CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 80-30-8.49 N 122-53-16.92 W | PROVINCE: N.W.T.

OPERATOR: Shell Canada Limited | CONTRACTOR: Atco Drlg | RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE | SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: T Dutovich

WEATHER CONDITIONS

TEMPERATURE	-22 °C
WIND SPEED	15 km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
m	m	m			89	01	13

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION – HOURS

CODE (ALL)	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	HRS
EVALUATION	2065	HRS
COMPLETION		HRS
		HRS
TOTAL HOURS ACCOUNT TO SHELL		HRS
BOILER	2042	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.
LENGTH CUT OFF m		LENGTH SLIPPED m
MEGAJOULES SINCE LAST CUT		PRESENT LENGTH m
CUMULATIVE MEGAJOULES		MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	m
1				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
		D.P.	STANDS			m
		D.P.	SINGLES			m
		KELLY DOWN				m
		TOTAL				m

WT. OF DC: 1000 daN

WT. OF STRING: 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS /32nds (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	

CUT STRUC.: D U L | I | O | D | L ; L | B | G | O | R

K+ (1000 mg/L)

Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS:

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS.-(s/L)	
PV/YP	
GELS (Pa)	
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
				Work on Camp Extra Sleeper; Engineer Shack
				Start up Welding Unit Lay out 9 Matts.

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME AND NO.: Shell et al Arrowhead B-41 DATE: Jan 13/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: T Dutovich RIG NO.: 48

DAY TOUR

P.M. / A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	8
DRKMAN		Bob Wuttke	8
MTRMAN		Relief	
FLRMAN			
FLRMAN			
FLRMAN			
Lease		Vern Vivier	8

NO. OF DAYS: SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. / A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olson	12
DRKMAN			
MTRMAN		Dean Bird	12
FLRMAN			
FLRMAN			
FLRMAN			

NO. OF DAYS: SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41
LOCATION: 60-30-8.49 N 122-53-16.92 W
PROVINCE: NWT

WEATHER CONDITIONS
TEMPERATURE: -22 °C
WIND SPEED: 12 km/h
WIND DIRECTION:
WEATHER:

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: Arco Drlg
RIG NO.:
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE: YEAR	MONTH	DAY
m	m	m			89	01	14

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION – HOURS

CODE (HR)	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE			
1	BIT			m
		I.D. mm	X	O.D. mm
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
	D.P.	STANDS		m
	D.P.	SINGLES		m
	KELLY DOWN			m
	TOTAL			m
WT. OF DC				1000 daN
WT. OF STRING				1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (32nds) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	

DULL	CUT STRUC. I	O	D	L
	B	G	O	R

K+ (1000 mg/L)
Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS-(s/L)	
PV/YP	/ / /
GELS (Pa)	
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
				Conduct Safety Meeting Prior To Start Rigging Up.
				Spot MaHing Rig Up Sub Spot Over Conductor Level Spot Mud Tanks.

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	HRS
EVALUATION	2065	HRS
COMPLETION		HRS
		HRS
TOTAL HOURS ACCOUNT TO SHELL		HRS
BOILER	2042	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.
LENGTH CUT OFF m		LENGTH SLIPPED m
MEGAJOULES SINCE LAST CUT		PRESENT LENGTH m
CUMULATIVE MEGAJOULES		MJ

MJ

DRILLING ASSEMBLY AT END OF TOUR
BIT RECORD
MUD RECORD
BOTTOMS-UP RATE
HOLE CONDITION
METRES DRILLED
DEVIATION RECORD

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: et al Arrowhead B-41 DATE: Jun 14/89
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

DAY TOUR

P.M. / A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	10
DRKMAN		Bob Wanke	10
MTRMAN		Paul Hanpel	8
FLRMAN		Dale Minor	8
FLRMAN			
FLRMAN			
Lease		Vern Vivier	10

NO. OF DAYS: SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. / A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olson	10
DRKMAN		Francis Paquette	8
MTRMAN		Dean Bird	10
FLRMAN		Dennis Bertrand	8
FLRMAN		Ernin Berreault	8
FLRMAN			

NO. OF DAYS: SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60-30-8.49 N 122-53-16.92 W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — CONTRACTOR: Atco Drlg — RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

WEATHER CONDITIONS

TEMPERATURE	-25 °C
WIND SPEED	20 km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
m	m	m			89	01	15

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm	X	O.D. mm	
1	BIT					m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.			
SIZE (mm)			
IADC CODE			
MFG.			
TYPE			
SERIAL NO.			
JETS (32nds) (mm)			
DEPTH OUT (m)			
DEPTH IN (m)			
TOTAL METRES DRILLED (m)			
TOTAL HRS. RUN			

CUT STRUC.: DULL (I O D L) / (B G O R)

K+ (1000 mg/L)

Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)		
TORQUE AT BOTTOM	(DP TURNS)	
FILL ON BOTTOM (m)		

REMARKS:

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
				Hold Safety Meeting Topic Safety around Rig Move Trucks + Cranes.
				Spot Matting on Back End of Rig Complex Spot Bldgs Put Derrick Together + Pin

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	HRS
EVALUATION	2065	HRS
COMPLETION		HRS
		HRS
TOTAL HOURS ACCOUNT TO SHELL		HRS
BOILER	2042	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	
LENGTH CUT OFF m		LENGTH SLIPPED m	
MEGAJOULES SINCE LAST CUT	MJ	PRESENT LENGTH m	
CUMULATIVE MEGAJOULES	MJ		

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: et al Arrowhead B-41 — DATE: Jan 15/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: Tolco Ltd — RIG NO.: 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soney	11
DRKMAN		Bob Wanka	16
MTRMAN		Paul Hengel	16
FLRMAN		Dale Miner	11
FLRMAN			
FLRMAN			
Lease		Vern Vivier	11

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olson	11
DRKMAN		Francis Paquette	11
MTRMAN		Dean Bird	10
FLRMAN		Dennis Bertrand	11
FLRMAN		Ervin Berreault	11
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

DRILLING ASSEMBLY AT END OF TOUR
BIT RECORD
MUD RECORD
METRES DRILLED
DEVIATION RECORD
HOLE CONDITION
BOTTOMS-UP RATE
DAY TOUR
EVENING TOUR

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41
LOCATION: 60-30-8.49 N 122-53-16.92 W
PROVINCE: N.W.T

WEATHER CONDITIONS
TEMPERATURE: -32 °C
WIND SPEED: 40 km/h
WIND DIRECTION:
WEATHER: Cold.

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: Atco Drlg
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
m	m	m			89	01	16

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm	X	O.D. mm	
1	BIT					m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.			
SIZE (mm)			
IADC CODE			
MFG.			
TYPE			
SERIAL NO.			
JETS 1/32's (mm)			
DEPTH OUT (m)			
DEPTH IN (m)			
TOTAL METRES DRILLED (m)			
TOTAL HRS. RUN			
CUT STRUC. D U L L	I	O	D	L
	B	G	O	R

HOLE CONDITION

HOLE DRAG (daN)		
TORQUE AT BOTTOM (DP TURNS)		
FILL ON BOTTOM (m)		
REMARKS:		

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl– (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
				String Blocks Put up Pump Prefabs Start up #1 Generator Mount Shakers Centrifuge Degasser.
				Trucks + Cranes Released 1200 Hrs Jun 16/89

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	HRS
EVALUATION	2065	HRS
COMPLETION		HRS
		HRS
TOTAL HOURS ACCOUNT TO SHELL		HRS
BOILER	2042	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m			PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT			MJ
CUMULATIVE MEGAJOULES			MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm	X	O.D. mm	
1	BIT					m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BIT RECORD

BIT NO.			
SIZE (mm)			
IADC CODE			
MFG.			
TYPE			
SERIAL NO.			
JETS 1/32's (mm)			
DEPTH OUT (m)			
DEPTH IN (m)			
TOTAL METRES DRILLED (m)			
TOTAL HRS. RUN			
CUT STRUC. D U L L	I	O	D	L
	B	G	O	R

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl– (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

HOLE CONDITION

HOLE DRAG (daN)		
TORQUE AT BOTTOM (DP TURNS)		
FILL ON BOTTOM (m)		
REMARKS:		

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: et al Arrowhead B-41 DATE: Jun 16/89
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE: RIG NO.: 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	12
DRKMAN		Bob Wanka	12
MTRMAN		Paul Hempel	12
FLRMAN		Dale Miner	12
FLRMAN		Antoine Bertrand	7
FLRMAN			
Lease		Vern Vivier	16

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olson	12
DRKMAN		Francis Paquette	12
MTRMAN		Dean Bird	16
FLRMAN		Dennis Bertrand	12
FLRMAN		Ernie Berreault	12
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60-30-8.49 N 122-53-16.92 W. PROVINCE: N.W.T.

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Atco Drlg. — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	-30 °C
WIND SPEED	10 km/h
WIND DIRECTION	
WEATHER	Cold.

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
m	m	m			89	01	17

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm	X	O.D. mm	
1	BIT					m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m

WT. OF DC: 1000 daN
WT. OF STRING: 1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (32nds) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L L I O D L B G O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ /
GELS (Pa)	/ /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
				HookUp Traction Motors To Drawworks
				Fire up Boiler at 1200 Hrs Jan 17/89.
				Pick up Floor Prefabs
				Inspect Derrick Pinor To Raising (TV.)
				Raise Derrick

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	HRS
EVALUATION	2065	HRS
COMPLETION		HRS
		HRS
TOTAL HOURS ACCOUNT TO SHELL		HRS
BOILER	2042 12 hrs	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.

SIZE mm	# OF LINES	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT		MJ
CUMULATIVE MEGAJOULES		MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: Shell et al Arrowhead B-41 DATE: Jan 17/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: RIG NO.: 48

DAY TOUR

P.M. A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	12
DRKMAN		Bob Wanke	12
MTRMAN		Paul Hempel	12
FLRMAN		Dale Minor	12
FLRMAN		Antoine Bertrand	12
FLRMAN			
Lease		Vern Vivier	16

NO. OF DAYS: SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olson	8
DRKMAN		Francis Paquette	8
MTRMAN		Dean Bird	12
FLRMAN		Dennis Bertrand	8
FLRMAN		Ervin Berreault	8
FLRMAN			

NO. OF DAYS: SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60-30-8.49 N 122-53-46.92 W. | PROVINCE: N.W.T

OPERATOR: Shell Canada Limited | SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Atco Drlg. | RIG NO.: 48 | SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

WEATHER CONDITIONS

TEMPERATURE	−32 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	Cold

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR (m)	DEPTH AT END OF EVENING TOUR (m)	DAILY PROGRESS (m)	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE: YEAR	MONTH	DAY
					89	01	18

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE			
1	BIT			m
		I.D. (mm) X O.D. (mm)		m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
	D.P.	STANDS		m
	D.P.	SINGLES		m
		KELLY DOWN		m
		TOTAL		m

WT. OF DC: 1000 daN
WT. OF STRING: 1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (32nds) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L L: I O D L / B G O R	
K+ (1000 mg/L)	
Cl− (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ /
GELS (Pa)	/ /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl− (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	2400	0300		Cut Conductor Weldon Bowl
	0300	0800		Pick up BOP Assembly
	0800	1200		Rig Up

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	HRS
EVALUATION	2065	HRS
COMPLETION		HRS
		HRS
TOTAL HOURS ACCOUNT TO SHELL		HRS
BOILER	2042	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	
LENGTH CUT OFF m		LENGTH SLIPPED m	
MEGAJOULES SINCE LAST CUT		PRESENT LENGTH m	
CUMULATIVE MEGAJOULES			

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: Shell et al Arrowhead B-41 DATE: Jan 18/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: RIG NO.: 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	12
DRKMAN		Bob WanKe	12
MTRMAN		Paul Hengel	12
FLRMAN		Dale Miner	12
FLRMAN		Antoine Bertrand	12
FLRMAN			
Lease		Vern Vivier	16

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	2400		Rig Up

DRILLER

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olson	12
DRKMAN		Francis Paquette	12
MTRMAN		Dean Bird	12
FLRMAN		Dennis Bertrand	12
FLRMAN		Ernin Berreault	12
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60-30-8.49 N 122-53-16.92 W — PROVINCE: N W T

WEATHER CONDITIONS

TEMPERATURE	-36 °C
WIND SPEED	15 km/h
WIND DIRECTION	
WEATHER	Cold

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Atco Drlg. — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: T Dalton — RIG NO.:

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
m	m	m			89	01	19

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN	12	12	24
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	HRS
EVALUATION	2065	HRS
COMPLETION		HRS
		HRS
TOTAL HOURS ACCOUNT TO SHELL	0	HRS
BOILER	2042	24 HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD — REEL NO.

SIZE mm	# OF LINES	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT		MJ
CUMULATIVE MEGAJOULES		MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	m
1						
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
		D.P.	STANDS			m
		D.P.	SINGLES			m
		KELLY DOWN				m
		TOTAL				m

WT. OF DC — 1000 daN

WT. OF STRING — 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	

CUT STRUC.: DULL | I | O | D | L | B | G | O | R

K+ (1000 mg/L)

Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM	(DP TURNS)
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS-(s/L)				
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	2400	0800		Rig Up Mud Tanks
	0800	1200		Rig Up.

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	12 00	2400		Rig Up

Mervin Timbre Extra Hand as Per Eng Request. Third Party Charge.

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: et al Arrowhead B-41 — DATE: Jan 19/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: T Dalton — RIG NO.: 48

DAY TOUR

12 P.M. — 12 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olson	8
DRKMAN		Francis Paquette	8
MTRMAN		Dean Bird	8
FLRMAN		Dennis Bertrand	8
FLRMAN		Ernie Berreault	8
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	8
DRKMAN		Bob Wanke	8
MTRMAN		Paul Hengel	8
FLRMAN		Dale Minor	8
FLRMAN		Antoine Bearcault	8
FLRMAN			
Lease		Vern Vivier	16
Driller		Sheldon Barsness	8
D/R		Barry Wright	8
MM		Art Wright	8
Floor		Keith McCarty	8
Floor		Angus Capot Blanc	8
Lease		Mervin Timbre	8
Mervin Timbre		Extra Hand As Per Shell Eng. Request. Third Party Charge.	

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

REMARKS: Head Up BOPs
Swedge Down Flow Nipple 30" To 20"

Conduct Safety Meeting with Afternoon Crew

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60-30- 8.49 N 122 -53 -16.92 W

PROVINCE: NWT.

OPERATOR: Shell Canada Limited

SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Aten Drlg.

SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

RIG NO.:

WEATHER CONDITIONS

TEMPERATURE	-38 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE: YEAR	MONTH	DAY
m	m	m			89	01	20

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG. HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN	12	12	24
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	HRS
EVALUATION	2065	HRS
COMPLETION		HRS
		HRS
TOTAL HOURS ACCOUNT TO SHELL	0	HRS
BOILER	2042 24.	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.

SIZE mm | # OF LINES | LENGTH SLIPPED m

LENGTH CUT OFF m | PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm		O.D. mm	
1	BIT			X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m

WT. OF DC 1000 daN

WT. OF STRING 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.			
SIZE (mm)			
IADC CODE			
MFG.			
TYPE			
SERIAL NO.			
JETS (1/64") (mm)			
DEPTH OUT (m)			
DEPTH IN (m)			
TOTAL METRES DRILLED (m)			
TOTAL HRS. RUN			

CUT STRUC.: D U L L | I | O | D | L | B | G | O | R

K+ (1000 mg/L)

Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS: Modify Kill Lines Choke Lines Flowline To Fit New Shakers.

Cond

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS-(s/L)				
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	2400	1200		Rig Up.

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	2400		Rig Up. Fill Tanks with Water Head Up BOPs
				Marvin Timbre Extra Hand as Requested By Eng. Third Party Charge.

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: et al Arrowhead B-41 DATE: Jan 20/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: RIG NO.: 48

DAY TOUR

P.M. A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	16
DRKMAN		Bob Wanke	16
MTRMAN		Paul Hengel	12
FLRMAN		Dale Minor	12
FLRMAN		Antoine Barreault	12
FLRMAN			
Lease		Vern Vivier	16

NO. OF DAYS SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Sheldon Barsness	13
DRKMAN		Barry Wright	13
MTRMAN		Art Wright	13
FLRMAN		Keith McCarty	
FLRMAN			
FLRMAN		Angus Capot Blanc	
Lease		Mervin Timbre	

Mervin Timbre Extra hand as Requested By Engineer Third Party Charge.

NO. OF DAYS SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60-30-8.49 N 122-53-16.92 W

PROVINCE: N.W.T.

WEATHER CONDITIONS

TEMPERATURE: -34 °C

WIND SPEED: 35 km/h

WIND DIRECTION:

WEATHER:

OPERATOR: Shell Canada Limited

SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Alco Drlg.

SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

RIG NO.: 48

LEGEND (METRIC DIMENSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
21 m	m	m		0	89	1	21

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD

PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
1	National	235	50	
2	National	235	50	

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN	12	12	24
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	18	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
			HRS
TOTAL HOURS ACCOUNT TO SHELL		18	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.

SIZE mm — # OF LINES — LENGTH SLIPPED m

LENGTH CUT OFF m — PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT			m
			I.D. mm	X O.D. mm	
				X	m
				X	m
				X	m
				X	m
				X	m
				X	m
				X	m
				X	m
				X	m
				X	m
				X	m
				X	m
		D.P.	STANDS		m
		D.P.	SINGLES		m
		KELLY DOWN			m
		TOTAL			m

WT. OF DC — 1000 daN

WT. OF STRING — 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.			
SIZE (mm)			
IADC CODE			
MFG.			
TYPE			
SERIAL NO.			
JETS (32nds) (mm)			
DEPTH OUT (m)			
DEPTH IN (m)			
TOTAL METRES DRILLED (m)			
TOTAL HRS. RUN			

DULL	CUT STRUC. I	O	D	L
	B	G	O	R

K+ (1000 mg/L)

Cl− (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS:

MUD RECORD

TIME			
DENSITY (kg/m³)			
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)			
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH			
OIL VOL. FRAC.			
SAND VOL. FRAC.			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Gel	70		
Soda Ash	2		
Caustic	2		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	2400			Rig Up Premix Mud Circ Sack Down with Steam
		0800		Finish Handing Up.
	0800	1200		Rig Up Floor Tongs. Shorten Cables Put Weights In.

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	1600		Free Up Tong Shivs.
	1600	2000		Pick up BHA
	2000	2400		Tidy Up Location Prior To Spudding.

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: et al Arrowhead B-41 — DATE: Jan 21/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: Rolstad — RIG NO.: 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Somey	12
DRKMAN		BoB WanKe	12
MTRMAN		Paul Hengel	12
FLRMAN			
FLRMAN		Dale Miner	12
FLRMAN		Antoine Berreault	12
Lease		Vern Vivier	16

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Shelton Barsness	12
DRKMAN		Barry Wright	12
MTRMAN		Art Wright	12
FLRMAN		Keith McCarty	12
FLRMAN		Angus Capot Blanc	12
FLRMAN			
Lease		Mervin Timbre	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41.
LOCATION: 60-30-8.49 N 122-53-16.92 W
PROVINCE: NWT

WEATHER CONDITIONS
TEMPERATURE 35 °C
WIND SPEED 20 km/h
WIND DIRECTION
WEATHER

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: Ateo Drlg. RIG NO. 48
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

LEGEND (METRIC EXPRESSIONS)
All lengths expressed in metres to two decimal places.
mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
0 m	89 m	89 m	13	0	89	1	22

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
						1	National	235	50	
						2	National	235	50	

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	2 1/2	10 1/2	
2	TRIPS			
3	HANDLE TOOLS	2 1/2		
4	DIRECTIONAL WORK	1 1/4	1	
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE		1/4	
8	RIG REPAIR	2 1/4		
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.	1/2		
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	SAFETY MEETING	1/4	1/4	
22	RIG UP TEAR DOWN	4		
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	O.D. mm	X	I.D. mm	
1		BIT				.45 m
	SU		70	X	279	2.36 m
	DC		78	X	326	8.85 m
	SU		75	X	230	2.71 m
	XO		71	X	279	.85 m
	XO		70	X	171	.78 m
	XO		60	X	76	.41 m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.		STANDS			m
	D.P.		SINGLES			m
	KELLY DOWN					12.83 m
	TOTAL					29.38 m
WT. OF DC						12 000 1000 daN
WT. OF STRING						25 000 1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	1A
SIZE (mm)	444
IADC CODE	
MFG.	SDT
TYPE	Smith
SERIAL NO.	XE3390
JETS (1/32") (mm)	3 X 14.3
DEPTH OUT (m)	
DEPTH IN (m)	21
TOTAL METRES DRILLED (m)	8
TOTAL HRS. RUN	2 3/4
CUT STRUC. D U L / I O D L / L B G O R	

HOLE CONDITION

HOLE DRAG (daN)
TORQUE AT BOTTOM (DP TURNS)
FILL ON BOTTOM (m)
REMARKS:

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP	/	/	/	/
GELS (Pa)	/	/	/	/
W.L. (cm³)				
F.C. (mm)				
pH				10.
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Gel	17 SKS		
CAUSTIC	1 SKS		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
21 m	29 m	3	D			4-5	60			152	50	152	50		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
20	0		38	1°				

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
22	2400	0400	4	Thaw Ice Plug From Kelly Hose.
3	0400	0530	1 1/2	Make up x0 Subs & Break Circ.
17	0530	0600	1/2	Press Test Diverter Conduct Diverter Drill & Safety Meeting.
1	0600	0800	2	Spud with 444MM Bit.
3	0800	0900	1	Pick up Shock Sub
4	0900	0915	1/4	Survey
1	0915	0945	1/2	Drill
8	0945	1200	2 1/4	Work on [redacted] Pump Suctions – Recharge Amps
			12	
				24 Hrs Prior To Actual Spud — Pressure Test Diverter
				For Rigging Up Diverter System — 1000 Kpa 15 Min Held OK.
				Press Test Same For Start of Day Rate.
				K. B. To Ground. 7.6M

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	21 3/4 HRS
EVALUATION	2065	HRS
COMPLETION		HRS
		HRS
TOTAL HOURS ACCOUNT TO SHELL		21 3/4 HRS
BOILER	2042	24 HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT MJ			
CUMULATIVE MEGAJOULES MJ			

DRILLING CREW PAYROLL DATA

WELL NAME & NO. et al Arrowhead B-41 DATE Jan 22/89
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE: RIG NO. 48

DAY TOUR P.M. A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	12
DRKMAN		Bob Wanke	12
MTRMAN		Paul Hampel	12
FLRMAN		Antoine Bertrand	12
FLRMAN		Dale Minor	12
FLRMAN			
Lease.		Vern Vivier	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR P.M. A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Sheldon Barsness	12
DERRICK MOTOR		Barry Wright	12
DRKMAN		Art Wright	12
MTRMAN		Keith McCarty	12
FLRMAN		Angus Capot Blanc	12
FLRMAN		Lease. Mervin Timbre	12
FLRMAN			
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
22	1200	1400	2	Drill
21	1400	1430	1/2	Survey
2	1430	1845	4 1/4	Drill
4	1845	1900	1/4	Survey
2	1900	2000	1	Drill
21	2000	2015	1/4	Safety Meeting W/ Both Crews
7	2015	2030	1/4	Rig Srvc
4	2030	2045	1/4	Survey at 67m
8	2045	1200	3 1/4	Drill
			12	
				Daily walk around Inspection

DRILLER

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
29 m	89 m			D		2/5	80/100			152	90	152	90		
m	m					5/7	100/120			152	110	152	110		
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
38	1°		58	1/2°		67	1/4	

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	1200	1400	2	DRILL
21	1400	1430	1/2	SURVEY
2	1430	1845	4 1/4	DRILL
4	1845	1900	1/4	SURVEY
2	1900	2000	1	DRILL
21	2000	2015	1/4	SAFETY MEETING W/ BOTH CREWS
7	2015	2030	1/4	Rig SERV
4	2030	2045	1/4	SURVEY at 67m
8	2045	1200	3 1/4	DRILL
			12	
				Daily walk around Inspection

DRILLER

GRAINSET

CP-225 (10/86)

DAILY DRILLING REPORT — 12 HOUR TOUR

ACCUMULATOR, 49

WELL NAME: SHELL ET AL ARROWHEAD B-41

LOCATION: 60-30 8-49 N-22-53-16 W4 | PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	-40 °C
WIND SPEED	25 km/h
WIND DIRECTION	
WEATHER	

OPERATOR: **Shell Canada Limited** | CONTRACTOR: ATCO DRILLING | RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE: | SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: Talbot

LEGEND (METRIC DIMENSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE: MONTH	DAY
89 m	207 m	118 m	32 3/4	2	89	1	23

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127		E	90	159	NC 127 XH	1	NAT	235	HI 50 LO 20	3300
127		X-2	82	159	127 XH	2	NAT	235	HI 50 LO 20	3300

KILL SPEED

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

TIME DISTRIBUTION -- HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	10 1/2	9 1/4	19 3/4
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	1	3/4	1 3/4
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	1/2		1/2
8	RIG REPAIR		2	2
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	[illegible]			
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	22	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
			HRS
TOTAL HOURS ACCOUNT TO SHELL		22	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		4 HR
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD — REEL NO.

SIZE mm	# OF LINES	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT		MJ
CUMULATIVE MEGAJOULES		MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
1						45 m
	SU			X		236 m
	DC			X		885 m
	SU			X		271 m
	SS			X		388 m
	XO			X		85 m
3	DC			X238		2858 m
	XO			X		78 m
				X		m
				X		m
16	DC			X		143.45 m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					506 m
	TOTAL					2070 m
WT. OF DC						400 (1000 daN)
WT. OF STRING						1900 (1000 daN)

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		1A	
SIZE (mm)		444	
IADC CODE			
MFG.		SDT	
TYPE		SMITH	
SERIAL NO.		XE3380	
JETS (1/32")	(mm)	3/14/3	
DEPTH OUT	(m)		
DEPTH IN	(m)	21	
TOTAL METRES DRILLED	(m)	186	
TOTAL HRS. RUN		33 1/2	

DULL	CUT STRUC. I	O	D	L
	B	G	O	R

K+ (1000 mg/L)

Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS:

MUD RECORD

TIME	11:00	1500	1900
DENSITY (kg/m³)	1080	1090	1120
GRADIENT (kPa/m)			
FUNNEL VIS.-(s/L)	54	60	85
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH	9.5	9.5	9.5
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Gel	145 KG		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
89 m	147 m					5/10	60/80	7000		152	120	152	120		
147 m	207 m		D			5/100	60/80	9000	152	152	120	152	120		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
86	1/8		105	3/4		115	1/4	
						135	1/4	

DAY TOUR

CODE	TIME LOG FROM	TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	0000	0030	1/2	DRILL
7	0030	0045	1/4	RIG SERV CHECK PINS AND LEAKAGE ON DRAWORKS
4	0045	0100	1/4	SURVEY
1	0100	0430	3 1/2	DRILL
4	0430	0445	1/4	SURVEY
1	0445	0630	1 3/4	DRILL HOLD BACK ON WT
4	0630	0645	1/4	SURVEY
1	0647	0800	1 1/4	DRILL
7	0800	0815	1/4	RIG SERVICE
1	0815	1030	2 1/4	DRILL
4	1030	1045	1/4	SURVEY
1	1045	1200	1 1/4	DRILL

DRILLER: B Soucy

EVENING TOUR

CODE	TIME LOG FROM	TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	1200	1330	1 1/2	DRILL
4	1330	1345	1/4	SURVEY @ 145
8	1345	1415	1/2	CHANGE HEAD + LINER #2 PUMP
1	1415	1645	2 1/2	DRILL
4	1645	1700	1/4	SURVEY
1	1700	1945	2 3/4	DRILL
4	1945	2000	1/4	SURVEY
1	2000	2330	3 1/2	DRILL
8	2230	2400	1 1/2	REPAIR PUMPS

Work Around Rig [illegible]

DRILLER: [illegible]

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ET AL ARROWHEAD B-41 | DATE: 89 01 23

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: Talbot | RIG NO.: 48

DAY TOUR

P.M. ____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		BOB WANKE	12
MTRMAN		PAUL HAMPEL	12
FLRMAN		ANTOINE BERTRAND	12
FLRMAN		DALE MINOR	
FLRMAN			
WELDER		VERN VIVIER	12

NO. OF DAYS ____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. ____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARSNESS	12
DRKMAN		BARRY WRIGHT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH MCCARTY	12
FLRMAN		ANGUS CAPOT BLANC	12
FLRMAN		MERVIN TIMBRE	12

NO. OF DAYS ____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B-41
LOCATION: 60.30 8.49 N-22-53 1692 W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — CONTRACTOR: NICO DRILLING — RIG NO. 48
SIGNATURE OF SHELL'S REPRESENTATIVE — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

WEATHER CONDITIONS

TEMPERATURE	−30 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED 0000 2300

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump–stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
207 m	311 m	104 m	49	J	89	1	24

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG. HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS

DP. SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	E	E	90	159	127 XH	1	WAT 9P-100	235	120	1
127	X-D	X-D	82	159	127 XH	2	WAT 9P-100	235	120	

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	7	9¼	
2	TRIPS	3½	¾	
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	¾	1	
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	½		
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	¼		
10	CONDITION MUD		1	
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
			HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	7+246=253	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa	@ 12	12
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH OUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT			MJ
CUMULATIVE MEGAJOULES			MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE BIT	I.D. mm	X	O.D. mm	
1	BIT				45 m
1	SU	S	X		236 m
1	DC		X		885 m
1	SU		X		271 m
1	SS		X		388 m
			X		85 m
1	XO		X		85 m
3	DC		X		2858 m
1	XO		X		78 m
18	DC		X		17226 m
1	XO		X		41 m
2	HW		X		1831 m
			X		m
	D.P.	STANDS			m
	D.P.	SINGLES			m
	KELLY DOWN				856 m
	TOTAL				24800 m
WT. OF DC					50 1000 daN
WT. OF STRING					51 1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.		1A	
SIZE	(mm)	444	
IADC CODE			
MFG.		SMITH	
TYPE		SDT	
SERIAL NO.		3380	
JETS (mm)	(mm)	3 X 14.3	
DEPTH OUT	(m)	311	
DEPTH IN	(m)	21	
TOTAL METRES DRILLED	(m)	290	
TOTAL HRS. RUN		49	

CUT STRUC.: D | U | L | I | O | D | L | B | G | O | R

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM	(DP TURNS)
FILL ON BOTTOM (m)	

REMARKS: Spare Boiler Fired 1600 Hrs Jan 24/89.

MUD RECORD

TIME	1500	1900	2100
DENSITY (kg/m³)	1110	1110	11.10
GRADIENT (kPa/m)			
FUNNEL VIS-(s/L)	53	74	78
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)	8	8	
F.C. (mm)			
pH	9	9	10.
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Gel	65 SKS		
		CAUSTIC	1 SKS

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
207 m	248 m	7				12	80	9500		152	110	152	110		
248 m	311 m	7¾				12	80	9500		152	110	152	110		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
205	½		232	¾				
249	½		267	½		285	½	
311	1°							

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	0000	0100	1	DRILL
4	0100	0130	½	CIRC AND SURVEY
7	0130	0145	¼	RIG SERV CHECK CROWN SAVER 21577
2	0145	0515	3½	BLOW KELLY TRIP TO CHECK BIT STRAP OUT 21565
39	0515	0530	¼	BAFARC IR CLEAN 9m TO BOTTOM .12 PAP
1	0530	0830	3	DRILL
4	0830	0845	¼	SURVEY
7	0845	0900	¼	RIG SERVICE
1	0900	1200	3	DRILL

DRILLER: R C Soucy

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	1230	1230	½	DRILL
4	1230	1245	¼	SURVEY
1	1245	1530	2¾	DRILL
4	1530	1545	¼	SURVEY
1	1545	1800	2¼	DRILL
4	1800	1815	¼	SURVEY
1	1815	2200	3¾	DRILL
10	2200	2300	1	CIRC & CLEAN HOLE CONDITION MUD
4	2300	0315	¼	SURVEY
2	0315	0400	¾	BLOW KELLY DUMMY TRIP
			½	
				WALK AROUND RIG CHECK RV

DRILLER: J Barsnick

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL ET AL ARROWHEAD B-41 — DATE 89/1/24
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		BOB WAWKE	12
MTRMAN		PAUL HAMPEL	12
FLRMAN		ANTOINE BERTRAND	12
FLRMAN		DALE MINOR	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARSNICK	12
DRKMAN		BARRY WRIGHT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH MCCARTY	12
FLRMAN		ANGUS CAPOT BLANC	12
FLRMAN		MERVIN TIMBRE	12
WELDER		VERN VIVIER	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/86)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B341

LOCATION: 60-30 849 N-22-53-16 W2W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — CONTRACTOR: ATCO DRILLING — RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

WEATHER CONDITIONS

TEMPERATURE	-26 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	E	E	90	159	127X11	1	NAT 9P100	235	1	
127	X-2	X-2	82	159	127X4	2	NAT 9P100	235		

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump–stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
311 m	311 m	m		4	89	01	25

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	316	29	311.86		311.00	53	G W/1% CACL²	

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	3		
3	HANDLE TOOLS	3		
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	3	4¾	
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT	3	6	
16	WAIT ON CEMENT		1¼	
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
			HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	#1-24 #2-24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD — REEL NO.

SIZE mm	# OF LINES	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT		MJ
CUMULATIVE MEGAJOULES		MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (32nds) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L L I O D L B G O R	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS	Conduct Safety Meeting with Rig Crew Csg Crew lay Down Crew Prior to Running Csg.

MUD RECORD

TIME	0400
DENSITY (kg/m³)	1045
GRADIENT (kPa/m)	10.75
FUNNEL VIS–(s/L)	70
PV/YP	22/85 / /
GELS (Pa)	5/20 / /
W.L. (cm³)	9.2
F.C. (mm)	1.5
pH	9.0
OIL VOL. FRAC.	–
SAND VOL. FRAC.	.01
K+ (1000 mg/L)	–
Cl- (1000 mg/L)	320

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	14		
Emulite	125K		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
Surface	TD 311							9500		152	110	152	110		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	0000	0130	1½	Dummy TO SURFACE STRAPPED 31100
9	0130	0430	3	CIRC CONDITION MUD 31055
2	0430	0600	1½	BLOW KELLY, HOIST TO RUN CASING D.P. 45
2	0600	0900	3	LAY DOWN 2 REAMER AND 14 in DC AND SHOCK SUB
15	0900	1200	3	RIG TO RUN & RUN CASING (Held Safety Meeting.)
				Daily Rig Inspection Ed N.

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
15	1200	1600	4	RUN CASING
9	1600	2045	4¾	CIRCULATE (Held Safety Meeting).
15	2045	2245	2	RIG TO CEMENT 339.9mm SURFACE Csg.
22	2245	2400	1¼	RIG OUT CEMENTERS ; W.O.C
16				
				DRILLED 444.5mm HOLE TO 311.0m RAN 29 JTS 339.9mm, K55, 81.1 Kg/m, ST&C NEW NIPPON Csg FOLLOWED BY 8 JTS 339.9mm, K55, 90.8 Kg/m, ST&C, NEW NIPPON C.59 Csg STRING LANDED @ 311.0m KB.
				CEMENTING START w/ 9.0m³ OF WATER AHEAD, FOLLOWED BY 53.0 TONNES 0-1-0 "G" w/ 1% CaCl₂ USED 100% EXCESS FROM GAUGE HOLE, DISP w/ 24.22m³ MUD. FULL RETURNS THROUGHOUT JOB. GOOD CEMENT RETURNS. MAX PSI 5.0m³ FLOATS HELD OK PLUG DOWN @ CEMENT IN PLACE @ 2230 HRS 89/1/25 DID NOT BUMP PLUG AFTER PUMPING 5m³ OVER CALCULATED DISP.

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL ET AL-ARROWHEAD — DATE 89/1/25

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		BOB WANKE	12
MTRMAN		PAUL HAMPEL	12
FLRMAN		ANTOINE BERTRAND	12
FLRMAN		DALE MINOR	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARSNESS	12
DRKMAN		BARRY WRIGHT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH MC CARTY	12
FLRMAN		ANGUS CAPOT BLANC	12
FLRMAN		MERVIN TIMBRE	12
WELDER		VERN VIVIER	~~12~~ 16

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/86)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B-41

LOCATION: 6030 949 N-22-53-16 92 W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — CONTRACTOR: ATCO — RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE: [signature] — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: [signature]

WEATHER CONDITIONS

TEMPERATURE	-20 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
311 m	311. m	0 m	49.	4	89	01	26

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	11.71	311.0	53	"G"	4/12%CACL2

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS (kPa)
127		E	90	159	127XH	1	NAT 9P100	235		
127		X-2	82	159	127XH	2	NAT 9P100	235		

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE			
1	BIT			m
		I.D. (mm) X O.D. (mm)		m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
	D.P.	STANDS		m
	D.P.	SINGLES		m
	KELLY DOWN			m
	TOTAL			m
WT. OF DC				1000 daN
WT. OF STRING				1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (/64) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L L / I O D L / B G O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME			
DENSITY (kg/m³)			
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)			
PV/YP	/	/	/
GELS (Pa)			
W.L. (cm³)			
F.C. (mm)			
pH			
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
@311 m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	0000	0300	3	W.O.C
	0300	0400	1	Lift BOP's + Cut Csg.
	0400	0530	1½	Lay Down 20" BOP's.
	0530	1200	6½	Cut Cond. + Csg.

