4 RESULTS

4 RESULTS

Due to the extensive data obtained, only those figures worthy of discussion are presented in *Volume 1*, the rest of the plots and the raw data can be found in *Volume 2*.

4.1 Setting Out and Utility Survey

The report of the setting out and utility survey conducted by the Contractor is provided in Appendix H. The layout of wells and monitoring points at VT1 to VT4 are depicted on Figures 3.1 to 3.3. A more detailed layout of the arrangement of wells and monitoring points at VT3 and VT4 are depicted on Figure 3.4.

4.2 Boring Log and Soil Particle Size Analyses

It should be noted that in the boring log, the soil samples were described according to their appearance only. It was recorded in the boring log that the soil formation beneath VT1 comprised coarse sand, sand and clayey/silty sand; that beneath VT2 comprised coarse sand (with rock fragment) and marine sand; that beneath VT3 comprised coarse sand, sand and clayey sand; and that beneath VT4 comprised coarse sand (with rock fragment) and marine sand. The boring log and observations made on site show that there is no confining soil layer restricting vertical air movement. The thickness of concrete slab is about 0.5m at all the drilling points. The boring log and *the well installation log* are provided in Appendix I.

Some of the soil samples were sent to laboratory for confirmatory analyses. The laboratory report of the soil particle size analyses is given in Appendix J. The graphical formats of the results are shown on Figures 4.1 to 4.13. The particle size ranges according to several soil classification systems are shown on Figure 4.14 for ease of comparison.

4.3 Short-term Soil Vapour Extraction Tests

The field data (together with plots) of the short-term SVE tests (conducted at VT1 to VT4) are included separately in *Volume 2 (Section 1)*. The following essential plots are shown on Figures 4.15 to 4.21:

1) applied vacuum at each SVE well *vs* extracted air flow rate (Figures 4.15 and 4.16)
2) steady state vacuum (in log-scale) at vapour probes *vs* distance (Figures 4.17 to 4.20)
3) steady state vacuum at radial vapour probes *vs* direction from SVE well (VT3) (Figure 4.21)

4.4 Long-term Soil Vapour Extraction Tests

The baseline conditions of VOC, CO_2, O_2 and CH_4 for the long-term SVE test conducted at the four testing locations are tabulated in Tables 4.1 to 4.4 respectively. It has been clarified that all baseline conditions of gases (including DO as well), as presented in data sheets and here, were measured prior to the start-up of the blower.

Table 4.1 Baseline Conditions of VOC, CO_2, O_2 and CH_4 for Long-term SVE Test Conducted at VT1

			VOC (ppm)	CO_2 (%)	O_2 (%)	CH_4 (%)
Vapour Probes	5m	Shallow	6.8	0.18	18.2	0.58
		Deep	4.0	0.88	16.8	0.15
	10m	Shallow	167	0.54	15.9	1.68
		Deep	117	1.50	11.7	6.19
	20m	Shallow	214	2.29	1.40	39.9
		Deep	22.0	1.50	15.5	11.7
Blower Outlet			27.0	1.88	11.9	1.99
Carbon Absorber Outlet			ND	0.10	12.0	ND

Remark: ND = Not detected (detection limit for VOC = 0.1 ppm, CH_4 = 0.01%)

Table 4.2 Baseline Conditions of VOC, CO_2, O_2 and CH_4 for Long-term SVE Test Conducted at VT2

			VOC (ppm)	CO_2 (%)	O_2 (%)	CH_4 (%)
Vapour Probes	5m	Shallow	44.6	0.30	18.6	15.6
		Deep	62.9	0.57	17.2	7.44
	10m	Shallow	42.6	1.27	13.8	4.81
		Deep	49.4	2.05	12.5	4.73
	20m	Shallow	49.5	3.61	10.2	3.34
		Deep	52.3	5.49	2.6	4.11
Blower Outlet			70.2	0.80	13.7	9.80
Carbon Absorber Outlet			ND	0.92	13.8	9.00

Remark: ND = Not detected (detection limit for VOC = 0.1 ppm)

Table 4.3 Baseline Conditions of VOC, CO_2, O_2 and CH_4 for Long-term SVE Test Conducted at VT3

			VOC (ppm)	CO_2 (%)	O_2 (%)	CH_4 (%)
Vapour Probes	1m	Shallow	39.7	0.22	18.0	0.66
		Deep	18.8	0.14	16.3	0.31
	5m	Shallow	53.4	0.80	12.8	1.09
		Deep	55.7	0.22	12.3	0.78
	10m	Shallow	15.4	ND	17.7	0.23
		Deep	80.6	0.18	5.00	8.62
	20m	Shallow	60.9	0.37	9.70	3.17
		Deep	23.9	0.53	17.8	1.02
	5m (E)	Shallow	5.59	2.40	0.30	11.4
		Deep	17.4	1.66	1.20	17.2
	5m (F)	Shallow	56.5	2.05	10.5	10.9
		Deep	79.7	3.23	9.40	9.80
Blower Outlet			308	0.06	10.0	2.40
Carbon Absorber Outlet			108	1.86	10.0	1.25

Remark: ND = Not detected (detection limit for CO_2 = 0.01%)

Table 4.4 Baseline Conditions of VOC, CO_2, O_2 and CH_4 for Long-term SVE Test Conducted at VT4

			VOC (ppm)	CO_2 (%)	O_2 (%)	CH_4 (%)
Vapour Probes	1m	Shallow	90.7	12.7	0.10	61.7
		Deep	97.0	18.6	0.10	56.3
	5m	Shallow	90.2	16.2	ND	43.4
		Deep	102	6.46	12.2	19.1
	10m	Shallow	70.9	6.62	3.70	48.1
		Deep	79.4	21.3	ND	72.4
	20m	Shallow	126	7.52	1.00	30.9
		Deep	155	17.0	ND	34.4
	5m (E)	Shallow	108	8.11	1.40	43.8
		Deep	120	18.6	ND	52.4
	5m (F)	Shallow	63.4	11.1	3.50	50.5
		Deep	85.7	17.0	3.50	53.2
Blower Outlet			124	17.7	0.60	50.7
Carbon Absorber Outlet			ND	18.1	0.80	41.4

Remark: ND = Not detected (detection limit for VOC = 0.1 ppm, for O_2 = 0.01%)

The baseline condition of VOC (average concentration from vapour probes) was highest at VT4 (118.8 ppm) and lowest at VT2 (50.2 ppm). The baseline condition of VOC (from blower outlet) at VT3 was highest (308 ppm) and at VT1 was lowest (27 ppm). CO_2 was highest at VT4 (17.7%) and lowest at VT3 (0.06%). O_2 was highest at VT3 (10%) and lowest at VT4 (0.6%). CH_4 was highest at VT4 (50.7%) and lowest at VT1 (1.99%).

The field data (together with plots) of the long-term SVE tests (conducted at VT1 to VT4) are included separately in *Volume 2 (Section 2)*. The following essential plots are shown on Figures 4.22 to 4.25:

- VOC, CO_2, O_2 and CH_4 concentration at blower outlet *vs* time

4.5 Short-term Air Sparging Tests

The baseline conditions of DO for the short-term AS test conducted at VT3 and VT4 are tabulated in Tables 4.5.

Table 4.5 Baseline Conditions of DO for Short-term AS Tests Conducted at VT3 and VT4

			VT3	VT4
DO (mgl^{-1}) at Groundwater Monitoring Well	2.5m	Shallow (W1)	0.68	0.29
		Deep (W2)	0.31	0.32
	5.5m	Shallow	0.21	0.29
		Deep	0.52	0.30
	2.5m	Shallow (W6 for VT3; W5 for VT4)	0.34	0.29
		Deep (W5 for VT3; W6 for VT4)	0.25	0.31
	2.5m	Shallow (W8)	0.66	0.27
		Deep (W7)	0.19	0.30

Remark: The values shown are the average of the different tests conducted at a location

The average baseline concentrations of DO at VT3 and VT4 were close to each other (0.4 mgl^{-1} and 0.3 mgl^{-1} respectively).

The field data (together with plots) of the short-term AS tests (conducted at VT3 and VT4 only) are included separately in *Volume 2 (Section 3)*. The following essential plots are shown on Figures 4.26 to 4.35:

1) steady state pressure at vapour probes *vs* distance from AS well (Figures 4.26 and 4.27)
2) steady state pressure at radial vapour probes *vs* radial direction from AS well (Figures 4.28 and 4.29)
3) depth to water table at groundwater monitoring wells *vs* time (Figures 4.30 and 4.31)
4) DO at groundwater monitoring wells *vs* time (Figures 4.32 to 4.35)

During the course of two short-term AS tests conducted at VT3 (flow rate 4 cfm (6.72 m^3h^{-1}) and 2 cfm (3.36 m^3h^{-1})), the deep probe A2 was found to be likely marginally plugged by groundwater, because relatively elevated groundwater level was observed at the nearby groundwater monitoring well. Consequently, the corresponding data were not used for data interpretation.

4.6 Tracer (Helium) Tests

The baseline conditions of helium for the tracer (helium) tests conducted at VT3 and VT4 are tabulated in Table 4.6.

Table 4.6 Baseline Conditions of Helium for Tracer (Helium) Tests Conducted at VT3 and VT4

			VT3	VT4
Helium Concentration (%) at Vapour Probes	1m	Shallow	ND	ND
		Deep	ND	0.04
	5m	Shallow	ND	ND
		Deep	0.01	ND
	10m	Shallow	0.01	ND
		Deep	0.07	ND
	20m	Shallow	0.02	ND
		Deep	0.02	ND
	5m (E)	Shallow	ND	ND
		Deep	0.04	0.02
	5m (F)	Shallow	0.08	0.02
		Deep	0.03	0.05

Remarks:
a The values shown are the average of the different tests conducted at a location
b ND = not detected (detection limit = 0.01%)

The average baseline concentrations of helium at VT3 and VT4 were close to each other (0.03% and 0.02% respectively).

It should be noted that some of the positive readings were due to the presence of methane. The helium detector also detects methane, although at a much lower sensitivity. As the typical magnitude of our helium concentrations during the tracer test is in %, methane is therefore treated as a background noise.

The field data (together with plots) of the tracer (helium) tests (conducted at VT3 and VT4) are included separately in *Volume 2 (Section 4)*. The plots of helium concentration at vapour probes *vs* time are shown on Figures 4.36 to 4.43.

4.7 Long-term Combined Soil Vapour Extraction/ Air Sparging Tests

The baseline conditions of VOC, CO_2, O_2 and CH_4 for the long-term combined SVE/AS tests conducted at VT3 and VT4 are tabulated in Tables 4.7 and 4.8 respectively. The baseline conditions of DO at VT3 and VT4 are tabulated in Table 4.9.

Table 4.7 Baseline Conditions of VOC, CO_2, O_2 and CH_4 for Long-term Combined SVE/AS Test Conducted at VT3

			VOC (ppm)	CO_2 (%)	O_2 (%)	CH_4 (%)
Vapour Probes	1m	Shallow	60.0	0.14	19.8	2.29
		Deep	9.6	0.02	20.1	0.04
	5m	Shallow	244	0.49	13.2	3.01
		Deep	177	0.33	6.30	3.21
	10m	Shallow	4.7	0.02	19.7	0.35
		Deep	95.0	0.45	2.10	21.5
	20m	Shallow	28.0	0.53	11.9	10.9
		Deep	11.4	0.57	17.3	8.25
	5m (E)	Shallow	83.9	2.01	4.00	2.27
		Deep	8.6	0.02	19.8	0.19
	5m (F)	Shallow	41.0	0.30	14.8	5.60
		Deep	20.6	0.76	15.0	4.86
Blower Outlet			145	0.14	18.5	3.95
Carbon Absorber Outlet			1.7	0.26	18.0	ND

Remark: ND = Not detected (detection limit for CH_4 = 0.01%)

Table 4.8 Baseline Conditions of VOC, CO_2, O_2 and CH_4 for Long-term Combined SVE/AS Test Conducted at VT4

			VOC (ppm)	CO_2 (%)	O_2 (%)	CH_4 (%)
Vapour Probes	1m	Shallow	96.1	3.11	15.2	11.7
		Deep	189	4.89	15.3	10.1
	5m	Shallow	213	0.80	19.4	3.20
		Deep	19.9	0.61	19.8	1.36
	10m	Shallow	134	0.45	20.0	2.89
		Deep	192	0.14	21.0	4.70
	20m	Shallow	307	0.78	20.2	2.13
		Deep	175	0.22	20.8	0.27
	5m (E)	Shallow	87.7	0.01	20.9	0.69
		Deep	257	7.45	10.0	13.7
	5m (F)	Shallow	132	5.66	12.3	6.90
		Deep	64.0	3.15	16.9	9.05
Blower Outlet			280	8.20	9.10	20.8
Carbon Absorber Outlet			ND	10.3	5.10	19.5

Remark: ND = Not detected (detection limit for VOC = 0.1ppm)

For long-term combined SVE/AS tests, the baseline condition of VOC (from vapour probes (averaged concentration) and blower outlet) at VT4 was higher than that at VT3 (155.6 ppm *vs* 65.3 ppm and 280 ppm *vs* 145 ppm respectively). CO_2 at VT4 was also higher than that at VT3 (8.2% *vs* 0.14%). O_2 at VT3 was higher than that at VT4 (18.5% *vs* 9.1%). CH_4 at VT4 was higher than that at VT3 (20.8% *vs* 3.95%).

Table 4.9 Baseline Conditions of DO for Long-term Combined SVE/AS Tests Conducted at VT3 and VT4

			VT3	VT4
DO (mgl^{-1}) at Groundwater Monitoring Well	2.5m	Shallow (W1)	0.40	0.20
		Deep (W2)	0.41	0.28
	5.5m	Shallow	0.25	0.22
		Deep	0.90	0.23
	2.5m	Shallow (W6 for VT3; W5 for VT4)	0.41	0.30
		Deep (W5 for VT3; W6 for VT4)	0.36	0.32
	2.5m	Shallow (W8)	0.52	0.23
		Deep (W7)	0.50	0.27

In this case, the average baseline concentration of DO at VT3 was higher than that at VT4 (0.47 mgl^{-1} *vs* 0.26 mgl^{-1}).

The field data (together with plots) of the long term combined SVE/AS tests (conducted at VT3 and VT4) are included separately in *Volume 2 (Section 5)*. The following essential plots are shown on Figures 4.44 to 4.49:

1) depth to water table at SVE well and groundwater monitoring wells *vs* time (Figures 4.44 and 4.45)
2) DO concentration at groundwater monitoring wells *vs* time (Figures 4.46 and 4.47)
3) VOC, CO_2, O_2 and CH_4 concentration at blower outlet *vs* time (Figures 4.48 and 4.49)

It should be noted that for the measurement of gases (VOC, CO_2, O_2, CH_4 and helium), sometimes the concentration of a gas was too low to be detected by the gas analyser (0.1 ppm for VOC and 0.01% for all other gases). In such cases, the concentration of the gas was reported as N.D. although the actual concentration of the gas might not be zero.

4.8 Cross-checking of VOC Measurements

The records of the cross-checking of VOC measurements together with analyses of the measurements are provided in Appendix K.

The analyses (in graphical format) reveal that there was discrepancy in limited measurements. These discrepancies were due to the natural fluctuation of VOC measurements. The followings contribute to the variance:

1) the changing flow/ vapour concentration of the gas stream (the sample is not static), and measurements are done sequentially
2) the different rating of the internal pump of the instrument (extracting gas from a moving medium)

3) *the different model of instrument, and their intrinsic response to VOC and interfering gas (methane)*
4) *the slight difference of the sampling location at the blower and filter outlets (positive pressure necessitate some space between the outlet valves and instrument head)*

4.9 Computer Modelling on Permeability of Soil

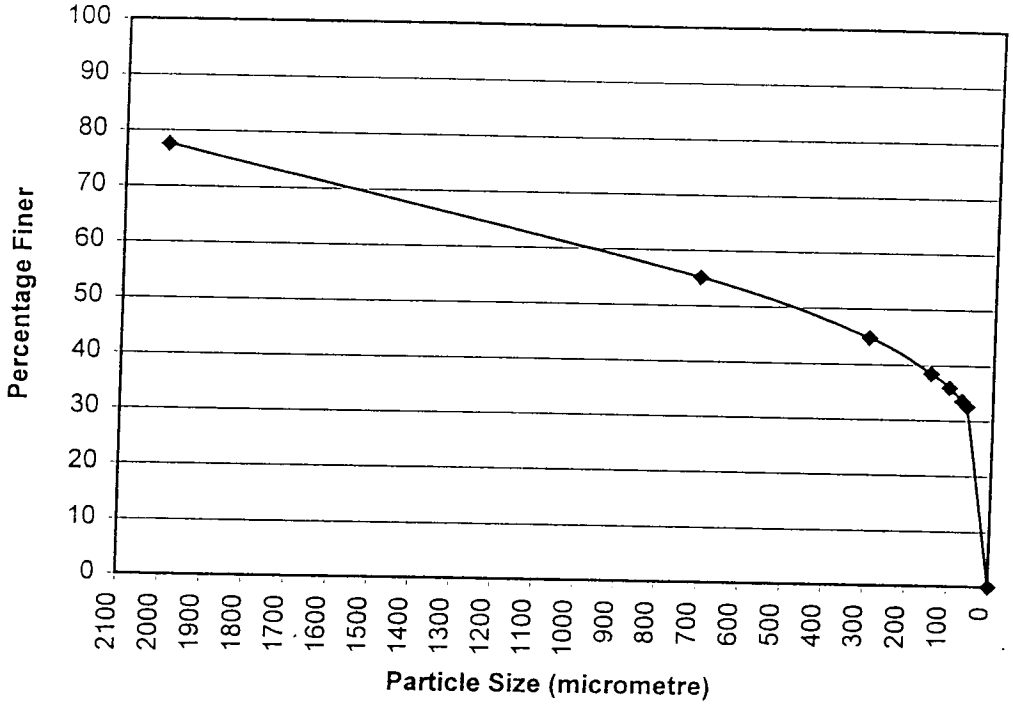
The screened interval thickness was assumed to be 6.6 ft (2m). The printouts of the results of the modelling on permeability of soil are provided in Appendix L. It should be noted that since both the flows rates and well screen intervals were known accurately, method A was used to calculate the permeability. The average permeability (except for anomaly) of soil at each testing location was calculated and compared with typical permeabilities of geological materials (with reference to Figure 1.6). The results are summarised in Table 4.10.

Table 4.10 Summary of Results of Computer Modelling on Permeability of Soil

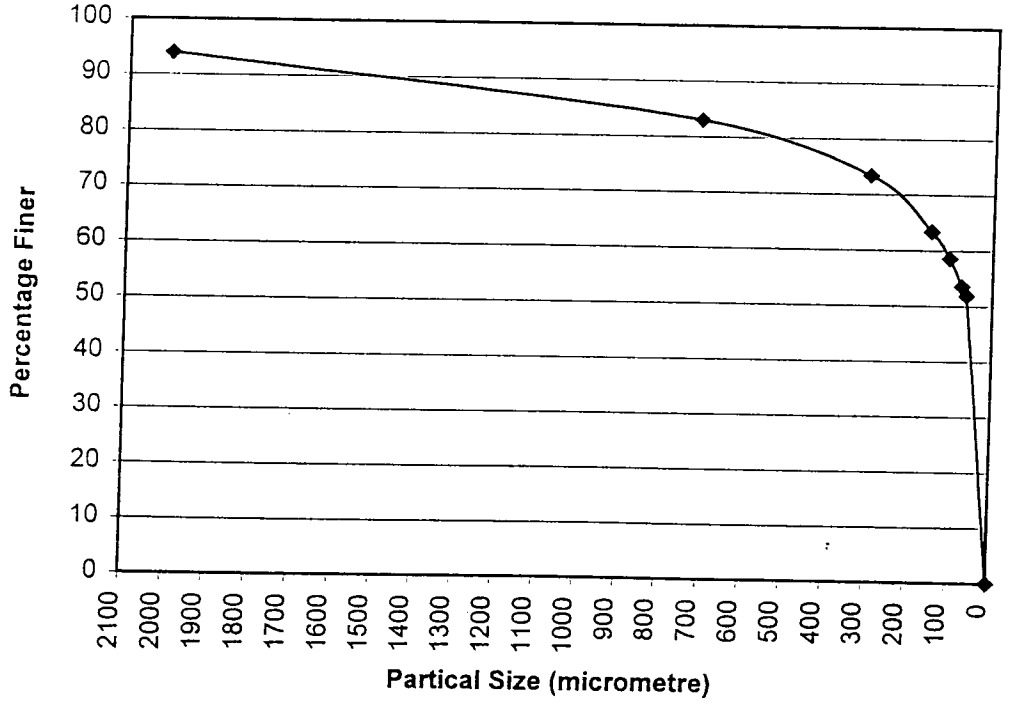
Location	Range of Permeability[a] (darcy)	Closest Soil Type[b]	Degree of Homogeneity
VT1	10^{1} to 10^{2}	Sand	Medium
VT2	10^{2} to 10^{3}	Sandy gravel	High
VT3	10^{0} to 10^{3}	Silty sand to sandy gravel	Low
VT4	10^{2} to 10^{3}	Sandy gravel	High

a For equivalent in ms^{-1}, refer to Figure 1.6.
b Assessed by comparing with typical permeabilities of geological materials as shown on Figure 1.6.

Particle Size Distribution of Soil Taken at VT1 (VT1-1m)

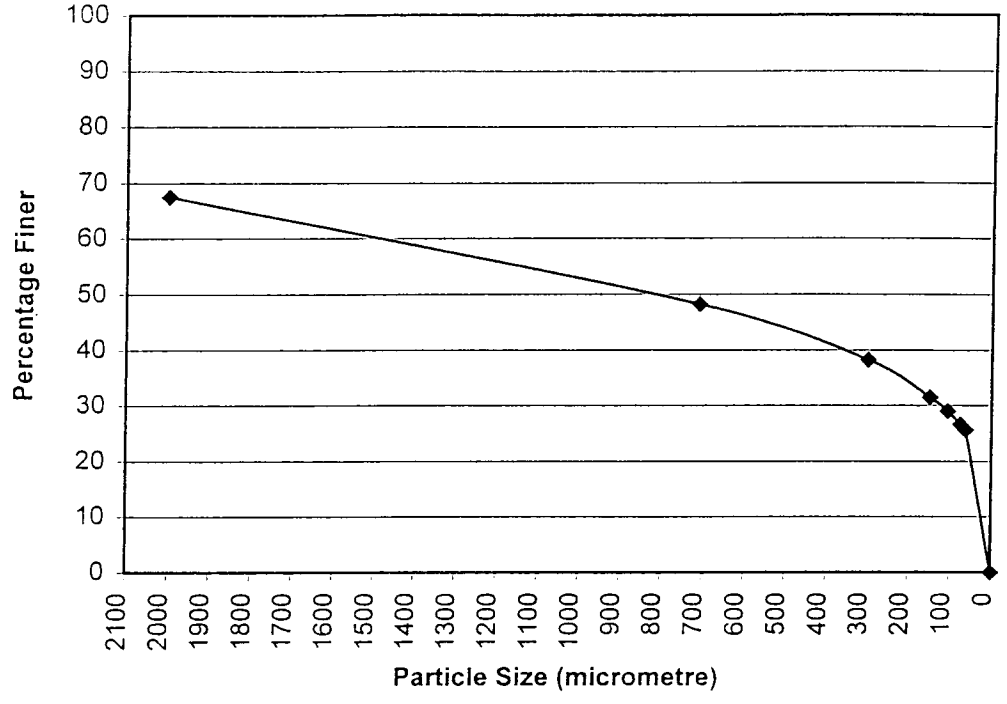


Particle Size Distribution of Soil Taken at VT1 (VT1-2m)

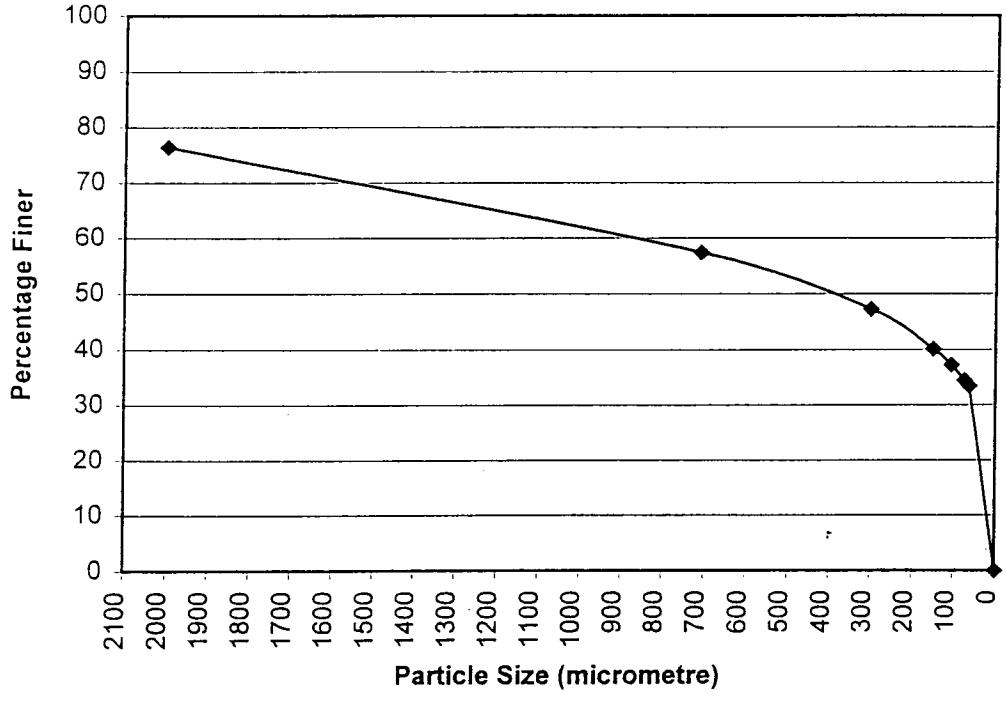


Maunsell	TITLE: Particle Size Distribution of Soil Taken at VT1-1m and VT1-2m	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.1
		DESIGNED/ CHECKED	EL	DATE Dec 1998

Particle Size Distribution of Soil Taken at VT1 (VT1C-1m)

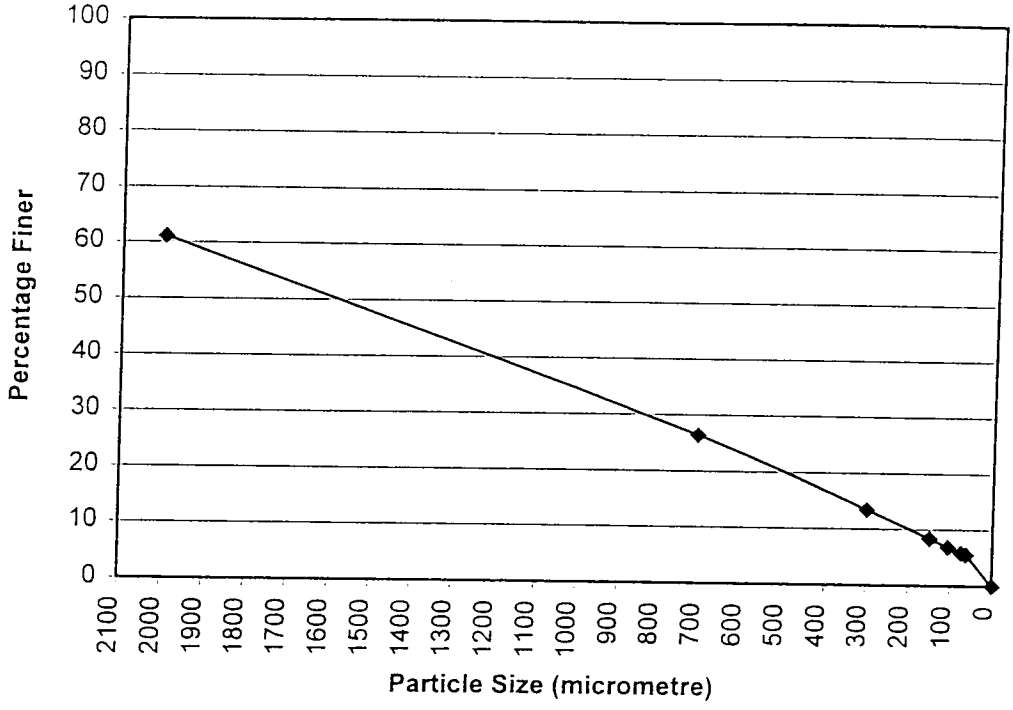


Particle Size Distribution of Soil Taken at VT1 (VT1C-2m)

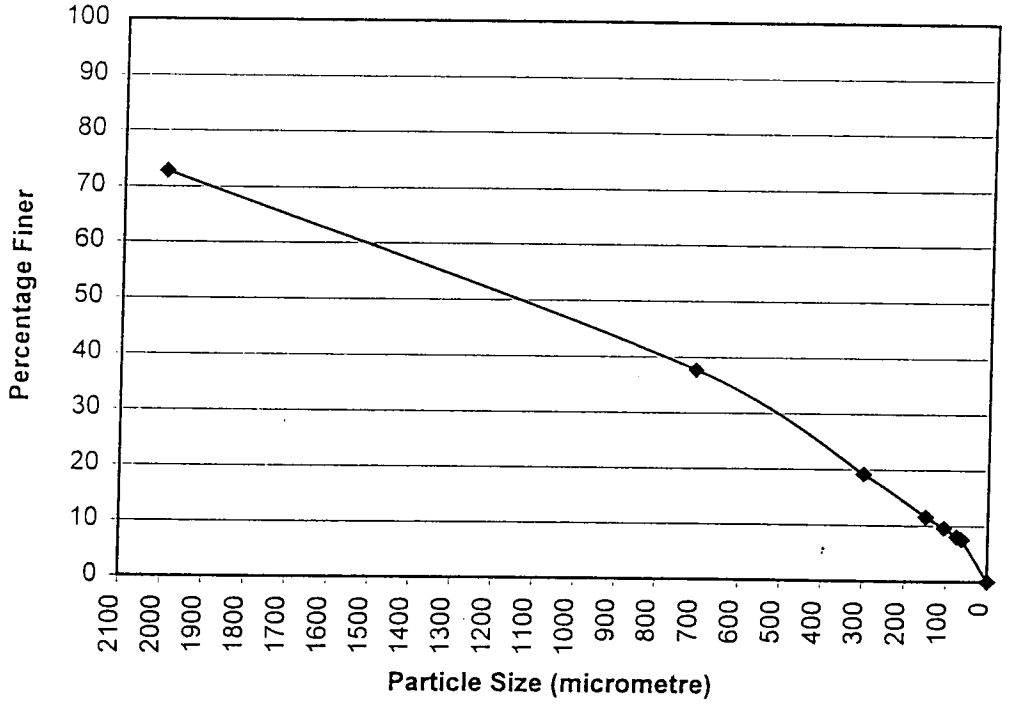


Maunsell	TITLE: Particle Size Distribution of Soil Taken at VT1C-1m and VT1C-2m	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.2
		DESIGNED/ CHECKED	EL	DATE	Dec 1998

Particle Size Distribution of Soil Taken at VT2 (VT2-1m)

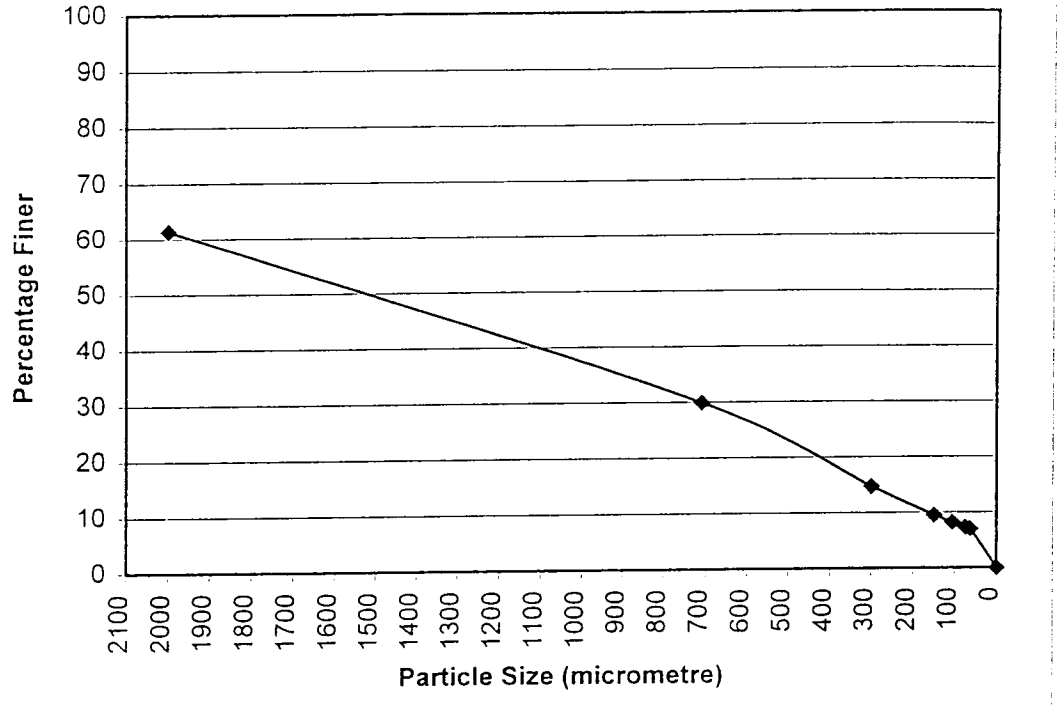


Particle Size Distribution of Soil Taken at VT2 (VT2-2m)

