

9211-P33-4-7
CALGARY COPY

**C L BREDIN HOLDINGS LTD
GEOLOGICAL CONSULTING**

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**WELLSITE GEOLOGICAL REPORT
FOR**

PARAMOUNT RESOURCES LTD.

**Paramount et al Cameron
M-73**

WELL SUMMARY

Well Name: Paramount et al Cameron M-73

Location: 60° 10' N 117° 15' W

Elevation: Ground 771.45m KB 775.15m

Total Depth: Driller 1657.0m Logger 1651.0m

Operator: Paramount Resources Ltd.

Contractor: Sierra Drilling Rig #2

Geologist: Colin Bredin

Drilling Supervisor: Dave Wilson

Logs Run: Phasor-SFL, BHC Sonic, CNL-LDT, Microlog
Velocity Survey

Drill Stem Tests:	#1	Slave Point	1341.0-1377.6	Bottom Hole
	#2	Sulfur Point	1404.0-1425.0	Bottom Hole
	#3	Granite Wash	1608.0-1629.5	Inflate
	#4	Keg River	1501.5-1523.0	Inflate
	#5	Keg River	1511.0-1530.0	Inflate Misrun

Core Cut:	#1	Slave Point	1343.0-1361.0	Full Recovery
	#2	Slave Point	1361.0-1377.6	Full Recovery
	#3	Sulfur Point	1397.0-1407.0	Jam, Full Recovery
	#4	Sulfur Point	1407.0-1425.0	Full Recovery

Surface Casing: 244.5mm landed @ 394.0m KB

Production Casing: 139.7mm landed @ 1657.0m KB

Spud Date: 91-01-28

Rig Release: 91-02-20

Status: Potential Sulfur Point Gas

COLIN BREDIN BSc PGeol

WELL NAME: Paramount et al Cameron M-73
 LOCATION: 60° 10' N 117° 15' W

GR 771.45
 KB 775.15

FORMATION	DEPTH	SUBSEA
Wabamun	556.2m	+218.95
Fort Simpson	716.0m	+ 59.15
Twin Falls	827.5m	- 52.35
Hay River	987.5m	-212.35
Muskwa	1315.0m	-539.85
Slave Point	1340.3m	-565.15
Fort Vermillion	1372.6m	-597.45
Watt Mountain	1389.5m	-614.35
Sulfur Point	1393.0m	-617.85
Muskeg	1421.5m	-646.35
Keg River	1519.0m	-743.85
Chinchaga	1591.0m	-815.85
Granite Wash	1611.4m	-836.25
Precambrian	1637.0m	-861.85
Total Depth	1657.0m	-881.85

DRILL STEM TEST REPORT

WELL NAME Paramount et al Cameron M-73DATE 91-02-08 TEST # One KB 775.15 TD 1377.6m
yr mo dayFORMATION Slave Point INTERVAL 1341.0 TO 1377.6TYPE Bottom Hole Conventional WTS - minGTS - minFLOWTIMES 10 / 60 / 120 / 240 OTS - min

BLOW DESCRIPTION

Preflow very weak air blow throughoutValve Open very weak air blow throughout, NGTS

PRESSURES

RECOVERY

PF 1629 - 1039 180m TotalHP 15773 - 15773 50m foamy drilling mudFP 1376 - 1881 130m watery drilling mudSIP 11058 - 11058 17000 ppm

REMARKS

DRILL STEM TEST REPORT

WELL NAME Paramount et al Cameron M-73DATE 91-02-11 TEST # Two KB 775.15 TD 1425.0m
yr mo dayFORMATION Sulfur Point INTERVAL 1404.0m TO 1425.0mTYPE Bottom Hole Conventional WTS - minGTS 8 minFLOWTIMES 10 / 60 / 72 / 308 OTS 57 min

BLOW DESCRIPTION

Prewell SAB in 45 seconds, GTS 8 minutes, steady throughoutValve Open SAB, GTS immediate, steady throughout, 18 minutes
mud slugging to surface, 57 minutes oil to surface

PRESSURES

RECOVERY

PF 1454 - 1952 About 250m TotalHP 16000 - 15960 250m gassy drilling mud,
oil and water.FP 1717 - 3131SIP 9505 - 9505

