

ALCAN AUSTRALIA LIMITED  
JOB NUMBER 4315/3  
JANUARY 1992

PRELIMINARY ENVIRONMENTAL  
ASSESSMENT OF FORMER CAUSTIC  
WASTE DISPOSAL AREAS  
EAGLE FARM

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RTI Act 2009



**AGC Woodward-Clyde Pty Limited**

A.C.N. 000-691-690





**AGC Woodward-Clyde**

Engineering & sciences applied to the earth & its environment



TRL:sch:4315-3E1  
c3E1-691-690

1 February 1993

Director  
Contaminated Land Unit  
Department of Environment and Heritage  
160 Ann Street  
**BRISBANE QLD 4000**

**ATTENTION: MR DAVID MILES**

Dear Sir,

**RE: PRELIMINARY SITE CONTAMINATION ASSESSMENT REPORT  
- LOT 981 ON SL 6741, EAGLE FARM**

Please find attached a copy of a report prepared by AGC Woodward-Clyde Pty Limited (Woodward-Clyde) on behalf of Alcan Australia Limited (Alcan) in relation to Alcan's Eagle Farm anodising plant site.

Alcan require a Site Contamination Report (SCR) for on-going General Industry land use, based on the findings outlined in these two reports.

Please call sch4p4( 6) Personal information on 393 1533, should you have any queries or require any further information.

Yours faithfully,

**WOODWARD-CLYDE PTY LIMITED**

sch4p4( 6) Personal information

sch4p4( 6) Personal information

**Principal Environmental Consultant**

sch4p4( 6) Personal information

**Senior Environmental Consultant**

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**1****INTRODUCTION AND OBJECTIVES**

At the request of Alcan Australia Limited (Alcan), AGC Woodward-Clyde Pty Limited (AGC Woodward-Clyde) conducted a preliminary assessment of potential soils and groundwater contamination in the area of two decommissioned and rehabilitated caustic waste disposal ponds, at Alcan's Eagle Farm plant site (refer Figure 1 for location).

The objective of the work was to assess the depth and extent of potential soil and groundwater contamination arising from the former disposal of spent caustic waste (and possible waste oils) and to assess the potential for off-site migration, in groundwaters, of any identified contamination.

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## SITE DESCRIPTION AND HISTORY

Information provided by Alcan indicated former caustic storage ponds to have been located along the northern boundary of the Alcan site, between the Anodising Building on the Aluminium Centre property and the Home Improvements Building on the Home Improvements property (refer Figure 2). A wire mesh fence divides the two properties and separates the two former caustic storage ponds. A creek drains to the east, outside the northern boundary of the site.

An access road follows the fence line on the Aluminium Centre property up towards the Anodising Building and a second road follows alongside the southwest edge of the Home Improvement Buildings to where it intersects the fence.

The inferred location of the former ponds (based on information provided by Alcan) is shown in Figure 2. The former storage ponds have been filled and re-landscaped with grass. Depressions within the landscaped area are assumed to indicate the position of the original caustic storage facilities. Some "dieback" of vegetation (grasses) has been noted in these areas in recent times.

Information provided by Alcan indicated that the caustic waste disposal ponds were built in 1971, became operational in 1972 and were decommissioned in 1977.

A total of six boreholes were drilled in and around the two former storage areas. Three holes (BH2, BH3 and BH5) were drilled within the two depressions to a maximum depth of 2.75 m, to determine the nature and depth of fill and in-situ soils. A further three holes were drilled to depths of 5.0 m - one within the eastern depression (BH4) and two along the northern boundary fence (BH3 and BH6), downgradient of the waste disposal areas (between the waste disposal areas and the creek). These three bores are for permanent groundwater sampling/monitoring and were constructed using 50 mm uPVC casing (acid washed, factory slotted and screw jointed) and were gravel packed to 0.5 m below surface level. A bentonite/cement grout was placed above the gravel pack to the surface with a secure surface collar and cap concreted over the bore. The uPVC casing was slotted from 1.0 m to 5.0 m below ground level.

Borehole locations are shown in Figure 2. Soil sample borehole logs are presented in Table 1. Monitoring bore construction logs are presented in Appendix A.

A total of twenty six (26) composite soil samples were collected (at 0.5 m intervals) from the boreholes (to a maximum depth of 3.25 m). A hollow flight drill auger was used to obtain the soil samples. This was decontaminated between sampling and boreholes by scrubbing with a solution of "Decon 90" detergent and water, then rinsing in clean potable water.

Each soil sample collected was screened in the field for potential contamination by petroleum hydrocarbons by carrying out a "headspace" test, using a portable Photovac "Microtrip" organic vapour analyser (to measure the concentration of organic vapours in the soil<sup>1</sup>).

The soil samples were sent to Australian Laboratory Services Pty Ltd (NATA registered) in Stafford for analysis of pH. Five samples were selected (based on site history and sample "headspace" analysis results) for laboratory analysis for Total Petroleum Hydrocarbon (TPH) and moisture content.

Following completion, the monitoring bores were allowed to stabilise and were developed and purged. Conductivity and pH of water samples obtained from each bore were tested in the field and samples sent for laboratory analysis. A water sample from BH6 was also submitted for a comprehensive analysis (comprising major cations, anions, metals and physio-chemical parameters).

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<sup>1</sup> Note: Microtip instrument is sensitive to organic compounds with an ionisation potential of 10.6 eV, or less.

## 4 RESULTS

### 4.1 Drilling

Soils within the former waste disposal ponds generally consist of a superficial layer (to 0.75 m depth) of dark brown gravelly clay fill with some "builders rubble". Below this layer are varying thicknesses of grey brown to grey black stiff to very stiff clays with occasional roots persisting to 2.0 m. Borehole BH1 and BH2 intersected a grey black clay with abundant organic matter between 1.7 m and 2.0 m possibly indicating the base of the former pond. This horizon was not apparent in the depression outlining the waste disposal pond on the Home Improvement property. A similar layer was intersected in BH6, but was sandy and may indicate an old creek channel. Below these clay layers a grey sandy clay was intersected. This was common below both former waste disposal areas, from between 2.25 m (BH6) and 3.50 m (BH3) to the base of the holes at 5.00 m.

### 4.2 Field Testing and Laboratory Analyses

Field and laboratory soils sampling, testing and analysis results are presented in Table 2. Alkane banding analysis results for samples returning potentially elevated total petroleum hydrocarbon (TPH) levels are presented in Table 3.

Screening for potential contamination of petroleum hydrocarbons using the Photovac "Microtip" showed soil gas levels between 63 ppm and 203 ppm from surface to 2.0 m in BH1. The remainder of the holes drilled showed soil gas levels of between 12.8 ppm and 72 ppm (refer Table 2).

Soil pH levels analysed in the laboratory indicated the pH to vary from 5.25 to 8.15. The laboratory analyses on selected samples from each borehole indicated TPH levels of <50 mg/kg and up to 150 mg/kg in boreholes BH4 and BH5 between 1.0 m and 1.5 m. Hydrocarbon alkane grouping analysis results for the samples from BH4 and BH5 indicated TPH alkane fractions below laboratory detection limits (refer Table 3). Petroleum hydrocarbon levels in the samples tested were, therefore, below current Department of Environment and Heritage (DEH) investigation threshold levels.

Field and laboratory water sampling, testing and analysis results are presented in Tables 4 and 5. The conductivity of the water samples tested in the field were reported as 25 400  $\mu\text{S}/\text{cm}$  (BH3); 27 400  $\mu\text{S}/\text{cm}$  (BH4); 33 100  $\mu\text{S}/\text{cm}$  (BH6). The pH for all three water samples was 6. Laboratory analysis of the three water samples showed pH to vary from 5.41 m to 5.66 m and the conductivity from 22 100  $\text{mS}/\text{cm}$  to 31 800  $\mu\text{S}/\text{cm}$ . The comprehensive analysis on the water sample from BH6 showed elevated levels (relative to current drinking water standards) of calcium (393 mg/L), magnesium (693 mg/L), sodium (5,920 mg/L), potassium (170 mg/L), sulphate (3,730 mg/L), chloride (9,960 mg/L) and iron (434 mg/L) and potentially elevated levels of cadmium (0.05 mg/L), nickel (0.4 mg/L), arsenic (0.04 mg/L) and lead (0.1 mg/L) (refer Table 5).

The pH level in sample from BH6 was initially reported in the field as 6 and later as 5.41 by the laboratory; the pH level two weeks after the sample was collected was reported as 3, indicating significant hydrochemical reaction processes had occurred in the stored sample.

**TABLE 1  
BOREHOLE LOGS**

BH1	0.00 - 0.60	CLAY - high plasticity, dark brown with coarse gravel, moist, very stiff, with roots. FILL
	0.60 - 1.00	CLAY - medium to high plasticity, dark brown, moist, stiff, with roots. CH
	1.00 - 1.90	CLAY - medium to high plasticity, grey brown, moist, stiff, with roots. CH
	1.90 - 2.00	CLAY - low plasticity, grey to black, moist, firm to stiff, contains roots and other organic matter. CL
BH2	0.00 - 0.70	CLAY - high plasticity, dark brown with coarse gravel, moist, very stiff, with roots. FILL
	0.70 - 1.00	CLAY - medium to high plasticity, dark brown, moist, stiff with roots. CH
	1.00 - 1.70	CLAY - medium to high plasticity, grey brown, moist, stiff with roots. CH
	1.70 - 2.00	CLAY - low plasticity, grey to black, moist, firm to stiff, contains roots and other organic matter. CL
	2.00 - 2.75	CLAY - medium to high plasticity, grey, moist, stiff to very stiff. CH
BH3	0.00 - 0.60	CLAY - high plasticity, dark brown, with coarse gravel, moist, very stiff, with roots. FILL
	0.60 - 3.50	CLAY - medium to high plasticity, grey brown, moist, stiff, with roots to 1.5 m. Sandy silt band at 0.88 m to 0.91 m. CH
	3.50 - 5.00	SANDY CLAY - low plasticity, grey, wet, soft to firm. CL



**TABLE 1 (CONT'D)  
BOREHOLE LOGS**

BH4	0.00 - 0.60	CLAY - high plasticity, dark brown with coarse gravel, moist, very stiff, with roots. FILL
	0.60 - 1.70	CLAY - medium to high plasticity, grey brown, moist, stiff, with roots. CH
	1.70 - 3.15	CLAY - medium to high plasticity, grey, moist, stiff, becoming silty at 2.5 m. CH
	3.15 - 5.00	SANDY CLAY - low plasticity, grey, wet, soft to firm. CL
BH5	0.00 - 1.0	CLAY - high plasticity, dark brown with coarse gravel and brick fragments, moist, very stiff, with roots. FILL
	1.00 - 1.50	CLAY - medium to high plasticity, grey to brown, moist, stiff, with roots. CH
	1.50 - 2.15	CLAY - medium to high plasticity, grey to black, moist, stiff, with some roots to 2.00 m. CH
	2.15 - 2.5	SANDY CLAY - low plasticity, grey, moist to wet, soft to firm. CL
BH6	0.00 - 0.75	CLAY - high plasticity, dark brown with coarse gravel, moist, very stiff, with roots. FILL
	0.75 - 1.40	CLAY - high plasticity, brown, moist, very stiff. CH
	1.40 - 1.80	CLAY - medium plasticity, grey brown, moist, firm. CL - CH
	1.80 - 1.90	SANDY CLAY - low plasticity, black, moist, soft to firm, with organic fragments. CL
	1.90 - 2.25	CLAY - high plasticity, grey with black specks, moist, very stiff. CH
	2.25 - 5.00	SANDY CLAY - low plasticity, grey, wet, soft to firm. CL

**TABLE 2  
RESULTS OF FIELD AND LABORATORY  
ANALYSES OF SOIL SAMPLES**

LOCATION	DEPTH (m)	MICROTIP READOUT*	pH	TPH (mg/kg)
BH1	0.0 - 0.5	203.0	8.2	-
	0.5 - 1.0	135.0	7.9	< 50
	1.0 - 1.5	63.0	7.6	-
	1.5 - 2.0	131.0	7.3	-
BH2	0.0 - 0.5	14.0	6.9	-
	0.5 - 1.0	12.8	7.2	50
	1.0 - 1.5	22.0	7.1	-
	1.5 - 2.0	72.0	7.2	-
	2.0 - 2.75	41.0	7.5	-
BH3	0.0 - 0.75	45.4	7.5	-
	0.75 - 1.5	44.9	7.0	-
	1.5 - 2.25	38.0	6.8	-
BH4	0.0 - 0.5	21.0	6.5	-
	0.5 - 1.0	24.0	7.2	-
	1.0 - 1.5	27.0	7.2	150
	1.5 - 2.0	36.0	7.0	-
	2.0 - 2.5	17.0	7.4	-
	2.5 - 3.25	25.0	6.5	-
BH5	0.0 - 0.5	17.0	5.3	-
	0.5 - 1.0	20.0	6.9	-
	1.0 - 1.5	24.5	6.9	150
	1.5 - 2.0	25.0	7.0	-
	2.0 - 2.5	23.5	6.8	-
BH6	0.0 - 0.75	21.5	7.1	-
	0.75 - 1.5	29.0	7.5	-
	1.5 - 2.25	28.5	7.5	50

\* ppm Benzene equivalent  
- not sampled

**TABLE 3**  
**RESULTS OF TOTAL PETROLEUM HYDROCARBON FRACTIONS ANALYSES**

TPH FRACTION (alkane grouping)	LOD* (mg/kg)	LOCATION BH4 (1.0m - 1.5m)	LOCATION BH5 (1.0m - 1.5m)
C <sub>6</sub> - C <sub>9</sub>	20	<20	<20
C <sub>10</sub> - C <sub>4</sub>	50	<50	<50
C <sub>15</sub> - C <sub>28</sub>	100	<100	<100
Moisture Content %		35.6	40.6

\* LOD - Limit of Detection

**TABLE 4**  
**RESULTS OF FIELD AND LABORATORY ANALYSES OF WATER SAMPLES**

Location	Water Levels (m)*	pH		Conductivity $\mu$ S/cm	
		Field	Lab	Field	Lab
BH3	3.75	6	5.6	25 500	23 500
BH4	3.95	6	5.7	27 100	22 100
BH6	3.96	6	5.4	33 400	31 800

\* Water level measured from top of casing.

**TABLE 5**  
**COMPREHENSIVE ANALYSIS OF WATER SAMPLE FROM BH6**

ANALYSIS DESCRIPTION	UNITS	DET.	BH6	POTABLE WATER (HUMAN)*
pH Value		0.01	5.41	6.5 - 8.5
Conductivity @ 25°C	µS/cm	1	31800	N.A.
Calcium - Filtered	mg/L	1	393	up to 200
Magnesium - Filtered	mg/L	1	693	< 30
Sodium - Filtered	mg/L	1	5920	300
Potassium - Filtered	mg/L	1	170	N.A.
Alkalinity as CaCO <sub>3</sub>	mg/L	1	235	500
Sulphate - Filtered	mg/L	1	3730	400
Chloride	mg/L	1	9960	400
Aluminium - Filtered	mg/L	0.1	<1.0	0.2
Cadmium - Filtered	mg/L	0.05	0.05	0.005
Copper - Filtered	mg/L	0.1	<0.1	1.0
Iron - Filtered	mg/L	1	434	0.3
Nickel - Filtered	mg/L	0.1	0.4	0.134
Lead - Filtered	mg/L	0.1	0.1	0.05
Zinc - Filtered	mg/L	0.1	<0.1	5.0
Arsenic - Filtered	mg/L	0.01	0.04	0.05
Mercury - Filtered	mg/L	0.0005	<0.0005	0.001
Total Cations	mEq/L	0.01	362	
Total Anions	mEq/L	0.01	363	
Actual Anion - Cation Difference	mEq/L	0.01	1.51	
Allowed Anion - Cation Difference	mEq/L	0.01	5.74	

\* From  
ANZEC (1990), Draft National Water Quality Guidelines, EPA (Victoria)  
NH & MRC (1987) Guidelines for Drinking Water Quality in Australia, AGPS  
Hart (1974) A Compilation of Australian Water Quality Criteria, AGPS

N.A. Not Available

## CONCLUSIONS

Preliminary environmental site assessment work carried out has indicated that:

- within the inferred area of the former caustic waste disposal ponds, the surface soils to a depth of 1.0 m consisted of fill material. These soils are neutral to slightly alkaline in BH2 and neutral to slightly acidic in BH5;
- the sub-surface clays and sandy clays below the fill material, to a depth of 5.0 m, show a consistently neutral pH;
- the landscaped cover over the area shows a large shallow depression which is assumed to represent the location of the former ponds. The apparent dieback of grasses which cover smaller depressions within these areas may be due to the waterlogging of surface clays;
- reported TPH fraction levels for samples collected from boreholes BH4 and BH5 were below laboratory detection limits (and hence below current DEH investigation threshold levels);
- both the field and laboratory analyses of the three water samples taken, indicate conductivity levels similar to those of an estuarine environment. The ratios of calcium, magnesium, sodium, potassium, and sulphate to chloride are similar to those found in naturally occurring seawater and indicate some form of saltwater intrusion (i.e. via the nearby drain and the Brisbane River). The high level of iron has similarly been observed in similar hydrological environments i.e. Nudgee Beach and Bramble Bay areas and is considered to be due to "natural" hydrochemical reactions occurring in an oxygen deficient environment below the water table. These possible reaction processes were further indicated by the significant lowering in the pH (to 3) of water samples collected, following a period of exposure to air during storage;
- potentially elevated levels (relative to current drinking water standards) of cadmium, nickel, lead and arsenic were recorded in the water sample obtained from BH6. These results may indicate the potential for elevated levels of some heavy metals in soils at the site, due to sorption during the period of waste disposal.

