



Certificate of Analysis

Vessel / Object:		Job No:	654-22-00391
Location:	Fujairah / Port of Fujairah (United Arab Emirates)	Date Sampled:	09 Mar 2022
Job Type:	Sample	Date Tested:	22 Mar 2022
Product Grade:	HFO	Version:	2 / 24 Mar 2022 13:10
Client Reference:	Fujairah Court Expert		

<u>Sample</u>	<u>Sample ID, Type & Description</u>
654-22-00391-001	HT 1 Running Sample

<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9208	kg/l

<u>Sample</u>	<u>Sample ID, Type & Description</u>
654-22-00391-004	HT 2 Running Sample

<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9125	kg/l
ASTM D93B	Flash Point (Fuel Oil)	79.0	°C
ASTM D95	Water % (V/V)	0.20	% v/v

<u>Sample</u>	<u>Sample ID, Type & Description</u>
654-22-00391-007	HT 3 Running Sample

<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9104	kg/l
ASTM D93B	Flash Point (Fuel Oil)	76.0	°C
ASTM D95	Water % (V/V)	0.15	% v/v

<u>Sample</u>	<u>Sample ID, Type & Description</u>
654-22-00391-010	HT 4 Running Sample

<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9290	kg/l

<u>Sample</u>	<u>Sample ID, Type & Description</u>
654-22-00391-013	HT 5 Running Sample

<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9262	kg/l

<u>Sample</u>	<u>Sample ID, Type & Description</u>
654-22-00391-016	HT 6 Running Sample

<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9337	kg/l
ASTM D95	Water % (V/V)	0.20	% v/v

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Job Type:	Sample	Date Tested:	22 Mar 2022
Product Grade:	HFO	Version:	2 / 24 Mar 2022 13:10
Client Reference:	Fujairah Court Expert		

<u>Sample</u>	<u>Sample ID, Type & Description</u>		
654-22-00391-019	HT 7 Running Sample		
<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9168	kg/l
ASTM D93B	Flash Point (Fuel Oil)	72.0	°C
ASTM D95	Water % (V/V)	0.35	% v/v

<u>Sample</u>	<u>Sample ID, Type & Description</u>		
654-22-00391-022	HT 8 Running Sample		
<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9262	kg/l

<u>Sample</u>	<u>Sample ID, Type & Description</u>		
654-22-00391-025	HT 9 Running Sample		
<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9240	kg/l

<u>Sample</u>	<u>Sample ID, Type & Description</u>		
654-22-00391-028	HT 10 Running Sample		
<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9256	kg/l



Certificate of Analysis

Vessel / Object:		Job No:	654-22-00391
Location:	Fujairah / Port of Fujairah (United Arab Emirates)	Date Sampled:	09 Mar 2022
Job Type:	Sample	Date Tested:	22 Mar 2022
Product Grade:	#6 Fuel Oil	Version:	2 / 24 Mar 2022 13:10
Client Reference:	Fujairah Court Expert		

<u>Sample</u>	<u>Sample ID, Type & Description</u>		
654-22-00391-031	X22 Running Sample		
<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9079	kg/l
ASTM D93B	Flash Point (Fuel Oil)	< 40.0	°C
ASTM D95	Water % (V/V)	4.70	% v/v

<u>Sample</u>	<u>Sample ID, Type & Description</u>		
654-22-00391-035	VT 1 Running Sample		
<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9102	kg/l
ASTM D93B	Flash Point (Fuel Oil)	58.0	°C
ASTM D95	Water % (V/V)	0.90	% v/v

<u>Sample</u>	<u>Sample ID, Type & Description</u>		
654-22-00391-040	V12 Dead Bottom Sample		
<u>Method</u>	<u>Test</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C	0.9467	kg/l
ASTM D95	Water % (V/V)	4.00	% v/v

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Certificate of Analysis

Vessel / Object:		Job No:	654-22-00391
Location:	Fujairah / Port of Fujairah (United Arab Emirates)	Date Sampled:	
Job Type:	Sample	Date Tested:	17 Mar 2022
Product Grade:	Fuel Oil	Version:	1 / 17 Mar 2022 16:23
Client Reference:	Fujairah Court Expert		

Sample
654-22-00391-065

Sample ID, Type & Description
Shore tanks X-22, VT-1, HT-3, HT-2, & HT-7. Volumetric Composite Sample

Method	Test	Min	Max	Result	Units
IP 365	Density @15°C		0.9910	0.9109	kg/l
ASTM D445	Kinematic Viscosity @122°F/50°C		380	21.91	cSt
ASTM D4294	Total Sulfur Content		3.50	1.19	%wt
ASTM D93B	Flash Point	60		46.0 *	°C
ASTM D97	Pour Point		30	-3	°C
ASTM D95	Water % (V/V)		0.50	2.35 *	% v/v

Notes: 1.The report shall not be reproduced except in full without the approval of the laboratory.
2.The test results are only applicable to the sample(s) referred above.

