

	Data	Notes	Reference ID
<b>Origin:</b> Iran			
<b>Synonyms:</b> Ardeshir			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
<b>API Gravity</b>	26.9		OGJ 99
<b>Sulphur (weight %)</b>	2.48		OGJ 99
<b>Reid Vapour Pressure (kPa)</b>	38		OGJ 99
<b>Hydrogen Sulphide (weight %)</b>	0		OGJ 99
<b>Pour Point (°C)</b>	-34		OGJ 99
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>			
<u>Temperature (°C)</u>			
20	37		OGJ 99
50	13		OGJ 99
<b>Yield on Crude (volume %)</b>			
<u>Boiling Range (°C)</u>			
Light hydrocarbons	4		OGJ 99
Naphtha (C5-93)	6		OGJ 99
Naphtha (93-160)	8		OGJ 99
Naphtha (160-182)	4		OGJ 99
Kerosene (182-271)	14		OGJ 99
Gas oil (271-343)	13		OGJ 99
Residue (>343)	54		OGJ 99
<b>Metals (ppm)</b>			
Nickel	21		OGJ 99
Vanadium	71		OGJ 99

**Abu Al Bu Khoosh**

	<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> United Arab Emirates			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
<b>API Gravity</b>	31.6		OGJ 99
<b>Sulphur (weight %)</b>	2.00		OGJ 99
<b>Reid Vapour Pressure (kPa)</b>	24		OGJ 99
<b>Pour Point (°C)</b>	-12		OGJ 99
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>			
	<u>Temperature (°C)</u>		
	38	7	OGJ 99
<b>Yield on Crude (volume %)</b>			
	<u>Boiling Range (°C)</u>		
	Low boiling products (<15)	1	OGJ 99
	Light naphtha (15-65)	4	OGJ 99
	Heavy naphtha (65-165)	17	OGJ 99
	Kerosene (165-230)	13	OGJ 99
	Light gas oil (230-300)	13	OGJ 99
	Heavy gas oil (300-375)	13	OGJ 99
	Distillate (375-550)	25	OGJ 99
	Residue (>550)	16	OGJ 99
<b>Metals (ppm)</b>			
	Nickel	7	OGJ 99
	Vanadium	12	OGJ 99

		Data	Notes	Reference ID
<b>Origin:</b> Beaufort Sea, Canada				
<b>API Gravity</b>		16.8		EETD 84
<b>Equation(s) for Predicting Evaporation</b>				
Short term (<5 days): %Ev = (0.11 + 0.013T)sqrt(t) Long term: %Ev = (0.68 + 0.045T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				ESD 96
<b>Sulphur (weight %)</b>				
<u>Evaporation (volume %)</u>				
0		0.19		EETD 86
5		0.21		EETD 86
<b>Density (g/mL)</b>				
<u>Evaporation (volume %)</u>		<u>Temperature (°C)</u>		
0		0	0.9590	EETD 84
		15	0.9530	EETD 84
3		0	0.9620	EETD 84
		15	0.9600	EETD 84
5		0	0.9672	EETD 85
<b>Dynamic Viscosity (mPa·s or cP)</b>				
<u>Evaporation (volume %)</u>		<u>Temperature (°C)</u>		
0		0	165	EETD 84
		15	62	EETD 84
3		0	220	EETD 85
		15	73	EETD 85
<b>Chemical Dispersibility (volume %)</b>				
		Corexit 9500	29	ESD 95
		Dasic LTS	10	EETD 89
<b>Hydrocarbon Groups (weight %)</b>				
<u>Evaporation (volume %)</u>				
0		Saturates	80	EETD 85
		Aromatics	19	EETD 85
		Resins	1	EETD 85
		Asphaltenes	0	ESD 91
		Waxes	0	ESD 91
3		Asphaltenes	1	EETD 89

**Adgo**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Volatile Organic Compounds (ppm)</b>				
	Benzene	50		ESD 94
	Toluene	50		ESD 94
	Ethylbenzene	50		ESD 94
	Xylenes	280		ESD 94
	C3-benzenes	510		ESD 94
	Total BTEX	420		ESD 94
	Total VOCs	930		ESD 94
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	33.3		EETD 84
	15	32.0		EETD 84
3	0	31.5		EETD 84
	15	30.6		EETD 84
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	16.8		EETD 85
	15	6.9		EETD 84
3	0	16.8		EETD 85
	15	21.5		EETD 85
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	25.9		EETD 85
	15	24.9		EETD 84
3	0	22.6		EETD 85
	15	22.2		EETD 85
<b>Boiling Point Distribution (weight %)</b>				
	<u>Boiling Point (°C)</u>			
	160	1		ESD 94
	180	2		ESD 94
	200	5		ESD 94
	250	20		ESD 94
	300	43		ESD 94
	350	65		ESD 94
	400	79		ESD 94
	450	91		ESD 94
	500	95		ESD 94
	550	98		ESD 94
	600	99		ESD 94

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Metals (ppm)</b>				
<u>Evaporation (volume %)</u>				
0	Barium	19		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	47		Cao 92
	Lead	< 3		Cao 92
	Magnesium	17		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	< 1		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	1		Cao 92
34	Barium	3		Cao 92
	Chromium	3		Cao 92
	Copper	1		Cao 92
	Iron	51		Cao 92
	Lead	< 3		Cao 92
	Magnesium	42		Cao 92
	Molybdenum	1		Cao 92
	Nickel	2		Cao 92
	Titanium	2		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	1		Cao 92

**Alaska North Slope (1989)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Alaska, USA				
<b>Synonyms:</b> ANS				
North Slope				
<b>API Gravity</b>		26.8		EETD 89
<b>Sulphur (weight %)</b>				
<u>Evaporation (volume %)</u>				
0		1.04		API 81
		1.15		EETD 89
9		1.19		EETD 89
16		1.30		EETD 89
<b>Reid Vapour Pressure (kPa)</b>		19		ESD 91
<b>Density (g/mL)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.9037		EETD 89
	15	0.8936		EETD 89
	16	0.8930		API 81
9	0	0.9203		EETD 89
	15	0.9086		EETD 89
16	0	0.9342		EETD 89
	15	0.9225		EETD 89
<b>Pour Point (°C)</b>		-8		EETD 89
<b>Dynamic Viscosity (mPa·s or cP)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	15	23		EETD 89
9		66		EETD 89
16		184		EETD 89
<b>Chemical Dispersibility (volume %)</b>				
<u>Evaporation (volume %)</u>				
0	Corexit 9500	10		ESD 94
	Dasic LTS	15		EETD 89
9	Corexit 9527	10		EETD 89
	Dasic LTS	10		EETD 89
	Enersperse 700	10		EETD 89
16	Corexit 9527	5		EETD 89
	Dasic LTS	0		EETD 89
	Enersperse 700	5		EETD 89

**Alaska North Slope (1989)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Hydrocarbon Groups (weight %)</b>				
<u>Evaporation (volume %)</u>				
0	Asphaltenes	2		ESD 91
	Waxes	7		ESD 91
9	Asphaltenes	3		EETD 89
16		5		EETD 89
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	15	28.1		EETD 89
9	0	29.6		EETD 89
	15	29.1		EETD 89
16	0	31.1		EETD 89
	15	29.7		EETD 89
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	23.8		EETD 89
	15	27.4		EETD 89
9	0	27.6		EETD 89
	15	26.6		EETD 89
16	0	24.2		EETD 89
	15	24.9		EETD 89
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	26.1		EETD 89
	15	29.4		EETD 89
9	0	28.7		EETD 89
	15	27.7		EETD 89
16	0	25.7		EETD 89
	15	25.1		EETD 89

**Alaska North Slope (1989)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Distillation (°C)</b>				
	<u>Total Distillate (volume %)</u>			
	IBP	42		EETD 89
	5	98		EETD 89
	10	127		EETD 89
	15	147		EETD 89
	20	172		EETD 89
	30	216		EETD 89
	40	238		EETD 89
	45	247		EETD 89
	50	258		EETD 89
	55	265		EETD 89
	60	272		EETD 89
	70	282		EETD 89



**Alaska North Slope (1989)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Metals (ppm)</b>				
<u>Evaporation (volume %)</u>				
0	Aluminum	< 5		Cao 92
	Barium	< 0.3		Cao 92
	Cadmium	< 0.5		Cao 92
	Calcium	111		Cao 92
	Chromium	< 2		Cao 92
	Cobalt	< 1		Cao 92
	Copper	< 0.6		Cao 92
	Iron	8		Cao 92
	Lead	< 3		Cao 92
	Magnesium	11		Cao 92
	Manganese	< 0.3		Cao 92
	Mercury	< 15		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	7		Cao 92
		21		API 81
	Selenium	28		Cao 92
	Strontium	< 0.2		Cao 92
	Tin	< 15		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	21		Cao 92
		9.4 to 9.7		API 81
	Zinc	< 0.6		Cao 92
20	Barium	< 0.3		Cao 92
	Chromium	2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	14		Cao 92
	Lead	< 3		Cao 92
	Magnesium	2		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	15		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	34		Cao 92
	Zinc	< 0.6		Cao 92
<b>Other Elements (weight %)</b>				
<u>Evaporation (volume %)</u>				
0	Nitrogen	0.20		API 81
<b>Aqueous Solubility (mg/L)</b>				
	Room temperature	28	(a)	ESD 91
(a) fresh water				

## Alaska North Slope (Middle Pipeline)

	Data	Notes	Reference ID
<b>Origin:</b> Alaska, USA			
<b>Synonyms:</b> ANS North Slope			
This oil was analyzed as part of a project entitled "Assessment of the Freshwater Biodegradation Potential of Oils Commonly Transported in Alaska". The sample was collected from a crude supply line at MAPCO Alaska Petroleum Inc.'s refinery in North Pole, Alaska.			Blenkinsopp 97
<b>API Gravity</b>	29.9		ESD 96
<b>Equation(s) for Predicting Evaporation</b>			
%Ev = (2.64 + 0.045T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 96
<b>Sulphur (weight %)</b>			
Evaporation (weight %)			
0	1.16		ESD 97
31	1.43		ESD 97
<b>Water Content (weight %)</b>			
Evaporation (weight %)			
0	0.2		ESD 98
31	< 0.1		ESD 98
<b>Flash Point (°C)</b>			
Evaporation (weight %)			
0	-23		ESD 96
31	> 95		ESD 96
<b>Density (g/mL)</b>			
Evaporation (weight %)	Temperature (°C)		
0	0	0.8869	ESD 96
	15	0.8761	ESD 96
31	0	0.9538	ESD 96
	15	0.9418	ESD 96
<b>Pour Point (°C)</b>			
Evaporation (weight %)			
0	-54		ESD 96
31	14		ESD 96
<b>Dynamic Viscosity (mPa·s or cP)</b>			
Evaporation (weight %)	Temperature (°C)		
0	0	34	ESD 96
	15	16	ESD 96
31	0	5,655	(a) ESD 96
	15	900	ESD 96
(a) slightly non-newtonian			

# Alaska North Slope (Middle Pipeline)

		Data	Notes	Reference ID
<b>Emulsion Formation</b>				
<u>Evaporation (weight%)</u>				
0	Visual stability	none		ESD 98
31		meso		ESD 98
	Viscosity (mPa·s)	2,600		ESD 98
	Complex modulus (mPa)	120,000		ESD 98
	Water content (wt %)	62		ESD 98
<b>Chemical Dispersibility (volume %)</b>				
<u>Evaporation (weight %)</u>				
0	Corexit 9500	46		ESD 98
31		5		ESD 98
<b>Hydrocarbon Groups (weight %)</b>				
<u>Evaporation (weight %)</u>				
0	Saturates	52		ESD 98
	Aromatics	35		ESD 98
	Resins	9		ESD 98
	Asphaltenes	5		ESD 98
31	Saturates	42		ESD 98
	Aromatics	38		ESD 98
	Resins	12		ESD 98
	Asphaltenes	7		ESD 98
<b>Adhesion (g/m<sup>2</sup>)</b>				
<u>Evaporation (weight %)</u>				
0		28	<i>SD = 2</i>	ESD 96
31		33	<i>SD = 5</i>	ESD 96
<b>Volatile Organic Compounds (ppm)</b>				
<u>Evaporation (weight %)</u>				
0	Benzene	3,698		ESD 97
	Toluene	9,040		ESD 97
	Ethylbenzene	1,689		ESD 97
	Xylenes	8,197		ESD 97
	C3-benzenes	8,038		ESD 97
	Total BTEX	22,624		ESD 97
	Total VOCs	30,662		ESD 97
31	Benzene	38		ESD 97
	Toluene	9		ESD 97
	Ethylbenzene	1		ESD 97
	Xylenes	3		ESD 97
	C3-benzenes	4		ESD 97
	Total BTEX	52		ESD 97
	Total VOCs	56		ESD 97

**Alaska North Slope (Middle Pipeline)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	27.6		ESD 96
	15	27.0		ESD 96
31	0	DNF		ESD 96
	15	31.5		ESD 96
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	19.8		ESD 96
	15	19.9		ESD 96
31	0	DNF		ESD 96
	15	14.7		ESD 96
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	23.8		ESD 96
	15	21.9		ESD 96
31	0	DNF		ESD 96
	15	19.3		ESD 96

