NCR vol. 2
McEachern-1

FUEL EXPLORATION N.L.

PEP 119

OTWAY BASIN

VICTORIA

McEACHERN No.1

WELL COMPLETION REPORT

VOLUME II

(W1017)

V.AKBARI

JULY, 1990

McEACHERN No.1
WELL COMPLETION REPORT
VOLUME II

1. DETAILS OF DRILLING PLANT

APPENDIX 1

Details of Drilling Plant

RIG #2

SUPERIOR MODEL 700E SCR
CAPACITY 11,000FT, 3,350M NOMINAL

DRAWWORKS

ONE SUPERIOR MODEL 700E SCR ELECTRIC DRIVEN DRAWWORKS COMPLETE WITH AUXILIARY BRAKE AND SANDREEL. MAXIMUM INPUT H.P. 1000. DRIVEN BY EMD MOTOR.

ONE FOSTER MODEL 37 MAKE-UP SPINNING CATHEAD. MOUNTED ON DRILLERS SIDE.

ONE FOSTER MODEL 24 BREAK-OUT CATHEAD. MOUNTED OFF DRILLERS SIDE.

TRANSMISSION - 2 SPEED TRANSMISSION WITH HIGH CHAIN 1 1/4" TRIPLE 26T TO 24T. TWIN DISC PO218 AIR CLUTCH. LOW CHAIN 1 1/4" TRIPLE 20T TO 39T TWIN DISC PO218 AIR CLUTCH.

ENGINES

FOUR CATERPILLAR MODEL 3412 PCTA DIESEL ENGINES.

MAST

FLOOR MOUNTED CANTILEVER MAST DRECO - MODEL NO: M12713-510 DESIGNED IN ACCORDANCE WITH A.P.I. SPECIFICATION 4E 'DRILLING AND WELL SERVICING STRUCTURES'.

CLEAR WORKING HEIGHT - 127'
BASE WIDTH - 13' 6"
HOOK LOAD
GROSS NOMINAL CAPACITY - 510,000 LBS
HOOK LOAD CAPACITY WITH:

10 LINES STRUNG	*410,000 LBS*
8 LINES STRUNG	*365,000 LBS*
6 LINES STRUNG	*340,000 LBS*
4 LINES STRUNG	*306,000 LBS*

MAXIMUM WIND LOAD 100 MPH - NO SETBACK
MAXIMUM WIND LOAD 84 MPH - RATED SETBACK

ADJUSTABLE RACKING BOARD WITH CAPACITY FOR 108 STANDS OF 4 1/2" DRILL PIPE, 10 STANDS OF 6 1/2" DRILL COLLARS, 3 STANDS OF 8" DRILL COLLARS DESIGNED TO WITHSTAND AN A.P.I. WINDLOAD OF 84 MPH WITH PIPE RACKED.

CRONN BLOCK

215 TON WITH FIVE 36" SHEAVES, AND ONE 36" FASTLINE SHEAVE GROOVED 1 1/8".

SUBSTRUCTURE

ONE PIECE SUBSTRUCTURE. 14' H X 13' 6" W X 50' L W/ 12' BOP CLEARANCE.
SET-BACK - 200,000 LBS - CASING = 210,000 LBS.

RIG LIGHTING

EXPLOSION PROOF FLUORESCENT.

TRAVELLING BLOCK

ONE 667 CROSBY MCKISSICK 250 TONE COMBINATION BLOCK HOOK WEB WILSON 250 TON HYDRA - HOOK UNIT 5 - 36" SHEAVES.

KELLY DRIVE

ONE 20 HDP VARCO KELLY DRIVE BUSHING.

KELLY

ONE SQUARE KELLY DRIVE 4 1/4" X 40' COMPLETE WITH SCABBARD.

SWIVEL

ONE OILWELL PC-300 TON SWIVEL.

ROTARY TABLE

ONE OILWELL A 20 1/2" ROTARY TABLE TORQUE TUBE DRIVEN FROM DRAWWORKS.

AIR COMPRESSORS & RECEIVERS

TWO LEROI DRESSER MODEL 660A AIR COMPRESSOR PACKAGES C/W 10 H.P. MOTORS RATED AT 600 VOLT 60 HZ 3 PHASE. RECEIVERS EACH 120 GALLON CAPACITY AND FITTED WITH RELIEF VALVES.

INSTRUMENTATION

ONE (1) 6 PEN DRILL SENTRY RECORDER TO RECORD:
WEIGHT (D) 1-MARTIN DECKER SEALTITE
1-CAMERON DEADLINE TYPE
PENETRATION (FEET)
PUMP PRESSURE (0 - 6000 P.S.I.)
ELECTRIC ROTARY TORQUE
ROTARY SPEED (R.P.M.)
PUMP S.P.M. (WITH SELECTOR SWITCH)

INSTRUMENTATION (Cont)

ONE (1) DRILLERS CONSOLE INCLUDING THE FOLLOWING EQUIPMENT:

MARTIN DECKER WEIGHT INDICATOR TYPE 'D' ELECTRIC ROTARY TORQUE GAUGE.
PIT SCAN.
S.P.M. GAUGE (2 PER CONSOLE).
ROTARY R.P.M. GAUGE.
ONE SET OF 'DOUBLE SHOT'
DEVIATION INSTRUMENT 'TOTCO'.
ONE SET OF MUD TESTING LABORATORY STANDARD KIT (BAROID).

DRILLING LINE

5000' OF 1 1/8" - TIGER BRAND.

MUD PUMPS

TWO GARDNER DENVER MUD PUMPS MODEL NO: PZHVE 750 EACH DRIVEN BY 800 HP EMD MOTOR.

GENERATOR

FOUR BROWN BOVERI 600 VOLT 3 PHASE 60 HZ AC GENERATORS. POWERED BY FOUR CAT 3412 PCTA DIESEL ENGINES.

B.O.P'S AND ACCUMULATOR

ONE HYDRIL 13 5/8" X 3000 P.S.I. SPHERICAL ANNULAR B.O.P.,STUDDED TOP AND FLANGED BOTTOM. HEIGHT 14"
ONE HYDRIL 13 5/8" X 5000 P.S.I. FLANGED DOUBLE GATE B.O.P.
ONE GALAXIE 13 5/8" X 5000 P.S.I. 3000 DOUBLE STUDDED ADAPTOR FLANGES COMPLETE WITH STUDS AND NUTS.
ONE CUP TESTER. GRAY C/W TEST CUPS FOR 9-5/8" AND 13-3/8"
ONE WAGNER MODEL 130 - 160 3 BND 160 GALLON ACCUMULATOR CONSISTING OF:

SIXTEEN 11 GALLON BLADDER TYPE BOTTLES.
ONE 20 H.P. ELECTRIC DRIVEN TRIPLEX PUMP 600 VOLT 60 HZ 3 PHASE MOTOR AND CONTROLS.
ONE WAGNER MODEL A - 60 AUXILIARY AIR PUMP 4.5 GALS/MINUTE.
ONE WAGNER MODEL UM2SCB5S MOUNTED HYDRAULIC CONTROL PANEL WITH FIVE (5) 1" STAINLESS STEEL FITTED SELECTOR VALVES AND TWO (2) STRIPPING CONTROLS AND PRESSURE REDUCING VALVES. THREE (3) 4" HYDRAULIC READOUT GAUGES:

- *ONE FOR ANNULAR PRESSURE*
- *ONE FOR ACCUMULATOR PRESSURE*
- *ONE FOR MANIFOLD PRESSURE*

ONE WAGNER MODEL GMSB - 5A 5 STATION REMOTE DRILLERS CONTROL WITH THREE PRESSURE READBACK GAUGES, INCREASE AND DECREASE CONTROL FOR ANNULAR PRESSURE.

SPOOLS

ONE SET FLANGED ADAPTOR SPOOLS TO MATE 13 5/8" LOT X 5000 P.S.I. A.P.I. B.O.P. FLANGE TO FOLLOWING WELLHEAD FLANGES:

12" X 900 SERIES, HEIGHT 14"
10" X 900 SERIES " "
8" X 900 SERIES " "
B.O.P. SPACER. FLANGE 12" 3000 R57 STUDDED X 6" 3000 R45 FLANGE, HEIGHT 16"
B.O.P. SPACER SPOOL (DRILLING SPOOL) 12" 5000 X 12" 5000 BX160, HEIGHT 14"

KELLY COCKS

ONE GRIFFITH LOWER KELLY COCK 6 1/2" O.D. WITH 4 1/2" X H CONNECTIONS.
ONE GRIFFITH UPPER KELLY COCK 7 3/4" WITH 6 5/8" A.P.I. CONNECTIONS.

DRILL PIPE
SAFETY VALVE

ONE GRIFFITH 6 1/2" INSIDE BLOWOUT PREVENTORS (4 1/2" X H)
ONE GRIFFITH 6 1/2" STABBING VALVE (4 1/2" X H)

CHOKE MANIFOLD

ONE MCEVOY CHOKE AND KILL MANIFOLD 3" - 5000 P.S.I.

MUD SYSTEM

ONE PILL TANK CAPACITY 25 BBLS.
TWO MIX TANKS CAPACITY 108 BBLS. (EACH)
ONE RESERVE TANK CAPACITY 120 BBLS.
ONE DESILT TANK CAPACITY 120 BBLS.
ONE DESAND TANK CAPACITY 120 BBLS.
ONE SHAKER TANK CAPACITY 130 BBLS.
ONE SAND TRAP CAPACITY 15 BBLS.

FUEL TANKS

ONE 140 BBLS.
ONE 6000 GALS - 30,000 LITRES.

WATER TANKS

ONE 400 BBLS

MIXING PUMPS

FIVE MISSION MAGNUM 5" X 6" X 14" CENTRIFUGAL PUMPS COMPLETE WITH 50 H.P. 600 VOLT HZ 3 PH EXPLOSION PROOF ELECTRIC MOTORS.

TRIP TANK PUMP

ONE MISSION MAGNUM 2" X 3" CENTRIFUGAL PUMP COMPLETE WITH 20 H.P. 600 VOLT 60 HZ 3 PH EXPLOSION PROOF MOTORS.

WATER TRANSFER PUMPS

THREE MISSION MAGNUM 2" X 3" CENTRIFUGAL PUMPS C/W 20 H.P. 600 VOLT 60 HZ 3 PH EXPLOSION PROOF MOTORS.

MUD AGITATORS

SIX GEOLOGRAPH/PIONEER 40 TD - 15" 'PITBULL' MUD AGITATORS WITH 15 H.P. 600 VOLT 60 HZ 3 PH ELECTRIC MOTORS.

SHALE SHAKER

ONE BRANDT - DUAL TANDEM SHALE SHAKER.

DESANDER

ONE PIONEER T8-6 'SANDMASTER' DESANDER.

DESILTER

ONE PIONEER T12-4 'SILTMASTER' DESILTER.

DRILL PIPE

10000 FT OF 4 1/2" GRADE 'E' 16.60 LBS/FT HARD BANDED DRILL PIPE 326 JOINTS.

DRILL COLLARS

1 - 6 1/2" OD DRILL COLLAR (SHORT) 15'
27 - 6 1/2" OD DRILL COLLARS.
3 ACTUAL 8" OD DRILL COLLARS.
9 ACTUAL JOINTS OF 4 1/2" HEVI-WATE DRILL PIPE.

TWO (2) BIT SUBS - 6-5/8" REG DBL BOX
TWO (2) BIT SUBS - 4-1/2" REG X 4-1/2" XH DBL BOX
ONE (1) XO SUB - 7-5/8" REG X 6-5/8" REG DBL BOX
ONE (1) XO SUB - 4-1/2" XH BOX X 4-1/2" IF PIN
ONE (1) XO SUB - 4-1/2" REG X 4-1/2" XH DBL PIN
TWO (2) XO SUB - 6-5/8" REG PIN X 4-1/2" XH BOX
ONE (1) JUNK SUB - 6-5/8" REG PIN X 6-5/8" REG BOX
ONE (1) JUNK SUB - 4-1/2" REG BOX X 4-1/2" REG PIN
ONE (1) JUNK SUB - 4-1/2" REG BOX X 4-1/2" XH BOX
TWO (2) KELLY SAVER SUB S/W RUBBER 4-1/2" XH PXB
TWO (2) CIRCULAR SUBS - 4-1/2" XH X 1502 HAMMR UNION
TWO (2) 12-1/4" EZI CHANGE S/STAB 6-5/8 REG PXB
TWO (2) 8-1/2" INTEGRAL BLADE STABILIZERS 4-1/2" XH PXB

ELEVATORS

ONE (1) 4-1/2" BJ 250 TON 18 DEGREE TAPER D/P ELEVATORS
ONE (1) 2-7/8" IUS 100 TON TUBING ELEVATORS
ONE (1) 2-7/8" EUI 100 TON TUBING ELEVATORS
ONE (1) 13-3/8" BAASH ROSS 150 TON S/DOOR ELEVATORS
ONE (1) 13-3/8" S/JOINT P.U. ELEVATORS
ONE (1) 9-5/8" WEBB WILSON 150 TON S/DOOR ELEVATORS
ONE (1) 9-5/8" S/JOINT P.U. ELEVATORS
ONE (1) 7" BJ 200 TON S/DOOR ELEVATORS
ONE (1) 7" S/JOINT P.U. ELEVATORS
ALL P.U. ELEVATORS C/W SLINGS & SWIVEL

ONE (1) 8" WEBB WILSON 150 TON S/DOOR ELEVATORS D/C
ONE (1) 5-3/4" WEBB WILSON 150 TON S/DOOR ELEVATORS D/C
ABOVE C/W LIFT NUBBING AND BAILS

ROTARY SLIPS D/P TUBING

TWO (2) 4-1/2" VARCO SDML D/P SLIPS
ONE (1) 3-1/2" VARCO SDML TUBING SLIPS
TWO (2) 8" - 6-1/2" DCS-R DRILL COLLAR SLLIPS

ROTARY TONGS

ONE (1) BJ TYPE 'B' C/W LATCH & LUG JAWS 13-3/8" - 3-1/2"

CASING SLIPS

THREE (3) 13-3/8" - 9-5/8" - 7" VARCO CSML CASING SLIPS

BIT BREAKERS

FOUR (4) 17-1/2" - 12-1/4" - 8-1/2" - 6"

FISHING TOOLS

ONE (1) 8-1/8" BOWEN SERIES 150 F.S. O/SHOT
ONE (1) 10-5/8" BOWEN SERIES 150 F.S. O/SHOT
C/W GRAPPLES & PACKOFFS TO FISH CONTRACTORS DOWN HOLE EQUIPMENT.
ONE (1) 8 O.D. FISHING MAGNET 4-1/2" REG PIN
ONE (1) REVERSE CIRC JUNK BASKET 4-1/2" XH BOX
ONE (1) JUNK BASKET MILL TYPE C/W MILL SHOE 4-1/2" REG PIN
ONE (1) JARS 6-1/2" O.D. GRIFFITHS FISHING 4-1/2" XH PXB
ONE (1) JAR ACCELERATOR GRIFFITHS FISHING 6-1/2" O.D. 4-1/2" XH PXB
ONE (1) BUMPER SUB 6-1/2" O.D. FISHING 4-1/2" XH PXB
ONE (1) 12" JUNK MILL - 6-5/8" REG PIN
ONE (1) 8" JUNK MILL 4-1/2" REG PIN

ROTARY REAMERS

ONE (1) 6-1/2" O.D. DRILCO N.B. ROLLER REAMER C/W TYPE K CUTTERS 8-1/2" HOLE

PUP JOINTS

THREE (3) 5' - 10; - 15; 4-1/2" O.D. GRADE 'G' PUP JOINTS

AUGER

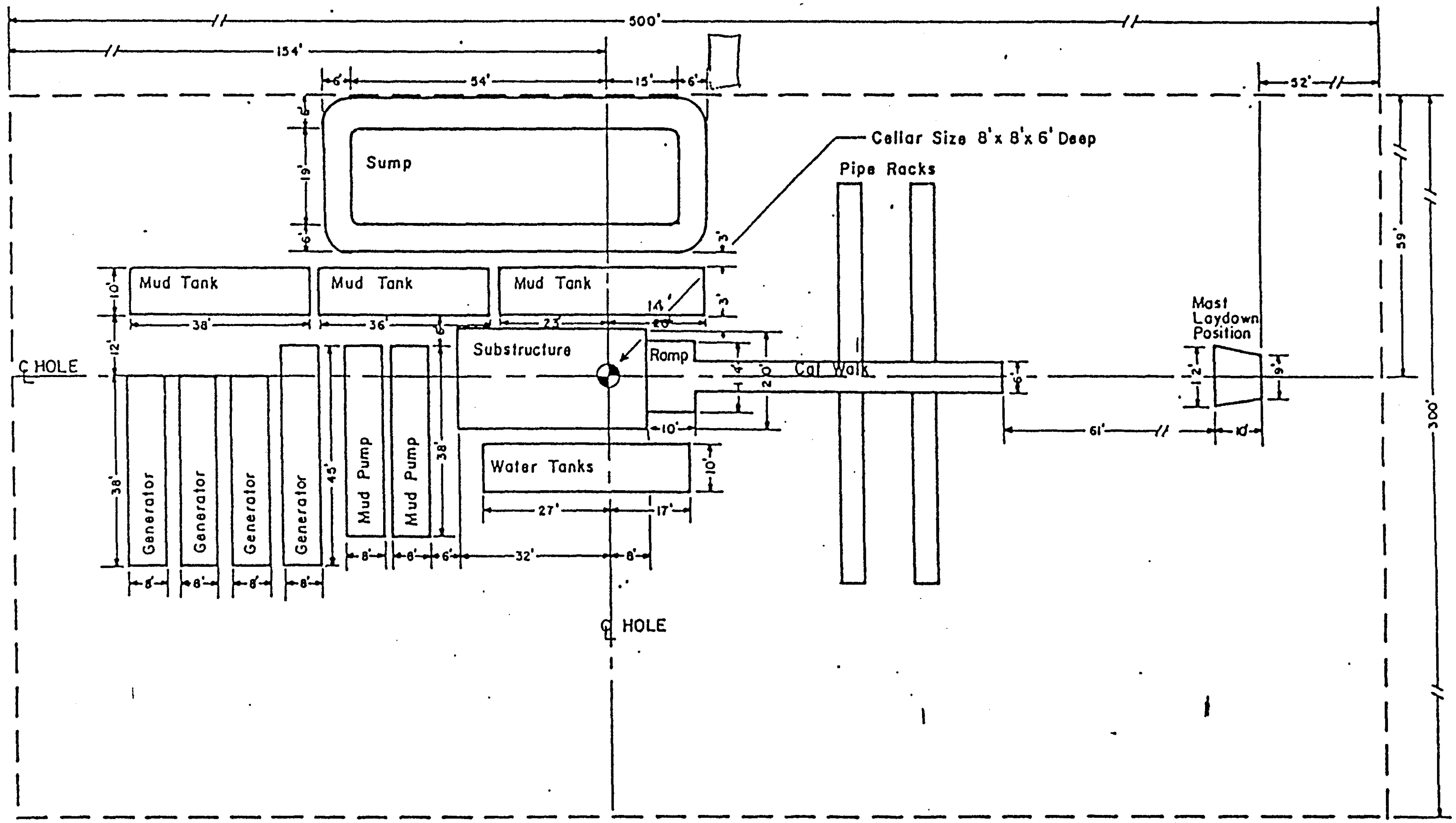
ONE (1) 27-1/2" AUGER 4-1/2" XH BOX

RATHOLE DIGGER

ONE (1) FABRICATED ROTARY TABLE CHAIN DRIVEN

POWER TONG

ONE (1) FARR 13-5/8" - 5-1/2" HYDRAULIC POWER TONS
C/W HYD. POWER PACK & HOSES & TORQUE GUAGE ASSY



Scale: 1" = 30'

Location Size: 300' x 500'

Drilling Services
Rig No. 2

GEARHAR DRILLING SERVICE

2. SUMMARY OF WELLSITE OPERATION

APPENDIX 2

The McEachern No.1 drill site was prepared by Mt. Gambier Earth Movers Pty. Ltd.

Prior to rig arrival, a 16-in conductor pipe had been installed and cemented.

The G.D.S.A Rig No. 2 was rigged up and McEachern No.1 was spudded on 1000 HRS 19th December, 1989.

Drilling 12 $^{1}/_{4}$-in hole continued to 357m where the 9 $^{5}/_{8}$-in casing was run and cemented with float at 342m and shoe at 354m.

The B.O.P.'s, choke manifold, and flareline were installed and the B.O.P.'s were successfully tested to the following pressures.

Blind Rams	1200 PSI
Pipe Rams & Manifold	1500 "
Hydrill	500 "

The float, cement, and shoe were drilled out and after drilling 5 metres of new hole, a formation integrity test was established having 8.7 lb/gal mud in the hole. The formation held 140 PSI.

Drilling 8 $^{1}/_{2}$-in hole continued uneventfully to 1370m with a bit change at 934m.

At the depth of 1370m, a total of 79.5 hours were lost waiting on repairs to the Silicon Control Rectifier (S.C.R.).

The 8 $^{1}/_{2}$-in hole was deepened to 1456 meter at which depth drill stem test No.1 was carried out over the interval 1445 to 1456 metres using open hole straddle packers set at 1443.2m, 1445.7m.

Drilling continued with new bit to total depth with bit changes at 1683 and 2138 metres.

The total depth of 2384m was reached at 0630 HRS 8th January, 1990.

The following logs were then run by Gearhart Australia

DLL/MSF/GR
LSS/GR/TAC
FDC/GR
FED/GR
SWC
Velocity Survey

Cement plugs were then set over the interval 2060 - 2010m, 1410 - 1360m, 360-310m.

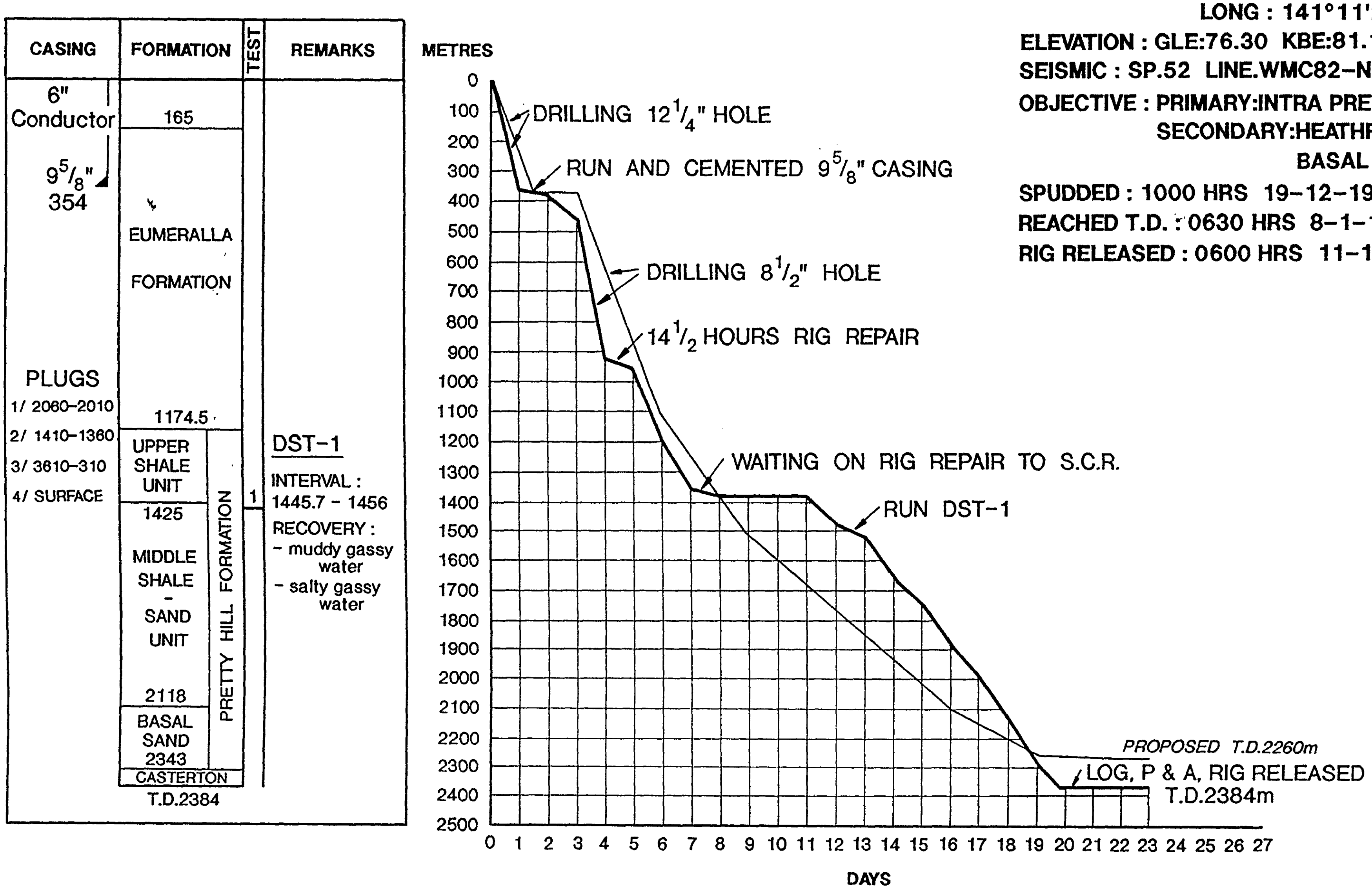
The last plug was successfully tested to 10,000 lbs. prior to settling surface plug and abandonment of the well.

The rig was released at 0900 HRS, 11th January, 1990.

GAS AND FUEL EXPLORATION N.L.

McEACHERN No.1

CO-ORDINATES LAT : 37°33'51.2"
LONG : 141°11'25.5"
ELEVATION : GLE:76.30 KBE:81.13
SEISMIC : SP.52 LINE.WMC82-N
OBJECTIVE : PRIMARY:INTRA PRETTY HILL SAND
SECONDARY:HEATHFIELD SAND
BASAL PRETTY HILL
SPUDDED : 1000 HRS 19-12-1989
REACHED T.D. : 0630 HRS 8-1-1990
RIG RELEASED : 0600 HRS 11-1-1990



3. DRILLING FLUID RECAP.

3. DRILLING FLUID RECAP

GAS AND FUEL EXPLORATION

DRILLING FLUID RECAP

McEACHERN NO. 1

Prepared By : M Olenjniczak

Dated : December 1989

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APPENDICES

WELL SUMMARY

Operator	:	Gas and Fuel Exploration
Well Number	:	McEachern No 1
Location	:	P.E.P 119 Vic
Contractor	:	GearHart Drilling
Rig	:	2
Rig on Location	:	18th December 1989
Spud Date	:	19th December 1989
RKB Elevation	:	4.8 m
Total Depth	:	2384 m
Date Reached TD	:	10th January 1990 (Plug & Abandon)
Total Days Drilling	:	23 days
Rig off Location	:	11th January 1990 (Rig Release)
Total Days on Well	:	25 days

Drilling Fluid Type	Interval	Hole Size	Cost
F.W Gel - Native Clay	9m - 357m	12¼	$ 2,012.16
KCl Polymer	357m -2384m	8½	$ 23,175.81

MUD MATERIALS CHARGED TO DRILLING	$ 25,187.97
Engineer on Location from 19-12-89 to 10-01-90 Mud Engineering : 23 days @ $410.00/day	$ 9,430.00
TOTAL DRILLING COST MATERIALS & ENGINEERING SERVICE	$ 34,617.97
Mud Materials not charged to Drilling	$ -
Engineering not charged to Drilling	$ -

Casing Program	:	$9^5/8$" @ 354 m
Drilling Supervisors	:	C McKay
Baroid Mud Engineers	:	M Olejniczak

GAS AND FUEL EXPLORATION
McEACHERN NO. 1

INTRODUCTION

McEachern No 1 was drilled using Gearhart Rig 2 over 23 days from spud in on 19th December, 1989 until plug and abandonment on 10th January 1990.

This was very close to the projected dry hole time of 24 days, but actual drilling operations were under projection as more than four days of rig time was lost due to an S.C.R breakdown.

There were no serious drilling or mud problems and hole conditions appeared to be good through out. A drill stem test was successfully run at 1456 m without problems. The TD of 2384 m was reached on 8th January, and Gearhart wireline logs were then run over 1½ days without significant hole problems.

The final total mud cost of $25,187.00 was only slightly above the programmed mud cost of $22,894, with the excess being almost solely due to Barite and additional KCl cost.

GAS AND FUEL EXPLORATION
McEACHERN NO. 1

DISCUSSION BY INTERVAL

12¼" HOLE Surface - 357 m

When the Mud Engineer arrived on site at 0300 hrs on 19th December 1989, the kelly rathole and mousehole were just being drilled out with water and the main tanks still only had water in them.

After mixing 140 bbl of Pre-hydrated Bentonite actual spud in took place at 10.00 hrs using the active mud tanks only, by passing the desander and desilter. Began drilling very loose sands with no significant clay content from the bottom of the 16" conductor which had been set at 9.0 m. As it was expected to encounter the top of the Eumeralla Claystones and Siltstones from about 50 1 it was hoped that the initial amount of Pre-hydrated Bentonite mixed would be enough to get through the sands, then dilution with water and additions of lime would suffice until $9^{5}/8$" casing point.

The pump rate was kept to 300 gpm till 40 m and then increased to 550 gpm, but as soon as this was done the conductor began to shake badly and appeared to sink a couple of inches. The pump rate was cut back to 300 gpm at 50 m as conductor washout appeared imminent. Drilling continued through loose sands and gravels with the mud viscosity being maintained at about 45 seconds with lime and caustic. Hole cleaning was not a problem with the yield point at 28 to 30 lb/100 ft^2. However the sand content of the mud increased to over 1% so the pit volume was slowly increased so that the desander and desilter could be run.

At 94 m while still apparently drilling loose sands, the conductor sagged badly and washed out so drilling stopped. After unsuccessfully attempting to seal the conductor by dripping sacks of Barite around it, an 80 sx cement plug was set immediately beneath the conductor shoe.

DISCUSSION BY INTERVAL

12¼" HOLE Surface - 357 (Cont)

After waiting on cement for three hours drilling resumed, without encountering any cement, but the conductor held. The top of the Eumeralla Formation was encountered at 151 m, with the mud being maintained at 40 to 45 seconds viscosity and 8.9 to 9.0 ppg, with water and lime additions only, until casing point was reached at 357 m.

After circulating the hole clean for ½ hour, a wiper trip was run to surface. Had to pump through a bridge at 35 m while running back in, and also washed 4 m back to bottom. Circulated the hole clean for another ½ hour using Lime to raise viscosity to 55 seconds with a lot of sand and clay being returned at the shakers until bottoms up.

The $9^5/8$" casing was then run in, washing down the last 7 m to bottom, and cemented with a 2½% gel lead slurry and neat tail slurry. Only a contaminated mud-cement mixture was returned at surface during the displacement, indicating that proper cement had reached close to surface. The upper part of the hole, in the loose sands must have been significantly washed out.

Instead of doing a top up cement job, the casing and conductor were later packed with loose gravel.

DISCUSSION BY INTERVAL

8½" HOLE - 357 m - 2384 m

While waiting on cement and nippling up the BOP stack the surface pits were dumped retaining only about 150 bbl of the mud from the 12¼" hole. This was diluted with an equal volume of water, so that as the float collar, cement and casing shoe were drilled out the contaminating effect of the cement gave a viscosity of about 33 - 34 seconds with a yield point of 15 lb/100 ft^2, providing good hole cleaning.

At 359 m, after drilling 2 m of new hole a formation leak off test was run giving an 11.0 ppg equivalent Drilling then continued quite rapidly through consistent silty claystone of the Eumeralla Formation, maintaining a 1 to 1½% KCl content in the mud and treating lightly with EZ Mud D.P. Polyacrylamide, Pre-Hydrated in fresh water. This produced a flocculated mud of the following properties:-

Mud Weight	:	8.7 ppg
Viscosity	:	34 seconds
Yield	:	15 lb/100ft^2
Filtrate	:	No Control
Chlorides	:	8 - 10,000 pg/l

This system was maintained down to 700 m, with very little solids build up, very little dilution, and very good cuttings returns at the shakers. The main purpose of running EZ Mud DP in a light KCl concentration for this short interval was to demonstrate that this could be an effective low cost method of drilling thicker sections of Eumeralla Formation in future wells where filtration control is not required.

DISCUSSION BY INTERVAL

8½" HOLE - 357 m - 2384 m (Cont)

As the first potential target, the Heathfield Sandstone, was expected at about 830 m, the mud system was gradually converted to a PAC-R, Dextrid based KCl Polymer mud of 3½ to 4% KCl, by additions of premix. It should be noted that the KCl was mixed directly into the mud system so the KCl percentage was raised rapidly, as the use of bulk bags of 1000 kg made mixing of the KCl very much easier. By the time 825 m had been reached the KCl content was at 3½% and the A.P.I Filtrate was at 5.8 ccs. The Heathfield Sandstone was not present in this well and control drilling of the Eumeralla Formation with the weight on bit limited to 5,000 lb continued.

At 934 m it was decided to trip for a bit change and to pick up a stabiliser, as the rig had begun having power supply problems with its S.C.R. There were no problems pulling out of the hole, but after running into the shoe while working on the S.C.R, tight spots had to be reamed from 386 m back to bottom over 9 hrs, in order to get the newly stabilised drilling assembly in, the hole.

Drilling continued with small amounts of Pre-hydrated Aquagel added to maintain the mud M.B.T level around 10 ppb as the Eumeralla Formation appeared to be predominantly silty. However after about 1195 m the formation appeared to change character with soft clay cuttings being returned at the shaker, increasing mud viscosity and sticky connections were experienced. The dilution rate was increased with some Q-Broxin added to give additional viscosity control. This formation change was later interpreted as the top of the Pretty Hill shale sequence. A ten stand wiper trip was run at 1239 m, without problems, to check the hole condition. Meanwhile the mud weight had also risen rapidly up to 9.4 ppg at which level it was controlled for the rest of the well.

DISCUSSION BY INTERVAL

8½" HOLE - 357 m - 2384 m (Cont)

At 1370, while tripping for a bit change, power from the S.C.R was lost at 924 m. After effecting a temporary repair managed to pull out under reduced power, change the bit and run back in to the casing shoe. The S.C.R unit was then repaired during the next four days, with the mud in the casing being circulated 1 hour each 12 hours.

After completing the repair ran back in the hole, but had to ream tight hole from 1275 m back to bottom at 1370 m over 5½ hrs, with the hole packing off on two occasions with partial mud loss of about 30 bbl. Quite a lot of larger, hard block shale cuttings were returned at the shakers which persisted as drilling continued. At 1454 m, after drilling into the top of the pretty hill sandstone, circulated out a drilling break, then drilled to 1456 m, circulated out again and it was decided to run a D.S.T. A 10 stand wiper trip was run as a precaution without problems, but with 3 m of fill. The hole was then circulated out for another hour with more large shale cuttings at the shakers till the hole cleaned up.

The drill stem test was then successfully run over the interval from 1456 m to 1445 m with water recovered. There were no problems running or retrieving the test string. Drilling then continued steadily through the sandstone/shale sequence of the Pretty Hill formation with mud properties steadily maintained with premix additions. Typical mud properties were:

Mud Weight	:	9.3 - 9.4 ppg
Viscosity	:	39 - 44 seconds
Yield Point	:	12 - 16 lb/100 ft^2
API Filtrate	:	6.2 - 7.0 ccs
Chlorides	:	18,500 - 20,000 mg/l
% KCl	:	3½ - 4%

DISCUSSION BY INTERVAL

8½" HOLE - 357 m - 2384 m (Cont)

The API water loss was maintained relatively low without very much difficulty, mainly due to the lack of dispersive Native Clays in the formation, with small regular additions of Pre-hydrated Aquagel made to maintain the M.B.T content at 10 - 12 ppb. This was done to provide a better sealing quality to the downhole filter cake particularly with the long section of sandstones being drilled.

The drilling rate slowed down markedly, but all significant drilling breaks were circulated out to check for hydrocarbon shows. Trips for bit changes were run at 1683 m and 2138 m with srurral 10 stand wiper trips in between all without significant problems other than very minor reaming. In the lower section of the Pretty Hill formation, the drilling rate increased markedly through a massive relatively clean sandstone section, before slowing dramatically to 3 - 4m/hr from 2344 m. As it appeared that the Casterton Formation Siltstone had been reached TD was decided upon at 2384 m.

After running a 10 stand wiper trip and circulating the hole clean for 1½ hrs Gearhart wiring logs were run during the next 1½ days, with the only problem being ledges between 1175 m and 1275 m being slightly difficult to pass.

The Caliper Log showed a hole of generally good condition with one notable section of bad hole from 1175 to 1275 m varying from gauge to 14", in the Pretty Hill shale section. This was the section which was sticky during drilling, and required a lot of reaming after the rig S.C.R repair. The pretty hill formation sandstone sections were all generally gauge to ¼" to ½" underguage indicating significant filter cake build up.

DISCUSSION BY INTERVAL

8½" HOLE - 357 m - 2384 m (Cont)

With porosities indicated at 15% from logs, and a steady 1 bbl/hr mud loss downhole during logging this is not surprising, especially as some of the sands were quite coarse. The main point is that the filter cake build up did not create any logging problems or any signs of dirrerential sticking. The Eumeralla Formation averaged 8½ to 10½" even including the upper section which drilled very rapidly, which can also be considered as quite good.

After completing logging the well was plugged and abandoned on 10th January 1990.

GAS AND FUEL EXPLORATION
McEACHERN NO. 1

CONCLUSIONS & RECOMMENDATION

1. Kelly rathole and mousehole, should be drilled with mud not water in areas with sandy surfaces to avoid potential erosion around surface conductor pipes.

2. Circulation rates in loose surface sands should be minimised until at least the sands have been totally drilled through, with mud viscosity maintained higher if required to avoid conductor washout.

3. The use of a low percentage KCl Polyacrylamide mud (EZ Mud D.P) to drill the Eumeralla Formation appears to have been successfully demonstrated, with low solids build up, good cuttings and good hole gauge all obtained at low cost.

4. The only badly washed section of the hole corresponded to the sticky section of the Pretty Hill shale, between 1175 m and 1275 m, which required a lot of reaming after being out of the hole for 4 days during the S.C.R repair. An increased KCl percentage might help, but there is no clear evidence for this, although the section appeared to stabilise with time.

5. Overall the KCl -Gel-Polymer Mud of 3½ - 4% KCl preformed quite adequately with the bulk of the hole being in good gauge. Note that the reasonably low pumping hydraulics of 250 gpm combined with moderate nozzle sizes would also have played a large part in limiting hole washout.

6. The significant filter cake build up indicated by the caliper log in the lower parts of the pretty hill formation, corresponded with high porosities and coarse grain sized sands with inferred high permiabilities. In this situation it is better to run a KCl Polymer Mud with added Pre-hydrated Aquagel, to improve the sealing and lubricity of the filter cake, and as a direct result reduce filtrate invasion.

CONCLUSIONS & RECOMMENDATIONS

7. During the latter half of the well a sweet smell of fermenting Polymer Mud was evident around the rig. The mud PH was run higher to help reduce any possible fermentation, and no signs of mud deterioration were detected, suggesting it was purely mud on the ground and in the sump that was fermenting. Even after completing logging and circulating bottoms up prior to setting cement plugs, the bottoms up mud came back in very good condition. Still it would be a good idea to have some bactericide available for a longer duration well.

NL Baroid Australia PTY. LTD./NL INDUSTRIES INC.

MATERIAL RECAP

COMPANY GAS AND FUEL
WELL McEACHERN No1
LOCATION OTWAY BASIN
COST/DAY $1006.08
COST/M $ 5.78
COST/bbl $ 1.72
RECAPPED BY M.OLEJNICZAK
DATE 20/12/89

MUD TYPES FRESH WATER BENTONITE/ NATIVE CLAY FLOCULLATED WITH LIME

CONTRACTOR GEARHART DRILLING
DRILLING DAYS/PHASE 2
ROTATING HRS/PHASE 12½

HOLE SIZE 12¼"
INTERVAL TO 357 m
FROM 9 m
DRILLED 348 m

MUD CONSUMPTION FACTOR 3.3 bbl/m

MATERIAL	UNIT	UNIT COST	ACTUAL USED	TOTAL COST ACTUAL
AQUAGEL	100 lb	18.64	90	1677.60
CAUSTIC SODA	25 kg	27.93	5	139.65
LIME	25 kg	6.51	9	58.59
BARITE	50 kg	11.36	12	136.32

CHEMICAL VOLUME	bbl	20	
FRESH WATER	bbl	1150	
SEA WATER			
TOTAL MUD MADE	bbl	1170	
COST LESS BARYTES			A$1875.84
COST WITH BARYTES			A$2012.16
COMMENTS			

Baroid Australia PTY. LTD./NL INDUSTRIES INC.

MATERIAL RECAP

COMPANY GAS AND FUEL
WELL McEACHERN No1
LOCATION OTWAY BASIN
COST/DAY $1103.61
COST/M $ 11.43
COST/bbl $ 6.85
RECAPPED BY M.OLEJNICZAK
DATE 9/1/90

MUD TYPES 1½% KCL POLYACRYLAMIDE
CHANGING TO % KCL POLYMER FROM 700 m

CONTRACTOR GEARHART DRILLING
DRILLING DAYS/PHASE 21
ROTATING HRS/PHASE 222

HOLE SIZE 8½
INTERVAL TO 2384 m
FROM 357 m
DRILLED 2027m

MUD CONSUMPTION FACTOR 1.7 bbl/m

MATERIAL	UNIT	UNIT COST	ACTUAL USED	TOTAL COST ACTUAL
AQUAGEL	100 lb	18.64	100	1864.00
CAUSTIC SODA	25 kg	27.93	27	754.11
SODA ASH	25 kg	14.06	3	42.18
LIME	25 kg	6.51	1	6.51
BICARBONATE	40 kg	26.69	3	80.07
PAC-R	50 lb	97.18	70	6802.60
DEXTRID	50 lb	37.96	132	5010.72
EZ MUD DP	50 lb	150.00	2	300.00
Q BROXIN	50 lb	25.12	6	150.72
POTASSIUM CHLORIDE (BULK BAG)	1000 kg	306.07	22	6733.54
BARITE	50 kg	11.36	126	1431.36

CHEMICAL VOLUME	bbl	95	
FRESH WATER	bbl	3290	
SEA WATER			
TOTAL MUD MADE	bbl	3385	
COST LESS BARYTES			A$21,744.45
COST WITH BARYTES			A$23,175.81
COMMENTS			

Baroid Australia PTY. LTD./NL INDUSTRIES INC.

MATERIAL SUMMARY

COMPANY GAS AND FUEL
WELL McEACHERN No1
LOCATION OTWAY BASIN
COST/DAY $1095.13
COST/ M $ 10.60
COST/ bbl $ 5.53
RECAPPED BY M.OLEJNICZAK

MUD TYPE F.W. GEL/LIME SPUD MUD TO 357 m. 1½% KCL POLYACRYLAMIDE TO 700m. 4% KCL POLYMER TO TD
TOTAL ROTATING HRS 234½
TOTAL DAYS ON HOLE 23
TOTAL DEPTH 2384 m
MUD CONSUMPTION : WELL AVERAGE

HOLE SIZE	DRILLED	DRILLING DAYS
12¼	348	2
8½	2027	21
TOTAL	2375m	23 days

MATERIAL	UNIT	UNIT COST	ESTIMATED USED	KG/M³	ACTUAL USED	TOTAL COST ACTUAL
AQUAGEL	100 lb	18.64			190	3541.60
CAUSTIC SODA	25 kg	27.93			32	893.76
SODA ASH	25 kg	14.06			3	42.18
LIME	25 kg	6.51			10	65.10
BICARBONATE	40 kg	26.69			3	80.07
PAC-R	50 lb	97.18			70	6802.60
DEXTRID	50 lb	37.96			132	5010.72
EZ MUD DP	50 lb	150.00			2	300.00
Q-BROXIN	50 lb	25.12			6	150.72
POTASSIUM CHLORIDE (BULK BAG)	1000 kg	306.07			22	6733.54
BARITE	50 kg	11.36			138	1567.68

CHEMICAL VOLUME	bbl	115	
FRESH WATER	bbl	4440	
SEA WATER			
TOTAL MUD MADE	bbl	4555	
COST LESS BARYTES			A$23,620.29
COST WITH BARYTES			A$25,187.97
COMMENTS			

Baroid Australia PTY. LTD./NL INDUSTRIES INC.

DRILLING FLUID PROPERTY RECAP

COMPANY *GAS AND FUEL EXPLORATION* WELL *McEACHERN No. 1*

DATE 1989	DEPTH m	HOLE SIZE	TEMP °C	WEIGHT ppg	VIS SEC	PV	YP	GELS 10 sec	GELS 10 min	WATER LOSS API	CAKE 32nd	pH	Pf	Mf	Cl mg/l	Ca mg/l	SAND %	SOLIDS %	WATER %	OIL %	MBC kg/m³	REMARKS TREATMENT FORMATION
Dec																						
19	143	$12\frac{1}{4}$	-	9.0	45	7	28	15	18	20	4	11.5	1.6	1.7	1500	120	1.0	4	96	-	-	Spud in conductor washed out
20	357	$12\frac{1}{4}$	-	9.0	55	10	38	25	28	N.C	4	11.0	.6	.7	1200	180	0.1	4	96	-	-	Drill Run and CMT $9^5/8$ CSG
21	357	$8\frac{1}{2}$	-	8.7	29	4	4	3	4	N.C	4	12.0	1.1	1.2	800	190	TR	2	98	-	-	WOC nipple up. Run in
22	825	$8\frac{1}{2}$	-	9.1	40	14	12	2	4	5.8	1	9.0	.05	.06	17500	350	TR	$3\frac{1}{2}$	$96\frac{1}{2}$	-	6	Drill, change to KCl Polymer
23	934	$8\frac{1}{2}$	-	9.1	37	11	10	2	4	5.5	1	9.5	.08	.1	19000	200	TR	$3\frac{1}{2}$	$96\frac{1}{2}$	-	6	Drill, repair SCR
24	1088	$8\frac{1}{2}$	42	9.2+	40	12	12	2	8	6.4	2	9.5	.1	.12	20000	320	TR	$4\frac{1}{2}$	$95\frac{1}{2}$	-	11	Drill
25	1300	$8\frac{1}{2}$	42	9.4	41	12	13	3	8	7.0	2	9.5	.1	.12	21000	320	TR	5	95	-	13	Drill, wiper trip
26	1370	$8\frac{1}{2}$	42	9.3	40	11	10	2	4	5.0	1	9.5	.1	.12	20000	320	TR	5	95	-	13	Drill, POH, Repair to SCR
27	1370	$8\frac{1}{2}$	-	9.3	37	10	8	2	3	5.0	1	9.5	.1	.12	20000	300	TR	5	95	-	13	Wait on repair to SCR
28	1370	$8\frac{1}{2}$	-	9.3	37	10	8	2	3	5.0	1	9.5	.1	.12	2000	300	TR	5	95	-	13	Wait on Repair to SCR
29	1370	$8\frac{1}{2}$	-	9.3	37	10	8	2	3	5.0	1	9.5	.1	.12	19500	300	TR	5	95	-	13	" " "
30	1446	$8\frac{1}{2}$	44	9.3+	39	9	10	2	9	6.8	2	10.0	.1	.15	20500	180	TR	5	95	-	12	Ream back to bottom, Drill
31	1460	$8\frac{1}{2}$	43	9.4	42	11	13	6	14	7.2	2	9.5	.1	.15	20000	180	TR	5	95	-	11	Ran DST No 1
Jan																						
1	1602	$8\frac{1}{2}$	46	9.3	40	9	12	3	8	6.8	2	10.0	.15	.22	19000	220	TR	5	95	-	12	Drilling
2	1701	$8\frac{1}{2}$	48	9.3+	40	10	12	3	12	6.3	1	9.5	.1	.13	18500	100	TR	$5\frac{1}{2}$	$94\frac{1}{2}$	-	12	Drilling trip for bit change
3	1833	$8\frac{1}{2}$	48	9.4	39	11	11	3	7	6.2	1	10	.18	.22	18500	50	TR	$5\frac{1}{2}$	$94\frac{1}{2}$	-	11	Drilling
4	1943	$8\frac{1}{2}$	48	9.4	39	10	12	2	8	6.5	1	9.5	.12	.18	20000	40	TR	5	95	-	11	Drilling, wiper trip
5	2075	$8\frac{1}{2}$	52	9.4	44	13	16	5	18	6.8	1	10.5	.25	.3	18500	20	TR	$5\frac{1}{2}$	$94\frac{1}{2}$	-	11	Drilling, wiper trip
6	2217	$8\frac{1}{2}$	53	9.4	42	14	14	3	10	6.5	1	9.5	.12	.18	18000	40	0.1	5	95	-	9	Drill, trip for new bit
7	2374	$8\frac{1}{2}$	56	9.3+	42	13	14	3	10	6.7	1	10.2	.25	.35	20000	20	TR	$4\frac{1}{2}$	$95\frac{1}{2}$	-	10	Drilling
8	2384	$8\frac{1}{2}$	-	9.3+	42	13	14	3	10	6.7	1	10.2	.25	.35	20000	20	TR	$4\frac{1}{2}$	$95\frac{1}{2}$	-	10	TD Logging
9	2384	$8\frac{1}{2}$	-	9.3+	42	13	14	3	10	6.7	1	10.2	.25	.35	20000	20	TR	$4\frac{1}{2}$	$95\frac{1}{2}$	-	10	Logging P & A

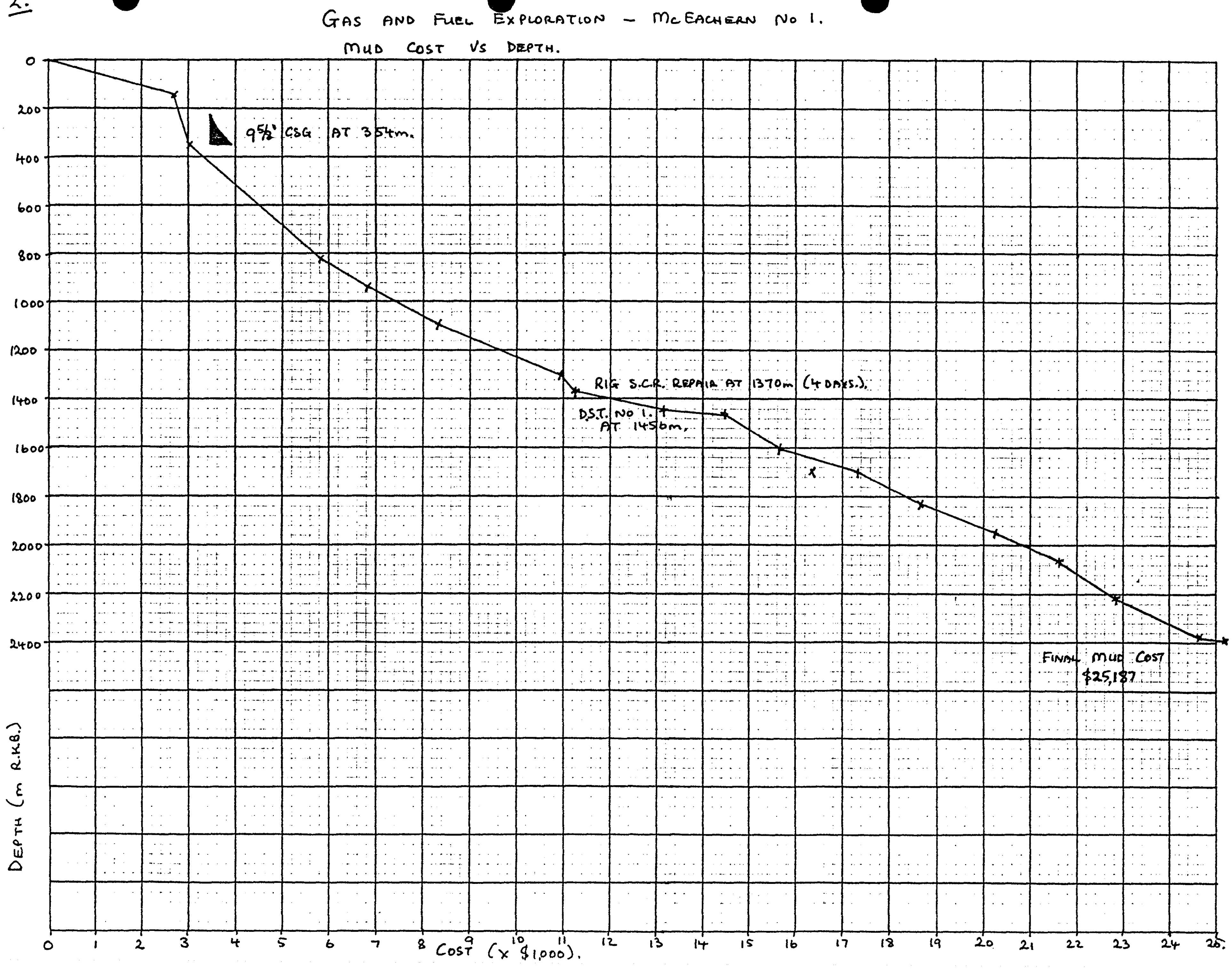
Baroid Australia PTY. LTD./NL INDUSTRIES INC.

BIT RECORD

McEACHERN NO. 1

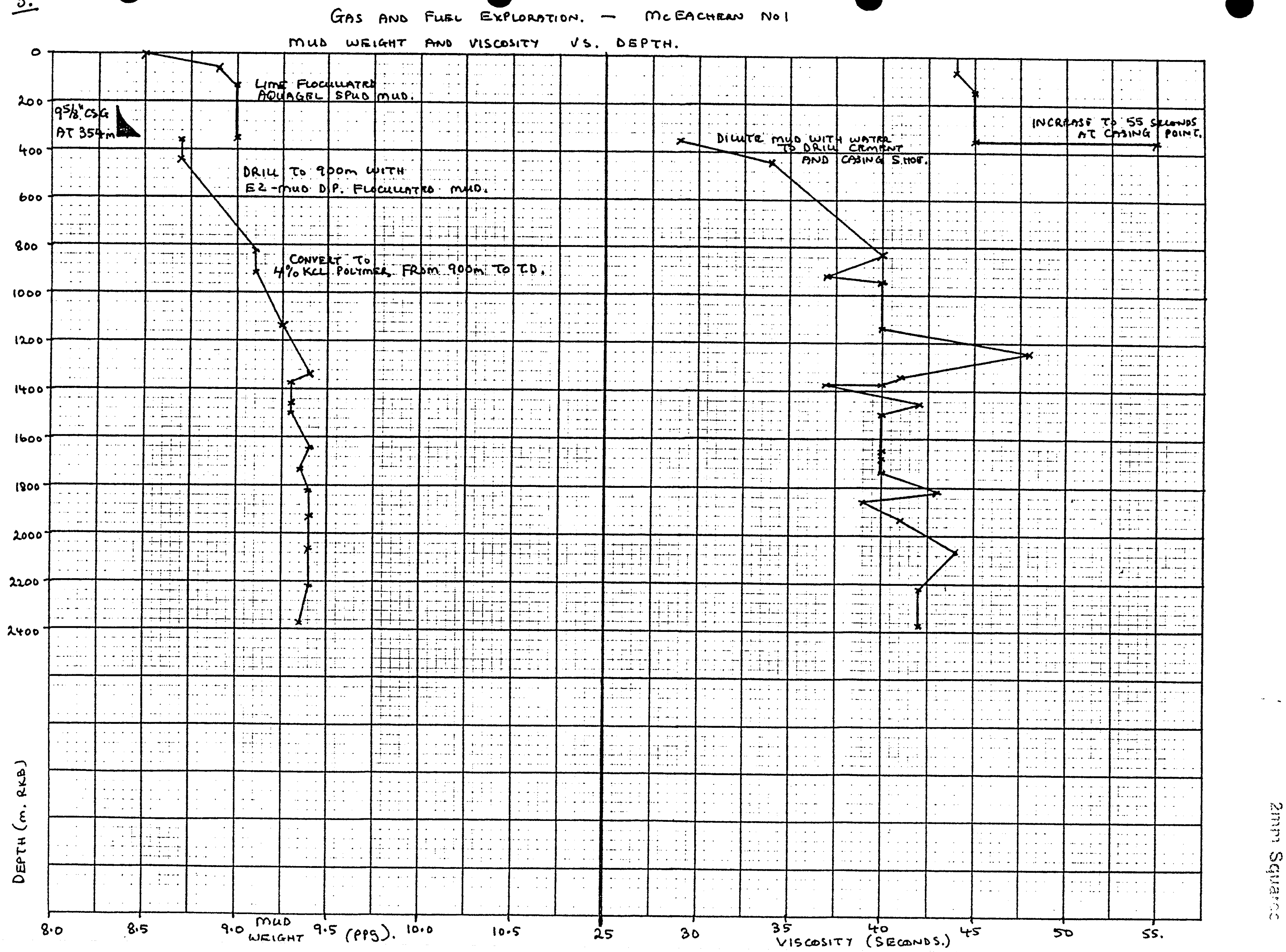
DATE 1989	No.	SIZE	MAKE	TYPE	JETS 32nd"	DEPTH OUT m	METRES DRILLED	HOURS	MTRS/ HR	ACCUM DRLG HOURS	BIT WEIGHT lb	RPM	VERT DEV'N	PUMP PRESSURE p.s.i.	PUMP RATE spm	WT ppg	MUD VIS sec	CONDITION T	CONDITION B	CONDITION G	FORMATION	REMARKS
Dec																						
20	1	$12\frac{1}{4}$	SEC	S335	15.15.18	357	352.2	$12\frac{1}{2}$	28.2	$12\frac{1}{2}$	10 - 20	140	$3/4^{\circ}$	800	180	9.0	45	2	4	0	Sand/Cyst	$9\frac{5}{8}$ CSG
23	2	$8\frac{1}{2}$	VAREL	L114	3x10	934	577	28	20.6	$40\frac{1}{2}$	5 - 10	120	1°	1100	90	9.1	37	4	1	$\frac{1}{4}$	Clyst	
26	3	$8\frac{1}{2}$	VAREL	L137	3x10	1370	436	38	11.5	$78\frac{1}{2}$	10 - 20	90	1°	1350	90	9.3	41	2	1	0	Clyst	
31	4	$8\frac{1}{2}$	VAREL	V437	11.11.10	1456	86	$14\frac{1}{2}$	5.9	93	20 - 25	90	1°	1150	90	9.3	40				Clyst/SST	Pull for test
Jan																						
2	5	$8\frac{1}{2}$	VAREL	V437	11.11.10	1683	227	34	6.7	127	20 - 30	70/90	2°	1100	90	9.3	40	3	4	$\frac{1}{4}$	SST/Clyst	
6	6	$8\frac{1}{2}$	HTC	J22	10.10.12	2138	455	$73\frac{1}{2}$	6.2	$200\frac{1}{2}$	20 - 30	60/80	3°	1150	90	9.4	42	2	4	1/8	SST/Clyst	
8	7	$8\frac{1}{2}$	VAREL	V517	11.11.10	2384	246	34	7.2	$234\frac{1}{2}$	20 - 35	60/80	$3\frac{3}{4}^{\circ}$	1150	90	9.3+	42	4	3	0	SST/SLST	TD

2.



GAS AND FUEL EXPLORATION - McEACHERN No 1.
MUD COST VS DEPTH.
9⅝" CSG AT 354m.
RIG S.C.R. REPAIR AT 1370m (4 DAYS.)
D.S.T. No 1. AT 1456m.
FINAL MUD COST $25,187
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
DEPTH (m R.K.B.)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
COST (x $1,000).

3.


GAS AND FUEL EXPLORATION. — McEACHERN No 1
MUD WEIGHT AND VISCOSITY VS. DEPTH.
LIME FLOCCULATED AQUAGEL SPUD MUD.
9 5/8" CSG AT 354m
DRILL TO 900m WITH EZ-MUD D.P. FLOCCULATED MUD.
CONVERT TO 4% KCL POLYMER FROM 900m TO T.D.
DILUTE MUD WITH WATER TO DRILL CEMENT AND CASING SHOE.
INCREASE TO 55 SECONDS AT CASING POINT.
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
DEPTH (m. RKB)
8.0
8.5
9.0
9.5
10.0
10.5
MUD WEIGHT (PPG).
25
30
35
40
45
50
55.
VISCOSITY (SECONDS.)
2mm Squares

GAS AND FUEL EXPLORATION. — McEACHEAN No 1.

