

**HYDROCARBON SHOW REPORT #1**

**715-1150M**

**SUMMARY OF HYDROCARBON INDICATORS**

12.25" hole was drilled in this interval. The first traces of hydrocarbons were detected here; the first appearance of C-1 started a few meters above. Traces of free oil, iridescence, and fluorescence were seen.

In addition to oil evidence, alkanes included C-2 and C-3, with C-1. Quantities were small, but their presence is notable.

Scattered to common live oil pops and faint iridescent sheen were seen on the mud. Live pops had faint yellow fluorescence. By 765m, slight petroleum odor was detectable while washing samples. Rare spots in the washed samples fluoresce moderate to bright yellow. No visible stains or cuts were seen. Weak yellow cut fluorescence and yellow to white residual cut fluorescence were reported.

Oil traces occurred intermittently through the section. Oil pops, iridescence, and residual cut fluorescence were the most consistent indicators.

**LITHOLOGY**

This is a clastic-rich interval. Sand and mudstone predominate. A significant amount of clay, up to 40% of some samples' volume, is possibly washed from sand/sandstone. The mudstone grades in part to laminated shale. A siltstone layer occurs at about 780m. Minor amounts of coal are present, up to 20%, but usually as traces.

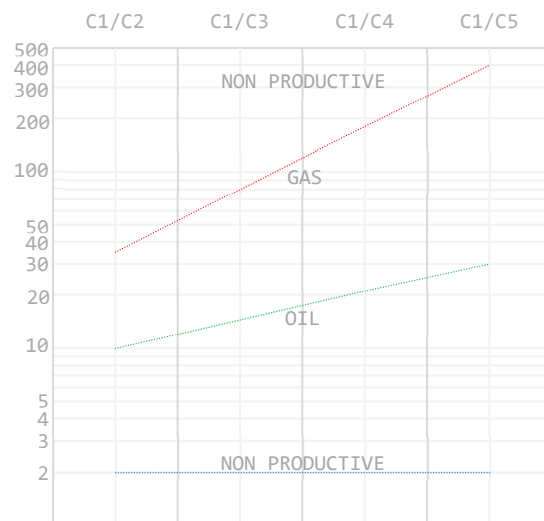
The sand is unconsolidated to partly consolidated, poorly to moderately sorted, and appears to have potential of good porosity and permeability. It is medium to coarse, occasionally fine, subangular to subrounded, moderate to high sphericity, and pyritic. A massive sand body from 1000 to 1100m appears clean with high porosity.

Carbonates first appear below 1100', consisting of limestone and dolostone.

**DRILLING & MUD PARAMETERS**

	MIN	MAX	AVG	Ø AVG
ROP (M/HR)	1	13	8	8
WOB (KLBS)	1	13	3	4
TOTAL GAS (UNITS)	0	5	0	1
SHOWS (0-100)	0	10	1	3
C1 (PPM)	2	678	35	35
C2 (PPM)	0	19	4	7
C3 (PPM)	0	22	3	13
C4 (PPM)	0	0	0	0
C5 (PPM)	0	0	0	0
MUD WEIGHT (PPG)	9.0	9.3	9.3	9.2
VISCOSITY (SEC/QT)	30	38	37	37
WATER LOSS (ML/30MIN)	8.5	14.3	NA	NA
MUD CHLORIDES (MG/L)	250	550	NA	NA