Unit Around Rig + RU

DRILLER [signature]

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	1700		WELD ON BOWL PRESS TEST WELD 7000 KPA 15 MIN
	1700	2400		NIPPLE UP

DRILLER [signature]

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24. HRS
EVALUATION	~~2065~~	HRS
COMPLETION	C100 D699 2	HRS
Boiler # 2		24 HRS
TOTAL HOURS ACCOUNT TO SHELL		HRS
BOILER	2042	24 HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO. / LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT		MJ
CUMULATIVE MEGAJOULES		MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD B-41 DATE 89/1/26

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: [signature] RIG NO. 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	8
DRKMAN		BOB WANKE	8
MTRMAN		PAUL HAMPER	8
FLRMAN		ANTOINE BERTRAND	8
FLRMAN		DALE MINOR	8
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARSNESS	13
DRKMAN		BARRY WRIGHT	13
MOTOR		ART WRIGHT	13
MTRMAN			
FLRMAN		KIETH MCCARTY	13
FLRMAN		ANGUS CAPOT BLANC	13
FLRMAN		MERVIN TIMORE	2
DRILLER		DENNIS OLSEN	3
DRKMAN		FRANCIS PAQUETTE	3
MTRMAN		DEAN BIRD	3
FLOOR		DENIS BERTRAND	8
		IRWIN BERTRAULT	8

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60-30-84.9 N, 122-53-16.92 W — PROVINCE: N.W.T.

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE

CONTRACTOR: Atco Drlg — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: Robert Vil — RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	−32 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
311 m	311 m	— m	49	5	89	01	27

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD

PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	29	311.86	7.71	311	53	"G" + 1.2% $CaCl_2$	

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION	CWO #24972		HRS
Boiler #2		24	HRS
TOTAL HOURS ACCOUNT TO SHELL			HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT		MJ	
CUMULATIVE MEGAJOULES		MJ	

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE			
1	BIT			m
		I.D. mm	X	O.D. mm	m
			X		m
			X		m
			X		m
			X		m
			X		m
			X		m
			X		m
			X		m
			X		m
			X		m
			X		m
	D.P.	STANDS			m
	D.P.	SINGLES			m
	KELLY DOWN				m
	TOTAL				m
WT. OF DC					1000 daN
WT. OF STRING					1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.				
SIZE (mm)				
IADC CODE				
MFG.				
TYPE				
SERIAL NO.				
JETS (32nds) (mm)				
DEPTH OUT (m)				
DEPTH IN (m)				
TOTAL METRES DRILLED (m)				
TOTAL HRS. RUN				

DULL	CUT STRUC. I	O	D	L
	B	G	O	R

HOLE CONDITION

HOLE DRAG (daN)				
TORQUE AT BOTTOM (DP TURNS)				
FILL ON BOTTOM (m)				
REMARKS:				

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	2400	1200	12	Nipple Up.
				COGA INSPECTION — Dave Swil
				DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	2400		NIPPLE UP BOPS LINES. WORK ON MANIFOLD.
				DRILLER

CRAINSET

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: et al Arrowhead B-41 — DATE: Jan 27/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: Robert Vil — RIG NO.: 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		DENNIS OLSEN	8
		FRANCIS PAQUETTE	8
DRKMAN		DEAN BIRD	8
		DENIS BERTHRAND	8
MTRMAN		ERWIN BERREAULT	8
FLRMAN			
FLRMAN			
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARSNESS	8
DRKMAN		BARRY WRIGHT	8
MTRMAN		ART WRIGHT	8
FLRMAN		KEITH McCARTY	8
FLRMAN		ANGUS CAPOT BLANC	8
FLRMAN			
DRILLER		DENNIS OLSEN	8
DERRICK		FRANCIS PAQUETTE	8
MOTORS		DEAN BIRD	8
FLOOR		DENNIS BERTRAND	8
FLOOR		ERWIN BERREAULT	8

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B-41

LOCATION: 60 30 84 9 N 22 53 16 92 W — PROVINCE: NWT

OPERATOR: Shell Canada Limited

SIGNATURE OF SHELL'S REPRESENTATIVE: [signature]

CONTRACTOR: ATCO DRILLING — RIG NO.: 48

SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: [signature]

WEATHER CONDITIONS

TEMPERATURE	−32 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LEGEND (METRIC DIMENSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit; indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
311 m	311 m	— m	49	6	89	01	28

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	29	311.86	7.91	311.0	53	G	4/12% CACL²

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.		12	
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.	8	4	
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	?			
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1			I.D. mm X O.D. mm	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
		D.P.	STANDS	m
		D.P.	SINGLES	m
		KELLY DOWN		m
		TOTAL		m
WT. OF DC				1000 daN
WT. OF STRING				1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (32nds) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	

CUT STRUC.	D	I	O	D	L
	U				
	L				
	L	B	G	O	R

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
17	0	0800	8	NIPPLE UP
				AT 0500 HRS IS 30HRS FROM WHEN CSG BOWL (WELDED) ON.

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	5	HRS
EVALUATION #	2065		HRS
COMPLETION DG772			HRS
Boiler #2		24	HRS
TOTAL HOURS ACCOUNT TO SHELL			HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT MJ			
CUMULATIVE MEGAJOULES MJ			

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ARROWHEAD B-41 — DATE: 89 01 28

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: [signature] — RIG NO.: 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARSNESS	12
DRKMAN		BARRY WRIGHT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH MCCARTY	12
FLRMAN		ANGUS CAPOTOSTAN	12
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
5	0800	1200	4	INSPECT + PRESS MANIFOLD VALVES LOW 1500 HIGH 35000 10 MIN EACH
17	1200	1600	4	COMPLETE NIPPLE UP - RE HAMMER ALL BOP BOLTS
5	1600	2400	8	INSTALL TEST PLUG + BLANK TOOL PRESS TEST STACK VALVES BLIND RAMS PIPE RAMS LOW 1500 HIGH 21000 10 MIN EACH
				ACCUMULATOR CHECK

DRILLER

EVENING TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	12
DRKMAN		DEAN BIRD	12
MTRMAN			
FLRMAN		DENNIS BERTRAND	12
FLRMAN		ERWIN BERREAULT	12
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B-41

LOCATION: 60 30 849 N 22 53 1692 W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE: [signature]

CONTRACTOR: ATCO DRILLING — RIG NO.: 48 — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: [signature]

WEATHER CONDITIONS

TEMPERATURE	-37 °C
WIND SPEED	50 km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
311 m	311 m	— m	49	7	88	01	29

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	7.71	311	53	G	w/1% $CaCl_2$

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm	X	O.D. mm	
1	BIT					m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.			
SIZE (mm)			
IADC CODE			
MFG.			
TYPE			
SERIAL NO.			
JETS (1/64) (mm)			
DEPTH OUT (m)			
DEPTH IN (m)			
TOTAL METRES DRILLED (m)			
TOTAL HRS. RUN			
CUT STRUC. D U L L / I O D L / B G O R			

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
5	0000	0330	3½	PRESSURE TEST MUD VALVES MUD LINES KILL LINES FROM FLOOR TO PUMPS 1500 LOW 21000 HIGH 10 MIN EACH
8	0330	0415	¾	REPAIR MANIFOLD VALVES W/PARTS FLOWN IN
5	0415	0545	1½	PRESS TEST REPAIRED MANIFOLD VALVES 1500 LOW 35000 HIGH 10 MIN EACH
8	0545	0800	2¼	TRY TO PULL BLANK TOOL - CARRIER BOLTS STRIPED OUT OF RAM BODY. REMOVE SAME & CHECK ALL CARRIER BOLTS IN ALL RAMS
		1200		

DAILY WALK AROUND
[signature] I.M.

DRILLER: A. Baroness

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
8	1200	2400	12	WAIT ON PIPE RAM BODY, UPPER & LOWER KELLY COCKS
				INSULATE MANIFOLD LINES, INSTAL HOPPER MIX LINES
				BREAK OUT OLD UPPER KELLY COCK
				WORK ON ACCUMULATOR

DRILLER: Francis Paquette

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	0	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
BOILER #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL			HRS
BOILER	2042	24	HRS

SWO # 16992.

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT			MJ
CUMULATIVE MEGAJOULES			MJ

DRILLING ASSEMBLY AT END OF TOUR
BIT RECORD
MUD RECORD
BOTTOMS-UP RATE
HOLE CONDITION

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ARROWHEAD B-41 — DATE: 88 01 29

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: [signature] — RIG NO.: 48

DAY TOUR

P.M. / A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARSNESS	12
DRKMAN		BARRY WRIGHT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH MCCARTY	12
FLRMAN		ANGUS CAPOT BLANC	12
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. / A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	12
DRKMAN		DEAN BIRD	12
MTRMAN		DENNIS DERTRAND	12
FLRMAN		ERWIN BERREAULT	12
FLRMAN			
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B 41

LOCATION: 60 39 84 9 N 22 53 16 92 W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE: [signature]

CONTRACTOR: [illegible] — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: [signature] — RIG NO. 48

WEATHER CONDITIONS

TEMPERATURE	-37 °C
WIND SPEED	65 km/h
WIND DIRECTION	
WEATHER	

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump–stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
311 m	311 m	— m	49	8	89	01	30

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127		E			127XH	1	National	235		
127		X-2			127XH	2	National	235		

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	7.71	311.0	53	G	4/1% CaCl²

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS		6½	
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.	10½	12	
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR	1½	5½	
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
1		BIT		X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (1/32") (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
DULL CUT STRUC.	I O D L / B G O R
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS: Accum. 45 CM	

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
311 m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	0	01¹⁵	1¼	WAIT ON RAM TOP
5	01¹⁵	0300	1¾	INSTAULL RAM & FUNCTION TEST TOP PIPE RAM
5	0300	0430	1½	MAKE UP: SET TEST PLUG, PRESS TEST TOP PIPE RAM: ALL RAM DOORS LOW 1500 KPA HIGH 21000 KPA 10 MIN EACH CHECK: MAKE UP: INSTALL WEAR BUSHING.
5	0430	0515	¾	ACCUMULATOR CHECK
	0515			PICK UP KELLY: CHANGE UPPER: LOWER KELLY COCK:
5		10³⁰	5¼	PRESS TEST UPPER KELLY COCK LOW 1500 HIGH 35000 10 MIN EA NO HIGH TEST COMPLETED
8	10³⁰	12⁰⁰	1½	STEAM STAND PIPE + MUD LINE BACK: DAILY RIG JACK AROUND TO MUD TANK THAW OUT HOOK AND ELEVATOR & TONGS.
				ACCUMULATOR CHECK START PRESS 22500 KPA AFTER SHELL SPEC. FUNCTIONS 8800 KPA PRECHARGE TIME 9 SEC ONE PUMP BOTH PUMPS 9 MIN.

DRILLER: [signature]

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	0	HRS
EVALUATION	2065		HRS
COMPLETION	CWO # 26992		HRS
Boiler #2		24	HRS
TOTAL HOURS ACCOUNT TO SHELL			HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm — # OF LINES — REEL NO. — LENGTH SLIPPED m — LENGTH CUT OFF m — PRESENT LENGTH m — MEGAJOULES SINCE LAST CUT MJ — CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
1		BIT				.35 m
1	WP	3	224	X	78	1.46 m
1	DS	225	X		78	9.03 m
1	SU	224	X		73	1.80 m
1	SS	095	X		72	2.40 m
3	DC	095	X		72	28.60 m
1	JM	225	X		73	1.54 m
1	KD	223/175	X		72	.78 m
18	DC		X			172.56 m
1	X/O		X			.41 m
6	HW		X			54.83 m
			X			m
			X			m
1	D.P.	STANDS				9.66 m
	D.P.	SINGLES				m
	KELLY DOWN					6.75 m
	TOTAL					293.15 m
WT. OF DC						48000 1000 daN
WT. OF STRING						50000 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	1
SIZE (mm)	311
IADC CODE	
MFG.	REED
TYPE	HPS1A
SERIAL NO.	698567
JETS (1/32") (mm)	3/11.11
DEPTH OUT (m)	
DEPTH IN (m)	300
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
DULL CUT STRUC.	I O D L / B G O R
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS	

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
311 m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	1200	1500	3	MAKE UP BHA STRAP IN
8	1500	1700	2	THAW OUT MUD LINE TO CENTRIFUGE START SHAKERS
2	1700	1830	1½	RUN STD OF 9" DC PICK UP JARS x/o SUB 1 STD 127 mm
8	1830	2000	1½	WORK ON TONG JAW PINS & CHANGE SAME CHANGE OUT TONG LINE SYNTHETIC
2	2000	2200	2	FINISH RIH LAY DOWN 2 SINGLES STRAP IN
8	2200	2400	2	THAW KELLY FROZEN IN RAT HOLE
				TAGGED CEMENT @ 293.10

DRILLER: [signature]

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL ARROWHEAD B 41 — DATE 88 01 30

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: [signature] — RIG NO. 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARKNESS	12
DRKMAN		BARRY WRIGHT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH MCCARTY	12
FLRMAN		ANGUS CAPOTBLANC	12
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	12
DRKMAN		DEAN BIRD	12
MTRMAN		DENNIS DESTRANA	12
FLRMAN		ERVIN VERREAULT	12
FLRMAN			
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B41
LOCATION:
PROVINCE: NWT

WEATHER CONDITIONS
TEMPERATURE: -30 °C
WIND SPEED: km/h
WIND DIRECTION:
WEATHER:

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE: Paul Gillis
CONTRACTOR: A.E.& D. Drlg.
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: Richard Dahl
RIG NO.:

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127		E			IF	1	NATIONAL			
						2	NATIONAL			

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	MONTH	DAY
311 m	311 m	— m	49	9	89	01	31

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	7.71	311.0	53	G	w/1.2%CACL²

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	3½	7½	11
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR	6½		6
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING		2	2
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILLSTEM TEST - TPS	1		1
21	DRILL CEMENT	1½	2½	4
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
						35 m
1	50			X		1.46 m
1	DM			X		903 m
1	50			X		180 m
1	SS			X		240 m
3	DC			X		2860 m
1	JM			X		454 m
1	70			X		.78 m
18	DC			X		172.56 m
1	70			X		41 m
6	HO			X		5483 m
				X		m
				X		m
1	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.		1	
SIZE	(mm)	311	
IADC CODE			
MFG.		REED	
TYPE		HP51A	
SERIAL NO.		L99687	
JETS (1/32")	(mm)	3/11/11	
DEPTH OUT	(m)	300	
DEPTH IN	(m)	300	
TOTAL METRES DRILLED	(m)		
TOTAL HRS. RUN			
DULL	CUT STRUC. I	O	D	L
	B	G	O	R

HOLE CONDITION

HOLE DRAG (daN)
TORQUE AT BOTTOM (DP TURNS)
FILL ON BOTTOM (m)
REMARKS:

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS.-(s/L)				
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
BICARB	35x		
CAUSTIC	15x		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
311 m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	0	0030	½	CHANGE OUT LOWER KELLY COCK
8	0030	0100	½	THAW OUT MUD MANIFOLD
	0100			CIRCULATE CHANGE SHAKER SCREENS AND ATTEMPT
21		0230	1½	TO DRILL CEMENT VERY HIGH & ERATIC TORQUE W/3000 SHOT
	0230	0700		PRESS TEST CASING TO 6600 KPA 15 MIN & PRESS TEST
		0330	1	UPPER KELLY COCK 34000 FOR 10 MIN ALL OK
8	0330	0900	5½	MAKE DOWN DIVING BOARD STRAIGHTEN AND WELD REATAIN SAME
2	0900	1100	2	HOIST BIT
2	1100	1200	1	CHECK STABLIZERS AND BIT LAY DOWN BIT AND BIT SUB BLADE STAB

DAILY RIG INSPECTION DR

DRILLER: D A Barsness

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	23	HRS
EVALUATION	2085		HRS
COMPLETION	CWO#86972		HRS
Boiler #2.		24	HRS
TOTAL HOURS ACCOUNT TO SHELL			HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT		MJ	
CUMULATIVE MEGAJOULES		MJ	

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
						35 m
1	EO		216	X	238	.90 m
1	DM		78	X	225	9.03 m
1	SS		78	X	225	9.40 m
2	DC			X		19.05 m
1	JM		78	X	225	4.54 m
1	DC			X		9.58 m
1	70			X		.78 m
18	DC			X		172.56 m
1	70			X		.41 m
6	HO			X		54.81 m
				X		m
				X		m
1	D.P.	STANDS				95.0 m
	D.P.	SINGLES				m
	KELLY DOWN					12.87 m
	TOTAL					296.75 m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.		2	
SIZE	(mm)	311	
IADC CODE			
MFG.		SMITH	
TYPE		SDGH	
SERIAL NO.		L21309	
JETS (1/32")	(mm)	3/11/13	
DEPTH OUT	(m)		
DEPTH IN	(m)	300	
TOTAL METRES DRILLED	(m)		
TOTAL HRS. RUN			
DULL	CUT STRUC. I	O	D	L
	B	G	O	R

HOLE CONDITION

HOLE DRAG (daN)
TORQUE AT BOTTOM (DP TURNS)
FILL ON BOTTOM (m)
REMARKS:

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS.-(s/L)				
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
BICARB	95KG		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
311 m	311 m					3/7	60			152	100	152	100		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	1200	1445	2¾	PICK UP MAGNET, ~~TRIP~~ STAB AND BIT SUB AND RIH
				PICK UP 2 STS DP BREAK CIRC. CHECKED CROWN SAVER OK
13	1445	1545	1	WORK MAGNET C
2	1545	1730	1¾	BLOW KELLY CHAIN OUT OF HOLE
13	1730	1830	1	BREAK OFF MAGNET RECOVER FILINGS
2	1830	2130	3	MAKE UP NEW BHA & RIH DOUBLE STRAP IN
21	2130	2400	2½	BREAK CIRC & DRILL CEMENT 393-

DRILLER: Francis Paquette

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ARROWHEAD B-41 DATE: 89 01 31
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE: Richard Dahl RIG NO.: 48

DAY TOUR

P.M. A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARSNESS	12
DRKMAN		BARRY WRIGHT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH MCCARTY	12
FLRMAN			
FLRMAN			

NO. OF DAYS: SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	12
DRKMAN		DEAN BIRD	12
MTRMAN		DENNIS DERTRAND	12
FLRMAN		ERWIN VERREAULT	12
FLRMAN			
FLRMAN			

NO. OF DAYS: SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/86)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B-41
LOCATION: 60-30-8.49N 122-53-16.92W
PROVINCE: NWT

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE: Dave Ouellette
CONTRACTOR: HICO DRILLING
RIG NO.: 48
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: Toolpusher

WEATHER CONDITIONS

TEMPERATURE	-28 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD
127		E		162	4½ IF

PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
1	NATIONAL	9	100	7000
2	NATIONAL		100	9500

KILL SPEED

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
311 m	455 m	144 m	16¼	12.	89	02	01

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	7.71	311.	53	G	W/ 1% CACL2

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	6½	9¾	16¼
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK		1	1
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	¼	½	¾
8	RIG REPAIR	1¾	¾	2½
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST	~~3½~~		
21		3½		3½
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
						35 m
1	EO			X		90 m
1	DM	78	X	225		903 m
1	SS	78	X	225		240 m
2	DC	72	X	238		1905 m
1	JM	73	X	225		454 m
1	DC	72	X	238		955 m
1	3/0	70	X	171		78 m
18	DC	69	X	171		1725.6 m
1	2/0	70	X	168		41 m
6	HO			X		548 m
				X		m
				X		m
2	D.P.	STANDS				57.30 m
1	D.P.	SINGLES				9.45 m
	KELLY DOWN					8.87 m
	TOTAL					351 m

WT. OF DC: 20 (1000 daN)
WT. OF STRING: 51.000 (1000 daN)

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.		2	
SIZE	(mm)	311	
IADC CODE			
MFG.		SMITH	
TYPE		SDGH	
SERIAL NO.		LX1205	
JETS (1/32")	(mm)	3/14/13	
DEPTH OUT	(m)		
DEPTH IN	(m)	311	
TOTAL METRES DRILLED	(m)	140	
TOTAL HRS. RUN		8¾	

CUT STRUC: D U L | I O D L | L B G O R

HOLE CONDITION

HOLE DRAG (daN)		NIL
TORQUE AT BOTTOM	(DP TURNS)	
FILL ON BOTTOM (m)		

REMARKS:

MUD RECORD

TIME	0100	0500	1100
DENSITY (kg/m³)	1060	1060	1060
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	38	35	35
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH	10.5	10	10
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	585		
CAUSTIC	15		
SODA ASH	105		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RO-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
311 m	351 m	6½		40		8/10	80	10,000		152	100	152	100		
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
21	0	0215	2¼	DRILL CEMENT TO 311m.
1	0215	0345	1½	DRILL 311m HOLE TO 320m
21	0345	0430	¾	L FORMATION LEAK OFF TEST NO LEAK OFF AT 6500 KPA FULL GRADIENT 31.3 KPA/m
21	0430	0500	½	BOP DRILL
8	0500	0645	1¾	CLEAN UP RIG PRIOR TO DRILLING AHEAD; REMOVE PUMPS.
1	0645	0800	1¼	DRILL
7	0800	0815	¼	RIG SERV FUNCTION ANNULAR CLOSED 14 SEC
1	0815	1200	3¾	DRILL 311 HOLE

HELD BOP DRILL W/CREW PRIOR TO DRILL OUT FULL MUD
WITNESSED By Dave Ouellette
DAILY RIG INSPECTION OK
DRILLER: J. Barsness

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	1200	1430	½	DRILL 311 HOLE SPM 110 FLOW 17%
8	1430	1800	½	REPAIR POP VALVE NO1 PUMP
1	1800	1515	2¼	DRILL 311 HOLE
4	1515	1545	½	SURVEY WORK DRILL PIPE
7	1545	1600	¼	RIG SERV FUNCTION UPPER PIPE RAMS CLOSED 7 SEC RSPP 7000 KPA SURGED 8500 KPA STD PIPE
1	1600	1915	3¼	DRILL 311 HOLE
8	1915	1930	½	REPAIR 4" VALVE ON MUD PUMP #2
1	1930	2045	1¼	DRILL 311 HOLE
7	2045	2100	¼	RIG SERVICE CROWN SAVER
1	2100	2130	½	DRILL
4	2130	2200	½	SURVEY @ 417
1	2200	2400	2	DRILL

HELD BOP DRILL W/CREW DRILL MODE
WITNESSED By Dave Ouellette
DRILLER: Francis Paquette

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	21½	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler #2		24.	HRS
TOTAL HOURS ACCOUNT TO SHELL		21½	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa	5	
INTAKE DENSITY (kg/m³)	1060	
OVERFLOW DENSITY (kg/m³)	1040	
UNDERFLOW DENSITY (kg/m³)	1200	

DESILTER	DAY	EVENING
HOURS RUN @ kPa	~~12~~	~~12~~
INTAKE DENSITY (kg/m³)	~~1200~~	~~1085~~
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa	12	12
INTAKE DENSITY (kg/m³)	1060	1085
OVERFLOW DENSITY (kg/m³)		~~1040~~
UNDERFLOW DENSITY (kg/m³)		~~1090~~

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.
LENGTH CUT OFF m		LENGTH SLIPPED m
MEGAJOULES SINCE LAST CUT MJ		PRESENT LENGTH m
CUMULATIVE MEGAJOULES MJ		

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
						35 m
1	EO			X		90 m
1	DM	78	X	225		903 m
1	SS	78	X	225		240 m
2	DC	72	X	238		1905 m
1	SM	73	X	225		454 m
1	DC	72	X	238		955 m
1	XO	70	X	171		78 m
18	DC	69	X	171		1725.6 m
1	XO	70	X	168		41 m
6	HO			X		548 1 m
				X		m
				X		m
6	D.P.	STANDS				1727.1 m
	D.P.	SINGLES				m
	KELLY DOWN					79.5 m
	TOTAL					455.05 m

WT. OF DC: 30 (1000 daN)
WT. OF STRING: 550 (1000 daN)

BOTTOMS-UP RATE

1080 m/min
1850 @ FLOW RATE m³/min

BIT RECORD

BIT NO.		2	
SIZE	(mm)	311	
IADC CODE			
MFG.		SMITH	
TYPE		SDGH	
SERIAL NO.		421901	
JETS (1/32")	(mm)	3/14/13	
DEPTH OUT	(m)		
DEPTH IN	(m)	311	
TOTAL METRES DRILLED	(m)	144	
TOTAL HRS. RUN		16¼	

CUT STRUC: D U L | I O D L | L B G O R

HOLE CONDITION

HOLE DRAG (daN)		NIL
TORQUE AT BOTTOM	(DP TURNS)	
FILL ON BOTTOM (m)		

REMARKS:

MUD RECORD

TIME	1400	1900	2300
DENSITY (kg/m³)	1060	1060	1060
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	86	36	47
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH	10	10	10
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	215kg		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RO-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
351 m	455 m	9¾		104		12000	95	13000		152	110	152	110		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
357	¼	S43W						
417	0	0						

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	1200	1430	½	DRILL 311 HOLE SPM 110 FLOW 17%
8	1430	1800	½	REPAIR POP VALVE NO1 PUMP
1	1800	1515	2¼	DRILL 311 HOLE
4	1515	1545	½	SURVEY WORK DRILL PIPE
7	1545	1600	¼	RIG SERV FUNCTION UPPER PIPE RAMS CLOSED 7 SEC RSPP 7000 KPA SURGED 8500 KPA STD PIPE
1	1600	1915	3¼	DRILL 311 HOLE
8	1915	1930	½	REPAIR 4" VALVE ON MUD PUMP #2
1	1930	2045	1¼	DRILL 311 HOLE
7	2045	2100	¼	RIG SERVICE CROWN SAVER
1	2100	2130	½	DRILL
4	2130	2200	½	SURVEY @ 417
1	2200	2400	2	DRILL

HELD BOP DRILL W/CREW DRILL MODE
WITNESSED By Dave Ouellette
DRILLER: Francis Paquette

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ARROWHEAD B-41 DATE: 89 02 01
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE: Toolpusher RIG NO.: 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARSNESS	12
DRKMAN		BARRY WRIGHT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH MCCARTY	12
FLRMAN			
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	12
DRKMAN		DEAN BIRO	12
MTRMAN		DENNIS BERTRAND	12
FLRMAN		ERWIN BERREAULT	12
FLRMAN			
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B-41

LOCATION: 60-30-8.49N 122-53-16.92W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: ATCO DRILLING — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE °C	-28
WIND SPEED km/h	
WIND DIRECTION	
WEATHER	

KILL SPEED

OP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD
127		E		162	4½IF

PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
1	NATIONAL		110	4800
2	NATIONAL			

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
455 m	m	m		89	02	02	

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	7.71	311	53	G	W/1% CACL²

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	10½		
2	TRIPS		4¼	
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	½	1½	
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR		½	½
9	CLEAN TO BOTTOM & CIRCULATING	1	¾	
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	TRIP & SERVICE		6½	
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
						35 m
1	EO			X		90 m
1	DM	78		X	225	9.03 m
1	SS	72		X	225	2.40 m
2	DC	72		X	238	19.05 m
1	JM	73		X	225	4.54 m
1	DC	72		X	238	9.55 m
1	½0	70		X	171	.78 m
18	DC	69		X	171	172.56 m
1	½0	70		X	168	.41 m
6	HW			X		54.86 m
				X		274.32 m
				X		m
9	D.P.	STANDS				258.84 m
1	D.P.	SINGLES				9.65 m
	KELLY DOWN					2.13 m
	TOTAL					560 m
WT. OF DC						80 1000 daN
WT. OF STRING						560 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		2	
SIZE	(mm)	311	
IADC CODE			
MFG.		SMITH	
TYPE		SDGH	
SERIAL NO.		LZ1207	
JETS (1/32")	(mm)	3/14.3	
DEPTH OUT	(m)		
DEPTH IN	(m)	311	
TOTAL METRES DRILLED	(m)		
TOTAL HRS. RUN		9¼	
DULL	CUT STRUC. I		
	O		
	D		
	L		
	B		
	G		
	O		
	R		

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS: ST

MUD RECORD

TIME	0300	0600	1200
DENSITY (kg/m³)	1100	1105	1110
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	45	55	56
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH	10	10.5	10.5
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl– (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	45 sx		
KELZAN	1 sx		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
455 m	517 m				F	12/15	95	1350		152	110	152	110		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
474	0	N 29 E						

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	0	0330	3½	DRILL 311 HOLE
4	0330	0400	½	SURVEY @ 474
1	0400	0800	4	DRILL
1	0800	1100	3	DRILL 311 HOLE
9	1100	1200	1	CIRCULATE UP BTTM SAMPLE — HELD SAFTY MEETING W/SHELL
4	1200			SURVEY @ 540 m.

DAILY Rig Inspection

DRILLER: T. L. Barsness

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ARROWHEAD B-41 — DATE: 890202

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		SHELDON BARSNESS	8
DRKMAN		BARRY WRIGHT	8
MTRMAN		ART WRIGHT	8
FLRMAN		KEITH MCCARTY	8
FLRMAN			
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	23½	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Baile #7	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		23½	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.

SIZE mm — # OF LINES — LENGTH SLIPPED m

LENGTH CUT OFF m — PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
						35 m
1	EO			X		90 m
1	DM	78		X	225	9.03 m
1	SS	72		X	225	2.40 m
2	DC	72		X	238	19.05 m
1	JM	72		X	225	4.54 m
1	DC	72		X	238	9.55 m
1	½0	70		X	171	.78 m
18	DC	69		X	171	172.56 m
1	½0	70		X	168	.41 m
6	HW			X		54.86 m
		BHA				274.32 m
				X		m
9	D.P.	STANDS				258.84 m
1	D.P.	SINGLES				9.65 m
	KELLY DOWN					2.13 m
	TOTAL					550 m
WT. OF DC						3800 1000 daN
WT. OF STRING						5600 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		2	3
SIZE	(mm)	311	215
IADC CODE			
MFG.		SMITH	HW
TYPE		SDGH	ATS-22
SERIAL NO.		LZ1207	258470
JETS (1/32")	(mm)	3/14.3	3/14.3
DEPTH OUT	(m)		
DEPTH IN	(m)		
TOTAL METRES DRILLED	(m)		
TOTAL HRS. RUN		26¾	
DULL	CUT STRUC. I		
	O		
	D		
	L		
	B		
	G		
	O		
	R		

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS:

MUD RECORD

TIME	1700		
DENSITY (kg/m³)	1110		
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	57		
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH	10		
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl– (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
517 m	550 m				CHECK PINION CLEARANCE ON BRAKE (15)										
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
4	1200	1830	½	SURVEY @ 540 m
9	1230	1245	¼	CIRCULATE
2	1245	1315	½	BLOW KELLY LAY DOWN TWO SINGLE HOIST BIT #2
8	1315	1345	½	FIX MAIN AIR LINE & HOLE FILL PUMP
2	1345	1430	¾	HOIST PIPE
21	1430	2100	6½	BREAK CIRCULATION BACK REAM 310 m
2	2100	2400	3	HOIST TO CHANGE BHA LAY DOWN 9" SHOCK SUB AND 9" JARS
			12	

DRILLER: R. L. Barsness

EVENING TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	8
DRKMAN		DEAN BIRD	8
MTRMAN		DENNIS BERTRAND	8
FLRMAN		ERWIN BERREAULT	8
FLRMAN			
FLRMAN			
DRILLER		RAY SOUCY	8
DRKMAN		BOB WANKE	8
MTRMAN		GARY BUCHBERGER	8
FLOORHAND		CHRIS ENTZ	8
FLOORHAND		ALLAN LARSEN	8

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B41

LOCATION: 60°30' 8.49"N 122°53'16.93"W — PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	-25 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Atco Drilling — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.06	E		162	4½IF	1	NATIONAL		46	1800
						2	NATIONAL		46	

LEGEND (METRIC DIMENSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

75 3/4

LAST CASING TUBING OR LINER

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
550 m	607 m	47 m	84	12	89	02	03

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	2.71	311	53	G	W1% CaCl2

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	4 1/4		4 1/4
2	TRIPS	5	5 3/4	10 3/4
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	1/4		1/4
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	1/2		1/2
8	RIG REPAIR			
9	CLEAR TO BOTTOM & CIRCULATING	1 1/2	2 1/4	3 3/4
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING		4	4
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	SAFETY MEETING	1/2		1/2
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. (mm)	X	O.D. (mm)	
						127 m
1	EC		175	X	180	.87 m
1	SS		65	X	170	2.34 m
1	Dm		70	X	170	8.63 m
16	DC			X	171	152.40 m
1	XO		70	X	168	.41 m
6	HW			X		54.81 m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
13	D.P.	STANDS				372 m
	D.P.	SINGLES				m
	KELLY DOWN					506 m
	TOTAL					597 m

WT. OF DC: 19000 (1000 daN)
WT. OF STRING: 51000 (1000 daN)

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	3
SIZE (mm)	215.9
IADC CODE	
MFG.	HW
TYPE	ATS22
SERIAL NO.	25840
JETS (1/64") (mm)	3 1 1 3
DEPTH OUT (m)	597
DEPTH IN (m)	550
TOTAL METRES DRILLED (m)	47
TOTAL HRS. RUN	4 1/4
DULL CUT STRUC.	I O D L / B G O R

HOLE CONDITION

HOLE DRAG (daN)
TORQUE AT BOTTOM (DP TURNS)
FILL ON BOTTOM (m)
REMARKS:

MUD RECORD

TIME	06 30		
DENSITY (kg/m³)	1110		
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	62		
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH	9.5		
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
550 m	597 m	47			FUEL .55	10,000	80	12500		152	110	152	110		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
590	3/4	DUE NORTH						

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
7	0030	0045	1/4	Rig Serv Function Test Blind Rams
2	0045	0415	3 1/2	Pick Monel, Shock Sub Bit Make BHA
				Run In Hole Pick Up 4 Stds.
9	0415	0530	1 1/4	Break Circ Clean 30m To Btm
7	0530	0545	1/4	Rig Serv
1	0545	1000	4 1/4	Drill 25
9	1000	1015	1/4	Circ Bottom Hole Sample
21	1015	1045	1/2	Rig Serv, Safety Meeting w/ Karl and Don
4	1045	1100	1/4	Survey
2	1100	1200	1	Blow Kelly, Dummy Trip
			12	

DRILLER: Francis Paquette

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: Shell Et Al Arrowhead B41 — DATE: 89/02/03

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

DAY TOUR

P.M. / A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Francis Paquette	12
DRKMAN		Dean Bird	12
MTRMAN		Allan Carsen	12
FLRMAN		Dennis Bertrand	12
FLRMAN		Ervin Berreault	12
FLRMAN			

NO. OF DAYS: — SINCE LAST LOST TIME ACCIDENT

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler #1	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		12
INTAKE DENSITY (kg/m³)		1100
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		1110

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)	1100	1100
OVERFLOW DENSITY (kg/m³)	1040	1090
UNDERFLOW DENSITY (kg/m³)	1750	1750

WIRELINE RECORD

REEL NO.
SIZE mm — # OF LINES — LENGTH SLIPPED m
LENGTH CUT OFF m — PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT MJ
CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. (mm)	X	O.D. (mm)	
						127 m
1	SB			X		19.67 m
1	E			X		.30 m
1	Dm		70	X	170	8.63 m
1	JM			X	1	4.54 m
16	DC			X	171	152.49 m
1	XO		70	X	168	.41 m
6	HW			X		54.81 m
				X		m
				X		m
				X		m
				X		m
				X		m
12	D.P.	STANDS				343.84 m
1	D.P.	SINGLES				961 m
	KELLY DOWN					12.43 m
	TOTAL					607 m

WT. OF DC: 19000 (1000 daN)
WT. OF STRING: 51000 (1000 daN)

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	5C
SIZE (mm)	215.9
IADC CODE	
MFG.	Hughes Christensen
TYPE	RC446
SERIAL NO.	061422
JETS (1/64") (mm)	11 11 10
DEPTH OUT (m)	
DEPTH IN (m)	597
TOTAL METRES DRILLED (m)	10 4
TOTAL HRS. RUN	
DULL CUT STRUC.	I O D L / B G O R

HOLE CONDITION

HOLE DRAG (daN)
TORQUE AT BOTTOM (DP TURNS)
FILL ON BOTTOM (m)
REMARKS:

MUD RECORD

TIME	1200	2000	0400
DENSITY (kg/m³)	1110	1090	1100
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	52	50	54
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH	9	9.5	9.0
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	2 SKS		
KELZAN	1 SK		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
597 m	607 m		10		CAL 540	4-6	60	5000				152	110		
m	m				MEDIUM 535										
m	m				OSAR1										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
9	1200	1315	1 1/4	Circ Hole Core Point (597) Check Blowdowns
2	1315	1430	1 1/4	Blow Kelly Hoist To Pick Up Core Barrel Lay Down Shock Sub Int Sub
3 1/2	1430	1745	3 1/4	Pick Up Core Barrel And Survey Too
2	1745	1900	1 1/4	Break Circ Clean 9m To Bottom Run In Hole
9	1900	2000	1	Break Circ Clean 9m To Bottom
18	2000	2400	4	Cut Core #1
			12	

Core #1 597 To 615 = 18m.
Formation: Basal Quartz.
Recovered 18m.

