APPENDIX C
GROUND PENETRATING RADAR REPORT

DowElanco (NZ) Ltd.
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GROUND*SEARCH* EES Ltd.

Ground Penetrating Radar (GPR) and Resistivity Survey, DowElanco (NZ) Ltd

for Groundwater Technology (NZ) Ltd
2 November, 1995

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soil is the foundation of life

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22/11/95

Groundwater Technology (NZ) Ltd
8 Leek St
Newmarket

ATTN. David Whyte

Dear David,

Groundsearch are pleased to present the final results of the Ground Penetrating Radar and Resistivity survey carried out during October at DowElanco, New Plymouth.

We were very satisfied with the GPR performance during the survey and in geophysical terms, some of the reflections obtained are of 'text book' quality.
As discussed, the site plan accompanying this report has boreholes plotted in approximate locations only.

Please don't hesitate to contact us regarding any questions you may have after reading the report. Thank you for the opportunity to carry out this survey.

Yours faithfully
GROUND*SEARCH* EES Ltd.

M. Watson

Matt Watson
Geophysicist.

NEW ZEALAND 3067 Gt North Rd. (PO Box 15038). New Lynn, Auckland 10 Ph 64 (09) 826 0700 Fax 64 (09) 826 0900
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1.0 CONTENTS

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Groundsearch was requested to carry out a Ground Penetrating Radar (GPR) survey at the DowElanco site, New Plymouth. The objective of the survey was to determine the geological structure beneath the site, in particular the lateral and vertical extent of an area of topographically higher andesite buried beneath airfall tephras. This will provide control for groundwater modelling.

While GPR was the principle survey method, it was also proposed that some Electrical Resistivity measurements are carried out. These enhance the resistivity data collected at this site in 1994 and improve the accuracy of the radar interpretation.

Survey Location

The survey was within the grounds of DowElanco (NZ) Ltd, New Plymouth (figure 1). The site consists of open grassland and asphalt hardstand, with a number of flat areas separated by three metre high, forty degree slopes.

[redacted]

2.1 Data Collection

GSEES used a SIR-2 radar system from Geophysical Survey Systems Inc. The data is displayed in real-time on a colour monitor and is stored on internal hard drive. The Sir-2 system is compatible with a wide range of antenna frequencies, from 20 MHz to 2.5 GHz. Operation takes place from the back of a vehicle using a 12V power supply.

This survey was conducted using two 35 MHz antennae (one receiver and one transmitter). These antennae provide better depth penetration than those of the higher frequency.

Over 100 individual radar profiles were carried out using the SIR-2. Some of the data was collected in point mode and some in continuous mode. Point mode involves taking measurements (scans) using stationary antennas at 0.5m intervals. This ensures maximum depth penetration and clarity of signal return.
Continuous measurements involve moving the antennae slowly across the ground, taking scans at a rate of 8,16 or 32 scans/second. The data is generally poorer quality than using point mode due to the up/down movement of the antennae. A continuous profile takes considerably less time to run than a point mode profile.

2.3 Data Processing

After data collection, the data is filtered to extract unwanted information (called 'noise'. Noise can be generated by the radar system itself, other nearby electrical equipment or by the vehicle in which the radar is mounted.

Vertical high/low pass filters, Horizontal high/low pass filters and background removal filters were used to eliminate as much of the noise as possible. All radar data must be corrected for change in surface topography. This involves adjusting each scan line to a specified elevation datum, which was taken as mean sea level for this survey.

2.4 Theory

The *Ground Penetrating Radar* (GPR) method involves transmitting and receiving electromagnetic (EM) energy. An EM pulse is sent into the ground, which travels at a speed dependent on the electrical properties of the material through which it passes. At boundaries between different materials some of the EM energy is reflected back to the surface, whereupon its arrival time is measured and the distance to the reflective boundary can therefore be inferred.

Radar waves are partially reflected (and partially transmitted) at interfaces where there is a contrast in dielectric properties. The amount of energy reflected (ie. the strength or amplitude of the return signal) is dependent on the magnitude of the contrast.

In order to calculate the depth to the reflectors, or objects of interest seen on the radar section, the velocity of the radar wave through that particular medium must be known. This is dependent on the dielectric permittivity of the ground material it passes through, linked by the equation:

$V = C / K^{1/2}$ (where C=velocity of light in a vacuum = 0.3 m/*n*S)

For this survey, the average value of K was assumed to be 9.5. This is based on our understanding of the geology at this particular location. We believe that an error of approximately 20% in the assumed K value is likely, based on our experience to date with GPR. This is due to variability mainly in saturation and clay content. This has an effect on the accuracy of the depth determination.

Definitions of some technical terms that are used in this report:

Dielectric constant (K)	A value describing the ability of a particular material to retain electrical charge. It determines the velocity of radar waves through the ground.
Diffraction	This is a hemispherical, concave downward, feature seen on the radar sections. It is caused by the scattering of radar waves when they hit an object of different electrical properties to the surrounding material. Likely causes of diffractions are pipes, underground phone/power lines, buried metal objects, angular or isolated rocks.
Two-way travel time	The time taken for a radar wave (electromagnetic impulse) to reach a particular subsurface boundary and return to the surface.
nS	nano-second. 1×10^{-9} seconds
radar section	The printed results of a radar survey, consisting of thousands of individual pulses (sounding events). This is usually displayed with horizontal distance as the x-axis and depth or two-way travel time as the y-axis.
reflector	A reflector is a point, or surface beneath the ground that is capable of returning (bouncing) radar waves back to the surface. It appears on a wiggle trace as a darker, larger than normal bump on the trace, which is seen on the radar section as a dark line.

[redacted]

DC Resistivity was used as a secondary exploration method for this survey, and was the principle exploration method used for the 1994 survey. The technique uses passage of electric current together with simultaneous voltage readings to define distribution of resistivity versus depth. GSEES used the Schlumberger Array to determine the lateral and vertical variation in resistivity. The resistivity reflects electrical properties of the ground. Material saturated with water has a much lower resistivity than the dry equivalent.

The theory used to model the data assumes the ground surface is flat and the ground consists of discrete, flat layers of constant resistivity. Local variations, especially steep slopes, cause distortions of the measurements. Pipes and cables also cause variations. The interpretation has taken these into account where possible.

For Andesite, typical resistivities are between about 80 and 500 ohm metres.

Resistivity of sediments is related to:
a) porosity: greater porosity = resistivity lower
b) groundwater salinity: higher salinity = lower resistivity
c) clay/silt content: high clay/silt = lower resistivity

clays	1-50	
sands	30-200	
gravels	80-2500	
basalts (older)	100-500	(French, AC 1980)
basalts (young)	500-2000	
waitemata series	20-30	
recent gravels	50-150 (lower permeability)	G.Roberts 1984/85
recent gravels	200-2000 (higher perm.)	G.Roberts 1984/85

The Schlumberger Array was used to measure the electrical resistivity of the subsurface. The array is fully described in geophysical texts (*eg Introduction to Geophysical Prospecting*, M.B. Dobrin, McGraw Hill Publishers). This array applies current through two widely spaced electrodes. The induced electrical field produces a voltage drop across the array, which is measured between two central potential electrodes. The voltage drop is measured for a number of current-electrode spacings. This is called a "spread". Current electrode spacings of up to 400m each way were used.

Apparent resistivity was calculated from the applied current, measured voltage and array configuration. It was plotted in the field. Unusual results were repeated to eliminate spurious data points. Additional current electrode spacings were used to confirm unexpected data trends.

The field stations were organised into traverse lines, varying number of spreads. The Lines were generally started in the centre of the survey area. Field stations were then surveyed in both directions, keeping spreads in line with the current electrodes (collinear). The line was extended until field interpretation of the apparent resistivity plots showed no andesite.

The first field station was a full sounding. The other stations have a reduced number of current electrode spacings. The reduced number gives good sounding data with fast ground coverage.

Apparent resistivity was calculated using the following formula:

$$\rho_a = \pi \times \frac{\left(\frac{A\,B}{2}\right)^2}{m\,n} \times \frac{V}{I}$$

where AB = current electrode spacing
mn = potential electrode spacing
V = voltage drop across the potential electrodes
I = current applied to the current electrodes

The resistivity field results are given in Appendix A.

The greater the distance apart of the current injection spikes, the deeper the penetration of the current. The measured resistivity for greater electrode separation therefore reflects conditions at greater depth. Modelling of the data gives the ground electrical structure. This structure is then interpreted to give the geological structure.

Buried electrical conductors, like cables or pipes, can affect the applied electrical field. The effect can either increase or decrease the apparent resistivity.

The self potential of the ground is generally accounted for during measurement of the resistivity. Rain showers often cause rapid variation in the self potential. Such variation is very difficult to filter from the applied signal.

Leakage from the overhead power lines along the western fence line during and after rain showers caused very unstable self potential fields. Resistivity could not be carried out in these locations until the grass had sufficiently dried.

The measurements of the field stations were graphed against current electrode separation. There is an empirical relationship between electrode separation and depth. Graphing of field stations against pseudo-depth is called a resistivity pseudo-section.

Computer modelling was performed for the all resistivity data. This provided information on the thickness and resistivity of subsurface layers. It is impossible to uniquely determine both the thickness and resistivity (without some independent control). This is due to the "equivalence" theory, as explained below.

If the modelling gives a ten metre thick layer of 300 Ωm, it could really be:

5 meters thick	600 Ωm
10 metres thick	300 Ωm
20 metres thick	150 Ωm
60 metres thick	50 Ωm

Wider current electrode spacings give deeper current paths. Modelling of the data for a field station therefore gives a one dimensional Vertical Electrical Sounding.

The model indicates the andesite has a resistivity of 300Ωm to 400Ωm and is some 12 to 15 m thick. Noise at greater current electrode spacings prescribed detailed modelling below the andesite.

The resistivity data was modelled to give layers of reasonably consistent resistivity. These were then interpreted to a geologic structure. The layer model is a requirement of the electrical theory used.

Surface topography affects the apparent resistivity. Where possible topography is taken into account. It is a primary cause of erroneous data.

[redacted]

All GPR and resistivity data is provided in Appendix A.

The processing and interpretation of the data for this survey involved the following stages:

1) Plotting all data points and profile lines on 1:1000 scale map.
2) Applying vertical / horizontal filters and background removal filters to GPR data to increase signal/noise ratio.
3) Applying topographic corrections to GPR data to allow for surface topography
4) Correcting for variability in horizontal distances of GPR profiles
5) Computer modelling of resistivity data
6) Plotting resistivity pseudo sections
7) Constructing geological cross-sections based on processed GPR and resistivity data
8) Constructing three-dimensional map of geological structure based on cross-sections.
9) Making final geological interpretation

Summary of geological cross sections

Geological cross-sections were drawn to a scale of 1:10000, with 2.5x vertical exaggeration. A map of the site showing location of sections is given as figure 1.

Section #1 (figure 2)

This section runs parallel to the western fence line from South to North. Two andesite highs can be seen. Strong diffractions seen on the GPR data in this vicinity support the presence of these steep sided structures. Diffractions are caused when radar waves are scattered from sharp objects.

The depths of andesite from the GPR interpretation, resistivity interpretation and bore hole drilling logs all correlate at BH10A. This gives confidence in the geological interpretation.

Section #2 (figure 3)

This section runs SW to NE along the northern fence line. The andesite is interpreted from the GPR data to lie at a depth of about 54m a.s.l. The resistivity data suggests a depth of about 58m a.s.l.

The discrepancy is most likely to be caused by the equivalence error in the resistivity model, as explained in section 4. The GPR data is the more reliable of the two depths.

Section #3 (figure 4)

Running parallel to section 1, but further east. This section shows similar features to section 1, with a strong reflector, interpreted as andesite, rising to 5 m below the surface. This reflector has the characteristic andesite return signal, in terms of amplitude. It is possible that this is a reflection from a tephra layer overlying an andesite high.

Section #4 (figure 5)

This intersects sections 1 and 5, running from western fence line to just beyond BH5.

Andesite is interpreted as rising to 52m a.s.l., 10m past the intersection with section #5. This puts the andesite high 15m (horizontal distance) away from the high on section #5.

Section #5 (figure 6)

This section was drawn using two GPR lines along Centennial Drive, outside the Dow Elanco site. Topography was not covered by the 1:1000 site base map, and was therefore estimated in the field. The andesite is at a maximum of 57m a.sl, descending to 52m to the west and 45m + steeply to the east.

Section #6 (figure 7)

Two short sections around BH10B. These show a depth to Andesite of between 55m and 60m.

Section #7 (figure 8)

This section runs south towards building 30 (incinerator building) and a steep north dipping gradient can be seen down to an elevation of 58m asl. No deeper reflectors or structures were visible.

6.0 Conclusions

Extent of Andesite layer

Based on the GPR data, the andesite is present under all of the survey area covered. The upper surface of this layer varies from gently undulating to very steep gradients. Isolated high points were found with elevations up to and above 60m a.s.l.

Figure 9 shows a contour map of the area. This map was constructed using an interpretation of all geophysical measurements carried out at the DowElanco site during 1994 and 1995. The high points can be seen as the 'conical' features in the southern end of the site. The low points in the Andesite surface can be seen in the north-west corner of the site.

Lithologic boundaries in the material overlying the andesite generally gave weaker return signals. It is therefore difficult to identify individual layers or structure within this depth range from the GPR or resistivity data.

Yours faithfully
GROUND*SEARCH* Ltd

Matt Watson
Geophysicist

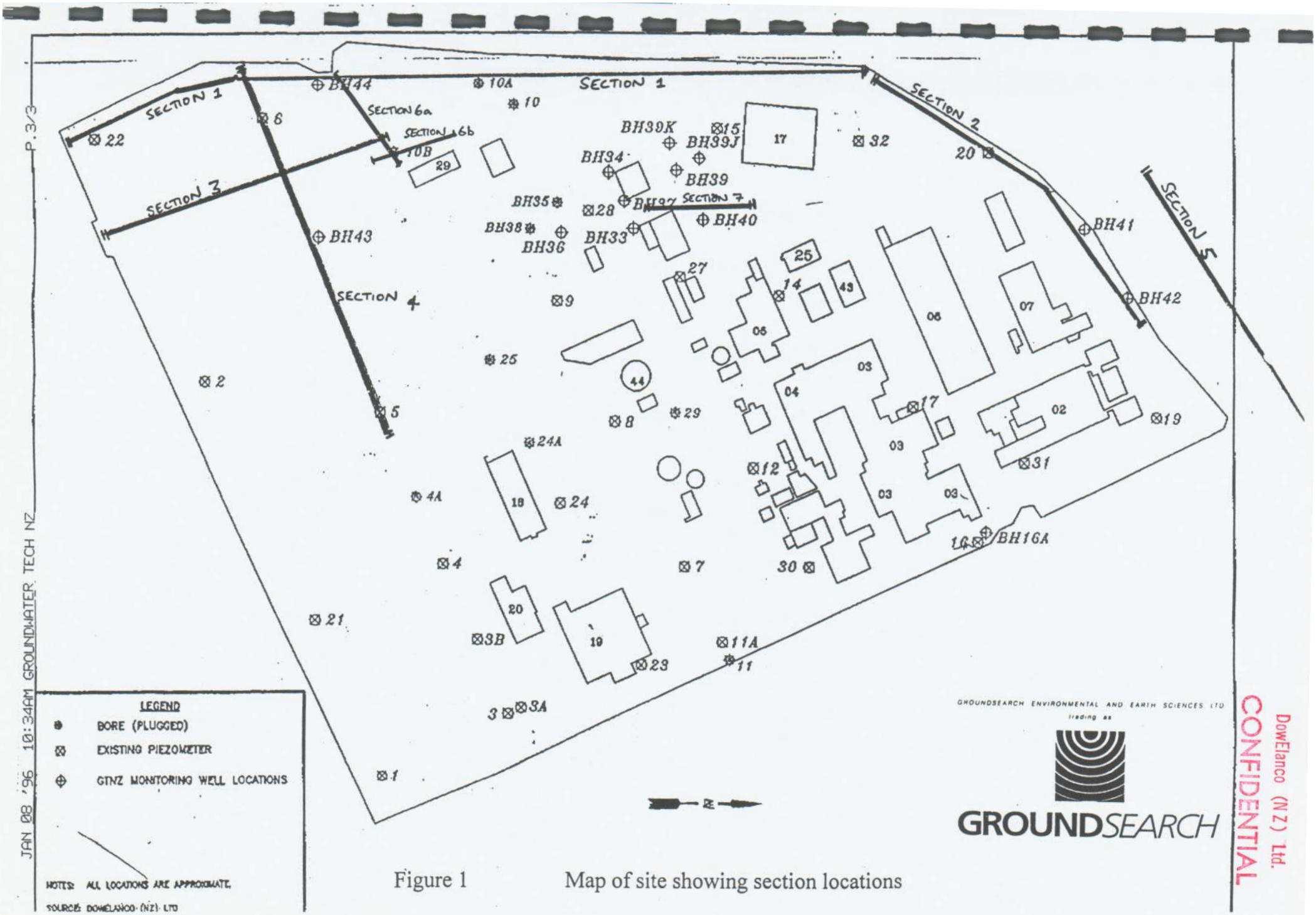

Figure 1 Map of site showing section locations

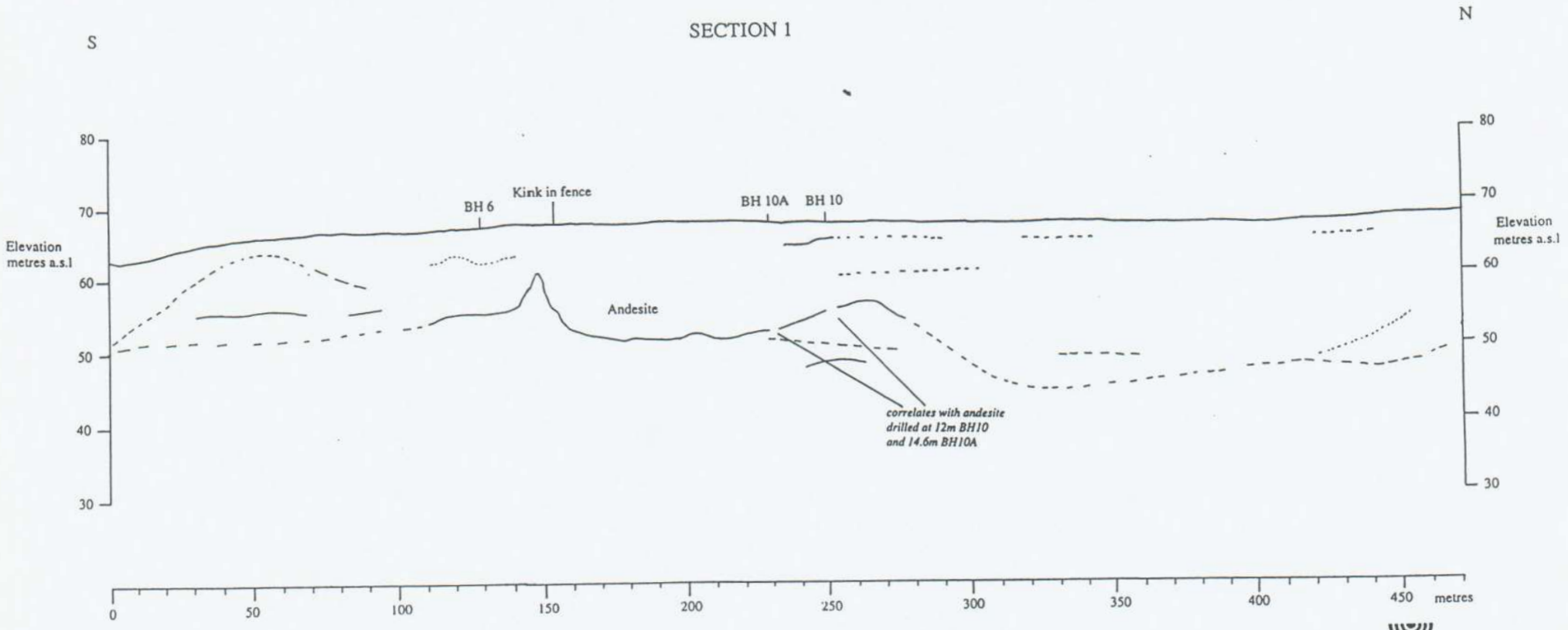

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Figure 2

NE

SECTION 2

SW

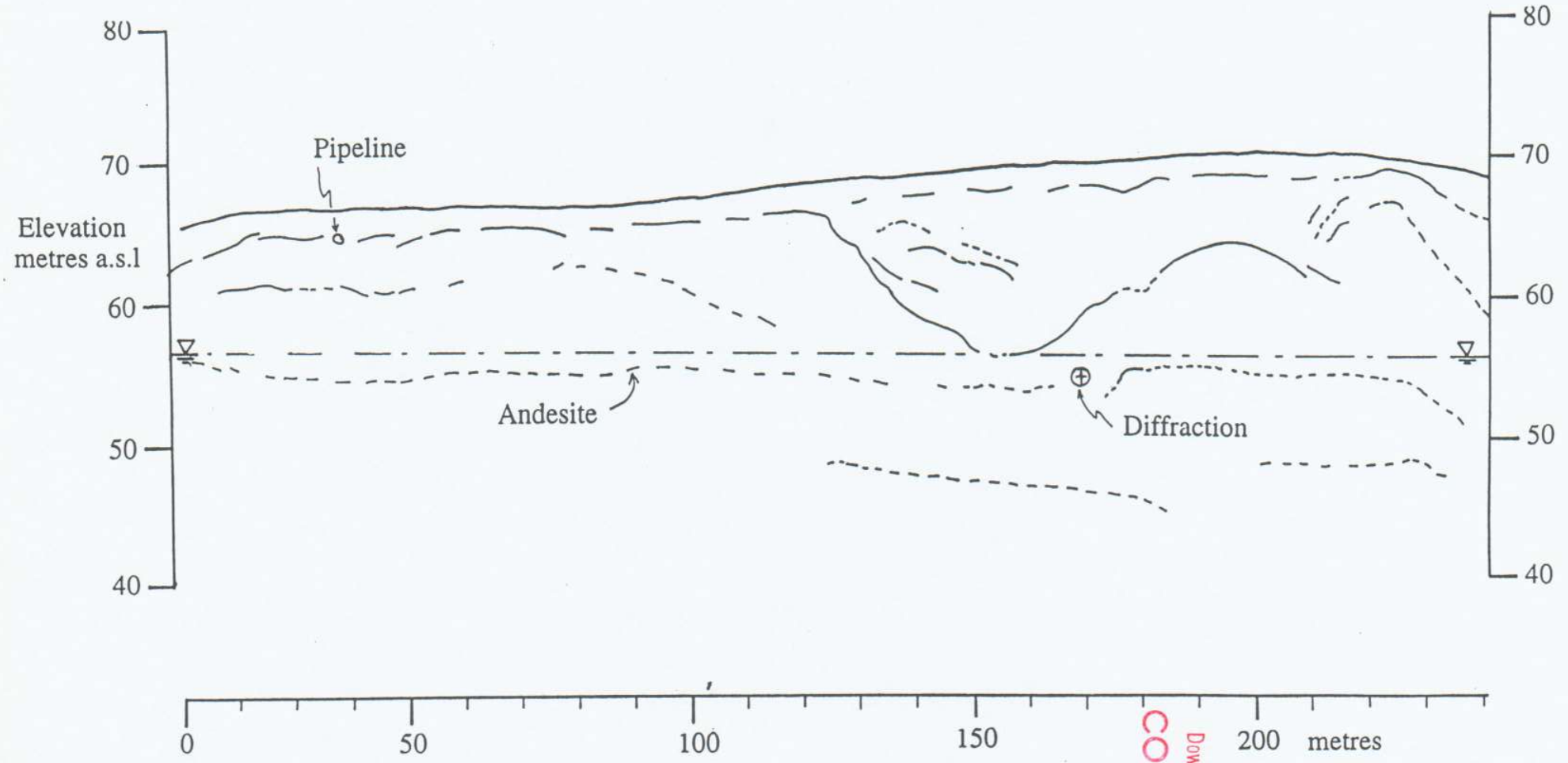

Figure 3

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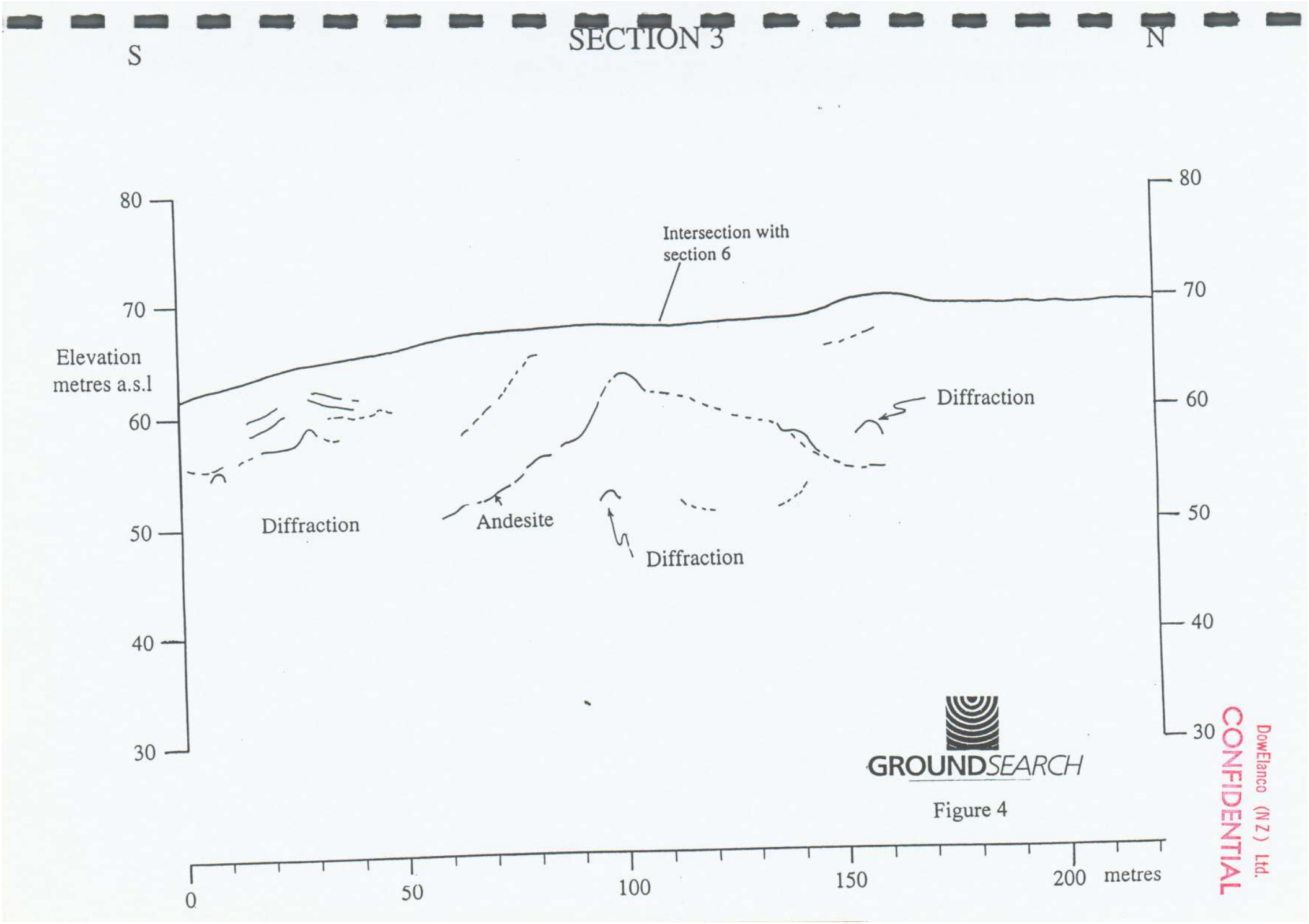