**CHROMATOGRAPHY RATIOS (NOT APPLICABLE)**



## HYDROCARBON SHOW REPORT #1 715-1150M

### HIGHLIGHTED DETAILS

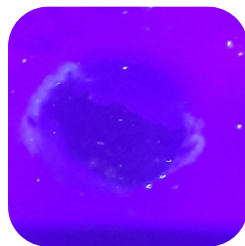
DEPTH	DOOR	IRID	POPS	VIS STAIN	SMPL FL		CUT FL		RESID CUT		VIS CUT	REMARKS
					FL	FL %	FL	SPEED	COL	INTS		
715	1	1	1	0	2	1	1	1	1	1	0	weak bulk spl fl
725	1	1	1	0	2	1	1	1	1	1	0	first tr C-2 and C-3
735	1	1	2	0	2	1	2	1	1	1	0	weak bulk spl fl
745	1	1	2	0	2	1	1	1	1	1	0	sli incrs bulk spl fl
755	1	1	2	0	2	1	1	1	1	1	0	clear oil in spl, pops
765	1	2	2	0	2	1	1	1	1	1	0	fnt irid sheen, sli petro odor
775	1	1	2	0	2	1	1	1	1	1	0	scat fnt yel pops
785	1	2	2	0	2	1	2	1	1	1	0	trace irid sheen
795	1	1	1	0	2	1	1	1	1	1	0	scat fnt yel fl pops
805	1	2	1	0	2	1	2	1	0	0	0	fnt petr odor while washing spl
815	1	1	2	0	2	1	1	1	0	0	0	black coal w/conch frac
855	1	0	1	0	1	1	0	0	0	0	0	live oil pops in mud
890	0	1	1	0	1	1	0	0	0	0	0	oil pops & irid w/washing
1080	2	0	0	1	1	1	1	3	3	4	2	bright resid cut fl
1090	0	1	0	1	1	1	1	3	3	4	2	slo developing resid ring
1100	1	0	0	1	1	1	1	2	4	1	1	slo resid ring
1130	1	1	1	1	1	1	1	1	3	4	2	bright resid ring fl
1140	1	1	1	1	1	1	1	1	3	4	2	irid when washing spl

DOOR	IRIDSCENCE	POPS	VIS STAIN	SPL FL	SPL FL %	CUT FL	CUT SPEED	COLOR	INTENSITY	VIS CUT
1. Very Faint	1. Rare	1. Rare	1. <1%	1. Very Faint	1. <10%	1. Very Faint	1. Diffuse	1. Orange	1. Very Faint	1. Pale Straw
2. Faint	2. Occasional	2. Occasional	2. 1-10%	2. Faint	2. 10-25%	2. Transprt	2. Slow	2. Gold	2. Faint	2. Straw
3. Fair	3. Common	3. Common	3. 10-40%	3. Moderate	3. 25-75%	3. Transclnt	3. Fast	3. Yellow	3. Mod Brt	3. Amber
4. Good	4. Abundant	4. Abundant	4. >40%	4. Bright	4. >75%	4. Opaque	4. Instant	4. White	4. Bright	4. Brow

### IMAGES & DESCRIPTIONS



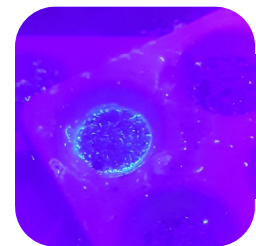
740m mudbucket with floating oil



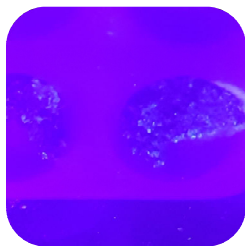
741m resid ring cut fl



820m mud distillate 0.8% oil



1088m resid ring cut fl



1141m resid ring cut fl

**HYDROCARBON SHOW REPORT #2**

**1270M-1450M**

**SUMMARY OF HYDROCARBON INDICATORS**

This interval was drilled to 8.5" diameter. 1280 to 1287m was cored. Oil traces occurred consistently. Shows were more significant in siltstone transitions, decreasing when carbonates were abundant. The best shows were from 1280 to 1300 meters and 1380 to 1440 meters. Faint petroleum odor, trace iridescence, and occasional visible and fluorescent pops were present from 1280 to 1300 meters. 1%-5% visible staining is present with faint 15% sample fluorescence. Cuts were transparent, fast, with gold to yellow bright intensity. Between 1280-1300 meters, a pale straw to straw visible cut was noted. Samples in this interval often displayed common, up to 25%, white mineral fluorescence from the presence of calcite.

