

**Remedial Action Plan
Former Boral Timber Site
Lot 310, Murray Road
Wingham NSW**

Prepared for:

Boral Limited
Greystanes Road
(PO Box 42)
Wentworthville NSW 2145

19 February 2001
Project Reference: J109264B

Prepared by:

IT Environmental (Australia) Pty Ltd
17 Forrester Street, Kingsgrove
New South Wales, Australia

Written/Submitted by:



Matthew Bennett
Project Manager

Record of Distribution

No. of copies	Report File Name	Report Status	Date	Prepared for:	Initials
3	J109264B-R01	Final	19/02/01	Boral Limited, Peter Allcorn	MPS
1	J109264B-R01	Final	19/02/01	IT Environmental, Sydney file	

Table of Contents

1	Introduction	1
1.1	Background	1
1.2	Objectives	1
1.3	Occupational Health and Safety.....	1
2	Background Information	2
2.1	Site Identification	2
2.2	Proposed End Land Use for the Site	2
2.3	Site Geology and Hydrogeology	2
2.4	Extent and Distribution of Contaminants	2
3	Remediation Strategy	3
3.1	Site Validation Criteria	3
3.1.1	Excavation Validation Criteria	3
3.1.2	Offsite Disposal Criteria	3
3.1.3	Imported Fill Validation Criteria	3
3.2	Excavation of Impacted Soil.....	4
3.3	Validation of Excavation	4
3.4	Offsite Disposal	5
3.5	Backfilling of Excavation and Compaction	5
3.6	Environmental Management	5
4	References	6

List of Attachments

FIGURES

- Figure 1 Site Location Map
Figure 2 Site Map

APPENDICES

- Appendix A Waste Disposal Criteria

1 Introduction

1.1 Background

IT Environmental (Australia) Pty Ltd were commissioned by Boral Limited (Boral) to prepare a remedial action plan (RAP) for remediation works at their property located on Murray Road in Wingham, NSW (**Figure 1**).

The RAP has been prepared to provide details of the remediation approach to be undertaken at one location of the site, based on the results of an environmental site assessment (ESA) reported to Boral by *IT* in November 1999 (Ref: IT, 1999).

1.2 Objectives

The objectives of the RAP are to:

- Indicate the proposed end land use for the site, and discuss and present remediation criteria for the proposed end land use;
- Define the area of the site to be remediated; and
- Outline the remedial strategy.

1.3 Occupational Health and Safety

A site health and safety plan will be prepared for remedial works at the site, which will include:

- Hazard identification and control
- Personal protective equipment requirements
- Work zones
- Incident reporting
- Emergency contact numbers

The safety plan for the remedial works will comply with all relevant safety regulations.

2 Background Information

2.1 Site Identification

The site is located on the corner of Murray Road and Lambert Street in Wingham, NSW (**Figure 1**). The site is identified as Lot 310 in DP 976294.

One area of the site has been identified for remediation based on the results of previous investigation (IT, 1999). This area is identified on **Figure 2**.

2.2 Proposed End Land Use for the Site

The RAP has been prepared on the basis that the site will be suitable for low density residential landuse.

2.3 Site Geology and Hydrogeology

The site is generally overlain with topsoil immediately over weathered bedrock. Refusal on bedrock has occurred during previous investigations as shallow as 0.5m below ground surface (bgs).

No shallow groundwater was detected at the site (IT, 1999). Remediation at this site deals only with the shallow soil profile (to 0.5m). Subsequently, groundwater at the site is not considered an issue during the remedial works presented in this RAP.

2.4 Extent and Distribution of Contaminants

Sampling undertaken during the previous ESA (IT, 1999) indicated the following impact required remediation:

1. A near surface sample to depth 0.15m bgs detected total petroleum hydrocarbons (TPH) at 2661mg/kg in the C₁₅-C₃₆ range. This sample was collected immediately beneath the concrete floor of a former factory/storage shed. A sample between 0.3-0.5m bgs detected TPH at 115mg/kg in the C₂₉-C₃₆ range. The impact may be related to equipment storage and maintenance, and is expected to be isolated.

3 Remediation Strategy

3.1 Site Validation Criteria

Based on the recommendations made to Boral following completion of the previous ESA (IT, 1999), the remedial works presented in this RAP target TPH impacted surface soil at one location only. The following criteria are proposed.

3.1.1 Excavation Validation Criteria

NSW EPA (1994) guidelines for sensitive landuse will be used for validation of TPH results. These criteria are shown in the table below.

TPH range	Excavation Validation Criteria (mg/kg)
C6-C9	65
C10-C36	1000

3.1.2 Offsite Disposal Criteria

Off-site disposal of excavated soil may be required. Soil results will be compared to the NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. Tables A2, A3 and A4 from these guidelines will form the basis for waste classification of any soil to be disposed to landfill. Copies of these tables are included in Appendix A.

Further sampling after excavation is required to characterise the material for offsite disposal.

3.1.3 Imported Fill Validation Criteria

If impacted fill is required to backfill the excavation, then unless the backfill supplied is certified as virgin excavated natural material (VENM), all imported fill will be validated against NSW EPA (1998) NEHF A criteria for metals, organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs). These criteria are also contained in the National Environment Protection Measure (NEPM, 1999) (Schedule B1, Table 5-A, Column A). Fill material will also be validated against NSW EPA (1994) guidelines for TPH and benzene, toluene, ethylbenzene and xylenes (BTEX) compounds. Backfill validation criteria are shown in the table below.

Analyte	Backfill Validation Criteria (mg/kg)
Arsenic	500
Cadmium	100
Chromium (III)	600000
Chromium (VI)	500
Copper	5000
Lead	1500
Mercury	75
Nickel	3000
Zinc	35000

Analyte	Backfill Validation Criteria (mg/kg)
<i>OCPs</i>	
• Aldrin + Dieldrin	50
• DDT	1000
• Heptachlor	50
PCBs (total)	50
TPH (C6-C9)	65
TPH (C10-C36)	1000
Benzene	1
Toluene	1.4
Ethylbenzene	3.1
Xylenes (total)	14

3.2 Excavation of Impacted Soil

Impacted material will be excavated based on olfactory and visual recognition of impact, such as hydrocarbon odour and visible staining, as well as field screening for volatile organic compounds (VOCs) using a portable photoionisation detector (PID). However, the previous results indicate non-volatile hydrocarbon impact, which suggests that the PID may not detect any VOCs.

It is assumed that only a minor area requires excavation to around 0.3m depth, based on previous investigation results. Once the impacted soil is excavated, it will be stockpiled adjacent to the excavation for characterisation sampling.

Any concrete removed in order to excavate impacted soil will be placed under cover near the excavation area, for removal by Boral.

3.3 Validation of Excavation

Following removal of impacted material, validation samples will be collected from the walls and base of the excavation. Excavation walls will be validated at a rate of 1 sample per 10m (linear), and the base of the excavation will be validated at a rate of 1 sample per 25m². A total of 4 wall samples (1 along each wall) and 1 base sample is assumed.

Based on the results of the previous site assessment, validation samples will be analysed for TPH only.

For quality assurance/quality control (QA/QC), duplicate and triplicate samples will be taken at a rate of 1 duplicate for every 10 primary samples. The duplicate samples will be analysed by the primary laboratory, while the triplicate sample will be analysed by a secondary laboratory. Each laboratory will be NATA (National Association of Testing Authorities) accredited for the analyses requested.

3.4 Offsite Disposal

Once the impacted material is excavated and stockpiled, it will be sampled at a rate of 1 sample per 25m³ (1 sample is assumed). The sample will be analysed for TPH as well as total and leachable metals.

It is assumed that the material can be disposed of to a local landfill as inert waste (if required) after additional characterisation sampling has been undertaken. It is assumed that Boral will arrange disposal following characterisation, if required.

If the results of stockpile sampling indicate that the soil meets site validation criteria, disposal of the soil off site will not be required.

3.5 Backfilling of Excavation and Compaction

Once validation of the excavation has been achieved to the site validation criteria, Boral will arrange for the excavation to be backfilled and reinstated, if required.

3.6 Environmental Management

As the excavation is located away from any potential environmental receptors and the site boundaries, minor environmental management controls will be required during remediation. These will include:

- Dust will be monitored visually, and if deemed to be excessive and impacting offsite areas during windy periods, work will be stopped until such time as dust will not be an issue. Wetting may be required if dust becomes an issue.
- Excavated soil will be placed on a concrete surface beneath the covered area of the shed, such that no runoff can occur.

IT ENVIRONMENTAL (AUSTRALIA) PTY LTD

4 References

IT (1999) Additional Environmental Site Assessment, Boral Timber, Wingham. Report prepared by IT Environmental (Australia) Pty Ltd for Boral Limited, dated 3 November 1999 (Reference J109264A).

NEPM (1999) National Environment Protection (Assessment of Site Contamination) Measure, Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater, December 1999. Prepared by the National Environment Protection Council.

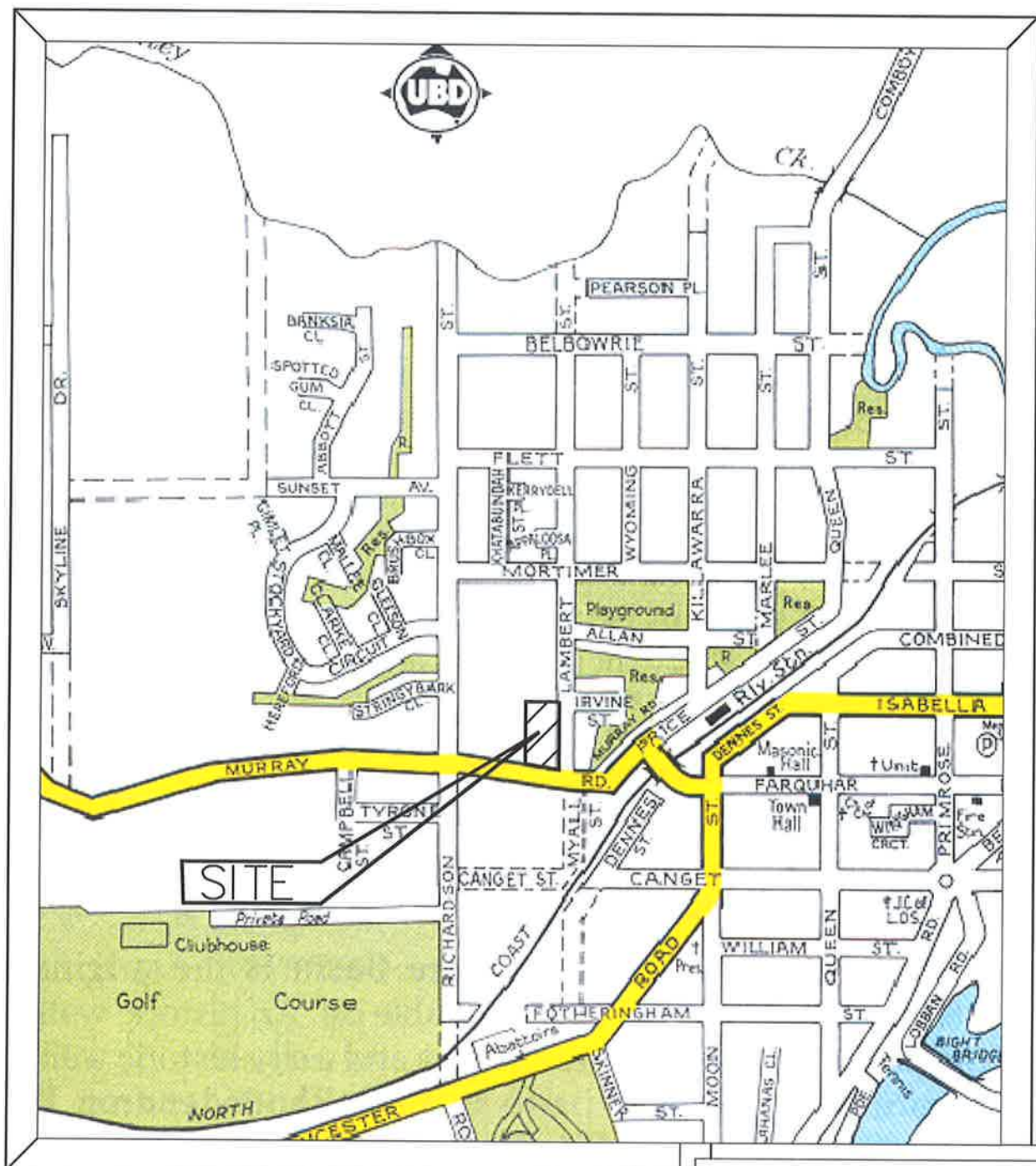
NSW EPA (May 1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes.

NSW EPA (1998) Guidelines for the NSW Site Auditor Scheme.

NSW EPA (1994) Guidelines for Assessing Service Stations Sites.

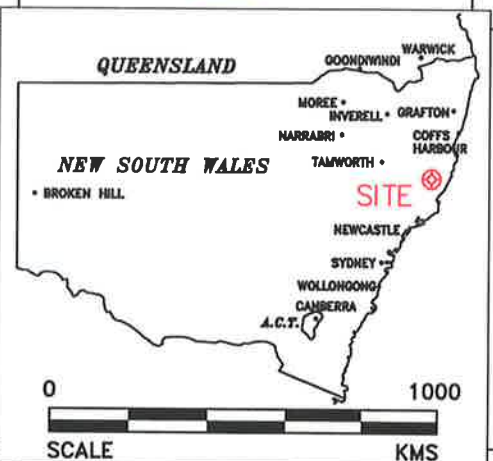
Figures

Remedial Action Plan
Former Boral Wingham Timber Plant, Lot 310



SOURCE: UBD N.S.W. CITIES AND TOWNS WINGHAM

SCALE: 1:25 000



IT Environmental
A Member of
the i group

17 FORRESTER STREET
KINGSGROVE NSW 2208
(02) 9502 4844

DESIGNED:

J.T.

COMPILED:

M.D.B

PROJ. NO.

J109264B

SITE LOCATION MAP

CLIENT:

BORAL LIMITED

LOCATION:

CNR LAMBERT ST & MURRAY RD
WINGHAM NEW SOUTH WALES

DRAWING DATE:

19/02/01

FIGURE:

1

LEGEND

- PREVIOUS TEST HOLE LOCATIONS
- ADDITIONAL TEST HOLE LOCATIONS
- ⊗ REMEDIATION AREA



NOTES: ALL LOCATIONS ARE APPROXIMATE.
SOURCE: McGLASHAN, CRISP & PARTNERS 17/5/93
SOURCE: IT ENVIRONMENTAL



GULLY

C L O S E D R O A D

LOT 246

LOT 270

LOT 310

OFFICE & STORAGE

WAREHOUSE

FACTORY

A/G DIESEL TANK BUND

M U R R A Y R O A D

APPROX. LOCATION OF OPEN STORAGE AREA FOR TREATED TIMBER

TEMPORARY STORAGE AREA FOR CCA TREATED TIMBER

SAWDUST BIN

REMEDIAL AREA

LOCATION OF BORON DIP TANKS

STORMWATER INTERCEPTION SUMP (SUMP1)

TRANSFORMER

IT Environmental
A Member of
the Group

17 FORRESTER STREET
KINGSGROVE NSW 2208
(02) 9502 4944

REV. NO.:	1	DRAWING DATE:	19/02/01	ACAD FILE:	J:\020204\020204\LOT 310 SAMPLE LOCATIONS
-----------	---	---------------	----------	------------	---

LOT 310 SITE PLAN AND REMEDIAL AREA

CLIENT:	BORAL LIMITED	PM:	M.D.B.
LOCATION:	CNR LAMBERT ST & MURRAY RD WINGHAM, N.S.W.	PS:	A.P.
DESIGNED:	M.D.B.	PROJECT NO.:	J109264B
DETAILED:	L.S.	FIGURE:	2

R I C H A R D S O N S T R E E T

APPENDIX A

Offsite Disposal Criteria

Remedial Action Plan
Former Boral Wingham Timber Plant, Lot 310

Table A2: Summary of criteria for chemical contaminants in non-liquid waste classification (See also Table 6 in Section 3.4.3.)		
Waste classification¹	Criteria² for classification (any of the alternative options given)	Comments
Inert	1. SCC test values $\leq$ CT1.	TCLP test not required.
	2. TCLP test values $\leq$ TCLP1 <u>and</u> SCC test values $\leq$ SCC1.	
	3. TCLP test values $\leq$ TCLP1 <u>and</u> SCC test values $>$ SCC1 <u>and</u> immobilisation ³ is EPA approved.	Without EPA approval of immobilisation, classify as solid, industrial or hazardous.
Solid	1. SCC test values $\leq$ CT2.	TCLP test not required.
	2. TCLP1 $<$ TCLP test values $\leq$ TCLP2 <u>and</u> SCC test values $\leq$ SCC2.	
	3. TCLP1 $<$ TCLP test values $\leq$ TCLP2 <u>and</u> SCC test values $>$ SCC2 <u>and</u> the immobilisation ³ is EPA approved.	Without EPA approval of immobilisation, classify as industrial or hazardous.
Industrial	1. SCC test values $\leq$ CT3.	TCLP test not required.
	2. TCLP2 $<$ TCLP test values $\leq$ TCLP3 <u>and</u> SCC test values $\leq$ SCC3.	
	3. TCLP test values $\leq$ TCLP3 <u>and</u> SCC2 $<$ SCC test values $\leq$ SCC3.	
	4. TCLP2 $<$ TCLP test values $\leq$ TCLP3 <u>and</u> SCC test values $>$ SCC3 <u>and</u> immobilisation ³ is EPA approved.	Without EPA approval of immobilisation, classify as hazardous.
Hazardous	1. TCLP test values $>$ TCLP3.	Store or treat waste as appropriate.
	2. TCLP test values $\leq$ TCLP3 <u>and</u> SCC test values $>$ SCC3 <u>and</u> immobilisation is not EPA approved.	Store or treat waste as appropriate.
Notes: 1. See also the general rules relating to waste classification (listed earlier in Part 5) for other criteria that must be satisfied before the waste can be classified. 2. These criteria apply to each toxic and ecotoxic contaminant present in the waste (see Tables A3 and A4). 3. In certain cases the EPA will consider specific conditions, such as the segregation of such waste from all other types of waste in a monofill or a monocell, in order to achieve a greater margin of safety against a possible failure of the immobilisation in the future. Information about the construction and operation of a monofill/monocell is available in the <i>Draft Environmental Guidelines for Industrial Waste Landfilling</i> , (EPA 1998a).		

Worked examples of this assessment and classification process are given later in this part of the Appendix.

Table A3: Contaminant threshold values for waste classification of non-liquid wastes without doing the leaching test¹

Contaminant	Maximum values of <i>total concentration</i> for classification without TCLP.			CAS registry number
	Inert waste	Solid waste	Industrial waste	
	CT1 (mg/kg)	CT2 (mg/kg)	CT3 (mg/kg)	
Arsenic	10	100	400	
Benzene	1	10	40	71-43-2
Benzo(a)pyrene ²	0.08	0.8	3.2	50-32-8
Beryllium	2	20	80	
Cadmium	2	20	80	
Carbon tetrachloride	1	10	40	56-23-5
Chlorobenzene	200	2000	8000	108-90-7
Chloroform	12	120	480	67-66-3
Chromium (VI) ³	10	100	400	
m-Cresol	400	4000	16000	108-39-4
o-Cresol	400	4000	16000	95-48-7
p-Cresol	400	4000	16000	106-44-5
Cresol (total)	400	4000	16000	1319-77-3
Cyanide (amenable) ⁴	7	70	280	
Cyanide (total)	32	320	1280	
2,4-D	20	200	800	94-75-7
1,2-Dichlorobenzene	8.6	86	34.4	95-50-1
1,4-Dichlorobenzene	15	150	600	106-46-7
1,2-Dichloroethane	1	10	40	107-06-2
1,1-Dichloroethylene	1.4	14	56	75-35-4
Dichloromethane	17.2	172	688	75-09-2
2,4-Dinitrotoluene	0.26	2.6	10.4	121-14-2
Ethylbenzene	60	600	2400	100-41-4
Fluoride	300	3000	12000	
Lead	10	100	400	
Mercury	0.4	4	16	
Methyl ethyl ketone	400	4000	16000	78-93-3
Molybdenum	10	100	400	
Nickel	4	40	160	
Nitrobenzene	4	40	160	98-95-3
C6-C9 petroleum hydrocarbons	N/A ⁶	N/A ⁶	N/A ⁶	-

Table A3: Contaminant threshold values for waste classification of non-liquid wastes without doing the leaching test¹

Contaminant	Maximum values of total concentration for classification without TCLP.			CAS registry number
	Inert waste	Solid waste	Industrial waste	
	CT1 (mg/kg)	CT2 (mg/kg)	CT3 (mg/kg)	
C10-C36 petroleum hydrocarbons	N/A ⁶	N/A ⁶	N/A ⁶	—
Phenol (non-halogenated)	28.8	288	1152	108-95-2
Polychlorinated biphenyls ⁵	N/A ⁶	N/A ⁶	N/A ⁶	1336-36-3
Polycyclic aromatic hydrocarbons (total) ⁵	N/A ⁶	N/A ⁶	N/A ⁶	—
Scheduled chemicals ⁵	N/A ⁶	N/A ⁶	N/A ⁶	Refer to Appendix 5
Selenium	2	20	80	
Silver	10	100	400	
Styrene (vinyl benzene)	6	60	240	100-42-5
1,1,1,2-Tetrachloroethane	20	200	800	630-20-6
1,1,2,2-Tetrachloroethane	2.6	26	104	79-34-5
Tetrachloroethylene	1.4	14	56	127-18-4
Toluene	28.8	288	1152	108-88-3
1,1,1-Trichloroethane	60	600	2400	71-55-6
1,1,2-Trichloroethane	2.4	24	96	79-00-5
Trichloroethylene	1	10	40	79-01-6
2,4,5-Trichlorophenol	800	8000	32000	95-95-4
2,4,6-Trichlorophenol	4	40	160	88-06-2
Vinyl chloride	0.4	4	16	75-01-4
Xylenes (total)	100	1000	4000	1330-20-7

Notes to Table A3:

1. For organic and inorganic chemical contaminants not listed in Table A3, contact the EPA for disposal requirements. Note that aluminium, barium, boron, chromium (0 and III oxidation states), cobalt, copper, iron, manganese, vanadium and zinc have deliberately not been listed in this table and need not be tested for.
2. There may be a need for the laboratory to concentrate the sample to achieve the TCLP limit value for benzo(a)pyrene with confidence.
3. These limits apply to chromium in the +6 oxidation state only.
4. Analysis for cyanide (amenable) is the established method used to assess potentially leachable cyanide. Other methods may be considered by the EPA if it can be demonstrated that these methods yield the same information.
5. Scheduled chemicals, polycyclic aromatic hydrocarbons and polychlorinated biphenyls are assessed by using SCC1, SCC2 and SCC3. No TCLP analysis is required.
6. N/A means not applicable, but, see Table A4 for SCC criteria.

Table A4: Leachable concentration (TCLP) and total concentration (SCC) values for non-liquid waste classification¹

Contaminant	Maximum values for <i>leachable concentration</i> and <i>total concentration</i> when used together .						CAS registry number
	Inert waste		Solid waste		Industrial waste		
	Leachable concentration	Total concentration	Leachable concentration	Total concentration	Leachable concentration	Total concentration	
	TCLP1 (mg/L)	SCC1 (mg/kg)	TCLP2 (mg/L)	SCC2 (mg/kg)	TCLP3 (mg/L)	SCC3 (mg/kg)	
Arsenic	0.5	500	5.0 ²	500	20	2000	
Benzene	0.05	18	0.5 ²	18	2	72	71-43-2
Benzo(a)pyrene ²	0.004 ³	1	0.04 ⁴	10	0.16	23	50-32-8
Beryllium	0.1	100	1.0 ⁵	100	4	400	
Cadmium	0.1	100	1.0 ²	100	4	400	
Carbon tetrachloride	0.05	18	0.5 ²	18	2	72	56-23-5
Chlorobenzene	10	3600	100 ²	3600	400	14400	108-90-7
Chloroform	0.6	216	6 ²	216	24	864	67-66-3
Chromium (VI) ⁷	0.5	1900	5 ²	1900	20	7600	
m-Cresol	20	7200	200 ²	7200	800	28800	108-39-4
o-Cresol	20	7200	200 ²	7200	800	28800	95-48-7
p-Cresol	20	7200	200 ²	7200	800	28800	106-44-5
Cresol (total)	20	7200	200 ²	7200	800	28800	1319-77-3
Cyanide (amenable) ^{8,9}	0.35	300	3.5 ⁸	300	14	1200	
Cyanide (total) ⁸	1.6	5900	16 ⁸	5900	64	23600	
2,4-D	1	360	10 ²	360	40	1440	94-75-7
1,2-Dichlorobenzene	0.43	155	4.3 ²	155	17.2	620	95-50-1
1,4-Dichlorobenzene	0.75	270	7.5 ²	270	30	1080	106-46-7
1,2-Dichloroethane	0.05	18	0.5 ²	18	2	72	107-06-2
1,1-Dichloroethylene	0.07	25	0.7 ²	25	2.8	100	75-35-4
Dichloromethane	0.86	310	8.6 ²	310	34.4	1240	75-09-2
2,4-Dinitrotoluene	0.013	4.68	0.13 ²	4.68	0.52	18.7	121-14-2
Ethylbenzene	3	1080	30 ⁶	1080	120	4320	100-41-4
Fluoride	15	10000	150 ⁶	10000	600	40000	
Lead	0.5	1500	5 ²	1500	20	6000	
Mercury	0.02	50	0.2 ²	50	0.8	200	
Methyl ethyl ketone	20	7200	200 ²	7200	800	28800	78-93-3

Table A4: Leachable concentration (TCLP) and total concentration (SCC) values for non-liquid waste classification¹

Contaminant	Maximum values for <i>leachable concentration</i> and <i>total concentration</i> when used together .						CAS registry number
	Inert waste		Solid waste		Industrial waste		
	Leachable concentra- tion	Total concentra- tion	Leachable concentra- tion	Total concentra- tion	Leachable concentra- tion	Total concentra- tion	
	TCLP1 (mg/L)	SCC1 (mg/kg)	TCLP2 (mg/L)	SCC2 (mg/kg)	TCLP3 (mg/L)	SCC3 (mg/kg)	
Molybdenum	0.5	1000	5 ⁶	1000	20	4000	
Nickel	0.2	1050	2 ⁶	1050	8	4200	
Nitrobenzene	0.2	72	2 ²	72	8	288	98-95-3
C6-C9 petroleum hydrocarbons ¹⁴	N/A ¹⁴	650	N/A ¹⁴	650	N/A ¹⁴	2600	-
C10-C36 petroleum hydrocarbons ¹⁴	N/A ¹⁴	5000	N/A ¹⁴	10000	N/A ¹⁴	40000	-
Phenol (non-halogenated)	1.44	518	14.4 ¹⁰	518	57.6	2073	108-95-2
Polychlorinated biphenyls ¹¹	N/A ¹¹	2	N/A ¹¹	<50	N/A ¹¹	<50	1336-36-3
Polycyclic aromatic hydrocarbons(total) ^{11,12}	N/A ¹¹	200	N/A ¹¹	200	N/A ¹¹	800	-
Scheduled chemicals ^{11, 13}	N/A ¹¹	1	N/A ¹¹	<50	N/A ¹¹	<50	Refer to Appendix 5
Selenium	0.1	50	1 ²	50	4	200	
Silver	0.5	180	5.0 ²	180	20	720	
Styrene (vinyl benzene)	0.3	108	3 ⁶	108	12	432	100-42-5
1,1,1,2 – Tetrachloroethane	1	360	10 ²	360	40	1440	630-20-6
1,1,2,2- Tetrachloroethane	0.13	46.8	1.3 ²	46.8	5.2	187.2	79-34-5
Tetrachloroethylene	0.07	25.2	0.7 ²	25.2	2.8	100.8	127-18-4
Toluene	1.44	518	14.4 ¹⁰	518	57.6	2073	108-88-3
1,1,1-Trichloroethane	3	1080	30 ²	1080	120	4320	71-55-6
1,1,2-Trichloroethane	0.12	43.2	1.2 ²	43.2	4.8	172.8	79-00-5
Trichloroethylene	0.05	18	0.5 ²	18	2	72	79-01-6
2,4,5-Trichlorophenol	40	14400	400 ²	14400	1600	57600	95-95-4
2,4,6-Trichlorophenol	0.2	72	2 ²	72	8	288	88-06-2
Vinyl chloride	0.02	7.2	0.2 ²	7.2	0.8	28.8	75-01-4
Xylenes (total)	5	1800	50 ¹⁵	1800	200	7200	1330-20-7

NSW Environment Protection Authority

SITE AUDIT STATEMENT

Schedule 1, Form 2 (Contaminated Land Management Regulation 1998)

SITE AUDITOR (accredited under the *Contaminated Land Management Act 1997*):

Name:	Dr William Ryall	Phone:	02 9810 7973
Company:	Contamination Management Pty Ltd	Fax:	02 9810 5956
Address:	PO Box 1021	Accred. No:	9809
	ROZELLE NSW 2039		

SITE AUDIT STATEMENT NO: WRR98/1

SITE DETAILS:

Address:	Murray Road, Wingham	Postcode:	2429
Lot and DP number:	Lot 310 in DP 976294.		
Local government area:	Greater Taree Council		

SITE AUDIT REQUESTED BY:

Name:	Mr P Allcom		
Company:	Boral Limited		
Address:	Level 39, AMP Centre		
	50 Bridge Street, Sydney	Postcode:	2000
Phone:	9220 6406	Fax:	9233 3725

Name of contact person (if different from above): N/A

Consultancy(ies) who conducted the site investigation(s) and/or remediation:

IT Environmental (Australia) Pty Ltd.