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Figure 4

WSW

SECTION 4

ENE

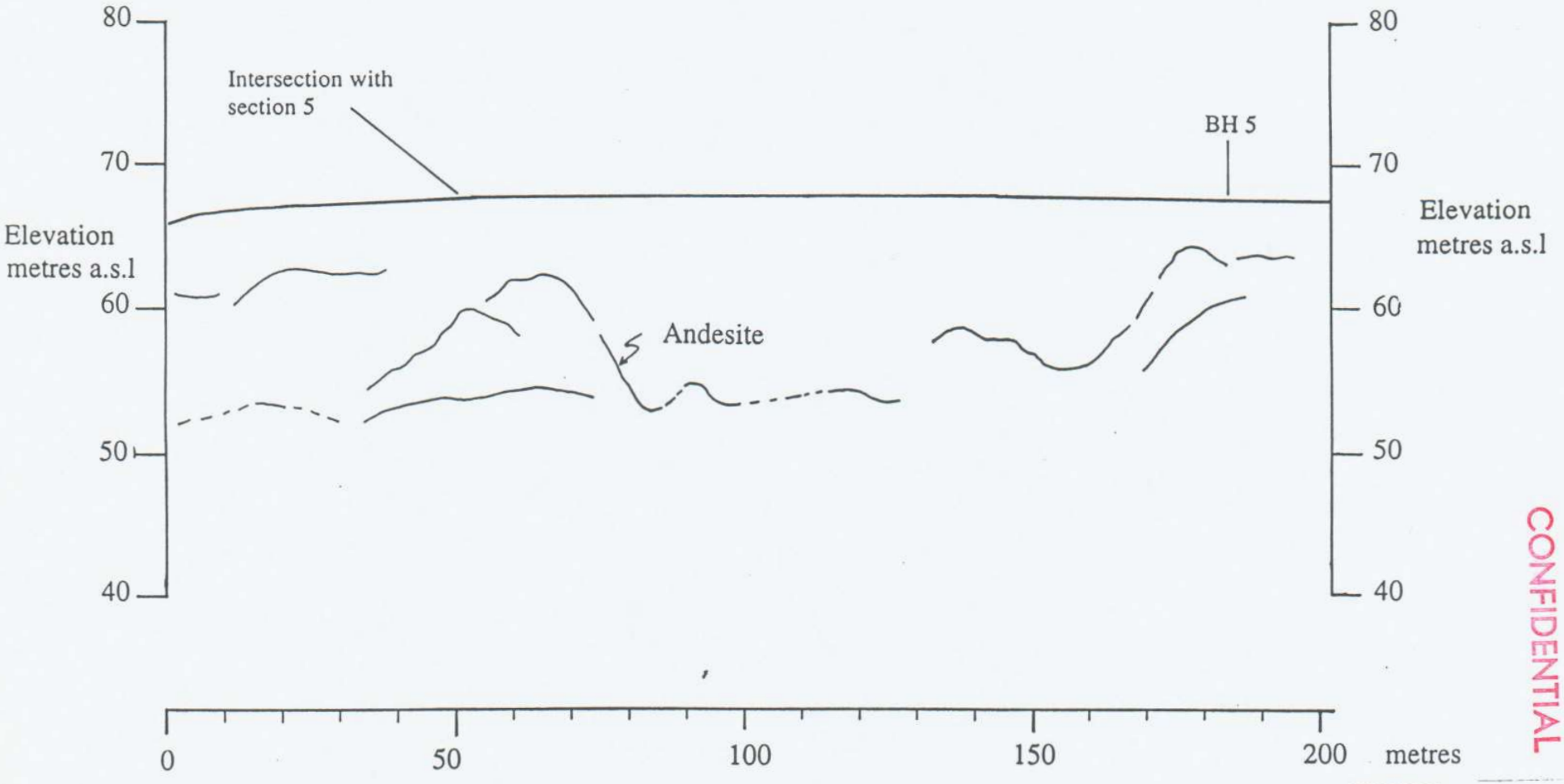

Figure 5

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W

SECTION 5

E

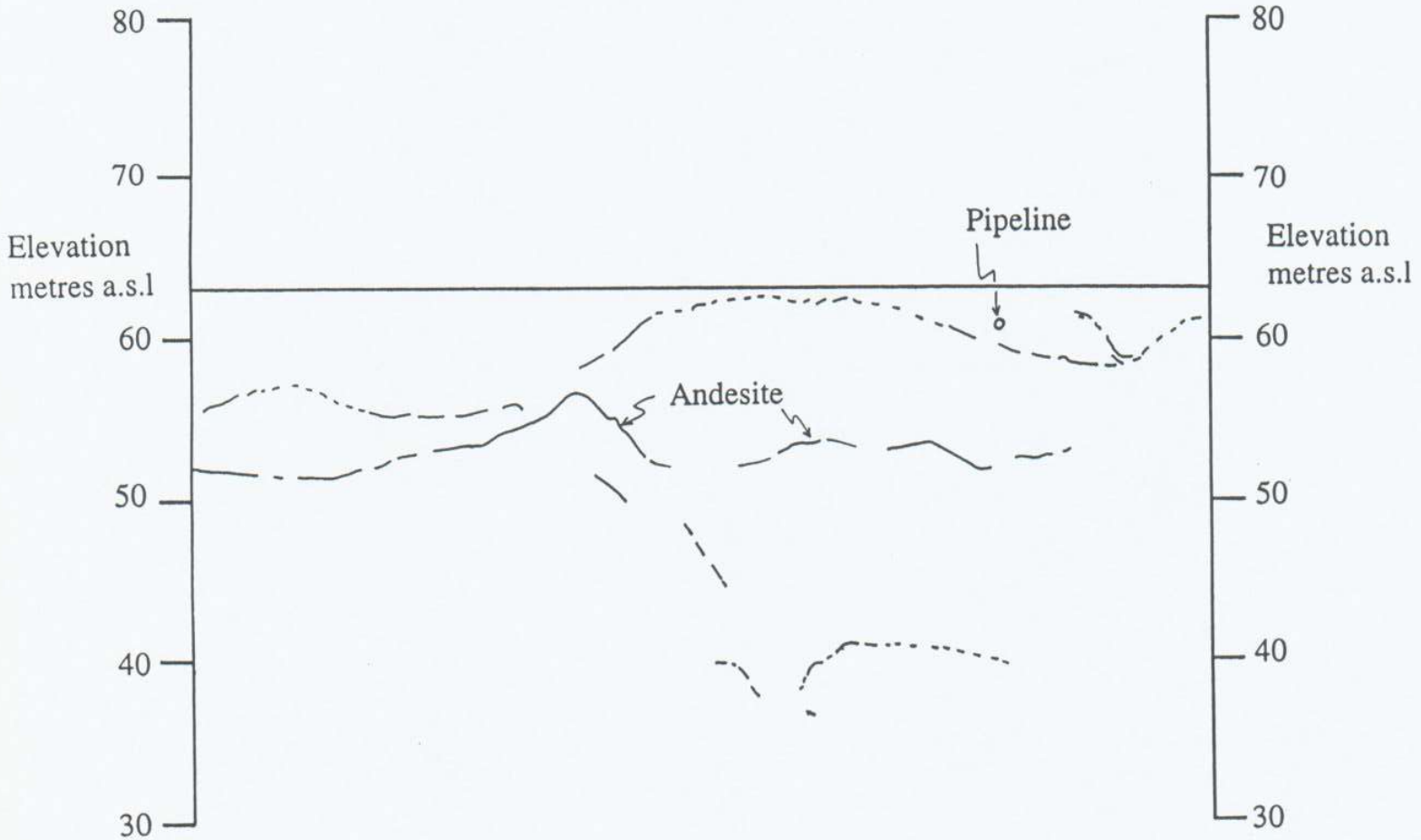

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Figure 6

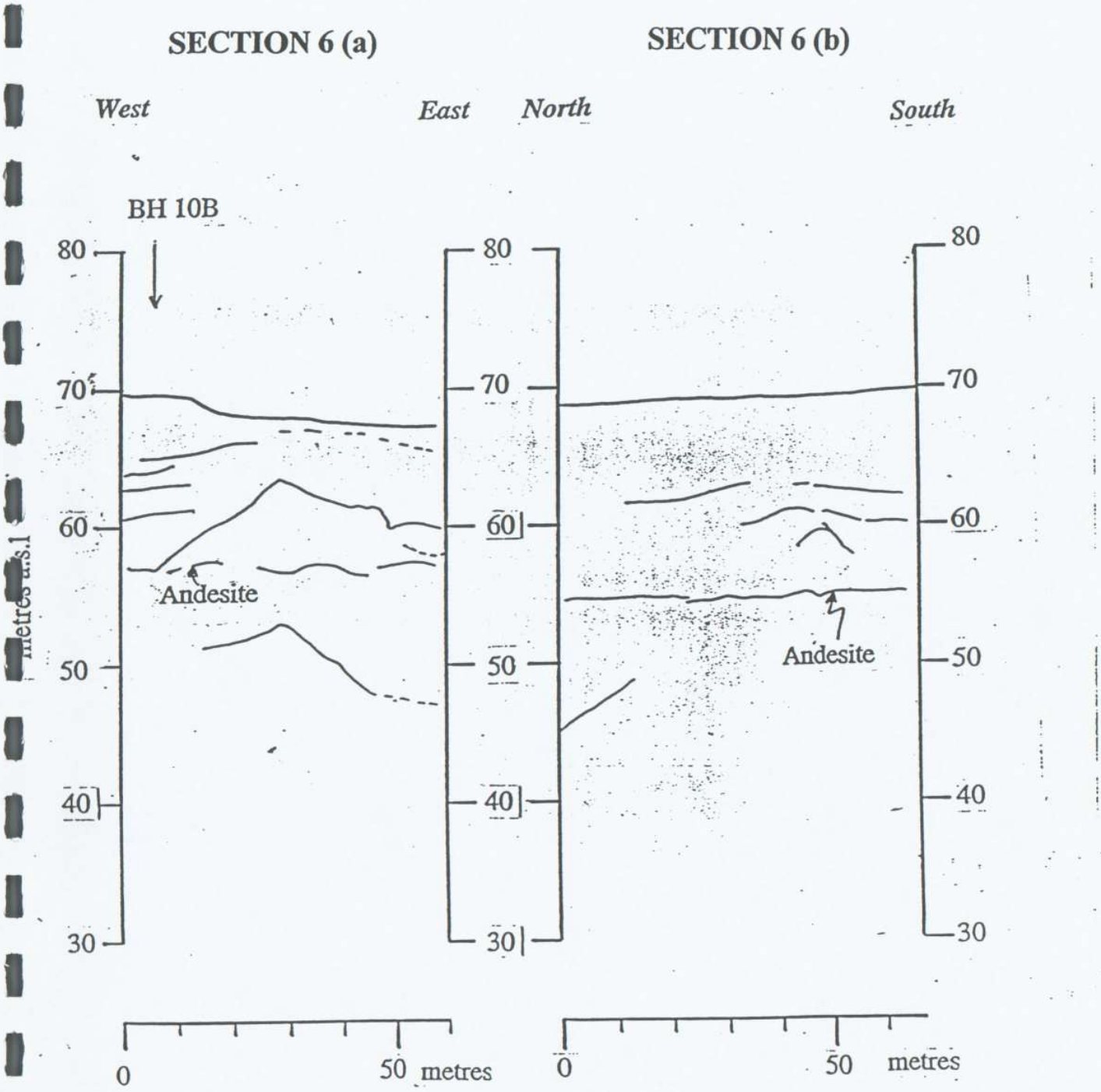

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Figure 7

N S

SECTION 7

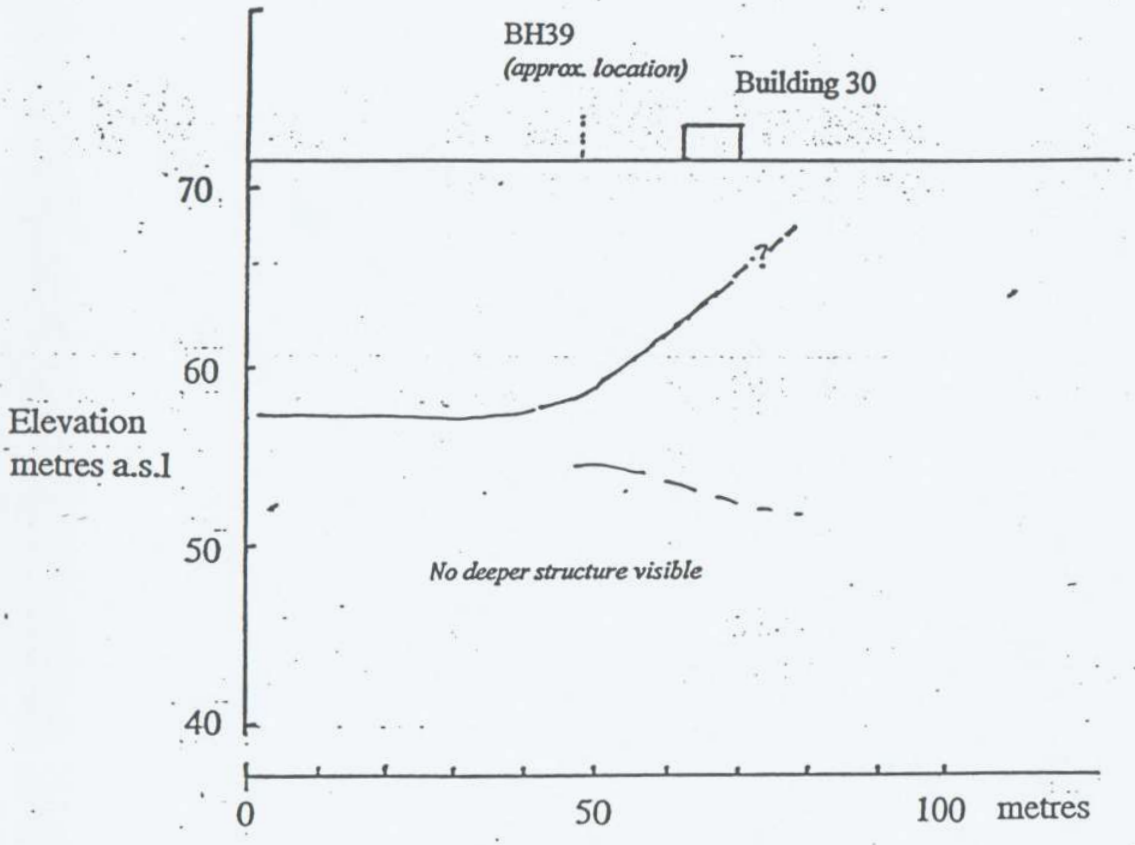

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Figure 8

Figure 9 **Contour Map of Andesite**
DowElanco, New Plymouth

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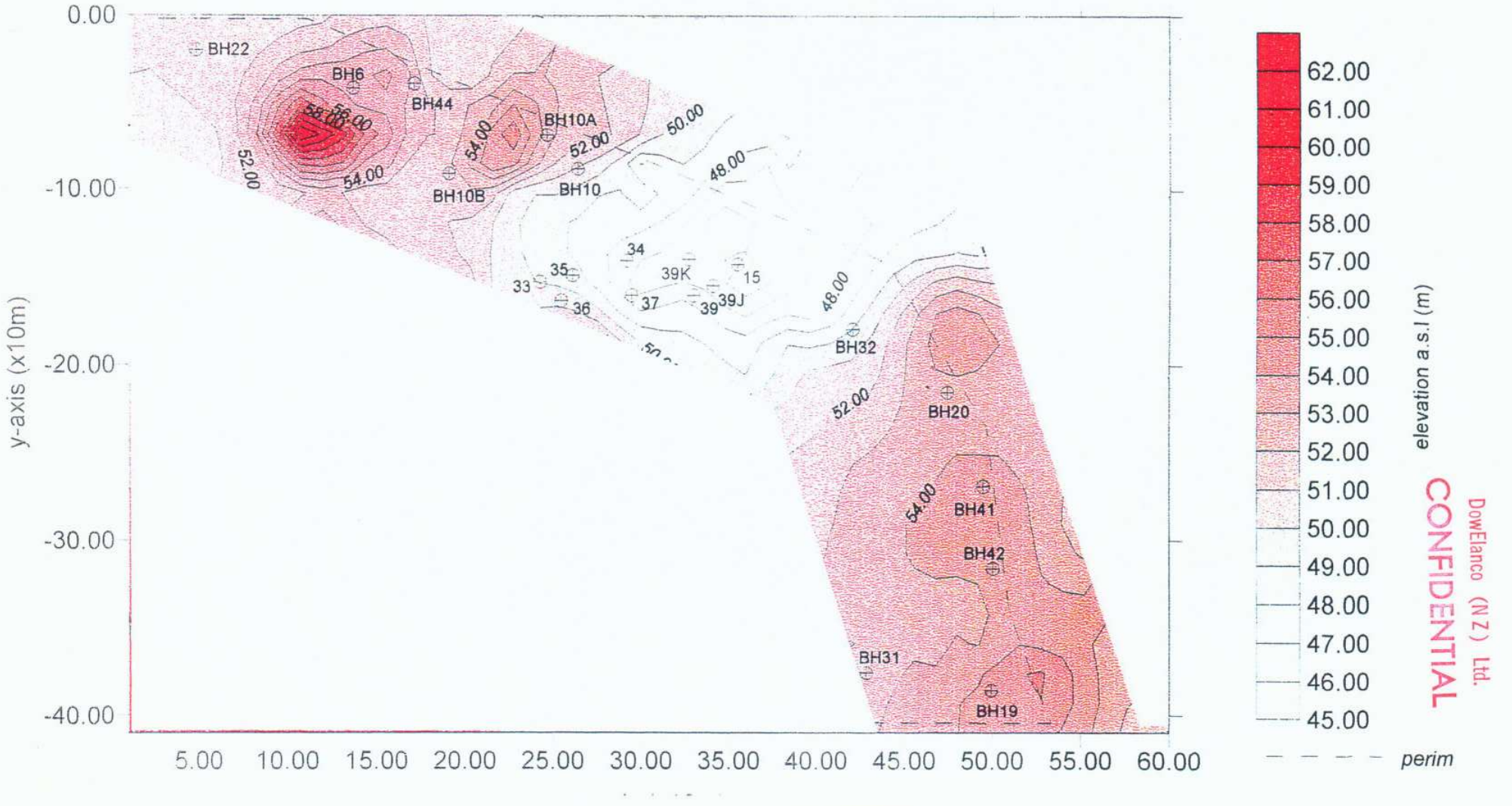
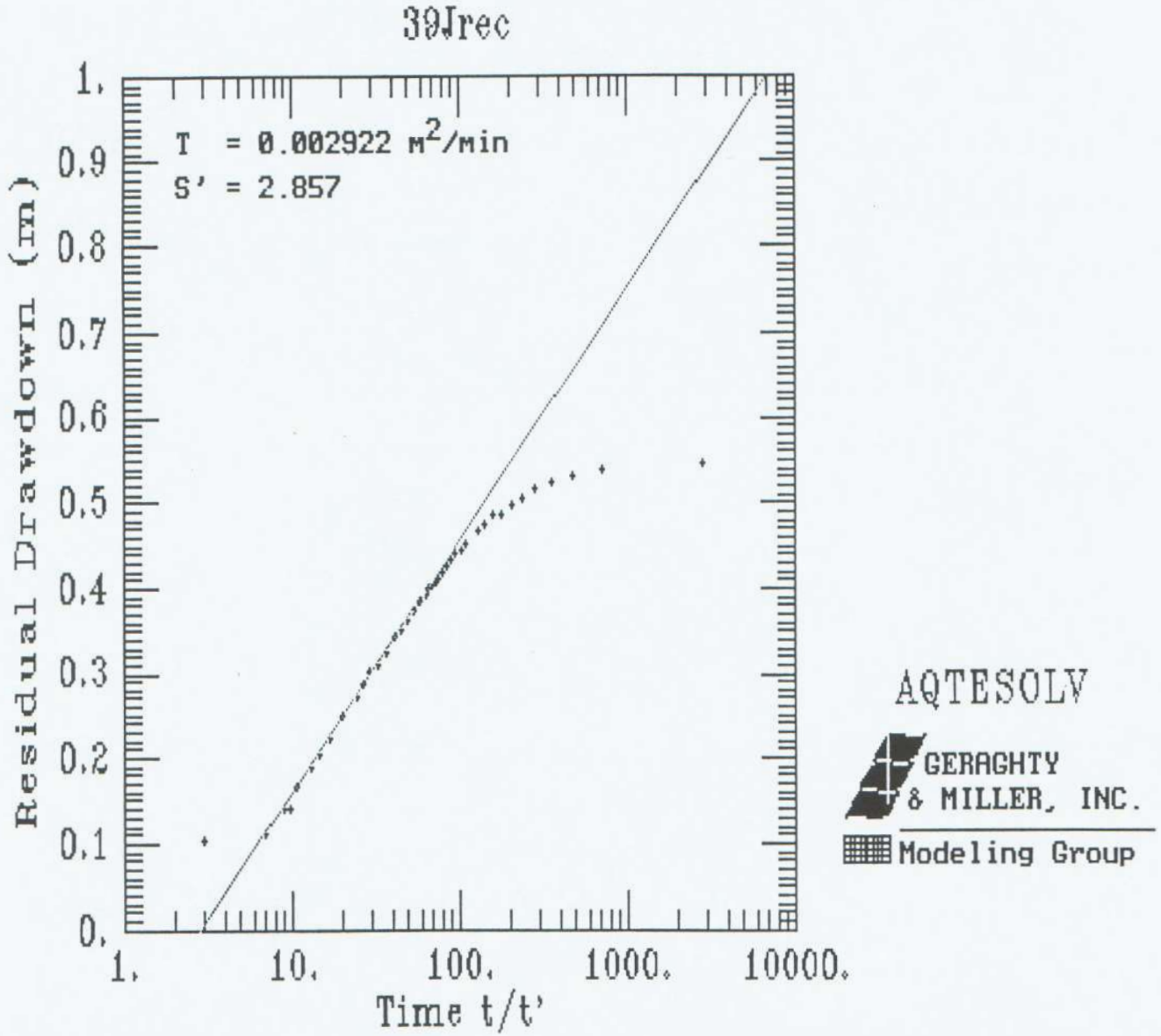
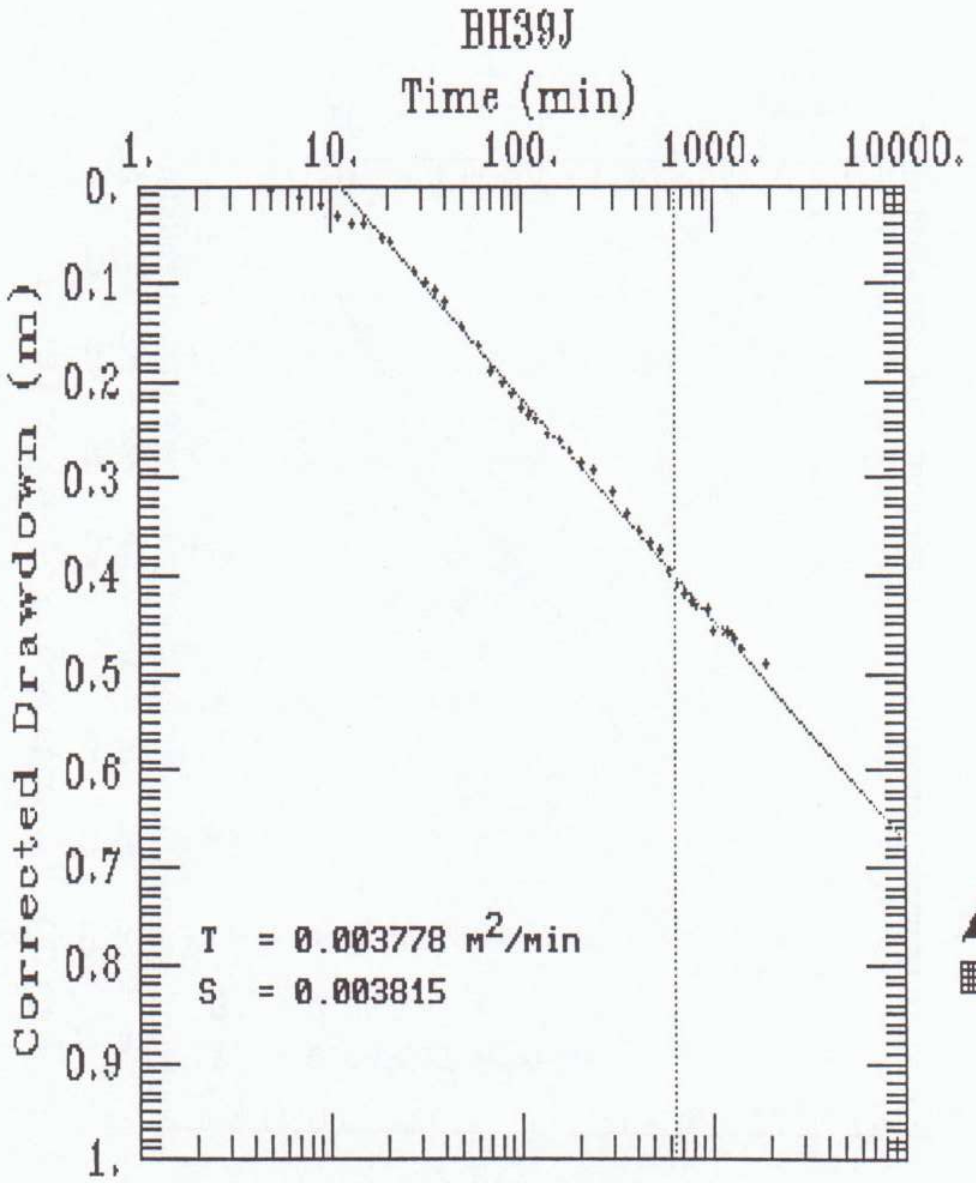


APPENDIX D
PUMP TEST DATA





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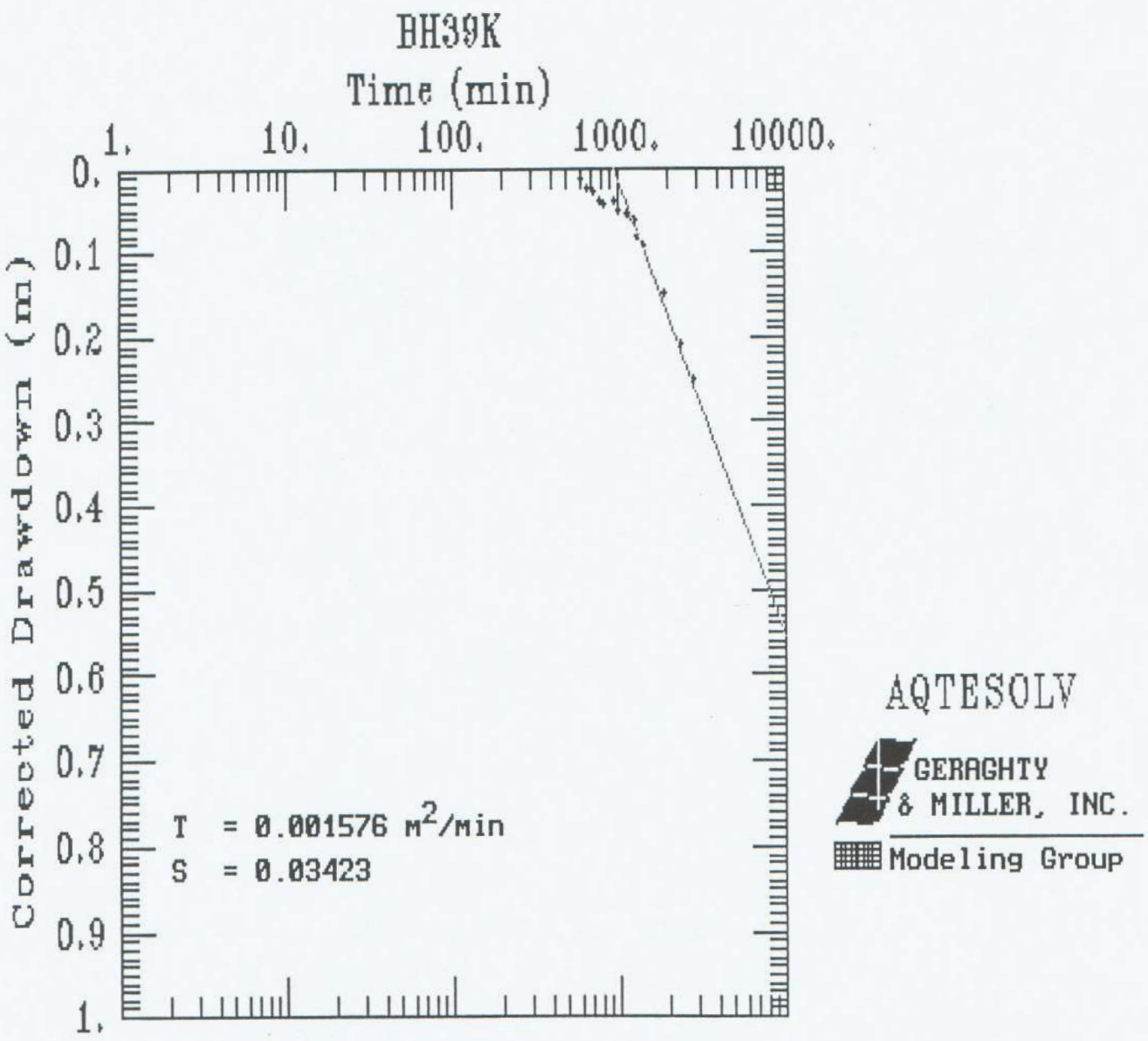