PROGRESS VS DAYS

GAS AND FUEL EXPLORATION
McEACHERN NO. 1

APPENDIX - A

FORMATION TOPS	DEPTH
Post Otway Group	Surface
Eumeralla Formation	151
Top Pretty Hill Shale	1195
Top Pretty Hill Sandstone	1426.5
Casterton Formation	2344

GAS AND FUEL EXPLORATION
McEACHERN NO. 1

APPENDIX - B

8½" HOLE CALIPER (AVERAGED EVERY 25M)

DEPTH M	INCHES	DEPTH	INCHES	DEPTH	INCHES
375	10	1075	9 3/8	1775	8¼
400	9½	1100	9¼	1800	8¼
425	8 3/8	1125	10	1825	8 5/8
450	9½	1150	10 3/4	1850	83/8
475	9 3/8	1175	11	1875	8½
500	9¼	1200	11	1900	8½
525	9¼	1225	10½	1925	8 3/8
550	8 7/8	1250	11	1950	8 5/8
575	8 3/4	1275	10½	1975	8 3/8
600	8½	1300	9½	2000	8½
625	9 3/8	1325	9 3/4	2025	8 5/8
650	9½	1350	9 1/8	2050	8½
675	10¼	1375	9	2075	8½
700	9½	1400	9	2100	8½
725	9½	1425	9	2125	8 1/8
750	9 7/8	1450	9¼	2150	8
775	10	1475	8 3/8	2175	8
800	8½	1500	9	2200	8 1/8
825	8½	1525	9	2225	8 1/8
850	9 3/8	1550	8½	2250	8¼
875	9	1575	8½	2275	8 1/8
900	8 5/8	1600	8 1/8	2300	8¼
925	9¼	1625	8 3/8	2325	8¼
950	9 3/8	1650	8¼	2350	8¼
975	10½	1675	8 5/8	2375	8¼
1000	11	1700	8 3/8		
1025	10 3/4	1725	8 3/8		
1050	10	1750	8 3/8		

GAS AND FUEL EXPLORATION
McEACHERN NO. 1

APPENDIX - C

FINAL MUD INVENTORY FOR RETURN TO ADELAIDE - 9/1/90

Aquagel	100 lb	SX	130
Barite	50 kg	SX	262
Caustic Soda	25 kg	SX	8
Soda Ash	25 kg	SX	7
Bicarbonate	40 kg	SX	4
Q-Broxin	50 lb	SX	4
PAC-R	50 lb	SX	10
Dextrid	50 lb	SX	28
EZ Mud DP	50 lb	SX	2
Baradefoam	25 l	Can	2
Condet	200 l	Drum	1
Envirospot	200 l	Drum	2
Potassium Chloride (Ag)	1000 kg	Bag	1
Total tonnage	22.2 excluding palletising		

Returned to Adelaide by associated transport of Australia Truck, loaded as above on 9th January 1990.

4. SAMPLE DESCRIPTION

4. SAMPLE DESCRIPTION

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 19-12-89 GEOLOGIST: A. TABASSI PAGE: 1 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
		McEACHERN NO. 1 PEP 119 OTWAY BASIN - VICTORIA SPUDDED @ 10.00 HOURS TUESDAY, 19TH DECEMBER, 1989 RIG: GDSA RIG 2 K.B. =							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 19-12-89 GEOLOGIST: A. TABASSI PAGE: 2 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
00- 10	-	No Sample							
10- 20	90	Limestone off white to lt yel brown, loose, fri in part, med to VC, dom C to VC, extremely fossiliferous, bryozoa, forams, crinoids and other shell frag, sub-rnd to rnd, v gd vis Ø							
	10	Sandstone translucent to v lt gry, v lt brn gry in part, unconsolidated, med to VC, dom C-VC, sub rnd-rnd, dom subrnd mod sorted quartz grains, no apparent mtx, rare multi-col lithics, v good vis Ø							
20- 30	15	Limestone as above							
	85	Sandstone as above							
30- 40	15	Limestone as above							
	65	Sandstone as above with some VC med gry arg quartz grains (apparently the angularity caused by bit action of some "over grown" quartz pebble)							
40- 50	10	Limestone as above (possibly caving)							
	90	Sandstone as above, dom lt-med gry, lt-med brn-gry							
50- 60	50	Sandstone as above, with tr quartz overgrowth and rare pyr cmt							
	50	Claystone dk greenish gry, drk brn gry in part, firm to soft,							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 **DATE:** 19-12-89 **GEOLOGIST:** A. TABASSI **PAGE:** 3 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
		disp in part, mod silty, rarely micaceous, mod glauconitic in part with trace of med to C grained glauconite pellets, v dk green, tr med grained quartz & multi-col lith.							
60- 70	30	Sandstone as above with inferred abundant dk green gry arg mtx and some quartz grains with green staining.							
	70	Claystone as above, mod to abundantly silty							
70-80	100	Sandstone med - dk green gry, med brn gry in part, v lt gry in part, fri-firm, hd in part, med-VC, sub arg-sub rnd, mod - poor sorted quartz, some partially green stained and minor med-C glauconite, abundant dk green gry arg mtx, tr pyr cmt, rare pyr nodule, tr overgrowth quartz grains, mod to poor vis Ø rare pyr nodule, tr overgrowth quartz grains, mod to poor vis Ø							
	tr	Claystone as above							
80- 90	100	Sandstone lt brn gry, lt-med gry, fri-firm, med-VC, dom C, sub rnd-rnd, dom sub rnd, poorly sorted qtz, abundant med gry arg mtx, disp in part, silty in part, rarely micaceous in part, tr glauc (cavings?) rare pyr cmt, mod to poo vis.Ø							
90- 100	100	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 19-12-89 GEOLOGIST: A. TABASSI PAGE: 4 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
100- 110	100	Sandstone clear-translucent to v lt gry, lt gry brn in part, apparently unconsolidated, med-VC, dom C, sub ang-sub rnd, poorly sorted qtz, no apparent mtx, tr pyr, tr shell frag. tr med gry qtz overgrowth, v good vis Ø							
110- 120	100	Silty Claystone med-dk brn gry, soft, dispersing in part, extremely silty, becomes clayey siltstone in part, becomes v fine arg sandstone in part, finely micaceous, tr lith with minor; Carbonaceous Claystone, V dk gry-blk, soft, firm to elastic in touch, becoming coally in part with dull luster.							
120- 130	100	Sandstone as per 100-110							
130- 140	100	Sandstone med brn, med brn gry, loose - fri, firm in part, VF - VC tr silt size in part, dom f and med (bimodel dist.), SA-SR, poorly sorted qtz, abundant med gry brn disp arg mtx, rare fine mica tr multi-col lith mod-poor vis Ø							
140- 151	100	Silty Claystone, med to dk brn, med brn gry in part, firm, disp in part, extremely micaceous, tr fine, carb det, extremely silty and/or sandy, rare fine lith.							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 **DATE:** 20-12-89 **GEOLOGIST:** A. TABASSI **PAGE:** 5 **OF**

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
		POST OTWAY SEDIMENTS/OTWAY GROUP UNCONFORMITY?							
		OTWAY GROUP							
151- 160	90	Claystone med green gry, med blue green, firm, hd in part, sticky in part, occ disp in part, extremely silty, becoming Siltstone in part, finely micaceous in part, tr carb mat., interbd/interlam with:							
	10	Sandstone med green gry, lt gry brn in part, speckled, fri-firm, hd in part f-med, SA-SR, mod sorted qtz & lithic frag including "volcanolithics" and chlorite (?) tr-com, med brn gry & green gry arg mtx, disp in part, silty in part, tr calc cmt, tr carb mat., poor vis Ø							
160- 170	85	Sandstone as above							
	15	Claystone as above							
170- 180	100	Silty Claystone/Clayey Siltstone as above							
	tr	Sandstone as above							
180- 190	100	Silty Claystone as above							
190- 200	100	Silty Claystone as above, dom med brn gry							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 20-12-89 GEOLOGIST: A. TABASSI PAGE: 6 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
	tr	Sandstone as above							
210- 220	100	Silty Claystone as above							
	tr	Sandstone as above, dom fine							
220- 230	90	Silty Claystone as above, dom med brn gry, med green gry in part, becoming in part;							
	5	Siltstone as above which in turn becoming minor;							
	5	Sandstone as above							
230- 240	95	Silty Claystone as above							
	5	Siltstone as above							
240- 250	100	Silty Claystone as above							
250- 260	100	Claystone as above, becoming med green gry in part, silty in part							
260- 270	100	Claystone as above occ med brn, silty in part							
270- 280	90	Claystone as above occ med brn, silty in part interlam with;							
	10	Sandstone generally as above, med green gry, speckled, fri-firm vf to med, dom f, SA-SR mod-well sorted qtz & multi-col volcanolithics abundant lt-med gry & green gry, brn gry in part arg mtx, tr biotite & muscovite, tr carb det, poor vis Ø							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 20-12-89 GEOLOGIST: A. TABASSI PAGE: 7 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
280- 290	100	Clayey Siltstone/Silty Claystone as above							
290- 300	100	Silty Claystone as above							
300- 310	100	Silty Claystone as above with tr of coally particle							
310- 320	70	Silty Claystone as above with tr of coally particle							
	30	Sandstone as above with tr of coally particle							
320- 330	60	Silty Claystone as above, med brn gry, med green gry, lt green gry							
	40	Sandstone as above							
330- 340	60	Silty Claystone as above							
	40	Sandstone as above							
340- 350	60	Silty Claystone as above							
	40	Sandstone as above							
350- 357	55	Silty Claystone as above (Possible caving ?)							
	45	Sandstone as above (Possible caving ?)							
		Drilled to 357m, set casing, casing shoe @ 354m, drilled out of casing shoe. Drilled new hole, F.I.T., Resumed Drilling							
357- 360	60	Silty Claystone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 22-12-89 GEOLOGIST: A. TABASSI PAGE: 8 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	40	Sandstone as above							
360- 365	85	Silty Claystone as above grading into;							
		Siltstone lt-med green gry, lt-med brn gry, lt-med blueish green, lt-med gry in part, soft to firm, block in part, rarely disp., in part abundantly argillaceous, rarely micaceous, rarely to moderately carbonaceous trace very fine sand in part, slightly calcareous in part, interbd/interlam with;							
	15	Sandstone as above, occ med brn with strong sil cmt.							
365- 370	90	Siltstone as above							
	10	Sandstone as above							
370- 375	90	Siltstone as above							
	10	Sandstone as above							
375- 380	70	Siltstone as above grading in part into							
		Silty Claystone as above							
	30	Sandstone as above							
380- 385	70	Siltstone/Silty Claystone as above							
	30	Sandstone as above							
385- 390	70	Siltstone as above, grading in part into vf sandstone							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 22-12-89 GEOLOGIST: A. TABASSI PAGE: 9 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
	30	Sandstone as above							
390- 395	40	Siltstone as above							
	40	Claystone as above							
	20	Sandstone as above							
395- 400	70	Sandstone, generally as above, med green gry, med brn gry in part, speckled, fri-firm, vf-f, occ siltsize to vf, dom f, SA-SR, well sorted qtz & "volcanolithics" and/or chlorite(?) com to abundant arg mtx, med green gry, med gry in part, tr-com mica, rare pyr, tr carb mat., poor vis Ø interbd/ interlam with							
	30	Silty Claystone as above							
400- 405	70	Sandstone as above							
	30	Silty Claystone as above							
405- 410	70	Claystone as above							
	20	Siltstone as above							
	10	Sandstone as above							
410- 415	70	Claystone as above							
	20	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 22-12-89 GEOLOGIST: A. TABASSI PAGE: 10 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
	10	Sandstone as above							
415- 420	70	Claystone as above							
	20	Siltstone as above							
	10	Sandstone as above							
420- 425	70	Claystone as above							
	20	Siltstone as above							
	10	Sandstone as above							
425- 430	60	Claystone as above							
	30	Siltstone as above							
	10	Sandstone as above							
435- 440	70	Claystone as above							
	20	Siltstone as above							
	10	Sandstone as above							
440- 445	70	Claystone as above, slightly calcareous							
	20	Siltstone as above							
	10	Sandstone as above							
445- 450	80	Claystone as above, slightly calcareous							
	15	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 **DATE:** 22-12-89 **GEOLOGIST:** A. TABASSI **PAGE:** 11 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
	5	Sandstone as above							
450- 455	80	Claystone as above, non calcareous							
	15	Siltstone as above							
	5	Sandstone as above							
455- 460	80	Claystone as above							
	15	Siltstone as above							
	5	Sandstone as above							
460- 465	80	Claystone as above							
	20	Siltstone as above							
465- 470	80	Claystone as above							
	20	Siltstone as above							
470- 475	80	Claystone as above							
	15	Siltstone as above							
	5	Sandstone as above							
475- 480	80	Claystone as above							
	15	Siltstone as above							
	5	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 22-12-89 GEOLOGIST: A. TABASSI PAGE: 12 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
480- 485	70	Claystone as above							
	10	Siltstone as above							
	20	Sandstone as above							
485- 490	70	Claystone as above							
	10	Siltstone as above							
	20	Sandstone as above							
490- 495	70	Claystone as above							
	15	Siltstone as above							
	15	Sandstone as above, with tr calc cmt							
495- 500	70	Claystone as above							
	15	Siltstone as above							
	15	Sandstone as above, with tr calc cmt							
500- 505	70	Claystone as above							
	20	Siltstone as above							
	10	Sandstone as above, with tr calc cmt							
505- 510	70	Claystone as above							
	20	Siltstone as above							
	10	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 **DATE:** 22-12-89 **GEOLOGIST:** A. TABASSI **PAGE:** 13 **OF**

			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
510- 515	70	Claystone as above							
	20	Siltstone as above							
	10	Sandstone as above, with tr calc cmt							
515- 520	70	Claystone as above							
	20	Siltstone as above							
	10	Sandstone as above, with tr calc cmt							
520- 525	80	Claystone as above	0.18	35					
	20	Siltstone as above							
	tr	Coal, black v dk brn, soft-firm, dull luster, blocky in part subfis in part, rarely arg & pyritic in part, no fluor, no cut							
525- 530	80	Claystone as above	0.02	4					
	20	Siltstone as above							
	tr	Coal as above							
530- 535	90	Claystone as above	0.02	4					
	10	Siltstone as above							
	tr	Coal as above							
	tr	Sandstone as above, with rare calc cmt							
535- 540	90	Claystone as above	0.02	4					

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 22-12-89 GEOLOGIST: A. TABASSI PAGE: 14 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
	10	Siltstone as above							
	tr	Coal as above							
	tr	Sandstone as above							
540- 545	70	Claystone as above	0.37	74					
	30	Siltstone as above							
	tr	Sandstone as above							
545- 550	70	Claystone as above	0.18	24					
	30	Siltstone as above							
	tr	Sandstone as above							
550- 555	70	Claystone as above	0.12						
	30	Siltstone as above							
555- 560	70	Claystone as above	0.07	14					
	30	Siltstone as above							
560- 565	70	Claystone as above	0.39	76					
	30	Siltstone as above							
	tr	Sandstone as above							
565- 570	60	Claystone as above	0.15	30					
	10	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 **DATE:** 22-12-89 **GEOLOGIST:** A. TABASSI **PAGE:** 15 **OF**

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	30	Sandstone as above, dom lt greenish gry to lt gry, com calc cmt							
	tr	Coal as above							
570- 575	60	Claystone as above	0.3	58					
	20	Siltstone as above							
	20	Sandstone as above, dom med green gry, tr calc cmt tr-com mica							
575- 580	60	Claystone as above							
	20	Siltstone as above							
	20	Sandstone as above, dom med green gry, tr calc cmt tr-com mica							
580- 585	70	Claystone as above							
	20	Siltstone as above							
	10	Sandstone as above							
585- 590	70	Claystone as above	0.39	70					
	20	Siltstone as above							
	10	Sandstone as above							
590- 595	65	Claystone as above							
	20	Siltstone as above							
	15	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 22-12-89 GEOLOGIST: A. TABASSI PAGE: 16 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
595- 600	65	Claystone as above	0.25	48					
	20	Siltstone as above							
	15	Sandstone as above							
600- 605	65	Claystone as above	0.3	60					
	20	Siltstone as above							
	15	Sandstone as above							
605- 610	65	Claystone as above	0.18	36					
	20	Siltstone as above							
	15	Sandstone as above							
610- 615	85	Claystone as above, occ med gry brn in part							
	15	Siltstone as above							
	5	Sandstone as above							
615- 620	80	Claystone as above	0.07	13					
	15	Siltstone as above							
	5	Sandstone as above							
620- 625	80	Claystone as above							
	15	Siltstone as above							
	5	Sandstone as above							

<u>GAS AND FUEL EXPLORATION N.L.</u>

WELL: McEACHERN NO.1 DATE: 22-12-89 GEOLOGIST: A. TABASSI PAGE: 17 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
625- 630	80	<u>Claystone</u> as above	0.3	58					
	10	<u>Siltstone</u> as above							
	5	<u>Sandstone</u> as above							
630- 635	70	<u>Claystone</u> as above, occ subfis in part, blocky in part.	0.2	40					
	25	<u>Siltstone</u> as above							
	5	<u>Sandstone</u> as above							
	tr	<u>Coal</u> as above							
635- 640	70	<u>Claystone</u> as above	0.2	39					
	25	<u>Siltstone</u> as above							
	5	<u>Sandstone</u> as above							
	tr	<u>Coal</u> as above							
640- 645	70	<u>Claystone</u> as above	0.42						
	30	<u>Siltstone</u> as above							
	tr	<u>Coal</u> as above							
645- 650	70	<u>Claystone</u> as above	0.21	41					
	30	<u>Siltstone</u> as above							
	tr	<u>Coal</u> as above							
650- 655	60	<u>Claystone</u> as above	0.36	56					

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 22-12-89 GEOLOGIST: A. TABASSI PAGE: 18 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	30	Siltstone as above							
	10	Sandstone as above							
655- 660	60	Claystone as above	0.21	41					
	30	Siltstone as above							
	10	Sandstone as above							
660- 665	60	Claystone as above							
	30	Siltstone as above							
	10	Sandstone as above							
665- 670	60	Claystone as above	0.21	41					
	30	Siltstone as above							
	10	Sandstone as above							
670- 675	60	Claystone as above, occ v lt brn gry, subfis in part	0.2	40					
	30	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
675- 680	60	Claystone as above	0.20	40					
	30	Siltstone as above							
	10	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 22-12-89 GEOLOGIST: A. TABASSI PAGE: 19 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	tr	Coal as above							
680- 685	50	Claystone as above, subfis to fis in part	0.78	156					
	35	Siltstone as above							
	10	Sandstone as above							
	5	Coal as above, subfis in part, sub conchoidal fracture, no fluor no cut							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 23-12-89 GEOLOGIST: A. TABASSI PAGE: 20 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
685- 690	50	Claystone as above	0.37	73					
	35	Siltstone as above							
	10	Sandstone as above, with tr-com calc cmt, poor vis Ø							
	5	Coal as above							
690- 695	50	Claystone as above	0.75	150					
	35	Siltstone as above							
	10	Sandstone as above							
	5	Coal as above							
695- 700	50	Claystone as above	0.48	96					
	35	Siltstone as above							
	10	Sandstone as above							
	5	Coal as above							
700- 705	50	Claystone as above	0.84	168					
	40	Siltstone as above							
	10	Sandstone as above, with tr-com calc cmt, poor vis Ø							
	tr	Coal as above							
705- 710	50	Claystone as above	0.33	66					
	45	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 23-12-89 GEOLOGIST: A. TABASSI PAGE: 21 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
	10	Sandstone as above							
	5	Coal as above							
710- 715	50	Claystone as above							
	35	Siltstone as above							
	5	Sandstone as above							
	tr	Coal as above							
715- 720	60	Claystone as above	0.96	192					
	35	Siltstone as above							
	15	Sandstone as above							
720- 725	50	Claystone generally as above, lt-med greenish gry, lt med bluish gry, occ lt-med brn gry, soft-firm, occ hd, blocky & subfis in part, rarely disp in part, tr-com fine mica, rarely carbonaceous, in part very silty, grading in part and/or interlam with;	1.46	290					
	25	Siltstone as above, interbd/interlam with;							
	25	Sandstone as above, lt-med gry green, lt-med brn gry, occ lt brn, rarely off white to v lt gry, speckled, fri-firm, occ hd, silt size to fine, occ med, dom fine, SA-SR, mod-							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 23-12-89 GEOLOGIST: A. TABASSI PAGE: 22 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
		well sorted qtz, multi-col volcanolithics & occ mica (biotite & mascovite), tr-abundant arg mtx, lt-med green gry, lt-med brn gry, occ white and kaolinitic, tr-com calc cmt, mod strong, occ strong, tr-rare pyr cmt & crystal, rare carb det, rare partially altered feldspar(?), poor-nil vis Ø							
725- 730	50	Claystone as above	0.84	168					
	25	Siltstone as above							
	25	Sandstone as above							
730- 735	70	Claystone as above	0.6	120					
	20	Siltstone as above							
	10	Sandstone as above							
735- 740	70	Claystone as above	0.70	141					
	20	Siltstone as above							
	10	Sandstone as above							
740- 745	70	Claystone as above							
	15	Siltstone as above							
	15	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 23-12-89 GEOLOGIST: A. TABASSI PAGE: 23 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
745- 750	60	Claystone as above	2.19	749					
	20	Siltstone as above							
	20	Sandstone as above							
750- 755	60	Claystone as above							
	20	Siltstone as above							
	20	Sandstone as above							
755- 760	50	Claystone as above	0.6	120					
	30	Siltstone as above							
	20	Sandstone as above							
760- 765	50	Claystone as above							
	30	Siltstone as above							
	20	Sandstone as above							
765- 770	50	Claystone as above	0.42	90					
	30	Siltstone as above							
	20	Sandstone as above							
770- 775	40	Claystone as above							
	30	Siltstone as above							
	30	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 23-12-89 GEOLOGIST: A. TABASSI PAGE: 24 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
775- 780	40	Claystone as above	0.90	290					
	30	Siltstone as above							
	30	Sandstone as above							
780- 785	60	Claystone as above							
	30	Siltstone as above							
	10	Sandstone as above							
785- 790	60	Claystone as above	0.54	89					
	30	Siltstone as above							
	10	Sandstone as above							
790- 795	40	Claystone as above							
	20	Siltstone as above							
	40	Sandstone as above							
795- 800	40	Claystone as above	0.6	130					
	30	Siltstone as above							
	30	Sandstone as above							
800- 805	60	Claystone as above							
	30	Siltstone as above							
	10	Sandstone as above							

WELL: McEACHERN NO.1 DATE: 23-12-89 GEOLOGIST: A. TABASSI PAGE: 25 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
805- 810	60	Claystone as above	0.36	64					
	30	Siltstone as above							
	10	Sandstone as above							
810- 815	60	Claystone as above	0.12	45					
	30	Siltstone as above							
	10	Sandstone as above							
815- 820	60	Claystone as above	0.18	32					
	30	Siltstone as above							
	10	Sandstone as above							
820- 825	50	Claystone as above	0.15	26					
	30	Siltstone as above							
	20	Sandstone as above							
825- 830	50	Claystone as above	0.3	58					
	30	Siltstone as above							
	20	Sandstone as above							
830- 835	50	Claystone as above	0.2	42					
	30	Siltstone as above							
	20	Sandstone as above							

WELL: McEACHERN NO.1 DATE: 23-12-89 GEOLOGIST: A. TABASSI PAGE: 26 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
835- 840	50	Claystone as above, dom med brn gry in part	0.2	42					
	30	Siltstone as above							
	20	Sandstone as above							
840- 845	60	Claystone as above	0.18	36					
	30	Siltstone as above							
	10	Sandstone as above							
845- 850	60	Claystone as above	0.36	70					
	30	Siltstone as above							
	10	Sandstone as above							
850- 855	60	Claystone as above	0.36	80					
	30	Siltstone as above							
	10	Sandstone as above							
855- 860	60	Claystone as above, dom med brn gry in part	0.18	36					
	30	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
860- 865	50	Claystone as above	0.24	48					
	45	Siltstone as above, occ v pale green gry to off white							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 23-12-89 GEOLOGIST: A. TABASSI PAGE: 27 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	5	Sandstone as above							
865- 870	60	Claystone as above	0.6	120					
	30	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
870- 875	55	Claystone as above	0.72	182					
	30	Siltstone as above							
	15	Sandstone as above							
875- 880	60	Claystone as above	0.72	180					
	30	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
880- 885	55	Claystone as above	0.66	112					
	25	Siltstone as above							
	tr	Coal as above							
885- 890	50	Claystone as above	0.9	208					
	30	Siltstone as above							
	20	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 23-12-89 GEOLOGIST: A. TABASSI PAGE: 28 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
895- 900	70	Claystone as above	0.3	60					
	25	Siltstone as above							
	5	Sandstone as above							
900- 905	70	Claystone as above	0.48	92					
	20	Siltstone as above							
	10	Sandstone as above							
905- 910	75	Claystone as above	0.57	108					
	20	Siltstone as above							
	5	Sandstone as above							
	tr	Coal as above							
910- 915	75	Claystone as above	0.47	92					
	20	Siltstone as above							
	5	Sandstone as above							
915- 920	75	Claystone as above	0.57	114					
	20	Siltstone as above							
	5	Sandstone as above							
920- 925	70	Claystone as above	0.36	72					
	20	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 23-12-89 GEOLOGIST: A. TABASSI PAGE: 29 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
	10	Sandstone as above							
925- 930	70	Claystone as above	0.69	118					
	20	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
930- 934	70	Claystone as above	0.3	60					
	20	Siltstone as above							
	10	Sandstone as above							
		(Changed bit, Repaired generator(s), Resumed drilling @ 3.00P.M. 24-12-89)							
934- 940	50	Claystone as above	0.3	60					
	40	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 24-12-89 GEOLOGIST: A. TABASSI PAGE: 30 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	GAS C1	GAS C2	GAS C3	GAS C4	FLUOR NAT.	FLUOR CUT
940- 945	50	Claystone as above, becoming firm-hd with depth, subfis-fis in part	0.3	60					
	35	Siltstone as above, becoming slightly firmer with depth poor o							
	15	Sandstone as above, with mod strong calc and/or sil cmt poor o							
	tr	Coal as above							
945- 950	50	Claystone as above	1.2	240					
	35	Siltstone as above							
	15	Sandstone as above							
	tr	Coal as above							
950- 955	40	Claystone as above	.4	60					
	40	Siltstone as above							
	15	Sandstone as above							
	tr	Coal generally as above, dk brn-black, firm, blocky in part subfis-fis in part, arg in part, sub conchoidal frac in part							
955- 960	40	Claystone as above	.3	60					
	40	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 24-12-89 GEOLOGIST: A. TABASSI PAGE: 31 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	15	Sandstone as above							
	5	Coal as above							
960- 965	40	Claystone as above, occ med brn	.4	80					
	45	Siltstone as above							
	10	Sandstone as above							
	5	Coal as above							
965- 970	45	Claystone as above	1.1	220					
	45	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
970- 975	35	Claystone as above	.5	100					
	45	Siltstone as above							
	20	Sandstone as above							
	tr	Coal as above							
975- 980	40	Claystone as above	.5	100					
	45	Siltstone as above							
	15	Sandstone as above							
	tr	Coal as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 24-12-89 GEOLOGIST: A. TABASSI PAGE: 32 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
980- 985	40	Claystone as above	.6	120					
	50	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
985- 990	40	Claystone as above	3.3	640					
	50	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
990- 995	45	Claystone as above	.8	160					
	45	Siltstone as above							
	10	Sandstone as above							
995-1000	45	Claystone as above	.8	160					
	45	Siltstone as above							
	10	Sandstone as above							
1000-1005	45	Claystone as above	1.1	220					
	45	Siltstone as above							
	10	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 24-12-89 GEOLOGIST: A. TABASSI PAGE: 33 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
1005-1010	40	Claystone as above	1.3	260					
	45	Siltstone as above							
	15	Sandstone as above							
1010-1015	45	Claystone as above	.4	80					
	50	Siltstone as above							
	5	Sandstone as above							
1015-1020	45	Claystone as above	.6	60					
	50	Siltstone as above							
	5	Sandstone as above							
1020-1025	45	Claystone as above	.5	100					
	50	Siltstone as above							
	5	Sandstone as above							
1025-1030	45	Claystone as above	.3	60					
	45	Siltstone as above							
	10	Sandstone as above							
1030-1035	55	Claystone as above	.3	60					
	40	Siltstone as above							
	5	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 24-12-89 GEOLOGIST: A. TABASSI PAGE: 34 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
1035-1040	45	Claystone as above	.8	160					
	45	Siltstone as above							
	10	Sandstone as above							
1040-1045	45	Claystone as above	.9	180					
	45	Siltstone as above							
	10	Sandstone as above							
1045-1050	45	Claystone as above	.9	180					
	50	Siltstone as above							
	5	Sandstone as above							
	tr	Coal as above							
1050-1055	45	Claystone as above	.5	100					
	45	Siltstone as above							
	10	Sandstone as above							
1055-1060	45	Claystone as above	.5	100					
	45	Siltstone as above							
	10	Sandstone as above							
		(Circulated Return @ 1063m, Fast drilling 1061-1063, No Show)							
1060-1065	50	Claystone as above, dom soft & disp	1.0	200					

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 24-12-89 GEOLOGIST: A. TABASSI PAGE: 35 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	45	Siltstone as above							
	5	Sandstone as above							
1065-1070	50	Claystone as above	.2	40					
	50	Siltstone as above							
	10	Sandstone as above							
	tr.	Carb. clay grading into Coal as above							
1070-1075	40	Claystone as above	.2	40					
	40	Siltstone as above							
	20	Sandstone, lt-med green gry, lt brn, speckled, unconsolidated in part, fri-firm in part, Vf-f, dom f, SA-SR, mod-well sorted qtz, tr.-com multi-col lithics (some rare pink & red but don't appear to be garnet?), no apparent mtx in unconsolidated portion, com to abundant lt-med green gry, lt-med brn gry and occ white Kaolinitic clay mtx in the remaining portion, com calc cmt v rare mica & pyr, rare carb det, good-poor vis O no shows.							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 **DATE:** 25-12-89 **GEOLOGIST:** A. TABASSI **PAGE:** 36 **OF**

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
		rare carb det, good-poor vis Ø no shows.							
1075-1080	45	Claystone as above	.3	60					
	45	Siltstone as above							
	10	Sandstone as above, dom fri-firm							
1080-1085	45	Claystone as above	.3	60					
	45	Siltstone as above							
	10	Sandstone as above							
1085-1090	45	Claystone as above	.3	60					
	45	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
1090-1095	45	Claystone as above	.4	80					
	45	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
1095-1100	40	Claystone as above	.3	60					
	50	Siltstone as above							
	10	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 25-12-89 GEOLOGIST: A. TABASSI PAGE: 37 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
1100-1105	40	Claystone as above	.4	80					
	45	Siltstone as above							
	15	Sandstone as above, rarely f-med, rare med, occ coarse clear qtz sand grains and few overgrowth qtz.							
1105-1110	40	Claystone as above	.4	80					
	45	Siltstone as above							
	15	Sandstone as above							
1110-1115	45	Claystone as above	.4	80					
	45	Siltstone as above							
	10	Sandstone as above							
1115-1120	45	Claystone as above	.3	60					
	50	Siltstone as above							
	5	Sandstone as above							
1120-1125	50	Claystone as above	.4	80					
	50	Siltstone as above							
1125-1130	50	Claystone as above	.4	80					
	50	Siltstone as above							
1130-1135	50	Claystone as above	.4	80					

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 25-12-89 GEOLOGIST: A. TABASSI PAGE: 38 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
	50	Siltstone as above							
1135-1140	50	Claystone as above	.3	60					
	50	Siltstone as above							
1140-1145	50	Claystone as above	.3	60					
	50	Siltstone as above							
	tr	Coal as above, extremely arg in part, grading into Carb Claystone in part.							
1145-1150	50	Claystone as above	1.2	240					
	50	Siltstone as above							
	tr.	Coal as above, grading into Carb Claystone as above							
1150-1155	50	Claystone as above							
	50	Siltstone as above							
	tr.	Coal as above, grading into Carb Claystone as above							
1155-1160	45	Claystone as above	.5	100					
	50	Siltstone as above							
	tr.	Coal as above							
1160-1165	45	Claystone as above	.17						
1160-1165	45	Claystone as above	.17						

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 25-12-89 GEOLOGIST: A. TABASSI PAGE: 39 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	50	Siltstone as above							
	5	Sandstone as above							
	tr.	Coal as above grading into Carb Claystone in part							
1165-1170	45	Claystone as above, lt-med gry, lt med green gry in part, med brn gry in part, rarely med-dk gry, firm-hd, dom firm, v rarely soft & disp, blocky in part, subfis-fis in part, dom subfis, dom rarely carbonaceous, occ very carbonaceous and grading into arg Coal, trace mica, dom rarely silty, occ extremely silty and grading into and interlam with	1.7						
	45	Siltstone, as above, lt to med green gry, lt-med brn gry, occ med-dk brn, rarely off white to v lt gry, speckled in part, soft-firm, occ hd, disp in part, blocky in part, subfis in part extremely arg, rarely micaceous, rarely to occ mod card, interbd. interlam with,							
	10	Sandstone, as above, lt occ med green gry, lt gry to brn gry, lt-med gry, rarely off-white to v lt gry, speckled in part, fri-firm, occ had, vf-f dom f, rarely f-med, SA-SR, mod sorted qtz & multi-col lithics including volcanolithics, com-abundant							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 25-12-89 GEOLOGIST: A. TABASSI PAGE: 40 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
		arg mtx, lt-med gry, lt-med green gry, lt-med brn in part, off-white Kaolinite clay in part, disp in part, tr-com calc cmt, com carb flecks, rare mica, rare pyrite, rare med-c. occ v, clear to translucent to frosty loose qtz semd grains, some appear to be qtz overgrowth, v rare partially altered feldspar (?), mod-poor vis Ø, interlam with;							
	tr.	Coal & Carbonaceous Claystone as above							
1170-1175	40	Claystone as above	.17						
	55	Siltstone as above							
	5	Sandstone as above							
	tr	Coal & Carbonaceous Claystone as above							
1175-1180	45	Claystone as above	.23						
	50	Siltstone as above							
	5	Sandstone as above							
	tr	Coal & Carbonaceous Claystone as above							
1180-1185	40	Claystone as above	.19						
	60	Siltstone as above							
	tr	Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 25-12-89 GEOLOGIST: A. TABASSI PAGE: 41 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
	tr	Coal as above							
1185-1190	35	Claystone as above, becoming dominantly med-dk gry	.17						
	55	Siltstone as above							
	10	Sandstone as above							
	tr	Coal & Carb Claystone as above							
1190-1195	40	Claystone as above, becoming dominantly med-dk gry	.17						
	55	Sandstone as above							
1195-1200	40	Claystone as above. becoming dominantly med-dk gry	.25						
	55	Siltstone as above							
	5	Sandstone as above							
1200-1205	25	Claystone as above, dominantly med-dk gry	.28						
	45	Siltstone as above							
	30	Sandstone as above							
1205-1210	25	Claystone as above	.41						
	45	Siltstone as above							
	30	Sandstone as above							
1210-1215	30	Claystone as above	.5						
	60	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 25-12-89 GEOLOGIST: A. TABASSI PAGE: 42 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
	10	Sandstone as above							
	tr	Coal as above							
1215-1220	30	Claystone as above	.5						
	60	Siltstone as above							
	10	Sandstone as above							
	tr	Coal as above							
1220-1225	30	Claystone as above	.5						
	50	Siltstone as above							
	20	Sandstone as above							
	tr	Coal as above with minor carb Claystone							
1225-1230	30	Claystone as above	1.2						
	40	Siltstone as above							
	30	Sandstone as above with minor portion of it being med-c, mod strong calc cmt & com Kaolinitic clay matrix, v poor vis Ø							
	tr	Coal as above							
1230-1235	40	Claystone as above	.22						
	45	Siltstone as above							
	15	Sandstone as above vf-f, occ med as before							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 **DATE:** 25-12-89 **GEOLOGIST:** A. TABASSI **PAGE:** 45 **OF**

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	tr	Sandstone, lt-med brn, med gry brn in part, firm, occ hd, f-c, dom med, SA-SR, poor-mod sorted qtz, clear to frosty, minor multi-col lithics, tr lt-med brn gry arg mtx, com-abundant calc cmt (including dolomite) some qtz grains are lt brn stained, poor vis Ø							
1290-1205	50	Claystone as above	.22						
	45	Siltstone as above							
	5	Sandstone as above							
	tr	Brown Sandstone as above							
1295-1300	50	Claystone as above	.17						
	45	Siltstone as above							
	5	Sandstone as above							
	tr	Brown Sandstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 26-12-89 GEOLOGIST: A. TABASSI PAGE: 46 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
1300-1305	55	Claystone as above	.22						
	45	Siltstone as above							
	tr	Brown Sandstone as above							
1305-1310	55	Claystone as above	.7						
	45	Siltstone as above							
	tr	Brown Sandstone as above							
1310-1315	50	Claystone as above	.4						
	45	Siltstone as above							
	5	Coal as above							
1315-1320	50	Claystone as above	2.6						
	45	Siltstone as above							
	tr	Sandstone as above							
	5	Coal as above							
1320-1325	60	Claystone as above	.44						
	40	Siltstone as above							
1325-1330	60	Claystone as above	.39						
	40	Siltstone as above							
1330-1335	55	Claystone as above	.33						

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 26-12-89 GEOLOGIST: A. TABASSI PAGE: 47 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
	40	Siltstone as above							
	5	Sandstone as above							
1335-1340	60	Claystone as above	.22						
	40	Siltstone as above							
	tr	Brown Sandstone as above							
1340-1345	60	Claystone as above	.36						
	40	Siltstone as above							
1345-1350	55	Claystone as above	.36						
	40	Siltstone as above							
	5	Sandstone as above							
	tr	Coal as above							
1350-1355	55	Claystone as above	.41						
	40	Siltstone as above							
	5	Sandstone as above							
1355-1360	55	Claystone as above	.41						
	40	Siltstone as above							
	5	Sandstone as above with tr. of loose, med-c, SA-SR qtz sand grains							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 26-12-89 GEOLOGIST: A. TABASSI PAGE: 48 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
1360-1365	50	Claystone as above, occ med-dk brn gry	3.6	620	12	tr	tr		
	40	Siltstone as above							
	5	Sandstone as above							
	5	Coal as above							
1365-1370	40	Claystone generally as above, med-dk gry, med-dk brn gry, occ med green gry, rarely off white to v lt gry, firm, occ hd, off white claystone is soft, disp & mod silty/sandy, the other Claystone is blocky in part, subfis to fis in part, v rarely micaceous,rarely carbonaceous,some strongly carbonaceous,mod silty in part, grading in part into;	.3						
	30	Siltstone, generally as above, lt-med gry, lt-med green gry, occ lt-med brn gry, firm, rarely hard, abundantly arg in part, rare Carb & micaceous, interbd/interlam with;							
	30	Sandstone, lt gry, lt brn gry, pale greenish gry in part, med brn gry in part, fri-firm, occ firm, vf-f, occ vf-med, v rarely c, dom f, SA-SR, mod sorted qtz and minor med green gry & med brn gry lithics, qtz are clear-frosty,lt brn stained in part,tr in part com arg mtz,lt green gry in part,Kaolinitic							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 26-12-89 GEOLOGIST: A. TABASSI PAGE: 49 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
		in part, tr in part com arg mtz, lt green gry in part, Kaolinitic in part, tr-com mod strong Calc cmt in part, rare biotite and muscovite, rare Carb det, v rare med brn dull dolomite crystal, poor occ mod vis Ø, interlam with minor;							
	tr.	Coal as above, black v dk brn, v dk gry brn in part, firm, rarely hd in part, blocky in part, subfis in part, arg & dirty in part, rarely sub-conehoidal fracture in part, no fluor, no cut.							
		- Circulated Return @ 1370m. No Shows - POOH to change bit, lost power - By Passed SCR, Continued to POOH, Changed bit & RIH to casing Shoe - Wait on repairs to SCR - On bottom to resume drilling @ 10.30 A.M. (approx) on Saturday 30-12-89. (For more details see "Daily Drilling Reports").							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 30-12-89 GEOLOGIST: A. TABASSI PAGE: 50 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
1370-1375	55	Claystone as above dom med-dk gry, dom blocky & subfis (Partly due to caving and/or reaming the side of the hole rather than being grinded by the centre of the bit at the bottom?), v rare gypsum, rare loose med-C grained SA-SR qtz in soft part,	.2	40	tr.				
	35	Siltstone as above							
	10	Sandstone as above, dom vf-f, v rarely med with trace of partially altered feldspar, v poor vis O							
	tr	Dolomite, med yel brn, dull, firm, occ hrd, amorphose to cryptocrystalline							
1375-1380	55	Claystone as above, dom soft & disp	.15	30	tr.				
	30	Siltstone as above							
	15	Sandstone as above							
1380-1385	60	Claystone as above, dom soft & disp	.4	80	tr.				
	30	Siltstone as above							
	10	Sandstone as above							
	tr	Coal & Carbonaceous Claystone (Coally Shale) as above							
1385-1390	60	Claystone as above, dom blocky & Subfis, dom med-dk gry, dom firm-hd	.15	30					

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	30	Siltstone as above, com to abundantly micaceous							
	10	Sandstone as above, the med-grained Sst has com partially altered feldspar							
	tr	Coal & Carbonaceous Claystone as above							
	tr	Dolomite as above							
1390-1395	60	Claystone as above, dom med-dk gry, dom blocky & subfis, dom had	.2	40	tr.				
	35	Siltstone as above, com micaceous,							
	5	Sandstone as above							
	tr	Coal as above							
	tr	Dolomite as above							
1395-1400	60	Claystone dom med-dk gry, dom hd, dom blocky f subfis	.6	120	tr.				
	35	Siltstone as above, com micaceous, com carb.							
	5	Sandstone as above							
	tr	Dolomite as above							
1400-1405	60	Claystone as above, dom med-dk gry, dom hd, dom blocky, dom subfis-fis	.3	60	tr.				
	35	Siltstone as above,							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 30-12-89 GEOLOGIST: A. TABASSI PAGE: 52 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
	5	Sandstone as above							
	tr	Coal as above							
	tr	Dolomite as above							
	35	Siltstone as above, com micaceous,							
	5	Sandstone as above							
	tr	Coal as above							
	tr	Dolomite as above							
1395-1400	60	Claystone dom med-dk gry, dom hd, dom blocky f subfis	.6	120	tr.				
	35	Siltstone as above, com micaceous, com carb.							
	5	Sandstone as above							
	tr	Dolomite as above							
1400-1405	60	Claystone as above, dom med-dk gry, dom hd, dom blocky, dom subfis-fis	.3	60	tr.				
	35	Siltstone as above,							
	5	Sandstone as above							
	tr	Coal as above							
	tr	Dolomite as above							
1405-1410	60	Claystone as above dom med-dk gry,	.2	40	tr.				

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 30-12-89 GEOLOGIST: A. TABASSI PAGE: 53 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	35	Siltstone as above							
	5	Sandstone as above							
	tr	Dolomite as above							
1410-1415	60	Claystone as above	.3	60	tr.				
	35	Siltstone as above,							
	5	Sandstone as above							
	tr	Coal as above							
	tr	Dolomite as above							
1415-1420	50	Claystone as above	.25	50	tr.				
	40	Siltstone as above, dom. med-dk gry brn, subfis in part							
	5	Sandstone as above							
	tr	Carbonaceous Claystone as above grading into Coal as above							
1420-1425	50	Claystone as above	.25	50	tr.				
	50	Siltstone as above							
	tr	Sandstone as above							
		Drilling break @ 1426.4m - 1429.5m							
		Minor gas & minor fluorescence & cut							
1425-1426.5	50	Claystone as above	.7	150	tr.				

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 30-12-89 GEOLOGIST: A. TABASSI PAGE: 54 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	50	Siltstone as above							
	tr	Sandstone as above							
		PRETTY HILL SANDSTONE							
1426.5-1430	60	Sandstone, off white to v lt gry, clear in part, v rare lt yell gry in part, loosely consolidated to fri, rarely loose, rarely firm in part, f-C, dom med, occ VC, SA-SR, dom SA, poorly sorted qtz, clear-transluscent, occ frosty, tr-com med gry & med green gry lithics, some reworked shale fragments, tr-com white Kaolinitic clay mtx, disp in part tr mod weak calcite cmt, rare clear to translucent pink and med red garnet, mod good vis Ø.	.11	22	tr			/	/
		The Sandstone has +-5% pin-point dull-occ med bright bluish yell fluor with slow occ mod fast, diffusing and occ streaming V dull pale yell blue cut fluor with no natural cut colour, the tight sandstone has no cut but it has slow occ mod fast streaming occ radiating dull greenish yell crush cut with patchy dull yell residual ring.							
		The sample also has 5%-10% dull med blue & dull med yell brn							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 30-12-89 GEOLOGIST: A. TABASSI PAGE: 55 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
		mineral fluor.							
	20	Claystone , med-dk gry, med-dk brn gry, rarely med-dk green gry in part, firm, occ hd, rarely soft & disp in part, rarely finely micaceous,mod carbonaceous,occ grading into Carbonaceous Claystone (Shaley Coal, occ mod silty, in part grading into -							
	20	Siltstone, med gry, med brn gry, med green gry in part, speckled in part firm, occ hd, mod arg, tr-com finely micaceous, tr carb det,							
	tr	Coal,black-dk brn & dk brn gry,firm,block in part,subfis-fis in part, slafy clevage in part, dull, earthy or abundantly arg in part, occ with subconshoidal fracture with no fluor. cut or crush cut							
1430-1435	40	Sandstone as above with tr-5 fluor. cut and/or crush cut as above	2.9	570	12	3		/	/
	40	Claystone as above with minor with Kaolinitic Claystone, soft, disp & Sandy							
	20	Siltstone as above							
	tr	Coal and Carbonaceous Claystone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 30-12-89 GEOLOGIST: A. TABASSI PAGE: 56 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
1435-1440	40	Sandstone as above with 5%-10% Fluor; cut and/or Crush cut as above	2.0	380	12	tr.		/	/
	35	Claystone as above with minor Kaolinitic Claystone as above							
	25	Siltstone as above							
	tr	Coal and Carbonaceous Claystone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 31-12-89 GEOLOGIST: A. TABASSI PAGE: 57 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
1440-1445	40	Sandstone as above, 5%-10% fluor; and cut as above	1.25	223	6	tr.		/	/
	20	Claystone as above							
	30	Siltstone as above							
1445-1450	40	Sandstone as above, 5%-10% fluor; and cut as above	.6	120	tr.			/	/
	20	Claystone as above							
	30	Siltstone as above							
1450-1454	80	Sandstone as above, dom loosely unconsolidated, v good-good vis O with up to 20% fluor & cut as above	1.0	183	4			/	/
	10	Claystone as above							
	10	Siltstone as above							
		Drilling Break @ 1452-1454m							
1454-1456	80	Sandstone as above, fluor; cut as above	2.15	410	6	tr.		/	/
	10	Claystone as above							
	10	Siltstone as above							
		CONDUCTED DST-1							
		1445.7-1456.0							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 01-01-90 GEOLOGIST: A. TABASSI PAGE: 58 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
1456-1460	60	Sandstone, with tr-5% fluor & cut as above, dom dull med yell brn	1.5	290	5	tr.		/	/
	25	Claystone as above							
	15	Siltstone as above							
1460-1465	20	Sandstone, with tr. of fluor & cut as above	0.8	161	3			/	/
	40	Claystone as above	.3	60					
	40	Siltstone as above							
1465-1470	20	Sandstone as above with tr. of fluor & cut as above	0.9	175	4	tr.		/	/
	45	Claystone as above							
	35	Siltstone as above							
1470-1475	60	Sandstone as above, dom loose, tr fluor & cut as above	1.6	238	4			/	/
	15	Claystone as above							
	25	Siltstone as above							
1475-1480	15	Sandstone as above, tr. fluor & cut as above	0.9	175	4			/	/
	45	Claystone as above							
	40	Siltstone as above							
1480-1485	70	Sandstone as above, dom loose, tr fluor & cut as above	2.05	405	7	tr.		/	/
	15	Claystone as above							
	15	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 01-01-90 GEOLOGIST: A. TABASSI PAGE: 59 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
1485-1490	50	Sandstone as above with few specks of fluor as above	0.5	95	tr.			/	/
	20	Claystone as above							
	30	Siltstone as above							
1490-1495	15	Sandstone as above, with few specks of fluor as above	.6	109	3			/	/
	40	Claystone as above							
	45	Siltstone as above							
1495-1500	10	Sandstone as above	0.6	112	4				
	40	Claystone as above							
	50	Siltstone as above							
1500-1505	50	Claystone as above	1.9	354	10	tr.			
	50	Siltstone as above							
	tr.	Sandstone as above							
1505-1510	50	Claystone as above	1.5	291	6	tr.			
	50	Siltstone as above							
1510-1515	50	Claystone as above	1.3	254	6	tr.			
	50	Siltstone as above							
1515-1520	40	Claystone as above	1.1	218	4	tr.			
	60	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 01-01-90 GEOLOGIST: A. TABASSI PAGE: 60 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
1520-1525	40	Claystone as above	2.9	542	15	tr.			
	60	Siltstone as above							
	tr	Coal and Carbonaceous Claystone							
1525-1530	40	Claystone as above	2	390	10	tr.			
	60	Siltstone as above							
	tr	Coal as above							
1530-1535	50	Claystone as above	2.6	500	13	tr.			
	50	Siltstone as above							
	tr	Coal as above							
1535-1540	50	Claystone as above	2.4	471	11	tr.			
	50	Siltstone as above							
1540-1545	80	Sandstone as above with tr-5% dull orange brn mineral fluor	5.3	1029	18	tr.			
	10	Claystone as above	2.6	500	13	tr.			
	10	Siltstone as above							
1545-1550	80	Sandstone as above with tr-5% dull orange brn mineral fluor	0.9	178	4				
	10	Claystone as above							
	10	Claystone as above							
	10	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 01-01-90 GEOLOGIST: A. TABASSI PAGE: 61 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS					SHOWS: FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
1550-1555	10	Sandstone as above with tr dull orange brn mineral fluor	0.8	155	tr.				
	50	Claystone as above	2.6	500	13	tr.			
	40	Siltstone as above							
1555-1560	10	Sandstone as above with tr mineral fluor as above	1.2	241	7				
	50	Claystone as above							
	40	Siltstone as above							
1560-1565	20	Sandstone as above with tr mineral fluor as above	1.5	294	5				
	50	Claystone as above partly soft & disp.							
	30	Siltstone as above							
1565-1570	25	Sandstone as above with tr-5% mineral fluor as above	2.0	400	9	tr.			
	50	Claystone as above, partly soft & disp.							
	25	Siltstone as above							
1570-1575	20	Sandstone as above, with tr-5% mineral fluor as above							
	50	Claystone as above, partly soft & disp.							
	25	Siltstone as above							
1570-1575	20	Sandstone as above, with tr-5% mineral fluor as above							
	50	Claystone as above, partly soft & disp.							
	30	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 01-01-90 GEOLOGIST: A. TABASSI PAGE: 62 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
1575-1580	25	Sandstone as above with tr-5% mineral flour as above, lt brn sandstone has mod strong calc cmt	1.6	156	tr	tr			
	50	Claystone as above partly soft and disp.							
	25	Siltstone as above							
1580-1585	50	Sandstone generally as above, dom loose-friable, dom med, well sorted with apparent very disp. arg. mtx. (no mtx. in the sample) V.good vis Ø							
	40	Claystone as above, partly soft and disp							
	10	Siltstone as above							
1585-1590	70	Sandstone as above,the lt. brn. sandstone has mod. strong calc. cmt. (possibly responsible for slower drilling within the interval) with tr-5% mineral fluor	2.1	410	7	tr			
	30	Claystone as above, dom. soft of disp.							
1590-1595	100	Sandstone generally as above, clear - V lt. gry, v occ lt. brn, unconsolidated to friable, lt. brn. Sst. firm-hd, dom. med. occ f, v rarely c, SA-SR, mod. sorted qtz, com. white-lt gry arg mtx, disp, (matrix is easily washed away), v rare weak calc. cmt. mod. strong in lt brn. sandstone, tr-rare lithics,	4.0	790	31	tr			

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 01-01-90 GEOLOGIST: A. TABASSI PAGE: 63 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
		med green gry, rare lt and med pink and med red garnet, tr biotite and muscovite very good vis Ø, tr-5% dull orange brn. mineral fluor.							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 02-01-90 GEOLOGIST: A. TABASSI PAGE: 64 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
1595-1600	100	Sandstone as above	4.0	790	31	tr			
1600-1605	50	Sandstone as above, c grains become more frequent, min fluor as above	0.8	130	3	tr			
	40	Claystone as above, dom soft and disp.							
	10	Siltstone as above							
1605-1610	35	Sandstone as above, c grains more frequent, min fluor as above							
	55	Claystone as above dom soft and disp.							
	10	Siltstone as above							
1610-1615	50	Sandstone as above, C grains more frequent, min fluor as above	2.2	420	8	tr			
	50	Claystone as above, dom soft and disp.							
	tr	Siltstone as above							
1615-1620	40	Sandstone as above, C grains more frequent, min fluor as above	0.8						
	60	Claystone a above, dom soft and disp.							
1620-1625	70	Sandstone as above, C grains more frequent, min fluor as above	0.8						
	30	Claystone as above, occ soft and disp.							
	tr	Coal and Carbonaceous claystone as above							
1625-1630	70	Sandstone as above, occ dom fine, firm, mod strong calc. cmt., with occ C-VC loose grains (disp. clay mtx. is possibly washed),	2.9	550	9	tr			

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 02-01-90 GEOLOGIST: A. TABASSI PAGE: 65 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
		lt. brn. sandstone with mod. strong-strong calc. cmt., mod. to occ good vis Ø, tr-5% dull orange brn mineral fluor							
	25	Claystone as above, occ soft and disp.							
	5	Siltstone as above							
1635-1640	90	Sandstone as above	1.0	190	5	tr			
	10	Claystone as above							
1640-1645	90	Sandstone as above	0.9	177	5	tr			
	10	Claystone as above							
1645-1650	10	Sandstone as above	1.2	221	5	tr			
	70	Claystone as above							
	20	Siltstone as above							
1650-1655	10	Sandstone as above	1.3	261	7	tr			
	60	Claystone as above							
	30	Siltstone as above							
1655-1660	10	Sandstone as above	3.7	699	20	tr			
	60	Claystone as above							
	30	Siltstone as above							
1660-1665	10	Sandstone as above	4.6	822	20	tr			

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 02-01-90 GEOLOGIST: A. TABASSI PAGE: 66 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
	60	Claystone as above							
	30	Siltstone as above							
1665-1670	70	Claystone as above							
	30	Siltstone as above							
1670-1675	80	Claystone as above	1.2	221	5	tr			
	20	Siltstone as above							
1675-1680	70	Claystone as above							
	30	Siltstone as above							
		P.O.O.H. to change bit @ 1683 m (test B.O.P.s)							
1680-1685	40	Claystone as above, med-dk gry, occ med. brn. gry and med. green gry, dom. firm, occ. hd., rarely soft & disp, blocky, subfis-fis, rare micaceous, occ com carb, com silty in part, grading and/or intebd/interlam with;	0.4	66	tr				
	60	Siltstone as above, med-dk gry, occ lt green gry, rarely med brn gry, soft to firm, hd in part, block and subfis in part, com micaceous and carbonaceous, interlam with minor:							
	tr	Coal and carbonaceous claystone as above							
1685-1690	40	Claystone as above	0.3	63	tr				

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 02-01-90 GEOLOGIST: A. TABASSI PAGE: 67 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	60	Siltstone as above							
1690-1695	40	Claystone as above	0.35	69	tr				
	55	Siltstone as above							
	5	Sandstone, lt-med gry, occ lt green gry, firm, friable in part, vf-f, dom f, SA-SR, mod-well sorted qtz, abundant white kaolinitic and lt gry arg mtx, disp in part, tr-com lithics including partially altered feldspar, tr-com mica (biotite and Muscovite), v rare-nil med red garnet, poor vis Ø							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 03-01-90 GEOLOGIST: A. TABASSI PAGE: 68 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
1695-1700	40	Claystone as above, drilling break @ 1699.5m	1.2	248	4				
	55	Siltstone as above, circulated return @ 1702.5m no shows							
	5	Sandstone as above							
1700-1705	80	Sandstone clear-trans, milky-off white in part, occ lt brn gry ease-firm dom med occ C, SA-SR, mod sorted qtz, tr-com white-lt gry mtx, disp tr calc cmt, tr lithics, v rare lt & med pink and med red garnet, good vis Ø	1.2						
	10	Claystone as above							
	10	Siltstone as above							
1705-1710	40	Sandstone as above	0.8	158	5	tr			
	30	Claystone as above							
	30	Siltstone as above							
1710-1715	10	Sandstone as above	0.9	170	5	tr			
	40	Claystone as above							
	50	Siltstone as above							
1715-1720	10	Sandstone as above	1.2	209	5	tr			
	30	Claystone as above							
	60	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 03-01-90 GEOLOGIST: A. TABASSI PAGE: 69 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
		Drilling break @ 1724.5m							
		Circulated return @ 1727.5m no shows							
1720-1725	60	Sandstone as above	2.9	550	12	tr			
	20	Claystone as above							
	20	Siltstone as above							
	tr	Coal as above							
1725-1730	30	Sandstone as above	0.8	156	tr				
	30	Claystone as above							
	40	Siltstone as above							
1730-1735	60	Sandstone as above	1.0	179	4				
	20	Claystone as above							
	20	Siltstone as above							
1735-1740	30	Sandstone as above dom firm	1.2	225	7	tr			
	30	Claystone as above							
	40	Siltstone as above							
1740-1745	60	Sandstone as above, dom med - c	4.1	788	17	tr			
	30	Claystone as above							
	10	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 03-01-90 GEOLOGIST: A. TABASSI PAGE: 70 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
1745-1750	40	Sandstone as above	2.0	417	9	tr			
	30	Claystone as above							
	30	Siltstone as above							
1750-1755	10	Sandstone as above	1.0	179	4				
	40	Claystone as above							
	50	Siltstone as above							
		Drilling Break @ 1754.4m							
		Circulated Return @ 1757.0 m No Shows							
1755-1760	90	Sandstone as above, generally as above, dom med-C, dom firm, with med strong calc cmt in part fair occ good vis Ø	1.0	185	5				
	5	Claystone as above							
	5	Siltstone as above							
1760-1765	80	Sandstone as above	2.0	380	5				
	10	Claystone as above							
	10	Siltstone as above							
1765-1770	100	Sandstone as above, clear-lt gry, dom loose, dom med-C, good vis 0	1.4	271	5				
1770-1775	100	Sandstone as above,clear-lt gry,dom loose,dom med-C,good vis Ø	2.2	427	7				

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 03-01-90 GEOLOGIST: A. TABASSI PAGE: 71 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
1775-1790	100	Sandstone as above,clear-lt gry,dom loose,dom med-C,good vis O	1.8	354	7				
1780-1785	100	Sandstone as above,clear-lt gry,dom loose,dom med-C,fair-good vis Ø	1.2	238	5				
1785-1790	100	Sandstone as above,clear-lt gry,dom loose,dom med-C,good vis O	2.1	410	6	tr			
1790-1795	100	Sandstone as above,clear-lt gry,dom loose,dom med-C,good vis O	2.2	423	6	tr			
1795-1800	90	Sandstone as above,clear-lt gry,dom loose,dom med-C,fair-good vis Ø	0.7	127	3				
	10	Claystone as above							
	tr	Siltstone as above							
1800-1805	40	Sandstone as above	0.8	127	3				
	30	Claystone as above							
	30	Siltstone as above							
1805-1810	10	Sandstone as above	1.0	180	5	tr			
	40	Claystone as above							
	50	Siltstone as above							
1810-1815	10	Sandstone as above	0.8	150	4	tr			
	50	Claystone as above, hd in part							
	40	Siltstone as above, hd in part							

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS: TOTAL	C1	C2	C3	C4	FLUOR: NAT.	CUT
1815-1820	60	Claystone as above, hd in part	1.1	224	7	tr			
	40	Siltstone as above, hd in part							
1820-1825	70	Claystone as above, hd in part	1.2	226	7	tr			
	30	Siltstone as above, hd in part							
1825-1830	60	Claystone as above, hd in part	2.9	558	10				
	40	Siltstone as above, hd in part							
1830-1835	90	Sandstone as above, dom f-med, friable, good vis Ø	2.4						
	10	Claystone as above							
	tr	Siltstone as above							
		DRILLING BREAK @ 1830.5m							
		CIRCULATED RETURN @ 1833.0m NO SHOW							
1835-1840	40	Sandstone as above	0.9	170	tr	tr			
	30	Claystone as above							
	30	Siltstone as above							
1840-1845	90	Sandstone as above, dom f-med, friable, good vis Ø	0.9						
	10	Claystone as above							
1845-1850	40	Sandstone as above	1.8	292	7	tr			
	50	Claystone as above							