DRILLER:

EVENING TOUR

P.M. / A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	12
DRKMAN		Bob Wanke	12
MTRMAN		Gary Bockburger	12
FLRMAN		Chris Entz	12
FLRMAN		Herbie Berreault	12
FLRMAN			
LEASE		Earl Hope	12

NO. OF DAYS: — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B-41
LOCATION: 60° 30' 8.49"N 122° 53' 16.93"W
PROVINCE: NWT

WEATHER CONDITIONS
TEMPERATURE: -2 °C
WIND SPEED: km/h
WIND DIRECTION
WEATHER

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: ATCO DRILLING
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump–stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
607 m	645 m	38 m	91.5	13	89	02	04

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	07	311.86	7.71	311	53	6	W1% CACL²

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.02	E		162	4½IF	1	NATIONAL		50	1100 kPa
						2	NATIONAL		110	4100

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL		2¼	2¼
2	TRIPS	5¾	3¼	9
3	HANDLE TOOLS	1	2¾	3¾
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE	½		½
7	RIG SERVICE	¼		¼
8	RIG REPAIR			
9	CUT/RI TO BOTTOM & CIRCULATING		2	2
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING	5¾		5¾
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	BOP DRILL		1	1
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
1						14.1 m
1	CB			X		196.7 m
1	XO			X		.30 m
1	DM		70	X	170	8.63 m
1	JH		70	X	171	4.54 m
16	DC		70	X	169	152.49 m
1	XO		69	X	168	.41 m
6	HW		70	X	127	54.81 m
				X		m
				X		m
				X		m
				X		m
				X		m
13	D.P.		STANDS			372 m
	D.P.		SINGLES			964 m
	KELLY DOWN					1032 m
	TOTAL					633 m
WT. OF DC						38000 1000 daN
WT. OF STRING						52000 1000 daN

BOTTOMS–UP RATE
m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	1
SIZE (mm)	215.9
IADC CODE	
MFG.	EASTMAN
TYPE	RC476
SERIAL NO.	06/492
JETS /32nds (mm)	CLEAN
DEPTH OUT (m)	
DEPTH IN (m)	597
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L L / I O B / O D G / L O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	1000		
DENSITY (kg/m³)	1090		
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	55		
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH	9.5		
OIL VOL. FRAC.			
SAND VOL. FRAC.			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	5 SKS		
CAUSTIC	1 SKS		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
607 m	633 m					7/15	25	4300		152	110				
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
18	00⁰¹	0145	1 3/4	CUT CORE #1 — 50 STROKES 1100 KPA
2	0145	0445	3	BLOW KELLY ; TRIP OUT W/ CORE #1
3	0445	0545	1	BREAK DOWN CORE BBL RECOVER CORE - SERV RIG
2	0545	0800	2 1/4	TRIP IN W/ CORE #2, WASH 4m TO BOTTOM
18	0800	1130	3 1/2	CUT CORE #2
2	1130	1200	1/2	BLOW KELLY, HOIST CORE #2
				CHECK LEAKAGE AND PINE ON BRAKE
				HELD BOP DRILL W/ CREW
				TRIP TANK
				WITNESSED BY
				DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	1200	1330	1 1/2	HOIST CORE #2 LAY DOWN JARS
3	1330	1500	1 1/2	RECOVER SURVEY TOOL AND CORE #2
3	1500	1615	1 1/4	LAY DOWN CORE BARREL FUNCTION TEST BLIND RAMS
2	1615	1645	1/2	PICK UP SHOCK SUB MAKE UP BIT PICK UP JARS
21	1645	1715	1/2	BOP'S DRILL POSITION TALK W/ SHELL
18	1715	1745	1/2	SLIP 15m DRILLING LINE
7	1745	1800	1/4	RIG SERV, TOP PIPE RAMS.
2	1800	1915	1 1/4	RUN IN HOLE
9	19¹⁵	21¹⁵	2	REAM RAT HOLE 596m - 633m
1	21¹⁵	22³⁰	1 1/4	DRILL 215.9 HOLE — CORE #2 633 - 615 = 18m
21	22³⁰	23⁰⁰	1/2	BOP DRILL + DISCUSSION W/ SHELL
1	23⁰⁰	24⁰⁰	1	DRILL 215.9 HOLE
			12 HR	FORMATION: BASAL QUARTZ RECOVERED 18m
				HELD BOP DRILL W/ CREW
				TRIP TANK WITNESSED BY
				DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	2 3/4	HRS
EVALUATION	2065	21¼	HRS
COMPLETION			HRS
M 2.		24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER #1	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa	12 HRS	12 HRS
INTAKE DENSITY (kg/m³)	11.00	11.00
OVERFLOW DENSITY (kg/m³)	10.90	10.80
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa	12 HR	
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT			MJ
CUMULATIVE MEGAJOULES			MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
1						2.3 m
1	E			X		.87 m
1	SS			X		2.43 m
1	DM			X		98.63 m
1	DC			X		9.50 m
1	SM			X		1.54 m
15	DC			X		142.99 m
1	XO			X		.41 m
6	HW			X		54.81 m
				X		m
BHA				X		224.32 m
				X		m
				X		m
14	D.P.		STANDS			4008.8 m
	D.P.		SINGLES			m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						35000 1000 daN
WT. OF STRING						52000 1000 daN

BOTTOMS–UP RATE
m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	4RR
SIZE (mm)	215.9
IADC CODE	
MFG.	HW
TYPE	ATS2
SERIAL NO.	25840
JETS /32nds (mm)	3/14 3
DEPTH OUT (m)	597m
DEPTH IN (m)	633 639
TOTAL METRES DRILLED (m)	36
TOTAL HRS. RUN	2½ 2
CUT STRUC. D U L L / I O B / D G O R / L A	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	9.00	1600	2300
DENSITY (kg/m³)	1100	1090	1085
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	54	60	50
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH	9.5	9.5	9.5
OIL VOL. FRAC.			
SAND VOL. FRAC.			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	9 SKS		
CAUSTIC	1 SKS		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
633 m	645 m	2½	12		MUDSTONE 516	10,000	80	11500		152	95	152	95		
m	m				COAL 531										
m	m				.15 DRF										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	1200	1330	1 1/2	HOIST CORE #2 LAY DOWN JARS
3	1330	1500	1 1/2	RECOVER SURVEY TOOL AND CORE #2
3	1500	1615	1 1/4	LAY DOWN CORE BARREL FUNCTION TEST BLIND RAMS
2	1615	1645	1/2	PICK UP SHOCK SUB MAKE UP BIT PICK UP JARS
21	1645	1715	1/2	BOP'S DRILL POSITION TALK W/ SHELL
18	1715	1745	1/2	SLIP 15m DRILLING LINE
7	1745	1800	1/4	RIG SERV, TOP PIPE RAMS.
2	1800	1915	1 1/4	RUN IN HOLE
9	19¹⁵	21¹⁵	2	REAM RAT HOLE 596m - 633m
1	21¹⁵	22³⁰	1 1/4	DRILL 215.9 HOLE — CORE #2 633 - 615 = 18m
21	22³⁰	23⁰⁰	1/2	BOP DRILL + DISCUSSION W/ SHELL
1	23⁰⁰	24⁰⁰	1	DRILL 215.9 HOLE
			12 HR	FORMATION: BASAL QUARTZ RECOVERED 18m
				HELD BOP DRILL W/ CREW
				TRIP TANK WITNESSED BY
				DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ET AL ARROWHEAD — DATE: 89/02/04
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	12
DRKMAN		DEAN BIRD	12
MTRMAN		ALLAN LARSEN	12
FLRMAN		DENNIS BERTRAND	12
FLRMAN		ERWIN BERREAULT	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		BOB WANKE	12
MTRMAN		GARY BUCHBERGER	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		HERBIE BERREAULT	12
FLRMAN			
LEASE		EARL HOPE	12
WELDER		HUBERT FUGLESANG	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROW HEAD B-41

LOCATION: 60° 30' 8.49" N 122° 53' 16.73" W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: AEC Drilling — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC DIMENSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
645 m	667 m	22 m	96	14	89	02	05

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	7.71	311	53	6	W1% CACL2

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS (kPa) SWAC
127	29.02	E		162	4½IF	1	NATIONAL		110	4000
						2	NATIONAL			

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	4½		4½
2	TRIPS	4	1	5
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	¼		¼
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	¼		¼
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	2		2
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG	1	11	12
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	11	HRS
EVALUATION	2065	13	HRS
COMPLETION			HRS
BOILER #2		24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER #1	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa	12	
INTAKE DENSITY (kg/m³)	1085	
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)	1120	

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa	12	
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)	1080	
UNDERFLOW DENSITY (kg/m³)	1930	

WIRELINE RECORD — REEL NO.

SIZE mm	# OF LINES	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT		MJ
CUMULATIVE MEGAJOULES		MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm		
1		BIT				23.5	m
1	E			X	172	87	m
1	SS	GS		X	170	2.43	m
1	DM	7		X	170	8.63	m
1	DC	7		X	171	9.50	m
1	JM			X		4.54	m
15	DC	7		X	171	142.79	m
1	XO			X	168	.41	m
6	HW			X	137	54.81	m
				X			m
BHA				X		234.32	m
				X			m
15	D.P.	STANDS				429.11	m
1	D.P.	SINGLES				940	m
		KELLY DOWN				41.17	m
		TOTAL				667	m

WT. OF DC: 19 000 daN (1000 daN) — WT. OF STRING: 52 000 daN (1000 daN)

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min — 18% FLOW 98.9 m³ VOL

BIT RECORD

BIT NO.		4RR
SIZE	(mm)	215.9
IADC CODE		
MFG.		HW
TYPE		ATJ22
SERIAL NO.		25940
JETS (1/32")	(mm)	3/14.3
DEPTH OUT	(m)	667
DEPTH IN	(m)	633
TOTAL METRES DRILLED	(m)	34
TOTAL HRS. RUN		6¾

CUT STRUC: D U L L | I O D L | B G O R

K+ (1000 mg/L) — Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS:

MUD RECORD

TIME	01.00	05.00
DENSITY (kg/m³)	1085	1080
GRADIENT (kPa/m)		
FUNNEL VIS-(s/L)	55	60
PV/YP	/	/
GELS (Pa)	/	/
W.L. (cm³)		
F.C. (mm)		
pH	10	10
OIL VOL. FRAC.		
SAND VOL. FRAC.		

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	185 x		
KELZAN	15 x		
CAUSTIC	15 x		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
645 m	667 m	4½	22		MFA 605	8000	80	11000		152	110	152	110		
m	m				CAL 630	14000	60								
m	m				-25										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
660	.5°	N24E						

DAY TOUR — DETAILS OF OPERATION IN SEQUENCE AND REMARKS

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	00.01	04.15	4¼	DRILL 215.9mm HOLE — STRAP 668.40
7	04.15	04.30	¼	RIG SERV ✓REMOTE CHOKE
1	04.30	04.45	¼	DRILL 215.9mm HOLE — 667.00
9	04.45	05.15	½	CIRCULATE UP BTM HOLE SAMPLE — 1.40
2	05.15	07.00	1¾	BLOW KELLY 14 STD WIPER TRIP
9	07.00	08.30	1½	CIRC HOLE
4	08.30	08.45	¼	SURVEY
2	08.45	11.00	2¼	BLOW KELLY HOIST TO LOG — STRAP OUT LAY DOWN SHOCK SUB AND JARS
19	11.00	12.00	1	RIG UP LOGGER
			12	

LOGS
1/ PHASOR INDUCTION/ML-MSFL-GR-C 667m TO S.C.
2/ CNL-LDT-DAC-GR 667-S.C. — DAILY RIG WALK AROUND

3 CIR MUD IN TRIP TANK

DRILLER

EVENING TOUR — DETAILS OF OPERATION IN SEQUENCE AND REMARKS

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
19	12.00	22.30	10½	RUN LOGS
19	22.30	23.00	½	RIG OUT LOGGERS
2	23.00	24.00	1	MAKE UP RHA RIH

LOGS
3/ PHCS-GR-C
667m TO S.C.

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD B-41 — DATE: 89/02/05

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

DAY TOUR

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	12
DRKMAN		DEAN BIRD	12
MTRMAN		ALLEN LARSEN	12
FLRMAN		DENNIS BERTRAND	12
FLRMAN		ERWIN BERREAULT	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		BOB WANKE	12
MTRMAN		GARY BUCHBERGER	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		HERBIE BERREAULT	12
FLRMAN			
LEASE		EARL HOPE	12
WELD		HUBERT FERGUSON	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CP-225 (10/86)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B41
LOCATION: 60° 30' 8.49"N 122° 53' 16.93W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE
CONTRACTOR: ATCO DRILLING — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.02	E		162	4½IF	1	NATIONAL		110	4000
						2	NATIONAL			

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
667 m	667 m	NIL m	96		89	02	06

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	7.71	311	53	6	W1% CaCl2

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	5	4¼	9¼
3	HANDLE TOOLS	2¾	2	4¾
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	¼		¼
8	RIG REPAIR	½		½
9	CLEAN TO BOTTOM & CIRCULATING	3¼	¼	3½
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST		5	5
21	SAFETY MEETIN	¼	¼	½
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS		12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. (mm)	X	O.D. (mm)	
1		BIT		X		5354 m
	DC			X		171.52 m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
15	D.P.	STANDS				m
XX	D.P.	SINGLES				4474.7
	KELLY DOWN					328 m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min 19% Flow
104 m³

BIT RECORD

BIT NO.	HRR
SIZE (mm)	215.9
IADC CODE	
MFG.	HW
TYPE	ATJ22
SERIAL NO.	25840
JETS (1/32") (mm)	3X14 3
DEPTH OUT (m)	
DEPTH IN (m)	667
TOTAL METRES DRILLED (m)	CLEAN
TOTAL HRS. RUN	OUT
CUT STRUC. D U L L / I O B / O D G / L O R	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	0300
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ /
GELS (Pa)	/ /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	6 SKS		
CAUSTIC	1 SK		
KELZAN	1 SKS		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
667 m	m					—	40	4000		152	110	152	110		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	00⁰¹	00⁴⁵	¾	RIH
7	00⁴⁵	01⁰⁰	¼	RIG SERV FUNCTION UPPER PIPE RAMS CLOSED 8 SEC
9	01⁰⁰	01³⁰	½	WORK ON PUMPS
9	01³⁰	02⁰⁰	½	CLEAN 18m TO BTM 1m FILL
9	02⁰⁰	02³⁰	½	CIRCULATE W/ #1 PUMP
9	02³⁰	04⁴⁵	2¼	CIRCULATE W/ BOTH PUMPS
2	04⁴⁵	0800	3¼	HOIST FOR DST #1
21	0800	0815	¼	SAFETY MEETING ON PICK UP TEST TOOL
3	0815	1100	2¾	PICK UP TEST TOOL
2	1100	1200	1	RUNNING HOLE W/ DST #

DST #1 INTERVAL 633 TO 641m = 8m
FORMATION BASAL QUARTZ.

DAILY RIG WALK AROUND

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	HRS
EVALUATION	2065	23½ HRS
COMPLETION		HRS
BOILER #2		24 HRS
TOTAL HOURS ACCOUNT TO SHELL		23½ HRS
BOILER #1	2042	24 HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO. / LENGTH SLIPPED m	
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT		MJ	
CUMULATIVE MEGAJOULES		MJ	

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. (mm)	X	O.D. (mm)	
1	E			X 172		.88 m
				X		m
16	DC			X 171		171.52 m
				X		m
1	XO			X 164		.41 m
				X		m
6	HW			X 127		54.81 m
	INT	DERRICK		X		m
	EMA			X		227.62 m
				X		m
				X		m
				X		m
15	D.P.	STANDS				m
2	D.P.	SINGLES				441.7 m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min 87.8 m³

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (1/32") (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L L / I O B / O D G / L O R	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ /
GELS (Pa)	/ /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
667 m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
21	1200	1215	¼	SAFETY MEETING ON H₂S W/ TOOL PUSHER UNITED SAFETY (Crew Change)
20	1215	1715	5	MAKE UP AND TEST DST #1
2	1715	2000	2¾	BREAK FREE HOIST TO 550 FILL PIPE HOIST TO 353
9	20⁰⁰	20³⁰	½	353 BACK CIR HOLE 474 STK 4½m³ DISPLACEMENT
2	20³⁰	22⁰⁰	1½	HOIST TO DST #1 FUNCTION BLIND RAMS 5 SEC CLOSED.
23	22⁰⁰	24⁰⁰	2	BREAK DOWN DST #1 MAKE UP DST #2

DRILLER Francis Paquette

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL ET AL ARROWHEAD B41 — DATE 89/02/06
OPERATOR SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	12
DRKMAN		DEAN BIRD	12
MTRMAN		ALLEN LARSEN	12
FLRMAN		DENNIS BERTRAND	12
FLRMAN		ERVIN BERREAULT	12
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	
DRKMAN		BOB WANKE	
MTRMAN		GARY BRAHBERGER	
FLRMAN		CHRIS ENTZ	
FLRMAN			
FLRMAN			
LEASE		EARL HOPE	
WELDER		HUBERT FURGESON	

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B-41

LOCATION: 60° 30' 8.49" N 122° 53' 16.93" W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE

CONTRACTOR: ATCO DRILLING — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD
127	29.02	E		162	4½IF

PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
1	NATIONAL			
2	NATIONAL			

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
667 m	667 m	N/C m	96		89	02	07

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	2.21	311	53	G	W1% CACL²

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	2	4	6
3	HANDLE TOOLS	5	4	9
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING		4	4
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST	5		5
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE BIT	I.D. mm	X	O.D. mm	
	DST		X		m
	16 DC		X	171	171.54 m
			X		m
1	XO		X		.41 m
6	HW		X		54.81 m
			X		m
			X		m
			X		m
			X		m
			X		m
			X		m
			X		m
14	D.P.	STANDS			400.84 m
	D.P.	SINGLES			m
	KELLY DOWN				m
	TOTAL				621 m
	WT. OF DC				3800 (1000 daN)
	WT. OF STRING				44000 (1000 daN)

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min 91.6 m³

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (1/64") (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L L I O B G D L O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
667 m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
3	00⁰¹	0330	3½	LAY DOWN DST #1 PICK UP DST #2.
2	0330	0530	2	RIH W/ DST #2 DOUBLE STRAP IN.
3	0530	0700	1½	HEAD UP DST #2 INFLATE PACKER
20	0700	1200	5	DST #2 HELD H₂S SAFTY MEETING W/ UNITED. 621 - 632
			12	

DRILLER: B Seery

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
9	1200			PULL FREE HOIST DST #2 PULL TO STAND FILL PIPE
		1600	4	BACK CIRC MIN AND FORWARD CIRC at 610m
2	1600	1800	2	BLOW DOWN BELLY HOIST DST #2 FLOW CHECK & STAND OUT FLOW CHECK AT DC.
3	1800	2200	4	RIG OUT DST #2 AND LOAD UP TRUCK
2	2200	2400	2	PICK UP 9" STABILIZERS SHOCK SUB + JARS.

DRILLER: Francis Paquette

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	2	HRS
EVALUATION	2065	22	HRS
COMPLETION			HRS
BOILER #2		24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER 1	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT			MJ
CUMULATIVE MEGAJOULES			MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE BIT	I.D. mm	X	O.D. mm	
					.35 m
1	SU	73	X	224	1.46 m
1	DM	78	X	225	9.08 m
1	SU	73	X	224	1.80 m
1	DC	72	X	238	9.53 m
1	SS	72	X	225	2.40 m
1	DC	72	X	238	9.52 m
1	JM	73	X	225	4.54 m
1	DC	72	X	238	9.53 m
1	XO	70	X	171	.78 m
18	DC		X	171	172.56 m
1	XO		X	168	.41 m
6	HW		X	127	54.81 m
BHA	D.P.	STANDS			276.72 m
	D.P.	SINGLES			m
	KELLY DOWN				m
	TOTAL				m
	WT. OF DC				1000 daN
	WT. OF STRING				1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min 91.6m³

BIT RECORD

BIT NO.	RR
SIZE (mm)	311
IADC CODE	
MFG.	REED
TYPE	HASIA
SERIAL NO.	CPH657
JETS (1/64") (mm)	3/11
DEPTH OUT (m)	
DEPTH IN (m)	667
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L L I O B G D L O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m				MEA 280										
m	m				CnL 355										
m	m				275										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS

DRILLER: Francis Paquette

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL ET AL ARROWHEAD B41 — DATE 89/02/07

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	12
DRKMAN		DEAN BIRD	12
MTRMAN		ALLEN LARSEN	12
FLRMAN		DENNIS BERTRAND	12
FLRMAN		~~ERWIN CARPENTER~~	
FLRMAN		TODD KRYWAY	2

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		BOB WANKE	12
MTRMAN		GARY BUCHBERGER	12
FLRMAN		CHRIS ENTZ	12
FLRMAN			
FLRMAN			
LEASE		EARL HOPE	12
WELDER		HOBERT FURGESON	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B41

LOCATION: 60° 30' 8,49"N 122° 53' 16,93"W — PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: HTCO DRILLING — RIG NO. 48 — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.02	E		162	4½IF	1	NATIONAL		110	5500
						2	NATIONAL		110	5500

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
667.55 m	643 m	93 REAM m	101¼		89	08	08

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.86	7.71	311	53	6	W 1% CACL²

TIME DISTRIBUTION – HOURS

CODE SEQ.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	8½	3	11½
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE		¼	¼
8	RIG REPAIR	2½		2½
9	CLEAN TO BOTTOM & CIRCULATING	1	3½	4½
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING		5½	5½
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm	X	O.D. mm	
1	BIT					45 m
	BS		223	X	79	91 m
	DC		228	X	78	903 m
	SS		224	X	73	240 m
2	DC		238	X	72	1905 m
	STAB		225	X	73	454 m
1	DC		238	X	73	953 m
1	XO		170	X	70	78 m
18	DC		170	X	70	17256 m
1	XO		169	X	69	41 m
6	HW		127	X	70	5481 m
		BHA		X		274 m
				X		m
12	D.P.	STANDS				m
2	D.P.	SINGLES				36.56 m
	KELLY DOWN					5.97 m
	TOTAL					643 m

WT. OF DC: 32000 1000 daN
WT. OF STRING: 55000 1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	8RR
SIZE (mm)	311
IADC CODE	
MFG.	REED
TYPE	HP51A
SERIAL NO.	696137
JETS (32nds) (mm)	3/14/9
DEPTH OUT (m)	
DEPTH IN (m)	550 REAM
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	5½
CUT STRUC. D U L L	I O D L B G O R
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)
TORQUE AT BOTTOM (DP TURNS)
FILL ON BOTTOM (m)
REMARKS:

WELL FILE
Ken

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS-(s/L)				
PV/YP	/	/	/	/
GELS (Pa)	/	/	/	/
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
550 m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	00⁰¹	0300	3	MAKE UP BHA RIH TO 335m
8	0300	0530	2½	WORK ON MUD PUMPS
9	0530	0680	1	BREAK CIRC REAM 335m - 347m
2	0680			PUMP OUT 4 SINGLES HOIST OUT OF HOLE HOIST TO CHANN
		1030	4	BHA LAYDOWN 3 STBS
2	1030	1200	1½	MAKE BHA RUN IN HOLE

Daily Rig Work Around

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	1200			RUN IN HOLE SLOW BREAK CIRC ~~1350~~ LAYDOWN
		1500	3	9 SINGLE RUN IN 3 STAND PICK UP KELLY
9	1500			CBEAM FROM 437 TO 527 LAYDOWN 8 SINGLE
		1830	3½	RUN IN 3 STAND CLEAN FROM 527 TO 550
14	1830	2230	4	DRILL RAT FROM 550 TO 621
7	2230	2245	¼	RIG SERV FUNCTION UPPER PIPE RAM 7 SEC CLOSED
14	2245	2400	1¼	DRILL RAT HOLE FROM 621 - 643

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	21½ HRS
EVALUATION	2065	HRS
COMPLETION		HRS
BOILER #2		24 HRS
TOTAL HOURS ACCOUNT TO SHELL		21½ HRS
BOILER #1	2042	24 HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		12
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		1180

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		12
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		1080
UNDERFLOW DENSITY (kg/m³)		1450

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT MJ			
CUMULATIVE MEGAJOULES MJ			

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD B41 — DATE: 89/02/08

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		FRANCIS PAQUETTE	12
DRKMAN		DEAN BIRD	12
MTRMAN		ALLEN LARSEN	12
FLRMAN		TODD KRYWAY	10
FLRMAN		DENNIS BERTRAND	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		BOB WANKE	12
MTRMAN		GARY BUCHBERGER	12
FLRMAN		CHRIS FENTZ	12
FLRMAN			
FLRMAN			
LEASE		EARL HOPE	12
WELD		HUBER FURGESON	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B41
LOCATION: 60° 30' 8.49" N 122° 53' 16.93" W
PROVINCE: N.W.T.

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: Arco Drilling
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.02	E		162	4½IF	1	NATIONAL			
						2	NATIONAL		64	7500

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
667 m	791 m	124 m	122 3/4		89	02	09

LAST CASING TUBING OR LINER

	O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
	339.7	314	27	311.86	7.71	311	53	6	W1%CACL²

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	8 1/4	10 1/4	18½
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK		1	1
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	1/4	1/4	½
8	RIG REPAIR	½	½	1
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING	3		3
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm X O.D. mm	
1	Fe⁹	76 X 223	91	m
1	Dm	73 X 225	9.03	m
1	SS	73 X 224	2.40	m
2	DU	72 X 238	19.05	m
1	SH	73 X 225	4.54	m
1	DU	73 X 238	9.55	m
1	X6	70 X 190	.73	m
18	DU	70 X 170	182.56	m
1	X6	CA X 165	.41	m
6	MW	70 X 127	54.81	m
		BIT X	274.47	
		X		m
		X		m
17	D.P.	STANDS		m
2	D.P.	SINGLES	504.68	m
		KELLY DOWN	11.85	m
		TOTAL	791	m

WT. OF DC: 45000 (1000 daN)
WT. OF STRING: 58000 (1000 daN)

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min 34.1 m³
16% ↑

BIT RECORD

BIT NO.		8RR		
SIZE	(mm)	311		
IADC CODE				
MFG.		REED		
TYPE		HP51A		
SERIAL NO.		699637		
JETS (32nds)	(mm)	3/11/9		
DEPTH OUT	(m)			
DEPTH IN	(m)	667		
TOTAL METRES DRILLED	(m)	124		
TOTAL HRS. RUN		18 1/2		

CUT STRUC.: D | U | L | I | O | D | L | B | G | O | R

HOLE CONDITION

HOLE DRAG (daN)
TORQUE AT BOTTOM (DP TURNS)
FILL ON BOTTOM (m)
REMARKS:

MUD RECORD

TIME	01:00	05:00	08:00
DENSITY (kg/m³)	1085	1090	10.90
GRADIENT (kPa/m)			
FUNNEL VIS-(s/L)	75	66	64
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)		2.5	8
F.C. (mm)			
pH	10	10	10.5
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	1 SKS		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
643 m	667 m	3	2-1			13/16	50/70	15000		152	110	152	110		
667 m	686 m	7 3/4													
686 m	705 m	7 1/4													

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

TIME FROM	TIME TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
00:01	03:00	3	REAM RAT HOLE 643 - 667
03:00	09:45	6 3/4	DRILL 311 HOLE
09:45	10:00	1/4	RIG SER, ✓ BTM PIPE RAMS.
10:00	11:30	1 1/2	DRILL 311 HOLE
11:30	12:00	1/2	REPAIR WASHED #2 PUMP MUDVALE
			Daily Walk around Inspection

DRILLER: Francis Paquette

EVENING TOUR

TIME FROM	TIME TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
12:00	12:30	1/2	REPAIR WASHED #2 PUMP MUDVALE
12:30	15:45	3 1/4	DRILL
15:45	16:15	1/2	SURVEY @ 711 m
16:15	21:00	4 3/4	DRILL — CHOKE CONTROL KILL SPEED 64 SPM @ 2500 kPa
21:00	21:15	1/4	SERVICE RIG + CREATE ANNULAR PREVENTER CLOSE 18 SEC + OPEN
21:15	21:45	1/2	SURVEY @ 760 m
21:45	24:00	2 1/4	DRILL

DRILLER: Ray Soucy

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		12
INTAKE DENSITY (kg/m³)		1080
OVERFLOW DENSITY (kg/m³)		1035
UNDERFLOW DENSITY (kg/m³)		1890

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT		MJ	
CUMULATIVE MEGAJOULES		MJ	

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD B41 DATE: 89/02/09
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE: RIG NO.: 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS	
DRILLER		FRANCIS PAQUETTE	8	10
DRKMAN		DEAN BIRD	8	10
MTRMAN		ALLEN LARSEN	8	10
FLRMAN		TODD KRYWAY	8	10
FLRMAN		DENNIS BERTRAND	8	10
FLRMAN				

EXTRA HOURS FOR WHMIS TRAINING 1800

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

1200 P.M. 2400 A.M.

CREW	SOC. INS. NO.	NAME	HOURS	
DRILLER		RAY SOUCY	10	
DRKMAN		GARY BUCHBERGER	10	
MTRMAN		CHRIS ENTZ	10	
FLRMAN		DOUG HOOD	4	
~~FLRMAN~~		EARL HOPE	10	
FLRMAN		EXTRA HOURS FOR WHMIS TRAINING		1800
LEASE		ROBERT BERTRAND	4	
DRILLER		ROBERT HOPE	8	
DRKMAN		ALEX SCOTT	8	
MTRMAN		ART WRIGHT	8	
FLRMAN		KEITH MCCARTY	8	
FLRMAN		DAN MORRILL	8	
LEASEMAN		HENRY BERTRAND	8	
LEASEMAN		JULIAN SASSIE	8	

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-22S (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B-41

LOCATION: 60° 30' 8.49"N 122° 53' 16.93"W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: ATCO DRILLING — RIG NO.: 48 — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
791 m	954 m	163 m	144	19	89	02	10

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.36	7.71	311	83	6	w/1% CaCl²

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.02	E		162	4½IF	1	NATIONAL	235		
						2	NATIONAL	235	88	2000

KILL SPEED

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	10	11¼	21¼
2	TRIPS	1½		1½
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	¼	½	¾
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE		¼	¼
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD	¼		¼
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	BIT			45 m
1	EDB	28 X 222		91
1	DM	73 X 225	9.03 m	
1	SS	73 X 224	2.40 m	
2	DU	72 X 238	19.65 m	
1	SH	73 X 226	4.54 m	
1	DU	73 X 239	9.56 m	
1	X6	76 X 170	.79 m	
18	DU	76 X 170	172.56 m	
1	X6	69 X 168	.41 m	
6	HW	70 X 127	54.81 m	
		BHA	274.47 m	
		X	m	
		X	m	
21	D.P.	STANDS	600.26 m	
	D.P.	SINGLES	m	
	KELLY DOWN		3.3 m	
	TOTAL		878 m	

WT. OF DC: 45 (1000 daN)
WT. OF STRING: 60,000 (1000 daN)

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min
Flow % 17
PBT 882.5

BIT RECORD

BIT NO.		BHA		
SIZE	(mm)	311		
IADC CODE				
MFG.		REED		
TYPE		HP51A		
SERIAL NO.		699637		
JETS (1/64)	(mm)	3/11/9		
DEPTH OUT	(m)			
DEPTH IN	(m)	667		
TOTAL METRES DRILLED	(m)	211		
TOTAL HRS. RUN		29½		

CUT/STRUC.: D U L L | I B | O G | D L | O R

HOLE CONDITION

HOLE DRAG (daN)	0-1
TORQUE AT BOTTOM (DP TURNS)	4
FILL ON BOTTOM (m)	Nil

REMARKS:

MUD RECORD

TIME	12:00	17:00	08:00
DENSITY (kg/m³)	1090	1095	1095
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	77	61	64
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)	7.8	7.6	7.8
F.C. (mm)			
pH	10.5	10.5	10.0
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
DESANDER			
OF		UF	
11.00		10.15	

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
791 m	878 m	16	87		FUEL 54.	15/17	69/70	17000		152	110	152	110		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
817	0	N						

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	0000	0045	¾	DRILL 311 mm HOLE SAFETY MEETING W/CREW (RD)
9	0045	0100	¼	CIRC HOLE
2	0100	0230	1½	WIPER TRIP 10 STAND @ 801 NO FILL ON BOTTOM
	0230	0515	2¾	DRILL
	0515	0530	¼	SURVEY
	0530	0800	2½	DRILL
	0800	1200	4	DRILL

Daily Walk around Inspection

DRILLER:

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler ⅔	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa	12	12
INTAKE DENSITY (kg/m³)	1100	1100
OVERFLOW DENSITY (kg/m³)	1015	1090
UNDERFLOW DENSITY (kg/m³)	1115	1115

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa	12	12
INTAKE DENSITY (kg/m³)	1110	1110
OVERFLOW DENSITY (kg/m³)	1100	1090
UNDERFLOW DENSITY (kg/m³)	1910	1950

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	
LENGTH CUT OFF m		LENGTH SLIPPED m	
MEGAJOULES SINCE LAST CUT MJ		PRESENT LENGTH m	
CUMULATIVE MEGAJOULES MJ			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	BIT			45 m
1	EDB	27 X 223		91
1	DM	78 X 225	9.03 m	
1	SS	73 X 221	2.40 m	
1	DU	72 X 238	19.05 m	
1	SH	73 X 225	4.54 m	
1	DU	73 X 233	9.55 m	
1	X6	76 X 170	.79 m	
18	DU	76 X 170	172.56 m	
1	X6	69 X 168	41 m	
6	HW	70 X 127	548 m	
		BHA	274.47 m	
		X	m	
		X	m	
23	D.P.	STANDS	658.81 m	
	D.P.	SINGLES	97.0 m	
	KELLY DOWN		11.77 m	
	TOTAL		954 m	

WT. OF DC: 45 (1000 daN)
WT. OF STRING: 60 (1000 daN)

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min
PUMP 12:00 89.5
Flow % 17
PBT 2980. 882.4
FLO 90 16

BIT RECORD

BIT NO.		8 RR		
SIZE	(mm)	311		
IADC CODE				
MFG.		REED		
TYPE		HP51A		
SERIAL NO.		699637		
JETS (1/64)	(mm)	3/11/9		
DEPTH OUT	(m)			
DEPTH IN	(m)	667		
TOTAL METRES DRILLED	(m)	287		
TOTAL HRS. RUN		39¾		

CUT/STRUC.: D U L L | I B | O G | D L | O R

HOLE CONDITION

HOLE DRAG (daN)	—
TORQUE AT BOTTOM (DP TURNS)	—
FILL ON BOTTOM (m)	—

REMARKS: Pump 16 L/min Water in Mud

MUD RECORD

TIME	12:00	16:00	20:00
DENSITY (kg/m³)	1095	1110	1110
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	64	66	71
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)	7.8	8.0	8.4
F.C. (mm)			
pH	10.0	10.0	10
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	15K		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
878 m	954 m	11¼	76			17,000	55/60	17600		152	110	152	110		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
877	¼°	N16W						

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	1530	3½	DRILL — SERVICE #1 MUD PUMP
	1530	1545	¼	RIG SERVICE OPERATE ANNULAR CLOSE 15 SECS + OPEN KILL STAND #2 55 SPM @ 2000
	1545	1615	½	SURVEY @ 877
	1615	1200	7¾	DRILL
			12	

HELD BOP DRILL W/ CREW + CREWS
SAFETY MEETING
OPERATE HYDRIL CLOSE 17 SECS + OPEN
OPERATE REMOTE CHOKE O.K.