The results from the investigation indicate a naturally occurring estuarine environment. No significant contamination due to the former disposal of caustic wastes was apparent at the locations tested. Assessment of groundwater flow patterns through monitoring of groundwater levels and further sampling and analysis of groundwaters and soils (to further assess levels of heavy metals indicated by the initial investigations) should be carried out to confirm these initial conclusions.

## 6

## RECOMMENDATIONS

The following programme is recommended to confirm the results of the initial assessment work:

- (i) The installed groundwater monitoring bore collars and ground levels should be surveyed to an appropriate datum (e.g. AHD).
- (ii) A further round of groundwater samples be collected for laboratory analysis to assess potentially elevated levels of heavy metals (e.g. cadmium, nickel, lead and arsenic) indicated by initial assessment work.
- (iii) A series of shallow soils sample be collected from the investigation area (by hand auger) and analysed to assess potential levels of these heavy metals.

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**LIMITATION**

This report is based on data from the indicated background data supplied by Alcan, site inspection, and drilling /sampling /analysis results. Soil "headspace" determinations and chemical analyses at sample points may not be representative of all conditions across the site. Inferences about the nature and continuity of subsoil conditions away from the sample points, where made, cannot be guaranteed.

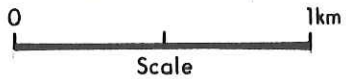
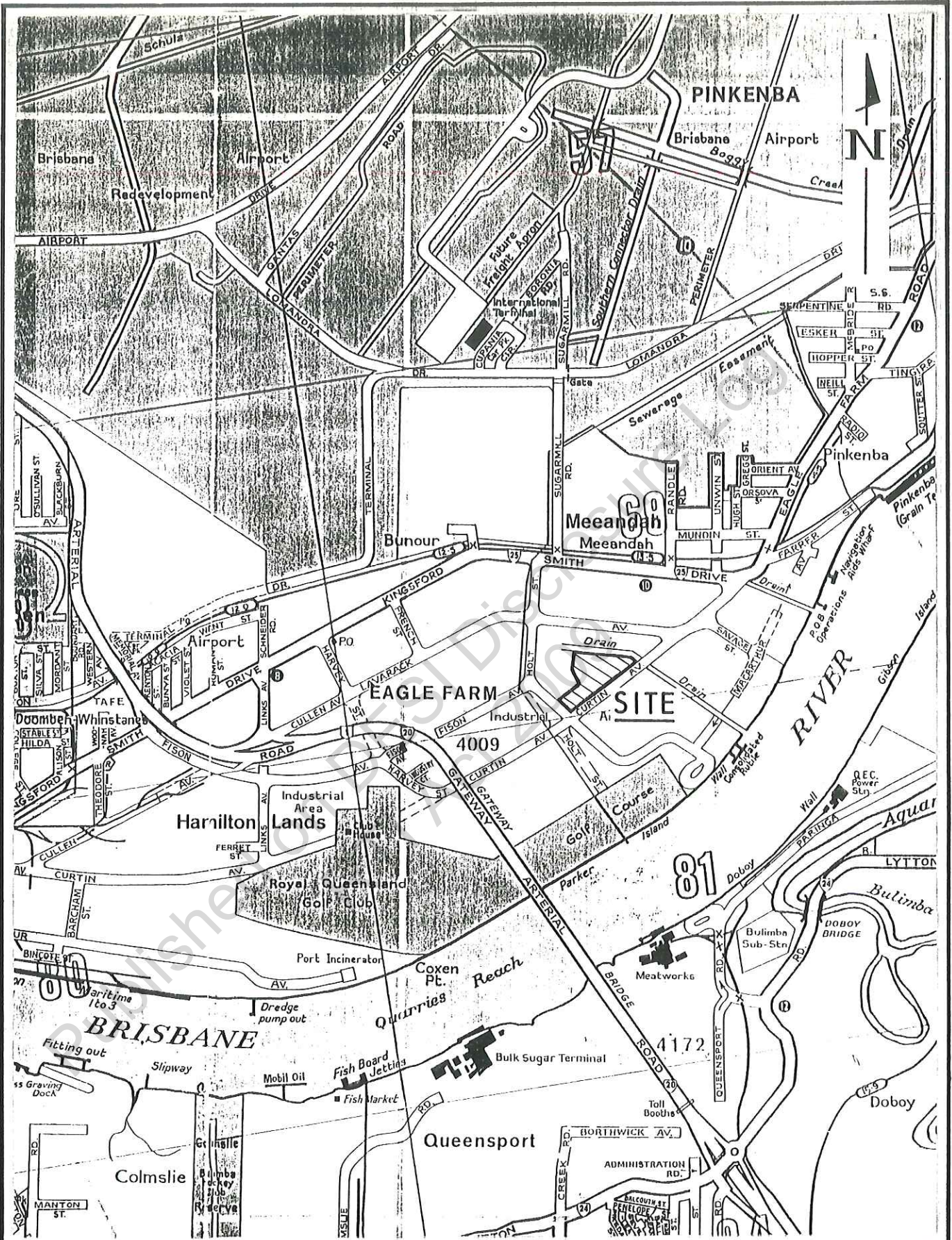
This report has been prepared for the particular investigations described and no responsibility is accepted for the use of any part of the report in other contexts or for any other purpose.

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**FIGURES**

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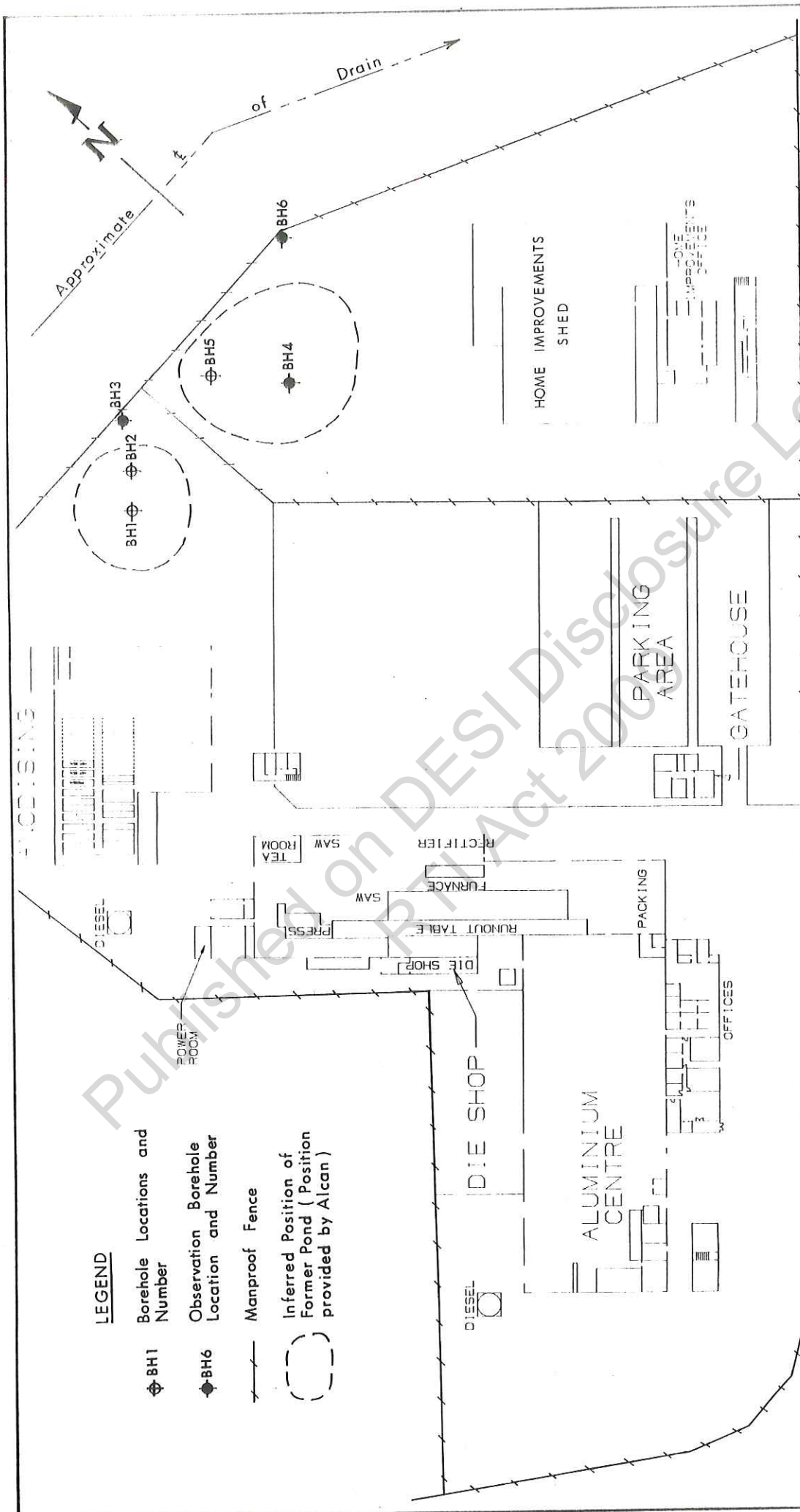




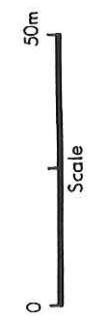
CLIENT: **ALCAN AUSTRALIA LTD**  
 PROJECT: **ALCAN: EAGLE FARM PRELIMINARY SITE ASSESSMENT**

**REGIONAL LOCALITY MAP**

DATE: **MAY 1992**      DWG No: **4315/1**      FIGURE: **1**



CURTIN AVENUE



CLIENT: ALCAN AUSTRALIA LTD
PROJECT: ALCAN: EAGLE FARM PRELIMINARY SITE ASSESSMENT
<b>PLAN SHOWING SITE LAYOUT AND APPROXIMATE BOREHOLE LOCATIONS</b>
DATE: MAY 1992
DWG No: 4315 / 2
FIGURE: 2

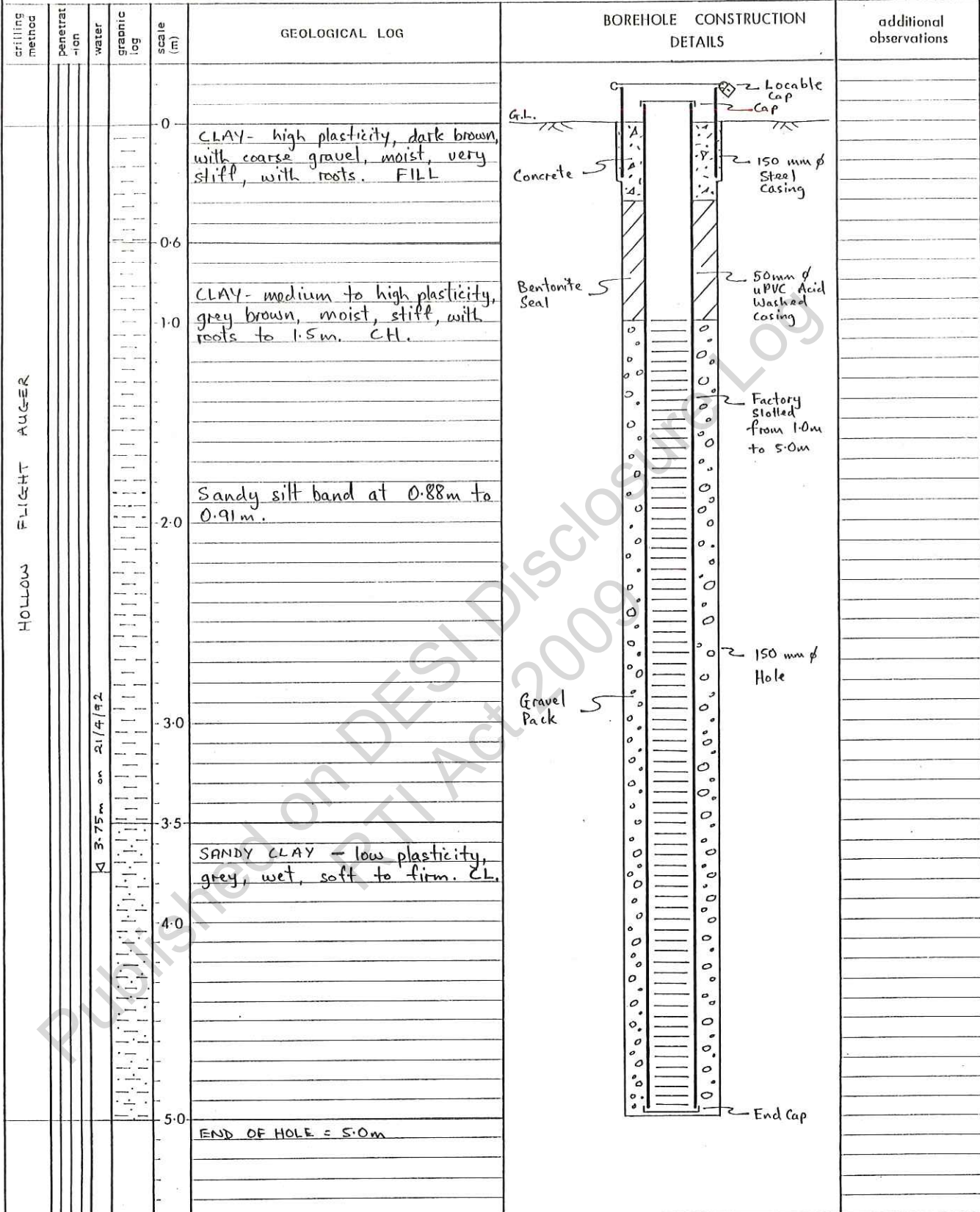
**APPENDICES**

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**APPENDIX A**  
**BOREHOLE LOGS AND OBSERVATION BORE CONSTRUCTION DETAILS**

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HOLE No.: **BH 3** JOB No. **4315**  
 CO-ORDINATES: **E N** RL  
 LOCATION: **ALUMINIUM CENTRE PROPERTY**



DRILL TYPE HYDRA 500  
 FEED HOLLOW STEM AUGER  
 DRILLER: R. NYLON  
 COMMENCED 15/4/92  
 COMPLETED 15/4/92  
 LOGGED BY: D.L.  
 CHECKED BY: P.L.  
 VERTICAL SCALE  
 AS SHOWN

**KEY**

penetration no resistance ranging to refusal

water 10.1.00 water level and date

water inflow

water outflow

CLIENT: **ALCAN AUSTRALIA LTD**

PROJECT: **ALCAN, EAGLE FARM PRELIMINARY SITE ASSESSMENT**

**BOREHOLE LOG AND OBSERVATION BORE CONSTRUCTION DETAIL, BH 3**

HOLE No.: **BH 4** JOB No. **4315**  
 CO-ORDINATES: E N RL  
 LOCATION: **HOME IMPROVEMENTS PROPERTY**

drilling method	penetration	water	graphic log	scale (m)	GEOLOGICAL LOG	BOREHOLE CONSTRUCTION DETAILS	additional observations
HOLLOW FLIGHT AUGER				0	CLAY- high plasticity, dark brown, with coarse gravel, very stiff, with roots. FILL		
				0.6	CLAY- medium to high plasticity, grey brown, moist, stiff, with roots. CH.		
				1.0			
				1.7	CLAY- medium to high plasticity, grey, moist, stiff, becoming silty at 2.5 m. CH.		
				2.0			
				3.0			
				3.15	SANDY CLAY - low plasticity, grey, wet, soft to firm. CL.		
				4.0			
				5.0	END OF HOLE = 5.0m		

DRILL TYPE HYDRA-500  
 FEED HOLLOW STEM AUGER  
 DRILLER... R. NYLON  
 COMMENCED 16/4/92  
 COMPLETED 16/4/92  
 LOGGED BY... D.J.  
 CHECKED BY... D.J.  
 VERTICAL SCALE  
 AS SHOWN