REMARKS

Time	Choke	Kpa	m ³ /D	Time	Choke	Kpa	m ³ /D
5	6.35	600	4198	35	19.04	500	35299
10	6.35	800	5428	40	19.04	500	35299
15	6.35	900	6045	45	19.04	400	
20	6.35	1000	6664	50	19.04	450	
25	19.04	500	35299	55	19.04	500	35299
30	19.04	500	35299	60	19.04	500	35299

DRILL STEM TEST REPORT

WELL NAME Paramount et al Cameron M-73DATE 91-02-17 TEST # Three KB 775.15 TD 1657.0m
yr mo dayFORMATION Granite Wash INTERVAL 1608.0 TO 1629.5TYPE Inflate Straddle WTS - minGTS - minFLOWTIMES 10 / 60 / 10 / 60 OTS - min

BLOW DESCRIPTION

Preflow a few bubbles then deadValve Open a few bubbles then dead

PRESSURES

RECOVERY

PF 982 - 1000 see DST #4HP 18637 - 18534FP 1034 - 1034SIP 8603 - 7689

REMARKS

pulled up and reset for DST #4

DRILL STEM TEST REPORT

WELL NAME Paramount et al Cameron M-73DATE 91-02-18 TEST # Four KB 775.15 TD 1657.0
yr mo dayFORMATION Keg River INTERVAL 1501.5 TO 1523.0TYPE Inflate Straddle WTS - minGTS - minFLOWTIMES 10 / 60 / 30 / 60 OTS - min

BLOW DESCRIPTION

Prewlow a few bubbles then deadValve Open dead

PRESSURES

RECOVERY

PF 1120 - 1120 81m Total #3 and #4HP 17362 - 17293 72m inhibitor and waterFP 1137 - 1137 9m drilling mudSIP 5034 - 3327

REMARKS

results do not appear to reflect what was expected fromfrom samples and penetration rates

DRILL STEM TEST REPORT

WELL NAME Paramount et al Cameron M-73DATE 91-02-19 TEST # Five KB 775.15 TD 1657.0m
yr mo dayFORMATION Keg River INTERVAL 1511.0 TO 1530.0TYPE Inflate Straddle WTS - minGTS - minFLOWTIMES 10 / 60 / - / - OTS - min

BLOW DESCRIPTION

Preflow WAB increasing to FAB in 10 minutesValve Open lost packer seat

PRESSURES

RECOVERY

PF 1133 - 1646 222m TotalHP 17381 - 17210 60m inhibitor, mud and H₂OFP - - - 35m mud and inhibitorSIP 10429 - - 127m mud

REMARKS

lost packer seat at start of valve open

SAMPLE DESCRIPTION

1290
SHALE medium grey
1295
SHALE medium grey
1300
as above
1305
SHALE light to medium grey, medium brown slightly calcareous
trace of LIMESTONE light grey-white, argillaceous, tight
1310
SHALE light to medium grey calcareous, trace of LIMESTONE
as above
1315
SHALE medium grey, dark brown, trace of LIMESTONE white to
light grey, mudstone, tight
1320
SHALE light to medium grey calcareous, trace of LIMESTONE
as above
1325
as above
1330
SHALE light to medium grey calcareous, LIMESTONE white to
light grey, cryptocrystalline, mudstone, tight, trace of
LIMESTONE light grey, cryptocrystalline, no stain, no
fluorescence, no Ø
1335
LIMESTONE light grey, cryptocrystalline, tight, SHALE
light to medium grey calcareous
1340
as above, LIMESTONE light to medium brown, cryptocrystalline,
mudstone, no stain, no fluorescence, no Ø
1345
CORE #1 1343-1361
1350
CORE #1
1355
CORE #1
1360
CORE #2 1361-1377.6
1365
CORE #2
1370
CORE #2
1375
CORE #2 Cavings
1380