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Jithesh Puthumana
Laboratory Chemist I Fujairah Branch

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Certificate of Analysis

Vessel / Object:		Job No:	654-22-00391
Location:	Fujairah / Port of Fujairah (United Arab Emirates)	Date Sampled:	
Job Type:	Sample	Date Tested:	17 Mar 2022
Product Grade:	Fuel Oil	Version:	1 / 17 Mar 2022 16:47
Client Reference:	Fujairah Court Expert		

Sample
654-22-00391-066

Sample ID, Type & Description
Shore tanks HT-1, HT-9, HT-10, HT-5, HT-8, & HT-4. Volumetric Composite Sample

Method	Test	Mn	Max	Result	Units
IP 365	Density @15°C		0.9910	0.9258	kg/l
ASTM D445	Kinematic Viscosity @122°F/50°C		380	43.29	cSt
ASTM D4294	Total Sulfur Content	60	3.50	1.48	%wt
ASTM D93B	Flash Point			120.0	°C
ASTM D97	Pour Point		30	-6	°C
ASTM D95	Water % (V/V)		0.50	0.30	% v/v

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Certificate of Analysis

Vessel / Object:		Job No:	654-22-00391
Location:	Fujairah / Port of Fujairah (United Arab Emirates)	Date Sampled:	
Job Type:	Sample	Date Tested:	17 Mar 2022
Product Grade:	#6 Fuel Oil	Version:	2 / 24 Mar 2022 17:27
Client Reference:	Fujairah Court Expert		

Sample	Sample ID, Type & Description
654-22-00391-067	Shore tanks HT-6 & V-12. Volumetric Composite Sample

<u>Method</u>	<u>Test</u>	<u>Min</u>	<u>Max</u>	<u>Result</u>	<u>Units</u>
IP 365	Density @15°C		0.9910	0.9350	kg/l
ASTM D445	Kinematic Viscosity @122°F/50°C		380	65.16	cSt
ASTM D4294*	Total Sulfur Content	60	3.50	1.70	%wt
ASTM D93B	Flash Point			120.0	°C
ASTM D97	Pour Point		30	-3	°C
ASTM D95	Water % (V/V)		0.55	0.55 *	% v/v

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John Abraham
Assistant Laboratory Manager

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Certificate of Analysis

Vessel / Object:
Location: Fujairah / Port of Fujairah (United Arab Emirates)
Job Type: Sample
Product Grade: HFO
Client Reference: Fujairah Court Expert

Job No: 654-22-00391
Date Sampled: 22/03/22
Date Tested: 23/03/22
Version: 1 / 23 Mar 2022 11:51

Sample
 654-22-00391-069

Sample ID, Type & Description
 VT1(12.89)HT3(6.93)HT2(9.15)HT7(9.71)HT1(9.99)HT9(5.49)HT10(5.51)HT5(10.13)HT8(10.13)
 Handblend Sample

Method	Test	Min	Max	Result	Units
ASTM D445-21!!	Kinematic Viscosity @ 50°C		380	36.88	cSt
IP 365 - 94 (2004)!!	Density @15°C		0.9910	0.9206	kg/l
ISO 8217	Calculated Carbon Aromaticity Index (CCAI)		870	812	
ASTM D4294!!	Total Sulfur Content		3.5	1.45	%wt
ASTM D93B!!	Flash Point (Fuel Oil)	60		83.0	°C
IP 570	Hydrogen Sulfide		2.0	< 0.60	mg/kg
ASTM D664A!!	Total Acid Number		2.50	0.95	mg KOH/g
IP 390A	Potential Total Sediment		0.10	1.02	%m/m
ASTM D4530!!	Micro Method Carbon Residue		18.0	6.60	%wt
ASTM D97!!	Pour Point		30	-6	°C
ASTM D95!!	Water % (V/V)		0.50	0.30	% v/v
ASTM D482	Ash Content		0.100	> 0.180 *	mass%
IP 501!!	Vanadium Content		350	33	mg/kg
IP 501!!	Sodium Content		100	> 100	mg/kg
IP 501!!	Aluminum Content			> 150	mg/kg
IP 501!!	Silicon Content			215	mg/kg
IP 501	Aluminum + Silicon Content		60	> 400 *	mg/kg
IP 501!!	Calcium Content			> 100 *	mg/kg
IP 501!!	Zinc Content			> 70 *	mg/kg
IP 501!!	Phosphorus Content			> 60 *	mg/kg
ASTM D7845	Chemical Species in Marine Fuel Oil by GCMS				
	N-butyl alcohol			< 10	mg/kg
	Cyclohexanol			< 10	mg/kg
	N-butyl ether			< 10	mg/kg
	N-butyl acrylate			< 10	mg/kg
	Styrene			47	mg/kg
	alpha-pinene			< 10	mg/kg
	Phenol			< 20	mg/kg
	alpha-methyl styrene			< 10	mg/kg
	beta-pinene			< 10	mg/kg
	4-methyl styrene			< 10	mg/kg
	trans-B-methyl styrene			< 10	mg/kg
	3-methyl styrene			< 10	mg/kg
	2-methyl styrene			< 10	mg/kg
	Limonene			< 10	mg/kg
	Dicyclopentadiene			57	mg/kg
	Indene			86	mg/kg
	1-phenyl ethanol			< 20	mg/kg

