AGAT® Laboratories

HYDROCARBON LIQUID ANALYSIS

CONTAINER IDENTIFICATION: AGAT 30950

LABORATORY NUMBER: CF42027A

OPERATOR NAME: PARAMOUNT RESOURCES LTD.

UNIQUE WELL IDENTIFIER:

WELL NAME: PARMOUNT et al LIARD F-36

ELEVATIONS KB m: GRD m:

FIELD OR AREA: LIARD

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY: AGAT

TEST TYPE:

NO:

TEST RECOVERY:

TEST INTERVAL OR PERFS:

SAMPLING POINT: TEST SEPARATOR

* Bubble Point

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa	4551			4551		5200*
TEMPERATURE °C	26			26		21*

DATE SAMPLED (Y-M-D): 99-08-23

DATE RECEIVED (Y-M-D): 99-08-25

DATE REPORTED (Y-M-D): 99-08-25

ANALYST: CT NCO

OTHER INFORMATION:

COMP	MOLE FRACTION	MASS FRACTION	VOLUME FRACTION
N_2	0.0002	0.0000	0.0000
CO_2	0.0051	0.0020	0.0018
H_2S	0.0000	0.0000	0.0000
C_1	0.1985	0.0281	0.0708
C_2	0.0179	0.0048	0.0101
C_3	0.0133	0.0052	0.0077
IC_4	0.0062	0.0032	0.0043
NC_4	0.0095	0.0049	0.0063
IC_5	0.0096	0.0061	0.0074
NC_5	0.0096	0.0061	0.0073
C_6	0.0309	0.0233	0.0264
C_7 +	0.6992	0.9163	0.8579
C_8			
C_9			
C_{10}			
C_{11}			
C_{12}+			
TOTAL	1.0000	1.0000	1.0000

OBSERVED PROPERTIES OF C_7+ RESIDUE (15/15° C)

806.7 kg/m³	0.8074	43.6
DENSITY	RELATIVE DENSITY	API @ 15.5° C

148.4

RELATIVE MOLECULAR MASS

CALCULATED PROPERTIES OF TOTAL SAMPLE (15/15° C)

755.8 kg/m³	0.7565	55.4
DENSITY	RELATIVE DENSITY	API @ 15.5° C

113.2

RELATIVE MOLECULAR MASS

REMARKS:

Calculations for C6 and C7 are based on Boiling Point Grouping. If Carbon Number Grouping had been done, the mole fractions would be C_6 0.0781 C_{7+} 0.6503

File No. : CF42027A
Company : PARAMOUNT RESOURCES LTD.
Well No. :