**Alaska North Slope (Middle Pipeline)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	40	3		ESD 96
	60	4		ESD 96
	80	7		ESD 96
	100	10		ESD 96
	120	13		ESD 96
	140	16		ESD 96
	160	19		ESD 96
	180	22		ESD 96
	200	25		ESD 96
	250	33		ESD 96
	300	42		ESD 96
	350	51		ESD 96
	400	60		ESD 96
	450	69		ESD 96
	500	76		ESD 96
	550	82		ESD 96
	600	88		ESD 96
	650	92		ESD 96
	700	95		ESD 96
31	250	5		ESD 96
	300	16		ESD 96
	350	30		ESD 96
	400	43		ESD 96
	450	55		ESD 96
	500	65		ESD 96
	550	74		ESD 96
	600	81		ESD 96
	650	87		ESD 96
	700	92		ESD 96

## Alaska North Slope (Northern Pipeline)

	Data	Notes	Reference ID
<b>Origin:</b> Alaska, USA			
<b>Synonyms:</b> ANS			
North Slope			
This oil was analyzed as part of a project entitled "Assessment of the Freshwater Biodegradation Potential of Oils Commonly Transported in Alaska". The sample was collected as comingled North Slope oil field production streams, at Pump Station 1 of the Trans Alaska Pipeline system.			Blenkinsopp 97
<b>API Gravity</b>			
	30.6		ESD 96
<b>Equation(s) for Predicting Evaporation</b>			
%Ev = (2.64 + 0.045T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 96
<b>Sulphur (weight %)</b>			
<u>Evaporation (weight %)</u>			
0	1.14		ESD 97
31	1.39		ESD 97
<b>Water Content (weight %)</b>			
<u>Evaporation (weight %)</u>			
0	0.1		ESD 98
31	< 0.1		ESD 98
<b>Flash Point (°C)</b>			
<u>Evaporation (weight %)</u>			
0	-19		ESD 96
31	> 90		ESD 96
<b>Density (g/mL)</b>			
<u>Evaporation (weight %)</u>		<u>Temperature (°C)</u>	
0	0	0.8828	ESD 96
	15	0.8719	ESD 96
31	0	0.9516	ESD 96
	15	0.9402	ESD 96
<b>Pour Point (°C)</b>			
<u>Evaporation (weight %)</u>			
0	-55		ESD 96
31	8		ESD 96
<b>Dynamic Viscosity (mPa·s or cP)</b>			
<u>Evaporation (weight %)</u>		<u>Temperature (°C)</u>	
0	0	29	ESD 96
	15	14	ESD 96
31	0	4,406	(a) ESD 96
	15	748	ESD 96

(a) slightly non-newtonian

**Alaska North Slope (Northern Pipeline)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Emulsion Formation</b>				
	<u>Evaporation (weight%)</u>			
	0	Visual stability	none	ESD 98
	31		meso	ESD 98
		Viscosity (mPa·s)	1,400	ESD 98
		Complex modulus (mPa)	110,000	ESD 98
		Water content (wt %)	70	ESD 98
<b>Chemical Dispersibility (volume %)</b>				
	<u>Evaporation (weight %)</u>			
	0	Corexit 9500	33	ESD 98
	31		6	ESD 98
<b>Hydrocarbon Groups (weight %)</b>				
	<u>Evaporation (weight %)</u>			
	0	Saturates	51	ESD 98
		Aromatics	34	ESD 98
		Resins	9	ESD 98
		Asphaltenes	5	ESD 98
	31	Saturates	44	ESD 98
		Aromatics	37	ESD 98
		Resins	12	ESD 98
		Asphaltenes	7	ESD 98
<b>Adhesion (g/m<sup>2</sup>)</b>				
	<u>Evaporation (weight %)</u>			
	0		26	<i>SD = 3</i> ESD 96
	31		23	<i>SD = 2</i> ESD 96
<b>Volatile Organic Compounds (ppm)</b>				
	<u>Evaporation (weight %)</u>			
	0	Benzene	2,140	ESD 97
		Toluene	6,197	ESD 97
		Ethylbenzene	1,363	ESD 97
		Xylenes	6,544	ESD 97
		C3-benzenes	7,074	ESD 97
		Total BTEX	16,243	ESD 97
		Total VOCs	23,318	ESD 97
	31	Benzene	38	ESD 97
		Toluene	8	ESD 97
		Ethylbenzene	2	ESD 97
		Xylenes	4	ESD 97
		C3-benzenes	7	ESD 97
		Total BTEX	52	ESD 97
		Total VOCs	59	ESD 97

**Alaska North Slope (Northern Pipeline)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	27.6		ESD 96
	15	26.8		ESD 96
31	0	DNF		ESD 96
	15	31.4		ESD 96
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	22.3		ESD 96
	15	20.6		ESD 96
31	0	DNF		ESD 96
	15	21.5		ESD 96
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	23.7		ESD 96
	15	22.5		ESD 96
31	0	DNF		ESD 96
	15	22.4		ESD 96



**Alaska North Slope (Northern Pipeline)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	40	4		ESD 96
	60	5		ESD 96
	80	8		ESD 96
	100	11		ESD 96
	120	14		ESD 96
	140	17		ESD 96
	160	20		ESD 96
	180	23		ESD 96
	200	26		ESD 96
	250	34		ESD 96
	300	43		ESD 96
	350	53		ESD 96
	400	62		ESD 96
	450	70		ESD 96
	500	77		ESD 96
	550	83		ESD 96
	600	88		ESD 96
	650	92		ESD 96
	700	96		ESD 96
31	250	6		ESD 96
	300	17		ESD 96
	350	31		ESD 96
	400	43		ESD 96
	450	55		ESD 96
	500	66		ESD 96
	550	74		ESD 96
	600	81		ESD 96
	650	87		ESD 96
	700	92		ESD 96

**Alaska North Slope (SOCSEX)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b>	Alaska, USA			
<b>Synonyms:</b>	ANS North Slope			
The oil analyzed by ESD was used in the 1994/95 Subsurface Oil in Coarse Sediments Experiment (SOCSEX). The evaporated oils were produced by Coastal and Ocean Resources, using air stripping.				Harper 95
Data from OGJ 99 were originally published in 1992.				
<b>API Gravity</b>				
		27.5		OGJ 99
		25.0		ESD 96
<b>Sulphur (weight %)</b>				
		1.11		OGJ 99
<b>Density (g/mL)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.8922		ESD 95
	15	0.8814		ESD 95
		0.8899		OGJ 99
15	0	0.9087		ESD 95
	15	0.8976		ESD 95
<b>Pour Point (°C)</b>				
		-18		OGJ 99
<b>Dynamic Viscosity (mPa·s or cP)</b>				
	<u>Temperature (°C)</u>			
	0	42		ESD 95
	5	32		ESD 95
	10	25		ESD 95
	15	21		ESD 95
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>				
	<u>Temperature (°C)</u>			
	16	32		OGJ 99

**Alaska North Slope (SOCSEX)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Hydrocarbon Groups (weight %)</b>				
<u>Evaporation (volume %)</u>				
0	Saturates	53		ESD 95
	Aromatics	37		ESD 95
	Resins	6		ESD 95
	Asphaltenes	4		ESD 95
15	Saturates	52		ESD 95
	Aromatics	38		ESD 95
	Resins	7		ESD 95
	Asphaltenes	3		ESD 95
22	Saturates	47		ESD 95
	Aromatics	40		ESD 95
	Resins	9		ESD 95
	Asphaltenes	5		ESD 95
<b>Adhesion (g/m<sup>2</sup>)</b>				
<u>Evaporation (volume %)</u>				
0		22	<i>SD = 5</i>	ESD 95
15		19	<i>SD = 3</i>	ESD 95
22		32	<i>SD = 9</i>	ESD 95
<b>Volatile Organic Compounds (ppm)</b>				
<u>Evaporation (volume %)</u>				
0	Benzene	2,080		ESD 95
	Toluene	4,670		ESD 95
	Ethylbenzene	1,620		ESD 95
	Xylenes	7,060		ESD 95
	C3-benzenes	6,650		ESD 95
	Total BTEX	15,430		ESD 95
	Total VOCs	22,080		ESD 95
15	Benzene	320		ESD 95
	Toluene	2,670		ESD 95
	Ethylbenzene	1,490		ESD 95
	Xylenes	7,060		ESD 95
	C3-benzenes	8,780		ESD 95
	Total BTEX	11,540		ESD 95
	Total VOCs	20,320		ESD 95
22	Benzene	130		ESD 95
	Toluene	90		ESD 95
	Ethylbenzene	520		ESD 95
	Xylenes	2,910		ESD 95
	C3-benzenes	5,860		ESD 95
	Total BTEX	3,650		ESD 95
	Total VOCs	9,510		ESD 95

## Alaska North Slope (SOCSEX)

		Data	Notes	Reference ID
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
0	40	2		ESD 95
	60	2		ESD 95
	80	5		ESD 95
	100	8		ESD 95
	120	10		ESD 95
	140	13		ESD 95
	160	15		ESD 95
	180	18		ESD 95
	200	21		ESD 95
	250	28		ESD 95
	300	37		ESD 95
	350	46		ESD 95
	400	55		ESD 95
	450	64		ESD 95
	500	71		ESD 95
	550	78		ESD 95
	600	83		ESD 95
	650	87		ESD 95
	700	91		ESD 95
15	100	1		ESD 95
	120	3		ESD 95
	140	6		ESD 95
	160	9		ESD 95
	180	13		ESD 95
	200	16		ESD 95
	250	25		ESD 95
	300	35		ESD 95
	350	46		ESD 95
	400	56		ESD 95
	450	66		ESD 95
	500	74		ESD 95
	550	80		ESD 95
	600	86		ESD 95
	650	90		ESD 95
22	700	94		ESD 95
	140	1		ESD 95
	160	3		ESD 95
	180	5		ESD 95
	200	8		ESD 95
	250	17		ESD 95
	300	27		ESD 95

**Alaska North Slope (SOCSEX)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
22	350	38		ESD 95
	400	49		ESD 95
	450	59		ESD 95
	500	68		ESD 95
	550	76		ESD 95
	600	82		ESD 95
	650	88		ESD 95
	700	92		ESD 95
<b>Yield on Crude</b>				
	<u>Boiling Range (°C)</u>			
Weight %	C1-C5	2		OGJ 99
Volume %	20-175	17		OGJ 99
	175-295	20		OGJ 99
	295-343	10		OGJ 99
	343-565	30		OGJ 99
<b>Other Elements (weight %)</b>				
	Nitrogen	0.22		OGJ 99

## Alaska North Slope (Southern Pipeline)

	Data	Notes	Reference ID
<b>Origin:</b> Alaska, USA			
<b>Synonyms:</b> ANS North Slope			
This oil was analyzed as part of a project entitled "Assessment of the Freshwater Biodegradation Potential of Oils Commonly Transported in Alaska". The sample was collected at Valdez Marine Terminal.			Blenkinsopp 97
<b>API Gravity</b>	29.8		ESD 96
<b>Equation(s) for Predicting Evaporation</b>			
%Ev = (2.47 + 0.045T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 96
<b>Sulphur (weight %)</b>			
Evaporation (weight %)			
0	1.13		ESD 97
30	1.46		ESD 97
<b>Water Content (weight %)</b>			
Evaporation (weight %)			
0	0.2		ESD 98
30	< 0.1		ESD 98
<b>Flash Point (°C)</b>			
Evaporation (weight %)			
0	-21		ESD 96
30	> 95		ESD 96
<b>Density (g/mL)</b>			
Evaporation (weight %)	Temperature (°C)		
0	0	0.8875	ESD 96
	15	0.8766	ESD 96
40	0	0.9547	ESD 96
	15	0.9431	ESD 96
<b>Pour Point (°C)</b>			
Evaporation (weight %)			
0	-30		ESD 96
30	14		ESD 96
<b>Dynamic Viscosity (mPa·s or cP)</b>			
Evaporation (weight %)	Temperature (°C)		
0	0	36	ESD 96
	15	18	ESD 96
30	0	6,406	(a) ESD 96
	15	961	ESD 96
(a) slightly non-newtonian			

**Alaska North Slope (Southern Pipeline)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Emulsion Formation</b>				
	<u>Evaporation (weight%)</u>			
	0	Visual stability	none	ESD 98
	30		meso	ESD 98
		Viscosity (mPa·s)	1,900	ESD 98
		Complex modulus (mPa)	190,000	ESD 98
		Water content (wt %)	53	ESD 98
<b>Chemical Dispersibility (volume %)</b>				
	<u>Evaporation (weight %)</u>			
	0	Corexit 9500	45	ESD 98
	30		6	ESD 98
<b>Hydrocarbon Groups (weight %)</b>				
	<u>Evaporation (weight %)</u>			
	0	Saturates	54	ESD 98
		Aromatics	32	ESD 98
		Resins	8	ESD 98
		Asphaltenes	6	ESD 98
	30	Saturates	42	ESD 98
		Aromatics	39	ESD 98
		Resins	13	ESD 98
		Asphaltenes	7	ESD 98
<b>Adhesion (g/m<sup>2</sup>)</b>				
	<u>Evaporation (weight %)</u>			
	0		28	<i>SD = 4</i> ESD 96
	30		30	<i>SD = 2</i> ESD 96
<b>Volatile Organic Compounds (ppm)</b>				
	<u>Evaporation (weight %)</u>			
	0	Benzene	3,524	ESD 97
		Toluene	8,666	ESD 97
		Ethylbenzene	1,566	ESD 97
		Xylenes	8,700	ESD 97
		C3-benzenes	7,315	ESD 97
		Total BTEX	22,455	ESD 97
		Total VOCs	29,770	ESD 97
	30	Benzene	37	ESD 97
		Toluene	7	ESD 97
		Ethylbenzene	1	ESD 97
		Xylenes	4	ESD 97
		C3-benzenes	3	ESD 97
		Total BTEX	50	ESD 97
		Total VOCs	53	ESD 97