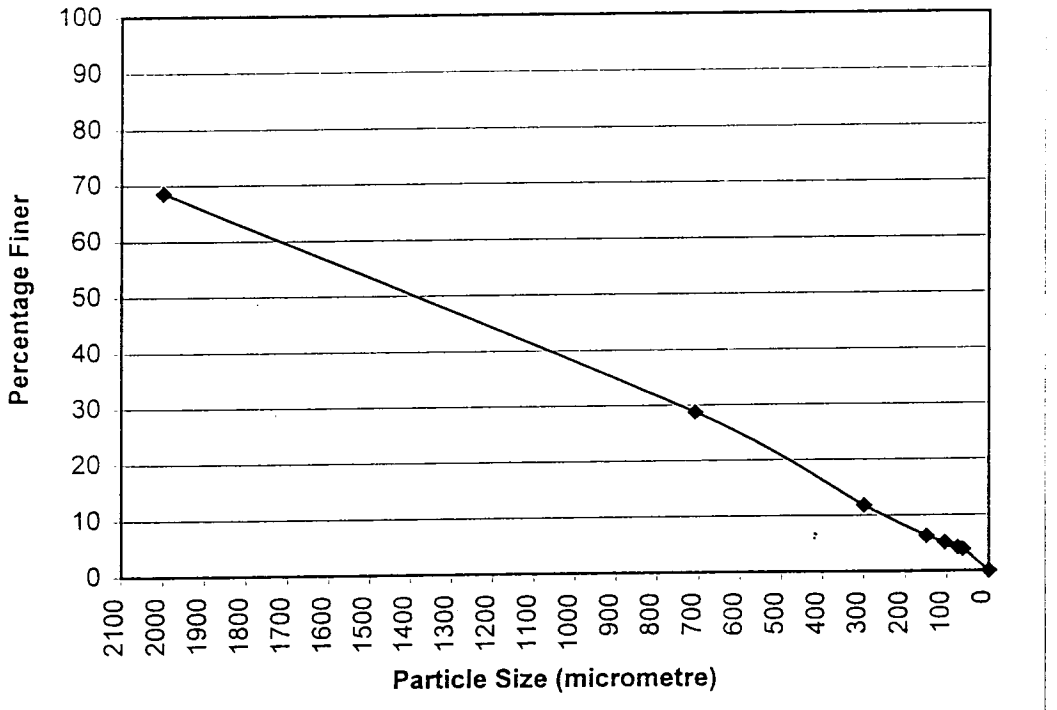


Maunsell	TITLE: Particle Size Distribution of Soil Taken at VT2-1m and VT2-2m	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.3
		DESIGNED/ CHECKED	EL	DATE Dec 1998

Particle Size Distribution of Soil Taken at VT2 (VT2C-1m)



Particle Size Distribution of Soil Taken at VT2 (VT2C-2m)



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TITLE

Particle Size Distribution of Soil Taken at VT2C-1m and VT2C-2m

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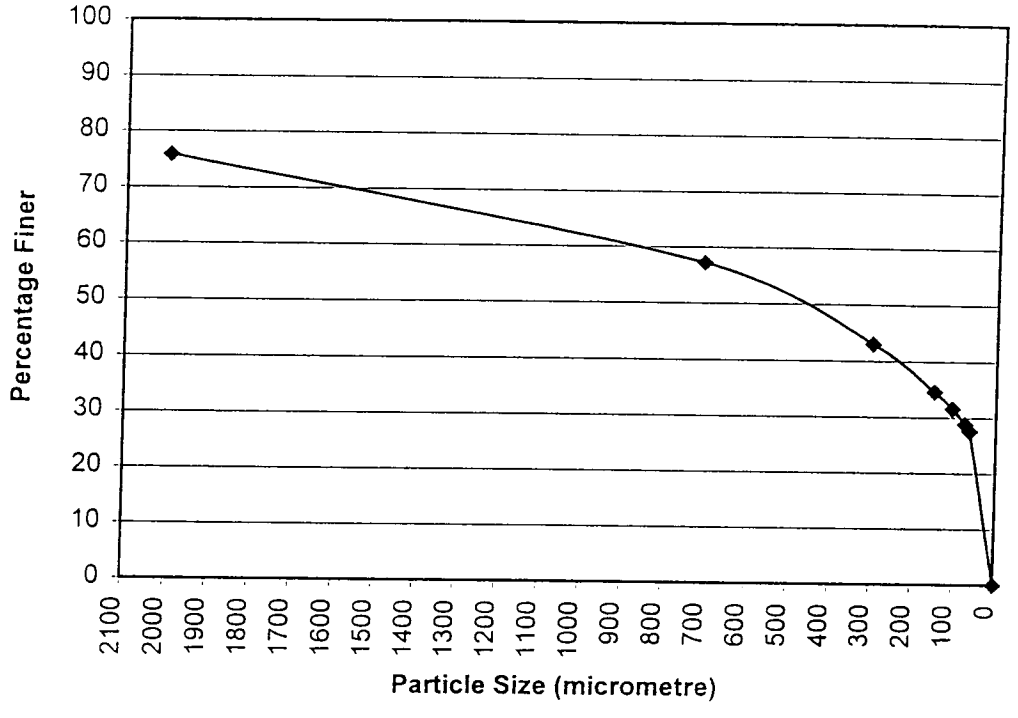
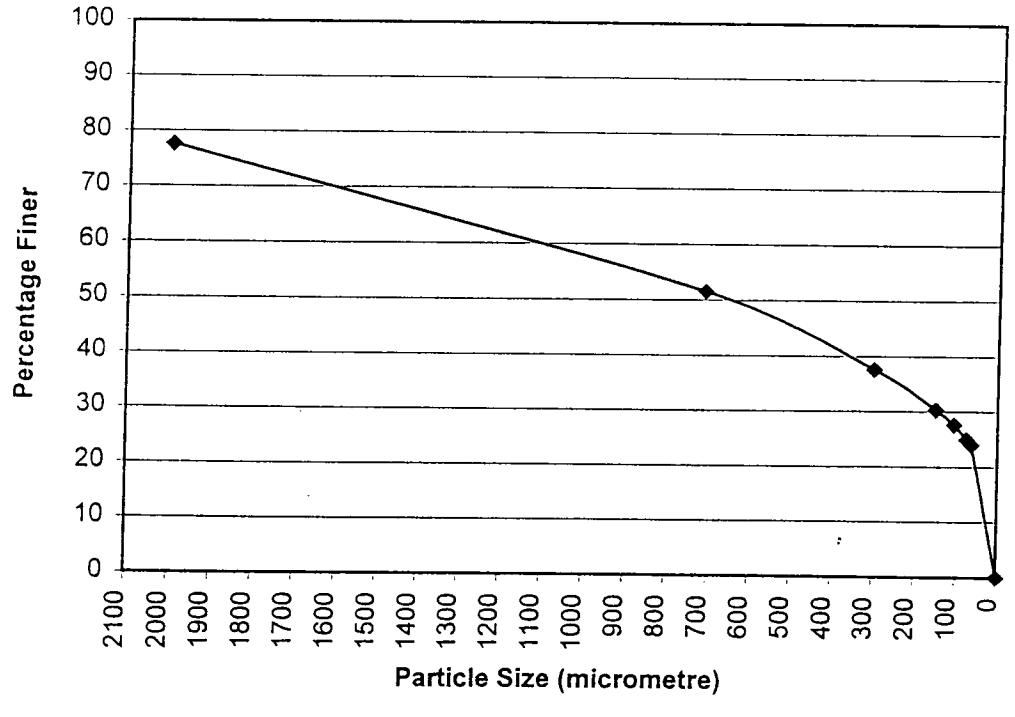
PROJECT NO	C418	FIGURE NO.	Figure 4.4
DESIGNED/ CHECKED	EL	DATE	Dec 1998

Particle Size Distribution of Soil Taken at VT3 (VT3-1m)

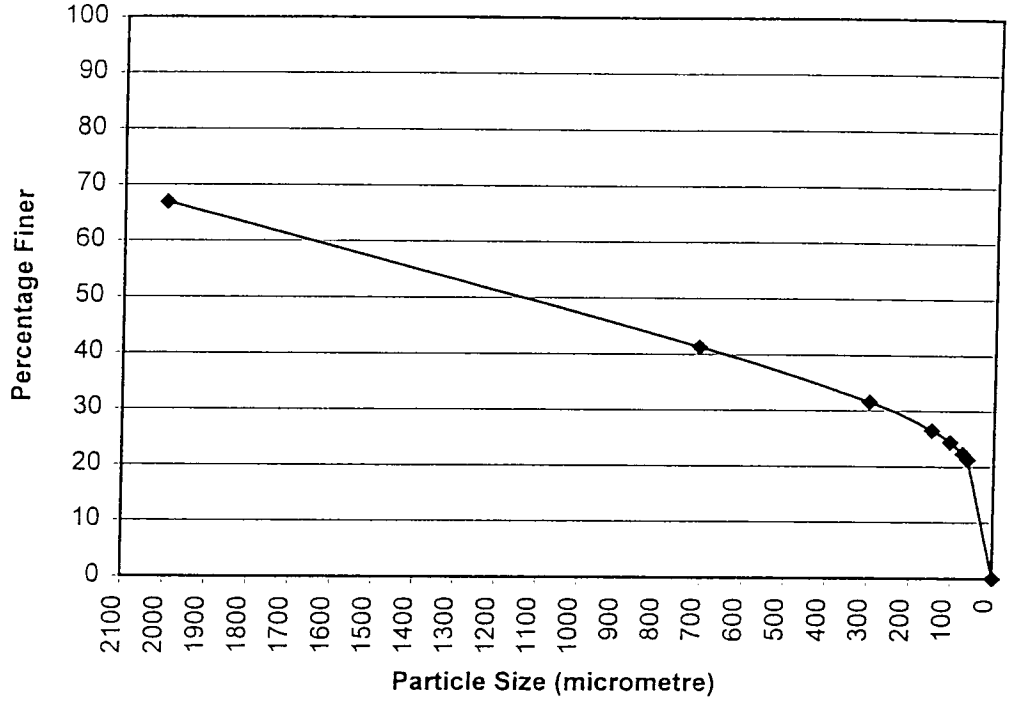


Particle Size Distribution of Soil Taken at VT3 (VT3-2m)

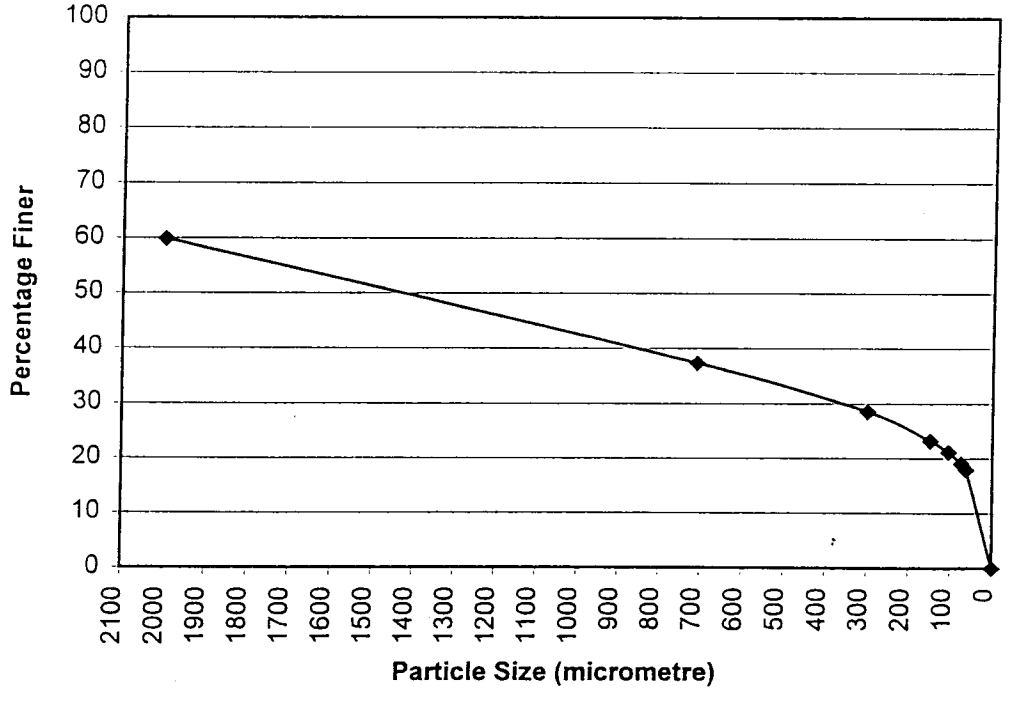


Maunsell	TITLE: Particle Size Distribution of Soil Taken at VT3-1m and VT3-2m	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.5
		DESIGNED/ CHECKED	EL	DATE Dec 1998

Particle Size Distribution of Soil Taken at VT3 (VT3D-1m)

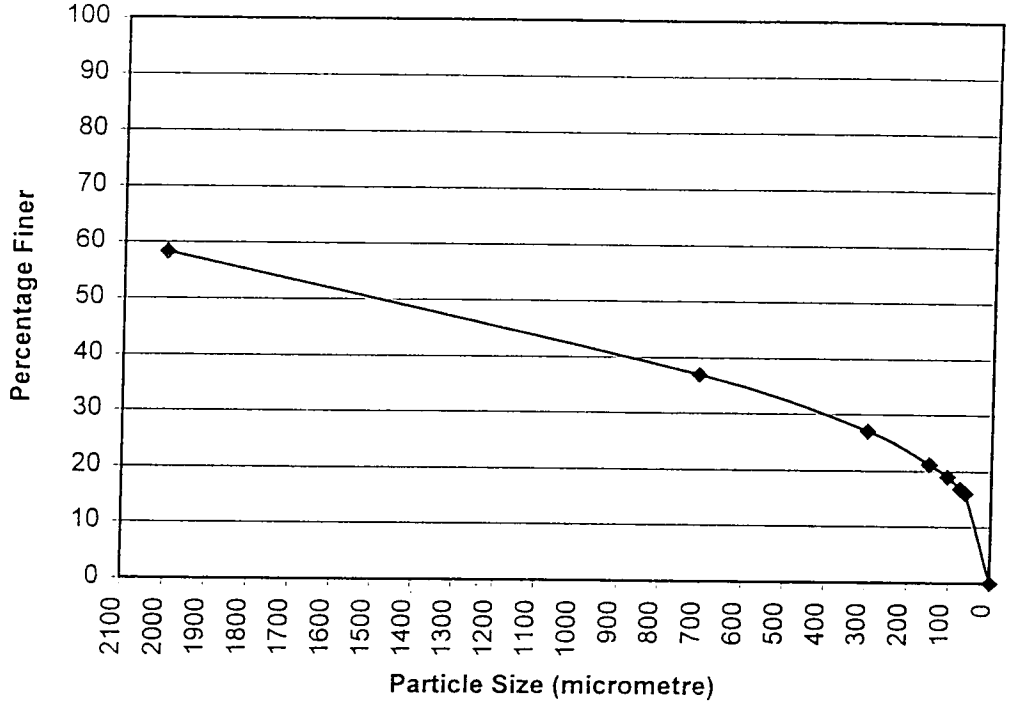


Particle Size Distribution of Soil Taken at VT3 (VT3D-2m)

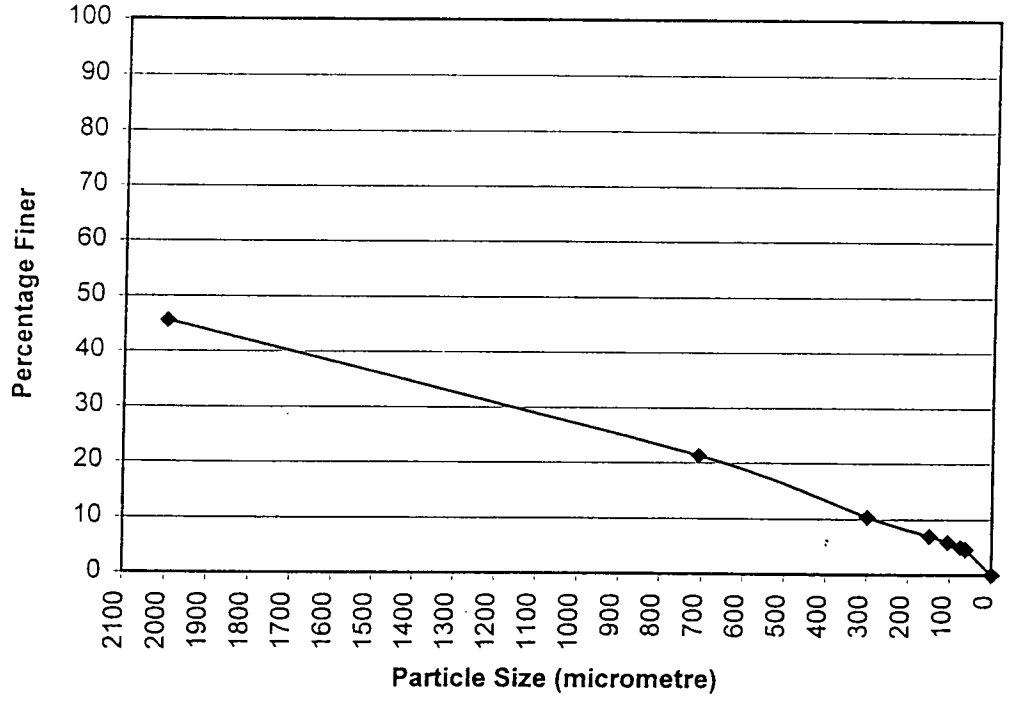


Maunsell	TITLE	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
	Particle Size Distribution of Soil Taken at VT3D-1m and VT3D-2m	PROJECT NO	C418	FIGURE NO.	Figure 4.6
		DESIGNED/ CHECKED	EL	DATE	Dec 1998

Particle Size Distribution of Soil Taken at VT3 (VT3E-2m)

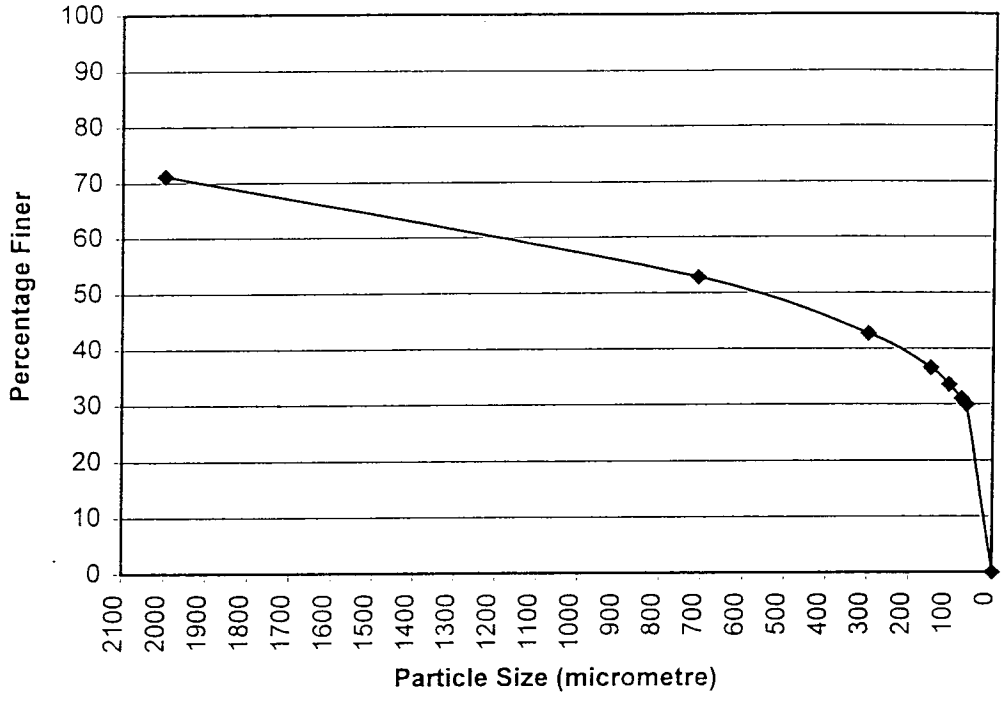


Particle Size Distribution of Soil Taken at VT3 (VT3E-3m)

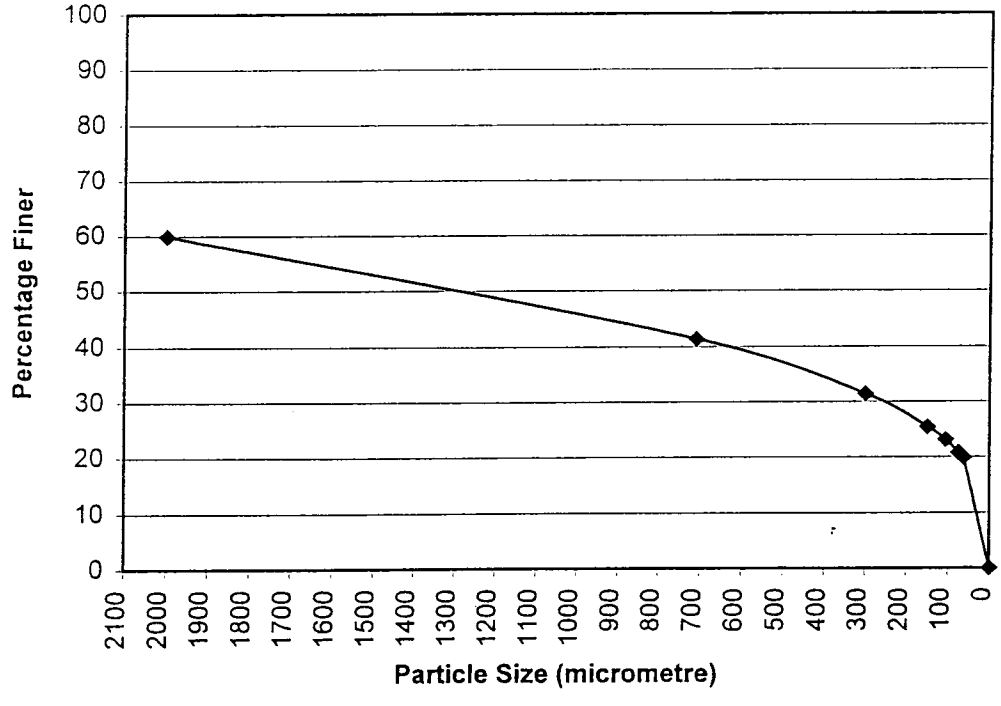


Maunsell	TITLE: Particle Size Distribution of Soil Taken at VT3E-2m and VT3E-3m	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.7
		DESIGNED/ CHECKED	EL	DATE Dec 1998

Particle Size Distribution of Soil Taken at VT3 (VT3F-2m)



Particle Size Distribution of Soil Taken at VT3 (VT3F-3m)



Maunsell

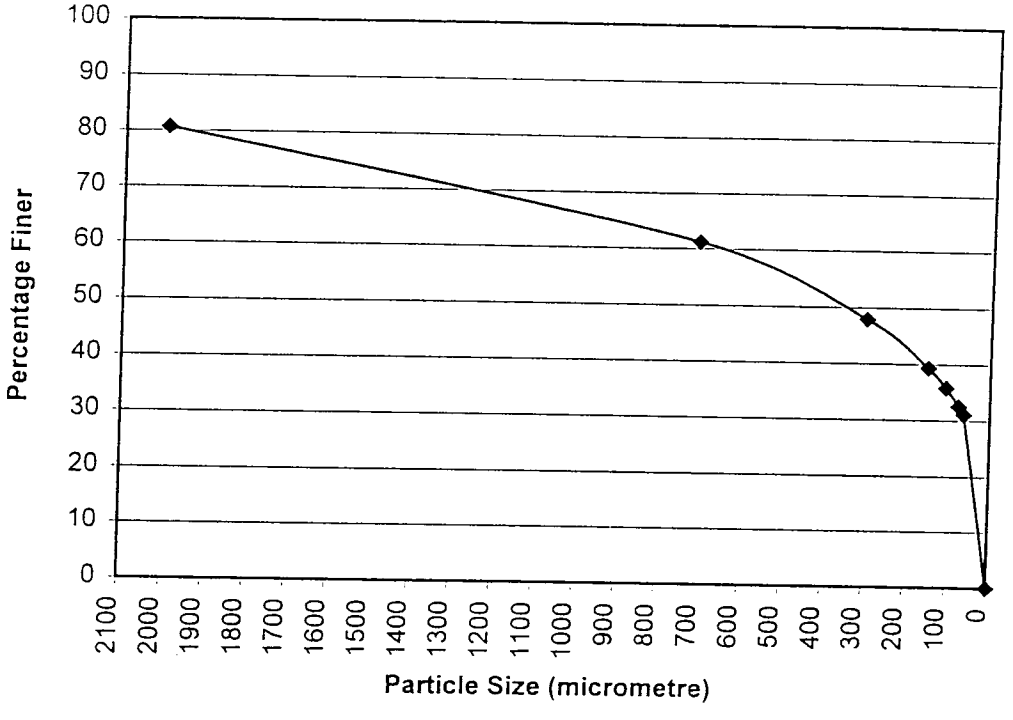
TITLE

Particle Size Distribution of Soil Taken at VT3F-2m and VT3F-3m

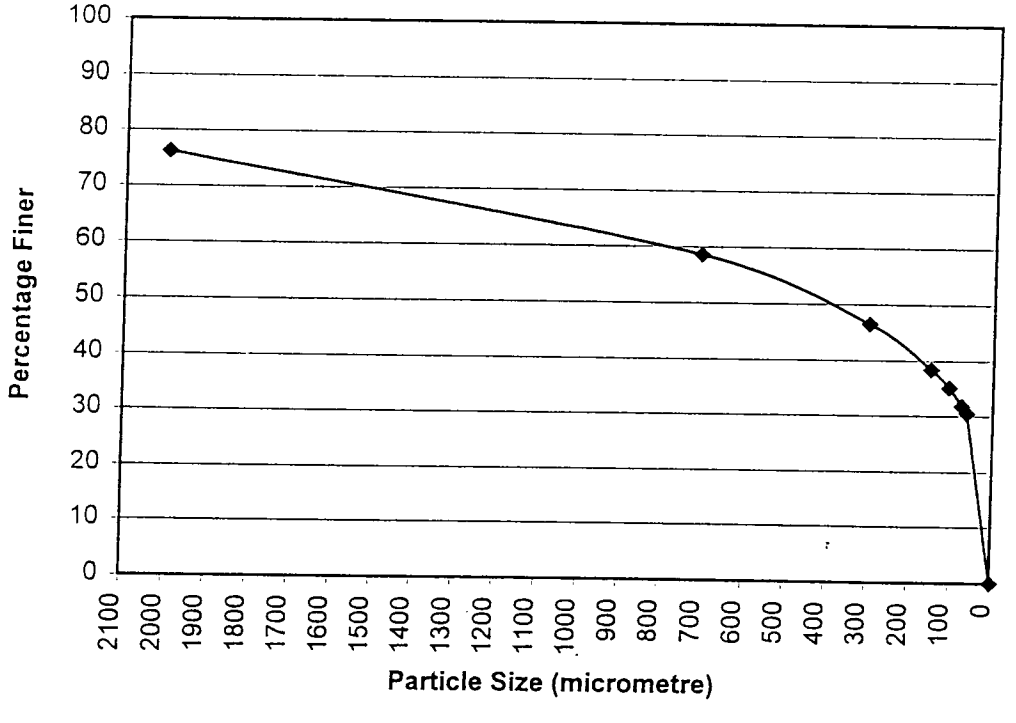
MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD

PROJECT NO	C418	FIGURE NO.	Figure 4.8
DESIGNED/ CHECKED	EL	DATE	Dec 1998

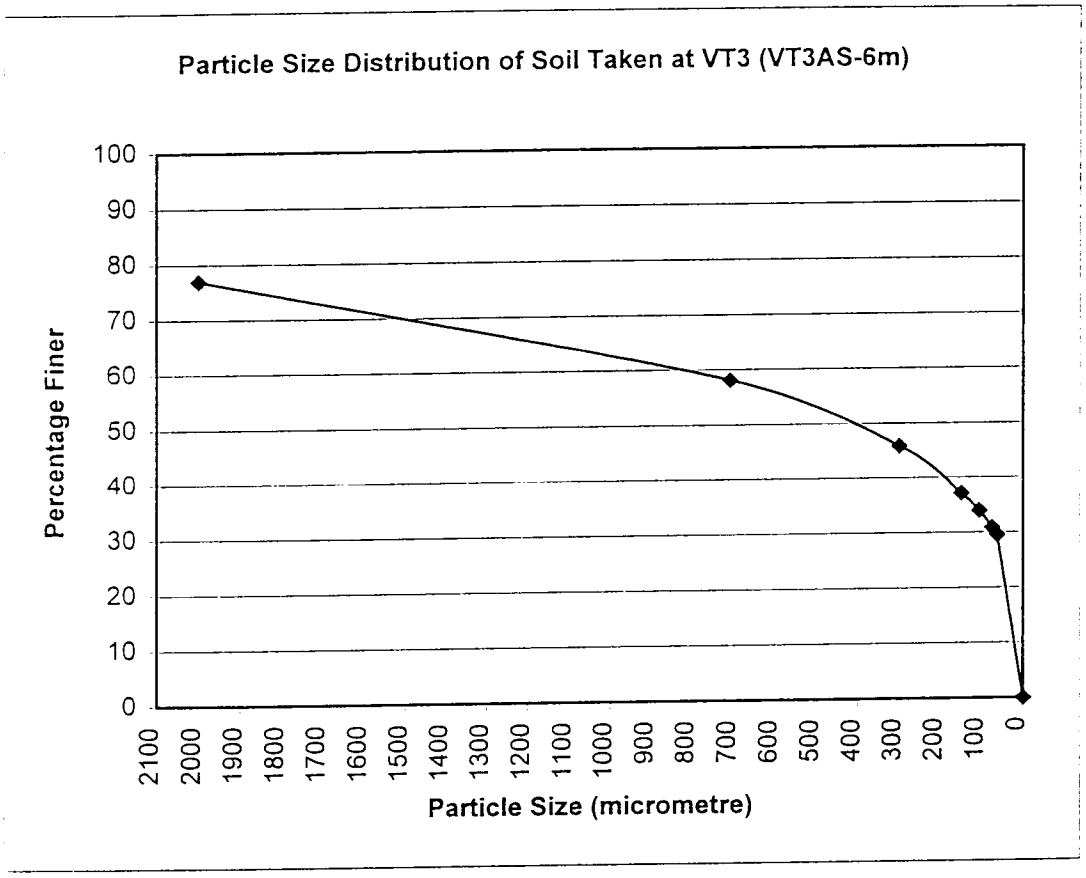
Particle Size Distribution of Soil Taken at VT3 (VT3AS-4m)



Particle Size Distribution of Soil Taken at VT3 (VT3AS-5m)

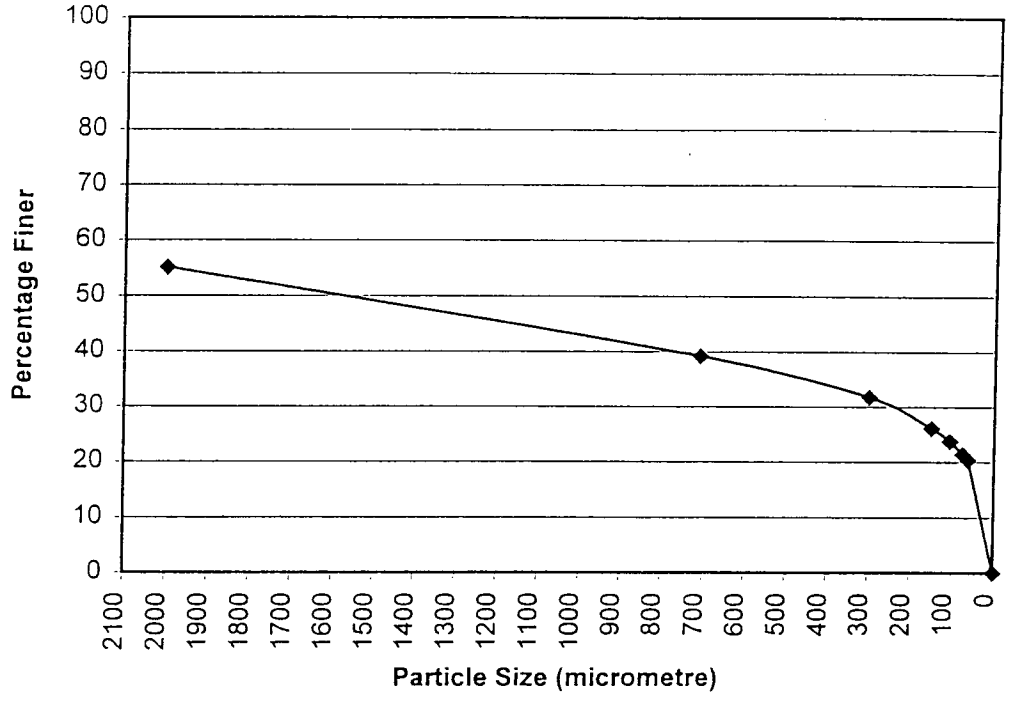


Maunsell	TITLE: Particle Size Distribution of Soil Taken at VT3AS-4m and VT3AS-5m	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO: C418	FIGURE NO.: Figure 4.9	
		DESIGNED/ CHECKED: EL	DATE: Dec 1998	