GREASED CROWN + TRAVELLING BLOCKS

DRILLER:

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD — DATE: 89/02/10

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

DAY TOUR 0600 – 1200

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRYWAY	12
FLRMAN		CHRIS FRITZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	12
LEASE		ROBERT BERTRAND	12

NO. OF DAYS: — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR 1200 – 2400

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		REGGIE HODGE	12
DRKMAN		ALEX SCOTT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH MCARTY	12
FLRMAN		DAVE MORRELL	12
FLRMAN			
LEASE		JULIAN SASSIE	12
LEASE		HENRY BERTRAND	12

NO. OF DAYS: — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B41
LOCATION: 60° 30' 849"N 122° 53' 1693"W
PROVINCE: NWT

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: ATCO DRILLING
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
940 m	1051 m	111 m	156.50	20	89	02	11

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.02	E		162	4½IF	1	NATIONAL 9P100	235	30	3200
						2	NATIONAL 9P100	235		

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.36	7.71	311	53	6	w/1° CAL²

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	10 3/4	1 3/4	12 1/2
2	TRIPS		5 1/4	5 1/4
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	1		1
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	1/4		1/4
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING		5	5
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	FG	98 X 225	.91	m
1	Dm	78 X 225	9.03	m
1	SS	73 X 224	2.40	m
2	DU	72 X 238	18.05	m
1	SH	73 X 225	4.54	m
1	DU	73 X 238	9.55	m
1	No	70 X 170	.78	m
18	DU	70 X 170	172.56	m
1	No	69 X 168	.41	m
6	No	70 X 127	54.81	m
		BHA	274.47	m
		X		m
		X		m
26	D.P.	STANDS		m
1	D.P.	SINGLES	754.38	m
		KELLY DOWN	7.65	m
		TOTAL	1035	m
WT. OF DC			43000	1000 daN
WT. OF STRING			63100	1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min
16-17%
38 PUT

BIT RECORD

BIT NO.		7RR
SIZE	(mm)	311
IADC CODE		
MFG.		REED
TYPE		MP9A
SERIAL NO.		697637
JETS (1/32)	(mm)	3/14
DEPTH OUT	(m)	
DEPTH IN	(m)	667
TOTAL METRES DRILLED	(m)	368
TOTAL HRS. RUN		50 1/2

CUT STRUC.: D | U | I | O | D | L | L | B | G | O | R

HOLE CONDITION

HOLE DRAG (daN)	0-1
TORQUE AT BOTTOM (DP TURNS)	1/4
FILL ON BOTTOM (m)	NIL

REMARKS: HOLE GOOD ON CONNECTIONS
NO FILL AFTER SURVEY

MUD RECORD

TIME	00:00	04:00	08:00
DENSITY (kg/m³)	1110	1110	1110
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	70	85	70
PV/YP	/	/	/
GELS (Pa)			
W.L. (cm³)	8.4	8	8
F.C. (mm)			
pH	10	10.5	10.0
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	18 SKS		
CAUSTIC	1 SKS		
SAWDUST	10 SKS.		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
954 m	1035 m	18 3/4	3 1		FUEL 1.90	16/17	65	17900		152	110	152	110		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
940	1 1/4	N64E						

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
4	0000	0030	1/2	SURVEY at 940 BOP DRILL - CLOSED IN DRILL WITH DRILL MODE & OPEN HCR APPROPRIATE CHOKE
	0030	0800	7 1/2	DRILL
	0800	0830	1/2	SURVEY @ 995
	0830	0945	1 1/4	DRILL
	0945	1000	1/4	SERVICE RIG OPERATE TPPRams CLOSE 6 SECS + OPEN KILL SPEED #1 30 SPM @ 3200 KPA
	1000	1200	2	DRILL
				Daily Walk around Insp.
				DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	1700	1345	1 3/4	DRILL (Held Safety Meeting w/ Crew)
9	1345	1445	1	SERVICE RIG (CROWN) HOLE + MUD WORK PT
2	1445	1700	2 1/4	DUMMY TRIP MEASURE DRILLPIPE TO BHA HOLE TITE TO 1050 - 750
2	1700	1715	1/4	PUH BOP DRILL w/ CREW OUTSIDE TRIPPING - INSTALL STABBING VALVE + OPERATE HYDRIL CLOSE + OPEN
2	1715	2000	2 3/4	RUNIN BRIDGED @ 830 REAM 20m 830-850 RUN INTO 870
9	2000	2400	4	REAM 870 TO 965
			12	
				DRILLER

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
1035 m	m														
830 m	965 m	1 3/5			Ream	6/15	55	11000		152	80	152	80		
m	1051 m	1/6													

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
995	1°	N57E						

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	
LENGTH CUT OFF m		LENGTH SLIPPED m	
MEGAJOULES SINCE LAST CUT MJ		PRESENT LENGTH m	
CUMULATIVE MEGAJOULES MJ			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	10.97	98 X 225	.91	m
1	DM	78 X 225	9.03	m
1	SS	73 X 224	2.40	m
2	DU	72 X 238	18.05	m
1	SH	73 X 225	4.54	m
1	DU	73 X 238	9.55	m
1	No	70 X 170	.78	m
18	DU	70 X 170	172.56	m
1	No	69 X 168	.41	m
6	No	70 X 127	54.81	m
		BHA	274.47	m
		X		m
		X		m
26	D.P.	STANDS		m
XX	D.P.	SINGLES	766.14	m
		KELLY DOWN	16.38	m
		TOTAL	1051	m
WT. OF DC			45000	1000 daN
WT. OF STRING			63000	1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min
19% PR 97.1

BIT RECORD

BIT NO.		8RR
SIZE	(mm)	311
IADC CODE		
MFG.		REED
TYPE		M91A
SERIAL NO.		697637
JETS (1/32)	(mm)	3/14
DEPTH OUT	(m)	
DEPTH IN	(m)	667
TOTAL METRES DRILLED	(m)	384
TOTAL HRS. RUN		52 1/4

CUT STRUC.: D | U | I | O | D | L | L | B | G | O | R

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME	12:00	16:00	20:00
DENSITY (kg/m³)	1110	1110	1
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	71	70	R
PV/YP	/	/	
GELS (Pa)			
W.L. (cm³)	8.0		P
F.C. (mm)			
pH	10.0	10.00	U
OIL VOL. FRAC.			
SAND VOL. FRAC.			N
K+ (1000 mg/L)			
Cl- (1000 mg/L)			G

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	1 SK		
SAWDUST	10 SKS.		

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD DATE: 89/02/11
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

DAY TOUR 24⁰⁰ P.M. 12⁰⁰ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRYWAY	12
FLRMAN		CHRIS FENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	8
LEASE		BOBERT BERTRAND	12

NO. OF DAYS: SINCE LAST LOST TIME ACCIDENT

EVENING TOUR 12⁰⁰ P.M. 24⁰⁰ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		ROBERT HODGE	12
DRKMAN		ALEX SCOTT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH McCARTY	12
FLRMAN		DAVID MORRIS	12
FLRMAN			
LEASE		JULIEN SASSIE	12
LEASE		HENRY BERTRAND	12

NO. OF DAYS: SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHEHA ETAH ARROWHEAD 1341

LOCATION: 60° 30' 849"N 122° 53' 1683"W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: ATCO DRILLING — RIG NO. 48 — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

WEATHER CONDITIONS

TEMPERATURE	-12 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

156½

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
1051 m	1056 m	5 m	137	21	89	02	12

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.02	E		162	4½ IF	1	NATIONAL 9P100	235	80	32 00
						2	NATIONAL 9P100	235		

KILL SPEED

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	3113.6	7.71	311	53	G	W/1 °CAL 2

TIME DISTRIBUTION – HOURS

CODE ADD.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	1½		1½
2	TRIPS	3¼		3¼
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	¼		¼
8	RIG REPAIR	1		1
9	CLEAN TO BOTTOM & CIRCULATING	6¼		6¼
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG	3¼	9¼	10
20	DRILL STEM TEST			
21	RIG UP TEAR DOWN	2¾	2	3¾
22				
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	14	HRS
EVALUATION	2065	10	HRS
COMPLETION			HRS
Boiler #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		12
INTAKE DENSITY (kg/m³)		1115
OVERFLOW DENSITY (kg/m³)		1100
UNDERFLOW DENSITY (kg/m³)		1555

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD — REEL NO. 2

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED m

LENGTH CUT OFF m — PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT 10016 MJ

CUMULATIVE MEGAJOULES 55458 MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1		BIT		45 m
1	EOP	311 X 223		91 m
1	DPM	78 X 225	903	m
2	DU	72 X 238	1805	m
1	BH	73 X 233	454	m
1	DU	73 X 239	955	m
1	MO	70 X 170	78	m
18	DU	70 X 170	17256	m
1	MO	69 X 169	41	m
6	MWT	70 X 127	3481	m
		BHA	2713.49	m
		X		m
		X		m
		X		m
27	D.P.	STANDS	77584	m
	D.P.	SINGLES		m
	KELLY DOWN		667	m
	TOTAL		105603	m
WT. OF DC			45000	1000 daN
WT. OF STRING			63000	1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	8RR
SIZE (mm)	311
IADC CODE	
MFG.	REED
TYPE	HPSIA
SERIAL NO.	699637
JETS (1/64) (mm)	3 11 9
DEPTH OUT (m)	
DEPTH IN (m)	667
TOTAL METRES DRILLED (m)	389
TOTAL HRS. RUN	52¾

CUT STRUC.: D U L L | I 1 | O 6 | D T | L H | B E | G S | O G | R D

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS:

MUD RECORD

TIME	00:00 / 04:00 / 0600
DENSITY (kg/m³)	1130 / 1130 / 1120
GRADIENT (kPa/m)	
FUNNEL VIS-(s/L)	98 / 120 / 80
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	7.4 / / 8.0
F.C. (mm)	
pH	9.5 / 9.2 / 9.5
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	65 Sk		
CAUSTIC	1 SK		
SODACOAST	10 SK		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
1051 m	1056 m	½			FUEH 2.30 m										
m	m				COMP # 5540										
m	m				# 5430										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
7	0000	0015	¼	Rig Srvd Function Test Lower Pipe Rams Closed Psr
9	0015	0415	4	Ream To Bottom 965 To 1051
1	0415	0430	¼	Drill
8	0430	0530	1	Work On Kelly Hose
1	0530	0545	¼	Drill
9	0545	0800	2¼	Circ Hole Clean Work DP
2	0800	0915	1¼	Blow Kelly & Hose Out To Log
2	0915	0930	¼	Flo = & Hwt Install Stabbing Valve / Mcr's Fill Up Record
2	0930	1115	1¾	Hoist BHA & Lay Down Shock Sub & Drilling Jars
19	1115	1200	¾	Rig Up Loggers & Run In w/ Loggers
				RUN #1 LOGGING
				PHASOR-DMES-GR-CAL ITD - 550m CAL TO S.C.
				RUN #2 LOGGING
				CNL-LDT-DAC-SP ITD - 550m DAC TO S.C.
				Daily walk around Inspect

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
19	1200	2315	9¼	Logging — Tally 1056
21	2115	2400	2¾	Running Hole In Spect 170 DC On Tlfish — Slm 1054.85
			12	Dif 1.15
				Serviced #2 Pump

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHEHA ETAH ARROWHEAD — DATE 89/02/12

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO. 48

DAY TOUR 2400 P.M. 1200 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	4
LEASE		ROBERT BERTAND	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR 1200 P.M. 2400 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		ROBERT HODGE	12
DRKMAN		ALEX SCOTT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH McGRATY	12
FLRMAN		DAVID MORRILL	12
FLRMAN			
LEASE		JULIEN SASSIE	12
LEASE		HENRY BERTRAND	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B41

LOCATION: 60° 30' 849"N 122° 53' 169"W — PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE

CONTRACTOR: ATCO Drilling — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	2902	E		162	4½ IF	2	NATIONAL 9P100	235	80	3200
						2	NATIONAL 9P100	235		

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

15

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
1056 m	1056 m	— m	157	22	89	02	13

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG. HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
339.7	314	27	311.36	2.71	311	53	6	W/1% CAL²

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	5 3/4		5 3/4
3	HANDLE TOOLS	2 1/4		2 1/4
4	DIRECTIONAL WORK	1/2		1/2
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	2 1/2	2	4 1/2
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT	1	10	11
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT			
1		FC9778	X9455		97 m
1	DW	78	X9256		903 m
2	DW	72	X9236		1805 m
1	311	73	X8238		454 m
1	DW	73	X9238		955 m
1	1/0	70	X120		78 m
14	DW	70	X170		1727.81 m
1	1/0	69	X168		41 m
6	HOST	70	X127		54.91 m
		BHA			271.34 m
		X			m
		X			m
		X			m
27	D.P.	STANDS			778.84 m
	D.P.	SINGLES			m
	KELLY DOWN				8.82 m
	TOTAL				1056 m

WT. OF DC: 4580 (1000 daN)

WT. OF STRING: 6,700 (1000 daN)

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	8RR
SIZE (mm)	311
IADC CODE	
MFG.	REED
TYPE	HYCALOG
SERIAL NO.	L69677
JETS (32nds) (mm)	3 X 11
DEPTH OUT (m)	1056
DEPTH IN (m)	667
TOTAL METRES DRILLED (m)	389
TOTAL HRS. RUN	52¾
CUT STRUC. (D U L / I O D L / L B G O R)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME			04:00
DENSITY (kg/m³)	T		10.90
GRADIENT (kPa/m)	R		
FUNNEL VIS.-(s/L)	I		60
PV/YP	P	/	/
GELS (Pa)	P	/	/
W.L. (cm³)			-
F.C. (mm)			
pH	N		9.5
OIL VOL. FRAC.	6		
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	6 SKS		
CAUSTIC	1 SKS		
KELZAN	1 SKS		
SAWDUST	10 SKS		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m				EUEK 2.00	-	-	13560		152	90	152	90		
m	m				COMP 1 SB960										
m	m				2 6450										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
~~1056~~								
1043	3/4	N83E						

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
3	0000	0215	2¼	INSPECT DC AND KELLY LAY DOWN ONE DC PICK UP ONE DC
2	0215	0315		RUN IN HOLE SLOW TO 300 INSTALL STABBING VALVE ABOVE
		0345	1/2	HOR. CLOSED HYDRIL CHOKE REMOTE CHOKE
9	0345	0415	1/2	BREAK CIRC CLEAN 8 m TO BOTTOM
9	0415	0615	2	CIRC CONDITION MUD CLEAN HOLE
4	0615	0645	1/2	SURVEY
2	0645	0830	1¾	HOIST TO RUN CASING
2	0830	0915	¾	FLOW CHECK FILL UP RECORD INSTALL STABBING VALVE
2	0915	1100	1¾	HOIST DOG LAY DN 228 mm EQUIPMENT
15	1000	1200	1	RIG UP TO RUN CASING CHANGE TOP PIPE RAMS TO 4½

Walk Around Rig Inspection

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
15	1200	2200	10	RIG UP TO RUN CASING. PULL WEAR BUSHING & PSI TEST RAM BONNETS 7,000 KPA 15 MINS
9	2200	2400	2	Rig Tool Circ. Casing

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT		MJ	
CUMULATIVE MEGAJOULES		MJ	

DRILLING ASSEMBLY AT END OF TOUR
BIT RECORD
MUD RECORD
HOLE CONDITION
BOTTOMS-UP RATE
METRES DRILLED
DEVIATION RECORD
DAY TOUR
EVENING TOUR

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL ETAL ARROWHEAD — DATE 89/02/13

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HODE	12
LEASE		ROBERT BERTAND	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — 1200 P.M. — 2400 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		ROBERT HODGE	12
DRKMAN		ALEX SCOTT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH MCKAY	12
FLRMAN		DAVID MORRILL	12
FLRMAN			
LEASE		JULIEN SASSIE	12
LEASE		HORT BERTAND	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B41

LOCATION: 60° 30' 849" N 122° 53' 1693" W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: ATCO DRILLING — RIG NO. 48 — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS (kPa)
127	2902	E		162	4½ IF	2	NATIONAL 9P100	235	80	3200
						2	NATIONAL 9P100	235		

KILL SPEED

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
1056 m	m	m	157	23	89	02	14

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057.59		1056	51	0-1-0	1'G"
								20% EXCESS.

TIME DISTRIBUTION – HOURS

CODE (NO.)	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	5		5
3	HANDLE TOOLS	2½		2½
4	DIRECTIONAL WORK			
5	TEST B.O.P.	4½		4½
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	3½	2	3½
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT	3½	15	3½
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.	15½	12	17½
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	23½	12	24

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO. / LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT		MJ
CUMULATIVE MEGAJOULES		MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	O.D. mm	X	O.D. mm	m
				X		
				X		
				X		
				X		
				X		
				X		
				X		
				X		
				X		
				X		
				X		
				X		
				X		
				X		
		D.P.	STANDS			
		D.P.	SINGLES			
		KELLY DOWN				
		TOTAL				

WT. OF DC — 1000 daN
WT. OF STRING — 1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.				
SIZE (mm)				
IADC CODE				
MFG.				
TYPE				
SERIAL NO.				
JETS (32nds) (mm)				
DEPTH OUT (m)				
DEPTH IN (m)				
TOTAL METRES DRILLED (m)				
TOTAL HRS. RUN				
CUT STRUC. D U L L / I O D L / B G O R				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

HOLE CONDITION

HOLE DRAG (daN)		
TORQUE AT BOTTOM (DP TURNS)		
FILL ON BOTTOM (m)		
REMARKS:		

MUD RECORD

TIME	00:00	04:00		
DENSITY (kg/m³)	1120	1110		
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	61	51		
PV/YP	/	/	/	/
GELS (Pa)				
W.L. (cm³)	8.8	9.2		
F.C. (mm)				
pH	9	9		
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m				FUEL 226			3010		152	110	152	110		
m	m			1	6186 (casing 412)										
m	m			2	7450										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
9	0000	0300	3	CIRC CASING
7 5	0300	0315	¼	SAFETY MEETING
15	0315	0630	3¼	HEAD UP PRESSURE TEST LINE AND CEMENT
17	0630			NIPPLE DOWN BOP'S SET SLIP SET SLIPS w/ CASING IN TENSION 45 000 daN
	1200		5½	

Please put on well file. R

WALK around Rig 2130

DRILLED 3¼ m HOLE TO 1056 m. RAN 89 JTS (1057.59 m) 244.5 mm, 53.6 kg/m K55 STC NEW NIGOMA CSG LANDED @ 1056 m KB. CEMENT w/ 51 TONNES 0-1-0 CLASS "G" w/ .75% HALAD 322 USED 20% EXCESS FROM CALIPER LOG. DISP w/ 42.0 m³ WATER FULL RETURNS THROUGHOUT CEMENT TOB. PRESS TEST CSG TO 10 000 KPA/10 MIN ALL OK

DRILLER

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
17	1200	2400	12	NIPPLE UP CASING HANGER CUT CASING FLOWLINE PRESSURE TEST MANIFOLD LINE CHANGE OUT CASING RAMS
				PRESSURE TEST ALL MANIFOLD LINE VALVES, BOP SHAFFER CHOKE LINE VALVES STABBING VALVE INSIDE BOP LOW KELLY COCK LOW TEST 1500 KPa HIGH TEST 35000 KPa 10 MIN EACH ALL OK.
				CHECK ALL PRECHARGE BOTTLES ON ACCUMULATOR ALL @ 8200 KPA
				PRESS TEST UPPER KELLY INT LOW 1500 KPA HIGH 21000 KPA

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL ETAL ARROWHEAD B41 — DATE 89/02/14

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO. 48

DAY TOUR

12⁰⁰ P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD BRYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		AARL HOPE	12
LEASE		ROBERT BERTRAND	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

12⁰⁰ P.M. 24⁰⁰ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		ROBERT HODGE	12
DRKMAN		AZAK SCOTT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH McCAFFREY	12
FLRMAN		DAVID MORRILL	12
FLRMAN			
LEASE		HENRY BERTRAND	12
LEASE		JULIEN SASSIE	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B41
LOCATION: 60°30 849 122° 53" 1693 "W
PROVINCE: NWT

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: HTCO DRILLING
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:
RIG NO.: A8

WEATHER CONDITIONS

TEMPERATURE	-30 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
1056 m	1056 m	— m	151	24	89	02	15

LAST CASING TUBING OR LINER

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.02	E		162	4½IF	1	NATIONAL	235		
						2	NATIONAL	235		

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057.57		1056	51	010	6"

TIME DISTRIBUTION – HOURS

CODE	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.	9½		9½
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING		4½	4½
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P. & FLOW LINE	2½	4	6½
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	N.U. & TEST B.O.P.		3½	3½
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm	X	O.D. mm	
1	BIT					m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (1/64") (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L / I O D L / L B G O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS.-(s/L)	
PV/YP	/ /
GELS (Pa)	/ /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m				Fye 1063.0-7.00m										
m	m				1/64420										
m	m				2/85.70 Recov. 4.4m										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	0000			FINISH CHANGING RAMS, PICK UP SINGLE DRILL PIPE MAKE UP TEST PLUG INSTALL SAME PRESURE HYDRIL UPPER AND LOWER PIPE RAM LOW KILL LINE LOW 1500 High 35000
		0930	9½	10 MIN Test Upper & Lower Kelly Cocks " " 10 MIN
	0930			Pickup Grant Head To Rig in Air Drillers
		1200	2½	
				Press Test Csg to 18000 KPA 15 MIN.
				Accumulator Check Shell Procedure
				Start Press 22500 KPA
				After Function 8500 KPA
				Press up Time Both Pumps @ 11th
				one Pump 9½ in 11.

DRILLER: R Soucy

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	1600	4	Tie Down Grant Head & Tie in Blow Line to Flare Pit
	1600	1900	3	Run in w/ Magnet to fish for BOP Bolt Operate Accumulator
				Rig for Skirt Test Defeat Flow to Tank Worked
	1900	2230	3½	on Mud Trunk and Drive Shaker
	2230	2400	1½	Work Magnet on Bottom.
			12	

DRILLER:

Canada Oil and Gas Land Regulation
MAR 06 1989
Northern Region

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
#2 RAZLER	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL	CWO# 86972	24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT			MJ
CUMULATIVE MEGAJOULES			MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm	X	O.D. mm	
1	BIT					m
1	M86			X	.50	m
1	BS			X	.87	m
18	DU			X	17.81	m
6	DP			X	54.54	m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
28	D.P.	STANDS			704.42	m
	D.P.	SINGLES				m
3	KELLY DOWN				3.00	m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (1/64") (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L / I O D L / L B G O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS.-(s/L)	
PV/YP	/ /
GELS (Pa)	/ /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m				Fye 1124 Rec. 4.0			2000		152	190				
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	1600	4	Tie Down Grant Head & Tie in Blow Line to Flare Pit
	1600	1900	3	Run in w/ Magnet to fish for BOP Bolt Operate Accumulator
				Rig for Skirt Test Defeat Flow to Tank Worked
	1900	2230	3½	on Mud Trunk and Drive Shaker
	2230	2400	1½	Work Magnet on Bottom.
			12	

DRILLER:

Canada Oil and Gas Land Regulation
MAR 06 1989
Northern Region

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ET AL ARROWHEAD
DATE: 89/02/15
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRAYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		[illegible]	
FLRMAN		DOUG HOOD	12
LEASE		EARL HOPE	12
LEASE		ROBERT BERTRAND	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

12⁰⁰ P.M. 24⁰⁰ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		ROBERT HOUSE	12
DRKMAN		ALEX SCOTT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KEITH McCARTY	12
FLRMAN		DAVID MORRILL	12
FLRMAN			
LEASE		JULIEN SASSIE	12
LEASE		HENRY BERTRAND	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B41

LOCATION: 60° 30' 849 122° 53" 1693" W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE: [signature]

CONTRACTOR: [illegible] — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: [signature] — RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	-30 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	Cold

KILL SPEED

SPM	PRESS. (kPa)

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
1056 m	1056 m	m		25	89	02	16

LAST CASING TUBING OR LINER

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)
127	29.02	E		162	4½IF	1	NATIONAL	235
						2	NATIONAL	235

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057		1056	51	G10G	

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	9¼	3	12¼
3	HANDLE TOOLS	1¼	3/4	2
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	½		½
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE MUD		5	5
13	STUCK OR FISHING	1		1
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	DRILL OUT		3¼	3¼
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. (mm)	X	O.D. (mm)	
1		BIT				185 m
1	EQ		176	X	89	.91 m
1	DR		167	X	73	8.62 m
18	DU		171	X	70	172.56 m
1	XO		168	X	69	.41 m
6	HW		127	X	70	54.81 m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
28	D.P.	STANDS				804.89 m
1	D.P.	SINGLES				9.65 m
	KELLY DOWN					2.90 m
	TOTAL					1055.00 m
WT. OF DC						1000 daN
WT. OF STRING						62000 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	9
SIZE (mm)	219
IADC CODE	
MFG.	J+L
TYPE	VGHJ
SERIAL NO.	C1704
JETS (1/64") (mm)	OPEN
DEPTH OUT (m)	
DEPTH IN (m)	1056
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L L / I O D L / B G O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
1056 m	m					R/S	50	3000		152	116				
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
T	0000	0030	½	Rig Serv, Blow Kelly
2	0030	0300	2½	Hoist to check Magnet
3	0300	0415	1¼	Build Shoe for Magnet
2	0415	0530	1¼	Run in Hole w/ Magnet
13	0530	0630	½	Break Circ. Work Magnet From 1036 to 1039 m.
2	0630	0800	1½	Hoist to check Magnet.
2	0800	0900	1	Chain Out w/ Magnet + Recover Fish
2	0900	1200	3	Pickup Motor, Make up Bit, Orient BHA + Trip in Hole Bit #9

Fuel Add Drlg Tank 6.5m From Top.

Jazzy Rig Inspection

DRILLER: [signature]

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION WO# 06972			HRS
Boiler #2		24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER #1	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	
LENGTH CUT OFF m		LENGTH SLIPPED / PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT			MJ
CUMULATIVE MEGAJOULES			MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD B41 — DATE: 89/02/16

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: [signature] — RIG NO.: 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	8
DRKMAN		Gary Buchberger	8
MTRMAN		Todd Kriway	8
FLRMAN		Chris Entz	8
FLRMAN		Doug Hood	8
FLRMAN			
LEASE		Earl Hope	8
LEASE		Robert Bertrand	8

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — 1200 P.M. — 2400 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	8
DRKMAN		Alex Scott	8
MTRMAN		Art Wright	8
FLRMAN		Keith McCarty	8
FLRMAN		David Morrill	8
FLRMAN			
LEASE		Julian Sassie	8
LEASE		Henry Bertrand	8
DRILLER		Dennis Olsen	8
DRKMAN		Dave Millar	8
MTRMAN		Dean Bird	8
FLRMAN		Alain Larsen	8
FLRMAN		Ron Petersen	8
LEASE		Dennis Bertrand	8
LEASE		Brian Hope	8

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
1056 m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	1200	1400	2	Run in, Install Rotating Head Rubber
21	1400	1715	3 ¼	Drill Out Cement To 1055 m
3	1715	1800	¼	Rig up Floor & Drill w/ Air
12	1800	2000	2	Displace Hole w/ Air
2	2000	2030	½	Hoist 10 Stds
12	2030	2100	½	Displace Hole w/ Air
2	2100	2130	½	Run in Hole To 1055
12	2130	2145	¼	Displace Hole w/ Air
12	2145	2400	2 ¼	Blow Hole Dry – Hold Safety Meeting w/ Crews

Held BOP Drill + Fire Safety Meeting w/ Crew Witnessed by Dave Cepitt

DRILLER: [signature]

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60° 30' 34" 122° 53' 16" 53" W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Arco Drilling — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: — RIG NO. 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

DP SIZE (mm)	UNIT MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT. O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.90	E	93	162	4" IF	1	National	235		
						2	National	235		

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

	DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE: MONTH	DAY
	1056 m	1285 m	229 m	168 1/2	26	89	02	17

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.70	1056	51	0-1-0	"G"

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	1/2	10	11 1/2
2	TRIPS	4 1/2		4 1/2
3	HANDLE TOOLS	3 1/4		3 1/4
4	DIRECTIONAL WORK		1 3/4	1 3/4
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE		1/4	1/4
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	2 3/4		2 3/4
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE WIRE			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	DRILL OUT			
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	O.D. mm	X	I.D. mm		
1						1.20	m
1	3L		73	X	170	1.97	m
1	DM		73	X	167	8.62	m
1	SU		74	X	171	1.73	m
1	AF		75	X	176	.64	m
2	DU		69	X	170	19.25	m
1	SH		64	X	171	4.34	m
15	DU		69	X	170	143.69	m
1	AF		74	X	169	.56	m
1	DU		69	X	169	9.62	m
1	XO		69	X	168	.41	m
6	HW	127 mm 5"	127	X	70	54.81	m
			BHA			246.84	m
			X				m
	D.P.		STANDS				m
	D.P.		SINGLES				m
	KELLY DOWN						m
	TOTAL						m
WT. OF DC						20.6	1000 daN
WT. OF STRING							1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	9	10
SIZE (mm)	219	219
IADC CODE		
MFG.	SHL	Mission
TYPE	HZH5	MDCH
SERIAL NO.	CA764	U7668
JETS (1/32") (mm)	—	—
DEPTH OUT (m)	1064	
DEPTH IN (m)	1066	1064
TOTAL METRES DRILLED (m)	8	
TOTAL HRS. RUN	1	
CUT STRUC. D U L	1	1
CUT STRUC. I O D L	WT	A
CUT STRUC. B G O R	1	WT

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP	/	/	/	/
GELS (Pa)	/	/	/	/
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-F CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
1056 m	1064 m	1 1/2	S												
m	m				Accumulator @ 1.35m										
m	m				Morning Tour 1.30										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
12	00 60	01 30	1 1/2	Hold Safety Meeting w/ Boneyard Crew Blow Hole Dry Tidy Up Rig Prior To Drill Out Shoe
~~21~~	~~01 30~~			
21	01 30	02 30	1	Drill Out — 1054 to 1064m
2	02 30	04 15	1 3/4	Pull Rotating Rubber & Trip Out To Pick Up Hammer & BHA
3	04 15	06 15	2	Handle BHA Pick up Air Hammer Ass
2	06 15	08 00	1 3/4	Run In w/ Hammer
2	0800	0900	1	Run In Hole w/ Air Hammer
3	0900	1015	1 1/4	Pull Mouse Hole To Clean + Weld Holes On Bottom
9	1015	1130	1 1/4	Rotate + Circulate w/ Air To Bottom
1	1130	1200	1/2	Drill 219 mm Hole w/ Hammer.

Daily Rig Walk Around
Held BOP Drill w/ Crew & Air Raid Meeting Witnessed By Dave Millar

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: Shell et al Arrowhead B-41 — DATE: 89/02/17

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO. 48

DAY TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Art Wright	12
FLRMAN		Keith McCarty	12
FLRMAN		David Morrill	12
FLRMAN			
LEASE		Julius Sassie	12
LEASE		Henry Bertrand	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24.	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
#2 Boiler	2042	24.	HRS
TOTAL HOURS ACCOUNT TO SHELL	C.I.O.# D6972	24	HRS
BOILER #1	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD — REEL NO.

SIZE	# OF LINES	LENGTH SLIPPED
32 mm	10	8 m

LENGTH CUT OFF 0 m — PRESENT LENGTH 1788 m

MEGAJOULES SINCE LAST CUT 15024 MJ

CUMULATIVE MEGAJOULES 90470 MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	O.D. mm	X	I.D. mm		
						1.20	m
1	3L		73	X	170	1.97	m
1	DM		73	X	167	8.62	m
1	SU		74	X	171	1.73	m
1	AF		75	X	176	.64	m
2	DU		69	X	170	19.25	m
1	SH		64	X	171	4.34	m
15	DU		69	X	170	143.69	m
1	AF		74	X	169	.56	m
1	DU		69	X	169	9.62	m
1	XO		69	X	168	.41	m
6	HW	127 mm 5"	127	X	70	54.81	m
			BHA			246.84	m
35	D.P.		STANDS			1025.46	m
2	D.P.		SINGLES			12.57	m
	KELLY DOWN						m
	TOTAL					1285.17	m
WT. OF DC						20.000	1000 daN
WT. OF STRING						72.000	1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	10
SIZE (mm)	219
IADC CODE	
MFG.	Mission
TYPE	MDCH
SERIAL NO.	U7668
JETS (1/32") (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	1064
TOTAL METRES DRILLED (m)	221
TOTAL HRS. RUN	10 1/2
CUT STRUC. D U L	1
CUT STRUC. I O D L	
CUT STRUC. B G O R	1

HOLE CONDITION

HOLE DRAG (daN)	3000
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	Blooied Air To 45m³ @ 2100 Hrs

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP	/	/	/	/
GELS (Pa)	/	/	/	/
W.L. (cm³)				
F.C. (mm)	AIR			
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-F CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
1064 m	1285 m	10	ZZ1			1000	150	1900	42 45m³						
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
1120	.75°	553E	1187	1°	S75E	1247	1/2°	S46E

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	12 00	15 00	3	Drill 219 mm Hole w/ Hammer
	15 00	15 45	3/4	Survey @ 1120
	15 45	18 45	3	Drill 219 mm Hole w/ Hammer.
	18 45	19 15	1/2	Survey @ 1199
	19 15	22 30	3 1/4	Drill 219 mm Hole w/ Hammer.
	22 30	22 45	1/4	Rig Service + Rotate w/ Head Clamp & Fully Drive Bushing
	22 45	23 15	1/2	Survey @ 1247
	23 15	24 00	3/4	Drill w/ Air Hammer

DRILLER

EVENING TOUR — 12 00 P.M. — 24 00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olsen	12
DRKMAN		Dave Millar	12
MTRMAN		Dean Bird	12
FLRMAN		Allan Larsen	12
FLRMAN		Ron Petersen	12
FLRMAN			
LEASE		Dennis Bertrand	12
LEASE		Brian Hope	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

GRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell Gtd Arrowhead B41

LOCATION: 60° 13' 849" N 122° 53' 1693" W — PROVINCE: BC

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Arctic Drilling — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
1285 m	1681 m	396 m	184 3/4	27	89	02	18

KILL SPEED

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.70	1056	51	0-1-0	G

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.00	E	93	162	4 1/2 IF	1	NATIONAL	235		
						2	NATIONAL	235		

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	8 1/2	7 3/4	16 1/4
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	2	2 3/4	4 3/4
5	REAM O.D.P.	1/2	1 1/2	1 2
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING		4 3/4	
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.	2 1/2	4	
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	[illegible]	1 1/2	3/4	1 1/2
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE			
1	MFT		170	1.20 m
1	MSSH	73 X 127	73 X 127	1.97
1	DM	73 X 167		8.62 m
1	SH	74 X 171		1.73 m
1	AF	75 X 176		.64 m
2	DH	69 X 170		19.25 m
1	SH	64 X 171		4.34 m
15	DH	69 X 170		143.69 m
1	AF	74 X 169		.56 m
1	DH	69 X 169		9.62 m
1	X0	64 X 168		.41 m
6	HW	73 162 X 70		54.84 m
		BHA		246.84 m
		X		m
42	D.P.	STANDS		1209.50 m
1	D.P.	SINGLES		9.73 m
		KELLY DOWN		10.93 m
		TOTAL		1477.00 m
WT. OF DC			20000	1000 daN
WT. OF STRING			77000	1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		10		
SIZE	(mm)	219		
IADC CODE				
MFG.		MISSION		
TYPE		MDCH		
SERIAL NO.		J7668		
JETS	(mm)			
DEPTH OUT	(m)			
DEPTH IN	(m)	1064		
TOTAL METRES DRILLED	(m)	413		
TOTAL HRS. RUN		18		

CUT STRUC.: D U L | I O D L | B G O R

HOLE CONDITION

HOLE DRAG (daN)	3-4	
TORQUE AT BOTTOM (DP. TURNS)	1/3	
FILL ON BOTTOM (m)		

REMARKS:

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS.-(s/L)				
PV/YP				
GELS (Pa)				
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Caustic	150		
Kelzan XCD	25		

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24.	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
#2 BOILER	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL (CWH# 16972)		24.	HRS
BOILER #1	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED 0 m

LENGTH CUT OFF 0 m — PRESENT LENGTH 1758 m

MEGAJOULES SINCE LAST CUT 15024 MJ

CUMULATIVE MEGAJOULES 90470 MJ

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
1285 m	1477 m	7 3/4	RR			0-1	15	2100	45						
m	m	8 1/2			ACCUMULATOR 3.5										
m	m				MARINE FUEL 1.95										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
1306	3/4°	S 41 E	1363	1/2°	S 43 E	1427	1/2°	S 9 W

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	0000			H2S Combustible Gas Alarm Went Off, Went in To Bop Preventer Crew To Upwind Briefing Area ✓ Out Rig w/ Gas Meter
Z1		0015	1/4	All Clear
1	0015	0200	1 3/4	Drill Ahead
4	0200	0245	3/4	Survey @ 1306 Tag Wells Dove
1	0245	0545	3	Drill w/ Air Hammer
4	0545	0630	3/4	Survey @ 1363 ✓ Rotating Head Clean & Kelly Drive Bushing
1	0630	0800	1 1/2	Drill
1	0800	0830	1/2	Drill
4	0830	0900	1/2	Survey @ 1427
1	0900	1015	1 1/4	Drill 219 mm Hole.
21	1015	1130	1 1/4	Gas to Surface @ 1468m. Cleared Area For Gas Safety Check. Air Press Increase 2100 KPA To 2700 KPA - Work Rpr - Gas Approved Back To Work
1	1130	1200	1/2	Drill 21T mm Hole Daily Rig Walk Around ✓

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	1200	1315	1 1/4	Drill 219 mm Hole
4	1315	1400	3/4	Survey @ 1494 Rig Service
1	1400	1615	2 1/4	Drill 219 mm Hole
4	1615	1700	3/4	Survey @ 1552.
1	1700	1915	2 1/4	Drill 219 mm Hole
4	1915	2000	3/4	Survey @ 1609
1	2000	2030	1/2	Drill w/ Air Hammer
5	2030	2200	1 1/2	Tag 28m Off Btm & Blow Bobs Blow Back To Btm Servicing
1	2200	2330	1 1/2	Drill
	2330	2400	1/2	Survey @ 1661

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: Shell Gtd Arrowhead B41 — DATE: 89/02/18

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

DAY TOUR — 2400 P.M. — 1200 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Art Wright	12
FLRMAN		Keith McCarty	12
FLRMAN		David Morris	12
FLRMAN			
LEASE		Julien Sassis	12
LEASE		Henry Bertrand	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — 1700 P.M. — 2400 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olsen	12
DRKMAN		Dave Millar	12
MTRMAN		Dean Bird	12
FLRMAN			
FLRMAN		Alan Larsen	12
FLRMAN		Ron Petersen	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

GRAINSET

CP-225 (10/86)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B41

LOCATION: 60° 13m 849 N 122° 53m 1693 W — PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	−16 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: **Shell Canada Limited** — SIGNATURE OF SHELL'S REPRESENTATIVE

CONTRACTOR: ATCO Drilling — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

	DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
	1681 m	1874 m	193 m	195 3/4	28	89	02	19

LAST CASING TUBING OR LINER	O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
	244.5	222	89	1057	6.70	1056	51	01-0	G

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS (kPa)
127	29.00	E	93	162	4 1/2 IF	1	NATIONAL 9-P-100	235		
						2	NATIONAL 9-P-100	235		

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	7 1/4	3 3/4	11
2	TRIPS	2 3/4	4 1/2	7 1/4
3	HANDLE TOOLS		1/2	1/2
4	DIRECTIONAL WORK	1 1/2	3/4	2 1/4
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE		1	1
7	RIG SERVICE BOP TEST	1/2		1/2
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING		3/4	3/4
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	Lay D.P.		3/4	3/4
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE			
1	BIT		170	1.20 m
1	DM	73 X 167	8.62 m	
1	SU	74 X 171	1.73 m	
1	AF	75 X 176	.64 m	
2	DU	69 X 170	19.25 m	
1	JH	64 X 171	4.34 m	
15	DU	69 X 170	143.69 m	
1	AF	74 X 169	.56 m	
1	DU	69 X 169	9.62 m	
1	XO	69 X 168	.41 m	
6	HW	127 mm X 70	54.84 m	
		BHA	246.84 m	
		X	m	
54	D.P.	STANDS	1555.13 m	
	D.P.	SINGLES	6.03 m	
	KELLY DOWN		1808.00 m	
	TOTAL		m	
WT. OF DC			20,000 1000 daN	
WT. OF STRING			1000 daN	

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		10
SIZE	(mm)	219
IADC CODE		
MFG.		HOSHIZAKI
TYPE		MDCH
SERIAL NO.		V47669
JETS (32nds)	(mm)	
DEPTH OUT	(m)	1808
DEPTH IN	(m)	1066
TOTAL METRES DRILLED	(m)	742
TOTAL HRS. RUN		33
CUT STRUC. D U L L	I O D L	1 / 1 - WT - I / NO TD
	B G O R	

HOLE CONDITION

HOLE DRAG (daN)		0-3
TORQUE AT BOTTOM	(DP TURNS)	1/2
FILL ON BOTTOM (m)		.50m

REMARKS: .50m Fill At Survey
Hole Working Good

Kelly In 6.60m
Razor to Trip.