## Alaska North Slope (Southern Pipeline)

		Data	Notes	Reference ID
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	27.7		ESD 96
	15	27.0		ESD 96
30	0	DNF		ESD 96
	15	31.4		ESD 96
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	24.4		ESD 96
	15	21.7		ESD 96
30	0	DNF		ESD 96
	15	17.7		ESD 96
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	24.6		ESD 96
	15	23.4		ESD 96
30	0	DNF		ESD 96
	15	20.2		ESD 96



**Alaska North Slope (Southern Pipeline)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	40	3		ESD 96
	60	4		ESD 96
	80	7		ESD 96
	100	9		ESD 96
	120	12		ESD 96
	140	15		ESD 96
	160	18		ESD 96
	180	20		ESD 96
	200	23		ESD 96
	250	31		ESD 96
	300	39		ESD 96
	350	49		ESD 96
	400	58		ESD 96
	450	67		ESD 96
	500	75		ESD 96
	550	81		ESD 96
	600	86		ESD 96
	650	90		ESD 96
	700	94		ESD 96
30	250	5		ESD 96
	300	16		ESD 96
	350	30		ESD 96
	400	43		ESD 96
	450	56		ESD 96
	500	67		ESD 96
	550	76		ESD 96
	600	83		ESD 96
	650	90		ESD 96
	700	95		ESD 96

**Alba**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> North Sea, UK				
<b>API Gravity</b>		20.0		OGJ 91a
<b>Sulphur (weight %)</b>		1.33		OGJ 91a
<b>Water Content (weight %)</b>		0.9		OGJ 91a
<b>Reid Vapour Pressure (kPa)</b>		< 1		OGJ 91a
<b>Density (g/mL)</b>				
	<u>Temperature (°C)</u>			
	15	0.9335		OGJ 91a
<b>Pour Point (°C)</b>		-30		OGJ 91a
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>				
	<u>Temperature (°C)</u>			
	25	259		OGJ 91a
	50	62		OGJ 91a
<b>Distillation (°C)</b>				
	<u>Total Distillate (volume %)</u>			
	0	20		OGJ 91a
	1	149		OGJ 91a
	4	204		OGJ 91a
	6	228		OGJ 91a
	9	249		OGJ 91a
	11	260		OGJ 91a
	14	277		OGJ 91a
	17	290		OGJ 91a
	19	303		OGJ 91a
	21	311		OGJ 91a
	23	322		OGJ 91a
	26	333		OGJ 91a
	28	343		OGJ 91a
	36	385		OGJ 91a
	50	454		OGJ 91a
	55	485		OGJ 91a
	63	534		OGJ 91a
	67	560		OGJ 91a

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Yield on Crude (volume %)</b>				
<u>Boiling Range (°C)</u>				
	<149	1		OGJ 91a
	149-204	3		OGJ 91a
	204-260	7		OGJ 91a
	260-343	17		OGJ 91a
	343-454	22		OGJ 91a
	454-560	17		OGJ 91a
	>560	34		OGJ 91a

**Alberta**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Alberta, Canada				
<b>API Gravity</b>		36.8		Mackay 82a
<b>Density (g/mL)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.8500		Mackay 82a
	5	0.8460		Mackay 82a
	10	0.8430		Mackay 82a
	15	0.8400		Mackay 82a
	20	0.8350		Mackay 82a
	25	0.8320		Mackay 82a
		0.8300		Mackay 82a
10	20	0.8550		Mackay 82a
20		0.8660		Mackay 82a
<b>Pour Point (°C)</b>				
<u>Evaporation (volume %)</u>				
0		-24		Mackay 82a
10		12		Mackay 82a
20		15		Mackay 82a
<b>Dynamic Viscosity (mPa·s or cP)</b>				
	<u>Temperature (°C)</u>			
	0	18		Mackay 82a
	5	12		Mackay 82a
	10	9		Mackay 82a
	15	6		Mackay 82a
	20	5		Mackay 82a
	25	4		Mackay 82a

		Data	Notes	Reference ID
<b>Hydrocarbon Groups (weight %)</b>				
<u>Evaporation (volume %)</u>				
0	Saturates	78		Mackay 82a
	Aromatics	18		Mackay 82a
	Resins	3		Mackay 82a
	Asphaltenes	1		Mackay 82a
	Waxes	7		Mackay 82a
10	Saturates	80		Mackay 82a
	Aromatics	13		Mackay 82a
	Resins	3		Mackay 82a
	Asphaltenes	4		Mackay 82a
	Waxes	7		Mackay 82a
20	Saturates	77		Mackay 82a
	Aromatics	15		Mackay 82a
	Resins	4		Mackay 82a
	Asphaltenes	4		Mackay 82a
	Waxes	11		Mackay 82a
<b>Distillation (°C)</b>				
<u>Total Distillate (volume %)</u>				
	10	120		Mackay 82a
	25	187		Mackay 82a
	40	254		Mackay 82a

**Alberta Sweet Mixed Blend (Petawawa)**

	<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Alberta, Canada			
<b>Synonyms:</b> ASMB			
This oil was used during the May 1993 airborne oil spill sensor test program carried out at Canadian Forces Base Petawawa. The program was sponsored by the Emergencies Science Division of Environment Canada and the Marine Spill Response Corporation, Washington, D.C.. Six aircraft from across North America participated in the program.			Brown 94
<b>API Gravity</b>	35.1		ESD 93
<b>Sulphur (weight %)</b>	0.65		ESD 93
<b>Flash Point (°C)</b>	-9		ESD 93
<b>Density (g/mL)</b>			
	<u>Temperature (°C)</u>		
	0	0.8611	ESD 93
	15	0.8487	ESD 93
<b>Dynamic Viscosity (mPa·s or cP)</b>			
	<u>Temperature (°C)</u>		
	0	34	ESD 93
	15	7	ESD 93
<b>Boiling Point Distribution (weight %)</b>			
	<u>Boiling Point (°C)</u>		
	40	2	ESD 94
	60	3	ESD 94
	80	6	ESD 94
	100	10	ESD 94
	120	13	ESD 94
	140	17	ESD 94
	160	20	ESD 94
	180	24	ESD 94
	200	28	ESD 94
	250	37	ESD 94
	300	48	ESD 94
	350	59	ESD 94
	400	68	ESD 94
	450	77	ESD 94
	500	83	ESD 94
	550	88	ESD 94
	600	93	ESD 94
	650	96	ESD 94
	700	99	ESD 94

**Alberta Sweet Mixed Blend Reference #2**

	<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Alberta, Canada			
<b>Synonyms:</b> ASMB			
EETD standard oil for dispersant testing prior to 1989.			
<b>API Gravity</b>			
	37.0		EETD 84
<b>Sulphur (weight %)</b>			
<u>Evaporation (volume %)</u>			
0	0.55		EETD 86
15	0.61		EETD 86
23	0.66		EETD 86
<b>Flash Point (°C)</b>			
	7		EETD 84
<b>Reid Vapour Pressure (kPa)</b>			
	19		EETD 84
<b>Density (g/mL)</b>			
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>		
0	0	0.8470	EETD 84
	15	0.8390	EETD 84
15	0	0.8740	EETD 84
	15	0.8680	EETD 84
26	0	0.8880	EETD 84
	15	0.8830	EETD 84
<b>Pour Point (°C)</b>			
<u>Evaporation (volume %)</u>			
0		-8	EETD 83
15		7	EETD 83
<b>Dynamic Viscosity (mPa·s or cP)</b>			
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>		
0	0	47	EETD 85
	15	9	EETD 85
15	0	7,500	EETD 85
	15	44	EETD 85
26	0	> 10,000	EETD 85
	15	48	EETD 85

## Alberta Sweet Mixed Blend Reference #2

		Data	Notes	Reference ID
<b>Hydrocarbon Groups (weight %)</b>				
<u>Evaporation (volume %)</u>				
0	Saturates	84		EETD 86
	Aromatics	13		EETD 86
	Resins	1		EETD 86
	Asphaltenes	2		EETD 86
		2		EETD 89
15		2		EETD 89
26		2		EETD 89
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	32.0		EETD 85
	15	25.6		EETD 84
15	0	NM		EETD 84
	15	28.1		EETD 84
26	0	NM		EETD 84
	15	29.4		EETD 84
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	17.5		EETD 85
	15	8.4		EETD 84
15	0	NM		EETD 84
	15	8.6		EETD 84
26	0	NM		EETD 84
	15	15.5		EETD 84
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	30.3		EETD 85
	15	21.5		EETD 84
15	0	NM		EETD 85
	15	23.8		EETD 84
26	0	NM		EETD 85
	15	21.1		EETD 84



**Alberta Sweet Mixed Blend Reference #2**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Distillation (°C)</b>				
<u>Evaporation (volume %)</u>	<u>Total Distillate (volume %)</u>			
0	IBP	37		EETD 85
	5	95		EETD 85
	10	111		EETD 85
	15	126		EETD 85
	20	142		EETD 85
	25	155		EETD 85
	30	189		EETD 85
	34	213		EETD 85
	IBP	45		EETD 85
15	5	125		EETD 85
	10	148		EETD 85
	15	153		EETD 85
	20	170		EETD 85
	25	193		EETD 85
<b>Metals (ppm)</b>				
<u>Evaporation (volume %)</u>				
15	Barium	0.3		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	< 3		Cao 92
	Lead	3		Cao 92
	Magnesium	2		Cao 92
	Molybdenum	0.6		Cao 92
	Nickel	3		Cao 92
	Titanium	0.6		Cao 92
	Vanadium	18		Cao 92
	Zinc	0.6		Cao 92
<b>Aqueous Solubility (mg/L)</b>				
	<u>Temperature (°C)</u>			
	20 (approx.)	16	(a)	MacLean 89
	22	31	(a)	Suntio 86
	20 (approx.)	14	(b)	MacLean 89
	22	22	(b)	Suntio 86
		35	(c)	Suntio 86

(a) fresh water; (b) salt water; (c) distilled water

## Alberta Sweet Mixed Blend Reference #2

		Data	Notes	Reference ID
<b>Acute Toxicity of Water Soluble Fraction (mg/L)</b>				
	<u>Test Organism</u>			
24h EC50	Artemia spp.	8	(a)	MacLean 89
		15	(b)	EETD 89
48h EC50	Daphnia magna	1	(a)	MacLean 89
		2	(b)	EETD 89
24h LC50	Artemia spp.	11	(a)	MacLean 89
		19	(b)	EETD 89
48h LC50	Daphnia magna	6	(a)	MacLean 89
		12	(b)	EETD 89
<i>(a) results based on fluorescence spectroscopy; (b) results based on GC purge-and-trap analysis</i>				
<b>Acute Toxicity, Oil in Water Emulsion (µL/L)</b>				
	<u>Test Organism</u>			
96h LC50	Frog larvae	78	(a)	Hedtke 82
		28	(b)	Hedtke 82
	Fathead minnow	3	(a)	Hedtke 82
<i>(a) static test; (b) flow-through test</i>				

### Alberta Sweet Mixed Blend Reference #3

	Data	Notes	Reference ID
<b>Origin:</b> Alberta, Canada			
<b>Synonyms:</b> ASMB			
This oil was poured into small bottles in 1989. It has been used by Environment Canada as a reference oil for analytical quality assurance procedures, and as a standard oil for testing oil spill treating agents.			
<b>API Gravity</b>	37.1		ESD 93
<b>Flash Point (°C)</b>	-17		ESD 93
<b>Density (g/mL)</b>			
	<u>Temperature (°C)</u>		
	0	0.8506	ESD 93
	15	0.8386	ESD 93
<b>Pour Point (°C)</b>	-10		ESD 93
<b>Dynamic Viscosity (mPa·s or cP)</b>			
	<u>Temperature (°C)</u>		
	0	19	ESD 93
	15	5	ESD 93
<b>Chemical Dispersibility (volume %)</b>			
	Dasic LTS	20	EETD 89
<b>Hydrocarbon Groups (weight %)</b>			
	Asphaltenes	2	ESD 91
	Waxes	7	ESD 91

**Alberta Sweet Mixed Blend Reference #3**

	<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Boiling Point Distribution (weight %)</b>			
<u>Boiling Point (°C)</u>			
40	4		ESD 94
60	5		ESD 94
80	8		ESD 94
100	13		ESD 94
120	16		ESD 94
140	21		ESD 94
160	25		ESD 94
180	29		ESD 94
200	33		ESD 94
250	43		ESD 94
300	53		ESD 94
350	64		ESD 94
400	73		ESD 94
450	81		ESD 94
500	88		ESD 94
550	93		ESD 94
600	96		ESD 94
650	99		ESD 94
<b>Metals</b>			
Aluminum	< 5		Cao 92
Barium	0.6		Cao 92
Cadmium	< 0.5		Cao 92
Calcium	53		Cao 92
Chromium	< 2		Cao 92
Cobalt	< 1		Cao 92
Copper	0.6		Cao 92
Iron	< 3		Cao 92
Lead	< 3		Cao 92
Magnesium	1		Cao 92
Manganese	< 0.3		Cao 92
Mercury	< 15		Cao 92
Molybdenum	0.6		Cao 92
Nickel	2		Cao 92
Selenium	18		Cao 92
Strontium	< 0.2		Cao 92
Tin	< 15		Cao 92
Titanium	< 0.6		Cao 92
Vanadium	14		Cao 92
Zinc	< 0.6		Cao 92