From 1380-1440 meters the oil shows were more consistent with faint petroleum odor, occasional iridescence, and rare to occasional pops. Traces of visible oil staining were seen under the microscope. Under the fluoroscope, samples had approximately 15% faint iridescence. Solvent cuts showed fast to instant cut fluorescence. Residual cut fluorescence ranged from gold, yellow, and white with bright intensity. Visible (white light) cuts were pale straw to straw with traces of brown.

C-1 was present in miniscule amounts. A very minute trace of C-2 and C-3 also occurred, in single digit parts per million.

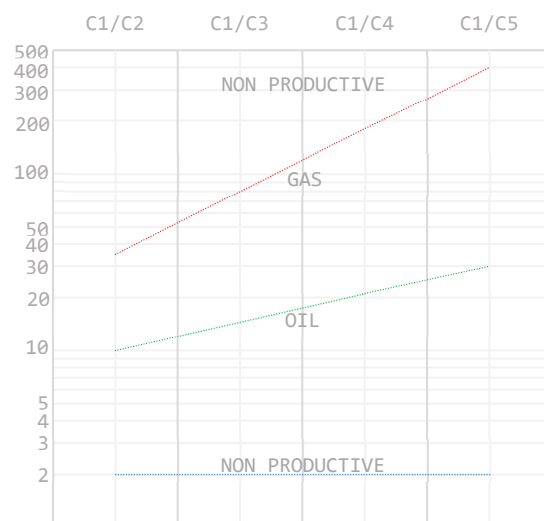
**LITHOLOGY**

Carbonates predominate in this interval, consisting of grainstone, dolostone, limestone and marl. Minor amounts of siltstone and shale occur in part. Little porosity was noted: the grainstone tends to have a sucrosic texture. Traces of heavy oil were seen in siltstone.

**DRILLING & MUD PARAMETERS**

	MIN	MAX	AVG	Ø AVG
ROP (M/HR)	1	15	6	6
WOB (KLBS)	1	15	7	7
TOTAL GAS (UNITS)	0	2	0	1
SHOWS (0-100)	0	18	4	5
C1 (PPM)	2	39	8	8
C2 (PPM)	0	6	0	4
C3 (PPM)	0	2	0	2
C4 (PPM)	0	0	0	0
C5 (PPM)	0	0	0	0
MUD WEIGHT (PPG)	9.3	9.8	9.7	9.7
VISCOSITY (SEC/QT)	40	46	44	44
WATER LOSS (ML/30MIN)	6	7.2	6.7	6.7
MUD CHLORIDES (MG/L)	1900	2200	2000	2000

**CHROMATOGRAPHY RATIOS (NOT APPLICABLE)**



### HYDROCARBON SHOW REPORT #2

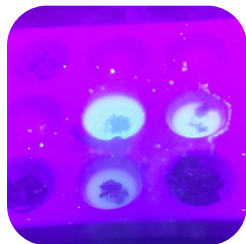
1270M-1450M

#### HIGHLIGHTED DETAILS

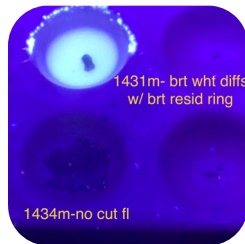
DEPTH	DOOR	IRID	POPS	VIS STAIN	SMPL FL		CUT FL		RESID CUT		VIS CUT	REMARKS
					FL	FL %	FL	SPEED	COL	INTS		
1280	2	1	2	2	2	1	3	4	2	4	2	vis pops & oil resid @ shakers
1290	2	1	2	1	2	1	3	4	2	4	2	incrs resid ring fl, color, cut speed
1300	1	0	1	1	1	1	1	2	3	1	1	brt grnsh gold resid fl
1310	1	0	1	1	1	1	1	2	2	1	1	fnt yel resid ring
1320	1	0	1	1	1	1	1	2	2	1	1	slo, fnt yel diffuse cut
1330	1	0	1	1	1	1	1	2	2	1	1	slo, fnt yel cut fl
1340	1	0	1	1	1	1	1	2	2	1	1	slo, v fnt yel diffuse cut
1350	1	0	1	1	1	1	1	2	2	1	1	slo, v fnt yel resid ring fl
1360	1	0	1	1	1	1	1	2	2	1	1	slo, v fnt yel resid ring
1370	1	0	1	1	1	1	1	2	2	1	1	weak irid w/wash
1380	2	1	2	1	2	1	2	2	2	1	1	fnt yel fl pops
1390	2	1	2	2	2	2	2	1	3	1	2	inst v fnt wht cut fl
1400	3	1	3	2	2	3	3	3	3	3	2	v fnt wht cut, slo dvlp
1410	2	1	2	1	2	2	2	3	3	4	2	v fnt wht cut, slo dvlp
1420	2	2	2	1	1	2	1	4	4	4	2	inst brt wht strmg cut fl
1430	0	1	1	1	1	1	1	4	4	3	2	inst brt wht strmg cut fl
1440	1	1	1	0	1	1	1	1	2	3	1	hvy oil, tar balls, brt yel wht strms
1450	1	1	1	1	3	2	2	3	3	1	2	slo, fnt wht diffuse cut fl