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP				
GELS (Pa)				
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	1SK		
KELZAN	2SK		
Baroid	2.5 SX		
Soda Ash	1.0 SX		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
1681 m	1808 m	7 1/4	127			0-1	15	2730	55						
m	m				ARROWHEAD LEAD										
m	m				MEASURED FROM	1.72 m									

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
1661	1/2°	N 24 W	1720	3/4°	S 89 W	1780	1 1/4	N 14 W

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
4	00:00	00:15	1/4	Survey @ 1661 Rot. Survey Lower Kelly Hose & Bushing & Rotate Head Clamp
1	00:15	03:30	3 1/4	Drill
4	03:30	04:15	3/4	Survey @ 1720
1	04:15	08:00	3 1/4	Drill
4	08:00	08:30	1/2	Survey @ 1780
1	0830	0845	1/4	Drill Drill To 1808
2	0845	0915	1/2	Blow Hole Clean Pull Grant Rubber
2	0915	0945	1/2	Pull 10 Stds + Install Grant Rubber
7	0945	1015	1/2	Blow out Bop's + Function Test Lower+Upper Rams, Hydril
2	1015	1200	1 3/4	Pull Grant Rubber + Pdh, w/Hammer

Daily Rig Work Around

Released Crown + Traveling Blocks Derrick Sheaves

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24. HRS
EVALUATION	2065	HRS
COMPLETION		HRS
#2 Boiler	2042	24 HRS
TOTAL HOURS ACCOUNT TO SHELL	Cust# 56992	24 HRS
BOILER	2042	24 HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO. 2

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED 13 m

LENGTH CUT OFF 15 m — PRESENT LENGTH 1993 m

MEGAJOULES SINCE LAST CUT 5337 MJ

CUMULATIVE MEGAJOULES 96333 MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE			
1	BIT		170	1.20 m
1	DM	73 X 167	8.62 m	
1	SU	74 X 171	1.73 m	
1	AF	75 X 176	.64 m	
2	DU	69 X 170	19.25 m	
1	JH	64 X 171	4.34 m	
15	DU	69 X 170	143.69 m	
1	AF	74 X 169	.56 m	
1	DU	69 X 169	9.62 m	
1	XO	69 X 168	.41 m	
6	HW	127 mm X 70	54.84 m	
		BHA	246.84 m	
		X	m	
56	D.P.	STANDS	m	
1	D.P.	SINGLES	1620.74 m	
	KELLY DOWN		6.50 m	
	TOTAL		1574 m	
WT. OF DC			20,000 1000 daN	
WT. OF STRING			85,000 1000 daN	

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		11
SIZE	(mm)	219
IADC CODE		
MFG.		HOSHIZAKI
TYPE		MDCH
SERIAL NO.		V47669
JETS (32nds)	(mm)	
DEPTH OUT	(m)	
DEPTH IN	(m)	1808
TOTAL METRES DRILLED	(m)	66
TOTAL HRS. RUN		3 3/4
CUT STRUC. D U L L	I O D L	
	B G O R	

HOLE CONDITION

HOLE DRAG (daN)		0-3
TORQUE AT BOTTOM	(DP TURNS)	1/2
FILL ON BOTTOM (m)		Nil

REMARKS: Boosting @ 2000 Hrs
To 57m³

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP				
GELS (Pa)				
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
1808 m	1874 m	3 3/4	66			0-1.5	20	2730	55						
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
1840	1 1/4°	N 1 E						

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	1200	1315	1 1/4	Pdh w/Hammer
3	1315	1345	1/2	Change out B.T + Hammer
2	1345	1500	1 1/4	RIH w/ #11 + Hammer
6	1500	1600	1	Slip is cut 15 m Drill Line - Set Crown Stopper.
2	1600	1800	2	Run in Hole
2	1800	1845	3/4	Clean out Flare P.T w/ Backhoe
9	1845	1930	3/4	Rotate + Circulate 3 Singles To Bottom
	1930	2215	2 3/4	Drill
	2215	2300	3/4	Survey @ 1840
	2300	2400	1	Drill

DRILLER

CRAINSET

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL ET AL ARROWHEAD B41 — DATE 89/02/19

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

DAY TOUR

2400 P.M. — 1200 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Art Wright	12
FLRMAN		Keith McCarty	12
FLRMAN		David Morrill	12
FLRMAN			
LEASE		Julien Sassie	12
LEASE		Henry Beatdand	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

_____ P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olsen	12
DRKMAN		Dave McKar	12
MTRMAN		Dean Bird	12
FLRMAN			
FLRMAN		Allan Larsen	12
FLRMAN		Ron Petersen	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD I341

LOCATION: 00 130° 849 N 122° 53' 1693 W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: AKITA DRILLING — RIG NO.: 48 — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

SPM	PRESS. (kPa)

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
1874 m	2205 m	331 m	213	29	89	02	20

LAST CASING TUBING OR LINER

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	27.00	E	93	162	4½IF	1	NATIONAL	235		
127	29.00	G	93	162		2	NATIONAL	235		

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.70	1056	51	0-10	G

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	9	8¼	17¼
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	1¼	2¾	4
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	¼	½	¾
8	RIG REPAIR			
9	CLEAN OUT TO BOTTOM & CIRCULATE		½	½
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	WORK ON DUST BUSTER	1½		1½
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE			
1	BIT		170	1.20 m
1	MSW	73 X 167		1.97
1	DM	73 X 167		8.62 m
1	SU	74 X 171		1.73 m
1	AF	75 X 176		.64 m
2	DU	69 X 170		19.25 m
1	SH	64 X 171		4.34 m
15	DU	69 X 170		143.69 m
1	AF	74 X 169		.56 m
1	DU	69 X 169		9.62 m
1	XO	69 X 168		.41 m
6	HW	102 X 70		54.84 m
	BHA			246.84 m
	X			m
61	D.P.	STANDS		m
2	D.P.	SINGLES		1773.72 m
	KELLY DOWN			12.44 m
	TOTAL			2033.00 m
WT. OF DC				1000 daN
WT. OF STRING				1000 daN

BOTTOMS-UP RATE

m/min @ FLOW RATE m³/min

GAS FLARE @ 1882 m
2.0 SEC

BIT RECORD

BIT NO.	11
SIZE (mm)	219
IADC CODE	
MFG.	MISSION
TYPE	MDCH
SERIAL NO.	17669
JETS (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	1808
TOTAL METRES DRILLED (m)	225
TOTAL HRS. RUN	12¾
CUT STRUC. D U L L / I O D L B G O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	NIL

REMARKS:
GAS FLARE AFT SURVEY
FOR BOSEC
NO FILL AFTER SURVEY

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS-(s/L)	
PV/YP	
GELS (Pa)	
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
#2 Boiler	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL # D6572		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO. / LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT MJ		
CUMULATIVE MEGAJOULES MJ		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
1874 m	2033 m	9	15S			0-2	20	2200	57						
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
1901	1¼	S91W	1961	1⅛	N86W			

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	0000	0300	3	DRILL
7	0300	0315	¼	RIG SERVICE ✓ROTATING HEAD CLAMP + KELLY DRIVE BUSHING
4	0315	0400	¾	SURVEY @ 1901
1	0400	0600	2	DRILL
21	0600	0700	1	REPAIR ELECTRICAL PROBLEM IN FLOOD PUMP FOR DUST BUSTER
1	0700	0800	1	DRILL
4	0800	0830	½	SURVEY @ 1961
1	0830	0915	¾	DRILL
21	0915	0945	½	CHANGE OUT DUST BUSTER PUMP
1	0945	1200	2¼	DRILL

Daily Rig Walk Around

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
4	1200	1245	¾	SURVEY @ 2015
1	1245	1530	2 ¾/4	DRILL — HELD TALK ON BOP DRILL W/CREW. WITNESSED BY
4	1530	1600	½	SURVEY @ 2076
1	1600	1630	½	DRILL
7	1630	1700	½	WORK ON HOOK LOCK RIG SERVICE
1	1700	1845	1 ¾/4	DRILL
4	1845	1930	¾	SURVEY
9	1930	2000	½	SAFETY MEETING W/ SHELL MANAGEMENT + SAFETY PERSONNEL
1	2000	2030	½	DRILL
4	2030	2115	¾	SURVEY @ 2146
1	2115	2400	2¾	DRILL

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD I341 — DATE: 89/02/20

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

DAY TOUR 0000 P.M. 1200 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		ROBERT HODGE	12
DRKMAN		ALEX SCOTT	12
MTRMAN		ART WRIGHT	12
FLRMAN		KIETH MCCARTY	12
FLRMAN		DAVID MORRILL	12
FLRMAN			
LEASE		JULIEN SASSIE	12
LEASE		HENRY BERTRAND	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR P.M. A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		DENNIS OLSEN	12
DRKMAN		DAVE MILLAR	12
MTRMAN		DEAN BIRD	12
FLRMAN		ALLAN LARSEN	12
FLRMAN		RON PETERSEN	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell Cdn Arrowhead B41

LOCATION: 69° 13' 54.9" N 122° 53' 16.93" W

PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE: A. Jaul

CONTRACTOR: Arctic Drilling — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: [signature] — RIG NO.: 48

KILL SPEED

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE: YEAR	DATE: MONTH	DATE: DAY
2205 m	2504 m	299 m	227	30	89	02	21

LAST CASING TUBING OR LINER

	O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
	244.5	222	89	1057	6.70	1056	51	0-1-0	G

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.00	E	93	162	4½ IF	1	NATIONAL 9-P-100	235		
127	29.00	G	93	162	4½ IF	2	NATIONAL 9-P-100	235		

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	7½	6½	14
2	TRIPS		2	2
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	3¼	1¾	5
5	TEST B.O.P. DRILL PIPE VALVE		1	1
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	¼		¼
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING		¾	¾
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	CLEAN SUMP	1		1
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	T	B/R	I.D.	O.D.	L
1	HSU	75	X	176	1.20 m	
1	DM	73	X	169	8.62 m	
1	SU	74	X	171	1.73 m	
1	AF	75	X	176	.64 m	
2	DU	69	X	170	19.25 m	
1	SH	64	X	171	4.34 m	
15	DU	69	X	170	143.64 m	
1	AF	74	X	169	.56 m	
1	DU	69	X	169	9.62 m	
1	XO	69	X	168	.41 m	
6	HW	127 / 102	X	70	54.84 m	
		3 1/2			246.84 m	
			X		m	
73	D.P.	STANDS			m	
2	D.P.	SINGLES			2121.41 m	
	KELLY DOWN				11.75 m	
	TOTAL				2380.00 m	
	WT. OF DC				1000 daN	
	WT. OF STRING				95000 1000 daN	

REMARKS: 155sec Flare Aft Survey

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		11	
SIZE	(mm)	Z19	
IADC CODE			
MFG.		MISSION	
TYPE		MDCH	
SERIAL NO.		V7669	
JETS (1/32")	(mm)		
DEPTH OUT	(m)	2504	
DEPTH IN	(m)	1808	
TOTAL METRES DRILLED	(m)	696	
TOTAL HRS. RUN		35	

CUT STRUC. (I O D L / B G O R): 1 1 A3

HOLE CONDITION

HOLE DRAG (daN)	UP / DN	0-3 / 0-3
TORQUE AT BOTTOM	(DP TURNS)	½
FILL ON BOTTOM (m)		NIL

REMARKS: GASFLARE AFT SURVEY
755sec
✓ GRANTHEAD CLAMP

MUD RECORD

TIME	1600			
DENSITY (kg/m³)	1080			
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	58			
PV/YP	/	/	/	/
GELS (Pa)	/	/	/	/
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Bentonite	2.5t		
Gel	1.75t		

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24.	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
#2 BOILER ACCOUNT TO SHELL	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL	#16972	24	HRS
BOILER	2042	24.	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.

SIZE mm | # OF LINES | LENGTH SLIPPED m

LENGTH CUT OFF m | PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES MJ

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2205 m	2380 m	7⅛	175			0-2	20	2350	62						
m	m														
m	m				Morning Flare 1.25m										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
2200	1⅜	N04W	2260	1⅜	N14W	2320	1⅜	S86W
2357	1¾	S45W						

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	0000	0015	¼	Drill
4	0015	0100	¾	Survey @ 2200 ✓ Rotating Head Clamp + Kelly Drive Bushing
1	0100	0300	2	Drill
7	0300	0315	¼	Rig Service
1	0315	0400	¾	Drill
4	0400	0500	1	Survey @ 2260
1	0500	0715	2¼	Drill
4	0715	0800	¾	Survey @ 2319
1	0800	0915	1¼	Drill
21	0915	0945	½	Clean Dust Buster Pump Screen
1	0945	1030	¾	Drill
4	1030	1115	¾	Survey @ 2357
21	1115	1145	½	Clean Flare Pit w/ Backhoe
1	1145	1200	¼	Drill

Daily R/A/M Walkaround

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	1200	1345	1¾	Drill
4	1345	1430	¾	Survey @ 2414
1	1430	1915	4¾	Drill
9	1915	2000	¾	Blow Hole Clean
	2000	2100	1	Survey @ 2490
	2100	2230	1½	Pull 5 STDS + Chain Out 6 Singles Pull Out to 1650
	2230	2330	1	Blow Out BOPs + Function Btm Pipe Ram Top Pipe Ram Annular Preventer + HCR
	2330	2400	½	Tripping

Held BOP Drill/Crew - Cogla
Witnessed By [signature]

Btm Pipe Ram Close 6 sec
Close 6 sec
Top Pipe Ram Close 6 sec
Open 6 sec
Annular Close 23 sec
Open 23 sec

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: Shell Cdn Arrowhead B41 — DATE: 89/02/21

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: [signature] — RIG NO.: 48

DAY TOUR

0000 P.M. — 1200 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Allen Scott	12
MTRMAN		Art Wright	12
FLRMAN		Keith McCarty	12
FLRMAN		David Morell	12
FLRMAN			
GAZE		Julien Sasseville	12
GAZE		Henry Redmond	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olsen	12
DRKMAN		Dave McLean	12
MTRMAN		Dean Bird	12
FLRMAN		Allan Lawson	12
FLRMAN		Ron Paterson	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell Et Al Arrowhead B41

LOCATION: 160° 13' 34" N 122° 53' 16" W — PROVINCE: B.C.

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited — CONTRACTOR: Arctic Drilling — RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE: Dave Olson — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: [illegible]

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.00	E	93	162	4½IF	1	NATIONAL 9-P-160	235		
127	29.00	G	93	162	4½IF	2	NATIONAL 9-P-160	235		

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

	DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
	2504 m	2504 m	0 m	227	31	89	02	22

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.70	1056	51	0-1-0	"G"

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	7		7
3	HANDLE TOOLS	2¼		2¼
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE	¾		¾
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	2	3½	5½
10	CONDITION MUD		8½	8½
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	RR	12¼ X 1BT	.24 m	
			.87 m	
1	DM	73 X 167	8.62 m	
1	SS	69 X 170	2.35 m	
3	DU	69 X 167	28.74 m	
1	SH	64 X 171	4.34 m	
15	DU	69 X 167	143.69 m	
1	XO	73 X 170	.91 m	
6	HW	70 X 127 / 162	54.81 m	
		BHA	244.57 m	
		X	m	
		X	m	
		X	m	
		X	m	
76	D.P.	STANDS	2188.06 m	
	D.P.	SINGLES	m	
	KELLY DOWN		12.80 m	
	TOTAL		2445.53 / 2504.00 m	
WT. OF DC			1000 daN	
WT. OF STRING			89000 1000 daN	

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.		12
SIZE	(mm)	219
IADC CODE		
MFG.		Reed
TYPE		FP53A
SERIAL NO.		515602
JETS (32nds)	(mm)	3/9.5
DEPTH OUT	(m)	
DEPTH IN	(m)	2504
TOTAL METRES DRILLED	(m)	
TOTAL HRS. RUN		
CUT STRUC. D U L / I O D L / B G O R		
K+ (1000 mg/L)		
Cl- (1000 mg/L)		

HOLE CONDITION

HOLE DRAG (daN)
TORQUE AT BOTTOM (DP TURNS)
FILL ON BOTTOM (m)
REMARKS: TANK Volumes

MUD RECORD

TIME	1700			2000
DENSITY (kg/m³)	1080			1050
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	47			130
PV/YP	/	/	/	/
GELS (Pa)	/	/	/	/
W.L. (cm³)	10.4			8.6
F.C. (mm)				
pH	10.5			10.0
OIL VOL. FRAC.				
SAND VOL. FRAC.				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Gel	1 sx		
Caustic	1 sx		
Soda Ash	2 sx		
Cans	1 sx		
Kelzan	1 sx		
Barite	1 sx		
Polypac	4 sx		
Lignite	2		
Spersene	10		

Start of Mud up 139.0 m³
Hole Vol. 88.8 m³

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2504 m	m														
	m														
	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	0000	0130	1½	TRIPPING Lay Dn Fire Stops
3	0130	0300	1½	Lay Down Hammer; SLS Pick up Steck Tool
2	0800	0400	1	Run in Double Strap
6	0400	0445	¾	Slip & Cut 46m Drlg Line
2	0445	0800	3¼	Trip
2	0800	0915	1¼	Strap in Hole — Set Crown Stopper.
3	0915	1000	¾	Install Grant Head Rubber - Remove Air Lines from Standpipe
9	1000	1200	2	Displace Hole w/ mud.

Daily Rig Walk Around

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
9	1200	1345	1¾	Circulate @ 40 stks/min
9	1345	1500	1¼	" @ 60 " "
9	1500	1630	1½	" @ 80 " "
9	1630	1830	2	" @ 100 " "
9	1830	2030	2	" @ 120 " "
	2030	2400	3½	Clean Slowly To Btm Work & Circ 6 Singles in ½ Hr/single

While Circulating In Hole Pop Valve Blew @ Circulating Pressure of 15,000 KPa Causing Damage to Suction Isolation, Dampener, Which Needed Repairs Needed to Weld & Rebuild New Suction Line

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
#2 BOILER	2042	24	HRS
TOTAL HOURS ACCOUNTED FOR	#6972	24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO. 2
SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED 36 m
LENGTH CUT OFF 46 m — PRESENT LENGTH 1727 m
MEGAJOULES SINCE LAST CUT 0 MJ
CUMULATIVE MEGAJOULES 105 211 MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	ED	12¼ X 1BT	.24 m	
			.87 m	
1	DM	73 X 167	8.62 m	
1	SS	69 X 170	2.35 m	
3	DU	69 X 167	28.74 m	
1	SH	64 X 171	4.34 m	
15	DU	69 X 167	143.69 m	
1	XO	73 X 170	.91 m	
6	HW	70 X 127 / 162	54.81 m	
		BHA	244.57 m	
		X	m	
		X	m	
		X	m	
		X	m	
77	D.P.	STANDS	2276.41 m	
1	D.P.	SINGLES	12.37 m	
	KELLY DOWN			
	TOTAL		2488.54	
WT. OF DC			20,200 1000 daN	
WT. OF STRING			89,000 1000 daN	

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.		12
SIZE	(mm)	219
IADC CODE		
MFG.		Reed
TYPE		FP53A
SERIAL NO.		515602
JETS (32nds)	(mm)	3/9.5
DEPTH OUT	(m)	
DEPTH IN	(m)	2504
TOTAL METRES DRILLED	(m)	
TOTAL HRS. RUN		
CUT STRUC. D U L / I O D L / B G O R		
K+ (1000 mg/L)		
Cl- (1000 mg/L)		

HOLE CONDITION

HOLE DRAG (daN)
TORQUE AT BOTTOM (DP TURNS)
FILL ON BOTTOM (m)
REMARKS:

MUD RECORD

TIME	1700			2000
DENSITY (kg/m³)	1080			1050
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	47			130
PV/YP	/	/	/	/
GELS (Pa)	/	/	/	/
W.L. (cm³)	10.4			8.6
F.C. (mm)				
pH	10.5			10.0
OIL VOL. FRAC.				
SAND VOL. FRAC.				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Gel			
Lignite	2		
Spersene	10		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2504 m	2442 m	3½	41		Ream & Clean 2442 - 2483	04	46	15,000		152		152	120		
								15,000		152	110	152	120		
	m							12,000							

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
9	1200	1345	1¾	Circulate @ 40 stks/min
9	1345	1500	1¼	" @ 60 " "
9	1500	1630	1½	" @ 80 " "
9	1630	1830	2	" @ 100 " "
9	1830	2030	2	" @ 120 " "
	2030	2400	3½	Clean Slowly To Btm Work & Circ 6 Singles in ½ Hr/single

While Circulating In Hole Pop Valve Blew @ Circulating Pressure of 15,000 KPa Causing Damage to Suction Isolation, Dampener, Which Needed Repairs Needed to Weld & Rebuild New Suction Line

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO. Shell GA Arrowhead B41 — DATE 89/02/22

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: [illegible] — RIG NO. 48

DAY TOUR

0000 P.M. 1200 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Art Wright	12
FLRMAN		Keith McCarty	12
FLRMAN		David Morral	12
FLRMAN			
LEASE		Julien Sassie	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

1200 P.M. 2400 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olsen	12
DRKMAN		Dave Millar	12
MTRMAN		Don Bird	12
FLRMAN		Allen Larsen	12
FLRMAN		Ron Peterson	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60° 130' 84" N 122° 53' 16" W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — CONTRACTOR: Arctic Drilling — RIG NO.: 45

SIGNATURE OF SHELL'S REPRESENTATIVE — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT. O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.00	E	93	162	4½IF	1	National 9-P-100	235		
127	29.00	G	93	162	4½IF	2	National 9-P-100	235	60	4200

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE: YEAR	DATE: MONTH	DATE: DAY
2504 m	2562 m	58 m	243½	32	89	02	23

LAST CASING TUBING OR LINER

	O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
	244.5	222	89	1057	6.70	1056	51	0+0	"G"

TIME DISTRIBUTION – HOURS

CODE	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	5½	11	16½
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK		½	½
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE		½	½
8	RIG REPAIR	5		5
9	CLEAN TO BOTTOM & CIRCULATING	½		½
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	12

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE BIT			
1	E89	75 X 221	.89	m
1	DM	75 X 167	8.62	m
1	S5	69 X 170	2.35	m
3	DW	69 X 169	28.74	m
1	SH	64 X 171	4.34	m
15	DW	69 X 169	143.69	m
1	XO	73 X 170	.91	m
6	HW	70 X 127/162	54.31	m
		BHA	244.32	m
		X		m
		X		m
		X		m
		X		m
78	D.P.	STANDS		m
2	D.P.	SINGLES	226.83	m
	KELLY DOWN		10.63	m
	TOTAL		2517	m
WT. OF DC				1000 daN
WT. OF STRING			90	1000 daN

BIT RECORD

BIT NO.		12				
SIZE	(mm)	219				
IADC CODE						
MFG.		Reed				
TYPE		EP55A				
SERIAL NO.		BT5602				
JETS (32nds)	(mm)	3/19.5				
DEPTH OUT	(m)					
DEPTH IN	(m)	2504				
TOTAL METRES DRILLED	(m)	99				
TOTAL HRS. RUN		24				

CUT STRUC.: D | I | O | D | L; U | B | G | O | R

HOLE CONDITION

HOLE DRAG (daN)		1
TORQUE AT BOTTOM	(DP TURNS)	½
FILL ON BOTTOM (m)		—

REMARKS: PKR 00:00 97.7 m³

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

MUD RECORD

TIME	00:00	05:19		
DENSITY (kg/m³)	1080	1080		
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	62	58		
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)	9.0	8.8		
F.C. (mm)				
pH	10.0	10.5		
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
STARCH	15 K		
CAUSTIC	35 KG		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2504 m	7 m							1200		152	110				
2504 m	2506 m	1½	3			16	60	1300		152	60	152	60		
2506 m	2517 m	4	13		Mostly Fine Sand, 30										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
8	00:00	05:00	5	Circulate + Replace Pump Suction
9	05:00	06:30	1½	Clean To Btm 2493 - 2504 21m
1	06:30	08:00	1½	Drill 2504 2506
1	08:00	12:00	4	Drill — Function BOPM Pipe Rams close Stack Open

Daily Rig Work Around

Service # 1 Pump

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	12:00	12:30	½	Drill
7	12:30	12:45	¼	Service Rig Function Test Pipe Rams Close Stack Open
1	12:45	17:30	4¾	Drill
7	17:30	17:45	¼	Rig Serv. Function Test Remote Choke
4	17:45	18:15	½	Survey
1	18:15	24:00	5¼	Drill
			12	

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042		HRS
EVALUATION	2065		HRS
COMPLETION	Repair	5	HRS
R. Bozeler	2042	24.	HRS
TOTAL HOURS ACCOUNTED FOR	06972	19	HRS
BOILER	2042	24.	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO. 3

SIZE 32 mm — # OF LINES 13 — LENGTH SLIPPED m

LENGTH CUT OFF m — PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE BIT			
1	E89	75 X 221	.94	m
1	DM	73 X 167	8.62	m
1	S5	69 X 170	2.35	m
3	DW	69 X 169	28.74	m
1	SH	64 X 171	4.34	m
15	DW	69 X 169	143.69	m
1	XO	73 X 170	.91	m
6	HW	70 X 127/162	54.31	m
		BHA	244.57	m
		X		m
		X		m
		X		m
		X		m
80	D.P.	STANDS		m
1	D.P.	SINGLES	230.93	m
	KELLY DOWN		8.19	m
	TOTAL			m
WT. OF DC			3800	1000 daN
WT. OF STRING			9000	1000 daN

BIT RECORD

BIT NO.		12				
SIZE	(mm)	219				
IADC CODE						
MFG.		Reed				
TYPE		EP55A				
SERIAL NO.		BT5602				
JETS (32nds)	(mm)	3/19.5				
DEPTH OUT	(m)					
DEPTH IN	(m)	2504				
TOTAL METRES DRILLED	(m)	99				
TOTAL HRS. RUN		24				

CUT STRUC.: D | I | O | D | L; U | B | G | O | R

HOLE CONDITION

HOLE DRAG (daN)		N.L
TORQUE AT BOTTOM	(DP TURNS)	½
FILL ON BOTTOM (m)		N.L

REMARKS: Hole Condition on Connection is Good

MUD RECORD

TIME	1330	1900	2100	
DENSITY (kg/m³)	1080	1080	1080	
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	62	71	65	
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)	7.8	7.6	7.6	
F.C. (mm)	1.0	1.0	1.0	
pH	10.5	10.5	10.5	
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	28		
BARAPAC	2		

BOTTOMS-UP RATE

Mud Volume 1600 m³ — 9.1.9 m/min

@ FLOW RATE m³/min 101

Mud Volume 95.9

@ 23.45 HRS

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2517 m	2562 m	11	4 5		WE @ 870 m³	16	60	1300		152		152	120		
m	m														
m	m				Acum 40 cm										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
2525.4	2°	361N						

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	12:00	12:30	½	Drill
7	12:30	12:45	¼	Service Rig Function Test Pipe Rams Close Stack Open
1	12:45	17:30	4¾	Drill
7	17:30	17:45	¼	Rig Serv. Function Test Remote Choke
4	17:45	18:15	½	Survey
1	18:15	24:00	5¼	Drill
			12	

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: Shell et al Arrowhead B41 — DATE 89/02/23

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO. 45

DAY TOUR

00:00 P.M. 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	10
DRKMAN		Alex Scott	10
MTRMAN		Art Wright	10
FLRMAN		Keith McCarty	10
FLRMAN		Dan Morrill	10
FLRMAN			
LEASE		Julien Sassie	10

Extra Hours For Witness Course Held In Camp After Work

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

12:00 P.M. 24:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dennis Olea	8
Driller		Dave Miller	4
DRKMAN		Dave Miller	4
DRKMAN		Darryl Laplante	4
MTRMAN		Dean Bird	8
FLRMAN		Allen Lee	8
FLRMAN		Ron Peterson	8
FLRMAN			
DRILLER		Ray Soucy	8
DRKMAN		Gary Buchberger	8
MTRMAN		Todd Kayway	8
FLOOR		Chris Entz	8
FLOOR		Doug Hood	8
LEASE		Earl Hope	8

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B-41

LOCATION: 60° 30' 30"N 122° 53' 45"W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — CONTRACTOR: ATCO Drilling — RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

243½

DEPTH AT START OF MORNG TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
2562 m	2681 m	119 m	296	33	89	02	24

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG. HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.70	1056	51	G-1-0	G"

KILL SPEED

SPM	PRESS (kPa)
50	3000
60	4600

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)
127	29.0	E	93	162	4½ IF	1	National 9-P-100	235
127	29.0	G	93	162	4½ IF	2	National 9-P-100	235

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	11¼	11½	22¾
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	½	½	1
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	¼	¼	½
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE				
1	BIT		I.D. mm	X	O.D. mm	
						24 m
1	109		73	X	171	87 m
1	WR		73	X	117	9.62 m
1	2		19	X	120	2.25 m
7	104		69	X	169	29.74 m
1	54		64	X	171	4.34 m
15	04		69	X	169	143.69 m
1	16		73	X	170	91 m
6	HO		70	X	127	348.1 m
				X	162	m
		BHA				244.57 m
				X		m
				X		m
82	D.P.	STANDS				m
X	D.P.	SINGLES				m
	KELLY DOWN					12.87 m
	TOTAL					2624.82 m
WT. OF DC						3800 1000 daN
WT. OF STRING						9200 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		12
SIZE	(mm)	215.9
IADC CODE		
MFG.		Reed
TYPE		FP53A
SERIAL NO.		875402
JETS (DAO)	(mm)	3 x 15
DEPTH OUT	(m)	
DEPTH IN	(m)	2504
TOTAL METRES DRILLED	(m)	177
TOTAL HRS. RUN		39

CUT STRUC.: D U L | I | O | D | L | B | G | O | R

HOLE CONDITION

HOLE DRAG (daN)		1 daN
TORQUE AT BOTTOM	(DP TURNS)	½
FILL ON BOTTOM (m)		

REMARKS:

MUD RECORD

TIME	0001	0200	0600
DENSITY (kg/m³)	1050	1050	1050
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	64	65	58
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)	7.2	7.0	7.0
F.C. (mm)			
pH	9.5	9.0	10.2
OIL VOL. FRAC.			
SAND VOL. FRAC.	Dumbell	Sand	Trap
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	15K		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2562 m	2624 m	11¼	6.2		PUTO @ 2600 96.0 m³	15	60	14000		152	60	152	60		
m	m														
m	m				Fuel @ 2600 655 m										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
2573	2¼	N 89 W						

DAY TOUR

CODE	TIME LOG FROM	TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	00:00	03:45	3¾	Drill
7	03:45	04:00	¼	Service Rig Function Annular close 12sec Open
4	04:00	04:30	½	Work Pipe, Circ, Survey @ 2573.m.
1	04:30	1200	7½	Drill
			12	
				Daily Rig Inspection
				Service # 2 Pump

DRILLER: [signature]

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO. 1

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED m

LENGTH CUT OFF m — PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE				
1	BIT		I.D. mm	X	O.D. mm	
						24 m
1	E09		73	X	171	87 m
1	DM		73	X	167	86.2 m
1	55		69	X	120	2.35 m
3	00		69	X	169	28.74 m
1	54		64	X	171	4.34 m
15	04		69	X	169	143.69 m
1	40		73	X	170	91 m
6	HWT		70	X	127	348.1 m
				X	162	m
		BHA				244.57 m
				X		m
				X		m
80	D.P.	STANDS				2434.24 m
X	D.P.	SINGLES				190.58 m
	KELLY DOWN					12.19 m
	TOTAL					2681 m
WT. OF DC						3800 1000 daN
WT. OF STRING						95 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		12
SIZE	(mm)	215.9
IADC CODE		
MFG.		REED
TYPE		FP53A
SERIAL NO.		875402
JETS (DAO)	(mm)	3 x 15
DEPTH OUT	(m)	
DEPTH IN	(m)	2504
TOTAL METRES DRILLED	(m)	177
TOTAL HRS. RUN		39

CUT STRUC.: D U L | I | O | D | L | B | G | O | R

HOLE CONDITION

HOLE DRAG (daN)		1 daN
TORQUE AT BOTTOM	(DP TURNS)	¼
FILL ON BOTTOM (m)		–

REMARKS:

MUD RECORD

TIME	0830	1230	2300
DENSITY (kg/m³)	0.75	1100	1100
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	50	62	68
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)	7.5	8.2	8.8
F.C. (mm)			
pH	10	10	10
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	20		
BARITE	165		
CAUSTIC	1		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2624 m	2681 m	11½	5.7		GRAVEL CROWN AND	15	60	14000		152	60	152	60		
m	m				BLOCK (RS)										
m	m				PUTO 2000 108.6 m³										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
2630	2	W 70 W						

EVENING TOUR

CODE	TIME LOG FROM	TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	1545	3¾	DRILL BOP OUT DRILL AND SAFETY MEETING OPEN HCR CLOSED
				HYDRIL, ADJUSTED SWACO CLAMP, HYDRIL CLOSE IN 13 SEC
	1545	1600	¼	Rig SERV, Function Test Top Pipe Ram closed 11 SEC
	1600	1630	½	SURVEY at 2630
	1630	2400	7½	Drill
				Service # 1 Pump

DRILLER: [signature]

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL ETAL ARROWHEAD B41 — DATE 89/02/24

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

DAY TOUR

00:00 P.M. — 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Miller	8
DRKMAN		Darrell LaPlante	8
MTRMAN		Dean Bird	8
FLRMAN		Allan Larsen	8
FLRMAN		Ron Peterson	8
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD RAYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B-41

LOCATION: 60° 30' 8.49" N 122° 53' 16.93" W — PROVINCE: N.W.T.