Title(s) of report(s) reviewed:

1. Remedial Action Plan, Lot 310, Former Boral Timber Site, Lot 310, Murray Road, Wingham, NSW" by IT Environmental (Australia) Pty Ltd (ITE) dated 19 February 2001.
2. "Excavation and Validation of Hydrocarbon 'Hotspot' Lot 310, Former Boral Timber Site, Murray Road, Wingham, NSW" by ITE dated 18 December 2001.

Other information reviewed:

N/A.

Summary Site Audit Report

Title: Summary Site Audit Report. Lot 310 Former Boral Timber Site, Wingham.

Date : 19 March 2002.

I have completed a site audit (as defined in the *Contaminated Land Management Act 1997*) and reviewed the reports and information referred to above with due regard to relevant laws and guidelines. I certify that the site (tick **all** appropriate boxes):

(a) is suitable for the following use(s):

- ☐ residential, including substantial vegetable garden and poultry;
- ☐ residential, including substantial vegetable garden excluding poultry;
- ☒ residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake) excluding poultry;
- ☒ residential with minimal opportunity for soil access, including units;
- ☒ daycare centre, preschool, primary school;
- ☒ secondary school;
- ☒ park, recreational open space, playing field;
- ☒ commercial/industrial use;
- ☐ other (please specify): N/A

subject to:

- ☐ condition(s) (please specify): N/A

(b) is not suitable for any beneficial use due to risk of harm from contamination.

- ☐ (comments): N/A

I am accredited by the NSW Environment Protection Authority under the *Contaminated Land Management Act 1997* as a Site Auditor.

Accreditation Number: 9809

I certify that:

- (a) I have personally examined and am familiar with the information contained in this statement, including the reports and information referred to in this statement, and
- (b) this statement is, to the best of my knowledge, true, accurate and complete, and
- (c) on the basis of my inquiries made to those individuals immediately responsible for making the reports, and obtaining the information, referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties for wilfully submitting false, inaccurate or incomplete information.

Signed:



Date: 19 March 2002

FORWARD TO:

Manager, Contaminated Sites Section
NSW Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

Phone: 02 9995 5614

Fax: 02 9995 5999

Summary Site Audit Report

**Lot 310
Former Boral Timber Site
Wingham**

0078

19 March 2002

Contamination Management Pty Ltd

ABN 53 082 736 276
PO Box 1021
Rozelle NSW 2039
Tel 9810 7973 Fax 9810 5956

1. Introduction

I have completed an independent review of the reports listed below relating to the environmental condition of Lot 301, which formed part of the former Boral Timber site at Wingham, and have produced this Summary Site Audit Report in support of Site Audit Statement WRR98/1, which is attached to and must be read with this Report.

The former Boral Timber site at Wingham comprised Lots 246, 270 and 310 and a parcel of land referred to as the "closed road". I have previously reviewed a number of reports relating to the environmental condition of the three lots and the closed road. The assessment of Lots 246 and 270 and the closed road demonstrated that no significant contamination was present, but some petroleum hydrocarbon contamination was identified on Lot 301. In my Summary Site Audit Report dated 10 November 1999, I concluded as follows:

"I agree with IT Environmental's conclusion that the levels of chemical substances identified in the soil on Lots 270 and 246 and on the closed road presents no significant risk to the health of occupiers of the site and that no remediation is indicated in this respect. Lots 270 and 246 can be safely developed for use as a retirement village.

I agree that remediation of the petroleum hydrocarbons identified on Lot 310 is required to be undertaken if this Lot is to be used for sensitive purposes. No remediation would be required to be undertaken if Lot 301 were to be continued to be used for commercial or industrial purposes."

It has been decided subsequently that Lot 301 should be developed for residential purposes and that the identified petroleum hydrocarbon contamination should be remediated and the site validated. This Summary Site Audit Report addresses the program of remediation and validation undertaken on Lot 301.

A list of references, source publications, abbreviations and acronyms is contained at the end of the report. In accordance with requirements of NSW EPA, in completing this Summary Site Audit Report I have completed the "Checklist for Site Auditors", which is kept on my file.

Purpose of the Site Audit

The purpose of the Site Audit was to determine the nature and extent of any contamination on the land and the nature and extent of the investigation and remediation, and what, if any investigation or remediation remains necessary before the land is suitable for the proposed use.

I understand that the Summary Site Audit Report is required for commercial purposes only at this time, but may be used in support of a development application at a later time. In this respect, the Audit is not a Statutory Audit.

The site audit process

The Site Audit process comprises an independent review by a Site Auditor accredited by

the NSW Environment Protection Authority (EPA) of one or more reports of investigation, remediation and validation of a contaminated or potentially contaminated site that have been prepared by an environmental consultant. The audit process includes, firstly, preparation of a Summary Site Audit Report and the "Checklist for Site Auditors using the EPA Guidelines for the NSW Site Auditor Scheme 1998", which summarises the results reported by the consultant, and, finally, preparation of a Site Audit Statement.

This Site Audit has been carried out by Bill Ryall who is a Site Auditor accredited by the NSW Environment Protection Authority (Accreditation No. 9809), who trades through Contamination Management Pty Ltd.

Site Audits are carried out by the environmental consultant by reference to guidelines published by the NSW EPA and if the reports prepared by the consultant are in substantial conformance with the guidelines the Site Auditor is entitled to accept the results and conclusions stated therein and to complete the Summary Site Audit Report and to issue a Site Audit Statement and/or to provide other advice based on the results and conclusions stated in the report/s by an environmental consultant.

The Site Auditor does not normally carry out any independent sampling or chemical analyses of soil, fill, groundwater or other media on the subject site, but relies on the testing and reporting that has been carried out by the environmental consultant if it has been demonstrated to be of adequate reliability by reference to quality indicators listed in the NSW EPA's guidelines.

It is expressly recognised that even when a qualified environmental consulting firm has substantially followed guidelines published by the NSW EPA that unidentified contamination or sub-surface structures may remain present on a site and that the processes of investigation, remediation and validation are statistically based and that no liability is accepted by the Site Auditor for unidentified contamination or sub-surface structures subsequently found to be present on a site which has been subjected to investigation, remediation and validation processes that are in substantial conformance to guidelines published by the NSW EPA.

This Summary Site Audit Report and the attached Site Audit Statement have addressed the suitability of the site for the proposed purpose in its state at the time of the consultant's investigation and/or remedial works and has not addressed the suitability of fill materials or soil for off-site disposal or for any other purpose. Should the site be used for any other purpose in the future, its environmental condition should be assessed in accordance with appropriate guidelines published by NSW EPA.

Reports reviewed

The reports I reviewed in preparing this Summary Site Audit Report were:

1. Remedial Action Plan, Lot 310, Former Boral Timber Site, Lot 310, Murray Road, Wingham, NSW" by IT Environmental (Australia) Pty Ltd (ITE) dated 19 February 2001.

2. "Excavation and Validation of Hydrocarbon 'Hotspot' Lot 310, Former Boral Timber Site, Murray Road, Wingham, NSW" by ITE dated 18 December 2001.

Site identification

The subject site is located at Murray Road, Wingham, as shown on ITE's Figure 1, which is contained in Attachment 1 to this Report. The site is essentially rectangular in shape and has an approximate area of 8170 square metres.

The site is identified as Lot 310 in DP 976294 and is located in the Greater Taree Council local government area. The present zoning of the site was not addressed by ITE.

2. Remedial Action Plan

Site characterisation

The RAP presented satisfactory documentation relating to the site identification, history of use of the site, site condition, geology and hydrogeology and the environmental condition of the site, which had been described in acceptable detail in the environmental investigation report.

Identified contamination

The contamination identified by ITE comprised medium and heavy fraction petroleum hydrocarbons (referred to by ITE as "TPH", for petroleum hydrocarbons) located in shallow soils within a shed at the south-eastern part of Lot 310. ITE concluded that "The TPH impacted soil is believed to be related to vehicles parked in that area of the shed".

Bo BTEX compounds (benzene, toluene, ethylbenzene, xylenes) or polycyclic aromatic hydrocarbons (PAHs) were identified during the site investigation.

The extent of the contaminated soil was limited, being confined to the surface to soil to a depth of 0.3 m, and petroleum hydrocarbons were not present in samples from the depth range 0.3 to 0.5 m.

Groundwater was not encountered on the site during the investigation or remedial works.

Remediation goals

The goals of the remedial works outlined in the RAP ensured that the site can be used for the proposed low-density residential purposes and that there would be no unacceptable environmental or health impacts during remediation.

The goals are appropriate for the proposed remedial works.

Remediation options and strategy

ITE did not present options for the remedial works and did not satisfy the ANZECC (1992) order of preferred remediation options, which have been adopted by NSW EPA. However, the removal of contaminated soil from the site was justified because the heavy end petroleum hydrocarbons are not amenable to bioremediation processes within a reasonable period of time.

In addition, classification of the soils indicated them to be “inert waste” which could be used at the landfill as cover material.

Scope of the remedial works

The RAP listed in appropriate detail the scope of the remedial works, which comprised excavation, stockpiling and classifying the contaminated material and was commensurate with the nature and extent of the identified contamination and is satisfactory.

The area of contaminated soil was approximately 12.5 m x 7.5 m and extended to a depth of approximately 0.3 m.

Classification of contaminated materials

ITE stated that the classification of the contaminated materials was to be carried out in accordance with the requirements of NSW EPA (1999). This was satisfactory.

Licences and approvals

The RAP did not list any licences and approvals, although landfills in the Greater Taree Council local government area are not required to be licensed by NSW EPA to receive contaminated soil.

Environmental management plan

The RAP presented the general concepts for the Environmental Management Plan (EMP). The concept EMP addressed the following:

- Handling of stockpiled materials;
- Establishment (preparation of the landfarm areas, installation of pollution control measures and safety equipment and establishment of decontamination and truck cleaning facilities);
- Soil management plan (the process for identifying and managing the removal of contaminated soils and identifying natural soils, drainage control, processing of excavated soils, backfilling of excavations and equipment to be used);
- Stormwater management, including sediment control, erection and maintenance of silt-stop fences, isolation of existing stormwater drains, diversion of off-site stormwater, settling ponds, handling of water in excavations and disposal of waste water;
- Dust management, including application of water sprays to active earthworks areas, covering of stockpiles and loads, control of access roads, mitigation of dust generation

during excavation using dust suppression compounds, if required, and minimising excavated areas;

- Noise management, including requirements for equipment and adherence to hours of operation;
- Odour management, including covering and minimising excavation faces, covering of trucks and the use of odour suppressants;
- Site supervision by the Site Superintendent and the contractor's representative; and
- Hours of operation.

Overall, the matters listed in the RAP to be addressed in the remediation contractor's EMP are satisfactory.

Contingency management plan

The RAP did not address contingencies that may be encountered during the remedial works and this was reasonable because of the small scale of the remedial works.

Communications

The RAP listed the names and contact details of personnel responsible for various stages of the remedial works. This was satisfactory.

Long-term site management plan

No requirement for a long-term site management plan was addressed in the RAP. This was satisfactory because of the small scale of the remedial works.

Occupational health and safety plan

The RAP stated that a health and safety plan would be prepared by the remediation contractor.

Site validation criteria

Soils and fill

Site validation criteria for any petroleum hydrocarbons in soils left in place were stated in the RAP to be according to levels listed in NSW EPA (1994) "Contaminated Sites: Guidelines for Assessing Service Station Sites". The criteria listed in the RAP were appropriate for the site.

Soil disposal criteria

Soil to be disposed from the site was listed as being classified according to NSW EPA (1999). This was satisfactory.

Validation Program

Excavations

The strategy for validating that the contaminated materials had been removed from the excavation was outlined in RAP. Sampling was to be undertaken in accordance with the requirements of NSW EPA (1994) from the walls and floors of excavations, from stockpiled materials and from fill materials required to reinstate the site. The frequency of testing proposed in the RAP was satisfactory.

Validation samples from the UST excavation were stated as being analysed for petroleum hydrocarbons, BTEX compounds and lead. Samples of imported fill materials were stated as being analysed for heavy metals, petroleum hydrocarbons, BTEX compounds, organochlorine pesticides (OCPs) and polychlorinated biphenyls (PCBs). These chemicals of concern are appropriate for the proposed validation program. Samples were proposed to be analysed in a laboratory accredited by NATA for the specific analyses.

Quality control

The RAP provided an outline of the Data Quality Objectives (DQOs) required to be achieved for the validation program. The RAP addressed sample collection methods, preservation, decontamination, the number and types of field and laboratory quality control samples, transport or documentation requirements.

Reporting

The RAP proposed that only a final validation report would be prepared and no documentation would be produced during the remedial works. This is satisfactory given the small scale of the proposed remedial works.

Audit opinion

It is my opinion that the RAP substantially met the requirements of NSW EPA (1997).

Based on the information provided in the RAP, it is my opinion that the proposed remedial works were capable of being completed and were technically and environmentally justified.

3. Remedial works and validation program

Introduction

The Validation Report presented satisfactory documentation relating to the site identification, history of use of the site, site condition, geology and hydrogeology and environmental condition of the site, which had been described in acceptable detail in the reports reviewed previously.

Objectives

The objectives of the Validation Report were stated to "...excavate and stockpile hydrocarbon impacted soil, to validate the walls and floors of the excavations to NSW EPA (1994) criteria and to indicate that the site as a whole is suitable for low density residential development".

The objectives for the validation program were satisfactory.

Scope of work

To achieve the objectives, ITE listed tasks that were completed as follows:

- Excavation and stockpiling of hydrocarbon impacted soil;
- Collection and analysis of samples for quality control and validation purposes from the base and walls of the excavation;
- Sampling and analysis of excavated material at a rate of 1 per 25 cubic metres for petroleum hydrocarbons; and
- Preparation of a Validation Report documenting the above and providing any recommendations that were required.

The scope of work listed in the Validation Report was satisfactory to achieve the objectives of the remedial works.

Health & Safety Plan

The Validation Report did not comment on the health and safety plan implemented during the remedial works and I have not sighted this document.

Excavation of contaminated soil

Approximately 30 cubic metres of contaminated soil, identified by visual and olfactory means was excavated and stockpiled on a concrete pad under cover on the site. /

The Validation Report did not state the identity of the contractor employed for the remedial works.

Classification of excavated soil

Excavated soil was sampled at the rate of 1 per 25 cubic metres for analysis for petroleum hydrocarbons, BTEX compounds (benzene, toluene, ethylbenzene, xylenes), polycyclic aromatic hydrocarbons (PAHs) and the heavy metals (arsenic, cadmium, total chromium, hexavalent chromium, copper, lead, mercury and zinc).

Classification was stated as being made according to NSW EPA (1999), but details of the classification were not provided in the Validation Report. However, inspection of the laboratory reports verified ITE's classification.

Reinstatement of the excavation

The excavation was not reinstated. This was satisfactory in view of its shallowness.

Validation criteria

Chemicals to be analysed

For validation purposes, the Validation Report stated that samples were analysed only for petroleum hydrocarbons to meet levels listed in NSW EPA (1994) "Contaminated Sites: Guidelines for Assessing Service Station Sites".

Suitability of the site criteria

The site criteria adopted by ITE for validation purposes for the protection of the health of occupiers of the site are suitable.

Validation sampling and analysis

Sample locations

The locations of validation samples adopted by ITE were as stated in the RAP, in accordance with the requirements of NSW EPA (1994), and were shown on ITE's Figure 2 (Attachment 1).

Sample depths

The Validation Report was not specific on the depths from which samples for validation purposes were collected other than "Following removal of impacted material, validation samples were collected from the walls and base of the excavation...".

Sample collection methodology

Samples were stated as being collected with new neoprene gloves and were transferred into new glass jars and were labelled and placed on an ice-filled cooler for transport to the laboratory.

For the validation program, discrete samples were only employed and no composite samples were used.

Decontamination

No decontamination of sampling equipment was required for the validation program.

Documentation

Validation samples were collected on 19-22 February and 22 March 2001 and sent to the laboratories in two batches. Chain of custody documentation accompanied each batch and 0078. Summary Site Audit Report. Lot 310, Former Boral Timber Site, Wingham.

confirmed that the samples were received within three days of sample collection. Samples for classification of the excavated soil stockpiled on the site were collected on 8 May 2001.

The laboratories indicated that the samples were received chilled and intact.

Dates of receipt, extraction and completion of chemical analyses were reported by the laboratory, as noted below. Inspection of the laboratory reports sheets indicated that all samples were analysed within 10 days and indicated that holding times appropriate for each analyte were achieved.

Relevant dates for the validation program and stockpile classification were as follows:

<u>Date collected</u>	<u>Date received</u>	<u>Date extracted</u>	<u>Date analysed</u>	<u>Date reported</u>	<u>Laboratory</u>
19-22/2/01	22/2/01	26/2/01	27/2/01	5/4/01	ALS
22/3/01	27/3/01	26/28/3/01	28/3/01	29/3/01	ALS
19-22/2/01	22/2/01	not reported	not reported	23/2/01	Gribbles
8/5/01	8/5/01	9/5/01	9/5/01	14/5/01	ALS

Field screening analysis

Field screening for the presence of volatile organic compounds was carried out by ITE using a photoionisation detector (PID). Certificates documenting the calibration were provided in the Validation Report for 20 February 2001 and for 22 March 2001. However, I assume the latter date should read 22 February 2001 to correlate with the dates of sampling listed elsewhere in the report.

The make and model of the PID and the energy of the lamp source were not stated in the Validation Report. These omissions are not optimal, but the calibration sheets indicate that the PID was calibrated on a daily basis.

It is noted that the Validation Report indicated that the PID did not respond well to the petroleum hydrocarbons, which were mostly medium and heavy fractions.

Chemical analysis

Soil samples for validation purposes were analysed for the following substances:

- Petroleum hydrocarbons; and
- BTEX compounds.

To classify contaminated fill material from the excavation for disposal to landfill, three samples from the stockpile were analysed, in addition to the above, for:

- Heavy metals;
- Petroleum hydrocarbons;
- BTEX compounds;
- PAHs
- OCPs; and

- Phenoxyacid herbicides.

Samples were analysed by ALS (primary laboratory) and Gribbles (secondary laboratory). Both laboratories are certified by NATA to carry out the analyses for organic compounds.

The methods employed by ALS and the Practical Quantitation Levels (PQLs), were listed in the Validation Report and were in compliance with ANZECC (1996) and NEPC (1999c) and were satisfactory. The methods employed by ALS and the practical quantitation levels (PQLs) were as follows:

<u>Analyte</u>	<u>Reference method</u>	<u>Description</u>	<u>PQL</u> (mg/kg)
heavy metals	USEPA 6010	ICP-AES	0.5
mercury	USEPA 6020	ICPMS	0.05
petroleum hydrocarbons (C10-C36)	Tumbler/USEPA 8015A	GC/MS/FID	2-100
petroleum hydrocarbons (C6-C9)	Tumbler/USEPA 8260A	P&T/GC/MS	0.5
PAHs	USEPA 8270C	GC/MS	0.5 - 1
BTEX	USEPA 5030A, 8260A	P&T/GC/PID/FID	0.2 - 1
OCPs	Tumbler/USEPA 8270B	GC/MS	0.5 - 1

Analyses for PAHs using the specific method listed above analysed for 16 priority PAH compounds (naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benz(a)anthracene, chrysene, benzo(a)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1.2.3.cd)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)pyrene).

Analyses for OCPs listed above analysed for 14 compounds (alpha-, beta-, gamma- and delta-BHC, heptachlor, aldrin, heptachlor epoxide, endosulfan 1 and 2, 4,4'-DDE, dieldrin, endrin, 4,4'-DDD, endosulfan sulfate and 4,4'-DDT) and eight OPPs (methanesulfonate methyl and ethyl, dichlorvos, cis- and trans-isosafrole, safrole, dimethoate and diazinon).

The methods employed by ALS for chemical analysis of the samples were certified by NATA and were in accordance with the requirements of ANZECC (1996) and NEPC (1999c) and were satisfactory.

Field quality control

ITE employed the following procedures which comprised the Quality Control Plan for the project:

- use of experienced personnel for the collection of samples;
- appropriate methodology for the collection and handling of soil samples;
- preparation of field duplicate and field spilt samples for interlaboratory analysis; and
- use of a NATA certified laboratories, employing appropriate methods to analyse the field samples.

The above procedures were satisfactory.

Formal Data Quality Objectives (DQOs) were adopted by ITE, but no actions were

0078. Summary Site Audit Report. Lot 310, Former Boral Timber Site, Wingham.

specified to be undertaken if the analytical results did not meet the expected DQOs. It is noted that the DQOs were not in accordance with those listed in NSW EPA (1997).

Field duplicate samples

For petroleum hydrocarbons, where reported, Relative Percent Differences (RPDs) for analyses reported for original and duplicate samples ranged from 38 to 82 % for the C29 to C36 fractions. No C6 to C28 fractions were reported in either the original or duplicate quality control samples. The elevated RPDs were explained by ITE as being due to reported results close to the PQLs. However, the matter is not significant because in final validation samples concentrations of petroleum hydrocarbons were either less than the PQLs or were less than the site criteria.

No BTEX compounds were reported in any of the quality control samples.

Laboratory quality control

The laboratories reported the results of their internal quality control procedures for each batch of soil samples analysed. As noted above, the analytical methods employed were appropriate for the investigation and were in accordance with methods certified by NATA.

The detection limits and PQLs for all analytes were compatible with the DQOs that are required for the project.

The quality control program implemented by ITE was of adequate scope, but the discussion of the quality control program was brief and was not in accordance with the requirements of NSW EPA (1997). I have made an independent assessment of attainment of the project DQOs by reference to the Data Quality Indicators (precision, accuracy, representativeness, completeness and comparability), as required in NSW EPA (1997).

The quality control program reported by ALS consisted of the following:

- Analyses of method blanks for all analytes;
- Surrogate recoveries for volatile petroleum hydrocarbons, BTEX compounds and PAHs; /
- Single and duplicate control samples for BTEX compounds and PAHs;
- Matrix spike and matrix spike duplicate analyses for BTEX compounds, PAHs and metals;
- Laboratory control samples for metals; and
- Laboratory duplicate analyses for all analytes.

The quality control program reported by Gribbles consisted of the following:

- Analyses of method blanks for all analytes;
- Surrogate recoveries for volatile petroleum hydrocarbons and BTEX compounds;
- Matrix spike and matrix spike duplicate analyses for petroleum hydrocarbons, BTEX compounds;
- Laboratory control samples for metals; and

- Laboratory duplicate analyses for all analytes.

Method blank analyses were acceptable as none of the substances analysed for were detected for any of the analytes.

For metals, single and duplicate control sample recoveries were within the range 89 to 111 %, which were within acceptable control limits. Matrix spike and matrix spike duplicate recoveries were within the range 77 to 112 %, which were within acceptable control limits. No analyses of laboratory duplicate samples were carried out so that the precision of laboratory analyses could not be determined by this method.

For petroleum hydrocarbons and BTEX compounds, single and duplicate control sample recoveries ranged from 88 to 108 %, which were within acceptable control limits. Surrogate recoveries for volatile fractions and BTEX compounds ranged from 74 to 118 %, which were within acceptable control limits. Matrix spike and matrix spike duplicate recoveries ranged from 93 to 109 %, which were within acceptable control limits and indicated no significant matrix interference. RPDs of analyses of duplicate samples ranged from 0 to 15 %, which were within acceptable control limits.

For PAHs, single control and duplicate sample recoveries ranged from 69 to 85 %, which were within acceptable control limits. Surrogate recoveries ranged from 93 to 112 %, which were within acceptable control limits. Matrix spike and matrix spike duplicate recoveries ranged from 71 to 82 %, which were within acceptable control limits. No analyses of duplicate samples were reported and this method could not be used to assess the precision of the analyses.

OCPs and phenoxyacid herbicides were analysed for only by Gribbles, who reported results of only method blank, spike and duplicate analyses. It is my opinion that the results reported by Gribbles were not of high demonstrated reliability and are suitable only for confirmation purposes. No OCPs were reported in the investigation or validation stages and it is safe to conclude that the non-detect results reported by Gribbles confirm that OCPs are not of concern on Lot 310.

Equipment rinse blanks

No equipment rinse blanks were employed for the validation program.

Interlaboratory quality control analyses

Interlaboratory quality control analyses were reported by ITE only for petroleum hydrocarbons. The RPD of the interlaboratory duplicate analysis was 38 % for detected petroleum hydrocarbons, which indicated acceptable precision and accuracy.

Consultant's data validation

ITE presented a very brief commentary of the laboratory quality control results, but this was not of the standard reported for the investigation stage of the project, and each of the

Data Quality Indicators (precision, accuracy, representativeness, completeness and comparability) was not addressed in accordance with the requirements of NSW EPA (1997).

ITE concluded “Based on the laboratory quality control results, the laboratory data provided is considered valid and acceptable”. It is my opinion, however, that without assessing the quality control data in relation to all DQIs, ITE were not entitled to make the above conclusions. I have assessed the reliability of the analytical data, below.

Assessment of results of QC

Based on the results of the documented field and laboratory procedures and the analyses of QC samples submitted by ITE and the results of the internal laboratory QC analyses reported by the laboratories, it is my opinion that the results reported for the validation samples by ALS can be considered in terms of accuracy and precision to have adequate reliability for the purposes of the present validation program. The results reported by Gribbles have lesser reliability and are suitable only for confirmation purposes.

