

Pyrenees Exp Bld DST (BHP) '09 (18.7 API, 0.26 Sul WT %)

Crude Name:	Pyrenees Exp Bld DST (BHP) '09	API Gravity	API	18.70	Component	Wt %	Vol %
Crude ID:	PYRN187C	Density @15 deg C	KG/L	0.9415	C2 Minus	0	0
Country:	Australia	Sulfur	WT%	0.260	C3	0	0
Region:	Far East	Reid Vapor Pressure	kPa	2.76	IC4	0	0
State:	Western Australia	Nitrogen	ppm	1,099.0	NC4	0	0
Assay Year:	2009	Pour Point	deg C	-27	IC5	0	0
Assay Library:	652201	Acidity (TAN)	mgKOH/g	1.52	NC5	0	0
Assay Source:	CVX	Vanadium	ppm	0.20 C	CycP	0	0
Sulfur Type:	Low	Nickel	ppm	2.00	IC6	--	--
Crude Type:	Heavy	Viscosity @104 F (40 C)	cSt	64.8	NC6	--	--
Chemical Class:	Naphthenic	Viscosity @122 F (50 C)	cSt	39.2	Benzene	0	0

Property	Unit	WC	GAS	NAP1	NAP2	KERO	LDIST	HDIST	ARES
Initial Boiling Pt	deg C	--	IBP	15	85	175	250	300	360
End Boiling Pt	deg C	--	15	85	175	250	300	360	EBP
Cut Yield (Vol%)	LV%	100.00	0.00	0.02	1.27	5.27	14.03	18.67	60.73
Cut Yield (Wgt%)	WT%	100.00	0.00	0.01	1.12	4.92	13.39	18.27	62.28
API Gravity	API	18.70	--	61.00	39.93	29.73	26.23	22.37	15.28
Specific Gravity (@60F)	--	0.9421	--	0.7351	0.8254	0.8776	0.8971	0.9196	0.9640
Density @15 deg C	KG/L	0.9415	--	0.7349	0.8250	0.8771	0.8966	0.9191	0.9635
K-Factor	--	11.21 C	--	11.64	11.06	10.96	11.05	11.11	11.36
Molecular Weight	--	294	--	83	117	158	194	239	405
Hydrogen	WT%	12.2	--	15.0	14.0	13.3	12.8	12.6	11.8
Sulfur	WT%	0.260	--	0.001	0.002	0.012	0.041	0.087	0.391
Mercaptan Sulfur	ppm	105	--	6	13	23	36	26	3
Total H2S dissolved	--	--	--	--	--	--	--	--	--
Nitrogen	ppm	1,099.0	--	0.0	0.0	0.3	5.7	174.5	2,009.8
Basic Nitrogen	ppm	415.0	--	0.0	0.0	0.0	0.6	45.2	653.4
Research Octane clear	--	--	--	82.1	58.2	37.5	24.8	--	--
Motor Octane clear	--	--	--	79.4	54.9	34.3	21.9	--	--
Flash Point	deg C	75	--	-30	23	75	113	149	222
Reid Vapor Pressure	kPa	2.76	--	16.49	2.16	0.10	0.01	--	--
Paraffins (Total) Vol	LV%	--	--	45.8	19.1	14.5	12.5	10.8	6.1
iso-Paraffins Vol	LV%	--	--	45.77	--	--	--	--	--

Property	Unit	WC	GAS	NAP1	NAP2	KERO	LDIST	HDIST	ARES
n-Paraffins Vol	LV%	--	--	0.00	--	--	--	--	--
Naphthenes Vol	LV%	--	--	52.4	69.5	65.6	59.4	52.5	51.9
Aromatics Vol	LV%	--	--	1.8	11.4	19.7	27.3	34.9	40.2
N + 2A	LV%	--	--	56.07	92.34	105.07	113.99	122.36	132.33
Freeze Point	deg C	--	--	-101	-90	-70	-55	-41	18
Cloud Point	deg C	--	--	-105	-92	-74	-62	-46	14
Pour Point	deg C	-27	--	-107	-95	-76	-64	-50	1
Naphthalenes	WT%	--	--	0.0	0.0	1.3	6.9	--	--
Smoke Point (ASTM)	mm	--	--	30.24	17.40	13.22	11.87	10.77	--
Aniline Point	deg C	--	--	56	52	55	58	62	75
Acidity (TAN)	mgKOH/g	1.52	--	0.00	0.02	0.09	0.32	0.77	1.72
Cetane Index	--	--	--	0.0	7.1	25.5	34.3	36.4	18.2
Cetane Index (D4737)	--	--	--	15.1	15.6	24.2	31.7	37.4	--
Cetane Index (D4737-B)	--	--	--	37.6	23.5	23.8	30.0	36.2	--
Refractive Index @ 20deg C	--	--	--	1.41240	1.46386	1.49318	1.50377	1.51622	1.54039
Refractive Index @ 70deg C	--	--	--	1.38866	1.44112	1.47159	1.48308	1.49655	1.52109
Viscosity @ 68 F (20 C)	cSt	233.1 C	--	1.3	2.5	3.8	8.5	32.3	2,694.9
Viscosity @104 F (40 C)	cSt	64.8	--	1.0	1.7	2.4	4.7	13.8	501.1
Viscosity @122 F (50 C)	cSt	39.2	--	0.9	1.4	2.0	3.7	9.8	256.1
Viscosity @212 F (100 C)	cSt	7.1	--	0.5	0.8	1.0	1.6	3.0	26.2
Viscosity @275 F (135 C)	cSt	3.5 C	--	0.3	0.4	0.6	0.9	1.4	10.0
MCRT carbon number	WT%	1.60	--	0.00	0.00	0.00	0.00	0.00	2.70
Vanadium	ppm	0.20 C	--	0.00	0.00	0.00	0.00	0.00	0.32
Nickel	ppm	2.00	--	0.00	0.00	0.00	0.00	0.00	1.89
Vanadium + Nickel Total	ppm	1.37 C	--	0.00	0.00	0.00	0.00	0.00	2.20
Iron	ppm	6.00	--	0.00	0.00	0.00	0.00	0.00	9.61
Wax	WT%	1.60	--	0.00	0.00	0.00	0.00	1.14	2.23
Asphaltenes	WT%	0.20	--	0.00	0.00	0.00	0.00	0.00	0.36
Salt Content	--	--	--	--	--	--	--	--	--
Penetration	dmm	--	--	--	--	--	--	--	--
Mercury	ppb	1.0	--	--	--	--	--	--	--