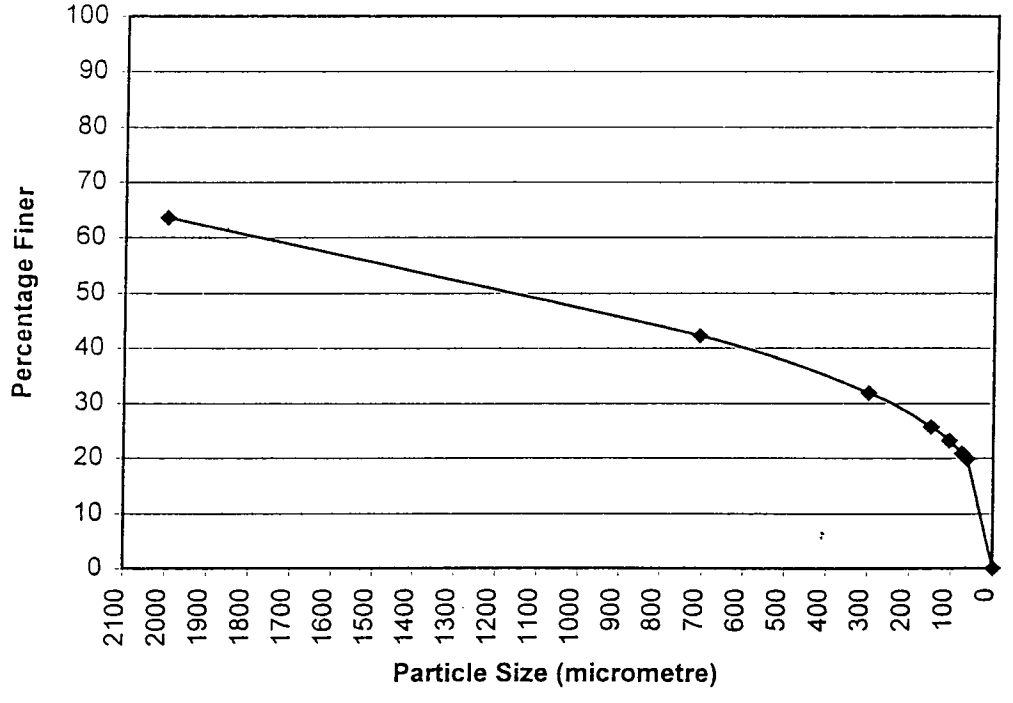


Maunsell	TITLE: Particle Size Distribution of Soil Taken at VT3AS-6m	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.10
		DESIGNED/ CHECKED	EL	DATE	Dec 1998

Particle Size Distribution of Soil Taken at VT3 (VT3W3-2m)

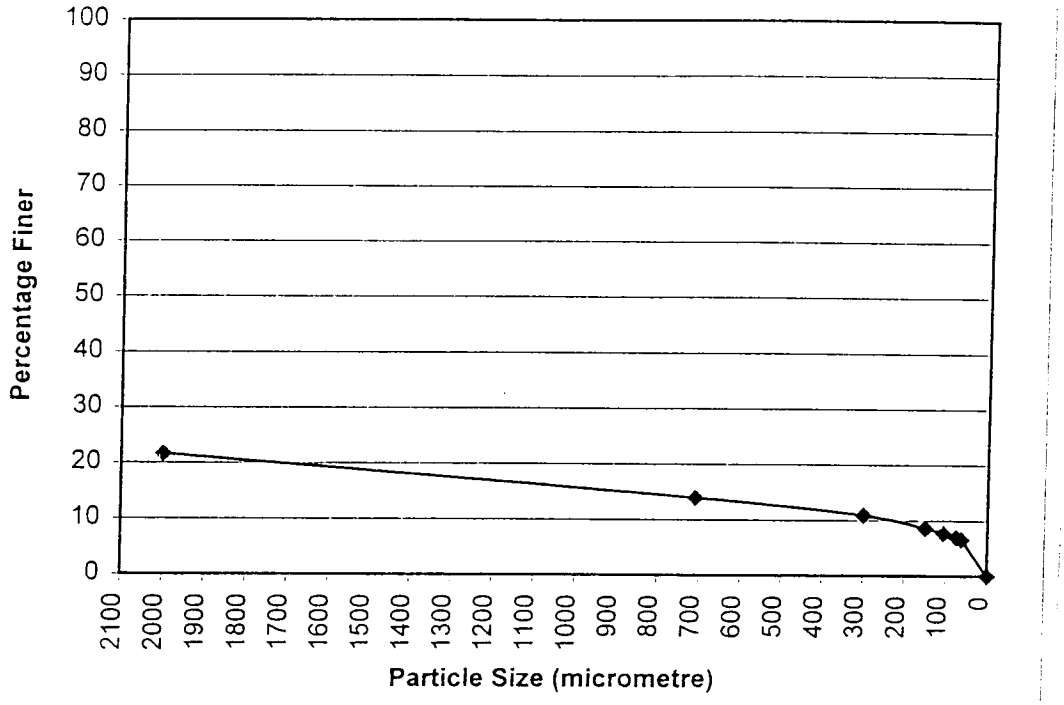


Particle Size Distribution of Soil Taken at VT3 (VT3W3-3m)

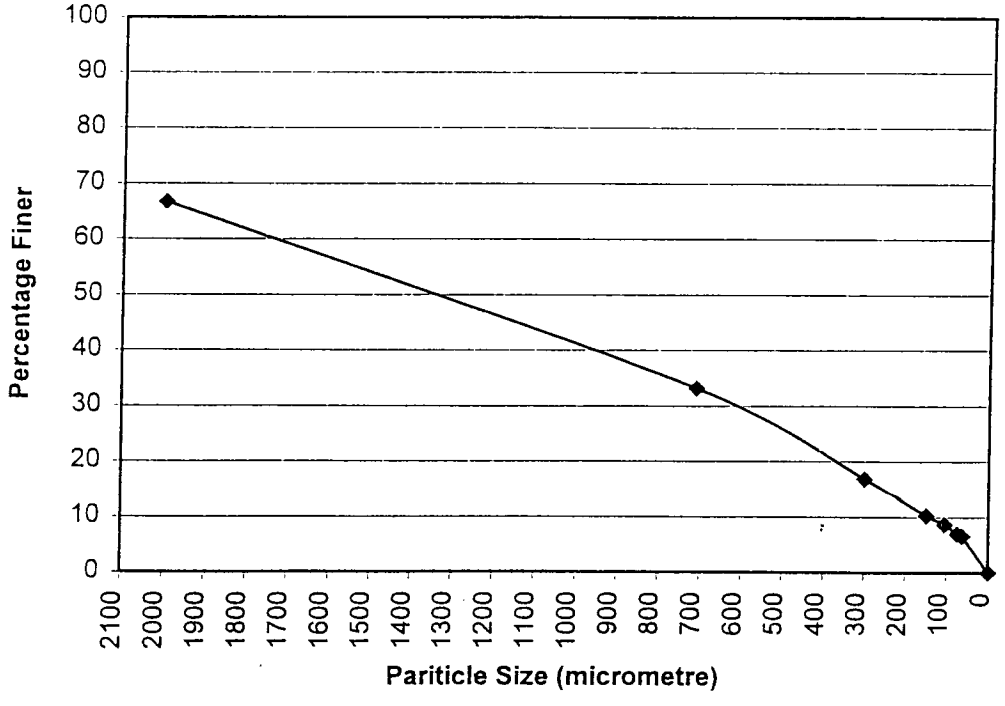


Maunsell	TITLE: Particle Size Distribution of Soil Taken at VT3W3-2m and VT3W3-3m	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.11
		DESIGNED/ CHECKED	EL	DATE Dec 1998

Particle Size Distribution of Soil Taken at VT4 (VT4-1m)

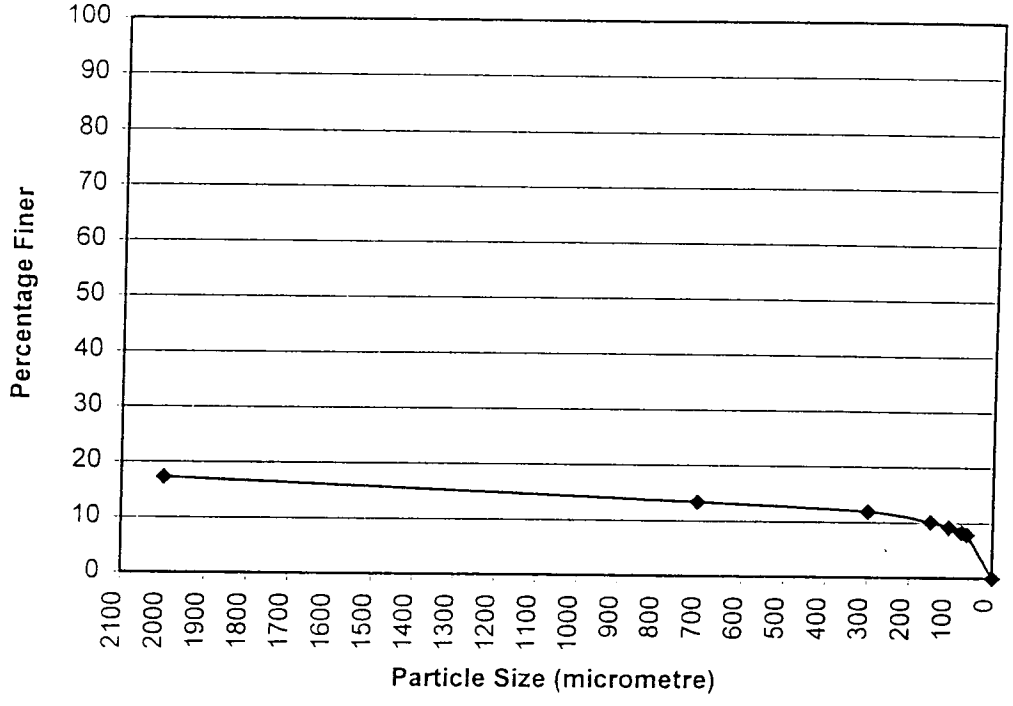


Particle Size Distribution of Soil Taken at VT4 (VT4-2m)

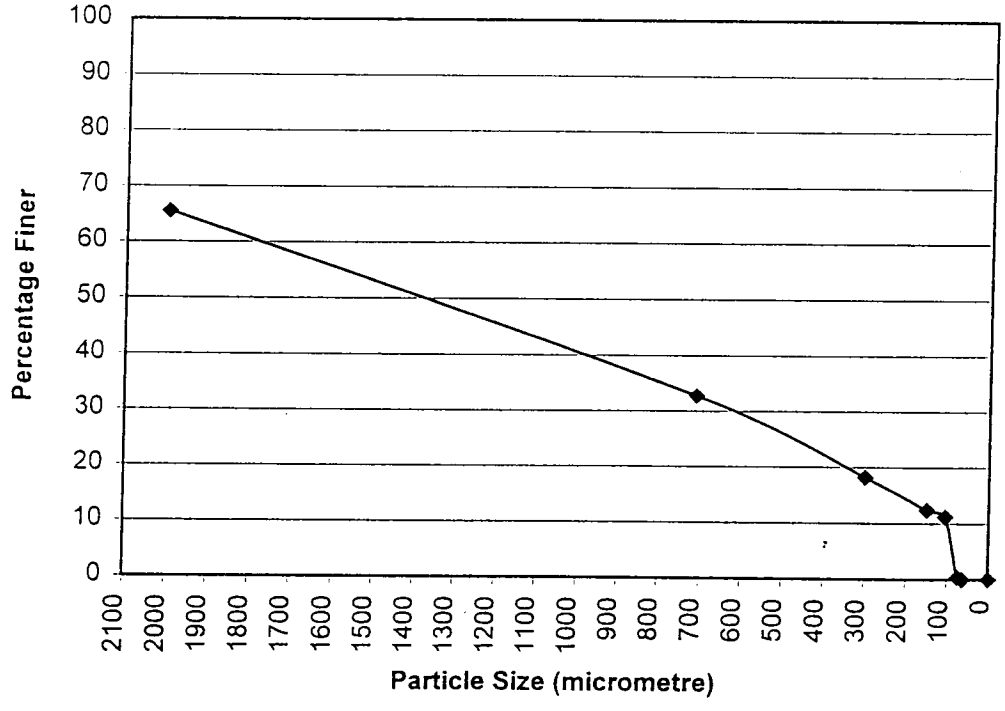


Maunsell	TITLE: Particle Size Distribution of Soil Taken at VT4-1m and VT4-2m	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.12
		DESIGNED/ CHECKED	EL	DATE	Dec 1998

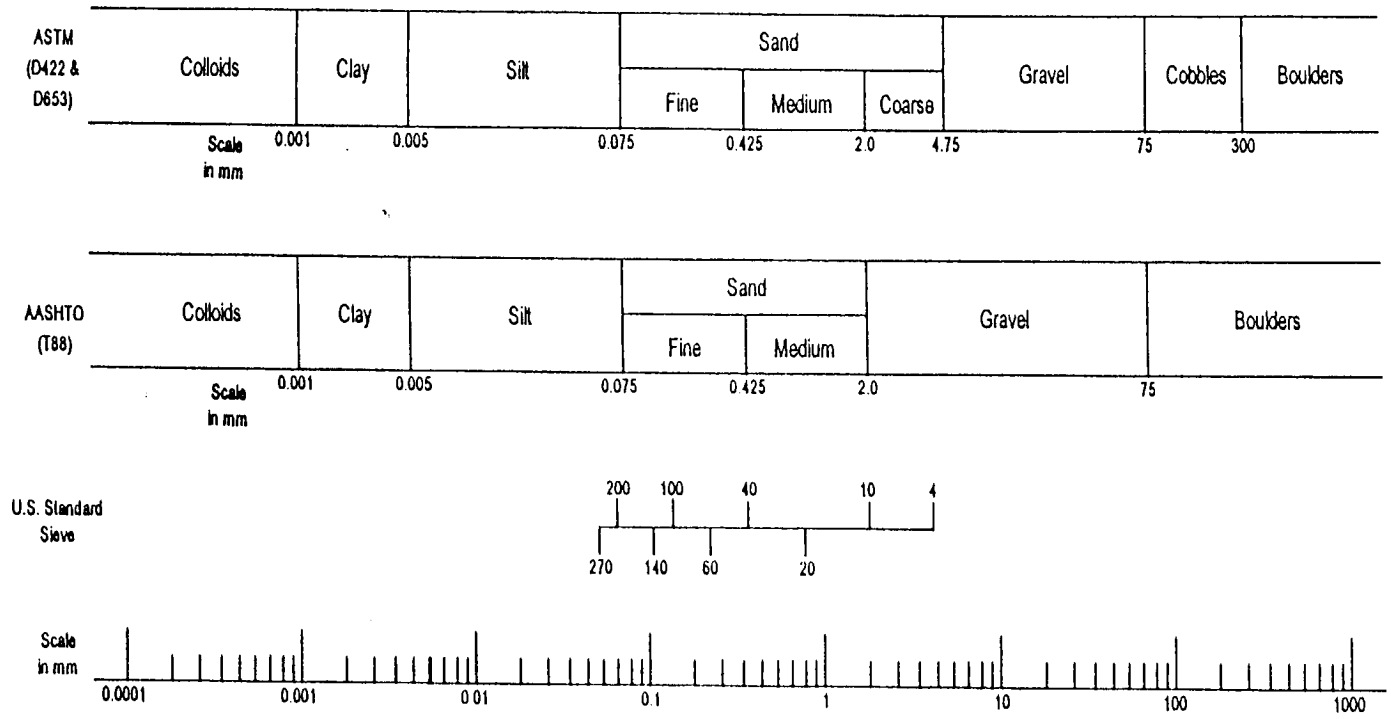
Particle Size Distribution of Soil Taken at VT4 (VT4C-1m)



Particle Size Distribution of Soil Taken at VT4 (VT4C-2m)



Maunsell	TITLE: Particle Size Distribution of Soil Taken at VT4C-1m and VT4C-2m	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.13
		DESIGNED/ CHECKED	EL	DATE Dec 1998

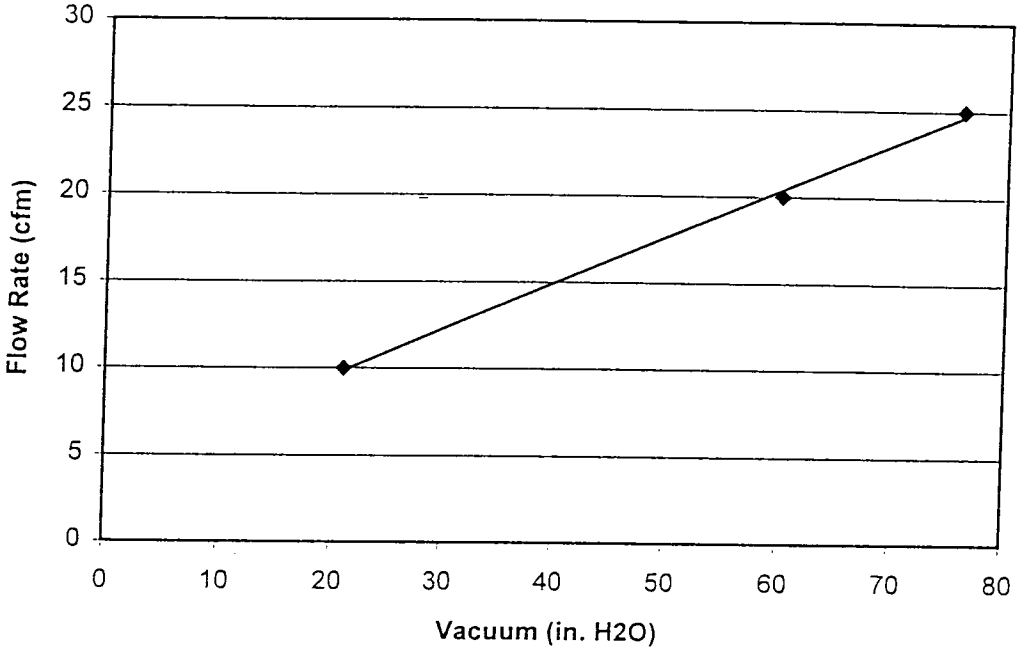


Grain size ranges according to several soil classification systems. ASTM = American Society for Testing Materials; AASHTO = American Association for State Highway and Transportation Officials.

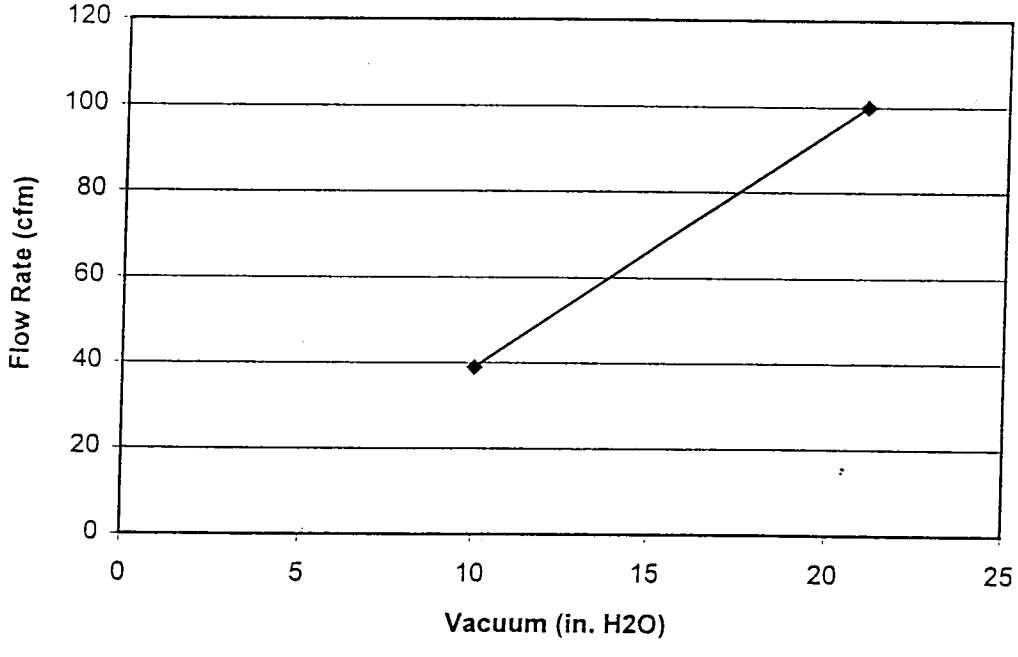
Source: Wong, J. H. C., Lim, C. H. and Nolen, G. L. (1997) *Design of Remediation System*, p 263. CRC-Lewis Press, New York

Maunsell	TITLE **Particle Size Ranges According to Several Soil Classification Systems**	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.14
		DESIGNED/ CHECKED		DATE	Dec 1998

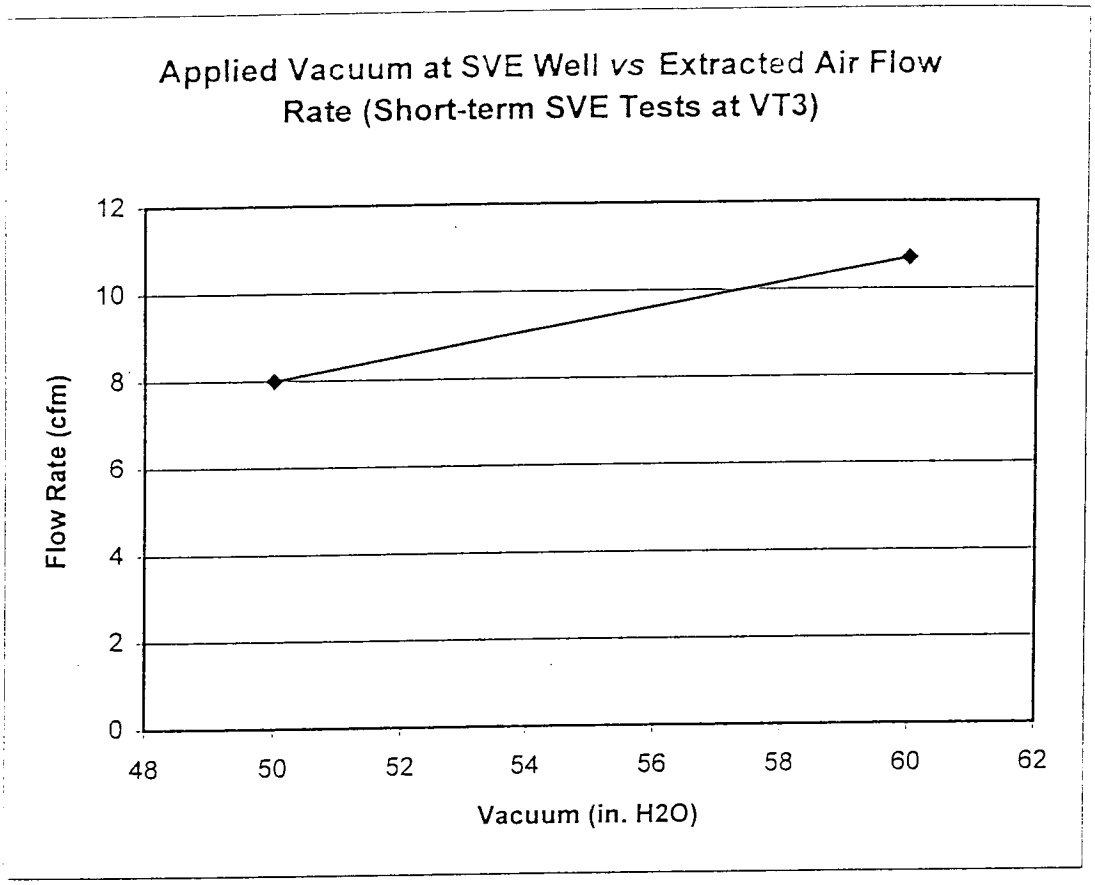
Applied Vacuum at SVE Well *vs* Extracted Air Flow Rate (Short-term SVE Tests at VT1)

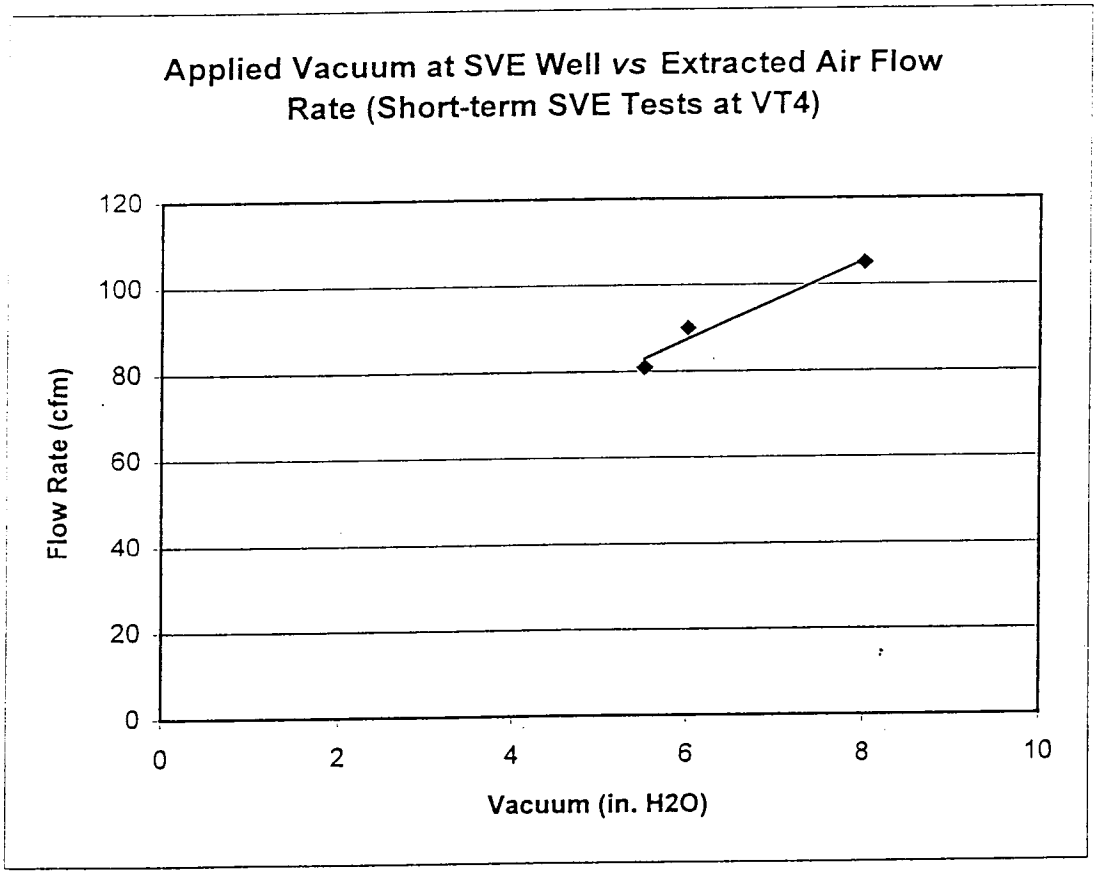


Applied Vacuum at SVE Well *vs* Extracted Air Flow Rate (Short-term SVE Tests at VT2)



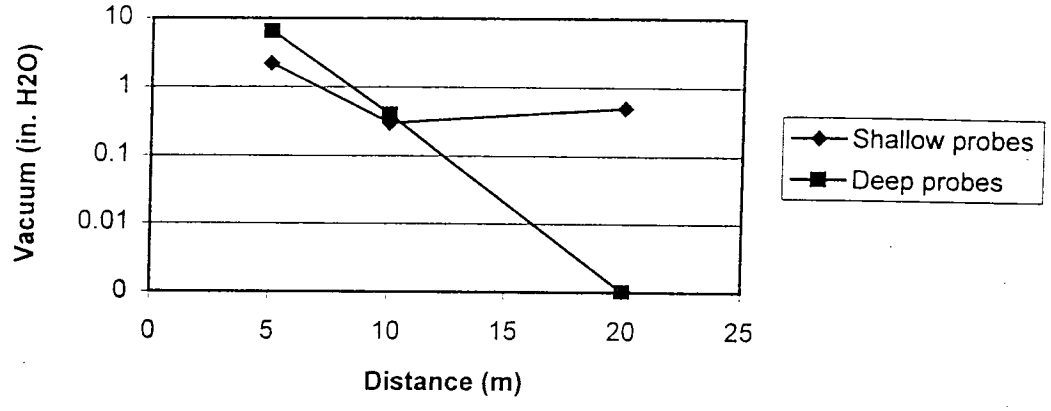
Maunsell	TITLE: Applied Vacuum *vs* Extracted Air Flow Rate (Short-term SVE Tests at VT1 and VT2) ,	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.15
		DESIGNED/ CHECKED		DATE	Dec 1998



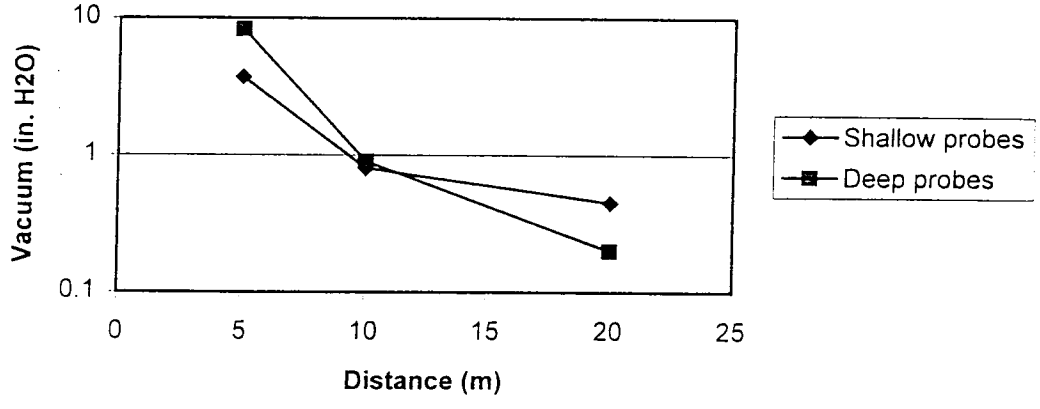


Maunsell	TITLE Applied Vacuum *vs* Extracted Air Flow Rate (Short-term SVE Tests at VT3 and VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.16
		DESIGNED/ CHECKED		DATE Dec 1998

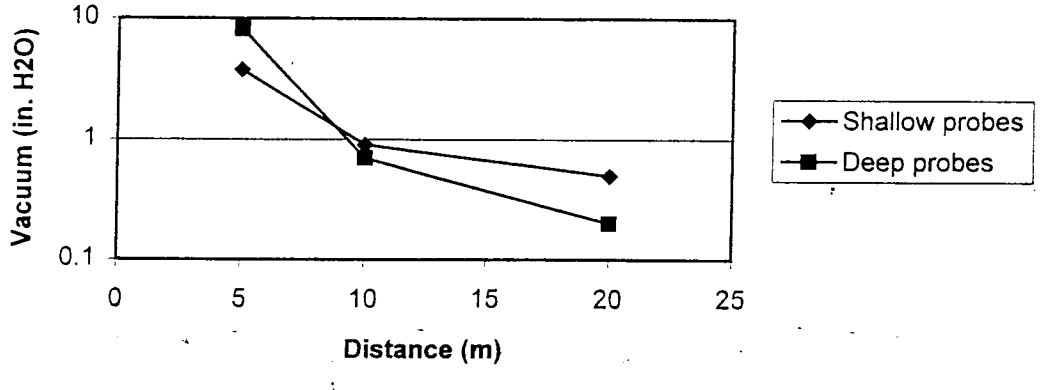
Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Test at VT1, extracted air flow rate = 10 cfm)



Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Test at VT1, extracted air flow rate = 20 cfm)

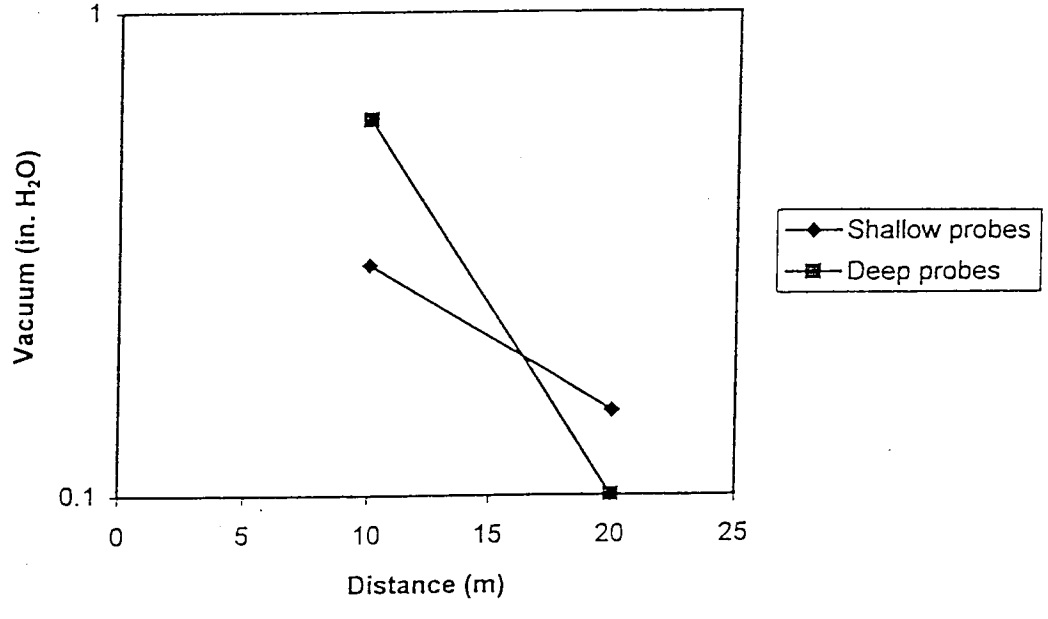


Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Test at VT1, extracted air flow rate = 19 - 25 cfm)