- 1380 LIMESTONE white to buff, cryptocrystalline, mudstone to wackstone, tight, trace of ANHYDRITE white to light brown
- 1385 LIMESTONE white to buff, cryptocrystalline, mudstone, LIMESTONE light to medium grey, slightly argillaceous, cryptocrystalline, mudstone, tight, abundant pellets, occasional crinoid plates, minor SHALE medium green
- 1390 SHALE light, medium, dark green, LIMESTONE buff to light brown, medium brown, crypto to microcrystalline, mudstone to wackstone, no stain, no fluorescence, no Ø
- 1395 LIMESTONE as above
- 1400 CORE #3 1397-1407
- 1405 CORE #3
- 1410 CORE #4 1407-1425
- 1415 CORE #4
- 1420 CORE #4
- 1425 ANHYDRITE white, light grey, light brown, abundant cavings
- 1430 as above
- 1435 ANHYDRITE white, light brown, light grey, minor DOLOMITE medium to dark brown, cryptocrystalline, tight
- 1440 Cavings
- 1445 Cavings
- 1450 Cavings, minor ANHYDRITE white, light brown, light grey
- 1455 as above
- 1460 as above
- 1465 Cavings
- 1470 ANHYDRITE white-light brown, light grey, trace of DOLOMITE light, medium brown, crypto to microcrystalline, wackstone to packstone, no stain, **spotty streaming yellow-green wet cut fluorescence**, no visual Ø
- 1475

- 1475
ANHYDRITE white, light brown, light grey, abundant cavings
- 1480
as above
- 1485
DOLOMITE light to medium brown, crypto to microcrystalline, wackstone to packstone, no stain, no fluorescence, no Ø
ANHYDRITE white, light brown
- 1490
ANHYDRITE white, light brown, minor DOLOMITE as above
- 1495
as above
- 1500
as above, trace of DOLOMITE
- 1505
as above
- 1510
ANHYDRITE white, light brown, trace of DOLOMITE light to medium brown, crypto to microcrystalline, wackstone to packstone, no stain, no fluorescence, no Ø
- 1515
as above
- 1520
DOLOMITE light to medium brown, microcrystalline, packstone to grainstone, no stain, occasional **streaming yellow wet cut fluorescence, trace of pinpoint and intercrystalline** Ø
- 1525
DOLOMITE light brown, medium brown, crypto to microcrystalline, wackstone to packstone, no stain, no fluorescence, no visual Ø
- 1530
DOLOMITE light brown, medium brown, cryptocrystalline to microcrystalline, wackstone to packstone, no stain, no fluorescence, trace of **intercrystalline** Ø
- 1535
DOLOMITE medium brown, dark brown, cryptocrystalline, microcrystalline, wackstone to packstone, some sucrosic, no stain, **faint streaming yellow wet cut fluorescence, small vuggy Ø 8-9%, fair petroliferous odor**
- 1540
DOLOMITE medium brown, dark brown, cryptocrystalline to microcrystalline, wackstone, no stain, no fluorescence, **trace of vuggy** Ø.
- 1545
as above
- 1550
DOLOMITE light brown, crypto to microcrystalline, wackstone, no stain, no fluorescence, no Ø, trace of ANHYDRITE, cavings
- 1555

- 1555
DOLOMITE light brown, crypto to microcrystalline, wackstone,
no stain, no fluorescence, no Ø, abundant Cavings
- 1560
as above
- 1565
DOLOMITE dark brown to black, some carbonaceous, crypto
to microcrystalline, wackstone, no stain, no fluorescence,
no Ø, trace of ANHYDRITE cavings
- 1570
as above
- 1575
DOLOMITE medium brown, dark brown, crypto to microcrystalline,
wackstone, no stain, no fluorescence, no Ø, trace of coal
- 1580
DOLOMITE medium grey-brown, cryptocrystalline, wackstone,
argillaceous, no stain, no fluorescence, no Ø
- 1585
as above mudstone to wackstone, trace of ANHYDRITE
- 1590
DOLOMITE buff to light brown, light grey, cryptocrystalline,
mudstone to wackstone, no stain, no fluorescence, no Ø,
minor ANHYDRITE light brown
- 1595
as above
- 1600
ANHYDRITE white to light brown, trace of DOLOMITE as above
- 1605
ANHYDRITE white to light brown
- 1610
as above, trace of SANDSTONE
- 1615
SANDSTONE clear to frosted quartz, medium to very coarse
grained, angular to subrounded, medium sorting, no stain
no fluorescence, Ø 10-12%
- 1620
SANDSTONE clear to frosted quartz, fine to very coarse
grained, angular to subround, poorly sorted, minor siliceous
cement, no stain, no fluorescence, Ø 8-10%
- 1625
SANDSTONE clear to frosted quartz, medium to very coarse,
angular, poorly sorted, no stain, no fluorescence, Ø 6-8%
- 1630
Quartzite clear to frosted quartz, medium to very coarse,
angular, poorly sorted, no stain, no fluorescence, no Ø
- 1635
as above, GRANITE quartz and feldspars
- 1640
GRANITE quartz and feldspars
- 1645
as above
- 1650
as above
- 1655
as above
- 1657