## Alberta Sweet Mixed Blend Reference #4

	Data	Notes	Reference ID
<b>Origin:</b> Alberta, Canada			
<b>Synonyms:</b> ASMB			
This oil was poured into small bottles in 1994 and refrigerated. It has been used by Environment Canada as a reference oil for analytical quality assurance procedures, and as a standard oil for testing oil spill treating agents.			
<b>API Gravity</b>			
	36.1		ESD 95
<b>Equation(s) for Predicting Evaporation</b>			
%Ev = (3.24 + 0.054T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			
			ESD 96
<b>Sulphur (weight %)</b>			
<u>Evaporation (weight %)</u>			
0	0.58		ESD 97
14	0.63		ESD 97
26	0.73		ESD 97
39	0.86		ESD 97
<b>Flash Point (°C)</b>			
<u>Evaporation (weight %)</u>			
0	-22		ESD 95
14	35		ESD 95
26	79		ESD 95
39	> 95		ESD 95
<b>Density (g/mL)</b>			
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>		
0	0	0.8548	ESD 95
	15	0.8434	ESD 95
14	0	0.8833	ESD 95
	15	0.8712	ESD 95
26	0	0.9026	ESD 95
	15	0.8902	ESD 95
39	0	0.9195	ESD 95
	15	0.9078	ESD 95
<b>Pour Point (°C)</b>			
<u>Evaporation (weight %)</u>			
0	-27		ESD 95
14	-9		ESD 95
26	3		ESD 95
39	14		ESD 95

# **Alberta Sweet Mixed Blend Reference #4**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Dynamic Viscosity (mPa·s or cP)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	26		ESD 95
	15	7		ESD 95
14	0	41		ESD 95
	15	15		ESD 95
26	0	295		ESD 95
	15	44		ESD 95
39	0	1,646	(a)	ESD 95
		6,760	(b)	ESD 95
		85,450	(c)	ESD 95
	15	168		ESD 95
<i>Shear rate = (a) 100/s; (b) 10/s; (c) 1/s</i>				
<b>Chemical Dispersibility (volume %)</b>				
	Corexit 9500	40		ESD 95
	Corexit 9527	30		ESD 98
	Enersperse 700	23		ESD 98
<b>Hydrocarbon Groups (weight %)</b>				
<u>Evaporation (weight %)</u>				
0	Saturates	65		ESD 96
	Aromatics	27		ESD 96
	Resins	5		ESD 96
	Asphaltenes	3		ESD 96
	Waxes	6		ESD 98
14	Saturates	60		ESD 96
	Aromatics	31		ESD 96
	Resins	6		ESD 96
	Asphaltenes	3		ESD 96
	Waxes	6		ESD 98
26	Saturates	57		ESD 96
	Aromatics	32		ESD 96
	Resins	6		ESD 96
	Asphaltenes	3		ESD 96
	Waxes	7		ESD 98
39	Saturates	54		ESD 96
	Aromatics	33		ESD 96
	Resins	7		ESD 96
	Asphaltenes	5		ESD 96
	Waxes	8		ESD 98

**Alberta Sweet Mixed Blend Reference #4**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Adhesion (g/m<sup>2</sup>)</b>				
<u>Evaporation (weight %)</u>				
0		13	<i>SD = 1</i>	ESD 95
14		22	<i>SD = 1</i>	ESD 95
26		35	<i>SD = 1</i>	ESD 95
39		61	<i>SD = 4</i>	ESD 95
<b>Volatile Organic Compounds (ppm)</b>				
<u>Evaporation (weight %)</u>				
0	Benzene	860		ESD 96
	Toluene	7,060		ESD 96
	Ethylbenzene	1,360		ESD 96
	Xylenes	8,490		ESD 96
	C3-benzenes	11,250		ESD 96
	Total BTEX	17,770		ESD 96
	Total VOCs	29,020		ESD 96
14	Benzene	198		ESD 97
	Toluene	2,553		ESD 97
	Ethylbenzene	2,026		ESD 97
	Xylenes	9,364		ESD 97
	C3-benzenes	11,744		ESD 97
	Total BTEX	14,141		ESD 97
	Total VOCs	25,886		ESD 97
26	Benzene	0		ESD 97
	Toluene	17		ESD 97
	Ethylbenzene	218		ESD 97
	Xylenes	1,732		ESD 97
	C3-benzenes	12,102		ESD 97
	Total BTEX	1,968		ESD 97
	Total VOCs	14,069		ESD 97
39	Benzene	0		ESD 96
	Toluene	20		ESD 96
	Ethylbenzene	110		ESD 96
	Xylenes	980		ESD 96
	C3-benzenes	5,400		ESD 96
	Total BTEX	1,100		ESD 96
	Total VOCs	6,500		ESD 96

**Alberta Sweet Mixed Blend Reference #4**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	27.2		ESD 95
	15	25.8		ESD 95
14	0	28.9		ESD 95
	15	28.2		ESD 95
26	0	31.0		ESD 95
	15	28.5		ESD 95
39	0	DNF		ESD 95
	15	30.6		ESD 95
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	16.5		ESD 95
	15	12.2		ESD 95
14	0	14.2		ESD 95
	15	10.8		ESD 95
26	0	NM		ESD 95
	15	11.5		ESD 95
39	0	DNF		ESD 95
	15	10.4		ESD 95
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	18.5		ESD 95
	15	15.0		ESD 95
14	0	15.1		ESD 95
	15	14.5		ESD 95
26	0	NM		ESD 95
	15	14.3		ESD 95
39	0	DNF		ESD 95
	15	13.9		ESD 95



**Alberta Sweet Mixed Blend Reference #4**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	40	3		ESD 96
	60	3		ESD 96
	80	4		ESD 96
	100	9		ESD 96
	120	13		ESD 96
	140	17		ESD 96
	160	22		ESD 96
	180	26		ESD 96
	200	30		ESD 96
	250	41		ESD 96
	300	51		ESD 96
	350	62		ESD 96
	400	71		ESD 96
	450	80		ESD 96
	500	87		ESD 96
	550	92		ESD 96
	600	95		ESD 96
	650	98		ESD 96
14	100	2		ESD 96
	120	4		ESD 96
	140	8		ESD 96
	160	12		ESD 96
	180	17		ESD 96
	200	21		ESD 96
	250	33		ESD 96
	300	45		ESD 96
	350	58		ESD 96
	400	68		ESD 96
	450	77		ESD 96
	500	85		ESD 96
26	550	91		ESD 96
	600	95		ESD 96
	650	98		ESD 96
	160	2		ESD 96
	180	5		ESD 96
	200	9		ESD 96
	250	22		ESD 96
	300	36		ESD 96
	350	50		ESD 96
	400	62		ESD 96
	450	73		ESD 96

**Alberta Sweet Mixed Blend Reference #4**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
26	500	82		ESD 96
	550	89		ESD 96
	600	94		ESD 96
	650	97		ESD 96
	700	100		ESD 96
39	250	7		ESD 96
	300	22		ESD 96
	350	40		ESD 96
	400	54		ESD 96
	450	67		ESD 96
	500	78		ESD 96
	550	86		ESD 96
	600	92		ESD 96
	650	97		ESD 96
	700	99		ESD 96

	Data	Notes	Reference ID
<b>Origin:</b> Yemen			
<b>Synonyms:</b> Marib			
Data from OGJ 99 were originally published in 1994.			
<b>API Gravity</b>	40.3		OGJ 99
<b>Sulphur (weight %)</b>	0.10		OGJ 99
<b>Water Content (volume %)</b>	0.2		OGJ 99
<b>Reid Vapour Pressure (kPa)</b>	45		OGJ 99
<b>Density (g/mL)</b>			
	<u>Temperature (°C)</u>		
	15	0.8233	OGJ 99
<b>Pour Point (°C)</b>	25		OGJ 99
<b>Yield on Crude (volume %)</b>			
	<u>Boiling Range (°C)</u>		
	Naphtha (20-100)	15	OGJ 99
	Naphtha (100-150)	12	OGJ 99
	Kerosene (150-265)	26	OGJ 99
	Middle distillate (265-343)	16	OGJ 99
	Gas oil (343-565)	23	OGJ 99
	Residue (>565)	7	OGJ 99

**Amauligak**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Beaufort Sea, Canada				
<b>API Gravity</b>		27.4		EETD 85
<b>Equation(s) for Predicting Evaporation</b>				
Amauligak: %Ev = (1.63 + 0.045T)ln(t)				ESD 96
Amauligak F-24: %Ev = (1.91 + 0.045T)ln(t)				
Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				
<b>Sulphur (weight %)</b>		0.15		EETD 86
<b>Flash Point (°C)</b>		0		EETD 85
<b>Density (g/mL)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.9014		EETD 85
		0.8936	(a)	EETD 89
	15	0.8896		EETD 85
		0.8836	(a)	EETD 89
13	0	0.9090		EETD 85
	15	0.8992		EETD 85
19	0	0.9146		EETD 85
	15	0.9048		EETD 85
(a) sample F-24				
<b>Pour Point (°C)</b>				
<u>Evaporation (volume %)</u>				
0		-66		EETD 86
13		-48		EETD 86
<b>Dynamic Viscosity (mPa·s or cP)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	25		EETD 85
	15	14		EETD 85
13	0	42		EETD 85
	15	21		EETD 85
19	0	68		EETD 85
	15	32		EETD 85
<b>Chemical Dispersibility (volume %)</b>				
	Corexit 9500	45		ESD 94
	Corexit 9527	55		EETD 89
	Dasic LTS	25		EETD 89

		Data	Notes	Reference ID
Hydrocarbon Groups (weight %)				
	Saturates	90		EETD 86
	Aromatics	9		EETD 86
	Resins	0		EETD 86
	Asphaltenes	0		ESD 91
	Waxes	1		ESD 91
Volatile Organic Compounds (ppm)				
	Benzene	100		ESD 94
	Toluene	670		ESD 94
	Ethylbenzene	380		ESD 94
	Xylenes	4,240		ESD 94
	C3-benzenes	6,760		ESD 94
	Total BTEX	5,380		ESD 94
	Total VOCs	12,140		ESD 94
Surface Tension (mN/m or dynes/cm)				
Evaporation (volume %)		Temperature (°C)		
0	0	30.0		EETD 85
	15	29.2		EETD 85
13	0	31.1		EETD 85
	15	29.0		EETD 85
19	0	31.3		EETD 85
	15	28.5		EETD 85
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
Evaporation (volume %)		Temperature (°C)		
0	0	21.1		EETD 85
	15	20.9		EETD 85
13	0	19.7		EETD 85
	15	15.0		EETD 85
19	0	17.8		EETD 85
	15	15.1		EETD 85
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
Evaporation (volume %)		Temperature (°C)		
0	0	27.5		EETD 85
	15	21.5		EETD 85
13	0	21.6		EETD 85
	15	20.4		EETD 85
19	0	20.8		EETD 85
	15	19.6		EETD 85

**Amauligak**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Boiling Point Distribution (weight %)</b>				
Sample F-24				
	<u>Boiling Point (°C)</u>			
	100	2		ESD 94
	120	4		ESD 94
	140	6		ESD 94
	160	9		ESD 94
	180	13		ESD 94
	200	17		ESD 94
	250	32		ESD 94
	300	50		ESD 94
	350	65		ESD 94
	400	76		ESD 94
	450	86		ESD 94
	500	92		ESD 94
	550	96		ESD 94
	600	98		ESD 94
	650	99		ESD 94
<b>Aqueous Solubility (mg/L)</b>				
	<u>Temperature (°C)</u>			
	20 (approx.)	9	(a)	MacLean 89
	22	10	(a)	MacLean 89
	20 (approx.)	7	(b)	Suntio 86
(a) fresh water; (b) salt water				
<b>Acute Toxicity of Water Soluble Fraction (mg/L)</b>				
	<u>Test Organism</u>			
24h EC50	Artemia spp.	6	(a)	MacLean 89
		8	(b)	EETD 89
48h EC50	Daphnia magna	2	(a)	MacLean 89
		2	(b)	EETD 89
24h LC50	Artemia spp.	> 7	(a)	MacLean 89
		> 8	(b)	EETD 89
48h LC50	Daphnia magna	7	(a)	MacLean 89
		7	(b)	EETD 89
(a) results based on fluorescence spectroscopy; (b) results based on GC purge-and-trap analysis				