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 04-01-90 GEOLOGIST: A. TABASSI PAGE: 73 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
	10	Siltstone as above							
1850-1855	10	Sandstone as above	1.4						
	50	Claystone as above							
	40	Siltstone as above							
	tr	Coal as above							
1855-1860	60	Claystone as above	0.8	156	tr	tr			
	40	Siltstone as above							
1860-1865	50	Claystone as above	1.6	317	6	tr			
	50	Siltstone as above, occ grading into v f sandstone in part							
1865-1870	40	Sandstone as above	3.8	735	11	tr			
	30	Claystone as above							
	30	Siltstone as above							
1870-1875	100	Sandstone generally as above, dom loose, dom med-c dom SR, no apparent matrix (the possible kaolinitic clay mtx is disp and washed away), very good vis Ø	3.2	629	10	tr			
1875-1880	80	Sandstone as above, dom friable - firm with tr calc cmt, fair vis O	1	198	5	tr			
	10	Claystone as above							

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	10	Siltstone as above							
1880-1885	30	Sandstone as above, firm-hd, dom f-med, tr-com mod strong calc cmt, far-poor vis 0	2.4	450	11	tr			
	40	Claystone as above, dom firm, hd in part							
	30	Siltstone as above, dom firm, hd in part							
1885-1890	10	Sandstone as above	1.3	251	5	tr			
	60	Claystone as above							
	30	Siltstone as above							
1890-1895	tr	Sandstone as above	2.4	463	10	tr			
	70	Claystone as above							
	30	Siltstone as above							
	tr	Coal and Carbonaceous claystone as above							
1895-1900	tr	Sandstone as above	2.5	477	13	tr			
	60	Claystone as above							
	30	Siltstone as above							
1900-1905	50	Claystone as above, occ hd in part	1.1	211	5				
	50	Siltstone as above, grading into hd vf sandstone in part							
1905-1910	10	Sandstone generally as above,dom f-med,friable-hd,poor vis Ø	2.2	424	10	tr			

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DEPTH (m)	%	SAMPLE DESCRIPTION	GAS TOTAL	GAS C1	GAS C2	GAS C3	GAS C4	FLUOR NAT.	FLUOR CUT
	40	Claystone as above, occ hd in part.							
	50	Siltstone as above, grading into hd vf sandstone in part							
1910-1915	10	Sandstone as above, dom f-med, friable - hd, v hd in part poor poor vis Ø	1.5	291	6	tr			
	40	Claystone as above, occ hd in part							
	50	Siltstone as above, grading into vh vf sandstone in part							
1915-1920	10	Sandstone as above, dom f-med, v rarely c, friable - hd, poor occ fair vis Ø							
	40	Claystone as above, occ hd in part							
	50	Siltstone as above, grading into hd vf sandstone in part							
1920-1925	80	Sandstone as above, f-c, dom med, loose - friable good vis Ø	3.5	680	13	tr			
	10	Claystone as above							
	10	Siltstone as above							
		Drilling Break @ 1923.0m							
		Circulated Return @ 1925.5m No Shows							
1925-1930	60	Sandstone as above	0.9	170	6	tr			
	10	Claystone as above							
	30	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
1930-1935	50	Sandstone as above	1.2	228	6	tr			
	20	Claystone as above							
	30	Siltstone as above							
1935-1940	tr	Sandstone as above	1.5	270	8	tr			
	40	Claystone as above							
	60	Siltstone as above							
1945-1950	10	Sandstone as above	2.3	430	10	tr	tr		
	40	Claystone as above							
	50	Siltstone as above							
	tr	Coal and carbonaceous claystone as above							
1950-1955	30	Sandstone as above	1.3						
	20	Claystone as above							
	50	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
1955-1960	10	Sandstone as above, com white - lt gry arg mtx & com calc cmt, poor vis Ø	1.5	264	8	tr	tr		
	30	Claystone as above							
	60	Siltstone as above							
1960-1965	70	Sandstone as above, dom loose, dom med-c, in part with no apparent mtx (disp and washed way?) good - v good vis Ø	3.9	744	14	3	tr		
	10	Claystone as above							
	20	Siltstone as above							
		Drilling Break @ 1963.0m							
		Circulated returns @ 1965.0m No Shows							
		(The presence of C_3 and C_4, increase in background gas and connection gas together with the convincing drilling break warranted the circulation of returns)							
1965-1970	40	Sandstone as above	1.5	283	7	2	tr		
	20	Claystone as above							
	40	Siltstone as above							
1970-1975	10	Sandstone as above	1.6	299	8	3	tr		
	30	Claystone as above							

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
	60	Siltstone as above							
1975-1980	80	Sandstone generally as above, off white lt gry, med gry in part, occ clear loose - friable, firm in part, f-med, dom med, occ C, SA-SR, dom SA mod sorted qtz, clear to frosty, com-abundant kaolinitic clay mtx, (mtx of loose sand is washed away), tr-occ com calc cmt, occ mod strong, tr med green of med gry lithics, tr partially altered feldspar tr micas v rare lt & med pink & med red garnet, fair-good occ v good vis Ø	4.1.	782	15	3	tr		
	10	Claystone as above							
	10	Siltstone as above							
1980-1985	90	Sandstone as above	1.4	260	8	2	tr		
	5	Claystone as above							
	5	Siltstone as above							
1985-1990	90	Sandstone as above	1.1	210	6	2	tr		
	5	Claystone as above							
	5	Siltstone as above							
1990-1995	40	Sandstone as above	1.3	238	7	2	tr		

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
	30	Claystone as above							
	30	Siltstone as above							
1995-2000	10	Sandstone as above	1.4	257	6	2	tr		
	50	Claystone generally as above, med-dk gry, med-dk brn gry, dom firm, occ soft & disp, rarely hd, block & subfis in part, tr-com micaceous rarely carbonaceous, moderately silty and in part grading into;							
	40	Siltstone generally as above,med-dk gry,med-dk brn gry speckled in part, firm, occ hd, blocky, subfis in part. com micaceous, rarely carbonaceous com to abundantly argillaceous, in place grading into vf hd sandstone interlam with;							
	tr	Coal and carbonaceous claystone as above							
2000-2005	60	Sandstone as above	3.4	641	15	3	tr		
	20	Claystone as above							
	20	Siltstone as above							
2005-2010	80	Sandstone as above	1.8	330	9	3	tr		
	10	Claystone as above							
	10	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
2010-2015	60	Sandstone as above	3.3	630	13	2	tr		
	20	Claystone as above							
	20	Siltstone as above							
2015-2020	20	Sandstone as above	1.3	249	8	2	tr		
	50	Claystone as above							
	30	Siltstone as above							
2020-2025	30	Sandstone as above	1.5	278	8	3	tr		
	40	Claystone as above							
	30	Siltstone as above							
2025-2030	10	Sandstone as above	1.2	228	6	1	tr		
	50	Claystone as above							
	40	Siltstone as above							
2030-2035	10	Sandstone as above	2.0	370	11	3	tr		
	50	Claystone as above							
	40	Siltstone as above							
2035-2040	20	Sandstone as above, dom firm, dom med	2.2	414	13	4	tr		
	40	Claystone as above							
	40	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
2040-2045	20	Sandstone as above, dom firm, dom med	1.6	243	9	3	tr		
	40	Claystone as above							
	40	Siltstone as above							
2045-2050	10	Sandstone as above	1.8	344	10	3	tr		
	40	Claystone as above							
	50	Siltstone as above							
2050-2055	tr	Sandstone as above	1.8						
	50	Claystone as above							
	50	Siltstone as above							
2055-2060	50	Sandstone as above, dom firm, dom med	3.0						
	30	Claystone as above							
	20	Siltstone as above							
2060-2065	70	Sandstone as above, dom firm, dom med	4.5	836	20	4	tr		
	20	Claystone as above							
	10	Siltstone as above							
2065-2070	50	Sandstone as above	1.8						
	30	Claystone as above							
	20	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
2070-2075	40	Sandstone as above	1.7	314	10	3	tr		
	30	Claystone as above							
	30	Siltstone as above							
2075-2080	70	Sandstone as above, dom firm with com kaolinitic clay mtx, tr-com mod strong calc cmt, fair vis Ø	2.0						
	20	Claystone as above							
	10	Siltstone as above							
2080-2085	60	Sandstone as above, dom firm, com kaolinitic clay mtx, tr-com mod strong calc cmt, fair vis Ø	1.6	294	10	3	tr		
	20	Claystone as above							
	20	Siltstone as above							
2085-2090	40	Sandstone as above, dom firm com Kaolinitic clay mtx, tr-com mod strong calc cmt, fair vis Ø	2	374	12	3	tr		
	30	Claystone as above							
	30	Siltstone as above							

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS: GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
2090-2095	60	Sandstone as above, as above, firm in part fair-good vis Ø	2.6	494	14	3	tr		
	15	Claystone as above							
	25	Siltstone as above							
2095-2100	90	Sandstone as above, in part dom firm, fair-good vis Ø	5.6	1048	27	6	tr		
	5	Claystone as above							
	5	Siltstone as above							
2100-2105	80	Sandstone as above, dom good vis Ø	1.5	274	9	3	tr		
	10	Claystone as above							
	10	Siltstone as above							
2105-2110	90	Sandstone as above, f-vc, dom med-c, dom loose v good vis Ø	4.8	906	21	4	tr		
	5	Claystone as above							
	5	Siltstone as above							
2110-2115	80	Sandstone as above, as above, f-vc, dom med-c, dom SR, dom loose, v good Ø	2.4	445	13	3	tr		
	10	Claystone as above							
	10	Siltstone as above							
2115-2120	80	Sandstone as above, f-c, dom med, dom loose, in part with mod strong calc cmt, good - v good, occ fair vis Ø	6.8	1269	32	9	tr		

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 06-01-90 GEOLOGIST: A. TABASSI PAGE: 84 OF			SHOWS						
			GAS					FLUOR	
DEPTH (m)	%	SAMPLE DESCRIPTION	TOTAL	C1	C2	C3	C4	NAT.	CUT
	10	Claystone as above							
	10	Siltstone as above							
2120-2125	100	Sandstone as above, dom loose, med to vc, dom C, poorly sorted vis Ø	4.8	905	20	5	tr		
2120-2125	100	Sandstone as above, dom loose, med to vc, dom C, poorly sorted vis Ø	4.8	905	20	5	tr		
2125-2130	100	Sandstone as above, dom loose, med - VC, dom C, poorly sorted good vis Ø	6.8	1300	23	3	tr		
2130-2135	100	Sandstone as above, dom loose, med - VC, dom C, poorly sorted tr qtz overgrowth, v good vis Ø	6.4	1230	20	3	tr		
2135-2138	100	Sandstone as above, loose, dom med, fairly sorted v good vis Ø "Bit Changed"							
2138-2140	100	Sandstone as above, loose, med - VC, dom C, rare qtz overgrowth, v good vis Ø (claystone and siltstone are possibly caving)	7.5	1420	31	7	tr		
2140-2145	100	Sandstone as above, loose, med - VC, dom C, rare qtz overgrowth, v good vis Ø (some cavings!)	1.8	320	7	tr	tr		
2145-2150	90	Sandstone generally as above, loose, very rare friable -	1.8	320	7	tr	tr		

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
		firm, med-VC,dom C, dom SA, rare qtz overgrowth, v good vis Ø							
	5	Claystone as above							
	5	Siltstone as above							
2150-2155	95	Sandstone as above, loose, med-VC, dom C, dom SA, arg in part, rare qtz overgrowth, v good vis Ø	2.9	554	9	tr	tr		
	5	Claystone as above							
2155-2160	100	Sandstone , generally as above, clear, off-white, rarely v lt gry and vlt brn gry, loose, very rarely fri, f - VC, dom C - VC, occ granule A-SA, rarely SR, poorly occ fairly sorted qtz, clear, translucent occ frosty, no apparent mtx (kaolinitic clay mtx easily washed away) rare - v rare multi - coloured metamorphic lithics (including phyllite, chert? quartzite, serpentine (?), garnets, reworked med green shale fragment), rare mica flecks, v rare coal fragments, v rare pyrite, rare qtz overgrowth, some qtz grain has v f dk gry - black inclusions, excellent vis ø	3.3	628	9	tr	tr		
2160-2165	100	Sandstone as above	2.4	424	9	tr	tr		
2165-2170	100	Sandstone as above	3.2	596	10	tr	tr		

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
2170-2175	100	Sandstone as above, granule grains increase with depth, rare calc cmt v good vis Ø	2.5	466	8	tr			
2175-2180	100	Sandstone as above, granule grains increase with depth, rare calc cmt v good vis Ø	1.0	174	5	tr			
2180-2185	100	Sandstone as above, granule grains increase with depth, rare calc cmt v good vis Ø	1.7	314	6	tr			
2185-2190	100	Sandstone as above, granule grains increase with depth, rare calc cmt v good vis Ø	1.5						
2190-2195	100	Sandstone as above, granule grains increase with depth, rare calc cmt v good vis Ø	3.5	668	12	tr			
2195-2200	100	Sandstone as above, dom VC, tr-com granule grains, rare calc cmt v good vis Ø	1.1	196	4	tr			
2200-2205	100	Sandstone as above, dom VC, tr-com granule grains, rare calc cmt v good vis Ø	1.8	343	6	tr			
2205-2210	100	Sandstone as above, dom VC, tr-com granule grains, rare calc cmt v good vis Ø	2.4	458	7	tr			

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
2210-2215	100	Sandstone as above, dom VC, tr-com granule grains, rare calc cmt v good vis Ø	3.7	710	10	tr			
2215-2220	100	Sandstone as above, dom VC, tr-com granule grains, rare calc cmt v good vis Ø	1.0						
2220-2225	100	Sandstone as above, dom VC, tr-com granule grains, rare calc cmt v good vis Ø	1.3						
2225-2230	100	Sandstone as above, dom VC, tr- granule grain, rare calc cmt v good vis Ø	1.8	345	5				
2230-2235	100	Sandstone as above, dom VC, tr- granule grain, rare calc cmt v good vis Ø	1.4						
2235-2240	100	Sandstone as above, dom VC, tr- granule grain, rare calc cmt v good vis Ø	1.1	208	4				
2240-2245	100	Sandstone as above, dom C, rare granule grains, rare calc cmt v good vis Ø	1.4						
2245-2250	100	Sandstone as above, dom C, rare granule grains, rare calc cmt v good vis Ø	2.6	496	7	tr			
2250-2255	100	Sandstone as above, dom C, rare granule grains, rare calc cmt v good vis Ø	1.2						

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
2255-2260	100	Sandstone as above, dom C, rare granule, rare calc cmt in part, v good vis Ø	1.2	224	4	tr			
2260-2265	100	Sandstone as above, dom C, rare granule, rare calc cmt in part, v good vis Ø	1.7	318	5	tr			
2265-2270	100	Sandstone as above, dom C, rare granule, rare calc cmt in part, v good vis Ø	.7	146	3	tr			
2270-2275	100	Sandstone as above, dom C, rare granule, v good vis Ø	1.6	310	7	tr			
2275-2280	100	Sandstone as above, dom C, rare granule, v good vis Ø	2.4						
2280-2285	100	Sandstone as above, dom C, rare granule, v good vis Ø	.7						
2285-2290	80	Sandstone as above, rare granule, v good vis O (including some cavings?)	1.4	265	7	tr			
	10	Claystone lt green, lt green gry, med-dk gry, med-dk brn gry in part, firm-hd, occ vh, rarely soft & disp. blocky subfis - fis, com carb in part tr mica in part, mod silty and in part grading into and/or interlam with;							
	10	Siltstone lt-med green, med-dk gry, med brn gry in part, speckled in part, firm-hd,occ v hd, dom blocky, tr mica flecks & streaks, tr-mod carb in part, mod arg in part, rarely	.8	157	3	tr			

GAS AND FUEL EXPLORATION N.L.

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DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
		grading into vf sandstone							
2290-2295	80	Sandstone as above							
	10	Claystone as above							
	10	Siltstone as above							
2295-2300	80	Sandstone as above	2.4	460	8	tr			
	10	Claystone							
	10	Siltstone							
2300-2305	100	Sandstone as above	3.2	620	9	tr			
2305-2310	100	Sandstone as above	1.9	360	8	tr			
2310-2315	100	Sandstone as above	3.6	710	11	tr			
2315-2320	100	Sandstone as above	1.0	195	3				
2320-2325	100	Sandstone as above	1.4	261	5	tr			
2325-2330	100	Sandstone as above, tr med strong silliceous cmt good vis Ø	3.3	640	10	tr			
2330-2335	100	Sandstone as above, tr med strong silliceous cmt good vis Ø	1.0	204	4	tr			
2335-2340	100	Sandstone as above, tr med-c, tr dom strong sil cmt,good vis Ø	3.2	620	11	tr			
2340-2344	100	Sandstone as above, dom med-c, v good vis Ø	.7	129	tr	tr			
		"CASTERTON FORMATION"							
2344-2350	30	Claystone med-dk brn gry, med gry, dk gry in part, firm-hd, soft	.6	99	3	tr			

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 07-01-90 GEOLOGIST: A. TABASSI PAGE: 90 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS GAS TOTAL	C1	C2	C3	C4	FLUOR NAT.	CUT
		and disp in part, blocky & subfis in part, speckled in part, com micaceous, tr-com carbonaceous, mod silty, in part grading into and/or interlam with;							
	70	Siltstone, med-dk gry,med brn gry, occ lt brn gry, r rarely med green gry, firm-hd, occ v hd, rarely soft, dom blocky, subfis in part, com micaceous, com carb flecks & streaks, trace fine partially altered feldspar, tr fine lithics, com arg, tr-com vf qtz sand grains, in part grading into minor vf, hd sandstone, v lt brn gry, v slightly calc cmt, poor-no vis 0							
	?	Sandstone as above (possibly all caving?)							
2350-2355	25	Claystone as above	.6	45	5	tr			
	75	Siltstone as above							
2355-2360	20	Claystone as above	.7	120	4	tr			
	80	Siltstone as above							
2365-2370	20	Claystone as above	1.0	168	6	3			
	80	Siltstone as above							
2370-2375	10	Claystone as above	1.0	16	7	3			

GAS AND FUEL EXPLORATION N.L.

WELL: McEACHERN NO.1 DATE: 07-01-90 GEOLOGIST: A. TABASSI PAGE: 91 OF

DEPTH (m)	%	SAMPLE DESCRIPTION	SHOWS						
			GAS					FLUOR	
			TOTAL	C1	C2	C3	C4	NAT.	CUT
	90	Siltstone							
2375-2380	10	Claystone as above	1.2	198	10	4			
	75	Siltstone as above							
2380-2385	100	Siltstone as above	1.1	167	7	4			

TOTAL DEPTH OF 2,384.0 METRES

WAS REACHED @ 0200 HOURS

MONDAY, JANUARY 8TH, 1990

5. CORE DESCRIPTION

GAS AND FUEL EXPLORATION N.L.

SIDEWALL CORE DESCRIPTIONS

WELL McEACHERN NO. 1 **DATE:** 10 / 1 / 1990

DEPTH (metres)	RECOVERY (centimetres)	ROCK TYPE	COLOUR	CLAY SIZE %: CLAY MINERALS	CLAY SIZE %: MICRITE	SILT SIZE %: QUARTZ	SILT SIZE %: CALCITE	GRAINS TYPE & %: QUARTZ	GRAINS TYPE & %: SKELETAL	GRAINS TYPE & %: CALCITE	GRAINS SIZE: RANGE	GRAINS SIZE: DOMINANT	CEMENT: TYPE & %	CEMENT: TYPE & %	Diagenesis: TYPE	Diagenesis: %	Diagenesis: TEXTURE	ROUNDING	SORTING	HARDNESS	POROSITY TYPE & %	ACCESSORIES: TYPE & %	ACCESSORIES: TYPE & %	ACCESSORIES: TYPE & %	HYDROCARBONS	SEDIMENTARY STRUCTURES	SUPPLEMENTARY DATA
2378	0	----																									
2366.6	0	----																									
2354.6	0	----																									
2344.6	0	----																									
2330.6	2.7	Sandstone	off wh/lt grey	10	-	-	-	90	-	-	f-c	M	-	-				SA	M	VS	g15	Lf tr	Hm tr	-	-	-	tr garnets
2259.6	1.0	" "	" "	7	-	-	-	93	-	-	f-c	M															
2226.6	1.7	" "	Lt-med grey	10	-	-	-	85	-	-	vf-c	M	Q 5%	-				SA	P	H	g 5	Lf tr	Hm tr	-	-	-	tr garnets
2202.6	1.0	" "	Lt-med grey-brn grey	10	-	-	-	90	-	-	vf-m	M	-	-				SA	P	S	g10	Lf tr	Hm tr	-	-	-	tr garnet
2148.6	2.0	" "	off wh/lt grey	10	-	-	-	90	-	-	f-vc		-	-				SA SR	P	M	g15	Lf tr	Hm tr	-	-	-	tr garnet
2116.6	0	------																									

ABBREVIATIONS

GRAIN SIZE
- VF Very Fine
- F Fine
- M Medium
- C Course
- VC Very Course
- G Granule & larger

CEMENT
- Q Silica
- Py Pyrite
- C Calcite
- D Dolomite
- Sd Siderite

ROUNDING
- R Rounded
- SR Subrounded
- SA Subangular
- A Angular

SORTING
- P Poor
- M Moderate
- W Well
- VW Very Well

HARDNESS
- U Unconsolidated
- VS Very Soft
- S Soft
- M Moderate
- H Hard

POROSITY
- g Intergranular
- v Vugular
- I Intraskeletal

ACCESSORIES
- Py Pyrite
- Mc Mica
- Ch Chert
- Co Lignite/Coal
- Hm Heavy minerals
- Lf Lithic fragments
- Gl Glauconite

GAS AND FUEL EXPLORATION N.L.

SIDEWALL CORE DESCRIPTIONS

WELL McEACHERN NO.1 DATE : 10 / 1 / 1990 PAGE 2 OF 5

DEPTH (metres)	RECOVERY (centimetres)	ROCK TYPE	COLOUR	CLAY SIZE % CLAY MINERALS	CLAY SIZE % MICRITE	SILT SIZE % QUARTZ	SILT SIZE % CALCITE	GRAINS TYPE & % QUARTZ	GRAINS TYPE & % SKELETAL	GRAINS TYPE & % CALCITE	GRAINS SIZE RANGE	GRAINS SIZE DOMINANT	CEMENT TYPE & %	CEMENT TYPE & %	Diagenesis TYPE	Diagenesis %	Diagenesis TEXTURE	ROUNDING	SORTING	HARDNESS	POROSITY TYPE & %	ACCESSORIES TYPE & %	ACCESSORIES TYPE & %	ACCESSORIES TYPE & %	HYDROCARBONS	SEDIMENTARY STRUCTURES	SUPPLEMENTARY DATA
2076.1	0	-																									
2041.6	0	-																									
2023.6	0.7	Sandstone	dk. grey	10	-	10	-	80	-	-	vf	vf	-	-				SR	W	H	g tr	Lf tr	HM tr	-	-	-	rare garnet
1992.6	0	-																									
1946.1	0.5	Claystone	dk grey	95	-	5	-	-	-	-	-	-	-	-				-	-	H	-	Lf tr	-	-	-	-	blocky in part
1924.6	0	-																									
1895.6	0	-																									
1857.6	3.0	Claystone	v dk grey	100	-	-	-	-	-	-	-	-	-	-	-	-		-	-	VH	-	Lf tr	-	-	-	-	blocky and subfis
1824.6	0	-																									
1801.6	1.5	Claystone	dk-vdk grey	100	-	tr	-	-	-	-	-	-	-	-						SM	-	Lf tr	-	-	-	-	blocky in part

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GAS AND FUEL EXPLORATION N.L.

SIDEWALL CORE DESCRIPTIONS

WELL McEACHERN NO. 1 DATE : 10 / 1 / 1990

DEPTH (metres)	RECOVERY (centimetres)	ROCK TYPE	COLOUR	CLAY SIZE %		SILT SIZE %		GRAINS TYPE & %			GRAINS SIZE		CEMENT		Diagenesis			ROUNDING	SORTING	HARDNESS	POROSITY TYPE & %	ACCESSORIES			HYDROCARBONS	SEDIMENTARY STRUCTURES	SUPPLEMENTARY DATA
				CLAY MINERALS	MICRITE	QUARTZ	CALCITE	QUARTZ	SKELETAL	CALCITE	RANGE	DOMINANT	TYPE & %	TYPE & %	TYPE	%	TEXTURE					TYPE & %	TYPE & %	TYPE & %			
1796.6	1.0	Sandstone	off wh/lt. grey	10	-	-	-	85	-	-	f.c	M	-	-				SA	P	vs-s	g15	Lf 5	Co tr	Hm tr	-	-	rare garnet/drilling mud invasion
1776.6	1.0	Sandstone	" " " "	10	-	-	-	85	-	-	f.c	M	-	-				SA	P	S	g15	Lf 5	Co tr	Hm tr	-	-	rare garnet
1741.1	0.5	Claystone	dk grey	70	-	25	-	5	-	-	vf	vf	-	-				-	-	M	-	Lf tr	Mc tr	Hm tr	-	-	mod. carb. vr garnet
1674.6	2.5	"	dk grey	95	-	5	-	-	-	-	-	-	-	-				-	-	M-H	-	Lf tr	Mc tr	-	-	-	tr. carb. det. blocky in part
1649.1	1.5	"	dk grey - dk br, grey	95	-	5	-	-	-	-	-	-	-	-				-	-	S-M	-	Mc tr	-	-	-	-	tr. carb. det. blocky in part
1607.6	2.0	"	dk-vdk grey	95	-	5	-	-	-	-	-	-	-	-				-	-	M-H	-	Mc tr	-	L d tr	-	-	tr. carb. det. blocky in part
1593.6	1.5	Sandstone	off wh/lt grey	10	-	5	-	80	-	-	vf-c	M	-	-				SA	P	S M	g15	Lf 5	Hm tr	-	-	-	tr. carb. det. blocky in part
1573.6	3.0	Claystone	dk grey - dk br, grey	90	-	10	-	-	-	-	-	-	-	-				-	-	M	-	Co tr	Mc tr	-	-	-	Carb blocky
1545.6	2.0	Sandstone	off wh/lt grey	10	-	tr	-	85	-	-	vf-c	M	-	-				SA	P	S	g10	Lf 5	Hm tr	Co tr	-	-	tr garnet
1523.6	2.5	Claystone	v dk grey - br. grey	100	-	-	-	-	-	-	-	-	-	-				-	-	H	-	-	-	-	-	-	very carb., fissile

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GAS AND FUEL EXPLORATION N.L.

SIDEWALL CORE DESCRIPTIONS

WELL McEACHERN NO.1 **DATE :** 10 / 1 / 1990 **PAGE** 4 **OF** 5

DEPTH (metres)	RECOVERY (centimetres)	ROCK TYPE	COLOUR	CLAY SIZE %: CLAY MINERALS	CLAY SIZE %: MICRITE	SILT SIZE %: QUARTZ	SILT SIZE %: CALCITE	GRAINS TYPE & %: QUARTZ	GRAINS TYPE & %: SKELETAL	GRAINS TYPE & %: CALCITE	GRAINS SIZE: RANGE	GRAINS SIZE: DOMINANT	CEMENT: TYPE & %	CEMENT: TYPE & %	Diagenesis: TYPE	Diagenesis: %	Diagenesis: TEXTURE	ROUNDING	SORTING	HARDNESS	POROSITY TYPE & %	ACCESSORIES: TYPE & %	ACCESSORIES: TYPE & %	ACCESSORIES: TYPE & %	HYDROCARBONS	SEDIMENTARY STRUCTURES	SUPPLEMENTARY DATA
1504.6	3.0	Claystone	dk grey	100	-	tr	-	tr	-	-	-	-	-	-				-	-	M-H	-	Lf tr	-	-	-	-	blocky, mod carb.
1461.6	3.0	"	" "	100	-	tr	-	-	-	-	-	-	-	-				-	-	M	-	-	-	-	-	-	blocky, mod carb.
1435.1	0	-																									
1414.1	3.0	Claystone	dk grey	95	-	5	-	-	-	-	-	-	-	-				-	-	M	-	Mc tr	-	-	-	-	blocky, mod carb.
1384.1	0	-																									
1364.6	2.5	Claystone	med brn	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	) coal is soft-firm) blocky in part, arg. in
		Coal	black-v dk brn	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	C_o50	-	-	-	-	) part, rarely sub conch frac
1293.6	0	-																									
1289.5	3.0	Claystone	med-dk grey	100	-	tr	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	Mc tr	-	-	-	-	tr cab, blocky in part
1174.5	3.5	Claystone	med gry, med green gry	100	-	tr	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	Mc tr	-	-	-	-	" " " " "

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GAS AND FUEL EXPLORATION N.L.

SIDEWALL CORE DESCRIPTIONS

WELL McEACHERN NO. ! DATE : 10 / 1 / 1990 PAGE 5 OF 5

DEPTH (metres)	RECOVERY (centimetres)	ROCK TYPE	COLOUR	CLAY SIZE % CLAY MINERALS	CLAY SIZE % MICRITE	SILT SIZE % QUARTZ	SILT SIZE % CALCITE	GRAINS TYPE & % QUARTZ	GRAINS TYPE & % SKELETAL	GRAINS TYPE & % CALCITE	GRAINS SIZE RANGE	GRAINS SIZE DOMINANT	CEMENT TYPE & %	CEMENT TYPE & %	Diagenesis TYPE	Diagenesis %	TEXTURE	ROUNDING	SORTING	HARDNESS	POROSITY TYPE & %	ACCESSORIES TYPE & %	ACCESSORIES TYPE & %	ACCESSORIES TYPE & %	HYDROCARBONS	SEDIMENTARY STRUCTURES	SUPPLEMENTARY DATA
1146.6	3.5	Claystone/ Carb Chyst.	dk grey/dk brn grey	90	-	tr	-	-	-	-	-	-	-	-				-	-	S-M	-	Co10	-	-	-	-	blocky-sub fis. dom carb clay
1113.6	2.0	Siltst/Sst	med grey/med green fewy	20	-	65	-	15	-	-	vf	vf	-	-				SR	W	S	g tr	Lf tr	Mc tr	-	-	-	Siltstone inter lam with Sst.
1048.6	1.5	Siltst/Sst	f-med green grey	5	-	55	-	35	-	-	vf	vf	-	-				SR	W	S	g tr	Lf tr	Mc tr	-	-	-	" " " " "
905.6	1.5	Claystone	med grey/med green grey	95	-	5	-	-	-	-	-	-	-	-				-	-	S-M	-	Lf tr	Mc tr	-	-	-	blocky in part, med carb.
793.1	2.0	Sandstone	med grey/ speckled med green grey	tr	-	10	-	85	-	-	vf	vf	-	-				SR	VW	S	g tr	Lf tr	Mc tr	Co rare	-	-	Lithics dom Volcanogenic
699.6	2.5	"	med green grey	tr	-	10	-	85	-	tr	vf	vf	-	-				SR	VW	S	g tr	Lf tr	Mc tr	Co rare	-	-	" " "
594.6	2.0	Claystone	med green med grey	95	tr	5	-	-	-	-	-	-	-	-				-	-	S-M	-	Lf tr	Mc tr	-	-	-	disp in part, blocky in part mod carb.
504.6	3.2	"	med grey	95	-	5	-	-	-	-	-	-	-	-				-	-	VS-S	-	Lf tr	Mc rare	-	-	-	disp in part, mod carb.
402.6	3.2	Sandstone	Lt-med green grey	5	-	10	-	80	-	-	vf-f	vf	-	-				SR	W	S	g tr	Lf 5	Mc tr	-	-	-	Lithics dom Volcanogenic mod carb.

ABBREVIATIONS

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ROUNDING
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- A Angular

SORTING
- P Poor
- M Moderate
- W Well
- VW Very Well

HARDNESS
- U Unconsolidated
- VS Very Soft
- S Soft
- M Moderate
- H Hard

POROSITY
- g Intergranular
- v Vugular
- i Intraskeletal

ACCESSORIES
- Py Pyrite
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- Ch Chert
- Co Lignite/Coal
- Hm Heavy minerals
- Lf Lithic fragments
- Gl Glauconite

6. VELOCITY SURVEY

6. VELOCITY SURVEY

Velocity Data

WELL VELOCITY SURVEY

McEACHERN #1

PEP 119

VICTORIA

for

GAS & FUEL EXPLORATION N/L

recorded by

VELOCITY DATA PTY LTD

prccessed by

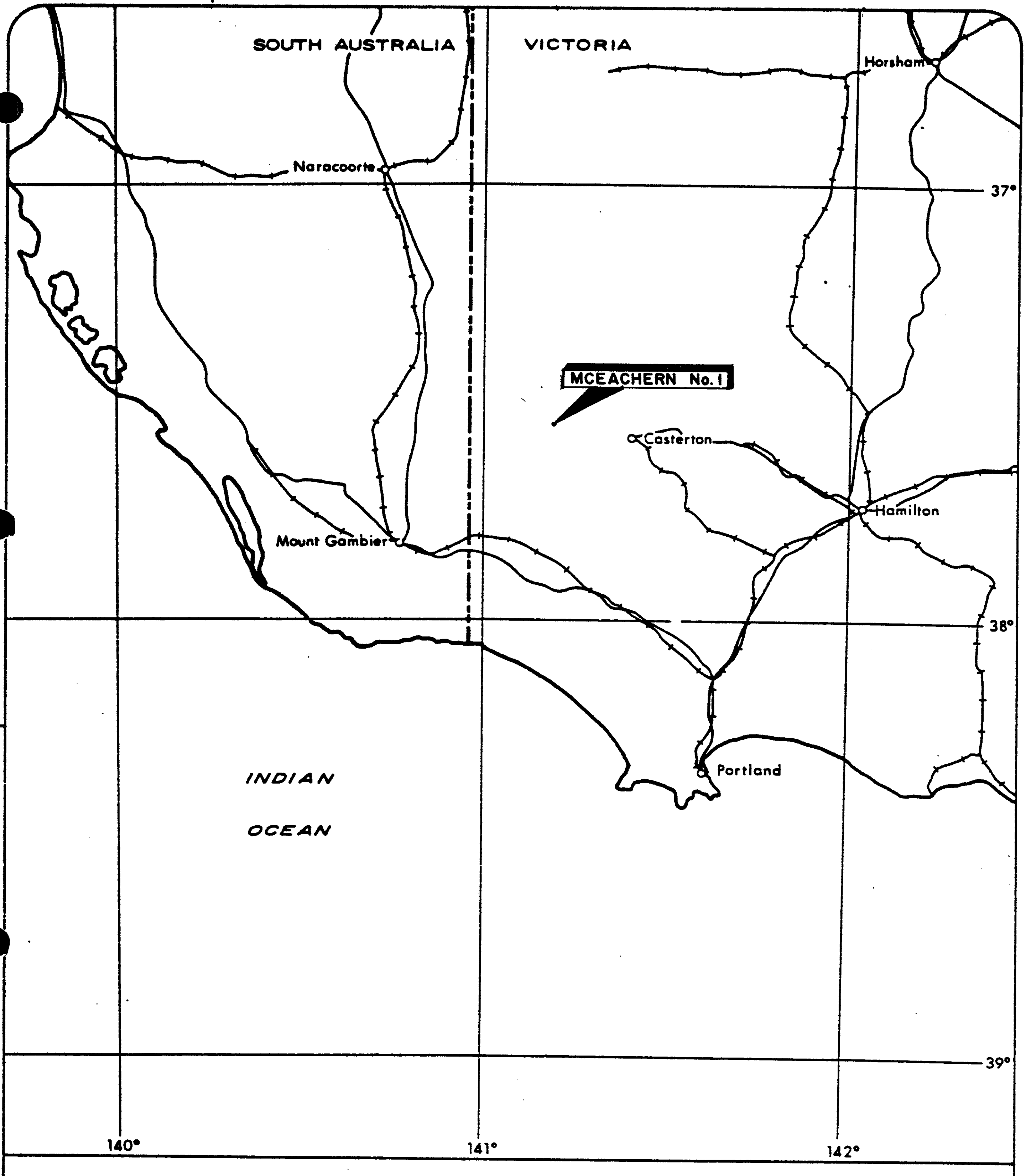
VELSEIS PTY LTD

Integrated Seismic Technologies

Brisbane, Australia

April 12, 1990

CONTENTS



MCEACHERN No. 1

GAS AND FUEL EXPLORATION

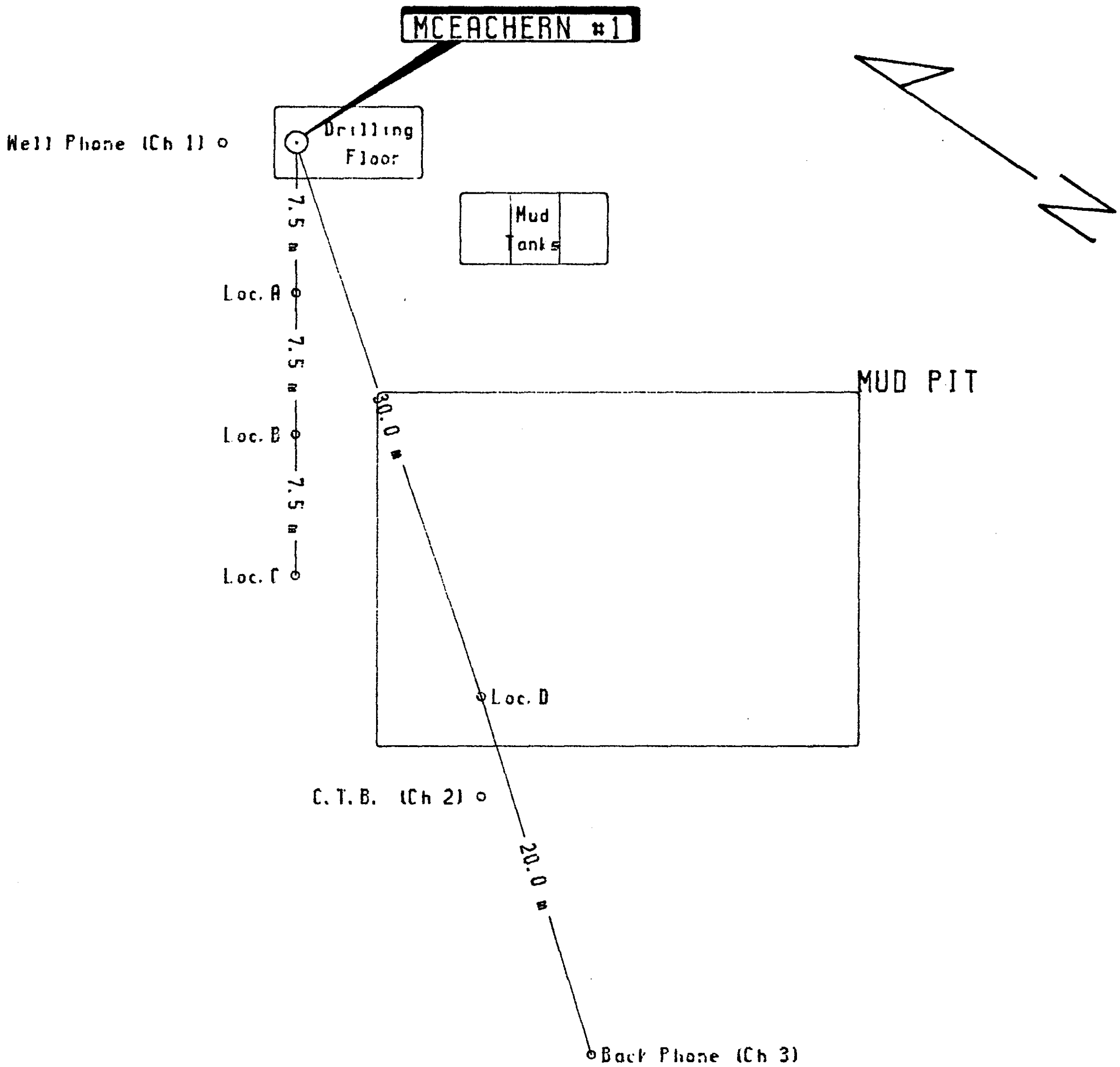
WELL LOCATION MAP

Scale 1: 1250 000 approx. (1 in. = 20 mi.)

0 5 10 20 30 40 50 MILES

0 5 10 20 30 40 50 60 KILOMETRES

Figure 1



MCEACHERN #1

GAS AND FUEL EXPLORATION

SHOT POINT LOCATION SKETCH

Figure 2

SUMMARY

Velocity Data Pty Ltd conducted a velocity survey for Gas and Fuel Exploration N/L in the McEachern No.1 well PEP 119, Victoria , Australia. The survey was carried out on the 9th January 1990.

The results of the survey, which are considered to be reliable, have been used to calibrate the sonic log. The calibrated logs were used to produce synthetic seismograms these are covered in a separate report.

Explosives were used as an energy source with shots being fired in the mud pit.

GENERAL INFORMATION

Name of Well	:	McEachern #1
Location (Figure 1)	:	PEP 119
Coordinates	:	Latitude 037 33' 51"
	:	Longitude 141 11' 26"
Date of Survey	:	9th January 1990.
Wireline Logging	:	Gearhart
Weather	:	Fine
Operational Base	:	Brisbane
Operator	:	N. Delfos
Shooter	:	J. Brown
Client Representative	:	Mr A. Tabassi

EQUIPMENT

Downhole Tool

Veldata Camlock 100 (90 mm) - three conductor model

Sensors:

6 HSI 4.5 Hz 215 ohm, high temperature (300 degrees F) detectors connected in series parallel. Frequency response 8-300 Hz within 3 dB.

Preamplifier:

48 dB fixed gain.
Frequency response 5-200 Hz within 3 dB.

Reference Geophone

Mark Products L1 4.5 Hz

Recording Instrument

VDLS 11/10 software controlled digital recording system utilizing SIE OPA-10 floating point amplifiers for digital recording and SIE OPA-4 amplifiers for analog presentation. The system includes a DEC LSI-11 CPU, twin cassette tape unit and printer.

RECORDING

Energy Source	:	Explosive, AN-60
Shot Location	:	Mud pit
Charge Size	:	0.5 to 2.0 (125 grm) sticks
Average Shot Depth	:	2.0 metres
Average Shot Offset	:	30.0 metres
Recording Geometry	:	Figure 2

Shots were recorded on digital cassette tape. Printouts of the shots used are included with this report. (Enclosure 2)

The sample rate was 1 ms with 0.5 ms sampling over a 200 ms window encompassing the first arrivals. The scale of the graphic display varies with signal strength and is noted on each playout.

The times were picked from the printouts using the numerical value of the signal strength. (Enclosure 2)

PROCESSING

Elevation Data

Elevation of KB	:	81.7 metres above sea level
Elevation of Ground	:	76.4 metres above sea level
Elevation of Seismic Datum	:	0.0 metres above sea level
Depth Surveyed	:	2372.0 metres below KB
Total Depth	:	2384.0 metres below KB
Depth of Casing	:	354.0 metres below KB
Sonic Log Interval	:	354.4 to 2377.5 metres below KB

PROCESSING

Recorded Data

Number of Shots Used	:	32
Number of Levels Recorded	:	23
Data Quality	:	Good
Noise Level	:	Low
Rejected Shots	:	6

Correction for Instrument Delay and Shot Offset

The 'corrected' times shown on the calculation sheet have been obtained via:

(i) Subtraction of the instrument delay (4msec) from the recorded arrival times
(ii) geometric correction for non-verticality of ray paths resulting from shot offset.
(iii) shot static correction to correct for the depth of shot below ground level at the well head using a correction velocity of 760.0m/sec
(iv) readdition of the instrument delay (4msec).

Correction to Datum

A datum of 0.0 metres ASL has been specified and this level was shot four times during the survey. The average corrected value was calculated to be 51.1msecs. This is the effective datum correction.

PROCESSING

Calibration of Sonic Log - Method

The sonic log was modified by deleting values that lay within the casing.

Sonic times were adjusted to checkshot times using a linear correction of the sonic transit times.

These differences arise as the sonic tool measures the local velocity characteristics of the formation with a high frequency signal, whereas the downhole geophone records the bulk velocity character using a signal of significantly lower frequency.

Calibration of Sonic Log - Results (Enclosure 1)

The discrepancies between shot and sonic interval velocities were generally small. The largest adjustment was 55.34 μs/m on the interval 447.0 to 550.0 metres below KB.

In aggregate, the shot and sonic interval times differed by 19.1 msec over the logged portion of the well.

PROCESSING

Trace Playouts (Figure 4)

Figure 4A is a plot of all traces used. No filter or gain recovery has been applied.

Figure 4B is a plot to scale in depth and time of selected traces. No filter or gain recovery has been applied.

Figure 4C is a plot to scale in depth and time of selected traces with a 5 Hz - 40 Hz filter and a gain recovery function of t^2 applied.

Figures 4D is a plot of selected surface traces. No filter or gain recovery has been applied.

Tie to Seismic Section (Figure 5)

A tie was effected between the seismic section and the well velocity data using a two way time correction of 8 msecs. This adjustment arises due to differences in well velocity and seismic datum corrections.

Per **Geoffrey Bell**
Geophysical Analyst.

PE906721

This is an enclosure indicator page.
The enclosure PE906721 is enclosed within the container PE902115 at this location in this document.

The enclosure PE906721 has the following characteristics:

```
     ITEM_BARCODE = PE906721
CONTAINER_BARCODE = PE902115
             NAME = Time-Depth and Velocity Curves
            BASIN = OTWAY
           PERMIT = PEP119
             TYPE = WELL
          SUBTYPE = VELOCITY_CHART
      DESCRIPTION = Time-Depth and Velocity Curves,
                    McEarchern-1
          REMARKS =
     DATE_CREATED = 9/01/90
    DATE_RECEIVED = 27/01/90
             W_NO = W1017
        WELL_NAME = McEARCHERN-1
       CONTRACTOR = VELSEIS PTY LTD
     CLIENT_OP_CO = GFE RESOURCES LTD
```

(Inserted by DNRE - Vic Govt Mines Dept)

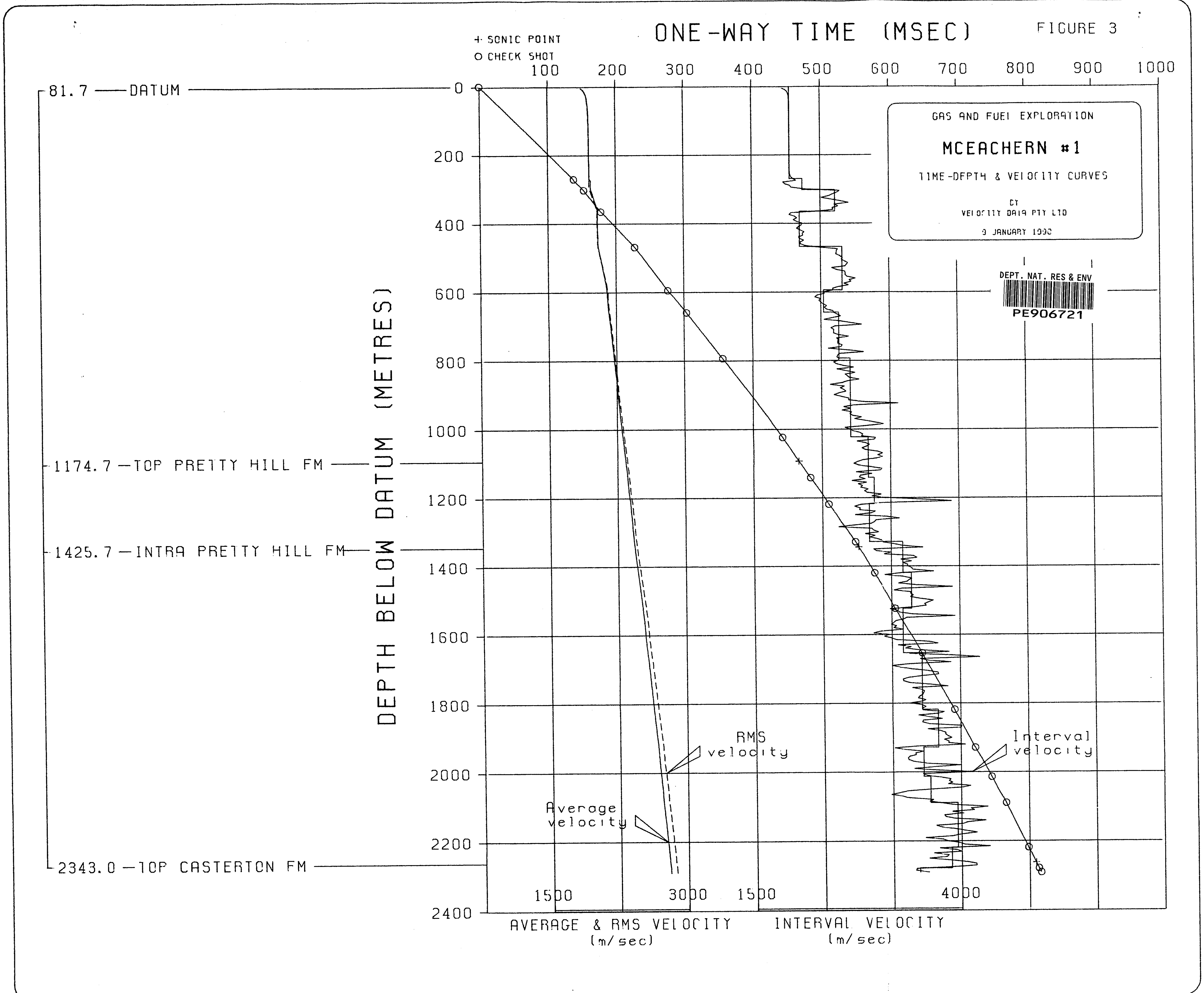
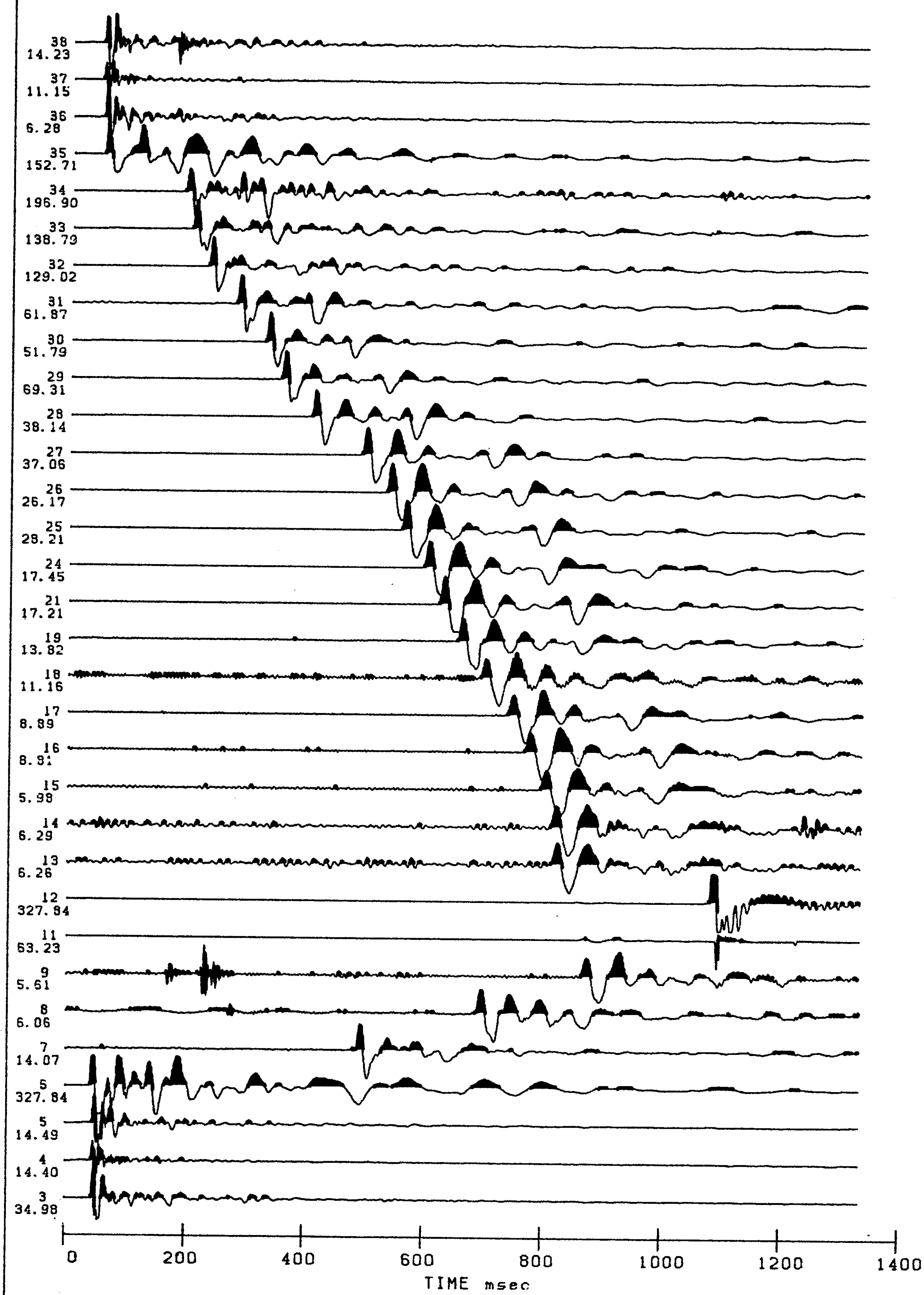


FIGURE 3
ONE-WAY TIME (MSEC)
+ SONIC POINT
O CHECK SHOT
100
200
300
400
500
600
700
800
900
1000
GAS AND FUEL EXPLORATION
MCEACHERN #1
TIME-DEPTH & VELOCITY CURVES
BY
VELOCITY DATA PTY LTD
9 JANUARY 1990
DEPT. NAT. RES & ENV
PE906721
81.7 — DATUM
1174.7 — TOP PRETTY HILL FM
1425.7 — INTRA PRETTY HILL FM
2343.0 — TOP CASTERTON FM
DEPTH BELOW DATUM (METRES)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
RMS velocity
Average velocity
Interval velocity
1500
3000
1500
4000
AVERAGE & RMS VELOCITY (m/sec)
INTERVAL VELOCITY (m/sec)