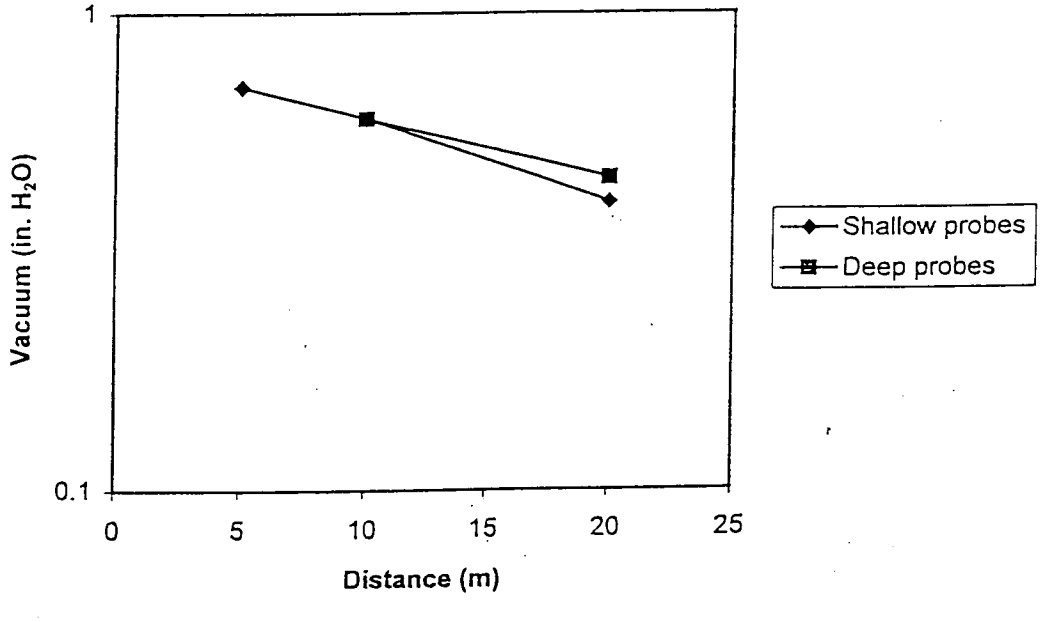


Maunsell	TITLE **Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Tests at VT1)**	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.17
		DESIGNED/ CHECKED	EL	DATE Jan 1999

Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Test at VT2, extracted air flow rate = 39 cfm)

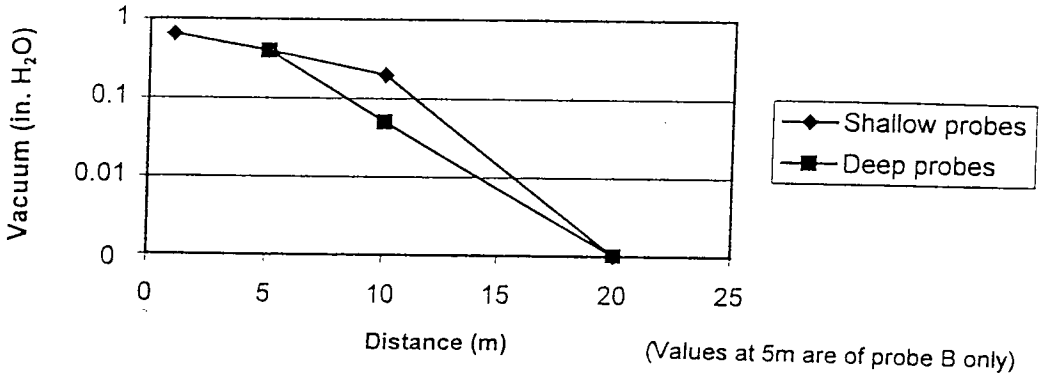


Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Test at VT2, extracted air flow rate = 100 cfm)



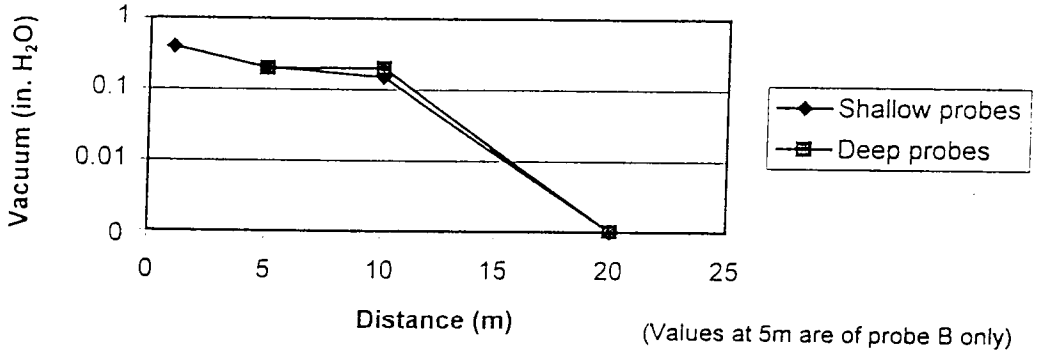
Maunsell	TITLE: Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Tests at VT2)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.18
		DESIGNED/ CHECKED	EL	DATE	Jan 1999

Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Test at VT3, extracted air flow rate = 8 cfm)



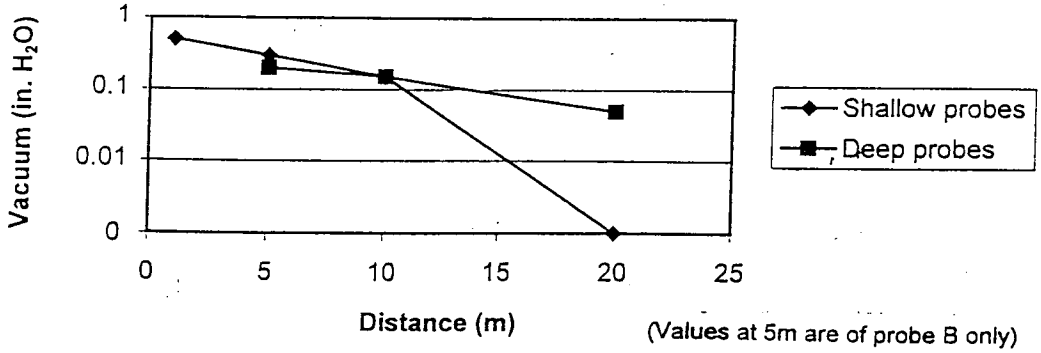
(Values at 5m are of probe B only)

Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Test at VT3, extracted air flow rate = 5.5 - 9.4 cfm)



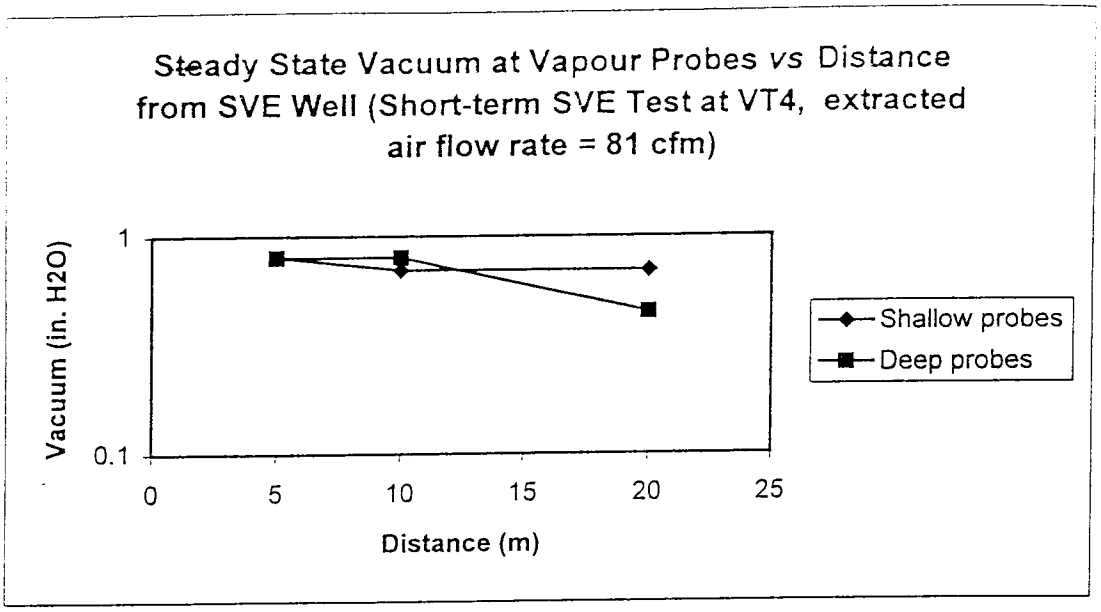
(Values at 5m are of probe B only)

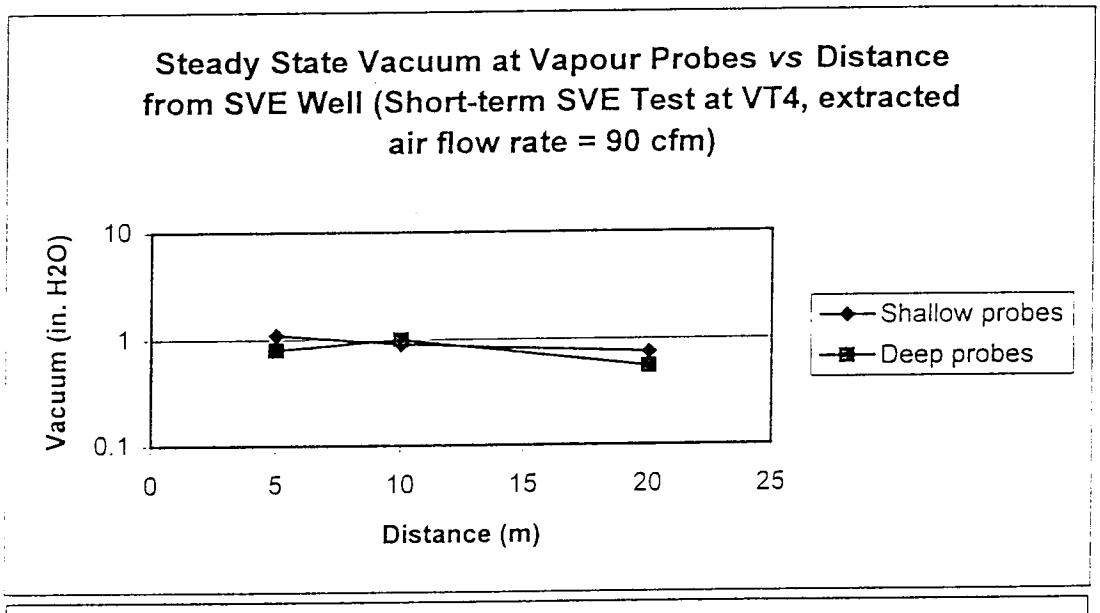
Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Test at VT3, extracted air flow rate = 4.3 - 10.7 cfm)

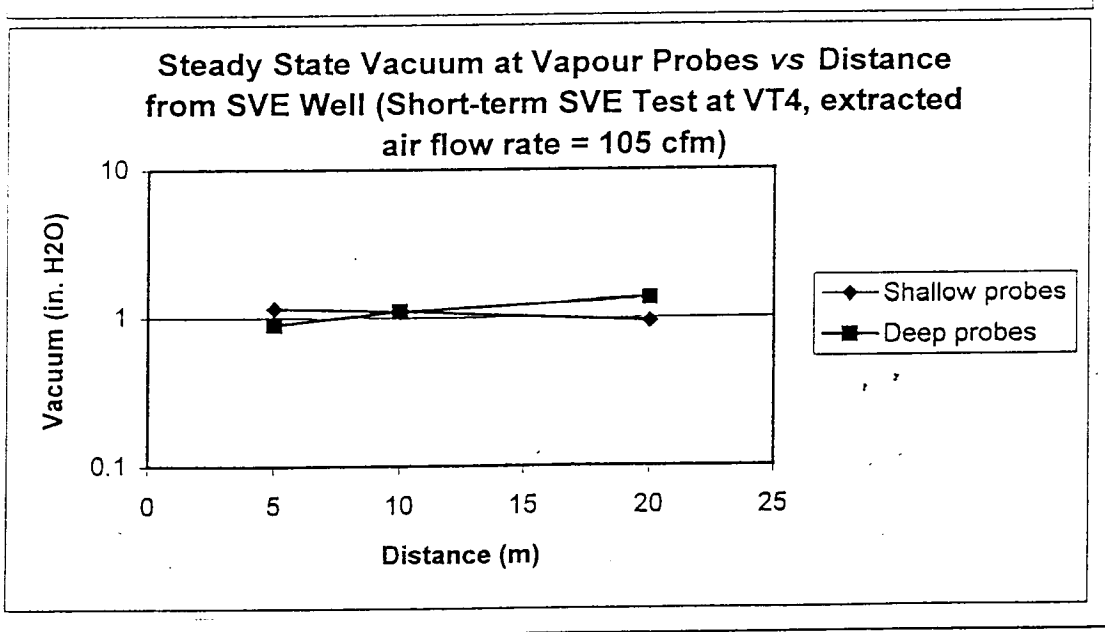


(Values at 5m are of probe B only)

Maunsell	TITLE Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Tests at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.19
		DESIGNED/ CHECKED	EL	DATE Jan 1999

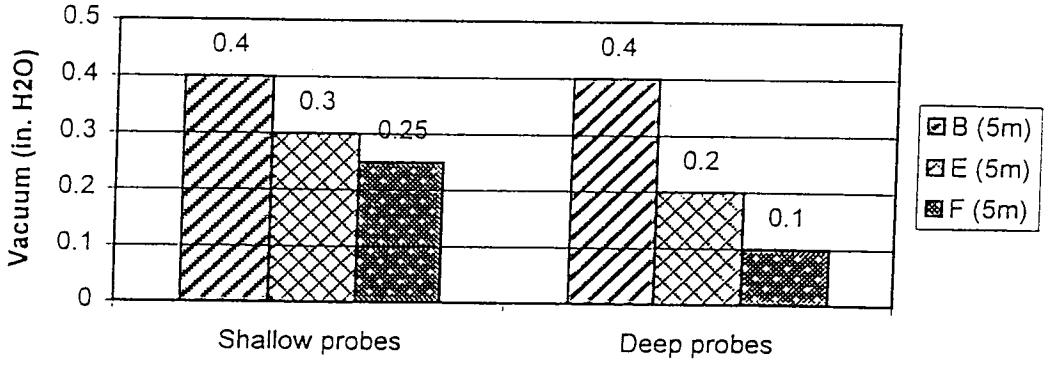




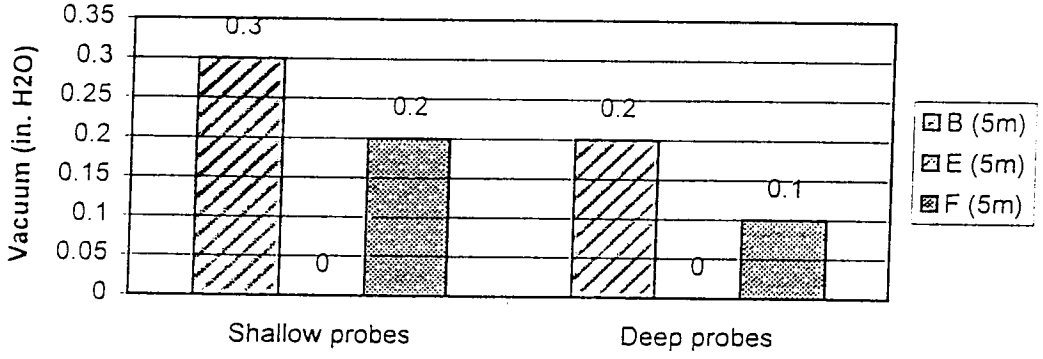


Maunsell	TITLE **Steady State Vacuum at Vapour Probes *vs* Distance from SVE Well (Short-term SVE Tests at VT4)**	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.20
		DESIGNED/ CHECKED	EL	DATE Jan 1999

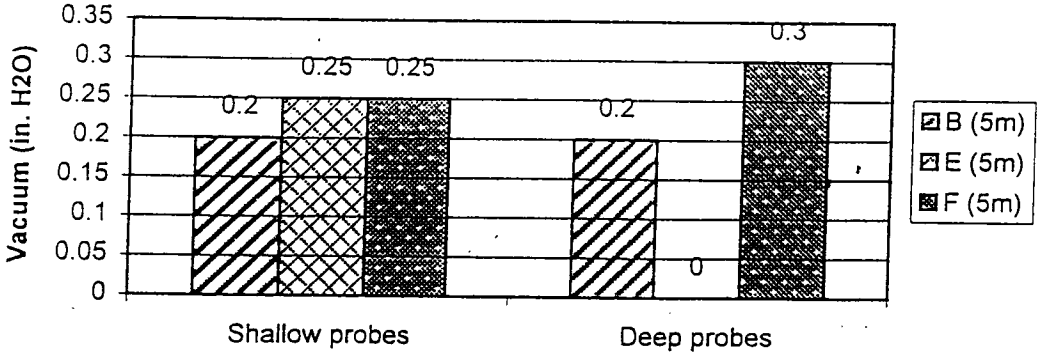
Steady State Vacuum at Radial Vapour Probes *vs* Direction from SVE Well (Short-term SVE Tests at VT3, extracted air flow rate = 8 cfm)



Steady State Vacuum at Radial Vapour Probes *vs* Direction from SVE Well (Short-term SVE Tests at VT3, vacuum at SVE well = 50" H2O)

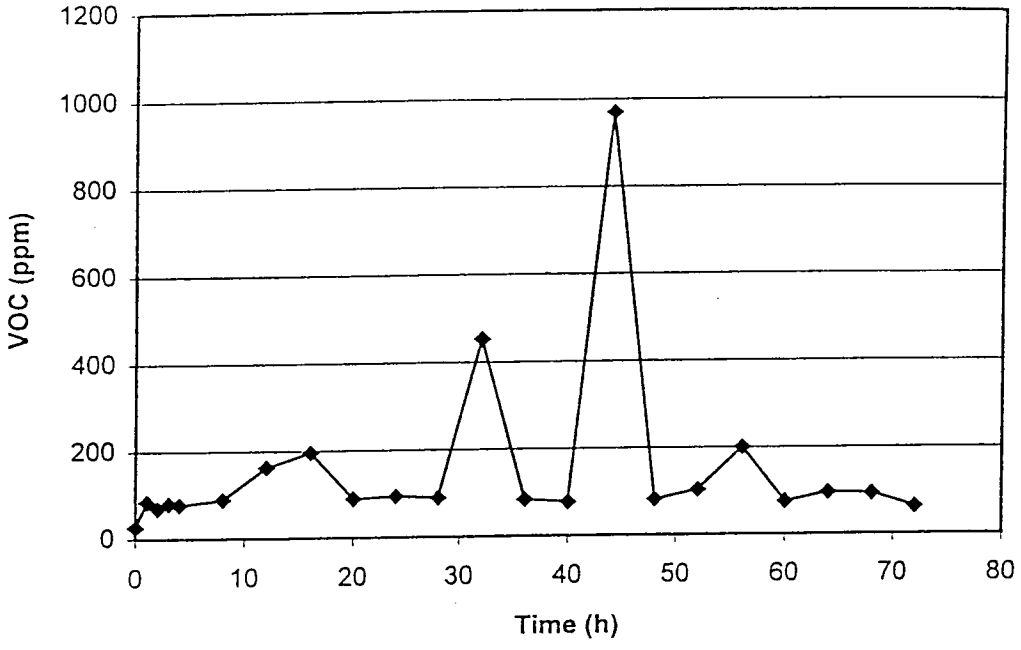


Steady State Vacuum at Radial Vapour Probes *vs* Direction from SVE Well (Short-term SVE Tests at VT3, vacuum at SVE well = 60 in. H2O)

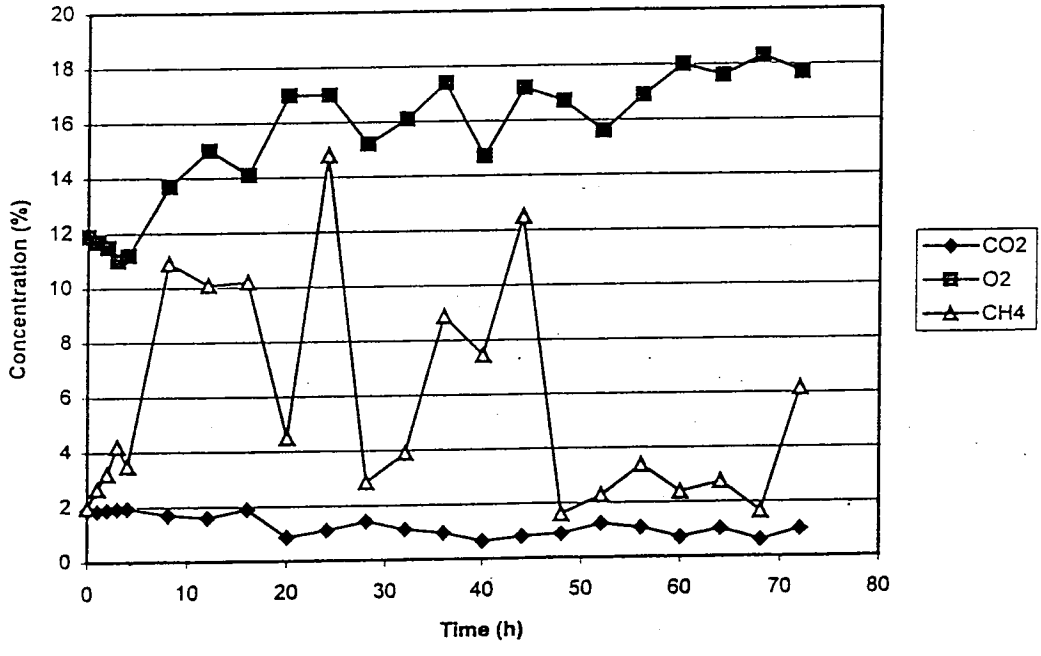


Maunsell	TITLE: **Steady State Vacuum at Radial Vapour Probes *vs* Direction from SVE Well (Short-term SVE Tests at VT3)**	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO: C418	FIGURE NO.: Figure 4.21	
		DESIGNED/ CHECKED: EL	DATE: Jan 1999	

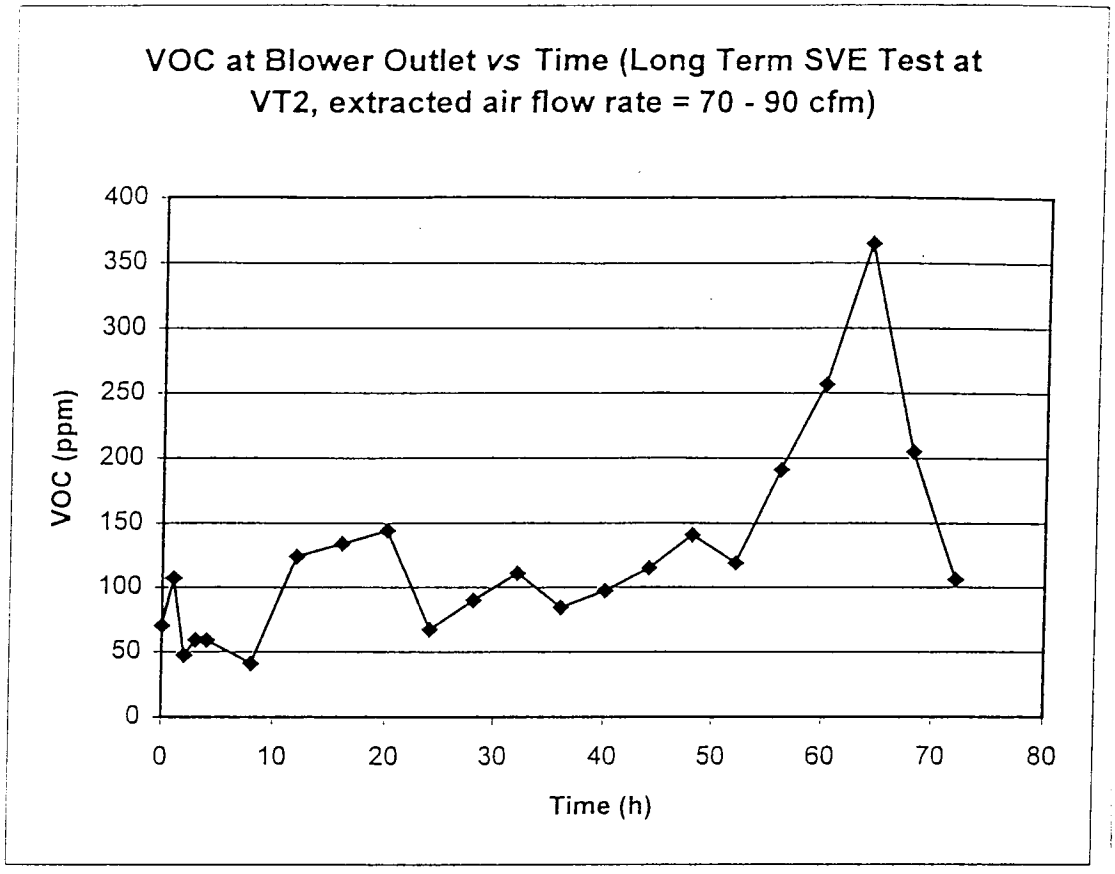
VOC at Blower Outlet *vs* Time (Long Term SVE Test at VT1, extracted air flow rate = 10 cfm)

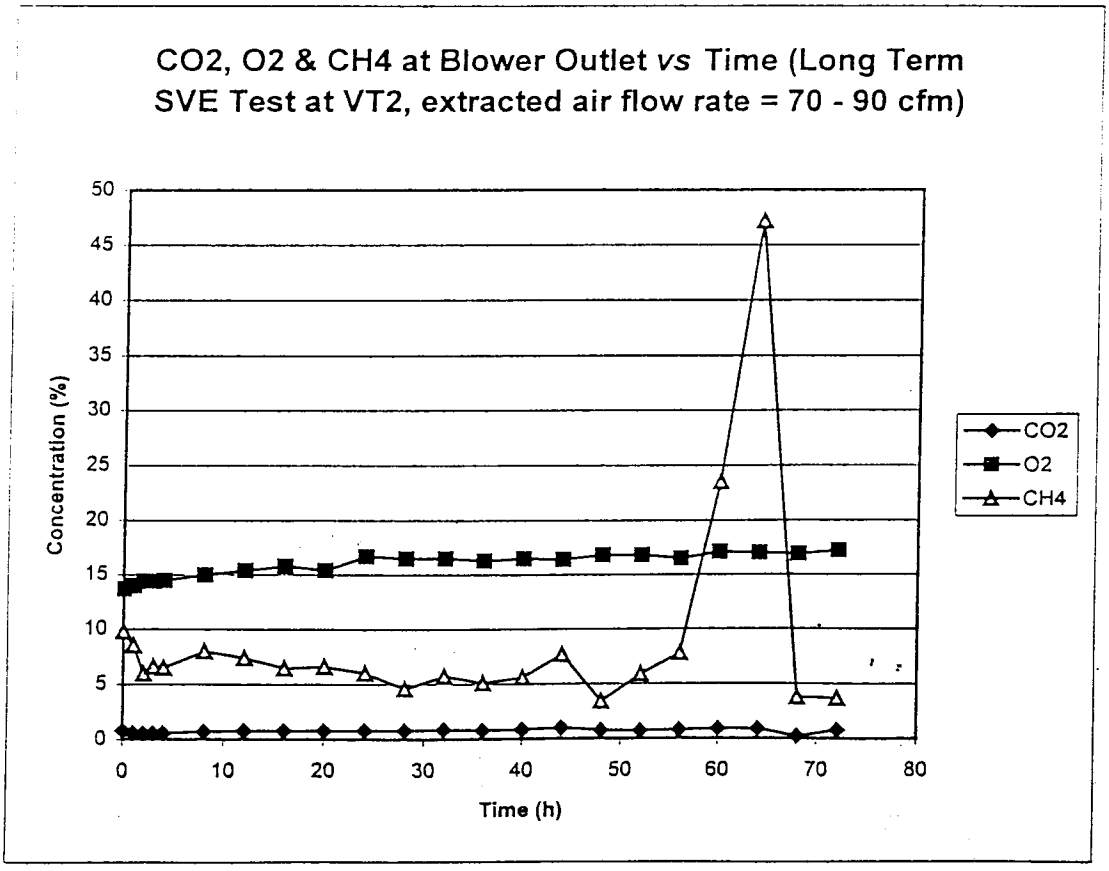


CO2, O2 & CH4 at Blower Outlet *vs* Time (Long Term SVE Test at VT1, extracted air flow rate = 10 cfm)



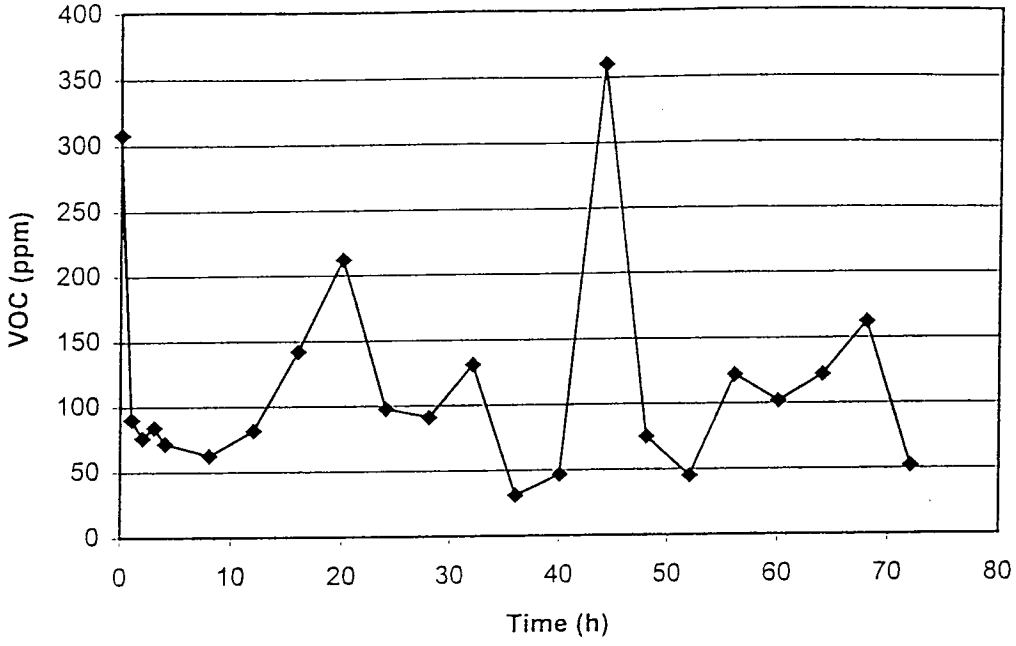
Maunsell	TITLE: Concentration of VOC, CO_2, O_2 & CH_4 at Blower Outlet *vs* Time (Long-term SVE Test at VT1)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.22
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998



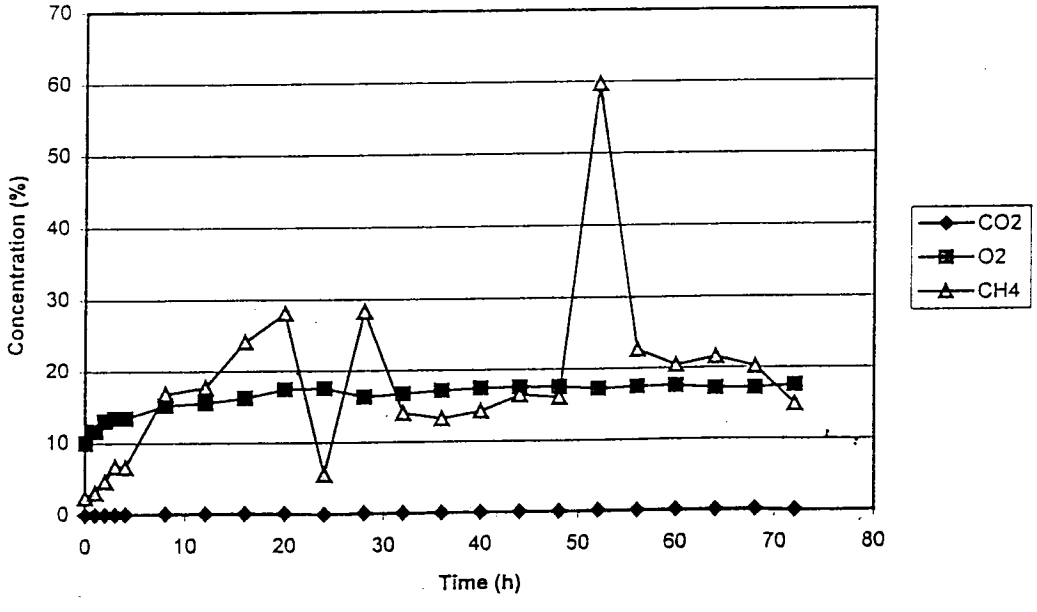


Maunsell	TITLE: Concentration of VOC, CO_2, O_2 & CH_4 at Blower Outlet *vs* Time (Long-term SVE Test at VT2)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.23
		DESIGNED/ CHECKED	EL	DATE Jan 1999

VOC at Blower Outlet *vs* Time (Long Term SVE Test at VT3, extracted air flow rate = 8.5 - 10.0 cfm)