PROPERTIES OF C6+ FRACTION

BOILING POINT RANGE (C)	COMPONENT	MOLE FRACTION	MASS FRACTION	VOLUME FRACTION
36.1- 68.9	HEXANES----------C6	0.0292	0.0222	0.0253
68.9- 98.3	HEPTANES----------C7	0.0352	0.0340	0.0349
98.3-125.6	OCTANES----------C8	0.0628	0.0691	0.0689
125.6-150.6	NONANES----------C9	0.0692	0.0855	0.0836
150.6-173.9	DECANES----------C10	0.1098	0.1501	0.1447
173.9-196.1	UNDECANES----------C11	0.0944	0.1420	0.1348
196.1-215.0	DODECANES----------C12	0.0590	0.0969	0.0910
215.0-235.0	TRIDECANES----------C13	0.0311	0.0554	0.0515
235.0-252.2	TETRADECANES----------C14	0.0177	0.0338	0.0312
252.2-270.6	PENTADECANES----------C15	0.0167	0.0342	0.0313
270.6-287.8	HEXADECANES----------C16	0.0084	0.0183	0.0166
287.8-302.8	HEPTADECANES----------C17	0.0055	0.0127	0.0116
302.8-317.2	OCTADECANES----------C18	0.0020	0.0050	0.0045
317.2-330.0	NONADECANES----------C19	0.0008	0.0021	0.0019
330.0-344.4	EICOSANES----------C20	0.0002	0.0007	0.0006
344.4-357.2	HENEICOSANES----------C21	0.0001	0.0003	0.0003
357.2-369.4	DOCOSANES----------C22	0.0000	0.0001	0.0001
369.4-380.0	TRICOSANES----------C23	0.0000	0.0000	0.0000
380.0-391.1	TETRACOSANES----------C24	0.0000	0.0000	0.0000
391.1-401.7	PENTACOSANES----------C25	0.0000	0.0000	0.0000
401.7-412.2	HEXACOSANES----------C26	0.0000	0.0000	0.0000
412.2-422.2	HEPTACOSANES----------C27	0.0000	0.0000	0.0000
422.2-431.7	OCTACOSANES----------C28	0.0000	0.0000	0.0000
431.7-441.1	NONACOSANES----------C29	0.0000	0.0000	0.0000
441.1 PLUS	TRIACONTANES PLUS-------C30+	0.0000	0.0000	0.0000
	AROMATICS			
80.0	BENZENES----------C6	0.0039	0.0030	0.0023
110.6	TOLUENE----------C7	0.0219	0.0194	0.0157
136.2	ETHYLBENZENE----------C8	0.0083	0.0086	0.0070
138.4-144.4	XYLENES----------C8	0.0470	0.0480	0.0391
168.9	1,2,4 TRIMETHYLBENZENE--C9	0.0174	0.0201	0.0161
	NAPHTHENES			
48.9	CYCLOPENTANE----------CC5	0.0017	0.0011	0.0011
72.2	METHYLCYCLOPENTANE------MCC5	0.0127	0.0102	0.0096
81.1	CYCLOHEXANE----------CC6	0.0306	0.0248	0.0223
101.1	METHYLCYCLOHEXANE-------MCC6	0.0445	0.0420	0.0383

The above hexanes plus values are based upon a measured mass fraction and a calculated mole fraction, and assume a total hydrocarbon recovery from the chromatographic system.

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Certificate of Analysis

CLIENT NAME: PARAMOUNT RESOURCES LTD.

AGAT WORK ORDER 99F42027

ATTENTION: Wayne Tomm

Trace Sulphur Analysis (GC/SCD) - Gas

SAMPLE TYPE: Gas
SAMPLE ID: BAG1A
SAMPLE DESCRIPTION: F-36 Paramount et al Liard F-36 TEST SEPARATOR

DATE SAMPLED: Aug 23, 1999
DATE RECEIVED: Aug 25, 1999
DATE REPORTED: Aug 26, 1999

PARAMETER	RESULTS	UNITS	M.D.L.	DATE ANALYZED	INITIALS	DATE PREPARED
Hydrogen Sulphide	1.6	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Carbonyl Sulphide	0.2	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Methyl Mercaptan	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Ethyl Mercaptan	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Methyl Sulphide	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Carbon Disulphide	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
2-Propyl Mercaptan	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
t-Butyl Mercaptan	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
1-Propyl Mercaptan	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Ethyl Methyl Sulphide	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
s-Butyl Mercaptan	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Thiophene	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
i-Butyl Mercaptan	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Ethyl Sulphide	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
n-Butyl Mercaptan	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
t-Butyl Methyl Sulphide	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Methyl Disulphide	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Ethyl Disulphide	<0.1	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999
Total Organic Sulphur	1.7	ppm (v/v)	0.1	Aug 25, 1999	RY	Aug 25, 1999

COMMENTS:

M.D.L. - Method Detection Limit
Identification based on retention time relative to standards.
All compounds quantified as ideal gases. Hydrogen sulphide quantified using it's standard response factor, all other compounds quantified using carbonyl sulphide's response factor.
Total organic sulphur includes compounds with chromatographic retention up to and including that of ethyl disulphide.

Certified By: G Wardop