	Data	Notes	Reference ID
<b>Origin:</b> Libya			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
<b>API Gravity</b>	36.1		OGJ 99
<b>Sulphur (weight %)</b>	0.15		OGJ 99
<b>Reid Vapour Pressure (kPa)</b>	27		OGJ 99
<b>Pour Point (°C)</b>	24		OGJ 99
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>			
	<u>Temperature (°C)</u>		
	38	14	OGJ 99
<b>Yield on Crude (volume %)</b>			
	<u>Boiling Range (°C)</u>		
	IBP-16	2	OGJ 99
	Light naphtha (16-49)	2	OGJ 99
	Light naphtha(49-121)	8	OGJ 99
	Heavy naphtha (121-166)	7	OGJ 99
	Kerosene (166-229)	9	OGJ 99
	Gas oil (229-316)	15	OGJ 99
	Gas oil (316-454)	23	OGJ 99
	Residue (>346)	56	OGJ 99
	Residue (>538)	22	OGJ 99
<b>Metals (ppm)</b>			
	Nickel	5	OGJ 99
	Vanadium	0.6	OGJ 99

**Arabian**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Saudi Arabia				
<b>API Gravity</b>		32.5		API 81
<b>Sulphur (weight %)</b>		1.87		API 81
<b>Density (g/mL)</b>				
Temperature (°C)				
	16	0.8620		API 81
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>				
Temperature (°C)				
	40	10		API 81
	100	3		API 81
<b>Distillation (°C)</b>				
Total Distillate (volume %)				
	IBP	29		API 81
	5	69		API 81
	10	100		API 81
	15	128		API 81
	20	151		API 81
	25	172		API 81
	30	198		API 81
	35	213		API 81
	40	238		API 81
	45	261		API 81
	50	282		API 81
	55	304		API 81
	60	329		API 81
	65	351		API 81
	70	373		API 81
	75	398		API 81
	80	422		API 81
	85	448		API 81
	90	475		API 81
	95	504		API 81
	FBP	537		API 81
<b>Metals (ppm)</b>				
	Nickel	14		API 81
	Vanadium	4		API 81
<b>Other Elements (weight %)</b>				
	Nitrogen	0.09		API 81



**Arabian Heavy**

	<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Saudi Arabia			
<b>Synonyms:</b> Safaniya			
Data from OGJ 99 were originally published in 1991 as part of a series entitled "Export Crudes for the '90s".			
<b>API Gravity</b>	27.4		OGJ 99
<b>Sulphur (weight %)</b>	2.80		OGJ 99
<b>Flash Point (°C)</b>			
Evaporation (volume %)			
15	36		Daling 91
23	72		Daling 91
30	122		Daling 91
<b>Density (g/mL)</b>			
Evaporation (volume %)	Temperature (°C)		
0	16	0.8870	Daling 91
		0.8914	OGJ 99
15		0.9200	Daling 91
23		0.9350	Daling 91
30		0.9510	Daling 91
<b>Pour Point (°C)</b>			
Evaporation (volume %)			
0		-28	Daling 91
15		-23	Daling 91
23		-18	Daling 91
30		-5	Daling 91
<b>Dynamic Viscosity (mPa·s or cP)</b>			
Evaporation (volume %)	Temperature (°C)		
0	13	41	Daling 91
15		241	Daling 91
23		700	Daling 91
30		2,344	Daling 91
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>			
	Temperature (°C)		
	16	48	OGJ 99
<b>Chemical Dispersibility</b>	Relatively high chemical dispersibility.		Daling 91

## Arabian Heavy

		Data	Notes	Reference ID
<b>Hydrocarbon Groups (weight %)</b>				
<u>Evaporation (volume %)</u>				
0	Asphaltenes (hard)	4		Daling 91
	Asphaltenes (soft)	7		Daling 91
	Waxes	5		Daling 91
15	Asphaltenes (hard)	5		Daling 91
	Asphaltenes (soft)	8		Daling 91
	Waxes	5		Daling 91
23	Asphaltenes (hard)	5		Daling 91
	Asphaltenes (soft)	9		Daling 91
	Waxes	6		Daling 91
30	Saturates	23		Daling 91
	Aromatics	49		Daling 91
	Resins	18		Daling 91
	Asphaltenes	10		Daling 91
	Asphaltenes (hard)	6		Daling 91
	Asphaltenes (soft)	10		Daling 91
	Waxes	6		Daling 91
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
				ESD 00
0	25	25.9		ESD 00
9	15	28.5		ESD 00
	25	27.9		ESD 00
16	15	29.3		ESD 00
	25	29.1		ESD 00
23	15	30.4		ESD 00
	25	29.6		ESD 00
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	13	20.0		Daling 91
15		14.0		Daling 91
23		18.0		Daling 91
30		17.0		Daling 91
<b>Distillation (°C)</b>				
	<u>Total Distillate (volume %)</u>			
	15	150		Daling 91
	23	200		Daling 91
	30	250		Daling 91

**Arabian Heavy**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Yield on Crude (volume %)</b>				
	<u>Boiling Range (°C)</u>			
	20-175	18		OGJ 99
	175-295	19		OGJ 99
	295-343	7		OGJ 99
	343-565	29		OGJ 99
	565-816	25		OGJ 99
<b>Other Elements (weight %)</b>				
	Nitrogen	0.16		OGJ 99

**Arabian Heavy (2000)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Saudi Arabia				
<b>Flash Point (°C)</b>				
<u>Evaporation (weight %)</u>				
0		-16		ESD 00
9		39		ESD 00
16		80		ESD 00
24		> 100		ESD 00
<b>Density (g/mL)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.9009		ESD 00
	15	0.8897		ESD 00
	25	0.8821		ESD 00
9	0	0.9298		ESD 00
	15	0.9176		ESD 00
	25	0.9108		ESD 00
16	0	0.9477		ESD 00
	15	0.9356		ESD 00
	25	0.9291		ESD 00
23	0	0.9658		ESD 00
	15	0.9538		ESD 00
	25	0.9469		ESD 00
<b>Pour Point (°C)</b>				
<u>Evaporation (weight %)</u>				
0		-32		ESD 00
9		-21		ESD 00
16		-12		ESD 00
24		-4		ESD 00
<b>Dynamic Viscosity (mPa·s or cP)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	132		ESD 00
	15	43		ESD 00
	25	30		ESD 00
9	0	542		ESD 00
	15	157		ESD 00
	25	84		ESD 00
16	0	2,466		ESD 00
		621		ESD 00
		256		ESD 00
23		28,870		ESD 00
	15	3,244		ESD 00
	25	1,318		ESD 00

**Arabian Heavy (2000)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Chemical Dispersibility (volume %)</b>				
<u>Evaporation (weight %)</u>				
0	Corexit 9500	15		ESD 00
9		14		ESD 00
16		13		ESD 00
24		11		ESD 00
<b>Adhesion (g/m<sup>2</sup>)</b>				
<u>Evaporation (weight %)</u>				
0		31	<i>SD = 1</i>	ESD 00
9		30	<i>SD = 7</i>	ESD 00
16		34	<i>SD = 3</i>	ESD 00
24		56	<i>SD = 3</i>	ESD 00
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	27.0		ESD 00
	15	26.4		ESD 00
	25	25.9		ESD 00
9	0	29.0		ESD 00
	15	28.5		ESD 00
	25	27.9		ESD 00
16	0	29.2		ESD 00
	15	29.3		ESD 00
	25	29.1		ESD 00
23	0	NM		ESD 00
	15	30.4		ESD 00
	25	29.6		ESD 00
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	24.0		ESD 00
	15	22.5		ESD 00
	25	22.4		ESD 00
9	0	16.8		ESD 00
	15	23.2		ESD 00
	25	21.0		ESD 00
16	0	NM		ESD 00
	15	NM		ESD 00
	25	15.9		ESD 00
23	0	NM		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00

**Arabian Heavy (2000)**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	25.5		ESD 00
	15	25.9		ESD 00
	25	23.8		ESD 00
9	0	19.8		ESD 00
	15	24.5		ESD 00
	25	22.9		ESD 00
16	0	NM		ESD 00
	15	NM		ESD 00
	25	21.4		ESD 00
23	0	NM		ESD 00
	15	NM		ESD 00
	25	NM		ESD 00

	Data	Notes	Reference ID
<b>Origin:</b> Saudi Arabia			
<b>Synonyms:</b> Berri			
Data from OGJ 99 were originally published in 1991 as part of a series entitled "Export Crudes for the '90s".			
<b>API Gravity</b>			
	33.4		OGJ 99
	31.8		ESD 92
<b>Equation(s) for Predicting Evaporation</b>			
%Ev = (2.52 + 0.037T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 96
<b>Sulphur (weight %)</b>			
<u>Evaporation (volume %)</u>			
0	1.77		OGJ 99
	1.84		ESD 93
12	1.85		ESD 93
24	2.06		ESD 93
<b>Water Content (weight %)</b>			
<u>Evaporation (volume %)</u>			
0	0.1		ESD 98
12	< 0.1		ESD 98
24	< 0.1		ESD 98
<b>Flash Point (°C)</b>			
<u>Evaporation (volume %)</u>			
0	-20		ESD 92
12	44		ESD 92
24	89		ESD 92
<b>Density (g/mL)</b>			
<u>Evaporation (volume %)</u>		<u>Temperature (°C)</u>	
0	0	0.8781	ESD 92
	15	0.8658	ESD 92
		0.8581	OGJ 99
12	0	0.9039	ESD 92
	15	0.8921	ESD 92
24	0	0.9225	ESD 92
	15	0.9111	ESD 92
<b>Pour Point (°C)</b>			
<u>Evaporation (volume %)</u>			
0	-53		OGJ 99
	-28		ESD 92
12	-13		ESD 92
	-12		ESD 92

## Arabian Light

		Data	Notes	Reference ID
<b>Dynamic Viscosity (mPa·s or cP)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	31		ESD 92
	15	14		ESD 92
12	0	116		ESD 92
	15	33		ESD 92
24	0	406		ESD 92
	15	94		ESD 92
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>				
	<u>Temperature (°C)</u>			
	16	12		OGJ 99
<b>Emulsion Formation</b>				
<u>Evaporation (volume %)</u>				
0	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	23,000		ESD 98
	Complex modulus (mPa)	470,000		ESD 98
	Water content (wt %)	87		ESD 98
12	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	46,000		ESD 98
	Complex modulus (mPa)	400,000		ESD 98
	Water content (wt %)	89		ESD 98
24	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	48,000		ESD 98
	Complex modulus (mPa)	510,000		ESD 98
	Water content (wt %)	85		ESD 98
<b>Chemical Dispersibility (volume %)</b>				
<u>Evaporation (volume %)</u>				
0	Corexit 9500	21		ESD 98
	Corexit 9527	25		EETD 89
	Dasic LTS	25		EETD 89
	Enersperse 700	10		EETD 89
12	Corexit 9500	17		ESD 98
24		14		ESD 98



		Data	Notes	Reference ID
<b>Hydrocarbon Groups (weight %)</b>				
<u>Evaporation (volume %)</u>				
0	Saturates	51		ESD 95
	Aromatics	39		ESD 95
	Resins	6		ESD 95
	Asphaltenes	3		ESD 95
	Waxes	5		ESD 98
12	Saturates	49		ESD 96
	Aromatics	37		ESD 96
	Resins	8		ESD 96
	Asphaltenes	5		ESD 96
	Waxes	5		ESD 97
24	Saturates	46		ESD 96
	Aromatics	39		ESD 96
	Resins	10		ESD 96
	Asphaltenes	6		ESD 96
	Waxes	5		ESD 98
<b>Adhesion (g/m<sup>2</sup>)</b>				
<u>Evaporation (volume %)</u>				
0		14	<i>SD = 2</i>	ESD 96
12		18	<i>SD = 2</i>	ESD 96
24		21	<i>SD = 2</i>	ESD 96

## Arabian Light

		Data	Notes	Reference ID
<b>Volatile Organic Compounds (ppm)</b>				
<u>Evaporation (volume %)</u>				
0	Benzene	680		ESD 94
	Toluene	1,980		ESD 94
	Ethylbenzene	1,560		ESD 94
	Xylenes	3,750		ESD 94
	C3-benzenes	7,450		ESD 94
	Total BTEX	7,970		ESD 94
	Total VOCs	15,420		ESD 94
12	Benzene	140		ESD 94
	Toluene	1,550		ESD 94
	Ethylbenzene	1,270		ESD 94
	Xylenes	3,050		ESD 94
	C3-benzenes	6,710		ESD 94
	Total BTEX	6,010		ESD 94
	Total VOCs	12,720		ESD 94
24	Benzene	0		ESD 94
	Toluene	50		ESD 94
	Ethylbenzene	0		ESD 94
	Xylenes	90		ESD 94
	C3-benzenes	2,430		ESD 94
	Total BTEX	140		ESD 94
	Total VOCs	2,570		ESD 94
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	27.1		ESD 92
	15	26.6		ESD 92
12	0	28.9		ESD 92
	15	28.0		ESD 92
24	0	30.2		ESD 92
	15	28.5		ESD 92
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	16.8		ESD 92
	15	20.4		ESD 92
12	0	14.8		ESD 92
	15	17.3		ESD 92
24	0	19.3		ESD 92
	15	20.2		ESD 92

		Data	Notes	Reference ID
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	19.8		ESD 92
	15	22.6		ESD 92
12	0	15.1		ESD 92
	15	17.2		ESD 92
24	0	29.0		ESD 92
	15	21.9		ESD 92

