PVT Analysis Report
ECW Geo Andijk
Well ADK-GT-01, Andijk

13 February 2018

Project 18001

PanTerra Geoconsultants BV
Weversbaan 1-3
2352 BZ Leiderdorp
the Netherlands

T +31 (0)71 5 81 35 05
F +31 (0)71 3 01 08 02
info@panterra.nl
www.panterra.nl

Company registration: 28047512
VAT registration: NL0091.32.582.B01

ABN Amro Bank: 49.28.54.319
Stationsweg 31-33, Leiden
IBAN: NL13 ABNA 0492 8543 19
SWIFT: ABNANL2A

PVT Analysis Report
ECW Geo Andijk
Well ADK-GT-01, Andijk

Authors
Lucian Pirlea
Reviewed by:
Sergio Fernandez

Prepared for
ECW Geo Andijk

Prepared by
PanTerra Geoconsultants B.V.
Weversbaan 1-3
2352 BZ Leiderdorp
The Netherlands
T +31 (0)71 581 35 05
F +31 (0)71 301 08 02
info@panterra.nl

Contents

Index of Figures

Index of Tables

1 Description of Analysis

1.1 Samples Receipt

3 surface and a number of stock tank water samples were received at PanTerra on 5th of January 2018.

1.2 Quality Control

The samples were checked for leakages, and other sign of damages, and were al found to be in good condition. The pressurized cylinders were heated and shaken until stable. Opening pressures and sample volumes were measured.

1.3 Bubble Point Measurement

The water at reservoir conditions is in liquid phase and uncompressible. Below the saturation point (bubble point) the gas comes out and the two-phase sample is vastly more compressible. That is the bubble point. It can be determined from the PV graph. The experiment is carried out by reducing the pressure in a PVT bottle or cell and measuring the volumes at each step. Below the bubble point, the reduction in pressure will result in a much higher volume increase due to the gas expansion.

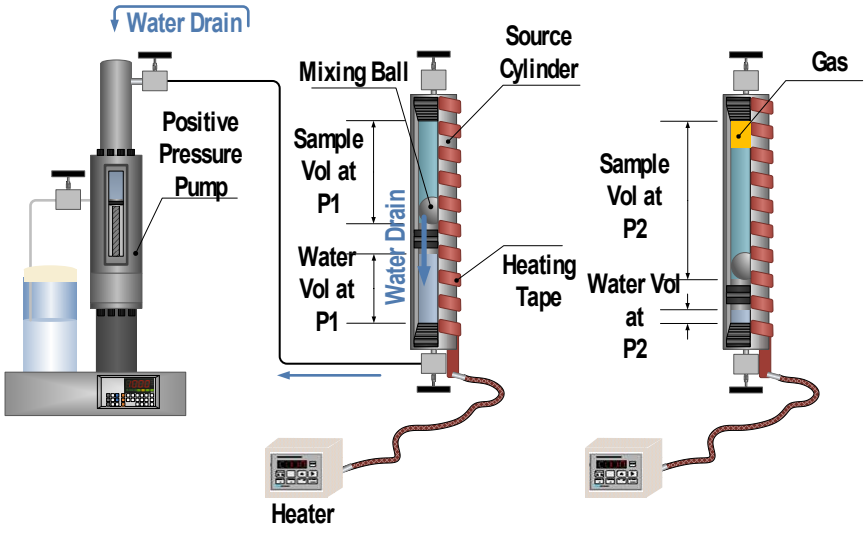

Figure 1 - Bubble Point Measurement Layout

1.4 Flashed Gas Composition

A volume of single-phase water was pumped from the sample cylinder into a trap connected to a gas meter at atmospheric conditions of pressure and temperature. The flashed water and gas volumes, separation temperatures and atmospheric pressures are accurately recorded. The composition of gas is subsequently measured using the procedure described below. The flash GWR (gas water ratio) is calculated as the ratio between the flashed water and the collected gas.