M-73

CORE DESCRIPTION

CORE # 1 INTERVAL 1343 TO 1361FORMATION SLAVE POINT RECOVERY FULL

DEPTH	CORING TIME MIN/M					LITHOLOGY	DESCRIPTION	
	10 70	20 80	30 90	40 100	50 110			
1344							LS lt-med bn, crypto-micro, wackstone trace of pp ϕ bleeding oil + gas	5.5 m ★ ϕ less than 5%
1345							LS ltbn, med bn, crypto-microcrystal, wackstone trace of pinpoint and intercrystalline	
1346							ϕ , bleeding oil + gas	
1347							as above	
1348							as above	
1349							LS lt-med bn, cryptocrystalline, tight	1.2 m tight
1350							LS ltbn, med bn, crypto-microcrystalline, wackstone, slight pinpoint ϕ , trace	
1351							intercrystalline ϕ with occasional tight bands. Bleeding oil + gas	
1352							as above	5 m ★ ϕ less than 5%
1353							as above	
1354							as above	
1355							as above	
1356						1-1 f1 P1-1 f1	LS lt-med gy bn, crypto, slig. arg tight, occ brachiopods	1.1 m tight
1357							LS lt-med bn, crypto-micro, wack stone, interxstal ϕ . Bleeding oil + gas	1.1 m ★ ϕ less than 5%
1358							LS lt-med bn, crypto-micro, wackstone occ small vugs, infilled, tight	1.1 m tight
1359							LS as above, bleeding oil + gas trace pinpoint + interxstal ϕ	2 m ϕ less than 5%
1360							as above	★
1361							LS as above, occ small horizontal vugs, open, pinpoint bleeding oil + gas	1.0 m ϕ less than 6%

M-73

CORE DESCRIPTION

CORE # 2 INTERVAL 1361 TO 1377.6FORMATION SLAVE POINT RECOVERY FULL

DEPTH	CORING TIME MIN/M					LITHOLOGY	DESCRIPTION	
	10 70	20 80	30 90	40 100	50 110			
1362							LS lt-med bn, crypto-micro, wackstone c, pp + intastal ϕ bleeding oil + gas	1.5 m *
1363							LS lt-med bn, crypto-micro, wackstone tight	ϕ 5-6%
1364							LS lt-med bn, crypto-micro, wackstone PP, interxstal, tr vuggy ϕ bleeding oil + gas	1.0 m tight
1365							LS lt-med bn, crypto-micro, wackstone tr PP ϕ bleeding oil + gas	1.8 m *
1366							as above	ϕ 5-6%
1367							as above	2.9 m *
1368							as above	ϕ 3-4%
1369							LS lt-med bn, crypto-micro, wackstone tight	3.9 m tight
1370							as above	
1371							as above	
1372							as above	
1373							INTBD LS as above and ANH	5.5 m
1374							as above	
1375							as above	
1376							as above	
1377							as above	

CORE # 3 INTERVAL 1397 TO 1407

FORMATION SULFUR POINT RECOVERY FULL

[illegible]

m-73

CORE DESCRIPTION

CORE # 4 INTERVAL 1407 TO 1425FORMATION SULFUR POINT RECOVERY FULL

DEPTH	CORING TIME MIN/M					LITHOLOGY	DESCRIPTION	
	10 70	20 80	30 90	40 100	50 110			
1407								
1408						/ / / / /	.6 m Dol lt-med bn, crypto-micro, wack ang Dol intraclasts, tight	tight
1409						/ / / / /	1 m LS lt-med gy, crypto, ang LS intraclasts, breccia, tight	
1410						/ / / / /	1 m Dol lt-med bn, crypto-micro, occ SH laminae, tight	
1411						/ / / / /	.7 m Dol lt-med bn, crypto-micro, thin SH laminae, trpp, tr microvugs, BO .4 m Dol aa + SH med gy	
1412						/ / / / /	1.7 m Dol lt-med bn, crypto-micro, wack mnr pp Ø, Bleeding oil, tr vugs, res oil	7-8% *
1413						/ / / / /	aa	8-9% *
1414						/ / / / /	2.0 m Dol lt-med bn, crypto-micro, wack fair pp Ø Bleeding oil, mnr small vugs with residual oil	
1415						/ / / / /	2.1 m Dol lt-med bn, crypto, dk bn micro wack-pack, tight	
1416						/ / / / /		tight
1417						/ / / / /	1.0 m Dol lt-med bn, crypto-micro, wack tr pp, occ v small vugs BO	tight
1418						/ / / / /	1.7 m Dol lt-med bn, crypto-micro, wack mnr pp + v small vugs, some BO	
1419						/ / / / /		7-8% *
1420						/ / / / /	.8 m Dol lt-med bn, crypto, fine SH lam	tight
1421						/ / / / /	.8 m LS med gy-bn, crypto, tight	
1422						/ / / / /	3.4 m ANH wh-lt bn, lt gy	
1423						/ / / / /	aa	
1424						/ / / / /	aa	tight
1425						/ / / / /	.6 m Dol med-dk bn, crypto-micro wack, tight	