**KEY**

penetration

no resistance ranging to refusal

water

▽ 10.1.00 water level and date

▶ water inflow

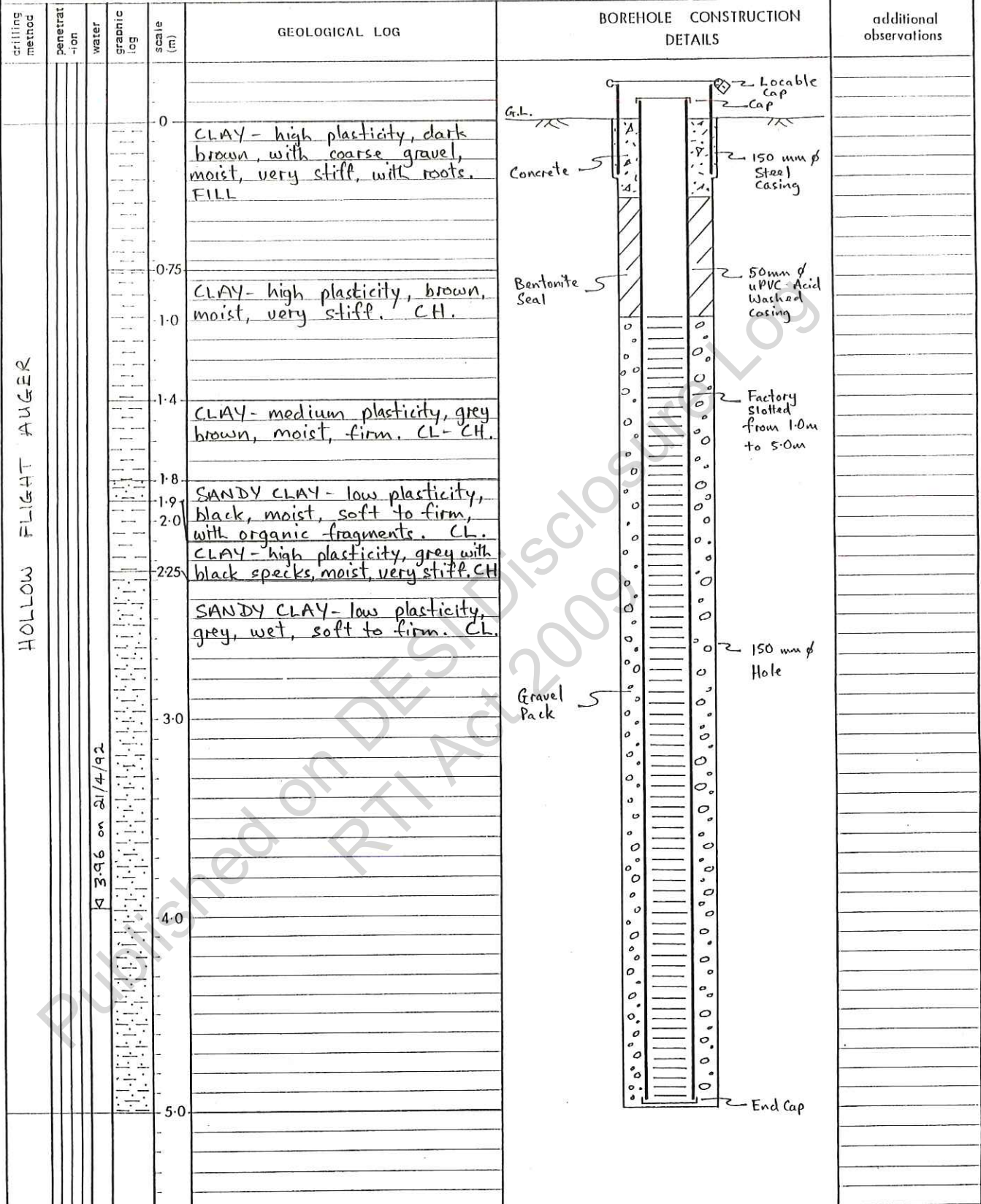
◀ water outflow

CLIENT:- **ALCAN AUSTRALIA LTD**

PROJECT:- **ALCAN, EAGLE FARM PRELIMINARY SITE ASSESSMENT**

**BOREHOLE LOG AND OBSERVATION BORE CONSTRUCTION DETAIL, BH 4**

HOLE No.: BH 6 JOB No. 4315  
 CO-ORDINATES: E                      N                      RL                       
 LOCATION: HOME IMPROVEMENTS PROPERTY



DRILL TYPE HYDRA 500  
 FEED HOLLOW STEM AUGER  
 DRILLER R. NYLON  
 COMMENCED 16/4/92  
 COMPLETED 16/4/92  
 LOGGED BY D.I.  
 CHECKED BY D.I.  
 VERTICAL SCALE  
 AS SHOWN

**KEY**

penetration no resistance ranging to refusal

water 10.1.00 water level and date

water inflow

water outflow

CLIENT:- **ALCAN AUSTRALIA LTD**

PROJECT:- **ALCAN, EAGLE FARM PRELIMINARY SITE ASSESSMENT**

**BOREHOLE LOG AND OBSERVATION BORE CONSTRUCTION DETAIL, BH 6**

**APPENDIX B  
RESULTS OF LABORATORY ANALYSIS**

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**AUSTRALIAN  
LABORATORY  
SERVICES P/L**  
A.C.N. 009 936 029

**Brisbane Head Office and Laboratory**  
32 Shand Street, Stafford, Q. 4053  
P.O. Box 66, Everton Park, Q. 4053  
Telephone: (07) 352 5577  
Facsimile: (07) 352 5109

# ANALYTICAL REPORT

PAGE 1 of 2

CLIENT: AGC WOODWARD-CLYDE  
ADDRESS: 6 QUALTROUGH STREET  
BURANDA  
QLD 4102

LABORATORY: ENVIRONMENTAL  
BATCH NUMBER: EN2295-0

CONTACT: sch4p4(6) Personal info

No. of SAMPLES: 31  
DATE RECEIVED: 16/04/92  
DATE COMPLETED: 30/04/92

ORDER No: 4315

SAMPLE TYPE: SOIL

PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	pH	Moisture %	TPH mg/Kg
		EA-005	EA-055	EP-015
	AC 1	8.15	-----	-----
	AC 2	7.85	-----	-----
	AC 3	7.61	-----	-----
	AC 4	7.25	-----	-----
	AC 5	6.94	-----	-----
	AC 6	7.23	-----	-----
	AC 7	7.06	-----	-----
	AC 8	7.18	-----	-----
	AC 9	7.54	-----	-----
	AC 10	7.49	-----	-----
	AC 11	6.97	-----	-----
	AC 12	6.80	-----	-----
	AC 13	6.48	-----	-----
	AC 14	7.19	-----	-----
	AC 15	7.24	-----	-----
	AC 16	7.00	-----	-----
	AC 17	7.40	-----	-----
	AC 18	6.52	-----	-----
	AC 19	5.25	-----	-----
	AC 20	6.90	-----	-----
	AC 21	6.89	-----	-----
	AC 22	7.04	-----	-----
	AC 23	6.83	-----	-----
	AC 24	7.14	-----	-----
	AC 25	7.45	-----	-----
	AC 26	7.53	-----	-----
	AC 2A	-----	25.6	<50
	AC 6A	-----	29.1	50
	AC 15A	-----	33.8	150
	AC 21A	-----	40.2	150
DETECTION LIMIT:		0.01	0.1	50

COMMENTS: \*\*\* DUPLICATE ASSAYS.  
Total petroleum hydrocarbons determined by APHA method 5520F  
(17th ed.).

sch4p4(6) Personal information

**Inverville Laboratory**  
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**Quarters Towers Laboratory**  
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**Orange Laboratory**  
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**Indigo Laboratory**  
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**Perth Laboratory**  
Phone: (09) 249 2988 Fax: (09) 249 2942  
**Kalgoorlie Laboratory**  
Phone: (090) 21 1457 Fax: (090) 21 6253  
**Southern Cross Laboratory**  
Phone: (090) 49 1292 Fax: (090) 49 1374

All pages of this report  
have been checked and  
approved for release.

File A

Page 28 of 36 Signed



**AUSTRALIAN  
LABORATORY  
SERVICES P/L**  
A.C.N. 009 936 029

**Brisbane Head Office and Laboratory**  
32 Shand Street, Stafford, Q. 4053  
P.O. Box 66, Everton Park, Q. 4053  
Telephone: (07) 352 5577  
Facsimile: (07) 352 5109

# ANALYTICAL REPORT

PAGE 2 of 2

CLIENT: AGC WOODWARD-CLYDE  
ADDRESS: 6 QUALTROUGH STREET  
BURANDA  
QLD 4102

LABORATORY: ENVIRONMENTAL  
BATCH NUMBER: EN2295-0

CONTACT: sch4p4(6) Personal information

No. of SAMPLES: 31  
DATE RECEIVED: 16/04/92  
DATE COMPLETED: 30/04/92

ORDER No: 4315

SAMPLE TYPE: SOIL

PROJECT No:

SAMPLE NUMBER	ELEMENT UNIT METHOD	pH EA-005	Moisture % EA-055	TPH mg/Kg EP-015		
AC 26A		-----	39.6	50		
DETECTION LIMIT:		0.01	0.1	50		

COMMENTS:

sch4p4(6) Personal information

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**Charters Towers Laboratory**  
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**Southern Cross Laboratory**  
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Environmental Consulting Pty. Ltd.

109 Station Street, Malvern, Victoria, 3144  
Postal Address: P.O. Box 120, Malvern, Victoria, 3144  
Telephone: (03) 509 1144  
Fax: (03) 509 8878

AUSTRALIAN LABORATORY SERVICES PTY.LTD.

EN2295

TOTAL PETROLEUM HYDROCARBONS - US EPA 418.1(IR), MGT 100A(GC)

Sample	(29) AC15A	(30) AC21A					
Lab. No.	A854	A855					
% Moisture w/w	35.6	40.6					
TPH Total by IR	-	-					
C <sub>6</sub> - C <sub>9</sub> Fraction by GC	<20	<20					
C <sub>10</sub> - C <sub>14</sub> Fraction by GC	<50	<50					
C <sub>15</sub> - C <sub>28</sub> Fraction by GC	<100	<100					

Results expressed in ppm(mg/kg dry for soils, mg/l for waters) standard reference oil.  
Soil extraction US EPA 3550(modified), water extraction US EPA 3510.

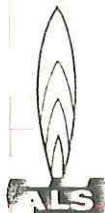
Date Received 30.4.92

23-054  
Report No. 88514(A)

sch4p4(6) Personal information  
File



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Page 27 of 86



# Australian Laboratory Services PTY. LTD.

A.C.N. 009 936 029  
CONSULTING ANALYTICAL CHEMISTS

INCORPORATED  
IN QUEENSLAND

## LABORATORY REPORT

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Phone: (054) 46 1390. Fax: (054) 46 13

**Orange Laboratory**  
10 Leewood Drive, Orange, N.S.W. 280  
Phone: (063) 631 722. Fax: (063) 631 1

Page 1 of 1

Client: AGC WOODWARD-CLYDE  
Address: 6 QUALTROUGH STREET  
BURANDA  
QLD 4102

Contact: sch4p4(6) Personal info

Order No. FJ: 4315

Sample Type: WATER

ENVIRONMENTAL  
Batch Number: 2305  
Sub-batch: 0  
No. of Samples: 3  
Date Received: 22/04/99  
Date Completed: 01/05/99

Code	Analysis description	Units	Det	BH 3 21/04/92	BH 4 21/04/92	BH 6 21/04/92
005	pH Value		0.01	5.62	5.66	5.41
010	Conductivity @ 25°C	uS/cm	1	23500	22100	31800
005F	Calcium - Filtered	ng/L	1	-----	-----	393
010F	Magnesium - Filtered	ng/L	1	-----	-----	693
015F	Sodium - Filtered	ng/L	1	-----	-----	5920
020F	Potassium - Filtered	ng/L	1	-----	-----	170
037	Alkalinity as CaCO3	ng/L	1	-----	-----	235
040F	Sulphate - Filtered	ng/L	1	-----	-----	3730
045	Chloride	ng/L	1	-----	-----	9960
005F	Aluminium - Filtered	ng/L	0.1	-----	-----	<1.0
005F	Cadmium - Filtered	ng/L	0.05	-----	-----	0.05
005F	Copper - Filtered	ng/L	0.1	-----	-----	<0.1
005F	Iron - Filtered	ng/L	1	-----	-----	434
005F	Nickel - Filtered	ng/L	0.1	-----	-----	0.4
005F	Lead - Filtered	ng/L	0.1	-----	-----	0.1
005F	Zinc - Filtered	ng/L	0.1	-----	-----	<0.1
030F	Arsenic - Filtered	ng/L	0.01	-----	-----	0.04
035F	Mercury - Filtered	ng/L	0.0005	-----	-----	<0.0005
005	Total Cations	nEq/L	0.01	-----	-----	362
010	Total Anions	nEq/L	0.01	-----	-----	363
015	Actual (Anion / Cation) Difference	nEq/L	0.01	-----	-----	1.51
020	Allowed (Anion / Cation) Difference	nEq/L	0.01	-----	-----	5.74

SAMPLES ANALYSED AS RECEIVED

Comments:

Metal detection limits raised due to high concentration of dissolved salts.



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Registered Laboratory No. 825

23-054

File A

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Signature:

Page 28 of 86

FORM 1

Contaminated Land Section  
227 7000

900615

21 April 1993

[sch4p4( 6) Person]

Principal Environmental Consultant  
AGC-Woodward Clyde  
6 Qualtrough Street  
BURANDA QLD 4102

Dear [sch4p4( 6) Per]

**PRELIMINARY SITE CONTAMINATION ASSESSMENT REPORT  
- LOT 981 ON SL 6741, EAGLE FARM**

Thank you for your letter and report on the above property dated 1 February 1993. The conclusions and recommendations of the preliminary report are confirmed as indicating a low potential for significant soil and/or groundwater contamination on the site.

I agree with the on-going monitoring of the site as suggested being:-

- (i) the installation of an additional groundwater monitoring bore in the vicinity of an area reporting elevated cobalt and petroleum hydrocarbon levels;
- (ii) a groundwater monitoring program monitored quarterly be established to identify flow patterns, direction and quality of groundwaters at the site;
- (iii) groundwater monitoring parameters as listed; and
- (iv) an annual report be prepared reviewing the previous 12 months groundwater monitoring data and assessing any environmental impact.

Unfortunately a site contamination report for on-going general industry use is not able to be issued as you requested. The site will remain listed as 'probable' on the register until such time as the zoning or activities change on the site. I commend the environmental management approach adopted by Alcan Australia Limited in the operation of its Eagle Farm anodising plant site.

Should you have any queries on the above please contact Mark Paton on 227 7000.

Yours sincerely

C:\WP51\DOC\PATON\BROWN.LTR

[sch4p4( 6) Personal]

David N Miles  
Director, Waste Management Branch  
Division of Environment

ALCAN AUSTRALIA LIMITED

JOB NUMBER 4315-3

JANUARY 1993

PRELIMINARY SITE  
CONTAMINATION ASSESSMENT AND  
GROUNDWATER MONITORING  
LOT 981 ON SL 6741 EAGLE FARM

Published on DESI Disclosure Log  
RTI Act 2009



**AGC Woodward-Clyde Pty Limited**  
A.C.N. 000-691-690





1 February 1993

Director  
Contaminated Land Unit  
Department of Environment and Heritage  
160 Ann Street  
**BRISBANE QLD 4000**

**ATTENTION:** sch4p4( 6) Personal information

Dear Sir,

**RE: PRELIMINARY SITE CONTAMINATION ASSESSMENT REPORT  
- LOT 981 ON SL 6741, EAGLE FARM**

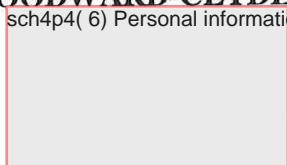
Please find attached a copy of a report prepared by AGC Woodward-Clyde Pty Limited (Woodward-Clyde) on behalf of Alcan Australia Limited (Alcan) in relation to Alcan's Eagle Farm anodising plant site.

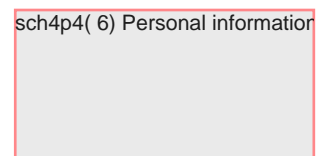
Alcan require a Site Contamination Report (SCR) for on-going General Industry land use, based on the findings outlined in these two reports.

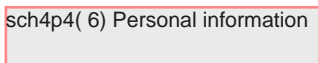
Please call sch4p4( 6) Personal information on 393 1533, should you have any queries or require any further information.

Yours faithfully,

**WOODWARD-CLYDE PTY LIMITED**

sch4p4( 6) Personal information  


sch4p4( 6) Personal information  


sch4p4( 6) Personal information  


**Principal Environmental Consultant**

**Senior Environmental Consultant**

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3	Plan Showing Site Layout and Approximate Borehole and Soil Sample Locations.