OPERATOR: Shell Canada Limited — CONTRACTOR: AFCO — RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE: — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

SPM	PRESS. (kPa)
60	4400
60	4600

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)
127	29.0	E	93	162	4½ IF	1	National 9-P 100	235
127	29.0	E	93	162	4½ IF	2	National 9-P 100	235

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

LAST CASING TUBING OR LINER

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
2681 m	2767 m	86 m	318¼	34	89	02	25

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG. HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.70	1056	51	G-1-0	"G"

TIME DISTRIBUTION – HOURS

CODE	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	11¼	11	22¼
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	½	¾	1¼
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	¼	¼	½
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. (mm)	X	O.D. (mm)	
1	BIT					.24 m
1	1	73		X	171	.87 m
1	1	73		X	167	8.62 m
1	1	69		X	170	2.35 m
3	1	69		X	169	28.74 m
1	1	64		X	171	4.34 m
15	1	69		X	169	143.69 m
1	1	73		X	170	.91 m
6	1	70		X	171	54.81 m
				X		m
				X		m
				X		m
				X		m
86	D.P.	STANDS				2472.18 m
	D.P.	SINGLES				m
	KELLY DOWN					12.87 m
	TOTAL					2729 m
WT. OF DC						3800 1000 daN
WT. OF STRING						9600 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min: PUT 1200 999

BIT RECORD

BIT NO.		12	
SIZE	(mm)	215.9	
IADC CODE			
MFG.		Reed	
TYPE		FA53A	
SERIAL NO.		RT6402	
JETS (32nds)	(mm)	3/16	
DEPTH OUT	(m)		
DEPTH IN	(m)	2504	
TOTAL METRES DRILLED	(m)	225	
TOTAL HRS. RUN		50¼	

CUT STRUC.: D U L L | I | O | D | L | B | G | O | R

K+ (1000 mg/L)
Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)		1-2
TORQUE AT BOTTOM	(DP. TURNS)	½
FILL ON BOTTOM (m)		—

REMARKS:

MUD RECORD

TIME	0001	0900	0:800	
DENSITY (kg/m³)	1110	1120	1125	
GRADIENT (kPa/m)				
FUNNEL VIS-(s/L)	57	65	75	
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)	7.9	7.6	7.5	
F.C. (mm)				
pH	10.5	9.5	10	
OIL VOL. FRAC.				
SAND VOL. FRAC.	Dump Sand Trap			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	2 SKS		
BARITE	100 SKS		
CAUSTIC	2 SKS		
GEL	15 SK		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D / RM-R / CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2681 m	2729 m	11¼	48		PUT @ 00:00 to 642 m³	35	50	14000		152	60	152	60		
m	m														
m	m				Fuel to 01:00 126 m										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
2687	2¼	N 50 W						

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	00:00	04:00	4	Drill
7	04:00	04:15	¼	Service Rig Function Btm Pipe Rams close Bsec open
1	04:15	04:30	¼	Drill
4	04:30	05:00	½	Work Pipe, Circ, Survey @ 2687 m
1	05:00	1200	7	Drill
			12	

Daily Rig Check

Service #2 Pump

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	1200	1700	5	DRILL
7	1700	1715	¼	RIG SERV, FUNCTION TEST UPPER PIPE RAMS
1	1715	1945	2½	DRILL
4	1945	2030	¾	WORK PIPE, CIRC, SURVEY @ 2748 CLEAN SUCT. SCREENS
1	2030	2400	3½	DRILL

SERVICE #1 PUMP

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.: 1

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED m

LENGTH CUT OFF m — PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD B-41 — DATE: 89/02/25

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

DAY TOUR

00:00 P.M. — 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Miller	12
DRKMAN		Darrell Lafkote	12
MTRMAN		Dean Bird	12
FLRMAN		Allan Larsen	12
FLRMAN		Ron Peterson	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRYWAY	12
FLRMAN		CHRIS FINTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	12
WELDER		HUBERT FERGUSON	

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARNGUILHEAD K-61

LOCATION: 60° 30' 8.49" N 122° 33' 16.93" W

PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	−8 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: **Shell Canada Limited**

CONTRACTOR: ATCO — RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE: [signature]

SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: [signature]

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.0	G	93	162	4½ IF	1	National 9-P-100	235	60	4500
127	29.0	G	93	162	4½ IF	2	National 9-P-100	235	60	4600

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.70	1056	51	G+10	G

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
2767 m	2779 m	12 m	322¼	35	89	02	26

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump–stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

TIME DISTRIBUTION – HOURS

COR. NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	4½		4½
2	TRIPS	6¼	4	10¼
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	¼	¼	½
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	1		1
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.		7¾	7¾
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1			I.D. mm X O.D. mm	m
1	FDP	7¾X171		87 m
1	DM	7¾X167		862 m
1	SS	6½X170		235 m
3	DU	6½X169		2874 m
1	SHI	6¼X171		434 m
15	DU	6½X169		14369 m
1	HO	7¾X170		91 m
6	HW	7¾X127		5481 m
		BHA		24457 m
		X		m
		X		m
		X		m
66	D.P.	STANDS	25256	m
	D.P.	SINGLES		m
	KELLY DOWN		814	m
	TOTAL		2779	m
WT. OF DC			38	1000 daN
WT. OF STRING			97	1000 daN

BOTTOMS–UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		12	
SIZE	(mm)	2159	
IADC CODE			
MFG.		Reed	
TYPE		EF63A	
SERIAL NO.		87616	
JETS (32nds)	(mm)	3/3/3.5	
DEPTH OUT	(m)	2779	
DEPTH IN	(m)	2504	
TOTAL METRES DRILLED	(m)	275	
TOTAL HRS. RUN		65¼	
CUT STRUC. D U L L	I O D L B G O R	4 8 BT W T E PR	
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	0200	0530
DENSITY (kg/m³)	1120	1125
GRADIENT (kPa/m)		
FUNNEL VIS–(s/L)	64	65
PV/YP	/	/
GELS (Pa)	/	/
W.L. (cm³)	7.9	7.2
F.C. (mm)		
pH	10.5	10.5
OIL VOL. FRAC.		
SAND VOL. FRAC.	Dump Sand Trap	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Bridge	25 Sx		
ASPHL	1 Sx		
BARO	1 Sx		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2767 m	2779 m	4½	1 2		Autosonde 96.3 m	5	80	10300		152	60	152	60		
m	m														
m	m				Fuel @ 05:00 m										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	00:00	03:30	3½	Drill — Hold Safety Meeting
7	03:30	03:45	¼	Service Rig Function Blinds Rams
1	03:45	04:45	1	Drill (close floor open)
9	04:45	05:05	⅓	Circ Btms Up, Work Pipe measure Kelly Out 6 m.
2	05:05	12:00	6¾	Pump Pill, Blow Kelly, Strap Out of hole, V.E. Up Record
			12	V.E. Flow @ 1 stds, 2 stds STRAP OUT

TRIP MEASURED 1340 STRAP = 2775.61m
CALCULATED 14.60 TALLY = 2779.70m
MORE DRK 1.20m³ Diff −4.09m

Service #2 Pump

DRILLER: [signature]

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m				Accum. Hc										
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	1200	1315	1¼	Hoist For Bit Bop Drill while Tripping
17	1315			Remove Grant Install Flow Nipple Function
		2100	7¾	Test Blind Rams
2	2100	2245	1¾	Make Up Bit #13 Trip In BHA (Pick up two DVs)
7	2245	2300	¼	Service Rig
2	2300	2400	1	Trip In Hole Break Circ @ 1100m

Daily Rig Inspection [signature]

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARNGUILHEAD K-61 — DATE: 89/02/26

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: [signature] — RIG NO.: 48

DAY TOUR

00:00 P.M. — 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Miller	12
DRKMAN		Darrell LaPlante	12
MTRMAN		Dean Bird	12
FLRMAN		Allen Larsen	12
FLRMAN		Ron Peterson	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	12
WELDER		HUBERT FURGERSON	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO. 1

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED — m

LENGTH CUT OFF — m — PRESENT LENGTH 1727 m

MEGAJOULES SINCE LAST CUT 7567 MJ

CUMULATIVE MEGAJOULES 112778 MJ

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B-41
LOCATION: 60°30" 9.49 N 122° 53' 16.93 W — PROVINCE: NWT

WEATHER CONDITIONS
TEMPERATURE °C
WIND SPEED km/h
WIND DIRECTION
WEATHER

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: ATCO — RIG NO. 48
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

KILL SPEED

LEGEND (METRIC EXPRESSIONS)
All lengths expressed in metres to two decimal places.
mud density = kilogram per cubic metre (kg/m³)
pump–stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)
322¾

	DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
	2779 m	2844 m	65 m	339½	36	89	02	27

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	84	1058.7	6.70	1056	51	0-10	G

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	220	E	93	162	4½ IF	1	NATIONAL 9P100	235	60	4800
127	290	G	93	162	4½ IF	2	" 9P100	235	60	

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	5½	11¼	16¾
2	TRIPS	4		4
3	HANDLE TOOLS			
4	DIRECTIONAL WORK		½	½
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE		¼	¼
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	2½		2½
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1		I.D. mm X O.D. mm		324 m
1	E29	73 X 171	287 m	
1	DH	73 X 167	8.62 m	
1	SS	G4 X 170	2.35 m	
3	DC	G4 X 165	28.74 m	
1	SH	G4 X 171	4.34 m	
17	DC	G4 X 165	162.96 m	
1	3/16	73 X 170	91 m	
6	HW	70 X 127	54.81 m	
		X	m	
		BHA	263.84 m	
		X	m	
		X	m	
86	D.P.	STANDS	2525.46 m	
	D.P.	SINGLES	m	
	KELLY DOWN		6.53 m	
	TOTAL		2796 m	
	WT. OF DC		400 1000 daN	
	WT. OF STRING		100.60 1000 daN	

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.		13	
SIZE	(mm)	215.9	
IADC CODE			
MFG.		SEC	
TYPE		M84F	
SERIAL NO.		399778	
JETS (1/32")	(mm)	13/13/13	
DEPTH OUT	(m)		
DEPTH IN	(m)	2779	
TOTAL METRES DRILLED	(m)	17	
TOTAL HRS. RUN		5½	

CUT STRUC: DULL I O D L / B G O R

HOLE CONDITION

HOLE DRAG (daN)		1-2
TORQUE AT BOTTOM	(DP TURNS)	½
FILL ON BOTTOM (m)		—

REMARKS:

MUD RECORD

TIME				08:00
DENSITY (kg/m³)	T			1135
GRADIENT (kPa/m)	R			
FUNNEL VIS–(s/L)				75
PV/YP	/	/	/	/
GELS (Pa)	P	/	/	/
W.L. (cm³)		P		7.5
F.C. (mm)			1	
pH			J	9
OIL VOL. FRAC.				
SAND VOL. FRAC.			G	
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D/RM-R/CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2779 m	2786 m	6½	12		PUT @ 2700 78.0m³	16	60	5000		152	60	152	60		
m	m				" 1200 84.7			13500		152	60	152	60		
m	m				Fuel @ 0600 m										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	00:00	3:30	3½	Trip In B/I @ 13 Break Circ @ 2000m / Motors
9	03:30	5:30	2	Clean Blades @ 2660-2690
2	05:30	06:00	½	Trip In
9	06:00	06:30	½	Clean F/ 2755- 2779 2m. Fill
1	06:30	1200	5½	Drill
			12	

Daily Rig Inspection

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		4
INTAKE DENSITY (kg/m³)		1110
OVERFLOW DENSITY (kg/m³)		1100
UNDERFLOW DENSITY (kg/m³)		1325

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		4
INTAKE DENSITY (kg/m³)		1230
OVERFLOW DENSITY (kg/m³)		1100
UNDERFLOW DENSITY (kg/m³)		1465

WIRELINE RECORD — REEL NO.
SIZE 32 mm — # OF LINES 15 — LENGTH SLIPPED m
LENGTH CUT OFF m — PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT MJ
CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1		I.D. mm X O.D. mm		324 m
1	E29	73 X 171	287 m	
1	DH	73 X 167	8.62 m	
1	SS	G4 X 170	2.35 m	
3	DC	G4 X 165	28.74 m	
1	SH	G4 X 171	4.34 m	
17	DC	G4 X 165	162.96 m	
1	3/16	73 X 170	91 m	
6	HW	70 X 127	54.81 m	
		X	m	
		BHA	263.84 m	
		X	m	
		X	m	
89	D.P.	STANDS	m	
2	D.P.	SINGLES	2573.54 m	
	KELLY DOWN		6.57 m	
	TOTAL		2844 m	
	WT. OF DC		20 1000 daN	
	WT. OF STRING		100 1000 daN	

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.		13	
SIZE	(mm)	215.9	
IADC CODE			
MFG.		SEC	
TYPE		M84F	
SERIAL NO.		399778	
JETS (1/32")	(mm)	13/13/13	
DEPTH OUT	(m)		
DEPTH IN	(m)	2779	
TOTAL METRES DRILLED	(m)	65	
TOTAL HRS. RUN		12	

CUT STRUC: DULL I O D L / B G O R

HOLE CONDITION

HOLE DRAG (daN)		2-3
TORQUE AT BOTTOM	(DP TURNS)	½
FILL ON BOTTOM (m)		—

REMARKS: 21. Bbld 65 m³ Cub. of MUD.

MUD RECORD

TIME	12:00	16:00		2200
DENSITY (kg/m³)	1130	1125		1115
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	62	85		61
PV/YP	/	/		/
GELS (Pa)	/	/		/
W.L. (cm³)	7.5	7		7.2
F.C. (mm)				
pH	10	10.5		10.5
OIL VOL. FRAC.				
SAND VOL. FRAC.			DUMPED SAND TRAP	
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	2 SKS		
GEL	30 SKS		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D/RM-R/CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2796 m	2844 m	11½	48		ACCUMULATOR .40	12/14	2/6	13400		152	60	152	60		
m	m				PUT @ 2800 99.0 m³										
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
2802	1¾	N 44 W						

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	1200	1615	4¼	Drill
7	1615	1630	¼	Rig Serv, Function Test T/g Drill Closed 12 Sec
4	1630	1700	½	Survey
1	1700	2400	7	Drill
			12	

Service Pump #1

DRILLER

CRAINSET

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL FINAL ARROWHEAD B-41 — DATE 89/02/27
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

DAY TOUR 00:00 P.M. — 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		DAVE MILLAR	12
DRKMAN		DARREL LAPLANTE	12
MTRMAN		DEAN BIRD	12
FLRMAN		ALLEN LARSEN	12
FLRMAN		RON PETERSON	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR — P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KAYWAY	12
FLRMAN		CHRIS FNTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	12
WELDER		HUBERT FURGERSON	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B-41

LOCATION: 60°30'8.49"N 122°53'16.93"W

PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited

SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: ATCO

RIG NO.: 48

SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL J.T.O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.0	E	93	162	4½ IF	1	NATIONAL 9P-100	235	60	3000
127	29.0	G	93	162	4½ IF	2	NATIONAL 9P-100	235		

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DATE DAY
2844 m	2859 m	15 m	41¼	37	89	02	28

LAST CASING TUBING OR LINER

O.D.	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.70	1056	51	G+10	G

TIME DISTRIBUTION – HOURS

CODE	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	2½		2½
2	TRIPS	6½	6¼	12¾
3	HANDLE TOOLS	1½		1½
4	DIRECTIONAL WORK	¼		¼
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE		1	1
7	RIG SERVICE	¼	¼	½
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	1	2	3
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING		2½	2½
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm	X	O.D. mm	
1	BIT					m
		X				m
		X				m
		X				m
		X				m
		X				m
		X				m
		X				m
		X				m
		X				m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	13		
SIZE (mm)	215.9		
IADC CODE			
MFG.	SEC		
TYPE	M84F		
SERIAL NO.	394779		
JETS (1/32") (mm)	3-13		
DEPTH OUT (m)	2855		
DEPTH IN (m)	2779		
TOTAL METRES DRILLED (m)	76		
TOTAL HRS. RUN	19¼		
D U L L	CUT STRUC. I O D L B G O R		

HOLE CONDITION

HOLE DRAG (daN)		
TORQUE AT BOTTOM	(DP TURNS)	
FILL ON BOTTOM (m)		

REMARKS:

MUD RECORD

TIME	2400	0400		
DENSITY (kg/m³)	1115	1115		
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	62	62		
PV/YP	/	/	/	/
GELS (Pa)	/	/	/	/
W.L. (cm³)	7.0	7.0		
F.C. (mm)				
pH	10	10		
OIL VOL. FRAC.				
SAND VOL. FRAC.	DUMPED			
K+ (1000 mg/L)	SAND TRAP			
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
BARITE	155	SXS	
SODA ASH	3	SXS	
SAW DUST	10	SK	

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2844 m	2855 m	2½	11		POT @ 00:00 101.8 m³	13/18	60/300			152	60	152	60		
m	m														
m	m				FUEL @ 06:00 M										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
2847	1¾	N58W						

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	0030	0230	2½	DRILL
9	0230	0330	1	CIRC BOTTOM HOLE SAMPLE WORKSTRING MEASURE BELLEY 8 m
4	0330	0345	¼	DROP SURVEY
7	0345	0400	¼	SERVICE RIG FUNCTION TEST TOP PIPE RAMS CLOSED 8 SEC OPEN
2	0400			PUMP P.H.L. TRIP OUT TO PICK CORE BARREL BLOW BELLY INSTALL STABBING VALVE FLOW AT 10 STANDS 25 STANDS AND BEFORE PULLING DRILL COLLOR LAY DOWN SHOCK SUB
		1030	6½	AND JARS FUNCTION TEST BLIND AND HCR.
3	1030	1200	1½	PICK UP CORE BARREL CHANGE OUT BEARING AND SERVICE CORE BARREL

Held BOP Drill While Tripping
Crew in Position Well Shut in
45 sec. 1m

Daily Rig Check

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD B-41 DATE: 89/02/28

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: RIG NO.: 48

DAY TOUR 00:00 P.M. 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		DAVE MILLAR	12
DRKMAN		DARREN LAPLANTE	12
MTRMAN		DEAN BIRD	12
FLRMAN		ALLEN LARSON	12
FLRMAN		RON PETERSON	12
FLRMAN			

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	21½ HRS
EVALUATION	2065	2½ HRS
COMPLETION		HRS
Boiler #2	2042	24 HRS
TOTAL HOURS ACCOUNT TO SHELL		24 HRS
BOILER	2042	24 HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa	2	
INTAKE DENSITY (kg/m³)	1110	
OVERFLOW DENSITY (kg/m³)	1100	
UNDERFLOW DENSITY (kg/m³)	1335	

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa	2	
INTAKE DENSITY (kg/m³)	1230	
OVERFLOW DENSITY (kg/m³)	1100	
UNDERFLOW DENSITY (kg/m³)	1335	

WIRELINE RECORD REEL NO. 1

SIZE 32 mm # OF LINES 10 LENGTH SLIPPED 30 m

LENGTH CUT OFF 30 m PRESENT LENGTH 1697 m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES 1189450 MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE		I.D. mm	X	O.D. mm	
1	BIT					0.29 m
2	FAH			X 171		19.40 m
1	1/0		53	X 143		.25 m
11	F-G-I		73	X 171		.87 m
1	1/4		66	X 170		4.70 m
15	0-4		59	X 170		178.01 m
1	1/0		73	X 170		.91 m
6	4-6		70	X 127		54.81 m
				X		m
				CH X		2510.24 m
				X		m
				X		m
				X		m
90	D.P.		STANDS			m
2	D.P.		SINGLES			21.02.27 m
	KELLY DOWN					3.19 m
	TOTAL					2859 m
WT. OF DC						30 1000 daN
WT. OF STRING						99 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	CORE #3	14C	
SIZE (mm)	215.9		
IADC CODE			
MFG.	ECLL		
TYPE	SCR778		
SERIAL NO.	601569		
JETS (1/32") (mm)	3-14		
DEPTH OUT (m)	2855		
DEPTH IN (m)	2844		
TOTAL METRES DRILLED (m)	11		
TOTAL HRS. RUN	3½		
D U L L	CUT STRUC. I O D L B G O R		

HOLE CONDITION

HOLE DRAG (daN)	3 3	
TORQUE AT BOTTOM	(DP TURNS) 3/4	
FILL ON BOTTOM (m)	1m.	1m

REMARKS:

MUD RECORD

TIME		0900	2400	
DENSITY (kg/m³)		1120		
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)		73		
PV/YP	/	/	/	/
GELS (Pa)	/	/	/	/
W.L. (cm³)				
F.C. (mm)				
pH		10.0		
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
XCD	25KG		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2855 m	2859 m	2½	4		POT @ 2200 85.5 m³	5	72/80	6200		152	95	152			
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	1200	1345	1¾	PICK JARS AND BIT SUB AND X/O RUN IN HOLE W/DRILL COLLAR
6	1345	1445	1	SLIP AND CUT 30m DRILL CHECK BRAKE PIN AND
2	1445		4½	LEAKAGE BEXT CROWN SAVER
				RUN IN HOLE SLOW STRAP DRILL (N) BLOW OUT DRILL
				OPEN HCR CLOSE HYDRIL FUNCTION REMOTE CHOKE
				FILL THE HOLE AND CIRC 5 MIN 30 STANDS IN AND 55 STANDS
				Hit Bridge @ 2760m.
		1900		
9	1900	2030	1½	Break Circ & Returns clean F 2760 T 2790
2	2030	2045	¼	Trip In
9	2045			~~Break Circ~~ Break Circ Returns Clean 15m To Bottom
		2115	½	Im Fill Circ
7	2115	2130	¼	Service Rig Function Btm Pipe Ram close 8 sec open
18	2130	2400	2½	Drop Ball Core # 3

RSPP #1 Run Pressure 3000 KPa

DRILLER

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR 12:00 P.M. 24:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SACY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOBE	12
WELDER		HUBERT FURGUSON	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B-41

LOCATION: 60° 30' 8-49 N 122° 53' 16-93 W — PROVINCE: N.B.T.

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited — CONTRACTOR: ATCO — RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
2859 m	2887 m	28 m	449.2	38	89	03	01

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	24.0	E	93	162	4½ IF	1	National	9-P-100	235	60	3000
127	29.0	G	93	162	4½ IF	2	National	9-P-100	235		

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.7	1056	51	G-10	G

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	6¾	5	11¾
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE	½	½	1
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	1¾		1¾
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING	5¾	4¾	10
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE			
1	BIT	I.D. mm	X O.D. mm	29 m
2	LB		X 171	19.40 m
1	50	58	X 143	.25 m
1	50	72	X 171	.37 m
1	3¼	66	X 170	4.70 m
18	40	59	X 170	173.01 m
1	46	72	X 170	.91 m
6	46	70	X 127	54.51 m
			X	m
			X	254.24 m
			X	m
			X	m
			X	m
91	D.P.	STANDS		261.58 m
1	D.P.	SINGLES		m
	KELLY DOWN			2.32 m
	TOTAL			2869 m
WT. OF DC				1000 daN
WT. OF STRING				100 1000 daN

REMARKS:

BIT RECORD

BIT NO.	CORE #3
SIZE (mm)	215.9
IADC CODE	
MFG.	ECCL
TYPE	SHP738
SERIAL NO.	dc1549
JETS (32nds) (mm)	1-14 1-13 1-12
DEPTH OUT (m)	2869
DEPTH IN (m)	2855
TOTAL METRES DRILLED (m)	14
TOTAL HRS. RUN	5
CUT STRUC. DULL	I O D L
CUT STRUC. LOCATION	B G O R

HOLE CONDITION

HOLE DRAG (daN)	3-4
TORQUE AT BOTTOM (DP TURNS)	¾
FILL ON BOTTOM (m)	—
REMARKS:	

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS-(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
BARITE	85		

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2859 m	2869 m	2.3	10		Pulp core 85.4 m³	25	80	2400		142	95	142			
m	m														
m	m				CORE #3 Rec 14.8 m										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
18	00:00	02:30	2½	Coring
2	02:30	02:45	¼	Pumpout 2 single G Pipes
2	02:45			Pump P. U. Fr. Out Core #3 Test Stabbing Valve TF 11 Up
		0		Record Wire Flare @ 1st Tbl, 25 std, BHA 90s Lay Down
		0830	5¾	JARS HOLE VOLUME
18	0830	1115	2¾	RECOVER CORE #3 MEASURED 13.40
2	1115			FUNCTION TEST BLIND RAMS & HCR CALCULATED 1.60
				MAKE UP AND STRIKE CORE BARREL DIFF 1.20
		1200	¾	RUN DRILL COLLAR
				Entered 2855-2869.8 Rec 14.97 & 14.8
				Daily Rig Check WD
				DRILLER S. DAVIS

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042		HRS
EVALUATION	2065	24	HRS
COMPLETION			HRS
Boiler #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2065	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO. 1

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED 10 m

LENGTH CUT OFF 0 m — PRESENT LENGTH 1687 m

MEGAJOULES SINCE LAST CUT 1221 MJ

CUMULATIVE MEGAJOULES 12171 MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE			
1	BIT	I.D. mm	X O.D. mm	29 m
2	LB		X 171	19.40 m
1	50	58	X 143	.25 m
1	50	72	X 171	.37 m
1	3¼	66	X 170	4.70 m
18	40	59	X 170	173.01 m
1	46	72	X 171	.91 m
6	46	70	X 127	54.51 m
			X	m
			X	254.24 m
			X	m
			X	m
			X	m
91	D.P.	STANDS		261.58 m
1	D.P.	SINGLES		26.21 m
	KELLY DOWN			11.23 m
	TOTAL			2887 m
WT. OF DC				26 1000 daN
WT. OF STRING				100 1000 daN

REMARKS:

BIT RECORD

BIT NO.	CORE #4
SIZE (mm)	215.9
IADC CODE	
MFG.	ECCL
TYPE	SHP738
SERIAL NO.	dc1549
JETS (32nds) (mm)	1-14 1-13 1-12
DEPTH OUT (m)	2887
DEPTH IN (m)	2869
TOTAL METRES DRILLED (m)	18
TOTAL HRS. RUN	4½
CUT STRUC. DULL	I O D L
CUT STRUC. LOCATION	B G O R

HOLE CONDITION

HOLE DRAG (daN)	4-5
TORQUE AT BOTTOM (DP TURNS)	¾
FILL ON BOTTOM (m)	—
REMARKS:	

MUD RECORD

TIME		16:00
DENSITY (kg/m³)	T	1115
GRADIENT (kPa/m)	R	
FUNNEL VIS-(s/L)		68
PV/YP	/ 21 /	
GELS (Pa)	/ 21 /	
W.L. (cm³)	I	
F.C. (mm)	P	
pH	6	10
OIL VOL. FRAC.		
SAND VOL. FRAC.		
K+ (1000 mg/L)		
Cl- (1000 mg/L)		

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	3 SKS		
GEL	30 SK		
KELZAN	1 SK		
SODA ASH	3 SK		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2869 m	2887 m	4.5	18		Pulp @ 2000 36.4 m³	25	95	2400		142	95	142			
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
6	1200	1230	½	INSTALL STABBIN VALVE SLIP 10 m DRILLING LINE
2	1230	1630	4	RUN IN HOLE W/ CORE BARREL
9	1630	1715	¾	CLEAN M m TO BOTTOM AND CIRC 10 MIN
18	1715	1745	½	CIRC AND DROP BALL
18	1715	2200	4¾	CUT CORE # 4
2	2200	2230	½	PUMP OUT AT RAT HOLE LAYED DOWN USING 6 PIPE
9	2230	2330	1	CIRC BLOW DOWN KELLY
2	23 30	24:00	½	PUMP PILL BLOW KELLY TRIP OUT CORE # 4
				DRILLER

CRAINSET

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD B-41 — DATE 89/03/01

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO. 48

DAY TOUR 00:00 P.M. 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Miller	12
DRKMAN		Darrell LaPointe	12
MTRMAN		Dean Bird	12
FLRMAN		Allan Larsen	12
FLRMAN		Ron Peterson	12
FLRMAN			

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRIWAY	12
FLRMAN		CHRIS FNTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	12
WELDER		HUBERT FURGUSON	12

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B-41

LOCATION | PROVINCE: West

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE

CONTRACTOR: ATCO — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE — RIG NO.

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE: YEAR	DATE: MONTH	DATE: DAY
2887 m	2907 m	20 m	454½	34	89	03	02

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.7	1056	51	G-10	G

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD B-41 — DATE: 89/03/02

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO.: 46

TIME DISTRIBUTION – HOURS

CODE	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL		5	5
2	TRIPS	8¾	5¼	14
3	HANDLE TOOLS	¾	¼	1
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE		¼	¼
7	RIG SERVICE	¼		¼
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING		1	1
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING	2¼		2¼
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. dm	m
1				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.		STANDS			m
	D.P.		SINGLES			m
	KELLY DOWN					m
	TOTAL					m

WT. OF DC — 1000 daN

WT. OF STRING — 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	Core #4
SIZE (mm)	216
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (32nds) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L	I O D L
CUT STRUC. L B G O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS-(s/L)	
PV/YP	/ / /
GELS (Pa)	
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
BARITE	50 sx		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2887 m	m				PUT @ 00:00 858m					152		152			
m	m				Pull @ 06:00 N										
m	m				CORE #4 2 19m										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	00:00			Trip Out Core #4 @ Install stabilizer valve / Hole Fill Record
		04:30	4½	Core Flow @ 1st lt. 25stds, Flow @ 65 stds, BHA
7	04:30	04:45	¼	Service Rig Function Hyd; 1 close 1 open
18	04:45	07:00	2¼	Lay Down Jars Recover Core Service Core Barrel, Function Blind Rams, Recover 18m.
2	07:00			Trip Tri Core Barrel To 1000
		09:15	2¼	Core #4 Interval 2869.8–2887.8 Rec 18.00m 18.0
18	09:15	09:45	½	Hoist To Lay Down Core Barrel
3	11:15	12:00	¾	Lay Down Jars and Core Barrels
			12	

Daily Rig Inspection

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
3	12:00	12:30	½	Lay Down Core Barrel
2	12:30			Function Test Blind Ram and HCR Pick up Shock
		14:45	2¼	Sub and Tar Run in Hole To 1000 m. Install Stabbing Valve
6	14:45	15:00	¼	Slip 10 m Drill Line Reset Crown Saver. Grease Crown
2	15:00	18:00	3	Run in Hole, Fill Pipe 3 Times on Way In And Blocks
9	18:00	19:00	1	Break Circ @ Ketchem 1 Clean 36m To Btm .50m Fill
1	19:00	24:00	5	Drill. Kelly Speed 62 SPM 3500 kPa #1 Pump

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	11½ HRS
EVALUATION	2065	12½ HRS
COMPLETION		HRS
Boiler #2	2042	24 HRS
TOTAL HOURS ACCOUNT TO SHELL		24 HRS
BOILER	2042	24 HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa	3	
INTAKE DENSITY (kg/m³)	1115	
OVERFLOW DENSITY (kg/m³)	1115	
UNDERFLOW DENSITY (kg/m³)	1250	

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa	3	
INTAKE DENSITY (kg/m³)	1250	
OVERFLOW DENSITY (kg/m³)	1025	
UNDERFLOW DENSITY (kg/m³)	2300	

WIRELINE RECORD

REEL NO. 1

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED 18 m

LENGTH CUT OFF 0 m — PRESENT LENGTH 1637 m

MEGAJOULES SINCE LAST CUT 6321 MJ

CUMULATIVE MEGAJOULES 121271 MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. dm	m
1	Rock	12¼		X	194	87 m
1	Dom	95		X	167	8.62 m
1	SS	64		X	130	2.35 m
3	DU	69		X	130	28.74 m
1	SH	64		X	171	4.34 m
17	DU	69		X	169	162.96 m
1	Ha	73		X	130	91 m
6	HW	70		X	127	54.81 m
		BHA				263.34 m
				X		m
				X		m
				X		m
				X		m
91	D.P.		STANDS			2633.12 m
2	D.P.		SINGLES			10.10 m
	KELLY DOWN					m
	TOTAL					2907 m

WT. OF DC — 22,000 1000 daN

WT. OF STRING — 105,000 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min — 11½ FCD — Put 31.5 @ 24:00

BIT RECORD

BIT NO.	15
SIZE (mm)	216
IADC CODE	
MFG.	SEC
TYPE	M 86F
SERIAL NO.	39997
JETS (32nds) (mm)	3-14 ONE
DEPTH OUT (m)	
DEPTH IN (m)	2887
TOTAL METRES DRILLED (m)	20
TOTAL HRS. RUN	5
CUT STRUC. D U L	I O D L
CUT STRUC. L B G O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	2-3
TORQUE AT BOTTOM (DP TURNS)	1
FILL ON BOTTOM (m)	.50

REMARKS: Hole Was Good On Trip In Build Mud Volume

MUD RECORD

TIME	19:30	21:30	23:30
DENSITY (kg/m³)	1120	1150	1130
GRADIENT (kPa/m)			
FUNNEL VIS-(s/L)	72	60	60
PV/YP	/	/	/
GELS (Pa)			
W.L. (cm³)	7.6	7.8	7.8
F.C. (mm)			
pH	9.5	9.5	9.5
OIL VOL. FRAC.			
SAND VOL. FRAC.			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	45KS		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2887 m	2907 m	6	20			16/18	60	8000		152	60	152	60		
m	m														
m	m				Start Drill at 79.9m³ HT										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
3	1200	1230	½	Lay Down Core Barrel
2	1230			Function Test Blind Ram and HCR Pick up Shock
		1445	2¼	Sub and Tar Run in Hole To 1000 m. Install Stabbing Valve
6	1445	1500	¼	Slip 10 m Drill Line Reset Crown Saver. Grease Crown
2	1500	1800	3	Run in Hole, Fill Pipe 3 Times on Way In And Blocks
9	1800	1900	1	Break Circ @ Ketchem 1 Clean 36m To Btm .50m Fill
1	1900	2400	5	Drill. Kelly Speed 62 SPM 3500 kPa #1 Pump

DRILLER

DAY TOUR

00:00 P.M. — 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS	
DRILLER		Dave Miller	12	8
DRKMAN		Darrell LaPlante	12	8
MTRMAN		Dean Bird	12	8
FLRMAN		Allen Larsen	12	8
FLRMAN		Ron Peterson	12	8
FLRMAN				

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

12:00 P.M. — 24:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS	
DRILLER		RAY SOUCY	10	
DRKMAN		GARY BUCHBERGER	8	
MTRMAN		TODD KRYWAY	8	
FLRMAN		CHRIS ENTZ	8	
FLRMAN		DOUG HOOD	10	
FLRMAN				
WELDER		HUBERT FURGUSON	12	
	2 HRS FOR WHMIS TRAINING			
DRILLER		ROBERT HODGE	8	
DERRICK		ALEX SCOTT	8	
MTRMAN		TIM HODGE	8	
FLRMAN		DARREN McMASTER	8	
FLRMAN		DAVID MORRIN	8	
FLRMAN		JULIEN SAGUE	8	
FLRMAN		JOCHIM KLONIKE	8	

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD

LOCATION: 60° 30' 08.4931" 60° 40' 16.9292" — PROVINCE: N WT

OPERATOR: Shell Canada Limited — CONTRACTOR: ATCO DRILLING — RIG NO. 48

SIGNATURE OF SHELL'S REPRESENTATIVE — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump–stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
2907 m	2997 m	90 m	325 3/4	40	89	03	03

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO BSC HEAD (m)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.7	1056	51	G+O	G

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.0	E	93	162	4½IF	1	NATIONAL 9P-100	235	75	3900
127	29.0	G	93	162	4½IF	2	NATIONAL 9P-100	235	60	3000

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	11 3/4	10 1/4	
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	1/2	1 1/2	
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	1/4	1/4	
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D.	X	O.D.		
1						24	m
1	E	04	73	X	171	87	m
1	D	M	73	X	167	86	m
1	S	S	69	X	170	2.35	m
3	D	W	69	X	170	28.74	m
1	S	M	69	X	171	4.34	m
17	D	W	69	X	169	162.96	m
1	W	6	73	X	170	91	m
6	H	W	70	X	127	54.81	m
			BHA			263.84	m
			X				m
			X				m
			X				m
			X				m
93	D.P.		STANDS			2724.60	m
2	D.P.		SINGLES			21.90	m
	KELLY DOWN					5.90	m
	TOTAL					2960.	m
WT. OF DC						22	1000 daN
WT. OF STRING						107000	1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		15	
SIZE	(mm)	215.9	
IADC CODE			
MFG.		SEC	
TYPE		M84F	
SERIAL NO.		39997	
JETS	(m/m)	16 16 OPEN	
DEPTH OUT	(m)		
DEPTH IN	(m)	2887	
TOTAL METRES DRILLED	(m)	110	
TOTAL HRS. RUN		27	

CUT STRUC.: DULL I O D L; B G O R

HOLE CONDITION

HOLE DRAG (daN)		2-3
TORQUE AT BOTTOM	(DP TURNS)	1
FILL ON BOTTOM (m)		NIL

REMARKS: Increase Pumping Rate Slowly

Start To Lose Mud @ 75 SPM

MUD RECORD

TIME	12:00	18:00	20:00
DENSITY (kg/m³)	1115	1115	1115
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	60	55	75
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)	8.2	8.5	8.5
F.C. (mm)			
pH	10.0	10.0	10.0
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl– (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	12 SKS		
CAUSTIC	1 SKS		
LIME	1 SKS		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2907 m	2960 m		53		Fort 1 Hills	15/14	55/60	8000		152	60	152	60		
m	m				Yoolaing (UPPER)										
m	m				Mbr Lwr 2672@ 4m/hr										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
7	0000	0015	1/4	Rig Serv, Function Test Hydr, Close 12 SEC Function Test Remote Choke Check Brake Pin and Leakage
	0015	08:00	7 3/4	Drill
	08:00	12:00	4	Drill

Daily Rig Inspection

SAFETY MEETING w/CREW & ENGINEER

SERVICE PUMP #1

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler 2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.