In terms of completeness, all results reported by ALS can be considered to have adequate reliability to be employed in assessing the environmental condition of the subject site. In terms of the representativeness, it is my opinion that the results reported by ALS can be relied on to provide an acceptable indication of the environmental condition of the fill, soil and groundwater on the site. In terms of comparability, it is my opinion that the results reported by ALS for each sampling event can be compared satisfactorily as samples were collected, preserved, handled and analysed in the same manner for each sampling event and any temporal differences were not significant.

Results of the validation process

Field screening analyses and odours

The results of screening analyses of samples collected for validation purposes with the PID were not reported by ITE.

ITE did not report on the presence of odours in the soil remaining after removal of the contaminated soil. However, given that the final validation samples did not contain any detectable petroleum hydrocarbons or BTEX compounds, it is safe to conclude that no significant odours were present in the excavation.

Validation of excavation

Samples of soil for validation purposes were collected from the walls and floors of the excavation at locations shown on ITE’s Figure 2 and the results of chemical analyses were reported in ITE’s Table 1. The final validation samples contained no detectable petroleum hydrocarbons or BTEX compounds.

Disposal of contaminated soil

A total of 57.5 t of contaminated soil was classified as inert waste and was disposed from the site to the landfill operated by Resource Recovery at Buckets Way, Taree. The Validation Report contained a facsimile from Resources Recovery confirming that this material had been accepted into their landfill.

Consultant's conclusion

ITE concluded that "Based on the field observations and laboratory results presented in this report, and in conjunction with reports from previous assessment and validation work, IT Environmental (Australia) Pty Ltd considers that the site is suitable for low density residential development".

4. Audit opinion

Based on the results presented in the environmental investigation and validation reports, and their substantial compliance with guidelines made by NSW EPA, it is my opinion that it is safe to conclude that the site is suitable for the proposed residential development and that no conditions are required to be noted on Site Audit Statement WRR98/1, which relates to the site.

Contamination Management Pty Ltd



W R Ryall

Accredited Site Auditor No 9809 (NSW EPA)

APPENDIX 1 – REFERENCES & SOURCE PUBLICATIONS

- ANZECC, 1992. Australian Water Quality Guidelines for Fresh and Marine Waters. Australian and New Zealand Environment and Conservation Council.
- ANZECC/NHMRC, 1992. Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites. Australian and New Zealand Environment and Conservation Council / National Health and Medical Research Council.
- ANZECC/NHMRC, 1992. Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites. Australian and New Zealand Environment and Conservation Council and National Health and Medical Research Council.
- Australian Standard AS 4482.1-1997. Guide to sampling and investigation of potentially contaminated soil: Part 2: Non-volatile and semi-volatile substances. Standards Australia.
- Australian Standard AS 4482.1-1999. Guide to sampling and investigation of potentially contaminated soil: Part 2: Volatile substances. Standards Australia.
- Imray, P and G Neville, 1993. Approaches to the Assessment and Management of Asbestos Contaminated Soils. Second National Workshop on the health risk Assessment and management of Contaminated Sites, South Australian Health Commission.
- MHSPE, 1994. Environmental Quality Objectives in the Netherlands. Ministry of Housing, Spatial Planning and the Environment.
- NEHF, 1998. Health-Based Soil Investigation Levels. National Environmental Health Forum Monographs. Soil Series No 2. National Environmental Health Forum.
- NEPC, 1999(a). Guideline on the Investigation Levels for Soil and Groundwater. Schedule B(1). National Environmental Protection Measure.). National Environmental Protection Council.
- NEPC, 1999(b). Guideline on Data Collection, Sample Design and Reporting. Schedule B(2). National Environmental Protection Measure.). National Environmental Protection Council.
- NEPC, (1999c). Guideline on Laboratory Analysis of Potentially Contaminated Soils. Schedule B(3). National Environmental Protection Measure.). National Environmental Protection Council.
- NSW EPA, 1994. Contaminated Sites: Guidelines for Assessing Service Station Sites. NSW Environment Protection Authority.
- NSW EPA, 1995. Contaminated Sites: Sampling Design Guidelines. NSW Environment Protection Authority.
- NSW EPA, 1996. Environmental Guidelines: Solid Waste Landfills. NSW Environment Protection Authority.
- NSW EPA, 1997. Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites. NSW Environment Protection Authority.
- NSW EPA, 1998. Contaminated Sites. Guidelines for the NSW Site Auditor Scheme. NSW Environment Protection Authority.
- NSW EPA, 1999. Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes. NSW Environment Protection Authority.

APPENDIX 2 – GLOSSARY OF ABBREVIATIONS AND ACRONYMS

ACM. Asbestos containing material(s).
ANZECC. Australian and New Zealand Environment and Conservation Council.
AHD. Australian Height Datum.
APHA. American Public Health Association.
ASS. Acid Sulfate Soil.
BaP. Benzo(a)pyrene (a PAH).
BTEX. Benzene, toluene, ethylbenzene and xylenes.
CCA. Copper chrome arsenate.
DQOs. Data Quality Objectives.
DQIs. Data Quality Indicators.
EPA. New South Wales Environment Protection Authority.
EMP. Environmental Management Plan.
HASP. Health and Safety Plan.
HRA. Health Risk Assessment.
NEHF. National Environmental Health Forum.
NEPC. National Environmental Protection Measure.
NSW EPA. New South Wales Environment Protection Authority.
OCPs. Organochlorine pesticides.
OH&S. Occupational Health & Safety.
OPPs. Organophosphorus pesticides.
PAHs. Polynuclear Aromatic Hydrocarbons.
PCBs. Polychlorinated biphenyls.
PID. Photoionisation detector.
PQL. Practical quantitation level.
PSH. Phase Separated Hydrocarbon.
QA. Quality Assurance.
QC. Quality Control.
RAP. Remedial Action Plan.
RPD. Relative Percent Difference.
SAP. Sampling and Analytical Plan.
SMP. Soil or Site Management Plan
SVOCs. Semi-volatile Organic Compounds.
SWL. Standing Water level.
UCL. Upper Confidence Limit (on mean).
USEPA. United States Environment Protection Agency.
UST. Underground Storage Tank.
VOC. Volatile Organic Compound.

Terms relating to chemical analysis methods:

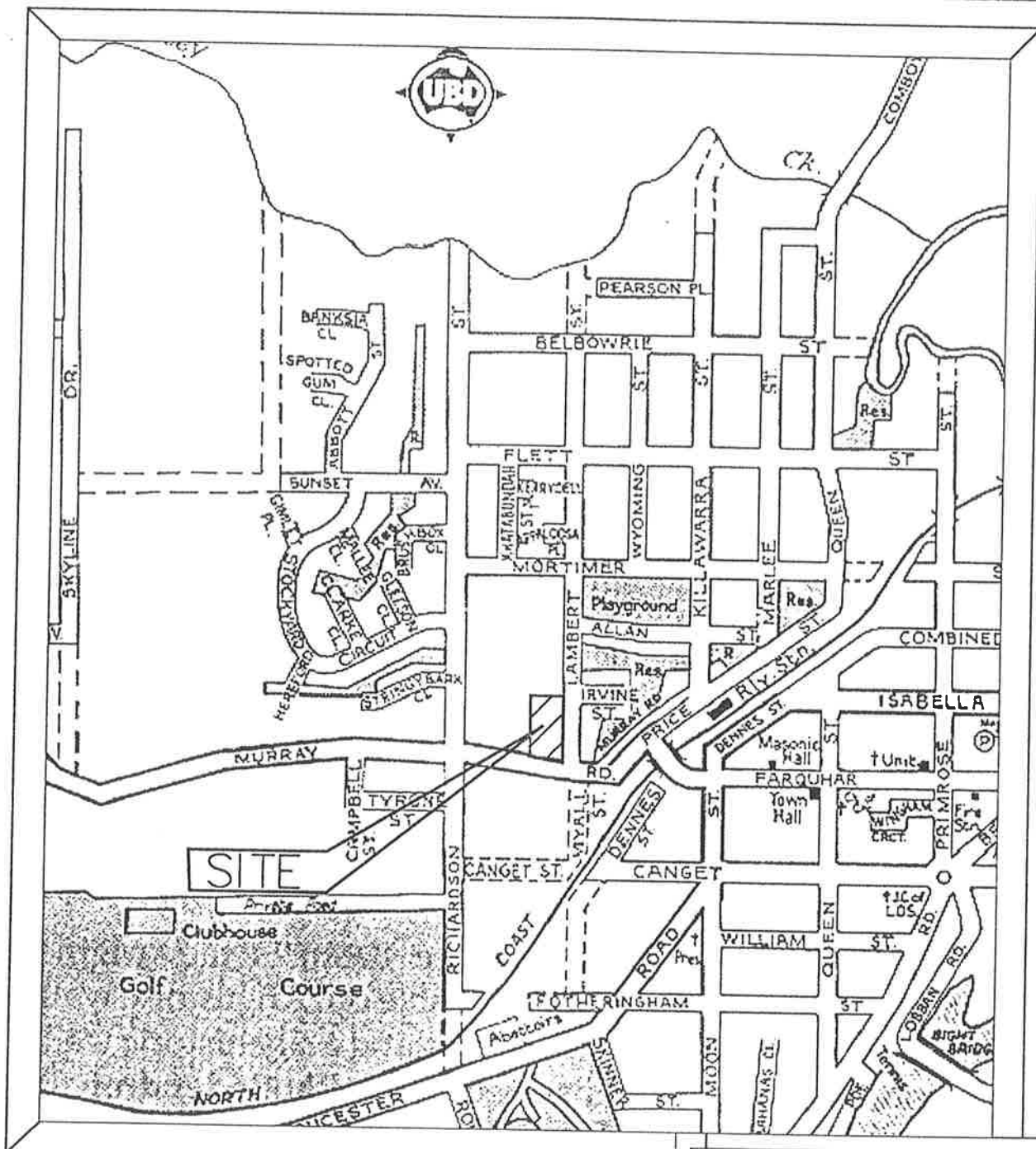
AES. Atomic emission spectrometry.
CV-AAS. Cold vapour atomic absorption spectrometry
GC/ECD. Gas chromatography/electron capture detector.
GC/FID. Gas chromatography/flame ionisation detector.
GC/NPD. Gas chromatography/nitrogen/phosphorus detector.
CG/MS. Gas chromatography/mass spectrometry.
GC/PID. Gas chromatography/photoionisation detector.
ICP Inductively coupled plasma.
OES. Optical emission spectrometry.
P&T. Purge and trap.

Units:

ha. hectare.
km. kilometre.
m. metre.
mg/kg. milligrams/kilogram.
ppm. parts per million.
mg/L. milligrams/litre.
µg/L. micrograms/litre.
t. tonne.

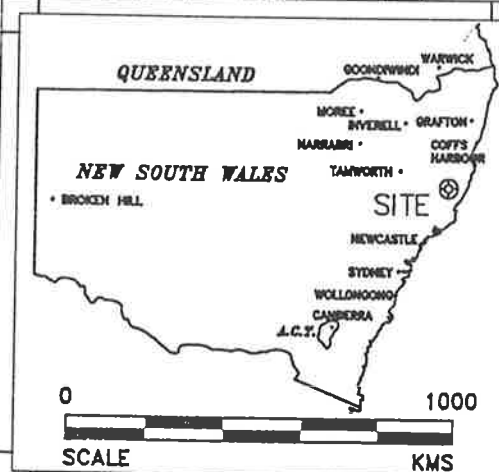
Attachment 1

Supporting information from validation program Figures



SOURCE: UBD N.S.W. CITIES AND TOWNS WINGHAM

SCALE: 1:25 000



IT Environmental
A Member of
the **igroup**

17 FORRESTER STREET
KINGSGROVE NSW 2208
(02) 9502 4844

DESIGNED:

J.T.

COMPILED:

M.D.B

PROJ. NO.

J109264B

CLIENT:

BORAL LIMITED

LOCATION:

CNR LAMBERT ST & MURRAY RD
WINGHAM NEW SOUTH WALES

DRAWING DATE:

19/02/01

FIGURE:

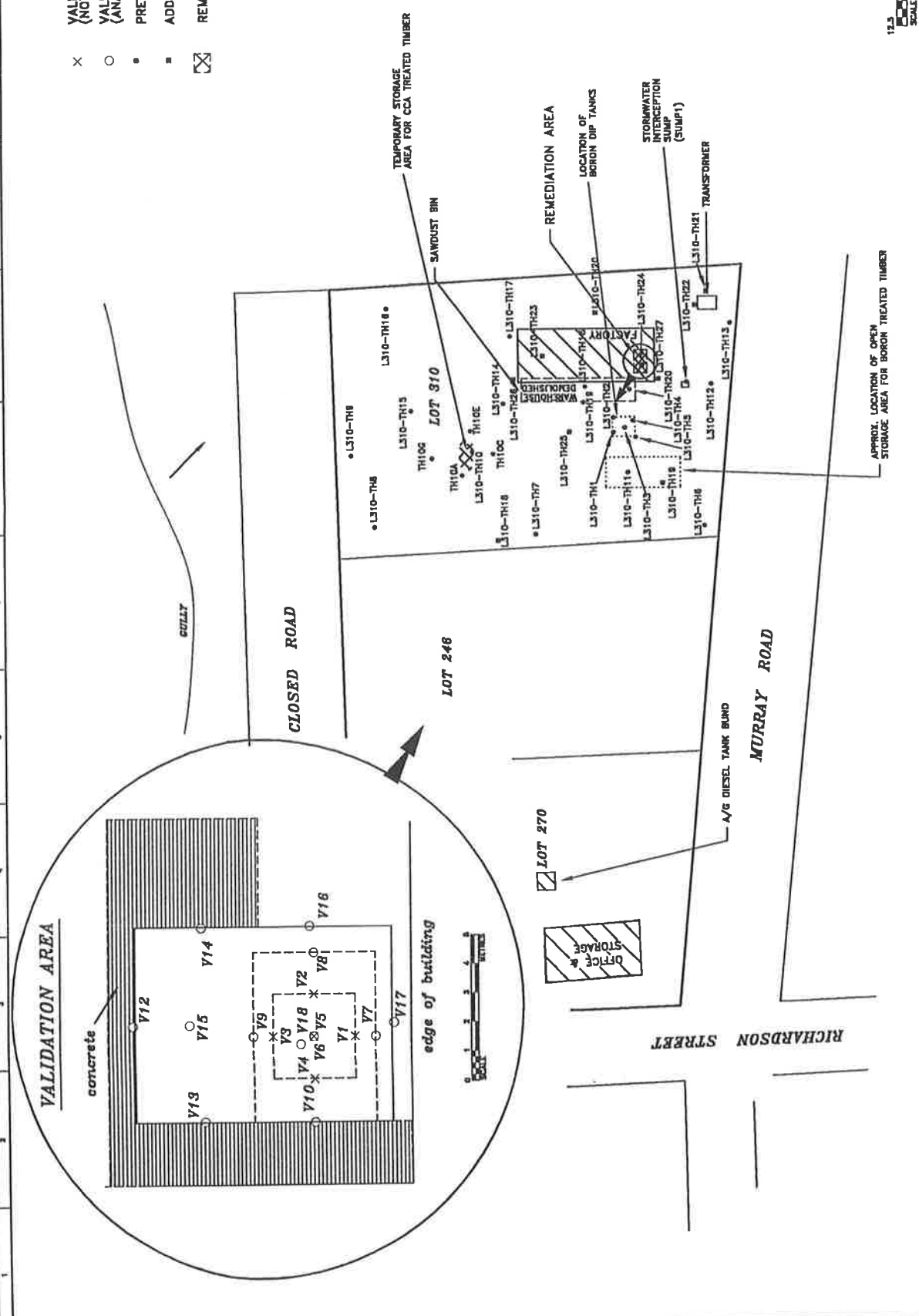
1

SITE LOCATION MAP

ADN FILE J1092648-003

LEGEND

- × VALIDATION SAMPLE LOCATIONS (NOT ANALYSED)
- VALIDATION SAMPLE LOCATIONS (ANALYSED)
- PREVIOUS TEST HOLE LOCATIONS
- ADDITIONAL TEST HOLE LOCATIONS
- ⊠ REMEDIATION AREA



LOCATION OF VALIDATION POINTS (LOT 310)

CLIENT:	BORAL	LOCATION:	MURRAY ROAD WINGHAM, NEW SOUTH WALES
DESIGNED:	AP	DATE:	9/03/01
DRAWN:	DPH	REV. NO:	A
CHECKED:		APPROVED:	
FIGURE:	2		

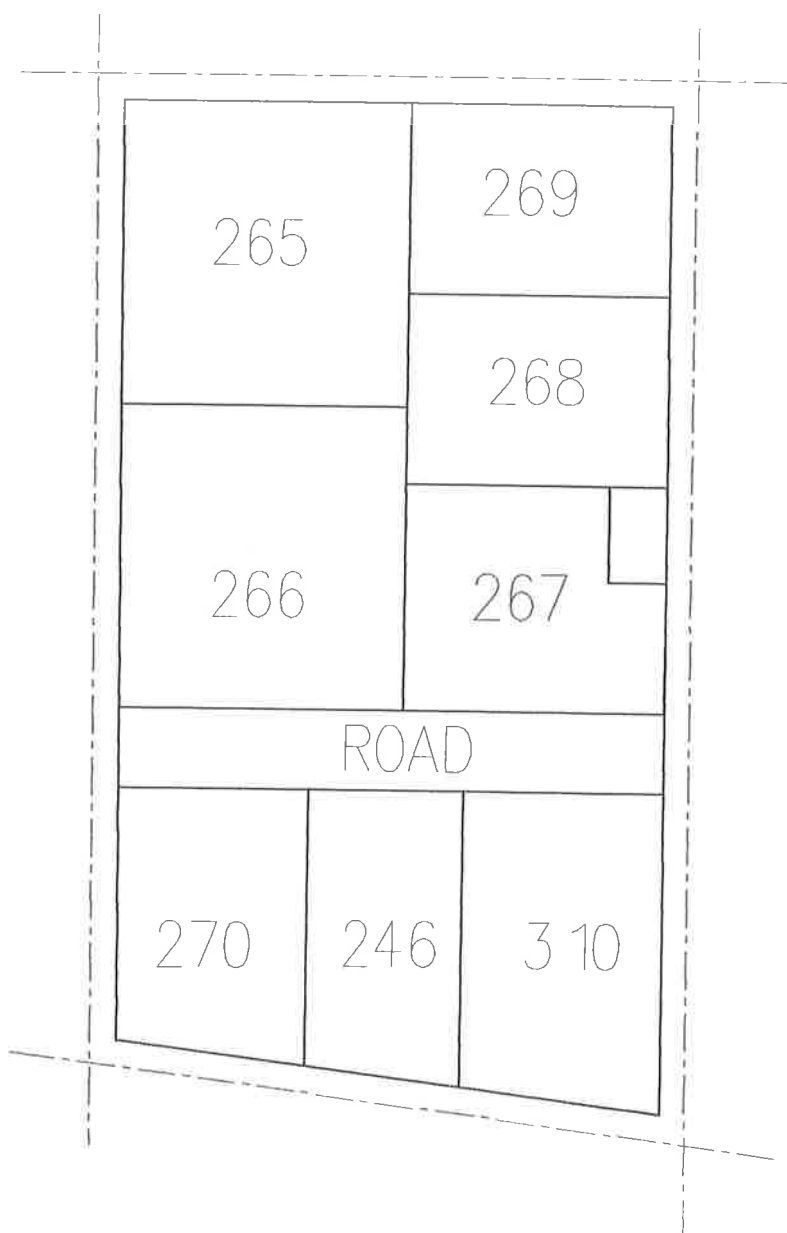
IT Environmental
1 Member of the *Q-group*

17 Enderby Street
Kingsgrove NSW 2038
Ph (02) 9592 4844
Fax (02) 9592 2105

DIMENSIONS IN m
DRAWING PRACTICE
DO NOT SCALE
TO AS1100

NOTES: ALL LOCATIONS ARE APPROXIMATE.
SOURCE: IT ENVIRONMENTAL

ISSUE	DATE	ORIGINAL ISSUE	AMENDMENTS	DEN	CD	APPO	SCALE	DATE	AMENDMENTS	DEN	CD	APPO
A	9/03/01											
A												



**Excavation and Validation of
Hydrocarbon 'Hotspot'
Lot 310, Former Boral Timber Site
Murray Road, Wingham, NSW**

Prepared for:

Boral Limited
Level 39, AMP Centre
50 Bridge Street
SYDNEY NSW 2000

18 December 2001
Project Reference: J109264B

Prepared by:

IT Environmental (Australia) Pty Ltd
17 Forrester Street, Kingsgrove 2208
New South Wales, Australia

Written/Submitted by:



per Alison Packwood
Environmental Scientist

Reviewed/Approved by:



Matthew Bennett
Project Manager

Record of Distribution

No. of copies	Report File Name	Report Status	Date	Prepared for:	Initials
4	J109264B-R03	Final	18 December 2001	Mr Peter Allcorn, Boral Limited	WPS
1	J109264B-R03	Final	18 December 2001	Mr Bill Ryall, Site Auditor, Contamination Management Pty Ltd	
1	J109264B-R03	Final	18 December 2001	IT Environmental (Australia) Pty Ltd	

Table of Contents

Executive Summary	iii
1 Introduction	1
1.1 Background	1
1.2 Objectives	1
1.3 Scope of Works.....	1
2 Background Information	2
2.1 Site Identification.....	2
2.2 Previous Investigations	2
2.3 Proposed End Land Use	3
2.4 Site Geology and Hydrogeology	3
2.5 Extent and Distribution of Contaminants	3
3 Validation Strategy.....	4
3.1 Site Validation Criteria	4
3.1.1 Criteria for Validation of Soils	4
3.1.2 Soil Disposal Criteria	4
3.1.3 Fill Validation Criteria	4
3.1.4 Data Quality Objectives.....	4
3.2 METHODOLOGY	6
3.2.1 Excavation of Impacted Soil	6
3.2.2 Validation of Excavation.....	6
3.2.3 Characterisation of Soil for Offsite Disposal	6
3.2.4 Backfilling of Excavations	7
3.2.5 Disposal	7
4 Results	8
4.1 Laboratory Analysis Results	8
4.1.1 Excavation Validation Samples	8
4.1.2 Excavated Material	8
4.2 QA/QC Results	8
5 Summary and Conclusions	10
6 References.....	11

Excavation and Validation of Hydrocarbon 'Hotspot'
Lot 310, Former Boral Timber site, Wingham

List of Attachments

TABLES

Table 1	Validation Soil Analytical Results – Total Petroleum Hydrocarbons (TPH)
Table 2	Stockpile Soil Analytical Results – TPH, Benzene, Toluene, Ethylbenzene and Xylenes (BTEX)
Table 3	Stockpile Soil Analytical Results – Polycyclic Aromatic Hydrocarbons (PAHs) and Metals
Table 4	Relative Percent Differences (RPDs) – TPH

FIGURES

Figure 1	Site Location Map
Figure 2	Site Plan and Sample Locations (20/2/2001 and 22/3/2001)

APPENDICES

Appendix A	Site Photographs
Appendix B	Laboratory Reports and Chain of Custody Documentation
Appendix C	Correspondence
Appendix D	Calibration Record Sheets
Appendix E	Soil Disposal Record

Executive Summary

IT Environmental (Australia) Pty Ltd (*IT*) were commissioned by Boral Limited (Boral) to carry out excavation and validation works at Lot 310 of the former Boral Timber site on Murray Road, Wingham NSW.

The objectives of the validation were to excavate hydrocarbon impacted soil, to validate the walls and floors of the excavations to NSW EPA (1994) criteria and to determine whether the site is suitable for divestment as low density residential land.

A previous environmental site assessment (ESA) (*IT*, 1999b) indicated that one isolated area at the site required remediation and validation, where hydrocarbon impact was present, possibly related to parking vehicles during site operations. The ESA report concluded that apart from this isolated hydrocarbon impacted area, the site was suitable for low density residential development.

Following excavation of impacted material, validation samples were collected from the walls and base of the excavation. All samples were analysed by a NATA registered laboratory for total petroleum hydrocarbons (TPH).

Analysis of validation samples collected on 20 February 2001 indicated that further excavation was necessary. Results from the analysis of validation samples collected on 22 March 2001 were all below the nominated NSW EPA criteria.

Approximately 30m³ of material (in-situ) was excavated. This was then stockpiled on site for characterisation for offsite disposal. At the time of excavation, results from one stockpile sample indicated that the TPH concentration exceeds NSW EPA (1999) solid waste criteria.

Analysis of stockpile samples collected on May 2001 indicated that all results met the inert waste criteria according to the NSW EPA (1999) waste guidelines. The stockpile of approximately 50m³ volume and a weight of 57.5 tonnes was removed on 16 October 2001 and transported to Bucketts Way Landfill Depot operated by Greater Taree City Council. Backfilling of the excavations was not undertaken during the validation works.

Based on the field observations and the laboratory results presented in this report and in conjunction with previous reports on assessment and validation work at the site, *IT* considers that the site is suitable for residential development.

1 Introduction

1.1 Background

IT Environmental (Australia) Pty Ltd (*IT*) were commissioned by Boral Limited (Boral) to carry out excavation and validation works on Lot 310 of the former Boral Timber site in Wingham, NSW (Figure 1).

The work undertaken at the site was based on the results of an environmental site assessment (ESA) reported to Boral by *IT* in November 1999 (Ref: *IT* 1999b) which identified one isolated area of hydrocarbon impacted soil located in the south western corner of Lot 310. The work was undertaken in accordance with a remedial action plan (RAP) prepared for Boral by *IT* in February 2001 (Ref: *IT* 2001).

The ESA report (*IT*, 1999b) concluded that apart from the isolated hydrocarbon impacted area, the site (Lot 310) was suitable for low density residential development.

An isolated area of arsenic impact was identified at sample location L310-TH10 (Figure 2) during a previous investigation of the site (Fluor Daniel GTI, 1998). Further assessment of this impact involving a number of 'step-out' samples (Fluor Daniel GTI (1999), concluded that the impact had been delineated, and that the 95% upper confidence limit (UCL) for arsenic was below the NSW EPA (1998) 'residential' assessment criteria. It was concluded that no further assessment or remediation of the isolated arsenic impact was required.

Hydrocarbon impacted soil excavated during remediation and validation of a former underground storage tank (UST) area on an adjacent parcel of land (Lot 270, Figure 2) owned by Boral (Fluor Daniel GTI, 1999), was landfarmed on a concreted area of Lot 310. This material was validated to below NSW EPA (1994) sensitive landuse criteria, and was considered suitable for reuse on site (*IT*, 1999a).

1.2 Objectives

The objectives of the current remediation and validation works were to excavate and stockpile hydrocarbon impacted soil, to validate the walls and floors of the excavations to NSW EPA (1994) criteria and to indicate that the site as a whole is suitable for low density residential development.

1.3 Scope of Works

To achieve the objectives the following work scope was undertaken for the remediation works:

- Excavation and stockpiling of hydrocarbon impacted soil. Backfilling of the excavation was not included;
- Collection and analysis of validation samples and appropriate QA/QC samples from the excavation walls and base for TPH;
- Sampling and analysis of excavated material exceeding a rate of 1 per 25m³ of material for total petroleum hydrocarbons (TPH); and
- Preparation of a report describing the results of the validation sampling and recommendations for remediation of excavated soil, if required.

2 Background Information

2.1 Site Identification

The site is located on Murray Road in Wingham (Figure 1) in the south eastern corner of a block of land owned by Boral. It comprises Lot 310 in DP 976294, and has an area of approximately 8170m². There is a large open ended shed located in the south western corner of the site.