**C.L. BREDIN HOLDINGS LTD.
GEOLOGICAL CONSULTING**

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Rig Release: <u>91-02-20</u> Finish Drilling <u>91-02-16</u>	<table border="1" style="width:100%"> <tr> <th align="center" colspan="3">FORMATION TOPS</th> </tr> <tr> <th align="center">Formation</th> <th align="center">Top</th> <th align="center">Subsea</th> </tr> <tr><td>Wabamun</td><td align="right">556.2</td><td align="right">+218.9</td></tr> <tr><td>Ft Simpson</td><td align="right">716.0</td><td align="right">+ 59.2</td></tr> <tr><td>Twin Falls</td><td align="right">827.5</td><td align="right">- 52.4</td></tr> <tr><td>Hay River</td><td align="right">987.5</td><td align="right">-212.4</td></tr> <tr><td>Muskwa</td><td align="right">1315.0</td><td align="right">-539.9</td></tr> <tr><td>Slave Pt</td><td align="right">1340.3</td><td align="right">-565.2</td></tr> <tr><td>Ft Verm</td><td align="right">1372.6</td><td align="right">-597.5</td></tr> <tr><td>Watt Mtn</td><td align="right">1389.5</td><td align="right">-614.4</td></tr> <tr><td>Sulfur Pt</td><td align="right">1393.0</td><td align="right">-617.9</td></tr> <tr><td>Muskeg</td><td align="right">1421.5</td><td align="right">-646.4</td></tr> <tr><td>Keg River</td><td align="right">1519.0</td><td align="right">-743.9</td></tr> <tr><td>Chinchaga</td><td align="right">1591.0</td><td align="right">-815.9</td></tr> <tr><td>Gran Wash</td><td align="right">1611.4</td><td align="right">-836.3</td></tr> <tr><td>Precambrian</td><td align="right">1637.0</td><td align="right">-861.9</td></tr> <tr><td>Total Depth</td><td align="right">1657.0</td><td align="right">-881.9</td></tr> </table>	FORMATION TOPS			Formation	Top	Subsea	Wabamun	556.2	+218.9	Ft Simpson	716.0	+ 59.2	Twin Falls	827.5	- 52.4	Hay River	987.5	-212.4	Muskwa	1315.0	-539.9	Slave Pt	1340.3	-565.2	Ft Verm	1372.6	-597.5	Watt Mtn	1389.5	-614.4	Sulfur Pt	1393.0	-617.9	Muskeg	1421.5	-646.4	Keg River	1519.0	-743.9	Chinchaga	1591.0	-815.9	Gran Wash	1611.4	-836.3	Precambrian	1637.0	-861.9	Total Depth	1657.0	-881.9
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Status: <u>Potential Sulfur Point Gas</u>																																																				
Casing: Surface <u>244.5mm landed at 394.0m KB</u>																																																				
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<u>Velocity Survey</u>																																																				

CORE AND DRILL STEM TEST SUMMARY

№	INTERVAL	RECOVERY	FORMATION
#1	1343.0-1361.0	Full	Slave Point
#2	1361.0-1377.6	Full	Slave Point
#3	1397.0-1407.0	Full	Sulfur Point
#4	1407.0-1425.0	Full	Sulfur Point

SHOWS

○○○○ Excellent
 ○○○ Good
 ○○ Fair
 ○ Poor

SORTING

W	Well
M	Medium
P	Poor

POROSITY

G	Intergranular
XL	Inter crystalline
SV	Small Vuggy
LV	Large Vuggy
E	Earthy
F	Fracture
PF	Pinpoint