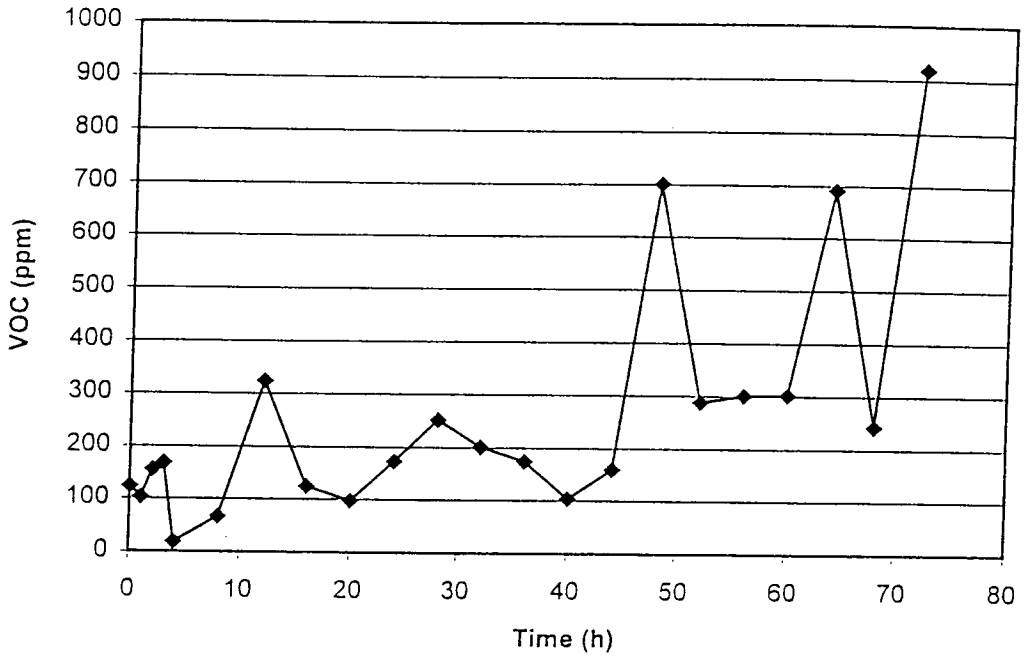


CO2, O2 & CH4 at Blower Outlet *vs* Time (Long Term SVE Test at VT3, extracted air flow rate = 8.5 - 10.0 cfm)

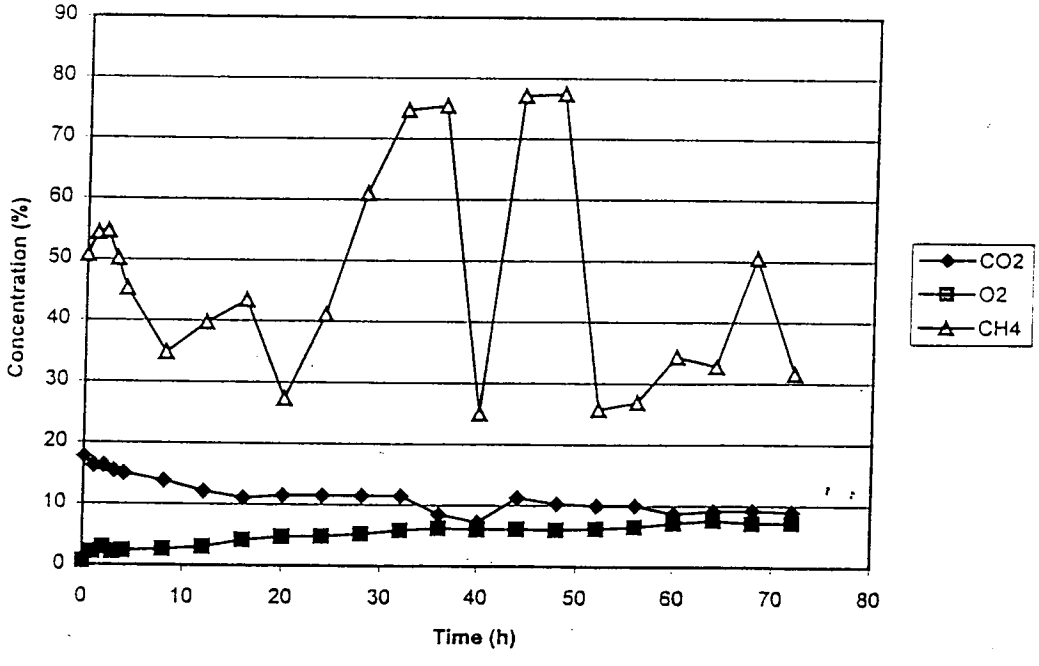


Maunsell	TITLE: Concentration of VOC, CO_2, O_2 & CH_4 at Blower Outlet *vs* Time (Long-term SVE Test at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.24
		DESIGNED/ CHECKED	EL	DATE	Jan 1999

VOC at Blower Outlet *vs* Time (Long-term SVE Test at VT4, extracted air flow rate = 81 - 90 cfm)

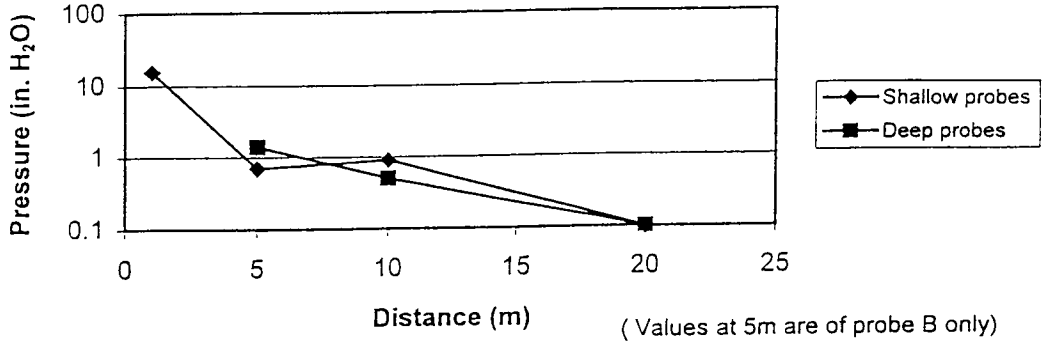


CO2, O2 & CH4 at Blower Outlet *vs* Time (Long-term SVE Test at VT4, extracted air flow rate = 81 - 90 cfm)



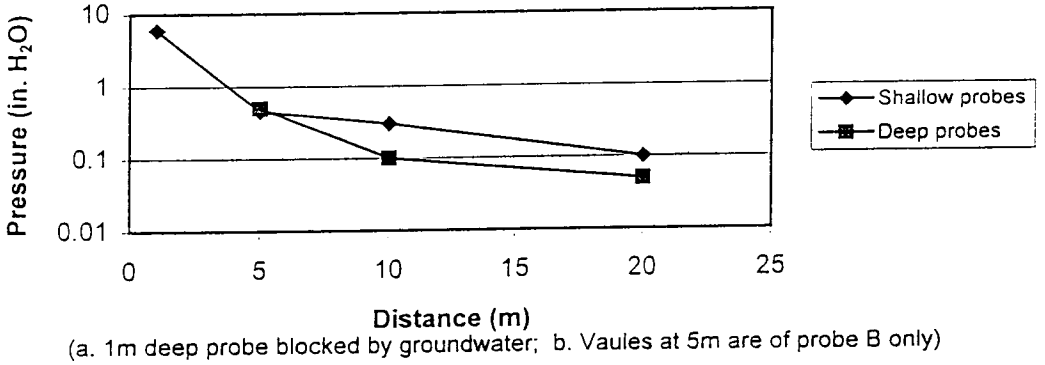
Maunsell	TITLE: Concentration of VOC, CO_2, O_2 & CH_4 at Blower Outlet *vs* Time (Long-term SVE Test at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.25
		DESIGNED/ CHECKED	EL	DATE	Jan 1999

Steady State Pressure at Vapour Probes *vs* Distance from AS well (Short Term AS Test at VT3, AS well flow rate = 10 cfm)



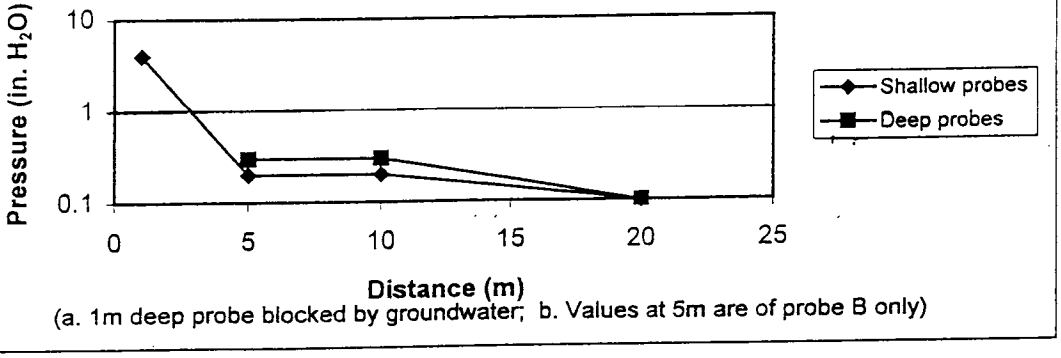
(Values at 5m are of probe B only)

Steady State Pressure at Vapour Probes *vs* Distance from AS well (Short Term AS Test at VT3, AS well flow rate = 4 cfm)



(a. 1m deep probe blocked by groundwater; b. Vaules at 5m are of probe B only)

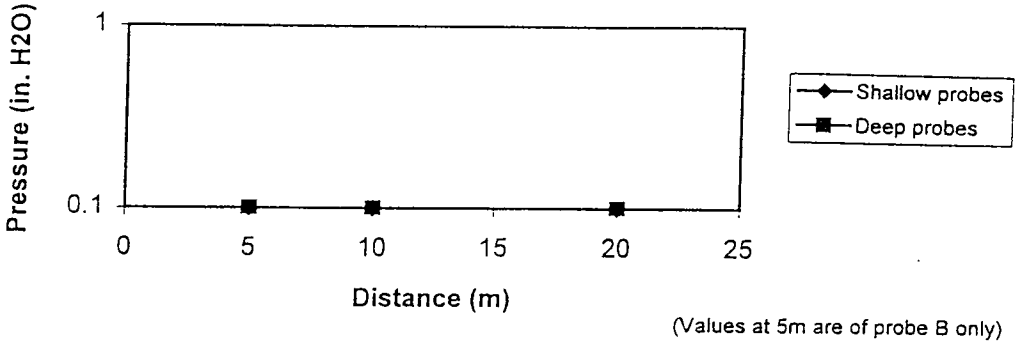
Steady State Pressure at Vapour Probes *vs* Distance from AS well (Short Term AS Test at VT3, AS well flow rate = 2 cfm)



(a. 1m deep probe blocked by groundwater; b. Values at 5m are of probe B only)

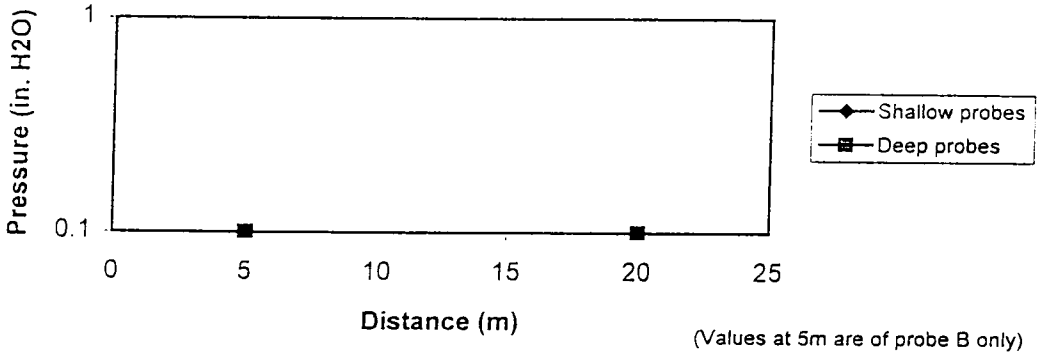
Maunsell	TITLE: Steady State Pressure at Vapour Probes *vs* Distance from AS Well (Short-term AS Tests at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.26
		DESIGNED/ CHECKED	EL	DATE	Jan 1999

Steady State Pressure at Vapour Probes *vs* Distance from AS Well (Short-term AS Test at VT4, AS well flow rate = 10 cfm)



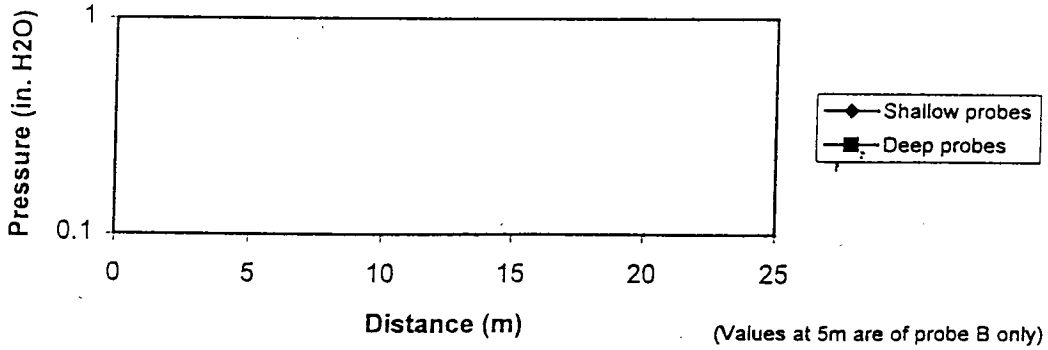
(Values at 5m are of probe B only)

Steady State Pressure at Vapour Probes *vs* Distance from AS Well (Short-term AS Test at VT4, AS well flow rate = 4 cfm)



(Values at 5m are of probe B only)

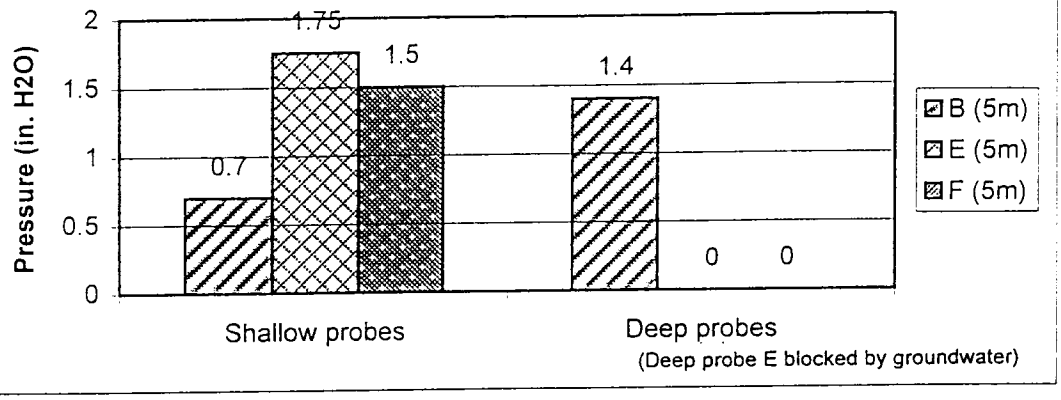
Steady State Pressure at Vapour Probes *vs* Distance from AS Well (Short-term AS Test at VT4, AS well flow rate = 2 cfm)



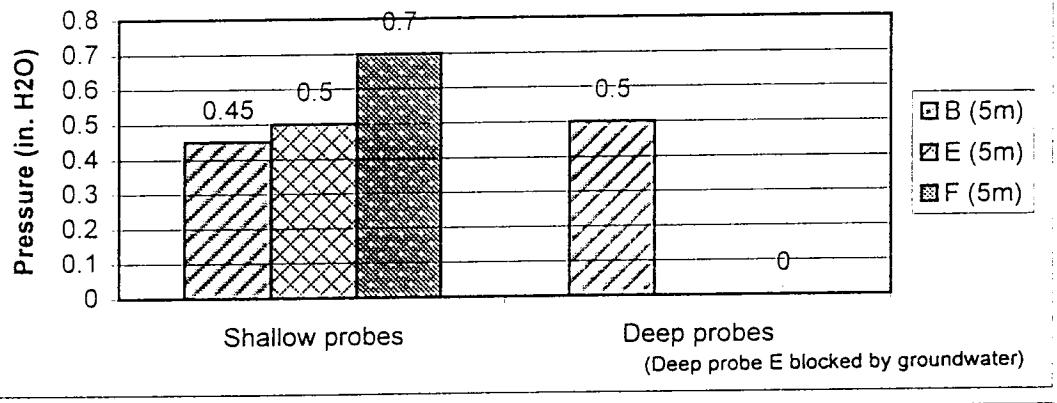
(Values at 5m are of probe B only)

Maunsell	TITLE: Steady State Pressure at Vapour Probes *vs* Distance from AS Well (Short-term AS Tests at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD	
		PROJECT NO: C418	FIGURE NO: Figure 4.27
		DESIGNED/ CHECKED: EL	DATE: Jan 1999

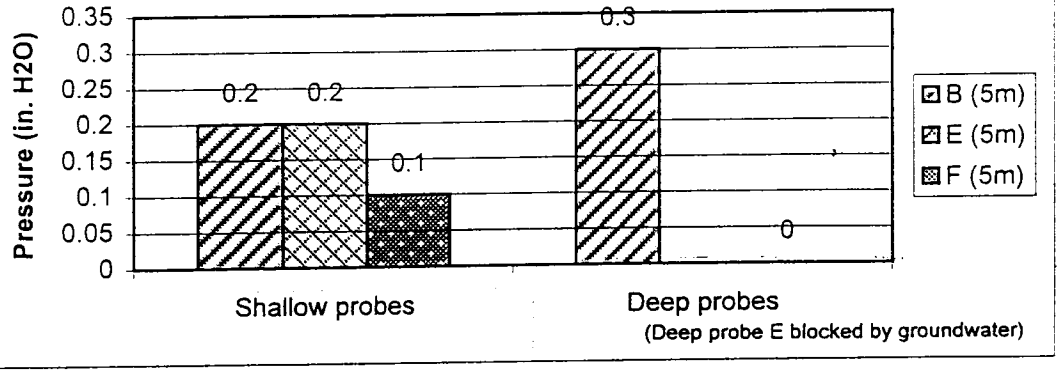
Steady State Pressure at Radial Vapour Probes *vs* Direction from AS Well (Short Term AS Test at VT3, AS well flow rate = 10 cfm)



Steady State Pressue at Radial Vapour Probes *vs* Direction from AS Well (Short Term AS Test at VT3, AS well flow rate = 4 cfm)

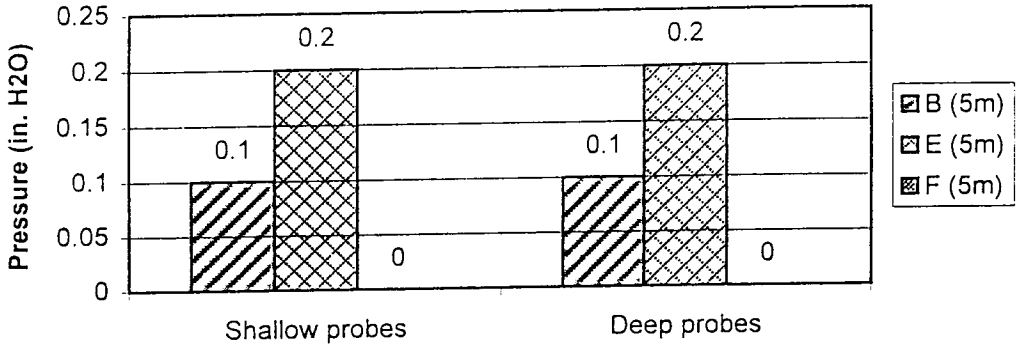


Steady State Pressure at Radial Vapour Probes *vs* Direction from AS Well (Short Term AS Test at VT3, AS well flow rate = 2 cfm)

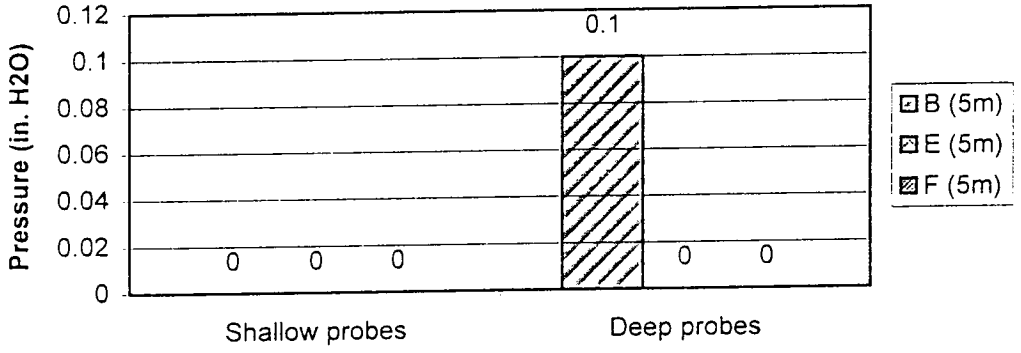


Maunsell	TITLE **Steady State Pressure at Radial Vapour Probes *vs* Direction from AS Well (Short-term AS Tests at VT3)**	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.28
		DESIGNED/ CHECKED	EL	DATE Jam 1999

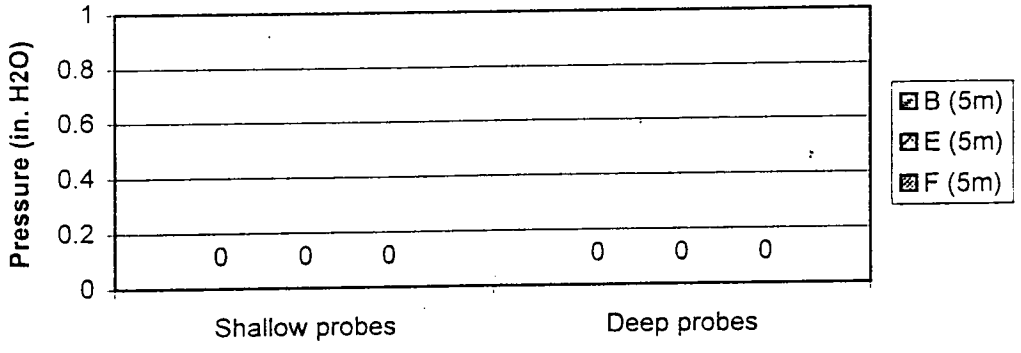
Steady State Pressure at Radial Vapour Probes *vs* Direction from AS Well (Short Term AS Test at VT4, AS well flow rate = 10 cfm)



Steady State Pressure at Radial Vapour Probes *vs* Direction from AS Well (Short Term AS Test at VT4, AS well flow rate = 4 cfm)

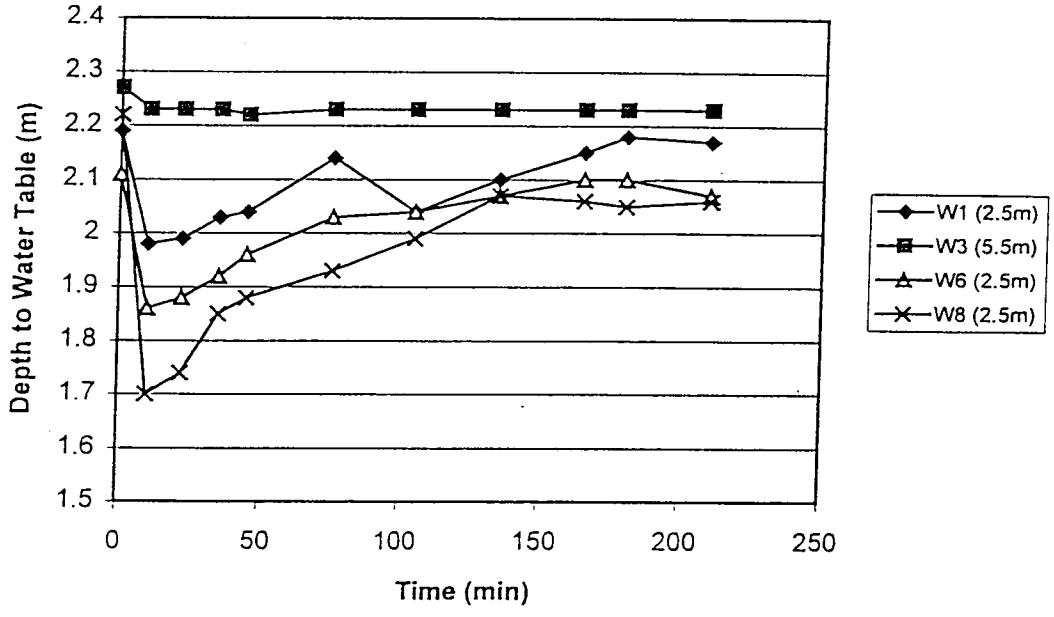


Steady State Pressure at Radial Vapour Probes *vs* Direction from AS Well (Short Term AS Test at VT4, AS well flow rate = 2 cfm)

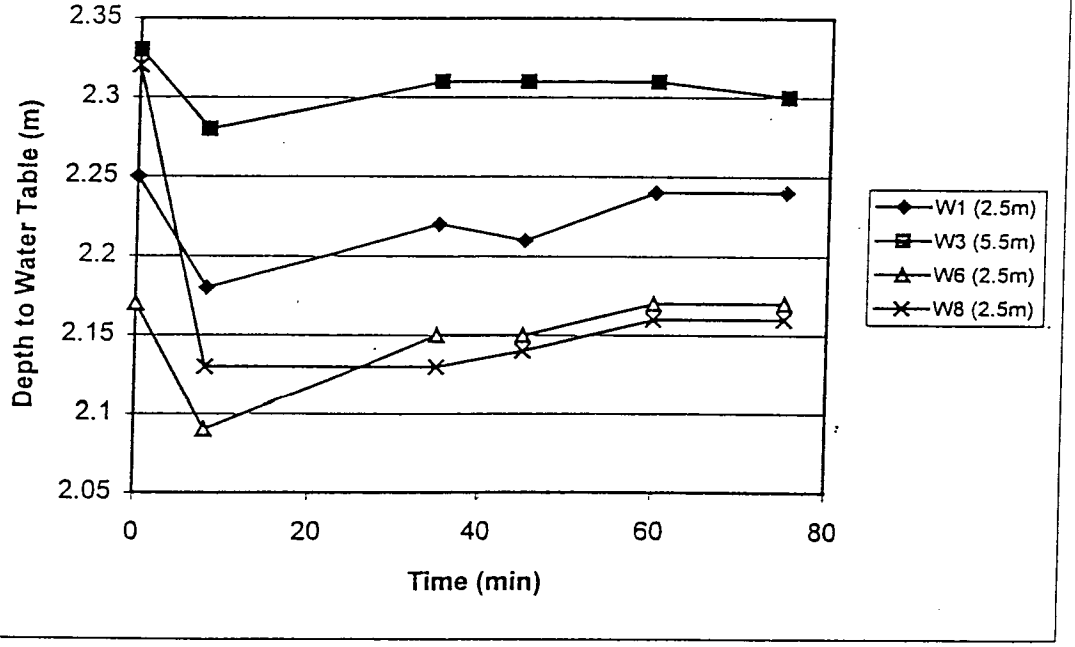


Maunsell	TITLE: Steady State Pressure at Radial Vapour Probes *vs* Direction from AS Well (Short-term AS Tests at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD	
		PROJECT NO: C418	FIGURE NO.: Figure 4.29
		DESIGNED/ CHECKED:	DATE: Dec 1998

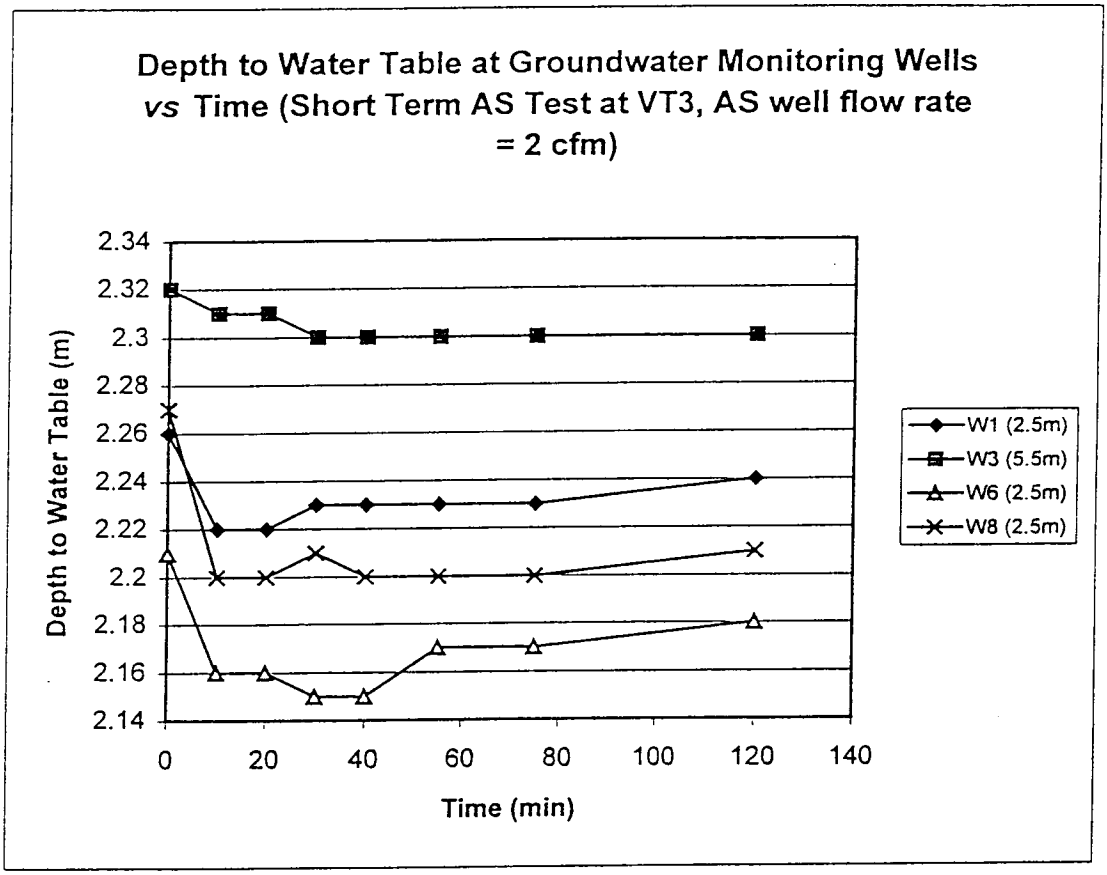
Depth to Water Table at Groundwater Monitoring Wells *vs* Time (Short Term AS Test at VT3, AS well flow rate = 10 cfm)



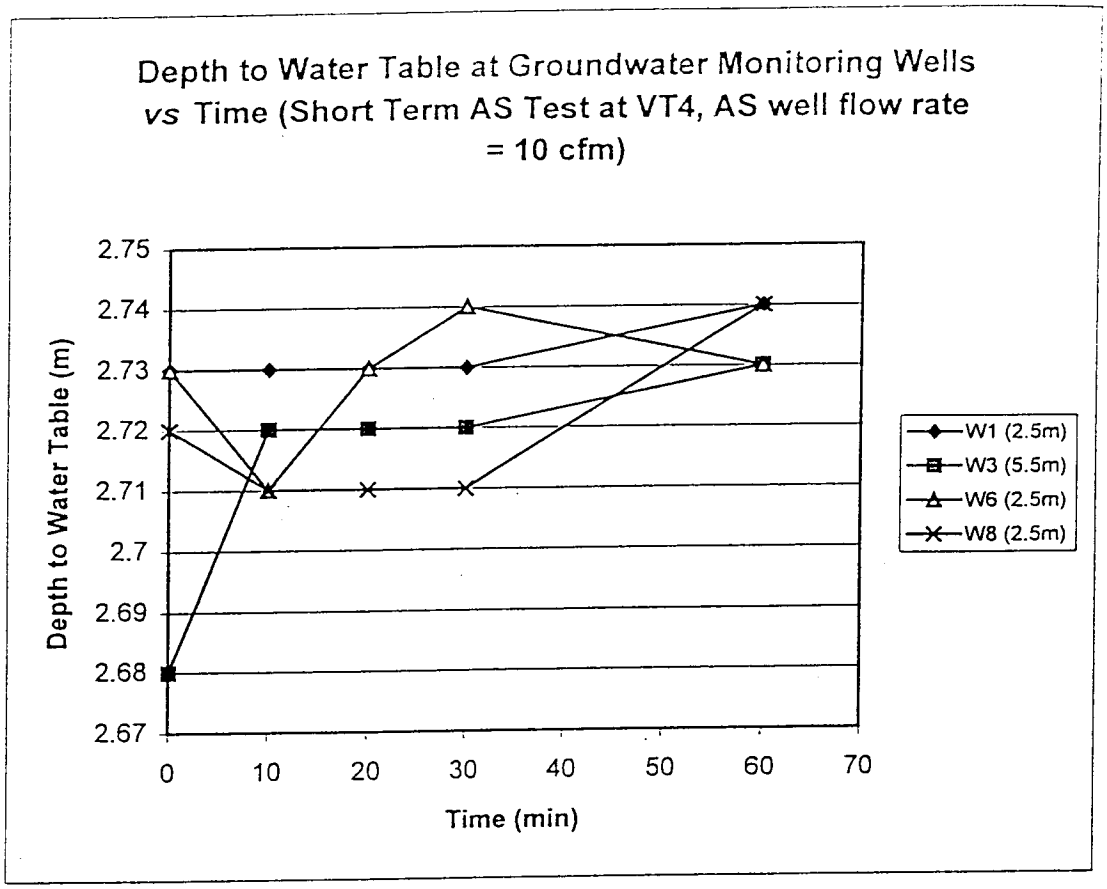
Depth to Water Table at Groundwater Monitoring Wells *vs* Time (Short Term AS Test at VT3, AS well flow rate = 4 cfm)