The area of the site requiring remediation is restricted to isolated hydrocarbon impacted soil encountered in a soil sample taken from the south western corner of the shed during an ESA previously conducted by IT (IT 1999b). Analysis of samples from the remainder of the site indicated that apart from the isolated hotspot, the site was suitable for unrestricted use.

2.2 Previous Investigations

Previous investigations of the former Boral Timber site identified an arsenic hotspot on Lot 310, and a TPH hotspot on Lot 270, which is adjacent to Lot 310. Excavated TPH impacted soil from Lot 270 was subsequently landfarmed on Lot 310. These activities are outlined below.

Arsenic Hotspot

- An arsenic hotspot was identified on Lot 310 (at sample point L310-TH10) during the initial ESA of the former Boral Timber site at Wingham (Fluor Daniel GTI 1998).
- During fieldwork conducted in November 1998 (Fluor Daniel GTI 1999), four 'step-out' samples were collected from within a 5m radius of the arsenic impacted area. A further four 'step-out' samples were collected approximately 10m from L310-TH10 to a maximum depth of 0.5m.
- Laboratory analysis of these samples indicated that arsenic concentrations were below the NSW EPA (1998) residential assessment criteria.
- Statistical analysis of the four 'step-out' samples collected from within a 5m radius, along with the original arsenic impacted sample indicated that the 95% UCL for arsenic in the vicinity of sample point L310-TH10 was below the NSW EPA (1998) residential assessment criteria (Fluor Daniel GTI 1999). Therefore no further assessment or remediation in relation to the arsenic hotspot was required.

Landfarm

- TPH impact was identified in the vicinity of a former underground storage tank (UST) on Lot 270, which is adjacent to Lot 310, during the initial ESA at the site (Fluor Daniel GTI 1998).
- The former UST area on Lot 270 was excavated and validated (Fluor Daniel GTI 1999). The excavated hydrocarbon impacted soil was landfarmed in two piles, one located on Lot 270 and one on a concreted area on Lot 310.
- The two landfarms were consolidated into one on Lot 310 in March/April 1999 (IT Environmental 1999b).
- Two samples were collected from the landfarm in August 1999 and analysis indicated that concentrations of TPH and BTEX were below NSW EPA (1994) sensitive landuse criteria and

Excavation and Validation of Hydrocarbon 'Hotspot'
Lot 310, Former Boral Timber site, Wingham

therefore suitable for reuse onsite. As the material was landfarmed on a concreted area, validation of the footprint was not considered necessary.

2.3 Proposed End Land Use

It is understood that the site is to be divested as suitable for low density residential development.

2.4 Site Geology and Hydrogeology

The site is generally overlain by silty sand topsoil to a maximum depth of 0.5m depth, which is underlain by weathered rock from a depth of 0.3m. Soil encountered during validation work was generally hard silty sand fill with some grey silty sand, overlying bedrock and weathered rock at a depth of between 0.3m and 0.8m.

No groundwater was encountered during the previous ESA conducted by IT (IT, 1999), or during the remedial works. Some seepage water was encountered during the validation work due to heavy rain prior to fieldwork.

2.5 Extent and Distribution of Contaminants

Contaminants of concern for the current exercise are total petroleum hydrocarbons (TPH). Hydrocarbon impacted soil was encountered in soil sample L310-TH24 (0 - 0.15m) (Figure 2) during the previous ESA (IT 1999). The deeper sample from this point (L310 - TH24 (0.3-0.5m)) was within assessment criteria. L310-TH24 was located in the south western corner of the shed in bare ground adjacent to the concrete floor slab.

The TPH in impacted soil is believed to be related to vehicles parked in that area of the shed. The remainder of the site was considered suitable for unrestricted landuse.

Excavation and Validation of Hydrocarbon 'Hotspot'
Lot 310, Former Boral Timber site, Wingham

3 Validation Strategy

The general remediation strategy involved the excavation of hydrocarbon impacted soil, validation of the excavation and characterisation of excavated soil for possible offsite disposal, in accordance with NSW EPA (1999) waste guidelines. A remedial action plan (RAP) was prepared prior to work commencing (IT 2001).

3.1 Site Validation Criteria

3.1.1 Criteria for Validation of Soils

NSW EPA (1994) threshold concentrations for sensitive landuse have been used for comparison with TPH compounds, which have been identified as the only remaining contaminant of concern at the site. Excavation validation criteria are shown in the table below.

Analyte	Excavation Validation Criteria (mg/kg)
TPH (C ₆ -C ₉)	65
TPH (C ₁₀ -C ₄₀)	1000

3.1.2 Soil Disposal Criteria

For potential offsite disposal of impacted soil, soil results were compared to the NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. Tables A3 and A4 from these guidelines form the basis for waste classification of soil to be disposed to landfill.

3.1.3 Fill Validation Criteria

Fill was not imported to the site during the remedial works. Should validation of imported fill be required in the future, appropriate fill validation criteria include NSW EPA (1994) sensitive landuse criteria for hydrocarbons, and NSW EPA (1998) standard residential criteria for metals, PAHs, pesticides and polychlorinated biphenyls. Virgin excavated natural material can be used for filling and does not require validation. However, it is recommended that confirmation that the material is natural be obtained in writing before backfilling.

3.1.4 Data Quality Objectives

A number of data quality objectives were set for the excavation and validation carried out at the site. These included:

- Provide sample integrity and container information on chain of custody (COC) documentation;
- Ensure all samples are dispatched and analysed within the recommended holding times for all analyses;
- Analysis of field duplicates at a frequency of 1 in 10;
- Analysis of field triplicates at a frequency of 1 in 20;
- Analysis of rinsate blanks to determine any contamination from the soil sampling process;

Excavation and Validation of Hydrocarbon 'Hotspot'
Lot 310, Former Boral Timber site, Wingham

- Review the relative percentage difference (RPDs) for field and laboratory duplicate samples to evaluate whether RPDs for the sample pairs were within acceptable ranges of +/-50% for field duplicates and 20-50% for laboratory duplicates to determine field precision;
- Analysis of method blanks to determine any contamination from the analytical process;
- Analysis of matrix spike, laboratory control sample and duplicate control sample to determine overall efficiency of the method, the effect of the sample matrix on the analytical results, and the accuracy of the method. Recovery data for accuracy, or average recovery, should be in the range 75-125% confirming acceptability;
- Analysis of surrogate spikes and comparison recovery results with documented acceptable control limits of between 70 and 130%; and
- Overall completeness should be a minimum of 95%.

Field QA/QC

Soil sampling was undertaken by Alison Packwood, a qualified environmental scientist.

The photoionisation detector (PID) used for soil vapour screening and soil sampling was calibrated in the field against a standard isobutylene in air gas mixture. The PID response factor was then programmed to adjust readings relative to benzene. Calibration was complete before any field work commenced. PID readings were recorded on field data sheets. Calibration records are provided in **Appendix D**.

New neoprene gloves were worn during soil sampling and were replaced between sample collection. New sample bottles were used for each soil sample. Sample bottles were labelled and identified with the project number, unique sample number and date of collection. Collected samples were placed immediately on ice and dispatched in an ice filled cooler (esky) to the laboratory for analysis. Samples were recorded on a chain of custody form. The chain of custody form accompanied samples upon dispatch to the laboratory for analysis.

Field duplicate soil samples were collected at a ration of 1 duplicate per 10 primary samples. Field interlaboratory triplicate soil samples were collected at a ratio of 1 triplicate per 20 primary samples. A list of the primary soil samples analysed are summarised below:

Soil Sampling

16 primary samples – TPH
2 primary samples – BTEX, PAHs and metals.

Duplicate/triplicate samples were identified sequentially and as a 'QC sample' but were not marked specifically as duplicate/triplicate samples. Two (2) field duplicates and one (1) triplicate soil sample pairs were collected and analysed for TPH. An equipment rinsate and trip blank were collected in the field during soil sampling. The QA/QC samples were collected and analysed as follows:

Soil Sampling conducted on 20 February 2001

QC3/QC3A duplicate/triplicate of V10 TPH

Soil Sampling conducted on 22 March 2001

QCX duplicate of V12 TPH

Excavation and Validation of Hydrocarbon 'Hotspot'
Lot 310, Former Boral Timber site, Wingham

Laboratory QA/QC

The quality control (QC) testing conducted internally by ALS consisted of analysis method blanks, duplicate samples, laboratory control samples, recovery samples, surrogate spikes and internal standards.

The QC testing conducted internally by GAL consisted of laboratory split duplicates, laboratory reagent blanks, laboratory matrix spike and matrix spike duplicate recovery samples, laboratory control samples and surrogate spikes.

The results of the QC testing are attached with each laboratory report (**Appendix B**).

3.2 METHODOLOGY

3.2.1 Excavation of Impacted Soil

Impacted material was excavated based mainly on visual and olfactory recognition of hydrocarbon impact, as the heavy-end hydrocarbons involved provided little measurable response by a portable PID, usually responsive to more volatile (light-end) hydrocarbons.

Approximately 30m³ of material (in-situ) was excavated. This was then stockpiled on site for characterisation for possible offsite disposal. The material was stockpiled on a concrete pad under cover.

3.2.2 Validation of Excavation

Following removal of impacted material, validation samples were collected from the walls and base of the excavation. Fieldwork was initially conducted on 20 February 2001, however, analytical results indicated that further excavation was necessary. Further excavation and sampling took place on 22 March 2001. The locations of the validation samples are marked on Figure 2. Excavation walls were validated at a rate of 1 sample per 10m (linear) or better, and the base of the excavation was validated at a rate of 1 sample per 25m² or better.

Four wall and one floor samples were collected and analysed during fieldwork conducted on 20 February 2001. A further five wall and two floor samples were collected and analysed on 22 March 2001.

Two duplicate samples and one triplicate sample were collected overall; QC3 and QC3a (duplicate and triplicate of sample V10) and QCX (duplicate of V12).

Based on the results of the previous site assessment, validation samples were analysed for TPH.

Photographs of the excavation are presented in Appendix A.

3.2.3 Characterisation of Soil for Offsite Disposal

The excavated material was stockpiled on site and sampled at a rate of 1 sample per 25m³ excavated (2 samples, V11 and SP1), to enable classification for offsite disposal.

Based on sampling results from the previous site assessment, the stockpile samples were analysed for TPH.

Excavation and Validation of Hydrocarbon 'Hotspot'
Lot 310, Former Boral Timber site, Wingham

Samples (SP2 and SP3) were collected from the stockpile in May 2001, and analysed for TPH, BTEX, PAHs and metals. In addition, sample SP2 was tested for the Toxicity characteristic Leaching Potential (TCLP) of lead.

3.2.4 Backfilling of Excavations

Backfilling was not undertaken as part of the scope of work.

3.2.5 Disposal

The stockpile with a volume of approximately 50m³ and a weight of 57.5 tonnes was removed on 16 October 2001. A representative of IT Environmental supervised and recorded the loading and transport of the soil to landfill. The stockpile was transported to Bucketts Way Landfill for disposal as inert waste. A record of disposal is included in **Appendix E**.

4 Results

4.1 Laboratory Analysis Results

All analyses were conducted at NATA registered Australian Laboratory Services (ALS), Smithfield, with the exception of the triplicate sample which was analysed at Gribbles Analytical Laboratories (GAL), Melbourne. GAL are also NATA registered. Laboratory analytical results are summarised in Tables 1- 3 and full laboratory reports are included in Appendix B. The results indicate the following:

4.1.1 Excavation Validation Samples

Twelve validation samples (Figure 2) were collected and analysed for TPH. Of the five validation samples collected on 20 February 2001, results were above the nominated criteria for four samples, with TPH (C₁₀-C₃₆) concentrations ranging between 1248 mg/kg to 16595 mg/kg. The results from the sample taken from the western wall of the excavation (V10) were below the nominated criteria (TPH (C₁₀-C₃₆) concentration of 120 mg/kg).

Results from validation samples collected on 22 March 2001 were all below the laboratory's limit of reporting, and were therefore below the nominated validation criteria. The results are summarised in Table 1 and laboratory analytical reports (**Appendix B**).

4.1.2 Excavated Material

Two samples of the excavated and stockpiled material, V11 (20/2/01) and SP1 (22/3/01), were collected and analysed for TPH. The results of these samples were 21,920 and 2,617mg/kg respectively.

Stockpile samples (SP2 and SP3) were collected in May 2001 and analysed for TPH, BTEX, PAHs and metals.

Stockpile samples (SP2 and SP3) collected in May 2001 show that all samples for TPH, BTEX, PAHs and metals meet the inert waste criteria according to the NSW EPA (1999) waste guidelines, with the exception of one metal result for lead in SP2 (12mg/L). The results are summarised in Tables 2 and 3 and laboratory analytical reports (**Appendix B**).

TCLP test result shows a concentration of <0.1mg/L lead in leachate for SP2. The combined total lead concentration (10mg/L) and TCLP (<0.1mg/L) are less than the NSW EPA (1999) inert waste criteria SCC1 (1500mg/kg) and TCLP1 (0.5mg/L) respectively.

4.2 QA/QC Results

A total of two duplicate soil samples and one triplicate soil sample were collected during the excavation and validation works. The results of the relative percentage difference (RPD) calculations between original and duplicate or triplicate samples are presented in Table 2.

One duplicate (QC3) and one triplicate sample (QC3a) were collected from V10, and one duplicate sample (QCX) was collected from V12. Each sample was analysed for TPH.

Excavation and Validation of Hydrocarbon 'Hotspot'
Lot 310, Former Boral Timber site, Wingham

The RPDs between analytical results for original and duplicate or triplicate samples were generally comparable and within the acceptable range (less than 30%-50%).

A variation was detected for TPH (C₂₉-C₃₆) between V10 and QC3, with a RPD of 82%. This discrepancy is due to the concentration in both samples being near to or below LOR. At concentrations near the limit of reporting, a small variation between the measured concentrations in the sample and the duplicate produces a large RPD.

The laboratory quality results indicate that the quality control adopted by the laboratories during analysis of the samples was satisfactory. An error in the recorded sample extraction date was noted in the ALS Quality Control Report for sample Batch No ES27394, where the extraction date was reported as 26/3/01

Based on the field and laboratory quality control results, the laboratory data provided is considered valid and acceptable. The data quality control results meet the data quality objectives as discussed in Section 3.1.4.

Excavation and Validation of Hydrocarbon 'Hotspot'
Lot 310, Former Boral Timber site, Wingham

5 Summary and Conclusions

An ESA previously conducted by IT (IT, 1999b) identified an isolated area of hydrocarbon impacted soil in the south western corner of Lot 310. Samples from the remainder of the site indicated that apart from this isolated hydrocarbon impact, the site was suitable for unrestricted landuse.

Approximately 30m³ (insitu) of hydrocarbon impacted soil was excavated and stockpiled on site for characterisation for offsite disposal. No backfilling was undertaken.

Eight validation samples were collected from the walls and base of the final excavation. Analysis of these samples indicated that concentrations of hydrocarbons were below the site validation criteria in all of the samples analysed.

The soil was stockpiled on site to enable characterisation for disposal at a local landfill. The stockpile was tested in May 2001 and characterised as inert waste. In October 2001 the stockpile of approximately 50m³ was removed to the Bucketts Way Landfill Depot, following communication and agreement with Greater Taree City Council.

Based on the field observations and the laboratory results presented in this report, and in conjunction with reports from previous assessment and validation work at the site, IT Environmental (Australia) Pty Ltd considers that the site is suitable for low density residential development.

IT ENVIRONMENTAL (AUSTRALIA) PTY LTD

Excavation and Validation of Hydrocarbon 'Hotspot'
Lot 310, Former Boral Timber site, Wingham

6 References

Fluor Daniel GTI (1998) Environmental Site Assessment, Boral Wingham Former Timber Site, dated 12 November 1998 (Reference S9209R02)

Fluor Daniel GTI (1999) Former Boral Timber Site, Wingham, Additional Validation Sampling for Arsenic and Hydrocarbons, Addendum to Report S9209, dated 9 February 1999 (Reference J-10-09264AL03)

IT (1999a) Former Boral Timber Site, Wingham NSW, Validation of Landfarm on Lot 310, Addendum to Report S9209, dated 9 September 1999 (Reference J109264A-L11)

IT (1999b) Additional Environmental Site Assessment, Boral Timber, Wingham. Report prepared by IT Environmental (Australia) Pty Ltd for Boral Limited, dated 3 November 1999 (Reference: J109264B-R01).

IT (February 2001) Remedial Action Plan, Former Boral Timber Site, Lot 310, Murray Road, Wingham NSW. Report prepared by IT Environmental (Australia) Pty Ltd for Boral Limited, dated 19 February 2001 (Reference: J109264B-R01).

NSW EPA (May 1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes.

NSW EPA (1998) Guidelines for the NSW Site Auditor Scheme

NSW EPA (1994) Guidelines for Assessing Service Station Sites

Statement of Limitations

IT Environmental (Australia) Pty Ltd has conducted work concerning the environmental status of the property which is the subject of this report, and has prepared this report on the basis of that assessment.

The work was conducted, and the report has been prepared, in response to specific instructions from the client to whom this report is addressed and in reliance on certain data and information made available to IT Environmental. 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.

IT Environmental will not update the report and has not taken into account events occurring after the time its assessment was conducted.

IT ENVIRONMENTAL (AUSTRALIA) PTY LTD

Tables

Excavation and Validation of Hydrocarbon 'Hotspot'
Former Boral Site, Lot 310, Wingham

TABLE 1
VALIDATION
SOIL ANALYTICAL RESULTS -
TOTAL PETROLEUM HYDROCARBONS (TPH)
BORAL WINGHAM (J109264B)
(All results in mg/kg, unless specified in Notes)

Sample ID	V6	V7	V8	V9	V10	QC3	QC3A	V12	QCX
Sample Collection Date	2/20/01	2/20/01	2/20/01	2/20/01	2/20/01	2/20/01	2/20/01	3/22/01	3/22/01
Sample Analysis Date	2/27/01	2/27/01	2/27/01	2/27/01	2/27/01	2/27/01	2/23/01	3/28/01	3/28/01
Comments						Duplicate of sample V10	Triplicate of sample V10		Duplicate of sample V12
Analytes	Lab Method*	LOR	Nominated Investigation Criteria						
TPH									
TPH C6 - C9	504 P+T	2	65 ⁽¹⁾	<LOR	<LOR	<LOR	<5.0	<LOR	<LOR
TPH C10 - C14	501 FID	50	NE	<LOR	<LOR	<LOR	<20	<LOR	<LOR
TPH C15 - C28	501 FID	100	NE	714	<LOR	<LOR	47	<LOR	<LOR
TPH C29 - C36	501 FID	100	NE	5880	120	<LOR	82	<LOR	<LOR
TPH C10 - C36	501 FID	NA ^(a)	1000 ⁽¹⁾	1695	120	#	129	#	#

Notes:

V = Validation Sample; SF = Stockpile Sample; QC = Quality Control Sample.

*SF = See Lab Methods & Description Table

*ppm_v = All constituent analyte concentrations are below LOR.

LOR = Limit of Reporting (= Method Detection Limit)

NE = Guideline not established

^(a) Where results are derived from the summation of selected analytes, LOR can not be determined.

Nominated Investigation Criteria:

⁽¹⁾ NSW EPA (1994) Guidelines for Assessing Service Station Sites: Threshold concentrations for sensitive land use - Soils.

Results Values in highlighted cells exceed nominated investigation criteria

TABLE 1
VALIDATION
SOIL ANALYTICAL RESULTS -
TOTAL PETROLEUM HYDROCARBONS (TPH)
BORAL WINGHAM (J109264B)
(All results in mg/kg, unless specified in Notes)

Sample ID	V13	V14	V15	V16	V17	V18
Sample Collection Date	3/22/01	3/22/01	3/22/01	3/22/01	3/22/01	3/22/01
Sample Analysis Date	3/28/01	3/28/01	3/28/01	3/28/01	3/28/01	3/28/01
Comments						
Analytes	Lab Method*	LOR	Nominated Investigation Criteria			
TPH						
TPH C6 - C9	504 P+T	2	65 ⁽¹⁾	<LOR	<LOR	<LOR
TPH C10 - C14	501 FID	50	NE	<LOR	<LOR	<LOR
TPH C15 - C28	501 FID	100	NE	<LOR	<LOR	<LOR
TPH C29 - C36	501 FID	100	NE	<LOR	<LOR	<LOR
TPH C10 - C36	501 FID	NA ^(a)	1000 ⁽¹⁾	#	#	#

Notes:

V = Validation Sample; SP = Stockpile Sample; QC = Quality Control Sample.

*** = See Lab Methods & Description Table

*µg = All constituent analyte concentrations are below LOR.

*ppm/v = Parts per million by volume

LOR = Limit of Reporting (= Method Detection Limit)

NE = Guideline not established

^(a) Where results are derived from the summation of selected analytes, LOR can not be determined.

Nominated Investigation Criteria:

⁽¹⁾ NSW EPA (1994) Guidelines for Assessing Service Station Sites: Threshold concentrations for sensitive land use - Soils.

Results: Values in highlighted cells exceed nominated investigation criteria

TABLE 2
STOCKPILE
SOIL ANALYTICAL RESULTS -
TOTAL PETROLEUM HYDROCARBONS (TPH) BTEX COMPOUNDS
BORAL WINGHAM (J109264B)
(All results in mg/kg, unless specified in Notes)

Sample ID	Sample Collection Date	V11	SP1	SP2	SP3
Sample Analysis Date		2/20/01	3/22/01	5/4/01	5/4/01
Sample Analysis Date		2/27/01	3/28/01	5/11/01	5/11/01
Comments	Stockpile Sample				
Analytes	Lab Method*	LOR	Nominated Investigation Criteria		
TPH					
TPH C6 - C9	EP-071-SS	2	NE	<LOR	<LOR
TPH C10 - C14	EP-071-SS	50	NE	1420	<LOR 70
TPH C15 - C28	EP-071-SS	100	NE	10400	538 1510
TPH C29 - C36	EP-071-SS	100	NE	10100	229 1780
TPH C10 - C36	EP-071-SS	NA ^(a)	NE	21920	2617 3360
BTEX COMPOUNDS					
Benzene	EP-080-SS	0.2	1	<LOR	<LOR
Toluene	EP-080-SS	0.2	28.8	<LOR	<LOR
Ethylbenzene	EP-080-SS	0.2	60	<LOR	<LOR
Xylene	EP-080-SS	0.4	100	<LOR	<LOR

Notes:

V = Validation Sample; SP = Stockpile Sample; QC = Quality Control Sample.

^{***} = See Lab Methods & Description Table

^{**} = All constituent analyte concentrations are below LOR.

^{*}ppmv = Parts per million by volume

LOR = Limit of Reporting (= Method Detection Limit)

NE = Guideline not established

^(a) Where results are derived from the summation of selected analytes, LOR can not be determined.

Nominated Investigation Criteria:

⁽¹⁾ NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes - Inert

Results Values in highlighted cells exceed nominated investigation criteria

TABLE 3
STOCKPILE
SOIL ANALYTICAL RESULTS -
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) and METALS
BORAL WINGHAM (J109264B)
(All results in mg/kg, unless specified in Notes)

Laboratory ID	1	2
Sample ID	SP2	SP3
Sample Collection Date	5/4/01	5/4/01
Sample Extraction Date	5/9/01	5/9/01
Sample Analysis Date	5/9/01	5/9/01
Comments		
Analytes	Lab Method*	Nominated Investigation Criteria
PAHs		
Pyrene	EP-075B-S	0.05 NE
Phenanthrene	EP-075B-S	0.05 NE
Naphthalene	EP-075B-S	0.05 NE
Indeno(1,2,3-c,d)pyrene	EP-075B-S	0.05 NE
Fluoranthene	EP-075B-S	0.05 NE
Fluorene	EP-075B-S	0.05 NE
Dibenz(a,h)anthracene	EP-075B-S	0.05 NE
Chrysene	EP-075B-S	0.05 NE
Benzo(b) & (k)fluoranthene	EP-075B-S	0.1 NE
Benzo(g,h,i)perylene	EP-075B-S	0.05 NE
Benzo(a)pyrene	EP-075B-S	0.05 0.08
Benzo(a)anthracene	EP-075B-S	0.05 NE
Anthracene	EP-075B-S	0.05 NE
Acenaphthene	EP-075B-S	0.05 NE
Acenaphthylene	EP-075B-S	0.05 NE
Total PAH's	EP-075B-S	NA ^(a) NE
METALS		
Arsenic	EG-005T	1 10
Cadmium	EG-005T	1 2
Chromium (Total)	EG-005T	1 NE
Copper	EG-005T	1 NE
Lead	EG-005T	1 10
Zinc	EG-005T	1 NE
Mercury	EG-035T	0.1 0.4
Hexavalent Chromium	EG-050	1 10

Notes:

*** = See Lab Methods & Description Table

*# = All constituent analyte concentrations are below LOR.

* = Analysis not requested

*m = metres

LOR = Limit of Reporting (= Method Detection Limit)

NE = Guideline not established

NA = Not Applicable

^(a) Where results are derived from the summation of selected analytes, LOR can not be determined.

Nominated Investigation Criteria:

⁽¹⁾ NSW EPA (1999) Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes - Inert

Results Values in highlighted cells exceed nominated investigation criteria

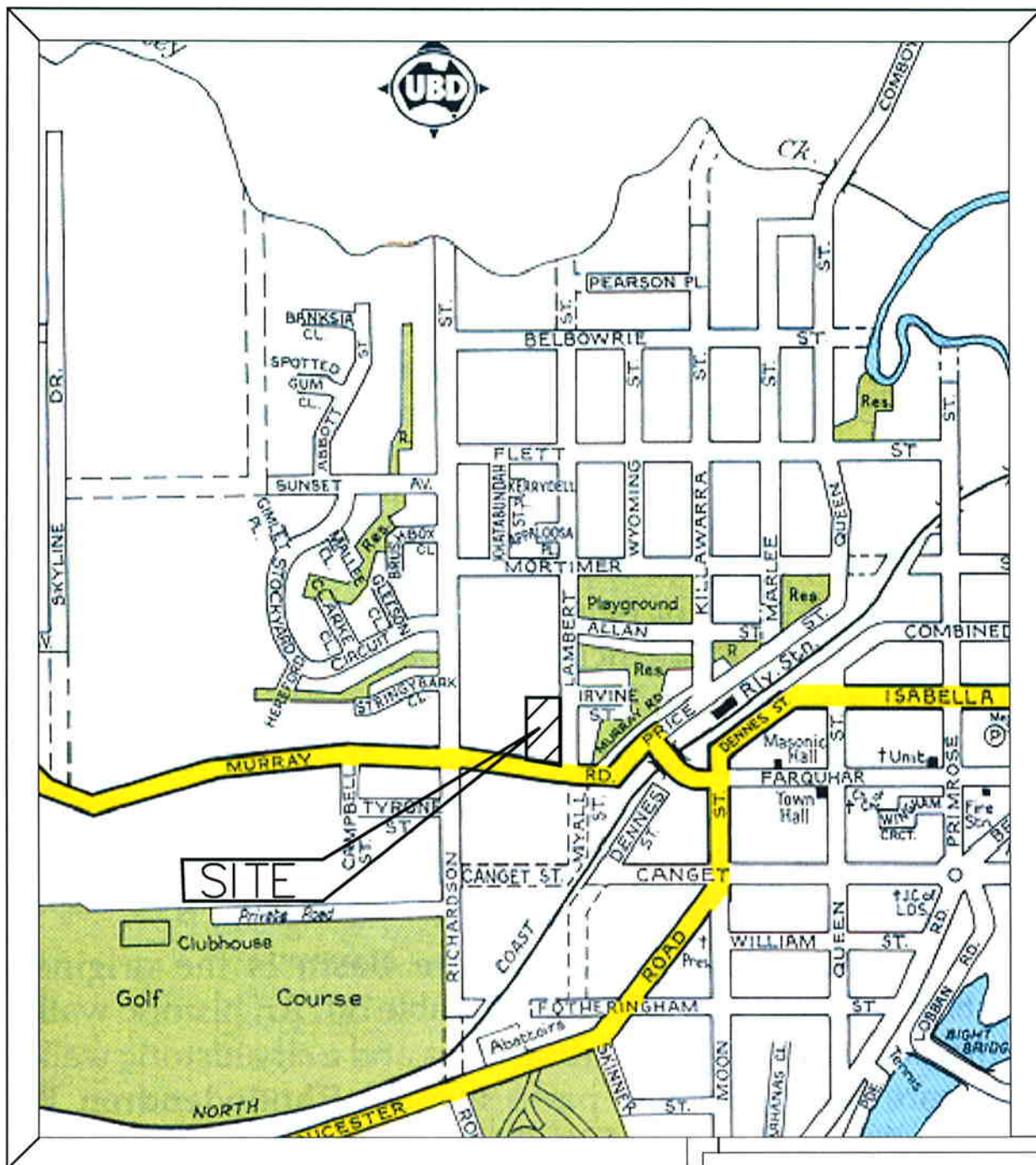
TABLE 4
RPDs BETWEEN ORIGINAL, DUPLICATE AND TRIPLICATE SAMPLES
BORAL WINGHAM (J109284B)

Sample ID		V10	QC3	RPD (%)	V10	QC3A	RPD (%)	V12	QCX	RPD (%)
Sample Collection Date		2/20/01	2/20/01		2/20/01	2/20/01		3/22/01	3/22/01	
Sample Analysis Date		2/27/01	2/27/01		2/27/01	2/23/01		3/28/01	3/28/01	
Comments			Duplicate of sample V10			Triplicate of sample V10			Duplicate of sample V12	
Analytes	Lab Method*	ALS LOR	Gribbles LOR							
TPH										
TPH C6 - C9	504 P+T	2	5	0	<LOR	<5.0	0	<LOR	<LOR	0
TPH C10 - C14	501 FID	50	20	0	<LOR	<20	0	<LOR	<LOR	0
TPH C15 - C28	501 FID	100	20	0	<LOR	47	n/a	<LOR	<LOR	0
TPH C29 - C36	501 FID	100	20	82	120	82	38	<LOR	<LOR	0

Notes:
V = Validation Sample; SP = Stockpile Sample; QC = Quality Control Sample.
LOR = Limit of Reporting (= Method Detection Limit)
NE = Guideline not established
na = differences in LOR between labs result in GAL results being reported which would be below LOR at ALS.