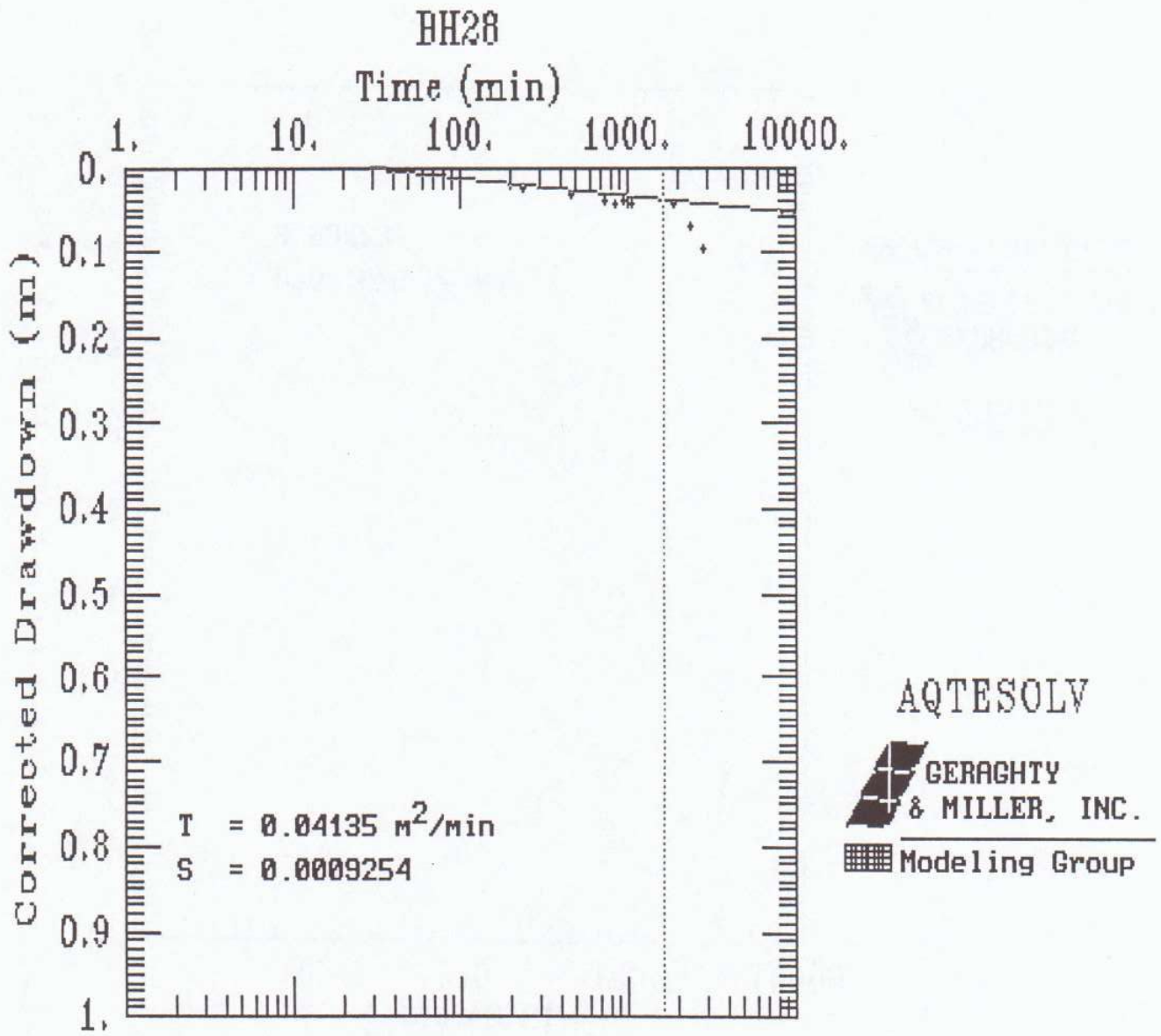

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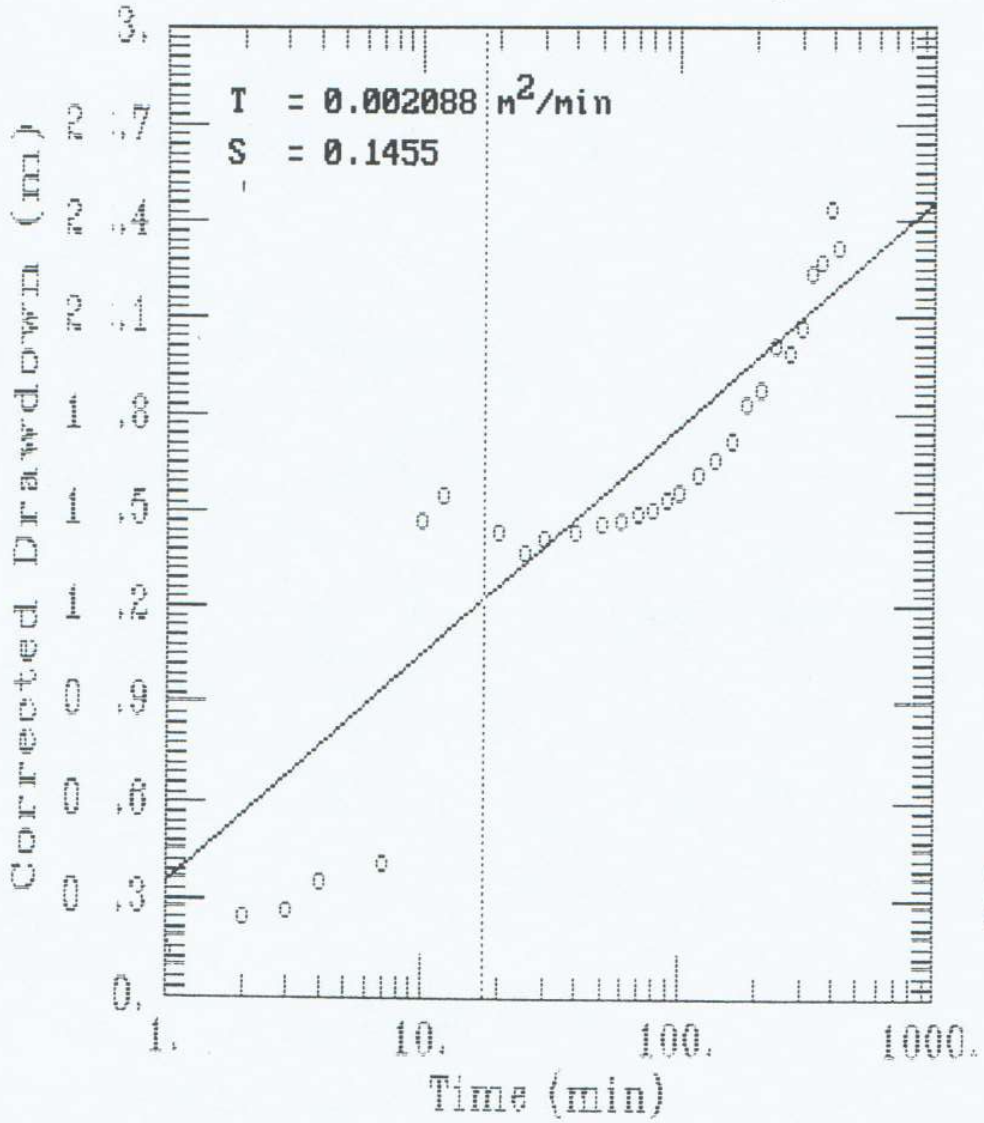
DOW ELANCO TEST WELL #39



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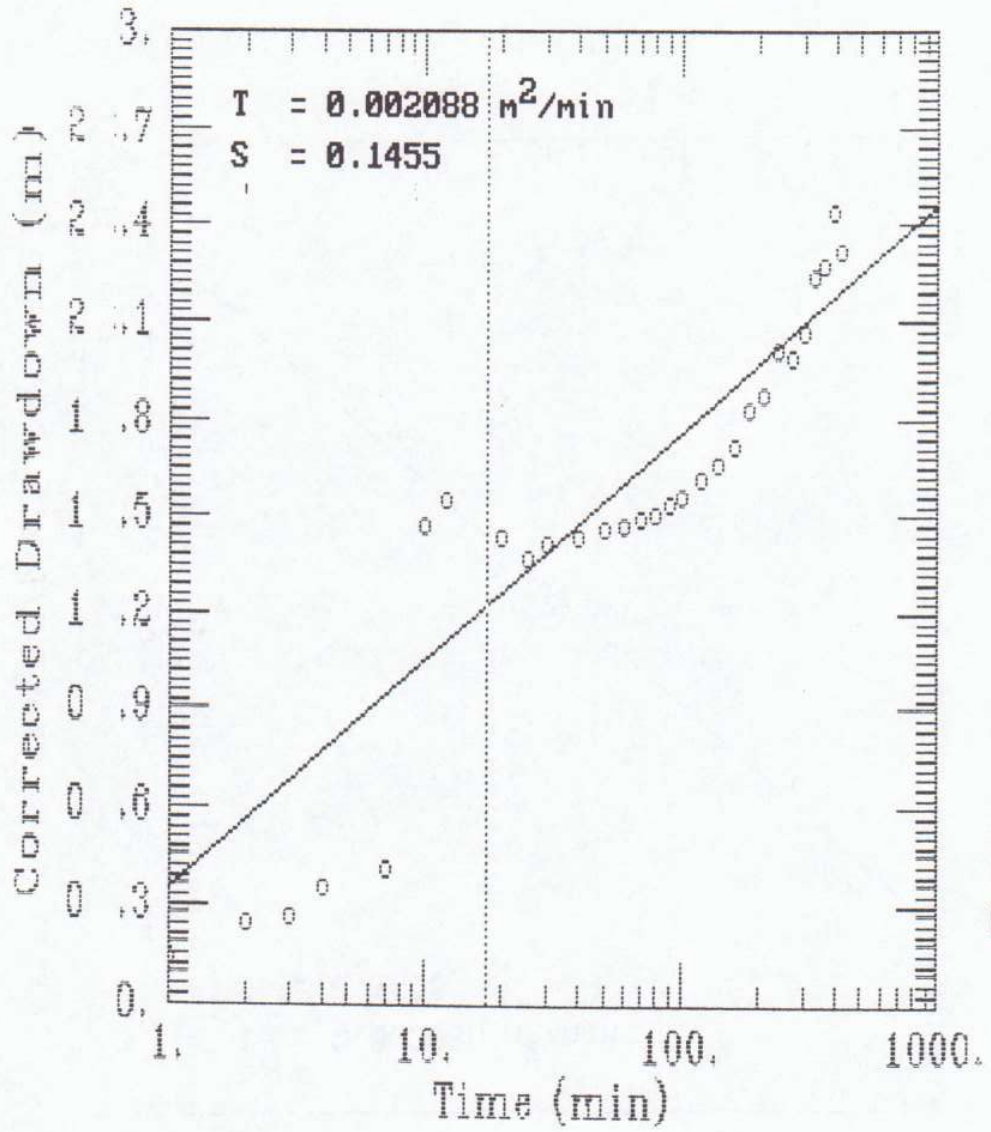

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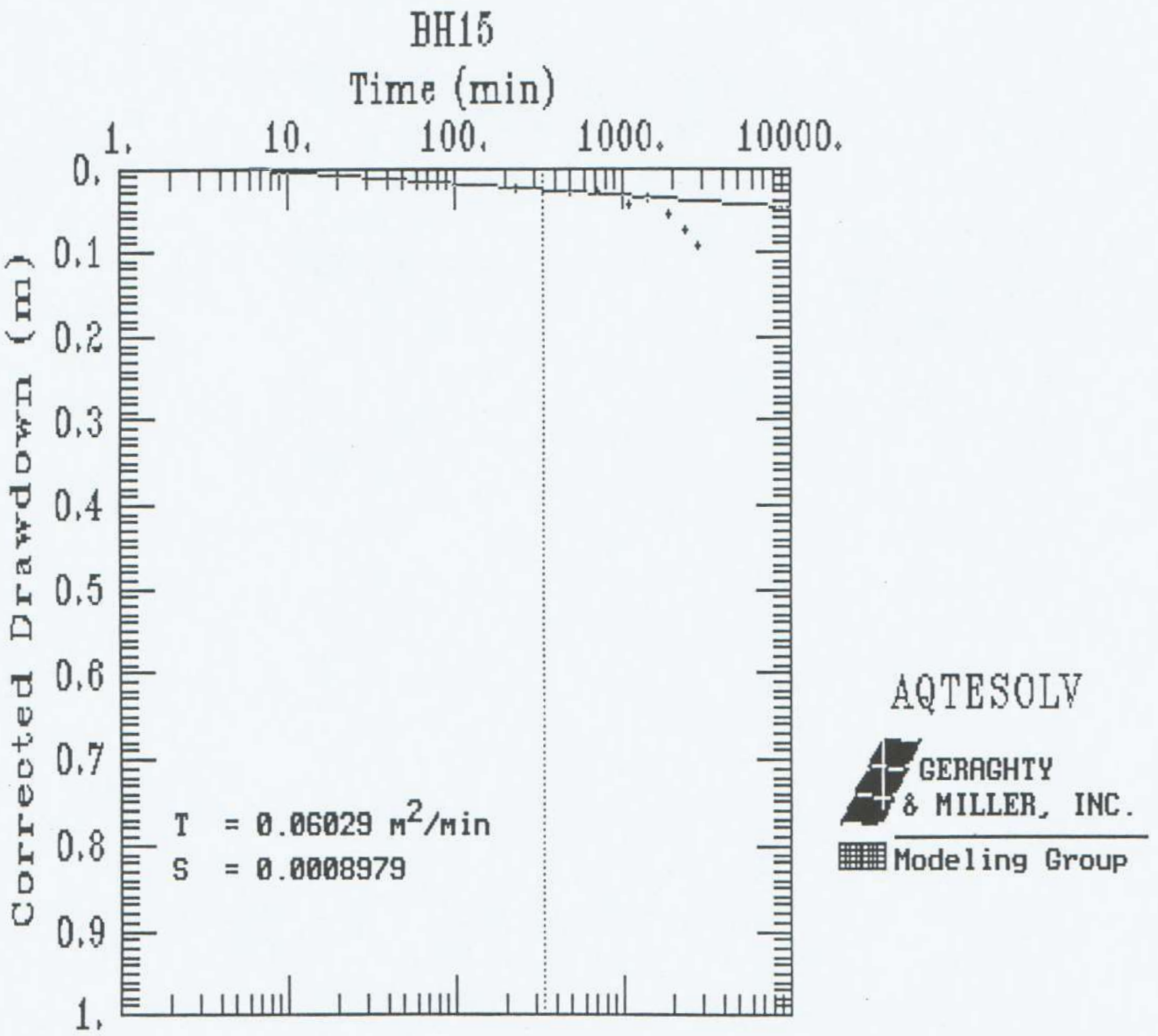

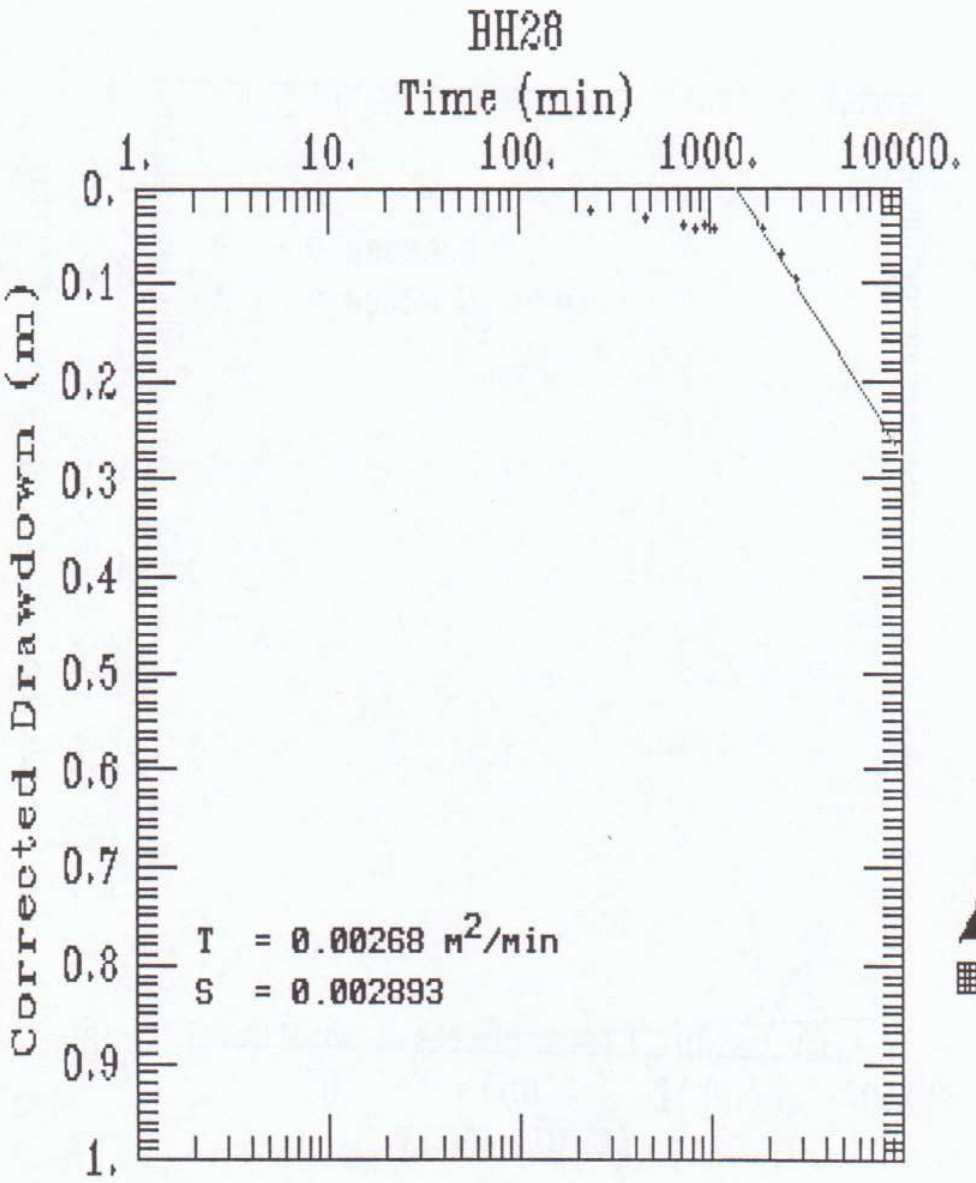

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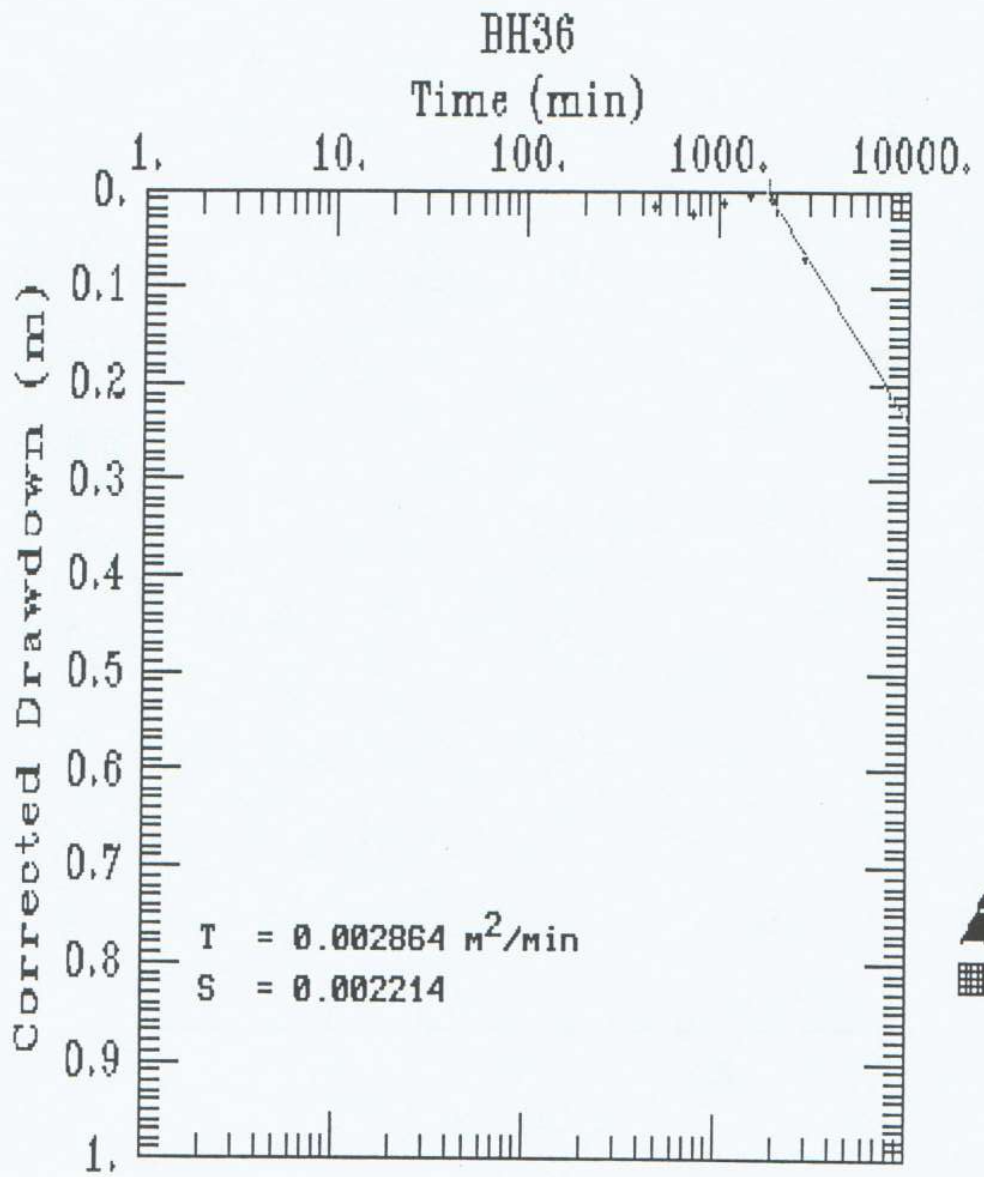

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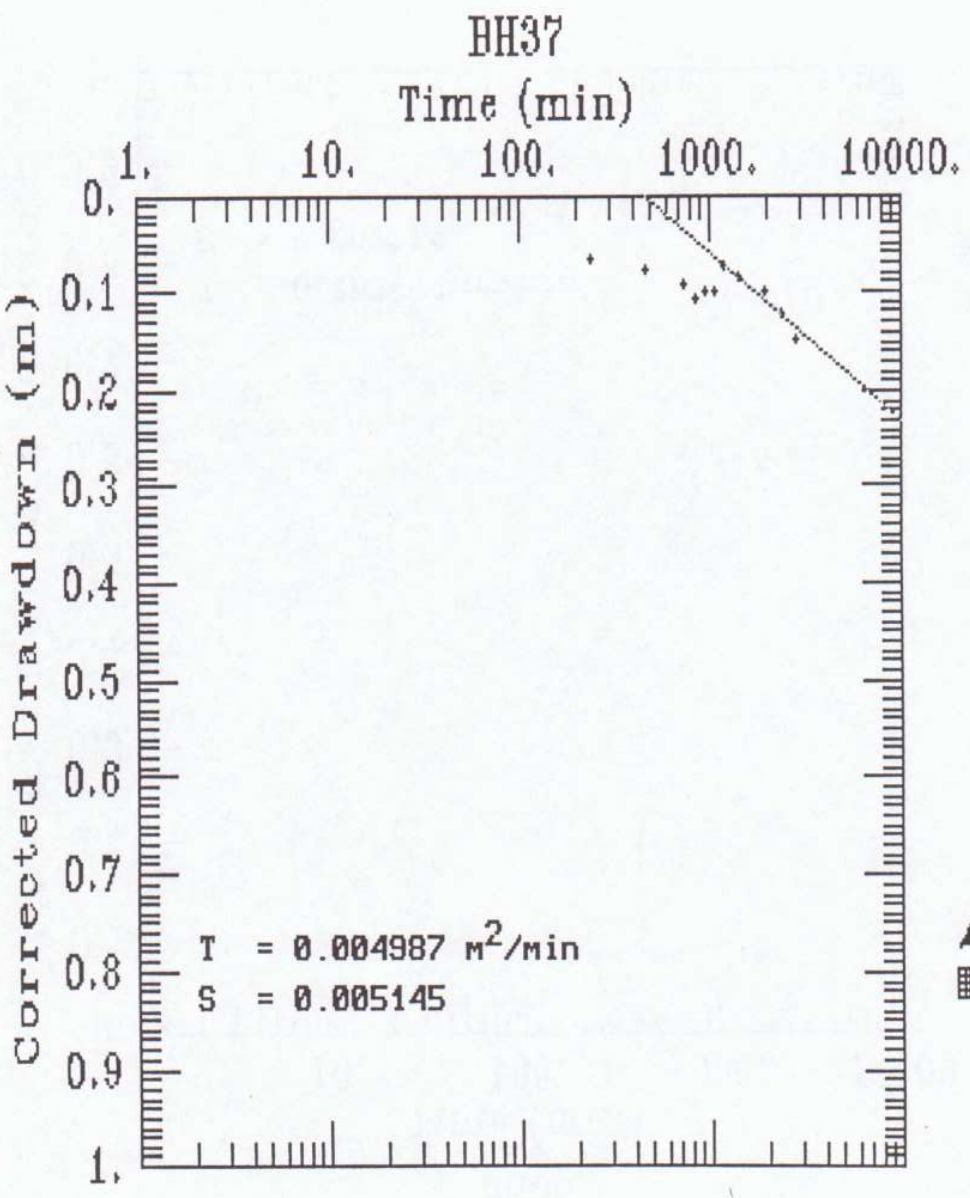

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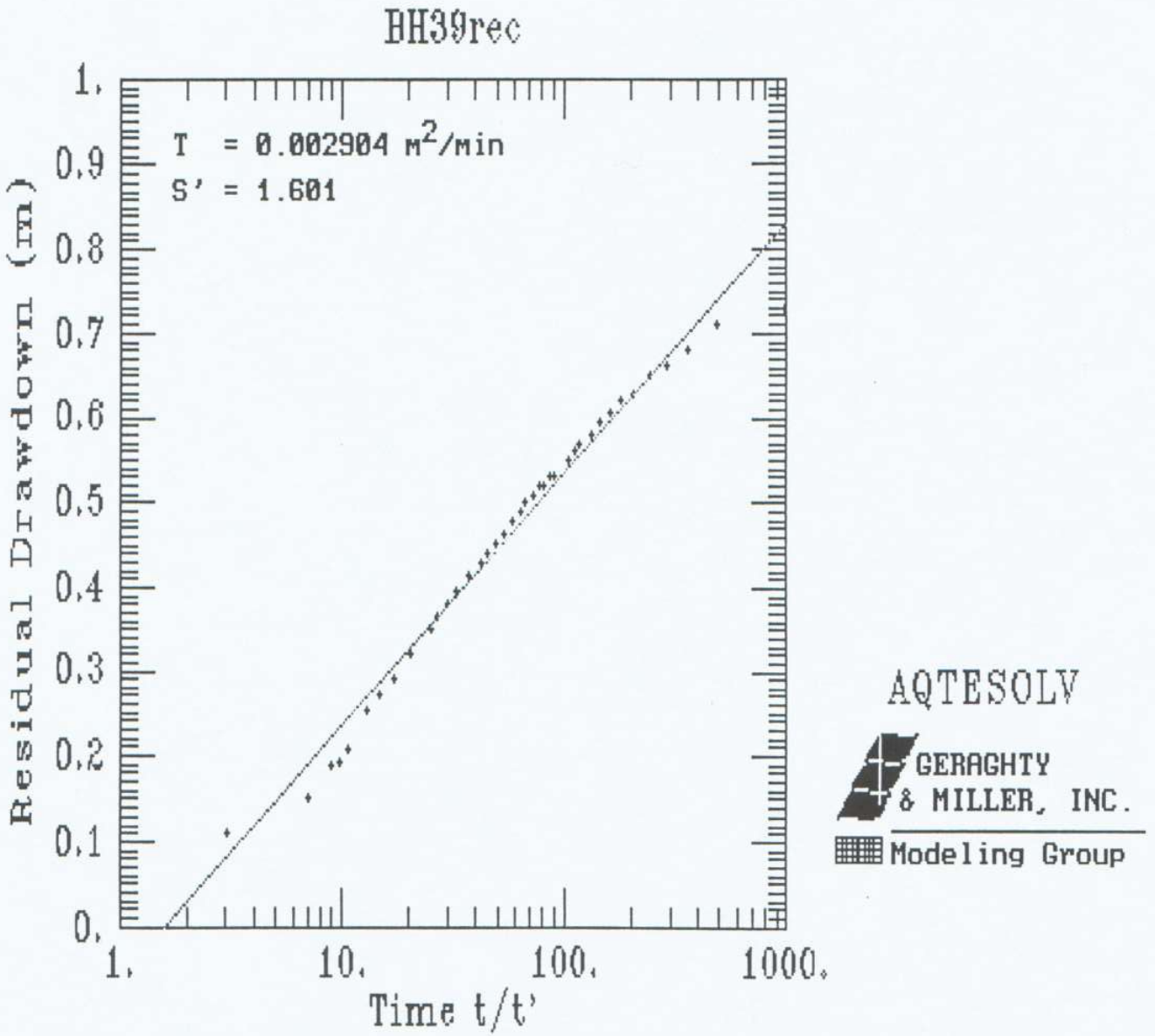

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APPENDIX E

LABORATORY REPORTS

Soil and Water Sample Analysis Results

Samples of soil and water were collected during the drilling of bores and following the installation of piezometers.