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A	Contaminated Land Register and Titles Information
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## EXECUTIVE SUMMARY

AGC Woodward-Clyde Pty Ltd (AGC Woodward-Clyde) was commissioned by Alcan Australia Limited (Alcan), to undertake a preliminary site contamination assessment at the Alcan aluminium extrusion and anodising plant site at the corner of Holt Street and Curtain Avenue, Eagle Farm, Brisbane.

AGC Woodward-Clyde had previously undertaken initial preliminary site investigation work at the site (April/May, 1992) comprising the installation of three groundwater monitoring bores at the site and the conduct of limited soil and groundwater testing, sampling and laboratory analysis. The results of this work are presented in AGC Woodward-Clyde's report to Alcan entitled "Preliminary Environmental Assessment of Former Casutic Waste Disposal Areas - Eagle Farm" of May 1992.

The purpose of the current work programme was to provide further information regarding site history and potential soils and/or groundwater contamination at the site in view of the provisions of the Contaminated Land Act, 1991.

The scope of work comprised a detailed site history review and site walkover inspection, conduct of a soils sampling program, sampling (and surveying) of existing groundwater monitoring bores, laboratory analysis of selected soil and groundwater samples and reporting.

The results obtained from the work carried out indicated low potential for significant soil and/or groundwater contamination at the site. The levels of most "indicator parameters" tested were below current DEH investigation threshold levels, within typical background ranges for soil types encountered, or below laboratory reporting limits.

Cobalt was recorded at levels slightly above typical background levels provided by DEH in a single sample analysed, whilst "heavy end" (i.e. lubricating oils or similar compounds) petroleum hydrocarbons were recorded at levels above current DEH investigation threshold levels at two locations samples. The levels of these parameters were, however, below indicative clean-up levels for industrial land use, based on a review of relevant international soil contamination standards.

It is recommended that an additional groundwater monitoring bores be installed at the site (in the vicinity of an area reporting elevated cobalt and petroleum hydrocarbon levels in soils) and that quarterly groundwater monitoring be carried out at the site to establish the flow patterns, direction and quality of groundwaters at the site.

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## 1

## INTRODUCTION AND PURPOSE OF WORK

AGC Woodward-Clyde Pty Ltd (AGC Woodward-Clyde) was commissioned by Alcan Australia Limited (Alcan), to undertake a preliminary site contamination assessment at the Alcan aluminium extrusion and anodising plant site at the corner of Holt Street and Curtin Avenue, Eagle Farm, Brisbane.

An initial preliminary site assessment was carried out in April/May 1992. This investigation involved assessment of potential soil contamination arising from the former disposal of spent caustic waste and waste oil in the area of the two decommissioned and rehabilitated caustic waste disposal ponds. Potential groundwater contamination in this area was also investigated by installing and sampling three groundwater monitoring bores.

The results of this initial preliminary site assessment work are outlined in our report entitled "Preliminary Environmental Assessment of Former Caustic Waste Disposal Areas - Eagle Farm" of 14 May, 1992.

The purpose of the second stage of work was to provide further information regarding potential soil contamination at the site. This work included a detailed site background review, soil investigations around the site, groundwater sampling of the monitoring bores installed during the initial site assessment and surveying of the monitoring bores. This work was carried on 17 November, 1992.

## SCOPE OF WORK

The scope of work for the preliminary site assessment comprised:

- a review of published topographic, geological and cadastral maps and historical air photos covering the area;
- an historical property title search;
- reference to the DEH's "Guidelines for the Assessment of Contaminated Land in Queensland - January, 1992";
- a detailed site walkover inspection;
- discussion with officers of various Government Departments regarding existing site services, land use and zoning and site history;
- the conducting of a preliminary soil sampling program at the site, based on the site background information;
- a "headspace" analysis survey (for ionisable "volatile" organics) of soil samples collected over the site;
- groundwater sampling of 3 groundwater monitoring bores (installed during the initial site assessment) including bore water level monitoring and selected field analyses;
- laboratory analysis of selected soil samples and the groundwater monitoring bore samples for selected chemical parameters, based on the above site background information and analyses carried out during the initial site assessment;

- assessment of results against current DEH investigation threshold levels and other relevant soils and water contamination standards; and
- reporting.

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### 3 SITE BACKGROUND REVIEW

#### 3.1 Site Location and Description

##### APPLICANT:

Name: Alcan Australia Limited

Address: Corner Holt Street and Curtin Avenue  
EAGLE FARM QLD 4009

##### PROPERTY IDENTIFICATION:

Address: Corner Holt Street and Curtin Avenue  
EAGLE FARM QLD 4009

Real Property  
Description: Lot 981 on SL 6741  
County of Stanley  
Area 5.2774 ha

Current Zoning: General Industry

Local Authority  
Name: Brisbane City Council

##### PROPERTY DESCRIPTION:

The site is 5.2774 ha in area and is bounded by Holt Street to the south west and Curtin Avenue to the southeast. The site is situated within the Eagle Farm industrial area and is bounded to the north by an open drainage creek which empties east into the Brisbane River (refer Figure 1).

Reference to the Geological Survey of Queensland's 1:100 000 Brisbane geological sheet indicates the site to be underlain by Holocene alluvial plains and tidal flats consisting of sands, gravels, silts and muds.

The site surface has been cleared of natural vegetation, and consists of factory buildings and offices, including a number of well grassed areas. A detailed site walkover inspection revealed several areas showing indications of surface contamination along the northern boundary adjacent to the anodising shed, and also adjacent to the Die Shop and Aluminium Centre. Four small squares of vegetation "dieback" were observed within the central grassed area northwest of the parking area. The site is level with no apparent slope.

A stormwater easement is located along the southwestern boundary of the site. Underground power lines are located beside this easement and continue along the fence line towards Holt Street. A septic tank is also located adjacent to this fence line.

An aerial photograph of the site (Circa 1981) is presented as Figure 2.

A current site plan is presented as Figure 3.

### 3.2 Site History and Land Use

Historical title's information (refer Appendix A) indicates the current property on Lot 981 of SL 6741 to have been mangrove swamp land that was filled with dredged materials.

Inspection of historical aerial photographs confirm the filling of the site and surrounding area around 1958. Aerial photographs from 1969 show the site to be vacant, and those from 1981 show the presence of the Alcan factory but do not indicate the presence of the caustic waste disposal ponds.

The DEH has advised that the site is not currently listed on the Contaminated Sites Register (refer Appendix A).



## 4 SITE INVESTIGATION PROGRAMME

### 4.1 Rationale and Scope of Soil Sampling Programme

Based on the site background information, a soil sampling and laboratory analysis programme was prepared.

Soil sampling locations (S1 to S12 - refer Figure 3) were selected to provide a broad site coverage (to assess the possible impact of the disposal of suspected contaminants indicative of aluminium extruding and anodising activities carried out on the site), with emphasis in the previous known caustic waste disposal pond areas and areas showing signs of surface staining.

The following "indicator" parameters (refer Table 1) were selected to assess potential soils contamination at the site, based on available site history information:

- soil pH value;
- heavy metals (arsenic, cadmium, cobalt, chromium, copper, aluminium, nickel, lead, zinc, antimony and mercury) potentially associated with aluminium extruding and anodising operations and/or imported fill material at the site;
- total petroleum hydrocarbons (TPH), within the soils sampled; and
- "broad scan" organochlorine and organophosphorous (OC/OP) pesticides potentially associated with former rural/agricultural land use, site maintenance activities and/or imported fill material.

### 4.2 Sample "Headspace" Analysis

A "headspace" soil gas analysis was conducted on each of the soil samples collected. A total of twenty two (22) samples (E1 to E22) were tested from twelve sample sites (S1 to S12) (refer Figure 3).

Each sample was placed into a sealable plastic bag partially filling the bag and leaving a space in which organic vapours could accumulate. A portable Photovac "Microtip" organic vapour analyser was used to measure the concentration of organic vapours within the space above the soil sample. This instrument utilises a photo-ionisation detector (PID)<sup>1</sup> to detect ionisable vapours in parts per million benzene equivalent.

**TABLE 1**  
**SOIL SAMPLING AND ANALYSIS SCHEDULE**

LOCATION	SAMPLE NUMBER AND DEPTH (m)	DEPTH (m)	LITHOLOGY	ANALYTICAL PARAMETERS
S1	E1 (0.0-0.25)	0.0-0.6	Sandy clay, dark brown, dry, some shells, fill	pH, M/C, TPH, Metals (including Cr, Co, Al, Zn, Ni, Pb, Cu, As, Cd)
	E2 (0.25-0.50)	0.6-1.5	Clay, dark brown, moist, some shells	pH, M/C, TPH, Metals (including Cr, Co, Al, Zn, Ni, Pb, Cu, As, Cd)
S2	E3 (0.0-0.25)	0.0-0.3	Sandy clay, dark brown with light brown patches of silty sand and cobbles, dry, fill	Not analysed (currently in storage)
	E4 (0.25-0.50)	0.3-1.0	Silty clay, dark brown with roots, moist, fill	Not analysed (currently in storage)
S3	E5 (0.0-0.25)	0.0-0.25	Silty sand, light brown with cobbles, dry, fill	pH, M/C, Metals (including Cr, Co, Al, Zn, Pb, Cu, Cd)
		0.25-	Concrete slab	
S4	E6 (0.0-0.25)	0.0-0.2	Sandy clay, dark brown with builders rubble, moist, fill	pH, M/C, Metals (including Cr, Co, Al, Zn, Ni, Pb, Cu, As, Cd)
	E7 (0.25-0.5)	0.2-0.6	Silty clay, dark brown with white grit, moist	pH, M/C, Metals (including Cr, Co, Al, Zn, Ni, Pb, Cu, As, Cd)
		0.6-1.2	Clay, dark brown, moist	

<sup>1</sup> Microtip instrument is sensitive to organic compounds with an ionisation potential of 10.6 eV, or less.

**TABLE 1  
SOIL SAMPLING AND ANALYSIS SCHEDULE**

LOCATION	SAMPLE NUMBER AND DEPTH (m)	DEPTH (m)	LITHOLOGY	ANALYTICAL PARAMETERS
S5	E8 (0.0-0.25)	0.0-0.2	Silty sand, orange brown with white precipitate on surface, dry, strong pesticide? smell, fill	pH, M/C, TPH, OC/OP, Metals (including Cr, Co, Al, Zn, Pb, Cu, Cd)
	E9 (0.25-0.5)	0.2-0.9	Clay, black, moist with strong pesticide? smell	pH, M/C, TPH, OC/OP, Metals (including Cr, Co, Al, Zn, Pb, Cu, Cd)
S6	E10 (0.0-0.25)	0.0-0.4	Silty sand, grey to orange brown with cobbles, dry, fill	pH, M/C, TPH, Metals (including Cr, Co, Al, Zn, Pb, Cu, Cd)
	E11 (0.25-0.5)	0.4-1.0	Clay, dark brown, moist	Not analysed (currently in storage)
S7	E12 (0.0-0.25)	0.0-0.35	Gravelly clay, light grey to brown, dry, road base. Greeny grey staining on surface	pH, M/C, TPH, Metals (including Cr, Co, Al, Zn, Pb, Cu, Cd)
	E13 (0.25-0.5)	0.35-0.5	Gravelly clay, dark brown, moist, fill	Not analysed (currently in storage)
S8	E14 (0.0-0.2)	0.0-0.2	Sandy gravel, light grey brown with siltstone rubble, road base. Dark oil? stain on surface	pH, M/C, TPH, Metals (including Cr, Co, Al, Zn, Pb, Cu, Cd)
	E15 (0.2-0.4)	0.2-0.4	Gravelly clay, brown to black with siltstone rubble road base.	Not analysed (currently in storage)
S9	E16 (0.0-0.2)	0.0-0.3	Gravelly sand, grey to orange brown, dry, road base. Dark oil? staining on surface	pH, M/C, TPH, Metals (including Cr, Co, Al, Zn, Pb, Cu, Cd)
	E17 (0.2-0.4)	0.3-0.4	Gravel clay, dark brown with siltstone rubble, slightly moist, road base	Not analysed (currently in storage)
S10	E18 (0.0-0.2)	0.0-0.2	Gravelly sand, orange brown, damp. Dark oil? staining on surface, fill	pH, M/C, TPH, Metals (including Cr, Co, Al, Zn, Pb, Cu, Cd)
	E19 (0.2-0.4)	0.2-0.4	Gravelly sand with clay, grey with siltstone rubble, moist, fill	Not analysed (currently in storage)

**TABLE 1  
SOIL SAMPLING AND ANALYSIS SCHEDULE**

LOCATION	SAMPLE NUMBER AND DEPTH (m)	DEPTH (m)	LITHOLOGY	ANALYTICAL PARAMETERS
S11	E20 (0.0-0.25)	0.0-0.75	Silty sand, grey brown with siltstone rubble, dry, fill	pH, M/C, TPH, Metals (including Cr, Co, Al, Zn, Ni, Pb, Cu, As, Sb, Cd, Hg)
	E21 (0.25-0.5)	0.75-0.9	Clay, dark brown, moist	Not analysed (currently in storage)
S12	E22 (0.0-0.3)	0.0-0.3	Silty sand, grey brown with siltstone rubble, dry	pH, M/C, TPH, Metals (including Cr, Co, Al, Zn, Ni, Pb, Cu, As, Sb, Cd, Hg)

### 4.3 Sampling and Laboratory Analysis Procedures

Field sampling was carried out on 17 November, 1992. A backhoe was used to dig the pits and to collect soil samples. Sampling equipment was decontaminated by brushing with a wire brush between sample locations, to minimise the risk of contamination between sample holes. Sampling and sample handling was carried out using disposable rubber gloves. New (clean) gloves were used at each sample location. Individual surface soil samples were taken from 0 to 0.25 m depth and from 0.25 to 0.50 m depth. Due to the close proximity of underground power lines, samples were collected between 0 to 0.2 m and 0.2 to 0.4 m at sites S8, S9 and S10. A single sample was collected between 0 to 0.3 m at site S12 due to the uniformity of the ground.

Groundwater sampling from the three existing monitoring bores on the site was carried out during the site investigation. The samples were collected from BH3, BH4 and BH6 respectively. Before sampling, each bore was purged using a Grundfos MP1 water sampling pump. Approximately five bore volumes were removed from each bore to obtain representative sample. To minimise cross-contamination between monitoring bores, the pump and related sampling equipment were decontaminated using phosphate free soap solution (Decon 90) and rinsed thoroughly in fresh water and finally distilled water. A "new" and decontaminated length of HDPE pump riser pipe and rubber disposable gloves were used at each bore and discarded following sampling. In addition, the bore water levels were used at each bore and discarded following sampling. In addition, the bore water levels and field measurements of water sample pH and electrical conductivity (EC) were recorded.

On completion of the sampling programme selected soil and groundwater samples were sent to Australian Laboratory Services Pty Ltd (ALS) at Stafford, for analysis. ALS are NATA registered and fully familiar with this type of work, including AGC Woodward-Clyde's quality assurance/quality control requirements.

The soil samples were selectively analysed for the following parameters, depending on sample location (refer Table 1):

- pH value;
- total petroleum hydrocarbons (TPH);
- broad scan organochlorine and organophosphorous (OC/OP) pesticides;
- heavy metals (including arsenic, cadmium, cobalt, chromium, copper, aluminium, nickel, lead, antimony, zinc, mercury).

The water samples were analysed for the following parameters:

- heavy metals (including arsenic, cadmium, cobalt, chromium, copper, aluminium, nickel, lead, zinc, iron).

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## 5 RESULTS

### 5.1 Site Geology

Soils encountered in the field were dark brown to light grey brown gravelly sands and clay fill to at least 1.0 m, underlain by grey to black gravelly clays to dark brown silty clays to the base of each excavation. Siltstone rubble was encountered in excavations at sample sites S7 to S12 which was indicative of imported fill material at these locations. The deeper, dark brown clays may have represented infill material, dredged from the Brisbane River, during reclamation of the original swamp area in the 1950's and 1960's. Details of samples collected are presented in Table 1.

### 5.2 Sample "Headspace" Analysis Results

The results of the "headspace" analyses carried out on soil samples tested indicated peak ionisable organic soil gas concentrations in the range 2.0 to 12.9 ppm. Background readings recorded during survey work were between 2.0 ppm and 2.5 ppm. The results are summarised in Table 2. The sampling locations are presented on Figure 3.