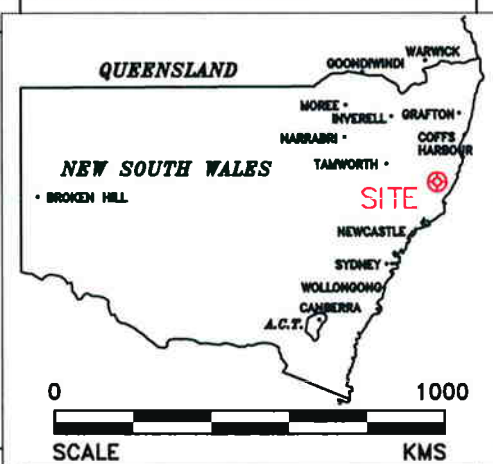
Figures

Excavation and Validation of Hydrocarbon 'Hotspot'
Former Boral Site, Lot 310, Wingham



SOURCE: UBD N.S.W. CITIES AND TOWNS WINGHAM

SCALE: 1:25 000



IT Environmental
A Member of
the **igroup**

17 FORRESTER STREET
KINGSGROVE NSW 2208
(02) 9502 4844

DESIGNED:

J.T.

COMPILED:

M.D.B

PROJ. NO.

J109264B

SITE LOCATION MAP

CLIENT:

BORAL LIMITED

LOCATION:

CNR LAMBERT ST & MURRAY RD
WINGHAM NEW SOUTH WALES

DRAWING DATE:

19/02/01

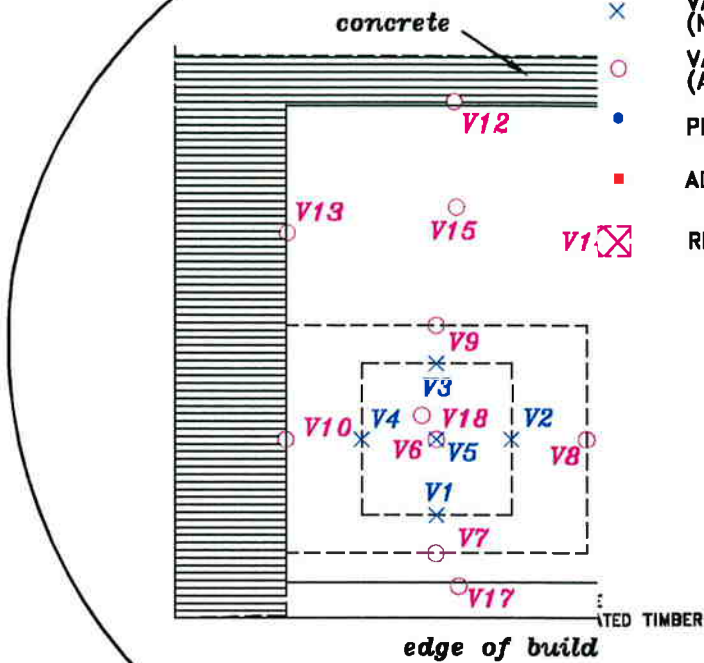
FIGURE:

1

VALIDATION AREA

LEGEND

- × VALIDATION SAMPLE LOCATIONS (NOT ANALYSED)
- VALIDATION SAMPLE LOCATIONS (ANALYSED)
- PREVIOUS TEST HOLE LOCATIONS
- ADDITIONAL TEST HOLE LOCATIONS
- ⊗ REMEDIATION AREA



SCALE 0 1 2 3 4 METRE

OFFICE & STORAGE

RICHARDSON STREET



SCALE 12.5 0 10 20 30 40 50 METRES

1:1250 (A3)

IT Environmental (Australia) Pty Ltd ©

BORAL WINGHAM LOCATION OF VALIDATION POINTS (LOT 310)

BORAL		LOCATION: MURRAY ROAD WINGHAM, NEW SOUTH WALES	
AP	DATE: 9/03/01	PROJECT NO.: J109264B	FIGURE: 2
DPM	REV. NO: A		

A3

ISSUE	DATE	AMENDMENTS	DRN	CKD
A	9/03/01	ORIGINAL ISSUE	DPM	

Appendix A

Site Photographs

Excavation and Validation of Hydrocarbon 'Hotspot'
Former Boral Site, Lot 310, Wingham



Plate 1: Looking north across the excavation which is located at the southern end of the shed on Lot 310.



Plate 2: Looking south across the excavation.



Plate 3: Looking to the north western corner of the excavation



Plate 4: Looking to the south western corner of the excavation



Plate 5: Looking to the north eastern corner of the excavation



Plate 6: Looking north east across the excavation

Appendix B

Laboratory Reports and Chain of Custody Documentation

Excavation and Validation of Hydrocarbon 'Hotspot'
Former Boral Site, Lot 310, Wingham

ALS Environmental

CERTIFICATE OF ANALYSIS



Batch: ES27573

Sub Batch: 0

CONTACT: M BENNETT
CLIENT: IT ENVIRONMENTAL (AUST) P/L
ADDRESS: 17 FORRESTER STREET
KINGSGROVE NSW 2208

LABORATORY: SYDNEY
DATE RECEIVED: 22/02/2001
DATE COMPLETED: 05/04/2001
SAMPLE TYPE: SOIL
No. of SAMPLES: 7

ORDER No.: J109264B
PROJECT: BORAL WINGHAM

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis. This is a re-batch of ES26959/AES26959.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

Phone: 61-2-8784 8555
Fax: 61-2-8784 8500
Email: brianw@als.com.au

Signatory

LABORATORIES

AUSTRALASIA

Brisbane
Melbourne
Sydney
Newcastle
Hong Kong
Singapore
Kuala Lumpur
Auckland

AMERICAS

Vancouver
Santiago
Lima

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.





CERTIFICATE OF ANALYSIS

Lab ID: ESZ1073
Batch: 0
Date of Issue: 05/04/2001
Client: IT ENVIRONMENTAL (AUST) P/L
Project Reference: BORAL WINGHAM

HOD		ANALYSIS DESCRIPTION	SAMPLE IDENTIFICATION									
			Laboratory I.D.		27	28	29	30	31	32	35	
			UNIT	LOR	20/02/2001	20/02/2001	20/02/2001	20/02/2001	20/02/2001	20/02/2001	20/02/2001	
-SS	-SS	Moisture Content (dried @ 103°C)	%	0.1	V6	V7	V8	V09	V10	QC3	V11	
-SS	-SS	TOTAL PETROLEUM HYDROCARBONS										
-SS	-SS	C6 - C9 Fraction	mg/kg	2	<2	<2	<2	<2	<2	<2	<2	
-SS	-SS	C10 - C14 Fraction	mg/kg	50	<50	367	<50	125	<50	<50	1420	
-SS	-SS	C15 - C28 Fraction	mg/kg	100	490	4660	714	7080	<100	<100	10.4g/kg	
-SS	-SS	C29 - C36 Fraction	mg/kg	100	758	5680	981	9390	120	<100	10.1g/kg	
-SS	-SS	BTEX										
-SS	-SS	Benzene	mg/kg	0.2	---	---	---	---	---	---	---	
-SS	-SS	Toluene	mg/kg	0.2	---	---	---	---	---	---	---	
-SS	-SS	Chlorobenzene	mg/kg	0.2	---	---	---	---	---	---	---	
-SS	-SS	Ethylbenzene	mg/kg	0.2	---	---	---	---	---	---	---	
-SS	-SS	meta- & para-Xylene	mg/kg	0.2	---	---	---	---	---	---	---	
-SS	-SS	ortho-Xylene	mg/kg	0.2	---	---	---	---	---	---	---	
-SS	-SS	VOLATILE TPH/STEX COMPOUND SURROGATES										
-SS	-SS	1,2-Dichloroethane-D4	%	1	86	81	82	82	81	82	81	
-SS	-SS	Toluene-D8	%	1	84	85	83	85	82	82	88	
-SS	-SS	4-Bromofluorobenzene	%	1	80	81	80	81	77	80	82	

Job Number: ES27573
Batch: 0
Date of Issue: 05/04/2001
Client: IT ENVIRONMENTAL (AUST) P/L
Reference: BORAL WINGHAM

QUALITY CONTROL REPORT



METHOD		ANALYSIS DESCRIPTION	UNIT	LOR	SAMPLE IDENTIFICATION						CHECKS AND SPIKES			
					Laboratory I.D.	100	101	102	103	104				
					Date Sampled	20/02/2001	22/02/2001	22/02/2001	22/02/2001	22/02/2001				
						METHOD	NTPHT2522	NTPHT2522	NTPHT2522	NTPHT2522	MSD % REC			
						BLANK	SCS % REC	DCS % REC	MS % REC					
1-SS	1-SS	Moisture Content (dried @ 103°C)	%	0.1		---	---	---	---	---	---			
1-SS	1-SS	TOTAL PETROLEUM HYDROCARBONS	mg/kg	2		<2	98.0%	94.0%	102%	101%				
1-SS	1-SS	C6 - C9 Fraction	mg/kg	50		<50	107%	97.0%	109%	110%				
1-SS	1-SS	C10 - C14 Fraction	mg/kg	100		<100	103%	93.0%	99.0%	104%				
1-SS	1-SS	C15 - C28 Fraction	mg/kg	100		<100	103%	93.0%	---	---				
0-SS	0-SS	BTEX	mg/kg			<0.2	99.0%	101%	95.0%	102%				
0-SS	0-SS	Benzene	mg/kg	0.2		<0.2	92.0%	94.0%	91.0%	102%				
0-SS	0-SS	Toluene	mg/kg	0.2		<0.2	93.0%	104%	105%	108%				
0-SS	0-SS	Chlorobenzene	mg/kg	0.2		<0.2	93.0%	90.0%	---	---				
0-SS	0-SS	Ethylbenzene	mg/kg	0.2		<0.2	92.0%	89.0%	---	---				
0-SS	0-SS	meta- & para-Xylene	mg/kg	0.2		<0.2	91.0%	92.0%	---	---				
0-SS	0-SS	ortho-Xylene	mg/kg	0.2		<0.2		92.0%	---	---				
0-SS	0-SS	VOLATILE TPH/BTEX COMPOUND SURROGATES												
0-SS	0-SS	1,2-Dichloroethane-D4	%	1		110	112	88	102	108				
0-SS	0-SS	Toluene-D8	%	1		107	103	85	100	98				
0-SS	0-SS	4-Bromofluorobenzene	%	1		104	90	81	100	100				



ORGANICS QUALITY CONTROL REPORT

BATCH NO : ES27573

DATE BATCH RECEIVED : 22/2/01

CLIENT : IT Environmental

DATE BATCH COMPLETED : 05/04/01

Method Code	Test	Matrix	Method Reference		QC Lot Number	Date Samples Extracted	Date Samples Analysed
			Extraction	Analysis			
EP-071	TPH-Volatile	Soil	USEPA 5030 A	USEPA 8260A	NVOCS2522	26/02/01	27/02/01
	-Semivolatile	Soil	Tumbler	USEPA 8015A	NTPHT2522	26/02/01	27/02/01
EP-080	BTEX	Soil	USEPA 5030 A	USEPA 8260A	NVOCS2522	26/02/01	27/01/01

Where applicable, internal standards are added to sample extracts prior to instrumental analysis. Absolute peak areas and retention times fall within the criteria specified in the individual methods.

BATCH QUALITY CONTROL - CONTROL SPIKE/DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

Vol QC Lot : NVOC52522
Semivol QC Lot NTPHT2522

MATRIX : Soil

COMPOUND	BATCH ADJ. (MDL)	Blank Conc.	Spike Conc.	Spike Results				Control Limits		
				SCS Conc.	DCS Conc.	Av. Rec.	RPD	Recovery %		RPD
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	Low	High	%
C6-C9	2.0	<LOR	20	19.5	18.8	96	4	90	108	20
C10-C14	25	<LOR	200	214	194	102	10	74	121	20
C15-C28	50	<LOR	200	206	186	98	10	68	129	20
C29-C36	50	<LOR	200	206	186	98	10	69	125	20

COMMENTS:

- 1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
- 2) * : Recovery or RPD falls outside the recommended control limit.
- 3) MDL = Method Detection Limit
- 4) LOR = Level Of Reporting

BATCH QUALITY CONTROL -- DUPLICATE**ALS EP-071 : Total Petroleum Hydrocarbons by Fractions**

SEMIVOLATILES QC LOT NO.: NTPHT2522
VOLATILES QC LOT No.: NVOCS2522

ANALYST: A.ROSSI
MATRIX : Soil

COMPOUND	QC DUPLICATE RESULTS		
	ES26913	ES26913	RPD
	6	6DUP	
	mg/kg	mg/kg	%
C 6-C 9	<LOR	<LOR	--
C10-C14	<LOR	<LOR	--
C15-C28	<LOR	<LOR	--
C29-C36	<LOR	<LOR	--

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

SEMIVOLATILES QC LOT NO.: NTPHT2522
VOLATILES QC LOT No.: NVOCS2522

ANALYST: A.ROSSI
MATRIX : Soil

COMPOUND	QC DUPLICATE RESULTS		
	ES26913	ES26913	RPD
	9	9DUP	
	mg/kg	mg/kg	%
C 6-C 9	<LOR	<LOR	--
C10-C14	<LOR	<LOR	--
C15-C28	<LOR	<LOR	--
C29-C36	<LOR	<LOR	--

BATCH QUALITY CONTROL - MATRIX SPIKE/DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

Vol QC Lot : NVOC2522
Semivol QC Lot : NTPHT2522

SPIKED SAMPLE : ES26913-9
MATRIX : Soil

COMPOUND	Sample Results	Spike Level	Spike Results				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
C6-C9	<LOR	10	10.2	10.1	102	1	20
C10-C14	<LOR	426	464	468	109	1	20
C15-C28	<LOR	1576	1568	1640	102	4	20
C29-C36	<LOR	N/A	--	--	--	--	--

COMMENTS :

- 1) LOR: level of reporting
- 2) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/06)
- 3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL - CONTROL SPIKE/DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOCS2522

MATRIX : Soil

COMPOUND	BATCH	Blank	Spike	Spike Results				Control Limits		
	ADJ.	Conc.	Conc.	SCS	DCS	Av.	RPD	Recovery		RPD
	(MDL)			Conc.	Conc.	Rec.		%		
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	Low	High	%
Benzene	0.1	<LOR	1.0	0.99	1.01	100	3	83	115	20
Toluene	0.1	<LOR	1.0	0.92	0.94	93	2	85	113	20
Chlorobenzene	0.1	<LOR	1.0	0.93	1.04	98	11	89	112	20
Ethylbenzene	0.1	<LOR	1.0	0.93	0.90	92	4	86	114	20
m- & p-Xylene	0.1	<LOR	1.0	0.92	0.89	91	4	80	116	20
o-Xylene	0.1	<LOR	1.0	0.91	0.92	91	1	85	115	20

COMMENTS :

- 1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
- 2) * : Recovery or RPD falls outside the recommended control limit.
- 3) MDL = Method Detection Limit
- 4) LOR = Level Of Reporting

BATCH QUALITY CONTROL --- DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOC52522
MATRIX : Soil

Analyst : S.Green

QC DUPLICATE RESULTS			
COMPOUND	ES26913	ES26913	RPD
	6	6DUP	
	mg/kg	mg/kg	%
Benzene	<LOR	<LOR	--
Toluene	<LOR	<LOR	--
Chlorobenzene	<LOR	<LOR	--
Ethylbenzene	<LOR	<LOR	--
m- & p-Xylene	<LOR	<LOR	--
o-Xylene	<LOR	<LOR	--

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No.: NVOC2522
MATRIX : Soil

Analyst : S.Green

QC DUPLICATE RESULTS			
COMPOUND	ES26913	ES26913	RPD
	g	gDUP	
	mg/kg	mg/kg	%
Benzene	<LOR	<LOR	--
Toluene	<LOR	<LOR	--
Chlorobenzene	<LOR	<LOR	--
Ethylbenzene	<LOR	<LOR	--
m- & p-Xylene	<LOR	<LOR	--
o-Xylene	<LOR	<LOR	--

BATCH QUALITY CONTROL - MATRIX SPIKE/DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOCS2522

SPIKED SAMPLE : ES26913-9

MATRIX : Soil

COMPOUND	Sample Results	Spike Level	Spike Results				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
Benzene	<LOR	2.5	2.4	2.6	99	8	20
Toluene	<LOR	2.5	2.3	2.5	96	11	20
Chlorobenzene	<LOR	2.5	2.6	2.7	107	3	20

COMMENTS :

- 1) LOR: level of reporting
- 2) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/06)
- 3) * : Recovery or RPD falls outside of the recommended control limits.

SRAES27394

**SAMPLE RECEIPT ADVICE**

COMPANY: IT ENVIRONMENTAL (AUST) P/L
ATTENTION: M BENNETT
DATE: Mar. 28, 2001
FROM: Karin Laanemaa, ENV SYDNEY

ALS has received samples pertaining to your reference: J109264B

For future reference the batch number on this order is: ES27394

All samples and paper work were received in good order.
Samples have been received within recommended holding times.
Samples chilled when received.
Samples received in appropriately pretreated and preserved containers.
Please direct any turnaround/technical queries to Michael Heery.
Any queries relating to sample condition/numbering/breakages should be directed to Leigh Wills.
ANALYTICAL WORK FOR THIS BATCH WILL BE CONDUCTED AT ALS SYDNEY
All aqueous samples are stored for two weeks and solid samples for three months from the date of completion of the batch, unless specific arrangements are made otherwise.

Purchase Order Number: J109264B
Chain of Custody Reference Number: 22141
Project Name: BORAL WINGHAM

You can expect results to be reported as detailed below:

All Environmental Results Mar. 29, 2001

A L S - SERVICING YOUR NEEDS BETTER

AUSTRALIAN LABORATORY SERVICES P/L
ABN: 84 009 936 029

BRISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
Tel: 61-7-3243 7222	Tel: 61-2-8784 8555	Tel: 61-3-9538 4444	Tel: 61-2-4968 9433	Tel: 64-9-379 9437
Fax: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449

22141

IT Environmental (Australia) Pty Ltd

ACN 003 031 05

A Division of The IT Group
www.itgroup.com.au

- ☐ Adelaide: Tel (08) 8443 5600 Fax (08) 8443 6499
27 Queen Street, Trebarrow SA 5031
- ☐ Brisbane: Tel (07) 3252 5711 Fax (07) 3252 5712
Level 2, 33 Longland Street, Newstead QLD 4006
- ☐ Hobart: Tel (03) 8231 1620 Fax (03) 8231 1640
127 Beshurst Street, Hobart TAS 7500
- ☐ Melbourne: Tel (03) 9619 0284 Fax (03) 9619 4079
189 Burnwood Road, Hawthorn VIC 3122

- ☐ Perth: Tel (08) 9481 4333 Fax (08) 9481 4122
Level 7, 220 George's Terrace, Perth WA 6000
- ☒ Sydney: Tel (02) 9502 4344 Fax (02) 9502 2106
17 Fortescue Street, Kingsgrove NSW 2208
- ☐ Other:

Project No: J109264B

Project Name: Boral Wingham

Sampler Name: A Packwood

Special Instructions:

Task No:

Laboratory: ALS

Project Manager: M. Bennett

Analysis Request Section

Lab. No.	Sample ID	Sample Location	Sample Depth	Sample Date	Time	Matrix (Soil, etc)	Container Type & Preservative*	T-A-T (Specs)	TPH	BTX	METALS (Specify)	PAHS	PHENOLS	OCs / OPs	NOTES
V12	①			22-3-01		SOIL	1-2-J	3-SD	✓						
V13	②								✓						
V14	③								✓						
V15	④								✓						
V16	⑤								✓						
V17	⑥								✓						
V18	⑦								✓						
SPI	⑧								✓						
QCX	⑨								✓						

RELINQUISHED BY:

RECEIVED BY:

Signature: [Signature]	Date: 22-3-01	Signature: [Signature]	Date: 27-3-01
Company: [Signature]	Time: 10:00 AM	Company: [Signature]	Time: 10:00 AM
Signature: [Signature]	Date: [Signature]	Signature: [Signature]	Date: [Signature]
Company: [Signature]	Time: [Signature]	Company: [Signature]	Time: [Signature]

Sample Receipt Advice: (Lab Use Only)

All Samples Received in: Good Condition ...

All Documentation is in Proper Order ...

Samples Received Properly Chilled ...

Lab. Ref/Batch No.

ES27394

ALS Environmental

CERTIFICATE OF ANALYSIS



Batch: ES27394
Sub Batch: 0

CONTACT: M BENNETT
CLIENT: IT ENVIRONMENTAL (AUST) P/L
ADDRESS: 17 FORRESTER STREET
KINGSGROVE NSW 2208

LABORATORY: SYDNEY
DATE RECEIVED: 27/03/2001
DATE COMPLETED: 30/03/2001
SAMPLE TYPE: SOIL
No. of SAMPLES: 9

ORDER No.: J109264B
PROJECT: BORAL WINGHAM

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis.

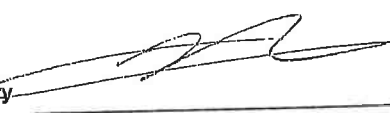
NOTES

This is the Final Report and supersedes any preliminary reports with this batch number. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

Phone: 61-2-8784 8555
Fax: 61-2-8784 8500
Email: brianw@als.com.au

Signatory 

LABORATORIES

AUSTRALASIA

Brisbane
Melbourne
Sydney
Newcastle

Hong Kong
Singapore
Kuala Lumpur
Auckland

AMERICAS

Vancouver
Santiago
Lima

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.





CERTIFICATE OF ANALYSIS

Job: ES27394
Batch: 0
Date of Issue: 30/03/2001
Client: IT ENVIRONMENTAL (AUST) P/L
Project Reference: BORAL WINGHAM

HOD		SAMPLE IDENTIFICATION									
		Laboratory I.D.	1	2	3	4	5	6	7	8	9
		Date Sampled	22/03/2001	22/03/2001	22/03/2001	22/03/2001	22/03/2001	22/03/2001	22/03/2001	22/03/2001	22/03/2001
		UNIT	V12	V13	V14	V15	V16	V17	V18	SP1	QCX
ANALYSIS DESCRIPTION		LOR									
-SS	Moisture Content (dried @ 103°C)	%	13.8	16.6	3.9	0.9	13.4	2.7	7.9	11.0	16.0
-SS	TOTAL PETROLEUM HYDROCARBONS										
-SS	C6 - C9 Fraction	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2
-SS	C10 - C14 Fraction	mg/kg	<50	<50	<50	<50	<50	<50	<50	67	<50
-SS	C15 - C28 Fraction	mg/kg	<100	<100	<100	<100	<100	<100	<100	1130	<100
-SS	C29 - C36 Fraction	mg/kg	<100	<100	<100	<100	<100	<100	<100	1420	<100
IS-SS	VOLATILE TPH/BTEX COMPOUND SURROGATES										
IS-SS	1,2-Dichloroethane-D4	%	85	83	92	84	80	90	86	80	88
IS-SS	Toluene-D8	%	82	87	89	84	81	88	82	87	86
IS-SS	4-Bromofluorobenzene	%	78	79	81	76	74	80	74	76	79



QUALITY CONTROL REPORT

ch: ES27394
Batch: 0
e of Issue: 30/03/2001
nt: IT ENVIRONMENTAL (AUST) P/L
nt Reference: BORAL WINGHAM

HOD		ANALYSIS DESCRIPTION		SAMPLE IDENTIFICATION							CHECKS AND SPIKES			
Laboratory I.D.		Date Sampled		UNIT	LOR	100	101	102	103	104				
						METHOD	NTPHT2563	NTPHT2563	NTPHT2563	NTPHT2563	MSD % REC	MS % REC	MSD % REC	MS % REC
						BLANK	SCS % REC	DCS % REC	MS % REC	MSD % REC				
1-SS	Moisture Content (dried @ 103°C)	%	0.1			---	---	---	---	---	---	---	---	---
1-SS	TOTAL PETROLEUM HYDROCARBONS					<2	95.0%	99.0%	104%	99.0%				
1-SS	C6 - C9 Fraction	mg/kg	2			<50	98.0%	97.0%	107%	111%				
1-SS	C10 - C14 Fraction	mg/kg	50			<100	89.0%	81.0%	104%	109%				
1-SS	C15 - C28 Fraction	mg/kg	100			<100	98.0%	86.0%	---	---				
1-SS	C29 - C36 Fraction	mg/kg	100											
OS-SS	VOLATILE TPH/BTEX COMPOUND SURROGATES													
OS-SS	1,2-Dichloroethane-D4	%	1			95	92	94	91	101				
OS-SS	Toluene-D8	%	1			92	91	94	91	85				
OS-SS	4-Bromofluorobenzene	%	1			89	92	97	86	85				



ORGANICS QUALITY CONTROL REPORT

BATCH NO: ES27394

DATE BATCH RECEIVED: 27/03/01

CLIENT: IT Environmental, Sydney

DATE BATCH COMPLETED: 29/03/01

PROJECT: J109264B_Boral Wingham

Method Code	Test	Matrix	Method Reference		QC Lot Number	Date Samples Extracted	Date Samples Analysed
			Extraction	Analysis			
EP-071	TPH(SV)	Soil	Tumbler	USEPA 8015A	NTPHT2563	28/03/01	28/03/01
EP-071/80	TPH(V)/BTEX	Soil	USEPA 5030A	USEPA 8260A	NVOC2563	26/03/01	28/03/01

Where applicable, internal standards are added to sample extracts prior to instrumental analysis. Absolute peak areas and retention times fall within the criteria specified in the individual methods.