1. SOIL SAMPLES

Bore Number	Depth (metres)	Sample Reference	Phenoxies mg/kg	Chlorophenols mg/kg
33	1.0	940823-3	< 1	< 1
	18.7	940823-1	< 1	< 1
	20.2	940823-2	< 1	< 1
34	0.5	940823-4	< 1	< 1
	23.4	940823-7	< 1	< 1
	25.6	940823-10	< 1	< 1
35	0.5	940823-16	< 1	< 1
	9.61	940823-13	< 1	< 1
	23.4	940823-19	< 1	< 1
36	0.5	940823-5	< 1	< 1
	14.4	940823-8	< 1	< 1
	23.4	940823-11	< 1	< 1
37	20.3	940823-22	< 1	< 1
	23.8	940823-25	< 1	< 1
	24.6	940823-28	< 1	< 1
38	6.55	940823-29	< 1	< 1
	12.67	940823-27	< 1	< 1
	18.0	940823-30	< 1	< 1

Soil Samples (continued)

Bore Number	Depth (metres)	Sample Reference	Phenoxies mg/kg	Chlorophenols mg/kg
39	1.91	940823-14	< 1	18.3
	6.5	940823-15	2.5	6.8
	9.56	940823-17	6.5	5.9
	12.62	940823-18	4.6	3.1
	15.68	940823-20	4.0	3.3
	17.21	940823-21	6.6	1.0
	20.2	940823-23	3.7	< 1
	22.0	940823-24	2.5	< 1
	24.8	940823-26	5.6	< 1
40	0.85	940823-32	< 1	< 1
	2.0	940823-9	< 1	< 1
	20.3	940823-12	< 1	< 1
	21.8	940823-31	< 1	< 1
16 A	21.95	940823-33	< 1	< 1
	25.01	940823-35	2.0	< 1
	27.0	940823-36	< 1	< 1
	29.0	940823-37	< 1	< 1

2. WATER SAMPLES

Bore Number	Sample Reference	Phenoxies mg/L	Chlorophenols mg/L	Organophosphates mg/L	Solvents mg/L
15	941005-15	< 0.1	< 0.1		
28	940823-16	0.1	< 0.1	< 0.005	< 10
33	940823-10	< 0.1	< 0.1	< 0.005	< 10
36	940823-13	0.15	0.14	< 0.005	< 10
37	940823-19	0.19	< 0.1	< 0.005	< 10
39	940823-2	2.3	1.6	< 0.005	< 10
39 (repeat)	941005-01	1.9	1.1	< 0.005	< 10
40	940823-5	<0.1	< 0.1	< 0.005	< 10

Bore Number 39 - Analysis of groundwater samples collected during the pump tests.

Sample Number	Date / Time	Volume Pumped (cumulative) Litres	pH (at 20°C)	Phenoxies mg/L	Chlorophenols mg/L
1	19.10.94 / 1130hrs	0	7.13	2.16	1.12
2	19.10.94 / 1140hrs	85	7.21	2.27	1.18
3	19.10.94 / 1200hrs	255	7.15	2.13	1.14
4	19.10.94 / 1540hrs	568	7.16	2.04	1.07
5	19.10.94 / 1630hrs	726	7.13	1.82	1.14
6	20.10.94 / 0926hrs	911	7.07	1.98	0.94
7	20.10.94 / 1000hrs	1091	not determined	1.90	1.07
8	20.10.94 / 1200hrs	1811	7.06	1.82	1.12
9	20.10.94 / 1320hrs	2319	7.14	1.78	0.98
10	20.10.94 / 1430hrs	2713	7.16	1.96	1.10
11	20.10.94 / 1500hrs	2895	7.10	1.94	0.95
12	20.10.94 / 1530hrs	3041	7.05	1.93	1.09
13	20.10.94 / 1600hrs	3170	7.09	1.80	0.98

amdel

AUSTRALIAN ANALYTICAL LABORATORIES PTY LTD
A.C.N. 001 491 667

Correspondence to:
P.O. Box 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 482 1922
Facsimile: (02) 482 1734

CERTIFICATE OF ANALYSIS

DowElanco (N Z) Ltd.
CONFIDENTIAL

DATE: 30/10/95

REPORT No: 5S02034A

QA/QC Appendix

CLIENT:	Groundwater Technology - New Zealand
SAMPLES:	1 x Soil
REFERENCE:	N/A
LAB Nos.:	10501
DATE RECEIVED:	18/10/95
DATE COMMENCED:	18/10/95

	TEST:	METHOD:
1.	Phenols	E1032/E162
2.	Phenoxy Acid Herbicides	E132
3.		
4.		

RESULTS: All samples analysed as received.
This report replaces preliminary results issued.

PLEASE SEE ATTACHED PAGES FOR RESULTS

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

PHENOLS by HPLC

DowElanco (N Z) Ltd.
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Australian Analytical Laboratories

CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02034

SAMPLES: 1 X SOIL

SAMPLE I.D.	PQL -	39H 0.55	Control Blank				
LAB I.D.	-	10501	C.B				
MOISTURE (% w/w)	-	46	-				
PHENOL	0.05	nd	nd				
4-NITROPHENOL	2.5	nd	nd				
m+p-CRESOLS	0.05	nd	nd				
o-CRESOL	0.05	nd	nd				
2-CHLOROPHENOL	0.05	nd	nd				
4-CHLOROPHENOL	0.05	nd	nd				
2-NITROPHENOL	0.5	nd	nd				
2,4-DIMETHYLPHENOL	0.05	nd	nd				
4-CHLORO-3-METHYLPHENOL	0.1	nd	nd				
2,6-DICHLOROPHENOL	0.1	nd	nd				
2,4-DICHLOROPHENOL	0.1	nd	nd				
2,5-DICHLOROPHENOL	0.1	nd	nd				
3,5-DICHLOROPHENOL	0.5	nd	nd				
2,3,6-TRICHLOROPHENOL	0.2	nd	nd				
2,3,4-TRICHLOROPHENOL	0.25	nd	nd				
2,4,6-TRICHLOROPHENOL	0.3	nd	nd				
2,4,5-TRICHLOROPHENOL	0.25	nd	nd				
PENTACHLOROPHENOL	1.0	nd	nd				
2,3,4,6-TETRACHLOROPHENOL	0.5	nd	nd				
SURROGATE % RECOVERY	-	102	95				

PQL = Practical Quantitation Limit

nd = Not Detected
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)

PHENOXY ACIDS HERBICIDES

CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02034

DowElanco (N Z) Ltd.

SAMPLES: 1 X SOIL

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SAMPLE I.D.	PQL -	39H -055	Control Blank				
LAB I.D.	-	10501	CB				
o-CHLOROPHENOXYACETIC ACID	0.1	nd	nd				
p-CHLOROPHENOXYACETIC ACID	0.1	nd	nd				
MCPP (MECOPROP)	0.1	nd	nd				
MCPA	0.1	nd	nd				
2,4 - D	0.01	nd	nd				
TRICHLOPYR	0.01	nd	nd				
SILVEX (FENOPROP)	0.01	nd	nd				
2,4,5 - T	0.01	nd	nd				

nd = Not Detected
- = Not Applicable

PQL = Practical Quantitation Limit

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)

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QA/QC APPENDIX No. 5S02034A

ANALYTE	No. of Pages.
Phenols	1
Phenoxy Acid Herbicides	1
TOTAL No. of PAGES	2

Other Criteria: (except Inorganics/Nutrients)

Retention Time Window	:	Within Acceptance Criteria
Check Standard	:	Within Acceptance Criteria
Recalibration	:	Within 15%

Signed:

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

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Australian Analytical Laboratories

Phenols by steam distillation - Matrix Spike/Duplicate

Reference No: 090106m1 **Page:** 1 of 1
Matrix ID: MS Soil

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
Phenol	1.00	0.98	0.91	98%	91%	95%	7%

Spike Units:mg/kg(ppm)

nd = Not Detected
- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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Australian Analytical Laboratories

Phenoxy Acids Herbicides - Matrix Spike/Duplicate

Reference No: 102303k1 **Page:** 1 of 1
Matrix ID: MB -soil

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
o-ChlPA	1.00	0.93	0.99	93%	99%	96%	6%
p-ChlPA	1.00	0.96	1.01	96%	101%	99%	4%
MCPP	1.00	1.05	1.04	105%	104%	105%	1%
MCPA	1.00	1.02	1.02	102%	102%	102%	0%
2,4-D	1.00	1.04	1.03	104%	103%	104%	0%
Trichlopyr	1.00	1.09	1.09	109%	109%	109%	0%
Silvex	1.00	1.13	1.12	113%	112%	113%	0%
2,4,5-T	1.00	1.09	1.10	109%	110%	110%	1%

Spike Units: mg/kg (ppm)

nd = Not Detected
- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

ENVIRONMENTAL ASSESSMENT PROJECT.

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
BH 39B	0·5	1·3.	
DATE SAMPLED	10/10/95	10/10/95	
TIME SAMPLED	08:20	09:00	

RESULTS:

Analyte	Conc in mg/kg	Conc in mg/kg	Conc in mg/kg
	Sample No.1	Sample No.2	Sample No.3
PENOXY ACIDS	=	39.58	
2,4-D	<1	<1	
MCPA	<1	2·34	
2,4,5-T	<1	6·04	
MCPB	<1	31·2	
PHENOLS	=	77.47	
2,4-DCP	<1	61·1	
PCOC	<1	2·76	
2,4,6-TCP	<1	5·77	
2,4,5-TCP	<1	7·84	

ANALYST:	
CHECKED BY:	
DATE:	10/10/95.

File: SITEREP.DOC

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
BH 39C.	2·7.	5·6.	8·6
DATE SAMPLED	10/10/95	10/10/95	10/10/95
TIME SAMPLED	10:40	11:15.	11:45.

RESULTS:

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PENOXY ACIDS =	5,521.5	6.30	5.99
2,4-D	2029	2·17	1·19
MCPA	829	<1	<1
2,4,5-T	2630	4·13	4·80
MCPB +	33·5	<1	<1
PHENOLS =	1906.5	10	4.89
2,4-DCP	1408	<1	<1
PCOC	284	<1	<1
2,4,6-TCP	17·1	<1	2·76
2,4,5-TCP +	97·4	1·0	2·13.

ANALYST:	
CHECKED BY:	
DATE:	10/10/95

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
BH39D	1.5	4.5	8.5
DATE SAMPLED	10-10-95	→	→
TIME SAMPLED	15:10	15:30	16:24

RESULTS:

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PENOXY ACIDS =	ND	= 2.99	= 3.33
2,4-D	< 1	< 1	< 1
MCPA	< 1	< 1	< 1
2,4,5-T	< 1	< 1	1.86
MCPB +	< 1	2.99	1.47
PHENOLS =	7.69	= 18.21	= 17.59
2,4-DCP	< 1	25.7	14.5
PCOC	< 1	8.70	< 1
2,4,6-TCP	< 1	10.6	2.79
2,4,5-TCP +	2.69.	8.21	1.20.

ANALYST:	
CHECKED BY:	
DATE:	11/10/95.

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
39E.	1·5	5·5	8·5.
DATE SAMPLED	11-10-95	11-10-95	11-10-95.
TIME SAMPLED	08:40	09:30	10:17

RESULTS :

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PHENOXY ACIDS			
2,4-D	<1	<1	<1
MCPA	<1	<1	<1
2,4,5-T	<1	<1	<1
MCPB	<1	<1	<1
PHENOLS			
2,4-DCP	<1	<1	<1
PCOC	<1	<1	<1
2,4,6-TCP	<1	<1	<1
2,4,5-TCP	<1	<1	<1
UNKNOWNS (See Note 1)	<1	2·07 (1)	5·40 (1)

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	11/10/95.

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
39F.	0·5	7·5	9·7
DATE SAMPLED	11:10:95	11:10:95	11:10:95.
TIME SAMPLED	13:30	14:50	15:15.

RESULTS :

Analyte	Conc in mg/kg	Conc in mg/kg	Conc in mg/kg
	Sample No.1	Sample No.2	Sample No.3
PHENOXY ACIDS	551.3	57.1	1.25
2,4-D	25·3	19·5	1·25
MCPA	<1	25·0	<1
2,4,5-T	263	12·6	<1
MCPB	263	<1	<1
PHENOLS	546.2	17.8	ND
2,4-DCP	152	13·9	<1
PCOC	3·58	3·90	<1
2,4,6-TCP	243	<1	<1
2,4,5-TCP	135	<1	<1
UNKNOWNS (See Note 1)	12·6.		

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	12-10-95.

File: SITEREP.DOC

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
396	0.5	3.5	7.5
DATE SAMPLED	12-10-95	→	→
TIME SAMPLED	08:20	09:04	10:15

RESULTS :

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PHENOXY ACIDS	~~<1~~	~~<1~~	~~<1~~
2,4-D	<1	<1	<1
MCPA	<1	<1	<1
2,4,5-T	<1	<1	<1
MCPB	<1	<1	<1
PHENOLS	~~<1~~	~~<1~~	~~<1~~
2,4-DCP	<1	<1	<1
PCOC	<1	<1	<1
2,4,6-TCP	<1	<1	<1
2,4,5-TCP	<1	<1	<1
UNKNOWNS (See Note 1)			

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	12/12/95

File: SITEREP.DOC

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
39H	0.5	1.5	8.2
DATE SAMPLED	12-10-95	→	→
TIME SAMPLED	11:30	13:00	14:23

RESULTS :

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PHENOXY ACIDS			
2,4-D	<1	<1	<1
MCPA	<1	<1	<1
2,4,5-T	<1	<1	<1
MCPB	<1	<1	<1
PHENOLS			
2,4-DCP	<1	<1	<1
PCOC	<1	<1	<1
2,4,6-TCP	<1	<1	<1
2,4,5-TCP	<1	<1	<1
UNKNOWNS (See Note 1)			

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	13/12/95

File: SITEREP.DOC

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
39I	0.5	5.5	8.2
DATE SAMPLED	12-10-95	12-10-95	13-10-95
TIME SAMPLED	13:51	16:50	08:15

RESULTS :

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PHENOXY ACIDS			
2,4-D	337	<1	<1
MCPA	16.5	<1	<1
2,4,5-T	1714	<1	<1
MCPB	4.15	<1	<1
PHENOLS			
2,4-DCP	<1	<1	<1
PCOC	22.9	<1	<1
2,4,6-TCP	<1	<1	<1
2,4,5-TCP	37.5	<1	<1
UNKNOWNS (See Note 1)	4.6	<1	<1

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	C P Biesiek
CHECKED BY:	
DATE:	13/10/95

File: SITEREP.DOC

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
B'H39J	20.7		
DATE SAMPLED	20-10-95		
TIME SAMPLED	09:15		

RESULTS :

Analyte	Conc in mg/kg	Conc in mg/kg	Conc in mg/kg
	Sample No.1	Sample No.2	Sample No.3
PHENOXY ACIDS			
2,4-D	<1		
MCPA	<1		
2,4,5-T	<1		
MCPB	1.03		
PHENOLS			
2,4-DCP	<1		
PCOC	<1		
2,4,6-TCP	<1		
2,4,5-TCP	<1		
UNKNOWNS (See Note 1)			

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	24/11/95

File: SITEREP.DOC

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
39K	23'		
DATE SAMPLED	24-10-95		
TIME SAMPLED	15:00		

RESULTS :

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PHENOXY ACIDS			
2,4-D	5.11		
MCPA	1.60		
2,4,5-T	1.76		
MCPB	3.7C		
PHENOLS			
2,4-DCP	8.9C		
PCOC	<1		
2,4,6-TCP	2.55		
2,4,5-TCP	1.12		
UNKNOWNS (See Note 1)			

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	24/10/95

File: SITEREP.DOC

ENVIRONMENTAL ASSESSMENT PROJECT.

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
BH 4	20.7		
DATE SAMPLED	26-10-95		
TIME SAMPLED	16:00		

RESULTS :

Analyte	Conc in mg/kg	Conc in mg/kg	Conc in mg/kg
	Sample No.1	Sample No.2	Sample No.3
PHENOXY ACIDS			
2,4-D	<1		
MCPA	<1		
2,4,5-T	<1		
MCPB	<1		
PHENOLS			
2,4-DCP	<1		
PCOC	<1		
2,4,6-TCP	<1		
2,4,5-TCP	<1		
UNKNOWNS (See Note 1)			

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	27/10/95

File: SITEREP.DOC

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
BH 42	18.9		
DATE SAMPLED	26-10-95		
TIME SAMPLED	08:30		

RESULTS :

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PHENOXY ACIDS			
2,4-D	<1		
MCPA	<1		
2,4,5-T	<1		
MCPB	<1		
PHENOLS			
2,4-DCP	<1		
PCOC	<1		
2,4,6-TCP	<1		
2,4,5-TCP	<1		
UNKNOWNS (See Note 1)			

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	27/11/95

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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
16B	8.5	11.3	20.5
DATE SAMPLED	18-10-95	→	→
TIME SAMPLED	10:00	10:50	14:10

* PLEASE QUANTIFY DETECTABLE CONCENTRATIONS FOR XYLENE RANGE (PURGEABLE AROMATIC HYDROCARBONS)

RESULTS :

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PHENOXY ACIDS			
2,4-D	<1	<1	1.13
MCPA	<1	<1	<1
2,4,5-T	<1	<1	1.08
MCPB	<1	<1	<1
PHENOLS			
2,4-DCP	<1	<1	<1
PCOC	<1	<1	<1
2,4,6-TCP	<1	<1	<1
2,4,5-TCP	<1	<1	<1
UNKNOWNS (See Note 1)			

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	19/10/95

File: SITEREP.DOC

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ENVIRONMENTAL ASSESSMENT PROJECT.

SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
BH 16 C	10.5	14.45	20.5
DATE SAMPLED	19-10-95	19-10-95	19-10-95
TIME SAMPLED	09:55	11:05	14:10

RESULTS :

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PHENOXY ACIDS			
2,4-D	4.5	12.04	1.01
MCPA	2.42	<1	<1
2,4,5-T	15.11	13.04	1.60
MCPB	<1	<1	<1
PHENOLS			
2,4-DCP	17.35	<1	<1
PCOC	<1	<1	<1
2,4,6-TCP	1.53	<1	<1
2,4,5-TCP	17.33	<1	<1
UNKNOWNS (See Note 1)	30.55 (1)		

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	24/10/95

Note samples did not show significant amounts of unknowns.
CE.

File: SITEREP.DOC

ENVIRONMENTAL ASSESSMENT PROJECT.

DowElanco (N Z) Ltd.
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SAMPLE ANALYSIS REPORT (WATER)

SAMPLE IDENTIFICATION & RESULTS

BORE HOLE NO	43	43S	2	Field C
DATE SAMPLED	31/10/95	31/10/95	1/11/95	1/11/95
TIME SAMPLED	1100	1130	0900	am
Analyte	Conc in mg/L	Conc in mg/L	Conc in mg/L	Conc in mg/L
PHENOXY ACIDS				
2,4-D	<0.03	<0.03	<0.03	<0.03
MCPA	<0.03	<0.03	<0.03	<0.03
2,4,5-T	<0.03	<0.03	<0.03	<0.03
MCPB	<0.03	<0.03	<0.03	<0.03
PHENOLS				
2,4-DCP	<0.03	<0.03	<0.03	<0.03
PCOC	<0.03	<0.03	<0.03	<0.03
2,4,6-TCP	<0.03	<0.03	<0.03	<0.03
2,4,5-TCP	<0.03	<0.03	<0.03	<0.03
UNKNOWNS (See Note 1)	0.79 (1)	0.91 (1)	0.34 (1)	0.35 (1)

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	C Biesiek
CHECKED BY:	
DATE:	2/11/95

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ENVIRONMENTAL ASSESSMENT PROJECT.

SAMPLE ANALYSIS REPORT (WATER)

SAMPLE IDENTIFICATION & RESULTS

BORE HOLE NO	28			
DATE SAMPLED	13/10			
TIME SAMPLED	2m			
Analyte	Conc in mg/L	Conc in mg/L	Conc in mg/L	Conc in mg/L
PHENOXY ACIDS				
2,4-D	<0.03			
MCPA	<0.03			
2,4,5-T	<0.03			
MCPB	<0.03			
PHENOLS				
2,4-DCP	<0.03			
PCOC	<0.03			
2,4,6-TCP	<0.03			
2,4,5-TCP	<0.03			
UNKNOWNS (See Note 1)	0.359			

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	15/10/85

ENVIRONMENTAL ASSESSMENT PROJECT.

DowElanco (NZ) Ltd.
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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
24-10-95	SB1-1.5	SB1-2.5	
DATE SAMPLED	24-10-95	24-10-95	
TIME SAMPLED	08:54	09:10	

RESULTS :

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PHENOXY ACIDS			
2,4-D	<1	<1	
MCPA	<1	<1	
2,4,5-T	<1	<1	
MCPB	<1	<1	
PHENOLS			
2,4-DCP	<1	<1	
PCOC	<1	<1	
2,4,6-TCP	<1	<1	
2,4,5-TCP	<1	<1	
UNKNOWNS (See Note 1)			

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	24/10/95

File: SITEREP.DOC

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CONFIDENTIAL **ENVIRONMENTAL ASSESSMENT PROJECT.**

SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
39A.	2·9	5·5	8·5
DATE SAMPLED	9/10/95	9/10/95	9/10/95

RESULTS:

Analyte	Conc in mg/kg Sample No.1	Conc in mg/kg Sample No.2	Conc in mg/kg Sample No.3
PENOXY ACIDS =	74.56	19.86	2.11
2,4-D	<1	<1	<1
MCPA	<1	<1	<1
2,4,5-T	7·66	17·0	2·11
MCPB	66·9	2·86	<1
PHENOLS =	129.71	75,3	7.92
2,4-DCP	2·71	38·8	3·35
PCOC	<1	7·91	1·31
2,4,6-TCP	<1	8·79	1·19
2,4,5-TCP	127	19·8	2·07

ANALYST:	
CHECKED BY:	
DATE:	10/10/95

ENVIRONMENTAL ASSESSMENT PROJECT.

DowElanco (N Z) Ltd.
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SAMPLE ANALYSIS REPORT

SAMPLE IDENTIFICATION

BORE HOLE NO	DEPTH SAMPLE No.1	DEPTH SAMPLE No.2	DEPTH SAMPLE No.3
39A	20.1m		
DATE SAMPLED	13-10-95		
TIME SAMPLED	13:17		

RESULTS :

Analyte	Conc in mg/kg	Conc in mg/kg	Conc in mg/kg
	Sample No.1	Sample No.2	Sample No.3
PHENOXY ACIDS			
2,4-D	<1		
MCPA	<1		
2,4,5-T	<1		
MCPB	<1		
PHENOLS			
2,4-DCP	<1		
PCOC	<1		
2,4,6-TCP	<1		
2,4,5-TCP	<1		
UNKNOWNS (See Note 1)			

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	17/10/95

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ENVIRONMENTAL ASSESSMENT PROJECT.

SAMPLE ANALYSIS REPORT (WATER)

SAMPLE IDENTIFICATION & RESULTS

BORE HOLE NO	33	33S	4C	
DATE SAMPLED	13/10	13/10	13/10	
TIME SAMPLED	16:30	17:00	17:45	
Analyte	Conc in mg/L	Conc in mg/L	Conc in mg/L	Conc in mg/L
PHENOXY ACIDS				
2,4-D	0.229	0.235	<0.03	
MCPA	0.224	0.228	<0.03	
2,4,5-T	0.745	0.745	<0.03	
MCPB	<0.03	<0.03	<0.03	
PHENOLS				
2,4-DCP	<0.03	<0.03	<0.03	
PCOC	0.132	0.133	<0.03	
2,4,6-TCP	<0.03	<0.03	<0.03	
2,4,5-TCP	<0.03	<0.03	<0.03	
UNKNOWNS (See Note 1)	1.263	1.329	0.372	

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	16/10/95

ENVIRONMENTAL ASSESSMENT PROJECT.

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SAMPLE ANALYSIS REPORT (WATER)

SAMPLE IDENTIFICATION & RESULTS

BORE HOLE NO	37	34	28B	36
DATE SAMPLED	13/10	13/10	13/10	13/10
TIME SAMPLED	am	am	am	am
Analyte	Conc in mg/L	Conc in mg/L	Conc in mg/L	Conc in mg/L
PHENOXY ACIDS				
2,4-D	<0.03	<0.03	<0.03	<0.03
MCPA	<0.03	0.051	<0.03	<0.03
2,4,5-T	<0.03	<0.03	<0.03	<0.03
MCPB	<0.03	<0.03	<0.03	<0.03
PHENOLS				
2,4-DCP	<0.03	<0.03	<0.03	<0.03
PCOC	<0.03	<0.03	<0.03	<0.03
2,4,6-TCP	<0.03	<0.03	<0.03	<0.03
2,4,5-TCP	<0.03	<0.03	<0.03	<0.03
UNKNOWNS (See Note 1)	0.502	0.557	0.464	0.334

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	16/12/91

File: SITEREP.DOC

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ENVIRONMENTAL ASSESSMENT PROJECT.

SAMPLE ANALYSIS REPORT (WATER)

SAMPLE IDENTIFICATION & RESULTS

BORE HOLE NO	16A	41	42	
DATE SAMPLED	31/10/95	31/10/95	31/10/95	
TIME SAMPLED	0700	0915	0815	
Analyte	Conc in mg/L	Conc in mg/L	Conc in mg/L	Conc in mg/L
PHENOXY ACIDS				
2,4-D	<0·03	<0·03	<0·03	
MCPA	<0·03	<0·03	<0·03	
2,4,5-T	0·11	<0·03	<0·03	
MCPB	<0·03	<0·03	<0·03	
PHENOLS				
2,4-DCP	<0·03	<0·03	<0·03	
PCOC	<0·03	<0·03	<0·03	
2,4,6-TCP	<0·03	<0·03	<0·03	
2,4,5-TCP	<0·03	<0·03	0·03	
UNKNOWNS (See Note 1)	1 2013)	0·72(1)	0·77(1)	

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	C Brewer
CHECKED BY:	
DATE:	2/11/95

ENVIRONMENTAL ASSESSMENT PROJECT.

DowElanco (N Z) Ltd.
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GROUNDWATER. **SAMPLE ANALYSIS REPORT**

SAMPLE IDENTIFICATION

BORE HOLE NO	~~DEPTH~~ SAMPLE ~~No.1~~	~~DEPTH~~ SAMPLE ~~No.2~~	~~DEPTH~~ SAMPLE ~~No.3~~
	39	39B	15
DATE SAMPLED	12/10	12/10	12/10
TIME SAMPLED	14 10	15:00	13:00

RESULTS :

Analyte	Conc in ~~mg~~ µg/kg	Conc in ~~mg~~ µg/kg	Conc in ~~mg~~ µg/kg
	Sample No.1	Sample No.2	Sample No.3
PHENOXY ACIDS			
2,4-D	<0.03	<0.03	<0.03
MCPA	<0.03	<0.03	<0.03
2,4,5-T	<0.03	<0.03	<0.03
MCPB	<0.03	<0.03	<0.03
PHENOLS			
2,4-DCP	<0.03	<0.03	<0.03
PCOC	<0.03	<0.03	<0.03
2,4,6-TCP	<0.03	<0.03	<0.03
2,4,5-TCP	<0.03	<0.03	<0.03
UNKNOWNS (See Note 1)	0.125	0.623	0.756

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	16/1/95

File: SITEREP.DOC

ENVIRONMENTAL ASSESSMENT PROJECT.

DowElanco (N Z) Ltd.

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SAMPLE ANALYSIS REPORT (WATER)

SAMPLE IDENTIFICATION & RESULTS

BORE HOLE NO	39 PT 1	39 PT 2		
DATE SAMPLED	30/10/95	30/10/95		
TIME SAMPLED	4 pm	11 am		
Analyte	Conc in mg/L	Conc in mg/L	Conc in mg/L	Conc in mg/L
PHENOXY ACIDS				
2,4-D	<0.03	<0.03		
MCPA	<0.03	<0.03		
2,4,5-T	<0.03	0.032		
MCPB	<0.03	<0.03		
PHENOLS				
2,4-DCP	<0.03	<0.03		
PCOC	<0.03	<0.03		
2,4,6-TCP	<0.03	<0.03		
2,4,5-TCP	<0.03	<0.03		
UNKNOWNS (See Note 1)		0.02 (2)		

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	
CHECKED BY:	
DATE:	

ENVIRONMENTAL ASSESSMENT PROJECT.