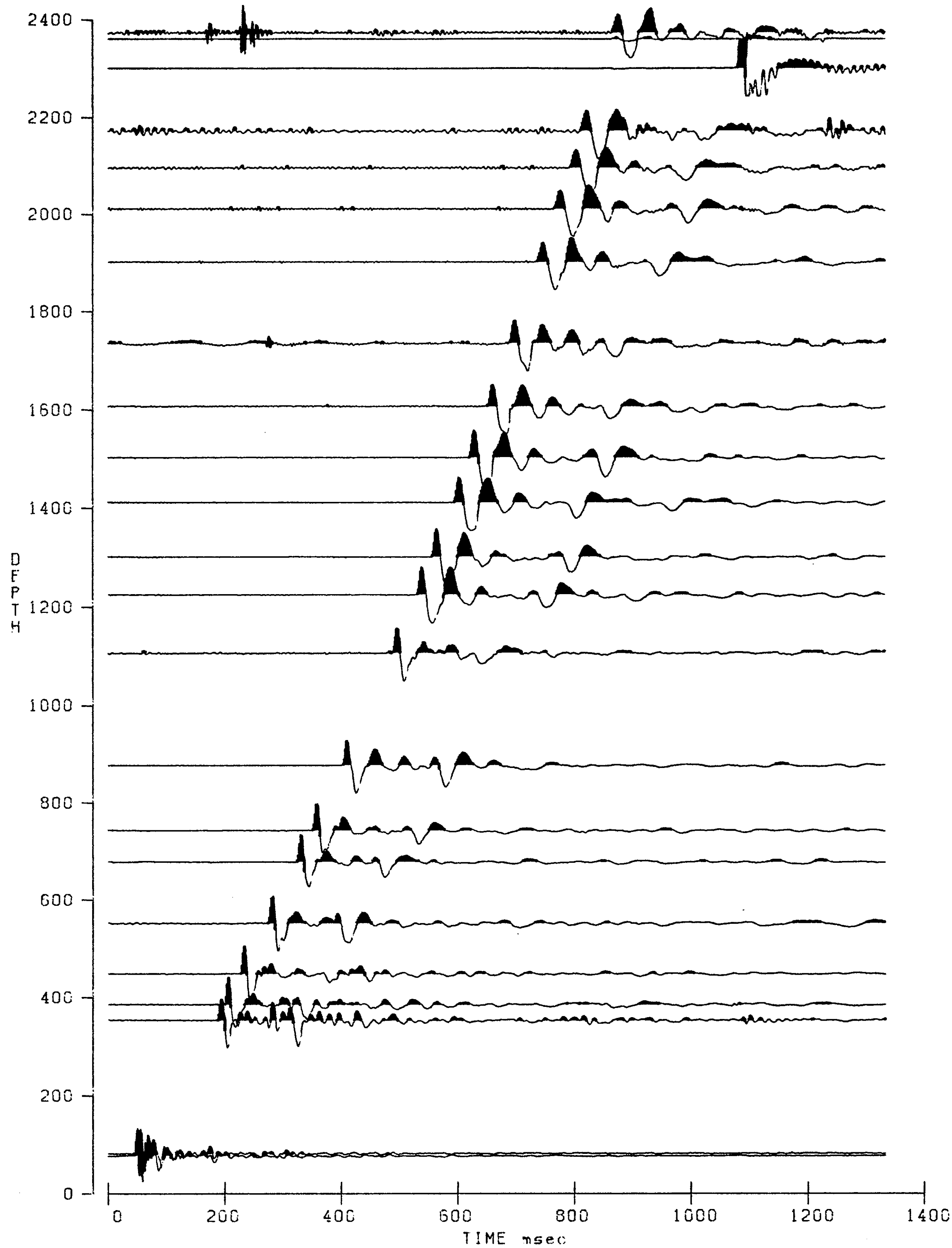
MCEACHERN #1

VELOCITY SURVEY TRACE DISPLAY

Filter OUT-OUT

No gain recovery

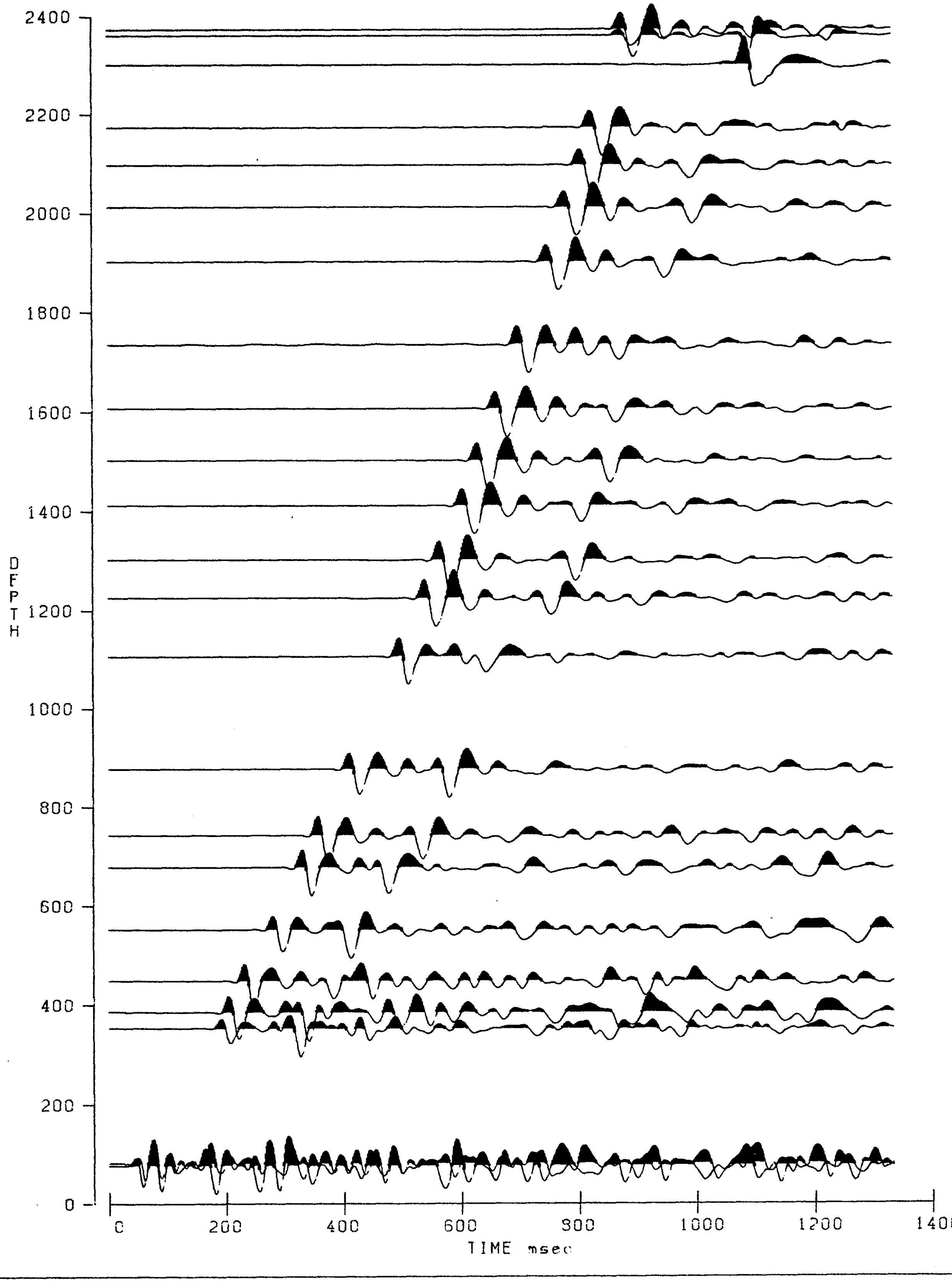
Figure 4A



MCEACHERN #1

VELOCITY SURVEY TRACE DISPLAY
Filter OUT-OUT
No gain recovery

Figure 4B



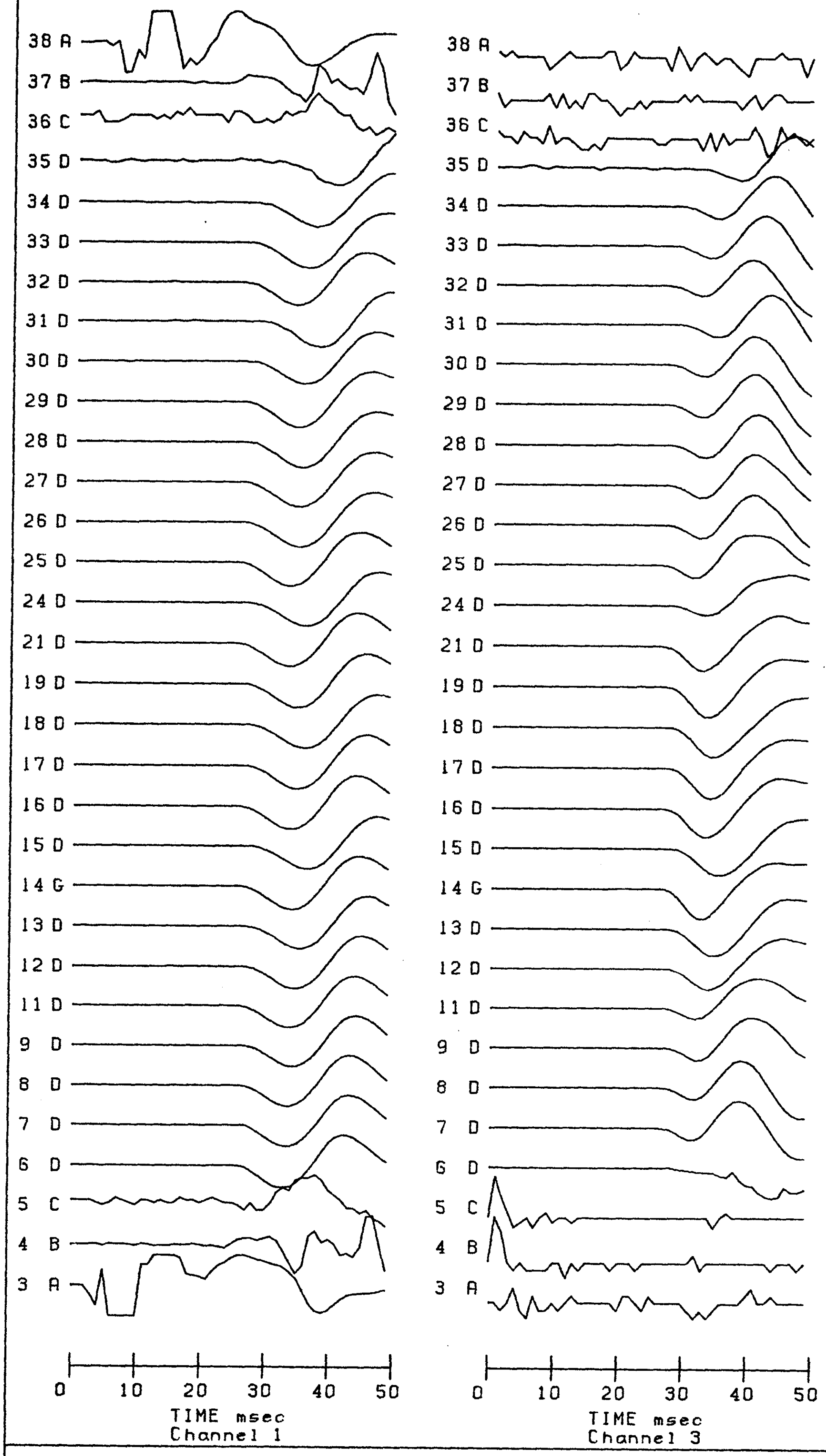
MCEACHERN #1

VELOCITY SURVEY TRACE DISPLAY

Filter 5-40

Gain $T^{2.0}$

Figure 4C



MCEACHERN #1

VELOCITY SURVEY TRACE DISPLAY
Auxiliary channels
Filter OUT-OUT

Figure 4D

Well : MCEACHERN #1 Client : GAS AND FUEL EXPLORATION
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 275.0 to 2290.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
5.0	2.7	1868	1868	1868	205.0	104.8	1956	1956	1961
10.0	5.3	1890	1890	1913	210.0	107.4	1956	1956	1961
15.0	7.9	1905	1905	1936	215.0	109.9	1956	1956	1961
20.0	10.4	1916	1916	1948	220.0	112.5	1956	1956	1961
25.0	13.0	1923	1924	1954	225.0	115.0	1956	1956	1961
30.0	15.6	1929	1929	1958	230.0	117.6	1956	1956	1961
35.0	18.1	1933	1933	1959	235.0	120.1	1956	1957	1961
40.0	20.7	1937	1937	1960	240.0	122.7	1957	1957	1961
45.0	23.2	1939	1939	1960	245.0	125.2	1957	1957	1962
50.0	25.8	1941	1941	1960	250.0	127.8	1957	1957	1963
55.0	28.3	1943	1943	1961	255.0	130.3	1957	1957	1966
60.0	30.9	1944	1945	1961	260.0	132.8	1957	1957	1972
65.0	33.4	1946	1946	1961	265.0	135.4	1958	1958	1983
70.0	36.0	1947	1947	1961	270.0	137.9	1959	1959	2005
75.0	38.5	1948	1948	1961	275.0	139.8	1968	1960	2042
80.0	41.1	1948	1949	1961	280.0	142.3	1968	1960	1974
85.0	43.6	1949	1949	1961	285.0	144.8	1968	1961	2001
90.0	46.2	1950	1950	1961	290.0	147.2	1970	1963	2063
95.0	48.7	1950	1951	1961	295.0	149.6	1972	1965	2080
100.0	51.3	1951	1951	1961	300.0	151.9	1974	1967	2141
105.0	53.8	1951	1951	1961	305.0	154.0	1980	1974	2427
110.0	56.4	1952	1952	1961	310.0	156.0	1987	1982	2527
115.0	58.9	1952	1952	1961	315.0	158.0	1994	1989	2477
120.0	61.5	1953	1953	1961	320.0	160.1	1999	1996	2428
125.0	64.0	1953	1953	1961	325.0	162.2	2004	2000	2341
130.0	66.6	1953	1953	1961	330.0	164.2	2009	2007	2452
135.0	69.1	1953	1954	1961	335.0	166.2	2016	2014	2568
140.0	71.7	1954	1954	1961	340.0	168.1	2023	2023	2668
145.0	74.2	1954	1954	1961	345.0	170.1	2029	2029	2496
150.0	76.8	1954	1954	1961	350.0	172.0	2035	2035	2542
155.0	79.3	1954	1954	1961	355.0	174.1	2040	2041	2470
160.0	81.9	1955	1955	1961	360.0	176.1	2045	2047	2482
165.0	84.4	1955	1955	1961	365.0	178.2	2048	2050	2334
170.0	87.0	1955	1955	1961	370.0	180.7	2048	2050	2045
175.0	89.5	1955	1955	1961	375.0	183.2	2047	2049	1961
180.0	92.1	1955	1955	1961	380.0	185.7	2047	2049	2030
185.0	94.6	1955	1955	1961	385.0	188.1	2047	2049	2060
190.0	97.2	1955	1956	1961	390.0	190.6	2046	2048	2013
195.0	99.7	1956	1956	1961	395.0	193.0	2047	2049	2055
200.0	102.3	1956	1956	1961	400.0	195.4	2047	2050	2124

Well : MCEACHERN #1 Client : GAS AND FUEL EXPLORATION
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 275.0 to 2290.0

Datum Depth	One-way time(ms)	Average	RMS	Interval	Datum Depth	One-way time(ms)	Average	RMS	Interval
		-----VELOCITIES-----					-----VELOCITIES-----		
405.0	197.7	2048	2050	2112	605.0	280.9	2154	2165	2379
410.0	200.1	2049	2051	2082	610.0	283.1	2155	2166	2286
415.0	202.6	2049	2051	2054	615.0	285.3	2155	2166	2261
420.0	204.9	2049	2051	2101	620.0	287.5	2157	2168	2331
425.0	207.3	2050	2052	2147	625.0	289.6	2158	2169	2312
430.0	209.6	2051	2053	2123	630.0	291.8	2159	2170	2332
35.0	212.0	2052	2054	2133	635.0	293.9	2161	2172	2365
440.0	214.4	2052	2054	2079	640.0	296.0	2162	2173	2407
445.0	216.8	2053	2055	2098	645.0	298.1	2164	2175	2377
450.0	219.1	2054	2056	2145	650.0	300.2	2165	2176	2400
455.0	221.5	2054	2056	2097	655.0	302.2	2168	2179	2480
460.0	223.9	2055	2057	2097	660.0	304.2	2170	2181	2500
465.0	226.2	2055	2057	2114	665.0	306.1	2172	2183	2546
470.0	228.5	2057	2059	2234	670.0	308.1	2175	2186	2572
475.0	230.4	2061	2064	2541	675.0	310.1	2177	2188	2470
480.0	232.4	2065	2068	2521	680.0	312.2	2178	2189	2370
485.0	234.4	2069	2072	2524	685.0	314.2	2180	2192	2560
490.0	236.4	2073	2076	2518	690.0	316.0	2183	2195	2685
495.0	238.3	2077	2081	2564	695.0	317.8	2187	2199	2823
500.0	240.3	2081	2086	2596	700.0	319.8	2189	2201	2494
505.0	242.2	2085	2090	2583	705.0	321.9	2190	2203	2449
510.0	244.1	2089	2095	2619	710.0	323.9	2192	2205	2485
15.0	246.0	2094	2100	2661	715.0	325.9	2194	2206	2485
520.0	247.9	2098	2104	2643	720.0	327.9	2196	2208	2481
525.0	249.8	2102	2109	2627	725.0	329.9	2198	2210	2536
530.0	251.8	2105	2112	2465	730.0	331.7	2201	2213	2665
535.0	253.8	2108	2115	2514	735.0	333.7	2202	2215	2519
540.0	255.7	2112	2120	2627	740.0	335.7	2204	2217	2539
545.0	257.6	2116	2124	2631	745.0	337.7	2206	2219	2532
550.0	259.5	2119	2128	2627	750.0	339.6	2208	2221	2532
555.0	261.4	2123	2132	2651	755.0	341.6	2210	2223	2586
560.0	263.2	2128	2137	2751	760.0	343.5	2212	2225	2570
565.0	265.1	2131	2141	2672	765.0	345.6	2214	2227	2419
570.0	266.9	2135	2146	2696	770.0	347.5	2216	2229	2656
575.0	268.8	2139	2149	2609	775.0	349.2	2219	2233	2845
580.0	270.7	2142	2153	2665	780.0	351.2	2221	2235	2549
585.0	272.7	2145	2156	2538	785.0	353.2	2223	2236	2526
590.0	274.7	2148	2159	2473	790.0	355.2	2224	2238	2519
75.0	276.7	2150	2161	2481	795.0	357.1	2226	2240	2545
600.0	278.8	2152	2163	2379	800.0	359.1	2228	2242	2537

TABLE 1. Time-Depth curve values Page 3.

Well : MCEACHERN #1 Client : GAS AND FUEL EXPLORATION
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 275.0 to 2290.0

Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval	Datum Depth	One-way time(ms)	-----VELOCITIES----- Average	RMS	Interval
805.0	361.1	2229	2243	2480	1005.0	435.8	2306	2324	2703
810.0	363.1	2231	2244	2508	1010.0	437.6	2308	2326	2788
815.0	365.0	2233	2246	2598	1015.0	439.4	2310	2328	2826
820.0	366.9	2235	2249	2721	1020.0	441.1	2312	2331	2810
825.0	368.8	2237	2251	2518	1025.0	442.8	2315	2333	2983
830.0	370.7	2239	2253	2634	1030.0	444.5	2317	2336	2962
35.0	372.6	2241	2255	2738	1035.0	446.3	2319	2338	2752
840.0	374.5	2243	2257	2618	1040.0	448.1	2321	2340	2856
845.0	376.4	2245	2259	2643	1045.0	449.8	2323	2343	2904
850.0	378.2	2247	2262	2668	1050.0	451.5	2325	2345	2874
855.0	380.0	2250	2264	2784	1055.0	453.3	2327	2347	2813
860.0	381.9	2252	2266	2642	1060.0	455.1	2329	2349	2853
865.0	383.9	2253	2268	2576	1065.0	456.7	2332	2352	3005
870.0	385.9	2254	2269	2438	1070.0	458.4	2334	2355	3071
875.0	387.8	2256	2271	2609	1075.0	460.0	2337	2357	3005
880.0	389.8	2258	2272	2558	1080.0	461.6	2339	2360	3067
885.0	391.7	2259	2274	2601	1085.0	463.3	2342	2363	2991
890.0	393.6	2261	2276	2627	1090.0	465.1	2344	2365	2823
895.0	395.6	2262	2277	2538	1095.0	466.9	2345	2366	2756
900.0	397.6	2264	2278	2483	1100.0	468.7	2347	2368	2711
905.0	399.6	2265	2280	2573	1105.0	470.6	2348	2369	2766
910.0	401.4	2267	2282	2662	1110.0	472.3	2350	2372	2914
15.0	403.3	2269	2284	2661	1115.0	473.9	2353	2374	3057
920.0	405.1	2271	2287	2840	1120.0	475.6	2355	2377	3036
925.0	406.6	2275	2291	3267	1125.0	477.4	2357	2379	2740
930.0	408.4	2277	2293	2722	1130.0	479.1	2359	2381	2929
935.0	410.4	2278	2295	2596	1135.0	480.9	2360	2382	2787
940.0	412.2	2280	2297	2681	1140.0	482.7	2362	2384	2781
945.0	414.2	2282	2298	2578	1145.0	484.4	2364	2386	2854
950.0	416.0	2284	2300	2695	1150.0	486.3	2365	2387	2672
955.0	417.9	2285	2302	2673	1155.0	488.1	2367	2389	2847
960.0	419.7	2287	2304	2699	1160.0	489.9	2368	2390	2746
965.0	421.5	2289	2306	2812	1165.0	491.7	2369	2392	2797
970.0	423.4	2291	2308	2727	1170.0	493.5	2371	2393	2777
975.0	425.1	2294	2310	2853	1175.0	495.2	2373	2395	2866
980.0	426.8	2296	2313	2973	1180.0	497.0	2374	2397	2823
985.0	428.4	2299	2317	3084	1185.0	498.7	2376	2399	2854
990.0	430.2	2301	2319	2870	1190.0	500.4	2378	2401	3033
95.0	432.1	2303	2321	2610	1195.0	502.1	2380	2403	2911
1000.0	433.9	2304	2322	2673	1200.0	503.7	2382	2405	3040

Well : MCEACHERN #1
Survey units : METRES
Calibrated sonic interval velocities used from 275.0 to 2290.0

Client : GAS AND FUEL EXPLORATION
Datum : 0.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
1205.0	505.2	2385	2409	3515
1210.0	506.5	2389	2414	3886
1215.0	508.0	2392	2417	3137
1220.0	509.7	2393	2419	2958
1225.0	511.6	2395	2420	2721
1230.0	513.4	2396	2421	2790
1235.0	515.2	2397	2422	2779
1240.0	516.8	2399	2424	2975
1245.0	518.6	2401	2426	2922
1250.0	520.4	2402	2427	2730
1255.0	522.0	2404	2430	3112
1260.0	523.5	2407	2433	3276
1265.0	525.2	2409	2435	2979
1270.0	526.9	2410	2437	2959
1275.0	528.6	2412	2438	2919
1280.0	530.4	2413	2439	2722
1285.0	532.4	2414	2440	2527
1290.0	534.1	2415	2441	2933
1295.0	535.8	2417	2443	2955
1300.0	537.5	2419	2445	3017
1305.0	539.2	2420	2447	2848
1310.0	540.9	2422	2448	2969
1315.0	542.6	2423	2450	2903
1320.0	544.3	2425	2452	2990
1325.0	546.0	2427	2454	3027
1330.0	547.6	2429	2456	3012
1335.0	549.2	2431	2458	3199
1340.0	550.7	2433	2461	3300
1345.0	552.1	2436	2464	3552
1350.0	553.8	2438	2466	2943
1355.0	555.5	2439	2467	2976
1360.0	557.1	2441	2470	3157
1365.0	558.7	2443	2472	3077
1370.0	560.1	2446	2475	3444
1375.0	561.6	2448	2478	3481
1380.0	563.1	2451	2480	3282
1385.0	564.6	2453	2483	3415
1390.0	566.1	2455	2486	3304
1395.0	567.6	2458	2488	3365
1400.0	569.1	2460	2491	3366

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
1405.0	570.5	2463	2494	3412
1410.0	572.0	2465	2497	3429
1415.0	573.3	2468	2500	3683
1420.0	574.9	2470	2503	3290
1425.0	576.5	2472	2505	3104
1430.0	578.0	2474	2507	3304
1435.0	579.4	2477	2510	3417
1440.0	580.9	2479	2512	3384
1445.0	582.4	2481	2515	3358
1450.0	583.9	2483	2517	3252
1455.0	585.4	2486	2520	3474
1460.0	586.7	2489	2524	3918
1465.0	588.2	2491	2526	3288
1470.0	589.7	2493	2528	3198
1475.0	591.2	2495	2531	3407
1480.0	592.7	2497	2533	3404
1485.0	594.1	2499	2536	3435
1490.0	595.6	2502	2538	3400
1495.0	597.0	2504	2541	3521
1500.0	598.4	2507	2544	3681
1505.0	599.8	2509	2547	3619
1510.0	601.2	2512	2550	3571
1515.0	602.6	2514	2553	3591
1520.0	604.0	2517	2555	3436
1525.0	605.6	2518	2557	3146
1530.0	607.1	2520	2559	3247
1535.0	608.7	2522	2561	3266
1540.0	610.1	2524	2564	3425
1545.0	611.4	2527	2567	3948
1550.0	612.9	2529	2569	3351
1555.0	614.4	2531	2571	3313
1560.0	616.0	2533	2573	3217
1565.0	617.5	2534	2575	3193
1570.0	619.1	2536	2577	3160
1575.0	620.7	2538	2579	3226
1580.0	622.2	2539	2580	3193
1585.0	623.7	2541	2582	3314
1590.0	625.4	2542	2584	3023
1595.0	627.1	2544	2585	2940
1600.0	628.7	2545	2586	3135

Well : MCEACHERN #1 Client : GAS AND FUEL EXPLORATION
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 275.0 to 2290.0

Datum	One-way	-----VELOCITIES-----			Datum	One-way	-----VELOCITIES-----		
Depth	time(ms)	Average	RMS	Interval	Depth	time(ms)	Average	RMS	Interval
1605.0	630.3	2546	2588	3073	1805.0	687.3	2626	2677	3519
1610.0	631.9	2548	2589	3163	1810.0	688.7	2628	2679	3571
1615.0	633.4	2550	2591	3223	1815.0	690.1	2630	2681	3540
1620.0	634.8	2552	2594	3630	1820.0	691.6	2632	2683	3563
1625.0	636.2	2554	2597	3735	1825.0	692.9	2634	2685	3790
1630.0	637.7	2556	2598	3245	1830.0	694.2	2636	2688	3709
1635.0	639.2	2558	2600	3409	1835.0	695.7	2638	2690	3474
1640.0	640.7	2560	2602	3336	1840.0	697.0	2640	2692	3613
1645.0	642.1	2562	2605	3508	1845.0	698.4	2642	2694	3767
1650.0	643.4	2565	2608	3913	1850.0	699.8	2644	2696	3527
1655.0	644.8	2567	2610	3443	1855.0	701.2	2645	2698	3519
1660.0	646.1	2569	2613	3901	1860.0	702.6	2647	2700	3605
1665.0	647.3	2572	2617	4228	1865.0	703.8	2650	2703	4000
1670.0	648.7	2574	2620	3504	1870.0	705.1	2652	2706	3993
1675.0	650.1	2577	2622	3607	1875.0	706.5	2654	2708	3586
1680.0	651.4	2579	2625	3880	1880.0	707.8	2656	2710	3739
1685.0	652.9	2581	2627	3383	1885.0	709.1	2658	2713	3804
1690.0	654.4	2582	2628	3159	1890.0	710.5	2660	2715	3804
1695.0	656.0	2584	2630	3257	1895.0	711.8	2662	2718	3833
1700.0	657.4	2586	2632	3410	1900.0	713.1	2665	2720	3877
1705.0	658.8	2588	2635	3601	1905.0	714.4	2667	2722	3785
1710.0	660.2	2590	2637	3722	1910.0	715.7	2669	2725	3840
1715.0	661.5	2593	2640	3727	1915.0	717.0	2671	2727	3838
1720.0	662.9	2595	2642	3542	1920.0	718.2	2673	2730	4041
1725.0	664.4	2596	2644	3360	1925.0	719.6	2675	2732	3551
1730.0	665.9	2598	2646	3290	1930.0	721.1	2676	2733	3312
1735.0	667.5	2599	2647	3298	1935.0	722.6	2678	2735	3319
1740.0	668.9	2601	2649	3367	1940.0	724.1	2679	2736	3536
1745.0	670.3	2603	2651	3622	1945.0	725.5	2681	2738	3435
1750.0	671.6	2606	2654	3842	1950.0	727.0	2682	2740	3442
1755.0	673.1	2607	2656	3402	1955.0	728.4	2684	2741	3365
1760.0	674.5	2609	2658	3517	1960.0	729.9	2685	2742	3344
1765.0	675.9	2611	2660	3553	1965.0	731.4	2687	2744	3352
1770.0	677.3	2613	2663	3541	1970.0	732.9	2688	2745	3416
1775.0	678.7	2615	2665	3529	1975.0	734.3	2690	2747	3580
1780.0	680.2	2617	2667	3491	1980.0	735.6	2692	2750	3983
1785.0	681.6	2619	2669	3475	1985.0	736.9	2694	2752	3655
1790.0	683.0	2621	2671	3569	1990.0	738.4	2695	2753	3421
1795.0	684.4	2623	2673	3524	1995.0	739.7	2697	2755	3715
1800.0	685.9	2624	2675	3381	2000.0	740.9	2699	2758	4124

Well : MCEACHERN #1
Survey units : METRES
Calibrated sonic interval velocities used from 275.0 to 2290.0

Client : GAS AND FUEL EXPLORATION
Datum : 0.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
2005.0	742.4	2701	2760	3524	2150.0	780.7	2754	2819	4008
2010.0	743.7	2703	2762	3628	2155.0	782.1	2756	2821	3687
2015.0	745.0	2705	2764	3855	2160.0	783.4	2757	2823	3756
2020.0	746.3	2707	2766	3882	2165.0	784.7	2759	2825	3924
2025.0	747.6	2709	2768	3856	2170.0	785.9	2761	2827	4055
2030.0	748.9	2711	2771	3899	2175.0	787.1	2763	2830	4181
35.0	750.2	2713	2773	3846	2180.0	788.3	2765	2832	3996
2040.0	751.4	2715	2776	4119	2185.0	789.6	2767	2834	3886
2045.0	752.7	2717	2778	4017	2190.0	791.0	2769	2836	3554
2050.0	754.0	2719	2780	3626	2195.0	792.4	2770	2838	3771
2055.0	755.5	2720	2781	3357	2200.0	793.7	2772	2839	3834
2060.0	757.1	2721	2782	3259	2205.0	794.9	2774	2842	3970
2065.0	758.7	2722	2783	3144	2210.0	796.2	2776	2844	4032
2070.0	760.2	2723	2784	3284	2215.0	797.3	2778	2846	4301
2075.0	761.7	2724	2785	3348	2220.0	798.7	2780	2848	3665
2080.0	763.0	2726	2787	3667	2225.0	800.0	2781	2850	3905
2085.0	764.4	2728	2789	3620	2230.0	801.2	2783	2852	3962
2090.0	765.7	2729	2791	3756	2235.0	802.6	2785	2854	3625
2095.0	767.0	2731	2793	3878	2240.0	803.9	2786	2856	3808
2100.0	768.2	2734	2796	4316	2245.0	805.2	2788	2857	3783
2105.0	769.4	2736	2799	4108	2250.0	806.6	2789	2859	3569
2110.0	770.6	2738	2801	4151	2255.0	807.9	2791	2861	3832
15.0	771.9	2740	2803	3884	2260.0	809.2	2793	2863	4036
2120.0	773.1	2742	2806	4023	2265.0	810.4	2795	2865	4138
2125.0	774.5	2744	2808	3785	2270.0	811.6	2797	2867	4141
2130.0	775.8	2746	2810	3805	2275.0	812.8	2799	2869	4039
2135.0	777.1	2748	2812	3919	2280.0	814.2	2800	2871	3770
2140.0	778.2	2750	2815	4292	2285.0	815.6	2802	2872	3523
2145.0	779.4	2752	2817	4064	2290.0	817.0	2803	2874	3660

PE906722

This is an enclosure indicator page.
The enclosure PE906722 is enclosed within the container PE902115 at this location in this document.

The enclosure PE906722 has the following characteristics:

```
      ITEM_BARCODE = PE906722
 CONTAINER_BARCODE = PE902115
              NAME = Shot Calculations, 1 of 2
             BASIN = OTWAY
            PERMIT = PEP119
              TYPE = WELL
           SUBTYPE = DIAGRAM
       DESCRIPTION = Shot Calculations, 1 of 2, Appendix 6,
                     McEarchern-1
           REMARKS =
      DATE_CREATED = 9/01/90
     DATE_RECEIVED = 27/01/90
              W_NO = W1017
         WELL_NAME = McEARCHERN-1
        CONTRACTOR = VELSEIS PTY LTD
      CLIENT_OP_CO = GFE RESOURCES LTD
```

(Inserted by DNRE - Vic Govt Mines Dept)

VELSEIS PTY LTD

WELL SURVEY CALCULATIONS

Company : GAS AND FUEL EXPLORATION
Well : MCEACHERN #1
Elevations : Datum : 0.0 Ground : 76.4 Kelly : 81.7
Shot data :

Location	Elevation	Offset
A	76.4	7.5
B	76.4	15.0
C	76.4	22.4
D	75.3	30.0

Latitude : 037 33 51
Longitude : 141 11 26
Rig identification : G.D.S 2
Energy source : AN60
Logger : GEARHART DDL6
Near surface velocity for shot statics: 760
Instrument delay: 4.0 ms

Survey date : 09-JAN-90
Survey units : METRES
Times in milliseconds.

SHOT CALCULATIONS

Shot No	Geophone depth Kelly	Geophone depth Datum	Shot Locn	Shot Depth	TIMES Record	TIMES Corr.	TIMES Avg.	TIMES Below datum	Check shot interval Distance	Check shot interval Time	Velocities Average	Velocities RMS	Velocities Interval
3	76.4	-5.3	A	0.1	46.0	45.9							
4	76.4	-5.3	B	0.1	46.0	45.2							
5	76.4	-5.3	C	0.1	48.0	46.1							
6	76.4	-5.3	D	1.2	44.0	43.7	45.2						
DATUM													
35	81.7	0.0	D	1.8	52.0	52.3							
36	81.7	0.0	C	0.1	53.0	51.1							
37	81.7	0.0	B	0.1	51.0	50.2							
38	81.7	0.0	A	0.1	51.0	50.9	51.1	0.0					
									270.3	138.0			1958.7
34	352.0	270.3	D	1.8	186.0	189.1	189.1	138.0			1958.7	1958.7	
									32.0	15.1			2119.2
33	384.0	302.3	D	1.8	201.0	204.2	204.2	153.1			1974.5	1975.1	
									63.0	25.1			2510.0
32	447.0	365.3	D	1.8	226.0	229.3	229.3	178.2			2049.9	2058.9	
									103.0	49.6			2076.6
31	550.0	468.3	D	1.8	275.5	278.9	278.9	227.8			2055.8	2062.7	
									126.0	48.6			2592.6
30	676.0	594.3	D	1.8	324.0	327.5	327.5	276.4			2150.1	2165.3	
									65.0	27.5			2363.6
29	741.0	659.3	D	1.8	351.5	355.0	355.0	303.9			2169.5	2184.0	
									134.1	52.6			2549.4
28	875.1	793.4	D	1.8	404.0	407.6	407.6	356.5			2225.5	2241.7	
									230.0	85.8			2680.7
7	1105.1	1023.4	D	1.8	490.0	493.6							
27	1105.1	1023.4	D	1.8	489.5	493.1	493.4	442.3			2313.8	2333.3	
									117.9	40.8			2889.7
26	1223.0	1141.3	D	1.8	530.5	534.2	534.2	483.1			2362.5	2385.3	
									77.0	26.0			2961.5
25	1300.0	1218.3	D	1.8	556.5	560.2	560.2	509.1			2393.0	2418.1	
									110.0	38.0			2894.7
24	1410.0	1328.3	D	1.8	594.5	598.2	598.2	547.1			2427.9	2454.2	
									91.0	27.5			3309.1
21	1501.0	1419.3	D	1.8	622.0	625.7	625.7	574.6			2470.1	2501.8	
									104.1	30.5			3413.1
19	1605.1	1523.4	D	1.8	652.5	656.2	656.2	605.1			2517.6	2555.5	

PE906723

This is an enclosure indicator page.
The enclosure PE906723 is enclosed within the container PE902115 at this location in this document.

The enclosure PE906723 has the following characteristics:

ITEM_BARCODE =	PE906723
CONTAINER_BARCODE =	PE902115
NAME =	Shot Calculations, 2 of 2
BASIN =	OTWAY
PERMIT =	PEP119
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Shot Calculations, 2 of 2, Appendix 6, McEarchern-1
REMARKS =	
DATE_CREATED =	9/01/90
DATE_RECEIVED =	27/01/90
W_NO =	W1017
WELL_NAME =	McEARCHERN-1
CONTRACTOR =	VELSEIS PTY LTD
CLIENT_OP_CO =	GFE RESOURCES LTD

(Inserted by DNRE - Vic Govt Mines Dept)

VELSEIS PTY LTD

WELL SURVEY CALCULATIONS

Company : GAS AND FUEL EXPLORATION
Well : MCEACHERN #1
Elevations : Datum : 0.0 Ground : 76.4 Kelly : 81.7
Shot data : Location Elevation Offset

Location	Elevation	Offset
A	76.4	7.5
B	76.4	15.0
C	76.4	22.4
D	75.3	30.0

Latitude : 037 33 51
Longitude : 141 11 26
Rig identification : G.D.S 2
Energy source : AN60
Logger : GEARHART DDL6
Near surface velocity
for shot statics: 760
Instrument delay: 4.0 ms

Survey date : 09-JAN-90
Survey units : METRES
Times in milliseconds.

SHOT CALCULATIONS

Shot No	Geophone depth Kelly	Geophone depth Datum	Shot Locn	Shot Depth	TIMES Record	TIMES Corr.	TIMES Avg.	TIMES Below datum	Check shot interval Distance	Check shot interval Time	Velocities Average	Velocities RMS	Velocities Interval
19	1605.1	1523.4	D	1.8	652.5	656.2	656.2	605.1			2517.6	2555.5	
									129.8	39.3			3302.8
18	1734.9	1653.2	D	1.8	691.5	695.2							
18	1734.9	1653.2	D	1.8	692.0	695.7	695.5	644.4			2565.5	2607.2	
									165.1	46.7			3535.3
17	1900.0	1818.3	D	1.8	738.5	742.2	742.2	691.1			2631.0	2680.1	
									110.0	29.5			3728.8
16	2010.0	1928.3	D	1.8	768.0	771.7	771.7	720.6			2676.0	2730.9	
									85.0	24.0			3541.7
15	2095.0	2013.3	D	1.8	792.0	795.7	795.7	744.6			2703.9	2760.8	
									76.1	21.0			3623.8
13	2171.1	2089.4	D	1.8	813.5	817.2							
14	2171.1	2089.4	D	1.8	812.5	816.2	816.7	765.6			2729.1	2788.0	
									128.6	32.5			3956.9
12	2299.7	2218.0	D	1.8	845.5	849.2	849.2	798.1			2779.1	2845.0	
									60.1	15.5			3877.4
11	2359.8	2278.1	D	1.8	861.0	864.7	864.7	813.6			2800.0	2868.1	
									12.2	3.5			3485.7
9	2372.0	2290.3	D	1.8	864.5	868.2	868.2	817.1			2803.0	2871.1	

PE906724

This is an enclosure indicator page.
The enclosure PE906724 is enclosed within the container PE902115 at this location in this document.

The enclosure PE906724 has the following characteristics:

ITEM_BARCODE =	PE906724
CONTAINER_BARCODE =	PE902115
NAME =	Sonic Drift Data
BASIN =	OTWAY
PERMIT =	PEP119
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Sonic Drift Data, Appendix 6, McEarchern-1
REMARKS =	
DATE_CREATED =	9/01/90
DATE_RECEIVED =	27/01/90
W_NO =	W1017
WELL_NAME =	McEARCHERN-1
CONTRACTOR =	VELSEIS PTY LTD
CLIENT_OP_CO =	GFE RESOURCES LTD

(Inserted by DNRE - Vic Govt Mines Dept)

VELSEIS PTY LTD

Company : GAS AND FUEL EXPLORATION
Well : MCEACHERN #1
Elevations : Datum : 0.0 Ground : 76.4 Kelly : 81.7

Latitude : 037 33 51
Longitude : 141 11 26

Survey date : 09-JAN-90
Survey units : METRES
Times in milliseconds.

SONIC DRIFT

	Geophone depth Kelly	Geophone depth Datum	Check shot times Average	Check shot times Below datum	Check shot interval Distance	Check shot interval Time	Sonic Int. time	Interval sonic drift usec/m	Interval sonic drift msec	Cumulative drift msec
	76.4	-5.3	45.2							
DATUM	81.7	0.0	51.1	0.0						
					270.3	138.0				
	352.0	270.3	189.1	138.0						
					32.0	15.1	14.3	25.00	0.8	0.8
	384.0	302.3	204.2	153.1						
					63.0	25.1	27.8	-42.86	-2.7	-1.9
	447.0	365.3	229.3	178.2						
					103.0	49.6	43.9	55.34	5.7	3.8
	550.0	468.3	278.9	227.8						
					126.0	48.6	51.4	-22.22	-2.8	1.0
	676.0	594.3	327.5	276.4						
					65.0	27.5	26.4	16.92	1.1	2.1
	741.0	659.3	355.0	303.9						
					134.1	52.6	49.9	20.13	2.7	4.8
	875.1	793.4	407.6	356.5						
					230.0	85.8	81.1	20.43	4.7	9.5
	1105.1	1023.4	493.4	442.3						
					117.9	40.8	40.8	0.00	0.0	9.5
	1223.0	1141.3	534.2	483.1						
					77.0	26.0	25.6	5.19	0.4	9.9
	1300.0	1218.3	560.2	509.1						
					110.0	38.0	34.4	32.73	3.6	13.5
	1410.0	1328.3	598.2	547.1						
					91.0	27.5	28.3	-8.79	-0.8	12.7
	1501.0	1419.3	625.7	574.6						
					104.1	30.5	28.9	15.37	1.6	14.3
	1605.1	1523.4	656.2	605.1						
					129.8	39.3	37.1	16.95	2.2	16.5
	1734.9	1653.2	695.5	644.4						
					165.1	46.7	45.4	7.87	1.3	17.8
	1900.0	1818.3	742.2	691.1						
					110.0	29.5	29.1	3.64	0.4	18.2
	2010.0	1928.3	771.7	720.6						
					85.0	24.0	22.6	16.47	1.4	19.6
	2095.0	2013.3	795.7	744.6						
					76.1	21.0	20.1	11.83	0.9	20.5
	2171.1	2089.4	816.7	765.6						
					128.6	32.5	34.0	-11.66	-1.5	19.0
	2299.7	2218.0	849.2	798.1						
					60.1	15.5	15.8	-4.99	-0.3	18.7
	2359.8	2278.1	864.7	813.6						
					12.2	3.5	3.1	32.79	0.4	19.1
	2372.0	2290.3	868.2	817.1						

PE906725

This is an enclosure indicator page.
The enclosure PE906725 is enclosed within the container PE902115 at this location in this document.

The enclosure PE906725 has the following characteristics:

ITEM_BARCODE =	PE906725
CONTAINER_BARCODE =	PE902115
NAME =	Sonic Calibrations Data, 1 of 2
BASIN =	OTWAY
PERMIT =	PEP119
TYPE =	WELL
SUBTYPE =	DIAGRAM
DESCRIPTION =	Sonic Calibrations Data, 1 of 2, Appendix 6, McEarchern-1
REMARKS =	
DATE_CREATED =	9/01/90
DATE_RECEIVED =	27/01/90
W_NO =	W1017
WELL_NAME =	McEARCHERN-1
CONTRACTOR =	VELSEIS PTY LTD
CLIENT_OP_CO =	GFE RESOURCES LTD

(Inserted by DNRE - Vic Govt Mines Dept)

Company : GAS AND FUEL EXPLORATION
Well : MCEACHERN #1
Elevations : Datum : 0.0 Ground : 76.4 Kelly : 81.7

Latitude : 037 33 51
Longitude : 141 11 26

Survey date : 09-JAN-90
Survey units : METRES
Times in milliseconds.

SONIC CALIBRATION

Geophone depth Kelly	Datum	Interval Distance	Original sonic times Interval	Cumulative	Adjusted sonic times Interval	Calibrated	Velocities Average	RMS	Interval
76.4	-5.3								
DATUM									
81.7	0.0								
		270.3							1958.7
352.0	270.3						1958.7	1701.0	
		32.0	14.3		15.1				2119.2
384.0	302.3			14.3		153.1	1974.5	1736.4	
		63.0	27.8		25.1				2510.0
447.0	365.3			42.1		178.2	2049.9	1839.6	
		103.0	43.9		49.6				2076.6
550.0	468.3			86.0		227.8	2055.8	1884.9	
		126.0	51.4		48.6				2592.6
676.0	594.3			137.4		276.4	2150.1	2007.9	
		65.0	26.4		27.5				2363.6
741.0	659.3			163.8		303.9	2169.5	2038.2	
		134.1	49.9		52.6				2549.4
875.1	793.4			213.7		356.5	2225.5	2112.2	
		230.0	81.1		85.8				2680.7
1105.1	1023.4			294.8		442.3	2313.8	2222.8	
		69.6	23.9		23.9				2912.1
TOP PRETTY HILL FM									
1174.7	1093.0			318.7		466.2	2344.5	2259.7	
		48.3	16.9		16.9				2858.0
1223.0	1141.3			335.6		483.1	2362.5	2281.3	
		77.0	25.6		26.0				2961.5
1300.0	1218.3			361.2		509.1	2393.0	2317.6	
		110.0	34.4		38.0				2894.7
1410.0	1328.3			395.6		547.1	2427.9	2358.9	
		15.7	4.8		4.7				3367.6
INTRA PRETTY HILL FM									
1425.7	1344.0			400.4		551.8	2435.8	2368.4	
		75.3	23.5		22.8				3297.1
1501.0	1419.3			423.9		574.6	2470.1	2409.0	
		104.1	28.9		30.5				3413.1
1605.1	1523.4			452.8		605.1	2517.6	2465.3	
		129.8	37.1		39.3				3302.8
1734.9	1653.2			489.9		644.4	2565.5	2520.5	
		165.1	45.4		46.7				3535.3
1900.0	1818.3			535.3		691.1	2631.0	2596.7	
		110.0	29.1		29.5				3728.8
2010.0	1928.3			564.4		720.6	2676.0	2649.3	
		85.0	22.6		24.0				3541.7
2095.0	2013.3			587.0		744.6	2703.9	2680.8	
		76.1	20.1		21.0				3623.8
2171.1	2089.4			607.1		765.6	2729.1	2709.3	

PE906726

This is an enclosure indicator page.
The enclosure PE906726 is enclosed within the container PE902115 at this location in this document.

The enclosure PE906726 has the following characteristics:

ITEM_BARCODE	= PE906726
CONTAINER_BARCODE	= PE902115
NAME	= Sonic Calibrations Data, 2 of 2
BASIN	= OTWAY
PERMIT	= PEP119
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Sonic Calibrations Data, 2 of 2, Appendix 6, McEarchern-1
REMARKS	=
DATE_CREATED	= 9/01/90
DATE_RECEIVED	= 27/01/90
W_NO	= W1017
WELL_NAME	= McEARCHERN-1
CONTRACTOR	= VELSEIS PTY LTD
CLIENT_OP_CO	= GFE RESOURCES LTD

(Inserted by DNRE - Vic Govt Mines Dept)

Company : GAS AND FUEL EXPLORATION
Well : MCEACHERN #1
Elevations : Datum : 0.0 Ground : 76.4 Kelly : 81.7

Latitude : 037 33 51
Longitude : 141 11 26

Survey date : 09-JAN-90
Survey units : METRES
Times in milliseconds.

SONIC CALIBRATION

Geophone depth Kelly	Geophone depth Datum	Interval Distance	Original sonic times Interval	Original sonic times Cumulative	Adjusted sonic times Interval	Adjusted sonic times Calibrated	Velocities Average	Velocities RMS	Velocities Interval
2171.1	2089.4			607.1		765.6	2729.1	2709.3	
		128.6	34.0		32.5				3956.9
2299.7	2218.0			641.1		798.1	2779.1	2767.8	
		43.3	11.6		11.4				3803.6
TOP CASTERTON FM									
2343.0	2261.3			652.7		809.5	2793.5	2784.2	
		16.8	4.2		4.1				4081.5
2359.8	2278.1			656.9		813.6	2800.0	2791.8	
		12.2	3.1		3.5				3485.7
2372.0	2290.3			660.0		817.1	2803.0	2795.0	

PE902116

This is an enclosure indicator page.
The enclosure PE902116 is enclosed within the container PE902115 at this location in this document.

The enclosure PE902116 has the following characteristics:

ITEM_BARCODE =	PE902116
CONTAINER_BARCODE =	PE902115
NAME =	Well Velocity survey - trace display & 1st arrival plots
BASIN =	OTWAY
PERMIT =	PEP 119
TYPE =	WELL
SUBTYPE =	VELOCITY_CHART
DESCRIPTION =	Well Velocity survey - trace display & 1st arrival plots (enclosure from appendix 6-Velocity Survey-of WCR vol.2) for McEachern-1
REMARKS =	
DATE_CREATED =	9/01/90
DATE_RECEIVED =	
W_NO =	W1017
WELL_NAME =	McEachren-1
CONTRACTOR =	Velocity Data Pty Ltd
CLIENT_OP_CO =	Gas and Fuel Exploration NL.

(Inserted by DNRE - Vic Govt Mines Dept)

7. SYNTHETIC SEISMOGRAMS.

Velocity Data

SYNTHETIC SEISMOGRAMS

McEACHERN #1

PEP 119

VICTORIA

for

GAS & FUEL EXPLORATION N/L

recorded by

VELOCITY DATA PTY LTD

processed by

VELSEIS PTY LTD

Integrated Seismic Technologies

Brisbane, Australia

April 6, 1990

<u>**CONTENTS**</u>

SUMMARY

Synthetic seismograms have been produced for the McEachern #1 well, PEP 119, Victoria for Gas and Fuel Exploration N/L.

These seismograms have been computed using a combination of check shot, sonic and density data. Velocity Data Pty Ltd acquired the check shot data and Gearhart Australia provided the other wireline services.

The sonic data was calibrated using the checkshot information. Reflection coefficients were derived from combinations of calibrated sonic and density data and then convolved with three specified wavelets to produce the synthetic seismograms. Both phases of the wavelet were generated at either polarity. This resulted in a total of twelve seismograms all plotted at a time scale of 15 cm/sec.

GENERAL INFORMATION

Name of Well	:	McEachern #1
Location	:	PEP 119
Coordinates	:	Latitude 037 33' 51"
	:	Longitude 141 11' 26"
Velocity Survey	:	Velocity Data Pty Ltd
Wireline Logging	:	Gearhart
Elevation of KB	:	81.7 metres above sea level
Elevation of Ground	:	76.4 metres above sea level
Elevation of Seismic Datum	:	0.0 metres above sea level
Borehole total depth	:	2384.0 metres below KB

CHECK SHOT DATA

Recorded by	:	Velocity Data Pty Ltd
Date	:	9th January 1990.
Energy source	:	AN-60
Shot Location	:	Mud pit
Charge Size	:	0.5 to 2 (125 grm) sticks
Average Shot Depth	:	2.0 metres
Average Shot Offset	:	30.0 metres
Number of shots used	:	32
Number of levels recorded	:	23

SONIC DATA

Recorded by	:	Gearhart
Top logged interval used	:	354.8 metres below KB
Bottom logged interval used	:	2377.5 metres below KB
Logging units	:	Microseconds/foot converted
Comments	:	The sonic log was calibrated to check shot data from 352.0 metres below KB. It was also extended to 2600m for processing purposes.

DENSITY DATA

Recorded by	:	Gearhart
Top logged interval	:	1350.4 metres below KB
Bottom logged interval	:	2367.3 metres below KB
Logging units	:	Grams/cc

Calibration of Sonic Log - Method

The sonic log was modified by deleting values that lay within the casing. A search of the file was also made and anomalous values deleted.

Sonic times were adjusted to checkshot times using a linear correction of the sonic transit times.

These differences arise as the sonic tool measures the local velocity characteristics of the formation with a high frequency signal, whereas the downhole geophone records the bulk velocity character using a signal of significantly lower frequency.

Calibration of Sonic Log - Results

The discrepancies between shot and sonic interval velocities were generally small. The largest adjustment was 55.34 µs/metres on the interval 447.0 to 550.0 metres below KB.

In aggregate, the shot and sonic interval times differed by 19.1 msec over the logged portion of the well.

CALIBRATION OF DENSITY DATA

The density data is calibrated using the adjusted and integrated sonic time.

REFLECTION COEFFICIENT GENERATION

Reflection coefficients were generated from a combination of sonic and density data, as noted on the display. The display shows that the sonic data set has been extended to 2600 metres the reason for this is to maximize the range of the synthetic. Failure to extend the sonic in this fashion would be to truncate the synthetic by one half wavelength of the wavelet being convolved with the reflection coefficient series.

MULTIPLES

Only the primary response of the reflection coefficient series has been generated.

WAVELETS

Three wavelets were convolved with the reflection coefficient series to produce the seismograms:

1) Band Pass 15-40 Hz, Zero/Min phase, Both Polarity.
2) Band Pass 15-50 Hz, Zero/Min phase, Both Polarity.
3) Band Pass 15-60 Hz, Zero/Min phase, Both Polarity.

SEISMOGRAM DISPLAYS

The seismograms that were generated were plotted at a scale of 15.0cm/sec. A total of twelve seismograms are presented. The final displays show the contributing logs in schematic form, with time and depth scales. The seismogram is displayed for each wavelet, against two-way time below the check shot datum. Although no balancing window has been used on the seismograms, the trace amplitudes are normalized against their maxima. A sub-datum two-way time of 282.0 msecs for the start of the sonic was taken from the check shot results .

Geoffrey Bell.
Geophysical Analyst.

TABLE 1. Time-Depth curve values Page 1.

Well : MCEACHERN #1 Client : GAS AND FUEL EXPLORATION
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 275.0 to 2290.0

Datum Depth	One-way time(ms)	-----VELOCITIES-----		
		Average	RMS	Interval
5.0	2.7	1868	1868	1868
10.0	5.3	1890	1890	1913
15.0	7.9	1905	1905	1936
20.0	10.4	1916	1916	1948
25.0	13.0	1923	1924	1954
30.0	15.6	1929	1929	1958
35.0	18.1	1933	1933	1959
40.0	20.7	1937	1937	1960
45.0	23.2	1939	1939	1960
50.0	25.8	1941	1941	1960
55.0	28.3	1943	1943	1961
60.0	30.9	1944	1945	1961
65.0	33.4	1946	1946	1961
70.0	36.0	1947	1947	1961
75.0	38.5	1948	1948	1961
80.0	41.1	1948	1949	1961
85.0	43.6	1949	1949	1961
90.0	46.2	1950	1950	1961
95.0	48.7	1950	1951	1961
100.0	51.3	1951	1951	1961
105.0	53.8	1951	1951	1961
110.0	56.4	1952	1952	1961
115.0	58.9	1952	1952	1961
120.0	61.5	1953	1953	1961
125.0	64.0	1953	1953	1961
130.0	66.6	1953	1953	1961
135.0	69.1	1953	1954	1961
140.0	71.7	1954	1954	1961
145.0	74.2	1954	1954	1961
150.0	76.8	1954	1954	1961
155.0	79.3	1954	1954	1961
160.0	81.9	1955	1955	1961
165.0	84.4	1955	1955	1961
170.0	87.0	1955	1955	1961
175.0	89.5	1955	1955	1961
180.0	92.1	1955	1955	1961
185.0	94.6	1955	1955	1961
190.0	97.2	1955	1956	1961
195.0	99.7	1956	1956	1961
200.0	102.3	1956	1956	1961
205.0	104.8	1956	1956	1961
210.0	107.4	1956	1956	1961
215.0	109.9	1956	1956	1961
220.0	112.5	1956	1956	1961
225.0	115.0	1956	1956	1961
230.0	117.6	1956	1956	1961
235.0	120.1	1956	1957	1961
240.0	122.7	1957	1957	1961
245.0	125.2	1957	1957	1962
250.0	127.8	1957	1957	1963
255.0	130.3	1957	1957	1966
260.0	132.8	1957	1957	1972
265.0	135.4	1958	1958	1983
270.0	137.9	1959	1959	2005
275.0	139.8	1968	1960	2042
280.0	142.3	1968	1960	1974
285.0	144.8	1968	1961	2001
290.0	147.2	1970	1963	2063
295.0	149.6	1972	1965	2080
300.0	151.9	1974	1967	2141
305.0	154.0	1980	1974	2427
310.0	156.0	1987	1982	2527
315.0	158.0	1994	1989	2477
320.0	160.1	1999	1996	2428
325.0	162.2	2004	2000	2341
330.0	164.2	2009	2007	2452
335.0	166.2	2016	2014	2568
340.0	168.1	2023	2023	2668
345.0	170.1	2029	2029	2496
350.0	172.0	2035	2035	2542
355.0	174.1	2040	2041	2470
360.0	176.1	2045	2047	2482
365.0	178.2	2048	2050	2334
370.0	180.7	2048	2050	2045
375.0	183.2	2047	2049	1961
380.0	185.7	2047	2049	2030
385.0	188.1	2047	2049	2060
390.0	190.6	2046	2048	2013
395.0	193.0	2047	2049	2055
400.0	195.4	2047	2050	2124

TABLE 1. Time-Depth curve values

Well : MCEACHERN #1 Client : GAS AND FUEL EXPLORATION
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 275.0 to 2290.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
405.0	197.7	2048	2050	2112
410.0	200.1	2049	2051	2082
415.0	202.6	2049	2051	2054
420.0	204.9	2049	2051	2101
425.0	207.3	2050	2052	2147
430.0	209.6	2051	2053	2123
435.0	212.0	2052	2054	2133
440.0	214.4	2052	2054	2079
445.0	216.8	2053	2055	2098
450.0	219.1	2054	2056	2145
455.0	221.5	2054	2056	2097
460.0	223.9	2055	2057	2097
465.0	226.2	2055	2057	2114
470.0	228.5	2057	2059	2234
475.0	230.4	2061	2064	2541
480.0	232.4	2065	2068	2521
485.0	234.4	2069	2072	2524
490.0	236.4	2073	2076	2518
495.0	238.3	2077	2081	2564
500.0	240.3	2081	2086	2596
505.0	242.2	2085	2090	2583
510.0	244.1	2089	2095	2619
515.0	246.0	2094	2100	2661
520.0	247.9	2098	2104	2643
525.0	249.8	2102	2109	2627
530.0	251.8	2105	2112	2465
535.0	253.8	2108	2115	2514
540.0	255.7	2112	2120	2627
545.0	257.6	2116	2124	2631
550.0	259.5	2119	2128	2627
555.0	261.4	2123	2132	2651
560.0	263.2	2128	2137	2751
565.0	265.1	2131	2141	2672
570.0	266.9	2135	2146	2696
575.0	268.8	2139	2149	2609
580.0	270.7	2142	2153	2665
585.0	272.7	2145	2156	2538
590.0	274.7	2148	2159	2473
595.0	276.7	2150	2161	2481
600.0	278.8	2152	2163	2379
605.0	280.9	2154	2165	2379
610.0	283.1	2155	2166	2286
615.0	285.3	2155	2166	2261
620.0	287.5	2157	2168	2331
625.0	289.6	2158	2169	2312
630.0	291.8	2159	2170	2332
635.0	293.9	2161	2172	2365
640.0	296.0	2162	2173	2407
645.0	298.1	2164	2175	2377
650.0	300.2	2165	2176	2400
655.0	302.2	2168	2179	2480
660.0	304.2	2170	2181	2500
665.0	306.1	2172	2183	2546
670.0	308.1	2175	2186	2572
675.0	310.1	2177	2188	2470
680.0	312.2	2178	2189	2370
685.0	314.2	2180	2192	2560
690.0	316.0	2183	2195	2685
695.0	317.8	2187	2199	2823
700.0	319.8	2189	2201	2494
705.0	321.9	2190	2203	2449
710.0	323.9	2192	2205	2485
715.0	325.9	2194	2206	2485
720.0	327.9	2196	2208	2481
725.0	329.9	2198	2210	2536
730.0	331.7	2201	2213	2665
735.0	333.7	2202	2215	2519
740.0	335.7	2204	2217	2539
745.0	337.7	2206	2219	2532
750.0	339.6	2208	2221	2532
755.0	341.6	2210	2223	2586
760.0	343.5	2212	2225	2570
765.0	345.6	2214	2227	2419
770.0	347.5	2216	2229	2656
775.0	349.2	2219	2233	2845
780.0	351.2	2221	2235	2549
785.0	353.2	2223	2236	2526
790.0	355.2	2224	2238	2519
795.0	357.1	2226	2240	2545
800.0	359.1	2228	2242	2537

Well : MCEACHERN #1 Client : GAS AND FUEL EXPLORATION
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 275.0 to 2290.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
805.0	361.1	2229	2243	2480	1005.0	435.8	2306	2324	2703
810.0	363.1	2231	2244	2508	1010.0	437.6	2308	2326	2788
815.0	365.0	2233	2246	2598	1015.0	439.4	2310	2328	2826
820.0	366.9	2235	2249	2721	1020.0	441.1	2312	2331	2810
825.0	368.8	2237	2251	2518	1025.0	442.8	2315	2333	2983
830.0	370.7	2239	2253	2634	1030.0	444.5	2317	2336	2962
835.0	372.6	2241	2255	2738	1035.0	446.3	2319	2338	2752
840.0	374.5	2243	2257	2618	1040.0	448.1	2321	2340	2856
845.0	376.4	2245	2259	2643	1045.0	449.8	2323	2343	2904
850.0	378.2	2247	2262	2668	1050.0	451.5	2325	2345	2874
855.0	380.0	2250	2264	2784	1055.0	453.3	2327	2347	2813
860.0	381.9	2252	2266	2642	1060.0	455.1	2329	2349	2853
865.0	383.9	2253	2268	2576	1065.0	456.7	2332	2352	3005
870.0	385.9	2254	2269	2438	1070.0	458.4	2334	2355	3071
875.0	387.8	2256	2271	2609	1075.0	460.0	2337	2357	3005
880.0	389.8	2258	2272	2558	1080.0	461.6	2339	2360	3067
885.0	391.7	2259	2274	2601	1085.0	463.3	2342	2363	2991
890.0	393.6	2261	2276	2627	1090.0	465.1	2344	2365	2823
895.0	395.6	2262	2277	2538	1095.0	466.9	2345	2366	2756
900.0	397.6	2264	2278	2483	1100.0	468.7	2347	2368	2711
905.0	399.6	2265	2280	2573	1105.0	470.6	2348	2369	2766
910.0	401.4	2267	2282	2662	1110.0	472.3	2350	2372	2914
915.0	403.3	2269	2284	2661	1115.0	473.9	2353	2374	3057
920.0	405.1	2271	2287	2840	1120.0	475.6	2355	2377	3036
925.0	406.6	2275	2291	3267	1125.0	477.4	2357	2379	2740
930.0	408.4	2277	2293	2722	1130.0	479.1	2359	2381	2929
935.0	410.4	2278	2295	2596	1135.0	480.9	2360	2382	2787
940.0	412.2	2280	2297	2681	1140.0	482.7	2362	2384	2781
945.0	414.2	2282	2298	2578	1145.0	484.4	2364	2386	2854
950.0	416.0	2284	2300	2695	1150.0	486.3	2365	2387	2672
955.0	417.9	2285	2302	2673	1155.0	488.1	2367	2389	2847
960.0	419.7	2287	2304	2699	1160.0	489.9	2368	2390	2746
965.0	421.5	2289	2306	2812	1165.0	491.7	2369	2392	2797
970.0	423.4	2291	2308	2727	1170.0	493.5	2371	2393	2777
975.0	425.1	2294	2310	2853	1175.0	495.2	2373	2395	2866
980.0	426.8	2296	2313	2973	1180.0	497.0	2374	2397	2823
985.0	428.4	2299	2317	3084	1185.0	498.7	2376	2399	2854
990.0	430.2	2301	2319	2870	1190.0	500.4	2378	2401	3033
995.0	432.1	2303	2321	2610	1195.0	502.1	2380	2403	2911
1000.0	433.9	2304	2322	2673	1200.0	503.7	2382	2405	3040

Well : MCEACHERN #1 Client : GAS AND FUEL EXPLORATION
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 275.0 to 2290.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
1205.0	505.2	2385	2409	3515	1405.0	570.5	2463	2494	3412
1210.0	506.5	2389	2414	3886	1410.0	572.0	2465	2497	3429
1215.0	508.0	2392	2417	3137	1415.0	573.3	2468	2500	3683
1220.0	509.7	2393	2419	2958	1420.0	574.9	2470	2503	3290
1225.0	511.6	2395	2420	2721	1425.0	576.5	2472	2505	3104
1230.0	513.4	2396	2421	2790	1430.0	578.0	2474	2507	3304
1235.0	515.2	2397	2422	2779	1435.0	579.4	2477	2510	3417
1240.0	516.8	2399	2424	2975	1440.0	580.9	2479	2512	3384
1245.0	518.6	2401	2426	2922	1445.0	582.4	2481	2515	3358
1250.0	520.4	2402	2427	2730	1450.0	583.9	2483	2517	3252
1255.0	522.0	2404	2430	3112	1455.0	585.4	2486	2520	3474
1260.0	523.5	2407	2433	3276	1460.0	586.7	2489	2524	3918
1265.0	525.2	2409	2435	2979	1465.0	588.2	2491	2526	3288
1270.0	526.9	2410	2437	2959	1470.0	589.7	2493	2528	3198
1275.0	528.6	2412	2438	2919	1475.0	591.2	2495	2531	3407
1280.0	530.4	2413	2439	2722	1480.0	592.7	2497	2533	3404
1285.0	532.4	2414	2440	2527	1485.0	594.1	2499	2536	3435
1290.0	534.1	2415	2441	2933	1490.0	595.6	2502	2538	3400
1295.0	535.8	2417	2443	2955	1495.0	597.0	2504	2541	3521
1300.0	537.5	2419	2445	3017	1500.0	598.4	2507	2544	3681
1305.0	539.2	2420	2447	2848	1505.0	599.8	2509	2547	3619
1310.0	540.9	2422	2448	2969	1510.0	601.2	2512	2550	3571
1315.0	542.6	2423	2450	2903	1515.0	602.6	2514	2553	3591
1320.0	544.3	2425	2452	2990	1520.0	604.0	2517	2555	3436
1325.0	546.0	2427	2454	3027	1525.0	605.6	2518	2557	3146
1330.0	547.6	2429	2456	3012	1530.0	607.1	2520	2559	3247
1335.0	549.2	2431	2458	3199	1535.0	608.7	2522	2561	3266
1340.0	550.7	2433	2461	3300	1540.0	610.1	2524	2564	3425
1345.0	552.1	2436	2464	3552	1545.0	611.4	2527	2567	3948
1350.0	553.8	2438	2466	2943	1550.0	612.9	2529	2569	3351
1355.0	555.5	2439	2467	2976	1555.0	614.4	2531	2571	3313
1360.0	557.1	2441	2470	3157	1560.0	616.0	2533	2573	3217
1365.0	558.7	2443	2472	3077	1565.0	617.5	2534	2575	3193
1370.0	560.1	2446	2475	3444	1570.0	619.1	2536	2577	3160
1375.0	561.6	2448	2478	3481	1575.0	620.7	2538	2579	3226
1380.0	563.1	2451	2480	3282	1580.0	622.2	2539	2580	3193
1385.0	564.6	2453	2483	3415	1585.0	623.7	2541	2582	3314
1390.0	566.1	2455	2486	3304	1590.0	625.4	2542	2584	3023
1395.0	567.6	2458	2488	3365	1595.0	627.1	2544	2585	2940
1400.0	569.1	2460	2491	3366	1600.0	628.7	2545	2586	3135

Well : MCEACHERN #1
Survey units : METRES
Calibrated sonic interval velocities used from 275.0 to 2290.0

Client : GAS AND FUEL EXPLORATION
Datum : 0.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval	Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
1605.0	630.3	2546	2588	3073	1805.0	687.3	2626	2677	3519
1610.0	631.9	2548	2589	3163	1810.0	688.7	2628	2679	3571
1615.0	633.4	2550	2591	3223	1815.0	690.1	2630	2681	3540
1620.0	634.8	2552	2594	3630	1820.0	691.6	2632	2683	3563
1625.0	636.2	2554	2597	3735	1825.0	692.9	2634	2685	3790
1630.0	637.7	2556	2598	3245	1830.0	694.2	2636	2688	3709
1635.0	639.2	2558	2600	3409	1835.0	695.7	2638	2690	3474
1640.0	640.7	2560	2602	3336	1840.0	697.0	2640	2692	3613
1645.0	642.1	2562	2605	3508	1845.0	698.4	2642	2694	3767
1650.0	643.4	2565	2608	3913	1850.0	699.8	2644	2696	3527
1655.0	644.8	2567	2610	3443	1855.0	701.2	2645	2698	3519
1660.0	646.1	2569	2613	3901	1860.0	702.6	2647	2700	3605
1665.0	647.3	2572	2617	4228	1865.0	703.8	2650	2703	4000
1670.0	648.7	2574	2620	3504	1870.0	705.1	2652	2706	3993
1675.0	650.1	2577	2622	3607	1875.0	706.5	2654	2708	3586
1680.0	651.4	2579	2625	3880	1880.0	707.8	2656	2710	3739
1685.0	652.9	2581	2627	3383	1885.0	709.1	2658	2713	3804
1690.0	654.4	2582	2628	3159	1890.0	710.5	2660	2715	3804
1695.0	656.0	2584	2630	3257	1895.0	711.8	2662	2718	3833
1700.0	657.4	2586	2632	3410	1900.0	713.1	2665	2720	3877
1705.0	658.8	2588	2635	3601	1905.0	714.4	2667	2722	3785
1710.0	660.2	2590	2637	3722	1910.0	715.7	2669	2725	3840
1715.0	661.5	2593	2640	3727	1915.0	717.0	2671	2727	3838
1720.0	662.9	2595	2642	3542	1920.0	718.2	2673	2730	4041
1725.0	664.4	2596	2644	3360	1925.0	719.6	2675	2732	3551
1730.0	665.9	2598	2646	3290	1930.0	721.1	2676	2733	3312
1735.0	667.5	2599	2647	3298	1935.0	722.6	2678	2735	3319
1740.0	668.9	2601	2649	3367	1940.0	724.1	2679	2736	3536
1745.0	670.3	2603	2651	3622	1945.0	725.5	2681	2738	3435
1750.0	671.6	2606	2654	3842	1950.0	727.0	2682	2740	3442
1755.0	673.1	2607	2656	3402	1955.0	728.4	2684	2741	3365
1760.0	674.5	2609	2658	3517	1960.0	729.9	2685	2742	3344
1765.0	675.9	2611	2660	3553	1965.0	731.4	2687	2744	3352
1770.0	677.3	2613	2663	3541	1970.0	732.9	2688	2745	3416
1775.0	678.7	2615	2665	3529	1975.0	734.3	2690	2747	3580
1780.0	680.2	2617	2667	3491	1980.0	735.6	2692	2750	3983
1785.0	681.6	2619	2669	3475	1985.0	736.9	2694	2752	3655
1790.0	683.0	2621	2671	3569	1990.0	738.4	2695	2753	3421
1795.0	684.4	2623	2673	3524	1995.0	739.7	2697	2755	3715
1800.0	685.9	2624	2675	3381	2000.0	740.9	2699	2758	4124

Well : MCEACHERN #1 Client : GAS AND FUEL EXPLORATION
Survey units : METRES Datum : 0.0
Calibrated sonic interval velocities used from 275.0 to 2290.0

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
2005.0	742.4	2701	2760	3524
2010.0	743.7	2703	2762	3628
2015.0	745.0	2705	2764	3855
2020.0	746.3	2707	2766	3882
2025.0	747.6	2709	2768	3856
2030.0	748.9	2711	2771	3899
2035.0	750.2	2713	2773	3846
2040.0	751.4	2715	2776	4119
2045.0	752.7	2717	2778	4017
2050.0	754.0	2719	2780	3626
2055.0	755.5	2720	2781	3357
2060.0	757.1	2721	2782	3259
2065.0	758.7	2722	2783	3144
2070.0	760.2	2723	2784	3284
2075.0	761.7	2724	2785	3348
2080.0	763.0	2726	2787	3667
2085.0	764.4	2728	2789	3620
2090.0	765.7	2729	2791	3756
2095.0	767.0	2731	2793	3878
2100.0	768.2	2734	2796	4316
2105.0	769.4	2736	2799	4108
2110.0	770.6	2738	2801	4151
2115.0	771.9	2740	2803	3884
2120.0	773.1	2742	2806	4023
2125.0	774.5	2744	2808	3785
2130.0	775.8	2746	2810	3805
2135.0	777.1	2748	2812	3919
2140.0	778.2	2750	2815	4292
2145.0	779.4	2752	2817	4064

Datum Depth	One-way time(ms)	VELOCITIES Average	RMS	Interval
2150.0	780.7	2754	2819	4008
2155.0	782.1	2756	2821	3687
2160.0	783.4	2757	2823	3756
2165.0	784.7	2759	2825	3924
2170.0	785.9	2761	2827	4055
2175.0	787.1	2763	2830	4181
2180.0	788.3	2765	2832	3996
2185.0	789.6	2767	2834	3886
2190.0	791.0	2769	2836	3554
2195.0	792.4	2770	2838	3771
2200.0	793.7	2772	2839	3834
2205.0	794.9	2774	2842	3970
2210.0	796.2	2776	2844	4032
2215.0	797.3	2778	2846	4301
2220.0	798.7	2780	2848	3665
2225.0	800.0	2781	2850	3905
2230.0	801.2	2783	2852	3962
2235.0	802.6	2785	2854	3625
2240.0	803.9	2786	2856	3808
2245.0	805.2	2788	2857	3783
2250.0	806.6	2789	2859	3569
2255.0	807.9	2791	2861	3832
2260.0	809.2	2793	2863	4036
2265.0	810.4	2795	2865	4138
2270.0	811.6	2797	2867	4141
2275.0	812.8	2799	2869	4039
2280.0	814.2	2800	2871	3770
2285.0	815.6	2802	2872	3523
2290.0	817.0	2803	2874	3660

PE902117

This is an enclosure indicator page.
The enclosure PE902117 is enclosed within the container PE902115 at this location in this document.