ROUNDING

A	Angular
o	Sub-angular
r	Sub-round
R	Round

LIMESTONE

Crystalline

DOLOMITE

Crystalline

EVAPORITES

Anhydrite

Salt/Potash

CLASTICS

Shale

Siltstone

Sandstone

Conglomerate

Coal

Arkose

IGNEOUS-METAMORPHIC

Granite

Metamorphic

Volcanic

Pelletoidal

Bioclastic-Fragmental

Oolitic

Reefal

Crinoidal

Chalky

Anhydritic

Cakite Crystal

Dolomite Crystal

Bentonite

Earthy

Sandy

Silty

Argillaceous

Bituminous

Chert-Siliceous

Glauconitic

Calcareous

Dolomitic

Sideritic

Pyritic

Fracture

Fossil

Brushwood

Bryozoan

Coral

Gastropod

Ostracod

Rock Description Procedure

Depth, Tops Eng. Data	Penetration Rate min / m	Fluorescence	Por Type	Porosity > 20% 15-20% 10-15% 5-10% < 5%	Lithology	V.F. F M CS	Sorting	Rounding	Rock Description Procedure	
									Gross Rock Type	Cementation
									Color	Porosity
									Composition	Permeability
									Grain Size	Staining, Fluorescence, Cu
									Rounding, Sorting, Induration	Structures
									SH med gy	
1295									SH med gy	
1300									aa	
1305									SH lt-med gy, med bn slig calc, tr LS lt gy-wh, arg, tight	
1310									SH lt-med gy calc, tr LS aa	
1315 MUSKWA									SH med gy, dk bn, tr LS wh-lt gy, mudstone, tight	
1320									SH lt-med gy calc, tr LS aa	
1325									aa	
1330									SH lt-med gy calc, LS wh-lt gy, crypto, mud, tight, tr LS lt gy, crypto, no st, no flour no Ø	
1335									LS lt gy crypto, tight, SH lt-med gy calc	
1340 SLAVE POINT									aa LS lt-med bn, crypto, mud, no st, no flour, no Ø	

Rock Description Procedure

Depth, Tops Eng. Data	Penetration Rate min / m	Fluorescence	Por Type	Porosity > 20% 15-20% 10-15% 5-10% < 5%	Lithology	V.F.	F.	M.	C.S.	Sorting	Rounding	Gross Rock Type Color Composition Grain Size Rounding, Sorting, Induration	Cementation Porosity Permeability Staining, Fluorescence, Cur Structures
1350		*										Core #1	
1355		*										Core #1	
1360		*										Core #1	
1365		*										Core #2	
1370		*										Core #2	
1375		*										Core #2	
1380												Core #2 abt cvngs	
1385												LS wh-buff, crypto, mud-wack, tight, tr ANH wh-lt bn	
1390												LS wh-buff, crypto, mud, LS lt-med gy, slig arg, crypto, mud, tight, abt pellets, occ crinoids, mnr SH med grn	
1395												LS aa, SH lt, med, dk grn, LS buff-lt bn, med bn, crypto-micro, mud-wack, no st, no flour, no Ø	
1395		*										LS aa Core #3	

Rock Description Procedure

Depth, Tops Eng. Data	Penetration Rate min / m	Fluorescence	Porosity Por Type > 20% 15-20% 10-15% 5-10% < 5%	Lithology	V.F.	F.	M.	CS.	Sorting	Rounding	Gross Rock Type Color Composition Grain Size Rounding, Sorting, Induration	Cementation Porosity Permeability Staining, Fluorescence, Cur Structures
1405											Core #3	
1410		*									Core #3	
1415		**									Core #4	
1420		**									Core #4	
1425		*									Core #4	
1430											ANHYDRITE wh, lt gy, lt bn abt cvngs	
1435											aa	
1440											ANH wh, lt bn, lt gy, mnr DOL med-dk bn, crypto, tight	
1445											Cavings	
1450											Cavings	
1455											Cavings, mnr ANH wh, lt bn, lt gy	