SAMPLE ANALYSIS REPORT (WATER)

DowElanco (N.Z) Ltd.
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SAMPLE IDENTIFICATION & RESULTS

BORE HOLE NO	33 PT 3	33 PT 4	33 PT 5	
DATE SAMPLED	30/10/95	31/10/95	1/11/95	
TIME SAMPLED	2200	1000	1000	
Analyte	Conc in mg/L	Conc in mg/L	Conc in mg/L	Conc in mg/L
PHENOXY ACIDS				
2,4-D	< 0.03	< 0.03	< 0.03	
MCPA	< 0.03	< 0.03	< 0.03	
2,4,5-T	0.03	0.03	0.04	
MCPB	< 0.03	< 0.03	< 0.03	
PHENOLS				
2,4-DCP	< 0.03	< 0.03	< 0.03	
PCOC	< 0.03	< 0.03	< 0.03	
2,4,6-TCP	< 0.03	< 0.03	< 0.03	
2,4,5-TCP	< 0.03	< 0.03	< 0.03	
UNKNOWNS (See Note 1)	0.44 (1)	0.44 (1)	0.44 (1)	

Note 1 Compounds detected by the HPLC analysis that are of sufficiently different retention time (>+/-5% relative) to the analyte being determined have been quantified using response factors of the analyte with closest rt. These unknowns have been added together and reported as TOTAL UNKNOWNS with the number of unknowns printed in brackets beside the concentration in the result column.

ANALYST:	C Cleiek
CHECKED BY:	
DATE:	8/11/95

amdel

DowElanco (NZ) Ltd.
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INDUSTRIAL AND ENVIRONMENTAL SERVICES DIVISION
Trading as Australian Analytical Laboratories Pty Ltd
A.C.N. 001 491 667

Correspondence to:
P.O. Box 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 482 1922
Facsimile: (02) 482 1734

CERTIFICATE OF ANALYSIS

DATE: 8/12/95

REPORT No: 5S02492/1

CLIENT:	Groundwater Technology - New Zealand
SAMPLES:	2 x Waters
BATCH:	N1034
LAB Nos.:	12339 - 12340
DATE RECEIVED:	7/11/95
DATE COMMENCED:	9/11/95
METHOD:	APHA 18th Edn.

RESULTS:

All samples analysed as received.

See Attached page for results

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

amdel

DowElanco (N Z) Ltd.
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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02492/1

SAMPLES: 2 x WATERS, N1034 PAGE: 2 OF 2

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

SAMPLE I.D.	AAL meth. Ref.	PQL -	UNITS -	BH 391C	BH 2			
LAB I.D.	-	-		12339	12340			
BOD (20) *	W026	5	mg/L	11	18			

B2

* Nata Registration does not cover the performance of this service.

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

** = USEPA 9060 (Mod.)

Registered No. 1464

DowElanco (NZ) Ltd.
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INDUSTRIAL AND ENVIRONMENTAL SERVICES DIVISION

Trading as Australian Analytical Laboratories Pty Ltd
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5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 482 1922
Facsimile: (02) 482 1734

CERTIFICATE OF ANALYSIS

DATE: 20/11/95

REPORT No: 5S02034

QA/QC Appendix

CLIENT: Groundwater Technology New Zealand

SAMPLES: 15 x Waters

REFERENCE: N1034

LAB Nos.: 10486 - 10500

DATE RECEIVED: 18/10/95

DATE COMMENCED: 18/10/95

	TEST:	METHOD:
1.	Organochlorine Pesticides/PCB's	E011
2.	Total Petroleum Hydrocarbons	E081
3.	Methane, Ethane, Ethene	M11/1
4	VHC	E042
5.	BOD (5), BOD (20)	W026
6.	pH	W031
7.	Conductivity	W032
8.	Total Dissolved Solids	W033
9.	Chemical Oxygen Demand	E038
10.	Total Organic Carbon	W048

RESULTS:

All samples analysed as received.
This report replaces any preliminary results issued on 9/11/95
20/11/95
27/11/95

Please see attached pages for results

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

ORGANOCHLORINE PESTICIDES / PCBs (OC/PCB)
(PCB 1016,1221,1232,1242,1248,1254,1260)

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CLIENT: GROUNDWATR TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 11 x WATERS, N1034 PAGE: 2 OF 15

SAMPLE I.D.	PQL	BH 15	BH 40	BH 39	BH39B	BH33	BH33S
LAB I.D.	-	10486	10489	10490	10491	10492	10493
MOISTURE % w/w	-	-	-	-	-	-	-
H.C.B.	0.001	nd	nd	nd	nd	nd	nd
α-BHC	0.001	nd	nd	nd	nd	nd	nd
LINDANE	0.001	nd	nd	nd	nd	nd	nd
HEPTACHLOR	0.001	nd	nd	nd	nd	nd	nd
ALDRIN	0.001	nd	nd	nd	nd	nd	nd
β-BHC	0.001	nd	nd	nd	nd	nd	nd
δ-BHC	0.001	nd	nd	nd	nd	nd	nd
OXYCHLORDANE	0.001	nd	nd	nd	nd	nd	nd
HEPTACHLOR EPOXIDE	0.001	nd	nd	nd	nd	nd	nd
α-ENDOSULFAN	0.001	nd	nd	nd	nd	nd	nd
γ-CHLORDANE	0.001	nd	nd	nd	nd	nd	nd
α-CHLORDANE	0.001	nd	nd	nd	nd	nd	nd
trans- NONACHLOR	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDE's	0.001	nd	nd	nd	nd	nd	nd
DIELDRIN	0.001	nd	nd	nd	nd	nd	nd
ENDRIN	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDD's	0.001	nd	nd	nd	nd	nd	nd
β-ENDOSULPHAN	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDT's	0.001	nd	nd	nd	nd	nd	nd
ENDOSULPHAN SULPHATE	0.001	nd	nd	nd	nd	nd	nd
METHOXYCHLOR	0.001	nd	nd	nd	nd	nd	nd
PCB's	0.01	nd	nd	nd	nd	nd	nd
PCB IDENTIFICATION	-	-	-	-	-	-	-
SURROGATE % RECOVERY	-	99	107	105	113	114	110

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(W) Water: mg/l (ppm)

ORGANOCHLORINE PESTICIDES / PCBs (OC/PCB)
(PCB 1016,1221,1232,1242,1248,1254,1260)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 11 x WATERS, N1034 PAGE: 3 OF 15

SAMPLE I.D.	PQL	BH34	BH37	BH28	BH36	BH28B	Control Blank
LAB I.D.	-	10494	10495	10498	10499	10500	CB
MOISTURE % w/w	-	-	-	-	-	-	-
H.C.B.	0.001	nd	nd	nd	nd	nd	nd
α-BHC	0.001	nd	nd	nd	nd	nd	nd
LINDANE	0.001	nd	nd	nd	nd	nd	nd
HEPTACHLOR	0.001	nd	nd	nd	nd	nd	nd
ALDRIN	0.001	nd	nd	nd	nd	nd	nd
β-BHC	0.001	nd	nd	nd	nd	nd	nd
δ-BHC	0.001	nd	nd	nd	nd	nd	nd
OXYCHLORDANE	0.001	nd	nd	nd	nd	nd	nd
HEPTACHLOR EPOXIDE	0.001	nd	nd	nd	nd	nd	nd
α-ENDOSULFAN	0.001	nd	nd	nd	nd	nd	nd
γ-CHLORDANE	0.001	nd	nd	nd	nd	nd	nd
α-CHLORDANE	0.001	nd	nd	nd	nd	nd	nd
trans- NONACHLOR	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDE's	0.001	nd	nd	nd	nd	nd	nd
DIELDRIN	0.001	nd	nd	nd	nd	nd	nd
ENDRIN	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDD's	0.001	nd	nd	nd	nd	nd	nd
β-ENDOSULPHAN	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDT's	0.001	nd	nd	nd	nd	nd	nd
ENDOSULPHAN SULPHATE	0.001	nd	nd	nd	nd	nd	nd
METHOXYCHLOR	0.001	nd	nd	nd	nd	nd	nd
PCB's	0.01	nd	nd	nd	nd	nd	nd
PCB IDENTIFICATION	-	-	-	-	-	-	-
SURROGATE % RECOVERY	-	101	102	105	115	116	-

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(W) Water: mg/l (ppm)

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TOTAL PETROLEUM HYDROCARBONS/BTEX (TPH/BTEX)

DowElanco (N Z) Ltd.
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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 11 x WATERS PAGE: 4 OF 15

SAMPLE I.D.	PQL	BH 15	BH 40	BH 39	BH 39B	BH 33	BH 33S
LAB I.D.	-	10486	10489	10490	10491	10492	10493
DEPTH (m)	-	-	-	-	-	-	-
MOISTURE (% w/w)	-	-	-	-	-	-	-
TPH C6-C36 as C8	-	nd	nd	0.09 *	nd	nd	nd
C6-C9	10	nd	nd	0.09 *	nd	nd	nd
C10-C14	20	nd	nd	nd	nd	nd	nd
C15-C28	100	nd	nd	nd	nd	nd	nd
C29-C36	100	nd	nd	nd	nd	nd	nd

* Single Peak

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

Reported values may be lower than the stated TPH PQL's if individual hydrocarbons are detected. PQL's for individual hydrocarbons are 1 ppm for soils and 0.01 ppm for water.

amdel

TOTAL PETROLEUM HYDROCARBONS/BTEX (TPH/BTEX)

DowElanco (NZ) Ltd.

CONFIDENTIAL

CLIENT: GROUNDWATER TECHNOLOGY- NEW ZEALAND REPORT No: 5S02034

SAMPLES: 11 x WATERS

SAMPLE I.D.	PQL -	BH 34	BH 37	BH 28	BH 36	BH28B	Control Blank
LAB I.D.	-	10494	10495	10498	10499	10500	CB
DEPTH (m)	-	-	-	-	-	-	-
MOISTURE (% w/w)	-	-	-	-	-	-	-
TPH C6-C36 as C8	-	nd	nd	nd	nd	nd	nd
C6-C9	0.02	nd	nd	nd	nd	nd	nd
C10-C14	0.04	nd	nd	nd	nd	nd	nd
C15-C28	0.2	nd	nd	nd	nd	nd	nd
C29-C36	0.2	nd	nd	nd	nd	nd	nd

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

Reported values may be lower than the stated TPH PQL's if individual hydrocarbons are detected. PQL's for individual hydrocarbons are 1 ppm for soils and 0.01 ppm for water.

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CLIENT: GROUNDWATER TECHNOLOGY NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 6 OF 15

SAMPLE I.D.	PQL	BH 15	TRIP	FIELD	BH 40	BH 39	BH39B
LAB I.D.	-	10486	10487	10488	10489	10490	10491
METHANE	0.2	nd	nd	nd	nd	nd	nd
ETHANE	0.4	nd	nd	nd	nd	nd	nd
ETHENE	0.4	nd	nd	nd	nd	nd	nd

B2

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 7 OF 15

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SAMPLE I.D.	PQL	BH 33	BH 33S	BH 34	BH 37	TRIP B	FIELD B
LAB I.D.	-	10492	10493	10494	10495	10496	10497
METHANE	0.2	nd	nd	nd	nd	nd	nd
ETHANE	0.4	nd	nd	nd	nd	nd	nd
ETHENE	0.4	nd	nd	nd	nd	nd	nd

B2

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 8 OF 15

SAMPLE I.D.	PQL	BH 28	BH 36	BH 28B			
LAB I.D.	-	10498	10499	10500			
METHANE	0.2	nd	nd	nd			
ETHANE	0.4	nd	nd	nd			
ETHENE	0.4	nd	nd	nd			

B2

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

VOLATILE HALOGENATED COMPOUNDS (VHC)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 9 OF 15

SAMPLE I.D.	PQL	BH 15	TRIP	FIELD	BH 40	BH 39	BH 39B
LAB I.D.	-	10486	10487	10488	10489	10490	10491
VINYL CHLORIDE	0.001	nd	nd	nd	nd	nd	nd
CHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
TRICHLOROFLUOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
METHYLENE CHLORIDE	0.001	0.005	0.007	0.004	0.005	0.029	0.010
trans-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
cis-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	0.004	nd
CHLOROFORM	0.001	nd	0.003	0.004	0.002	0.018	0.003
1,1,1-TRICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
CARBON TETRACHLORIDE	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROETHANE	0.001	nd	nd	nd	nd	0.080	nd
TRICHLOROETHYLENE	0.001	0.001	nd	nd	0.001	0.011	nd
1,2-DICHLOROPROPANE	0.001	nd	nd	nd	nd	nd	nd
BROMODICHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
Trans-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
cis-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
1,1,2-TRICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
TETRACHLOROETHYLENE	0.001	nd	nd	nd	0.001	0.001	nd
DIBROMOCHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
CHLOROBENZENE	0.001	nd	nd	nd	nd	0.036	nd
BROMOFORM	0.001	nd	nd	nd	nd	nd	nd
1,1,2,2-TETRACHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
1,3-DICHLOROBENZENE (m)	0.001	nd	nd	nd	nd	nd	nd
1,4-DICHLOROBENZENE (p)	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROBENZENE (o)	0.001	nd	nd	nd	nd	nd	nd

PQL = Practical Quantitation Limit

nd = Not Detected
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

VOLATILE HALOGENATED COMPOUNDS (VHC)

DowElanco (NZ) Ltd.
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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 10 OF 15

SAMPLE I.D.	PQL	BH 33	BH 33S	BH 34	BH 37	TRIP B	FIELD B
LAB I.D.	-	10492	10493	10494	10495	10496	10497
VINYL CHLORIDE	0.001	nd	nd	nd	nd	nd	nd
CHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
TRICHLOROFLUOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
METHYLENE CHLORIDE	0.001	0.004	0.006	0.008	nd	0.008	0.012
trans-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
cis-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
CHLOROFORM	0.001	0.004	0.003	0.011	nd	0.004	0.002
1,1,1-TRICHLOROETHANE	0.001	nd	nd	0.002	nd	nd	nd
CARBON TETRACHLORIDE	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROETHANE	0.001	nd	nd	0.002	nd	nd	nd
TRICHLOROETHYLENE	0.001	0.001	0.001	0.011	nd	nd	nd
1,2-DICHLOROPROPANE	0.001	nd	nd	nd	nd	nd	nd
BROMODICHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
Trans-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
cis-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
1,1,2-TRICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
TETRACHLOROETHYLENE	0.001	nd	nd	0.001	nd	nd	nd
DIBROMOCHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
CHLOROBENZENE	0.001	nd	nd	nd	nd	nd	nd
BROMOFORM	0.001	nd	nd	nd	nd	nd	nd
1,1,2,2-TETRACHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
1,3-DICHLOROBENZENE (m)	0.001	nd	nd	nd	nd	nd	nd
1,4-DICHLOROBENZENE (p)	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROBENZENE (o)	0.001	nd	nd	nd	nd	nd	nd

PQL = Practical Quantitation Limit

nd = Not Detected
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

VOLATILE HALOGENATED COMPOUNDS (VHC)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 11 OF 15

SAMPLE I.D.	PQL	BH 28	BH 36	BH 28B	Control Blank		
LAB I.D.	-	10498	10499	10500	CB		
VINYL CHLORIDE	0.001	nd	nd	nd	nd		
CHLOROETHANE	0.001	nd	nd	nd	nd		
TRICHLOROFLUOROMETHANE	0.001	nd	nd	nd	nd		
1,1-DICHLOROETHYLENE	0.001	0.002	0.002	nd	nd		
METHYLENE CHLORIDE	0.001	0.008	0.008	0.008	nd		
trans-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd		
1,1-DICHLOROETHANE	0.001	nd	nd	nd	nd		
cis-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd		
CHLOROFORM	0.001	0.001	0.005	0.005	nd		
1,1,1-TRICHLOROETHANE	0.001	0.003	0.006	0.015	nd		
CARBON TETRACHLORIDE	0.001	nd	nd	nd	nd		
1,2-DICHLOROETHANE	0.001	nd	0.002	nd	nd		
TRICHLOROETHYLENE	0.001	nd	0.003	nd	nd		
1,2-DICHLOROPROPANE	0.001	nd	nd	nd	nd		
BROMODICHLOROMETHANE	0.001	nd	nd	nd	nd		
Trans-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd		
cis-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd		
1,1,2-TRICHLOROETHANE	0.001	nd	nd	nd	nd		
TETRACHLOROETHYLENE	0.001	nd	nd	nd	nd		
DIBROMOCHLOROMETHANE	0.001	nd	nd	0.001	nd		
CHLOROBENZENE	0.001	nd	nd	nd	nd		
BROMOFORM	0.001	nd	nd	nd	nd		
1,1,2,2-TETRACHLOROETHANE	0.001	nd	nd	nd	nd		
1,3-DICHLOROBENZENE (m)	0.001	nd	nd	nd	nd		
1,4-DICHLOROBENZENE (p)	0.001	nd	nd	nd	nd		
1,2-DICHLOROBENZENE (o)	0.001	nd	nd	nd	nd		

PQL = Practical Quantitation Limit

nd = Not Detected
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 9 x WATERS, N1034 PAGE: 12 OF 15

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

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SAMPLE I.D.	AAL meth. Ref.	PQL	UNITS	BH15	Trip	Field	BH40	BH39
LAB I.D.	-			10486	10487	10488	10489	10490
BOD (5)	W026	5	mg/L	nd	-	-	nd	nd
BOD (20) *	W026	5	mg/L	7	-	-	26	103
pH	W031	5	-	6.8	-	-	6.7	6.4
CONDUCTIVITY	W032	-	uS/cm	530	-	-	564	480
TOTAL DISSOLVED SOLIDS	W033	2	mg/L	258	-	-	277	308
CHEMICAL OXYGEN DEMAND	W038.1	2	mg/L	nd	-	-	nd	28
TOTAL ORGANIC CARBON	W048 **	25	mg/L	2	-	-	2	2

B2

* BOD (20) is not a registered Nata Test.

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

** = USEPA 9060 (Mod.)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 9 x WATERS, N1034

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

SAMPLE I.D.	AAL meth. Ref.	PQL -	UNITS -	BH39B	BH33	BH33S	BH34	BH37
LAB I.D.	-	-		10491	10492	10493	10494	10495
BOD (5)	W026	5	mg/L	nd	nd	nd	15	nd
BOD (20) *	W026	5	mg/L	6	6	21	51	16
pH	W031	-	-	6.5	6.2	6.2	6.4	5.8
CONDUCTIVITY	W032	2	uS/cm	4	420	385	678	423
TOTAL DISSOLVED SOLIDS	W033	2	mg/L	nd	270	247	316	263
CHEMICAL OXYGEN DEMAND	W038.1	25	mg/L	nd	170	75	nd	nd
TOTAL ORGANIC CARBON	W048 **	1	mg/L	nd	6	4	14	nd

B2

* BOD (20) is not a registered Nata test.

PQL = Practical Quantitation Limit

** = USEPA 9060 (Mod.)

nd = Less than PQL

- = Not Applicable

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 9 x WATERS, N1034 PAGE: 14 OF 15

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

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SAMPLE I.D.	AAL meth. Ref.	PQL -	UNITS -	TRIP B	FIELD B	BH28	BH36	BH28B
LAB I.D.	-	-		10496	10497	10498	10499	10500
BOD (5)	W026	5	mg/L	-	-	nd	nd	nd
BOD (20) *	W026	5	mg/L	-	-	10	nd	nd
pH	W031	-	-	-	-	6.4	6.4	6.2
CONDUCTIVITY	W032	2	uS/cm	-	-	552	602	3
TOTAL DISSOLVED SOLIDS	W033	2	mg/L	-	-	240	324	nd
CHEMICAL OXYGEN DEMAND	W038.1	25	mg/L	-	-	nd	nd	nd
TOTAL ORGANIC CARBON	W048 **	1	mg/L	-	-	nd	3	nd

B2

* BOD (20) is not a registered Nata Test.

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

** = USEPA 9060 (Mod.)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: WATERS

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

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SAMPLE I.D.	AAL meth. Ref.	PQL -	UNITS -	Control Blank				
LAB I.D.	-	-		CB				
BOD (5)	W026	5	mg/L	nd				
BOD (20) *	W026	5	mg/L	nd				
pH	W031	-	-	-				
CONDUCTIVITY	W032	2	uS/cm	nd				
TOTAL DISSOLVED SOLIDS	W033	2	mg/L	nd				
CHEMICAL OXYGEN DEMAND	W038.1	25	mg/L	nd				
TOTAL ORGANIC CARBON	W048 **	1	mg/L	nd				

B2

* BOD (20) is not a registered Nata Test

PQL = Practical Quantitation Limit

nd = Less than PQL
\- = Not Applicable

** = USEPA 9060 (Mod.)

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QA/QC APPENDIX No. 5S02034

ANALYTE	No. of Pages.
Organochlorine Pesticides/PCB's	3
Total Petroleum Hydrocarbons	2
GC/MS Volatiles	2
Volatile Halogenated Carbons	4
Nutrients	2
TOTAL No. of PAGES	13

Other Criteria: (except Inorganics/Nutrients)

Retention Time Window	:	Within Acceptance Criteria
Check Standard	:	Within Acceptance Criteria
Recalibration	:	Within 15%

Signed:

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

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LABORATORY DUPLICATE - QA/QC REPORT

CLIENT: GROUNDWATER- NEW ZEALAND

REPORT No: 5S02054

SAMPLES: 15 x WATERS, N1034

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SAMPLE I.D.	UNITS -	PQL	TRIP B	TRIP B Duplicate	Average	RPD %	Comments
LAB I.D.	-		10496	10496			
METHANE	mg/L	0.2	nd	nd	nd	-	
ETHANE	mg/L	0.4	nd	nd	nd	-	
ETHENE	mg/L	0.4	nd	nd	nd	-	

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

RPD = Relative Percent Difference

QA/QC data within acceptance criteria

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LABORATORY DUPLICATE - QA/QC REPORT

CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034

DowElanco (NZ) Ltd.

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SAMPLE I.D.	UNITS	PQL	BH 28	BH 28 Duplicate	Average	RPD %	Comments
LAB I.D.	-		10498	10498			
METHANE	mg/L	0.2	nd	nd	nd	-	
ETHANE	mg/L	0.4	nd	nd	nd	-	
ETHENE	mg/L	0.4	nd	nd	nd	-	

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

RPD = Relative Percent Difference

QA/QC data within acceptance criteria

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LABORATORY DUPLICATE - QA/QC REPORT

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALANI REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034

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SAMPLE I.D.	UNITS	PQL	33	Duplicate	Average	RPD %	Comments
LAB I.D.	-		10492	10492			
CHEMICAL OXYGEN DEMAND	mg/L	25	160	180	170	12	
BOD (5)	mg/L	5	nd	nd	nd	-	
pH	-	-	6.2	6.2	6.2	0	
CONDUCTIVITY	uS/cm	2	421	420	420.5	<1	
TOTAL DISSOLVED SOLIDS	mg/L	5	170	269	269.5	<1	
BOD (20)	mg/L	5	6	7	6.5	15	

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

RPD = Relative Percent Difference

QA/QC data within acceptance criteria

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MATRIX SPIKE/CHECK SOLUTIONS - QA/QC REPORT

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 2 OF 2

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ANALYTE	UNITS -	PQL -	Matrix Spike/ Check Solution	Results	Acceptance Limits	Comments
TOTAL ORGANIC CARBON	mg/L	1	100	105	± 10%	
BOD (5)	mg/L	5	200	240	± 20%	
pH	-	-	7.4	7.5	± 0.2	
CONDUCTIVITY	uS/cm	2	303	305	± 10%	
TOTAL DISSOLVED SOLIDS	mg/L	5	293	273	± 10%	

PQL = Practical Quantitation Limit

nd = Less than PQL

- = Not Applicable

QA/QC data within acceptable criteria

DowElanco (NZ) Ltd.
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Australian Analytical Laboratories

OC's "A" - Matrix Spike/Duplicate

Reference No: 102011a1
Matrix ID: mb (water)

Analyte	Spike Level (ppm)	Level	Detected	Recovery Details			
		Spike 1 (ppm)	Spike 2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
HCB	0.05	0.05	0.05	100%	98%	99%	1%
alpha- BHC	0.05	0.05	0.05	97%	96%	97%	1%
Lindane	0.05	0.05	0.05	99%	98%	98%	1%
Heptachlor	0.05	0.05	0.05	99%	97%	98%	1%
Aldrin	0.05	0.05	0.05	99%	98%	98%	1%
beta- BHC	0.05	0.05	0.05	97%	105%	101%	8%
Oxychlordane	0.05	0.05	0.05	99%	98%	98%	1%
Hept.Epoxide	0.05	0.05	0.05	98%	98%	98%	1%
o,p'-DDE	0.05	0.05	0.05	99%	97%	98%	2%
Tech.Chlordane	0.15	0.15	0.15	99%	98%	99%	1%
p,p'-DDE	0.05	0.05	0.05	99%	98%	98%	1%
Dieldrin	0.05	0.05	0.05	100%	100%	100%	0%
Endrin	0.05	0.05	0.05	100%	99%	100%	1%
o,p'-DDD	0.05	0.05	0.05	100%	99%	100%	1%
p,p'-DDD	0.05	0.04	0.05	90%	103%	97%	14%
p,p'-DDT	0.05	0.05	0.05	98%	97%	97%	2%
Methoxychlor	0.05	0.04	0.04	84%	84%	84%	0%

Spike Units: mg/l ppm

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

Australian Analytical Laboratories

OC's "A" - Sample Duplicates

Reference No: 102011a1
Matrix Id: Water - 10492

Analyte	PQL	Conc 1	Conc 2	Average	RPD (%)
HCB	0.001	ND	ND	ND	-
alpha- BHC	0.001	ND	ND	ND	-
Lindane	0.001	ND	ND	ND	-
Heptachlor	0.001	ND	ND	ND	-
Aldrin	0.001	ND	ND	ND	-
beta- BHC	0.001	ND	ND	ND	-
Oxychlordane	0.001	ND	ND	ND	-
Hept.Epoxide	0.001	ND	ND	ND	-
o,p'-DDE	0.001	ND	ND	ND	-
Tech.Chlordane	0.003	ND	ND	ND	-
p,p'-DDE	0.001	ND	ND	ND	-
Dieldrin	0.001	ND	ND	ND	-
Endrin	0.001	ND	ND	ND	-
o,p'-DDD	0.001	ND	ND	ND	-
o,p'-DDT	0.001	ND	ND	ND	-
p,p'-DDD	0.001	ND	ND	ND	-
p,p'-DDT	0.001	ND	ND	ND	-
Methoxychlor	0.001	ND	ND	ND	-

Units: mg/l (ppm)

nd = Not Detected
- = Not Applicable
* = Indeterminate Value

All results are within the acceptance criteria

Water samples
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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Australian Analytical Laboratories

OC's "B" - Sample Duplicates

Reference No: 102011a1 **Page:** 3 of 3

Matrix Id: Water - 10492

Analyte	PQL	Conc 1	Conc 2	Average	RPD (%)
delta - BHC	0.001	ND	ND	ND	-
a-Endosulfan	0.001	ND	ND	ND	-
b-Endosulfan	0.001	ND	ND	ND	-
End. Sulphate	0.001	ND	ND	ND	-

Units: mg/l (ppm)

nd = Not Detected
- = Not Applicable
* = Indeterminate Value

All results are within the acceptance criteria

Water samples
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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TPH - Matrix Spike/Duplicate

Reference No: 102801h1 **Page:** 1 of 2
Matrix ID: mb - water

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
TPH C20-C28	5.00	5.56	4.57	111%	91%	101%	20%
C8	0.50	0.53	0.50	106%	100%	103%	6%

Spike Units: mg/L

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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TPH - Sample Duplicates

Reference No: 102801H1
Matrix Id: 10492

Analyte	PQL	Conc 1	Conc 2	Average	RPD (%)
TPH C6 - C36	-	ND	ND	ND	-
C6 - C9	0.02	ND	ND	ND	-
C10 - C14	0.04	ND	ND	ND	-
C15 - C28	0.2	ND	ND	ND	-
C29 - C36	0.2	ND	ND	ND	-

Units: mg/L (ppm)

nd = Not Detected
- = Not Applicable
* = Indeterminate Value

All results are within QA/QC acceptance criteria :

Water samples
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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VHC's "A" - Matrix Spike/Duplicate

Reference No: 103004d1
Matrix ID: mb

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
Vinyl Chloride	0.008	0.0087	0.0091	108%	113%	111%	5%
Chloroethane	0.002	0.0023	0.0023	115%	117%	116%	1%
Trichorofluoromethane	0.002	0.0019	0.0020	93%	102%	97%	10%
1,1-Dichloroethylene	0.002	0.0018	0.0021	90%	105%	98%	15%
Methylene Chloride	0.002	0.0023	0.0020	114%	101%	108%	12%
trans-1,2-Dichloroethylene	0.002	0.0023	0.0020	114%	101%	107%	13%
1,1-Dichloroethane	0.002	0.0021	0.0021	107%	103%	105%	4%
Chloroform	0.002	0.0024	0.0024	121%	121%	121%	1%
1,1,1-Trichloroethane	0.002	0.0023	0.0024	115%	118%	116%	3%
Carbon Tetrachloride	0.002	0.0022	0.0021	111%	106%	108%	5%
1,2-Dichloroethane	0.002	0.0026	0.0022	128%	110%	119%	15%
Trichloroethylene	0.002	0.0026	0.0024	128%	118%	123%	8%
1,2-Dichloropropane	0.002	0.0021	0.0022	106%	108%	107%	2%
Bromodichloromethane	0.002	0.0020	0.0022	100%	109%	104%	8%
trans-1,3-Dichloropropene	0.002	0.0023	0.0019	116%	96%	106%	19%
1,1,2-Trichloroethane	0.002	0.0018	0.0021	92%	106%	99%	14%
Tetrachloroethylene	0.002	0.0020	0.0021	101%	107%	104%	6%
Dibromochloromethane	0.002	0.0021	0.0023	103%	114%	109%	11%

Spike Units: mg/L (ppm)

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

Australian Analytical Laboratories

VHC's "B" - Matrix Spike/Duplicate

Reference No: 103004d1
Matrix ID: mb

Analyte	Spike Level (ppm)	Level	Detected	Recovery Details			
		Spike 1 (ppm)	Spike 2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
Chlorobenzene	0.002	0.0020	0.0019	98%	97%	98%	2%
Bromoform	0.002	0.0020	0.0020	98%	102%	100%	3%
1,1,2,2 - Tetrachloroethane	0.002	0.0022	0.0021	112%	106%	109%	6%
1,3 - Dichlorobenzene	0.002	0.0022	0.0019	108%	93%	101%	15%
1,4 - Dichlorobenzene	0.002	0.0021	0.0021	105%	103%	104%	2%
1,2 - Dichlorobenzene	0.002	0.0025	0.0023	123%	117%	120%	5%

Spike Units: mg/L (ppm)

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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Australian Analytical Laboratories

VHC's "A" - Sample Duplicates

Reference No: 103004d1 **Page:** 3 of 4
Matrix Id: Water - 10492

Analyte	PQL	Conc 1	Conc 2	Average	RPD (%)
Vinyl Chloride	0.001	ND	ND	ND	-
Chloroethane	0.001	ND	ND	ND	-
Trichorofluoromethane	0.001	ND	ND	ND	-
1,1-Dichloroethylene	0.001	ND	ND	ND	-
Methylene Chloride	0.001	0.003	0.004	0.004	29%
trans-1,2-Dichloroethylene	0.001	ND	ND	ND	-
1,1-Dichloroethane	0.001	ND	ND	ND	-
cis-1,2-Dichloroethylene	0.001	ND	ND	ND	-
Chloroform	0.001	0.004	0.004	0.004	0%
1,1,1-Trichloroethane	0.001	ND	ND	ND	-
Carbon Tetrachloride	0.001	ND	ND	ND	-
1,2-Dichloroethane	0.001	ND	ND	ND	-
Trichloroethylene	0.001	0.001	0.001	0.001	0%
1,2-Dichloropropane	0.001	ND	ND	ND	-
Bromodichloromethane	0.001	ND	ND	ND	-
trans-1,3-Dichloropropene	0.001	ND	ND	ND	-
cis-1,3-Dichloropropene	0.001	ND	ND	ND	-
1,1,2-Trichloroethane	0.001	ND	ND	ND	-
Tetrachloroethylene	0.001	ND	ND	ND	-
Dibromochloromethane	0.001	ND	ND	ND	-

Units: mg/L (ppm)

nd = Not Detected
- = Not Applicable
* = Indeterminate Value

All results are within the acceptance criteria

Water samples
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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VHC's "B" - Sample Duplicates

Reference No: 103004d1 **Page:** 4 of 4
Matrix Id: Water - 10492

Analyte	PQL	Conc 1	Conc 2	Average	RPD (%)
Chlorobenzene	0.001	ND	ND	ND	-
Bromoform	0.001	ND	ND	ND	-
1,1,2,2-Tetrachloroethane	0.001	ND	ND	ND	-
1,3 - Dichlorobenzene	0.001	ND	ND	ND	-
1,4 - Dichlorobenzene	0.001	ND	ND	ND	-
1,2 - Dichlorobenzene	0.001	ND	ND	ND	-

Units: mg/L (ppm)

nd = Not Detected
- = Not Applicable
* = Indeterminate Value

All results are within the acceptance criteria

Water samples
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.