The enclosure PE902117 has the following characteristics:

ITEM_BARCODE = PE902117
CONTAINER_BARCODE = PE902115
NAME = Synthetic Seismogram Displays
BASIN = OTWAY
PERMIT = PEP 119
TYPE = WELL
SUBTYPE = SYNTH_SEISMOGRAM
DESCRIPTION = Synthetic Seismogram Displays (enclosure from appendix 7-Synthetic Seismograms-of WCR vol.2) for McEachern-1
REMARKS =
DATE_CREATED =
DATE_RECEIVED =
W_NO = W1017
WELL_NAME = McEachren-1
CONTRACTOR = Velseis
CLIENT_OP_CO = Gas and Fuel Exploration NL.

(Inserted by DNRE - Vic Govt Mines Dept)

PE902118

This is an enclosure indicator page.
The enclosure PE902118 is enclosed within the container PE902115 at this location in this document.

The enclosure PE902118 has the following characteristics:

ITEM_BARCODE =	PE902118
CONTAINER_BARCODE =	PE902115
NAME =	Synthetic Seismogram Displays
BASIN =	OTWAY
PERMIT =	PEP 119
TYPE =	WELL
SUBTYPE =	SYNTH_SEISMOGRAM
DESCRIPTION =	Synthetic Seismogram Displays (enclosure from appendix 7-Synthetic Seismograms-of WCR vol.2) for McEachern-1
REMARKS =	
DATE_CREATED =	
DATE_RECEIVED =	
W_NO =	W1017
WELL_NAME =	McEachren-1
CONTRACTOR =	Velseis
CLIENT_OP_CO =	Gas and Fuel Exploration NL.

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PE902119

This is an enclosure indicator page.
The enclosure PE902119 is enclosed within the container PE902115 at this location in this document.

The enclosure PE902119 has the following characteristics:

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CONTAINER_BARCODE = PE902115
NAME = Synthetic Seismogram Displays
BASIN = OTWAY
PERMIT = PEP 119
TYPE = WELL
SUBTYPE = SYNTH_SEISMOGRAM
DESCRIPTION = Synthetic Seismogram Displays (enclosure from appendix 7-Synthetic Seismograms-of WCR vol.2) for McEachern-1
REMARKS =
DATE_CREATED =
DATE_RECEIVED =
W_NO = W1017
WELL_NAME = McEachren-1
CONTRACTOR = Velseis
CLIENT_OP_CO = Gas and Fuel Exploration NL.

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PE902120

This is an enclosure indicator page.
The enclosure PE902120 is enclosed within the container PE902115 at this location in this document.

The enclosure PE902120 has the following characteristics:

ITEM_BARCODE = PE902120
CONTAINER_BARCODE = PE902115
NAME = Synthetic Seismogram Displays
BASIN = OTWAY
PERMIT = PEP 119
TYPE = WELL
SUBTYPE = SYNTH_SEISMOGRAM
DESCRIPTION = Synthetic Seismogram Displays (enclosure from appendix 7-Synthetic Seismograms-of WCR vol.2) for McEachern-1
REMARKS =
DATE_CREATED =
DATE_RECEIVED =
W_NO = W1017
WELL_NAME = McEachren-1
CONTRACTOR = Velseis
CLIENT_OP_CO = Gas and Fuel Exploration NL.

(Inserted by DNRE - Vic Govt Mines Dept)

8. X-RAY DIFFRACTION ANALYSIS

AMDEL CORE SERVICES

PETROLOGICAL AND X-RAY DIFFRACTION ANALYSES REPORT

McEACHERN #1

OTWAY BASIN

Dr. S.E. PHILLIPS

Amdel Core Services
G.P.O. Box 109
Eastwood,
S.A. 5063

April 1990

INDEX

1. SUMMARY

This report contains the results of a petrological and X-ray diffraction study of selected sidewall core from McEachern #1 in the Otway Basin. Eight samples were provided for thin section description and sixteen for bulk X-ray diffraction.

Quartzarenites and subarkose from McEachern #1 are similar in terms of sediment provenance and depositional environment. The rocks are mineralogically submature to mature. Some contain relatively high proportions of feldspar and lithic fragments. Variations in provenance of lithics are reflected by the number of volcanic and metasedimentary rock fragments. The predominant detrital phases are plutonic quartz, microcline and sodic plagioclase and ubiquitous (though not abundant) garnet. The provenance area is thought, therefore, to have had exposed granitic and metamorphic rocks.

Whatever the ultimate depositional environment, transportation of detritus was sufficiently prolonged to yield mineralogically submature to mature sands. Slight variations in feldspar and lithic abundance probably reflect subtle differences in the distance of transport. Texturally mature sands are likely to have been deposited in high energy regimes, possibly fluvial, alluvial fan or beach environments. Submature sediments, and interbedding of mudstone and sandstone, suggests lower energy environments with current activity. These sediments may represent lagoonal, neritic or overbank deposits. Although terrestrial environments are considered more likely, there is no definitive evidence as to the type of depositional environment.

Sediments analysed by X-ray diffraction all contain quartz, feldspar and clay. Several different types of feldspar were identified, namely, calcian albite, oligoclase, anorthite and microcline. There are significant variations in the relative abundance of clay minerals. In particular, the amount of smectite (?montmorillonite), clinochlore IIB and randomly interstratified material changes noticeably. Below a depth of approximately 1,364m there is significantly less montmorillonite. Other minerals detected include illite/muscovite, dickite, kaolinite, siderite and almandite.

2. INTRODUCTION

A series of sidewall core samples from McEachern #1, Otway Basin, were received by Amdel Core Services from Gas and Fuel Exploration N/L. The client requested petrographic descriptions and X-ray diffraction analyses of selected samples. Furthermore, they requested comments on the depositional environment and sediment provenance. The following samples were supplied;

Sidewall core for petrology

No.	Depth (m)
5	2330.6
6	2259.6
8	2202.6
9	2148.6
21	1796.0
22	1766.0
27	1993.6
29	1545.6

Sidewall core for X-ray diffraction

No.	Depth (m)
18	1857.6
22	1766.0
24	1674.6
26	1607.0
29	1545.6
31	1504.6
36	1364.6
38	1239.5
40	1146.6
41	1113.6
43	905.6
44	793.1
45	699.6
46	594.6
47	504.6
48	402.6

3. METHODS

Sidewall core were impregnated with araldite prior to thin section preparation. Blue dye was used in the araldite to facilitate description of porosity and permeability. Thin sections were systematically scanned to determine lithology, composition, porosity and textural relationships. All percentages given in brief descriptions are based on visual estimates, not point counts.

To determine bulk mineralogy by X-ray diffraction, samples were prepared by hand grinding in acetone and then smeared onto a glass slide. Smears were used as the method of sample preparation to enhance clay peaks. Continuous scans were run from 3° to 75° 2 theta, at 4°/minute, using Co K alpha radiation, 50kV and 35mA, on a Philips PW1050 diffractometer. Peaks were identified by comparison with JCPDS files stored in a computer program called XPLOT.

4. PETROLOGY

Many of the samples examined have been extensively damaged during sidewall collection. Detrital grains have been fractured and drilling mud has penetrated into the samples. Due to this damage only brief descriptions of relatively undisturbed areas were possible.

4.1 McEachern #1, swc 5, depth 2330.6m

Thin section description

The sample is a very fine to medium grained, moderately sorted, mineralogically mature and texturally submature quartzarenite. It has been highly disrupted by sidewall collection.

Framework grains consist dominantly of quartz with minor to trace amounts of feldspar, lithics, muscovite and garnet. Quartz grains vary in the degree of roundness with variations in grain size. Typically, larger grains are rounded, whilst finer grains are subrounded. Most quartz consists of single crystals and there are rare polycrystalline varieties. Extinction in the quartz grains is straight to slightly undulose and there are rare to moderate numbers of inclusions. These characteristics suggest a plutonic source. Feldspars include microcline, plagioclase and K-feldspar which shows some alteration to patchy clays. Several types of lithic clast were recognised, namely chert, shale and metamorphic rock fragments. Several colourless grains with very high relief are probably garnet.

The matrix consists of illite, fractured quartz and possibly kaolin. Some of the kaolin may be authigenic since it forms booklets and rarely is vermiform. Other authigenic minerals and cements include minor amounts of opaque material and carbonate. The opaque material replaces and rims detrital grains and is possibly pyrite. Microspar and micrite cement occurs in blotches and embays quartz grains which float within the cement. It is likely that the micrite has recrystallized to microspar during burial. The very brown colour of the micrite suggests it is Fe rich, probably siderite.

Due to the highly disrupted nature of this sample it is difficult to identify grain relationships. The fact that some muscovite flakes are bent and broken indicates the influence of mechanical compaction. Any primary porosity has been at least partially reduced by the introduction of carbonate and kaolin cements.

Interpretation

Sediment provenance, based on the presence of garnet and metamorphic rock fragments, is probably from an amphibole bearing metamorphic terrain. However, the quartz is probably plutonic in provenance suggesting multiple sources. The relative lack of feldspar and lithics indicates the sediment is mineralogical mature. This may be attributed to either long distances of transport or tectonic quiescence in the source region. It is not possible to comment on the depositional environment based on this thin section.

4.2 McEachern #1, swc 6, depth 2259.6m

Thin section description

The sample is a highly disrupted, interbedded siltstone - sandstone. In the sandstone, which is a quartzarenite, grains are very fine to coarse in size, with an average of fine, and subround to round in outline. The lack of matrix and good sorting in the quartzarenite indicates that it is mineralogically and texturally mature.

Framework grains are dominantly quartz with minor to trace amounts of feldspar, mica, garnet and lithic fragments. Quartz consists of single crystals with straight to slightly undulose extinction and relatively few mineral and/or fluid inclusions. Feldspars are both fresh and highly altered. They include well rounded plagioclase, microcline and K-feldspar. There are several grains of detrital garnet similar to those observed in sidewall core 5. Several types of lithic fragments were recognised, namely shale and other metamorphic clasts and one igneous clast. The latter is a felted, feldspathic rock with an average length of the elongate feldspar crystals of about 0.03mm.

It is difficult to distinguish the matrix from authigenic minerals and cements in this sample. Illite, which rims detrital quartz grains, was part of an original matrix. There are patches of intergranular kaolin some of which fill pores, and therefore can be interpreted as authigenic. Rare euhedral rhombohedra of carbonate spar are also present, and micrite is replacing mica. Opaque material which partially rims grains could be part of the original matrix or an authigenic mineral. One patch, which is dark olive green in colour, is probably chlorite replacing another mineral.

Interpretation

This sample had a similar sediment source to that of sidewall core 5. There is definite evidence of mixed sediment provenance from metamorphic and igneous sources. This is based on the presence of both fresh and altered feldspars, garnet and lithological differences in the rock fragments. The garnet would appear to be of particular significance in identifying the source area. Feldspars and lithics are only minor components of the rock which suggests either long distances of transport or derivation from a tectonically quiescent terrain.

Fluctuations in current activity are suggested by the interbedding of siltstone and sandstone, possibly in a fluvial environment. This terrestrial environment of deposition is a highly speculative suggestion based on the lack of glauconite which typifies so many shallow marine environments.

4.3 McEachern #1, swc 8, depth 2202.6m

Thin section description

The sample is a moderately well sorted, very fine to coarse grained subarkose. Average grain size is 0.25mm.

Framework grains consist of quartz, feldspar, lithics, garnet and mica. Quartz grains occur as single crystals with straight to slightly undulose extinction and rare to moderate numbers of inclusions. They are equant and show considerable evidence of rounding. Feldspars are more abundant than in sidewall cores 5 and 6, and consist of angular and rounded, fresh and altered, coarse grained microcline, K-feldspar and plagioclase. Other detrital grains include garnet and rock fragments of metamorphic origin.

There is a high proportion of carbonate cement in this sample. Red-brown micrite has recrystallized to microspar which rims and replaces framework quartz grains. In addition, there are isolated euhedral rhombs of spar which do not have the distinctive red-brown colour. It is possible that there are at least two phases of carbonate present with the red-brown colour indicative of an Fe rich carbonate, possibly siderite. Kaolin booklets also form a distinctive cement where they fill oversized pores. Since micritic carbonate frequently partially rims pores filled with kaolin, it would appear that the carbonate predates precipitation of kaolin. Quartz overgrowths represent a third type of cement and are obvious due to the presence of straight contacts between grains. This silica cement is rare where there is abundant micrite, again indicating that the micrite was an early cement. The final type of authigenic mineral recognised in this sample is an opaque material which fills pores.

The fact that micas are bent indicates considerable mechanical compaction of this sample. Contacts between quartz grains are concavo-convex and long, particularly in the cleaner parts of the thin section. Where carbonate is abundant framework grains float within this cement. Only rare intergranular porosity has been preserved.

Interpretation

Framework components in this sample are very similar to those in sidewall cores 5 and 6. However, there is a significant increase in the proportion of feldspar which suggests either a change of sediment provenance, reduced distances of transport or tectonic activity in the source region. A change of sediment provenance is unlikely since detrital garnet is consistent in all the above samples.

There has been considerable diagenetic alteration of the subarkose after burial. Mechanical compaction, recrystallization of an early micritic cement, dissolution of labile components to form oversized pores and precipitation of kaolin in those pores have all significantly reduced porosity and permeability.

Again it is very difficult to identify a depositional environment. If the micrite is siderite then this favours a terrestrial environment, possibly swampy. The fact that this subarkose is only moderately well sorted suggests rapid deposition which could also explain the preservation of feldspar.

4.4 McEachern #1, swc 9, depth 2148.6m

Thin section description

The sample is a very fine to coarse grained, poor to moderately sorted, mineralogically mature quartzarenite. Coarse grains, up to 0.6mm in diameter, tend to be subangular to subrounded. Finer grains are mostly subangular and angular.

Framework grains consist dominantly of quartz, with minor to trace amounts of feldspar, mica, lithics, garnet and sphene. Single and rare polycrystalline quartz grains have slightly undulose extinction and rare inclusions. There are some quartz grains with significant numbers of vacuole trails and contacts within polycrystalline grains are highly sutured. Rare coarse grains of microcline and K-feldspar are present, but the proportion is significantly less than in sidewall core 8. Microcline is typically fresh whilst the K-feldspar generally shows minor turbidity and fracturing. Micas are dominantly muscovite, lithics consist of both shale and chert, and there are a few grains of sphene and garnet.

Matrix in this quartzarenite consists of silt sized quartz and illite. There are three different authigenic minerals present, namely micrite, kaolin and an opaque material. The micrite occurs as brownish blotches which have recrystallized to microspar. Kaolin booklets and the opaque material are pore filling. Rare single cubic crystals suggest that the opaque material may be pyrite. There is no evidence of quartz overgrowths.

Texturally, detrital quartz grains float within a matrix (plus cement) of very fine grained quartz, illite, kaolin and micrite. Due to the relative abundance of matrix (plus cement) there is limited development of long and curved contacts between detrital grains. Lithic fragments and micas are commonly bent, indicating some mechanical compaction.

Interpretation

Sediment provenance is slightly different to sidewall cores 5, 6, and 8 described above. There is less feldspar, in particular no plagioclase was recognised, sphene was not present in previous samples and there are no volcanic rock fragments. However, the presence of garnet is consistent and rock fragments are typically metasedimentary in origin. These characteristics suggest that sediments were derived from at least one source in common with other sidewall cores lower in the well.

Texturally the quartzarenite is submature which suggests deposition in a low energy environment such as a flood plain, alluvial fan, neritic or lagoonal environment.

4.5 McEachern #1, swc 21, depth 1796.0m

Thin section description

The sample is a laminated mudstone, interbedded with a sandstone. There is a gradual decrease in the proportion of quartz from the sandstone into the mudstone, indicating graded bedding. Without knowing the orientation of the sample it is not possible to identify whether this is coarsening or fining upwards.

The laminated mudstone contains abundant illite, with rare, angular silt sized quartz, opaques and micas. The latter are aligned parallel to laminae. Minor patches of Fe staining and micrite are evident, with rare sparry carbonate. The latter is probably authigenic and related to cementation in the sandstone.

The sandstone is a carbonate cemented, well sorted sandstone. Framework grains consist of quartz, mica (biotite), feldspars, lithics, garnet and sphene. Typically quartz grains are fractured due to sidewall collection. Detrital grains are subrounded single crystals, with straight to slightly undulose extinction and rare inclusions. Feldspars include coarse grained fresh microcline, K-feldspar altering to sericite and some which are partially dissolved, and plagioclase which has dissolved along preferred crystallographic axes. Lithics of shale and chert are rare, as are grains of garnet and sphene.

Carbonate spar is the dominant authigenic cement. Kaolin booklets also fill pores. Dust rims on quartz grains indicate the presence of quartz overgrowths. These are most abundant in zones with nominal carbonate cement.

The sandstone has a high proportion of intergranular pores and some micropores due to feldspar dissolution. Contacts between framework grains are typically point and tangential.

Interpretation

The relative abundance of feldspars in this sample suggests either a short distance of transport or tectonic activity in the source region. Sediment provenance is similar to that of sidewall core 9 in that garnet and sphene are present and lithics consist of shale and chert.

Diagenetic alteration of the sandstone has significantly altered the nature of porosity and permeability. Carbonate spar and kaolin have significantly reduced primary porosity. The carbonate is likely to be a relatively late diagenetic event. However, the partial dissolution of feldspars has contributed to secondary porosity. Flushing by fresh ground waters would usually cause the dissolution of garnets therefore it is possible that alkaline waters associated with the precipitation of carbonates were responsible for the dissolution of feldspars.

There is no definitive evidence of the depositional environment. Interbedding of mudstone and sandstone is possible in a number of environments although fluvial, neritic, and alluvial fans are the most likely.

4.6 <u>McEachern #1, swc 22, depth 1766.0m</u>

Thin section description

The sample is a fine to very coarse grained, well sorted, subarkose. Average grain size is medium (0.3mm) and most grains are subangular to subrounded.

Framework grains consist of quartz, feldspar, mica, lithics and garnet. Quartz grains are characteristically single crystals with undulose extinction and rare inclusions. Feldspar is relatively abundant (5-10%) with fresh microcline and plagioclase, and some dissolution of K-feldspar. The plagioclase has both albite and perthite twins and extinction angles that indicate the presence of anorthite. Lithics of chert, shale, metamorphic and volcanic rock fragments are evident. The latter contain phenocrysts of feldspar in a quartz and feldspathic groundmass. There is a small proportion of metasedimentary lithic fragments,, which consist of fine-grained phyllosilicate minerals and quartz or feldspathic material. Garnets concentrate as a distinct band in the sample. Opaque material associated with the garnet is probably Mg oxide.

Matrix was not recognised and there are only minor proportions of cements and authigenic minerals. These occur as traces of quartz overgrowths, kaolin booklets which fill pores and one isolated crystal of carbonate spar.

Most detrital grains have only point contacts with rare suturing in places. This texture has resulted in a high proportion of intergranular porosity. Rare bent micas are the result of mechanical compaction.

Interpretation

The relatively high proportion of feldspars and lithics in this mineralogically submature subarkose indicate either short distances of transport or tectonic activity in the source region. The reintroduction of volcanic lithics implies some kind of change in sediment source when compared to sidewall core 21. High Mg garnets which readily decompose to Mg oxide fall within the almandite-pyrope range that can be derived from either amphibole-bearing metamorphic rocks or mafic igneous rocks. Either source is possible given the nature of lithics in this sample.

Since the subarkose is texturally mature it implies a depositional environment with a high energy regime. Heavy mineral bands are typical of beach deposits and less commonly fluvial sediments. The second environment is favoured because detrital grains are not very well rounded.

4.7 McEachern #1, swc 27, depth 1993.6m

Thin section description

The sample is a well sorted, mineralogically submature, medium grained subarkose. Grains are typically subangular in outline.

Framework grains are dominated by quartz, with minor feldspar, and trace amounts of garnet, mica and lithic fragments. The quartz is a common or plutonic variety, characterised by straight to slightly undulose extinction and minor inclusions. Feldspar, both sodic and potassic varieties, represents up to 10% of the total rock composition. Some of the K-feldspars are altering to sericite and others are partially dissolved. Albite and carlsbad twins indicate the presence of fresh oligoclase, labradorite and andesine. Isolated grains of garnet have a typical rim of Mg oxide. Lithics include shale and other metasedimentary rock fragments.

Four groups of authigenic minerals and cements are present in minor proportions. Kaolin booklets fill intergranular and oversized pores. There are minor overgrowths on quartz and feldspars grains, and traces of twinned spar which embay adjacent quartz grains.

Grain contacts are generally at points with rare suturing and tangential arrangements evident. Suturing indicates chemical compaction of the sediment. Bent micas and deformed lithics demonstrate the effects of mechanical compaction. Pores are typically intergranular and oversized.

Interpretation

The mineralogical and textural maturity of this sample is very similar to that of sidewall core 22. However, there has been a slight change in sediment source since volcanic rock fragments are not apparent. The presence of detrital garnet indicates that at least one sediment source has remained constant throughout the sampled interval.

Diagenetic alteration is restricted to mechanical and chemical compaction, dissolution of labile components to produce oversized pores and the precipitation of authigenic minerals. It is possible that feldspar dissolution has released Si and Al for the precipitation of kaolin and silica cements.

4.8 McEachern #1, swc 29, depth 1545.6m

Thin section description

The sample is a very fine to medium grained, moderately well sorted quartzarenite. Extensive damage due to sidewall collection is evident.

Framework grains consist dominantly of quartz, feldspar, lithics, mica and garnet. Quartz grains are of the common or plutonic variety, with straight to slightly undulose extinction, and rare inclusions. Detrital quartz grains are well rounded. Fresh microcline is the most abundant feldspar present. There are examples of feldspars altering to sericite, and plagioclase (albite and possibly andesine) which have not been weathered. Micas are typically present as muscovite and some flakes are up to 0.6mm in length. Lithic fragments consist of large clasts of shale, and volcanic and metamorphic rock fragments. The shale has a characteristic Fe staining in places. Isolated grains of garnet with Mg oxide alteration rims were the only other framework grains recognised.

The matrix in this sample is difficult to identify because of the infiltration of drilling mud. Abundant kaolin is present filling pores and replacing grains, and there is some silt size quartz. It is possible that the latter is due to fracturing. In addition, there is an opaque material which fills pores and there are minor quartz overgrowths.

In coarser grained areas of the thin section grain contacts are typically sutured and tangential. Elsewhere framework grains only have point contacts because of the higher proportion of kaolin and very fine quartz in the matrix.

Interpretation

There are less feldspars and lithic fragments than in sidewall core 27 which suggests either longer distances of transport or changes in the source region. Since the assemblage of detrital minerals has not changed it must be assumed that longer distances of transport are responsible for the decline in feldspar abundance. The fact that kaolin is replacing grains (probably feldspar) further indicates the degree of alteration in this sample.

Mineralogically this quartzarenite is mature, but texturally it is submature. The latter indicates a lower energy regime was responsible for deposition than applied for sidewall core 27.

5. X-RAY DIFFRACTION

Although relative abundance of mineral phases are described in terms of dominance, subdominance, minor and trace proportions, caution is required in the interpretation of this data. The descriptions are based on peak height which is a function of a number of factors including crystallinity, crystal size and abundance. Due to this bias clay minerals give disproportionately small peaks when compared to highly crystalline minerals such as quartz. Therefore the descriptions are not a true indication of relative abundance. However, they do provide a means of comparing the same mineral in two different samples. Furthermore some minerals (e.g. feldspar) have a tendency to orient in a preferred direction when prepared as a smear. This preferred orientation can result in disproportionately high peaks.

Minerals present in less than approximately 5% of the total rock composition are unlikely to be detected by X-ray diffraction.

Where high backgrounds are recorded in XRD traces these can be attributed to the presence of either randomly interstratified clays or amorphous material. The latter could be organic or inorganic.

5.1 McEachern #1, swc 18, depth 1857.6m

Bulk XRD trace (Fig. 1) indicates that quartz is the dominant mineral present in this sample. There are minor to trace amounts of illite/muscovite, dickite, microcline, oligoclase, siderite and other clay minerals. A very broad background in the clay region suggests the presence of randomly interstratified material. In particular, clinochlore IIB (Fe rich chlorite) and montmorillonite may be present. To positively identify these clays an oriented sample of a less than 2 micron fraction is required.

5.2 McEachern #1, swc 22, depth 1766.0m

Bulk XRD trace (Fig. 2) indicates that quartz is the dominant mineral present. Feldspars are also relatively abundant and include microcline and anorthite. There are minor amounts of dickite and manganese rich almandite (garnet).

5.3 McEachern #1, swc 24, depth 1674.6m

Bulk XRD trace (Fig. 3) shows that quartz is the dominant mineral with subdominant dickite. A high degree of crystallinity is indicated by the sharpness of dickite peaks. This suggests the dickite is authigenic. There is a minor amount of oligoclase, ?albite and illite/muscovite. A broad background in the clay region suggests the presence of clinochlore IIB and montmorillonite, which could be interstratified.

5.4 McEachern #1, swc 26, depth 1607.0m

Bulk XRD trace (Fig. 4) indicates that quartz is the dominant mineral present. There is minor highly crystalline dickite which is probably authigenic. Calcian albite was the only feldspar detected.

Illite/muscovite (2M1), ?clinochlore IIB and ?montmorillonite are present in trace amounts. There is a high background in the clay region and under the major quartz peak. The latter indicates that there may be some organic and/or amorphous material in the sample. Interstratification of clays is also a possible explanation.

5.5 McEachern #1, swc 29, depth 1545.6m

Bulk XRD trace (Fig. 5) demonstrates that quartz is dominant with minor dickite, microcline and albite. There are trace amounts of kaolinite and illite/muscovite.

5.6 McEachern #1, swc 31, depth 1504.6m

Bulk XRD trace (Fig. 6) of this sample, indicates that quartz is dominant with subdominant clinochlore IIB and kaolinite. Minor albite, microcline, siderite and illite/muscovite (2M1) are present. A high background in the clay region indicates the possible presence of montmorillonite and interstratified material.

5.7 McEachern #1, swc 36, depth 1364.6m

Bulk XRD trace (Fig. 7) again shows the dominance of quartz. There is minor dickite and albite and a pronounced broad smectite (?montmorillonite) peak. The very high background is probably due to the presence of smectite.

5.8 McEachern #1, swc 38, depth 1239.5m

Bulk XRD trace (Fig. 8) of this sample illustrates that quartz is the dominant mineral present. Minor dickite, kaolinite, illite/muscovite and albite (calcian) were detected. There is possibly some clinochlore and/or randomly interstratified material.

5.9 McEachern #1, swc 40, depth 1146.6m

Bulk XRD trace (Fig. 9) illustrates that quartz is the dominant mineral present. There is minor dickite/kaolinite and trace amounts of illite/muscovite and albite. The very broad peak at 13 Angstroms is probably montmorillonite.

5.10 McEachern #1, swc 41, depth 1113.6m

Bulk XRD trace (Fig. 10) of this sample demonstrates that quartz is the dominant mineral present. Minor calcian albite, dickite, illite and clinochlore IIB were also detected. The relative proportion of montmorillonite is much greater in this sample than swc 40.

5.11 McEachern #1, swc 43, depth 905.6m

Bulk XRD trace (Fig. 11) indicates the dominance of quartz. There is a minor amount of microcline, calcian albite, clinochlore IIb, kaolinite and illite/muscovite. A relatively high background in the clay region suggests that there may be some smectite or randomly interstratified material present.

5.12 McEachern #1, swc 44, depth 793.1m

Bulk XRD trace (Fig. 12) demonstrates the dominance of quartz with subdominant to minor albite, illite/muscovite and clinochlore IIB. Again the broad clay peak is probably montmorillonite.

5.13 McEachern #1, swc 45, depth 699.6m

Bulk XRD trace (Fig. 13) of this sample indicates that quartz is dominant with subdominant albite and minor illite/muscovite, clinochlore IIB and kaolinite. There is only a trace of montmorillonite when compared to sidewall cores 41 and 46.

5.14 McEachern #1, swc 46, depth 594.6m

Bulk XRD trace (Fig. 14) indicates the dominance of quartz and albite (calcian). There is a trace amount of illite/muscovite, kaolinite and possibly calcite. The relative proportion of montmorillonite is high in this sample.

5.15 McEachern #1, swc 47, depth 504.6m

Bulk XRD trace (Fig. 15) of this sample shows quartz to be the dominant mineral present with minor albite and kaolinite. There are trace amounts of illite/muscovite and clinochlore IIB. The high clay background suggests there may be some randomly interstratified material present.

5.16 McEachern #1, swc 48, depth 402.6m

Bulk XRD trace (Fig. 16) again indicates the dominance of quartz and albite. There is minor illite/muscovite and clinochlore IIB in the sample.

6. CONCLUSIONS

a) Petrology

Quartzarenites and subarkose from McEachern #1 are all very similar in terms of likely sediment provenance and type of depositional environment. There are subtle variations in mineral and textural maturity which reflect minor differences between samples.

Proportions of feldspars and lithics are variable and suggest either differences in distances of sediment transport or slight changes in provenance. Garnet is ubiquitous to all samples and indicates that metamorphic rocks were probably exposed to erosion during the entire period of deposition. Intermittent introduction of volcanic rock fragments are likely to be the result of tectonic activity in the source area.

Some of the sediments, which are texturally mature, reflect depositional environments with high energy regimes. There is no definitive evidence as to the nature of this environment. It is possible that either fluvial, alluvial fan or beach environments are implicated. Texturally submature samples and interbedding of sandstones and mudstones, reflect lower energy environments with fluctuations in current activity. These samples may represent lagoonal, neritic or overbank deposits. A terrestrial environment is tentatively favoured for both hydraulic regimes because of the lack of fossils and glaucony which usually characterise shallow marine conditions.

Diagenetic alteration is pronounced in those sidewall core where there is a recrystallized carbonate cement (?siderite). Elsewhere, mechanical compaction, kaolinization and minor silicification are important controls on porosity and permeability. Minor dissolution of feldspars has also contributed to porosity in one sample.

b) X-ray diffraction

Bulk mineralogy demonstrates that quartz is the dominant mineral in all samples. Feldspars are the next most abundant mineral with calcian albite and microcline occurring in many samples. The relative proportions of clay minerals are highly variable and where abundant are probably associated with mudstones. Dickite concentrates in samples with a low clay content, it is crystalline in most samples and possibly authigenic in origin. There are varying amounts of randomly interstratified material, clinochlore and montmorillonite which could cause formation damage because they are highly reactive. Below approximately 1,364m the relative proportion of montmorillonite is significantly reduced. The only carbonate mineral detected was siderite. A Mg rich variety of almandite was detected in sidewall core 22. All the illite/muscovite present in these samples is a 2M1 variety which is likely to be detrital in origin.

7. FIGURES

Bulk XRD traces of each sample have been labelled to indicate only the strongest peak for each mineral. The following labels have been used;

A = almandite
Al = albite
An = anorthite
C = clinochlore IIB
D = dickite
I = illite/muscovite (2M1)
K = kaolinite
M = microcline
Mo = montmorillonite
O = oligoclase
Q = quartz
Sm = smectite
S = siderite

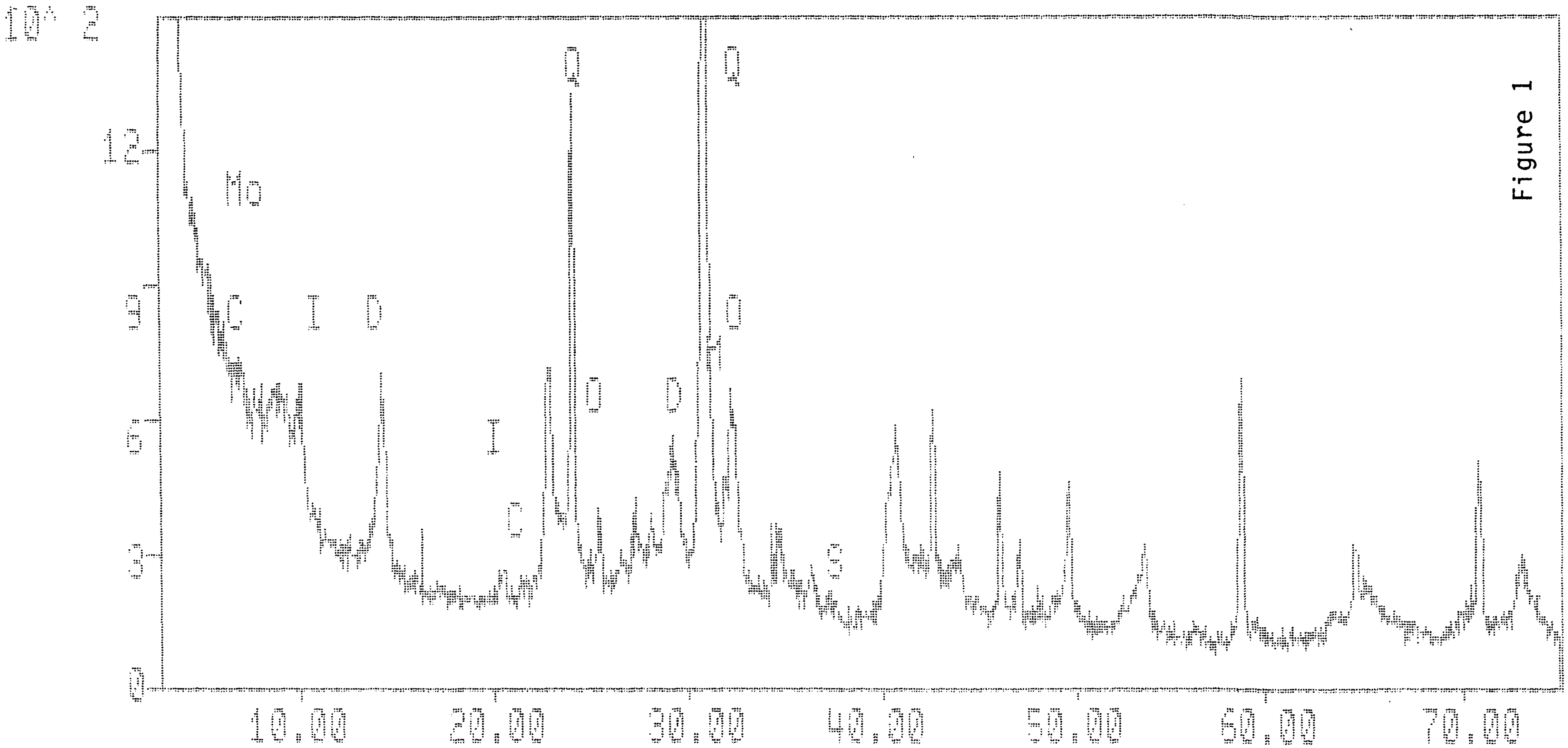

Figure 1

FILENAME: MCE-18.CPI

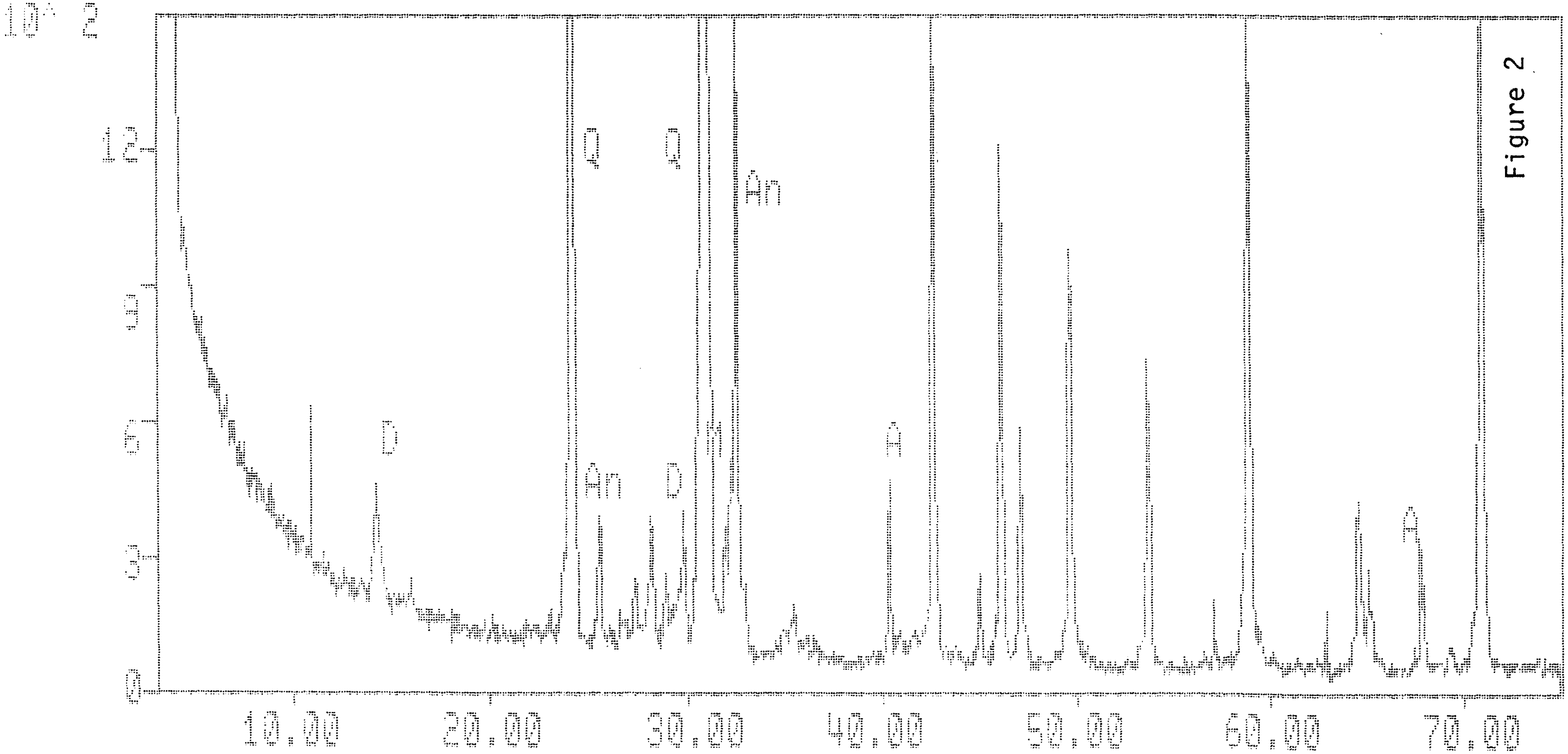

Figure 2

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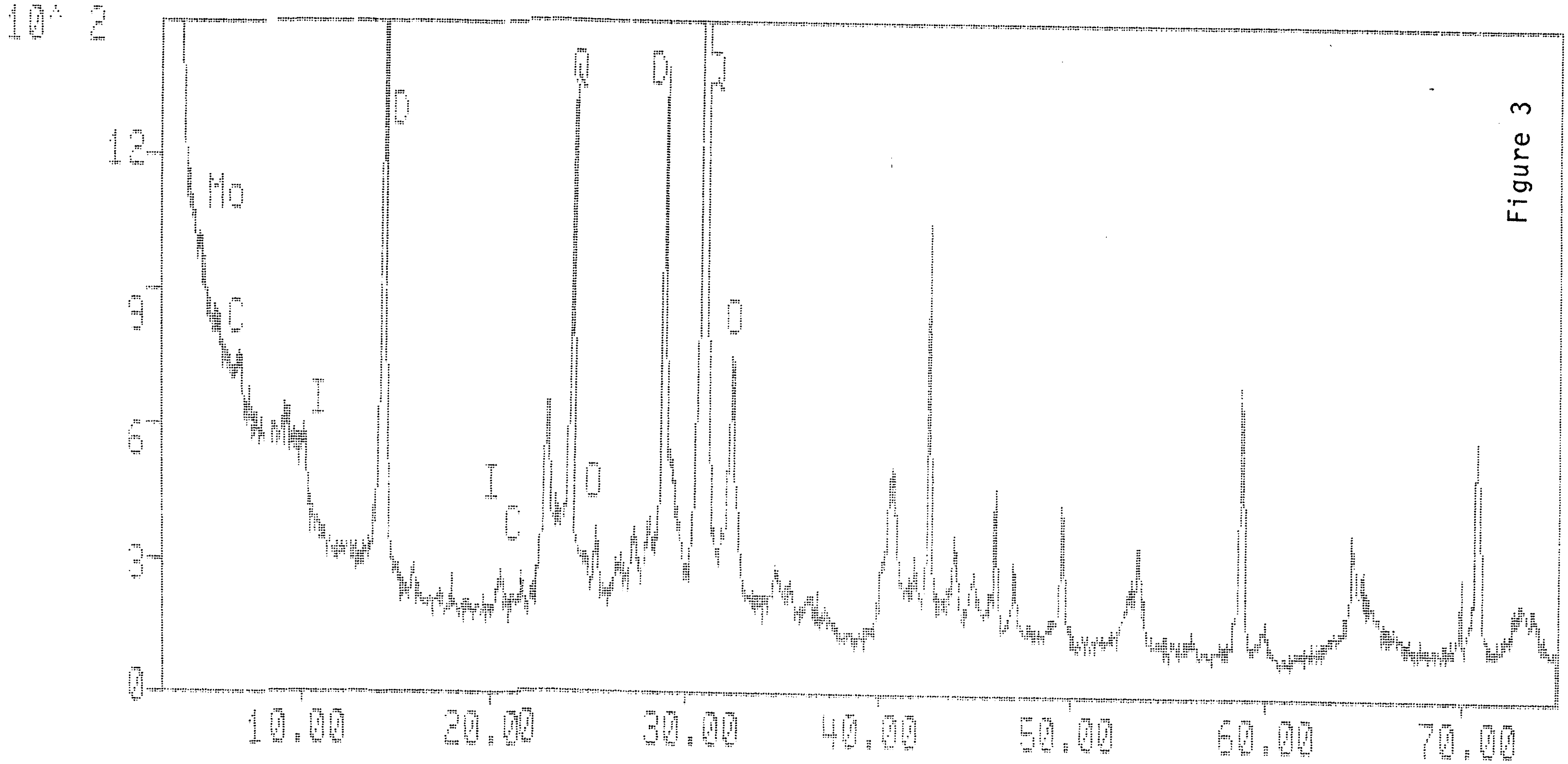

Figure 3

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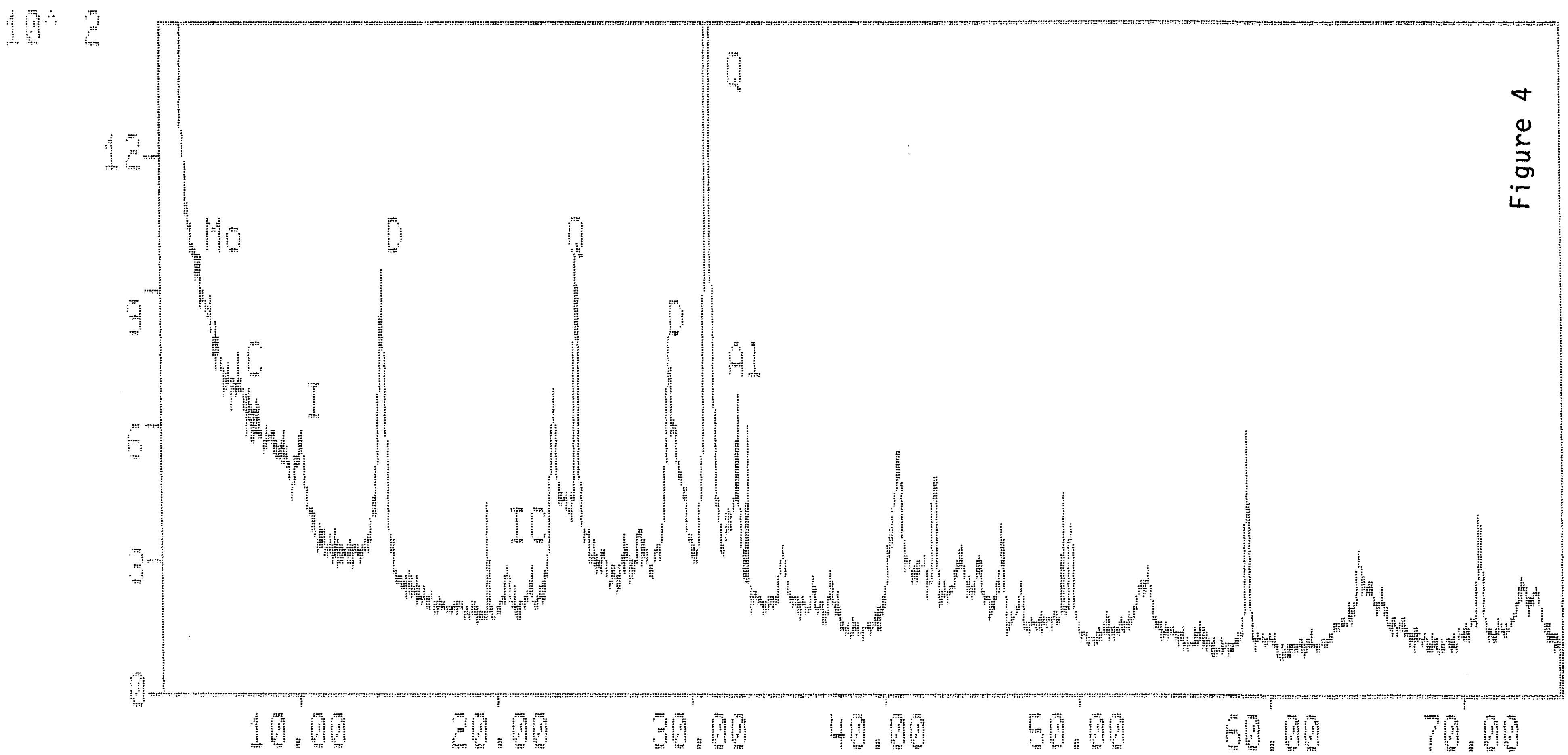

Figure 4

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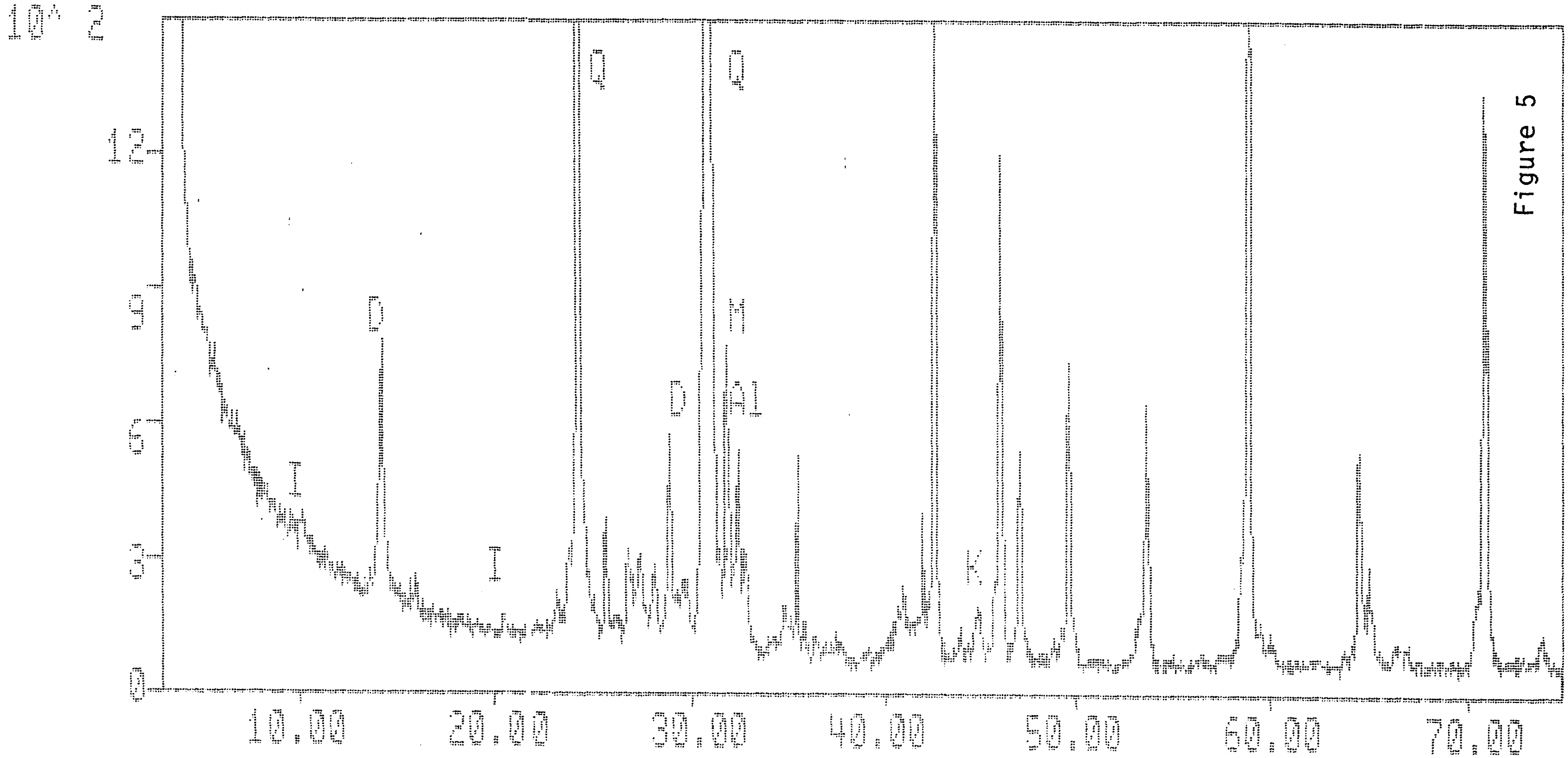

Figure 5

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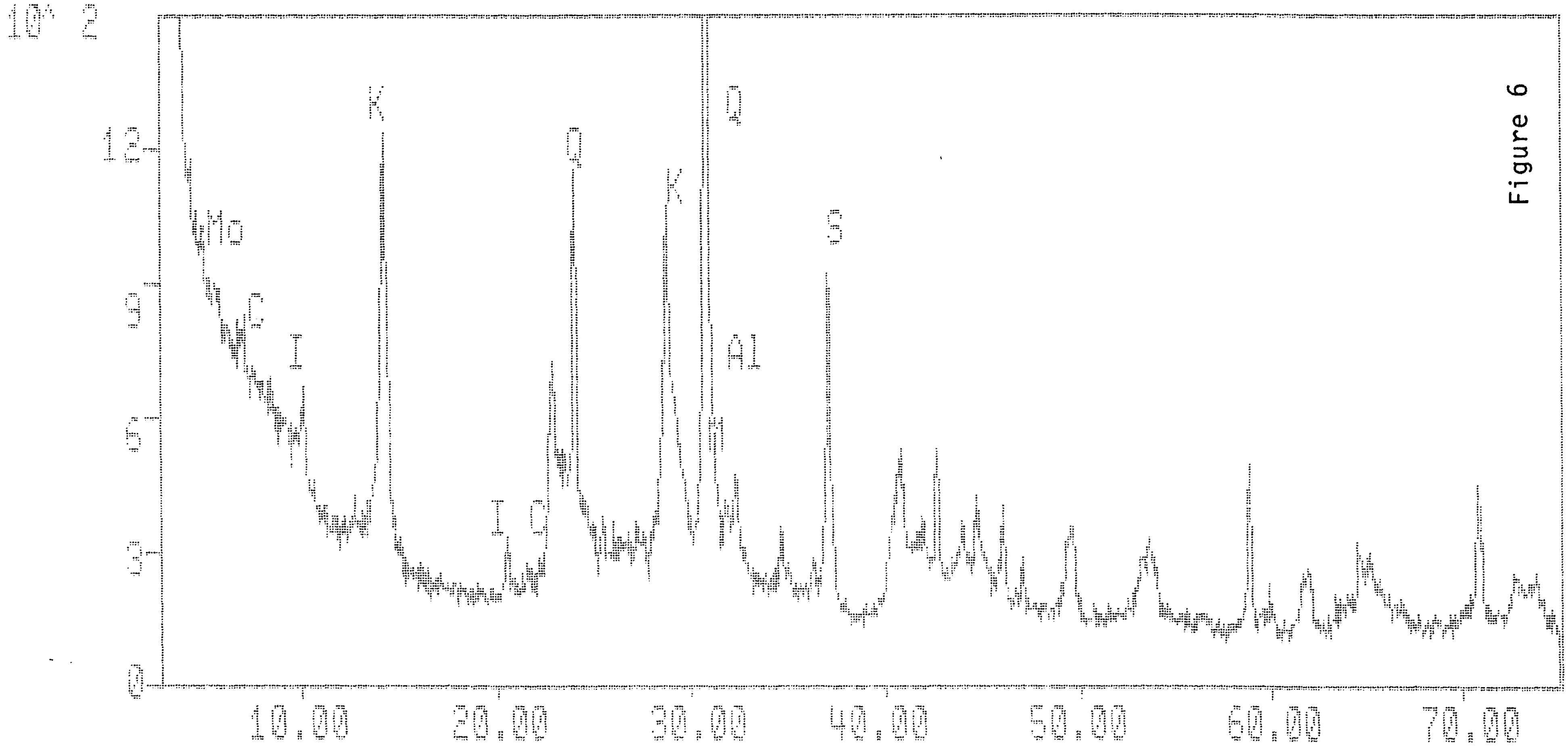