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Location:	Fujairah / Port of Fujairah (United Arab Emirates)	Date Sampled:	22/03/22
Job Type:	Sample	Date Tested:	23/03/22
Product Grade:	HFO	Version:	1 / 23 Mar 2022 11:51
Client Reference:	Fujairah Port Authority		

Sample	Sample ID, Type & Description
654-22-00391-069	VT1(12.89)HT3(6.93)HT2(9.15)HT7(9.71)HT1(9.99)HT9(5.49)HT10(5.51)HT5(10.13)HT8(10.13) Handblend Sample

Method	Test	Min	Max	Result	Units
ASTM D7845	Chemical Species in Marine Fuel Oil by GCMS				
	para, alpha-Dimethyl styrene			< 20	mg/kg
	2,5 Dimethyl styrene			< 20	mg/kg
	2,4 Dimethyl styrene			< 20	mg/kg
	2-phenyl ethanol (phenylethanol)			< 20	mg/kg
	2-Ethyl Phenol			< 50	mg/kg
	2,4 Dimethyl Phenol			< 20	mg/kg
	4 & 3 Ethyl Phenol			< 40	mg/kg
	2-Phenoxy-1-propanol			< 50	mg/kg
	2-Phenoxy ethanol			< 50	mg/kg
	4-isopropylphenol			< 50	mg/kg
	1-Phenoxy-2-Propanol			< 20	mg/kg
	Styrene Glycol			< 50	mg/kg

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 3.The analysis results denoted by (!!) are part of the laboratory ENAS accreditation to ISO/IEC 17025

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AmSpec Middle East L.L.C.
United Arab Emirates

Terminal GULF ENVIRONMENT
Port/Country Fujairah, United Arab Emirates
AmSpec Ref. No. 654-22-00391
Date March 09, 2022
Cargo Fuel Oil
Operation Tank Inspection, Sampling and Analysis

SHORE TANK REPORT

TANK NO.	Innage m	Reference Height m	Temp. °C	Maximum Capacity m3	Length m	Circumference m	Product	Volume m3	Samples
HT-1	2.056	2.625	27.20	45.000	10.105	7.735	Black	42.805	3 X 1.0 Litre
HT-2	1.917	2.610	25.50	45.000	9.985	7.685	Black	39.510	3 X 1.0 Litre
HT-3	1.517	2.577	26.50	45.000	9.770	7.690	Black	29.992	3 X 1.0 Litre
HT-4	2.070	2.665	26.60	45.000	10.090	7.745	Black	41.847	3 X 1.0 Litre
HT-5	2.072	2.660	25.60	45.000	10.060	7.745	Black	43.078	3 X 1.0 Litre
HT-6	2.100	2.650	26.30	45.000	10.060	7.732	Black	43.496	3 X 1.0 Litre
HT-7	2.010	2.620	26.30	45.000	10.020	7.745	Black	41.749	3 X 1.0 Litre
HT-8	2.065	2.620	25.80	45.000	10.040	7.730	Black	42.675	3 X 1.0 Litre
HT-9	2.105	2.620	26.20	45.000	10.060	7.732	Black	23.417	3 X 1.0 Litre
HT-10	1.218	2.160	25.40	45.000	10.070	7.742	Black	23.463	3 X 1.0 Litre
X-22	0.965	10.040	26.00	1,110.000	N/A	37.478	Black	107.862	4 X 1.0 Litre
VT-1	8.512	10.155	25.70	60.000	N/A	9.075	Black	55.785	3 X 1.0 Litre
V-14	3.588	6.570	26.20	65.000	N/A	12.027	Slop	N/A	2 X 1.0 Litre
V-12	0.310	6.570	N/A	65.000	N/A	12.030	Black	3.597	1 X 1.0 Litre
X-12	6.828	10.046	25.10	1,729.000	N/A	46.902	Slop	N/A	4 X 1.0 Litre
HT-13	NIL	2.785	0.00	30.000	5.355	8.622	Slop	N/A	1 X 1.0 Litre
VT-7	2.440	4.290	29.80	N/A	N/A	8.100	Slop	41.749	1 X 1.0 Litre
VT-5	N/A	N/A	N/A	50.000	N/A	N/A	Black	N/A	Unsafe to Sample
VT-6	N/A	N/A	N/A	50.000	N/A	N/A	Black	N/A	Unsafe to Sample
Untreated Water Tank	5.725	8.235	25.80	270.000	N/A	20.480	Slop	N/A	4 X 1.0 Litre
Treated Water Tank	NIL	4.960	0.000	203.000	N/A	22.710	N/A	Empty	N/A

Note: Volume given are estimates only.