Registered No. 1464

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INDUSTRIAL AND ENVIRONMENTAL SERVICES DIVISION

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CERTIFICATE OF ANALYSIS

DATE: 24/11/95

REPORT No: 5S02492

QA/QC Appendix

CLIENT: Groundwater Technology - New Zealand

SAMPLES: 5 x Waters

REFERENCE: N1034 Dow Elanco

LAB Nos.: 12339 - 12343

DATE RECEIVED: 7/11/95

DATE COMMENCED: 9/11/95

	TEST:	METHOD:
1.	Organochlorine Pesticides	E011
2.	Total Petroleum Hydrocarbons	E081
3.	Volatile Halogenated Carbons	E042
4.	Methane, Ethane, Ethene	M11/1 *
5.	Metals	E310/E330
6.	Arsenic	E311
7.	Mecury	E312
8.	Inorganics/Nutrients	APHA 18th Ed. (Please see results sheet for individual method numbers.)

RESULTS:

All samples analysed as received.
This report replaces preliminary results issued on 10/11/95, 20/11/95, 21/11/95, 22/11/95, 23/11/95, 24/11/95

* Amdel-Sydney is not Nata registered for Methane, Ethane, Ethene.

Please see attached pages for results

R G Mooney

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

ORGANOCHLORINE PESTICIDES / PCBs (OC/PCB)
(PCB 1016,1221,1232,1242,1248,1254,1260)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02492

DowElanco (N Z) Ltd.

SAMPLES: 4 x WATERS, N1034

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SAMPLE I.D.	PQL -	BH 39K	BH 39JB	BH 39J	BH2	Control Blank	
LAB I.D.	-	12339	12340	12341	12342	CB	
H.C.B.	0.001	nd	nd	nd	nd	nd	
α-BHC	0.001	nd	nd	nd	nd	nd	
LINDANE	0.001	nd	nd	nd	nd	nd	
HEPTACHLOR	0.001	nd	nd	nd	nd	nd	
ALDRIN	0.001	nd	nd	nd	nd	nd	
β-BHC	0.001	nd	nd	nd	nd	nd	
δ-BHC	0.001	nd	nd	nd	nd	nd	
OXYCHLORDANE	0.001	nd	nd	nd	nd	nd	
HEPTACHLOR EPOXIDE	0.001	nd	nd	nd	nd	nd	
α-ENDOSULFAN	0.001	nd	nd	nd	nd	nd	
γ-CHLORDANE	0.001	nd	nd	nd	nd	nd	
α-CHLORDANE	0.001	nd	nd	nd	nd	nd	
trans- NONACHLOR	0.001	nd	nd	nd	nd	nd	
TOTAL DDE's	0.001	nd	nd	nd	nd	nd	
DIELDRIN	0.001	nd	nd	nd	nd	nd	
ENDRIN	0.001	nd	nd	nd	nd	nd	
TOTAL DDD's	0.001	nd	nd	nd	nd	nd	
β-ENDOSULPHAN	0.001	nd	nd	nd	nd	nd	
TOTAL DDT's	0.001	nd	nd	nd	nd	nd	
ENDOSULPHAN SULPHATE	0.001	nd	nd	nd	nd	nd	
METHOXYCHLOR	0.001	nd	nd	nd	nd	nd	
PCB's	0.01	nd	nd	nd	nd	nd	
PCB IDENTIFICATION	-	-	-	-	-	-	
SURROGATE % RECOVERY	-	98	81	79	93	-	

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(W) Water: mg/l (ppm)

TOTAL PETROLEUM HYDROCARBONS/BTEX (TPH/BTEX)

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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02492

SAMPLES: 4 x WATERS, N1034 PAGE: 3 OF 7

SAMPLE I.D.	PQL	BH 39K	BH 39JB	BH 39J	BH 2	Control Blank	
LAB I.D.	-	12339	12340	12341	12342	CB	
DEPTH (m)	-	-	-	-	-	-	
MOISTURE (% w/w)	-	-	-	-	-	-	
TPH C6-C36 as C8	-	7.50	1.6	13.5	0.15	nd	
C6-C9	0.02	0.5	nd	1.5	nd	nd	
C10-C14	0.04	5.4	0.2	10	0.15	nd	
C15-C28	0.2	1.6	1.4	2.0	nd	nd	
C29-C36	0.2	nd	nd	nd	nd	nd	

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

Reported values may be lower than the stated TPH PQL's if individual hydrocarbons are detected. PQL's for individual hydrocarbons are 1 ppm for soils and 0.01 ppm for water.

VOLATILE HALOGENATED COMPOUNDS (VHC)
CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02492

DowElanco (N Z) Ltd.

SAMPLES: 5 x WATERS, N1034

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SAMPLE I.D.	PQL	BH 39K	BH 39JB	BH 39J	BH 2	Field C	Control Blank
LAB I.D.	-	12339	12340	12341	12342	12343	CB
VINYL CHLORIDE	0.001	nd	nd	nd	nd	nd	nd
CHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
TRICHLOROFLUOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
METHYLENE CHLORIDE	0.001	0.070	0.035	0.078	0.018	0.026	nd
trans-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
cis-1,2-DICHLOROETHYLENE	0.001	0.003	nd	0.006	nd	nd	nd
CHLOROFORM	0.001	0.031	0.005	0.020	0.001	0.005	nd
1,1,1-TRICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
CARBON TETRACHLORIDE	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROETHANE	0.001	0.16	nd	0.14	nd	nd	nd
TRICHLOROETHYLENE	0.001	0.023	nd	0.023	nd	nd	nd
1,2-DICHLOROPROPANE	0.001	nd	nd	nd	nd	nd	nd
BROMODICHLOROMETHANE	0.001	nd	0.002	nd	nd	0.002	nd
Trans-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
cis-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
1,1,2-TRICHLOROETHANE	0.001	0.001	nd	0.001	nd	nd	nd
TETRACHLOROETHYLENE	0.001	0.001	nd	0.001	nd	nd	nd
DIBROMOCHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
CHLOROBENZENE	0.001	0.027	nd	0.13	nd	nd	nd
BROMOFORM	0.001	nd	nd	nd	nd	nd	nd
1,1,2,2-TETRACHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
1,3-DICHLOROBENZENE (m)	0.001	nd	nd	nd	nd	nd	nd
1,4-DICHLOROBENZENE (p)	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROBENZENE (o)	0.001	nd	nd	0.001	nd	nd	nd
SURROGATE (% REC)	-	93	104	91	92	102	97

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02492

DowElanco (N Z) Ltd.

SAMPLES: 4 x WATERS, N1034 PAGE: 5 OF 7

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SAMPLE I.D.	PQL -	BH 39K	BH 39JB	BH 39J	BH 2		
LAB I.D.	-	12339	12340	12341	12342		
METHANE	0.2	nd	nd	nd	nd		
ETHANE	0.4	nd	nd	nd	nd		
ETHENE	0.4	nd	nd	nd	nd		

B2

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND

REPORT No: 5S02492

SAMPLES: 2 x WATERS, N1034

DowElanco (NZ) Ltd.

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

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SAMPLE I.D.	AAL meth. Ref.	PQL	UNITS	BH 39K	BH 2	Control Blank		
LAB I.D.	-			12339	12342	CB		
TOTAL ARSENIC	E311	0.05	mg/L	nd	nd	nd		
TOTAL MERCURY	E312	0.001	mg/L	nd	nd	nd		
TOTAL CADMIUM	E310/E330	0.01	mg/L	nd	nd	nd		
TOTAL CHROMIUM	E310/E330	0.05	mg/L	nd	nd	nd		
TOTAL LEAD	E310/E330	0.05	mg/L	nd	nd	nd		
TOTAL COPPER	E310/E330	0.05	mg/L	nd	nd	nd		
TOTAL IRON	E310/E330	0.05	mg/L	7.0	0.3	nd		
TOTAL ZINC	E310/E330	0.05	mg/L	nd	nd	nd		
TOTAL SILVER	E310/E330	0.01	mg/L	nd	nd	nd		
TOTAL NICKEL	E310/E330	0.05	mg/L	nd	nd	nd		

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

Dissolved metals are filtered through 0.45u filter

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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02492

SAMPLES: 4 x WATERS, N1034 PAGE: 7 OF 7

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

DowElanco (N Z) Ltd.

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SAMPLE I.D.	AAL meth. Ref.	PQL	UNITS	BH 39K	BH 39JB	BH 39J	BH 2	Control Blank
LAB I.D.	-			12339	12340	12341	12342	CB
BOD (5)	W026	5	mg/L	16	-	-	nd	-
TOTAL ORGANIC CARBON	W048 **	1	mg/L	24	nd	20	2	nd
SUSPENDED SOLIDS	W021	2	mg/L	515	-	-	275	nd
ACIDITY	W049	1	mg/L	98	-	-	39	nd
TOTAL ALKALINITY as CaCO3	W005	1	mg/L	275	-	-	38	nd
HARDNESS as CaCO3 (Calc)	W011.1	1	mg/L	210	-	-	73	nd
CHEMICAL OXYGEN DEMAND	W038.1	25	mg/L	310	-	-	165	nd
TOTAL CARBON	W048 **	1	mg/L	98	-	-	11	nd
INORGANIC CARBON	W048 **	1	mg/L	64	-	-	8	nd

B2

PQL = Practical Quantitation Limit

** = USEPA 9060 (Mod.)

nd = Less than PQL

- = Not Applicable

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QA/QC APPENDIX No. 5S02492

ANALYTE	No. of Pages.
Organochlorine Pesticides	1
Total Petroleum Hydrocarbons	1
Volatile Halogenated Carbons	2
Inorganics/Nutrients	1
TOTAL No. of PAGES	5

Other Criteria: (except Inorganics/Nutrients)

Retention Time Window	:	Within Acceptance Criteria
Check Standard	:	Within Acceptance Criteria
Recalibration	:	Within 15%

Signed:

R G Mooney

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

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MATRIX SPIKE/CHECK SOLUTIONS - QA/QC REPORT

CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02492

SAMPLES: 4 x WATERS, N1034

DowElanco (NZ) Ltd.

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ANALYTE	UNITS -	PQL -	Matrix Spike/ Check Solution	Results	Acceptance Limits	Comments
TOTAL ORGANIC CARBON	mg/L	1	100	101	± 10%	
TOTAL MERCURY	mg/L	0.001	0.01	0.009	± 10%	
TOTAL IRON	mg/L	0.05	1.0	0.98	± 10%	
TOTAL COPPER	mg/L	0.05	0.5	0.49	± 10%	
TOTAL ZINC	mg/L	0.05	0.5	0.53	± 10%	
TOTAL LEAD	mg/L	0.05	1.0	1.03	± 10%	
TOTAL CADMIUM	mg/L	0.01	0.5	0.52	± 10%	
TOTAL CHROMIUM	mg/L	0.01	1.0	0.98	± 10%	
SUSPENDED SOLIDS	mg/L	2	100	99	± 10%	
BOD (5)	mg/L	5	200	223	± 20%	

PQL = Practical Quantitation Limit

nd = Less Than PQL

\- = Not Applicable

QA/QC data within acceptable criteria

DowElanco (N Z) Ltd.

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OC's "A" - Matrix Spike/Duplicate

Reference No: 110909a1 **Page:** 1 of 1

Matrix ID: mb (water)

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
HCB	0.05	0.05	0.05	97%	97%	97%	0%
alpha- BHC	0.05	0.05	0.05	105%	107%	106%	2%
Lindane	0.05	0.05	0.05	105%	106%	105%	2%
Heptachlor	0.05	0.05	0.05	97%	96%	97%	0%
Aldrin	0.05	0.05	0.05	102%	102%	102%	0%
beta- BHC	0.05	0.05	0.05	106%	105%	105%	1%
Oxychlordane	0.05	0.05	0.05	103%	103%	103%	0%
Hept.Epoxide	0.05	0.05	0.05	105%	105%	105%	1%
o,p'-DDE	0.05	0.05	0.05	103%	105%	104%	1%
Tech.Chlordane	0.15	0.15	0.16	103%	104%	104%	1%
p,p'-DDE	0.05	0.05	0.05	104%	105%	104%	1%
Dieldrin	0.05	0.05	0.05	105%	106%	105%	1%
Endrin	0.05	0.05	0.05	98%	100%	99%	2%
o,p'-DDD	0.05	0.05	0.05	98%	100%	99%	2%
p,p'-DDD	0.05	0.05	0.06	107%	110%	109%	2%
p,p'-DDT	0.05	0.05	0.05	97%	99%	98%	2%
Methoxychlor	0.05	0.04	0.04	87%	87%	87%	0%

Spike Units: mg/l ppm

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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Australian Analytical Laboratories

PH - Matrix Spike/Duplicate

eference No: 111201h1 **Page:** 1 of 1
latrix ID: MB - WATER

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
PH C20-C28	5.00	5.54	4.7	111%	95%	103%	16%
8	0.50	0.64	0.6	128%	118%	123%	8%

Spike Units: mg/L (ppm)

nd = Not Detected
- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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VHC's "A" - Matrix Spike/Duplicate

Reference No: 111104d1 **Page:** 1 of 2

Matrix ID: MB

Analyte	Spike Level (ppm)	Level Detected		Recovery Details			
		Spike 1 (ppm)	Spike 2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
Vinyl Chloride	0.008	0.0085	0.0077	106%	96%	101%	10%
Chloroethane	0.002	0.0021	0.0020	105%	98%	101%	7%
Trichorofluoromethane	0.002	0.0021	0.0024	103%	121%	112%	16%
1,1-Dichloroethylene	0.002	0.0024	0.0024	121%	119%	120%	1%
Methylene Chloride	0.002	0.0023	0.0022	113%	109%	111%	3%
trans-1,2-Dichloroethylene	0.002	0.0022	0.0020	108%	100%	104%	8%
1,1-Dichloroethane	0.002	0.0022	0.0022	110%	108%	109%	2%
Chloroform	0.002	0.0021	0.0021	103%	104%	104%	0%
1,1,1-Trichloroethane	0.002	0.0022	0.0021	108%	105%	106%	3%
Carbon Tetrachloride	0.002	0.0021	0.0021	106%	106%	106%	0%
1,2-Dichloroethane	0.002	0.0022	0.0024	110%	119%	114%	7%
Trichloroethylene	0.002	0.0021	0.0021	103%	103%	103%	0%
1,2-Dichloropropane	0.002	0.0019	0.0021	94%	105%	100%	11%
Bromodichloromethane	0.002	0.0023	0.0023	117%	113%	115%	3%
trans-1,3-Dichloropropene	0.002	0.0020	0.0021	102%	107%	104%	5%
cis-1,3-Dichloropropene	0.002	0.0019	0.0022	94%	109%	102%	15%
1,1,2-Trichloroethane	0.002	0.0021	0.0022	105%	110%	108%	4%
Tetrachloroethylene	0.002	0.0021	0.0021	105%	106%	106%	1%
Dibromochloromethane	0.002	0.0021	0.0017	103%	85%	94%	19%

Spike Units: mg/L (ppm)

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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VHC's "B" - Matrix Spike/Duplicate

Reference No: 111104d1 **Page:** 2 of 2

Matrix ID: MB

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
Chlorobenzene	0.002	0.0018	0.0021	89%	104%	97%	16%
Bromoform	0.002	0.0023	0.0022	115%	110%	113%	4%
1,1,2,2 - Tetrachloroethane	0.002	0.0021	0.0022	106%	109%	108%	3%
1,3 - Dichlorobenzene	0.002	0.0020	0.0022	102%	110%	106%	8%
1,4 - Dichlorobenzene	0.002	0.0022	0.0021	110%	107%	109%	3%
1,2 - Dichlorobenzene	0.002	0.0024	0.0023	118%	115%	116%	3%

Spike Units: mg/L (ppm)

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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Registered No. 1464

Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.

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INDUSTRIAL AND ENVIRONMENTAL SERVICES DIVISION

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5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 482 1922
Facsimile: (02) 482 1734

CERTIFICATE OF ANALYSIS

DATE: 22/11/95

REPORT No: 5S02414

QA/QC Appendix

CLIENT: Groundwater Technology Aust. Pty. Ltd.

SAMPLES: 6 x Waters

REFERENCE: N1034

LAB Nos.: 12007 - 12012

DATE RECEIVED: 2/11/95

DATE COMMENCED: 2/11/95

	TEST:	METHOD:
1.	Organochlorine Pesticides / PCB's	E011
2.	Volatile Halogenated Compounds	E042
3.	TPH/BTEX	E081 / E052
4.	Total Organic Carbon	W048

RESULTS:

All samples analysed as received.
This report replaces preliminary results issued on 10/11/95, 20/11/95 & 23/11/95

Please see attached pages for results

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

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ORGANOCHLORINE PESTICIDES / PCBs (OC/PCB)
(PCB 1016,1221,1232,1242,1248,1254,1260)

CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02414

SAMPLES: 4 x WATERS, N1034

SAMPLE I.D.	PQL	BH42	BH41	BH44	BH44S	Control Blank	
LAB I.D.	-	12008	12009	12010	12011	CB	
MOISTURE (% w/w)	-	-	-	-	-	-	
H.C.B.	0.001	nd	nd	nd	nd	nd	
a-BHC	0.001	nd	nd	nd	nd	nd	
LINDANE	0.001	nd	nd	nd	nd	nd	
HEPTACHLOR	0.001	nd	nd	nd	nd	nd	
ALDRIN	0.001	nd	nd	nd	nd	nd	
b-BHC	0.001	nd	nd	nd	nd	nd	
delta-BHC	0.001	nd	nd	nd	nd	nd	
OXYCHLORDANE	0.001	nd	nd	nd	nd	nd	
HEPTACHLOR EPOXIDE	0.001	nd	nd	nd	nd	nd	
a-ENDOSULFAN	0.001	nd	nd	nd	nd	nd	
gamma-CHLORDANE	0.001	nd	nd	nd	nd	nd	
alpha-CHLORDANE	0.001	nd	nd	nd	nd	nd	
trans-NANOCHLOR	0.001	nd	nd	nd	nd	nd	
TOTAL DDE's	0.001	nd	nd	nd	nd	nd	
DIELDRIN	0.001	nd	nd	nd	nd	nd	
ENDRIN	0.001	nd	nd	nd	nd	nd	
TOTAL DDD's	0.001	nd	nd	nd	nd	nd	
b-ENDOSULPHAN	0.001	nd	nd	nd	nd	nd	
TOTAL DDT's	0.001	nd	nd	nd	nd	nd	
ENDOSULPHAN SULPHATE	0.001	nd	nd	nd	nd	nd	
METHOXYCHLOR	0.001	nd	nd	nd	nd	nd	
PCB's	0.01	nd	nd	nd	nd	nd	
PCB IDENTIFICATION	-	-	-	-	-	-	
SURROGATE % REC	-	99	101	104	106	-	

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(W) Waters: mg/l (ppm)

VOLATILE HALOGENATED CARBONS (VHC)

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CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02414

SAMPLES: 5 x WATERS; N1034

SAMPLE I.D.	PQL	BH16a	BH42	BH41	BH44	BH44S	Control Blank
LAB I.D.	-	12007	12008	12009	10010	12011	CB
VINYL CHLORIDE	0.001	nd	nd	nd	nd	nd	nd
CHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
TRICHLOROFLUOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
METHYLENE CHLORIDE	0.001	0.003	0.008	0.006	0.002	0.004	nd
trans-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHANE	0.001	nd	0.001	0.001	nd	nd	nd
cis-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
CHLOROFORM	0.001	nd	0.012	0.004	nd	nd	nd
1,1,1-TRICHLOROETHANE	0.001	nd	0.005	0.002	nd	nd	nd
CARBON TETRACHLORIDE	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROETHANE	0.001	nd	0.001	nd	nd	nd	nd
TRICHLOROETHYLENE	0.001	nd	0.007	0.014	nd	nd	nd
1,2-DICHLOROPROPANE	0.001	nd	nd	nd	nd	nd	nd
BROMODICHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
trans-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
cis-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
1,1,2-TRICHLOROETHANE	0.001	nd	0.002	nd	nd	nd	nd
TETRACHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
DIBROMOCHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
CHLOROBENZENE	0.001	0.015	nd	nd	nd	nd	nd
BROMOFORM	0.001	nd	nd	nd	nd	nd	nd
1,1,2,2-TETRACHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
1,3-DICHLOROBENZENE (m)	0.001	nd	nd	nd	nd	nd	nd
1,4-DICHLOROBENZENE (p)	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROBENZENE (o)	0.001	0.010	nd	nd	nd	nd	nd
SURROGATE (% REC)	-	113	106	109	102	99	89

vhc

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)

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TOTAL PETROLEUM HYDROCARBONS/BTEX (TPH/BTEX)

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CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02414

SAMPLES: 4 x WATERS; N1034

SAMPLE I.D.	PQL	BH42	BH41	BH44	BH44S	Control Blank	
LAB I.D.	-	12008	12009	12010	12011	CB	
DEPTH (m)	-	-	-	-	-	-	
% MOISTURE	-	-	-	-	-	-	
TPH C6-C36 as C8	-	nd	nd	nd	nd	nd	
C6-C9	0.02	nd	nd	nd	nd	nd	
C10-C14	0.04	nd	nd	nd	nd	nd	
C15-C28	0.2	nd	nd	nd	nd	nd	
C29-C36	0.2	nd	nd	nd	nd	nd	

tph-btex

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)

Reported values may be lower than the stated TPH PQL's if individual hydrocarbons are detected. PQL's for individual hydrocarbons are 1 ppm for soils and 0.01 ppm for water.

BTEX BY PURGE and TRAP

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CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02414

SAMPLES: 1 x WATER; N1034

SAMPLE I.D.	PQL	BH16a	Control Blank				
LAB I.D.		12007	CB				
DEPTH (m)	-	-	-				
MOISTURE (%w/w)	-	-	-				
BENZENE	0.001	nd	nd				
TOLUENE	0.001	nd	nd				
ETHYL BENZENE	0.001	0.16	nd				
XYLENE	0.003	0.36	nd				

BTEX-PT

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight

(W) Waters: mg/l (ppm)

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CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02414

SAMPLES: 4 x WATERS

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

SAMPLE I.D.	Amdel Meth. Ref.	PQL -	UNITS -	BH42	BH41	BH44	BH44S	Control Blank
LAB I.D.		-		12008	12009	12010	12011	CB
TOTAL ORGANIC CARBON	W048 **	1	mg/L	1	4	6	3	nd

WB2

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

** = USEPA 9060 (Mod.)

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QA/QC APPENDIX No. 5S02414

ANALYTE	No. of Pages.
Organochlorine Pesticides	1
Volatile Halogenated Compounds	2
TPH	1
BTEX	1
Total Organic Carbon	1
TOTAL No. of PAGES	6

Other Criteria: (except Inorganics/Nutrients)

Retention Time Window	:	Within Acceptance Criteria
Check Standard	:	Within Acceptance Criteria
Recalibration	:	Within 15%

Signed:

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

DowElanco (N Z) Ltd.