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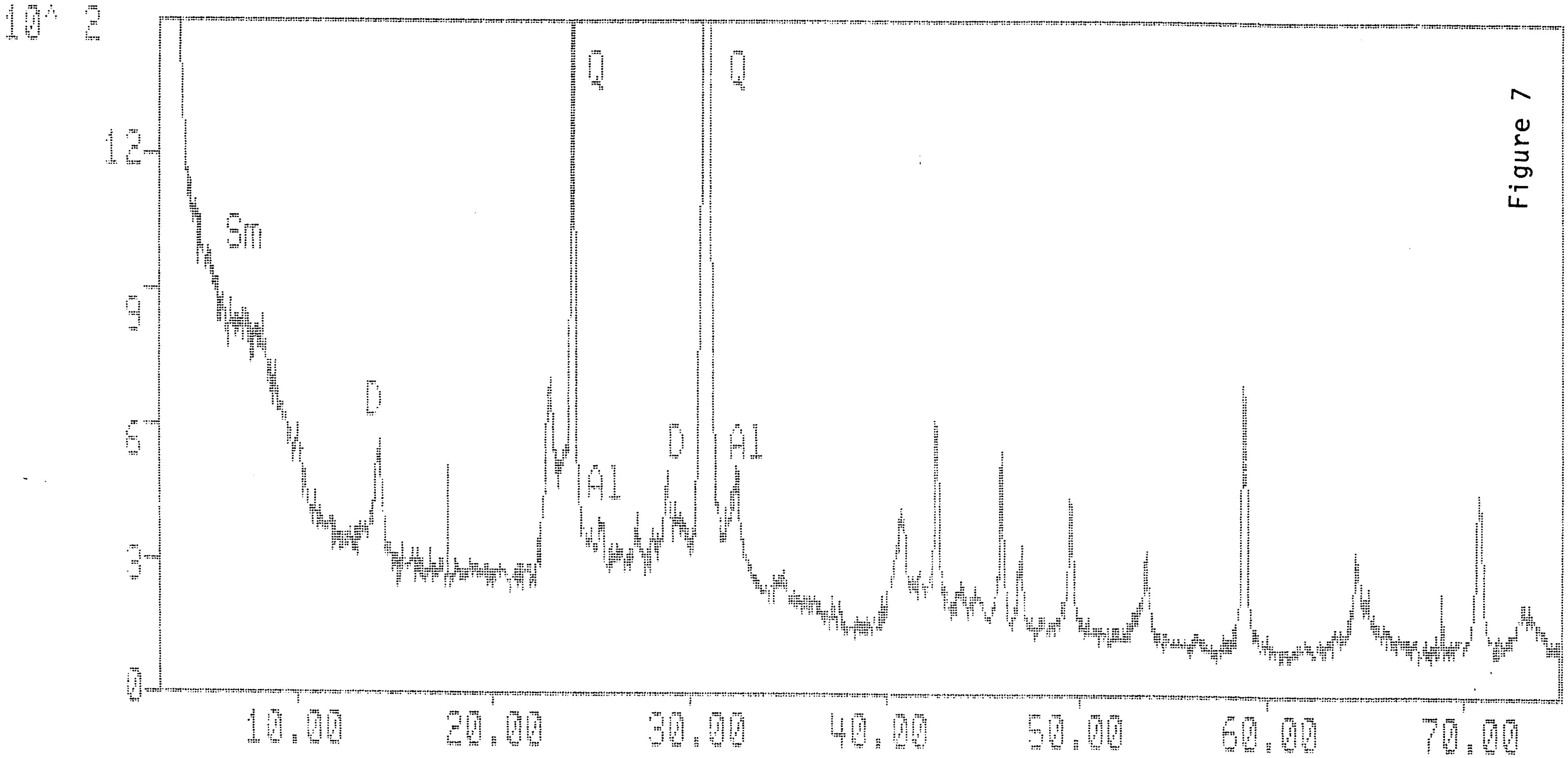

Figure 7

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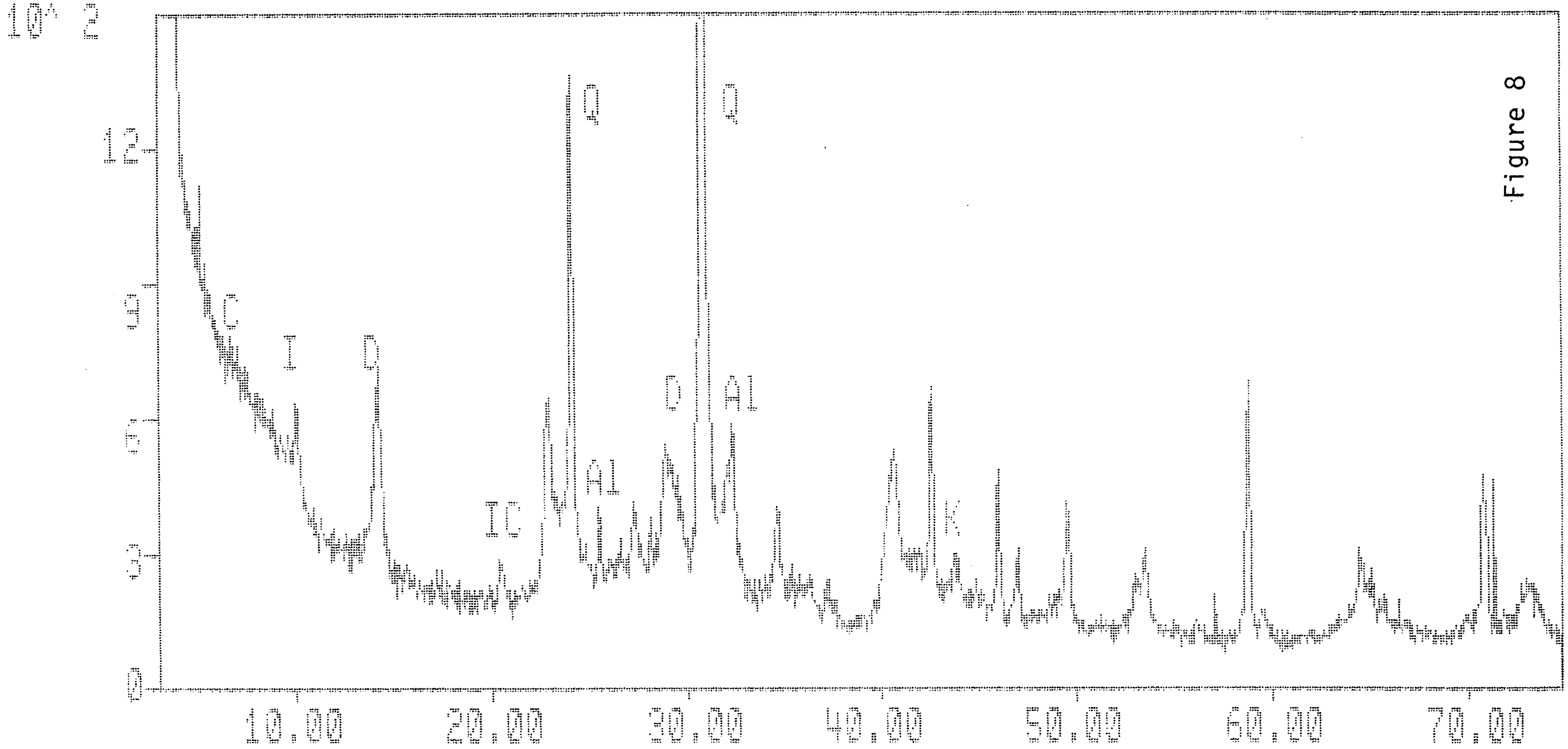

Figure 8

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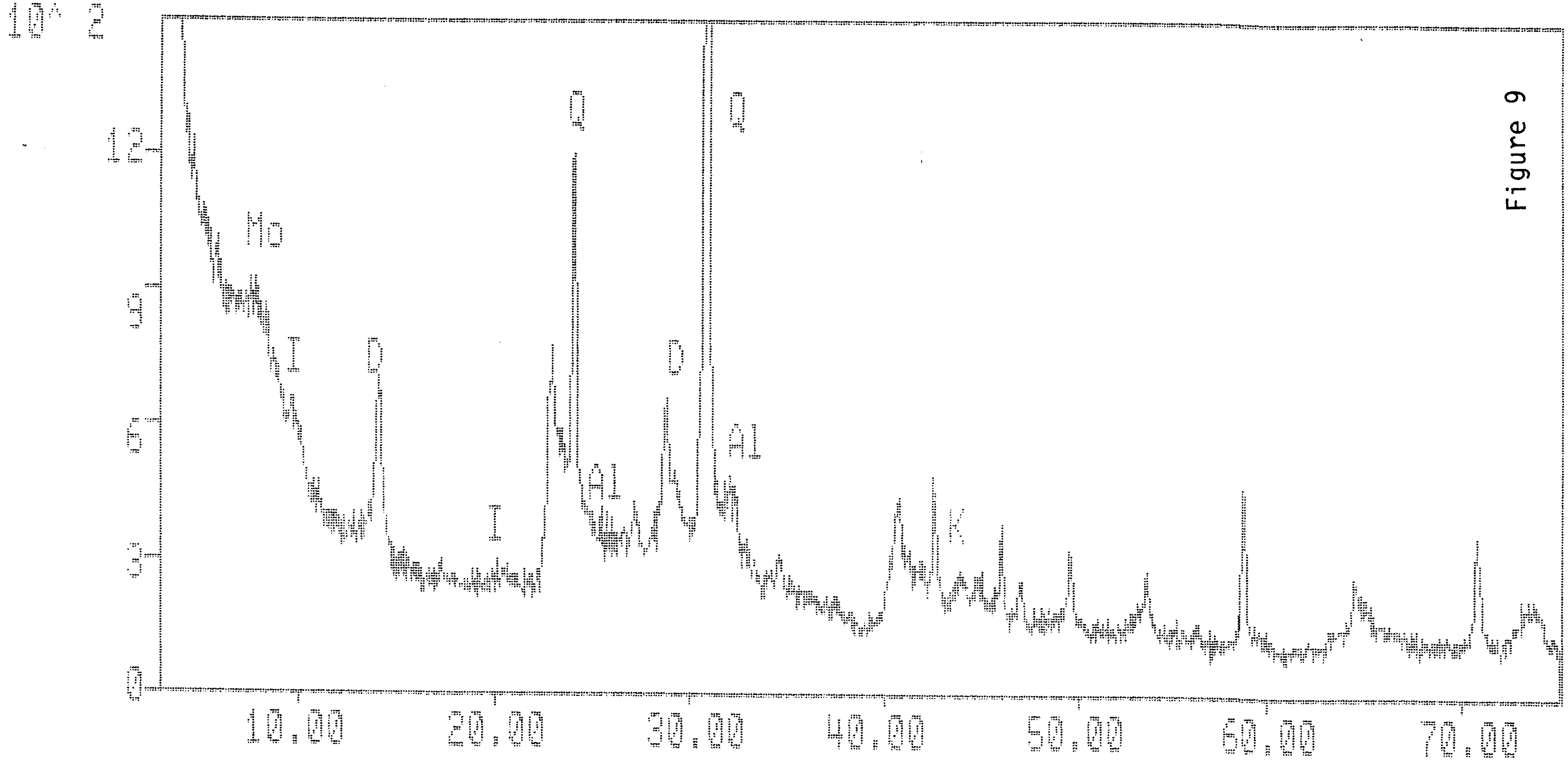

Figure 9

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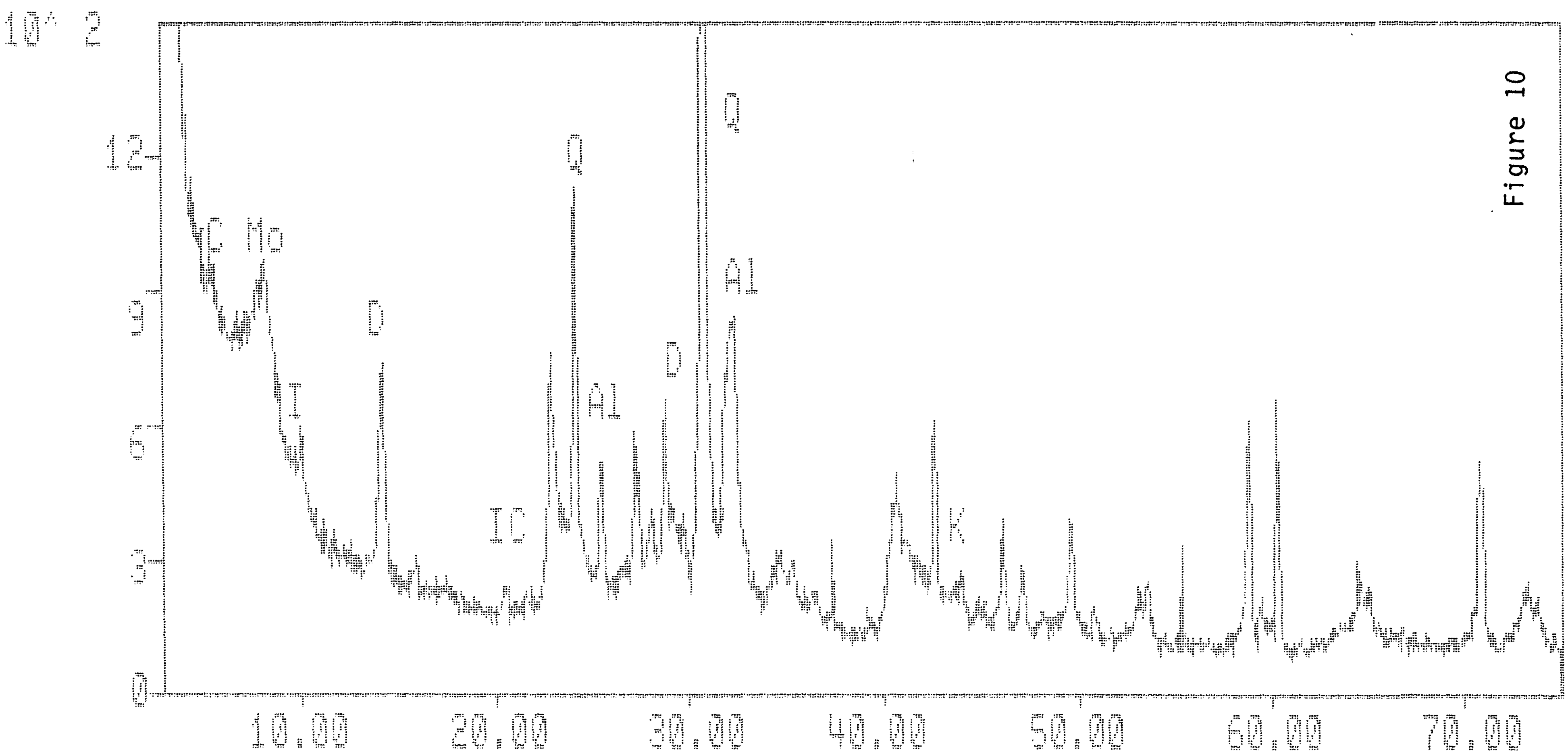

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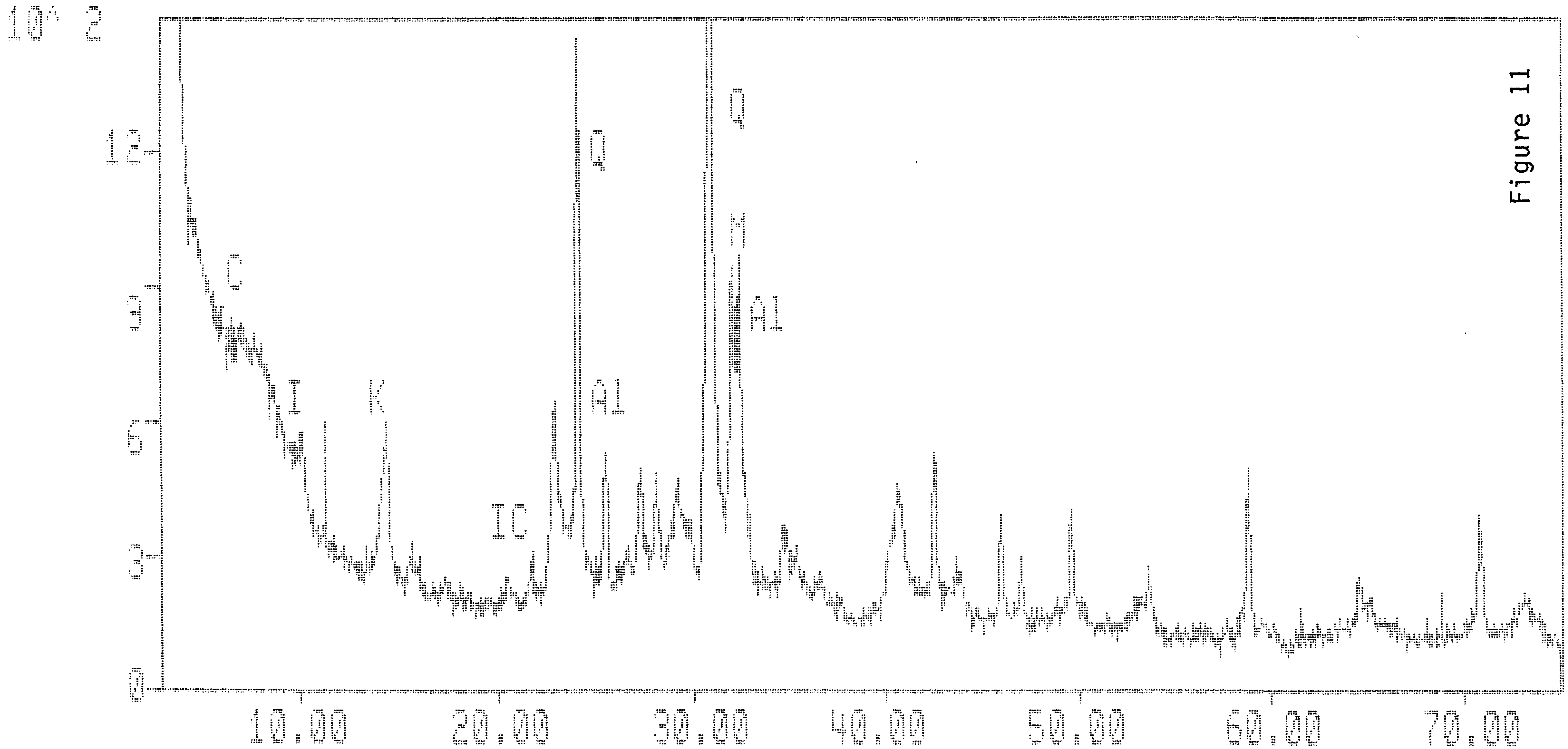

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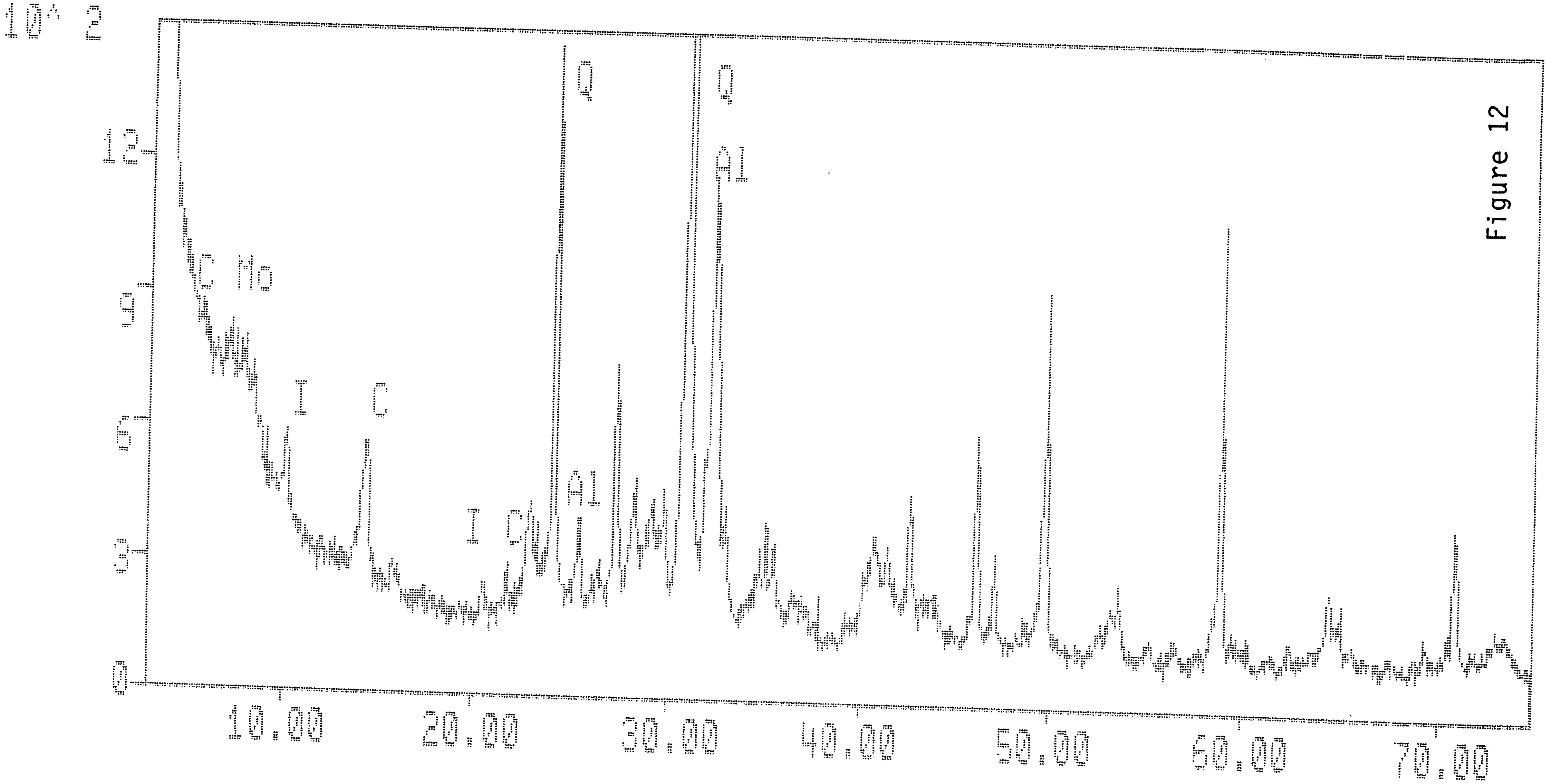

Figure 12

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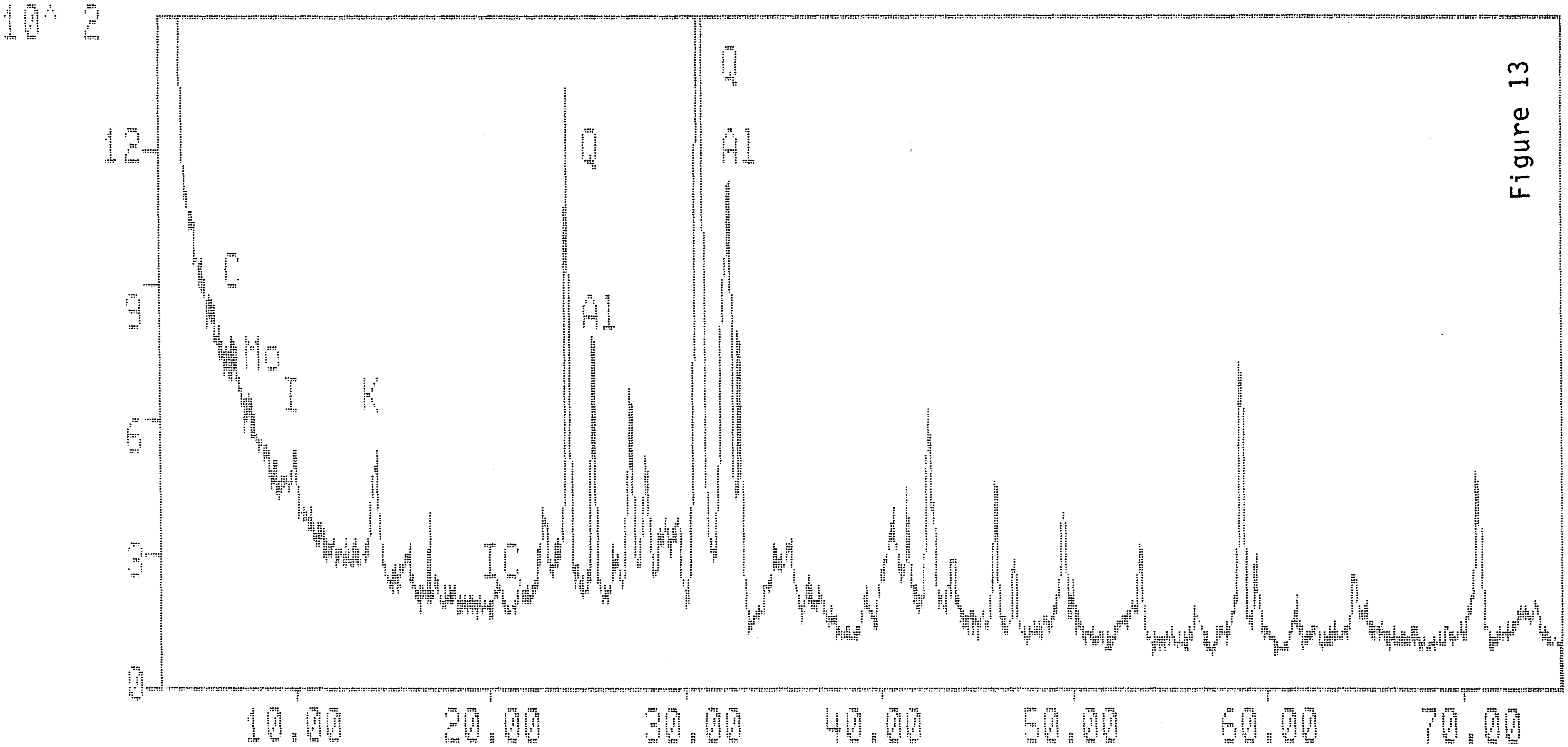

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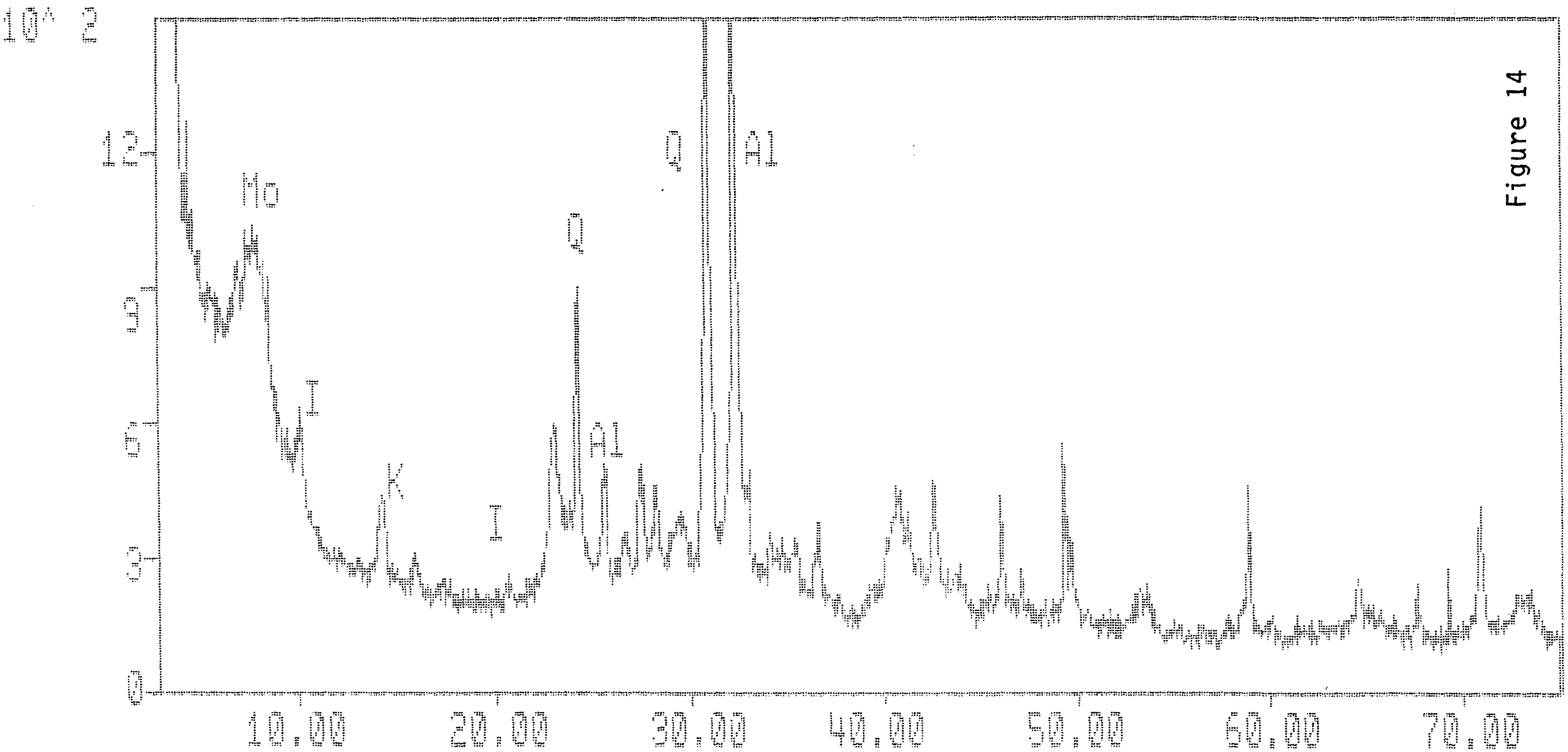
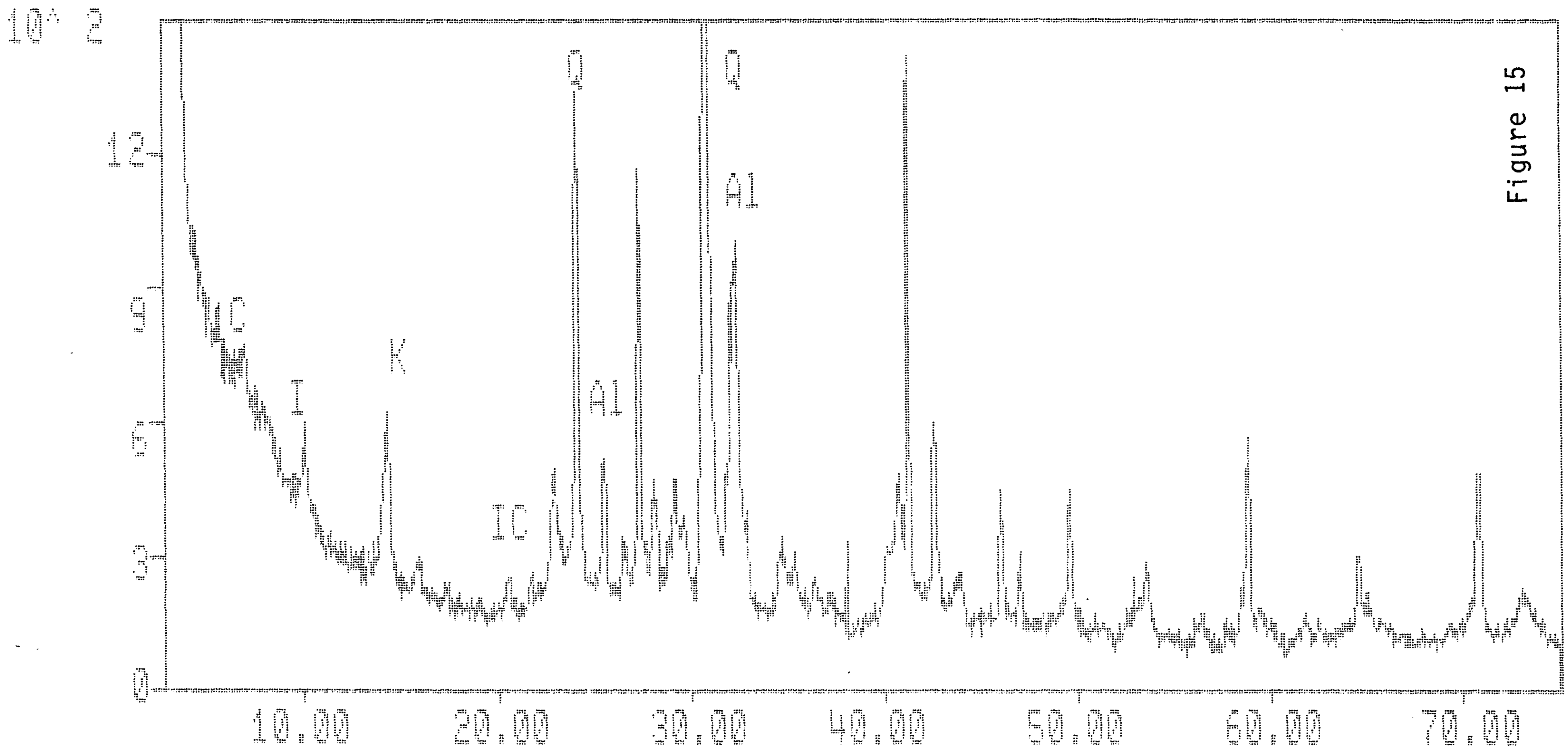


Figure 14

FILENAME: MCE-46.CPI



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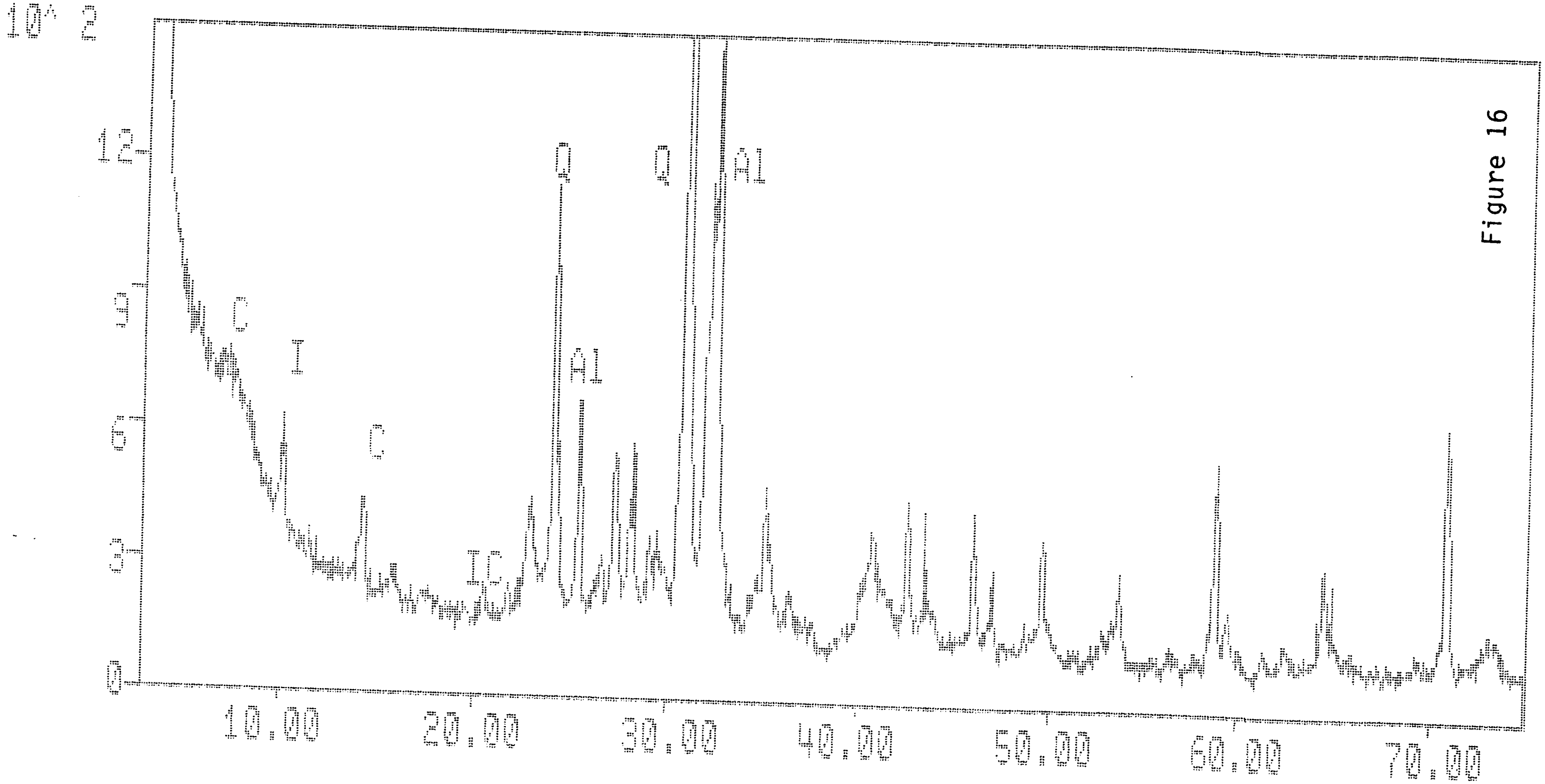


FILENAME: MCE-48.CPI

9. VITRINITE REFLECTANCE

9. VITRINITE REFLECTANCE

GAS AND FUEL EXPLORATION N/L

A Subsidiary of the Gas and Fuel Corporation of Victoria

Registered Office: 171 Flinders St., Melbourne, 3000.
Address all mail to Box 1841Q, G.P.O. Melbourne, 3001.
Cable Address: 'Gafcor'. Telephone: 652 4222. Telex: AA31422.

When replying please quote

27th April, 1990

Mrs Joan Cook
Director
Keiraville Konsultants Pty Ltd
7 Dallas Street
KEIRAVILLE NSW 2500

Dear Mrs Cook

Re: McEACHERN NO. 1
T.O.C. VITRINITE REFLECTANCE

In reference to my telephone conversation of today, I am sending you the following washed - dried cutting samples for T.O.C measurement and vitrinite reflectance evaluation.

No.	Depth (m)
1	2355
2	2360
3	2365
4	2370
5	2375
6	2380
7	2384 (T.D.)

These samples have been taken from the Casterton Formation in the well McEachern No. 1 which was recently drilled in PEP 119 in the Otway Basin of Victoria.

Please do not hesitate to contact me on (03) 652 4807 if there is any problems regarding the samples.

Yours sincerely

V. Akbari

V. Akbari
Senior Geologist

KEIRAVILLE KONSULTANTS
PTY. LTD.

7 DALLAS STREET,
KEIRAVILLE, N.S.W.
AUSTRALIA, 2500

TELEPHONE: (042) 29 9843
INTERNATIONAL: 61-42-299843
TELEX: PUBTLX AA29262 - NBR WG083

V. Akbari
Gas and Fuel Exploration
171 Flinders Street
MELBOURNE 3000
Victoria

28.3.90

Dear Mr. Akbari

Please find enclosed Vitrinite Reflectance results sheets, work sheets and Total Organic Carbon results for 18 samples from McEACHERN No.1 and an account on Invoice No. 1662.

Yours sincerely

Joan Cook

Encl

McEACHERN NO. 1 TOC DATA

K.K. No.	Depth (m)	SWC No.	TOC
v2202	402.6	48	0.32
v2203	504.6	47	0.53
v2204	699.6	45	0.16
v2205	793.1	44	0.48
v2206	1048.6	42	0.40
v2207	1113.6	41	0.40
v2208	1174.5	39	0.63
v2209	1289.5	38	0.56
v2210	1364.6	36	16.10
v2211	1414.1	34	0.67
v2212	1461.6	32	0.34
v2213	1504.6	31	0.31
v2214	1573	28	1.20
v2215	1674.6	24	0.46
v2216	1741	23	0.53
v2217	1857.6	18	0.45
v2218	2023.6	13	0.36
v2219	2226.6	7	0.34

Ave. 0.38

0.53

~~35.~~

5.85 0.47

K.K. No.	Depth (m)	$\bar{R}_v$ max	Range	N	Description Including Liptinite (Exinite) Fluorescence
V2202	402.6 SWC 48	0.41	0.27-0.50	27	Sparse phytoplankton and liptodetrinite, yellow to orange, rare to sparse cutinite, yellow to orange. (Sandstone>siltstone>>shaly coal. Shaly coal rare, V>>I>L. Vitrite. Dom common, I>V>or=L. Inertinite sparse to common, vitrinite and liptinite sparse. Pyrite common. Glauconite and iron oxide sparse.)
v2203	504.6 SWC 47	0.38	0.26-0.54	28	Sparse phytoplankton, yellow to orange, rare to sparse cutinite and liptodetrinite, yellow to orange, rare sporinite, yellow to dull orange. (Siltstone>sandstone. Dom common, I>V>L. Inertinite and vitrinite common, liptinite sparse. Sparse yellow oil droplets in siltstone. Pyrite common. Iron oxide sparse.)
v2204	699.6 SWC 45	0.42	0.32-0.53	15	Rare cutinite and liptodetrinite, yellow to orange, rare sporinite, yellow to dull orange, rare bituminite, brown. (Sandstone>carbonate>shaly coal. Shaly coal sparse, I>V>L. Inertinite>vitrinite>duroclarite=clarite. Dom sparse, I>V>L. Inertinite sparse, vitrinite rare to sparse, liptinite rare. Pyrite and iron oxide sparse.)
v2205	793.1 SWC 44	0.45	0.33-0.63	27	Sparse cutinite, yellow to dull orange, rare sporinite, dinoflagellates/acritarch and liptodetrinite, yellow to orange. (Sandstone>>shaly coal. Shaly coal sparse, V>I>L. Vitrite>clarite=vitrinertite. Dom abundant, I>V>L. Inertinite abundant, vitrinite common to abundant, liptinite sparse. Pyrite sparse. Iron oxide rare.)
v2206	1048.6 SWC 42	0.50	0.34-0.63	26	Rare to sparse cutinite, yellow to orange, rare sporinite, phytoplankton and liptodetrinite, yellow to orange. (Sandstone>>shaly coal>coal>siltstone. Coal common, I>>V>>L. Inertite>vitrite. Shaly coal common, I>>V>>L. Inertite. Dom abundant, I>V>L. Inertinite common, vitrinite sparse, liptinite rare to sparse. Pyrite sparse. Iron oxide rare.)
v2207	1113.6 SWC 41	0.49	0.40-0.61	26	Sparse cutinite, yellow to dull orange, sparse ?dinoflagellate/acritarch, yellow to orange, rare *Botryococcus* related telalginite, yellow to orange. (Sandstone>siltstone>>coal. Coal rare, I=V>>L. Vitrite=inertite. Dom abundant, I>L>V. INertinite common, liptinite sparse to common, vitrinite sparse. Pyrite and iron oxide sparse.)

K.K. No.	Depth (m)	$\bar{R}_v$ max	Range	N	Description Including Liptinite (Exinite) Fluorescence
v2208	1174.5 SWC 39	0.54	0.46-0.70	18	Sparse cutinite, yellow to orange, rare <u>?Botryococcus</u> related telalginite, yellow, sparse phytoplankton and liptodetrinite, yellow to orange, rare sporinite, yellow to orange. (Siltstone>sandstone>claystone. Dom common, I>L>V. Inertinite common, liptinite sparse, vitrinite rare. Sparse ?oil droplets, yellow. Iron oxide common. Pyrite sparse.)
v2209	1289.5 SWC 38	0.55	0.44-0.69	12	Sparse liptodetrinite, yellow to orange. rare to sparse sporinite, yellow to dull orange, rare cutinite, orange. (Calcareous siltstone>carbonate. Dom common, I>L>V. Inertinite common, liptinite sparse, vitrinite rare to sparse. Iron oxide sparse. Pyrite rare to sparse.)
v2210	1364.6 SWC 36	0.49	0.40-0.67	27	Major sporinite, bright yellow to orange, abundant cutinite and liptodetrinite, yellow to orange, sparse resinite, yellow to orange, rare suberinite and exsudatinite, orange to dull orange. (Claystone>shaly coal>coal. Shaly coal major, L>V>I. Clarite>vitrite. The composition of macerals; Vitrinite = 20.0% Liptinite = 79.8% Inertinite = 0.2% Coal abundant to major, L>V>I. Clarite>vitrite. The composition of macerals; Vitrinite = 40.0% Liptinite = 59.4% Inertinite = 0.6% Dom abundant, V>L>I. Vitrinite abundant, liptinite common, inertinite sparse. Pyrite sparse. Iron oxide rare.)
v2211	1414.1 SWC 34	0.45	0.39-0.54	3	Rare sporinite and liptodetrinite, orange to dull orange, rare phytoplankton and cutinite, orange. (Carbonate. Dom common, I>>L>V. Inertinite common, liptinite sparse and vitrinite rare. Rare shell fragments and other fossils. Mineral fluorescence major, green and orange. Rare bitumen, dull orange. Rare oil drops, yellow. Iron oxide and pyrite sparse.)
v2212	1461.6 SWC 32	0.58	0.41-0.68	7	Rare liptodetrinite, orange to dull orange. (Carbonate. Dom sparse, L>>I>V. All three maceral groups rare. Rare shell fragments and other fossils. Mineral fluorescence major, green and orange. Pyrite common. Iron oxide common.)

K.K. No.	Depth (m)	$\bar{R}_v max$	Range	N	Description Including Liptinite (Exinite) Fluorescence
v2213	1504.6 SWC 31	0.47	0.42-0.52	5	Rare liptodetrinite, orange to dull orange. (Calcareous siltstone>carbonate. Don sparse, I>>V>L. Inertinite sparse, vitrinite and liptinite rare. Mineral fluorescence abundant, yellow to orange. Pyrite common. Iron oxide rare.)
v2214	1573 SWC 28	0.44	0.33-0.59	7	Sparse cutinite, phytoplankton and liptodetrinite, yellow to orange, sparse sporinite, orange, rare suberinite, dull orange. (Calcareous siltstone>> claystone>>coal>shaly coal. Coal rare, I. Inertite. Shaly coal rare, V>>L. Clarite. Dom common, L>I>>V. LIptinite and inertinite common, vitrinite rare. Rare fossil fragments. Mineral fluorescence dominant, green. Bitumen rare, dull orange. Pyrite common. Iron oxide sparse.)
v2215	1674.6 SWC 24	0.48	-	1	Rare phytoplankton and liptodetrinite, yellow to orange, rare sporinite and cutinite, orange. (Calcareous siltstone>>claystone>>shaly coal>coal. Coal rare, I. inertite. Shaly coal rare, I. Inertite. Dom common, I>L>>V. Inertinite common, liptinite sparse, vitrinite rare. Rare fossil fragments. Mineral fluorescence dominant, green. Pyrite common. Iron oxide sparse.)
v2216	1741 SWC 23	0.51	0.49-0.54	4	Rare phytoplankton, liptodetrinite and cutinite, yellow to orange, rare sporinite, orange. (Calcareous siltstone. Don common, I>L>>V. Inertinite common, liptinite sparse, vitrinite rare. Rare fossil fragments. Mineral fluorescence dominant, green. Rare bitumen, orange. Pyrite common. Iron oxide common.)
v2217	1857.6 SWC 18	0.52	0.40-0.65	5	Rare phytoplankton and liptodetrinite, orange. (Calcareous siltstone. Don common, I>>L>V. Inertinite common, liptinite and vitrinite rare. Rare fossil fragments. Mineral fluorescence dominant, green. Oil drops rare, yellow. Pyrite sparse. Iron oxide rare.)
v2218	2023.6 SWC 13	0.59	0.47-0.64	14	Rare phytoplankton and liptodetrinite, yellow to orange. (Calcareous siltstone>sandstone. Don sparse, I>>L>V. Inertinite sparse, liptinite and vitrinite rare. Rare fossil fragments. Mineral fluorescence dominant, green. Oil drops rare, yellow. Pyrite and iron oxide sparse.)
v2219	2226.6 SWC 7	0.58	0.46-0.73	27	Rare liptodetrinite and phytoplankton, yellow to orange. (Siltstone>sandstone. Dom sparse to common, I>V>>L. Inertinite and vitrinite sparse, liptinite rare. Pyrite and iron oxide sparse.)

VITRINITE REFLECTANCE WORKSHEET

WELL NAME Mc Eachern -1 SAMPLE NO. V.2202 DEPTH 402.6m TYPE SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	NO. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	NO. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46	2	↓		.82				1.18				1.54				1.90			
.11				.47	2			.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49	2			.85				1.21				1.57				1.93			
.14				.50	3	↓		.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2·01			
.22				.58				.94				1.30				1.66				2·02			
.23				.59				.95				1.31				1.67				2·03			
.24				.60				.96				1.32				1.68				2·04			
.25				.61				.97				1.33				1.69				2·05			
.26				.62				.98				1.34				1.70				2·06			
.27	1	↑		.63				.99				1.35				1.71				2·07			
.28				.64				1.00				1.36				1.72				2·08			
.29				.65				1.01				1.37				1.73				2·09			
.30	1			.66				1.02				1.38				1.74				2·10			
.31	2			.67				1.03				1.39				1.75				2·11			
.32				.68				1.04				1.40				1.76				2·12			
.33	2			.69				1.05				1.41				1.77				2·13			
.34				.70				1.06				1.42				1.78				2·14			
.35				.71				1.07				1.43				1.79				2·15			
.36	1			.72				1.08				1.44				1.80							
.37	1			.73				1.09				1.45				1.81							
.38	2			.74				1.10				1.46				1.82							
.39	2			.75				1.11				1.47				1.83							
.40	3			.76				1.12				1.48				1.84							
.41		FGV		.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43	1			.79				1.15				1.51				1.87							
.44	2			.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

Organic matter Comp. (%)

Exinite	Alginite
0.5	
Vitrinite	**Inertinite**
0.3	0.5

Keiraville Konsultants Pty Ltd.

VITRINITE REFLECTANCE WORKSHEET

WELL NAME: Mc Eachern-1   SAMPLE NO.: V 2203   DEPTH: 504.6m   TYPE: SWC

FGV = First Generation Vitrinite   I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47	1			.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49	2			.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51	1			.87				1.23				1.59				1.95			
.16				.52	1			.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54	1	↓		.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60				.96				1.32				1.68				2.04			
.25				.61				.97				1.33				1.69				2.05			
.26	1	↑		.62				.98				1.34				1.70				2.06			
.27	1			.63				.99				1.35				1.71				2.07			
.28	2			.64				1.00				1.36				1.72				2.08			
.29	1			.65				1.01				1.37				1.73				2.09			
.30	3			.66				1.02				1.38				1.74				2.10			
.31	2			.67				1.03				1.39				1.75				2.11			
.32	1			.68				1.04				1.40				1.76				2.12			
.33	1			.69				1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35	1			.71				1.07				1.43				1.79				2.15			
.36	1			.72				1.08				1.44				1.80							
.37	1			.73				1.09				1.45				1.81							
.38		FGV		.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40	1			.76				1.12				1.48				1.84							
.41	2			.77				1.13				1.49				1.85							
.42	2			.78				1.14				1.50				1.86							
.43	1			.79				1.15				1.51				1.87							
.44	1			.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
0.3	
Vitrinite	**Inertinite**
0.6	0.9

Keiraville Konsultants Pty Ltd.

VITRINITE REFLECTANCE WORKSHEET

WELL NAME: Mc Eachern-1　　SAMPLE NO.: V 2204　　DEPTH: 699.6 m　　TYPE: SWC

FGV = First Generation Vitrinite　　I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46	2			.82				1.18				1.54				1.90			
.11				.47	1			.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53	1	↓		.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60				.96				1.32				1.68				2.04			
.25				.61				.97				1.33				1.69				2.05			
.26				.62				.98				1.34				1.70				2.06			
.27				.63				.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32	1	↑		.68				1.04				1.40				1.76				2.12			
.33				.69				1.05				1.41				1.77				2.13			
.34	1			.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37	1			.73				1.09				1.45				1.81							
.38	1			.74				1.10				1.46				1.82							
.39	1			.75				1.11				1.47				1.83							
.40				.76				1.12				1.48				1.84							
.41	2			.77				1.13				1.49				1.85							
.42		FGV		.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44	2			.80				1.16				1.52				1.88							
.45	2			.81				1.17				1.53				1.89							

Organic matter Comp. (%)

Exinite	Alginite
[illegible]	
Vitrinite	**Inertinite**
0.15	0.45

VITRINITE REFLECTANCE WORKSHEET

WELL NAME: MC Eachern SAMPLE NO. V2205 DEPTH 793.1 TYPE SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46		↓		.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49	1			.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51	2			.87				1.23				1.59				1.95			
.16				.52	1			.88				1.24				1.60				1.96			
.17				.53	1			.89				1.25				1.61				1.97			
.18				.54	1			.90				1.26				1.62				1.98			
.19				.55	1			.91				1.27				1.63				1.99			
.20				.56	2			.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2.01			
.22				.58	1			.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60				.96				1.32				1.68				2.04			
.25				.61	1			.97				1.33				1.69				2.05			
.26				.62				.98				1.34				1.70				2.06			
.27				.63	1	↓		.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33	1	↑		.69				1.05				1.41				1.77				2.13			
.34	4			.70				1.06				1.42				1.78				2.14			
.35	1			.71				1.07				1.43				1.79				2.15			
.36	2			.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39	1			.75				1.11				1.47				1.83							
.40	1			.76				1.12				1.48				1.84							
.41	1			.77				1.13				1.49				1.85							
.42	1			.78				1.14				1.50				1.86							
.43	2			.79				1.15				1.51				1.87							
.44				.80				1.16				1.52				1.88							
.45	1	FGV		.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
0.3	
Vitrinite	**Inertinite**
2.3	3.1

Keiraville Konsultants Pty Ltd.

VITRINITE REFLECTANCE WORKSHEET

WELL NAME: Mc Eachern-1 SAMPLE NO.: V 2206 DEPTH: 1048.6 TYPE: SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46	2			.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50	2	FGV		.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52	1			.88				1.24				1.60				1.96			
.17				.53	1			.89				1.25				1.61				1.97			
.18				.54	2			.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56	3			.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59	1			.95				1.31				1.67				2.03			
.24				.60	1			.96				1.32				1.68				2.04			
.25				.61	1			.97				1.33				1.69				2.05			
.26				.62	1			.98				1.34				1.70				2.06			
.27				.63	2			.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33				.69				1.05				1.41				1.77				2.13			
.34	1			.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36	2			.72				1.08				1.44				1.80							
.37	1			.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39	1			.75				1.11				1.47				1.83							
.40	1			.76				1.12				1.48				1.84							
.41				.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43	1			.79				1.15				1.51				1.87							
.44				.80				1.16				1.52				1.88							
.45	2			.81				1.17				1.53				1.89							

Organic matter Comp. (%)

Exinite	Alginite
0.1	
Vitrinite	**Inertinite**
0.4	4.1

Keiraville Konsultants Pty Ltd.

VITRINITE REFLECTANCE WORKSHEET

WELL NAME: MC Eachern-1 SAMPLE NO. V 2207 DEPTH 1113.6 m TYPE SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46	2			.82				1.18				1.54				1.90			
.11				.47	2			.83				1.19				1.55				1.91			
.12				.48	1			.84				1.20				1.56				1.92			
.13				.49	4	FGV		.85				1.21				1.57				1.93			
.14				.50	1			.86				1.22				1.58				1.94			
.15				.51	1			.87				1.23				1.59				1.95			
.16				.52	2			.88				1.24				1.60				1.96			
.17				.53	3			.89				1.25				1.61				1.97			
.18				.54	1			.90				1.26				1.62				1.98			
.19				.55	1			.91				1.27				1.63				1.99			
.20				.56	1			.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2·01			
.22				.58				.94				1.30				1.66				2·02			
.23				.59				.95				1.31				1.67				2·03			
.24				.60				.96				1.32				1.68				2·04			
.25				.61	1			.97				1.33				1.69				2·05			
.26				.62				.98				1.34				1.70				2·06			
.27				.63				.99				1.35				1.71				2·07			
.28				.64				1.00				1.36				1.72				2·08			
.29				.65				1.01				1.37				1.73				2·09			
.30				.66				1.02				1.38				1.74				2·10			
.31				.67				1.03				1.39				1.75				2·11			
.32				.68				1.04				1.40				1.76				2·12			
.33				.69				1.05				1.41				1.77				2·13			
.34				.70				1.06				1.42				1.78				2·14			
.35				.71				1.07				1.43				1.79				2·15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40	2			.76				1.12				1.48				1.84							
.41				.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44	2			.80				1.16				1.52				1.88							
.45	2			.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
0.5	<0.1

Vitrinite	Inertinite
0.4	1.8

VITRINITE REFLECTANCE WORKSHEET

WELL NAME: MC Eachern-1 SAMPLE NO. V.2208 DEPTH 1174.5m TYPE SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46	2	↑		.82				1.18				1.54				1.90			
.11				.47	2			.83				1.19				1.55				1.91			
.12				.48	1			.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50	2			.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52	2			.88				1.24				1.60				1.96			
.17				.53	1			.89				1.25				1.61				1.97			
.18				.54	1	FGV		.90				1.26				1.62				1.98			
.19				.55	2			.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2·01			
.22				.58				.94				1.30				1.66				2·02			
.23				.59	1			.95				1.31				1.67				2·03			
.24				.60	3			.96				1.32				1.68				2·04			
.25				.61				.97				1.33				1.69				2·05			
.26				.62				.98				1.34				1.70				2·06			
.27				.63				.99				1.35				1.71				2·07			
.28				.64				1.00				1.36				1.72				2·08			
.29				.65				1.01				1.37				1.73				2·09			
.30				.66				1.02				1.38				1.74				2·10			
.31				.67				1.03				1.39				1.75				2·11			
.32				.68				1.04				1.40				1.76				2·12			
.33				.69				1.05				1.41				1.77				2·13			
.34				.70	1	↓		1.06				1.42				1.78				2·14			
.35				.71				1.07				1.43				1.79				2·15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40				.76				1.12				1.48				1.84							
.41				.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44				.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
0.4 ~~1.8~~	<0.1 ~~0.2~~
Vitrinite	**Inertinite**
<0.1	1.0 ~~3.0~~

VITRINITE REFLECTANCE WORKSHEET

WELL NAME McEachern-1 SAMPLE NO V2209 DEPTH 1289.5m TYPE SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46	1			.82				1.18				1.54				1.90			
.11				.47	1			.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49	1			.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52	1			.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54		FGV		.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57	1			.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60	1			.96				1.32				1.68				2.04			
.25				.61				.97				1.33				1.69				2.05			
.26				.62	1			.98				1.34				1.70				2.06			
.27				.63				.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67	1			1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33				.69	2	↓		1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40	1	↑		.76				1.12				1.48				1.84							
.41				.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43	1	↑		.79				1.15				1.51				1.87							
.44				.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
0.2%	—
Vitrinite	**Inertinite**
0.1%	0.6%

Keiraville Konsultants Pty Ltd.