SIZE mm — # OF LINES — LENGTH SLIPPED m

LENGTH CUT OFF m — PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D.	X	O.D.		
1						.24	m
1	E	04	73	X	171	.37	m
1	D	M	73	X	167	8.62	m
1	S	S	69	X	170	2.35	m
3	D	W	69	X	170	28.74	m
1	S	M	69	X	171	4.34	m
17	D	W	69	X	169	162.96	m
1	W	6	73	X	170	91	m
6	H	W	70	X	127	54.81	m
			BHA			263.84	m
			X				m
			X				m
			X				m
			X				m
95	D.P.		STANDS			2724.60	m
3	D.P.		SINGLES				m
	KELLY DOWN					45.5	m
	TOTAL					2997	m
WT. OF DC						22000	1000 daN
WT. OF STRING						107000	1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		15	
SIZE	(mm)	215.9	
IADC CODE			
MFG.		SEC	
TYPE		M84F	
SERIAL NO.		39997	
JETS	(m/m)	16 16 OPEN	
DEPTH OUT	(m)		
DEPTH IN	(m)	2887	
TOTAL METRES DRILLED	(m)	110	
TOTAL HRS. RUN		27	

CUT STRUC.: DULL I O D L; B G O R

HOLE CONDITION

HOLE DRAG (daN)		
TORQUE AT BOTTOM	(DP TURNS)	
FILL ON BOTTOM (m)		

REMARKS:

MUD RECORD

TIME	12:00	18:00	20:00
DENSITY (kg/m³)	1115	1115	1115
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	60	55	75
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)	8.2	8.5	8.5
F.C. (mm)			
pH	10.0	10.0	10.0
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl– (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
BARITE	65 SX		
GEL	24 SX		
LIME	1 SX		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2960 m	2997 m	10 1/4	3 7			17/18	60	8000		152	70	152	70		
m	m							2500		152	60	152	60		
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
2963	5 1/2	N31W						

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1700	12 15	1/4	Rig Service + TP Pump Close 7 Sec + Open
	12 15	16 00	3 3/4	Drill
	16 00	17 30	1 1/2	Survey @ 2963
	17 30	2400	6 1/2	Drill
			12	

Held Safety Meeting w/ Crew + Need Hand Introducing Kill Speed 60 @ 3000 #2 Pump

Service #2 Pump

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO. 60° 30 08.4931 N 122 53 16.93 W — DATE 89/03/03

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO. 48 ATCO

DAY TOUR

00⁰⁰ P.M. — 12⁰⁰ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	12
DRKMAN		Gary Buchberger	12
MTRMAN		Todd Krayway	12
FLRMAN		Chris Fentz	12
FLRMAN		Doug Hood	12
FLRMAN			
LEASE		Earl Hope	12
LEASE		Douglas Bertrand	12
WELDER		Hubert Ferguson	

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

12⁰⁰ P.M. — 24⁰⁰ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Tim Hodge	12
FLRMAN		Doreen McMaster	12
FLRMAN		David Merrill	12
FLRMAN			
LEASE		Julien Sassie	12
LEASE		Jochim Hunke	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CP-225 (10/86)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B-41

LOCATION: 60°30'02.49"N 122°53'16.93"W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — CONTRACTOR: ATCO DRILLING — RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

WEATHER CONDITIONS

TEMPERATURE	-30 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
2997 m	3030 m	33 m	35.25	41	89	03	04

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.7	1056	230	G-10	G

TIME DISTRIBUTION – HOURS

CODE	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	3 1/4	8 1/4	11 1/2
2	TRIPS	9 1/4	2 3/4	10 1/2
3	HANDLE TOOLS			
4	DIRECTIONAL WORK	1/2		1/2
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE	1/2	1/4	3/4
7	RIG SERVICE		1/4	1/4
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING		1/2	1/2
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	609	12 1/4 X [illegible]		37 m
1	DW	7 3/8 X 167	8.62	m
1	SS	6 9/16 X 170	2.35	m
3	DW	6 9/16 X 170	28.74	m
1	SH	6 9/16 X 171	4.34	m
13	DW	6 9/16 X 169	162.96	m
1	WO	7 3/8 X 170	.91	m
6	HO	7 3/8 X 169	54.91	m
		BHA	263.54	m
		X		m
		X		m
		X		m
		X		m
26	D.P.	STANDS	275.79	m
	D.P.	SINGLES		m
	KELLY DOWN		8.76	m
	TOTAL		3030	m

WT. OF DC: 22,000 (1000 daN)
WT. OF STRING: 100,000 (1000 daN)

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min
PUT START DRILL 92.3m³

BIT RECORD

BIT NO.	16	RR13	
SIZE (mm)	215.9	215.9	
IADC CODE			
MFG.	SEC	Reed	
TYPE	MFDSF	HP41A	
SERIAL NO.	39777	BF6597	
JETS (1/64) (mm)	20 20 20	3 3 3	
DEPTH OUT (m)	3004		
DEPTH IN (m)	2887	3004	
TOTAL METRES DRILLED (m)	117	26	
TOTAL HRS. RUN	30 1/4	3 1/4	
CUT STRUC. D U L L	8 I 8 O D L		
B G O R	WT A E I NO TP		
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

HOLE CONDITION

HOLE DRAG (daN)		2.3
TORQUE AT BOTTOM (DP TURNS)		1-1 1/4
FILL ON BOTTOM (m)		.20

REMARKS: Hole good on 12.0.10

MUD RECORD

	0800	0400	0800
TIME	00:00	04:00	08:00
DENSITY (kg/m³)	1115	1115	1120
GRADIENT (kPa/m)			
FUNNEL VIS-(s/L)	68	65	63
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)	8.5	8.5	
F.C. (mm)			
pH	10	10	
OIL VOL. FRAC.			
SAND VOL. FRAC.			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
KELZAN	1		
GEL	12		
SODA ASH	3		
BARITE	65 SKS		

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler 2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD — REEL NO.

SIZE mm	# OF LINES	LENGTH SLIPPED m
LENGTH CUT OFF 470 m		PRESENT LENGTH 1647 m
MEGAJOULES SINCE LAST CUT 0		MJ
CUMULATIVE MEGAJOULES 129394		MJ

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
2997 m	3004 m	3 1/4	7		Fuel 1.35	10	50	9500		152	60	152	60		
m	m				122860										
m	m				27910 / accum 35.6m										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
1	0000	0315	3 1/4	DRILL
4	0315	0345	1/2	DROP SURVEY
2	0345	08:00	4 1/4	PUMP PILL BLOW KELLY HOIST FOR BIT FLOW CHECK 5 STAND 10 STAND 50 STAND
		0800	4 1/4	
	08:00	09:30	1 1/2	FINISH OUT RECOVER SURVEY BBL FLO ✓ @ BHA INSTALL STAB MAKE UP BIT #16 & TURN IN TOO 10:50 INSTALL STABBING VALVE HOLD BOP DRILL WITH CREWS IN
	09:30	11:30	2	
	11:30	12:00	1/2	SLIP 18m + CUT 40m
	12:00	12:15		RUNNING FILL PIPE 3 TIMES ON WAY IN

✓ HCR
CHANGE FLUID PUMPS WHEN OUT OF HOLE CLOSE TECS + OPEN

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO. 60°30'08 49"N 122°53'16.73"W — DATE MARCH 4/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO. 48 ATCO

DAY TOUR 00:00 P.M. 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
		EARL HODE	12
		DOUGLAS BERTRAND	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR 12:00 P.M. 24:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		ROBERT HODGE	12
DRKMAN		ALEX SCOTT	12
MTRMAN		TIM HODGE	12
FLRMAN		[illegible]	12
FLRMAN		DAVID MORRIS	12
FLRMAN			
WLRMN		JULIAN SASSIE	12
WLRMN		JOACHIM KLONIKE	12
WLRMN		HARRY FERGUSON	12

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
6	12:00	12:15	1/4	CUT LINE + SLIP
7	12:15	12:30	1/4	RIG SERVICE OPENED TOP PIPE RAMS CLOSED SECT OPEN
2	12:30	15:15	2 3/4	RUNNIN FILL PIPE 3 TIMES
9	15:15	15:45	1/2	BREAK CIRC ✓ RETURNS + CLEAN 18m TO BTM .50 m FILL
1	15:45	24:00	8 1/4	DRILL
			12	

Daily Rig Inspection

DRILLER

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL AARROWHEAD B-48-41

LOCATION: 60°30'08 49"N 120° 53 1693"W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: ATCO DRILLING — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

- mud density = kilogram per cubic metre (kg/m³)
- pump-stroke length = millimetre (mm)
- weight of string = decanewton (daN)
- weight on bit: indicator will record decanewton
- linear mass = kilogram per metre (kg/m)
- viscosity = second per litre (s/L)
- mud flow rate = cubic metres per minute (m³/min)
- pressure gradient = kilopascal per metre (kPa/m)
- yield point = pascal (Pa)
- plastic viscosity = millipascal second (mPa•s)
- gel strength = pascal (Pa)
- work completed by wire line = megajoule (MJ)
- inside diameter and outside diameter = millimetre (mm)
- pump pressure = kilopascal (kPa)

359.25

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE: MONTH	DAY
3030 m	3080 m	50 m	375.25	42	89	03	05

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	290	E	93	162	4½IF	1	NOT 9-P100	235	60	3500
127	290	G	93	162	4½IF	2	NOT 9-P100	235	65	4000

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.7	1056	51	G-10	

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	11¾	4¼	16
2	TRIPS		3¼	3¼
3	HANDLE TOOLS			
4	DIRECTIONAL WORK		1½	1½
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	½	¼	½
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	2¾		2¾
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
1		BIT				24 m
1	FDH		73	X	171	87 m
1	DBH		73	X	167	862 m
1	SS		69	X	170	235 m
3	DH		64	X	170	2874 m
1	SH		64	X	171	43.4 m
17	DH		69	X	170	162.96 m
1	X/O		73	X	170	91 m
6	HWDP		70	X	127	549.81 m
			BHA			263.84 m
			X			m
			X			m
			X			m
			X			m
92	D.P.	STANDS				m
2	D.P.	SINGLES				2505.34 m
		KELLY DOWN				11.02 m
		TOTAL				3080 m

WT. OF DC: 22,000 (1000 daN)

WT. OF STRING: 108,000 (1000 daN)

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

PUT @ 0800 37.8 m³

BIT RECORD

BIT NO.	17
SIZE (mm)	215.9
IADC CODE	
MFG.	REED
TYPE	HP11A
SERIAL NO.	BT6597
JETS (32nds) (mm)	3/11/11
DEPTH OUT (m)	
DEPTH IN (m)	3004
TOTAL METRES DRILLED	76
TOTAL HRS. RUN	24¼
CUT STRUC. D U L L / I O D L / B G O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	PUMPS OFF / DU	6-5 / 3-3
TORQUE AT BOTTOM (DP TURNS)		1½
FILL ON BOTTOM (m)		NIL

REMARKS:

92 JTS G PREM HWDP

MUD RECORD

TIME	5430	19:00	2000
DENSITY (kg/m³)	1130	1120	1130
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	63	61	75
PV/YP			
GELS (Pa)			
W.L. (cm³)	7.1	7.1	6.4
F.C. (mm)			
pH	10.5	10.5	10.5
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	24 SACKS		
CAUSTIC	1 SKS		
BARITE	2 SKS		

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION			HRS
Boiler #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa	6	
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa	6	
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD — REEL NO.

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED m

LENGTH CUT OFF m — PRESENT LENGTH 1647 m

MEGAJOULES SINCE LAST CUT 5001 MJ

CUMULATIVE MEGAJOULES 137395 MJ

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3030 m	3068 m	11¾	3B		FUT 1,00 m 12672 – 29210 accum 35 cm	7/8	50	10110		152	60	152	60		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	0000	0045	¾	DRILL
	0045	0100	¼	RIG SERV, FUNCTION TEST H/P DRILL CLOSED IN SEE
	0100	0800	7	DRILL
	0800	1200	4	DRILL

Daily Rig Inspection

SERVICE #1 PUMP

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
7	1200	1215	¼	RIG SERVICE CHANGE TOP PIPE RAM CLOSE 7 SEC ; OPEN RIG SPEED 65 SPM 4000
1	1215	1345	1½	DRILL ½ PUMP
4	1345	1445	1	SURVEY @ 3059 SURVEY LINE BROKE/PETY ; PU STRING LINE ; RETRIEVE BBL
1	1445	1730	2¾	DRILL
9	1730	2015	2¾	CIRCULATE BTMS UP SAMPLE CIRCULATE CONDITION MUD WORK DRILL STRING
4	2015	2045	½	DROP SURVEY
2	2045	2400	3¼	PUMP PILL BLOW ISELLY HOIST TO LOG 5 STDS FLOWCHECK 5,10 25 STAND
			12	

(BOP DRILL WELL TRIPPING) OPEN HCR CLOSE M/S DRILL CREW (RAY) REMOTE CHOKE

CHANGE OIL IN CAMP LITE PLANT ; TAKE FIGURES CLEANED CROWN ; BLOCKS ; DRAWORK SERVICES

DRILLER

CRAINSET

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: 60°30'08 4931N 2253'1692W — DATE: MARCH 5/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO.: ATCO 48

DAY TOUR 00⁰⁰ P.M. 12⁰⁰ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRAYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	12
LEASE		DOUGLAS BERTRAND	12
WELD		HUBERT FJARVSON	

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR 12⁰⁰ P.M. 2400 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		ROBERT HODGE	12
DRKMAN		ALEX SCOTT	12
MTRMAN		TIM HODGE	12
FLRMAN		JASON MCMASTER	12
FLRMAN		DAVID MERRILL	12
FLRMAN			
LEASE		JULIEN SASSIE	12
WELD		JOSHUA KUNIKE	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD
LOCATION: 60 30' 08 49 31" 122 53 16 9292" W
PROVINCE: N.W.T.

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: Arctic Drilling
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

SPM	PRESS (kPa)

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

3752.5

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	MONTH	DAY
3080 m	m	m		43	89	03	06

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.7	1056	51	G10	G

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)
127	29.0	E	93	162	4½IF	1	NAT 9-P100	235
127	29.0	G	93	162	4½IF	2	NAT 9 P100	235

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	4¾	5¼	10
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE		¼	¼
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING		6½	6½
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG	7¼		7¼
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	BIT			.24 m
1	EOR	12¼ X 194		57 m
1	DM	73 X 169		8.62 m
1	SS	64 X 176		2.35 m
3	DU	64 X 190		28.74 m
1	SH	64 X 171		4.34 m
17	DU	64 X 164		162.96 m
1	X6	73 X 170		.91 m
6	HW	76 X 127		54.81 m
		31XA		263.54 m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
97	D.P.	STANDS		2814.93 m
2	D.P.	SINGLES		2505.34 m
		KELLY DOWN		11.10 m
		TOTAL		3080 m
WT. OF DC			1000 daN	
WT. OF STRING			1000 daN	

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min
BTMS UP PMT 744.5 m³

BIT RECORD

BIT NO.	17	18 RR	
SIZE (mm)	215.9	215.9	
IADC CODE			
MFG.	REED	SEC	
TYPE	HPNP	MSHF	
SERIAL NO.	B7157	379939	
JETS (32nds) (mm)	3X11	6X11	
DEPTH OUT (m)	3080		
DEPTH IN (m)	3044	3080	
TOTAL METRES DRILLED (m)	76		
TOTAL HRS. RUN	24¼		
CUT STRUC. D U L	I O D L		
CUT STRUC. L B G O R			

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME				
DENSITY (kg/m³)	T			
GRADIENT (kPa/m)	R			
FUNNEL VIS–(s/L)	I			
PV/YP	P	/	/	/
GELS (Pa)		/	/	/
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
TD m	3080 m				Fuel, 70cm										
m	m				30770 – 30550										
m	m				Gycum 35cm										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
3085	5¾	N10W						

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	20000	0345	3¾	TripST To Log 5Lm Flow Check SO and Reported
19	0345			Rig up Loggers and Logging
		11:00	7¼	Rig Out Loggers & Prepare To Run in Clean Out
	11:00	12:00	1	Make Up Bit & Run in To Clean Out Lay Down Monels & Stabilizers

Daily Rig Inspection

DRILLER

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3080 m	m							9500		152	65	152	65		
2888 m	2900 m		12			0-3	60	8,000		152	90	152	90		
29.19 m	2930 m		11			0-3	60	8,000		152	90	152	90		

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
7	12:00	12:15	¼	Rig Service Operate To Pipe Rams Close - Open Hold BOP Drill w/Crew
2	12:15	16:30	2¼	Run in Break Circ Survey 3055 Ds Install Stabbing Valve
9	16:30	17:45	1¼	Klean Bridge @ 2888 – 2900 12m Run in Clean Bridge 2919 – 2930 + Run to Btm 3062
9	17:45	18:15	½	Break Circ + Clean 18m to Btm 1400 m Fill on Btm
9	18:15	21:00	2¾	Circulate Condition Hole Work Pipe
2	21:00	24:00	3	Pump Pill Blow Kelly Hoist To Log Pull out Slow

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	16¼	HRS
EVALUATION	2065	7¼	HRS
COMPLETION			HRS
Boiler 02	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE	# OF LINES	REEL NO.	LENGTH SLIPPED
32 mm	10		0 m

LENGTH CUT OFF 0 m
PRESENT LENGTH 1647 m
MEGAJOULES SINCE LAST CUT 1579 MJ
CUMULATIVE MEGAJOULES 144493 MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO. 60 30' 08.4931 122 53 16.9292 11
DATE MARCH 6
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE:
RIG NO. Arctic 48

DAY TOUR

00 00 A.M. to 12 00 P.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	12
DRKMAN		Gary Buchberger	12
MTRMAN		Todd Kayway	12
FLRMAN		Chris Entz	12
FLRMAN		Doug Hood	12
FLRMAN			
LEASE		Earl Hope	12
LEASE		Douglas Bertrand	12
WELDER		Hubert Ferguson	

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

12 00 P.M. to 24 00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Jim Hodgie	12
FLRMAN		Darren McMaster	12
FLRMAN		David Morrell	12
FLRMAN			
LEASE		Julian Sassie	12
LEASE		Joachim Nicholie	12
WLDER		Hubert Ferguson	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD B-41

LOCATION: 60°30' 084931 122 53 169292' — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: HTCO DRILLING — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	290	E	93	162	4½IF	1	NAT 9-P100	235		
127	290	G	93	162	4½IF	2	NAT 9-P100	235		

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

37525

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
TD 3080 m	m	m		49	89	03	07

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.7	1056	51	040	G

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	2½		2½
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG	9½	12	21½
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12		24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1		EOM	311 X 127	.87 m
4	DU	69	X 170	38.52 m
1	SH	64	X 171	4.34 m
16	DU	69	X 170	153.96 m
1	MO	73	X 170	.91 m
6	MO	76	X 127	54.81 m
		BHA		253.45 m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
98	D.P.	STANDS		2514.93 m
	D.P.	SINGLES		m
	KELLY DOWN			12.00 m
	TOTAL			3080 m
WT. OF DC				22 1000 daN
WT. OF STRING				1000 daN

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (32nds) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L L I O D L B G O R	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD RECORD

TIME			
DENSITY (kg/m³)			
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)			
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH			
OIL VOL. FRAC.			
SAND VOL. FRAC.			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Barite	9855		

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

94 5½ "G" Pipe In Use

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m				Fuel 1.15 m										
m	m				133840 - 31900										
m	m				accum 35cm										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	0000	0230	2½	Hoist To Log Flow Check 5, 10, 25, 50 And Before Deflation
19	0230	0800	5½	Rig up Logger And Logging Logon Bottom 0415
	0800	1200	4	Logging w/ Schlum Berger
				MEASURED 1525
				CAL 14.87
				.38
				Daily Rig Inspection
				Change oil & Filters 3 motor

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
19	1200	2400	12	Run Wire Line Logs Run #1 FMCS-GR/MAS or T.D.-I.C.
				#2 CNL-LDT-NGT-DAC T.D.-I.C.
				#3 DL-ML-MSFL-SP T.D.-2925 1300-1340

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	2½	HRS
EVALUATION	2085	21½	HRS
COMPLETION			HRS
Baike #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.

SIZE mm — # OF LINES — LENGTH SLIPPED m

LENGTH CUT OFF m — PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ET AL ARROWHEAD 60°30' 084931 N 122°53' 169292 W — DATE: MAR 7/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO.: HTCO 48

DAY TOUR

00⁰⁰ P.M. 1200 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	12
LEASE		DOUGLAS BEATAAND	12
WELDER		HUBERT FURGUSON	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

1200 P.M. 2400 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		ROBERT HODGE	12
DRKMAN		ALEX SCOTT	12
MTRMAN		TIM HODGE	12
FLRMAN		DARREN MC MASTER	12
FLRMAN		DAVID MORRISS	12
FLRMAN			
LEASE		JULIEN SASSIE	12
LEASE		JOACHIM KLINSKE	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ET AL ARROWHEAD
LOCATION: 60°30' 08 4931 122 53167292
PROVINCE: NWT

OPERATOR: Shell Canada Limited
SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: [illegible] DRILLING
SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

SPM: PRESS. (kPa):

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
3030 m	m	m	351.25	45	89	03	07

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	67	1056	51	G+10	6

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)
127	290	E	93	162	4½IF	1	NAT 9P100	235
127	290	E	93	162	4½IF	2	NAT 9P100	235

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG	12	12	24
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12		

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	FDT	222 X 127		87 m
4	DH	69 X 170	38.52	m
1	JH	64 X 171	4.34	m
16	DH	69 X 170	153.76	m
1	1/0	73 X 170	91	m
6	HW	70 X 127	54.81	m
		BHA	253.45	m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
98	D.P.	STANDS	2814.93	m
	D.P.	SINGLES		m
	KELLY DOWN		12.00	m
	TOTAL		3080	m
	WT. OF DC			1000 daN
	WT. OF STRING			1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min
PH @ 05:00 66.1 m³
TRIP TANK 4.4 m³

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (32nds) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. (D U L / I O D L / B G O R)	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP. TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	Well Remains To Be Delete

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Gel	35K		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3030 m	m				Fuel, 90cm										
m	m				135930-33320										
m	m				Accum 35cm										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
9	0001	0600	6	Run wire line log and tear out
	0600	1200	6	Rig up Dresser Atlas Velocity Survey
				Change oil in air comps

DRILLER: [signature]

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	[illegible]	HRS
EVALUATION	2065	24	HRS
COMPLETION			HRS
Boiler #2	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.
SIZE mm | # OF LINES | LENGTH SLIPPED m
LENGTH CUT OFF m | PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT MJ
CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	FDT	222 X 127		87 m
4	DH	69 X 170	38.52	m
1	JH	64 X 171	4.34	m
16	DH	69 X 170	153.76	m
1	1/0	73 X 170	91	m
6	HW	70 X 127	54.81	m
		BHA	253.45	m
		X		m
		X		m
		X		m
		X		m
		X		m
		X		m
98	D.P.	STANDS	2814.93	m
	D.P.	SINGLES		m
	KELLY DOWN		12.00	m
	TOTAL		3080	m
	WT. OF DC			1000 daN
	WT. OF STRING			1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min
4.6 @ 12.00 TRIP TANK
(Used Steam To Heat Up Well)
System PIT 12.5

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (32nds) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. (D U L / I O D L / B G O R)	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP. TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3030 m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	2130	9½	Log w/ Dresser Atlas Survey
	2130	0400	2½	Rig up Wire Log w/ Schlumberger
			12	
				~~VSP~~ VSP TD to S.C
				FMS TD to 2540

DRILLER: [signature]

CRAINSET

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ET AL ARROWHEAD 60°30'08 4931 122 53167292
DATE: 89/03/08
OPERATOR: SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

DAY TOUR

P.M. _____ A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY	12
DRKMAN		GARY BUCHBERGER	12
MTRMAN		TODD KRYWAY	12
FLRMAN		CHRIS ENTZ	12
FLRMAN		DOUG HOOD	12
FLRMAN			
LEASE		EARL HOPE	12
LEASE		DOUGLAS BERTRAND	12
WELDER		HUBERT ~~FERGUSON~~ FURGESON	

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

1200 P.M. 2400 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		ROBERT HODGE	12
DRKMAN		ALEX SCOTT	12
MTRMAN		TIM HODGE	12
FLRMAN		ANDREW MCMEER	12
FLRMAN		DAVID MORRILL	12
FLRMAN			
LEASE		JELLIEN SASSIE	12
LEASE		JOCHIM KUNLIKE	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CP-225 (10/86)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: 60 SHELL FTAL ARROWHEAD
LOCATION: 60°30' 08 4931 122° 53' 16 8272 — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: HTCO — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	−35 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
3080 m	3080 m	— m		46	89	03	09

LAST CASING TUBING OR LINER

	O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG. HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
	244.5	222	89	1057	67	1056	51	G10	G

	DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
	127	24.0	E	93	162	4½IF	1	NAT 9P-100	235	52	3000
	127	29.0	G	93	162	4½IF	2	NAT 9P-100	235		

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	2½	3	5½
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE	¾		¾
7	RIG SERVICE		¼	¼
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	½	1	1
10	CONDITION MUD	¾	7½	8¼
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG	8		8
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
1	BIT					m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	RR B
SIZE (mm)	215.9
IADC CODE	
MFG.	SEC
TYPE	M94F
SERIAL NO.	399979
JETS /mm (mm)	14 16 16e
DEPTH OUT (m)	
DEPTH IN (m)	3080
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	
CUT STRUC. D U L	I O D L
CUT STRUC. L L	B G O R

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	0430			
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	77			
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
GEL	20 sks		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3050 m	m				FUEL .65cm			2300		152	15/20				
m	m				138 200-34920										
m	m				ALCUM 35cm										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
19	0000	0800	8	Logging w/ Schlumberger
2	0800	1030	2½	Prepare to Run Hole Pick up Jars
6	1030	1115	¾	Cut from & Slip from Drill Line
19	1115	1700	¾	Fill Pipe & Break Circ Circulate Dehydrated Mud
				(Daily Rig Inspection)

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION CUO 07269			HRS
#2 Rezide 2042		24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24.	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.
SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED 18 m
LENGTH CUT OFF 18 m — PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT MJ
CUMULATIVE MEGAJOULES MJ

CP-225 (10/86)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: 60 SHELL FTAL ARROWHEAD
LOCATION: 60°30' 08 4931 122° 53' 16 8272 — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:
CONTRACTOR: HTCO — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:
RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	−35 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

	DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
	3080 m	3080 m	— m		46	89	03	09

LAST CASING TUBING OR LINER

	O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG. HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
	244.5	222	89	1057	67	1056	51	G10	G

	DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
	127	24.0	E	93	162	4½IF	1	NAT 9P-100	235	52	3000
	127	29.0	G	93	162	4½IF	2	NAT 9P-100	235		

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	2½	3	5½
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE	¾		¾
7	RIG SERVICE		¼	¼
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	½	1	1
10	CONDITION MUD	¾	7½	8¼
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG	8		8
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
1	109	7⅞		X 177		.24 m
4	DU	70		X 190		38.52 m
1	JH	67		X 171		4.34 m
16	DU	69		X 170		153.76 m
1	116	72		X 130		.91 m
6	HW	70		X 127		54.81 m
				X		m
		OPEN		X		253.45 m
				X		m
				X		m
				X		m
				X		m
98	D.P.	STANDS				2814.95 m
	D.P.	SINGLES				m
	KELLY DOWN					12.00 m
	TOTAL					7080 m
WT. OF DC						1000 daN
WT. OF STRING						109 1000 daN

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min

BIT RECORD

BIT NO.	RR B
SIZE (mm)	215.9
IADC CODE	
MFG.	SEC
TYPE	M94F
SERIAL NO.	399979
JETS /mm (mm)	3 FFF
DEPTH OUT (m)	
DEPTH IN (m)	3080
TOTAL METRES DRILLED (m)	—
TOTAL HRS. RUN	
CUT STRUC. D U L	I O D L
CUT STRUC. L L	B G O R

HOLE CONDITION

HOLE DRAG (daN)	2-3
TORQUE AT BOTTOM (DP TURNS)	1¼
FILL ON BOTTOM (m)	2 m
REMARKS:	Caliste 65X Bicarbate 15X

MUD RECORD

TIME	1600	0800	2300	
DENSITY (kg/m³)	1120	1110	1115	
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	120	70	105	
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)		9.0	10.0	
F.C. (mm)				
pH	9.0	9.5	10.0	
OIL VOL. FRAC.				
SAND VOL. FRAC.				
K+ (1000 mg/L)				
Cl- (1000 mg/L)				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Barite	140		
GEL	20		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3050 m	3080 m				PUT @ 18:00 93. m³			3300		152	140				
m	m							9000		152	60	152	60		
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
10	1200	1230	½	Circulate Thick Mud
2	1230			Run in Bacor Circ @ 1500 m Tie in w & Break Circ @ 2800m
		1630	3	Run in To 3052 Circ 10 mins
9	1630	1600	½	Break Circ Ream / Returns Clean To Btm
10	1600	1700	1	Circulate Out Gas Cut Mud @ 3050
9	1700	1730	½	Clean To Bottom 2 m. Fill
10	1730			Circ Condition Mud Work String (Raise Mud Wt. F/
		2000	2½	1110 T/ 1120
7	2000	2015	½	Service Rig Function Top Pipe Ram close & see open
10	2015	24:00	3¾	Circ Condition Mud (Raise Mud Wt., Work String)

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION CUO 07269			HRS
#2 Rezide 2042		24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24.	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO.
SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED 18 m
LENGTH CUT OFF 18 m — PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT MJ
CUMULATIVE MEGAJOULES MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO. SHELL FTAL ARROWHEAD 60°30' 08 4931 122° 53' 16 8272 — DATE 89/03/09
OPERATOR SHELL CANADA LIMITED
CONTRACTOR'S REPRESENTATIVE — RIG NO. HTCO 48

DAY TOUR

0000 P.M. 1200 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Ray Soucy	8
DRKMAN		Gary Buchberger	8
MTRMAN		Todd Krayway	8
FLRMAN		Chris Fritz	8
FLRMAN		Doug Hoop	8
FLRMAN			
LEASE		Earl Hopf	8
LEASE		Douglas Bertrand	8
WELDER		Hubert Furguson	8

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

1200 P.M. 2400 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	8
DRKMAN		Alex Scott	8
MTRMAN		Tim Hodge	4
FLRMAN		Damon McMaster	8
FLRMAN		David Morrill	8
FLRMAN			
LEASE		Julien Sassie	8
LEASE		Sylvain Kwaike	8
FLRMAN		Doug Hood	4
DRILLER		Dave Miller	8
DRKMAN		Tim Hodge	8
MTRMAN		Denny Bird	8
FLRMAN		Allan Larsen	8
FLRMAN		Ron Pearson	8
LEASE MAN		Douglas Bertrand	8
LEASEMAN		Eric Bertrand	8

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

GRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell GAL Arrowhead 3-41

LOCATION: 60° 20' 08.4931" N 127° 53' 16.9292" W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Arctic Drilling — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: — RIG NO. 48

WEATHER CONDITIONS

TEMPERATURE	-30 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	DATE YEAR	DATE MONTH	DATE DAY
3080 m	3080 m	— m	—	47	89	03	10

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1054	6.7	1056	51	0-1-0	G

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.0	E	93	162	4 ½ IF	1	NATIONAL 9-P-100	235		
127	29.0	G	93	162	4 ½ IF	2	NATIONAL 9-P-100	235	60	3200

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	6	13¼	
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.	5	9¾	
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	1		
10	CONDITION MUD		½	
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1		224	75 X 188	.24 m
				87
4	DU	70	X 170	38.52 m
1	JH	67	X 171	4.34 m
16	DU	69	X 170	153.76 m
1	MO	73	X 170	.91 m
6	MO	70	X 127	54.81 m
		BHA		253.45 m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
	D.P.	STANDS		m
	D.P.	SINGLES		m
	KELLY DOWN			m
	TOTAL			m
WT. OF DC				1000 daN
WT. OF STRING				1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

TYT @ 00:00 105 m³

BIT RECORD

BIT NO.	RR	18
SIZE (mm)		215.9
IADC CODE		
MFG.		SEC
TYPE		M94F
SERIAL NO.		399799
JETS (64ths) (mm)		6 6 6 (CHK)
DEPTH OUT (m)		
DEPTH IN (m)		3080
TOTAL METRES DRILLED (m)		
TOTAL HRS. RUN		
DULL	CUT STRUC. I O D L	
	B G O R	

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS:

MUD RECORD

TIME	00:00
DENSITY (kg/m³)	1120
GRADIENT (kPa/m)	
FUNNEL VIS-(s/L)	66
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	8.6
F.C. (mm)	
pH	10.5
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Baroid	475X		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3080 m	m				Morning Fuel 1.33			9000		152	60	152	60		
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
9	00:00	01:00	1	Circulate Condition Mud & Hole
2	01:00	07:00	6	Pump Weighted Slug & Flow Check - Tripping Flo V/C 10 stds 2559 DS
				Flo V & V Fill Up Recvrs Before Pulling BHA
5	07:00	08:00	1	Pull Wear Bushing To Perm Test.
5	08:00			Set Test Plug Press Test Blow. (Fix Hydrolic Leak on Top Pipe Rams)
				Pipe Test Top: 13 5/8" Kore Rams, Blind Rams - All Kill & Choke Functions
				Line Valves - Inner Low 1500 kPa High 21000 kPa 10 min Each. Close Open
				Test All Choke Lines, Manifold Valves, Bo Stack Valves Low 1500 kPa 10 sec
				On Choke Line Side, Standpipe Valve, Inside Bop. Test Pipe 7 sec 7 sec
				Low 1500 kPa High 35000 kPa 10 min Each. All Ok. Test Pipe 7 sec 7 sec
				Test Test Annular 20 Low 1500 kPa High 17500 kPa HCR Valve
				10 min Each. Blind Rams 8 sec 8 sec
		12:00	4	
				Pipe Test Test Line To Floor Pit 7,000 kPa 10 min. Daily Rig Inspection

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO. Shell GAL Arrowhead — DATE 89-03-10

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO. Arctic 48

DAY TOUR 00:00 P.M. 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Darren McMaster	12
FLRMAN		David Mckaill	12
FLRMAN		Doug Hood	12
FLRMAN			
LEASEMAN		Julien Sasse	12
LEASEMAN		Joachim Klonike	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24. HRS
EVALUATION	2065	HRS
COMPLETION CWO # D 6972		HRS
#2 Boiler 2042		24. HRS
TOTAL HOURS ACCOUNT TO SHELL		24 HRS
BOILER	2042	24 HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE 32 mm	# OF LINES 10	REEL NO.	LENGTH SLIPPED 6 m
LENGTH CUT OFF 0 m			PRESENT LENGTH 1629 m
MEGAJOULES SINCE LAST CUT 7076 MJ			
CUMULATIVE MEGAJOULES 151 551 MJ			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1		209	75 X 188	.24 m
				87
4	DU	70	X 170	38.52 m
1	JH	67	X 171	4.34 m
16	DU	69	X 170	153.76 m
1	MO	73	X 170	.91 m
6	MO	70	X 127	54.81 m
		BHA		253.45 m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
27	D.P.	STANDS		975.34 m
	D.P.	SINGLES		m
	KELLY DOWN			m
	TOTAL			1629 m
WT. OF DC				1000 daN
WT. OF STRING				1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

TYT Circulate

23:30 99.0 m³

BIT RECORD

BIT NO.	RR	19
SIZE (mm)		215.9
IADC CODE		
MFG.		SEC
TYPE		M94F
SERIAL NO.		399799
JETS (64ths) (mm)		6 6 6 (CHK)
DEPTH OUT (m)		
DEPTH IN (m)		3080
TOTAL METRES DRILLED (m)		
TOTAL HRS. RUN		
DULL	CUT STRUC. I O D L	
	B G O R	

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS:

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS-(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	
K+ (1000 mg/L)	
Cl- (1000 mg/L)	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3080 m	m				Accumulator Check Valves Leak to Functions 25500 kPa										
m	m				After Shell Fuel Stop Remedying Press @ 900 kPa										
m	m				Recaptame Both Pumps Total Strokes 9 min.										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
5	12:00	13:30	1½	Pull Test Plug Install Wear Bushing
	13:30			Pick Up Packer. Stand in Hole To 1400m.
		20:00	6½	Trip Packer Out Lay Down
	20:00	21:15	1 3/4	Shell BOP Check - Repair Upper Kelly Cock Bonnet Valve & Rotary Valve
	21:15	23:30	1 3/4	Trip in To 3 Stands in To Casing Shoe
	23:30	24:00	½	Fill Pipe & Break Circulate & Circulate To Test Test Kelly & Mud Lines

DRILLER

EVENING TOUR 12:00 P.M. 24:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Millar	12
DRKMAN		Tim Hodge	12
MTRMAN		Dean Bird	12
FLRMAN		Allan Larsen	12
FLRMAN		Ron Peterson	12
FLRMAN			
LEASEMAN			
LEASEMAN		Eric Bertrand	12
WELDER		Vern Vivier	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell Etal Arrowhead B-41

LOCATION: 60° 30' 84931 N 122° 53' 16929Z W — PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited — CONTRACTOR: Arctic Drilling — RIG NO. 48

SIGNATURE OF SHELL'S REPRESENTATIVE — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.0	E	93	162	4½IF	1	NATIONAL 9-P-100	235	50	4000
127	29.0	G	93	162	4½IF	2	NATIONAL 9-P-100	235		

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump–stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
3050 m	3080 m	— m	—	48	89	03	11

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.7 ~~10.56~~	1056	51	0-1-0	"G"

TIME DISTRIBUTION – HOURS

CODE	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	2¾	6¾	
3	HANDLE TOOLS		3½	
4	DIRECTIONAL WORK			
5	TEST B.O.P.	1¾		
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	1		
10	CONDITION MUD	6½	2	
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21	SAFETY MEET		½	
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
1		BIT				324 m
4	DH	76	X	190		38.52 m
1	SH	GA	X	171		4.34 m
16	DH	GA	X	190		153.76 m
1	NB	73	X	70		.91 m
6	HW	76	X	127		54.91 m
		BHA				253.45 m
				X		m
				X		m
				X		m
				X		m
				X		m
98	D.P.	STANDS				2814.93 m
	D.P.	SINGLES				m
	KELLY DOWN					12.00 m
	TOTAL					3080 m

WT. OF DC: 22.000 (1000 daN)
WT. OF STRING: 109.000 (1000 daN)

BOTTOMS-UP RATE

m/min
@ FLOW RATE m³/min
Pump C Branch 102.6

BIT RECORD

BIT NO.	RR	19	
SIZE (mm)	215.9		
IADC CODE			
MFG.		SEC	
TYPE		M84F	
SERIAL NO.		399979	
JETS (TFA) (mm)		6-16	
DEPTH OUT (m)			
DEPTH IN (m)		3060	
TOTAL METRES DRILLED (m)		CLEAN	
TOTAL HRS. RUN		OUT	

CUT STRUC: D | I | O | D | L ; L | B | G | O | R

HOLE CONDITION

HOLE DRAG (daN)	Pump Off	3.5
TORQUE AT BOTTOM	(DP TURNS)	1-1½
FILL ON BOTTOM (m)		12m

REMARKS: Hole Good on TRIP IN
Fill Washed Away Very Easily

MUD RECORD

TIME	06:30	08:00
DENSITY (kg/m³)	1120	1220
GRADIENT (kPa/m)		
FUNNEL VIS-(s/L)	60	60
PV/YP	/	/
GELS (Pa)	/	/
W.L. (cm³)	8.0	7.5
F.C. (mm)		
pH	10.5	10.5
OIL VOL. FRAC.		
SAND VOL. FRAC.		
K+ (1000 mg/L)		
Cl- (1000 mg/L)		

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
BARITE	50SX		
GEL	10SX		
CAUSTIC	2SX		

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3078 m	3080 m	½	12		Mackenzie Shale Lbz FM	0-2	60	9,000		152	60	152	60		
m	m				Niger Creek Mbr FM										
m	m				Delta Clastic 3500			~~9,000~~		152	90	152			

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
5	00:00	01:45	1¾	Press. test Lower Kelly Cock to 1000 ; 35000 Hi, Upper Kelly Cock to 35000 kPa Hi, Stand Pipe ; Mud line to Manifold 21000 Hi, Back to Mud Manifold to 1000 kPa ; 21000 Hi to Mud Pumps to 35000 kPa ; 21000 Hi. Circulate 10 mins. Aft Press. test
2	01:45	04:30	2¾	Run in to ~~3060~~ 3078 Break Circ. @ 1650m ; 2300 m Break Circulation @ 2700m ; Clean 18m to Btm 12m of Fill
10	04:30	05:30	1	Circulate : Condition Mud & Hole
12	05:30	08:00	2½	Circ Cond. Mud, Work String, Valves on BOP Stack, Manifold OK.
	08:00	12:00	4	Held Safety Meeting (W.H. United) Safety, All Crew Members Present, Hold BOP Drill (Drilling Mode), Crew in Position Well Secure, Closed Annular Preventer 17sec Open, Function Remote choke, Service ~~Top Drive~~ #1, 2 Pumps

DAILY RIG WALK AROUND

DRILLER

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3080 m	m				Accum. Unit .35 m³			7000		152	60	152	60		
m	m				DST @ 14:00 Hrs 116 m³										
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION
#3 DST INTERVAL 2975 TO 2994 = 69m FORMATION: ARNICA TEST TYPE: ANNULUS BYPASS								

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
10	12:00	~~24~~:00	2	Circ Cond. Mud, Work String
2	14:00			Pump Barite Pill, Blow Kelly Trip out Install Stabing Valve, Hole Fill Record @ Surface, @ 1st std., 25 std., @ Casing Shoe. Chain Out To Casing Lay Down Jars
		2000	6	Function Blind Rams Close Out of Hole
21	2000	2030	½	Held SAFETY MEETING Prior to Pick up Test Tools, Run in Tag Pipe 2430m., Pick up - Make up DST #3, Measure - Calculate
	2030			
		24:00	3½	All Tools Picked up.