**TABLE 2**  
**SUMMARY OF SOIL SAMPLE "HEADSPACE" ANALYSIS RESULTS**

SITE LOCATION	PEAK MICROTIP READINGS (ppm)*
E1	3.7
E2	3.4
E3	3.0
E4	3.7
E5	2.9
E6	3.3
E7	4.0
E8	3.2
E9	6.0
E10	4.1
E11	2.7
E12	4.0
E13	3.6
E14	12.9
E15	3.8
E16	4.1
E17	2.5
E18	3.0
E19	4.6
E20	3.0
E21	2.0
E22	3.7

\* Benzene equivalent

### 5.3 Results of Groundwater Monitoring and Field Testing

Prior to groundwater sampling, the groundwater level in each monitoring bore was recorded. A groundwater sample was then analysed in the field for pH and EC. The results of the field and water level monitoring are presented in Table 3. These data indicate the presence of moderately acidic, brackish to moderately saline groundwaters beneath the site. Electrical conductivity readings were approximately 30% lower than those recorded following initial emplacement of bores in April, 1992. pH values were similar, however, standing water levels were higher than levels measured in April, 1992. These data may be indicative of groundwater level and quality variations at the site, due to the tidal influence of the adjacent drain/creek. Further monitoring would be required to confirm these indications.

**TABLE 3**  
**RESULTS OF FIELD ANALYSES OF MONITORING BORES (17 NOVEMBER, 1992)**

LOCATION	SAMPLE NUMBER	STANDING WATER LEVEL (m)*	pH	ELECTRICAL CONDUCTIVITY ( $\mu$ s/CM)
BH3	EW1	3.46	5.6	14 700
BH4	EW2	3.71	5.5	17 070
BH6	EW3	3.71	5.5	19 570

\* Standing water levels recorded from top of casing.

#### 5.4 Laboratory Analysis Results - Soils

Laboratory analysis results for all soil and groundwater samples collected are summarised in Tables 4 and 5 respectively. Relevant DEH investigation threshold levels for soil contaminants and current national water quality guidelines<sup>1</sup> are also included in these tables, and are presented in Appendix B. A copy of all laboratory analysis results is included in Appendix C.

Total petroleum hydrocarbons (TPH) above laboratory detection limits were reported for samples collected from sites S5, S8, S9 and S12. However, only the samples collected from site S5 (between 0.25 m and 0.5 m depth) and S8 (0 -0.20 m) returned TPH values above current DEH investigation threshold levels. These samples reported levels of TPH of 140 mg/kg for C<sub>10</sub> - C<sub>14</sub>; 2880 mg/kg C<sub>15</sub> - C<sub>36</sub> (Site S4) and 1200 mg/kg for C<sub>15</sub> - C<sub>36</sub> (Site S8). The current DEH investigation threshold levels for these hydrocarbon fractions are 100 mg/kg (C<sub>10</sub> - C<sub>14</sub>) and 1000 mg/kg (C<sub>15</sub> - C<sub>36</sub>).

<sup>1</sup> ANZEC (1990), NH&MRC (1987), Hart (1974).



These results indicate the levels of most other "indicator parameters" tested to be below current DEH investigation threshold levels, within typical "background" ranges for the soil types encountered, or below laboratory reporting limits. The levels of cobalt reported for sample site S4 (225.0 mg/kg between 0.25 m and 0.50 m) was above typical "background" ranges specified by the DEH. Relatively elevated levels of cobalt (compared to other soil samples tested) were also reported for the shallower (0 -0.25 m) sample collected from site S4 (128.0 mg/kg) and a surface (0 - 0.25 m) sample collected from site S5 (148.0 mg/kg). The levels of aluminium reported for the samples analysed are consistent with typical levels of aluminium found naturally occurring in clay soils. Aluminium levels reported for samples collected from sites S4 and S5 were elevated compared to levels recorded for other samples tested from the site. As outlined above, these sites also recorded elevated TPH and cobalt levels compared to other samples tested and this data may be indicative of some minor contamination in these areas due to past waste disposal practices carried out at the site.

The DEH do not currently provide standards or guidelines for soil contamination in relation to industrial land use. However, a review of other relevant soil contamination standards<sup>1</sup> has indicated that TPH and cobalt levels reported above are below commonly adopted clean-up criteria for industrial land use activities.

## 5.5 Laboratory Analysis Results - Groundwaters

Laboratory analysis results of groundwater samples collected indicated elevated levels of (relative to current potable human water standards) of arsenic (0.5 mg/L in BH3), aluminium (2.0 mg/L in BH3, BH4 and BH6) and nickel (0.8 mg/L in BH3, 0.4 mg/L in BH4 and 0.5 mg/L in BH6), and cobalt (1.3 mg/L in BH6) relative to current livestock water standards.

## 5.6 Survey of Monitoring Bores

The three monitoring bores were surveyed by L.J. Hewitt & Associates to provide accurate location and bore water level elevation for each bore. The bore collars and ground levels were surveyed giving height datum as AHD. Results of the survey are presented in Table 6.

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<sup>1</sup> Dutch standards (indicative level for clean-up for mineral oils of 5,000 mg/kg and for cobalt of 300 mg/kg); French standards ("clean-up" level for cobalt of 300 mg/kg).

TABLE 4  
SUMMARY OF SOIL LABORATORY ANALYTICAL RESULTS

Analysis	LOR'	DEH Guidelines			S1 (E1)	S1 (E2)	S3 (E5)	S4 (E6)	S4 (E7)	S5 (E8)	S5 (E9)
		Background (mg/kg)	Environmental (mg/kg)	Health (mg/kg)	0-0.25m (mg/kg)	0.25-0.5m (mg/kg)	0-0.25m (mg/kg)	0-0.25m (mg/kg)	0.25-0.5m (mg/kg)	0-0.25m (mg/kg)	0.25-0.5m (mg/kg)
Petroleum Hydrocarbons											
C <sub>6</sub> - C <sub>9</sub>	2 mg/kg	n.a.	100	100	<LOR	<LOR	-	-	-	<LOR	<LOR
C <sub>10</sub> - C <sub>14</sub>	50 mg/kg	n.a.	100	100	<LOR	<LOR	-	-	-	<LOR	140
C <sub>15</sub> - C <sub>20</sub>	100 mg/kg	n.a.	1000	1000	<LOR	<LOR	-	-	-	720	2700
C <sub>20</sub> - C <sub>36</sub>	100 mg/kg	6 - 8	(C <sub>16</sub> -C <sub>36</sub> )	(C <sub>16</sub> -C <sub>36</sub> )	<LOR	<LOR	-	-	-	<LOR	180
Moisture Content (%)	0.1%	-	n.a.	n.a.	19.1	8.6	-	12.5	17.8	9.1	29.5
pH	0.01	-	n.a.	n.a.	7.14	8.33	-	7.71	7.52	9.51	8.79
OC/OP Pesticides		<0.001-0.97 (DDT)	0.2 (Dieldrin)	n.a.	-	-	-	-	-	<LOR	<LOR
Metals:											
Arsenic	0.5mg/kg	0.2-30	20	100	5.0	3.0	-	7.5	6.0	-	-
Cadmium	0.5mg/kg	0.04-2	3	20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	0.5mg/kg	2-170	n.a.	n.a.	10.0	10.0	4.5	128.0	225.0	148.0	14.5
Chromium	0.5mg/kg	0.5-110	50	n.a.	26.0	15.5	9.5	19.5	19.0	15.0	34.0
Copper	0.5mg/kg	1-190	60	n.a.	24.5	20.5	10.0	20.5	15.0	14.0	29.0
Aluminium	10m/kg	n.a.	n.a.	n.a.	9630	4580	4390	15600	20900	17600	10000
Nickel	0.5mg/kg	2-400	60	n.a.	15.5	10.5	-	14.0	15.0	-	-
Lead	0.5mg/kg	<2-200	300	300	27.5	24.5	25.0	33.0	24.5	22.5	32.0
Zinc	0.5mg/kg	2-180	200	n.a.	94.0	68.5	52.5	82.5	77.5	34.5	111.0
Antimony	5.0mg/kg	4-44	20	n.a.	-	-	-	-	-	-	-
Mercury	0.025mg/kg	0.001-0.1	1	n.a.	-	-	-	-	-	-	-

n.a. Not Available  
- Not Analysed  
1 Level of laboratory reporting

15

TABLE 4 (CONT'D)  
SUMMARY OF SOIL LABORATORY ANALYTICAL RESULTS

Analysis	LOR <sup>1</sup>	DEH Guidelines			S6 (E10)	S7 (E12)	S8 (E14)	S9 (E16)	S10 (E18)	S11 (E20)	S12 (E22)
		Background (mg/kg)	Environmental (mg/kg)	Health (mg/kg)	0-0.25m (mg/kg)	0.25-0.5m (mg/kg)	0-0.2m (mg/kg)	0-0.2m (mg/kg)	0.0-0.2m (mg/kg)	0-0.25m (mg/kg)	0.0-0.3m (mg/kg)
Petroleum Hydrocarbons											
C <sub>6</sub> - C <sub>9</sub>	2 mg/kg	n.a.	100	100	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
C <sub>10</sub> - C <sub>14</sub>	50 mg/kg	n.a.	100	100	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
C <sub>15</sub> - C <sub>20</sub>	100 mg/kg	n.a.	1000	1000	<LOR	<LOR	340	400	<LOR	<LOR	<LOR
C <sub>20</sub> - C <sub>30</sub>	100 mg/kg	n.a.	(C <sub>20</sub> -C <sub>30</sub> )	(C <sub>16</sub> -C <sub>30</sub> )	<LOR	<LOR	860	280	<LOR	<LOR	120
Moisture Content (%)	0.1%	n.a.	n.a.	n.a.	12.7	9.4	3.2	3.2	13.7	3.5	3.5
pH	0.01	6 - 8	n.a.	n.a.	8.70	3.30	9.29	9.49	8.08	6.15	7.03
OC/OP Pesticides		<0.001-0.97 (DDT)	0.2 (Dieldrin)	n.a.	-	-	-	-	-	<LOR	<LOR
Metals:											
Arsenic	0.5mg/kg	0.2-30	20	100	-	-	-	-	-	6.0	2.5
Cadmium	0.5mg/kg	0.04-2	3	20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	0.5mg/kg	2-170	n.a.	n.a.	11.0	6.0	6.0	6.0	3.0	7.5	2.0
Chromium	0.5mg/kg	0.5-110	50	n.a.	7.0	8.5	28.5	20.5	4.0	4.0	7.5
Copper	0.5mg/kg	1-190	60	n.a.	9.5	18.0	40.5	25.0	29.0	10.0	10.5
Aluminium	100 m/kg	n.a.	n.a.	n.a.	2760	4590	3520	3310	2770	2780	2780
Nickel	0.5mg/kg	2-400	60	n.a.	-	-	-	-	-	2.5	3.0
Lead	0.5mg/kg	<2-200	300	300	6.0	22.0	18.5	82.5	12.0	21.5	32.5
Zinc	0.5mg/kg	2-180	200	n.a.	41.0	24.0	37.5	48.0	29.0	47.0	50.0
Antimony	5.0mg/kg	4-44	20	n.a.	-	-	-	-	-	<0.1	<0.1
Mercury	0.025mg/kg	0.001-0.1	1	n.a.	-	-	-	-	-	0.10	0.15

n.a. Not Available  
- Not Analysed  
1 Level of laboratory reporting

16

**TABLE 5  
SUMMARY OF GROUNDWATER LABORATORY ANALYTICAL RESULTS**

Analysis	LOR <sup>1</sup> (mg/L)	Current National Guidelines for Water Quality <sup>2</sup>		BH3 (EW1)	BH4 (EW2)	BH6 (EW3)
		Potable (Human) (mg/L)	Livestock (Cattle) (mg/L)	0-0.25m (mg/L)	0.25-0.5m (mg/L)	0-0.25m (mg/L)
<b>Metals:</b>						
Arsenic	1.0	0.05	0.2	0.5	<0.1	<0.1
Cadmium	0.05	0.005	0.01	<0.05	<0.05	<0.05
Cobalt	0.1	n.a.	1.0	1.0	0.9	1.3
Chromium	0.1	0.05	1.0	<0.1	<0.1	<0.1
Copper	0.1	1.0	0.5	<0.1	<0.1	<0.1
Iron	0.1	0.3	50.0	817	506	573
Aluminium	0.1	0.2	7.0	2	2	2
Nickel	0.1	0.134	1.0	0.8	0.4	0.5
Lead	0.1	0.05	0.1	<0.1	<0.1	<0.1
Zinc	0.1	5.0	20.0	<0.1	<0.1	<0.1

n.a. Not Available

1 Level of laboratory reporting

2 From ANZEC (1990) Draft National Water Quality Guidelines, EPA (Victoria).  
NH&MRC (1984) Guidelines for Drinking Water Quality in Australia, AGPS.  
Hast (1974) A Compilation of Australian Water Quality Criteria, AGPS.

**TABLE 6  
SURVEY LEVELS OF MONITORING BORES**

MONITORING BORE	BORE HEAD ELEVATION (m)*	GROUND ELEVATION (m)*	REDUCED LEVEL OF GROUNDWATER (m)* 17/12/92
BH3	4.05	3.56	0.59
BH4	4.22	3.70	0.51
BH6	4.17	3.73	0.46

\* All reduced levels are AHD

## CONCLUSIONS AND RECOMMENDATIONS

The results obtained from preliminary site contamination assessment work carried out indicate low potential for significant soil and/or groundwater contamination at the site.

The levels of most "indicator parameters" tested were below current DEH investigation threshold levels, within typical background ranges for the soil types encountered, or below laboratory reporting limits. Relatively elevated levels (compared to other soil samples tested and typical background levels provided in DEH guidelines) of cobalt were reported at sample sites S4 and S5 (to at least 0.5 m depth). The levels reported for both cobalt and petroleum hydrocarbons were, however, below indicative clean-up levels for on-going industrial land use, based on a review of relevant international soil contamination standards. Levels of "heavy end" (i.e. lubricating oils or similar) hydrocarbons above current DEH investigation thresholds were also reported from sample sites S5 (0.25 - 0.5 m depth) and S8 (0 - 0.2 m depth).

The results of the field analyses of the three groundwater samples collected from existing monitoring bores (BH3, BH5 and BH6) were indicative of estuarine brackish to moderately saline waters.

Slightly elevated levels (relative to current national drinking water quality standards) of arsenic, cobalt, iron, aluminium and nickel were recorded for the groundwater samples analysed. The levels reported are not considered to be environmentally significant, in terms of the ambient groundwater quality and the low potential for groundwater usage. The levels of iron recorded are consistent with hydrochemical reactions occurring below the water table.

It is recommended that groundwater monitoring be conducted on a quarterly basis to provide on-going data regarding the flow patterns/direction and quality of groundwaters at the site.

It is recommended that each monitoring run include standing water level measurement, field determinations for pH and electrical conductivity, and collection of samples for laboratory analysis for arsenic, cobalt, aluminium and nickel. It is recommended that a more comprehensive suite of metals be included on an annual basis.

It is recommended that an additional groundwater monitoring bore be installed in the northern part of the site (i.e. adjacent to soil sample sites S5) in order to assess groundwater movement and quality in areas exhibiting cobalt and petroleum hydrocarbons levels in soils above current DEH investigation threshold/typical background levels.

It is also recommended that the quarterly groundwater monitoring of this additional bore include testing, sampling and analysis for petroleum hydrocarbons and selected heavy metals.

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**LIMITATION**

We have performed our services for this project in accordance with our current professional standards for preliminary site assessment investigations; no guarantees are either expressed or implied.

There is no investigation which is thorough enough to preclude the presence of material which presently, or in the future, may be considered hazardous at the site. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants presently considered low may, in the future, fall under regulatory standards that require investigation/remediation.