DOOR	IRIDSCENCE	POPS	VIS STAIN	SPL FL	SPL FL %	CUT FL	CUT SPEED	COLOR	INTENSITY	VIS CUT
1. Very Faint	1. Rare	1. Rare	1. <1%	1. Very Faint	1. <10%	1. Very Faint	1. Diffuse	1. Orange	1. Very Faint	1. Pale Straw
2. Faint	2. Occasional	2. Occasional	2. 1-10%	2. Faint	2. 10-25%	2. Transprnt	2. Slow	2. Gold	2. Faint	2. Straw
3. Fair	3. Common	3. Common	3. 10-40%	3. Moderate	3. 25-75%	3. Transclnt	3. Fast	3. Yellow	3. Mod Brt	3. Amber
4. Good	4. Abundant	4. Abundant	4. >40%	4. Bright	4. >75%	4. Opaque	4. Instant	4. White	4. Bright	4. Brown

#### IMAGES & DESCRIPTIONS



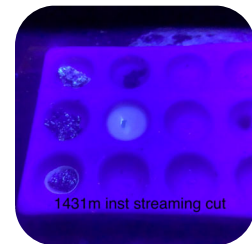
1280m  
cut fl



1431-1434m  
cut fl comparison



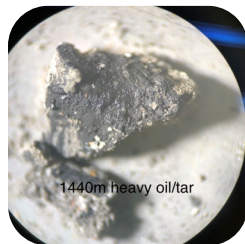
1431m  
Siltst spl fl



1431m  
inst strmg cut fl



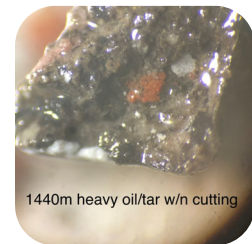
1431m  
Siltst with oil



1440m  
45x tar coating



1440m  
cut fl



1440m hvy oil or tar  
within

**HYDROCARBON SHOW REPORT #3**

**1590-1655M**

**SUMMARY OF HYDROCARBON INDICATORS**

8.5" hole was drilled through this section. No remarkable drilling events occurred, but a core was cut at the bottom of the interval. Oil traces were noted but generally weak. There was little to no iridescence or pops. Samples were under 10 percent fluorescent and very faint. From 1600-1620 meters, transparent instant cut fluorescence occurred leaving a bright gold residual cut fluorescence. Visible sample cuts were usually pale straw, with straw from 1600-1610 meters. Samples in this interval often displayed common, up to 25%, white mineral fluorescence from the presence of calcite.

C-1 was the only alkane detected. A trip gas event was noted at the bottom of the interval, with a maximum value of 151 parts per million.