## Arabian Light

		Data	Notes	Reference ID
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
0	40	2		ESD 94
	60	2		ESD 94
	80	4		ESD 94
	100	7		ESD 94
	120	9		ESD 94
	140	12		ESD 94
	160	15		ESD 94
	180	19		ESD 94
	200	22		ESD 94
	250	31		ESD 94
	300	40		ESD 94
	350	49		ESD 94
	400	57		ESD 94
	450	66		ESD 94
	500	73		ESD 94
	550	79		ESD 94
	600	85		ESD 94
	650	89		ESD 94
	700	92		ESD 94
12	100	1		ESD 96
	120	2		ESD 96
	140	4		ESD 96
	160	7		ESD 96
	180	11		ESD 96
	200	15		ESD 96
	250	25		ESD 96
	300	35		ESD 96
	350	47		ESD 96
	400	57		ESD 96
	450	67		ESD 96
	500	75		ESD 96
	550	83		ESD 96
	600	89		ESD 96
	650	94		ESD 96
	700	98		ESD 96
24	180	2		ESD 96
	200	5		ESD 96
	250	14		ESD 96
	300	26		ESD 96
	350	38		ESD 96
	400	49		ESD 96

		Data	Notes	Reference ID
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (volume %)</u>	<u>Boiling Point (°C)</u>			
24	450	59		ESD 96
	500	68		ESD 96
	550	76		ESD 96
	600	83		ESD 96
	650	88		ESD 96
	700	92		ESD 96
<b>Yield on Crude (volume %)</b>				
	<u>Boiling Range (°C)</u>			
	20-175	23		OGJ 99
	175-295	23		OGJ 99
	295-343	8		OGJ 99
	343-565	30		OGJ 99
	565-816	15		OGJ 99

## Arabian Light

		Data	Notes	Reference ID
<b>Metals (ppm)</b>				
<u>Evaporation (volume %)</u>				
0	Barium	< 0.3		Cao 92
	Chromium	< 2		Cao 92
	Copper	2		Cao 92
	Iron	< 3		Cao 92
	Lead	< 3		Cao 92
	Magnesium	6		Cao 92
	Molybdenum	0.9		Cao 92
	Nickel	3		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	16		Cao 92
	Zinc	< 0.6		Cao 92
24	Aluminum	< 5		Cao 92
	Barium	0.4		Cao 92
	Cadmium	< 0.5		Cao 92
	Calcium	35		Cao 92
	Chromium	< 2		Cao 92
	Cobalt	< 1		Cao 92
	Copper	2		Cao 92
	Iron	6		Cao 92
	Lead	4		Cao 92
	Magnesium	3		Cao 92
	Manganese	< 0.3		Cao 92
	Mercury	< 15		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	3		Cao 92
	Selenium	< 15		Cao 92
	Strontium	< 0.2		Cao 92
	Tin	< 15		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	20		Cao 92
	Zinc	5		Cao 92
<b>Other Elements (weight %)</b>				
	Nitrogen	0.09		OGJ 99
<b>Aqueous Solubility (mg/L)</b>				
	Room temperature	19	(a)	ESD 91
<i>(a) fresh water</i>				
<b>Acute Toxicity of Water Soluble Fraction (mg/L)</b>				
	<u>Test Organism</u>			
48h LC50	Daphnia magna	11	(a)	Harris 94
<i>(a) results based on GC headspace analysis</i>				

	Data	Notes	Reference ID
<b>Origin:</b> Saudi Arabia			
<b>Synonyms:</b> Khursaniyah			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
<b>API Gravity</b>			
	29.5		ESD 93
	30.8		OGJ 99
<b>Equation(s) for Predicting Evaporation</b>			
%Ev = (1.89 + 0.045T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 96
<b>Sulphur (weight %)</b>			
<u>Evaporation (weight %)</u>			
0	1.60		ESD 93
	2.40		OGJ 99
13	3.16		ESD 94
21	3.44		ESD 94
31	3.86		ESD 94
<b>Water Content (weight %)</b>			
<u>Evaporation (weight %)</u>			
0	0.3		ESD 98
13	< 0.1		ESD 98
21	< 0.1		ESD 98
31	< 0.1		ESD 98
<b>Flash Point (°C)</b>			
<u>Evaporation (weight %)</u>			
0	-13		ESD 93
13	52		ESD 94
21	90		ESD 94
31	> 95		ESD 94
<b>Reid Vapour Pressure (kPa)</b>			
	22		OGJ 99

## Arabian Medium

		Data	Notes	Reference ID
<b>Density (g/mL)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.8901		ESD 93
	15	0.8783		ESD 93
	20	0.8757		ESD 93
13	0	0.9222		ESD 94
	15	0.9102		ESD 94
21	0	0.9389		ESD 94
	15	0.9263		ESD 94
31	0	0.9619		ESD 94
	15	0.9495		ESD 94
<b>Pour Point (°C)</b>				
<u>Evaporation (weight %)</u>				
0		-10		ESD 93
		-15		OGJ 99
13		-4		ESD 94
21		-2		ESD 94
31		7		ESD 94
<b>Dynamic Viscosity (mPa·s or cP)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	59		ESD 93
	15	29		ESD 93
	20	23		ESD 93
13	0	365		ESD 94
	15	91		ESD 94
21	0	1,222		ESD 94
	15	275		ESD 94
31	0	22,150	(a)	ESD 94
		78,380	(b)	ESD 94
	15	2,155		ESD 94
<i>Shear rate = (a) 10/s; (b) 1/s</i>				
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>				
	<u>Temperature (°C)</u>			
	21	16		OGJ 99
	38	9		OGJ 99



		Data	Notes	Reference ID
<b>Emulsion Formation</b>				
<u>Evaporation (weight%)</u>				
0	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	41,000		ESD 98
	Complex modulus (mPa)	550,000		ESD 98
	Water content (wt %)	85		ESD 98
13	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	20,000		ESD 98
	Complex modulus (mPa)	150,000		ESD 98
	Water content (wt %)	77		ESD 98
21	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	21,000		ESD 98
	Complex modulus (mPa)	740,000		ESD 98
	Water content (wt %)	73		ESD 98
31	Visual stability	stable		ESD 98
	Viscosity (mPa·s)	46,000		ESD 98
	Complex modulus (mPa)	190,000		ESD 98
	Water content (wt %)	65		ESD 98
<b>Chemical Dispersibility (volume %)</b>				
<u>Evaporation (weight %)</u>				
0	Corexit 9500	23		ESD 98
	Corexit 9527	10		ESD 91
	Dasic LTS	10		ESD 91
	Enersperse 700	10		ESD 91
13	Corexit 9500	17		ESD 98
21		7		ESD 98
30		6		ESD 98

## Arabian Medium

		Data	Notes	Reference ID
<b>Hydrocarbon Groups (weight %)</b>				
<u>Evaporation (weight %)</u>				
0	Saturates	54		ESD 95
	Aromatics	32		ESD 95
	Resins	7		ESD 95
	Asphaltenes	6		ESD 95
	Waxes	6		ESD 98
13	Saturates	42		ESD 95
	Aromatics	44		ESD 95
	Resins	7		ESD 95
	Asphaltenes	7		ESD 95
	Waxes	5		ESD 97
21	Saturates	40		ESD 95
	Aromatics	46		ESD 95
	Resins	8		ESD 95
	Asphaltenes	7		ESD 95
	Waxes	5		ESD 97
31	Saturates	33		ESD 94
	Aromatics	54		ESD 94
	Resins	9		ESD 94
	Asphaltenes	7		ESD 94
	Waxes	5		ESD 97
<b>Adhesion (g/m<sup>2</sup>)</b>				
<u>Evaporation (weight %)</u>				
0		26	<i>SD = 5</i>	ESD 95
13		28	<i>SD = 2</i>	ESD 95
21		39	<i>SD = 5</i>	ESD 95
31		65	<i>SD = 5</i>	ESD 95

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Volatile Organic Compounds (ppm)</b>				
<u>Evaporation (weight %)</u>				
0	Benzene	310		ESD 94
	Toluene	1,480		ESD 94
	Ethylbenzene	850		ESD 94
	Xylenes	2,910		ESD 94
	C3-benzenes	5,780		ESD 94
	Total BTEX	5,560		ESD 94
	Total VOCs	11,350		ESD 94
13	Benzene	130		ESD 94
	Toluene	870		ESD 94
	Ethylbenzene	690		ESD 94
	Xylenes	2,250		ESD 94
	C3-benzenes	5,410		ESD 94
	Total BTEX	3,940		ESD 94
	Total VOCs	9,350		ESD 94
21	Benzene	0		ESD 94
	Toluene	0		ESD 94
	Ethylbenzene	50		ESD 94
	Xylenes	230		ESD 94
	C3-benzenes	2,240		ESD 94
	Total BTEX	280		ESD 94
	Total VOCs	2,520		ESD 94
31	Benzene	0		ESD 94
	Toluene	0		ESD 94
	Ethylbenzene	0		ESD 94
	Xylenes	0		ESD 94
	C3-benzenes	0		ESD 94
	Total BTEX	0		ESD 94
	Total VOCs	0		ESD 94

**Surface Tension (mN/m or dynes/cm)**

<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>		
0	0	27.8	ESD 94
	15	27.0	ESD 94
	20	25.6	ESD 93
13	0	29.8	ESD 94
	15	28.7	ESD 94
21	0	33.6	ESD 94
	15	29.9	ESD 94
31	0	DNF	ESD 94
	15	31.3	ESD 94

**Arabian Medium**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	18.6		ESD 94
	15	20.8		ESD 94
	20	22.1		ESD 93
13	0	22.2		ESD 94
	15	24.4		ESD 94
21	0	NM		ESD 94
	15	23.3		ESD 94
31	0	DNF		ESD 94
	15	20.0		ESD 94
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	17.9		ESD 94
	15	21.7		ESD 94
	20	23.3		ESD 93
13	0	21.7		ESD 94
	15	25.4		ESD 94
21	0	NM		ESD 94
	15	25.3		ESD 94
31	0	DNF		ESD 94
	15	23.0		ESD 94

		Data	Notes	Reference ID
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
0	80	1		ESD 94
	100	2		ESD 94
	120	8		ESD 94
	140	11		ESD 94
	160	13		ESD 94
	180	16		ESD 94
	200	18		ESD 94
	250	26		ESD 94
	300	33		ESD 94
	350	42		ESD 94
	400	49		ESD 94
	450	57		ESD 94
	500	64		ESD 94
	550	71		ESD 94
	600	76		ESD 94
	650	82		ESD 94
	700	86		ESD 94
13	120	1		ESD 95
	140	3		ESD 95
	160	5		ESD 95
	180	8		ESD 95
	200	11		ESD 95
	250	20		ESD 95
	300	29		ESD 95
	350	38		ESD 95
	400	47		ESD 95
	450	55		ESD 95
	500	63		ESD 95
	550	70		ESD 95
	600	77		ESD 95
21	650	82		ESD 95
	700	87		ESD 95
	160	1		ESD 95
	180	2		ESD 95
	200	4		ESD 95
	250	13		ESD 95
	300	22		ESD 95
	350	32		ESD 95
	400	42		ESD 95
	450	51		ESD 95
	500	59		ESD 95

## Arabian Medium

		Data	Notes	Reference ID
<b>Boiling Point Distribution (weight %)</b>				
<u>Evaporation (weight %)</u>	<u>Boiling Point (°C)</u>			
21	550	67		ESD 95
	600	74		ESD 95
	650	81		ESD 95
	700	86		ESD 95
31	250	2		ESD 95
	300	11		ESD 95
	350	23		ESD 95
	400	34		ESD 95
	450	44		ESD 95
	500	54		ESD 95
	550	63		ESD 95
	600	71		ESD 95
	650	78		ESD 95
	700	84		ESD 95
<b>Yield on Crude (volume %)</b>				
	<u>Boiling Range (°C)</u>			
	Light naphtha (20-100)	9		OGJ 99
	Heavy naphtha (100-150)	8		OGJ 99
	Kerosene (150-235)	15		OGJ 99
	Light gas oil (235-343)	18		OGJ 99
	Heavy gas oil (343-565)	31		OGJ 99
	Residual oil (>565)	19		OGJ 99
<b>Metals (ppm)</b>				
	Barium	0.3		Cao 92
	Chromium	3		Cao 92
	Copper	2		Cao 92
	Iron	7		Cao 92
	Lead	5		Cao 92
	Magnesium	15		Cao 92
	Molybdenum	0.6		Cao 92
	Nickel	10		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	46		Cao 92
	Zinc	2		Cao 92
<b>Aqueous Solubility (mg/L)</b>				
	Room temperature	18	(a)	ESD 93
(a) distilled water				
<b>Acute Toxicity of Water Soluble Fraction (mg/L)</b>				
	<u>Test Organism</u>			
48h LC50	Daphnia magna	7	(a)	Harris 94
(a) results based on GC headspace analysis				

	Data	Notes	Reference ID
<b>Origin:</b> Indonesia			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
<b>API Gravity</b>	35.2		OGJ 99
<b>Sulphur (weight %)</b>	0.11		OGJ 99
<b>Pour Point (°C)</b>	24		OGJ 99
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>			
Temperature (°C)			
38	4		OGJ 99
<b>Yield on Crude (volume %)</b>			
Boiling Range (°C)			
C1-C4	3		OGJ 99
Naphtha (C5-66)	5		OGJ 99
Heavy naphtha (66-193)	27		OGJ 99
Distillate (193-271)	16		OGJ 99
Distillate (271-343)	14		OGJ 99
Blended gas oil (343-449)	17		OGJ 99
Residue (>343)	35		OGJ 99
Vacuum residue (>385)	6		OGJ 99
<b>Metals (ppm)</b>			
Nickel	3		OGJ 99
Vanadium	< 1		OGJ 99
<b>Other Elements (weight %)</b>			
Nitrogen	0.03		OGJ 99