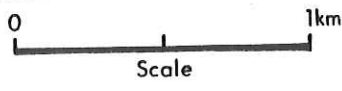
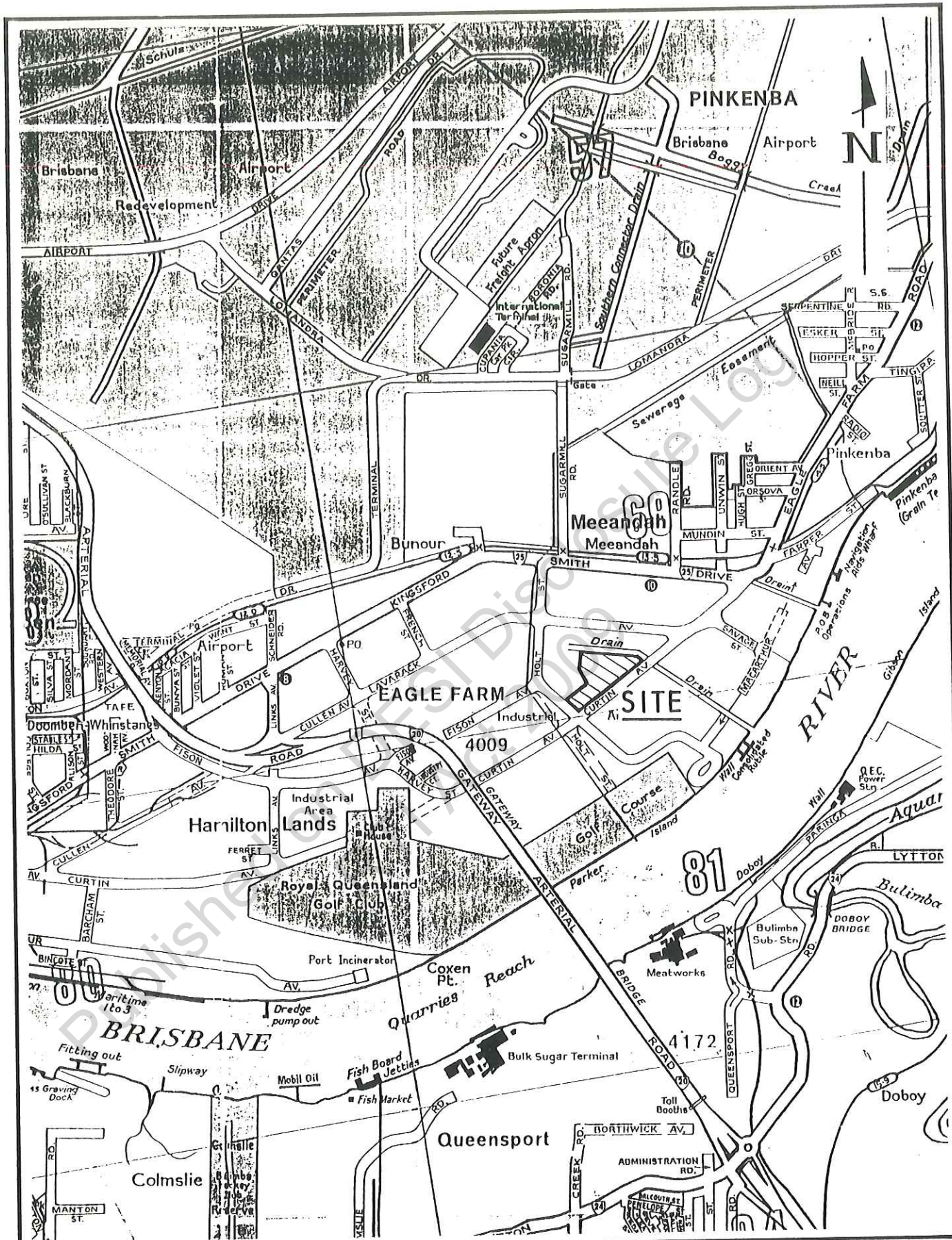
This report has been prepared based on data from the indicated information sources, site inspections and sampling/analysis results. Laboratory analyses at sample points may not be representative of all conditions across the site. Inferences about the nature and continuity of conditions arising from the sample points, where made, can not be guaranteed.

This report has been prepared for the particular investigation described and no responsibility is accepted for the use of any part of the report in any other context or for any other purpose.

**FIGURES**

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CLIENT: **ALCAN AUSTRALIA LTD**  
 PROJECT: PRELIMINARY SITE CONTAMINATION ASSESSMENT AND GROUNDWATER MONITORING, LOT 981 ON SL6741, EAGLE FARM

# REGIONAL LOCALITY MAP

DATE: **NOV 1992** DWG No: **4315/A/1** FIGURE: **1**  
 Page 57 of 86



23-054

54

53

File A

52

6965100m N



SCALE

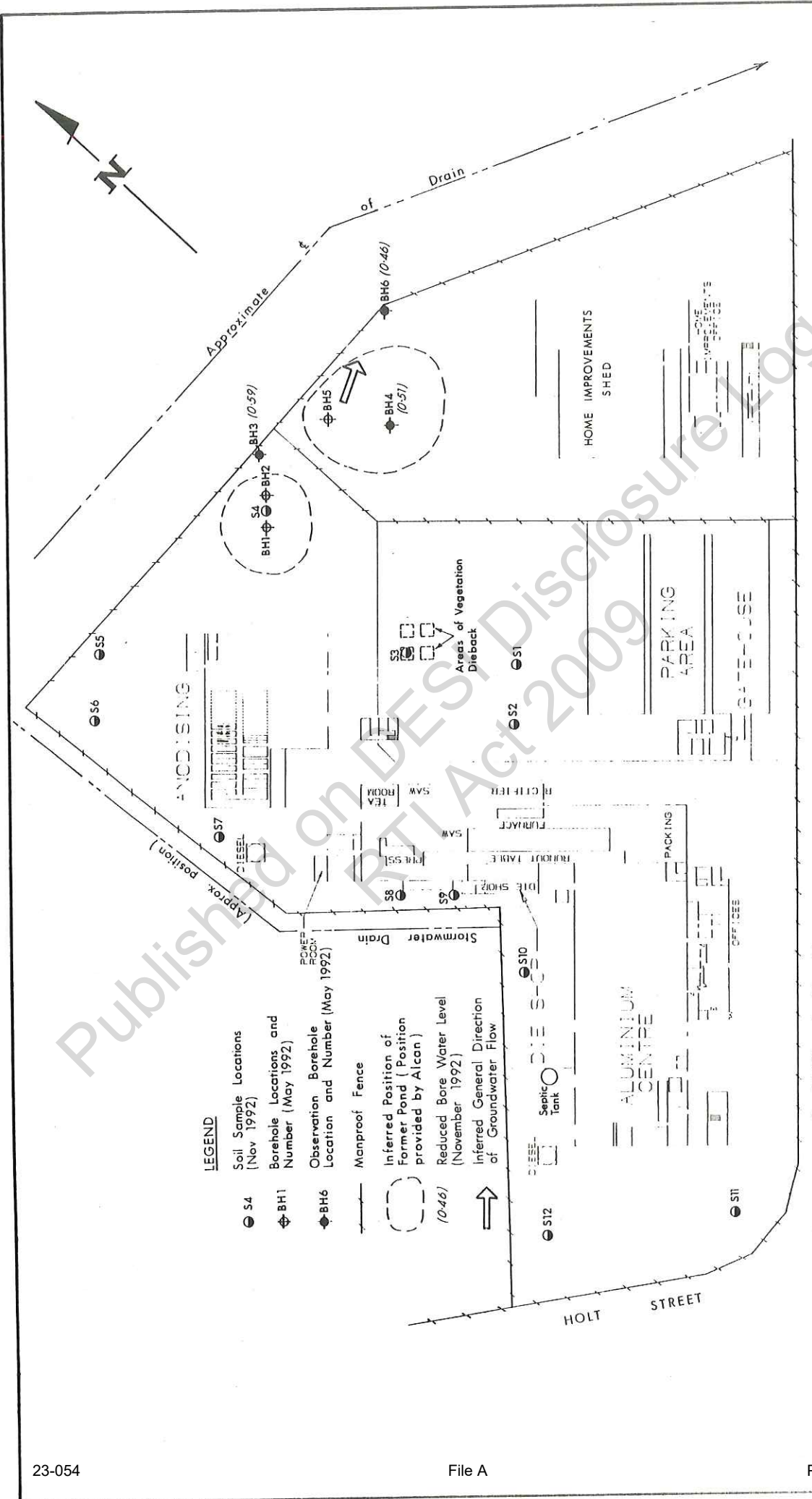
CLIENT: **ALCAN AUSTRALIA LTD**  
 PROJECT: PRELIMINARY SITE CONTAMINATION ASSESSMENT AND GROUNDWATER MONITORING, LOT 981 ON SL 6741, EAGLE FARM

**AERIAL PHOTOGRAPH OF SITE — CIRCA 1981**

DATE: NOV 1992      DWG No. 4315/1/2      FIGURE: 2



SOURCE :- 1 : 2500 Orthophoto Map, Pinkenba 23 ( 9543-33123 )



CLIENT: <b>ALCAN AUSTRALIA LIMITED</b>	
PROJECT: <b>PRELIMINARY SITE CONTAMINATION ASSESSMENT AND GROUNDWATER MONITORING LOT 981 ON SL 6741 EAGLE FARM</b>	
<b>PLAN SHOWING SITE LAYOUT AND APPROXIMATE BOREHOLE AND SOIL SAMPLE LOCATIONS</b>	
DATE: <b>NOV 1992</b>	DWG No: <b>4315 / 1/3</b>
	FIGURE: <b>3</b>



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**APPENDICES**

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**APPENDIX A**  
**CONTAMINATED LAND REGISTER AND TITLES INFORMATION**

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## Queensland Department of Environment and Heritage

160 Ann Street • Brisbane Queensland • PO Box 155 • North Quay Qld 4002 • Telephone (07) 227 7111 • Facsimile (07) 227 6534

Enquiries to  
Telephone  
Your reference  
Our reference

Land Contamination Section  
(07) 227 7369/227 7370

sch4p4( 6) Personal info

1 December 1992

AGC WOODWARE-CLYDE PTY LTD  
6 QUALTROUGH STREET  
BURANDA QLD 4102

Dear Sir

### INQUIRY REGARDING CONTAMINATED LAND

I refer to your letter of November, 1992.

The parcel of land described as LOT 981 ON SL 6741, known as CNR HOLT STREET & CURTAIN AVENUE, EAGLE FARM, is not included in the Contaminated Sites Register.

The development of the Contaminated Sites Register and our accumulation of information on land contamination is still an early state. Consequently, the ability of the Waste Management Branch to confirm the absence of contamination is still limited.

The information is accurate at the date given here.

For future reference the Waste Management Branch is establishing a link between the Contaminated Sites Register and the CITEC Public Access System to provide clients with direct access to the Register. This will mean clients will be able to get an instant response to an inquiry as well as printed confirmation of the outcome via their own computer. This facility is planned to commence in mid-November and you will be advised of the actual start as soon as it is finalised. It is recommended that an approach be made to CITEC via the CITEC Public Access Hotline on 008 773 773 (outside Brisbane) or 222 2700 (local to Brisbane) to inquire into the registration requirements for this service.

Yours faithfully

sch4p4( 6) Pers

sch4p4

David N. Miles  
Director  
Waste Management



DEPARTMENT OF LANDS

TITLE  
**CHECK SEARCH STATEMENT**

PAGE 1

BRISBANE 25/11/1992 16:28

PAID

SOUTHERN REGISTRY  
VOLUME: 7164 FOLIO: 227

NO UNREGISTERED DEALINGS OR ADVICES OVER THIS TITLE

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NOTE!

23-09-2009  
Computersised Check Searches do not provide any evidence of dealings lodged prior to the introduction of the Unregistered Dealings System.  
The above information should be used only in conjunction with a search of the Register and is current only to the date and hour shown here. Page 63 of 86  
Recorded Dealings are listed on Check Searches for 90 days after registration/cancellation.  
This Statement is subject to Crown copyright and should not be photocopied or reproduced.



QUEENSLAND

Deed of Grant of Land 7164 227

Land Act 1962-1988

Elizabeth the Second, by the Grace of God, Queen of Australia, and Her other Realms and Territories, Head of the Commonwealth:—

To All to whom these Presents shall come, Greeting:

We, with the advice of the Executive Council of Our State of Queensland, and in pursuance of the provisions of the Land Act 1962-1988

do hereby Grant in fee simple unto the person described in the Second Schedule hereto,

ALL that Parcel of Land in Our said State described in the First Schedule hereto and delineated on plan registered in the Department of Mapping and Surveying and having Catalogue Number as stated in such First Schedule,

SUBJECT TO the Reservations and Conditions hereinafter specified, and such other Reservations and Conditions as may be contained in and declared by the Laws of Our said State.

Specified Reservations:—

- 1. (a) All minerals (as defined by the Mining Act 1968-1988) on and below the surface of the land; and (b) The right of access for the purpose of searching for and working any mines (as defined by the Mining Act 1968-1988) in any part of the land. 2. (a) All petroleum (as defined by the Petroleum Act 1923-1988) on or below the surface of the land; and (b) All rights of access for the purposes of searching for and for the operations of obtaining petroleum in any part of the land, and all rights of way for access and for pipe-lines and other purposes requisite for obtaining and conveying petroleum in the event of petroleum being obtained in any part of the said land.

Specified Conditions:—

IN TESTIMONY WHEREOF, We have caused this Our Grant to be Sealed with the Seal of Our said State.

WITNESS Our Trusty and Well-beloved His Excellency the Honourable Sir WALTER BENJAMIN CAMPBELL, one of Her Majesty's Counsel learned in the law, Governor in and over the State of Queensland and its Dependencies in the Commonwealth of Australia, at Government House, Brisbane, in Queensland aforesaid, this Eleventh day of August, in the thirty-seventh year of Our Reign and in the year of Our Lord One thousand nine hundred and eighty-eight.

sch4p4(6) Personal information

FIRST SCHEDULE—DESCRIPTION OF LAND

Lot 981 on Plan SL6741

County STANLEY

Parish TOOMBUL

Area 5.277 HECTARES

SECOND SCHEDULE—GRANTEE

ALCAN AUSTRALIA LIMITED

Department of Lands File Reference:— PSL.06/2589 NCL (Por.981)

ENTERED in the Register Book, Vol. 7164 Folio 227 this 23rd day of August, 1988

Handled by Lands

File A

ACTING Registrar of Titles

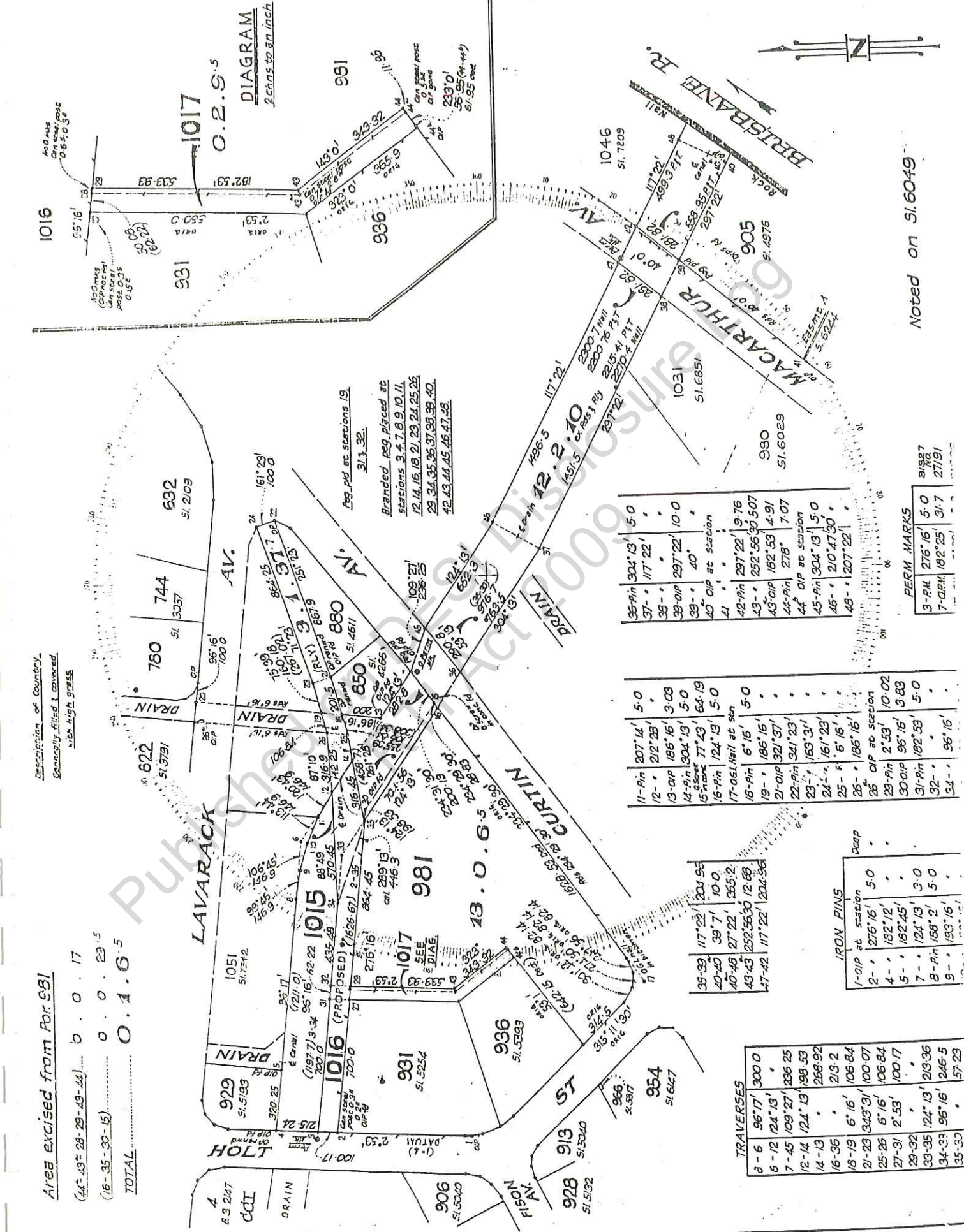
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TRAVERSES ETC.		
LINE	BEARING	DIST.