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION WELL #2	2072		HRS
#2 BOILER	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO. 1
SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED 0 m
LENGTH CUT OFF 0 m — PRESENT LENGTH 1629 m
MEGAJOULES SINCE LAST CUT 14156 MJ
CUMULATIVE MEGAJOULES 158679 MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO. Shell Arrowhead B-41 — DATE MAR 11/89

SHELL CANADA LIMITED

OPERATOR — CONTRACTOR'S REPRESENTATIVE — RIG NO. Arctic 48

DAY TOUR

00:00 P.M. — 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Darren McMaster	12
FLRMAN		David Morrill	12
FLRMAN		Doug Hood	12
FLRMAN			
LEASE		Julien Sassie	12
LEASE		Joachim Klonike	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

12:00 P.M. — 24:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Miller	12
DRKMAN		Tim Hodge	12
MTRMAN		Dean Bird	12
FLRMAN		Allen Larsen	12
FLRMAN		Ron Peterson	12
FLRMAN			
Welder		Vern Vivier	12
Lessee		Douglas Bertrand	12
Lessee		Eric Bertrand	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60° 30' 34.31" N 122° 53' 16.92" W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Arctic Drilling — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: — RIG NO.: 48

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
3050 m	— m	— m	—	49	89	03	12

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	39	1057	6.7	1056	51	G+D	"G"

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT. O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS (kPa)
127	29.00	E	93	162	4" IF	1	NATIONAL 9-P-100	235		
127	29.00	G	93	162	4" IF	2	NATIONAL 9-P-100	235		

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	7¼	8¼	
3	HANDLE TOOLS	1	1	
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE	¾		
7	RIG SERVICE		¼	
8	RIG REPAIR			
9	CLEAR TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST	3	3	
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION	CWO #2972		HRS
#2 BOILER	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24.	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD — REEL NO.

SIZE 32 mm — # OF LINES 93 — LENGTH SLIPPED m

LENGTH CUT OFF m — PRESENT LENGTH m

MEGAJOULES SINCE LAST CUT MJ

CUMULATIVE MEGAJOULES MJ

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
1		Tool Hrs		X		m
		Tool Hrs		X	169.71	m
14		Dia		X	133.58	m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
1		Pump		X		m
96		D.P.	STANDS			m
1		D.P.	SINGLES			m
		KELLY DOWN				m
		TOTAL				m

WT. OF DC — 1000 daN

WT. OF STRING — 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS 32nds (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	

CUT STRUC.: D U L | I | O | D | L | B | G | O | R

K+ (1000 mg/L)

Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)

TORQUE AT BOTTOM (DP TURNS)

FILL ON BOTTOM (m)

REMARKS:

Mud in Pump was Very Thick & Deflocculated Possible Chlorides in Mud

MUD RECORD

TIME	
DENSITY (kg/m³)	
GRADIENT (kPa/m)	
FUNNEL VIS–(s/L)	
PV/YP	/ / /
GELS (Pa)	/ / /
W.L. (cm³)	
F.C. (mm)	
pH	
OIL VOL. FRAC.	
SAND VOL. FRAC.	

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3050 m	m				Marine Fuel 1.29 m										
m	m				Boiler 3945										
m	m				Motor 14257										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
3	00:00	01:00	1	Picking Test Tools Measure & Caliper
2	01:00			Running in BHA Run Inflator Run in DST #3
2		04:15	3¼	Double Strap In
6	04:15	05:00	¾	Slip from 3 Cut 45m Drilling
2	05:00	08:00	3	Double Strap In w/ DST #3
2	08:00	09:00	1	Trip In
20	09:00	10:45	1¾	Head Up Test Head, Manifold, Pressure Test To 21000 kPa Knum.
20	10:45	12:00	1¼	Testing

Safety Rig Up Clean Around

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
20	12:00	15:00	3	Testing . Held Safety Meeting Pulling DST #3
2	15:00			Tear Down Test Head Trip Out DST #3 (Chain Out)
		17:30	2½	Took Stabing Valve ✓ Hole Fill Recorder Flow @ 1 Bottle, 3 Bottles Losses
7	17:30	17:45	¼	Service Rig Function Top Ram Close Spool Open
2	17:45	23:00	5¼	Trip Out DST #3 ✓ FLO Survey 26 Stds
	23:00	24:00	1	Handle Test Tools

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO. Shell et al Arrowhead B-41 — DATE Mar 12/89

OPERATOR SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE — RIG NO. Arctic 48

DAY TOUR

00:00 P.M. 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Darren McMaster	12
FLRMAN		David Morrill	12
FLRMAN		Doug Hood	12
FLRMAN			
Lease		Julien Sussie	12
Lease		Joshua Klonike	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

12:00 P.M. 24:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Miller	12
DRKMAN		Tim Hodge	12
MTRMAN		Dean Bird	12
FLRMAN		Allan Larson	12
FLRMAN		Ron Peterson	12
FLRMAN			
Lease Man		Douglas Bertrand	12
Lease Man		Eric Bertrand Jr	12
Welder		Vern Davies	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell et al Arrowhead B-41

LOCATION: 60° 30' 34931 N 122° 53' 16924 W — PROVINCE: NWT

OPERATOR: Shell Canada Limited — CONTRACTOR: Nabors Drilling — RIG NO.: 48 UE

SIGNATURE OF SHELL'S REPRESENTATIVE: Dave Shell — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: [illegible]

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS (kPa)
127	29.00	E	93	162	4½IF	1	National 9-P-100	235	60	2900
127	29.00	G	93	162	4½IF	2	National 9-P-100	235	60	2800

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
3080 m	m	m		50	89	03	13

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1067	6.7	1056	51	G-1-0	"G"

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	6	4¾	
3	HANDLE TOOLS	2½		
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE	¾		
7	RIG SERVICE	¼	¼	
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	2½	1¼	
10	CONDITION MUD		5¾	
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE BIT			
1	BIT	I.D. mm	X	O.D. mm
1	EHP	76	X	197 m
1	DU	89	X 170	38.92 m
1	JH	64	X 171	4.34 m
16	DU	69	X 170	138.40 m
1	NO	78	X 171	.91 m
6	HO	93	X 162	54.81 m
	BIKA			m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
98	D.P.	STANDS		2814.93 m
	D.P.	SINGLES		m
	KELLY DOWN			12.0 m
	TOTAL			3080 m
WT. OF DC				24 1000 daN
WT. OF STRING				103 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	RR	20
SIZE (mm)		215.9
IADC CODE		
MFG.		SEC
TYPE		M44F
SERIAL NO.		599979
JETS (1/32") (mm)		12 12 12
DEPTH OUT (m)		
DEPTH IN (m)		3050
TOTAL METRES DRILLED (m)		clean
TOTAL HRS. RUN		out

CUT STRUC.: D U L | I | O | D | L | B | G | O | R

K+ (1000 mg/L)

Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS: Checked BOP for Pressure Min Wear Clear

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP	/	/	/	/
GELS (Pa)	/	/	/	/
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3080 m	m				Horseshoe 1.16										
m	m				Boulder 3445										
m	m				Water 1517										

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
3	00:00	02:30	2½	Handle Test Tools Lay Dn: Long Out Of Hole
2	02:30	05:30	3	Make Up Bit: Run In [illegible] Break Circ - Circulate B/MA Run into Casing Shoe
6	05:30	06:15	¾	Cut 45m + Slip 45m Drlg Line
7	06:15	06:30	¼	Rig Service Operate Mpmp
2	06:30	08:00	1½	Run In Break Circ @ 1600m
2	08:00	09:30	1½	Trip In Break Circ @ 2900m √ Returns
9	09:30	12:00	2½	Clean F/2900 T 2970

Lazy Ass Work Around

Crew Fed Buck 3½ √ Drlg Took

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
9	12:00	12:45	¾	Clean F 2970 T 3000 m
2	12:45	01:00	¼	Trip To
9	01:00	01:30	½	Clean @ 18m To Btm. Lay Dn
7	01:30	01:45	¼	Service Rig Function Blr Pipe Rams close Stab open
10	01:45	07:30	5¾	Cir. Cond. Hole Work String Cond. Mud
2	07:30	24:00	4½	Pump Slug Blackout Hunt For DST #4 Flow 15-25 gpm Gas w Show; BHA √ Trip Record

Change Oil Comp Light Plant

Greased Crown

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION	CVO #2992		HRS
#2 BOILER	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO. 1

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED 15 m

LENGTH CUT OFF 18 m — PRESENT LENGTH 1595 m

MEGAJOULES SINCE LAST CUT 8312 MJ

CUMULATIVE MEGAJOULES 172795 MJ

DRILLING ASSEMBLY AT END OF TOUR

BIT RECORD

MUD RECORD

BIT NO.	RR	20	
SIZE (mm)		215.9	
IADC CODE			
MFG.		SEC	
TYPE		M44F	
SERIAL NO.		599979	
JETS (1/32") (mm)		12 12 12	
DEPTH OUT (m)			
DEPTH IN (m)		3050	
TOTAL METRES DRILLED (m)		[illegible]	
TOTAL HRS. RUN			

TIME	1300	1800	1900
DENSITY (kg/m³)	1130	1125	1125
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)	65	70	68
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)	7.5	7.8	7.2
F.C. (mm)			
pH	10.0	10.5	10.5
OIL VOL. FRAC.			
SAND VOL. FRAC.			

HOLE CONDITION

HOLE DRAG (daN)	2-3
TORQUE AT BOTTOM (DP TURNS)	½
FILL ON BOTTOM (m)	1m

REMARKS:

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
Gyp	1129 x		
Retrol	25 x		
Barrows	25 x		
Caustic	35 x		
Barite	42 x		

METRES DRILLED

DEVIATION RECORD

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m				Pulpit 14.00m 1145m	3	50	7000		152	50	152	50		
m	m				[illegible]			6500		152	60	152	60		
m	m				Accum Vol .37 m³										

DEVIATION RECORD	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
9	12:00	12:45	¾	Clean F 2970 T 3000 m
2	12:45	01:00	¼	Trip To
9	01:00	01:30	½	Clean @ 18m To Btm. Lay Dn
7	01:30	01:45	¼	Service Rig Function Blr Pipe Rams close Stab open
10	01:45	07:30	5¾	Cir. Cond. Hole Work String Cond. Mud
2	07:30	24:00	4½	Pump Slug Blackout Hunt For DST #4 Flow 15-25 gpm Gas w Show; BHA √ Trip Record

Change Oil Comp Light Plant

Greased Crown

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: Shell et al Arrowhead B-41 — DATE: MAR 13/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: [illegible] — RIG NO.: Nabors 48

DAY TOUR 00:00 P.M. 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Darren McMaster	12
FLRMAN		David Morrell	12
FLRMAN		Doug Hood	12
FLRMAN			
[illegible]		Julian Sassie	12
[illegible]		Stephen Klewince	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR 12:00 P.M. 24:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Miller	12
DRKMAN		Tim Hodge	12
MTRMAN		Pean Bird	12
FLRMAN		Allen Larsen	12
FLRMAN		Ron Peterson	12
FLRMAN			
Driller		Vern Vivier	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell Grc Arrowhead B-41

LOCATION: 60° 33' 34"31 N 122° 53' 16"32 W | PROVINCE: NWT

OPERATOR: Shell Canada Limited | CONTRACTOR: Atco Drilling | RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE | SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal-second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

Northern Region
MAR 28 1989

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
3060 m	m	m			89	3	14

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG. HEAD (M)	SET AT (m)	CEMENTING DETAILS: USED (tonnes)	TYPE	PERCENT WASH	REMARKS
244.5	222	89	1057	6.7	1056	51	0-16		6"

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.00	E	93	162	4½ F H 2½ F	1	NATIONAL 9-P-100	235		
127	29.00	G	93	162	H 2½ F	2	NATIONAL 9-P-100	235		

TIME DISTRIBUTION – HOURS

CODE	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	7¼	3½	10¾
2	TRIPS	7½	7½	14¾
3	HANDLE TOOLS	4	2	6
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE	¼		
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST		2½	2½
21	Safety Meeting	½		½
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m
WT. OF DC						1000 daN
WT. OF STRING						1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.			
SIZE (mm)			
IADC CODE			
MFG.			
TYPE			
SERIAL NO.			
JETS (1/32") (mm)			
DEPTH OUT (m)			
DEPTH IN (m)			
TOTAL METRES DRILLED (m)			
TOTAL HRS. RUN			

CUT STRUC.: D U L L | I O D L | B G O R

K+ (1000 mg/L)
Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME				
DENSITY (kg/m³)				
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)				
PV/YP	/	/	/	
GELS (Pa)	/	/	/	
W.L. (cm³)				
F.C. (mm)				
pH				
OIL VOL. FRAC.				
SAND VOL. FRAC.				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3060 m	m				Mobile 4235										
m	m				Mark 6931										
m	m				Test Interval 2872-2904	Formation Water									

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	00:00	01:30	1½	Finish Out ✓ Flo C BHA
21	01:30	02:00	½	Safety Meeting
3	02:00	06:00	4	Pick Up Services + Make Up Test Tools (Changed Out 3 Packers
2	06:00	08:00	2	Run In 4 Stds Water Cushion
7	08:00	08:15	¼	Service Rig Function Blm Pipe Rams Close & see Open
2	08:15	12:00	3¾	Trip In DST #4

Daily. Rig Walk Around
MA

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24.	HRS
EVALUATION	2065		HRS
COMPLETION (Evo #)	6972		HRS
#2 BOILER	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO. 2

SIZE	# OF LINES	LENGTH SLIPPED
32 mm	10	0 m

LENGTH CUT OFF 0 m | PRESENT LENGTH 1593 m

MEGAJOULES SINCE LAST CUT 15393 MJ

CUMULATIVE MEGAJOULES 179563 MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO. Shell Grc Arrowhead B-41 | DATE March 89

SHELL CANADA LIMITED

OPERATOR

CONTRACTOR'S REPRESENTATIVE | RIG NO. Atco 48

DAY TOUR

00:00 P.M. 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Darren McMaster	12
FLRMAN		David Morrill	12
FLRMAN		Doug Hood	12
FLRMAN			
LEASE		Julian Sassie	12
LEASE		Joshua Klukie	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

12:00 P.M. 24:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Millar	12
DRKMAN		Tim Hodge	12
MTRMAN		Dean Bird	12
FLRMAN		Allan Larsen	12
FLRMAN		Ron Peterson	12
FLRMAN			
Welder		Vern Vivier	12
Loader Man		Doug Bertrand	12
Loader Man		Eric Bertrand	12

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	12:00	13:30	1½	Trip In Tag Btm 1m Fill
	13:30	13:30	1	Heat Up Press Test Header Manifold To 21000 kpa for 10 min.
	13:30	15:00	1½	Test, Set Packers, Lost Packer seat Pulled Up To 20 Accordion
				Jars Fired Shut In Tool Fill Hole, Lay Down Test Head.
		15:00		(17.45 m Stick Up)
	15:00	22:00	7	Trip Out DST #4 Flowed @ 15stds Wet. Pulled Slick stands BHA
	22:00	24:00	2	Break Dn Test Tool

Operate Blind Rams When Out Of Hole

DRILLER

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell Gtd Arrowhead B-41

LOCATION: 60° 30' 34931 N 122° 53' 16982 W — PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	-20 °C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: **Shell Canada Limited** — SIGNATURE OF SHELL'S REPRESENTATIVE:

CONTRACTOR: Arctic Drilling Co — RIG NO.: 48UE — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE:

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.00	E	93	162	4½IF	1	NATIONAL 9-P-100	235	60	3000
127	29.00	G	93	162	4½IF	2	NATIONAL 9-P-100	235	60	3000

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump–stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit; indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
3080 m	– m	– m	–	52	89	03	15

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	226	89	1057	6.7	1056	51	G-1-0	"G"

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS	5½	10½	
3	HANDLE TOOLS	2		
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE	¾		
7	RIG SERVICE	½		
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	2½		
10	CONDITION MUD	1½	1½	
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1	1.0.9	215.9 mm X 190.5 mm O.D.		3.97 m
4	00	70 X 140	58.52	m
1	511	64 X 171	4.34	m
16	00	69 X 149	155.76	m
1	1/16	73 X 171	.91	m
6	1/16	73 X 127/102	54.81	m
		BHA	253.45	m
		X		m
		X		m
		X		m
		X		m
		X		m
98		D.P. STANDS	2814.93	m
		D.P. SINGLES		m
		KELLY DOWN		m
		TOTAL		m
WT. OF DC				1000 daN
WT. OF STRING			108	1000 daN

BOTTOMS–UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.		RR 2R	20
SIZE	(mm)	215.9	215.9
IADC CODE			
MFG.		SEC	SEC
TYPE		M84F	M84F
SERIAL NO.		399979	399979
JETS (1/32)	(mm)	6 6 6 0	6 6 6 0
DEPTH OUT	(m)		
DEPTH IN	(m)	3080	3080
TOTAL METRES DRILLED	(m)		
TOTAL HRS. RUN			

CUT STRUC: D U L | I O D L | B G O R

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP. TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME			11:30
DENSITY (kg/m³)			1135
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)			80
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH			10.0
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
3050 m	m				PUTO 11:00 93.m³	52	50	7200		152	50	152	30		
m	m							9000		152	60	152	60		
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
5	00:00	02:00	2	Finish W Test Tool Lay Dn + Load Out
2	02:00	03:45	1¾	Make Up Bit + Runin To Csg Shoe Install Stabbing Valve
6	03:45	04:30	¾	Cut 30m + Slip 30m Drlg Line
7	04:30	04:45	¼	Rig Service Operate Hoom Chek + Open Grease Bleeds
2	04:45	08:00	3¼	Runin Break Circ Wash Shoe 1300m + @ 2550
9	08:00	09:30	1½	Break Circ @ 2850 Returns Clean To 2910 m
2	09:30	09:45	¼	Trip In To 3060
9	09:45	10:15	½	Break Circ Returns Clean To Btm + Fill
7	10:15	10:30	¼	Service Rig Function Top Pipe Ram Close & Sec Open
10	10:30	12:00	1½	Circ Cond. Mud Work String

Daily Rig Walk Around OK

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION W.O. #16992			HRS
#2 BOILER	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

REEL NO. 1

SIZE 32 mm — # OF LINES 10 — LENGTH SLIPPED 30 m

LENGTH CUT OFF 30 m — PRESENT LENGTH 1703 m

MEGAJOULES SINCE LAST CUT 7079 MJ

CUMULATIVE MEGAJOULES 56941 MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO. Shell Gtd Arrowhead B-41 — DATE MAR 15/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: — RIG NO. Arctic #48

DAY TOUR 00:00 P.M. 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	12
DRKMAN		Alex Scott	12
MTRMAN		Darrell McMaster	12
FLRMAN		David Wardell	12
FLRMAN		Dale Hood	12
FLRMAN			
WLSE		Julien Sassie	12
WLSE		Jochum Klonike	12

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

EVENING TOUR 12:00 P.M. 24:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Millar	12
DRKMAN		Tim Hodge	12
MTRMAN		Dean Bird	12
FLRMAN		Allan Larsen	12
FLRMAN		Ron Peterson	12
FLRMAN			
Welder		Vern Vivier	12
Learner		Doug Bertrand	12
Learner		Eric	

NO. OF DAYS — SINCE LAST LOST TIME ACCIDENT

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
10	12:00	13:30	1½	Circ Cond Mud Work String
2	13:30			Pump Pill Blow Kelly Trip Out of Hole, Install stabbing valve
				Fill up Record Survey Rack Back Stabilizer, Bit Sub Lay Down
	20:00	20:00	6½	Tools
	20:00			Runin Hole w/ Open Ended Drill Pipe To Cement Plug Runin 955 SDS
				Drill Pipe Out Of Derrick Break Circ @ 2515
		24:00	4	Pickup Drill Pipe

DRILLER

GRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: Shell G/A Arrowhead B-41

LOCATION: 60° 30' 8"N 931 N 122° 53' 16" 927 W

PROVINCE: NWT

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

OPERATOR: Shell Canada Limited — SIGNATURE OF SHELL'S REPRESENTATIVE: Dave Christie

CONTRACTOR: Arctic Drilling — SIGNATURE OF CONTRACTOR'S REPRESENTATIVE: [illegible] — RIG NO.: 48UE

KILL SPEED

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	29.00	E	93	162	4 1/2 IF	1	NATIONAL 9-P-100	235		
127	29.00	E	93	162	4 1/2 IF	2	NATIONAL 9-P-100	235		

	DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS FROM SPUD	YEAR	DATE MONTH	DAY
	3080 m	– m	– m	–	53	89	03	16

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB. TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	89	1057	6.7	1058	51	0-1-0	"G"

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)
mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa•s)
gel strength = pascal (Pa)
work completed by wire line = megajoule (MJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL	3 1/2	1 1/2	5
2	TRIPS	7 1/2	1 1/2	9
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING	4		4
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON	4 1/2	9	13 1/4
70	STANDBY			
	TOTALS	12	12	24

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT		
1		BIT	I.D. (mm) X O.D. (mm)	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
			X	m
69		D.P.	STANDS	3073.35 m
		D.P.	SINGLES	m
		KELLY DOWN		m
		TOTAL		m
WT. OF DC				1000 daN
WT. OF STRING				1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.			
SIZE (mm)			
IADC CODE			
MFG.			
TYPE			
SERIAL NO.			
JETS (1/64") (mm)			
DEPTH OUT (m)			
DEPTH IN (m)			
TOTAL METRES DRILLED (m)			
TOTAL HRS. RUN			
CUT STRUC. D U L L / I O D L / B G O R			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	
REMARKS:	

MUD RECORD

TIME	22:45	04:30		
DENSITY (kg/m³)	1120	1125		
GRADIENT (kPa/m)				
FUNNEL VIS–(s/L)	65	56		
PV/YP	/	/	/	
GELS (Pa)				
W.L. (cm³)	7.9	8.4		
F.C. (mm)				
pH	10.0	10.0		
OIL VOL. FRAC.				
SAND VOL. FRAC.				

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)
CAUSTIC	35KG		
LIGNITE	105KG		

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION CWO #4972			HRS
#2 BOILER 2042		24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24.	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO. / LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m
MEGAJOULES SINCE LAST CUT		MJ
CUMULATIVE MEGAJOULES		MJ

METRES DRILLED

FROM	TO	ROT. HOURS	DP-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
Plug #1 3080	TO 2850 = 230m CEMENTED w/							4300		152	60	152	60		
0.75 TONNES Cl	A33 G w/ 40% SILICA FLOUR, .95% CFR-3, .29% HR-12, used 20% EXCESS FROM														
CALIPER LOG.	CEMENT IN PLACE @ 0900 HRS 89-03-16														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
2	00:00	01:30	1 1/2	Pickup D.P.
1	01:30	05:30	4	Circulate + Wash To Btm Circulate Q 3075 Work D.P.
60	05:30	06:30	1	Rig to: Cement Plug #1A @ 3080-2975
2	06:30	07:00	1/2	POOH after Running Plug #1A (Held Safety Meeting)
60	07:00	08:15	1 1/4	Rig to: Reverse Out From 2925m Prior To Cementing
60	08:15	09:00	3/4	Cement Plug #1B @ 2925-2850m
2	09:00	09:45	3/4	Trip Out To 2665
60	09:45	10:15	1/2	Rig To Reverse Circ @ 2665
60	10:15	11:00	3/4	Cement Plug #2 @ 2665 TO 2565
2	11:00	12:00	1	Trip Out To 1850m
				Run Fracturing Test Mud
Plug #2 2665 TO 2565 = 100m, Cemented w/ 5.1 Tonnes, Class G w/ 40% Silica Flour				
.95% CFR-3, .29% HR-12 used 20% Excess From Caliper Log, Cement In Place				
@ 1112 HRS 89-03-16 Felt w/ Comtech @ 2553m @ 1300 HRS 89-03-16 12m High.				

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
60	12:00	13:30	1 1/2	Run In With Wireline To Feel Plug #2
60	13:30	14:15	3/4	Cement Plug #3 1850 to 1795
2	14:15	14:45	1/2	Trip out to 1501m.
60	14:45	16:00	1 1/4	Run In With Wireline To Feel Plug #3
60	16:00	16:45	3/4	Run Plug #4 1500 To 1425
2	16:45	17:15	1/2	Trip out To 1085
60	17:15	18:30	1 1/4	Run in w/ wireline To Feel Plug #4
60	18:30	19:00	1/2	Run Plug #5(A) at 1085 to 975
2	19:00	19:15	1/4	Trip out To 962
60	19:15	19:30	1/4	Reverse Circ at 962
60	19:30	19:45	1/4	Run Plug #5(B) 925 To 845
2	19:45	20:00	1/4	Trip out To 845
60	20:00	20:45	3/4	Reverse Circ To Water at 845
60	20:45	22:30	1 3/4	Run in w/ Wireline to Feel Plug #5(B) Tear out Wireline
3	22:30	24:00	1 1/2	Pick up and Big up Lay Down Machine Truck
			12	

DRILLER

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: Shell G/A Arrowhead B-41 — DATE: March/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE: [illegible] — RIG NO.: Arctic 48

DAY TOUR 00:00 P.M. 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Robert Hodge	8
DRKMAN		Alex Scott	8
MTRMAN		Charles McMaster	8
FLRMAN		David Morrill	8
FLRMAN		Doug Todd	8
FLRMAN			
LEASE		Julian Sassie	8
LEASE		Jahim Kowlke	8

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

EVENING TOUR 12:00 P.M. 00:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Miller	8
DRKMAN		Tim Hodge	8
Derrickman		Darryl Lafonte	4
MTRMAN		Dean Berg	8
FLRMAN		Allan Larsen	8
FLRMAN		Ron Petersen	8
FLRMAN			
Leadman		Douglas Bertrand	8
DRILLER		Ray Soucy	8
DRK		Gary Buchbinder	8
Motorman		Todd Brymay	8
Derrickman		Tim Hodge	8
Motorman		Darren McMaster	8
LEASE		Doug Todd	
		Earl Hope	8

NO. OF DAYS _____ SINCE LAST LOST TIME ACCIDENT

CRAINSET

CP-225 (10/88)

DAILY DRILLING REPORT — 12 HOUR TOUR

WELL NAME: SHELL ETAL ARROWHEAD B-41

LOCATION: 60° 39' 04931 N 122° 53' 16929 W | PROVINCE: NWT

OPERATOR: Shell Canada Limited | CONTRACTOR: ATCO | RIG NO.: 48

SIGNATURE OF SHELL'S REPRESENTATIVE | SIGNATURE OF CONTRACTOR'S REPRESENTATIVE

WEATHER CONDITIONS

TEMPERATURE	°C
WIND SPEED	km/h
WIND DIRECTION	
WEATHER	

KILL SPEED

SPM	PRESS. (kPa)

LEGEND (METRIC EXPRESSIONS)

All lengths expressed in metres to two decimal places.

mud density = kilogram per cubic metre (kg/m³)
pump-stroke length = millimetre (mm)
weight of string = decanewton (daN)
weight on bit: indicator will record decanewton
linear mass = kilogram per metre (kg/m)
viscosity = second per litre (s/L)

mud flow rate = cubic metres per minute (m³/min)
pressure gradient = kilopascal per metre (kPa/m)
yield point = pascal (Pa)
plastic viscosity = millipascal second (mPa·s)
gel strength = pascal (Pa)
work completed by wireline = kilojoule (kJ)
inside diameter and outside diameter = millimetre (mm)
pump pressure = kilopascal (kPa)

Canada Oil and Gas Lands Administration
APR 03 1989
Northern Region

DP SIZE (mm)	LINEAR MASS (kg/m)	GRADE	MIN. I.D. (mm)	TOOL JT O.D. (mm)	TYPE THREAD	PUMP NO.	PUMP MANUFACTURER	STROKE LENGTH (mm)	SPM	PRESS. (kPa)
127	290	E	93	162	4½ IF	1	National 9-P100	254		
127	290	G	93	162	4½ IF	2	National 9-P100	235		

DEPTH AT START OF MORNING TOUR	DEPTH AT END OF EVENING TOUR	DAILY PROGRESS	CUMULATIVE ROTATING HOURS	DAYS SPUD	DATE MONTH	DATE DAY
3080 m	m	m	54	89	03	17

LAST CASING TUBING OR LINER

O.D. (mm)	MIN. I.D. (mm)	NO. OF JOINTS	TOTAL LENGTH (m)	KB TO CSG HEAD (M)	SET AT (m)	CEMENT USED (tonnes)	CEMENT TYPE	REMARKS
244.5	222	99	1057	6.7	1057	60	Type G	

TIME DISTRIBUTION – HOURS

CODE NO.	OPERATION	DAY	EVENING	TOTAL
1	DRILLING ACTUAL			
2	TRIPS			
3	HANDLE TOOLS			
4	DIRECTIONAL WORK			
5	TEST B.O.P.			
6	CUT AND/OR SLIP LINE			
7	RIG SERVICE			
8	RIG REPAIR			
9	CLEAN TO BOTTOM & CIRCULATING			
10	CONDITION MUD			
11	LOST CIRCULATION			
12	CIRCULATE KICK			
13	STUCK OR FISHING			
14	HOLE OPENING			
15	RUN CASING AND CEMENT			
16	WAIT ON CEMENT			
17	NIPPLE UP B.O.P.			
18	CORING			
19	WIRE LINE LOG			
20	DRILL STEM TEST			
21				
22	RIG UP TEAR DOWN			
40	COMPLETION			
60	ABANDON			
70	STANDBY			
	TOTALS			

DRILLING ASSEMBLY AT END OF TOUR

NO.	CODE	BIT	I.D. mm	X	O.D. mm	m
1				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
				X		m
	D.P.	STANDS				m
	D.P.	SINGLES				m
	KELLY DOWN					m
	TOTAL					m

WT. OF DC: 1000 daN

WT. OF STRING: 1000 daN

BOTTOMS-UP RATE

m/min

@ FLOW RATE m³/min

BIT RECORD

BIT NO.	
SIZE (mm)	
IADC CODE	
MFG.	
TYPE	
SERIAL NO.	
JETS (1/64) (mm)	
DEPTH OUT (m)	
DEPTH IN (m)	
TOTAL METRES DRILLED (m)	
TOTAL HRS. RUN	

CUT STRUC.: D U L L | I | O | D | L | B | G | O | R

K+ (1000 mg/L)

Cl- (1000 mg/L)

HOLE CONDITION

HOLE DRAG (daN)	
TORQUE AT BOTTOM (DP TURNS)	
FILL ON BOTTOM (m)	

REMARKS:

MUD RECORD

TIME			
DENSITY (kg/m³)			
GRADIENT (kPa/m)			
FUNNEL VIS–(s/L)			
PV/YP	/	/	/
GELS (Pa)	/	/	/
W.L. (cm³)			
F.C. (mm)			
pH			
OIL VOL. FRAC.			
SAND VOL. FRAC.			
K+ (1000 mg/L)			
Cl- (1000 mg/L)			

MUD MATERIALS ADDED

TYPE	AMT. (kg)	TYPE	AMT. (kg)

METRES DRILLED

FROM	TO	ROT. HOURS	DR-D RM-R CORE-C	CORE NO.	FORMATION (SHOW CORE RECOVERY)	WT. ON BIT (1000 daN)	ROTARY R.P.M.	CIRC. PRESS. (kPa)	AIR VOL. (m³/min)	PUMP NO. 1 LINER SIZE (mm)	PUMP NO. 1 S.P.M.	PUMP NO. 2 LINER SIZE (mm)	PUMP NO. 2 S.P.M.	PUMP NO. 3 LINER SIZE (mm)	PUMP NO. 3 S.P.M.
m	m														
m	m														
m	m														

DEVIATION RECORD

DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION	DEPTH (m)	DEVIATION (°)	DIRECTION

DAY TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	00:00	1030	10½	Lay Down Drill Pipe AND DRILL COLLARS AND MWD (LAYING) PICK UP SCRAPER BIT SUB RUN IN HOLE STAMP IN TAG CEMENT @ 1000m @ 854m.
	1030	1200		

DAILY ENGINEERING ACTIVITIES

DRILLER

EVENING TOUR

CODE	TIME LOG FROM	TIME LOG TO	ELAPSED TIME	DETAILS OF OPERATION IN SEQUENCE AND REMARKS
	1200	1600	4	LAY DOWN DRILL PIPE
	1600	1700	1	TEAR OUT LAY DOWN MACHINE
			1/2	SAFETY MEETING W/ SHELL
				RIG RELEASED TO PRODUCTION @ 1900 HRS 89/03/17

DRILLER

ACCOUNTING TIME DISTRIBUTION

DRILLING	2042	24	HRS
EVALUATION	2065		HRS
COMPLETION CWO #P6902			HRS
#2 BEZIER	2042	24	HRS
TOTAL HOURS ACCOUNT TO SHELL		24	HRS
BOILER	2042	24	HRS

SOLIDS CONTROL

DESANDER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

DESILTER	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

CENTRIFUGE	DAY	EVENING
HOURS RUN @ kPa		
INTAKE DENSITY (kg/m³)		
OVERFLOW DENSITY (kg/m³)		
UNDERFLOW DENSITY (kg/m³)		

WIRELINE RECORD

SIZE mm	# OF LINES	REEL NO.	LENGTH SLIPPED m
LENGTH CUT OFF m		PRESENT LENGTH m	
MEGAJOULES SINCE LAST CUT			MJ
CUMULATIVE MEGAJOULES			MJ

DRILLING CREW PAYROLL DATA

WELL NAME & NO.: SHELL ETAL ARROWHEAD B-41 | DATE: MARCH/17/89

OPERATOR: SHELL CANADA LIMITED

CONTRACTOR'S REPRESENTATIVE | RIG NO.: 48

DAY TOUR

00:00 P.M. — 12:00 A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		Dave Miller	8
DRKMAN		Darryl Laplante	8
MTRMAN		Dean Bird	8
FLRMAN		Allen Iversen	8
FLRMAN		Ron Peterson	8
FLRMAN			
LeaseMan		Doug Bentrand	8

NO. OF DAYS | SINCE LAST LOST TIME ACCIDENT

EVENING TOUR

P.M. — A.M.

CREW	SOC. INS. NO.	NAME	HOURS
DRILLER		RAY SOUCY #2	9
DRKMAN		GARY BUCHBERGER #2	9
DRKMAN		TIM HODGE	9
MTRMAN		TODD KRYWAY #2	9
FLRMAN		DARIN MCMASTER	9
FLRMAN			
FLRMAN			

NO. OF DAYS | SINCE LAST LOST TIME ACCIDENT

CRAINSET