Abbreviations: SV = semivolatile, V = volatile

*: In-house methods

BATCH QUALITY CONTROL - CONTROL SPIKE/DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

Vol QC Lot : NVOC2563
Semivol QC Lot : NTPHT2563

MATRIX : Soil

COMPOUND	BATCH ADJ. (MDL)	Blank Conc. mg/kg	Spike Conc. mg/kg	Spike Results				Control Limits		
				SCS Conc. mg/kg	DCS Conc. mg/kg	Av. Rec. %	RPD %	Recovery %		RPD %
				mg/kg	mg/kg	%	%	Low	High	%
C6-C9	2.0	< LOR	20	18.9	19.8	97	5	90	108	20
C10-C14	25	< LOR	200	196	194	98	1	74	121	20
C15-C28	50	< LOR	200	178	162	85	9	68	129	20
C29-C36	50	< LOR	200	196	172	92	13	69	125	20

COMMENTS:

- 1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
- 2) * : Recovery or RPD falls outside the recommended control limit.
- 3) MDL = Method Detection Limit
- 4) LOR = Level Of Reporting

BATCH QUALITY CONTROL -- DUPLICATE**ALS EP-071 : Total Petroleum Hydrocarbons by Fractions**

SEMIVOLATILES QC LOT NO.:
VOLATILES QC LOT NO.:

NTPHT2563
NVOC52563

ANALYST: A.ROSSI
MATRIX : Soil

COMPOUND	QC DUPLICATE RESULTS		
	NE2925	NE2925	RPD
	25	25DUP	
	mg/kg	mg/kg	%
C 6-C 9	209	217	4
C10-C14	1318	1288	2
C15-C28	1380	1360	1
C29-C36	< LOR	< LOR	--

BATCH QUALITY CONTROL -- DUPLICATE**ALS EP-071 : Total Petroleum Hydrocarbons by Fractions**

SEMIVOLATILES QC LOT NO.:
VOLATILES QC LOT No.:

NTPHT2563
NVOC2563

ANALYST: A.ROSSI
MATRIX : Soil

COMPOUND	QC DUPLICATE RESULTS		
	NE2925	NE2925	RPD
	27	27DUP	
	mg/kg	mg/kg	%
C 6-C 9	35	42	18
C10-C14	54	62	14
C15-C28	110	120	9
C29-C36	<LOR	<LOR	--

BATCH QUALITY CONTROL - MATRIX SPIKE/DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

Vol QC Lot : NVOC52563
Semivol QC Lot : NTPHT2563

SPIKED SAMPLE : NE2925-27
MATRIX : Soil

COMPOUND	Sample Results	Spike Level	Spike Results				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
C6-C9	351	10	10.4	9.9	102	5	20
C10-C14	54	430	458	478	109	4	20
C15-C28	110	1570	1630	1712	106	5	20
C29-C36	<LOR	N/A	--	--	--	--	--

COMMENTS :

- 1) LOR: level of reporting
- 2) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/06)
- 3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL - CONTROL SPIKE/DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOC52563

MATRIX : Soil

COMPOUND	BATCH ADJ. (MDL)	Blank Conc.	Spike Conc.	Spike Results				Control Limits		
				SCS Conc.	DCS Conc.	Av. Rec.	RPD	Recovery %		RPD
				mg/kg	mg/kg	%	%	Low	High	%
Benzene	0.1	< LOR	1.0	0.97	1.08	102	11	83	115	20
Toluene	0.1	< LOR	1.0	1.01	1.11	106	9	85	113	20
Chlorobenzene	0.1	< LOR	1.0	1.00	1.10	105	10	89	112	20
Ethylbenzene	0.1	< LOR	1.0	0.96	1.09	103	13	86	114	20
m- & p-Xylene	0.1	< LOR	1.0	0.99	1.10	104	10	80	116	20
o-Xylene	0.1	< LOR	1.0	0.97	1.09	103	11	85	115	20

COMMENTS :

- 1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
- 2) * : Recovery or RPD falls outside the recommended control limit.
- 3) MDL = Method Detection Limit
- 4) LOR = Level Of Reporting

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOC52563
MATRIX : Soil

Analyst : YEK HUN

QC DUPLICATE RESULTS			
COMPOUND	NE2925	NE2925	RPD
	25	25DUP	
	mg/kg	mg/kg	
Benzene	0.8	0.8	0
Toluene	1.1	1.1	0
Chlorobenzene	<LOR	<LOR	--
Ethylbenzene	3.4	3.6	6
m- & p-Xylene	7.3	7.6	4
o-Xylene	2	2.1	5

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOC52563
 MATRIX : Soil

Analyst : YEK HUN

QC DUPLICATE RESULTS			
COMPOUND	NE2925	NE2925	RPD
	27	27DUP	
	mg/kg	mg/kg	%
Benzene	1.1	1.1	0
Toluene	1.9	2.2	15
Chlorobenzene	<LOR	<LOR	--
Ethylbenzene	1.2	1.2	0
m- & p-Xylene	2.3	2.5	8
o-Xylene	0.7	0.8	13

BATCH QUALITY CONTROL - MATRIX SPIKE/DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOC2563

SPIKED SAMPLE : NE2925-27
MATRIX : Soil

COMPOUND	Sample Results	Spike Level	Spike Results				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
Benzene	1	2.5	2.3	2.4	93	3	20
Toluene	2	2.5	2.2	2.6	97	18	20
Chlorobenzene	<LOR	2.5	2.5	2.6	102	2	20

COMMENTS :

- 1) LOR: level of reporting
- 2) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/06)
- 3) * : Recovery or RPD falls outside of the recommended control limits.

ALS Environmental

CERTIFICATE OF ANALYSIS



Batch: ES27394
Sub Batch: 0

CONTACT: M BENNETT
CLIENT: IT ENVIRONMENTAL (AUST) P/L
ADDRESS: 17 FORRESTER STREET
KINGSGROVE NSW 2208

LABORATORY: SYDNEY
DATE RECEIVED: 27/03/2001
DATE COMPLETED: 30/03/2001
SAMPLE TYPE: SOIL
No. of SAMPLES: 9

ORDER No.: J109264B
PROJECT: BORAL WINGHAM

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis.

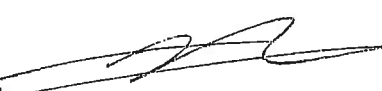
NOTES

This is the Final Report and supersedes any preliminary reports with this batch number. Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

Phone: 61-2-8784 8555
Fax: 61-2-8784 8500
Email: brianw@als.com.au

Signatory 

LABORATORIES

AUSTRALASIA

Brisbane
Melbourne
Sydney
Newcastle

Hong Kong
Singapore
Kuala Lumpur
Auckland

AMERICAS

Vancouver
Santiago
Lima

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.



No. 10918

Lab No: 394

Job Batch:

0

30/03/2001

Date of Issue:

IT ENVIRONMENTAL (AUST) P/L

Client:

BORAL WINGHAM

Client Reference:

CERTIFICATE OF ANALYSIS



		SAMPLE IDENTIFICATION										
Laboratory I.D.		1	2	3	4	5	6	7	8	9		
Date Sampled		22/03/2001	22/03/2001	22/03/2001	22/03/2001	22/03/2001	22/03/2001	22/03/2001	22/03/2001	22/03/2001		
THOD	ANALYSIS DESCRIPTION	UNIT	LOR	V12	V13	V14	V15	V16	V17	V18	SP1	QCX
5	Moisture Content (dried @ 103°C)	%	0.1	13.8	16.6	3.9	0.9	13.4	2.7	7.9	11.0	16.0
1-SS	TOTAL PETROLEUM HYDROCARBONS											
1-SS	C6 - C9 Fraction	mg/kg	2	<2	<2	<2	<2	<2	<2	<2	<2	<2
1-SS	C10 - C14 Fraction	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	67	<50
1-SS	C15 - C28 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	1130	<100
1-SS	C29 - C36 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	1420	<100
30S-SS	VOLATILE TPH/BTEX COMPOUND SURROGATES											
30S-SS	1,2-Dichloroethane-D4	%	1	85	83	92	84	80	90	86	80	88
30S-SS	Toluene-D8	%	1	82	87	89	84	81	88	82	87	86
30S-SS	4-Bromofluorobenzene	%	1	78	79	81	76	74	80	74	76	79

Tech: ES27394
 Lab Batch: 0
 Date of Issue: 30/03/2001
 Client: IT ENVIRONMENTAL (AUST) P/L
 Client Reference: BORAL WINGHAM

QUALITY CONTROL REPORT



THOD		ANALYSIS DESCRIPTION	Laboratory I.D.		SAMPLE IDENTIFICATION							
			UNIT	LOR	100	101	102	103	104			
					27/03/2001	27/03/2001	27/03/2001	27/03/2001	27/03/2001			
					METHOD	NTPHT2563	NTPHT2563	NTPHT2563	NTPHT2563			
					BLANK	SCS % REC	DCS % REC	MS % REC	MSD % REC			
CHECKS AND SPIKES												
15	15	Moisture Content (dried @ 103°C)	%	0.1	---	---	---	---	---			
15	15	TOTAL PETROLEUM HYDROCARBONS										
15	15	C6 - C9 Fraction	mg/kg	2	<2	95.0%	99.0%	104%	99.0%			
15	15	C10 - C14 Fraction	mg/kg	50	<50	98.0%	97.0%	107%	111%			
15	15	C15 - C28 Fraction	mg/kg	100	<100	89.0%	81.0%	104%	109%			
15	15	C29 - C36 Fraction	mg/kg	100	<100	98.0%	86.0%	---	---			
30S-SS	30S-SS	VOLATILE TPH/BTEX COMPOUND SURROGATES										
30S-SS	30S-SS	1,2-Dichloroethane-D4	%	1	95	92	94	91	101			
30S-SS	30S-SS	Toluene-D8	%	1	92	91	94	91	85			
30S-SS	30S-SS	4-Bromofluorobenzene	%	1	89	92	97	86	85			

ALS Environmental



CERTIFICATE OF ANALYSIS

Batch: ES27983
Sub Batch: 0

CONTACT: M BENNETT
CLIENT: IT ENVIRONMENTAL (AUST) P/L
ADDRESS:
17 FORRESTER STREET
KINGSGROVE NSW 2208

LABORATORY: SYDNEY
DATE RECEIVED: 08/05/2001
DATE COMPLETED: 14/05/2001
SAMPLE TYPE: SOIL
No. of SAMPLES: 2

ORDER No.: J109264B

PROJECT:

COMMENTS

Samples as received digested by USEPA method 3051 prior to the determination of metals. Cr6+ determined on a 1:5 soil/water extract.
Results reported on a dry weight basis.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

Phone: 61-2-8784 8555
Fax: 61-2-8784 8500
Email: brianw@als.com.au

Signatory

Breg Vogel

LABORATORIES

AUSTRALASIA

Brisbane
Melbourne
Sydney
Newcastle
Auckland

Hong Kong
Singapore
Kuala Lumpur
Bogor

AMERICAS

Vancouver
Santiago
Antofagasta
Lima

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.



No. 10918

Lab No: 983

Job Batch:

0

Date of Issue:

14/05/2001

Client:

IT ENVIRONMENTAL (AUST) P/L

Client Reference:

CERTIFICATE OF ANALYSIS



THOD		ANALYSIS DESCRIPTION		UNIT		Laboratory I.D. Date Sampled		LOR		SAMPLE IDENTIFICATION									
5		Moisture Content (dried @ 103°C)		%		0.1				1	2								
5T		Arsenic - Total		mg/kg		1				04/05/2001 SP2	04/05/2001 SP3								
5T		Cadmium - Total		mg/kg		1				10.0	11.7								
5T		Chromium - Total		mg/kg		1				3	5								
5T		Copper - Total		mg/kg		1				<1	<1								
5T		Lead - Total		mg/kg		1				12	14								
5T		Zinc - Total		mg/kg		1				6	10								
5T		Mercury - Total		mg/kg		1				12	2								
5T		Hexavalent Chromium		mg/kg		0.1				81	15								
5T				mg/kg		1				<0.1	0.3								
5T				mg/kg		1				<1	<1								



QUALITY CONTROL REPORT

Job Number: ES27983
Batch: 0
Date of Issue: 14/05/2001
Client: IT ENVIRONMENTAL (AUST) P/L
Client Reference:

SAMPLE IDENTIFICATION										
Laboratory I.D. Date Sampled				1 04/05/2001 SP2 MS % REC	1 04/05/2001 SP2 CHK	200 08/05/2001 METHOD BLANK	201 08/05/2001 LCS % REC	202 08/05/2001 MS % REC		
THOD	ANALYSIS DESCRIPTION			UNIT	LOR	CHECKS AND SPIKES				
5	Moisture Content (dried @ 103°C)			%	0.1	---	10.0	---	---	
15T	Arsenic - Total			mg/kg	1	---	---	85.0%	77.0%	
15T	Cadmium - Total			mg/kg	1	---	---	84.0%	89.0%	
15T	Chromium - Total			mg/kg	1	---	---	86.0%	88.0%	
15T	Copper - Total			mg/kg	1	---	---	90.0%	82.0%	
15T	Lead - Total			mg/kg	1	---	---	85.0%	93.0%	
15T	Zinc - Total			mg/kg	1	---	---	87.0%	94.0%	
35T	Mercury - Total			mg/kg	0.1	---	---	84.0%	80.0%	
50	Hexavalent Chromium			mg/kg	1	102%	<1	100%	---	



ALS Environmental

CERTIFICATE OF ANALYSIS

Batch: ES27983
Sub Batch: 1

CONTACT: M BENNETT
CLIENT: IT ENVIRONMENTAL (AUST) P/L
ADDRESS: 17 FORRESTER STREET
KINGSGROVE NSW 2208

LABORATORY: SYDNEY
DATE RECEIVED: 08/05/2001
DATE COMPLETED: 14/05/2001
SAMPLE TYPE: SOIL
No. of SAMPLES: 2

ORDER No.: J109264B

PROJECT:

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

Phone: 61-2-8784 8555
Fax: 61-2-8784 8500
Email: brianw@als.com.au

Signatory

LABORATORIES

AUSTRALASIA

Brisbane
Melbourne
Sydney
Newcastle
Auckland
Hong Kong
Singapore
Kuala Lumpur
Bogor

AMERICAS

Vancouver
Santiago
Antofagasta
Lima

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.



tch: ES27983
 b Batch: 1
 te of Issue: 14/05/2001
 ent: IT ENVIRONMENTAL (AUST) P/L
 ent Reference:

CERTIFICATE OF ANALYSIS



METHOD		ANALYSIS DESCRIPTION		Laboratory I.D. Date Sampled		UNIT		LOR		SAMPLE IDENTIFICATION					
										1 04/05/2001 SP2	2 04/05/2001 SP3				
5		Moisture Content (dried @ 103°C)				%		0.1		10.0	11.7				
1-SS		TOTAL PETROLEUM HYDROCARBONS													
1-SS		C6 - C9 Fraction				mg/kg		2		<2	<2				
1-SS		C10 - C14 Fraction				mg/kg		50		<50	70				
1-SS		C15 - C28 Fraction				mg/kg		100		538	1510				
1-SS		C29 - C36 Fraction				mg/kg		100		229	1780				
10-SS		BTEX													
10-SS		Benzene				mg/kg		0.2		<0.2	<0.2				
10-SS		Toluene				mg/kg		0.2		<0.2	<0.2				
10-SS		Chlorobenzene				mg/kg		0.2		<0.2	<0.2				
10-SS		Ethylbenzene				mg/kg		0.2		<0.2	<0.2				
10-SS		meta- & para-Xylene				mg/kg		0.2		<0.2	<0.2				
10-SS		ortho-Xylene				mg/kg		0.2		<0.2	<0.2				
30S-SS		VOLATILE TPH/BTEX COMPOUND SURROGATES													
30S-SS		1,2-Dichloroethane-D4				%		1		98	95				
30S-SS		Toluene-D8				%		1		99	94				
30S-SS		4-Bromofluorobenzene				%		1		95	93				

Sample ID: ES27983

Batch: 1

Date of Issue: 14/05/2001

Client: IT ENVIRONMENTAL (AUST) P/L

Reference:

Method:

QUALITY CONTROL REPORT



METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	SAMPLE IDENTIFICATION						CHECKS AND SPIKES			
				100	101	102	103	104		SCS % REC	DCS % REC	MS % REC	MSD % REC
08/05/2001	METHOD	BLANK											
1-SS	Moisture Content (dried @ 103°C)	%	0.1										
1-SS	TOTAL PETROLEUM HYDROCARBONS												
1-SS	C6 - C9 Fraction	mg/kg	2	<2	98.0%	102%	99.0%	98.0%					
1-SS	C10 - C14 Fraction	mg/kg	50	<50	90.0%	92.0%	107%	110%					
1-SS	C15 - C28 Fraction	mg/kg	100	<100	90.0%	93.0%	106%	103%					
1-SS	C29 - C36 Fraction	mg/kg	100	<100	108%	109%							
10-SS	BTEX												
10-SS	Benzene	mg/kg	0.2	<0.2	108%	101%	108%	104%					
10-SS	Toluene	mg/kg	0.2	<0.2	99.0%	95.0%	101%	99.0%					
10-SS	Chlorobenzene	mg/kg	0.2	<0.2	96.0%	98.0%	95.0%	95.0%					
10-SS	Ethylbenzene	mg/kg	0.2	<0.2	100%	99.0%							
10-SS	mela- & para-Xylene	mg/kg	0.2	<0.2	115%	101%							
10-SS	ortho-Xylene	mg/kg	0.2	<0.2	100%	100%							
10-SS	VOLATILE TPH/BTEX COMPOUND SURROGATES												
10-SS	1,2-Dichloroethane-D4	%	1	100	99	103	98	94					
10-SS	Toluene-D8	%	1	96	105	105	94	90					
10-SS	4-Bromofluorobenzene	%	1	96	100	101	90	87					



ALS Environmental

CERTIFICATE OF ANALYSIS

Batch: ES27983
Sub Batch: 2

CONTACT: M BENNETT
CLIENT: IT ENVIRONMENTAL (AUST) P/L
ADDRESS: 17 FORRESTER STREET
KINGSGROVE NSW 2208

LABORATORY: SYDNEY
DATE RECEIVED: 08/05/2001
DATE COMPLETED: 14/05/2001
SAMPLE TYPE: SOIL
No. of SAMPLES: 2

ORDER No.: J109264B

PROJECT:

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

Phone: 61-2-8784 8555
Fax: 61-2-8784 8500
Email: brianw@als.com.au

Signatory

LABORATORIES

AUSTRALASIA

Brisbane
Melbourne
Sydney
Newcastle
Auckland

Hong Kong
Singapore
Kuala Lumpur
Bogor

AMERICAS

Vancouver
Santiago
Antofagasta
Lima

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.



Lab: 983

Lab Batch:

2

Date of Issue:

14/05/2001

Client:

IT ENVIRONMENTAL (AUST) P/L

Client Reference:

CERTIFICATE OF ANALYSIS



Laboratory I.D. Date Sampled			SAMPLE IDENTIFICATION		
THOD	ANALYSIS DESCRIPTION	UNIT	LOR	1 04/05/2001 SP2	2 04/05/2001 SP3
5	Moisture Content (dried @ 103°C)	%	0.1	10.0	11.7
5B-SS	POLYNUCLEAR AROMATICS				
5B-SS	Naphthalene	mg/kg	0.05	<0.05	<0.05
5B-SS	2-Methylnaphthalene	mg/kg	0.05	<0.05	0.06
5B-SS	2-Chloronaphthalene	mg/kg	0.05	<0.05	<0.05
5B-SS	Acenaphthylene	mg/kg	0.05	<0.05	<0.05
5B-SS	Acenaphthene	mg/kg	0.05	<0.05	<0.05
5B-SS	Fluorene	mg/kg	0.05	<0.05	<0.05
5B-SS	Phenanthrene	mg/kg	0.05	<0.05	0.07
5B-SS	Anthracene	mg/kg	0.05	<0.05	<0.05
5B-SS	Fluoranthene	mg/kg	0.05	<0.05	0.06
5B-SS	Pyrene	mg/kg	0.05	<0.05	0.11
75B-SS	N-2-Fluorenylacetamide	mg/kg	0.05	<0.05	<0.05
75B-SS	Benzo(a)anthracene	mg/kg	0.05	<0.05	<0.05
75B-SS	Chrysene	mg/kg	0.05	<0.05	<0.05
75B-SS	Benzo(b) & (k)fluoranthene	mg/kg	0.1	<0.1	<0.1
75B-SS	7,12-Dimethylbenz(a)anthracene	mg/kg	0.05	<0.05	<0.05
75B-SS	Benzo(a)pyrene	mg/kg	0.05	<0.05	<0.05
75B-SS	3-Methylcholanthrene	mg/kg	0.05	<0.05	<0.05
75B-SS	Indeno(1,2,3-cd)pyrene	mg/kg	0.05	<0.05	<0.05
75B-SS	Dibenz(a,h)anthracene	mg/kg	0.05	<0.05	<0.05
75B-SS	Benzo(g,h,i)perylene	mg/kg	0.05	<0.05	<0.05
75T-SS	BASE/NEUTRAL EXTRACTABLE SURROGATES				
75T-SS	Nitrobenzene-D5	%	1	93	95
75T-SS	1,2-Dichlorobenzene-D4	%	1	86	88
75T-SS	2-Fluorobiphenyl	%	1	94	103
75T-SS	Anthracene-d10	%	1	95	101
75T-SS	p-Terphenyl-D14	%	1	112	105

QUALITY CONTROL REPORT



METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	Laboratory I.D. Date Sampled	SAMPLE IDENTIFICATION					CHECKS AND SPIKES				
					100 08/05/2001 METHOD BLANK	101 08/05/2001 NSVOCs1554 SCS % REC	102 08/05/2001 NSVOCs1554 DCS % REC	103 08/05/2001 NSVOCs1554 MS % REC	104 08/05/2001 NSVOCs1554 MSD % REC					
5	Moisture Content (dried @ 103°C)	%	0.1		---	---	---	---	---					
5B-SS	POLYNUCLEAR AROMATICS													
5B-SS	Naphthalene	mg/kg	0.05		<0.05	85.8%	83.3%	---	---					
5B-SS	2-Methylnaphthalene	mg/kg	0.05		<0.05	81.9%	78.9%	---	---					
5B-SS	2-Chloronaphthalene	mg/kg	0.05		<0.05	77.4%	75.4%	---	---					
5B-SS	Acenaphthylene	mg/kg	0.05		<0.05	77.4%	73.3%	---	---					
5B-SS	Acenaphthene	mg/kg	0.05		<0.05	88.2%	85.7%	102%	101%					
5B-SS	Fluorene	mg/kg	0.05		<0.05	86.4%	84.2%	---	---					
5B-SS	Phenanthrene	mg/kg	0.05		<0.05	91.8%	92.4%	---	---					
5B-SS	Anthracene	mg/kg	0.05		<0.05	89.4%	88.6%	---	---					
5B-SS	Fluoranthene	mg/kg	0.05		<0.05	89.2%	86.4%	---	---					
5B-SS	Pyrene	mg/kg	0.05		<0.05	91.5%	88.0%	107%	106%					
5B-SS	N-2-Fluorenylacetamide	mg/kg	0.05		<0.05	81.9%	82.4%	---	---					
5B-SS	Benz(a)anthracene	mg/kg	0.05		<0.05	88.3%	85.0%	---	---					
5B-SS	Chrysene	mg/kg	0.05		<0.05	88.2%	85.4%	---	---					
5B-SS	Benzo(b) & (k)fluoranthene	mg/kg	0.1		<0.1	88.8%	85.8%	---	---					
5B-SS	7,12-Dimethylbenz(a)anthracene	mg/kg	0.05		<0.05	82.5%	82.7%	---	---					
5B-SS	Benzo(a)pyrene	mg/kg	0.05		<0.05	88.5%	85.8%	---	---					
5B-SS	3-Methylcholanthrene	mg/kg	0.05		<0.05	91.9%	86.7%	---	---					
5B-SS	Indeno(1,2,3-cd)pyrene	mg/kg	0.05		<0.05	85.6%	82.3%	---	---					
5B-SS	Dibenz(a,h)anthracene	mg/kg	0.05		<0.05	87.1%	82.8%	---	---					
5B-SS	Benzo(g,h,i)perylene	mg/kg	0.05		<0.05	87.3%	84.1%	---	---					
5B-SS	BASE/NEUTRAL EXTRACTABLE SURROGATES													
75T-SS	Nitrobenzene-D5	%	1		88	86	82	79	77					
75T-SS	1,2-Dichlorobenzene-D4	%	1		79	77	78	71	71					
75T-SS	2-Fluorobiphenyl	%	1		78	72	69	76	76					
75T-SS	Anthracene-d10	%	1		85	79	80	80	80					
75T-SS	p-Terphenyl-D14	%	1		90	83	85	82	80					

**ORGANICS QUALITY CONTROL REPORT****BATCH NO: ES27983****DATE BATCH RECEIVED: 9/05/01****CLIENT: IT Environmental, Sydney****DATE BATCH COMPLETED: 11/05/01****PROJECT: J109264B**

Method Code	Test	Matrix	Method Reference		QC Lot Number	Date Samples Extracted	Date Samples Analysed
			Extraction	Analysis			
EP-071	TPH(SV)	Soil	Tumbler	USEPA 8015A	NTPHT2610	9/05/01	9/05/01
EP-071/80	TPH(V)/BTEX	Soil	USEPA 5030A	USEPA 8260A	NVOCs2610	9/05/01	9/05/01
EP-075	SV Scan	Soil	Tumbler	USEPA 8270B	NSVOCs1554	9/05/01	9/05/01

Where applicable, internal standards are added to sample extracts prior to instrumental analysis. Absolute peak areas and retention times fall within the criteria specified in the individual methods.