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OC's "A" - Matrix Spike/Duplicate

Reference No: 110909a1
Matrix ID: mb (water)

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
HCB	0.05	0.05	0.05	97%	97%	97%	0%
alpha- BHC	0.05	0.05	0.05	105%	107%	106%	2%
Lindane	0.05	0.05	0.05	105%	106%	105%	2%
Heptachlor	0.05	0.05	0.05	97%	96%	97%	0%
Aldrin	0.05	0.05	0.05	102%	102%	102%	0%
beta- BHC	0.05	0.05	0.05	106%	105%	105%	1%
Oxychlordane	0.05	0.05	0.05	103%	103%	103%	0%
Hept.Epoxide	0.05	0.05	0.05	105%	105%	105%	1%
o,p'-DDE	0.05	0.05	0.05	103%	105%	104%	1%
Tech.Chlordane	0.15	0.15	0.16	103%	104%	104%	1%
p,p'-DDE	0.05	0.05	0.05	104%	105%	104%	1%
Dieldrin	0.05	0.05	0.05	105%	106%	105%	1%
Endrin	0.05	0.05	0.05	98%	100%	99%	2%
o,p'-DDD	0.05	0.05	0.05	98%	100%	99%	2%
p,p'-DDD	0.05	0.05	0.06	107%	110%	109%	2%
p,p'-DDT	0.05	0.05	0.05	97%	99%	98%	2%
Methoxychlor	0.05	0.04	0.04	87%	87%	87%	0%

Spike Units: mg/l ppm

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

Australian Analytical Laboratories

VHC's "A" - Matrix Spike/Duplicate

Reference No: 110204d1
Matrix ID: mb

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
Vinyl Chloride	0.008	0.0093	0.0096	116%	120%	118%	3%
Chloroethane	0.002	0.0018	0.0019	88%	94%	91%	6%
Trichorofluoromethane	0.002	0.0017	0.0017	84%	87%	85%	4%
1,1-Dichloroethylene	0.002	0.0017	0.0018	83%	88%	85%	5%
Methylene Chloride	0.002	0.0017	0.0020	85%	99%	92%	15%
trans-1,2-Dichloroethylene	0.002	0.0018	0.0020	91%	98%	94%	7%
1,1-Dichloroethane	0.002	0.0017	0.0019	87%	95%	91%	8%
Chloroform	0.002	0.0022	0.0021	108%	106%	107%	2%
1,1,1-Trichloroethane	0.002	0.0019	0.0020	93%	100%	96%	7%
Carbon Tetrachloride	0.002	0.0018	0.0020	88%	101%	94%	15%
1,2-Dichloroethane	0.002	0.0019	0.0020	93%	98%	96%	5%
Trichloroethylene	0.002	0.0020	0.0022	98%	109%	104%	11%
1,2-Dichloropropane	0.002	0.0018	0.0021	92%	103%	97%	11%
Bromodichloromethane	0.002	0.0018	0.0019	88%	97%	92%	10%
trans-1,3-Dichloropropene	0.002	0.0018	0.0021	90%	105%	98%	15%
1,1,2-Trichloroethane	0.002	0.0020	0.0019	99%	96%	97%	3%
Tetrachloroethylene	0.002	0.0018	0.0019	88%	94%	91%	8%
Dibromochloromethane	0.002	0.0018	0.0019	88%	94%	91%	7%

Spike Units: mg/L (ppm)

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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VOC's "B" - Matrix Spike/Duplicate

Reference No: 110204d1
Matrix ID: mb

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
Chlorobenzene	0.002	0.0018	0.0019	92%	95%	93%	2%
Bromoform	0.002	0.0018	0.0020	88%	98%	93%	11%
1,1,2,2 - Tetrachloroethane	0.002	0.0019	0.0020	96%	99%	97%	3%
1,3 - Dichlorobenzene	0.002	0.0018	0.0019	88%	96%	92%	9%
1,4 - Dichlorobenzene	0.002	0.0018	0.0019	92%	97%	94%	6%
1,2 - Dichlorobenzene	0.002	0.0018	0.0019	90%	94%	92%	4%

Spike Units: mg/L (ppm)

nd = Not Detected
- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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TPH - Matrix Spike/Duplicate

Reference No: 112201h1
Matrix ID: MB - WATER

Analyte	Spike Level (ppm)	Level Detected		Recovery Details			
		Spike 1 (ppm)	Spike 2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
TPH C20-C28	5.00	5.31	4.97	106%	99%	103%	7%
C8	0.50	0.50	0.47	101%	94%	97%	7%

Spike Units: mg/L (ppm)

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

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BTEX - Matrix Spike/Duplicate

Reference No: 110204e1 **Page:** 1 of 1

Matrix ID: mb

Analyte	Spike Level (ppm)	Level Spike 1 (ppm)	Detected Spike 2 (ppm)	Recovery Details Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
BENZENE	0.002	0.0019	0.0018	94%	89%	91%	5%
TOLUENE	0.002	0.0017	0.0019	83%	93%	88%	11%
ETHYL BENZENE	0.002	0.0019	0.0019	96%	94%	95%	2%
XYLENE	0.006	0.0058	0.0056	96%	93%	95%	3%

Spike Units: mg/L (ppm)

nd = Not Detected
\- = Not Applicable
MB = Matrix Blank

All results are within the acceptance criteria

Water samples
%Recoveries within 70 - 130%
%RPD < 40% for low level (<10xPQL)
< 20% for high level (>10xPQL)

Soil samples
%Recoveries within 70 - 130%
%RPD < 50% for low level (<10xPQL)
< 30% for high level (>10xPQL)

MATRIX SPIKE/CHECK SOLUTIONS - QA/QC REPORT

DowElanco (N Z) Ltd.

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CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02414

SAMPLES: 4 x WATERS; N1034

Q1

ANALYTE	UNITS -	PQL -	Matrix Spike/ Check Solution	Results	Acceptance Limits	COMMENTS
TOTAL ORGANIC CARBON	mg/L	1	100	101	± 10%	

Q84M

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

QA/QC data within acceptable criteria

amdel

Registered No. 1464 DowElanco (NZ) Ltd.

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INDUSTRIAL AND ENVIRONMENTAL SERVICES DIVISION

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CERTIFICATE OF ANALYSIS

DATE: 20/11/95

REPORT No: 5S02034

QA/QC Appendix

CLIENT: Groundwater Technology New Zealand

SAMPLES: 15 x Waters

REFERENCE: N1034

LAB Nos.: 10486 - 10500

DATE RECEIVED: 18/10/95

DATE COMMENCED: 18/10/95

	TEST:	METHOD:
1.	Organochlorine Pesticides/PCB's	E011
2.	Total Petroleum Hydrocarbons	E081
3.	Methane, Ethane, Ethene	M11/1
4	VHC	E042
5.	BOD (5), BOD (20)	W026
6.	pH	W031
7.	Conductivity	W032
8.	Total Dissolved Solids	W033
9.	Chemical Oxygen Demand	E038
10.	Total Organic Carbon	W048

RESULTS:

All samples analysed as received.
This report replaces any preliminary results issued on 9/11/95
20/11/95
27/11/95

Please see attached pages for results

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

ORGANOCHLORINE PESTICIDES / PCBs (OC/PCB)
(PCB 1016,1221,1232,1242,1248,1254,1260)

CLIENT: GROUNDWATR TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

DowElanco (NZ) Ltd.

SAMPLES: 11 x WATERS, N1034 PAGE: 2 OF 15 CONFIDENTIAL

SAMPLE I.D.	PQL	BH 15	BH 40	BH 39	BH39B	BH33	BH33S
LAB I.D.	-	10486	10489	10490	10491	10492	10493
MOISTURE % w/w	-	-	-	-	-	-	-
H.C.B.	0.001	nd	nd	nd	nd	nd	nd
α-BHC	0.001	nd	nd	nd	nd	nd	nd
LINDANE	0.001	nd	nd	nd	nd	nd	nd
HEPTACHLOR	0.001	nd	nd	nd	nd	nd	nd
ALDRIN	0.001	nd	nd	nd	nd	nd	nd
β-BHC	0.001	nd	nd	nd	nd	nd	nd
δ-BHC	0.001	nd	nd	nd	nd	nd	nd
OXYCHLORDANE	0.001	nd	nd	nd	nd	nd	nd
HEPTACHLOR EPOXIDE	0.001	nd	nd	nd	nd	nd	nd
α-ENDOSULFAN	0.001	nd	nd	nd	nd	nd	nd
γ-CHLORDANE	0.001	nd	nd	nd	nd	nd	nd
α-CHLORDANE	0.001	nd	nd	nd	nd	nd	nd
trans- NONACHLOR	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDE's	0.001	nd	nd	nd	nd	nd	nd
DIELDRIN	0.001	nd	nd	nd	nd	nd	nd
ENDRIN	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDD's	0.001	nd	nd	nd	nd	nd	nd
β-ENDOSULPHAN	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDT's	0.001	nd	nd	nd	nd	nd	nd
ENDOSULPHAN SULPHATE	0.001	nd	nd	nd	nd	nd	nd
METHOXYCHLOR	0.001	nd	nd	nd	nd	nd	nd
PCB's	0.01	nd	nd	nd	nd	nd	nd
PCB IDENTIFICATION	-	-	-	-	-	-	-
SURROGATE % RECOVERY	-	99	107	105	113	114	110

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(W) Water: mg/l (ppm)

ORGANOCHLORINE PESTICIDES / PCBs (OC/PCB)
(PCB 1016,1221,1232,1242,1248,1254,1260)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

DowElanco (N Z) Ltd.

SAMPLES: 11 x WATERS, N1034

CONFIDENTIAL

SAMPLE I.D.	PQL	BH34	BH37	BH28	BH36	BH28B	Control Blank
LAB I.D.	-	10494	10495	10498	10499	10500	CB
MOISTURE % w/w	-	-	-	-	-	-	-
H.C.B.	0.001	nd	nd	nd	nd	nd	nd
α-BHC	0.001	nd	nd	nd	nd	nd	nd
LINDANE	0.001	nd	nd	nd	nd	nd	nd
HEPTACHLOR	0.001	nd	nd	nd	nd	nd	nd
ALDRIN	0.001	nd	nd	nd	nd	nd	nd
β-BHC	0.001	nd	nd	nd	nd	nd	nd
δ-BHC	0.001	nd	nd	nd	nd	nd	nd
OXYCHLORDANE	0.001	nd	nd	nd	nd	nd	nd
HEPTACHLOR EPOXIDE	0.001	nd	nd	nd	nd	nd	nd
α-ENDOSULFAN	0.001	nd	nd	nd	nd	nd	nd
γ-CHLORDANE	0.001	nd	nd	nd	nd	nd	nd
α-CHLORDANE	0.001	nd	nd	nd	nd	nd	nd
trans- NONACHLOR	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDE's	0.001	nd	nd	nd	nd	nd	nd
DIELDRIN	0.001	nd	nd	nd	nd	nd	nd
ENDRIN	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDD's	0.001	nd	nd	nd	nd	nd	nd
β-ENDOSULPHAN	0.001	nd	nd	nd	nd	nd	nd
TOTAL DDT's	0.001	nd	nd	nd	nd	nd	nd
ENDOSULPHAN SULPHATE	0.001	nd	nd	nd	nd	nd	nd
METHOXYCHLOR	0.001	nd	nd	nd	nd	nd	nd
PCB's	0.01	nd	nd	nd	nd	nd	nd
PCB IDENTIFICATION	-	-	-	-	-	-	-
SURROGATE % RECOVERY	-	101	102	105	115	116	-

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(W) Water: mg/l (ppm)

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TOTAL PETROLEUM HYDROCARBONS/BTEX (TPH/BTEX)

DowElanco (N.Z.) Ltd.
CONFIDENTIAL

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 11 x WATERS PAGE: 4 OF 15

SAMPLE I.D.	PQL	BH 15	BH 40	BH 39	BH 39B	BH 33	BH 33S
LAB I.D.	-	10486	10489	10490	10491	10492	10493
DEPTH (m)	-	-	-	-	-	-	-
MOISTURE (% w/w)	-	-	-	-	-	-	-
TPH C6-C36 as C8	-	nd	nd	0.09 *	nd	nd	nd
C6-C9	10	nd	nd	0.09 *	nd	nd	nd
C10-C14	20	nd	nd	nd	nd	nd	nd
C15-C28	100	nd	nd	nd	nd	nd	nd
C29-C36	100	nd	nd	nd	nd	nd	nd

* Single Peak

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

Reported values may be lower than the stated TPH PQL's if individual hydrocarbons are detected. PQL's for individual hydrocarbons are 1 ppm for soils and 0.01 ppm for water.

amdel

TOTAL PETROLEUM HYDROCARBONS/BTEX (TPH/BTEX)

DowElanco (N Z) Ltd.

CONFIDENTIAL

CLIENT: GROUNDWATER TECHNOLOGY- NEW ZEALAND REPORT No: 5S02034

SAMPLES: 11 x WATERS PAGE: 5 OF 15

SAMPLE I.D.	PQL	BH 34	BH 37	BH 28	BH 36	BH28B	Control Blank
LAB I.D.	-	10494	10495	10498	10499	10500	CB
DEPTH (m)	-	-	-	-	-	-	-
MOISTURE (% w/w)	-	-	-	-	-	-	-
TPH C6-C36 as C8	-	nd	nd	nd	nd	nd	nd
C6-C9	0.02	nd	nd	nd	nd	nd	nd
C10-C14	0.04	nd	nd	nd	nd	nd	nd
C15-C28	0.2	nd	nd	nd	nd	nd	nd
C29-C36	0.2	nd	nd	nd	nd	nd	nd

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

Reported values may be lower than the stated TPH PQL's if individual hydrocarbons are detected. PQL's for individual hydrocarbons are 1 ppm for soils and 0.01 ppm for water.

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CLIENT: GROUNDWATER TECHNOLOGY NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 6 OF 15

SAMPLE I.D.	PQL	BH 15	TRIP	FIELD	BH 40	BH 39	BH39B
LAB I.D.	-	10486	10487	10488	10489	10490	10491
METHANE	0.2	nd	nd	nd	nd	nd	nd
ETHANE	0.4	nd	nd	nd	nd	nd	nd
ETHENE	0.4	nd	nd	nd	nd	nd	nd

B2

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

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DowElanco (N Z) Ltd.
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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 7 OF 15

SAMPLE I.D.	PQL -	BH 33	BH 33S	BH 34	BH 37	TRIP B	FIELD B
LAB I.D.	-	10492	10493	10494	10495	10496	10497
METHANE	0.2	nd	nd	nd	nd	nd	nd
ETHANE	0.4	nd	nd	nd	nd	nd	nd
ETHENE	0.4	nd	nd	nd	nd	nd	nd

B2

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 8 OF 15

SAMPLE I.D.	PQL	BH 28	BH 36	BH 28B			
LAB I.D.	-	10498	10499	10500			
METHANE	0.2	nd	nd	nd			
ETHANE	0.4	nd	nd	nd			
ETHENE	0.4	nd	nd	nd			

B2

PQL = Practical Quantitation Limit

nd = Less than PQL
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

VOLATILE HALOGENATED COMPOUNDS (VHC)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 9 OF 15

DowElanco (NZ) Ltd.
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SAMPLE I.D.	PQL	BH 15	TRIP	FIELD	BH 40	BH 39	BH 39B
LAB I.D.	-	10486	10487	10488	10489	10490	10491
VINYL CHLORIDE	0.001	nd	nd	nd	nd	nd	nd
CHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
TRICHLOROFLUOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
METHYLENE CHLORIDE	0.001	0.005	0.007	0.004	0.005	0.029	0.010
trans-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
cis-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	0.004	nd
CHLOROFORM	0.001	nd	0.003	0.004	0.002	0.018	0.003
1,1,1-TRICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
CARBON TETRACHLORIDE	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROETHANE	0.001	nd	nd	nd	nd	0.080	nd
TRICHLOROETHYLENE	0.001	0.001	nd	nd	0.001	0.011	nd
1,2-DICHLOROPROPANE	0.001	nd	nd	nd	nd	nd	nd
BROMODICHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
Trans-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
cis-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
1,1,2-TRICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
TETRACHLOROETHYLENE	0.001	nd	nd	nd	0.001	0.001	nd
DIBROMOCHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
CHLOROBENZENE	0.001	nd	nd	nd	nd	0.036	nd
BROMOFORM	0.001	nd	nd	nd	nd	nd	nd
1,1,2,2-TETRACHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
1,3-DICHLOROBENZENE (m)	0.001	nd	nd	nd	nd	nd	nd
1,4-DICHLOROBENZENE (p)	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROBENZENE (o)	0.001	nd	nd	nd	nd	nd	nd

PQL = Practical Quantitation Limit

nd = Not Detected
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

VOLATILE HALOGENATED COMPOUNDS (VHC)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 10 OF 15

SAMPLE I.D.	PQL -	BH 33	BH 33S	BH 34	BH 37	TRIP B	FIELD B
LAB I.D.	-	10492	10493	10494	10495	10496	10497
VINYL CHLORIDE	0.001	nd	nd	nd	nd	nd	nd
CHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
TRICHLOROFLUOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
METHYLENE CHLORIDE	0.001	0.004	0.006	0.008	nd	0.008	0.012
trans-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
1,1-DICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
cis-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd	nd	nd
CHLOROFORM	0.001	0.004	0.003	0.011	nd	0.004	0.002
1,1,1-TRICHLOROETHANE	0.001	nd	nd	0.002	nd	nd	nd
CARBON TETRACHLORIDE	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROETHANE	0.001	nd	nd	0.002	nd	nd	nd
TRICHLOROETHYLENE	0.001	0.001	0.001	0.011	nd	nd	nd
1,2-DICHLOROPROPANE	0.001	nd	nd	nd	nd	nd	nd
BROMODICHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
Trans-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
cis-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd	nd	nd
1,1,2-TRICHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
TETRACHLOROETHYLENE	0.001	nd	nd	0.001	nd	nd	nd
DIBROMOCHLOROMETHANE	0.001	nd	nd	nd	nd	nd	nd
CHLOROBENZENE	0.001	nd	nd	nd	nd	nd	nd
BROMOFORM	0.001	nd	nd	nd	nd	nd	nd
1,1,2,2-TETRACHLOROETHANE	0.001	nd	nd	nd	nd	nd	nd
1,3-DICHLOROBENZENE (m)	0.001	nd	nd	nd	nd	nd	nd
1,4-DICHLOROBENZENE (p)	0.001	nd	nd	nd	nd	nd	nd
1,2-DICHLOROBENZENE (o)	0.001	nd	nd	nd	nd	nd	nd

PQL = Practical Quantitation Limit

nd = Not Detected
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

VOLATILE HALOGENATED COMPOUNDS (VHC)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034

DowElanco (N Z) Ltd.
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SAMPLE I.D.	PQL	BH 28	BH 36	BH 28B	Control Blank		
LAB I.D.	-	10498	10499	10500	CB		
VINYL CHLORIDE	0.001	nd	nd	nd	nd		
CHLOROETHANE	0.001	nd	nd	nd	nd		
TRICHLOROFLUOROMETHANE	0.001	nd	nd	nd	nd		
1,1-DICHLOROETHYLENE	0.001	0.002	0.002	nd	nd		
METHYLENE CHLORIDE	0.001	0.008	0.008	0.008	nd		
trans-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd		
1,1-DICHLOROETHANE	0.001	nd	nd	nd	nd		
cis-1,2-DICHLOROETHYLENE	0.001	nd	nd	nd	nd		
CHLOROFORM	0.001	0.001	0.005	0.005	nd		
1,1,1-TRICHLOROETHANE	0.001	0.003	0.006	0.015	nd		
CARBON TETRACHLORIDE	0.001	nd	nd	nd	nd		
1,2-DICHLOROETHANE	0.001	nd	0.002	nd	nd		
TRICHLOROETHYLENE	0.001	nd	0.003	nd	nd		
1,2-DICHLOROPROPANE	0.001	nd	nd	nd	nd		
BROMODICHLOROMETHANE	0.001	nd	nd	nd	nd		
Trans-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd		
cis-1,3-DICHLOROPROPENE	0.001	nd	nd	nd	nd		
1,1,2-TRICHLOROETHANE	0.001	nd	nd	nd	nd		
TETRACHLOROETHYLENE	0.001	nd	nd	nd	nd		
DIBROMOCHLOROMETHANE	0.001	nd	nd	0.001	nd		
CHLOROBENZENE	0.001	nd	nd	nd	nd		
BROMOFORM	0.001	nd	nd	nd	nd		
1,1,2,2-TETRACHLOROETHANE	0.001	nd	nd	nd	nd		
1,3-DICHLOROBENZENE (m)	0.001	nd	nd	nd	nd		
1,4-DICHLOROBENZENE (p)	0.001	nd	nd	nd	nd		
1,2-DICHLOROBENZENE (o)	0.001	nd	nd	nd	nd		

PQL = Practical Quantitation Limit

nd = Not Detected
- = Not Applicable

(S) Soils: mg/kg (ppm) dry weight
(W) Waters: mg/l (ppm)
(O) Oils: mg/kg (ppm)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 9 x WATERS, N1034 PAGE: 12 OF 15

DowElanco (NZ) Ltd.

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

CONFIDENTIAL

SAMPLE I.D.	AAL meth. Ref.	PQL	UNITS	BH15	Trip	Field	BH40	BH39
LAB I.D.	-			10486	10487	10488	10489	10490
BOD (5)	W026	5	mg/L	nd	-	-	nd	nd
BOD (20) *	W026	5	mg/L	7	-	-	26	103
pH	W031	5	-	6.8	-	-	6.7	6.4
CONDUCTIVITY	W032	-	uS/cm	530	-	-	564	480
TOTAL DISSOLVED SOLIDS	W033	2	mg/L	258	-	-	277	308
CHEMICAL OXYGEN DEMAND	W038.1	2	mg/L	nd	-	-	nd	28
TOTAL ORGANIC CARBON	W048 **	25	mg/L	2	-	-	2	2

B2

* BOD (20) is not a registered Nata Test.

PQL = Practical Quantitation Limit

nd = Less than PQL

- = Not Applicable

** = USEPA 9060 (Mod.)

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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 9 x WATERS, N1034

DowElanco (N Z) Ltd.

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

CONFIDENTIAL

SAMPLE I.D.	AAL meth. Ref.	PQL -	UNITS -	BH39B	BH33	BH33S	BH34	BH37
LAB I.D.	-	-		10491	10492	10493	10494	10495
BOD (5)	W026	5	mg/L	nd	nd	nd	15	nd
BOD (20) *	W026	5	mg/L	6	6	21	51	16
pH	W031	-	-	6.5	6.2	6.2	6.4	5.8
CONDUCTIVITY	W032	2	uS/cm	4	420	385	678	423
TOTAL DISSOLVED SOLIDS	W033	2	mg/L	nd	270	247	316	263
CHEMICAL OXYGEN DEMAND	W038.1	25	mg/L	nd	170	75	nd	nd
TOTAL ORGANIC CARBON	W048 **	1	mg/L	nd	6	4	14	nd

B2

* BOD (20) is not a registered Nata test.

PQL = Practical Quantitation Limit

** = USEPA 9060 (Mod.)

nd = Less than PQL

- = Not Applicable

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CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 9 x WATERS, N1034 PAGE: 14 OF 15

DowElanco (N Z) Ltd.

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

CONFIDENTIAL

SAMPLE I.D.	AAL meth. Ref.	PQL -	UNITS -	TRIP B	FIELD B	BH28	BH36	BH28B
LAB I.D.	-	-		10496	10497	10498	10499	10500
BOD (5)	W026	5	mg/L	-	-	nd	nd	nd
BOD (20) *	W026	5	mg/L	-	-	10	nd	nd
pH	W031	-	-	-	-	6.4	6.4	6.2
CONDUCTIVITY	W032	2	uS/cm	-	-	552	602	3
TOTAL DISSOLVED SOLIDS	W033	2	mg/L	-	-	240	324	nd
CHEMICAL OXYGEN DEMAND	W038.1	25	mg/L	-	-	nd	nd	nd
TOTAL ORGANIC CARBON	W048 **	1	mg/L	-	-	nd	3	nd

B2

* BOD (20) is not a registered Nata Test.

PQL = Practical Quantitation Limit

nd = Less than PQL

- = Not Applicable

** = USEPA 9060 (Mod.)

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: WATERS PAGE: 15 OF 15

METHOD REFERENCE: APHA 18th Ed. (Unless otherwise specified)

DowElanco (N Z) Ltd.

CONFIDENTIAL

SAMPLE I.D.	AAL meth. Ref.	PQL -	UNITS -	Control Blank				
LAB I.D.	-	-		CB				
BOD (5)	W026	5	mg/L	nd				
BOD (20) *	W026	5	mg/L	nd				
pH	W031	-	-	-				
CONDUCTIVITY	W032	2	uS/cm	nd				
TOTAL DISSOLVED SOLIDS	W033	2	mg/L	nd				
CHEMICAL OXYGEN DEMAND	W038.1	25	mg/L	nd				
TOTAL ORGANIC CARBON	W048 **	1	mg/L	nd				

B2

* BOD (20) is not a registered Nata Test

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

** = USEPA 9060 (Mod.)

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QA/QC APPENDIX No. 5S02034

ANALYTE	No. of Pages.
Organochlorine Pesticides/PCB's	3
Total Petroleum Hydrocarbons	2
GC/MS Volatiles	2
Volatile Halogenated Carbons	4
Nutrients	2
TOTAL No. of PAGES	13

Other Criteria: (except Inorganics/Nutrients)

Retention Time Window	:	Within Acceptance Criteria
Check Standard	:	Within Acceptance Criteria
Recalibration	:	Within 15%

Signed:

R.G. MOONEY B.Sc.(Hons), Dip.F.D.A., M.R.A.C.I.
Authorising Chemist

amdel

LABORATORY DUPLICATE - QA/QC REPORT

CLIENT: GROUNDWATER- NEW ZEALAND

REPORT No: 5S02054

SAMPLES: 15 x WATERS, N1034

DowElanco (NZ) Ltd.

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SAMPLE I.D.	UNITS -	PQL	TRIP B	TRIP B Duplicate	Average	RPD %	Comments
LAB I.D.	-		10496	10496			
METHANE	mg/L	0.2	nd	nd	nd	-	
ETHANE	mg/L	0.4	nd	nd	nd	-	
ETHENE	mg/L	0.4	nd	nd	nd	-	

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

RPD = Relative Percent Difference

QA/QC data within acceptance criteria

amdel

LABORATORY DUPLICATE - QA/QC REPORT

CLIENT: GROUNDWATER TECHNOLOGY

REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034

DowElanco (N Z) Ltd.

CONFIDENTIAL

SAMPLE I.D.	UNITS	PQL	BH 28	BH 28 Duplicate	Average	RPD %	Comments
LAB I.D.	-		10498	10498			
METHANE	mg/L	0.2	nd	nd	nd	-	
ETHANE	mg/L	0.4	nd	nd	nd	-	
ETHENE	mg/L	0.4	nd	nd	nd	-	

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

RPD = Relative Percent Difference

QA/QC data within acceptance criteria

amdel

LABORATORY DUPLICATE - QA/QC REPORT

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALANE REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 1 OF 2

DowElanco (NZ) Ltd.

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SAMPLE I.D.	UNITS	PQL	33	Duplicate	Average	RPD %	Comments
LAB I.D.	-		10492	10492			
CHEMICAL OXYGEN DEMAND	mg/L	25	160	180	170	12	
BOD (5)	mg/L	5	nd	nd	nd	-	
pH	-	-	6.2	6.2	6.2	0	
CONDUCTIVITY	uS/cm	2	421	420	420.5	<1	
TOTAL DISSOLVED SOLIDS	mg/L	5	170	269	269.5	<1	
BOD (20)	mg/L	5	6	7	6.5	15	

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

RPD = Relative Percent Difference

QA/QC data within acceptance criteria

amdel

MATRIX SPIKE/CHECK SOLUTIONS - QA/QC REPORT

CLIENT: GROUNDWATER TECHNOLOGY - NEW ZEALAND REPORT No: 5S02034

SAMPLES: 15 x WATERS, N1034 PAGE: 2 OF 2

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ANALYTE	UNITS -	PQL -	Matrix Spike/ Check Solution	Results	Acceptance Limits	Comments
TOTAL ORGANIC CARBON	mg/L	1	100	105	± 10%	
BOD (5)	mg/L	5	200	240	± 20%	
pH	-	-	7.4	7.5	± 0.2	
CONDUCTIVITY	uS/cm	2	303	305	± 10%	
TOTAL DISSOLVED SOLIDS	mg/L	5	293	273	± 10%	

PQL = Practical Quantitation Limit

nd = Less than PQL

\- = Not Applicable

QA/QC data within acceptable criteria

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Circulation: C.Nolan.

Analytical Request Number: 6587

PHENOXIES/CHLOROPHENOLS in BORE WATER SAMPLES

Date Raised: 09 April 1996 Date Completed: 15 April 1996

Details of Request:

Please analyse samples of Bore Water, as taken by Groundwater Technology, for Phenoxy Acids and Phenols.

Scientist: C.Collins

Author: C.Collins

A. SUMMARY

B. EXPERIMENTAL

Std Method PHN-ENV-91-1

C. RESULTS

Recovery ex BH32	2,4-D	MCPA	PCOC	2,4-DCP	2,4,5-T	2,4,6-TCP	2,4,5-TCP	MCPB
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	µg/L
Amount added	30.24	31.17	30.42	31.41	30.21	31.2	32.13	31.2
Amount found	30.56	30.21	33.42	31.87	28.28	31.74	30.6	36.4
Rec %	101	96.9	110	102	93.6	102	95.2	117

Recovery ex BH32	2,4-D	MCPA	PCOC	2,4-DCP	2,4,5-T	2,4,6-TCP	2,4,5-TCP	MCPB
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	µg/L
Amount added	100.8	103.9	101.4	104.7	100.7	104	107.1	104
Amount found	100.9	103.4	102.9	108.7	99.23	105.4	103.7	109.9
Rec %	100	99.5	102	104	98.5	101	96.8	106

Recovery ex BH32	2,4-D	MCPA	PCOC	2,4-DCP	2,4,5-T	2,4,6-TCP	2,4,5-TCP	MCPB
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	µg/L
Amount added	1008	1039	1014	1047	1007	1040	1071	1040
Amount found	1049	1070	1053	1114	1043	1139	1085	1104
Rec %	104	103	104	106	104	110	101	106

Sample ID	2,4-D	MCPA	PCOC	2,4-DCP	2,4,5-T	2,4,6-TCP	2,4,5-TCP	MCPB
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	µg/L
Trip A	ND	ND	ND	ND	ND	ND	ND	ND
MW22	ND	ND	ND	ND	ND	ND	ND	ND
MW3	ND	ND	ND	ND	ND	ND	ND	ND
MW6	ND	ND	ND	ND	ND	ND	ND	ND
Field A	ND	ND	ND	ND	ND	ND	ND	ND
MW34	83.0	ND	3.6	ND	ND	ND	ND	ND
MW28	ND	ND	ND	ND	ND	ND	ND	ND
MW15B	ND	ND	ND	ND	ND	ND	ND	ND
BH20	ND	ND	17.1	ND	ND	ND	ND	ND
BH40	ND	ND	ND	ND	ND	ND	ND	ND
MW42*	164	54.9	5.7	25.8	1630	11.2	409	ND
MW41	6.9	ND	ND	ND	ND	ND	ND	ND
Field B	ND	ND	ND	ND	ND	ND	ND	ND
MW15S	6.3	ND	ND	ND	ND	ND	ND	ND
MW15	6.5	ND	ND	ND	ND	ND	ND	ND
MW39B	ND	ND	ND	ND	ND	ND	ND	ND
MW33	3.8	ND	ND	3.8	ND	ND	ND	ND
MW36	ND	ND	ND	ND	ND	ND	ND	ND
MW39	ND	ND	ND	7.2	ND	ND	ND	ND
Trip B	ND	ND	ND	ND	ND	ND	ND	ND
BH32	ND	ND	ND	ND	ND	ND	ND	ND
MW39K	661	871	229	42.8	1035	26.4	ND	174
MW39J	3527	1437	1100	221	9507	93.0	110	61.0
39JS	3480	1421	1087	190	9418	ND	83.3	58.8
MW37	ND	ND	ND	ND	ND	ND	ND	ND

ND = < 30µg/L

* Note Sample MW42 was found to be subject to analyte reduction over the period of the analysis. The result quoted is the maximum found but the levels of 2,4,5-T and 2,4,5-TCP reduced to non detectable levels after approx 5 days.