VITRINITE REFLECTANCE WORKSHEET

WELL NAME: Mc Eachern-1 SAMPLE NO: V2210 DEPTH: 1364.6 m TYPE: SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47	4			.83				1.19				1.55				1.91			
.12				.48	1			.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50	3			.86				1.22				1.58				1.94			
.15				.51	1			.87				1.23				1.59				1.95			
.16				.52	1			.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54		FGV		.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57	1			.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59	1			.95				1.31				1.67				2.03			
.24				.60	1			.96				1.32				1.68				2.04			
.25				.61				.97				1.33				1.69				2.05			
.26				.62				.98				1.34				1.70				2.06			
.27				.63				.99				1.35				1.71				2.07			
.28				.64	2			1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67	1			1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33				.69				1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40	3			.76				1.12				1.48				1.84							
.41	1			.77				1.13				1.49				1.85							
.42	2			.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44	4			.80				1.16				1.52				1.88							
.45	1			.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
32.5%	—
Vitrinite	**Inertinite**
15 ~~40~~ %	0.7%

Keiraville Konsultants Pty Ltd.

VITRINITE REFLECTANCE WORKSHEET

WELL NAME McEACHERN -1 SAMPLE NO. V2211 DEPTH 1414.1 m TYPE SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	NO. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	NO. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54	I	↓		.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60				.96				1.32				1.68				2.04			
.25				.61				.97				1.33				1.69				2.05			
.26				.62				.98				1.34				1.70				2.06			
.27				.63				.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33				.69				1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39	I	↑		.75				1.11				1.47				1.83							
.40				.76				1.12				1.48				1.84							
.41				.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43	I			.79				1.15				1.51				1.87							
.44				.80				1.16				1.52				1.88							
.45		FGV		.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
0.2	–
Vitrinite	**Inertinite**
<0.1	0.7

VITRINITE REFLECTANCE WORKSHEET

WELL NAME McEACHERN-1 SAMPLE NO. V2212 DEPTH 1461.6 M TYPE SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50	1			.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2.01			
.22				.58	1	FGV		.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60	1			.96				1.32				1.68				2.04			
.25				.61	1			.97				1.33				1.69				2.05			
.26				.62				.98				1.34				1.70				2.06			
.27				.63				.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65	1			1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32				.68	1			1.04				1.40				1.76				2.12			
.33				.69				1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40				.76				1.12				1.48				1.84							
.41	1	↑		.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44				.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

Organic matter Comp. (%)

Exinite	Alginite
<0.1	–
Vitrinite	**Inertinite**
<0.1	<0.1

VITRINITE REFLECTANCE WORKSHEET

WELL NAME: Mc Eachern-1 SAMPLE NO. V 2213 DEPTH: 1504.6m TYPE: SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46		I		.82				1.18				1.54				1.90			
.11				.47		FGV		.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49	2			.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52	1			.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60				.96				1.32				1.68				2.04			
.25				.61				.97				1.33				1.69				2.05			
.26				.62				.98				1.34				1.70				2.06			
.27				.63				.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33				.69				1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40				.76				1.12				1.48				1.84							
.41				.77				1.13				1.49				1.85							
.42	1			.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44	1			.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

Organic matter Comp. (%)

Exinite	Alginite
<0.1	—
Vitrinite	**Inertinite**
<0.1	0.2

Keiraville Konsultants Pty Ltd.

VITRINITE REFLECTANCE WORKSHEET

WELL NAME McEACHERN-1 SAMPLE NO. V2214 DEPTH 1573.0 M TYPE SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57	1			.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59	1	↓		.95				1.31				1.67				2.03			
.24				.60				.96				1.32				1.68				2.04			
.25				.61				.97				1.33				1.69				2.05			
.26				.62				.98				1.34				1.70				2.06			
.27				.63				.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33	1	↑		.69				1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38	1			.74				1.10				1.46				1.82							
.39	2			.75				1.11				1.47				1.83							
.40				.76				1.12				1.48				1.84							
.41	1			.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44		FGV		.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
0.8	—
Vitrinite	**Inertinite**
<0.1	0.6

Keiraville Konsultants Pty Ltd.

VITRINITE REFLECTANCE WORKSHEET

WELL NAME. MCEACHERN - 1 ...... SAMPLE NO. V2215 ...... DEPTH. 1674.6 ...... TYPE. SWC ......

FGV = First Generation Vitrinite   I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	NO. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	NO. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48	1	FGV		.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60				.96				1.32				1.68				2.04			
.25				.61				.97				1.33				1.69				2.05			
.26				.62				.98				1.34				1.70				2.06			
.27				.63				.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33				.69				1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40				.76				1.12				1.48				1.84							
.41				.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44				.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
0.2	-
Vitrinite	**Inertinite**
<0.1	0.6

Keiraville Konsultants Pty Ltd.

VITRINITE REFLECTANCE WORKSHEET

WELL NAME MCEACHERN-1 SAMPLE NO. V2216 DEPTH 1741 M TYPE SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47				.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49	1	↑		.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51	2	FGV		.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54	1	↓		.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60				.96				1.32				1.68				2.04			
.25				.61				.97				1.33				1.69				2.05			
.26				.62				.98				1.34				1.70				2.06			
.27				.63				.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33				.69				1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40				.76				1.12				1.48				1.84							
.41				.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44				.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
0.2	
Vitrinite	**Inertinite**
<0.1	0.7

VITRINITE REFLECTANCE WORKSHEET

WELL NAME: MCELCHERN - 1   SAMPLE NO. V2217   DEPTH 1857.6 M   TYPE SWC

FGV = First Generation Vitrinite   I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47	1			.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50		FGV		.86				1.22				1.58				1.94			
.15				.51				.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54	1			.90				1.26				1.62				1.98			
.19				.55				.91				1.27				1.63				1.99			
.20				.56				.92				1.28				1.64				2.00			
.21				.57				.93				1.29				1.65				2.01			
.22				.58				.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60				.96				1.32				1.68				2.04			
.25				.61				.97				1.33				1.69				2.05			
.26				.62				.98				1.34				1.70				2.06			
.27				.63				.99				1.35				1.71				2.07			
.28				.64				1.00				1.36				1.72				2.08			
.29				.65	1	↓		1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33				.69				1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40	1	↑		.76				1.12				1.48				1.84							
.41				.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44				.80				1.16				1.52				1.88							
.45	1			.81				1.17				1.53				1.89							

Organic matter Comp. (%)

Exinite	Alginite
<0.1	-
Vitrinite	**Inertinite**
<0.1	0.8

Keiraville Konsultants Pty Ltd.

VITRINITE REFLECTANCE WORKSHEET

WELL NAME. MCEACHERN-1.... SAMPLE NO. V2218...... DEPTH. 2023.6M........ TYPE. SWC......

FGV = First Generation Vitrinite   I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type	Ro %	No. Read	Pop Rnge	Pop Type
.10				.46				.82				1.18				1.54				1.90			
.11				.47	1	↑		.83				1.19				1.55				1.91			
.12				.48				.84				1.20				1.56				1.92			
.13				.49				.85				1.21				1.57				1.93			
.14				.50				.86				1.22				1.58				1.94			
.15				.51	1			.87				1.23				1.59				1.95			
.16				.52				.88				1.24				1.60				1.96			
.17				.53				.89				1.25				1.61				1.97			
.18				.54				.90				1.26				1.62				1.98			
.19				.55	2			.91				1.27				1.63				1.99			
.20				.56	1			.92				1.28				1.64				2.00			
.21				.57	1			.93				1.29				1.65				2.01			
.22				.58		FGV		.94				1.30				1.66				2.02			
.23				.59				.95				1.31				1.67				2.03			
.24				.60	1			.96				1.32				1.68				2.04			
.25				.61	3			.97				1.33				1.69				2.05			
.26				.62	1			.98				1.34				1.70				2.06			
.27				.63	1			.99				1.35				1.71				2.07			
.28				.64	2	↓		1.00				1.36				1.72				2.08			
.29				.65				1.01				1.37				1.73				2.09			
.30				.66				1.02				1.38				1.74				2.10			
.31				.67				1.03				1.39				1.75				2.11			
.32				.68				1.04				1.40				1.76				2.12			
.33				.69				1.05				1.41				1.77				2.13			
.34				.70				1.06				1.42				1.78				2.14			
.35				.71				1.07				1.43				1.79				2.15			
.36				.72				1.08				1.44				1.80							
.37				.73				1.09				1.45				1.81							
.38				.74				1.10				1.46				1.82							
.39				.75				1.11				1.47				1.83							
.40				.76				1.12				1.48				1.84							
.41				.77				1.13				1.49				1.85							
.42				.78				1.14				1.50				1.86							
.43				.79				1.15				1.51				1.87							
.44				.80				1.16				1.52				1.88							
.45				.81				1.17				1.53				1.89							

Organic matter Comp.(%)

Exinite	Alginite
<0.1	–
Vitrinite	**Inertinite**
<0.1	0.4

VITRINITE REFLECTANCE WORKSHEET

WELL NAME Mc Eachern-1 SAMPLE NO. V2219 DEPTH 2226.6m TYPE SWC

FGV = First Generation Vitrinite I = Inertinite

Ro %	No. Read	Pop Rnge	Pop Type
.10			
.11			
.12			
.13			
.14			
.15			
.16			
.17			
.18			
.19			
.20			
.21			
.22			
.23			
.24			
.25			
.26			
.27			
.28			
.29			
.30			
.31			
.32			
.33			
.34			
.35			
.36			
.37			
.38			
.39			
.40			
.41			
.42			
.43			
.44			
.45			

Ro %	No. Read	Pop Rnge	Pop Type
.46	2	↑	
.47			
.48			
.49	1		
.50			
.51			
.52	1		
.53	4		
.54	4		
.55			
.56			
.57	2		
.58		FGV	
.59	1		
.60	1		
.61	1		
.62			
.63	1		
.64	2		
.65	1		
.66	4		
.67			
.68			
.69			
.70			
.71	1		
.72			
.73	1	↓	
.74			
.75			
.76			
.77			
.78			
.79			
.80			
.81			

Ro %	No. Read	Pop Rnge	Pop Type
.82			
.83			
.84			
.85			
.86			
.87			
.88			
.89			
.90			
.91			
.92			
.93			
.94			
.95			
.96			
.97			
.98			
.99			
1.00			
1.01			
1.02			
1.03			
1.04			
1.05			
1.06			
1.07			
1.08			
1.09			
1.10			
1.11			
1.12			
1.13			
1.14			
1.15			
1.16			
1.17			

Ro %	No. Read	Pop Rnge	Pop Type
1.18			
1.19			
1.20			
1.21			
1.22			
1.23			
1.24			
1.25			
1.26			
1.27			
1.28			
1.29			
1.30			
1.31			
1.32			
1.33			
1.34			
1.35			
1.36			
1.37			
1.38			
1.39			
1.40			
1.41			
1.42			
1.43			
1.44			
1.45			
1.46			
1.47			
1.48			
1.49			
1.50			
1.51			
1.52			
1.53			

Ro %	No. Read	Pop Rnge	Pop Type
1.54			
1.55			
1.56			
1.57			
1.58			
1.59			
1.60			
1.61			
1.62			
1.63			
1.64			
1.65			
1.66			
1.67			
1.68			
1.69			
1.70			
1.71			
1.72			
1.73			
1.74			
1.75			
1.76			
1.77			
1.78			
1.79			
1.80			
1.81			
1.82			
1.83			
1.84			
1.85			
1.86			
1.87			
1.88			
1.89			

Ro %	No. Read	Pop Rnge	Pop Type
1.90			
1.91			
1.92			
1.93			
1.94			
1.95			
1.96			
1.97			
1.98			
1.99			
2.00			
2.01			
2.02			
2.03			
2.04			
2.05			
2.06			
2.07			
2.08			
2.09			
2.10			
2.11			
2.12			
2.13			
2.14			
2.15			

Organic matter Comp. (%)

Exinite	Alginite
<0.1	
Vitrinite	**Inertinite**
0.2	0.3

Keiraville Konsultants Pty Ltd.

10. SOURCE ROCK ANALYSIS

P2813

AMDEL
CORE
SERVICES

25 June 1990

Gas & Fuel Exploration NL
GPO Box 1841Q
MELBOURNE VIC 3001

Attention: Val Akbari

RECEIVED
27 JUN 1990
GAS & FUEL EXPLORATION N.L.

REPORT: 009/304

CLIENT REFERENCE:	Letter V Akbari
MATERIAL:	Cuttings Samples
LOCALITY:	McEachern -1
WORK REQUIRED:	TOC and Rock-Eval Analyses

Please direct technical enquiries regarding this work to the signatory below under whose supervision the work was carried out.

BRIAN L WATSON
Petroleum Geochemistry Supervisor
on behalf of Amdel Core Services Pty Ltd

1. INTRODUCTION

Total organic carbon (TOC) and Rock-Eval analyses were carried out on seven cuttings samples from McEachern -1. This report contains the results of these analyses along with brief details of the analytical procedures used, graphical displays of the data and some preliminary interpretative comments.

2. ANALYTICAL PROCEDURE

2.1 Sample Preparation

Cuttings samples (as received) were ground in a Siebtechnik mill for 20-30 seconds.

2.2 Total Organic Carbon (TOC)

Total organic carbon was determined by digestion of a known weight (approximately 0.2 g) of powdered rock in 50% HCl to remove carbonates, followed by combustion in oxygen and measurement of the resultant CO_2 by infra-red detection.

2.3 Rock-Eval Analyses

A 100 mg portion of powdered rock was analysed by the Rock-Eval pyrolysis technique (Girdel IFP-Fina Mark 2 instrument; operating mode, Cycle 1).

3. RESULTS

TOC and Rock-Eval data for McEachern -1 are listed in Table 1. Figure 1 is a cross plot of Tmax versus Hydrogen Index illustrating kerogen Type and maturity for each of the samples examined.

4. PRELIMINARY INTERPRETATION

4.1 Maturity

Rock-Eval Tmax values are very consistent over the interval studied and indicate that these sediments are marginally mature for the generation of hydrocarbons (Tmax = 439 - 442°C, VR = 0.6 - 0.7%, Table 1, Figure 1).

Production indices increase slightly with depth and suggest that migrated hydrocarbons are absent from the interval studied.

4.2 Organic and Source Richness

Organic richness is, for the most part, fair in these cuttings (TOC = 1.10 - 1.18%). However, cuttings from 2355 metres depth contain slightly less organic matter (TOC = 0.75%) and have poor organic richness.

Source richness for the generation of hydrocarbons uniformly poor ($S_1 + S_2 =$ 1.08 - 1.82 kg of hydrocarbons/tonne) in most samples but is fair in the cuttings sample from 2384 metres depth ($S_1 + S_2 = 2.33$ kg of hydrocarbons/tonne).

4.3 Kerogen Type and Source Quality

Hydrogen Index and Tmax values indicate that the samples examined have the bulk composition of Type III kerogen (Figure 1).

AMDEL CORE SERVICES

Rock-Eval Pyrolysis 15/06/90

Client: GAS AND FUEL EXPLORATION N/L

Well: McEACHERN-1

Depth (m)	T Max	S1	S2	S3	S1+S2	PI	S2/S3	PC	TOC	HI	OI
2355	441	0.14	0.94	0.89	1.08	0.13	1.05	0.09	0.75	125	118
2360	441	0.25	1.54	1.27	1.79	0.14	1.21	0.14	1.11	138	114
2365	441	0.25	1.54	1.06	1.79	0.14	1.45	0.14	1.10	140	96
2370	441	0.22	1.47	0.99	1.69	0.13	1.48	0.14	1.14	128	86
2375	441	0.26	1.56	1.08	1.82	0.14	1.44	0.15	1.10	141	98
2380	442	0.25	1.46	1.13	1.71	0.15	1.29	0.14	1.11	131	101
2384	439	0.41	1.92	1.00	2.33	0.18	1.92	0.19	1.18	162	84

Amdel Core Services Pty Limited
Incorporated in South Australia

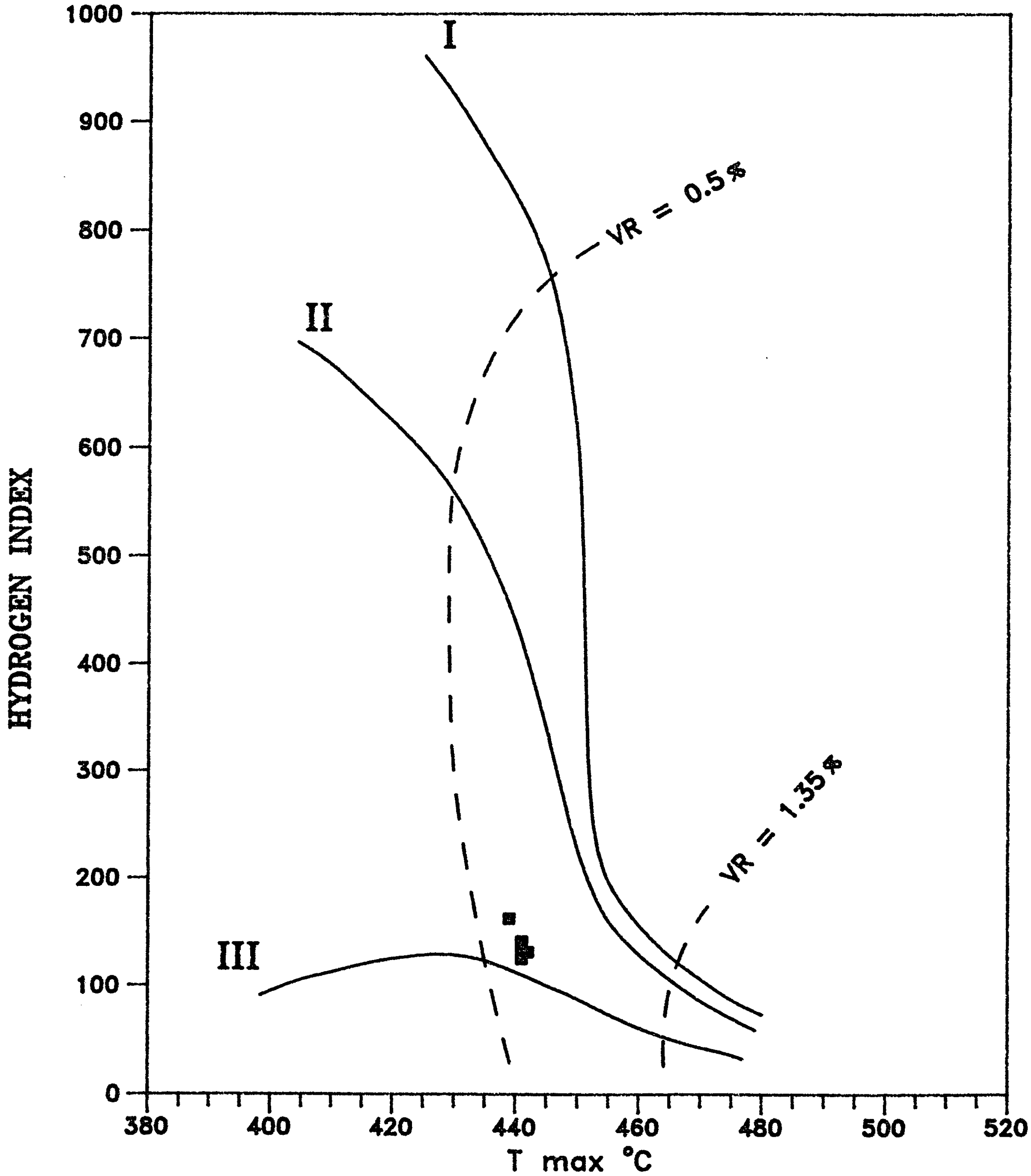
KEY TO ROCK-EVAL PYROLYSIS DATA SHEET

	PARAMETER	SPECIFICITY
T max	position of S_2 peak in temperature program (^{o}C)	Maturity/Kerogen type
S_1	kg hydrocarbons (extractable)/tonne rock	Kerogen type/Maturity/Migrated oil
S_2	kg hydrocarbons (kerogen pyrolysate)/tonne rock	Kerogen type/Maturity
S_3	kg CO_2 (organic)/tonne rock	Kerogen type/Maturity *
$S_1 + S_2$	Potential Yield	Organic richness/Kerogen type
PI	Production Index ($S_1/S_1 + S_2$)	Maturity/Migrated Oil
PC	Pyrolysable Carbon (wt. percent)	Organic richness/Kerogen type/Maturity
TOC	Total Organic Carbon (wt. percent)	Organic richness
HI	Hydrogen Index (mg h'c (S_2)/g TOC)	Kerogen type/Maturity
OI	Oxygen Index (mg CO_2(S_3)/g TOC)	Kerogen type/Maturity *

*Also subject to interference by CO_2 from decomposition of carbonate minerals.

HYDROGEN INDEX vs T max

Company : GAS AND FUEL EXPLORATION N/L
Location: McEACHERN-1



P941

AMDEL CORE SERVICES

9 March 1990

Gas and Fuel Exploration NL
GPO Box 1841Q
MELBOURNE VIC 3001

Attention: V Akbari

REPORT: 009/171

CLIENT REFERENCE: -

MATERIAL: Sidewall Core Samples

LOCALITY: McEachern -1

WORK REQUIRED: Source Rock Analysis

Please direct technical enquiries regarding this work to Brian L Watson (Adelaide) under whose supervision the work was carried out.

Dr Brian G Steveson
Manager Australasia
on behalf of Amdel Core Services Pty Ltd

1. INTRODUCTION

Fourteen sidewall core samples from McEachern -1 were received for TOC and Rock-Eval pyrolysis. This report is a formal presentation of the results of this study. Petrology and XRD results will be presented in a subsequent report.

2. ANALYTICAL PROCEDURE

2.1 Sample Preparation

Cuttings samples (as received) were ground in a Siebtechnik mill for 20-30 seconds.

2.2 Total Organic Carbon (TOC)

Total organic carbon was determined by digestion of a known weight (approximately 0.2 g) of powdered rock in 50% HCl to remove carbonates, followed by combustion in oxygen and measurement of the resultant CO_2 by infra-red detection.

2.3 Rock-Eval Analyses

A 100 mg portion of powdered rock was analysed by the Rock-Eval pyrolysis technique (Girdel IFP-Fina Mark 2 instrument; operating mode, Cycle 1).

3. RESULTS

TOC and Rock-Eval data are presented in Table 1. Figure 1 is a plot of Hydrogen Index versus Tmax illustrating kerogen Type and maturity.

4. INTERPRETATION

4.1 Maturity

Hydrogen Index and Tmax values indicate that the sediments examined from the McEachern -1 location are marginally mature (VR = 0.55-0.7%).

Production indicies although maturation dependent are also sensitive to the presence of migrated hydrocarbons. High production indices indicate the presence of migrated hydrocarbons in the following samples: 1414.1 and 1461.4 metres depth. Elevated production indices in the sidewall core samples from 1174.5, 1504.6 and 1857.6 metres depth are unreliable due to the small size of the S_1 and S_2 peaks in these samples.

4.2 Organic Richness and Source Richness

Organic richness is commonly poor in the samples studied (TOC <1%). However samples from 905.6, 1365.0 and 1649.1 have TOC values which are indicative of fair to excellent organic richness (TOC = 1.06 - 14.60%).

Source richness for the generation of hydrocarbons is generally similarly poor ($S_1 + S_2$ <2 kg hydrocarbons/tonne). However, samples from 905.6, 1365.0, 1414.1 and 1649.1 metres depth have $S_1 + S_2$ values, indication of fair to excellent source richness ($S_1 + S_2$ = 2.11-11.21 kg of hydrocarbons/tonne).

4.3 Kerogen Type

Hydrogen Index and Tmax values indicate that the majority of the samples examined contain organic matter with the bulk composition of Type III to Type IV kerogen. Sidewall cores containing better quality Type II-III kerogen occur at 905.6, 1414.1 and 1649.1 metres depth.

TABLE 1

AMDEL CORE SERVICES

Rock-Eval Pyrolysis 02/03/90

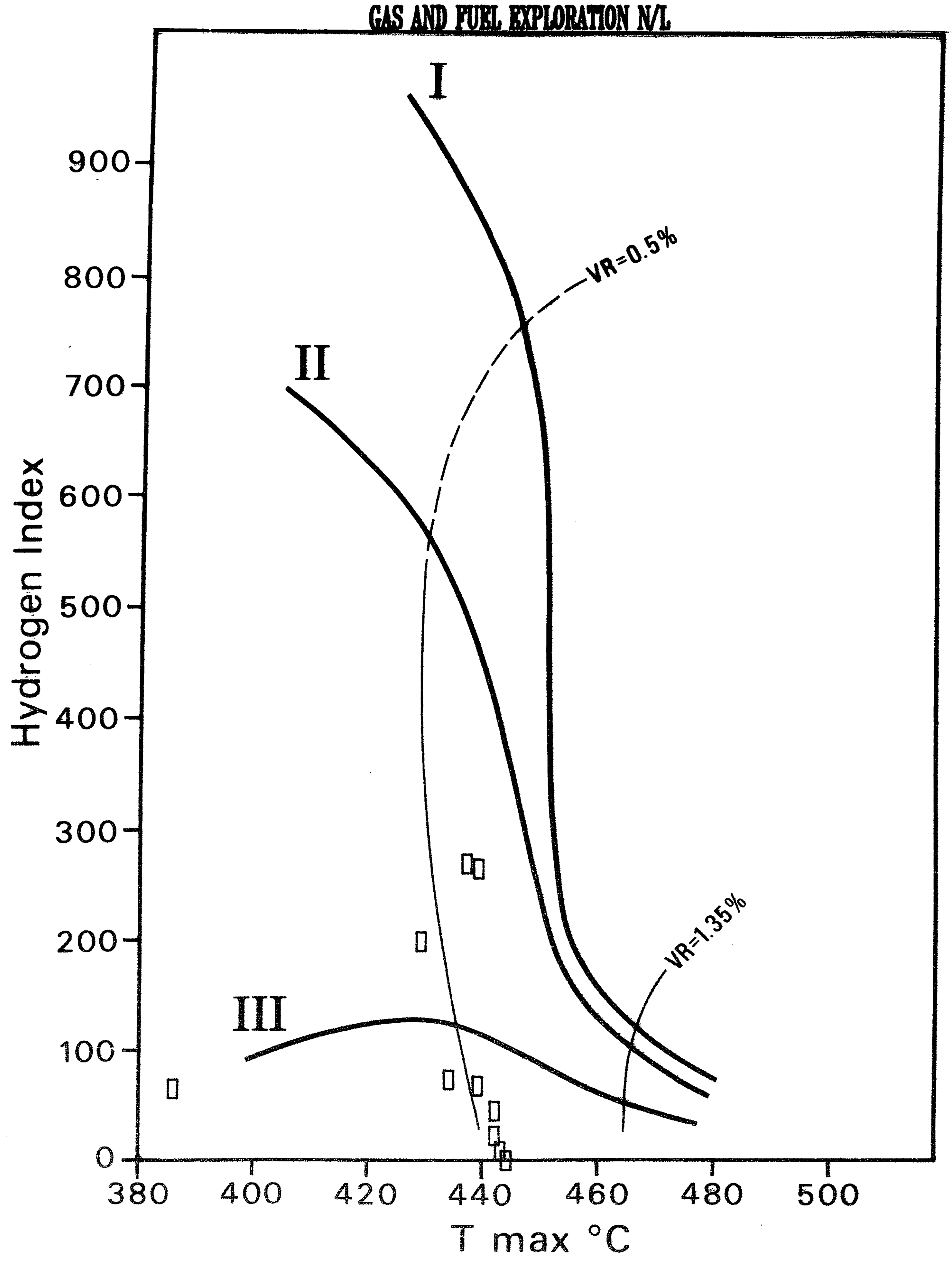
Client: GAS AND FUEL EXPLORATION N/L

Well: McEACHERN-1

Depth (m)	T Max	S1	S2	S3	S1+S2	PI	S2/S3	PC	TOC	HI	OI
504.6	443	0.01	0.05	0.02	0.06	0.17	2.51	0.00	0.58	9	3
699.6									0.26		
905.6	437	0.09	2.85	0.44	2.94	0.03	6.47	0.24	1.06	269	42
1048.6									0.32		
1174.5	442	0.05	0.12	0.40	0.17	0.31	0.30	0.01	0.53	23	75
1289.5	386	0.07	0.39	0.51	0.46	0.15	0.76	0.03	0.60	65	85
1365.0	434	0.45	10.76	0.20	11.21	0.04	53.80	0.93	14.60	74	1
1414.1	429	0.48	1.63	0.00	2.11	0.23	0.00	0.17	0.82	199	0
1461.6	339	0.07	0.25	8.29	0.32	0.22	0.03	0.02	0.38	66	2182
1504.6	271	0.04	0.07	2.17	0.11	0.40	0.03	0.00	0.35	20	620
1523.6	439	0.05	0.63	0.25	0.68	0.07	2.52	0.05	0.93	68	27
1649.1	439	0.18	3.65	0.54	3.83	0.05	6.75	0.31	1.38	264	39
1857.6	444	0.05	0.00	0.39	0.05	1.00	0.00	0.00	0.48	0	81
1946.1	442	0.04	0.26	0.56	0.30	0.13	0.46	0.02	0.58	45	97

FIGURE 1

McEACHERN-1



11. PALYNOLOGY

11. PALYNOLOGY

P1956

PALYNOLOGY OF GAS AND FUEL McEACHERN-1, OTWAY BASIN, AUSTRALIA

BY

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for GAS AND FUEL

APRIL, 1990.

PALYNOLOGY OF GAS AND FUEL McEACHERN-1, OTWAY BASIN, AUSTRALIA

BY

ROGER MORGAN

CONTENTS PAGE

I SUMMARY

Final study of 14 new swcs plus the existing 6 cuttings samples yielded the following results.

504.6m (swc) : lower C. paradoxa Zone : mid Albian : immature : slightly brackish : usually mid Eumeralla

699.6m (swc) : C. striatus Zone : early Albian : non-marine : immature : usually mid Eumeralla

905.6m (swc)-1048.6m (swc) : C. hughesi Zone : Aptian : non-marine : marginally mature : usually lower Eumeralla

1174.5m (swc)-1946.1m (swc) : F. wonthaggiensis zone : late Neocomian : non-marine with minor lacustrine influence especially near the top : marginally mature to early mature : usually Pretty Hill

2070m (cutts)-2354m (cutts) : upper C. australiensis Zone : early Neocomian : non-marine : mature : usually lower Pretty Hill : note that cuttings may have made this base too low through caving

2364m (cutts)-2384m (cutts) : lower C. australiensis-?R. watherooensis Zones : earliest Neocomian to ?Latest Jurassic : non-marine : mature : usually Casterton Beds

II INTRODUCTION

Fourteen sidewall cores and 6 cuttings of favourable lithology were processed, to provide information on age, encironment and maturity for the completion report.

Palynomorph occurence data are shown as Appendix I and form the basis for the assignment of the samples to sixe spore-pollen units of early Neocomian to mid Albian age. The Cretaceous spore-pollen zonation is essentially that of Dettmann and Playford (1969), but has been significantly modified and improved by various authors since, and most recently discussed in Helby et al (1987), as shown on figure 1 and modified by Morgan (1985) for application in the Otway Basin.

Maturity data was generated in the form of Spore Colour Index, and is plotted on figure 2 Maturity profile of Ultramar McEachern-1. The oil and gas windows in figure 2 follow the general consensus of geochemical literature. The oil window corresponds to spore colours of light-mid brown (Staplin Spore Colour Index of 2.7) to dark brown (3.6). These correspond to citrinite reflectance values of 0.6% to 1.3%.

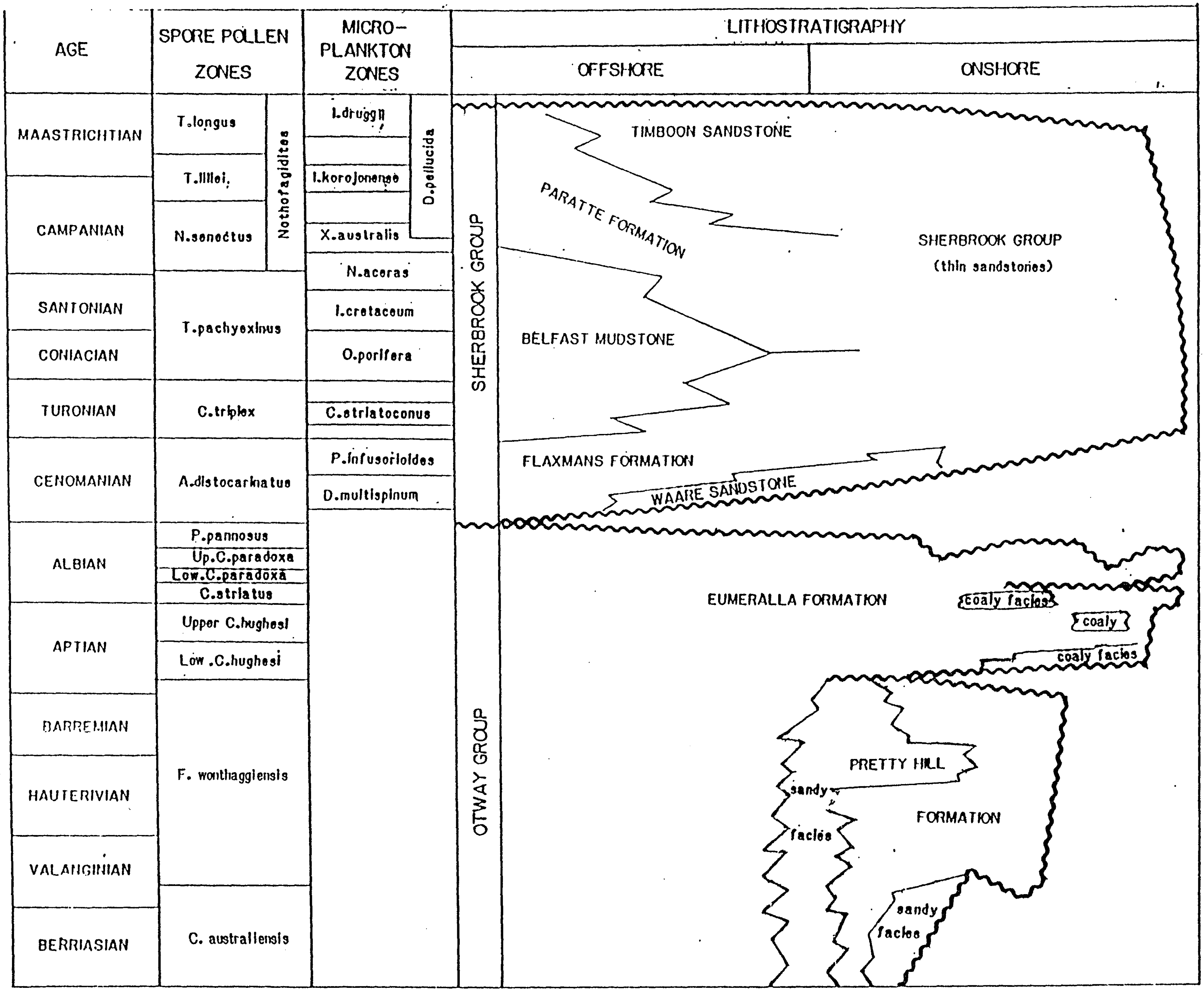

FIGURE 1. CRETACEOUS REGIONAL FRAMEWORK, OTWAY BASIN

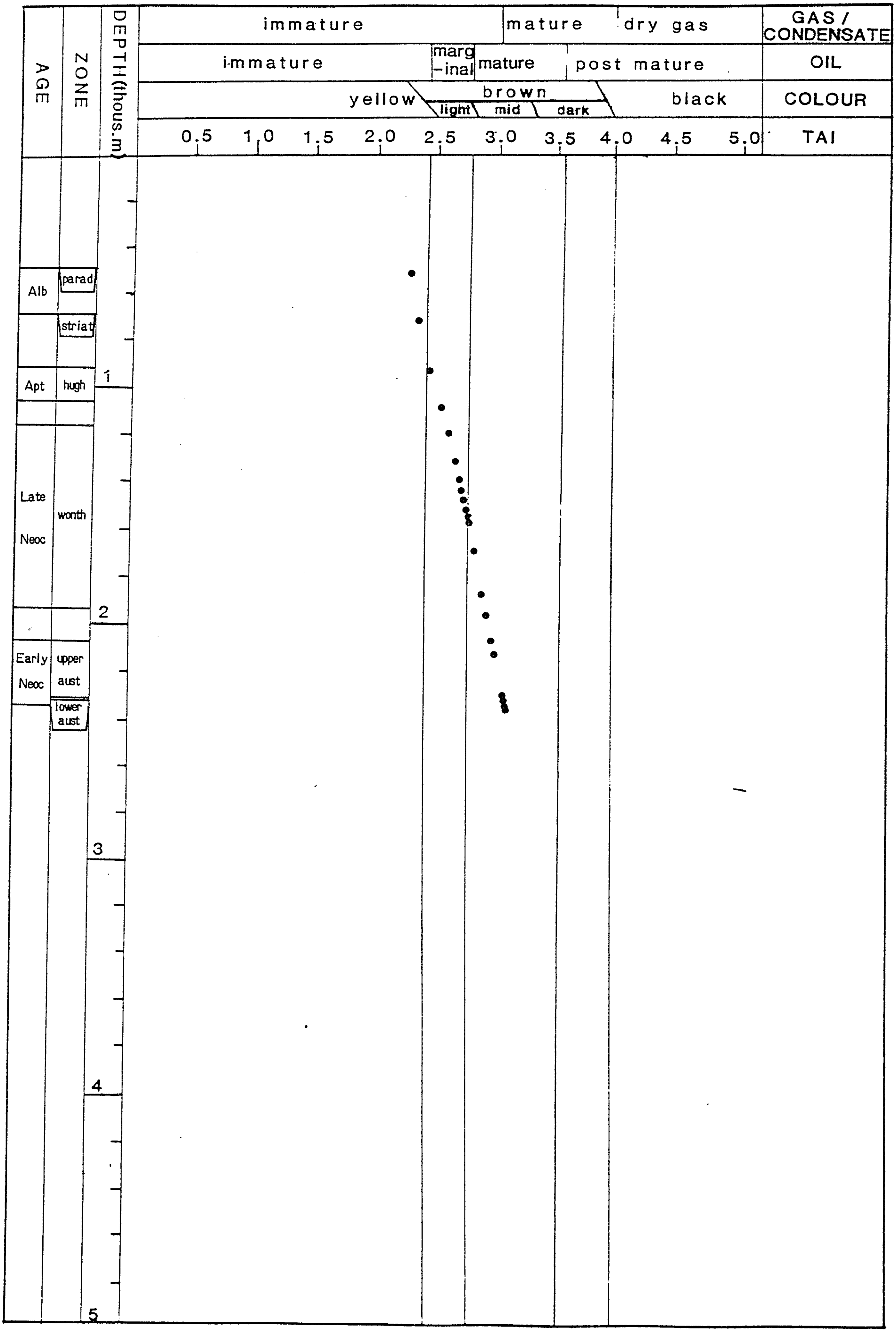

FIGURE 2 MATURITY PROFILE McEACHERN 1

III PALYNOSTRATGRAPHY

A. 504.6m (swc) : lower C. paradoxa Zone

Assignment to the lower Coptospora paradoxa Zone of mid Albian age is indicated by youngest Dictyotosporites speciosus and oldest Coptospora paradoxa. The absence of younger indicators, and the presence of oldest Perotriletes majus confirms the assignment. Falcisporites similis dominates the assemblage, with frequent Microcachryidites antarcticus and consistent Cicatricosisporites australiensis.

Slightly brackish environments are indicated by the very rare presence of spiny acritarchs (Micrhystridium) and dominance of diverse and abundant spores and pollen

These features are normally seen in the mid Eumeralla Formation.

Yellow to light brown spore colours indicate immaturity but approaching early marginal maturity for oil, and immaturity for gas/condensate.

B. 699.6m (swc) : C. striatus Zone

Assignment to the early Albian Crybelosporites striatus Zone is indicated by oldest C. striatus without younger indicators. Youngest Pilosisporites notensis occurs in this sample and confirms the assignment. Common taxa are C. australiensis, F. similis, Osmundacidites wellmanii and Retitriletes austroclavatidites.

Non-marine environments are indicated by the common and diverse spores and pollen, and absence of saline indicators. Rare algal acritarchs (Schizosporis spp.) indicate minor lacustrine influence.

These features are normally seen in the mid Eumeralla Formation, often in coaly facies.

Yellow to light brown spore colours indicate immaturity for oil, but approaching early marginal maturity. The sample is clearly immature for gas/condensate.

C. 905.6m (swc)-1048.6m (swc) C. hughesi Zone

Assignment to the Aptian Cyclosporite hughesi Zone is indicated at the top by the absence of younger markers, and at the base by oldest Pilosisporites notensis. Cyathidites, Falcisporites and Retitriletes are common in both samples, while P. notensis and D. speciosus and prominent at 905.6m.

Non-marine environments are indicated by the common and diverse spores and pollen, and absence of saline indicators. Amorphous sapropel and cuticle are common at 905.6m, suggesting anoxic swamp conditions.

These features are normally seen in the lower Eumeralla Formation, often associated with coaly lithologies.

Light brown to yellow spore colours indicate early marginal maturity for oil, but immaturity for gas/condensate.

D. 1174.5m (swc)-1946.1m (swc) : F. wonthaggiensis Zone

Assignment to the late Neocomian Foraminisporis wonthaggiensis Zone is indicated at the top by youngest Microfasta evansii and the absence of younger markers.

At the base, oldest D. speciosus indicates the assignment. Within the unit, oldest C. australiensis at 1174.5m suggests its assignment to an upper subunit, and the interval 1289.5-1946.1m to a lower subunit. A minor influx of Contignisporites cooksoniae occurs at 1174.5m. Within the interval, M. evansii is rare down to 1289.5m, and extremely scarce beneath, being seen only at 1523.6m. Cyathidites, Falcisporites, O. wellmanii and Retitriletes are the£most common forms. Callialasporites dampieri is consistently present beneath 1946.1m.

Non-marine environments are indicated by the common and diverse spores and pollen, abundant plant debris, and absence of saline indicators. Minor lacustrine influence is shown by the presence of algal acritarchs including M. evansii at the top of the interval. Common cuticle and amorphous sapropel at 1365m suggests swampy conditions.

These features are normally seen in the Pretty Hill Formation and its shaley equivalents, and therefore normally underlie the "top Pretty Hill unconformity".

Spore colours of light brown at 1174.5m to 1461.1m indicate marginal maturity for oil, but immaturity for gas condensate. Light to mid brown spore colours at 1504.6m to 1649.1m indicate early maturity for oil, and early marginal maturity for gas/condensate. Mid brown spore colours at 1857.6m and 1946.1m indicate maturity for oil, and marginal maturity for gas/condensate.

E. 2070m (cutts)-2354m (cutts) : upper C. australiensis Zone

Assignment to the upper part of the early Neocomian

Cicatricosisporites australiensis Zone is indicated at the top by the absence of younger indicators, and confirmed by youngest consistent C. dampieri. At the base, oldest Cyclosporites hughesi indicates the assignment. Unfortunately, swcs were not studied for palynology in this interval, and it is possible that oldest C. hughesi may be caved somewhat, causing this boundary to be picked low. Diversity is low, with Cyathidites and Falcisporites usually dominant. Minor Permian reworking was noted in some samples.

Non-marine environments are indicated by the common and diverse spores and pollen and absence of saline indicators.

These features are normally seen in the lower part of the Pretty Hill Formation.

Mid brown spore colours indicate maturity for oil, but only marginal maturity for gas/condensate.

F. 2364m (cutts)-2384m (cutts) : lower C. australiensis -?R. watherooensis

Assignment of this interval to the earliest Neocomian to late Jurassic lower Cicatricosisporites australiensis Zone to R. watherooensis Zone is indicated at the top by the absence of younger indicators and at the base by oldest Retitriletes watherooensis and Ceratosporites equalis. The base of the C. australiensis is usually picked on oldest C. australiensis, but this species is extremely rare at this level in the Otway Basin and is not a reliable indicator. A downhole influx of C. dampieri at 2384m is distinctive, and may have correlative value in the future. Above that sample, Cyathidites, O. wellmanii and Retitriletes dominate. Caving is noted in all samples and included M. evansii and some Aptian forms.

Environments are probably non-marine, as the spores and pollen are dominant and diverse. Very rare Micrhystridium spp. at 2374 and 2384m suggest brackish influence, but could be caved in these cuttings samples.

These features are normally seen in the Casterton Beds in the Otway Basin.

Mid brown spore colours indicate maturity for oil, and marginal to early maturity for gas/condensate.

IV CONCLUSIONS

A. Sparse sampling has precluded tight resolution of the zone boundaries and the available subzones, especially at top Pretty Hill unconformity leval. Correlation to better sampled sections will rely on logs. The study of cuttings only in the bottom hole section has further limited the data, precluding crisp resolution of the age relationships of the Casterton Beds.

B. Nevertheless, the sampled section comprises correlatives of the Casterton Beds, Pretty Hill Formation and Eumeralla Formation, mature below about 1800m, and almost all non-marine. Minor brackish influence is seen in the mid Albian Eumeralla Formation, and possible also in the Casterton Beds.

V REFERENCES

Dettmann, M.E. and Playford, G. (1969) Palynology of the Australian Cretaceous : a review In Stratigraphy and Palaeontology. Essays in honour of Dorothy Hill, KSW Campbell Ed. ANU Press, Canberra 174-210

Helby, R.J., Morgan, R.P. and Partridge, A.D. (1987) A palynological zonation of the Australian Mesozoic In Studies in Australian mesozoic Palynology Assoc. Australas. Palaeontols. Mem 4 1-94

Morgan, R.P. (1985) Palynology review of selected oil drilling, Otway basin, South Australia unpubl. rept. for Ultramar Australia

EACHERN #1 composite palynological data a) dino b) S/P

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phone (088) 32 2795.. ..fax (088) 32 2658

C L I E N T: Gas & Fuel Exploration
W E L L: McEachern #1
F I E L D / A R E A: Otway Basin

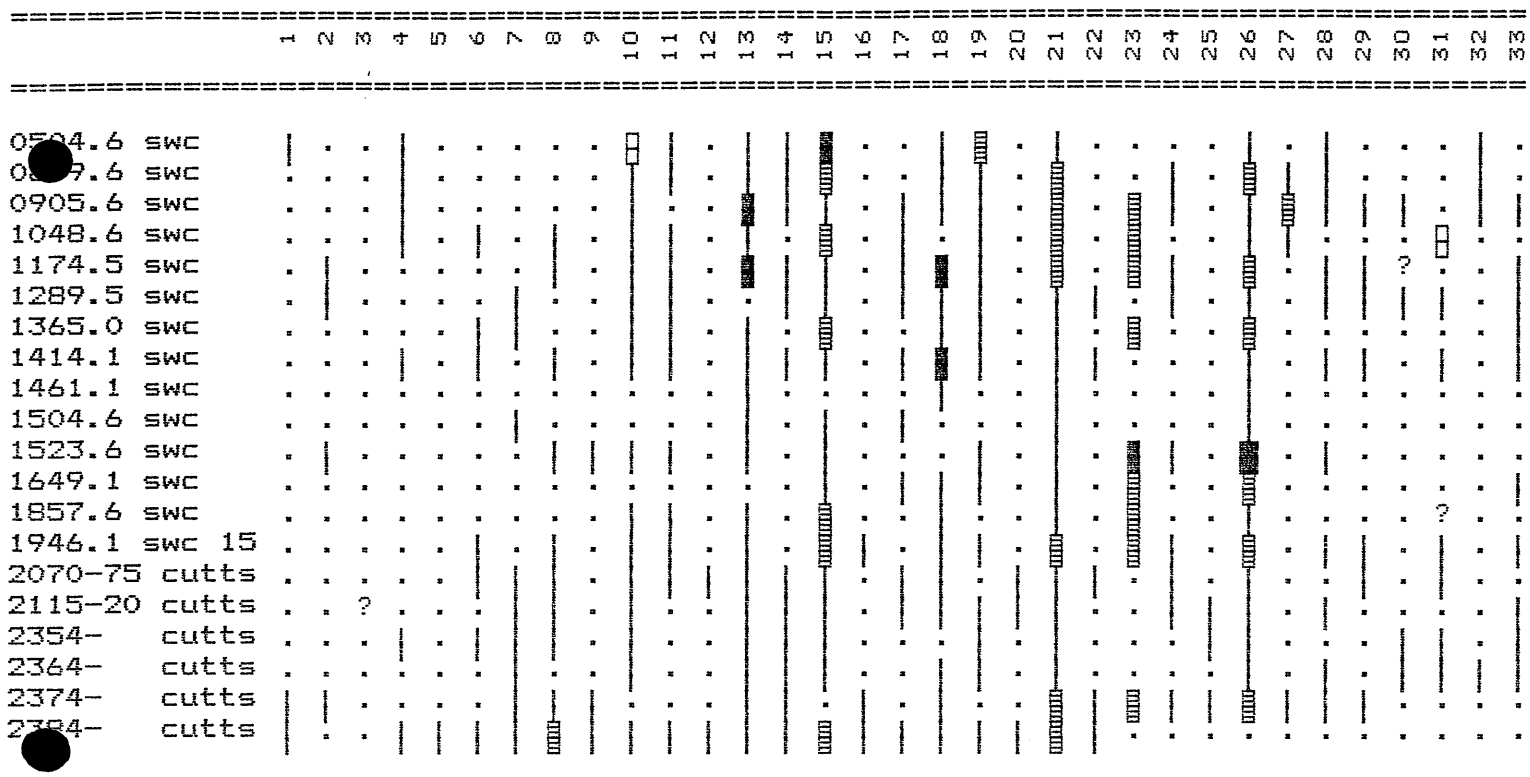
A N A L Y S T: Roger Morgan   D A T E : April '90
N O T E S: all sample depths are in metres

RANGE CHART OF GRAPHIC ABUNDANCES BY LOWEST APPEARANCE

Key to Symbols

- | = Very Rare
- = Rare
- = Few
- = Common
- = Abundant
- ? = Questionably Present
- . = Not Present

ICRHYSTRIDIUM
ICROFASTA EVANSII
UYLISPORITES LMNARIS
EQUITRIRADITES VERRUCOSUS
NAPICULATISPORITES PRISTIDENTATUS
RAUCARIACITES AUSTRALIS
ACULATISPORITES SP.
ALLIALASPORITES DAMPIERI
ALLIALASPORITES TURBATUS
ERATOSPORITES EQUALIS
OROLLINA TOROSUS
ORONATISPORA PERFORATA
YATHIDITES AUSTRALIS
ICTYOPHYLLIDITES HARRISII
ALCISPORITES SIMILIS
LEICHENIDITES
LUKISPORITES SCABERIS
EPTOLEPIDITES VERRUCATUS
ICROCACHRYDITES ANTARCTICUS
EORAISTRICKIA TRUNCATA
ETITRILETES AUSTROCLAVATIDITES
ETITRILETES NODOSUS
YATHIDITES MINOR
YCADOPITES FOLLICULARIS
UROSPORA FLORIDA
SMUNDACIDITES WELLMANII
ILOSISPORITES NOTENSIS
ETITRILETES EMINULUS
ETITRILETES WATHAROOENSIS
ICTYOTOSPORITES COMPLEX
ALCISPORITES GRANDIS
ORAMINISPORIS ASYMMETRICUS
EORAISTRICKIA SP.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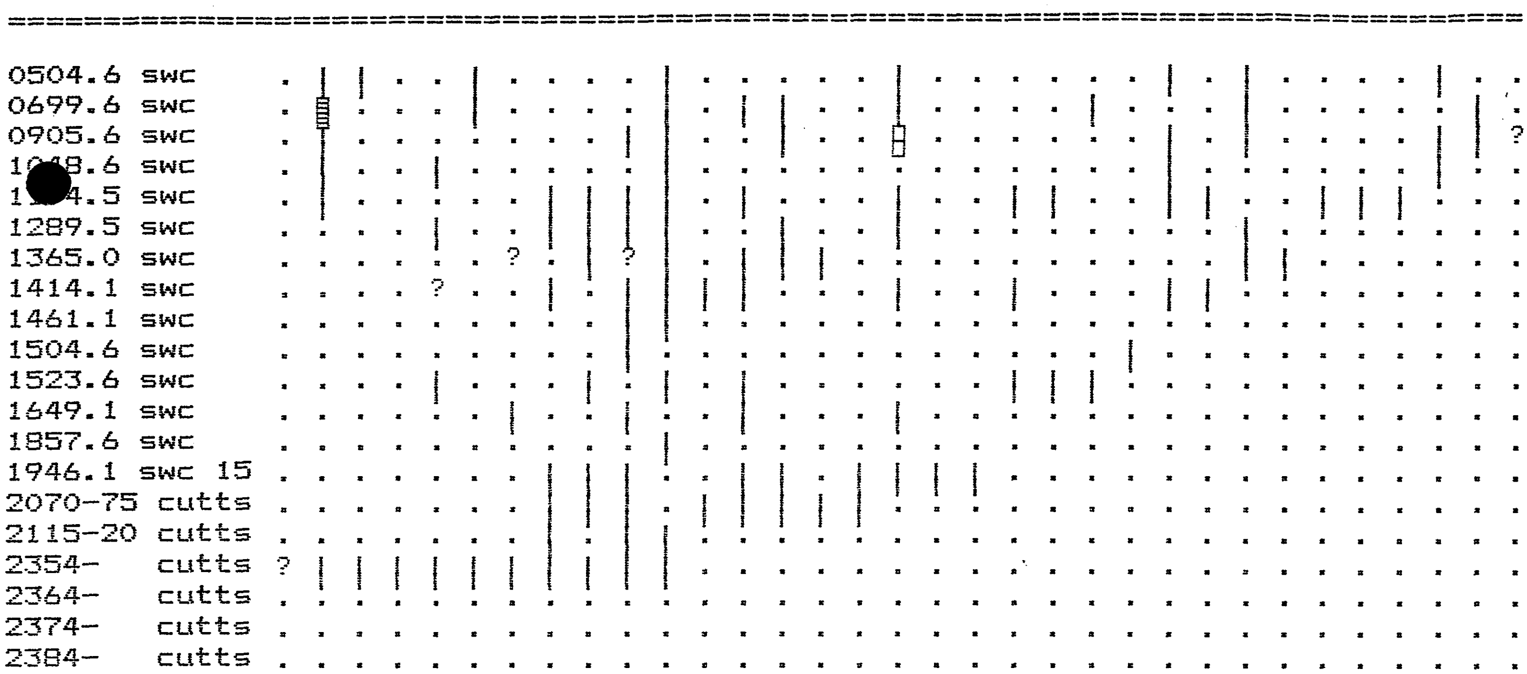
0504.6 swc
0??9.6 swc
0905.6 swc
1048.6 swc
1174.5 swc
1289.5 swc
1365.0 swc
1414.1 swc
1461.1 swc
1504.6 swc
1523.6 swc
1649.1 swc
1857.6 swc
1946.1 swc 15
2070-75 cutts
2115-20 cutts
2354- cutts
2364- cutts
2374- cutts
2384- cutts
?

34 AEQUITRIRADITES ACUSUS
35 CICATRICOSISPORITES AUSTRALIENSIS
36 CONCAVISSIMISPORITES PENOLAENSIS
37 CONCAVISSIMISPORITES VARIVERRUCATUS
38 COROLLINA SIMPLEX
39 CRYBELOSPORITES STRIATUS
40 CYATHIDITES ASPER
41 CYCLOSPORITES HUGHESI
42 FOVEOTRILETES PARVIRETUS
43 LEPTOLEPIDITES MAJOR
44 STERIESPORITES ANTIQUASPORITES
45 LAEVIGATOSPORITES BELFORDI
46 RETITRILETES CIRCOLUMENUS
47 RETITRILETES FACETUS
48 SESTROSPORITES PSUEDOALVEOLATUS
49 VELOSPORITES TRIQUETRUS
50 DICTYOTOSPORITES SPECIOSUS
51 PERINOPOLLENITES ELATOIDES
52 STAPLINISPORITES CAMINUS
53 CONTIGNISPORITES COOKSONIAE
54 ISCHYOSPORITES PUNCTATUS
55 LYCOPODIACIDITES ASPERATUS
56 CIRCULISPORITES PARVUS
57 AEQUITRIRADITES SPINULOSUS
58 VITREISPORITES PALLIDUS
59 FORAMINISPORIS DAILYI
60 STAPLINISPORITES MANIFESTUS
61 ANNULISPORITES FOLLICULOSA
62 CONTIGNISPORITES FORNICATUS
63 PEROTRILETES LINEARIS
64 AEQUITRIRADITES TILCHAENESIS
65 FORAMINISPORIS WONTHAGGIENSIS
66 PILOSISPORITES PARVISPINOSUS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0905.6 swc
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1365.0 swc
1414.1 swc
1461.1 swc
1504.6 swc
1523.6 swc
1649.1 swc
1857.6 swc
1946.1 swc 15
2070-75 cutts
2115-20 cutts
2354- cutts
2364- cutts
2374- cutts
2384- cutts

0504.6 SWC

.	67	TRIPOROLETES RADIATUS
—	68	TRIPOROLETES RETICULATUS
.	69	FOVEOSPORITES CANALIS
—	70	CINGUTRILETES CLAVUS
—	71	COPTOSPORA PARADOXA
—	72	MATONISPORITES COOKSONIAE
—	73	PEROTRILETES MAJUS
—	74	TRIPOROLETES SIMPLEX
.	75	SCHIZOSPORIS RETICULATA
.	76	SCHIZOSPORIS PSILATA
.	77	SCHIZOSPORIS PARVUS

0504.6 SWC

[illegible] swc	[illegible] swc
0905.6 swc	0905.6 swc
1048.6 swc	1048.6 swc
1174.5 swc	1174.5 swc
1289.5 swc	1289.5 swc
1365.0 swc	1365.0 swc
1414.1 swc	1414.1 swc
1461.1 swc	1461.1 swc
1504.6 swc	1504.6 swc
1523.6 swc	1523.6 swc
1649.1 swc	1649.1 swc
1857.6 swc	1857.6 swc
1946.1 swc 15	1946.1 swc 15
2070-75 cutts	2070-75 cutts
2115-20 cutts	2115-20 cutts
2354- cutts	2354- cutts
2364- cutts	2364- cutts
2374- cutts	2374- cutts
2384- cutts	2384- cutts

SPECIES LOCATION INDEX

Index numbers are the columns in which species appear.