1011 No	FARM No	Res. for	Purps
1016	K. 2453	Res. for Rally way	G.G. 1972. a. 104B
1015	R. 2454	Res. for Drainage	6.6.73. 1. 1093
1017	R. 2455	Res. for Drainage	6.6.73. 1. 1093
981	SL 33553		

REFERENCE TO CORNERS			
COR.	BEARING	FROM	DIST. MARKS



Area excised from Por. 981  
 (44° 49' 28" - 29° 49' - 44)..... 0 0 0 17  
 (16° 35' - 30° - 15)..... 0 0 0 23.5  
 TOTAL..... 0 1 0 5

35-Pin	304° 13'	5.0
37-	117° 22'	10.0
38-	297° 22'	10.0
39-OIP	40°	
40	OIP at station	
41		
42-Pin	297° 22'	9.76
43-	292° 56'	30.507
43-OIP	182° 53'	4.91
44-Pin	278°	7.07
45-Pin	304° 13'	5.0
46-	210° 47' 30"	
48-	207° 22'	

11-Pin	207° 14'	5.0
12-	212° 28'	
13-OIP	186° 16'	3.08
14-Pin	304° 13'	5.0
15-Pin	77° 43'	64.19
16-Pin	124° 13'	5.0
17-OIP Nail at sun		
18-Pin	6° 16'	5.0
19-	186° 16'	
21-OIP	321° 37'	
22-Pin	341° 23'	
23-Pin	163° 31'	
24-	161° 23'	
25-	6° 16'	
26-	186° 16'	
26-OIP at station		
29-Pin	2° 53'	10.02
30-OIP	96° 16'	3.83
31-Pin	182° 53'	5.0
32-	96° 16'	
34-	96° 16'	

39-39	117° 22'	203.95
40-40	39° 7'	10.0
40-48	27° 22'	265.2
43-43	252° 56' 30"	12.88
47-42	117° 22'	203.95

IRON PINS		
1-OIP at station	5.0	
2-	276° 16'	
4-	182° 12'	
5-	182° 45'	
7-	124° 13'	3.0
8-Pin	186° 16'	5.0
9-	193° 16'	

TRAVERSES		
3-6	96° 17'	300.0
6-12	124° 13'	
7-45	109° 27'	206.25
12-14	124° 13'	199.53
14-13		268.92
16-36		213.2
18-19	6° 16'	106.84
21-23	343° 31'	100.07
25-26	6° 16'	106.84
27-31	2° 53'	100.17
29-32		
33-35	124° 13'	213.36
34-33	96° 16'	246.5
35-33		57.23

Noted on SL 6049

PERM. MARKS		
3-P.M.	276° 16'	5.0
7-O.P.M.	182° 25'	31.7
		27/91

**APPENDIX B  
CURRENT QUEENSLAND AND AUSTRALIAN SOIL AND  
WATER QUALITY GUIDELINES**

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INVESTIGATION THRESHOLDS FOR CONTAMINANTS IN SOILS

BACKGROUND (mg/kg)	THRESHOLDS (mg/kg)	
	Environmental Investigation	Health based Investigation
<u>Heavy Metals</u>		
Antimony Sb 4-44	20	-
Arsenic As 0.2-30	20	100
Barium Ba 20-200	-	-
Cadmium Cd 0.04-2	3	20
Chromium Cr 0.5-110	50	-
Cobalt Co 2-170	-	-
Copper Cu 1-190	60	-
Lead Pb <2-200	300	300
Manganese Mn 4-12,600	500	-
Mercury Hg 0.001-0.1	1	-
Molybdenum Mo <1-20	-	-
Nickel Ni 2-400	60	-
Tin Sn 1-25	50	-
Zinc Zn 2-180	200	-
<u>Mineral Pollutants</u>		
Boron B 1-75	-	-
<u>Phenolic Compounds</u>		
Phenols 0.03-0.5	-	-
<u>Monocyclic Aromatic Hydrocarbons (MAH)</u>		
Benzene 0.05-1	1	-
Toluene 0.1-1	-	-
<u>Polycyclic Aromatic Hydrocarbons (PAH)</u>		
PAH (total) 0.95-5	-	20
<u>Chlorinated Hydrocarbons</u>		
PCB (total) 0.02-0.1	1	-
<u>Pesticides</u>		
Aldrin <0.001-<0.05	-	-
Dieldrin <0.005-<0.05	0.2	-
DDT <0.001-0.97	-	-
<u>Other Chemicals</u>		
Sulphate 35-1000	2000	-
pH 6-8	-	-

OTHER SUBSTANCES

Unlisted, potentially hazardous chemicals which are suspected, or have been identified on a site, should be referred to the CHEM Unit for assessment.

FOOTNOTES

- (1) Site-specific assessments will be made  
This table giving investigation thresholds is intended only as a indication of when detailed assessments and remediation are likely to be required. Levels of contaminants above the investigation threshold will require site-specific assessment and consideration of the level of risk in the particular circumstances.
- (2) Investigation Thresholds - If samples show levels below the investigation thresholds, the site may be regarded as uncontaminated and investigations beyond Stage 1 could be unnecessary if adequate sampling has been undertaken.

Source: Draft Australian and New Zealand Guidelines for Assessment and Management of Contaminated Sites, January 1992 (ANZECC/NHMRC).

**OPTIMUM RECOMMENDED GUIDELINE STANDARDS FOR POTABLE  
(HUMAN) AND LIVESTOCK (CATTLE) WATER QUALITY**

Parameter		Units	Potable (Human)	Livestock Cattle
pH		$\mu\text{S/cm}$	6.5 to 8.5	6.5 to 9.5
Conductivity	(EC) <sup>2</sup>	mg/L	N.A.	N.A.
Total Dissolved Solids	(TDS)	mg/L	1000	10000
Suspended Solids (Filterable Residue)	(SS)	mg/L	1500	N.A.
Total Solids	(TS)	NTU	1000	N.A.
Turbidity		mg/L	5	N.A.
Total Hardness as CaCO <sub>3</sub>		mg/L	500	N.A.
Calcium	(Ca)	mg/L	up to 200	1000
Magnesium	(Mg)	mg/L	< 30	400
Sodium	(Na)	mg/L	300	10000 <sup>1</sup>
Potassium	(K)	mg/L	N.A.	N.A.
Sulphate	(SO <sub>4</sub> )	mg/L	400	1000
Chloride	(Cl)	mg/L	400	4000
Aluminium	(Al)	mg/L	0.2	7.0
Boron	(B)	mg/L	1.0	5.0
Barium	(Ba)	mg/L	1.0	N.A.
Bismuth	(Bi)	mg/L	N.A.	N.A.
Cadmium	(Cd)	mg/L	0.005	0.01
Cobalt	(Co)	mg/L	N.A.	1.0
Chromium (total)	(Cr)	mg/L	0.05	1.0
Copper	(Cu)	mg/L	1.0	0.5
Iron	(Fe)	mg/L	0.3	50
Manganese	(Mn)	mg/L	0.1	400
Molybdenum	(Mo)	mg/L	N.A.	0.01
Nickel	(Ni)	mg/L	0.134	1.0
Lead	(Pb)	mg/L	0.05	0.1
Silica	(SiO <sub>2</sub> )	mg/L	N.A.	N.A.
Strontium	(Sr)	mg/L	N.A.	N.A.
Vanadium	(V)	mg/L	N.A.	0.1
Zinc	(Zn)	mg/L	5.0	20.0
Silver	(Ag)	mg/L	0.05	N.A.
Arsenic	(As)	mg/L	0.05	0.2
Antimony	(Sb)	mg/L	0.1	N.A.
Selenium	(Se)	mg/L	0.01	0.02
Mercury	(Hg)	mg/L	0.001	0.002
Fluoride	(F)	mg/L	0.5 to 1.7	2.0
Ammonia		mg/L	0.1	N.A.
Nitrite		mg/L	1.0	10
Nitrate		mg/L	10	130
Total Kjeldahl Nitrogen		mg/L	N.A.	N.A.
Total Nitrogen	(TN)	mg/L	0.5	N.A.
Total Phosphorous	(TP)	mg/L	0.05	N.A.
Oil and Grease	(O&G)	mg/L	0.01	N.A.

Sources: ANZEC (1990) Draft National Water Quality Guidelines, EPA (Victoria)  
NH&MRC (1987) Guidelines for Drinking Water Quality in Australia AGPS  
Hart (1974) A Compilation of Australian Water Quality Criteria AGPS

- 1 Refer to TDS  
2 From documented experimental correlation between TDS and E.C. approximate guideline standards for E.C. of 4,000  $\mu\text{S/cm}$  (Potable) could be adopted (Source: Studies and Interpretation of the Chemical Characteristics of Natural Water US Geological Survey Water Supply Paper 2254, 1985).

**APPENDIX C  
LABORATORY REPORTS**

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**A N A L Y T I C A L   R E P O R T**

AGC WOODWARD-CLYDE  
6 QUALTROUGH STREET  
BURANDA  
QLD

4102

Page 1 of 1

ENVIRONMENTAL  
Batch-no: 3836  
Sub-batch: 0  
No. samples: 1  
Received: 24/11/92  
Completed: 30/11/92

**ATTENTION**

sch4p4(6) Personal i

**ORDER-NO**  
4315/1

**SAMPLE-TYPE**  
SOIL

Method	Analysis description	Units	LOD	E 5
EA-005	pH Value		0.01	6.96
EA-055	Moisture Content (dried @ 103°C)	%	0.1	7.4
EG-005T	Aluminium - Total	mg/kg	0.01	4390
EG-005T	Cadmium - Total	mg/kg	0.5	<0.5
EG-005T	Cobalt - Total	mg/kg	0.5	4.5
EG-005T	Chromium - Total	mg/kg	0.5	9.5
EG-005T	Copper - Total	mg/kg	0.5	10.0
EG-005T	Lead - Total	mg/kg	0.5	25.0
EG-005T	Zinc - Total	mg/kg	0.5	52.5

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**SAMPLES ANALYSED AS RECEIVED**

Sample as received digested by USEPA method 3051 prior to the determination of metals. Results reported on an as received basis.  
pH determined and reported on 1:5 soil/water extract sch4p4(6) Personal information

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**A N A L Y T I C A L   R E P O R T**

AGC WOODWARD-CLYDE  
6 QUALTROUGH STREET  
BURANDA  
QLD

Page 1 of 1

**ATTENTION**

sch4p4(6) Personal inf

4102

ENVIRONMENTAL

Batch-no: 3780

Sub-batch: 0

No. samples: 3

Received: 19/11/92

Completed: 27/11/92

ORDER-NO  
4315/1

SAMPLE-TYPE  
WATER

Method	Analysis description	Units	LOD	EW 1	EW 2	EW 3
EG-005F	Aluminium - Filtered	mg/L	1	2	2	2
EG-005F	Cadmium - Filtered	mg/L	0.05	<0.05	<0.05	<0.05
EG-005F	Cobalt - Filtered	mg/L	0.1	1.0	0.9	1.3
EG-005F	Chromium - Filtered	mg/L	0.1	<0.1	<0.1	<0.1
EG-005F	Chromium - Filtered	mg/L	0.1	<0.1	<0.1	<0.1
EG-005F	Copper - Filtered	mg/L	0.1	817	506	573
EG-005F	Iron - Filtered	mg/L	0.1	0.8	0.4	0.5
EG-005F	Nickel - Filtered	mg/L	0.1	<0.1	<0.1	<0.1
EG-005F	Lead - Filtered	mg/L	0.1	<0.1	<0.1	<0.1
EG-005F	Zinc - Filtered	mg/L	0.1	<0.1	<0.1	<0.1
EG-030F	Arsenic - Filtered	mg/L	0.1	0.5	<0.1	<0.1

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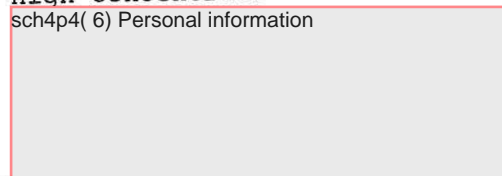
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Metal detection limits raised due to the high concentration of dissolved salts.

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**ENVIRONMENTAL  
GUARANTEED TESTING**

**A N A L Y T I C A L   R E P O R T**

Page 1 of 2

AGC WOODWARD-CLYDE  
6 QUALTROUGH STREET  
BURANDA  
QLD

4102

ENVIRONMENTAL  
**Batch-no:** 3780  
**Sub-batch:** 1  
**No. samples:** 4  
**Received:** 19/11/92  
**Completed:** 27/11/92

**ATTENTION**

sch4p4(6) Personal inf

**ORDER-NO**  
4315/1

**SAMPLE-TYPE**  
SOIL

Method	Analysis description	Units	LOD	E 1	E 2	E 6
EA-005	pH Value		0.01	7.14	8.33	7.71
EA-055	Moisture Content (dried @ 103°C)	%	0.1	19.1	8.6	12.5
EG-005T	Aluminium - Total	g/kg	0.01	9.63	4.58	15.6
EG-005T	Arsenic - Total	mg/kg	0.5	5.0	3.0	7.5
EG-005T	Cadmium - Total	mg/kg	0.5	<0.5	<0.5	<0.5
EG-005T	Cobalt - Total	mg/kg	0.5	10.0	10.0	128
EG-005T	Chromium - Total	mg/kg	0.5	26.0	15.5	19.5
EG-005T	Copper - Total	mg/kg	0.5	24.5	20.5	20.5
EG-005T	Nickel - Total	mg/kg	0.5	15.5	10.5	14.0
EG-005T	Lead - Total	mg/kg	0.5	27.5	24.5	33.0
EG-005T	Zinc - Total	mg/kg	0.5	94.0	68.5	82.5

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**SAMPLES ANALYSED AS RECEIVED**

Samples as received digested by USEPA method 3051 prior to the determination of metals. Results reported on an as received basis.

sch4p4(6) Personal information

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**ENVIRONMENTAL  
GUARANTEED TESTING**

**A N A L Y T I C A L   R E P O R T**

Page 2 of 2

AGC WOODWARD-CLYDE  
6 QUALTROUGH STREET  
BURANDA  
QLD

4102

ENVIRONMENTAL  
Batch-no: 3780  
Sub-batch: 1  
No. samples: 4  
Received: 19/11/92  
Completed: 27/11/92

ATTENTION  
sch4p4(6) Personal in

ORDER-NO  
4315/1

SAMPLE-TYPE  
SOIL

Method	Analysis description	Units	LOD	E 7
EA-005	pH Value		0.01	7.52
EA-055	Moisture Content (dried @ 103°C)	%	0.1	17.8
EG-005T	Aluminium - Total	g/kg	0.01	20.9
EG-005T	Arsenic - Total	mg/kg	0.5	6.0
EG-005T	Cadmium - Total	mg/kg	0.5	<0.5
EG-005T	Cobalt - Total	mg/kg	0.5	225
EG-005T	Chromium - Total	mg/kg	0.5	19.0
EG-005T	Copper - Total	mg/kg	0.5	15.0
EG-005T	Nickel - Total	mg/kg	0.5	15.0
EG-005T	Lead - Total	mg/kg	0.5	24.5
EG-005T	Zinc - Total	mg/kg	0.5	77.5

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**A N A L Y T I C A L   R E P O R T**

Page 1 of 3

AGC WOODWARD-CLYDE  
6 QUALTROUGH STREET  
BURANDA  
QLD

4102

ENVIRONMENTAL  
Batch-no: 3780  
Sub-batch: 2  
No. samples: 7  
Received: 19/11/92  
Completed: 27/11/92

**ATTENTION**  
sch4p4( 6) Personal i

**ORDER-NO**  
4315/1

**SAMPLE-TYPE**  
SOIL

Method	Analysis description	Units	LOD	E 8	E 9	E 10
EA-005	pH Value		0.01	9.51	8.79	8.70
EA-055	Moisture Content (dried @ 103'C)	%	0.1	9.1	29.5	12.7
EG-005T	Aluminium - Total	g/kg	0.01	17.6	10.0	2.76
EG-005T	Cadmium - Total	mg/kg	0.5	<0.5	<0.5	<0.5
EG-005T	Cobalt - Total	mg/kg	0.5	148	14.5	11.0
EG-005T	Chromium - Total	mg/kg	0.5	15.0	34.0	7.0
EG-005T	Copper - Total	mg/kg	0.5	14.0	29.0	9.5
EG-005T	Lead - Total	mg/kg	0.5	22.5	32.0	6.0
EG-005T	Zinc - Total	mg/kg	0.5	34.5	111	41.0

SAMPLES ANALYSED AS RECEIVED



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Samples as received digested by USEPA method 3051 prior to the determination of metals. Results reported on an as received basis.

sch4p4( 6) Personal information

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**A N A L Y T I C A L   R E P O R T**