Abbreviations: SV = semivolatile, V = volatile

*: In-house methods

BATCH QUALITY CONTROL - CONTROL SPIKE/DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

Vol QC Lot : NVOCS2610
Semivol QC Lot : NTPHT2610

MATRIX : Soil

COMPOUND	BATCH ADJ. (MDL) mg/kg	Blank Conc. mg/kg	Spike Conc. mg/kg	Spike Results				Control Limits		
				SCS Conc. mg/kg	DCS Conc. mg/kg	Av. Rec. %	RPD %	Recovery %		RPD %
								Low	High	
C6-C9	2.0	<LOR	20	19.6	20.3	100	4	90	108	20
C10-C14	25	<LOR	200	180	184	91	2	74	121	20
C15-C28	50	<LOR	200	180	186	92	3	68	129	20
C29-C36	50	<LOR	200	216	218	108	1	69	125	20

COMMENTS:

- 1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
- 2) * : Recovery or RPD falls outside the recommended control limit.
- 3) MDL = Method Detection Limit
- 4) LOR = Level Of Reporting

BATCH QUALITY CONTROL -- DUPLICATE**ALS EP-071 : Total Petroleum Hydrocarbons by Fractions**

SEMIVOLATILES QC LOT NO.: NTPHT2610
VOLATILES QC LOT No.: NVOCS2610

ANALYST: A.ROSSI
MATRIX : Soil

COMPOUND	QC DUPLICATE RESULTS		
	ES27901	ES27901	RPD
	8	8D	
	mg/kg	mg/kg	%
C 6-C 9	<LOR	<LOR	--
C10-C14	<LOR	<LOR	--
C15-C28	<LOR	<LOR	--
C29-C36	<LOR	<LOR	--

BATCH QUALITY CONTROL -- DUPLICATE**ALS EP-071 : Total Petroleum Hydrocarbons by Fractions**

SEMIVOLATILES QC LOT NO.: NTPHT2610
VOLATILES QC LOT No.: NVOCS2610

ANALYST: A.ROSSI
MATRIX : Soil

COMPOUND	QC DUPLICATE RESULTS		
	ES27901	ES27901	RPD
	9	9D	
	mg/kg	mg/kg	%
C 6-C 9	<LOR	<LOR	--
C10-C14	<LOR	<LOR	--
C15-C28	<LOR	<LOR	--
C29-C36	<LOR	<LOR	--

BATCH QUALITY CONTROL - MATRIX SPIKE/DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

Vol QC Lot : NVOCS2610
Semivol QC Lot : NTPHT2610

SPIKED SAMPLE : ES27901-9
MATRIX : Soil

COMPOUND	Sample Results	Spike Level	Spike Results				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
C6-C9	<LOR	10	9.9	9.8	99	1	20
C10-C14	<LOR	430	458	474	108	3	20
C15-C28	<LOR	1570	1668	1610	104	4	20
C29-C36	<LOR	N/A	--	--	--	--	--

COMMENTS :

- 1) LOR: level of reporting
- 2) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/06)
- 3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOC52610
MATRIX : Soil

Analyst : H.CAVANAUGH

QC DUPLICATE RESULTS			
COMPOUND	ES27901	ES27901	RPD
	8	8D	
	mg/kg	mg/kg	%
Benzene	<LOR	<LOR	--
Toluene	<LOR	<LOR	--
Chlorobenzene	<LOR	<LOR	--
Ethylbenzene	<LOR	<LOR	--
m- & p-Xylene	<LOR	<LOR	--
o-Xylene	<LOR	<LOR	--

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOCS2610
 MATRIX : Soil

Analyst : H.CAVANAUGH

QC DUPLICATE RESULTS			
COMPOUND	ES27901	ES27901	RPD
	9	9D	
	mg/kg	mg/kg	%
Benzene	<LOR	<LOR	--
Toluene	<LOR	<LOR	--
Chlorobenzene	<LOR	<LOR	--
Ethylbenzene	<LOR	<LOR	--
m- & p-Xylene	<LOR	<LOR	--
o-Xylene	<LOR	<LOR	--

BATCH QUALITY CONTROL - MATRIX SPIKE/DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOCS2610

SPIKED SAMPLE : ES27901-9
MATRIX : Soil

COMPOUND	Sample Results	Spike Level	Spike Results				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
Benzene	<LOR	2.5	2.7	2.6	106	4	20
Toluene	<LOR	2.5	2.5	2.5	100	3	20
Chlorobenzene	<LOR	2.5	2.4	2.4	95	0	20

COMMENTS :

- 1) LOR: level of reporting
- 2) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/06)
- 3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. :

NSVOCS1554

ANALYST ALICE TAT

MATRIX:

Soils

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
	mg/kg	mg/kg	%		%	%	Low	High	%
EP-075A : PHENOLS									
Phenol	<0.025	0.25	115	110	113	4.44	78.7	134	0 - 35
2-Chlorophenol	<0.025	0.25	99.3	94.8	97.1	4.64	66.4	130	0 - 35
2-Methylphenol	<0.025	0.25	100	97.4	98.7	2.63	67.9	126	0 - 35
4-Methylphenol	<0.025	0.5	93	87.8	90.4	5.75	54.4	132	0 - 35
2-Nitrophenol	<0.025	0.25	60.2	74.7	67.5	21.5	67	135	0 - 35
2,4-Dimethylphenol	<0.025	0.25	90.2	83.3	86.8	7.95	23.9	106	0 - 35
2,4-Dichlorophenol	<0.025	0.25	91	84.5	87.8	7.41	62.6	132	0 - 35
2,6-Dichlorophenol	<0.025	0.25	80.2	81.4	80.8	1.49	65.3	126	0 - 35
4-Chloro-3-methylphenol	<0.025	0.25	87.7	86.6	87.2	1.26	69.7	122	0 - 35
2,4,6-Trichlorophenol	<0.025	0.25	75.2	73.9	74.6	1.74	52.8	133	0 - 35
2,4,5-Trichlorophenol	<0.025	0.25	79.3	78.1	78.7	1.52	60.6	124	0 - 35
Pentachlorophenol	<0.05	0.5	108	99.4	104	8.29	0	112	0 - 35
EP-075B : POLYAROMATIC HYDROCARBONS									
Naphthalene	<0.025	0.25	85.8	83.3	84.6	2.96	67.9	134	0 - 35
2-Methylnaphthalene	<0.025	0.25	81.9	78.9	80.4	3.73	69.8	129	0 - 35
2-Chloronaphthalene	<0.025	0.25	77.4	75.4	76.4	2.62	72.4	125	0 - 35
Acenaphthylene	<0.025	0.25	77.4	73.3	75.4	5.44	70	127	0 - 35
Acenaphthene	<0.025	0.25	88.2	85.7	87	2.88	71.5	128	0 - 35
Fluorene	<0.025	0.25	86.4	84.2	85.3	2.58	72.3	127	0 - 35
Phenanthrene	<0.025	0.25	91.8	92.4	92.1	0.65	77.5	128	0 - 35
Anthracene	<0.025	0.25	89.4	88.6	89	0.9	73.6	127	0 - 35
Fluoranthene	<0.025	0.25	89.2	86.4	87.8	3.19	73.6	129	0 - 35
Pyrene	<0.025	0.25	91.5	88	89.8	3.9	73.4	128	0 - 35
N-2-Fluorenylacetamide	<0.025	0.25	81.9	82.4	82.2	0.61	39.7	152	0 - 35
Benz(a)anthracene	<0.025	0.25	88.3	85	86.7	3.81	72.7	128	0 - 35
Chrysene	<0.025	0.25	88.2	85.4	86.8	3.23	71.3	131	0 - 35
Benzo(b)&(k)fluoranthene	<0.05	0.5	88.8	85.8	87.3	3.44	76.7	124	0 - 35
7,12-Dimethylbenz(a)anthracene	<0.025	0.25	82.5	82.7	82.6	0.24	65.7	126	0 - 35
Benzo(a)pyrene	<0.025	0.25	88.5	85.8	87.2	3.1	73.5	122	0 - 35
3-Methylchloanthrene	<0.025	0.25	91.9	86.7	89.3	5.82	58.3	136	0 - 35
Indeno(1,2,3-cd)pyrene	<0.025	0.25	85.6	82.3	84	3.93	67.4	130	0 - 35
Dibenz(a,h)anthracene	<0.025	0.25	87.1	82.8	85	5.06	66	130	0 - 35
Benzo(g,h,i)perylene	<0.025	0.25	87.3	84.1	85.7	3.73	70.2	130	0 - 35

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1554

ANALYST ALICE TAT

MATRIX: Soils

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
	mg/kg	mg/kg	%		%	%	Low	High	%
EP-075S : ACID EXTRACTABLE SURROGATES									
2-Fluorophenol	107%	0.5	91.9	92.5	92.2	0.65	24.5	160	0 - 35
Phenol-d6	110%	0.5	105	101	103	3.88	61.6	135	0 - 35
2-Chlorophenol-d4	108%	0.5	98.6	95.6	97.1	3.09	59.8	138	0 - 35
2,4,6-Tribromophenol	77.7%	0.5	79.8	80	79.9	0.25	46.6	128	0 - 35
EP-075T : BASE/NEUTRAL EXTRACTABLE SURROGATES									
Nitrobenzene-d5	87.5%	0.5	85.6	81.8	83.7	4.54	75.5	126	0 - 35
1,2-Dichlorobenzene-d4	78.5%	0.5	76.9	77.7	77.3	1.03	62.9	123	0 - 35
2-Fluorobiphenyl	78.1%	0.5	71.9	68.8	70.4	4.41	70.7	127	0 - 35
Anthracene-d10	85.2%	0.5	79.3	80.1	79.7	1	73.5	130	0 - 35
4-Terphenyl-d14	90.3%	0.5	83.2	85.2	84.2	2.38	70.3	133	0 - 35

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1554

MATRIX : Soils

ANALYST: ALICE TAT

COMPOUND	LOR	QC DUPLICATE RESULTS		RPD	
		ES27901	ES27901	RPD	Cont. Limit
		10	10D		
	mg/kg	mg/kg	mg/kg		%
EP-075A : PHENOLS					
Phenol	0.025	<0.025	<0.025	n/a	
2-Chlorophenol	0.025	<0.025	<0.025	n/a	
2-Methylphenol	0.025	<0.025	<0.025	n/a	
4-Methylphenol	0.025	<0.025	<0.025	n/a	
2-Nitrophenol	0.025	<0.025	<0.025	n/a	
2,4-Dimethylphenol	0.025	<0.025	<0.025	n/a	
2,4-Dichlorophenol	0.025	<0.025	<0.025	n/a	
2,6-Dichlorophenol	0.025	<0.025	<0.025	n/a	
4-Chloro-3-methylphenol	0.025	<0.025	<0.025	n/a	
2,4,6-Trichlorophenol	0.025	<0.025	<0.025	n/a	
2,4,5-Trichlorophenol	0.025	<0.025	<0.025	n/a	
Pentachlorophenol	0.05	<0.05	<0.05	n/a	
EP-075B : POLYNUCLEAR AROMATIC HYDROCARBONS					
Naphthalene	0.025	<0.025	<0.025	n/a	
2-Methylnaphthalene	0.025	<0.025	<0.025	n/a	
2-Chloronaphthalene	0.025	<0.025	<0.025	n/a	
Acenaphthylene	0.025	<0.025	<0.025	n/a	
Acenaphthene	0.025	<0.025	<0.025	n/a	
Fluorene	0.025	<0.025	<0.025	n/a	
Phenanthrene	0.025	<0.025	<0.025	n/a	
Anthracene	0.025	<0.025	<0.025	n/a	
Fluoranthene	0.025	<0.025	<0.025	n/a	
Pyrene	0.025	<0.025	<0.025	n/a	
N-2-Fluorenylacetamide	0.025	<0.025	<0.025	n/a	
Benz(a)anthracene	0.025	<0.025	<0.025	n/a	
Chrysene	0.025	<0.025	<0.025	n/a	
Benzo(b)&(k)fluoranthene	0.05	<0.05	<0.05	n/a	
7,12-Dimethylbenz(a)anthracene	0.025	<0.025	<0.025	n/a	
Benzo(a)pyrene	0.025	<0.025	<0.025	n/a	
3-Methylchloanthrene	0.025	<0.025	<0.025	n/a	
Indeno(1,2,3-cd)pyrene	0.025	<0.025	<0.025	n/a	
Dibenz(a,h)anthracene	0.025	<0.025	<0.025	n/a	
Benzo(g,h,i)perylene	0.025	<0.025	<0.025	n/a	

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1554
 MATRIX : Soils
 ANALYST: ALICE TAT

COMPOUND	LOR	QC DUPLICATE RESULTS		RPD	
		ES27901	ES27901	RPD	Cont. Limit
	10	10D			
	mg/kg	mg/kg	mg/kg		%
EP-075S : ACID EXTRACTABLE SURROGATES					
2-Fluorophenol	1%	72.8%	87.2%	18	0 - 20
Phenol-d6	1%	83%	92%	10.3	0 - 20
2-Chlorophenol-d4	1%	89.6%	94.4%	5.22	0 - 20
2,4,6-Tribromophenol	1%	64.4%	72.8%	12.2	0 - 20
EP-075T : BASE/NEUTRAL EXTRACTABLE SURROGATES					
Nitrobenzene-d5	1%	78%	96.1%	20.8	* 0 - 20
1,2-Dichlorobenzene-d4	1%	73%	75%	2.7	0 - 20
2-Fluorobiphenyl	1%	71%	71%	0	0 - 20
Anthracene-d10	1%	81%	83.9%	3.52	0 - 20
4-Terphenyl-d14	1%	72.6%	85.3%	16.1	0 - 20

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:

Result < 10 times LOR, no limit.

Result between 10 and 20 times LOR, 0% - 50%.

Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOC1554
 MATRIX : Soils
 ANALYST: ALICE TAT

COMPOUND	LOR	QC DUPLICATE RESULTS		RPD	
		ES27901	ES27901	RPD	Cont. Limit
	11	11D			
	mg/kg	mg/kg	mg/kg		%
EP-075A : PHENOLS					
Phenol	0.025	<0.025	<0.025	n/a	
2-Chlorophenol	0.025	<0.025	<0.025	n/a	
2-Methylphenol	0.025	<0.025	<0.025	n/a	
4-Methylphenol	0.025	<0.025	<0.025	n/a	
2-Nitrophenol	0.025	<0.025	<0.025	n/a	
2,4-Dimethylphenol	0.025	<0.025	<0.025	n/a	
2,4-Dichlorophenol	0.025	<0.025	<0.025	n/a	
2,6-Dichlorophenol	0.025	<0.025	<0.025	n/a	
4-Chloro-3-methylphenol	0.025	<0.025	<0.025	n/a	
2,4,6-Trichlorophenol	0.025	<0.025	<0.025	n/a	
2,4,5-Trichlorophenol	0.025	<0.025	<0.025	n/a	
Pentachlorophenol	0.05	<0.05	<0.05	n/a	
EP-075B : POLYNUCLEAR AROMATIC HYDROCARBONS					
Naphthalene	0.025	<0.025	<0.025	n/a	
2-Methylnaphthalene	0.025	<0.025	<0.025	n/a	
2-Chloronaphthalene	0.025	<0.025	<0.025	n/a	
Acenaphthylene	0.025	<0.025	<0.025	n/a	
Acenaphthene	0.025	<0.025	<0.025	n/a	
Fluorene	0.025	<0.025	<0.025	n/a	
Phenanthrene	0.025	<0.025	<0.025	n/a	
Anthracene	0.025	<0.025	<0.025	n/a	
Fluoranthene	0.025	<0.025	<0.025	n/a	
Pyrene	0.025	<0.025	<0.025	n/a	
N-2-Fluorenylacetamide	0.025	<0.025	<0.025	n/a	
Benz(a)anthracene	0.025	<0.025	<0.025	n/a	
Chrysene	0.025	<0.025	<0.025	n/a	
Benzo(b)&(k)fluoranthene	0.05	<0.05	<0.05	n/a	
7,12-Dimethylbenz(a)anthracene	0.025	<0.025	<0.025	n/a	
Benzo(a)pyrene	0.025	<0.025	<0.025	n/a	
3-Methylchloanthrene	0.025	<0.025	<0.025	n/a	
Indeno(1,2,3-cd)pyrene	0.025	<0.025	<0.025	n/a	
Dibenz(a,h)anthracene	0.025	<0.025	<0.025	n/a	
Benzo(g,h,i)perylene	0.025	<0.025	<0.025	n/a	

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1554
 MATRIX : Soils
 ANALYST: ALICE TAT

COMPOUND	LOR	QC DUPLICATE RESULTS		RPD	
		ES27901	ES27901	RPD	Cont. Limit
		11	11D		
	mg/kg	mg/kg	mg/kg		

EP-075S : ACID EXTRACTABLE SURROGATES

2-Fluorophenol	1%	72.5%	76.9%	5.89	0 - 20
Phenol-d6	1%	82.3%	87.9%	6.58	0 - 20
2-Chlorophenol-d4	1%	85.5%	88.2%	3.11	0 - 20
2,4,6-Tribromophenol	1%	60.3%	79.5%	27.5	0 - 20

EP-075T : BASE/NEUTRAL EXTRACTABLE SURROGATES

Nitrobenzene-d5	1%	84.7%	91.2%	7.39	0 - 20
1,2-Dichlorobenzene-d4	1%	63.3%	69.4%	9.19	0 - 20
2-Fluorobiphenyl	1%	68%	65.3%	4.05	0 - 20
Anthracene-d10	1%	83%	76.1%	8.67	0 - 20
4-Terphenyl-d14	1%	73.2%	75.9%	3.62	0 - 20

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:

Result < 10 times LOR, no limit.

Result between 10 and 20 times LOR, 0% - 50%.

Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL -- MATRIX SPIKE/DUPLICATE							
ALS EP-075 : Semivolatile Organic Compounds							
QC LOT No. :	NSVOCS1554		ANALYST :		ALICE TAT		
MATRIX:	Soils		Sample ID:		ES27901-10		
COMPOUND	Sample Results	Spike Level	SPIKE QC RESULTS				Cont. Limit
			MS Rec.	MSD Rec.	Average Rec.	RPD	RPD
	mg/kg	mg/kg	%	%	%	%	%
EP-075A : PHENOLS							
Phenol	<0.025	1	93	93.5	93.3	0.536	0 - 35
2-Chlorophenol	<0.025	1	100	98.1	99.1	1.92	0 - 35
2-Nitrophenol	<0.025	1	89.2	92.7	91	3.85	0 - 35
4-Chloro-3-methylphenol	<0.025	1	97.7	97.7	97.7	0	0 - 35
Pentachlorophenol	<0.05	1	98.1	99.5	98.8	1.42	0 - 35
EP-075B : POLYAROMATIC HYDROCARBONS							
Acenaphthene	<0.025	1	102	101	102	0.985	0 - 35
Pyrene	<0.025	1	107	106	107	0.939	0 - 35
EP-075S : ACID EXTRACTABLE SURROGATES							
2-Fluorophenol	72.8%	0.5	82.7	99.7	91.2	18.6	0 - 35
Phenol-d6	83%	0.5	98.5	92.3	95.4	6.5	0 - 35
2-Chlorophenol-d4	89.6%	0.5	93.5	94.5	94	1.06	0 - 35
2,4,6-Tribromophenol	64.4%	0.5	112	81.5	96.8	31.5	0 - 35
EP-075T : BASE/NEUTRAL EXTRACTABLE SURROGATES							
Nitrobenzene-d5	78%	0.5	79	76.7	77.9	2.95	0 - 35
1,2-Dichlorobenzene-d4	73%	0.5	70.9	71.1	71	0.282	0 - 35
2-Fluorobiphenyl	71%	0.5	75.5	76	75.8	0.66	0 - 35
Anthracene-d10	81%	0.5	80.1	80.3	80.2	0.249	0 - 35
4-Terphenyl-d14	72.6%	0.5	82.2	80.4	81.3	2.21	0 - 35

COMMENTS:

- 1) The RPD control limits are fixed.
- 2) *: RPD falls outside the recommended control limit.



TO: IT ENVIRONMENTAL (AUST) P/L

17 FORRESTER STREET
KINGSGROVE NSW 2208

ATTENTION: M BENNETT

SUBJECT: Analytical results.

BATCH: ES29635-0

DATE: 05/09/01

AUSTRALIAN LABORATORY SERVICES P/L

ABN: 84 009 936 029

BRISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
Tel: 61-7-3243 7222	Tel: 61-2-8784 8555	Tel: 61-3-9538 4444	Tel: 61-2-4968 9433	Tel: 64-9-379 9437
Fax: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449



IT ENVIRONMENTAL (AUST) P/L

Attention: M BENNETT
 Order:
 SampleType: TCLP LEACHATE
 Project:

Page-no: 1
 ENV SYDNEY
 Batch-no: 29635
 Sub-batch: 0
 No-samples: 1
 Received: 29/08/01
 Checked:

Method	Analysis description	Units	LOR	SP2
1	Initial pH		0.1	6.5
2	After HCl pH		0.1	1.7
ALS	Extraction Fluid Number		1	1
ALS4	pH After Extract		0.1	5.0
005C	Lead - TCLP	mg/L	0.1	<0.1

The concentrations reported are those determined on the TCLP leachate.
 Extraction fluid #1 pH 4.88-4.98.

AUSTRALIAN LABORATORY SERVICES P/L
 ABN: 84 009 936 029

RISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
Tel: 61-7-3243 7222	Tel: 61-2-8784 8555	Tel: 61-3-9538 4444	Tel: 61-2-4968 9433	Tel: 64-9-379 9437
ex: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449



ENVIRONMENTAL (AUST) P/L

Attention: M BENNETT

Order:

Sample Type: QUALITY CONTROL

Subject:

Page-no: 1

ENV SYDNEY

Batch-no: 29635

Sub-batch: 0

No-samples: 1

Received: 29/08/01

Checked:

Method	Analysis description	Units	LOR	METHOD BLANK 29/08/01	LCS 29/08/01	MS 29/08/01
LS1	Initial pH		0.1	----	----	----
LS2	After HCl pH		0.1	----	----	----
LS3	Extraction Fluid Number		1	1	----	----
LS4	pH After Extract		0.1	----	----	----
MS-000C	Lead - TCLP	mg/L	0.1	<0.1	94.0 %	112 %

Results which appear on this report are routine laboratory checks for QUALITY CONTROL purposes.

AUSTRALIAN LABORATORY SERVICES P/L

ABN: 84 009 936 029

PERTH

Tel: 61-7-3243 7222

Fax: 61-7-3243 7218

SYDNEY

Tel: 61-2-8784 8555

Fax: 61-2-8784 8500

MELBOURNE

Tel: 61-3-9538 4444

Fax: 61-3-9538 4400

NEWCASTLE

Tel: 61-2-4968 9433

Fax: 61-2-4968 0349

AUCKLAND

Tel: 64-9-379 9437

Fax: 64-9-379 1449

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

22135

IT Environmental (Australia) Pty Ltd

ACN 903 931 057

A Member of The IT Group
www.itgroup.com.au

- ☐ Adelaide: Tel (08) 8443 5600 Fax (08) 8443 6409
27 Queen Street, Thebarton SA 5031
- ☐ Brisbane: Tel (07) 3252 5711 Fax (07) 3252 5712
Level 2, 33 Longland Street, Newstead QLD 4006
- ☐ Hobart: Tel (03) 6231 1620 Fax (03) 6231 1640
127 Bathurst Street, Hobart TAS 7000
- ☐ Melbourne: Tel (03) 9819 0264 Fax (03) 9819 4079
169 Burwood Road, Hawthorn VIC 3122

- ☐ Perth: Tel (08) 9481 4333 Fax (08) 9481 4122
Level 7, 228 George's Terrace, Perth WA 6000
- ☒ Sydney: Tel (02) 9502 4844 Fax (02) 9502 2105
17 Carrer Street, Kingsgrove NSW 2208
- ☐ Other:

Project No: 709264B

Task No:

Project Name: Coral Wingham

Laboratory: ALS

Samplers Name: Anson Packwood

Project Manager: Matt Bennett

Special Instructions:

AS, B, Cd, Cr (III), Cr (IV), Cu, Pb, Zn, Hg

Lab. No.	Sample ID	Sample Location	Sample Depth	Sample Date	Time	Matrix (Soil, etc)	Container Type & Preservative*	T-A-T (Specify)	TPH	BTEX	METALS (Specify)	PAHs	PHENOLS	OCs/OPs	NOTES
V4		HOLD		20-2-01		SOIL	1 x J	3-50							
V5		HOLD													
V6		(27)						ES26959							
V7		(28)						23-2-01							
V8		(29)													
V9		(30)													
V10		(31)													
QC2		HOLD													
QC3		(32)													
QC4		(33)													
QC5		HOLD													
QC6		HOLD													
QC7		(34)													
QC8		WATER													
V11		(35)													

RELINQUISHED BY:

RECEIVED BY:

Signature: [Signature]

Signature:

Date:

Date:

Company: IT Environmental

Company:

Date:

Date:

Signature:

Signature:

Date:

Date:

Company:

Company:

Date:

Date:

* Container Type & Preservation Codes: P - Plastic, G - Solvent Washed Acid Rinsed Glass Bottle, V - Vial, N - Nitric Acid Preserved
C - Hirtz-Hirtz Acid Preserved C - Sulphuric Acid Preserved I - Ice

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition

All Documentation is in Proper Order

Samples Received Properly Chilled

Lab. Ref/Batch No.

2576959

CHAIN OF CUSTODY DOCUMENTATION

028408

Australian Laboratory
Services Pty Ltd
32 Shand Street,
STAFFORD QLD 4053
TEL: (07) 3243 7222
EAX: (07) 3243 7218

CLIENT: **IT ENVIRONMENTAL**
 POSTAL ADDRESS: **17 FORRESTER ST MINJACCA RIVER 2208**
 SEND REPORT TO: **M. BOWEN** SEND INVOICE TO: **M. BOWEN**
 DATA NEEDED BY: **11-5-01** REPORT NEEDED BY: **11-5-01**
 PROJECT ID: **109624R** QUOTE NO.: **—**
 P.O. NO.: **—**

LABORATORY BATCH NO.: **—**
 ANALYSIS REQUIRED: **—**
 COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: **—**

COOLER SEAL: **Yes** ☒ **No** ☐
 Broken ☐ Intact ☒
 COOLER TEMP: **—** deg. C

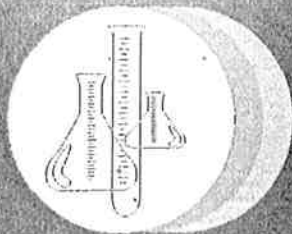
SAMPLE DATA			CONTAINER DATA		
SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	NO.
SP2 (1)	Soil	4/5/01	14:00	1 x 250 ml / 100 ml	1
SP3 (2)	Soil	4/5/01	14:00	1 x 250 ml / 100 ml	1

REMARKS: **Metals = As, Cd, Cr, Cu, Pb, Zn, Hg + CrVI**
PLEASE HOLD AFTER ANALYSIS (IN FRACTION)

Batch No.: **ES17983**
 Matched date: **3/5/01**
☒ Soil ☐ Ambient
☐ Water ☐ Chilled
☐ Other ☐ °C
☐ Subcontract Work
☐ Bottle Return
☐ Imm. Anal. Actioned

RECEIVED BY: **9/5/01**
 NAME: **—** OF: **—**
 DATE: **4/5/01** TIME: **—**
 NAME: **J. STEGEMAN** OF: **—**
 DATE: **4/5/01** TIME: **—**

METHOD OF SHIPMENT: **—**
 CONSIGNMENT NOTE NO.: **—**
 TRANSPORT CO. NAME: **—**



**Explosives
Water & Waste Water
Environmental
Food & Pharmaceuticals
Biological**

GRIBBLES
Analytical Laboratories

A.C.N. 006 823 089

585 Blackburn Road Notting Hill,
Victoria, Australia 3168
Telephone (03) 9562 5899 Fax (03) 9562 0336



Analytical Report

**IT ENVIRONMENTAL (AUSTRALIA) PTY LTD
17 FORRESTER ST
KINGSGROVE**

NSW 2208

**Contact : MATT BENNETT
Batch Number : 0102075
Job Ref : J109264B
Sample(s) Received : 23/02/2001
Report No : 30976**

Methods:

235 Chromium (III), Dry Weight
235 Chromium (VI), Dry Weight
404FIMS Mercury by Vapour AAS, Dry Weight
406-MS Elements by ICP-MS, Dry Weight
501-FID Total Petroleum Hydrocarbons, Dry Weight
504P&T BTEX/MAH (Purge & Trap), Dry Weight
504P&T C6-C9 (Purge & Trap), Dry Weight
504P&T MAH/TPH, Surrogate
506-ECD Organochlorine Pesticides, Dry Weight
509-HPLC Phenoxy Herbicides, Dry Weight
E100.01 Moisture Content

Attached Results Approved by:

John Levvey
Dip.App.Sci (Chemistry)
Senior Analyst - Metals

Anthony Crane
B.App.Sci. (Environmental)
Laboratory Manager

Daniel Dam
B.App.Sci (Chemistry)
Senior Analyst - Chromatography



This Laboratory is accredited by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with its terms of accreditation.