Samples N/A: No samples taken since tanks are either empty, have minimal volume, or cannot be gauged.

Original sign and stamp by:

Terminal : Gulf Environment

AmSpec Inspector

Rudy Bautista

Jerry Lopez

Bency Ascura

Anthony Reyes



AmSpec Middle East L.L.C.
United Arab Emirates

Terminal : GULF ENVIRONMENT
 Port/Country : Fujairah, United Arab Emirates
 AmSpec Ref. No. : 654-22-00391
 Date : March 09, 2022
 Cargo : Fuel Oil
 Operation : Tank Inspection, Sampling and Analysis

SHORE TANK REPORT

TANK NO.	Innage m	Reference Height m	Temp. °C	Maximum Capacity m3	Length m	Circumference m	Product	Volume m3	Samples
X-1	NIL	3.742	0.00	160.000	N/A	29.128	Water	Empty	N/A
X-2	N/A	N/A	N/A	160.000	N/A	N/A	N/A	Empty	N/A
X-30	N/A	N/A	N/A	266.000	N/A	N/A	N/A	Empty	N/A
VT-2	0.310	10.030	26.00	108.000	N/A	12.075	Black	Empty	N/A
VT-8	NIL	N/A	N/A	N/A	N/A	N/A	N/A	Empty	N/A
V-13	NIL	6.570	N/A	65.000	N/A	12.013	N/A	Empty	N/A
V-15	NIL	6.570	N/A	65.000	N/A	12.013	N/A	Empty	N/A
S-1	N/A	N/A	N/A	12.000	N/A	N/A	N/A	Empty	N/A
S-2	N/A	N/A	N/A	12.000	N/A	N/A	N/A	Empty	N/A
A-2	0.030	2.320	26.00	N/A	7.430	7.070	N/A	Empty	N/A
A-3	0.120	2.800	26.00	N/A	9.325	8.665	N/A	Empty	N/A
HT-11	NIL	N/A	0.00	30.000	N/A	N/A	N/A	Empty	N/A
HT-12	NIL	N/A	0.00	30.000	N/A	N/A	N/A	Empty	N/A

Note: Volume given are estimates only.
 Samples N/A: No samples taken since tanks are either empty or have minimal volume.

Original sign and stamp by:
Terminal : Gulf Environment

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 Jerry Lopez
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 Anthony Reyes



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United Arab Emirates

Terminal : GULF ENVIRONMENT
 Port/Country : Fujairah, United Arab Emirates
 AmSpec Ref. No. : 654-22-00391
 Date : March 09, 2022
 Cargo : Fuel Oil
 Operation : Tank Inspection, Sampling, and Analysis

Shore Tank Report

SI #	Group	Sample	Density at 15°C (kg/L)	Flash Point (°C)	Water Content (%Vol)	Grade	Quantity (M3)	Quantity (MT)	Analysis Done on Vol. Composite	Remarks
5	B	X-22	0.9079	<40.0(31.0)	4.40	Fuel Oil	107.862	96.987	N/A	Group B - No Further Analysis since Flash Point is very low & Water Content is very high.
6		V-12	0.9467	-	4.00		3.597	3.374		
7	C	VT-1	0.9102	58.0	0.80	Fuel Oil	55.785	50.299	Full RMG Specs + GCMS	Group C - Off Spec on Metals, Ash, & Sediment. GCMS components are also detected 3 chemical species.
8		HT-3	0.9104	76.0	0.05		29.992	27.033		
9		HT-2	0.9125	79.0	0.15		39.510	35.722		
10		HT-7	0.9168	72.0	0.30		41.749	37.904		
11		HT-1	0.9208	-	-		42.805	39.005		
12		HT-9	0.924	-	-		23.417	21.430		
13		HT-10	0.9256	-	-		23.463	21.522		
14		HT-5	0.9262	-	-		43.078	39.540		
15		HT-8	0.9262	-	-		42.675	39.162		
16		HT-4	0.929	-	-		41.847	38.499		
17	HT-6	0.9337	-	0.2	43.496	40.228				

Note: Volumes given are estimates only.
 Off Spec results are highlighted in red

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 Terminal : Gulf Environment

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