AGC WOODWARD-CLYDE  
6 QUALTROUGH STREET  
BURANDA  
QLD

Page 2 of 3

**ATTENTION**  
sch4p4(6) Personal inf

4102

ENVIRONMENTAL  
**Batch-no:** 3780  
**Sub-batch:** 2  
**No. samples:** 7  
**Received:** 19/11/92  
**Completed:** 27/11/92

**ORDER-NO**  
4315/1

**SAMPLE-TYPE**  
SOIL

Method	Analysis description	Units	LOD	E 12	E 14	E 16
EA-005	pH Value		0.01	3.33	9.29	9.42
EA-055	Moisture Content (dried @ 103°C)	%	0.1	9.4	3.2	3.2
EG-005T	Aluminium - Total	g/kg	0.01	4.59	3.52	3.31
EG-005T	Cadmium - Total	mg/kg	0.5	<0.5	<0.5	<0.5
EG-005T	Cobalt - Total	mg/kg	0.5	6.0	6.0	6.0
EG-005T	Chromium - Total	mg/kg	0.5	8.5	28.5	20.5
EG-005T	Copper - Total	mg/kg	0.5	18.0	40.5	25.0
EG-005T	Lead - Total	mg/kg	0.5	22.0	18.5	82.5
EG-005T	Zinc - Total	mg/kg	0.5	24.0	37.5	48.0

SAMPLES ANALYSED AS RECEIVED



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**A N A L Y T I C A L   R E P O R T**

Page 3 of 3

AGC WOODWARD-CLYDE  
6 QUALTROUGH STREET  
BURANDA  
QLD

4102

ENVIRONMENTAL

Batch-no: 3780

Sub-batch: 2

No. samples: 7

Received: 19/11/92

Completed: 27/11/92

**ATTENTION**

sch4p4(6) Personal info

**ORDER-NO**

4315/1

**SAMPLE-TYPE**

SOIL

Method	Analysis description	Units	LOD	E 18
EA-005	pH Value		0.01	8.08
EA-055	Moisture Content (dried @ 103°C)	%	0.1	13.7
EG-005T	Aluminium - Total	g/kg	0.01	2.77
EG-005T	Cadmium - Total	mg/kg	0.5	<0.5
EG-005T	Cobalt - Total	mg/kg	0.5	3.0
EG-005T	Chromium - Total	mg/kg	0.5	4.0
EG-005T	Copper - Total	mg/kg	0.5	29.0
EG-005T	Lead - Total	mg/kg	0.5	12.0
EG-005T	Zinc - Total	mg/kg	0.5	29.0

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SAMPLES ANALYSED AS RECEIVED

sch4p4(6) Personal information

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# ANALYTICAL REPORT

Page 1 of 1

AGC WOODWARD-CLYDE  
6 QUALTROUGH STREET  
BURANDA  
QLD

4102

ENVIRONMENTAL  
Batch-no: 3780  
Sub-batch: 3  
No. samples: 2  
Received: 19/11/92  
Completed: 27/11/92

ATTENTION  
sch4p4(6) Personal in

ORDER-NO  
4315/1

SAMPLE-TYPE  
SOIL

Method	Analysis description	Units	LOD	E 20	E 22
EA-005	pH Value		0.01	6.15	7.03
EA-055	Moisture Content (dried @ 103°C)	%	0.1	3.5	3.5
EG-005T	Aluminium - Total	g/kg	0.01	2.78	2.78
EG-005T	Arsenic - Total	mg/kg	0.5	6.0	2.5
EG-005T	Cadmium - Total	mg/kg	0.5	<0.5	<0.5
EG-005T	Cobalt - Total	mg/kg	0.5	7.5	2.0
EG-005T	Chromium - Total	mg/kg	0.5	4.0	7.5
EG-005T	Copper - Total	mg/kg	0.5	10.0	10.5
EG-005T	Nickel - Total	mg/kg	0.5	2.5	3.0
EG-005T	Lead - Total	mg/kg	0.5	21.0	32.5
EG-005T	Zinc - Total	mg/kg	0.5	47.0	50.0
EG-030T	Antimony - Total	mg/kg	0.1	<0.1	<0.1
EG-035T	Mercury - Total	mg/kg	0.05	0.10	0.15

SAMPLES ANALYSED AS RECEIVED

Samples as received digested by USEPA method 3051 prior to the determination of metals. Results reported on an as received basis.

sch4p4(6) Personal information



No. 825

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## AUSTRALIAN LABORATORY SERVICES P/L

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Page 77 of 86  
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## ANALYTICAL REPORT

**BATCH NUMBER:** EN3780  
**CLIENT :** AGC Woodward Clyde  
**ADDRESS:** 6 Qualtrough St  
Buranda 4102  
**CONTACT:** sch4p4( 6) Persona  
**CLIENT JOB No.:** 4315/1  
**CLIENT ORDER No.:** N/A  
**DATE RECEIVED:** 19/11/92  
**DATE COMPLETED:** 24/11/92  
**SAMPLE TYPE:** Soil  
**ANALYSIS REQUESTED:** Total Petroleum Hydrocarbon (TPH) by Fractions - 11  
Organochlorine/Organophosphorus Pesticides - 4  
**METHOD OF ANALYSIS:**  
**TPH** **ALS Method Code:** EP-071  
Extraction: Volatiles - Purge & Trap  
Semivolatiles - Ultrasonication  
Analysis: Volatiles - GCMS  
Semivolatiles - GCFID  
**Pesticides** **ALS Method Code:** EP-067  
Extraction: Solids - Ultrasonication  
Liquids - Separatory Funnel  
Analysis: GC/ECD & GC/MS

Signed.

sch4p4( 6) Personal informat

Senior Organic Chemist



No. 825

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**ANALYTICAL RESULTS SHEET**

**ALS EA-055 : MOISTURE CONTENT**

BATCH No: EN3780  
 ANALYST: sch4p4(6)

MATRIX: Soil  
 UNITS: %

Lab I.D.	-4	-5	-8	-9	-10	-11
Client I.D.	E1	E2	E8	E9	E10	E12
Moisture %	19.1	8.6	9.1	29.5	12.7	9.4

Lab I.D.	-12	-13	-14	-15	-16	
Client I.D.	E14	E16	E18	E20	E22	
Moisture %	3.2	3.2	13.7	3.5	3.5	

## ANALYTICAL RESULTS SHEET

### ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

BATCH No.: EN3780  
 ANALYST: sch4p4( 6) Personal information

MATRIX: Soil  
 UNITS: mg/kg

COMPOUND	Lab I.D.	-4	-5	-8	-9	-10	-11
	Client I.D.	E1	E2	E8	E9	E10	E12
	LOR						
C5 - C9	2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
C10 - C14	50	<LOR	<LOR	<LOR	140	<LOR	<LOR
C15 - C28	100	<LOR	<LOR	720	2700	<LOR	<LOR
C29 - C36	100	<LOR	<LOR	<LOR	180	<LOR	<LOR

COMPOUND	Lab I.D.	-12	-13	-14	-15	-16	
	Client I.D.	E14	E16	E18	E20	E22	
	LOR						
C5 - C9	2	<LOR	<LOR	<LOR	<LOR	<LOR	
C10 - C14	50	<LOR	<LOR	<LOR	<LOR	<LOR	
C15 - C28	100	340	400	<LOR	<LOR	<LOR	
C29 - C36	100	860	280	<LOR	<LOR	120	

**COMMENTS:**

1. Results are reported on an as recieved basis
2. LOR : Level Of Reporting



**BATCH QUALITY CONTROL - TPH**

**ALS EP-071 : Total Petroleum Hydrocarbons by Fractions**

MATRIX: Soil

ANALYST: sch4p4( 6) Personal infor

SPIKING STD: n-Alkane

**Volatile Components \***

COMPOUND	Level Of Reporting (LOR) mg/kg	Blank conc mg/kg	SOIL SPIKE RESULTS					CONTROL LIMITS		
			Spike Conc. mg/kg	SCS conc mg/kg	DCS conc mg/kg	Av. Rec. %	RPD %	Recovery (%)		RPD %
								Low	High	
QC Lot No.: VOCS036										
Applicable to Samples EN3780-4 to -16										
C6-C9	2	<LOR	40	38	39	96	3	70	130	20
C10	50	<LOR	10	9	9	93	2	70	130	20

**Semivolatile Components**

COMPOUND	Level Of Reporting (LOR) mg/kg	Blank conc mg/kg	SOIL SPIKE RESULTS					CONTROL LIMITS		
			Spike Conc. mg/kg	SCS conc mg/kg	DCS conc mg/kg	Av. Rec. %	RPD %	Recovery (%)		RPD %
								Low	High	
QC Lot No.: TPHES048										
Applicable to Samples EN3780-4 to -16										
C11-C14	50	<LOR	500	443	436	88	2	70	130	20
C15-C28	100	<LOR	260	208	188	76	10	70	130	20
C29-C36	100	<LOR	N/A	N/A	N/A	N/A	N/A	70	130	20

\* Surrogate standards are added to every QC spike and sample to monitor method performance.

## ANALYTICAL RESULTS SHEET

## ALS EP-067 : OC / OP PESTICIDES

QC Lot No. : OC/OPS030  
Batch No.: EN3780

Matrix : Soil  
Units : mg/kg

COMPOUND	Lab I.D.	-8	-9	-15	-16	
	Client I.D.	E8	E9	E20	E22	
	LOR					
Dichlorvos	0.10	<LOR	<LOR	<LOR	<LOR	
a-BHC	0.05	<LOR	<LOR	<LOR	<LOR	
Dimethoate	0.10	<LOR	<LOR	<LOR	<LOR	
g-BHC	0.05	<LOR	<LOR	<LOR	<LOR	
b-BHC	0.05	<LOR	<LOR	<LOR	<LOR	
Diazinon	0.10	<LOR	<LOR	<LOR	<LOR	
d-BHC	0.05	<LOR	<LOR	<LOR	<LOR	
Chlorpyrifos methyl	0.10	<LOR	<LOR	<LOR	<LOR	
Heptachlor	0.10	<LOR	<LOR	<LOR	<LOR	
Malathion	0.05	<LOR	<LOR	<LOR	<LOR	
Fenthion	0.10	<LOR	<LOR	<LOR	<LOR	
Aldrin	0.05	<LOR	<LOR	<LOR	<LOR	
Chlorpyrifos	0.10	<LOR	<LOR	<LOR	<LOR	
Pirimiphos ethyl	0.10	<LOR	<LOR	<LOR	<LOR	
Heptachlor epoxide	0.05	<LOR	<LOR	<LOR	<LOR	
Bromophos ethyl	0.05	<LOR	<LOR	<LOR	<LOR	
Endosulfan 1	0.05	<LOR	<LOR	<LOR	<LOR	
Prothiofos	0.10	<LOR	<LOR	<LOR	<LOR	
4,4'-DDE	0.05	<LOR	<LOR	<LOR	<LOR	
Dieldrin	0.05	<LOR	<LOR	<LOR	<LOR	
Endrin	0.05	<LOR	<LOR	<LOR	<LOR	
Endosulfan 2	0.05	<LOR	<LOR	<LOR	<LOR	
4,4'-DDD	0.05	<LOR	<LOR	<LOR	<LOR	
Ethion	0.20	<LOR	<LOR	<LOR	<LOR	
Endrin aldehyde	0.05	<LOR	<LOR	<LOR	<LOR	
Endosulfan sulfate	0.05	<LOR	<LOR	<LOR	<LOR	
4,4'-DDT	0.05	<LOR	<LOR	<LOR	<LOR	

## COMMENTS:

- 1) LOR : Level of Reporting.
- 2) The sample results are reported on an as received basis.

BATCH QUALITY CONTROL

ALS EP-067 : OC / OP PESTICIDES

MATRIX: SOIL  
QC Lot No. : OC/OPS030

ANALYST: sch4p4(6) Personal  
REAGENT BLANK: Tested clean

COMPOUND	BLANK Conc mg/kg	SOIL QC SPIKE RESULTS				Control Limits		
		SCS Conc mg/kg	DCS Conc mg/kg	Average Recovery %	RPD %	Recovery		RPD %
						Low	High	
Dichlorvos	ND	0.41	0.46	81	1	49	95	20
a-BHC	ND	0.20	0.20	76	0	37	134	20
Dimethoate	ND	0.44	0.45	84	0	50	150	20
g-BHC	ND	0.21	0.21	79	0	32	127	20
b-BHC	ND	0.19	0.19	72	0	17	147	20
Diazinon	ND	0.40	0.40	75	0	49	85	20
d-BHC	ND	0.21	0.21	78	0	19	140	20
Chlorpyrifos methyl	ND	0.39	0.40	75	0	50	150	20
Heptachlor	ND	0.22	0.22	82	0	34	111	20
Malathion	ND	0.40	0.40	76	0	50	150	20
Aldrin	ND	0.15	0.21	67	2	9	128	20
Fenthion	ND	0.41	0.42	78	0	42	122	20
Chlorpyrifos	ND	0.40	0.40	75 *	0	82	115	20
Pirimiphos ethyl	ND	0.41	0.40	76	0	50	150	20
Heptachlor epoxide	ND	0.20	0.20	75	0	37	142	20
Bromophos ethyl	ND	N/A	N/A	N/A	N/A	37	142	20
Endosulfan 1	ND	0.21	0.21	79	0	45	153	20
Prothiofos	ND	0.42	0.41	78	0	50	150	20
4,4'-DDE	ND	0.20	0.20	75	0	30	145	20
Dieldrin	ND	0.21	0.21	78	0	36	146	20
Endrin	ND	0.24	0.25	92	0	30	147	20
Endosulfan 2	ND	0.21	0.21	77	0	10	202	20
4,4'-DDD	ND	0.20	0.20	75	0	31	141	20
Ethion	ND	0.42	0.42	79	0	50	150	20
Endrin aldehyde	ND	0.16	0.19	65	1	25	145	20
Endosulfan sulfate	ND	0.21	0.21	79	0	26	144	20
4,4'-DDT	ND	0.29	0.33	117	1	25	160	20

COMMENTS :

- 1) The control limits are based on the U.S. E.P.A. SW846 criteria for methods 8080 and 8140.
- 2) A splat (\*) indicates that a recovery or RPD falls outside of the recommended control limits.

# Registered Site - Show Site

[Reg Site](#)[Comments](#)[Amend Log](#)[Categ. Hist](#)[Hist. Repos](#)[Show Docs](#)Lot:  Plan: Category:  CSR Cont Site ID: Local Authority: Entry Date: Site Name: MR Alter Date: Location Street: Prescribed Purpose: Location Suburb:  Post Code: Owner Address: Contsite File:  Officer: Current Use:  Past Use: DNR Parcel Status:  Contaminant: Prev Lot No:  Post Code: Prev Plan No: Zoning:  Area: UXO Region:  Cont Grid Water: Comments: Rec Status: Deleted Reason: Deleted Date:

# Registered Site - Show Site

Reg Site   Comments   Amend Log   Categ. Hist   Hist. Repos   Show Docs

Page 1   Page 2

Lot:	981	Plan:	SL6741	Rec Type:	BP	Id:	146
Category:	NOTIFIABLE ACTIVITY			Region:		Hist. Id:	140-710
LGA:	BRISBANE CITY COUNCIL			AMA/AN:			
Site Name:	LAND FILL EAGLE FARM ROAD			Notified By:	DATA CONV	Notif Rec'd:	
Street:	CNR HOLT ST & CURTIN AVENUE			Entry Date:	27/06/1998	Last Altered Date:	22/03/2005
Suburb:	EAGLE FARM	Post Code:	4009	20 - LANDFILL			
Owner:	ALCAN AUSTRALIA LIMITED			Notifiable Activities:			
Owner Address:	CNR HOLT STREET & CURTIN AVENUE						
	EAGLE FARM						
	QLD			File:	900615	Officer:	GROVES
				Offsite Disposal Date:		IPA Date:	06/10/2004
Parcel Status:	C	Area:	0 m <sup>2</sup>	Ext Ref:			
Site Inspection (SMP) Date:				Haz Cont:			
SMP Compliance Y/N:							

Edit

Delete

Print

CONTAMINATED SITE REGISTER - Data Entry Ins

LGA : BRISBANE CITY  
 Site Name: 692 CURTIN AVE EAST PINKENBA  
 Location : 692 CURTIN AVE EAST  
           PINKENBA 4008  
 Lot : 981 on Plan: SL6741  
 Volume : Folio: 0  
 OwnerName: ALCAN AUSTRALIA LIMITED  
 OwnerAddr: CNR HOLT ST & CURTIN AVE  
           EAGLE FARM 4009

142-0710  
 done.

Area : 0 sq. metres  
 Current Use: 169 Past Use: 910

Comments : PAST USE UNKNOWN. ALUMINIUM EXTRUSION.

s.73 Irrelevant information



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