C. REFERENCES

CC-27-32-33

C.Collins

Circulation: C.Nolan.

Analytical Request Number: 6704

DowElanco (N Z) Ltd.
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PHENOXIES/CHLOROPHENOLS In BORE WATER SAMPLES

Date Raised: 03-May-1996 Date Completed: 15-May-1996

Details of Request:

Please analyse samples of Bore Water and soil, as taken by Groundwater Technology, for Phenoxy Acids and Phenols.

Scientist: C.Collins

Author: C.Collins

A. SUMMARY

B. EXPERIMENTAL

Std Method PHN-ENV-91-1

C. RESULTS

Sample ID	When Analysed	2,4-D	MCPA	PCOC	2,4-DCP	2,4,5-T	2,4,6-TCP	2,4,5-TCP	MCPB
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	µg/L
BH42 1130 030596	030596 1235	650	166	ND	ND	2071	ND	265	ND
BH42 1130 030596	060596 1010	638	160	ND	ND	2048	ND	207	ND

Sample ID	When Analysed	2,4-D	MCPA	PCOC	2,4-DCP	2,4,5-T	2,4,6-TCP	2,4,5-TCP	MCPB
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	µg/L
BH42S 1130 030596	030596 1327	737	183	31	30	2334	ND	385	ND

Sample ID	When Analysed	2,4-D	MCPA	PCOC	2,4-DCP	2,4,5-T	2,4,6-TCP	2,4,5-TCP	MCPB
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	µg/L
BH42 1645 030596	030596 1957	1565	387	ND	ND	4557	ND	1434	ND
BH42 1645 030596	060596 1101	1602	383	ND	ND	4888	ND	1526	ND

Sample ID	When Analysed	2,4-D	MCPA	PCOC	2,4-DCP	2,4,5-T	2,4,6-TCP	2,4,5-TCP	MCPB
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	µg/L
BH41 030596	030596 1427	ND	ND	ND	ND	ND	ND	ND	ND
FIELD A 030596	030596 1815	ND	ND	ND	ND	ND	ND	ND	ND
RINSEATE A 030596	030596 1906	ND	ND	ND	ND	ND	ND	ND	ND
BH 19 030596	060596 1152	ND	ND	ND	ND	ND	ND	ND	ND
BH 20 030596	060596 1243	ND	ND	ND	ND	ND	ND	ND	ND

ND (Water Samples) = < 30µg/L

Sample ID	When Analysed	2,4-D	MCPA	PCOC	2,4-DCP	2,4,5-T	2,4,6-TCP	2,4,5-TCP	MCPB
SOIL A1A 030596	150596	ND	ND	ND	ND	ND	ND	ND	ND
SOIL A1B 030596	150596	ND	ND	ND	ND	ND	ND	ND	ND
SOIL A2A 030596	150596	ND	ND	ND	ND	ND	ND	ND	ND
SOIL A2B 030596	150596	ND	ND	ND	ND	ND	ND	ND	ND
SOIL A3 030596	150596	ND	ND	ND	ND	ND	ND	ND	ND
SOIL A4 030596	150596	ND	ND	ND	ND	ND	ND	ND	ND

ND(Soil Samples) = < 100µg/Kg

C. REFERENCES

CC-27-45,46

C.Collins

DowElanco (N Z) Ltd.
CONFIDENTIAL

GRAYSON LABORATORIES

amdel

35 O'Rorke Rd
P.O. Box 12-545
Penrose, Auckland
New Zealand
Phone (09) 579-2669
FAX (09) 579-0560

30 April 1996

Groundwater Technology NZ Ltd
PO Box 8497
Symonds Street
AUCKLAND

Attention: David Morton

FINAL REPORT 16/5/96

Dear David

re: Analysis of : 25x Water Samples
Received : 11 April 1996
Laboratory No. : 6I00836
Project No. : 1981

The water samples received from you were analysed as per your written instructions for pH, conductivity, total dissolved solids, total organic carbon and organo phosphates.

The method references are:

pH: -APHA 18th Edition. Section 4500-H+

Total Dissolved Solids @ 103-105°C : -APHA 18th Edition. Section 2540

Conductivity: -APHA18th Edition. Section 2510.

Organo Phosphates: -USEPA 507 by GC with NPD detection.

Non Purgeable Organic Carbon -Analysed by Shell Todd Oil Services Ltd.

RESULTS

See attached report from Shell Todd Oil Service Ltd for Non Purgeable Organic Carbon

Yours faithfully
~~W. GRAYSON~~ **& ASSOCIATES LTD**

J. Kellett

J. Kellett NZCS
Section Leader - Environmental

G. Nicholson NZCS MNZIC
Industrial/Environmental Group

amt

RESULTS
SCHEDULE I

SAMPLE ID	pH	CONDUCTIVITY µS/cm @25°C	TOTAL DISSOLVED SOLIDS mg/L
MW 15 S	6.9	455	289
MW15	6.9	423;471	222
MW15B	6.0	13.8;10.8	11
MW22	6.1	351	247
MW34	6.7	684	423
MW39	6.8	464	303
MW39J	6.6	836	560
BH20	6.6	431;387	289
BH32	6.5	409	262
BH40	6.8	421	265
MW3	6.5	319	222
MW6	6.8	388	237
MW28	6.7	470	300
MW33	6.5	308	241
MW36	6.5	501	318
MW37	6.4	302	222
MW39B	5.6	6.3;4.4	4;13
MW39JS	6.6	851	526
MW39K	6.6	1015	632
MW41	6.6	577	402
MW42	6.4	746	461
FIELD A	6.1	20.8;31.2	43;37
FIELD B	5.3	7.6;6.7	42
TRIP B	5.9	8.1;17.5	34
TRIP A	5.6	1.0;1.1	16

Limit of detection was 50 µg/L. Recoveries ranged from 60-110% at the detection limit.

RESULTS
SCHEDULE II

Sample Identification	Diazinon	Chloroferinphos	Chlorpyrifos	Dichlorvos	Temephos	Dimethoate	Pirimiphos Methyl	Acephate	Malathion	Azinphos
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW 15 S	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW15	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW15B	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW22	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW34	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW39	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW39J	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
BH20	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
BH32	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
BH40	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW3	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW6	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW28	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW33	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW36	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW37	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW39B	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW39JS	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW39K	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW41	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
MW42	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
FIELD A	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
FIELD B	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TRIP B	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TRIP A	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50

Limit of detection was 50 µg/L. Recoveries ranged from 60-110% at the detection limit.

DowElanco (N Z) Ltd.
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SHELL TODD OIL SERVICES Ltd
KAPUNI PRODUCTION STATION
LABORATORY MISCELLANEOUS REPORT

KAPUNI PRODUCTION STATION LABORATORY, PALMER ROAD, KAPUNI pH: (06) 272 6333

DATE ISSUED: 14.05.1996
REQUESTED BY: Graysons
RESULTS SENT TO: Graysons
REPORT ID NUMBER: M 96 0244

SAMPLE	LAB ID #	DATE TAKEN	NPOC ppmC
Trop B	6-2067	10/04/96	<1
Field A	6-2066		<1
BH 32 N1034B	6-2086	10/04/96	2.8
Field B	6-2080	10/04/96	<1
N1034B BH39JS	6-2090	10/04/96	21
N1034B MW28	6-2091	10/04/96	2.5
MW 22	6-2071	9/04/96	3
N1034B MW6	6-2075	9/04/96	2.3
N1034 MW34	6-2083	10/04/96	4.8
N1034B MW37	6-2093	10/04/96	3.5
N1034B MW33	6-2074	11/04/96	2.7
N1034B MW39B	6-2081	11/04/96	<1
N1034B BH40	6-2076	10/04/96	3.7
N1034B MW39	6-2077	11/04/96	6.1
N1034B MW36	6-2079	11/04/96	1.3
N1034 MW15 5	6-2089	9/04/96	3.2
N1034B MW41	6-2092	11/04/96	3.9
N1034B MW42	6-2084	10/04/96	3.6
N1034B BH20	6-2085	10/04/96	5.9
N1034 MW15	6-2087	9/04/96	2.4
N1034B MW3	6-2088	9/04/96	4.1
N1034B MB39K	6-2078	11/04/96	19
N1034 MW15B	6-2073	9/04/96	<1
N1034 Trip A	6-2072	9/04/96	<1
N1034B BH39J	6-2082	10/04/96	23

NOTES :

1.0 All sample labels contained the following information "W.Grayson and Associates Limited Lab No.:1981".

2.0 Samples tested as received ,except #6-2082 diluted 1:1 with nanopure water. Analysed at MPS Laboratory on the following dates 16/04, 17/04, 18/04, 19/04, 23/04 and 24/04/96.

3.0 Samples received at MPS Laboratory on 16/04/96.

4.0 The accuracies and detection limits for these tests are available from the laboratory on request.

CHECKED BY : IMH

APPROVED BY :

P.P P.Moller (Production Chemist)

06

APPENDIX F
MODELLING DATA

ZONBUDEM version 3.0

Program to compute a flow budget for subregions of a model using cell-by-cell flow data from the USGS Modular Ground-Water Flow Model.

The cell-by-cell budget file is:
N1034B.CBC

1 layers 24 rows 28 columns

DOW ELANCO, NZ

Zone block: LAYERS 1- 1 ROWS 10- 10 COLUMNS 19- 22 VALUE:
Zone block: LAYERS 1- 1 ROWS 10- 13 COLUMNS 23- 23 VALUE:
Zone block: LAYERS 1- 1 ROWS 14- 20 COLUMNS 23- 23 VALUE:
Zone block: LAYERS 1- 1 ROWS 5- 5 COLUMNS 7- 10 VALUE:
DOW ELANCO, NZ

Flow Budget for Zone 1 at Time Step 1 of Stress Period 1

Budget Term	Flow (L**3/T)
IN:	
CONSTANT HEAD =	0.00000
Zone 0 to 1 =	11.090
Zone 2 to 1 =	0.00000
Total IN =	11.090
OUT:	
CONSTANT HEAD =	0.00000
Zone 1 to 0 =	8.4723
Zone 1 to 2 =	3.0405
Total OUT =	11.513
IN - OUT =	-0.42248
Percent Discrepancy =	-3.74

DOW ELANCO, NZ

Flow Budget for Zone 2 at Time Step 1 of Stress Period 1

Budget Term	Flow (L**3/T)
IN:	
CONSTANT HEAD =	0.00000
Zone 0 to 2 =	7.2440
Zone 1 to 2 =	3.0405
Zone 3 to 2 =	2.2535
Total IN =	12.538
OUT:	
CONSTANT HEAD =	0.00000
Zone 2 to 0 =	12.960

```
                    Zone  2 to  1 =    0.00000
                    Zone  2 to  3 =    0.00000

                        Total OUT =     12.960

                         IN - OUT =   -0.42247

                  Percent Discrepancy =              -3.31
1DOW ELANCO, NZ

     Flow Budget for Zone  3 at Time Step  1 of Stress Period  1
     ---------------------------------------------------------

                       Budget Term      Flow (L**3/T)
                       ----------------------------

              IN:
              ---
                     CONSTANT HEAD =    0.00000
                     Zone  0 to  3 =     12.115
                     Zone  2 to  3 =    0.00000

                          Total IN =     12.115

              OUT:
              ----
                     CONSTANT HEAD =    0.00000
                     Zone  3 to  0 =     10.599
                     Zone  3 to  2 =     2.2535

                         Total OUT =     12.852

                          IN - OUT =   -0.73723

                   Percent Discrepancy =             -5.91
DOW ELANCO, NZ

     Flow Budget for Zone  4 at Time Step  1 of Stress Period  1
     ---------------------------------------------------------

                       Budget Term      Flow (L**3/T)
                       ----------------------------

              IN:
              ---
                     CONSTANT HEAD =    0.00000
                     Zone  0 to  4 =     9.2866

                          Total IN =     9.2866

              OUT:
              ----
                     CONSTANT HEAD =    0.00000
                     Zone  4 to  0 =     9.7069

                         Total OUT =     9.7069

                          IN - OUT =   -0.42032

                   Percent Discrepancy =             -4.43
```

```
 ----------------

      IN:
      ---
           STORAGE =    0.00000
     CONSTANT HEAD =    0.00000
             WELLS =     5.0000
          RECHARGE =     46.581
          TOTAL IN =     51.581
     OUT:
     ----
           STORAGE =    0.00000
     CONSTANT HEAD =     40.053
             WELLS =     11.500
          RECHARGE =    0.00000
         TOTAL OUT =     51.553
           IN - OUT =  0.27622E-01
PERCENT DISCREPANCY =                  0.05
```

FIG 3 MODFLOW WATER BALANCE FOR ENTIRE SITE

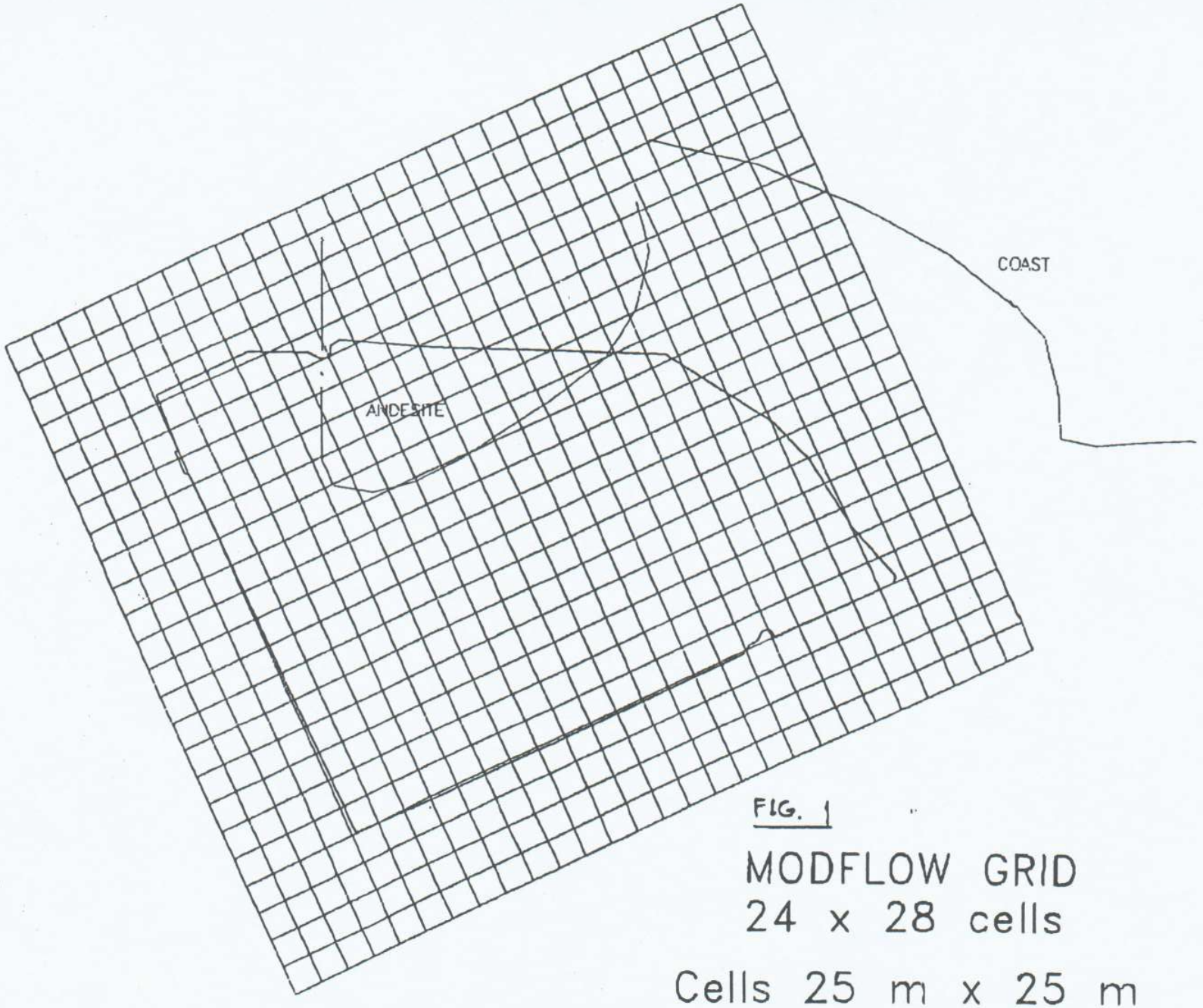

FIG. 1

MODFLOW GRID
24 x 28 cells

Cells 25 m x 25 m

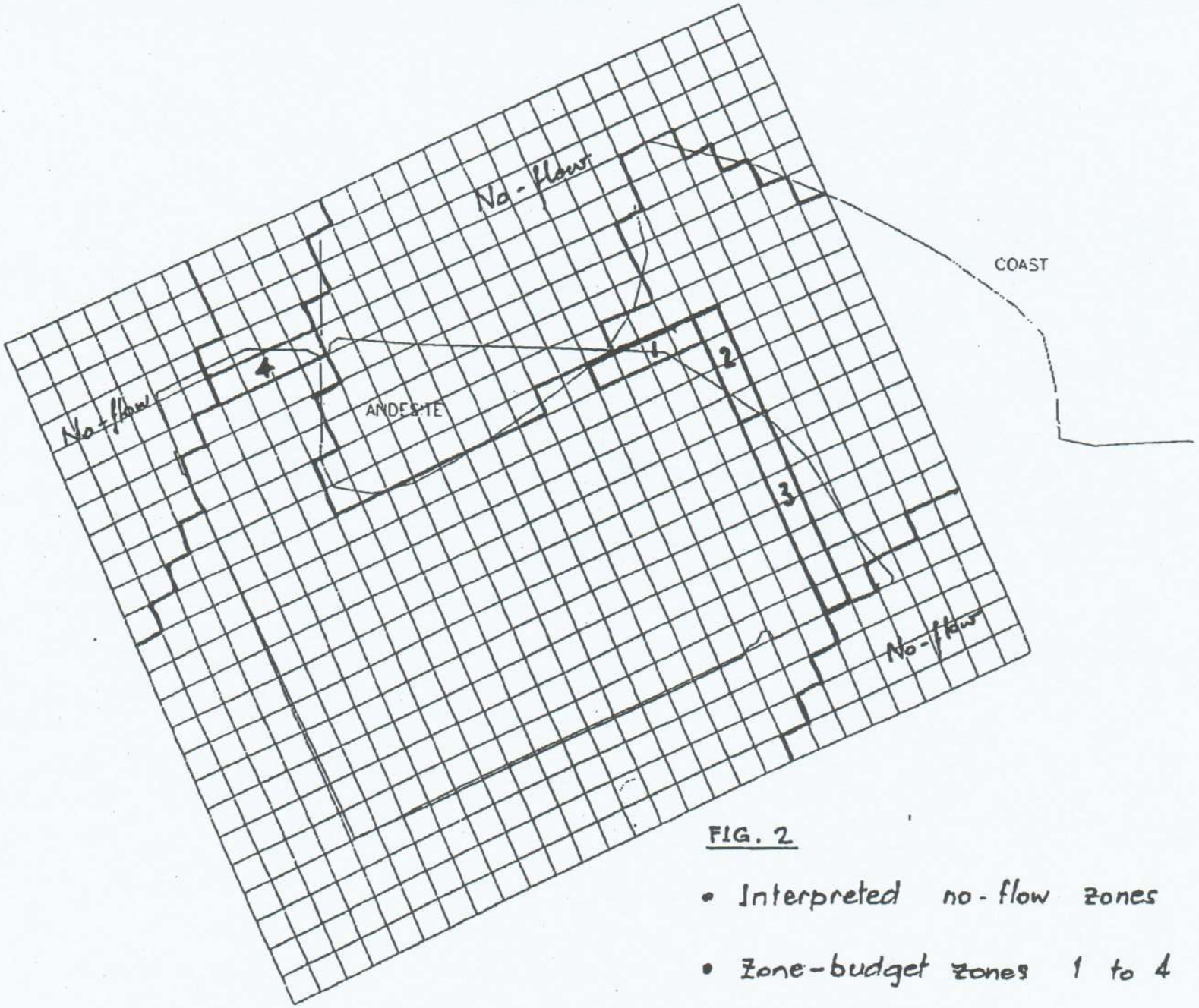

FIG. 2

- Interpreted no-flow zones
- Zone-budget zones 1 to 4

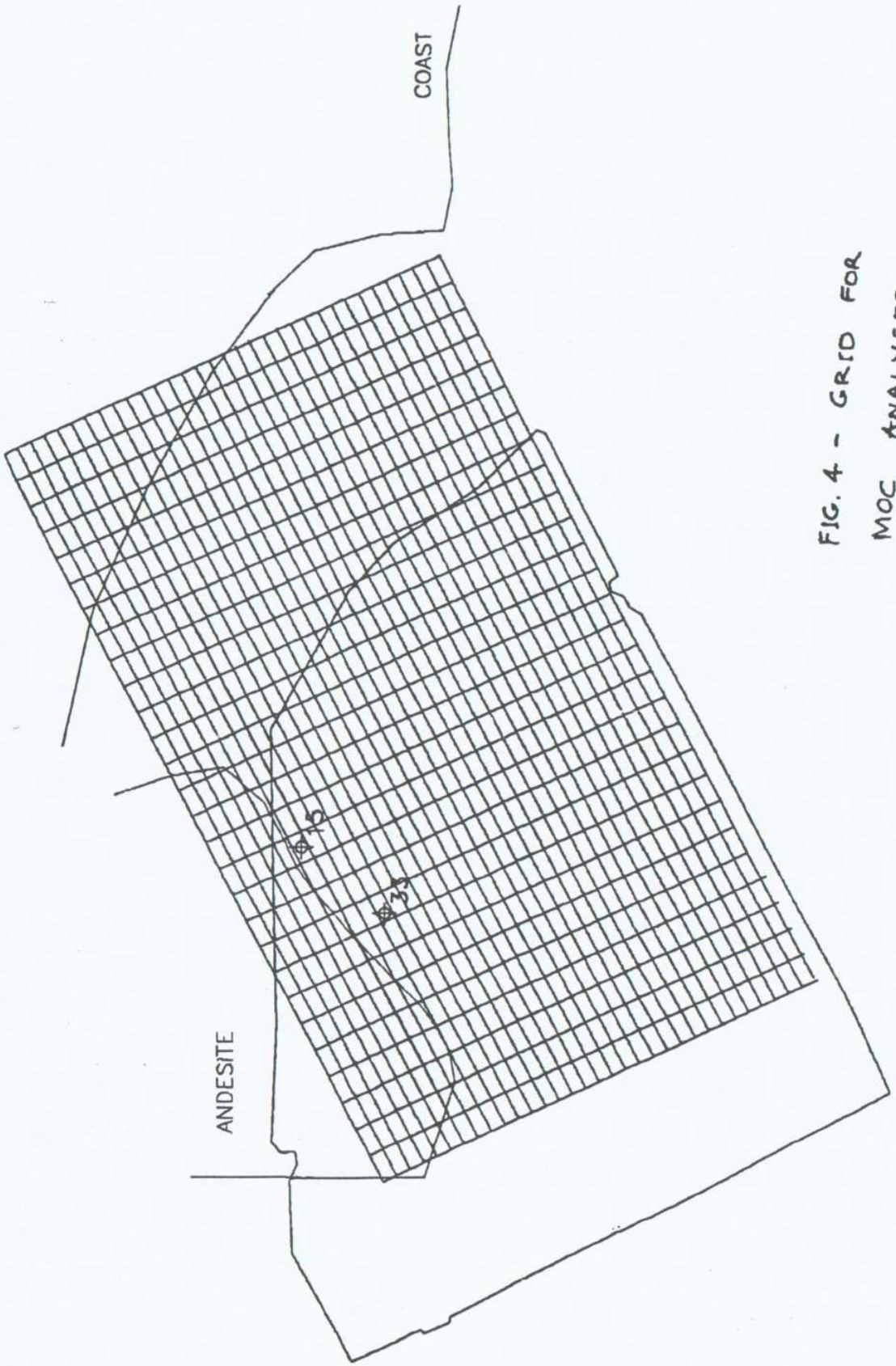

FIG. 4 - GRID FOR MOC ANALYSES

1200.
1000.
750.
500.
250.
100.
25.
15.
10.

Chlorophenols
(ppb)

50 0 50 100 150
metres

DOWELANCO NZ

Chlorophenol concentrations

After 1 month

DOWELANCO NZ

Chlorophenol concentrations

After 3 months

50 0 50 100 150

(metres)

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DOWELANCO NZ

Chlorophenol concentrations

After 6 months

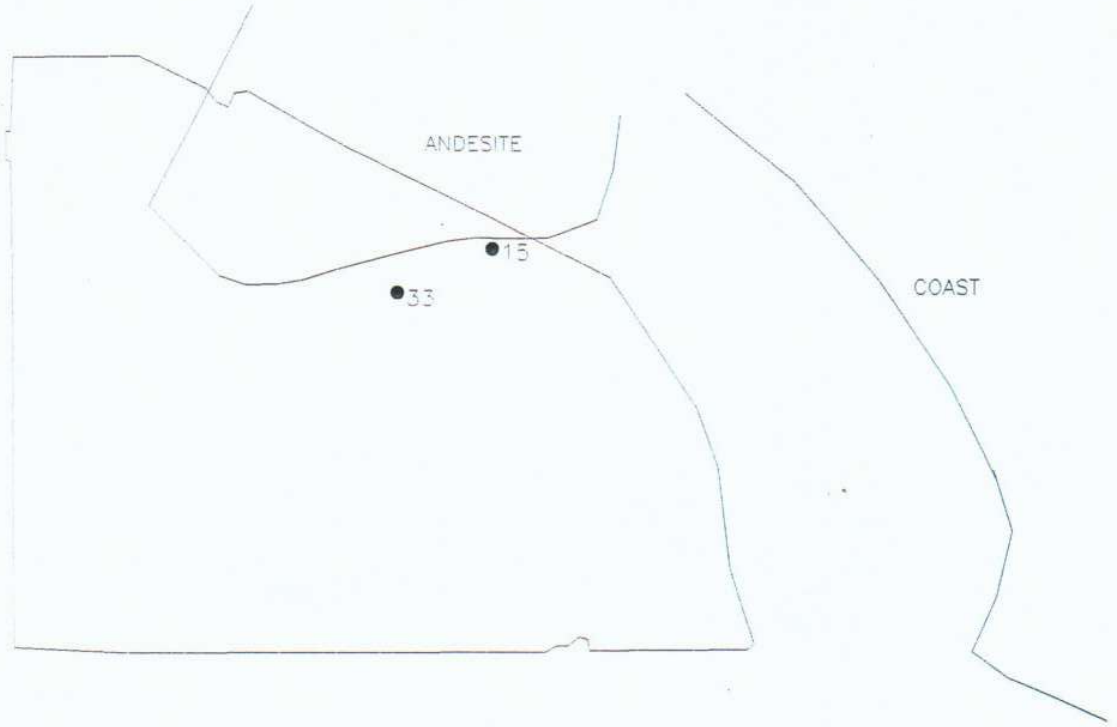
50 0 50 100 150

(metres)

DOWELANCO NZ

Chlorophenol concentrations

After 9 months



1200.
1000.
750.
500.
250.
100.
25.
15.
10.

Chlorophenols
(ppb)

50 0 50 100 150
(metres)

DOWELANCO NZ

Chlorophenol concentrations
After 12 months

DOWELANCO NZ

Phenoxies concentrations

After one month

50 0 50 100 150

(metres)

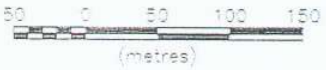
Phenoxies
(ppb)

DOWELANCO NZ

Phenoxies concentrations

After three months

Phenoxies (ppb)



DOWELANCO NZ

Phenoxies concentrations

After six months