INDEX NUMBER	SPECIES
34	AEQUITRIRADITES ACUSUS
57	AEQUITRIRADITES SPINULOSUS
64	AEQUITRIRADITES TILCHAENESIS
4	AEQUITRIRADITES VERRUCOSUS
5	ANAPICULATISPORITES PRISTIDENTATUS
61	ANNULISPORITES FOLLICULOSA
6	ARAUCARIACITES AUSTRALIS
7	BACULATISPORITES SP.
8	CALLIALASPORITES DAMPIERI
9	CALLIALASPORITES TURBATUS
10	CERATOSPORITES EQUALIS
35	CICATRICOSISPORITES AUSTRALIENSIS
70	CINGUTRILETES CLAVUS
56	CIRCULISPORITES PARVUS
36	CONCAVISSIMISPORITES PENOLAENSIS
37	CONCAVISSIMISPORITES VARIVERRUCATUS
53	CONTIGNISPORITES COOKSONIAE
62	CONTIGNISPORITES FORNICATUS
[illegible]1	COPTOSPORA PARADOXA
38	COROLLINA SIMPLEX
11	COROLLINA TOROSUS
12	CORONATISPORA PERFORATA
39	CRYBELOSPORITES STRIATUS
40	CYATHIDITES ASPER
13	CYATHIDITES AUSTRALIS
23	CYATHIDITES MINOR
24	CYCADOPITES FOLLICULARIS
41	CYCLOSPORITES HUGHESI
14	DICTYOPHYLLIDITES HARRISII
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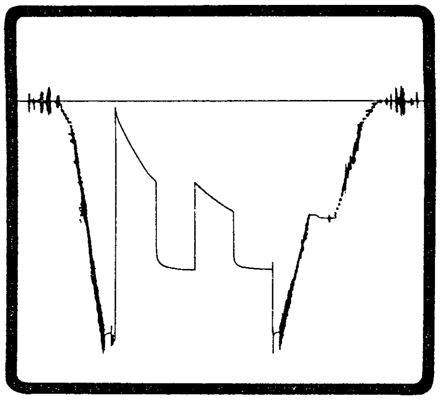
15	FALCISPORITES SIMILIS
32	FORAMINISPORIS ASYMMETRICUS
59	FORAMINISPORIS DAILYI
65	FORAMINISPORIS WONTHAGGIENSIS
69	FOVEOSPORITES CANALIS
[illegible]2	FOVEOTRILETES PARVIRETUS
16	GLEICHENIDITES
54	ISCHYOSPORITES PUNCTATUS
17	KLUKISPORITES SCABERIS
3	KUYLISPORITES LMNARIS
45	LAEVIGATOSPORITES BELFORDI
43	LEPTOLEPIDITES MAJOR
18	LEPTOLEPIDITES VERRUCATUS
55	LYCOPODIACIDITES ASPERATUS
72	MATONISPORITES COOKSONIAE
1	MICRHYSTRIDIUM
19	MICROCACHRYDITES ANTARCTICUS
2	MICROFASTA EVANSII
25	MUROSPORA FLORIDA
33	NEORAISTRICKIA SP.
20	NEORAISTRICKIA TRUNCATA
26	OSMUNDACIDITES WELLMANII
51	PERINOPOLLENITES ELATOIDES
63	PEROTRILETES LINEARIS
[illegible]3	PEROTRILETES MAJUS
27	PILOSISPORITES NOTENSIS
66	PILOSISPORITES PARVISPINOSUS
21	RETITRILETES AUSTROCLAVATIDITES
46	RETITRILETES CIRCOLUMENUS
28	RETITRILETES EMINULUS
47	RETITRILETES FACETUS

22 RETITRILETES NODOSUS
29 RETITRILETES WATHAROOENSIS
77 SCHIZOSPORIS PARVUS
76 SCHIZOSPORIS PSILATA
75 SCHIZOSPORIS RETICULATA
48 SESTROSPORITES PSUEDOALVEOLATUS
[illegible]2 STAPLINISPORITES CAMINUS
60 STAPLINISPORITES MANIFESTUS
44 STERIESPORITES ANTIQUASPORITES
67 TRIPOROLETES RADIATUS
68 TRIPOROLETES RETICULATUS
74 TRIPOROLETES SIMPLEX
49 VELOSPORITES TRIQUETRUS
58 VITREISPORITES PALLIDUS

12. FORMATION TESTING

12. FORMATION TESTING

FORMATION TESTING SERVICE REPORT



HALLIBURTON SERVICES

Duncan, Oklahoma 73536

A Halliburton Company

1296-R6 Southwestern

NOMENCLATURE

B	= Formation Volume Factor (Res Vol / Std Vol)	——
c_t	= System Total Compressibility	(Vol / Vol) / psi
DR	= Damage Ratio	——
h	= Estimated Net Pay Thickness	Ft
k	= Permeability	md
m	= (Liquid) Slope Extrapolated Pressure Plot	psi/cycle
	= (Gas) Slope Extrapolated m(P) Plot	MM psi^2/cp/cycle
m(P*)	= Real Gas Potential at P*	MM psi^2/cp
$m(P_f)$	= Real Gas Potential at P_f	MM psi^2/cp
AOF_1	= Maximum Indicated Absolute Open Flow at Test Conditions	MCFD
AOF_2	= Minimum Indicated Absolute Open Flow at Test Conditions	MCFD
P*	= Extrapolated Static Pressure	Psig
P_f	= Final Flow Pressure	Psig
Q	= Liquid Production Rate During Test	BPD
Q_1	= Theoretical Liquid Production w/ Damage Removed	BPD
Q_g	= Measured Gas Production Rate	MCFD
r_i	= Approximate Radius of Investigation	Ft
r_w	= Radius of Well Bore	Ft
S	= Skin Factor	
t	= Total Flow Time Previous to Closed-in	Minutes
Δt	= Closed-in Time at Data Point	Minutes
T	= Temperature Rankine	°R
ϕ	= Porosity	——
μ	= Viscosity of Gas or Liquid	cp
Log	= Common Log	

FORMATION TEST REPORT

HALLIBURTON SERVICES

A Halliburton Company

Customer: GAS AND FUEL EXPLORATION
Well Description: MCEACHERN #1

TEST NO. :DST #1
TEST DATE :31-DECEMBER-89
TICKET NO. :352064

HALLIBURTON
SERVICES

REPORT TICKET NO: 352064
BT-GAUGE TICKET NO: 352064
DATE: 31/12/89
HALLIBURTON CAMP: ADELAIDE
TESTER: TREVOR BURKE
WITNESS: C. McKAY

DRILLING CONTRACTOR: GEARHART RIG#2
LEGAL LOCATION: 37 33' 51.29"S
141 11' 25.50"E

OPERATOR: GAS & FUEL EXP.
LEASE NAME: McEACHERN
WELL NO: 1
TEST NO: 1
TESTED INTERVAL: 4743.00 - 4777.00 ft

FIELD AREA: OTWAY BASIN
COUNTY/LSD:
STATE/PROVINCE: VICTORIA
COUNTRY: AUSTRALIA

TABLE OF CONTENTS

Date: 31/12/89 Ticket No: 352064 Page No: 1.1

SUMMARY OF TEST

Lease Owner: GAS & FUEL EXP.

Lease Name: McEACHERN

Well No.: 1

Test No.: 1

County/LSD:

State/Province: VICTORIA

Country: AUSTRALIA

Formation Tested: PRETTY HILL

Hole Temp: 172.00 F

Total Depth: 4777.00 ft

Net Pay: 13.00 ft

Gross Tested Interval: 4743.00 - 4777.00 ft

Perforated Interval (ft): 1445.7 - 1456 m

RECOVERY:

41 bbls. SALTY GASSY WATER
9 bbls. SLIGHTY MUDDY GASSY WATER

REMARKS:

ALL DOWN HOLE PRESSURES ARE IN
ABSOLUTE PSIA

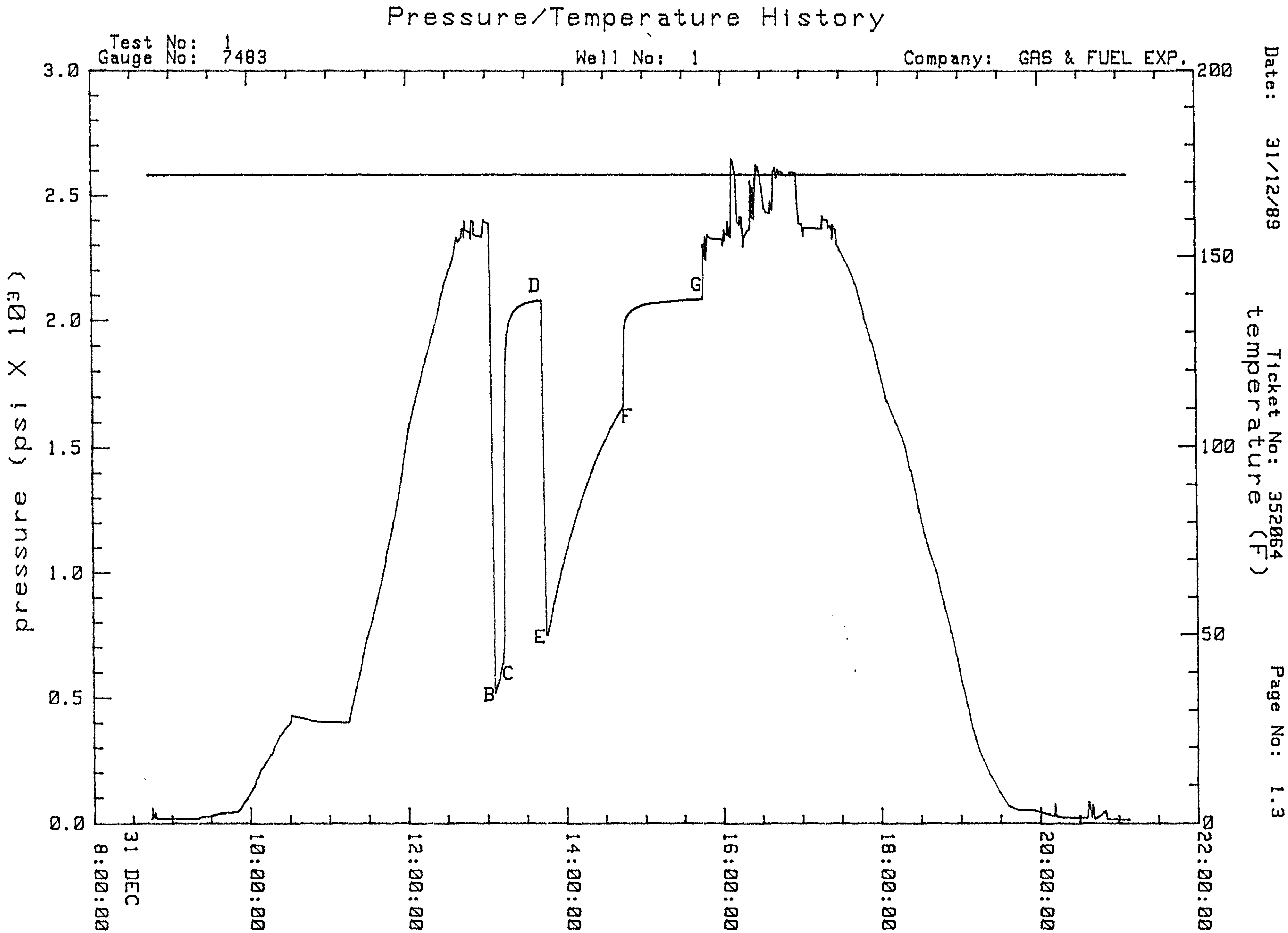
Date: 31/12/89 Ticket No: 352064 Page No: 1.2

TEST PERIOD SUMMARY

Gauge No.: 7483 Depth: 4774.00 ft Blanked off : Yes
Hour of clock: 24

ID	PERIOD	DESCRIPTION	PRESSURE (psi)	DURATION (min)
A		Initial Hydrostatic	2348.41	
B	1	Start Draw-down	517.64	
C		End Draw-down	635.71	6.17
C	2	Start Build-up	635.71	
D		End Build-up	2079.34	30.10
E	3	Start Draw-down	748.83	
F		End Draw-down	1661.09	59.38
F	4	Start Build-up	1661.09	
G		End Build-up	2083.81	61.27
H		Final Hydrostatic	2320.85	

NOTE: for Pressure vs. Time Plot, see next page.



Pressure/Temperature History
Test No: 1
Gauge No: 7483
Well No: 1
Company: GAS & FUEL EXP.
Date: 31/12/89
Ticket No: 352064
Page No: 1.3
pressure (psi X 10³)
temperature (F)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
200
150
100
50
0
B
C
D
E
F
G
31 DEC
8:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00

TEST AND FORMATION DATA

Formation Tested: PRETTY HILL
All Depths Measured From: KELLY BUSHINGS
Elevation: 268.00 ft
Total Depth: 4777.00 ft
Net Pay: 13.00 ft
Hole or Casing Size: 0.000 in
Gross Tested Interval: 4743.00 - 4777.00 ft
Perforated Interval (ft): 1445.7 - 1456.

HOLE FLUID		HOLE TEMPERATURE	
Type:	DRILLING MUD	Depth:	0.00 ft
Weight:	9.30 lb/gal	Estimated:	0.00 F
Viscosity:	45 seconds	Actual:	172.00 F

HYDROCARBON PROPERTIES

Oil Gravity (API): 0.0 @ 60 F
Gas/Oil ratio (ScF/STB): 0.0
Gas Gravity (SG): 0.00

CUSHION DATA

TYPE	AMOUNT	WEIGHT

FLUID PROPERTIES FOR RECOVERED MUD AND WATER

SOURCE	RESISTIVITY	CHLORIDES	SG	PH
	@ F	PPM		
	@ F	PPM		
	@ F	PPM		
	@ F	PPM		
	@ F	PPM		
	@ F	PPM		

SAMPLER DATA

Surface Pressure: 0 psi
Volume of Gas: 0 ft3
Volume of Oil: 0 cc
Volume of Water: 0 cc
Volume of Mud: 0 cc
Total Liquids: 0 cc

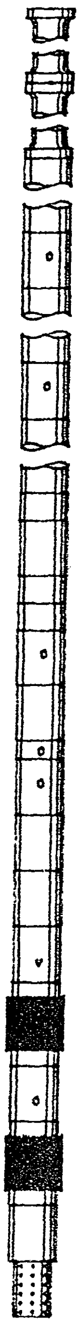
REMARKS:
ALL DOWN HOLE PRESSURES ARE IN
ABSOLUTE PSIA

RATE HISTORY TABLE

Period No	Test Type	j	Prod Rate q(j) (bbl/d)	Duration (hrs)	Cum. Time t(j) (hrs)
		0	0.0	0.00	0.00
1	DD	1		0.11	0.11
2	BU	2	0.0	0.49	0.60
3	DD	3		0.99	1.58
4	BU	4	0.0	1.03	2.61

Date: Ticket no: 352064 Page no: 1.6.1

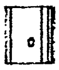
TEST STRING CONFIGURATION



	O.D. (in)	I.D. (in)	LENGTH (ft)	DEPTH (ft)
DRILL PIPE......................	4.500	3.820	4027.280	
FLEX WEIGHT.....................	4.500	2.870	120.960	
DRILL COLLARS...................	6.250	2.810	454.730	
PUMP OUT REVERSING SUB..........	6.000	3.000	1.000	4603.00
DRILL COLLARS...................	6.250	2.810	60.430	
IMPACT REVERSING SUB............	6.000	3.000	1.000	4664.00
DRILL COLLARS...................	6.250	2.810	29.950	
BAR CATCHER SUB.................	5.750	1.120	1.000	
AP RUNNING CASE.................	5.000	2.250	4.140	4697.00
CROSSOVER.......................	5.750	2.250	1.000	
CROSSOVER.......................	5.750	2.250	0.620	
DUAL CIP VALVE..................	5.000	0.870	4.870	
SAMPLE CHAMBER..................	5.000	2.500	4.870	
DRAIN VALVE.....................	5.000	2.200	0.860	
HYDROSPRING TESTER..............	5.000	0.750	5.310	4718.00
AP RUNNING CASE.................	5.000	2.250	4.140	4719.00
JAR.............................	5.000	1.750	5.000	
VR SAFETY JOINT.................	5.000	1.000	2.780	
OPEN HOLE PACKER................	6.000	1.530	5.850	4735.00
DISTRIBUTOR VALVE...............	5.000	1.680	2.000	
OPEN HOLE PACKER................	6.000	1.530	5.850	4743.00
ANCHOR PIPE SAFETY JOINT........	5.000	1.500	4.300	
PERFORATED TAIL PIPE............	5.000	2.370	25.000	

CONTINUED

TEST STRING CONFIGURATION

		O.D. (in)	I.D. (in)	LENGTH (ft)	DEPTH (ft)
	BLANKED-OFF RUNNING CASE........	5.000	2.440	4.060	4774.00

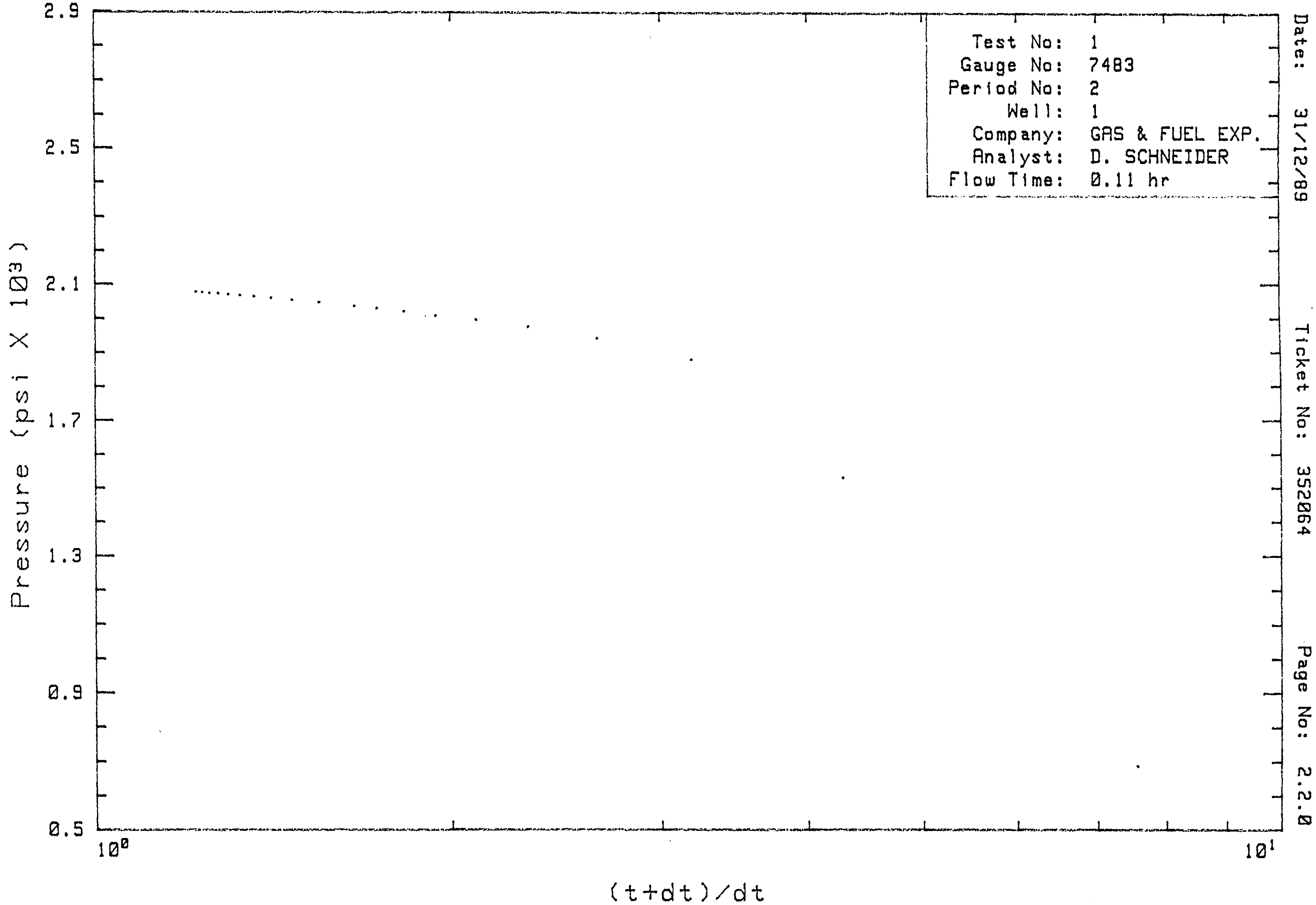
Date: 31/12/89 Ticket No: 352064 Page No: 1.7.1
Test No: 1

OPERATOR JOB LOG

Type of Flow Measuring Device:

TIME HH:MM:SS	CHOKE SIZE (in)	SURFACE PRESSURE (psi)	GAS RATE (MCF/D)	LIQUID RATE (bbl/d)	REMARKS
31-DEC-89					
08:15:00					SURFACE PRESSURE = PSIG
08:15:00					LOAD B.T. GAUGES
08:35:00					MAKE UP TOOLS
09:50:00					RUN IN HOLE
13:02:00					SET 25,000lbs. ON PACKERS
13:06:00	32/64	0.00			TOOL OPEN WEAK-MODERATE BLOW
13:10:00	32/64	0.00			MODERATE BLOW
13:16:00					TOOL CLOSED FOR 1st C.I.P.
13:46:00	32/64	0.00			TOOL OPEN WEAK-MODERATE BLOW
13:50:00	32/64	0.00			MODERATE BLOW
14:10:00	32/64	0.00			DECREASING SLIGHTLY
14:30:00	32/64	0.00			WEAK BLOW
14:46:00					TOOL CLOSED FOR 2nd C.I.P.
15:46:00					BYPASS OPENED PACKERS FREE
16:00:00					DROP BAR TO REVERSE CIRCULATE
16:04:00					BEGIN TO REVERSE CIRCULATE
17:10:00					FINISH REVERSE CIRCULATE
17:10:00					P.O.O.H.
19:35:00					TOOLS AT TABLE
20:45:00					TOOLS LAID DOWN

HORNER PLOT



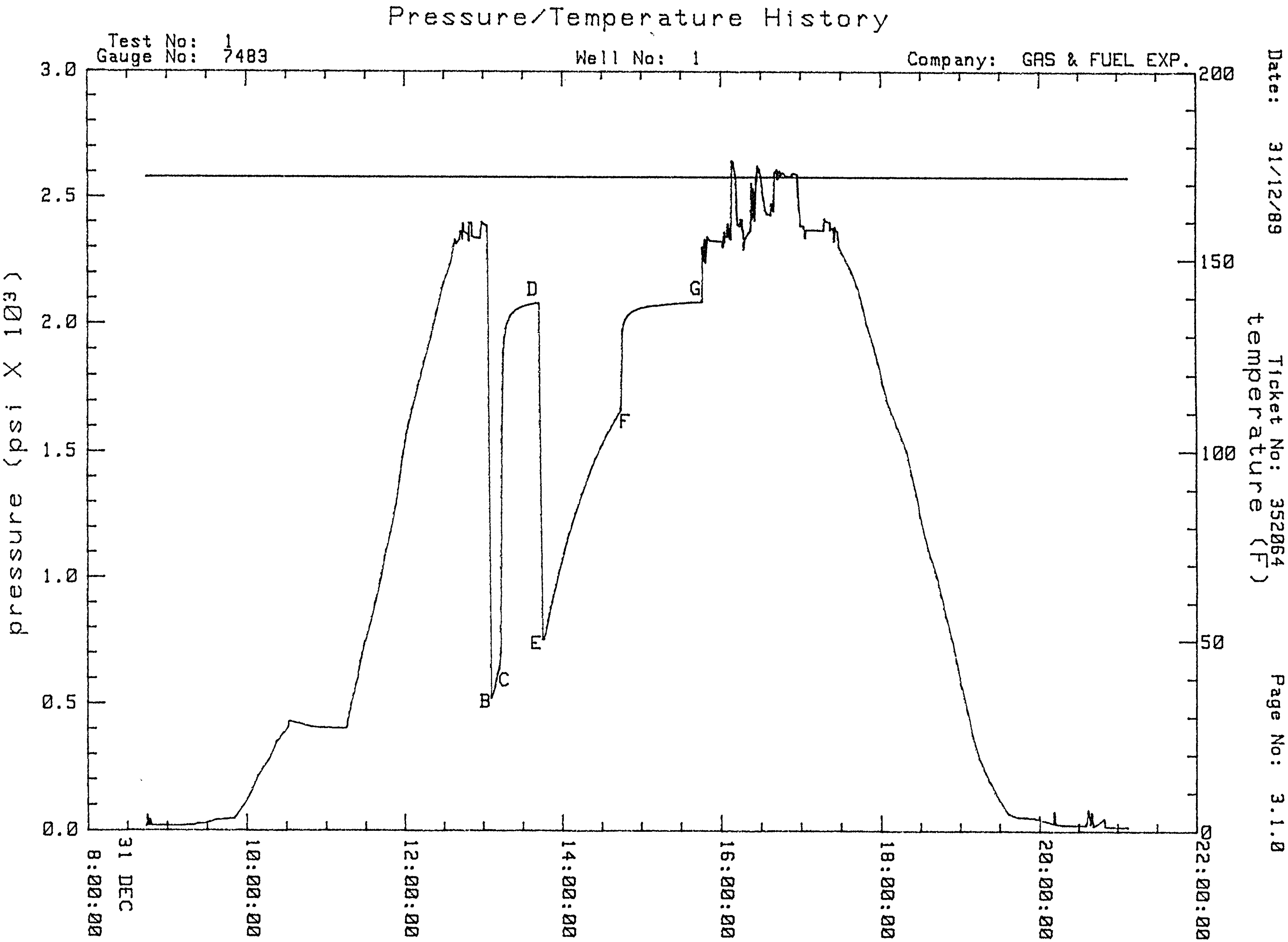
Test No: 1
Gauge No: 7483
Period No: 2
Well: 1
Company: GAS & FUEL EXP.
Analyst: D. SCHNEIDER
Flow Time: 0.11 hr
Date: 31/12/89
Ticket No: 352064
Page No: 2.2.0
Pressure (psi X 10³)
2.9
2.5
2.1
1.7
1.3
0.9
0.5
10⁰
10¹
(t+dt)/dt

TEST PERIOD SUMMARY

Gauge No.: 7483 Depth: 4774.00 ft Blanked off : Yes
Hour of clock: 24

ID	PERIOD	DESCRIPTION	PRESSURE (psi)	DURATION (min)
A		Initial Hydrostatic	2348.41	
B	1	Start Draw-down	517.64	
C		End Draw-down	635.71	6.17
C	2	Start Build-up	635.71	
D		End Build-up	2079.34	30.10
E	3	Start Draw-down	748.83	
F		End Draw-down	1661.09	59.38
F	4	Start Build-up	1661.09	
G		End Build-up	2083.81	61.27
H		Final Hydrostatic	2320.85	

NOTE: for Pressure vs. Time Plot, see next page.


Pressure/Temperature History
Test No: 1
Gauge No: 7483
Well No: 1
Company: GAS & FUEL EXP.
Date: 31/12/89
Ticket No: 352064
Page No: 3.1.0
pressure (psi X 10³)
temperature (F)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
200
150
100
50
0
B
C
D
E
F
G
31 DEC
8:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00

Date: 31/12/89 Ticket No: 352064 Page No: 3.1.1

PRESSURE VS TIME

MECHANICAL gauge no.: 7483 Gauge Depth: 4774.00 ft

Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
08:15:00				SURFACE PRESSURE = PSIG
08:15:00				LOAD B.T. GAUGES
08:35:00				MAKE UP TOOLS
08:44:26		14.091	172.0	
08:45:03		58.687	172.0	
08:46:14		19.688	172.0	
08:46:58		17.383	172.0	
08:47:25		40.590	172.0	
08:48:33		17.548	172.0	
08:56:51		17.054	172.0	
09:11:53		18.865	172.0	
09:17:44		20.511	172.0	
09:20:20		20.511	172.0	
09:23:32		26.766	172.0	
09:30:08		29.399	172.0	
09:37:33		41.248	172.0	
09:45:38		44.868	172.0	
09:50:00				RUN IN HOLE
09:50:48		46.842	172.0	
09:56:34		87.960	172.0	
10:02:11		136.113	172.0	
10:08:43		214.092	172.0	
10:16:01		271.320	172.0	
10:22:51		348.792	172.0	
10:31:02		402.947	172.0	
10:32:05		429.107	172.0	
10:39:28		420.116	172.0	
10:48:48		406.054	172.0	
10:58:42		402.129	172.0	
11:09:16		401.312	172.0	
11:15:33		401.312	172.0	
11:17:37		460.811	172.0	
11:20:35		531.840	172.0	
11:23:40		594.148	172.0	
11:26:08		662.257	172.0	
11:29:15		734.521	172.0	
11:33:30		812.879	172.0	
11:37:13		895.037	172.0	
11:41:32		987.788	172.0	
11:44:42		1082.839	172.0	
11:48:53		1175.981	172.0	
11:53:00		1284.491	172.0	
11:55:53		1381.075	172.0	
11:58:23		1474.152	172.0	
12:01:19		1567.757	172.0	
12:05:33		1663.174	172.0	

Date: 31/12/89 Ticket No: 352064 Page No: 3.1.2

PRESSURE VS TIME

MECHANICAL gauge no.: 7483 Gauge Depth: 4774.00 ft

Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
12:10:10		1755.268	172.0	
12:14:34		1845.655	172.0	
12:19:45		1942.502	172.0	
12:24:00		2034.445	172.0	
12:28:32		2140.657	172.0	
12:34:42		2233.829	172.0	
12:38:39		2330.092	172.0	
12:39:34		2312.090	172.0	
12:42:04		2329.614	172.0	
12:42:19		2362.741	172.0	
12:43:50		2362.104	172.0	
12:43:58		2329.614	172.0	
12:44:41		2394.425	172.0	
12:45:03		2358.601	172.0	
12:46:31		2354.142	172.0	
12:47:50		2350.161	172.0	
12:48:47		2348.409	172.0	
12:49:00		2346.657	172.0	
12:49:16		2320.852	172.0	
12:49:22		2396.494	172.0	
12:51:17		2393.947	172.0	
12:51:28		2341.719	172.0	
12:53:34		2335.667	172.0	
12:55:26		2335.667	172.0	
12:56:45		2332.640	172.0	
12:57:51		2332.640	172.0	
12:59:02		2399.678	172.0	
12:59:19		2394.584	172.0	
13:00:38		2388.694	172.0	
13:02:00				SET 25,000lbs. ON PACKERS
13:02:02		2384.873	172.0	
13:02:51		2383.600	172.0	
13:06:00				TOOL OPEN WEAK-MODERATE BLOW
		*** Start of Period 1 ***		
13:06:00	0.00	517.641	172.0	
13:07:00	1.01	531.677	172.0	
13:08:01	2.01	547.831	172.0	
13:09:01	3.02	564.959	172.0	
13:10:00				MODERATE BLOW
13:10:00	4.00	590.235	172.0	
13:11:00	5.01	614.849	172.0	
13:12:01	6.01	633.100	172.0	
13:12:10	6.17	635.706	172.0	
		*** End of Period 1 ***		

Date: 31/12/89 Ticket No: 352064 Page No: 3.1.3

PRESSURE VS TIME

MECHANICAL gauge no.: 7483 Gauge Depth: 4774.00 ft
Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
		*** Start of Period 2 ***		
13:13:10	1.01	689.121	172.0	
13:14:11	2.01	1532.226	172.0	
13:15:11	3.02	1880.245	172.0	
13:16:00				TOOL CLOSED FOR 1st C.I.P.
13:16:10	4.00	1942.982	172.0	
13:17:10	5.01	1977.372	172.0	
13:18:11	6.01	1998.319	172.0	
13:19:11	7.02	2010.150	172.0	
13:20:10	8.00	2022.298	172.0	
13:21:10	9.01	2031.568	172.0	
13:22:11	10.01	2037.961	172.0	
13:24:10	12.00	2048.507	172.0	
13:26:11	14.01	2055.378	172.0	
13:28:10	16.00	2060.810	172.0	
13:30:11	18.01	2066.082	172.0	
13:32:10	20.00	2069.437	172.0	
13:34:11	22.01	2071.834	172.0	
13:36:10	24.00	2074.389	172.0	
13:38:11	26.01	2075.987	172.0	
13:40:12	28.03	2078.702	172.0	
13:42:12	30.04	2079.820	172.0	
13:42:16	30.10	2079.341	172.0	
		*** End of Period 2 ***		
		*** Start of Period 3 ***		
13:45:10	0.00	748.834	172.0	
13:46:00				TOOL OPEN WEAK-MODERATE BLOW
13:46:11	1.01	750.949	172.0	
13:47:11	2.01	772.737	172.0	
13:48:11	3.02	797.280	172.0	
13:49:10	4.00	824.901	172.0	
13:50:00				MODERATE BLOW
13:50:10	5.01	850.399	172.0	
13:51:11	6.01	876.374	172.0	
13:52:11	7.02	900.716	172.0	
13:53:10	8.00	922.130	172.0	
13:54:10	9.01	946.131	172.0	
13:55:13	10.04	968.178	172.0	
13:57:10	12.00	1013.547	172.0	
13:59:11	14.01	1053.221	172.0	
14:01:10	16.00	1090.929	172.0	
14:03:11	18.01	1133.145	172.0	
14:05:10	20.00	1170.002	172.0	
14:10:00				DECREASING SLIGHTLY
14:10:10	25.00	1252.698	172.0	
14:15:11	30.01	1330.138	172.0	

PRESSURE VS TIME

MECHANICAL gauge no.: 7483 Gauge Depth: 4774.00 ft

Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
14:20:11	35.02	1402.180	172.0	
14:25:11	40.02	1467.875	172.0	
14:30:00				WEAK BLOW
14:30:10	45.00	1523.059	172.0	
14:35:10	50.01	1574.668	172.0	
14:40:11	55.01	1621.262	172.0	
14:44:33	59.38	1661.087	172.0	
		*** End of Period 3 ***		
		*** Start of Period 4 ***		
14:45:33	1.01	1968.256	172.0	
14:46:00				TOOL CLOSED FOR 2nd C.I.P.
14:46:34	2.01	1995.282	172.0	
14:47:34	3.02	2010.789	172.0	
14:48:33	4.00	2019.741	172.0	
14:49:33	5.01	2027.093	172.0	
14:50:34	6.01	2032.847	172.0	
14:51:34	7.02	2038.121	172.0	
14:52:33	8.00	2042.116	172.0	
14:53:33	9.01	2045.312	172.0	
14:54:34	10.01	2048.188	172.0	
14:56:33	12.00	2052.822	172.0	
14:58:34	14.01	2057.295	172.0	
15:00:33	16.00	2060.651	172.0	
15:02:33	18.01	2062.728	172.0	
15:04:33	20.00	2064.964	172.0	
15:09:33	25.00	2069.118	172.0	
15:14:33	30.01	2072.473	172.0	
15:19:34	35.02	2075.667	172.0	
15:24:34	40.02	2077.584	172.0	
15:29:33	45.00	2079.501	172.0	
15:34:33	50.01	2081.578	172.0	
15:39:34	55.01	2083.175	172.0	
15:44:34	60.02	2084.453	172.0	
15:45:49	61.27	2083.814	172.0	
15:46:00				BYPASS OPENED PACKERS FREE
		*** End of Period 4 ***		
15:46:02		2301.096	172.0	
15:46:38		2246.106	172.0	
15:47:21		2300.777	172.0	
15:47:39		2241.961	172.0	
15:48:14		2330.570	172.0	
15:48:36		2236.380	172.0	
15:49:43		2309.222	172.0	
15:50:09		2339.649	172.0	
15:50:31		2331.047	172.0	
15:52:06		2324.357	172.0	

Date: 31/12/89 Ticket No: 352064 Page No: 3.1.5

PRESSURE VS TIME

MECHANICAL gauge no.: 7483 Gauge Depth: 4774.00 ft

Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
15:54:13		2322.605	172.0	
15:57:05		2320.852	172.0	
15:57:20		2321.011	172.0	
16:00:00				DROP BAR TO REVERSE CIRCULATE
16:00:10		2320.056	172.0	
16:01:27		2319.418	172.0	
16:01:38		2296.475	172.0	
16:02:29		2329.773	172.0	
16:02:51		2360.671	172.0	
16:02:55		2316.551	172.0	
16:03:09		2345.542	172.0	
16:04:00				BEGIN TO REVERSE CIRCULATE
16:04:56		2338.375	172.0	
16:05:32		2392.515	172.0	
16:05:49		2364.812	172.0	
16:06:33		2358.920	172.0	
16:06:53		2331.844	172.0	
16:07:35		2329.136	172.0	
16:08:28		2644.196	172.0	
16:09:30		2637.526	172.0	
16:10:09		2612.750	172.0	
16:11:18		2585.266	172.0	
16:12:41		2386.624	172.0	
16:14:23		2379.779	172.0	
16:15:00		2409.387	172.0	
16:15:31		2388.376	172.0	
16:16:02		2407.796	172.0	
16:16:19		2367.359	172.0	
16:16:50		2364.175	172.0	
16:17:10		2288.825	172.0	
16:18:11		2331.685	172.0	
16:20:43		2353.505	172.0	
16:22:22		2362.901	172.0	
16:23:00		2556.186	172.0	
16:23:31		2407.796	172.0	
16:24:28		2534.093	172.0	
16:25:38		2401.429	172.0	
16:26:45		2578.116	172.0	
16:27:11		2561.590	172.0	
16:27:38		2625.139	172.0	
16:28:04		2598.930	172.0	
16:29:03		2611.797	172.0	
16:30:54		2547.127	172.0	
16:32:10		2491.800	172.0	
16:33:25		2446.465	172.0	
16:34:56		2430.077	172.0	

Date: 31/12/89 Ticket No: 352064 Page No: 3.1.6

PRESSURE VS TIME

MECHANICAL gauge no.: 7483 Gauge Depth: 4774.00 ft

Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency:		1
16:37:41		2424.984	172.0	
16:38:14		2473.987	172.0	
16:38:40		2445.829	172.0	
16:39:55		2440.578	172.0	
16:40:31		2595.593	172.0	
16:42:10		2608.461	172.0	
16:42:54		2569.377	172.0	
16:43:49		2579.388	172.0	
16:44:15		2603.378	172.0	
16:45:15		2585.108	172.0	
16:45:52		2594.481	172.0	
16:46:54		2593.846	172.0	
16:48:31		2581.135	172.0	
16:51:11		2581.294	172.0	
16:53:34		2582.565	172.0	
16:53:43		2592.734	172.0	
16:57:39		2587.491	172.0	
16:58:47		2464.443	172.0	
17:00:00		2382.963	172.0	
17:02:08		2380.415	172.0	
17:02:54		2348.727	172.0	
17:03:31		2334.711	172.0	
17:03:55		2366.563	172.0	
17:08:31		2367.041	172.0	
17:10:00				FINISH REVERSE CIRCULATE
17:10:00				P.O.O.H.
17:12:48		2364.493	172.0	
17:17:15		2364.015	172.0	
17:17:46		2414.958	172.0	
17:18:15		2401.429	172.0	
17:21:50		2396.654	172.0	
17:21:55		2366.722	172.0	
17:22:19		2373.569	172.0	
17:24:09		2373.569	172.0	
17:25:11		2321.808	172.0	
17:25:41		2379.301	172.0	
17:26:04		2365.130	172.0	
17:27:38		2360.034	172.0	
17:28:44		2298.227	172.0	
17:30:28		2275.597	172.0	
17:36:34		2216.924	172.0	
17:41:40		2145.765	172.0	
17:45:55		2067.361	172.0	
17:49:09		1995.282	172.0	
17:53:55		1918.341	172.0	
17:57:49		1845.975	172.0	

Date: 31/12/89 Ticket No: 352064 Page No: 3.1.7

PRESSURE VS TIME

MECHANICAL gauge no.: 7483 Gauge Depth: 4774.00 ft

Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
18:01:20		1762.964	172.0	
18:05:25		1681.312	172.0	
18:12:25		1591.541	172.0	
18:19:15		1502.310	172.0	
18:23:10		1409.590	172.0	
18:26:44		1333.524	172.0	
18:29:29		1248.178	172.0	
18:33:18		1154.970	172.0	
18:37:20		1078.955	172.0	
18:42:00		1007.878	172.0	
18:45:32		927.644	172.0	
18:49:03		845.689	172.0	
18:53:14		759.730	172.0	
18:57:21		665.351	172.0	
19:00:57		567.895	172.0	
19:05:21		473.880	172.0	
19:09:05		380.538	172.0	
19:14:38		282.628	172.0	
19:22:36		191.776	172.0	
19:29:30		123.956	172.0	
19:35:00				TOOLS AT TABLE
19:36:48		66.254	172.0	
19:44:15		51.613	172.0	
19:56:09		48.981	172.0	
20:06:21		34.830	172.0	
20:11:07		27.095	172.0	
20:11:38		76.944	172.0	
20:12:24		26.437	172.0	
20:17:39		21.993	172.0	
20:26:57		20.676	172.0	
20:35:41		20.511	172.0	
20:37:31		84.672	172.0	
20:39:12		25.449	172.0	
20:40:32		74.148	172.0	
20:41:36		17.219	172.0	
20:45:00				TOOLS LAID DOWN
20:49:47		48.323	172.0	
20:50:48		16.890	172.0	
20:59:44		13.762	172.0	
21:07:48		12.774	172.0	

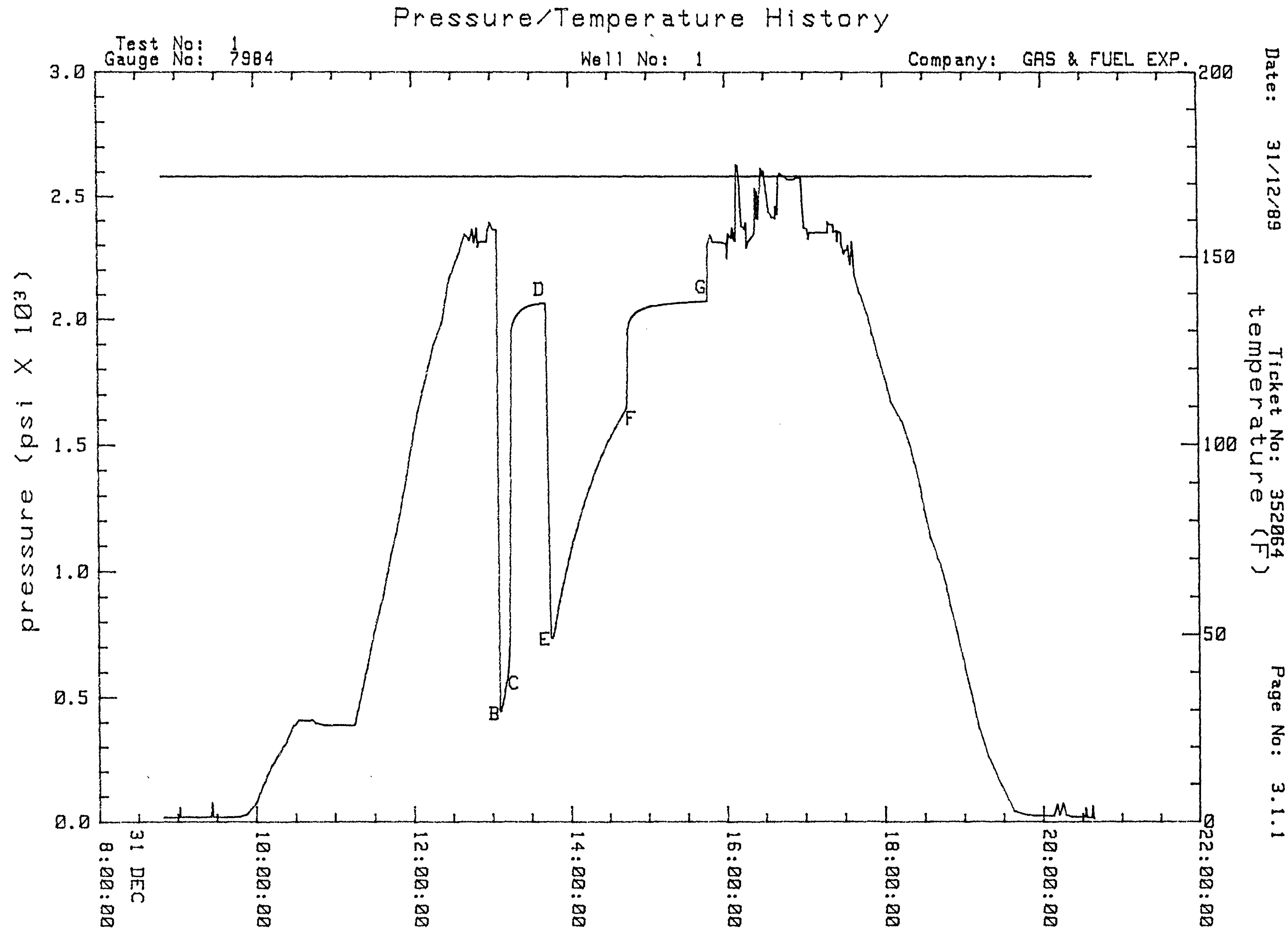
Date: 31/12/89 Ticket No: 352064 Page No: 3.2

TEST PERIOD SUMMARY

Gauge No.: 7984 Depth: 4719.00 ft Blanked off : No
Hour of clock: 24

ID	PERIOD	DESCRIPTION	PRESSURE (psi)	DURATION (min)
A		Initial Hydrostatic	2314.07	
B	1	Start Draw-down	443.59	
C		End Draw-down	598.83	6.61
C	2	Start Build-up	598.83	
D		End Build-up	2063.48	29.20
E	3	Start Draw-down	739.49	
F		End Draw-down	1645.01	59.18
F	4	Start Build-up	1645.01	
G		End Build-up	2072.80	61.63
H		Final Hydrostatic	2307.75	

NOTE: for Pressure vs. Time Plot, see next page.



Pressure/Temperature History
Test No: 1
Gauge No: 7984
Well No: 1
Company: GAS & FUEL EXP.
Date: 31/12/89
Ticket No: 352064
Page No: 3.1.1
pressure (psi X 10³)
temperature (F)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
200
150
100
50
0
B
C
D
E
F
G
31 DEC
8:00:00
10:00:00
12:00:00
14:00:00
16:00:00
18:00:00
20:00:00
22:00:00

Date: 31/12/89 Ticket No: 352064 Page No: 3.2.1

PRESSURE VS TIME

MECHANICAL gauge no.: 7984 Gauge Depth: 4719.00 ft

Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
08:15:00				SURFACE PRESSURE = PSIG
08:15:00				LOAD B.T. GAUGES
08:35:00				MAKE UP TOOLS
08:49:33		16.806	172.0	
09:01:32		16.806	172.0	
09:02:00		57.156	172.0	
09:02:20		18.406	172.0	
09:14:49		18.406	172.0	
09:25:33		18.406	172.0	
09:26:38		74.753	172.0	
09:27:15		18.050	172.0	
09:36:58		18.939	172.0	
09:47:41		22.316	172.0	
09:50:00				RUN IN HOLE
09:52:50		30.671	172.0	
10:00:09		75.108	172.0	
10:06:01		151.346	172.0	
10:12:38		227.030	172.0	
10:22:04		309.618	172.0	
10:29:06		388.452	172.0	
10:32:46		409.399	172.0	
10:39:49		407.446	172.0	
10:43:02		411.707	172.0	
10:45:26		397.861	172.0	
10:51:53		388.985	172.0	
11:04:44		388.985	172.0	
11:15:06		388.985	172.0	
11:17:23		444.366	172.0	
11:21:03		531.318	172.0	
11:24:33		608.129	172.0	
11:27:23		686.155	172.0	
11:30:10		758.481	172.0	
11:33:54		834.681	172.0	
11:37:34		908.551	172.0	
11:40:29		991.600	172.0	
11:43:31		1069.305	172.0	
11:47:18		1145.386	172.0	
11:50:00		1219.315	172.0	
11:52:37		1297.986	172.0	
11:55:39		1378.918	172.0	
11:58:10		1462.108	172.0	
12:00:54		1543.316	172.0	
12:04:04		1627.306	172.0	
12:07:34		1710.547	172.0	
12:12:34		1812.597	172.0	
12:16:23		1896.090	172.0	

Date: 31/12/89 Ticket No: 352064 Page No: 3.2.2

PRESSURE VS TIME

MECHANICAL gauge no.: 7984 Gauge Depth: 4719.00 ft

Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
12:22:46		1983.584	172.0	
12:25:08		2066.803	172.0	
12:28:29		2164.212	172.0	
12:35:13		2254.877	172.0	
12:40:41		2344.955	172.0	
12:44:09		2320.035	172.0	
12:46:23		2363.384	172.0	
12:47:40		2310.212	172.0	
12:49:33		2368.123	172.0	
12:50:35		2290.904	172.0	
12:51:06		2311.266	172.0	
12:53:11		2314.250	172.0	
12:54:55		2314.075	172.0	
12:55:55		2313.548	172.0	
12:57:13		2314.601	172.0	
12:57:58		2359.877	172.0	
12:59:23		2391.989	172.0	
13:01:49		2364.271	172.0	
13:02:00				SET 25,000lbs. ON PACKERS
13:04:32		2360.937	172.0	
13:06:00				TOOL OPEN WEAK-MODERATE BLOW
		*** Start of Period 1 ***		
13:06:00	0.00	443.594	172.0	
13:07:01	1.02	448.208	172.0	
13:08:01	2.02	471.456	172.0	
13:09:01	3.01	496.298	172.0	
13:10:00				MODERATE BLOW
13:10:00	4.00	529.832	172.0	
13:11:00	5.00	557.684	172.0	
13:12:01	6.02	579.679	172.0	
13:12:37	6.61	598.835	172.0	
		*** End of Period 1 ***		
		*** Start of Period 2 ***		
13:13:38	1.02	691.751	172.0	
13:14:38	2.02	1263.229	172.0	
13:15:37	3.01	1949.992	172.0	
13:16:00				TOOL CLOSED FOR 1st C.I.P.
13:16:37	4.00	1974.104	172.0	
13:17:36	5.00	1991.351	172.0	
13:18:38	6.02	2002.612	172.0	
13:19:37	7.01	2012.114	172.0	
13:20:37	8.01	2019.327	172.0	
13:21:37	9.00	2025.309	172.0	
13:22:38	10.02	2030.411	172.0	
13:24:37	12.01	2038.855	172.0	
13:26:36	14.00	2045.364	172.0	

PRESSURE VS TIME

MECHANICAL gauge no.: 7984 Gauge Depth: 4719.00 ft

Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
13:28:37	16.01	2050.289	172.0	
13:30:36	18.00	2054.862	172.0	
13:32:38	20.02	2057.852	172.0	
13:34:37	22.00	2060.315	172.0	
13:36:38	24.02	2060.667	172.0	
13:38:37	26.00	2062.777	172.0	
13:40:38	28.02	2063.832	172.0	
13:41:49	29.20	2063.481	172.0	
		*** End of Period 2 ***		
		*** Start of Period 3 ***		
13:45:08	0.00	739.490	172.0	
13:46:00				TOOL OPEN WEAK-MODERATE BLOW
13:46:09	1.02	733.285	172.0	
13:47:09	2.02	745.160	172.0	
13:48:08	3.01	771.390	172.0	
13:49:08	4.00	794.072	172.0	
13:50:00				MODERATE BLOW
13:50:08	5.00	826.673	172.0	
13:51:09	6.02	855.372	172.0	
13:52:09	7.01	881.941	172.0	
13:53:08	8.01	906.914	172.0	
13:54:08	9.00	930.466	172.0	
13:55:09	10.02	953.839	172.0	
13:57:08	12.01	1002.878	172.0	
13:59:08	14.00	1045.356	172.0	
14:01:09	16.01	1090.125	172.0	
14:03:08	18.00	1125.331	172.0	
14:05:09	20.02	1162.123	172.0	
14:10:00				DECREASING SLIGHTLY
14:10:09	25.01	1251.417	172.0	
14:15:08	30.01	1328.653	172.0	
14:20:08	35.00	1399.672	172.0	
14:25:08	40.00	1459.539	172.0	
14:30:00				WEAK BLOW
14:30:08	45.00	1515.324	172.0	
14:35:09	50.02	1563.151	172.0	
14:40:09	55.02	1612.198	172.0	
14:44:19	59.18	1645.006	172.0	
		*** End of Period 3 ***		
		*** Start of Period 4 ***		
14:45:20	1.02	1955.980	172.0	
14:46:00				TOOL CLOSED FOR 2nd C.I.P.
14:46:20	2.02	1983.611	172.0	
14:47:19	3.01	1995.929	172.0	
14:48:19	4.00	2005.078	172.0	
14:49:18	5.00	2011.236	172.0	

Date: 31/12/89 Ticket No: 352064 Page No: 3.2.4

PRESSURE VS TIME

MECHANICAL gauge no.: 7984 Gauge Depth: 4719.00 ft
Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
14:50:20	6.02	2017.042	172.0	
14:51:19	7.01	2024.079	172.0	
14:52:19	8.01	2027.598	172.0	
14:53:18	9.00	2031.292	172.0	
14:54:20	10.02	2033.931	172.0	
14:56:19	12.01	2039.208	172.0	
14:58:18	14.00	2043.254	172.0	
15:00:19	16.01	2046.596	172.0	
15:02:18	18.00	2049.938	172.0	
15:04:19	20.02	2051.872	172.0	
15:09:19	25.01	2055.390	172.0	
15:14:19	30.01	2060.139	172.0	
15:19:19	35.00	2063.129	172.0	
15:24:19	40.00	2065.415	172.0	
15:29:18	45.00	2067.350	172.0	
15:34:20	50.02	2069.109	172.0	
15:39:20	55.02	2070.164	172.0	
15:44:19	60.02	2071.923	172.0	
15:45:56	61.63	2072.802	172.0	
15:46:00				BYPASS OPENED PACKERS FREE
		*** End of Period 4 ***		
15:46:32		2298.437	172.0	
15:48:59		2340.043	172.0	
15:50:45		2312.138	172.0	
15:54:41		2309.506	172.0	
15:58:36		2307.750	172.0	
16:00:00				DROP BAR TO REVERSE CIRCULATE
16:01:20		2304.942	172.0	
16:01:31		2245.073	172.0	
16:02:40		2346.888	172.0	
16:03:36		2334.254	172.0	
16:04:00				BEGIN TO REVERSE CIRCULATE
16:05:13		2327.059	172.0	
16:05:42		2369.528	172.0	
16:06:18		2352.158	172.0	
16:07:08		2320.044	172.0	
16:08:09		2314.779	172.0	
16:08:58		2626.374	172.0	
16:10:01		2622.347	172.0	
16:11:08		2574.190	172.0	
16:12:45		2375.583	172.0	
16:15:01		2363.302	172.0	
16:16:12		2389.090	172.0	
16:16:40		2286.256	172.0	
16:17:50		2311.533	172.0	
16:22:41		2346.280	172.0	

Date: 31/12/89 Ticket No: 352064 Page No: 3.2.5

PRESSURE VS TIME

MECHANICAL gauge no.: 7984 Gauge Depth: 4719.00 ft

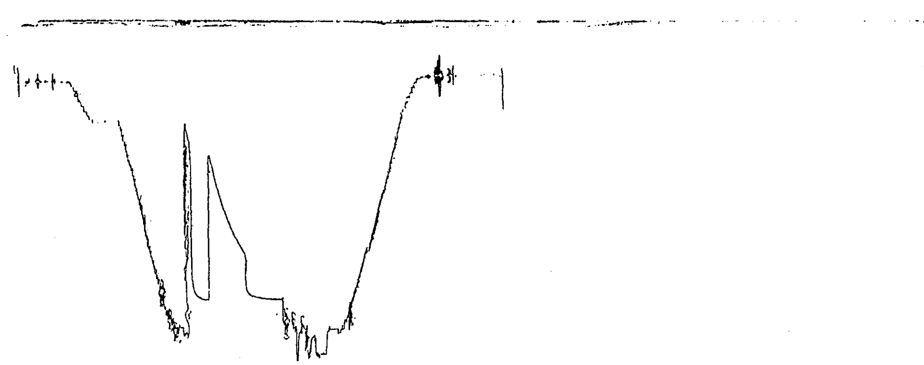
Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency:		1
16:23:16		2530.742	172.0	
16:24:12		2404.525	172.0	
16:24:49		2518.827	172.0	
16:25:30		2403.473	172.0	
16:28:01		2612.016	172.0	
16:29:02		2585.924	172.0	
16:30:06		2601.160	172.0	
16:31:39		2520.407	172.0	
16:33:18		2460.289	172.0	
16:33:44		2433.287	172.0	
16:36:03		2413.646	172.0	
16:38:38		2406.456	172.0	
16:38:55		2457.658	172.0	
16:39:13		2433.462	172.0	
16:40:13		2424.694	172.0	
16:40:59		2579.793	172.0	
16:42:29		2591.703	172.0	
16:44:45		2581.895	172.0	
16:48:32		2568.409	172.0	
16:53:18		2566.833	172.0	
16:54:27		2573.664	172.0	
16:58:20		2573.489	172.0	
16:59:20		2469.405	172.0	
17:00:21		2367.162	172.0	
17:02:37		2364.004	172.0	
17:03:44		2323.118	172.0	
17:04:29		2349.089	172.0	
17:10:00				FINISH REVERSE CIRCULATE
17:10:00				P.O.O.H.
17:12:01		2349.089	172.0	
17:18:01		2349.089	172.0	
17:18:21		2394.702	172.0	
17:18:45		2382.598	172.0	
17:22:29		2380.493	172.0	
17:22:34		2352.423	172.0	
17:25:14		2357.511	172.0	
17:25:39		2310.656	172.0	
17:25:59		2354.879	172.0	
17:28:26		2347.685	172.0	
17:28:43		2299.773	172.0	
17:30:36		2261.325	172.0	
17:31:40		2277.302	172.0	
17:33:18		2280.637	172.0	
17:33:54		2295.734	172.0	
17:34:12		2240.428	172.0	
17:35:20		2219.352	172.0	

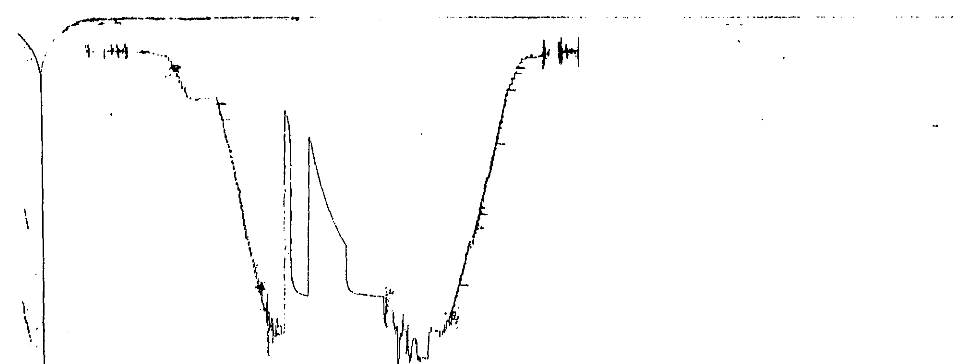
PRESSURE VS TIME

MECHANICAL gauge no.: 7984 Gauge Depth: 4719.00 ft
Clock no.: Hour: 24

TIME HH:MM:SS	D TIME (min)	PRESSURE (psi)	TEMP (F)	COMMENTS
31-DEC-89		Data Print Frequency: 1		
17:36:53		2312.934	172.0	
17:38:26		2170.161	172.0	
17:42:18		2103.197	172.0	
17:47:29		2020.545	172.0	
17:51:28		1940.484	172.0	
17:56:22		1841.707	172.0	
18:01:09		1758.901	172.0	
18:05:39		1665.998	172.0	
18:13:24		1593.856	172.0	
18:19:05		1508.266	172.0	
18:23:01		1431.107	172.0	
18:27:11		1340.482	172.0	
18:30:23		1239.906	172.0	
18:35:17		1128.656	172.0	
18:40:57		1046.191	172.0	
18:46:12		958.198	172.0	
18:49:59		862.546	172.0	
18:54:40		762.415	172.0	
18:58:55		666.313	172.0	
19:02:58		574.070	172.0	
19:06:58		482.142	172.0	
19:11:39		376.681	172.0	
19:18:36		258.735	172.0	
19:28:21		146.420	172.0	
19:35:00				TOOLS AT TABLE
19:38:11		41.703	172.0	
19:47:13		25.876	172.0	
19:55:32		22.497	172.0	
20:08:19		22.497	172.0	
20:10:51		69.246	172.0	
20:12:43		25.875	172.0	
20:15:27		72.801	172.0	
20:17:39		24.808	172.0	
20:21:51		19.119	172.0	
20:29:34		17.340	172.0	
20:32:07		17.340	172.0	
20:32:35		53.958	172.0	
20:33:34		16.985	172.0	
20:37:20		16.807	172.0	
20:38:12		64.267	172.0	
20:39:06		14.139	172.0	
20:45:00				TOOLS LAID DOWN



G.F.E. McEACHERN #1 DST #1 31-12-89
MID BT #7984 24 HR CLOCK #30075 @ 4719 FT



G F E. McEACHERN #1 DST #1 31-12-89
BTM BT #7483 24 HR CLOCK #13446 @ 4774 FT

EQUATIONS FOR DST LIQUID WELL ANALYSIS

Transmissibility	$\frac{kh}{\mu} = \frac{162.6\ QB}{m}$	$\frac{\text{md-ft}}{\text{cp}}$
Indicated Flow Capacity	$kh = \frac{kh}{\mu}\ \mu$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151 \left[\frac{P^{*} - P_f}{m} - \text{LOG}\left(\frac{k(t/60}{\phi\ \mu\ c_t r_w^2} \right) + 3.23 \right]$	—
Damage Ratio	$DR = \frac{P^{*} - P_f}{P^{*} - P_f - 0.87\ mS}$	—
Theoretical Potential w / Damage Removed	$Q_1 = Q\ DR$	BPD
Approx. Radius of Investigation	$r_i = 0.032 \sqrt{\frac{k(t/60)}{\phi \mu c_t}}$	ft

EQUATIONS FOR DST GAS WELL ANALYSIS

Indicated Flow Capacity	$kh = \frac{1637\ Q_g\ T}{m}$	md-ft
Average Effective Permeability	$k = \frac{kh}{h}$	md
Skin Factor	$S = 1.151 \left[\frac{m(P^{*}) - m(P_f)}{m} - \text{LOG}\left(\frac{k(t/60)}{\phi\ \mu\ c_t r_w^2} \right) + 3.23 \right]$	—
Damage Ratio	$DR = \frac{m(P^{*}) - m(P_f)}{m(P^{*}) - m(P_f) - 0.87\ mS}$	—
Indicated Flow Rate (Maximum)	$AOF_1 = \frac{Q_g\ m(P^{*})}{m(P^{*}) - m(P_f)}$	MCFD
Indicated Flow Rate (Minimum)	$AOF_2 = Q_g \sqrt{\frac{m(P^{*})}{m(P^{*}) - m(P_f)}}$	MCFD
Approx. Radius of Investigation	$r_i = 0.032 \sqrt{\frac{k(t/60)}{\phi \mu c_t}}$	ft