## Argyll

		Data	Notes	Reference ID
<b>Origin:</b> North Sea, UK				
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".				
<b>Density (g/mL)</b>				
	<u>Temperature (°C)</u>			
	15	0.8349		OGJ 99
<b>Pour Point (°C)</b>				
		6		OGJ 99
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>				
	<u>Temperature (°C)</u>			
	40	5		OGJ 99
<b>Yield on Crude (volume %)</b>				
	<u>Boiling Range (°C)</u>			
	Naphtha (IBP-175)	25		OGJ 99
	Kerosene (175-260)	15		OGJ 99
	Gas oil (260-360)	19		OGJ 99
	Residue (>360)	41		OGJ 99



	Data	Notes	Reference ID
<b>Origin:</b> Indonesia			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
<b>API Gravity</b>	31.8		OGJ 99
<b>Sulphur (weight %)</b>	0.20		OGJ 99
<b>Pour Point (°C)</b>	38		OGJ 99
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>			
Temperature (°C)			
38	13		OGJ 99
<b>Yield on Crude (volume %)</b>			
Boiling Range (°C)			
Naphtha (C5-110)	11		OGJ 99
Naphtha (110-168)	11		OGJ 99
Distillate (168-271)	17		OGJ 99
Distillate (271-343)	15		OGJ 99
Blended gas oil (343-449)	15		OGJ 99
Residue (>343)	46		OGJ 99
<b>Metals (ppm)</b>			
Nickel	3		OGJ 99
Vanadium	0.9		OGJ 99
<b>Other Elements (weight %)</b>			
Nitrogen	0.05		OGJ 99

**Ashtart**

	<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Tunisia			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
<b>API Gravity</b>	29.0		OGJ 99
<b>Sulphur (weight %)</b>	1.00		OGJ 99
<b>Reid Vapour Pressure (kPa)</b>	13		OGJ 99
<b>Pour Point (°C)</b>	9		OGJ 99
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>			
	<u>Temperature (°C)</u>		
	20	24	OGJ 99
<b>Hydrocarbon Groups (weight %)</b>			
	Asphaltenes	2	OGJ 99
	Saturates	11	OGJ 99
<b>Yield on Crude (volume %)</b>			
	<u>Boiling Range (°C)</u>		
	C1-C5	1	OGJ 99
	Light naphtha (15-100)	6	OGJ 99
	Heavy naphtha (100-145)	6	OGJ 99
	Kerosene (180-225)	7	OGJ 99
	Gas oil (145-350)	36	OGJ 99
	Residue (>350)	52	OGJ 99
<b>Metals (ppm)</b>			
	Nickel	9	OGJ 99
	Vanadium	20	OGJ 99

Asphalt Charged Stock				
	Data	Notes	Reference ID	
API Gravity	15.8		ESD 93	
Sulphur (weight %)	2.60		ESD 93	
Flash Point (°C)	> 95		ESD 93	
Density (g/mL)				
	Temperature (°C)			
	0	0.9580	(a)	ESD 93
	15	0.9600	(a)	ESD 93
	38	1.0067		ESD 93
(a) measured with a pycnometer				
Pour Point (°C)	> 50		ESD 93	
Dynamic Viscosity (mPa·s or cP)				
	Temperature (°C)			
	0	NM		ESD 93
	15	NM		ESD 93
	38	3,698,000		ESD 93
Hydrocarbon Groups (weight %)				
	Asphaltenes	17		ESD 93
	Waxes	20		ESD 93
Adhesion (g/m²)	1,534	(single result)	ESD 96	
Surface Tension (mN/m or dynes/cm)				
	Temperature (°C)			
	0	DNF		ESD 94
	15	DNF		ESD 93
Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)				
	Temperature (°C)			
	0	DNF		ESD 94
	15	DNF		ESD 93
Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)				
	Temperature (°C)			
	0	DNF		ESD 94
	15	DNF		ESD 93

**Asphalt Primer**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
Shell special asphalt primer.				
<b>API Gravity</b>		18.6		EETD 85
<b>Flash Point (°C)</b>		16		EETD 85
<b>Density (g/mL)</b>				
	<u>Temperature (°C)</u>			
	0	0.9526		EETD 85
	15	0.9421		EETD 85
<b>Pour Point (°C)</b>		-17		EETD 85
<b>Dynamic Viscosity (mPa·s or cP)</b>				
	<u>Temperature (°C)</u>			
	0	12,700		EETD 85
	15	3,280		EETD 85
<b>Surface Tension (mN/m or dynes/cm)</b>				
	<u>Temperature (°C)</u>			
	0	28.8		EETD 85
	15	28.3		EETD 85
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
	<u>Temperature (°C)</u>			
	0	26.8		EETD 85
	15	24.7		EETD 85
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
	<u>Temperature (°C)</u>			
	0	28.9		EETD 85
	15	27.8		EETD 85

**Athabasca Bitumen**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Alberta, Canada				
Syncrude Canada Ltd. coker feed bitumen produced by the hot water process.				ARC 87
<b>API Gravity</b>		7.7 to 9.0		ARC 87
<b>Sulphur (weight %)</b>		4.41 to 5.44		ARC 87
<b>Density (g/mL)</b>				
	<u>Temperature (°C)</u>			
	Unknown	1.006 to 1.016		ARC 87
<b>Dynamic Viscosity (mPa·s or cP)</b>				
	<u>Temperature (°C)</u>			
	15	19,000 to >700,000		ARC 87
	25	5,320 to 300,000		ARC 87
	60	3,630 to 4,350		ARC 87
	100	60 to 303		ARC 87
<b>Hydrocarbon Groups (weight %)</b>				
	Asphaltenes	4 to 5		ARC 87
<b>Metals (ppm)</b>				
	Nickel	69 to 85.2		ARC 87
	Vanadium	81 to 218		ARC 87
<b>Other Elements (weight %)</b>				
	Hydrogen	10 to 11		ARC 87
	Nitrogen	0.44 to 0.92		ARC 87
	Oxygen	0.76 to 1.38		ARC 87

**Atkinson**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> Beaufort Sea, Canada				
<b>API Gravity</b>		23.7		EETD 84
<b>Sulphur (weight %)</b>				
<u>Evaporation (volume %)</u>				
0		0.86		EETD 86
19		1.07		EETD 89
<b>Reid Vapour Pressure (kPa)</b>		6		ESD 91
<b>Density (g/mL)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	0.9219		EETD 85
	15	0.9110		EETD 84
19	0	0.9476		EETD 89
	15	0.9438		EETD 89
<b>Pour Point (°C)</b>		-46		ESD 97
<b>Dynamic Viscosity (mPa·s or cP)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	15	65		EETD 89
19		533		EETD 89
<b>Hydrocarbon Groups (weight %)</b>				
	Saturates	48		ESD 95
	Aromatics	36		ESD 95
	Resins	14		ESD 95
	Asphaltenes	3		ESD 95
	Waxes	1		ESD 98
<b>Volatile Organic Compounds (ppm)</b>				
	Benzene	100		ESD 94
	Toluene	200		ESD 94
	Ethylbenzene	100		ESD 94
	Xylenes	500		ESD 94
	Total BTEX	900		ESD 94
	Total VOCs	2,360		ESD 94
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	30.5		EETD 85
	15	28.8		EETD 85
19	0	31.2		EETD 89
	15	26.6		EETD 89

		Data	Notes	Reference ID
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	18.7		EETD 85
	15	17.9		EETD 85
19	0	7.1		EETD 89
	15	10.9		EETD 89
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	24.2		EETD 85
	15	23.2		EETD 85
19	0	22.3		EETD 89
	15	21.2		EETD 89
<b>Distillation (°C)</b>				
	<u>Total Distillate (volume %)</u>			
	IBP	58		EETD 85
	5	106		EETD 85
	10	123		EETD 85
	15	129		EETD 85
	17	201		EETD 85

**Atkinson**

		Data	Notes	Reference ID
Metals (ppm)				
Evaporation (volume %)				
0	Barium	0.6		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	7		Cao 92
	Lead	4		Cao 92
	Magnesium	5		Cao 92
	Molybdenum	0.6		Cao 92
	Nickel	2		Cao 92
	Titanium	0.6		Cao 92
	Vanadium	9		Cao 92
	Zinc	1		Cao 92
19	Barium	0.6		Cao 92
	Chromium	< 2		Cao 92
	Copper	0.6		Cao 92
	Iron	66		Cao 92
	Lead	4		Cao 92
	Magnesium	5		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	3		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	11		Cao 92
	Zinc	3		Cao 92
Aqueous Solubility (mg/L)				
	Temperature (°C)			
	20 (approx.)	2	(a)	MacLean 89
	22	3	(a)	Suntio 86
	20 (approx.)	2	(b)	MacLean 89
(a) fresh water; (b) salt water				
Acute Toxicity of Water Soluble Fraction (mg/L)				
	Test Organism			
24h EC50	Artemia spp.	> 2	(a)	MacLean 89
		> 3	(b)	EETD 89
48h EC50	Daphnia magna	0.6	(a)	MacLean 89
		0.8	(b)	EETD 89
24h LC50	Artemia spp.	> 2	(a)	MacLean 89
		> 3	(b)	EETD 89
48h LC50	Daphnia magna	> 2	(a)	MacLean 89
		> 3	(b)	EETD 89
(a) results based on fluorescence spectroscopy; (b) results based on GC purge-and-trap analysis				



	Data	Notes	Reference ID
<b>Origin:</b> Indonesia			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
<b>API Gravity</b>	42.3		OGJ 99
<b>Sulphur (weight %)</b>	0.09		OGJ 99
<b>Reid Vapour Pressure (kPa)</b>	47		OGJ 99
<b>Pour Point (°C)</b>	-23		OGJ 99
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>			
	<u>Temperature (°C)</u>		
	21	2	OGJ 99
<b>Hydrocarbon Groups (weight %)</b>			
	Waxes	4	OGJ 99
<b>Yield on Crude (volume %)</b>			
	<u>Boiling Range (°C)</u>		
	Naphtha (C5-100)	15	OGJ 99
	Naphtha (100-150)	18	OGJ 99
	Kerosene (150-250)	30	OGJ 99
	Gas oil (250-350)	25	OGJ 99
	Fuel oil (>350)	13	OGJ 99

**Auk**

	<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Origin:</b> North Sea, UK			
Data from OGJ 99 were originally published in 1983 as part of a series entitled "Guide to Export Crudes for the '80s".			
<b>API Gravity</b>	37.2		OGJ 99
<b>Sulphur (weight %)</b>	0.45		OGJ 99
<b>Reid Vapour Pressure (kPa)</b>	41		OGJ 99
<b>Hydrogen Sulphide (ppm)</b>	< 1		OGJ 99
<b>Density (g/mL)</b>			
	<u>Temperature (°C)</u>		
	15	0.8383	OGJ 99
<b>Pour Point (°C)</b>	9		OGJ 99
<b>Kinematic Viscosity (mm<sup>2</sup>/s or cSt)</b>			
	<u>Temperature (°C)</u>		
	40	4	OGJ 99
<b>Hydrocarbon Groups (weight %)</b>			
	Waxes	7	OGJ 99
<b>Yield on Crude (volume %)</b>			
	<u>Boiling Range (°C)</u>		
	C1-C5	2	OGJ 99
	Gasoline (C5-85)	8	OGJ 99
	Naphtha (85-165)	16	OGJ 99
	Kerosene (165-235)	13	OGJ 99
	Gas oil (235-300)	13	OGJ 99
	Gas oil (300-350)	9	OGJ 99
	Residue (>350)	39	OGJ 99

		Data	Notes	Reference ID	
<b>Origin:</b> Newfoundland, Canada					
<b>API Gravity</b>		36.0		EETD 84	
<b>Equation(s) for Predicting Evaporation</b>					
Avalon: %Ev = (1.41 + 0.045T)ln(t) Avalon J-34: %Ev = (1.58 + 0.045T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)				ESD 96	
<b>Sulphur (weight %)</b>					
<u>Evaporation (volume %)</u>					
0		0.71			EETD 86
6		0.86		EETD 86	
<b>Flash Point (°C)</b>					
<u>Evaporation (volume %)</u>					
0		14		EETD 84	
9		33		EETD 84	
20		66		EETD 84	
<b>Reid Vapour Pressure (kPa)</b>		64		EETD 84	
<b>Density (g/mL)</b>					
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>				
0	0	0.8510		EETD 84	
	10	0.8800	(a)	Buist 89	
	15	0.8440		EETD 84	
	20	0.8710	(a)	Buist 89	
	30	0.8640	(a)	Buist 89	
9	0	0.8670		EETD 84	
	10	0.8560		EETD 84	
20	0	0.8970		EETD 84	
	10	0.8860		EETD 84	
(a) sample J-34					
<b>Pour Point (°C)</b>					
<u>Evaporation (volume %)</u>					
0		12		EETD 84	
		18	(a)	Buist 89	
9		21		EETD 84	
20		24		EETD 84	
(a) sample J-34					