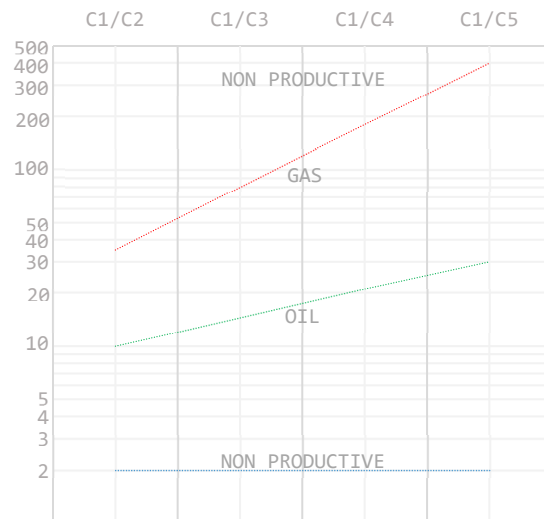
**LITHOLOGY**

This interval was dominated by marl and other carbonates but the significant lithologic change is presence of two thin siltstone and shale interbeds. Oil shows increased when carbonates decreased. The siltstone is earthy and poorly cemented but lacks significant porosity. There are minor amounts of anhydrite starting at 1595m, increasing to massive interbeds from 1650 to 1870m, and lesser amounts below.

**DRILLING & MUD PARAMETERS**

	MIN	MAX	AVG	Ø AVG
ROP (M/HR)	1	12	5	5
WOB (KLBS)	1	10	8	8
TOTAL GAS (UNITS)	0	2	0	1
SHOWS (0-100)	2	6	4	4
C1 (PPM)	2	151	21	21
C2 (PPM)	0	0	0	0
C3 (PPM)	0	0	0	0
C4 (PPM)	0	0	0	0
C5 (PPM)	0	0	0	0
MUD WEIGHT (PPG)	9.3	9.6	9.5	9.5
VISCOSITY (SEC/QT)	47	49	48	48
WATER LOSS (ML/30MIN)	5.3	5.8	5.6	5.6
MUD CHLORIDES (MG/L)	1600	1700	1650	1650

**CHROMATOGRAPHY RATIOS (NOT APPLICABLE)**



HYDROCARBON SHOW REPORT #3

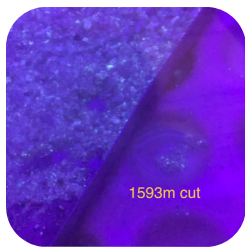
1590-1655M

HIGHLIGHTED DETAILS

DEPTH	DOOR	IRID	POPS	VIS STAIN	SMPL FL		CUT FL		RESID CUT		VIS CUT	REMARKS
					FL	FL %	FL	SPEED	COL	INTS		
1590	1	0	0	0	1	1	1	1	1	1	1	slo fnt resid ring fl
1600	1	1	1	1	1	1	2	4	2	3	2	brt inst goldish yel cut fl
1610	1	1	1	1	1	1	2	4	2	3	2	brt yel res cut fl w/time
1620	1	1	1	1	1	1	2	2	2	2	1	slo, strmgng dul yel cut fl
1630	1	1	1	1	1	1	1	2	2	1	1	slo, strmgng dul yel cut fl
1640	1	0	1	1	1	1	1	2	2	1	1	slo, strmgng dul yel cut fl
1650	1	0	1	1	1	1	1	2	2	1	1	slo, strmgng dul yel cut fl

DOOR	IRIDSCENCE	POPS	VIS STAIN	SPL FL	SPL FL %	CUT FL	CUT SPEED	COLOR	INTENSITY	VIS CUT
1. Very Faint	1. Rare	1. Rare	1. <1%	1. Very Faint	1. <10%	1. Very Faint	1. Diffuse	1. Orange	1. Very Faint	1. Pale Straw
2. Faint	2. Occasional	2. Occasional	2. 1-10%	2. Faint	2. 10-25%	2. Transprnt	2. Slow	2. Gold	2. Faint	2. Straw
3. Fair	3. Common	3. Common	3. 10-40%	3. Moderate	3. 25-75%	3. Translcnt	3. Fast	3. Yellow	3. Mod Brt	3. Amber
4. Good	4. Abundant	4. Abundant	4. >40%	4. Bright	4. >75%	4. Opaque	4. Instant	4. White	4. Bright	4. Brow

IMAGES & DESCRIPTIONS



15930m  
fluor