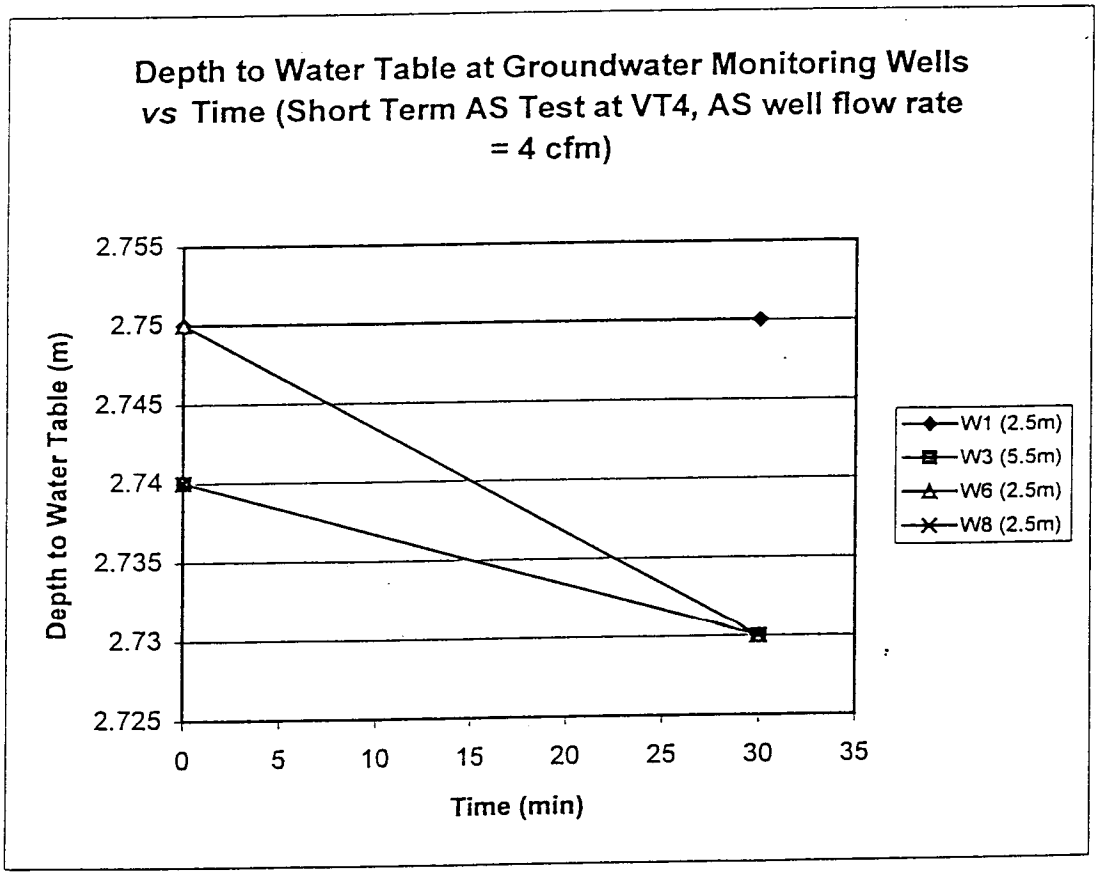


Maunsell	TITLE: Depth to Water Table at Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.30
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998

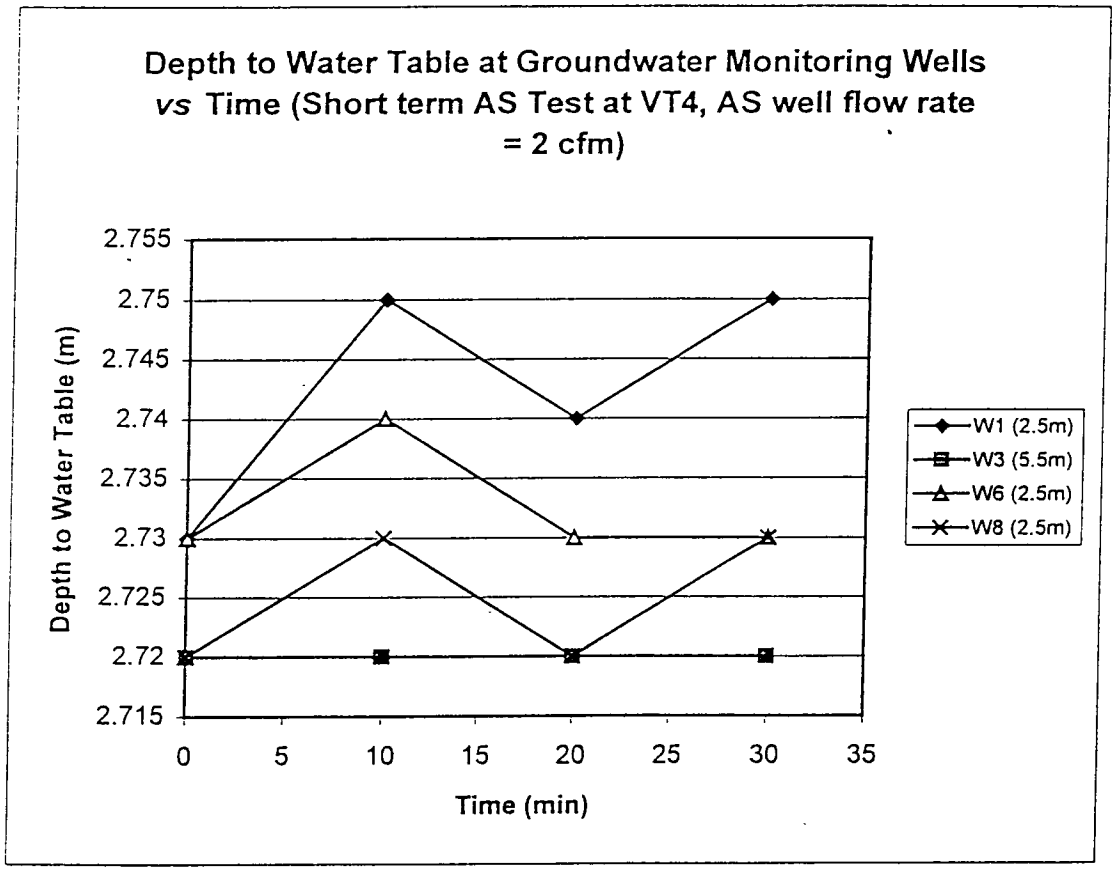


Maunsell	TITLE: Depth to Water Table at Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.30
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998



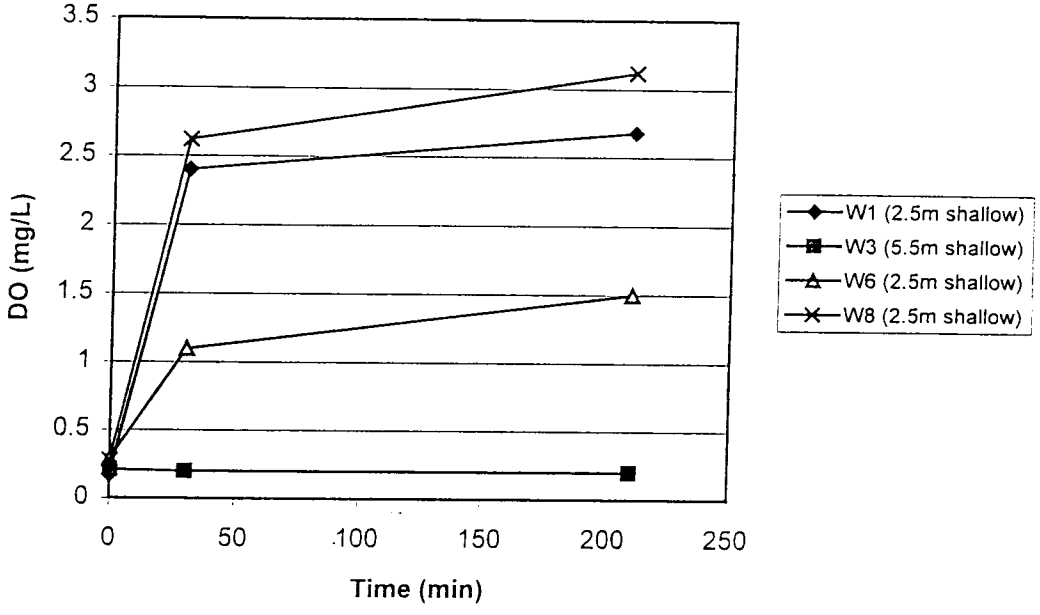


Maunsell	TITLE: Depth to Water Table at Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.31
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998

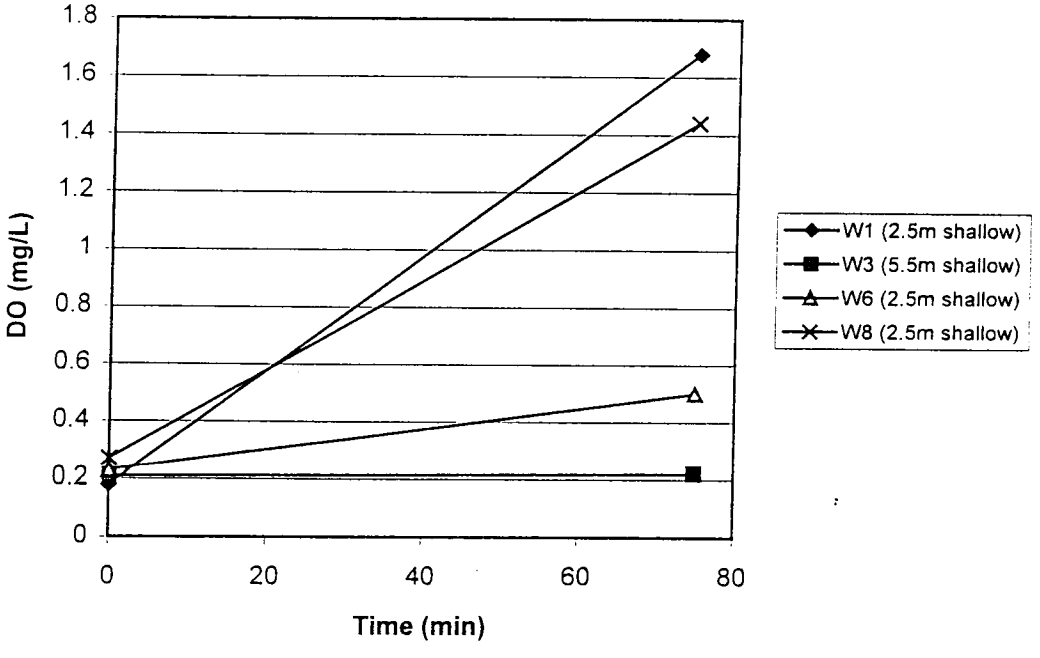


Maunsell	TITLE Depth to Water Table at Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.31
		DESIGNED/ CHECKED	Eric Lai	DATE Dec 1998

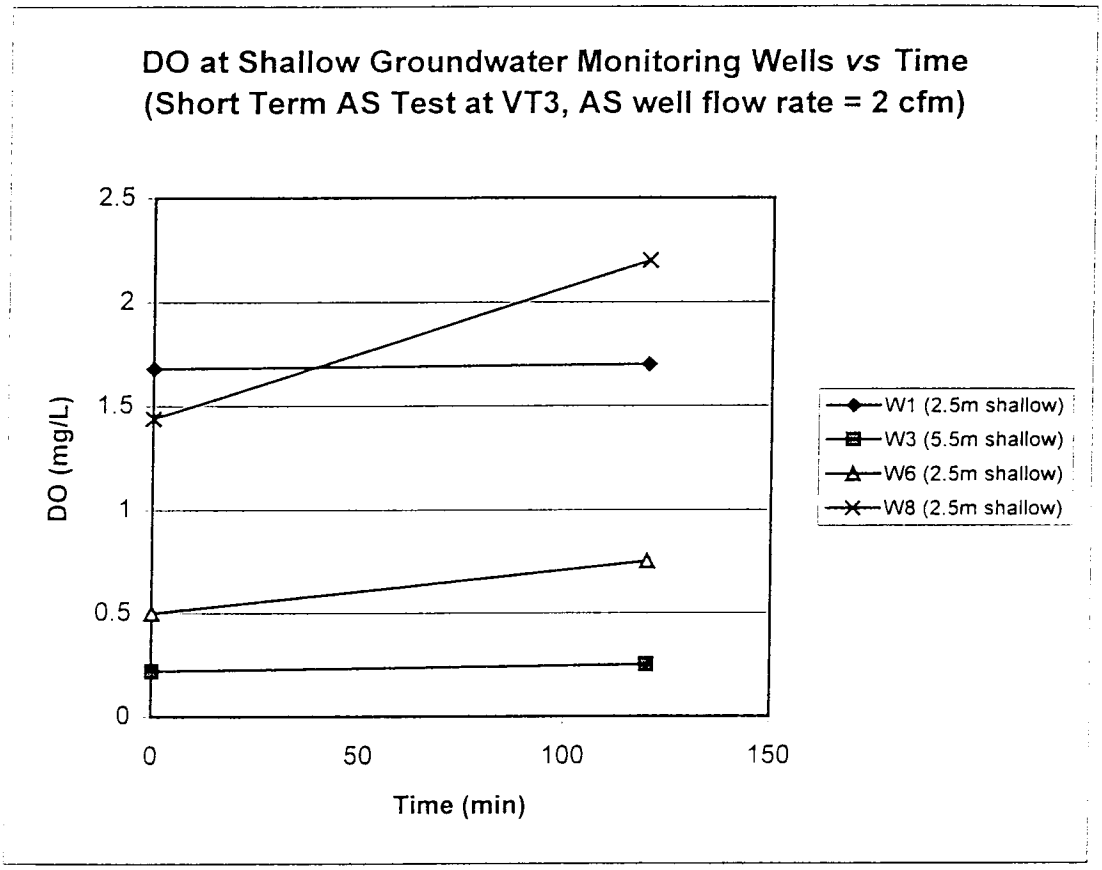
DO at Shallow Groundwater Monitoring Wells *vs* Time
(Short Term AS Test at VT3, AS well flow rate = 10 cfm)



DO at Shallow Groundwater Monitoring Wells *vs* Time
(Short Term AS Test at VT3, AS well flow rate = 4 cfm)

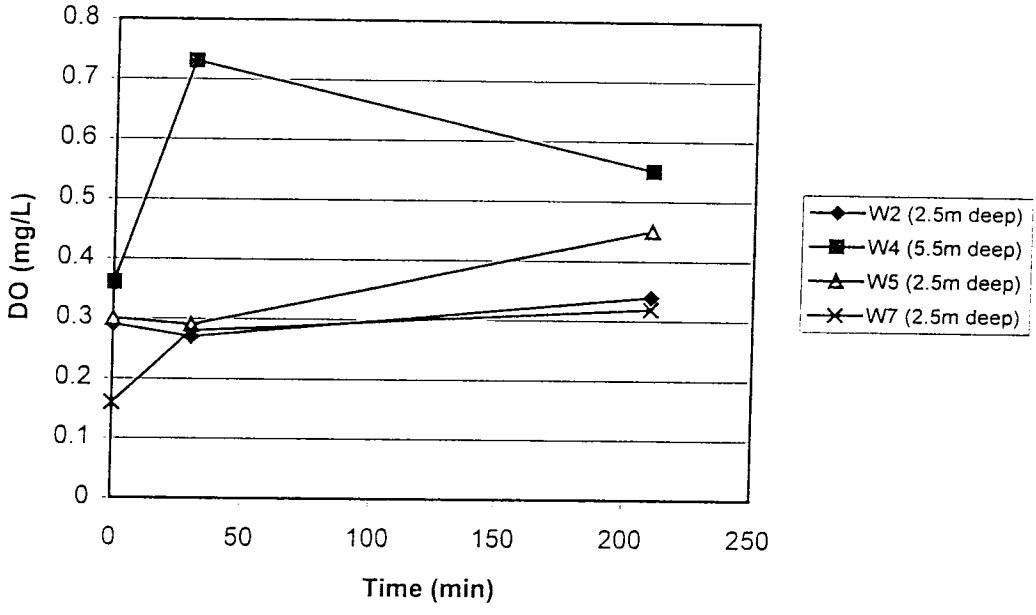


Maunsell	TITLE D.O. Concentration at Shallow Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.32
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998

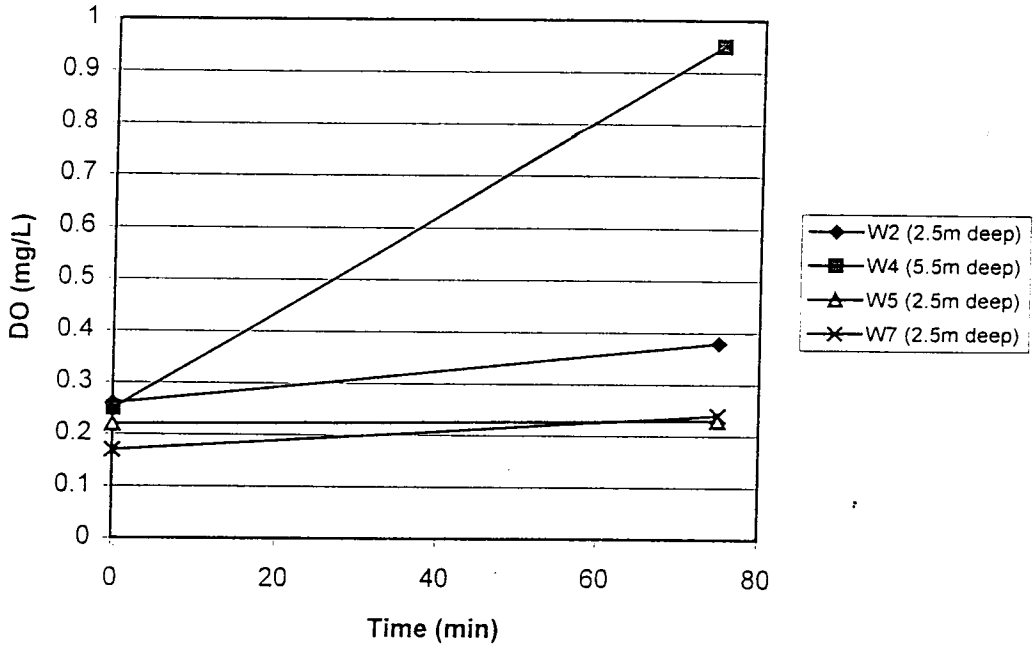


Maunsell	TITLE D.O. Concentration at Shallow Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.32
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998

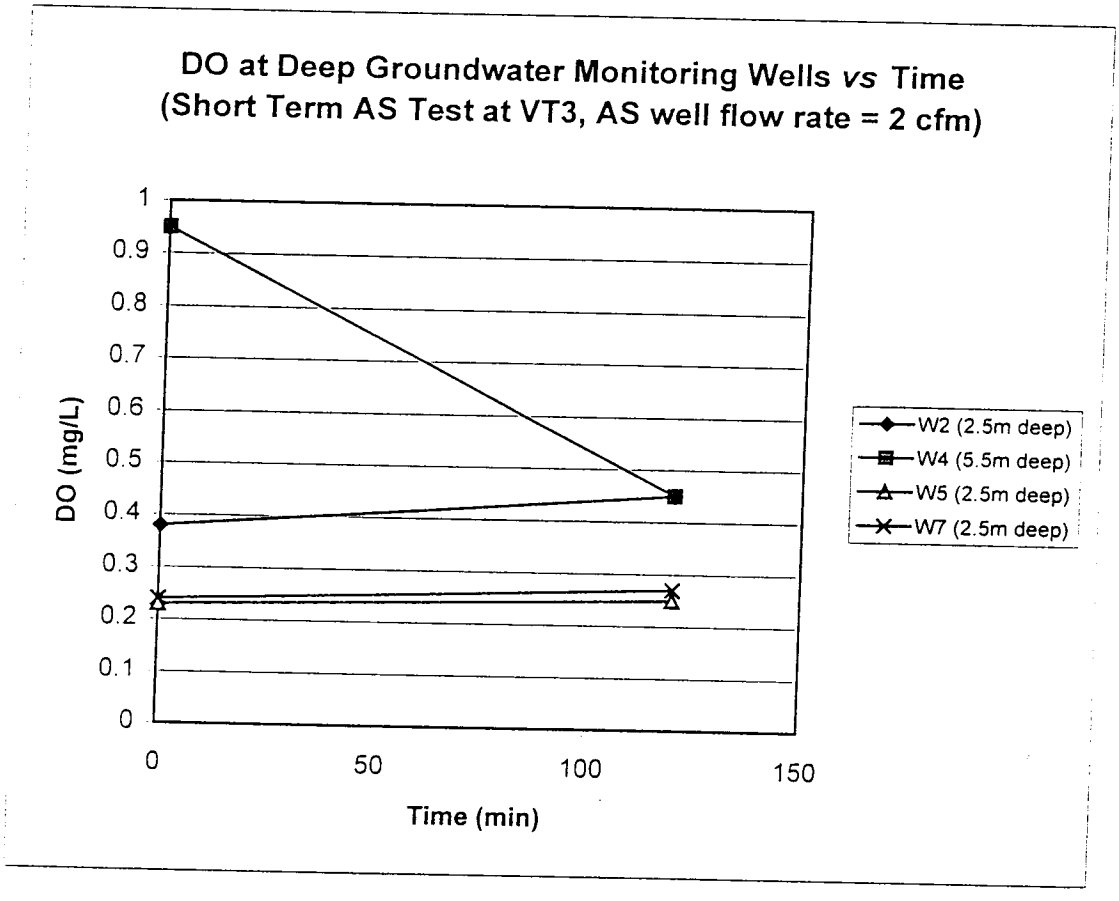
DO at Deep Groundwater Monitoring Wells *vs* Time
(Short Term AS Test at VT3, AS well flow rate = 10 cfm)



DO at Deep Groundwater Monitoring Wells *vs* Time
(Short Term AS Test at VT3, AS well flow rate = 4 cfm)

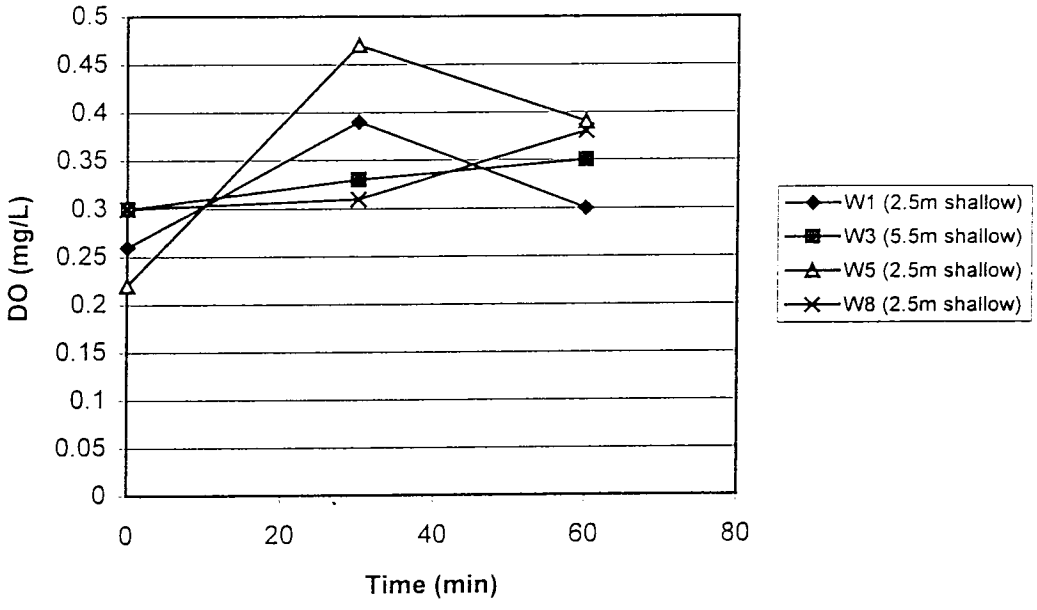


Maunsell	TITLE: D.O. Concentration at Deep Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.33
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998

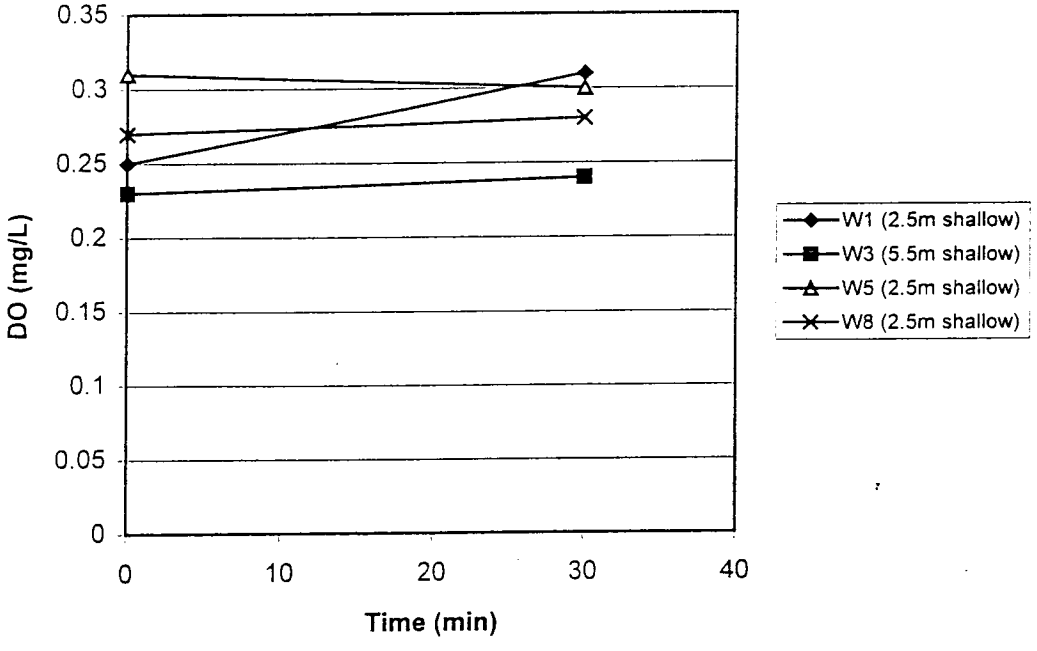


Maunsell	TITLE: D.O. Concentration at Deep Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.33
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998

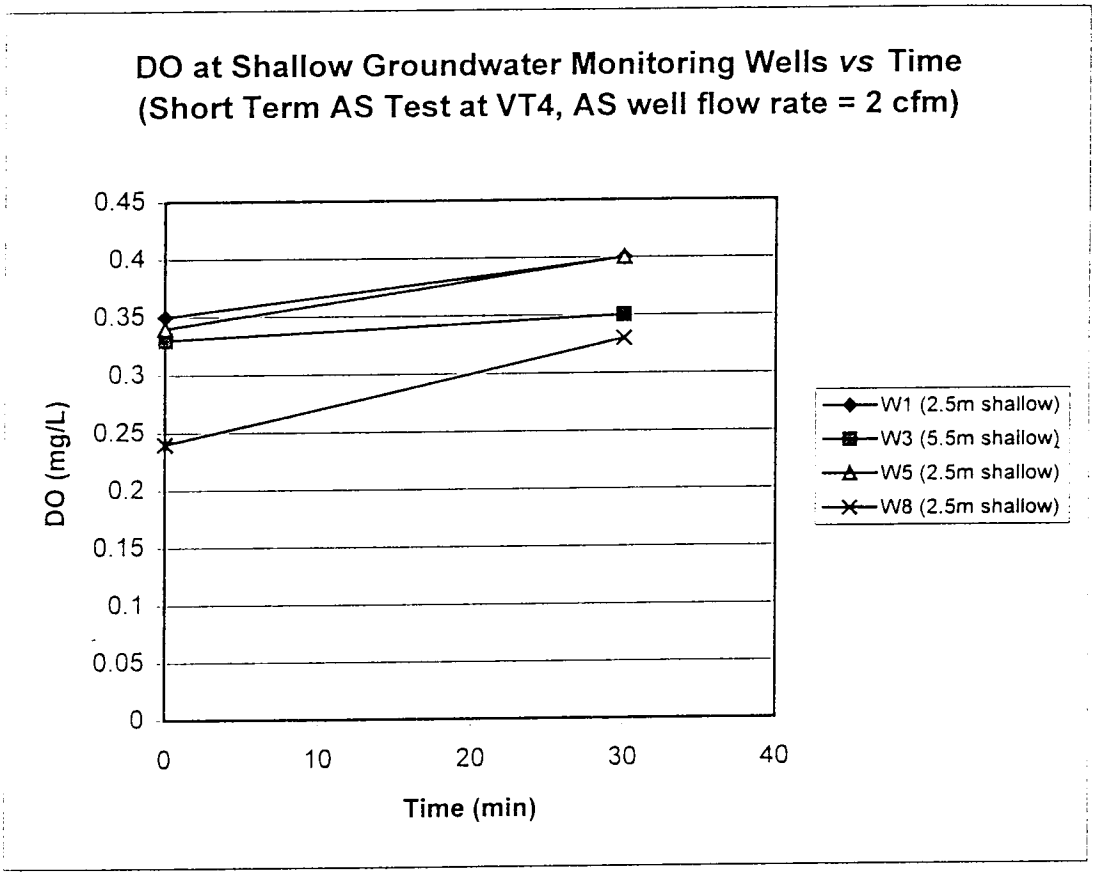
DO at Shallow Groundwater Monitoring Wells *vs* Time
(Short Term AS Test at VT4, AS well flow rate = 10 cfm)



DO at Shallow Groundwater Monitoring Wells *vs* Time
(Short Term AS Test at VT4, AS well flow rate = 4 cfm)

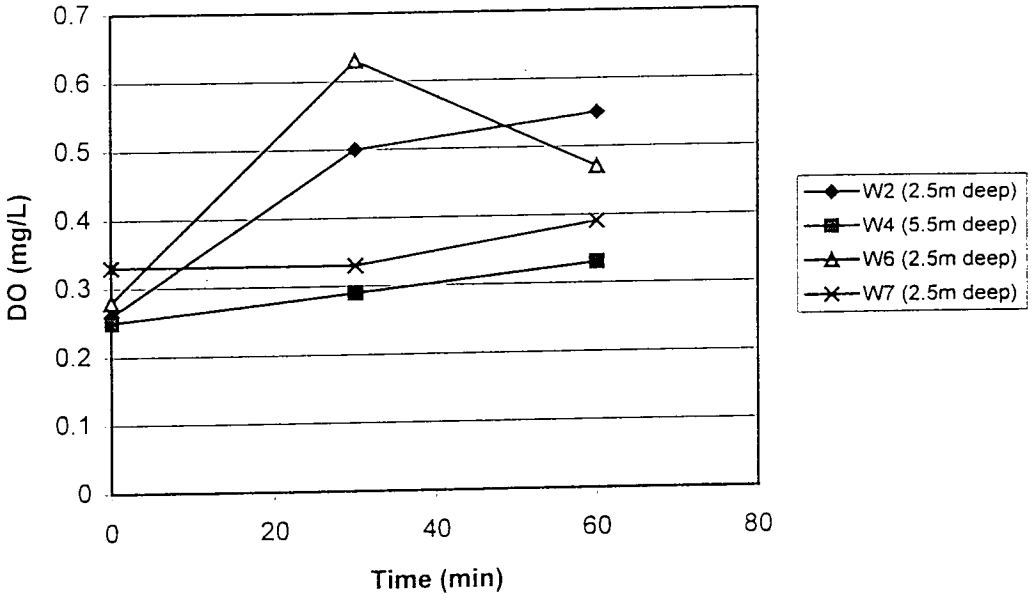


Maunsell	TITLE D.O. Concentration at Shallow Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.34
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998

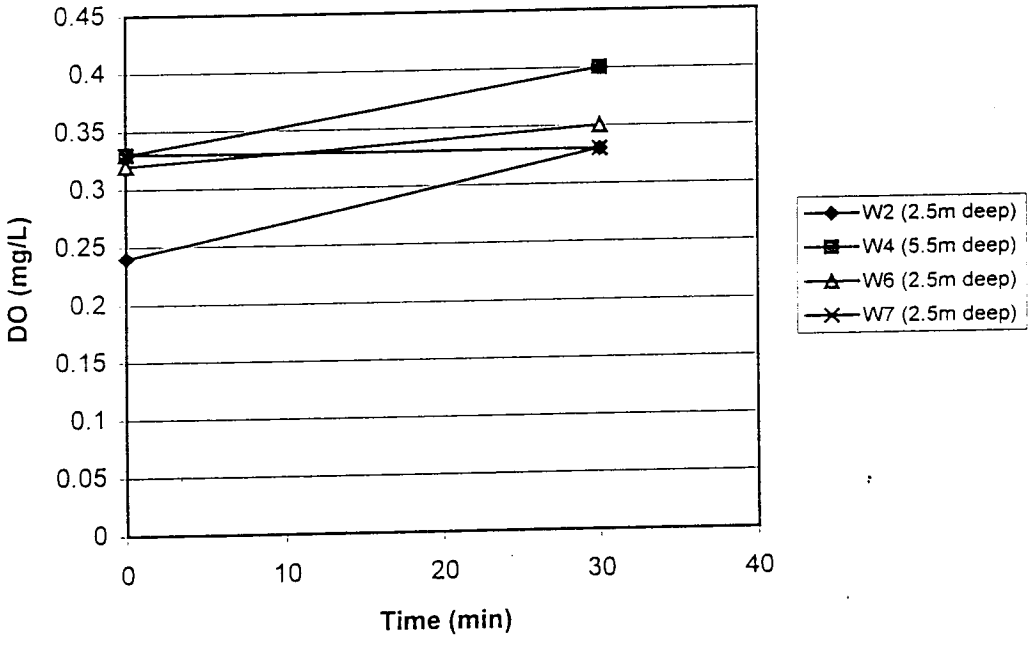


Maunsell	TITLE: D.O. Concentration at Shallow Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.34
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998