Rock Description Procedure

Depth, Tops Eng. Data	Penetration Rate min / m	Fluorescence	Por Type	Porosity > 20% 15-20% 10-15% 5-10% < 5%	Lithology	V F	F	M.	CS.	Sorting	Rounding	Rock Description Procedure	
												Gross Rock Type	Cementation
												Color	Porosity
												Composition	Permeability
												Grain Size	Straining, Fluorescence, Cut
												Rounding, Sorting, Induration	Structures
												Cavings, mnr ANH wh, lt gy, lt bn	
1460												aa	
1465												Cavings	
1470												ANH wh-lt bn, lt gy, tr DOL lt, med bn, crypto-micro, wack-pack, no st, yw wet cut flour, no vis Ø	
1475												ANH wh, lt bn, lt gy, abt Cavings	
1480												aa	
1485												DOL lt-med bn, crypto-micro, wack-pack, no st, no flour, no Ø, ANH wh, lt bn	
1490												ANH wh, lt bn, mnr DOL aa	
1495												aa	
1500												aa tr DOL	
1505												aa	

DST #4

Rock Description Procedure

Depth, Tops Eng. Data	Penetration Rate min / m	Fluorescence	Por Type	Porosity ≥ 20% 15-20% 10-15% 5-10% ≤ 5%	Lithology	V.F. F M CS	Sorting	Rounding	Gross Rock Type		Cementation	
									Color	Composition	Grain Size	Porosity
1515										ANH wh, lt bn, tr DOL lt-med bn, crypto-micro, wack-pack, no st, no flour, no Ø		
1520										aa		
1525										DOL lt-med bn, micro, pack-grain, no st, occ str yw wet cut flour, tr pp and intxstal Ø		
1530										DOL lt bn, med bn, crypto-micro, wack-pack, no st, no flour, no vis Ø		
1535										DOL med bn, dk bn, crypto, micro, wack-pack, some sucro, no st, ft str yw wet cut flour small vuggy Ø, fair petro odor		
1540										DOL med bn, dk bn, crypto-micro, wack, no st, no flour, tr vuggy Ø		
1545										aa		
1550										DOL lt bn, crypto-micro, wack, no st, no flour, no Ø, tr ANH, Cavings		
1555										DOL lt bn, crypto-micro, wack, no st, no flour, no Ø, abt Cvngs		
1560										aa		

Depth, Tops Eng. Data	Penetration Rate min / m	Fluorescence	Por Type	Porosity 20% 15-20% 10-15% 5-10% 5%	Lithology	V.F. F M CS	Sorting	Rounding	Gross Rock Type	Cementation
									Color	Porosity
									Composition	Permeability
									Grain Size	Staining, Fluorescence, Cui
									Rounding, Sorting, Induration	Structures
									DOL dk bn-blk, some carb, crypto-micro, wack, no st, no flour, no Ø, tr ANH, Cavings	
1570									aa	
1575									DOL med bn, dk bn, crypto-micro wack, no st, no flour, no Ø tr Coal	
1580									DOL med gy-bn, crypto, wack, arg, no st, no flour, no Ø	
1585									aa mud-wack, tr ANH	
1590 CHINCHAGA									DOL buff-lt bn, lt gy, crypto, mud-wack, no st, no flour, no Ø, mnr ANH lt bn	
1595									aa	
1600									ANH wh-lt bn, tr DOL aa	
1605									ANH wh-lt bn	
1610 GRANITE WASH									aa tr SS	
1615 DST #3			X						SS clr-fros qtz, med-vcrs gn, ang-srnd, med srtd, no st, no flour, Ø 10-12%	
			X							
			X							

Rock Description Procedure

Depth, Tops Eng. Data	Penetration Rate min / m	Fluorescence	Por Type	Porosity 20% 15-20% 10-15% 5-10% 5%	Lithology	V.F.	F.	M.	C.S.	Sorting	Rounding	Rock Description Procedure	
												Gross Rock Type	Cementation
												Color	Porosity
												Composition	Permeability
												Grain Size	Staining, Fluorescence, Cur
												Rounding, Sorting, Induration	Structures
ORD?			X								P A	SS clr-fros qtz, fn-vcrs gn, ang-srnd, psrtd, mnr silc cmt, psrtd, no st, no flour, Ø 8-10%	
1625			X								P A	SS clr-fros qtz, med-vcrs gn, ang, psrtd, no st, no flour, Ø 6-8%	
1630											A	QTZ clr-fros qtz, med-vcrs, ang, psrtd, no st, no flour, no Ø	
1635											A	aa GRANITE qtz and feldspars	
1640												GRANITE qtz and feldspars	
1645												aa	
1650												aa	
1655												aa	
1660													

TD
1657