**Avalon**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Dynamic Viscosity (mPa·s or cP)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	575		EETD 84
	15	11		EETD 84
		141	(a)	ESD 94
	20	220	(a)(b)	Buist 89
	25	40	(a)(b)	Buist 89
9	0	> 1,000		EETD 84
	15	83		EETD 84
20	0	> 5,200		EETD 84
	15	438		EETD 84
<i>(a) sample J-34; (b) shear rate = 10/s</i>				
<b>Chemical Dispersibility (volume %)</b>				
	Corexit 9527	10		EETD 89
		20	(a)	EETD 89
	Dasic LTS	5	(a)	EETD 89
	Enersperse 700	5	(a)	EETD 89
<i>(a) sample J-34</i>				
<b>Hydrocarbon Groups (weight %)</b>				
	Saturates	83		EETD 86
	Aromatics	13		EETD 86
	Resins	2		EETD 86
	Asphaltenes	3		EETD 86
		3	(a)	Buist 89
		2	(b)	EETD 89
		3	(a)	ESD 91
	Waxes	4	(a)	Buist 89
		13	(a)	ESD 91
<i>(a) sample J-34; (b) sample B-27</i>				
<b>Volatile Organic Compounds (ppm)</b>				
Sample J-34				
	Benzene	880		ESD 94
	Toluene	2,640		ESD 94
	Ethylbenzene	930		ESD 94
	Xylenes	3,260		ESD 94
	C3-benzenes	4,870		ESD 94
	Total BTEX	7,720		ESD 94
	Total VOCs	12,590		ESD 94

		Data	Notes	Reference ID
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	28.0		EETD 84
	15	26.4		EETD 84
9	0	28.4		EETD 84
	15	25.8		EETD 84
20	0	NM		EETD 84
	15	27.9		EETD 84
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (volume %)</u>	<u>Temperature (°C)</u>			
0	0	25.2		EETD 84
	15	20.5		EETD 84
9	0	33.2		EETD 84
	15	25.6		EETD 84
20	0	NM		EETD 84
	15	26.7		EETD 84
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
	<u>Temperature (°C)</u>			
	0	49.4		EETD 85
	15	29.1		EETD 85
<b>Boiling Point Distribution (weight %)</b>				
Sample J-34				
	<u>Boiling Point (°C)</u>			
	60	1		ESD 94
	80	2		ESD 94
	100	4		ESD 94
	120	6		ESD 94
	140	7		ESD 94
	160	10		ESD 94
	180	13		ESD 94
	200	15		ESD 94
	250	23		ESD 94
	300	31		ESD 94
	350	40		ESD 94
	400	48		ESD 94
	450	58		ESD 94
	500	66		ESD 94
	550	73		ESD 94
	600	80		ESD 94
	650	86		ESD 94
	700	91		ESD 94

		Data	Notes	Reference ID
<b>Metals (ppm)</b>				
Sample J-34	Barium	5		Cao 92
	Chromium	< 2		Cao 92
	Copper	1		Cao 92
	Iron	13		Cao 92
	Lead	< 3		Cao 92
	Magnesium	4		Cao 92
	Molybdenum	0.8		Cao 92
	Nickel	2		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	2		Cao 92
	Zinc	< 0.6		Cao 92
Sample B-27	Barium	2		Cao 92
	Chromium	< 2		Cao 92
	Copper	< 0.6		Cao 92
	Iron	5		Cao 92
	Lead	< 3		Cao 92
	Magnesium	5		Cao 92
	Molybdenum	2		Cao 92
	Nickel	< 1		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	< 0.6		Cao 92
<b>Aqueous Solubility (mg/L)</b>				
	Room temperature	20	(a)	ESD 91
(a) fresh water				

	Data	Notes	Reference ID
<b>Synonyms:</b> Avgas 100			
Blend of catalytically cracked naphthas, alkylates, and isopentanes. Operational fuel for most commercial piston engine aircraft.			
For additional fuel specifications refer to ASTM D910.			
<b>Colour</b>	Green		EETD 89
<b>API Gravity</b>	66.2		EETD 89
<b>Sulphur (weight %)</b>	0.05		EETD 89
<b>Density (g/mL)</b>			
	<u>Temperature (°C)</u>		
	0	0.7277	EETD 89
	15	0.7151	EETD 89
<b>Dynamic Viscosity (mPa·s or cP)</b>			
	<u>Temperature (°C)</u>		
	0	1	EETD 89
	15	1	EETD 89
<b>Surface Tension (mN/m or dynes/cm)</b>			
	<u>Temperature (°C)</u>		
	0	20.5	EETD 89
	15	20.0	EETD 89
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>			
	<u>Temperature (°C)</u>		
	0	40.0	EETD 89
	15	42.2	EETD 89
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>			
	<u>Temperature (°C)</u>		
	0	42.5	EETD 89
	15	42.2	EETD 89

## Aviation Gasoline 100

		Data	Notes	Reference ID
<b>Distillation (°C)</b>				
	<u>Total Distillate (volume %)</u>			
	IBP	25		EETD 89
	10	80		EETD 89
	20	97		EETD 89
	30	102		EETD 89
	40	105		EETD 89
	50	106		EETD 89
	60	107		EETD 89
	70	109		EETD 89
	80	112		EETD 89
	90	119		EETD 89
<b>Metals (ppm)</b>				
	Barium	< 0.3		Cao 92
	Chromium	1		Cao 92
	Copper	< 0.6		Cao 92
	Iron	< 3		Cao 92
	Lead	795		Cao 92
	Magnesium	8		Cao 92
	Molybdenum	< 0.6		Cao 92
	Nickel	< 1		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	< 0.6		Cao 92
<b>Aqueous Solubility (mg/L)</b>				
	Room temperature	100	(a)	ESD 91
<i>(a) fresh water</i>				
<b>Acute Toxicity of Water Soluble Fraction (mg/L)</b>				
	<u>Test Organism</u>			
48h LC50	Daphnia magna	28	(a)	Harris 94
<i>(a) results based on GC purge-and-trap analysis</i>				
<b>Threshold Limit Values (ppm)</b>				
	TWA	300		ACGIH 99
	STEL	500		ACGIH 99



	Data	Notes	Reference ID
<b>Synonyms:</b> Avgas 100 LL			
Blend of catalytically cracked naphthas, alkylate, and isopentanes. Operational fuel for most commercial piston engine aircraft. Similar to grade 100 except with lower lead-additive content.			
The sample analyzed by ESD was collected in the summer of 1998, at the MacDonald-Cartier International Airport in Ottawa, Ontario. The sample was >99.9% evaporated after four hours, using the standard rotary evaporation method.			
Data from Shell 1999 were taken from MSDS Number 142-012.			
For additional fuel specifications refer to ASTM D910.			
<b>Colour</b>			
	Blue		Shell 99a
<b>API Gravity</b>			
	66.6		ESD 98
<b>Equation(s) for Predicting Evaporation</b>			
In(%Ev) = (0.5 + 0.045T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			ESD 98
<b>Sulphur (weight %)</b>			
<u>Evaporation (weight %)</u>			
0	0.06		ESD 99
33	0.08		ESD 99
60	0.12		ESD 99
<b>Water Content (weight %)</b>			
<u>Evaporation (weight %)</u>			
0	0.1		ESD 99
33	< 0.1		ESD 99
60	< 0.1		ESD 99
<b>Flash Point (°C)</b>			
<u>Evaporation (weight %)</u>			
0	-27		ESD 98
	< 1		Shell 99a
33	0		ESD 98
60	0		ESD 98
<b>Flammability Limits in Air (volume %)</b>			
	1.4 to 7.6		Shell 99a
<b>Reid Vapour Pressure (kPa)</b>			
	> 38		Shell 99a

## Aviation Gasoline 100LL

		Data	Notes	Reference ID
<b>Density (g/mL)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	0.7270		ESD 98
	15	0.7143		ESD 98
	25	0.7060		ESD 98
33	0	0.7383		ESD 98
	15	0.7258		ESD 98
	25	0.7178		ESD 98
60	0	0.7415		ESD 98
	15	0.7292		ESD 98
	25	0.7210		ESD 98
<b>Pour Point (°C)</b>				
<u>Evaporation (weight %)</u>				
0		< -75		ESD 98
		< -60		Shell 99a
33		< -75		ESD 98
60		< -75		ESD 98
<b>Dynamic Viscosity (mPa s or cP)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	1		ESD 98
	15	1		ESD 98
	25	1		ESD 98
33	0	1		ESD 98
	15	1		ESD 98
	25	1		ESD 98
60	0	1		ESD 98
	15	1		ESD 98
	25	1		ESD 98
<b>Adhesion (g/m²)</b>				
<u>Evaporation (weight %)</u>				
0		1	<i>SD = 1</i>	ESD 98
33		1	<i>SD = 1</i>	ESD 98
60		1	<i>SD = 1</i>	ESD 98

		Data	Notes	Reference ID
<b>Volatile Organic Compounds (ppm)</b>				
<u>Evaporation (weight %)</u>				
0	Benzene	452		ESD 99
	Toluene	69,910		ESD 99
	Ethylbenzene	358		ESD 99
	Xylenes	1,509		ESD 99
	C3-benzenes	1,404		ESD 99
	Total BTEX	72,229		ESD 99
	Total VOCs	73,633		ESD 99
33	Benzene	128		ESD 99
	Toluene	52,719		ESD 99
	Ethylbenzene	352		ESD 99
	Xylenes	1,538		ESD 99
	C3-benzenes	1,687		ESD 99
	Total BTEX	54,737		ESD 99
	Total VOCs	56,424		ESD 99
<b>Surface Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	20.1		ESD 00
	15	20.1		ESD 98
	25	19.0		ESD 00
33	0	21.0		ESD 00
	15	20.6		ESD 98
	25	19.5		ESD 00
60	0	21.0		ESD 00
	15	21.0		ESD 98
	25	19.6		ESD 00
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	23.3		ESD 00
	15	24.0		ESD 98
	25	23.1		ESD 00
33	0	21.6		ESD 00
	15	23.4		ESD 98
	25	23.5		ESD 00
60	0	19.3		ESD 00
	15	21.9		ESD 98
	25	21.0		ESD 00

## Aviation Gasoline 100LL

		Data	Notes	Reference ID
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>				
<u>Evaporation (weight %)</u>	<u>Temperature (°C)</u>			
0	0	24.9		ESD 00
	15	28.8		ESD 98
	25	26.5		ESD 00
33	0	24.5		ESD 00
	15	30.0		ESD 98
	25	24.8		ESD 00
60	0	21.0		ESD 00
	15	26.6		ESD 98
	25	23.6		ESD 00
<b>Boiling Range (°C)</b>				
		75 to 170		Shell 99a
<b>Threshold Limit Values (ppm)</b>				
TWA		300		ACGIH 99
STEL		500		ACGIH 99

	Data	Notes	Reference ID
<b>Synonyms:</b> Avgas 80			
Blend of catalytically cracked and straight-run naphthas, alkylates, and isopentanes. Operational fuel for many small piston engine aircraft.			
For additional fuel specifications refer to ASTM D910.			
<b>Colour</b>			
	Red		EETD 89
<b>API Gravity</b>			
	71.8		EETD 89
<b>Equation(s) for Predicting Evaporation</b>			
%Ev = (15.4 + 0.045T)ln(t) Where %Ev = weight percent evaporated; T = surface temperature (°C); t = time (minutes)			
			ESD 96
<b>Sulphur (weight %)</b>			
	0.04		EETD 89
<b>Density (g/mL)</b>			
	Temperature (°C)		
	0	0.7078	EETD 89
	15	0.6953	EETD 89
<b>Dynamic Viscosity (mPa·s or cP)</b>			
	Temperature (°C)		
	0	1	EETD 89
	15	1	EETD 89
<b>Surface Tension (mN/m or dynes/cm)</b>			
	Temperature (°C)		
	0	19.7	EETD 89
	15	19.0	EETD 89
<b>Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)</b>			
	Temperature (°C)		
	0	32.1	EETD 89
	15	33.1	EETD 89
<b>Oil/Fresh Water Interfacial Tension (mN/m or dynes/cm)</b>			
	Temperature (°C)		
	0	33.1	EETD 89
	15	31.7	EETD 89

**Aviation Gasoline 80**

		<b>Data</b>	<b>Notes</b>	<b>Reference ID</b>
<b>Distillation (°C)</b>				
	<u>Total Distillate (volume %)</u>			
	IBP	26		EETD 89
	10	64		EETD 89
	20	77		EETD 89
	30	87		EETD 89
	40	95		EETD 89
	50	101		EETD 89
	60	105		EETD 89
	70	108		EETD 89
	80	111		EETD 89
	90	117		EETD 89
<b>Metals (ppm)</b>				
	Barium	< 0.3		Cao 92
	Chromium	< 2		Cao 92
	Copper	1		Cao 92
	Iron	< 3		Cao 92
	Lead	175		Cao 92
	Magnesium	8		Cao 92
	Molybdenum	0.6		Cao 92
	Nickel	< 1		Cao 92
	Titanium	< 0.6		Cao 92
	Vanadium	< 0.6		Cao 92
	Zinc	< 0.6		Cao 92
<b>Acute Toxicity of Water Soluble Fraction (mg/L)</b>				
	<u>Test Organism</u>			
48h LC50	Daphnia magna	15	(a)	Harris 94
(a) results based on GC purge-and-trap analysis				