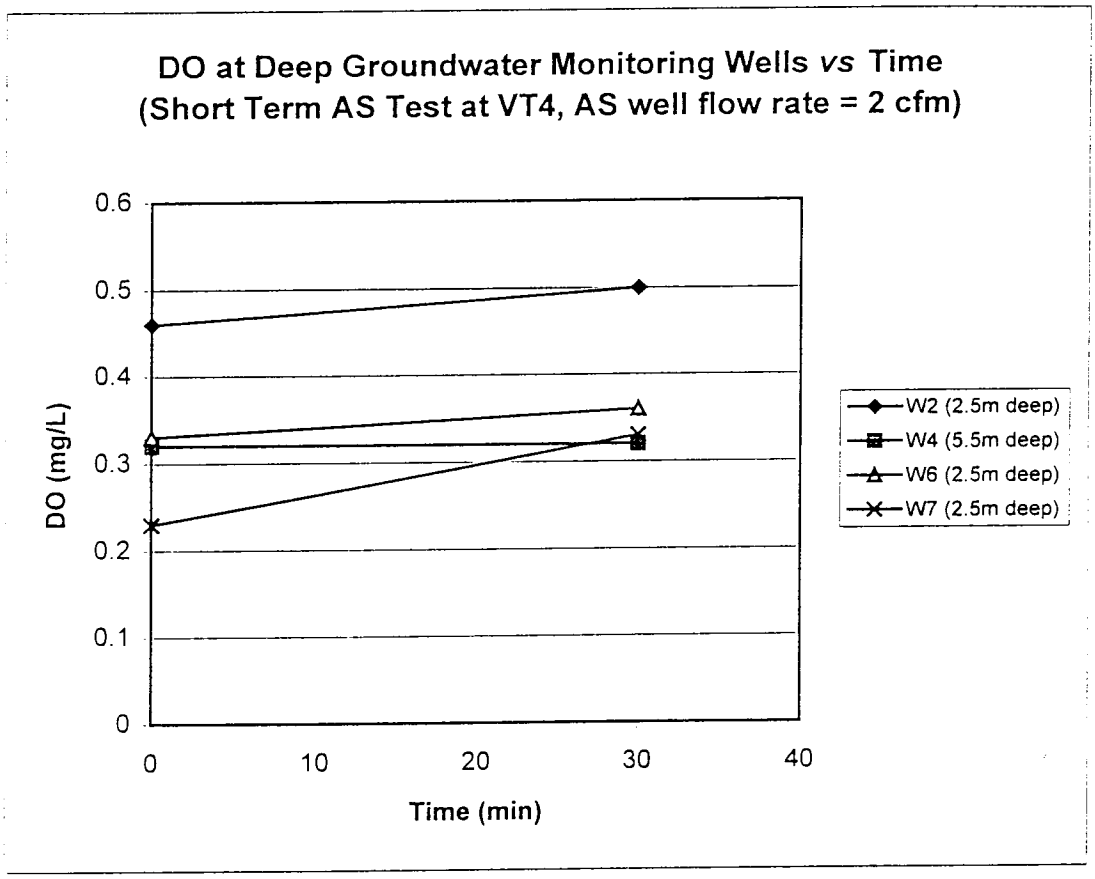
DO at Deep Groundwater Monitoring Wells *vs* Time (Short Term AS Test at VT4, AS well flow rate = 10 cfm)



DO at Deep Groundwater Monitoring Wells *vs* Time (Short Term AS Test at VT4, AS well flow rate = 4 cfm)

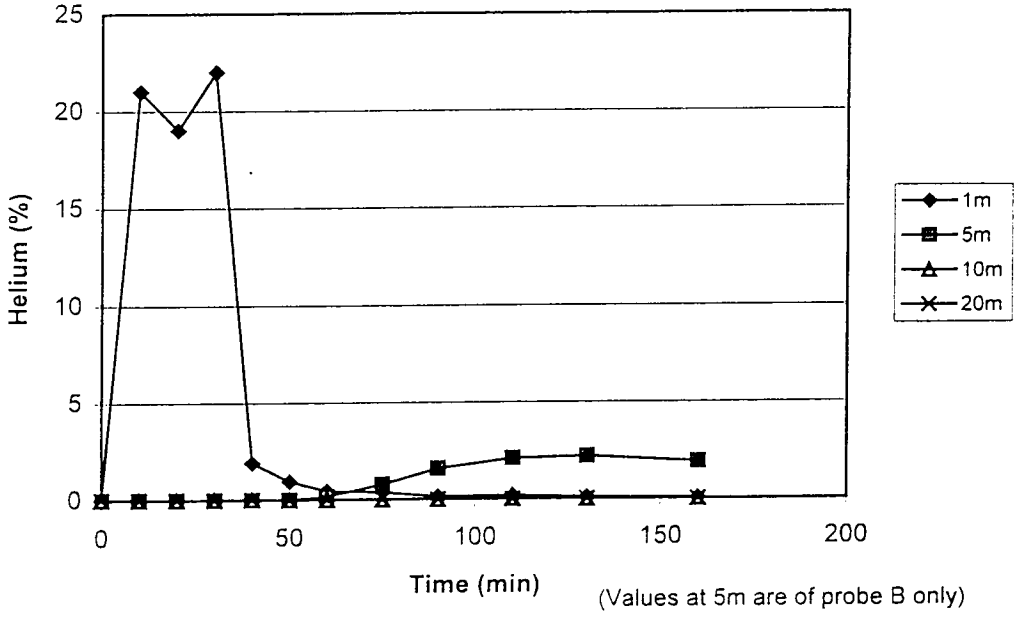


Maunsell	TITLE **D.O. Concentration at Deep Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT4)**	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD	
		PROJECT NO: C418	FIGURE NO: Figure 4.35
		DESIGNED/ CHECKED: Eric Lai	DATE: Dec 1998



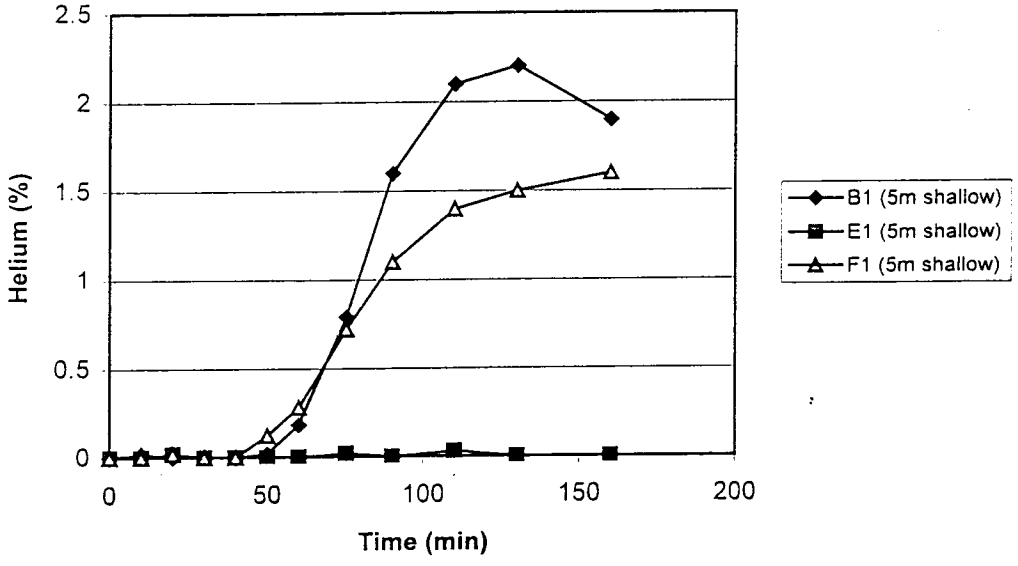
Maunsell	TITLE D.O. Concentration at Deep Groundwater Monitoring Wells *vs* Time (Short-term AS Tests at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.35
		DESIGNED/ CHECKED	Eric Lai	DATE	Dec 1998

Helium at Shallow Vapour Probes *vs* Time (Helium Test at VT3, AS well pressure= 157.5 in. H2O, AS well flow rate = 4 cfm, He conc. = 25%, He flow rate = 1 cfm)



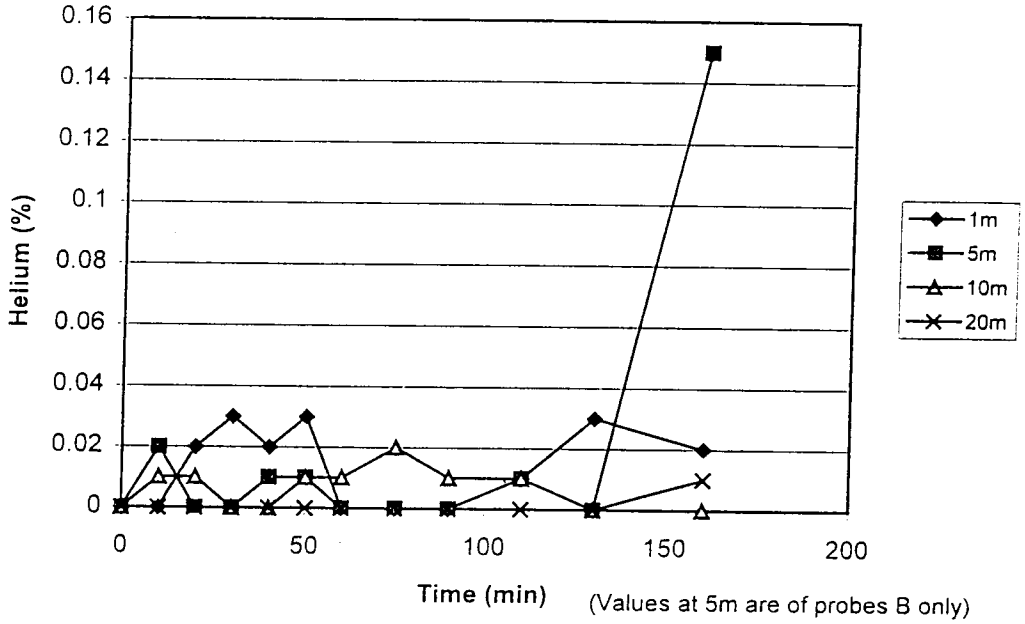
(Values at 5m are of probe B only)

Helium at Shallow Radial Vapour Probes *vs* Time (Helium Test at VT3, AS well pressure = 157.5 in. H2O, AS well flow rate = 4 cfm, He conc. = 25%, He flow rate = 1 cfm)



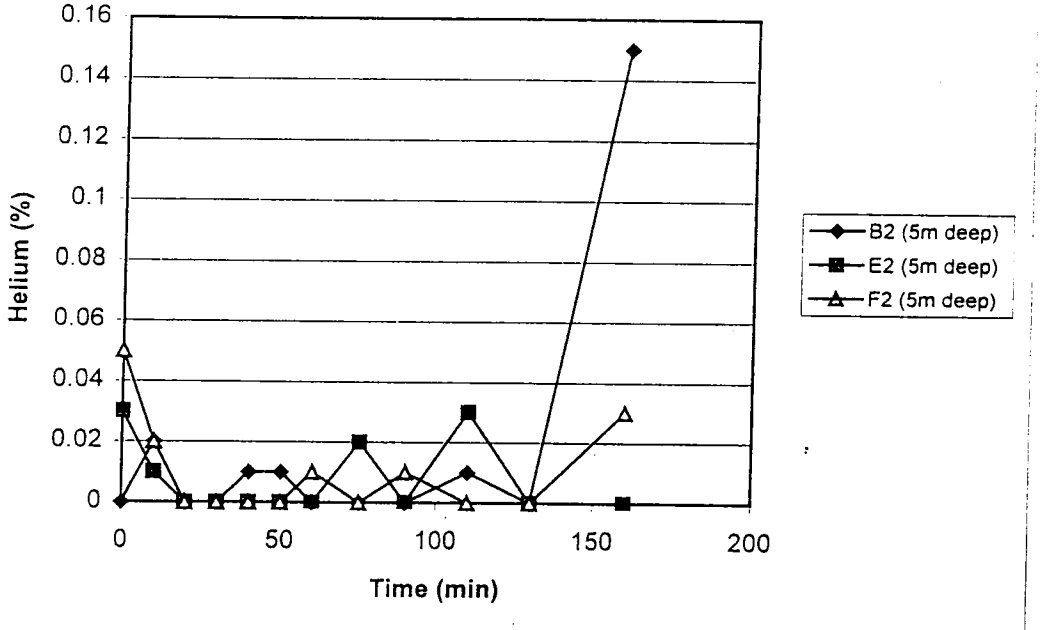
Maunsell	TITLE **Helium Concentration at Shallow Vapour Probes *vs* Time (Helium Test at VT3, Helium Concentration = 25%)**	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.36
		DESIGNED/ CHECKED		DATE Dec 1998

Helium at Deep Vapour Probes *vs* Time (Helium Test at VT3, AS well pressure = 157.5 in. H2O, AS well flow rate = 4 cfm, He conc. = 25%, He flow rate = 1 cfm)



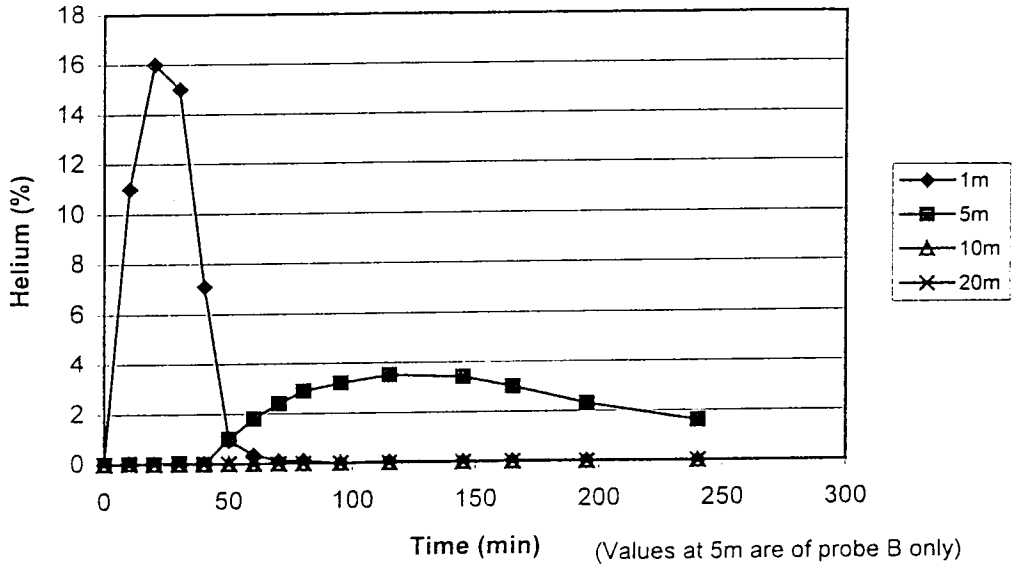
(Values at 5m are of probes B only)

Helium at Deep Radial Vapour Probes *vs* Time (Helium Test at VT3, AS well pressure = 157.5 in. H2O, AS well flow rate = 4 cfm, He conc. = 25%, He flow rate = 1 cfm)



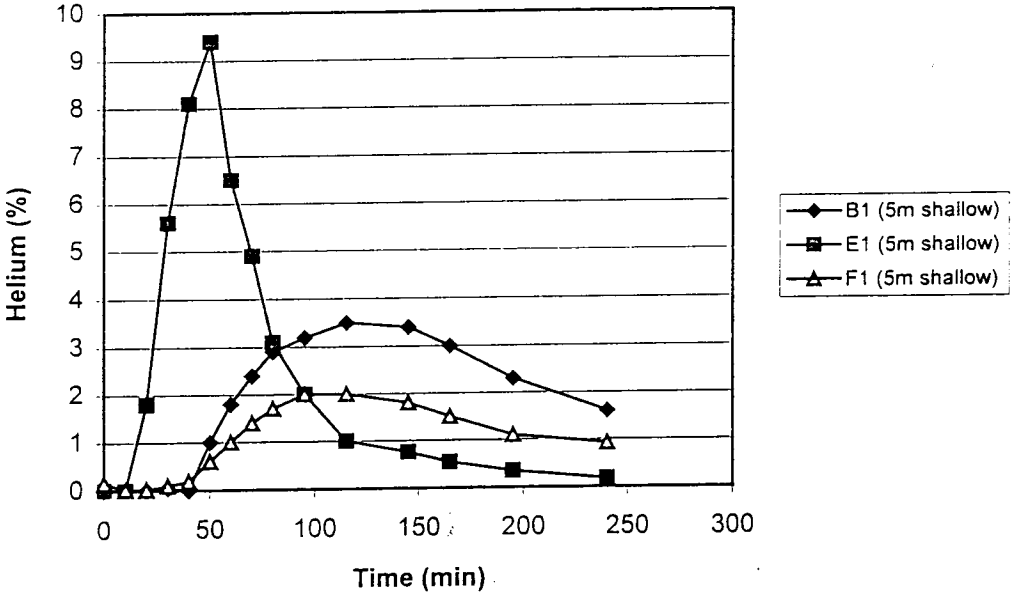
Maunsell	TITLE: Helium Concentration at Deep Vapour Probes *vs* Time (Helium Test at VT3, Helium Concentration = 25%)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO	Figure 4.37
		DESIGNED/ CHECKED	EL	DATE	Dec 1998

Helium at Shallow Vapour Probes *vs* Time (Helium Test at VT3, AS well pressure = 157.5 in. H2O, AS well flow rate = 6 cfm, He conc. = 16.5%, He flow rate = 1 cfm)



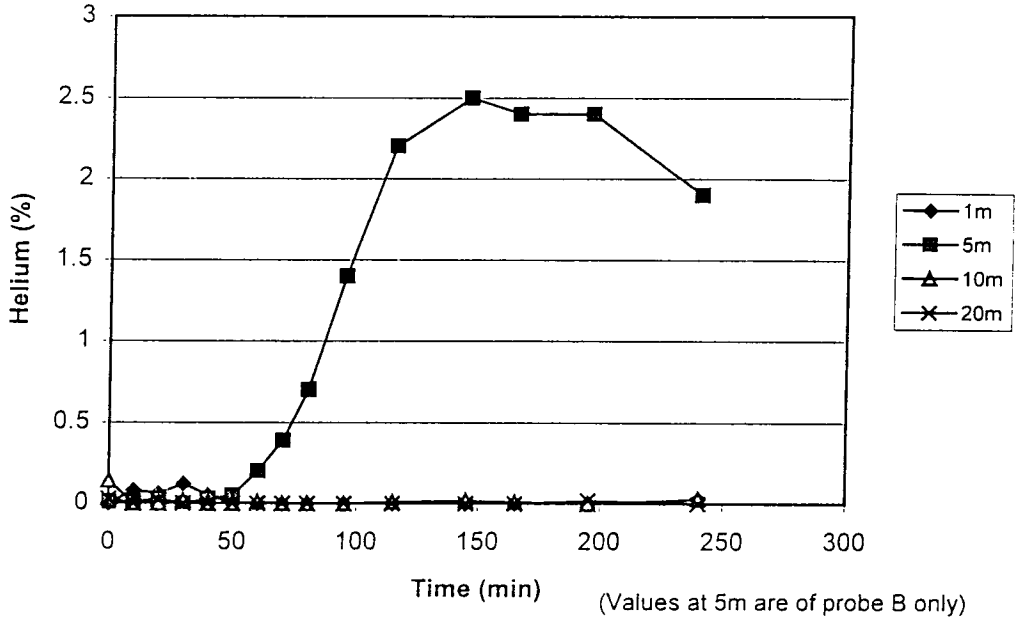
(Values at 5m are of probe B only)

Helium at Shallow Radial Probes *vs* Time (Helium Test at VT3, AS well pressure = 157.5 in. H2O, AS well flow rate = 6 cfm, He conc. = 16.5%, He flow rate = 1 cfm)



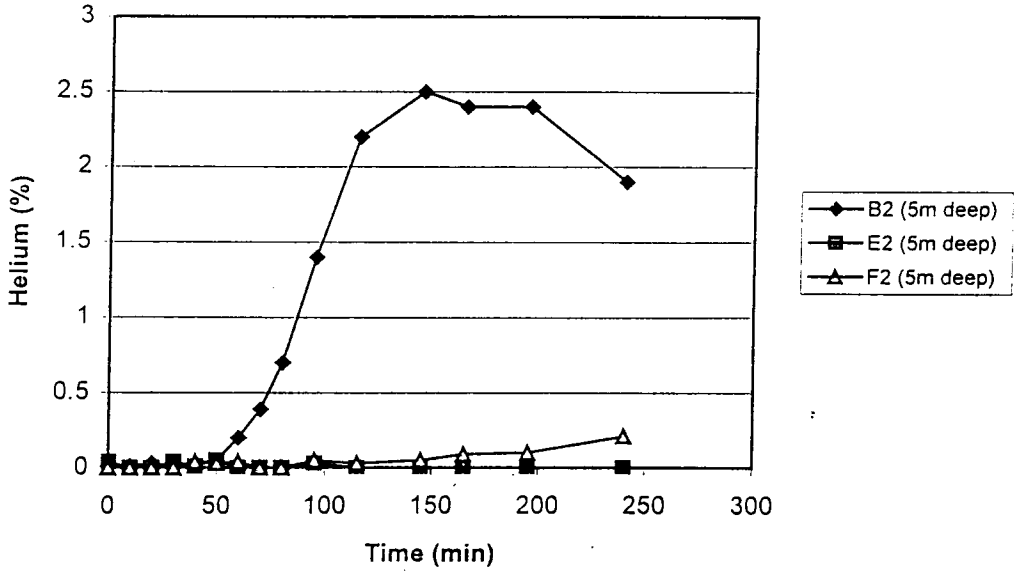
Maunsell	TITLE: Helium Concentration at Shallow Vapour Probes *vs* Time (Helium Test at VT3, Helium Concentration = 16.5%)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.38
		DESIGNED/ CHECKED	EL	DATE	Dec 1998

Helium at Deep Vapour Probes *vs* Time (Helium Test at VT3, AS well pressure = 157.5 in. H2O, AS well flow rate = 6 cfm, He conc. = 16.5%, He flow rate = 1 cfm)



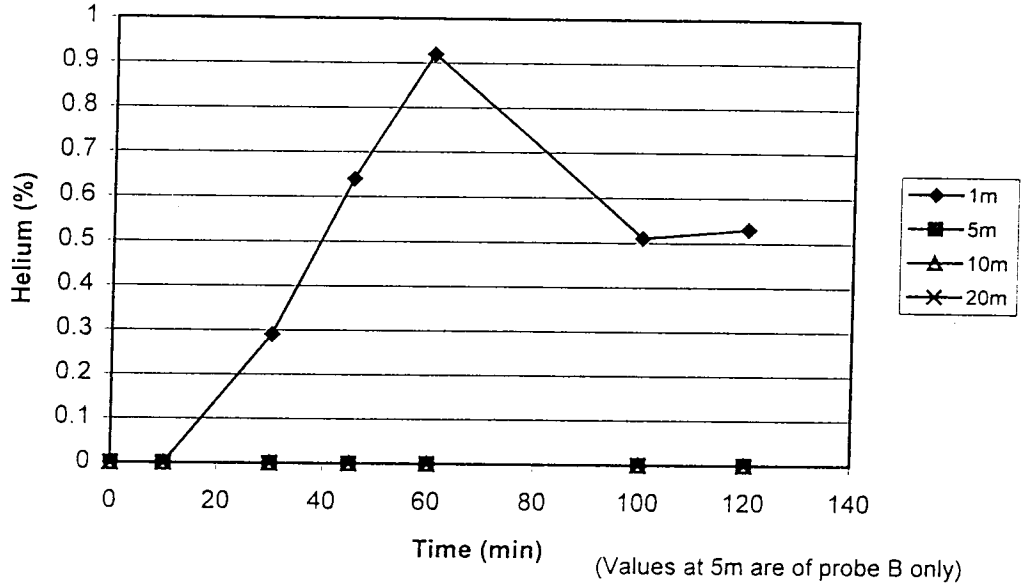
(Values at 5m are of probe B only)

Helium at Deep Radial Vapour Probes *vs* Time (Helium Test at VT3, AS well pressue = 157.5 in. H2O, AS well flow rate = 6 cfm, He conc. = 16.5%, He flow rate = 1 cfm)



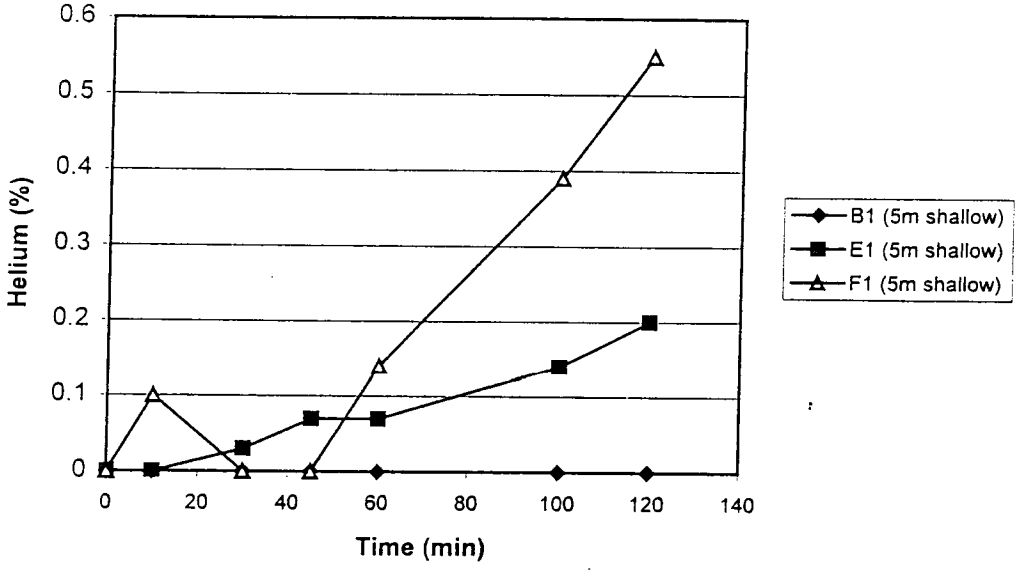
Maunsell	TITLE Helium Concentration at Deep Vapour Probes *vs* Time (Helium Test at VT3, Helium Concentration = 16.5%)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.39
		DESIGNED/ CHECKED	EL	DATE Dec 1998

Helium at Shallow Vapour Probes *vs* Time (Short-term AS at VT4, AS well pressure= 138.4 in. H2O, AS well flow rate = 9.3 cfm, He conc. = 9%, He flow rate = 0.83 cfm)



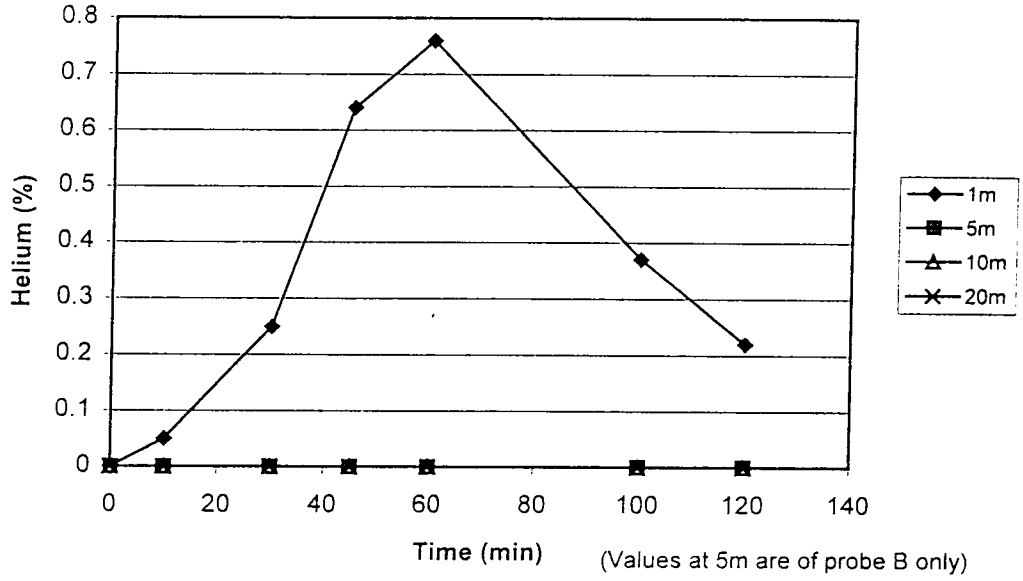
(Values at 5m are of probe B only)

Helium at Shallow Radial Vapour Probes *vs* Time (Short-term AS at VT4, AS well pressure = 138.4 in. H2O, AS well flow rate = 9.3 cfm, He conc. = 9%, He flow rate = 0.83 cfm)



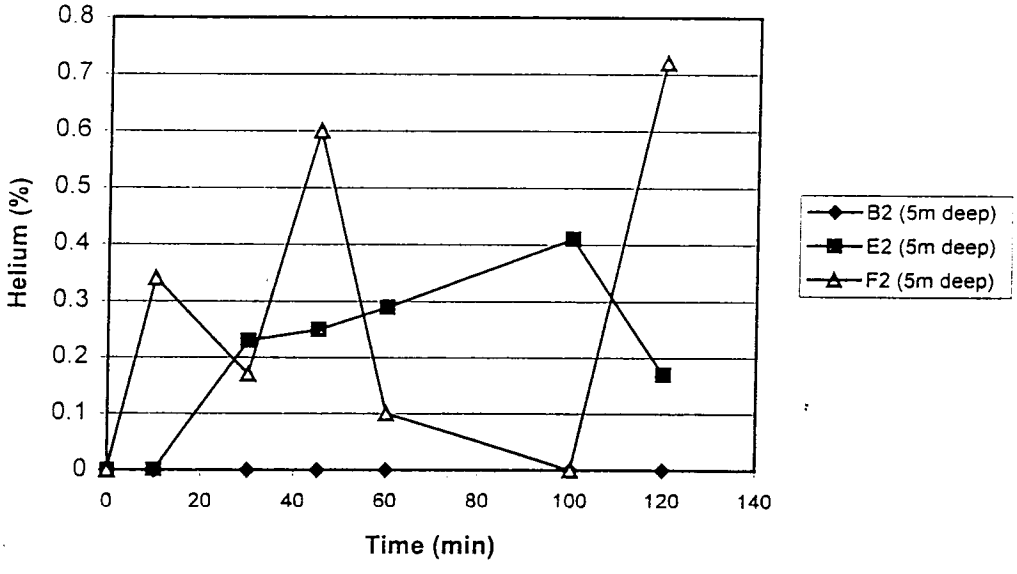
Maunsell	TITLE: Helium Concentration at Shallow Vapour Probes *vs* Time (Helium Test at VT4, Helium Concentration = 9%)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.40
		DESIGNED/ CHECKED	EL	DATE	Dec 1998

Helium at Deep Vapour Probes *vs* Time (Short-term AS at VT4, AS well pressure = 138.4 in. H2O, AS well flow rate = 9.3 cfm, He conc. = 9%, He flow rate = 0.83 cfm)



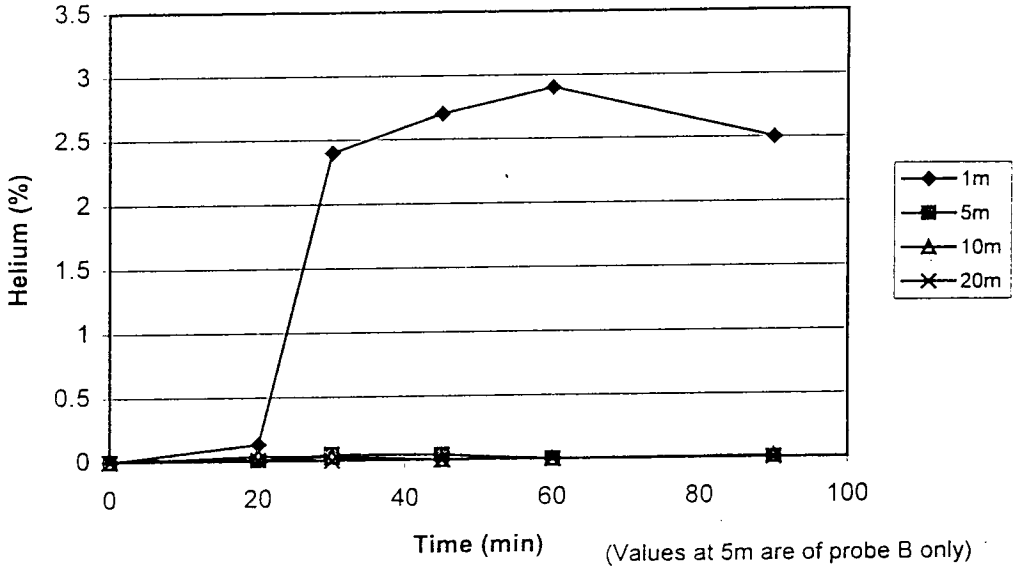
(Values at 5m are of probe B only)