Property	Unit	LVGO	HVGO	VRES
Initial Boiling Pt	deg C	360	450	565
End Boiling Pt	deg C	450	565	EBP
Cut Yield (Vol%)	LV%	27.12	21.39	12.21

Property	Unit	LVGO	HVGO	VRES
Cut Yield (Wgt%)	WT%	27.23	22.06	12.99
API Gravity	API	18.44	14.50	9.97
Specific Gravity (@60F)	--	0.9437	0.9692	1.0002
Density @15 deg C	KG/L	0.9432	0.9686	0.9996
K-Factor	--	11.23	11.42	11.68
Molecular Weight	--	313	447	741
Hydrogen	WT%	12.2	11.7	10.8
Sulfur	WT%	0.169	0.286	1.033
Mercaptan Sulfur	ppm	7	1	0
Total H2S dissolved	--	--	--	--
Nitrogen	ppm	880.8	1,848.4	4,650.9
Basic Nitrogen	ppm	351.1	715.2	1,182.3
Research Octane clear	--	--	--	--
Motor Octane clear	--	--	--	--
Flash Point	deg C	195	256	271
Reid Vapor Pressure	kPa	--	--	--
Paraffins (Total) Vol	LV%	7.8	4.8	4.5
iso-Paraffins Vol	LV%	--	--	--
n-Paraffins Vol	LV%	--	--	--
Naphthenes Vol	LV%	50.1	54.0	52.4
Aromatics Vol	LV%	39.5	39.6	42.9
N + 2A	LV%	129.01	133.16	138.19
Freeze Point	deg C	-21	4	40
Cloud Point	deg C	-25	0	36
Pour Point	deg C	-26	-2	35
Naphthalenes	WT%	--	--	--
Smoke Point (ASTM)	mm	8.94	7.42	--
Aniline Point	deg C	68	77	87
Acidity (TAN)	mgKOH/g	1.37	2.02	1.94
Cetane Index	--	31.1	12.1	--
Cetane Index (D4737)	--	43.0	--	--
Cetane Index (D4737-B)	--	46.6	--	--
Refractive Index @ 20deg C	--	1.52943	1.54318	1.55986
Refractive Index @ 70deg C	--	1.51105	1.52554	1.53562
Viscosity @ 68 F (20 C)	cSt	287.9	5,259.9	2,974,962.0
Viscosity @104 F (40 C)	cSt	77.8	828.2	142,101.0

Property	Unit	LVGO	HVGO	VRES
Viscosity @122 F (50 C)	cSt	46.4	397.0	41,868.7
Viscosity @212 F (100 C)	cSt	8.2	33.2	645.6
Viscosity @275 F (135 C)	cSt	4.0	12.1	114.4
MCRT carbon number	WT%	0.00	1.15	11.02
Vanadium	ppm	0.00	0.02	1.47
Nickel	ppm	0.00	0.59	8.06
Vanadium + Nickel Total	ppm	0.00	0.61	9.53
Iron	ppm	0.00	0.67	44.94
Wax	WT%	1.98	2.20	2.83
Asphaltenes	WT%	0.00	0.03	1.65
Salt Content	--	--	--	--
Penetration	dmm	--	--	337.4
Mercury	ppb	--	--	--

C-Calculated Value

Comments:

This is a paper blend prepared by ITS for BHP using data on preproduction samples of the actual field(s)-- composition and components unknown to reader. So this is a calculated printout based on DST samples not a lab assay! Pyrenees oil field is in license block WA-12-R in the South Carnarvon basin, Exmouth Sub-basin, approximately 20 kilometers offshore from North West Cape, Western Australia and produce to a FSPO able to process approximately 96,000 barrels of oil a day.. The Pyrenees fields of Crosby, Ravensworth and Stickle were discovered in WA-12-R in July 2003 and have estimated recoverable oil reserves of between 80-120 million barrels of oil and all of these will be included in the export blend as they are brought onstream. Ravensworth also lies in WA-155 and that portion is also shared by Inpex together with BHP and Apache. First production is expected during the first half of the 2010 calendar year. The estimated economic field life is 25 years. There is not field called 'Pyrenees'. This is the name of the project/development of WA-12R and the name of the FSPO. The subject sample is a DST sample. The actual

field of the sample is not identified although appraisal wells were drilled on each of the fields. BHP is operator with 71.4% equity.

reported 105 ppm rsh is probably drilling fluids that seem to create a positive response to the rsh test if not washed-- chemicals in crude are reactive to this test. not likely to be sour.

WAX CVX <2.0 wt%

VANADIUM below detection limit

COPPER below detection limit

Haverly Systems, Inc. (www.haverly.com)

Crude Assay Data from H/COMET Database 7/18/2023 5:39:26 PM