NATA ENDORSED DOCUMENT

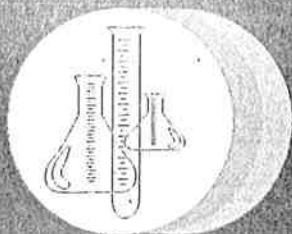
Document may not be reproduced except in full.

NATA Accreditation No. 1645

*** This is the Final Report which supersedes any reports previously issued relating to the sample(s) included.**

All samples tested as submitted by client.

Denotes methods not covered by NATA terms of accreditation



Explosives
Water & Waste Water
Environmental
Food & Pharmaceuticals
Biological

GRIBBLES
Analytical Laboratories

A.C.N. 006 823 089



585 Blackburn Road Notting Hill,
Victoria, Australia 3168

Telephone (03) 9562 5899 Fax (03) 9562 0336

Results

Report No: 30976

0102075/004 QC1A	0102075/006 QC3A	0102075/007 QC4A	0102075/010 QC7A	0102075/011 COMP QCD1
19/02/2001 23/02/2001	19/02/2001 23/02/2001	19/02/2001 23/02/2001	19/02/2001 23/02/2001	23/02/2001 23/02/2001

BTEX/MAH (PURGE & TRAP), DRY WEIGHT

Method: 504P&T Units: mg/kg

Benzene	-	-	<0.1	-	-
Ethylbenzene	-	-	<0.1	-	-
Toluene	-	-	<0.1	-	-
Xylenes	-	-	<0.1	-	-

CHROMIUM (III) ANALYSIS, DRY WEIGHT

Method: 235 Units: mg/kg

Trivalent Chromium, Cr3+	-	-	23	15	9.8
--------------------------	---	---	----	----	-----

CHROMIUM (VI) ANALYSIS, DRY WEIGHT

Method 235 Units: mg/kg

Hexavalent Chromium, Cr6+	-	-	<0.2	<0.2	<0.2
---------------------------	---	---	------	------	------

ELEMENTS by ICP-MS, DRY WEIGHT

Method: 406-MS Units: mg/kg

Arsenic	-	-	24	2.4	2.7
Boron	-	-	16	<2.0	5.7
Cadmium	-	-	<1.0	<1.0	<1.0
Chromium	-	-	23	15	10
Copper	-	-	16	2.8	3.8
Lead	-	-	42	11	15
Zinc	-	-	120	7.9	14

HYDROCARBONS (C6-C9), DRY WEIGHT

Method: 504P&T Units: mg/kg

TPH C6 - C9	-	<5.0	<5.0	-	-
-------------	---	------	------	---	---

HYDROCARBONS (TPH), DRY WEIGHT

Method: 501-FID Units: mg/kg

TPH C10 - C14	-	<20	<20	-	-
TPH C15 - C28	-	47	23	-	-
TPH C29 - C36	-	82	38	-	-

MERCURY by VAPOUR-AAS, DRY WEIGHT

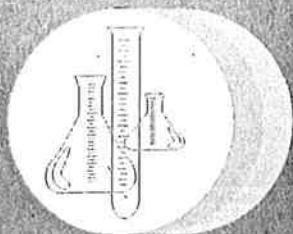
Method: 404FIMS Units: mg/kg

Mercury	-	-	0.04	0.05	0.42
---------	---	---	------	------	------

ORGANOCHLORINE PESTICIDES, DRY WEIGHT

Method: 506-ECD Units: mg/kg

Aldrin	-	-	-	-	<0.1
alpha - BHC	-	-	-	-	<0.1
alpha - Endosulphan	-	-	-	-	<0.1
beta - BHC	-	-	-	-	<0.1
beta - Endosulphan	-	-	-	-	<0.1



Explosives
Water & Waste Water
Environmental
Food & Pharmaceuticals
Biological

GRIBBLES
Analytical Laboratories

A.C.N. 006 823 089

585 Blackburn Road Notting Hill,
Victoria, Australia 3168

Telephone (03) 9562 5899 Fax (03) 9562 0336



Results

Report No: 30976

0102075/004 QC1A	0102075/006 QC3A	0102075/007 QC4A	0102075/010 QC7A	0102075/011 COMP QCD1
---------------------	---------------------	---------------------	---------------------	--------------------------

19/02/2001 23/02/2001	19/02/2001 23/02/2001	19/02/2001 23/02/2001	19/02/2001 23/02/2001	23/02/2001 23/02/2001
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

Chlordane	-	-	-	-	<0.1
DDD	-	-	-	-	<0.1
DDE	-	-	-	-	<0.1
DDT	-	-	-	-	<0.1
delta - BHC	-	-	-	-	<0.1
Dieldrin	-	-	-	-	<0.1
Endosulphan sulphate	-	-	-	-	<0.1
Endrin	-	-	-	-	<0.1
Endrin Aldehyde	-	-	-	-	<0.1
Heptachlor	-	-	-	-	<0.1
Heptachlorepoxyde	-	-	-	-	<0.1
Hexachlorobenzene	-	-	-	-	<0.1
Lindane	-	-	-	-	<0.1
Methoxychlor	-	-	-	-	<0.1

OVEN MOISTURE CONTENT

Method: E100.01 Units: % w/w

Moisture	16.8	18.3	18.3	13.8	15.8
----------	------	------	------	------	------

PHENOXY HERBICIDES, DRY WEIGHT

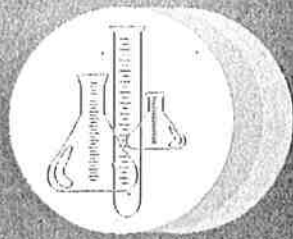
Method: 509-HPLC Units: mg/kg

2,4,5-Trichlorophenoxy- acetic acid (245T)	<0.5	-	-	-	-
2,4-Dichlorophenoxy- acetic acid (24D)	<0.5	-	-	-	-
2-Methyl-4-chlorophenoxy- acetic acid (MCPA)	<0.5	-	-	-	-

VOLATILES (PURGE & TRAP), SURROGATE RECOVERIES

Method: 504P&T Units: % Recovered

Surrogate Recovery, toluene-d8	-	118	117	-	-
-----------------------------------	---	-----	-----	---	---



Explosives
Water & Waste Water
Environmental
Food & Pharmaceuticals
Biological

GRIBBLES
Analytical Laboratories

A.C.N. 006 823 089



585 Blackburn Road Notting Hill,
Victoria, Australia 3168
Telephone (03) 9562 5899 Fax (03) 9562 0336

Quality Results

Report No: 30976

0102075Q012 Duplicate 0102075/010 26/02/2001 26/02/2001	0102075Q013 Spike Recovery 0102075/010 24/02/2001 26/02/2001	0102075Q014 Spike Recovery Lab Control 26/02/2001 26/02/2001	0102075Q015 DIGEST BLANK 26/02/2001 26/02/2001	0102075Q016 Duplicate 0102075/010 26/02/2001 26/02/2001
---	---	---	--	---

ELEMENTS by ICP-MS, AS RECEIVED

Method: 406-MS Units: mg/kg

Boron	-	-	-	<1.0	-
Cadmium	-	-	-	<1.0	-
Chromium	-	-	-	<1.0	-
Copper	-	-	-	<1.0	-
Lead	-	-	-	<1.0	-
Zinc	-	-	-	<1.0	-

MERCURY by VAPOUR-AAS, AS RECEIVED

Method: 404FIMS Units: mg/kg

Mercury	-	-	-	<0.01	-
---------	---	---	---	-------	---

QC RESULTS - DUPLICATES

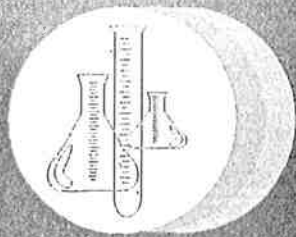
Relative Percent Difference, %

Boron	-	-	-	-	<1.0
Cadmium	-	-	-	-	<1.0
Chromium	-	-	-	-	21.2
Copper	-	-	-	-	12.4
Lead	2.9	-	-	-	-
Zinc	-	-	-	-	14.0

QC RESULTS - SPIKED SAMPLES

Percent Recovery, %

Lead	-	100	100	-	-
------	---	-----	-----	---	---



Explosives
Water & Waste Water
Environmental
Food & Pharmaceuticals
Biological

GRIBBLES
Analytical Laboratories

A.C.N. 006 823 089

585 Blackburn Road Notting Hill,
Victoria, Australia 3168

Telephone (03) 9562 5899 Fax (03) 9562 0336



Quality Results

Report No: 30976

0102075Q017	0102075Q018	0102075Q019	0102075Q020	0102075Q021
Spike	Spike	QCBlank	QCBlank	Spike
Recovery	Recovery	method blank	method blank	Recovery
0102075/010	Lab Control			soil
26/02/2001	26/02/2001	28/02/2001	28/02/2001	28/02/2001
26/02/2001	26/02/2001	28/02/2001	28/02/2001	28/02/2001

BTEX/<MAH (PURGE & TRAP), AS RECEIVED

Method: 504P&T Units: mg/kg

Benzene	-	-	-	<0.1	-
Ethylbenzene	-	-	-	<0.1	-
Toluene	-	-	-	<0.1	-
Xylenes	-	-	-	<0.1	-

HYDROCARBONS (C6-C9), AS RECEIVED

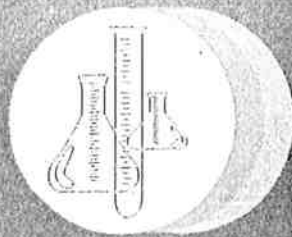
Method: 504P&T Units: mg/kg

TPH C6 - C9	-	-	<5.0	-	-
-------------	---	---	------	---	---

QC RESULTS - SPIKED SAMPLES

Percent Recovery, %

Arsenic	88.6	107	-	-	-
Cadmium	94.7	101	-	-	-
Chromium	118	114	-	-	-
Copper	122	113	-	-	-
Lead	102	97.1	-	-	-
Zinc	100	110	-	-	-
TPH C6 - C9	-	-	-	-	88.3
Benzene	-	-	-	-	94.6
Ethylbenzene	-	-	-	-	91.4
Toluene	-	-	-	-	94.8
Xylenes	-	-	-	-	92.2



Explosives
Water & Waste Water
Environmental
Food & Pharmaceuticals
Biological

GRIBBLES
Analytical Laboratories

A.C.N. 006 823 089



585 Blackburn Road Notting Hill,
Victoria, Australia 3168
Telephone (03) 9562 5899 Fax (03) 9562 0336

Quality Results

Report No: 30976

0102075Q022	0102075Q023	0102075Q024	0102075Q025	0102075Q026
Duplicate	QCBlank	Spike	Duplicate	QCBlank
0102075/006	METHOD	Recovery	0102075/006	METHOD BLK
	BLANK	SOIL		
28/02/2001			27/02/2001	23/02/2001
28/02/2001	27/02/2001	27/02/2001	28/02/2001	28/02/2001
	28/02/2001	28/02/2001		

HYDROCARBONS, AS RECEIVED

Method: 501-FID Units: mg/kg

TPH C10 - C14	-	<20	-	-
TPH C15 - C28	-	<20	-	-
TPH C29 - C36	-	<20	-	-

ORGANOCHLORINE PESTICIDES, AS RECEIVED

Method: 506-ECD Units: mg/kg

Aldrin	-	-	-	<0.1
alpha - BHC	-	-	-	<0.1
alpha - Endosulphan	-	-	-	<0.1
beta - BHC	-	-	-	<0.1
beta - Endosulphan	-	-	-	<0.1
Chlordane	-	-	-	<0.1
DDD	-	-	-	<0.1
DDE	-	-	-	<0.1
DDT	-	-	-	<0.1
delta - BHC	-	-	-	<0.1
Dieldrin	-	-	-	<0.1
Endosulphan sulphate	-	-	-	<0.1
Endrin	-	-	-	<0.1
Endrin Aldehyde	-	-	-	<0.1
Heptachlor	-	-	-	<0.1
Heptachlorepoxyde	-	-	-	<0.1
Hexachlorobenzene	-	-	-	<0.1
Lindane	-	-	-	<0.1
Methoxychlor	-	-	-	<0.1

QC RESULTS - DUPLICATES

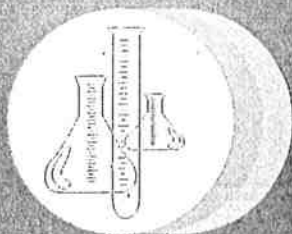
Relative Percent Difference, %

TPH C6 - C9	<1.0	-	-	-
TPH C10 - C14	-	-	<1.0	-
TPH C15 - C28	-	-	13.0	-
TPH C29 - C36	-	-	11.9	-

QC RESULTS - SPIKED SAMPLES

Percent Recovery, %

TPH C15 - C28	-	-	109	-
---------------	---	---	-----	---



Explosives
Water & Waste Water
Environmental
Food & Pharmaceuticals
Biological

GRIBBLES
Analytical Laboratories

A.C.N. 006 823 089

585 Blackburn Road Notting Hill,
Victoria, Australia 3168
Telephone (03) 9562 5899 Fax (03) 9562 0336



Quality Results

Report No: 30976

0102075Q027 Spike Recovery SOIL	0102075Q028 Duplicate 0102075/011 23/02/2001 28/02/2001	0102075Q029 QCBlank METHOD BLANK 27/02/2001 28/02/2001	0102075Q030 Spike Recovery WATER 27/02/2001 28/02/2001
--	---	---	---

PHENOXY HERBICIDES

Method: 509-HPLC Units: mg/L

2,4,5-Trichlorophenoxy- acetic acid (245T)	-	-	<0.1	-
2,4-Dichlorophenoxy- acetic acid (24D)	-	-	<0.1	-
2-Methyl-4-chlorophenoxy- acetic acid (MCPA)	-	-	<0.1	-

QC RESULTS - DUPLICATES

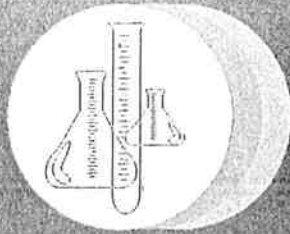
Relative Percent Difference, %

Aldrin	-	<1.0	-	-
alpha - BHC	-	<1.0	-	-
alpha - Endosulphan	-	<1.0	-	-
beta - BHC	-	<1.0	-	-
beta - Endosulphan	-	<1.0	-	-
Chlordane	-	<1.0	-	-
DDD	-	<1.0	-	-
DDE	-	<1.0	-	-
DDT	-	<1.0	-	-
delta - BHC	-	<1.0	-	-
Dieldrin	-	<1.0	-	-
Endosulphan sulphate	-	<1.0	-	-
Endrin	-	<1.0	-	-
Endrin Aldehyde	-	<1.0	-	-
Heptachlor	-	<1.0	-	-
Heptachlorepoxyde	-	<1.0	-	-
Hexachlorobenzene	-	<1.0	-	-
Lindane	-	<1.0	-	-
Methoxychlor	-	<1.0	-	-

QC RESULTS - SPIKED SAMPLES

Percent Recovery, %

Aldrin	100	-	-	-
alpha - BHC	92.5	-	-	-
alpha - Endosulphan	115	-	-	-
beta - BHC	75.0	-	-	-
beta - Endosulphan	97.5	-	-	-
Chlordane	92.5	-	-	-
DDD	102	-	-	-
DDE	100	-	-	-
delta - BHC	95.0	-	-	-
Dieldrin	110	-	-	-



Explosives
Water & Waste Water
Environmental
Food & Pharmaceuticals
Biological

GRIBBLES
Analytical Laboratories

A.C.N. 006 823 089



585 Blackburn Road Notting Hill,
Victoria, Australia 3168
Telephone (03) 9562 5899 Fax (03) 9562 0336

Quality Results

Report No: 30976

	0102075Q027	0102075Q028	0102075Q029	0102075Q030
	Spike	Duplicate	QCBlank	Spike
	Recovery	0102075/011	METHOD	Recovery
	SOIL		BLANK	WATER
	23/02/2001	23/02/2001	27/02/2001	27/02/2001
	28/02/2001	28/02/2001	28/02/2001	28/02/2001
Endosulphan sulphate	80.0	-	-	-
Endrin	70.0	-	-	-
Endrin Aldehyde	80.0	-	-	-
Heptachlor	75.0	-	-	-
Heptachlorepoxyde	92.5	-	-	-
Hexachlorobenzene	100	-	-	-
Lindane	110	-	-	-
Methoxychlor	60.0	-	-	-
2,4-Dichlorophenoxy- acetic acid (24D)	-	-	-	126

Quality Results provided in this report are for laboratory Quality Control purposes.

Due Wed 28/2 10:00

IT Environmental (AU)
ACN 003 931 057
A Member of The IT Group
www.theitgroup.com.au



☐ **Perth:** Tel (08) 9481 4333 Fax (08) 9481 4122
Level 7, 220 George's Terrace, Perth WA 6000

☒ **Sydney:** Tel: (02) 9502 4844 Fax (02) 9502 2105
17 Forrester Street, Kingsgrove NSW 2208

☐ **Other:**

☐ Hobart: Tel (03) 6231 1620 Fax (03) 6231 1640
127 Bathurst Street, Hobart TAS 7000

☐ Melbourne: Tel (03) 9819 0284 Fax (03) 9819 4169
169 Burwood Road, Hawthorn VIC 3122

Project No: 5709764B Task No: 020

Project Name: Royal Wingham
Laboratory: Corbitts

Project Manager: Math-Reports

Special Instructions: Quake No 10

Please composite QCA1 + QCB1 + QCC1 + QCD1
 & Piz, B, Cd, Cr(IV), Cr(VI), Cu, Pb, Zn, Hg

Sample ID	Sample Location	Sample Depth	Sample Date	Time	Matrix (Soil ... etc)	Container Type & Preservative*	T-A-T (Specify)
QC41	QCD1		19.2.01		SOIL	1 x 3	
QC51							
QC61							
QC7a							
QC8a							
QC9a							
QC10a							

Analysis Request Section

NOTES

phenoxycid hexachlor
 organochlorine PC

OC's / OP's

PHENOLS

PAH's

METALS (Specify)

BTEX

TPH

NOTES

Corp QCDI

RELINQUISHED BY:

Signature: *[Signature]* Date: *2-2-10*
 Company: *Novira* Time:
 Signature: _____ Date: _____
 Company: _____ Time: _____

RECEIVED BY.

Signature: <i>DM</i>	Date: 22/2/01
Company: <i>CoAL</i>	Time: 15:40
Signature: <i>DF</i>	Date: 23/2/01
Company: <i>CoAL</i>	Time: 10:00

Sample Receipt Advice: (Lab Use Only)

☐ All Samples Received in Good Condition . . .
☐ All Documentation is in Proper Order
☐ Samples Received Properly Chilled
 Lab. Ref/Batch No.

* Contains Type & Preservation Codes: **P** - Plastic, **G** - Solvent Washed Acid Rinsed Glass Bottle, **V** - Vial, **N** - Nitric Acid Preserved
C - 10% Citric Acid Preserved, **S** - Sulphuric Acid Preserved, **I** - Ice

STANDARD SIBLING AND SISTER REQUEST

ISSUE: 3

ISSUE DATE: 10/4/00

Appendix C

Correspondence

Excavation and Validation of Hydrocarbon 'Hotspot'
Former Boral Site, Lot 310, Wingham



A Member of The IT Group

Date: 14/9/01 Time: _____Made Call ☒Received Call ☐Return Call ☐Internal Message ☐Name: Andrew VaryCompany: Taree Council

Address: _____

Project Name: Boral WinghamProject Number: P109264CPhone: 6591 3399

Mobile: _____

Fax: _____

Email: _____

Summary of Conversation:

* We sent a fax regarding removal of soil from boral site in Wingham to Bucketts Way Landfill.

* Andrew hadn't realised we'd sent fax. He went to get it.

* Advised us we could dispose, but he wasn't sure of cost. May be no cost if the site operators thought they could use the soil as cover material. Speak to Andy Graham
ph 6551 5266
fax 6551 3631.

* Andy indicated \$35.20/t ^{incl} GST if couldn't use it for cover.

Action: _____



FAXED

P109264C
IT Environmental (Australia) Pty Ltd
A Member of The IT Group

ABN: 89 003 931 057

17 Forrester Street

Kingsgrove NSW 2208

Tel: (02) 9502 4844

Fax: (02) 9502 2105

Email: Sydney.Admin@theitgroup.com

www.theitgroup.com.au



FACSIMILE

To: Andrew Very,
Greater Taree Council

Fax No.: 02 6591 3351

cc:

Fax No.:

From: Matthew Bennett

Date: 6 September 2001

Page 1 of: 4

Re: Disposal of Soil to Landfill

Andrew,

Further to my previous fax dated 6 August 2001 and subsequent communications, please find attached a copy of a laboratory report showing TCLP leachate analysis results for stockpile sample SP2.

In my previous fax, which included all other relevant results, I indicated that this stockpile sample contained 12mg/kg lead - just above the NSW EPA (1999) inert waste criteria (CT1) of 10mg/kg. All other sample results from the stockpiled soil were below inert waste criteria.

The attached TCLP test result shows a concentration of <0.1mg/L lead in leachate from the sample SP2. The combined total lead concentration (10mg/kg) and TCLP lead (<0.1mg/L) are less than the NSW EPA (1999) inert waste criteria SCC1 (1500mg/kg) and TCLP1 (0.5mg/L) respectively.

These latest results show that all soil in the stockpile (approximately 30m³) meet the NSW EPA (1999) waste guidelines criteria for inert waste.

Can you please advise whether the Taree landfill will accept the soil, and if so what the cost of disposal would be? Your early response would be greatly appreciated.

If you require further information or wish to discuss this matter, please do not hesitate to contact me on (02) 9502 4844.

Regards,

Matthew Bennett
Project Manager



FAXED

IT Environmental (Australia) Pty Ltd
A Member of The IT Group

ABN: 89 003 931 057

17 Forrester Street
Kingsgrove NSW 2208
Tel: (02) 9502 4844
Fax: (02) 9502 2105
Email: Sydney.Admin@theitgroup.com

www.theitgroup.com.au



FACSIMILE

To: Andrew Very,
Greater Taree Council

Fax No.: 02 6591 3351

cc:

Fax No.:

From: Matthew Bennett

Date: 6 August 2001

Page 1 of: 14

Re: Disposal of Soil to Landfill

Andrew,

I have spoken to Phillip Martin regarding this matter, and he suggested I send the attached results to you.

We have assessed a site in Wingham for Boral Limited. One area of the site contained isolated petroleum hydrocarbon impacted soil from parking of diesel-operated equipment. We excavated all of this material, a total of approximately 30m³ soil in March this year. Since then the soil has been spread on a concrete slab under cover.

Our client has requested that we determine whether the soil could be removed to a landfill in the area. I understand from Phillip that the Taree landfill can accept inert waste, but not solid waste.

We have collected three samples of this material: SP1, SP2 and SP3. All samples have been analysed for total petroleum hydrocarbons (TPH). In addition, samples SP2 and SP3 have been analysed benzene, toluene, ethylbenzene and xylene (BTEX), for a suite of metals, polynuclear aromatic hydrocarbons (PAHs) and phenols.

Attached are copies of NATA-certified laboratory analysis reports for the above analyses. Some additional sample results are shown in one of the reports for sample ID's V12-V18, which are excavation validation samples, and QCX which is a duplicate validation sample.

The results show that all results for TPH, BTEX, PAHs, phenols and metals meet inert waste criteria in the NSW EPA (1999) waste guidelines, with the exception of one metal result for lead in SP2 (12mg/kg). The other lead result for SP3 was 2mg/kg. All other metal results were below the inert criteria of 10mg/kg.



IT Environmental (Australia) Pty Ltd
A Member of The IT Group

Can you please advise whether the Taree landfill will accept the material (30m³) based on the attached results and above information, and if so what the cost of disposal would be?

If you require further information or wish to discuss this matter, please do not hesitate to contact me on (02) 9502 4844.

Regards,

A handwritten signature in black ink, appearing to read 'Matthew Bennett', written over a horizontal line.

Matthew Bennett
Project Manager

Appendix D

Calibration Record Sheets

Excavation and Validation of Hydrocarbon 'Hotspot'
Former Boral Site, Lot 310, Wingham

CALIBRATION RECORD SHEET

Date: 19/12/01 - 20/2/01	Project: Boxal Wingham	Project No: J1092648
ITE Personnel: A. Packwood		PM: M Bennett

Description of Activities:
Validation of hotspot on Lot 310 - soil sampling
ESA of lots 267 & 266 - testpitting & soil sampling

Instrument Details:	
Instrument: PID #4	Brand/model:
Serial No/Equipment No:	Parameter:
Calibration Type & Make: Isobutylene	Calibration Concentration 95.5

Calibration: 95.5% isobutylene	
Time: 1:10pm	Response Factor: 0.60
Weather/Temp: humid, wet	Reading: 57.9
Signed: 	Satisfactory: YES/NO* ☒ YES ☐ NO

Calibration Check 1:	
Time:	Response Factor:
Weather/Temp:	Reading:
Signed:	Satisfactory: YES/NO* ☐ YES ☐ NO

Calibration Check 2:	
Time:	Response Factor:
Weather/Temp:	Reading:
Signed:	Satisfactory: YES/NO* ☐ YES ☐ NO

* Calibration reading must be within 10% of calibration standard to be satisfactory.

Please note action taken if calibration is not satisfactory

NB attach all relevant calibration certificates to this sheet.

CALIBRATION RECORD SHEET

Date: 22/3/01	Project: Boral Wingham	Project No: U1092648
ITE Personnel: A Packwood	PM: M Bennett	

Description of Activities: Validation 1 stockpile soil sampling

Instrument Details:	
Instrument: PID # 5	Brand/model:
Serial No/Equipment No:	Parameter:
Calibration Type & Make: Isobutylene	Calibration Concentration 109ppm

Calibration:	
Time: 12:45	Response Factor: 0.60
Weather/Temp: Warm, Dry	Reading: 66.7
Signed: AP	Satisfactory: YES/NO* ☒ YES ☐ NO

Calibration Check 1:	
Time:	Response Factor:
Weather/Temp:	Reading:
Signed:	Satisfactory: YES/NO* ☐ YES ☐ NO

Calibration Check 2:	
Time:	Response Factor:
Weather/Temp:	Reading:
Signed:	Satisfactory: YES/NO* ☐ YES ☐ NO

* Calibration reading must be within 10% of calibration standard to be satisfactory.

Please note action taken if calibration is not satisfactory

NB attach all relevant calibration certificates to this sheet.

Appendix E

Soil Disposal Record

Excavation and Validation of Hydrocarbon 'Hotspot'
Former Boral Site, Lot 310, Wingham



Resource Recovery

Waste Management and Recycling

TAREE DEPOT:

BUCKETTS WAY LANDFILL DEPOT

PO Box 492 TAREE 2430

Telephone (02) 86616236

Fax (02) ~~86616236~~ 65513631

FACSIMILE MESSAGE

DATE...17/10/01...

TO: Matthew Bennett IT Environmental

FAXNO. 02 95022105 PHONE

FROM: Reay Edge

PAGES (including cover page)....1.....

MESSAGE:

R.E. Soil from Boral Wingham

Please be advised 5 truckloads of soil
total weight 57.5 tonne was delivered
yesterday 16/10/01 to this site at no
cost

Great Lakes Community Resources Inc

Taree Depot: Bucketts Way, Taree
(P.O. Box 492)