Helium at Deep Radial Vapour Probes *vs* Time (Short-term AS at VT4, AS well pressure = 138.4 in. H2O, AS well flow rate = 9.3 cfm, He conc. = 9%, He flow rate = 0.83 cfm)



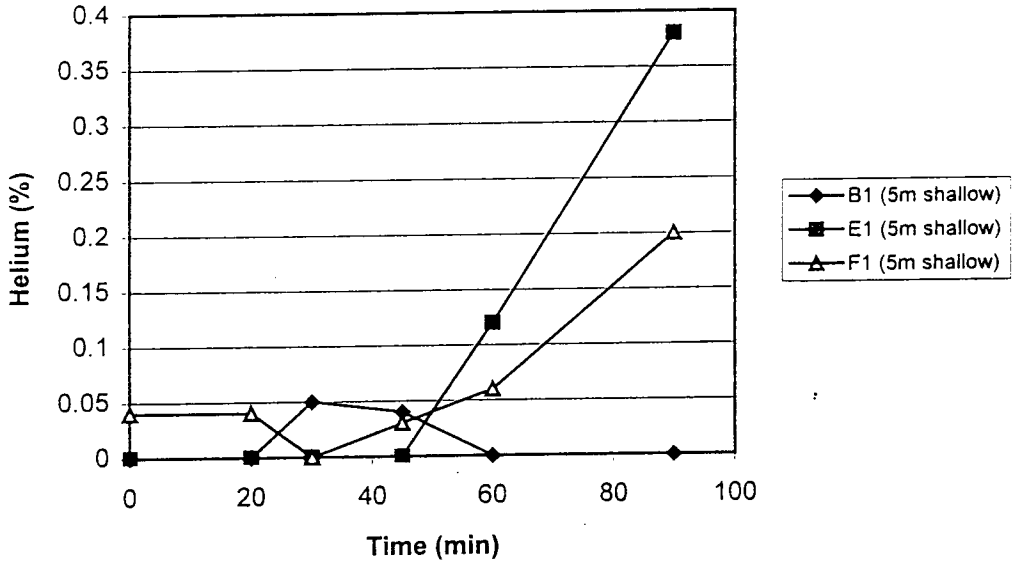
Maunsell	TITLE: Helium Concentration at Deep Vapour Probes *vs* Time (Helium Test at VT4, Helium Concentration = 9%)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.41
		DESIGNED/ CHECKED	EL	DATE	Dec 1998

Helium at Shallow Vapour Probes Vs Time (Short-term AS at VT4, AS well pressure = 149.6 in. H2O, AS well flow rate = 12 cfm, He conc. = 8.33%, He flow rate = 1 cfm)



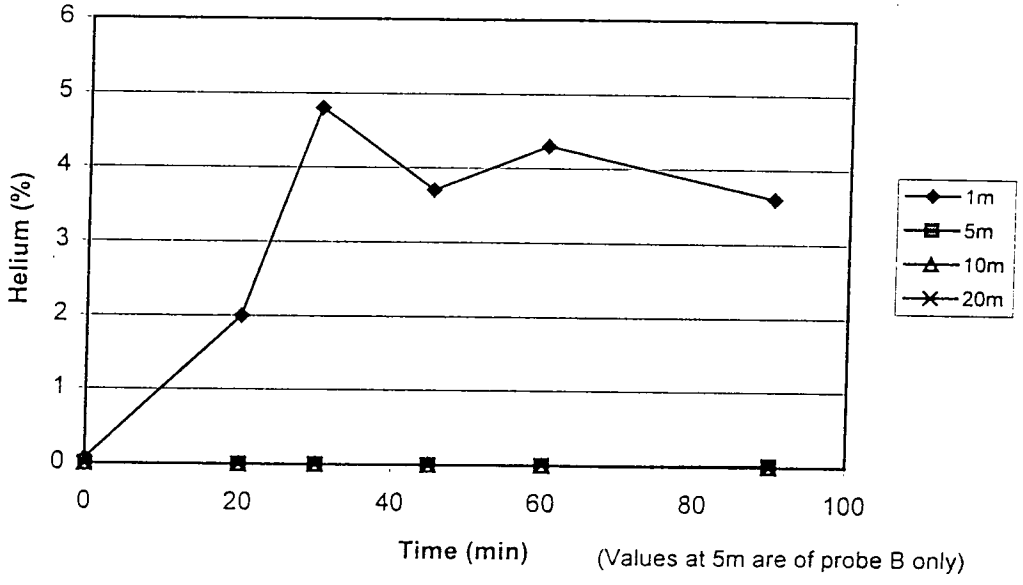
(Values at 5m are of probe B only)

Helium at Shallow Radial Vapour Probes *vs* Time (Short-term AS at VT4, AS well pressure = 149.6 in. H2O, AS well flow rate = 12 cfm, He conc. = 8.33%, He flow rate = 1 cfm)



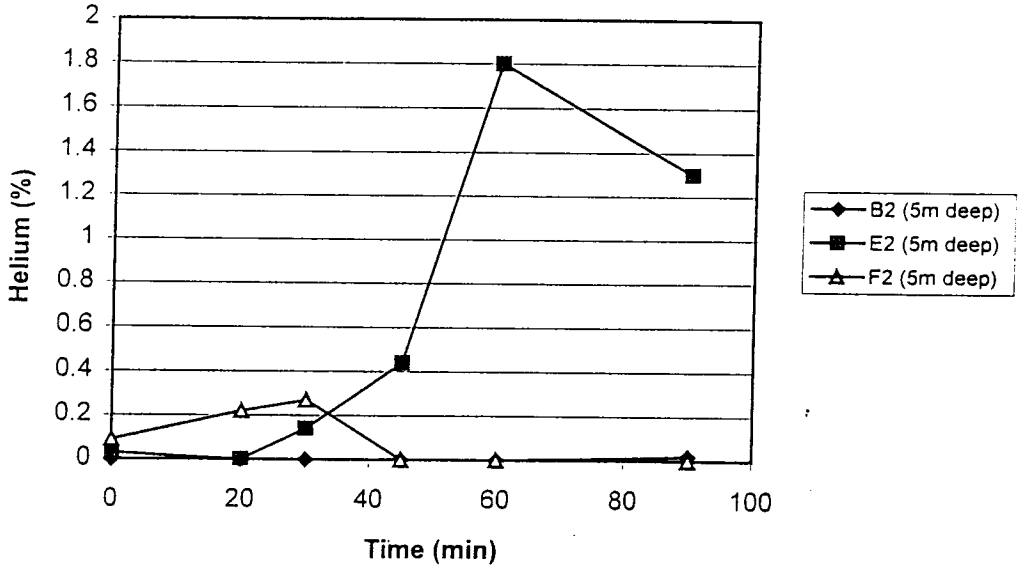
Maunsell	TITLE **Helium Concentration at Shallow Vapour Probes *vs* Time (Helium Test at VT4, Helium Concentration = 8.33%)**	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO	C418	FIGURE NO. Figure 4.42
		DESIGNED/ CHECKED	EL	DATE Dec 1998

Helium at Deep Vapour Probes *vs* Time (Short-term AS at VT4, AS well pressure = 149.6 in. H2O, AS well flow rate = 12 cfm, He conc. = 8.33%, He flow rate = 1 cfm)



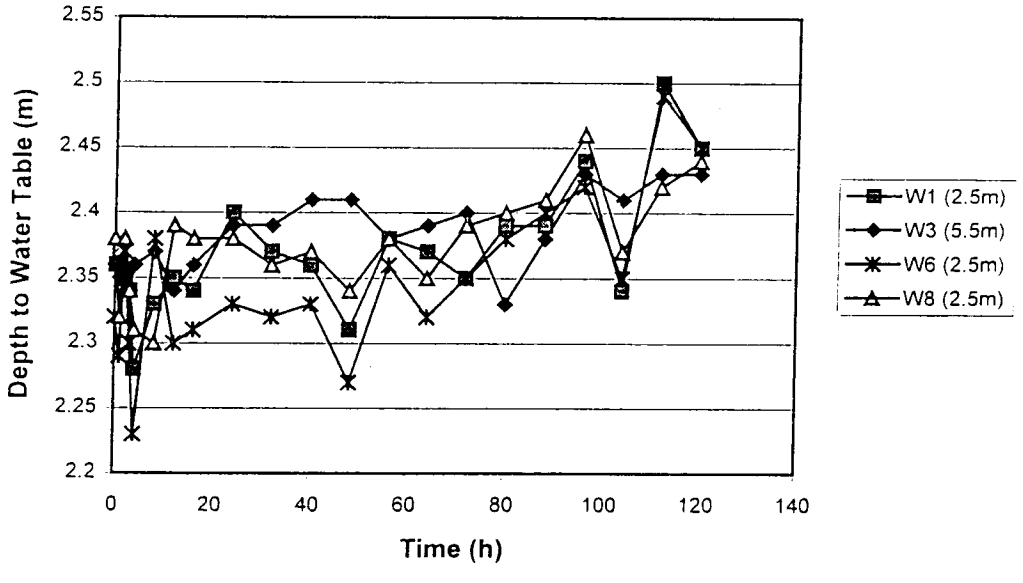
(Values at 5m are of probe B only)

Helium at Deep Radial Vapour Probes *vs* Time (Short-term AS at VT4, AS well pressue = 149.6 in. H2O, AS well flow rate = 12 cfm, He conc. = 8.33%, He flow rate = 1 cfm)



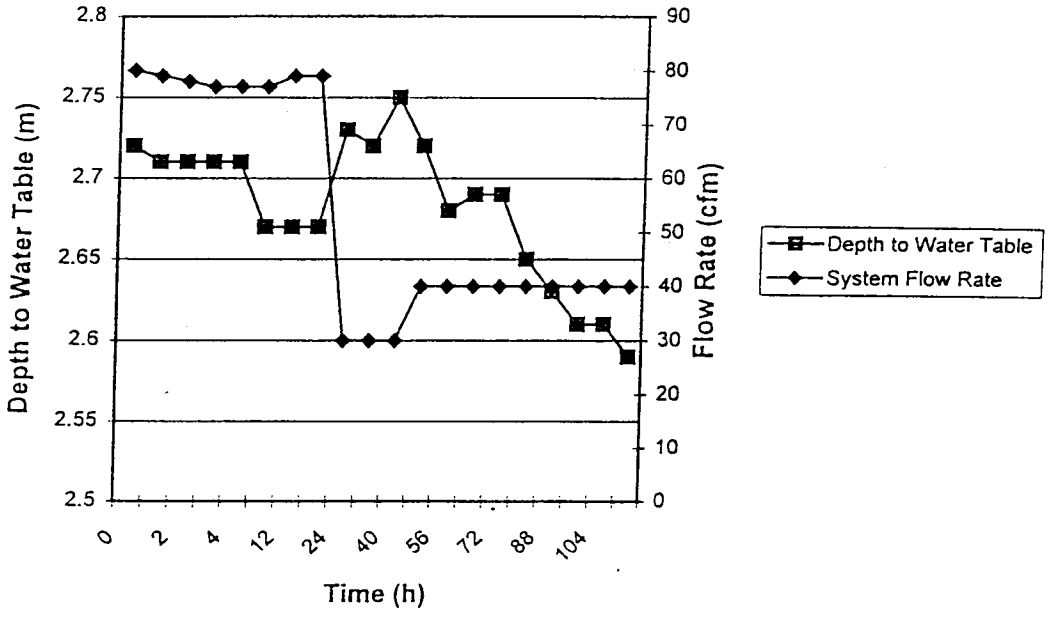
Maunsell	TITLE: Helium Concentration at Deep Vapour Probes *vs* Time (Helium Test at VT4, Helium Concentration = 8.33%)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.43
		DESIGNED/ CHECKED	EL	DATE	Dec 1998

Depth to Water Table at Groundwater Monitoring Wells *vs* Time (Long Term Combined SVE/AS Test at VT3, SVE well vacuum = 50 in. H2O, AS well flow rate = 2 cfm)

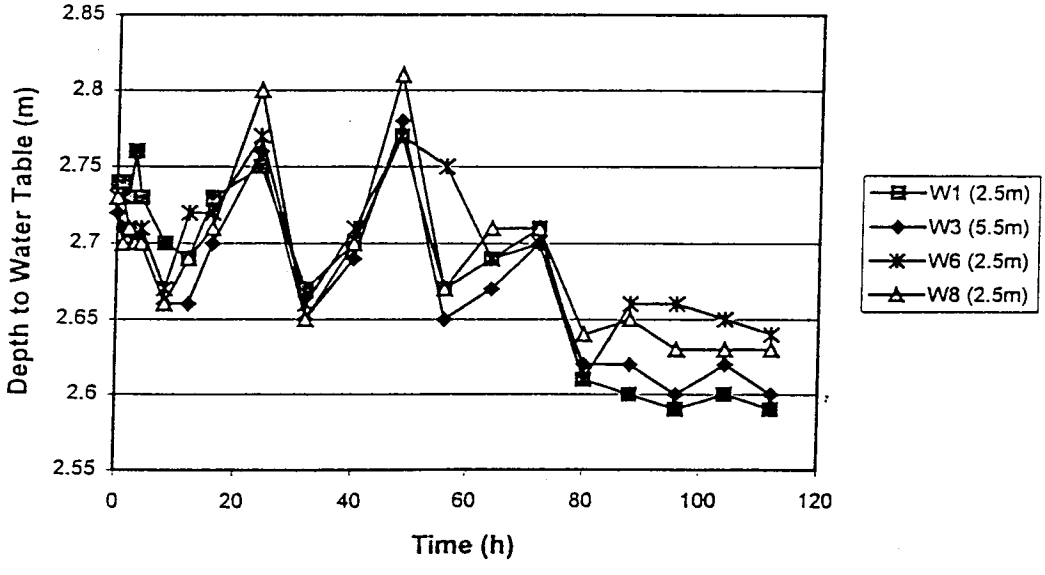


Maunsell	TITLE: Depth to Water Table at Groundwater Monitoring Wells *vs* Time (Long-term Combined SVE/AS Test at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.44
		DESIGNED/ CHECKED	EL	DATE	Jan 1999

Depth to Water Table at SVE Well *vs* Time (Long Term Combined SVE/AS at VT4, extracted air flow rate = 80 cfm, AS well flow rate = 8 cfm)

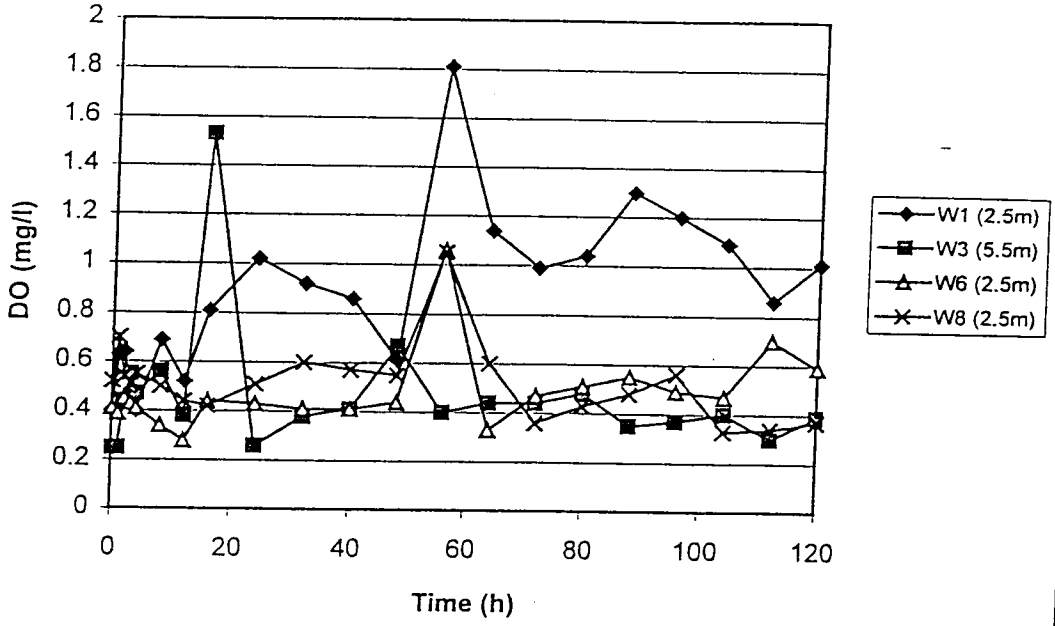


Depth to Water Table at Groundwater Monitoring Wells *vs* Time (Long Term Combined SVE/AS at VT4, extracted air flow rate = 80 cfm, AS well flow rate = 8 cfm)

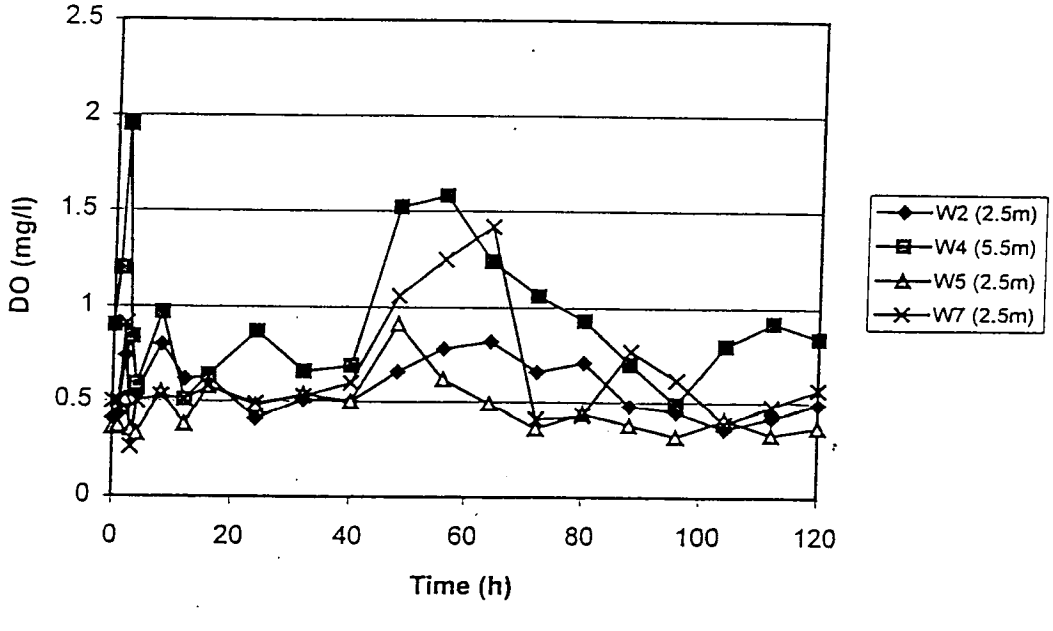


Maunsell	TITLE: Depth to Water Table at SVE Well and Groundwater Monitoring Wells *vs* Time (Long-term Combined SVE/AS Test at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.45
		DESIGNED/ CHECKED	EL	DATE	Jam 1999

DO at Shallow Groundwater Wells *vs* Time (Long Term Combined SVE/AS at VT3, SVE well vacuum = 50 in. H2O, AS well flow rate = 2 cfm)

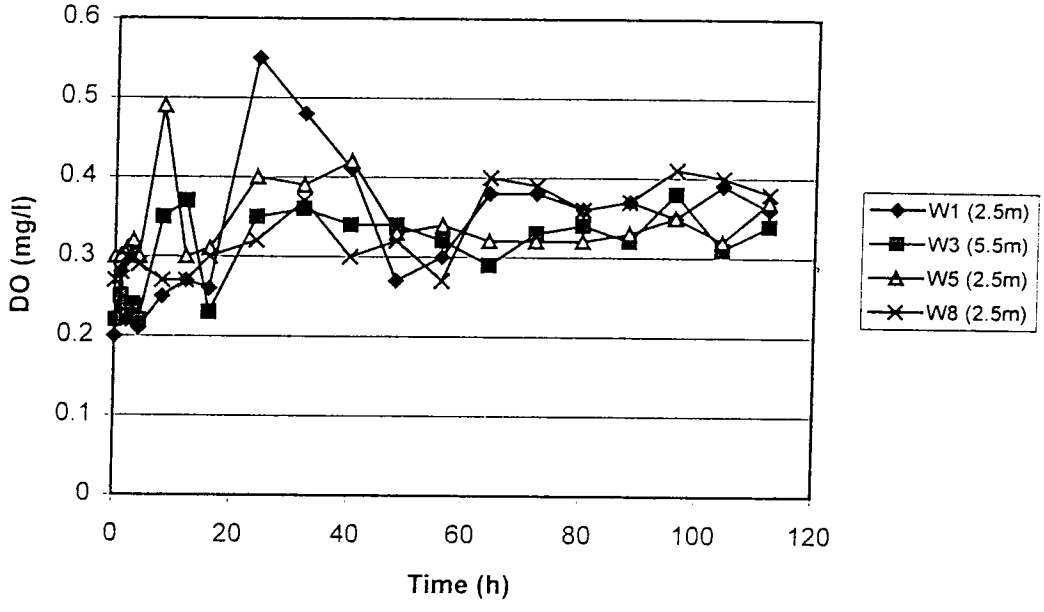


DO at Deep Groundwater Wells *vs* Time (Long Term Combined SVE/AS at VT3, SVE well vacuum = 50 in. H2O, AS well flow rate = 2 cfm)

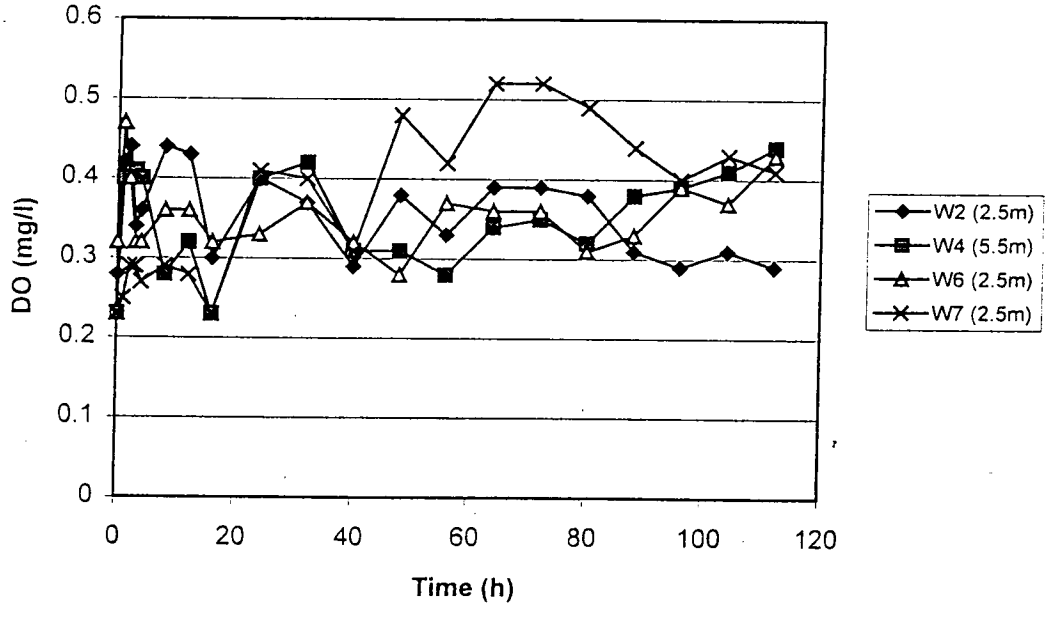


Maunsell	TITLE D.O. Concentration at Shallow & Deep Groundwater Monitoring Wells vs Time (Long-term Combined SVE/AS Test at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.46
		DESIGNED/ CHECKED	EL	DATE	Jan 1999

DO at Shallow Groundwater Wells *vs* Time (Long Term Combined SVE/AS at VT4, extracted air flow rate = 80 cfm, AS well flow rate = 8 cfm)

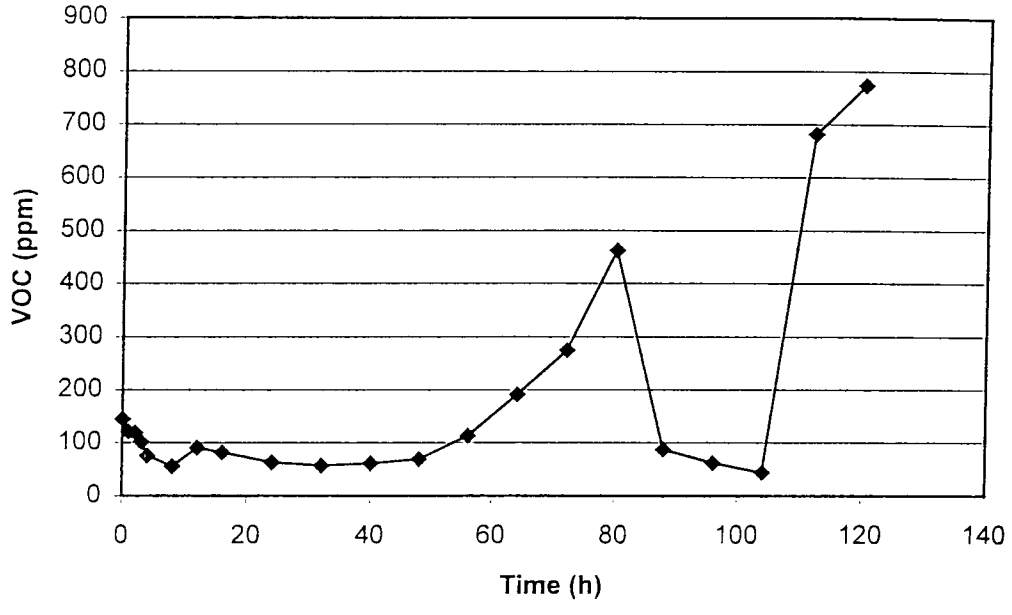


DO at Deep Groundwater Wells *vs* Time (Long Term Combined SVE/AS at VT4, extracted air flow rate = 80 cfm, AS well flow rate = 8 cfm)

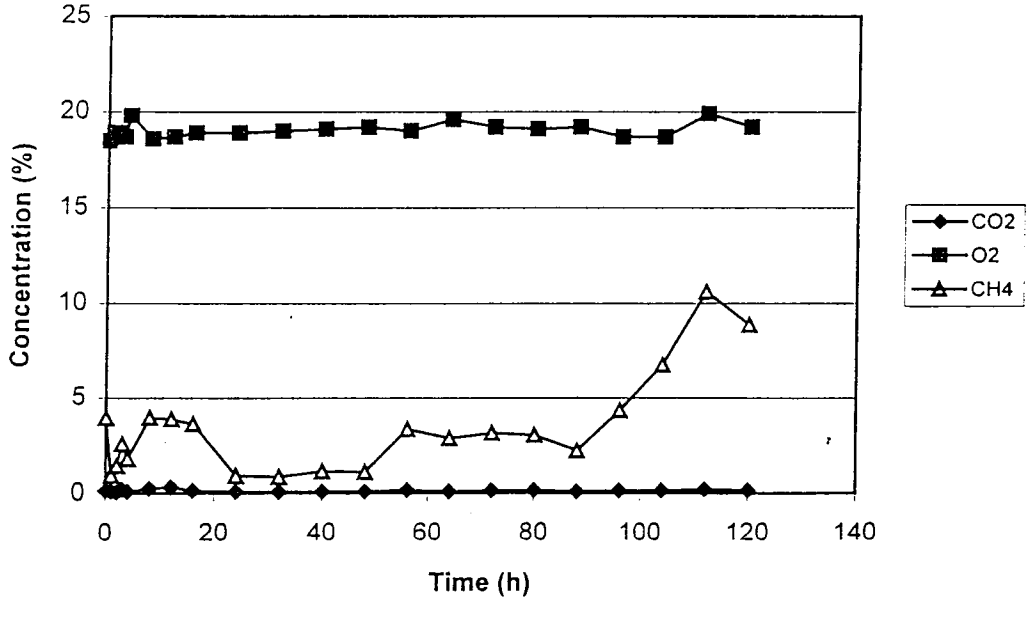


Maunsell	TITLE: D.O. Concentration at Shallow & Deep Groundwater Monitoring Wells vs Time (Long-term Combined SVE/AS Test at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO: C418	FIGURE NO.: Figure 4.47	
		DESIGNED/ CHECKED:	DATE: Dec 1998	

VOC at Blower Outlet *vs* Time (Long Term Combined SVE/AS Test at VT3, SVE well vacuum = 20 to 52 in. H2O, AS well flow rate = 2 cfm)

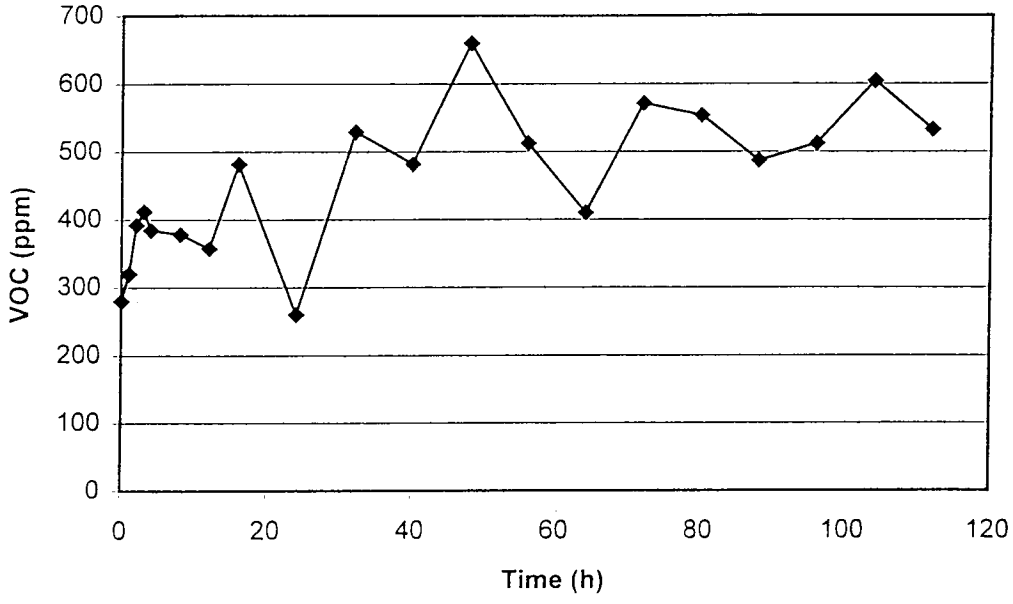


CO2, O2 & CH4 at Blower Outlet *vs* Time (Long Term Combined SVE/AS at VT3, SVE well vacuum = 20 to 52 in. H2O, AS well flow rate = 2 cfm)

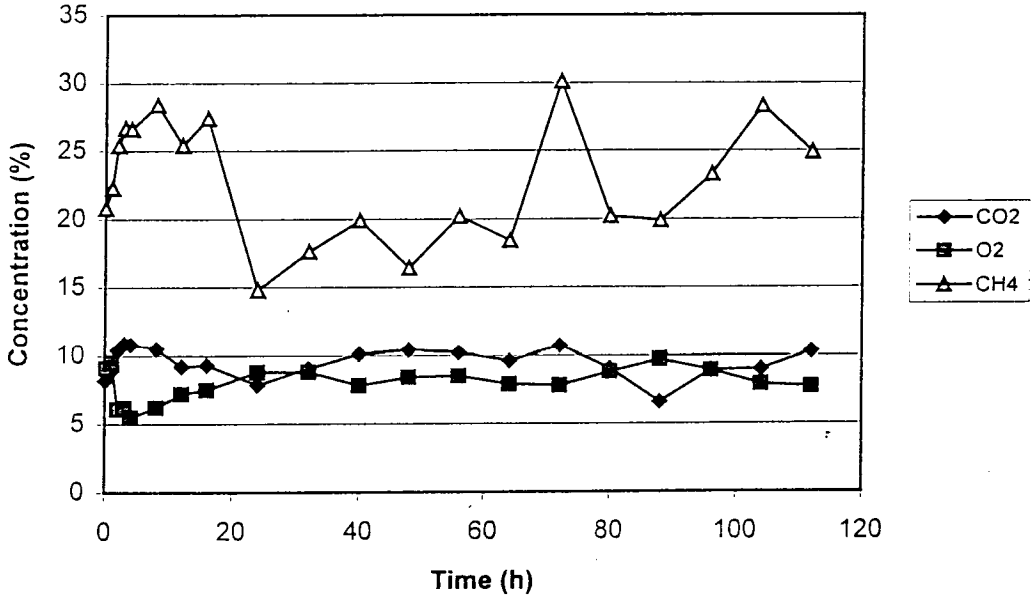


Maunsell	TITLE: Concentration of VOC, CO_2, O_2 & CH_4 at Blower Outlet vs Time (Long-term Combined SVE/AS Test at VT3)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD			
		PROJECT NO	C418	FIGURE NO.	Figure 4.48
		DESIGNED/ CHECKED	EL	DATE	Jan 1999

VOC at Blower Outlet *vs* Time (Long Term Combined SVE/AS at VT4, extracted air flow rate = 30 to 80 cfm, AS well flow rate = 8 cfm)



CO2, O2 & CH4 at Blower Outlet *vs* Time (Long Term Combined SVE/AS at VT4, extracted air flow rate = 30 to 80 cfm, AS well flow rate = 8 cfm)



Maunsell	TITLE: Concentration of VOC, CO_2, O_2 & CH_4 at Blower Outlet vs Time (Long-term Combined SVE/AS Test at VT4)	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
		PROJECT NO: C418	FIGURE NO: Figure 4.49	
		DESIGNED/ CHECKED:	DATE: Dec 1998	