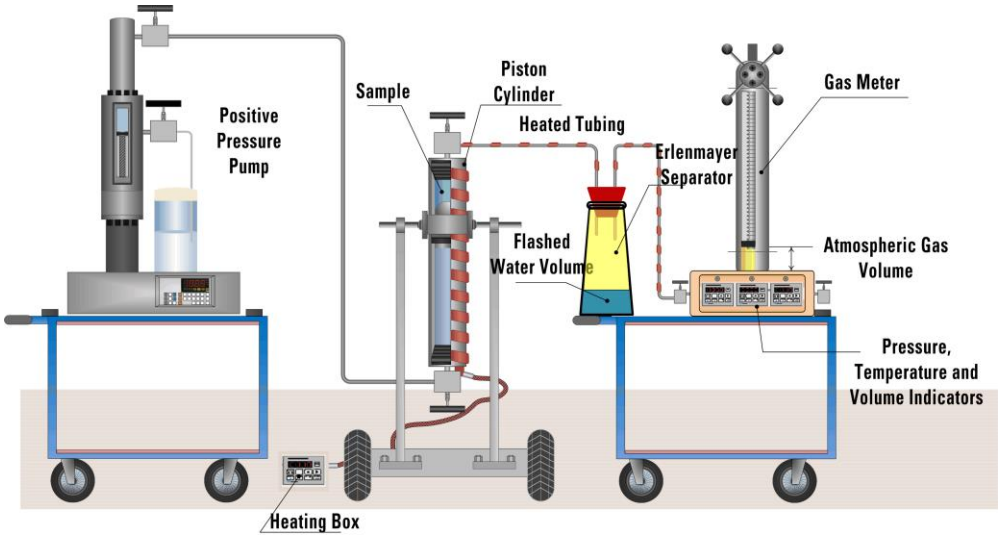

Figure 2 - Flash Separation Layout

The resulted gas fraction purged from the cylinder was analyzed using the gas chromatography procedure. Compositions up to C_{11+}were measured. Components: porous polymer and mole sieve columns, TCD detector (for C_1-C_3, permanent gases), capillary column and FID detector (for C_4 to C_{11+}).

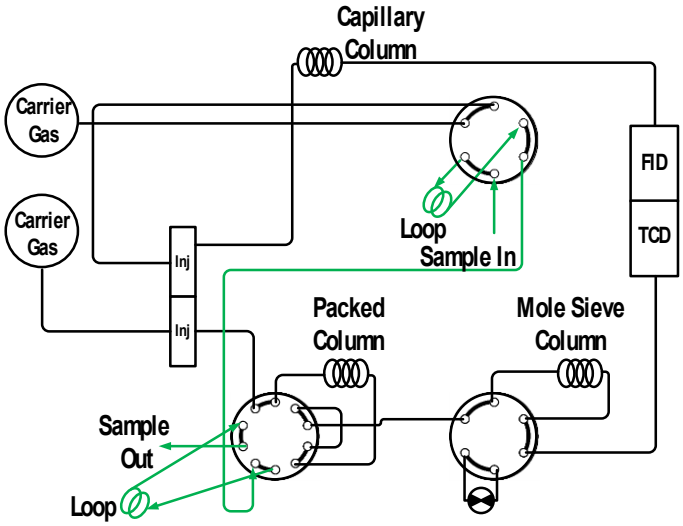

Figure 3 - Gas Chromatograph Layout

1.5 Water Physical Properties Measurement

1.5.1 Measurement of Water Resistivity

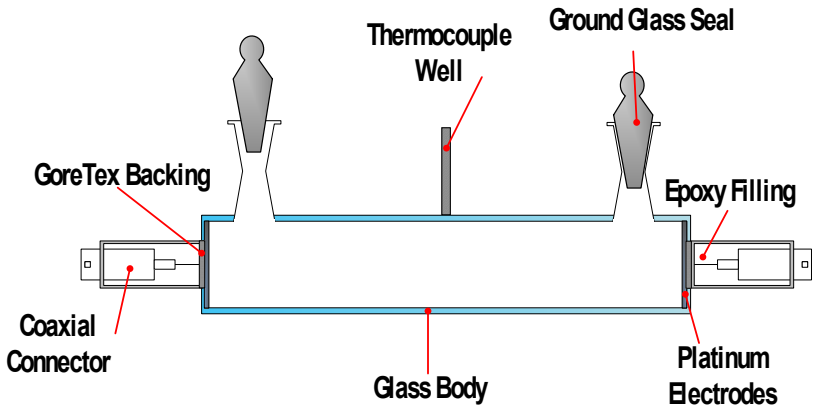

Figure 4 - Fluid Resistivity Cell

First the water sample is filtered and degassed. The resistivity must be measured by using a fluid resistivity cell connected to an impedance analyzer. The fluid resistance is converted into resistivity by multiplication by the cell constant.

1.5.2 Water Density Measurement

The density of the water was measured using a digital u-tube handheld densitometer, model Anton Paar DMA 35. A sample causes a change in the oscillation frequency of a vibrating glass U tube. The change is directly proportional to the density of the sample. The embedded software allows for temperature correction when the ambient temperature is different than standard.

Figure 5 - DMA 35 Densitometer

1.5.3 Water pH Measurement

The pH meter used is an Orion 370 pH meter. Before any measurement, a 3-point calibration measurement is run for the standard buffers that will correspond with the selected calibration pH mode (pH 4/7/10). After calibration, the pH electrodes are rinsed with deionized (D.I.) H_2O and blot dry. For the actual measurement, the bottom part of the electrode is immersed in the sample, and when the "ready" light comes up a stable pH value is obtained and frozen and the display can be read. For each new sample, the step above is repeated and the electrode is rinsed every time in deionized water.

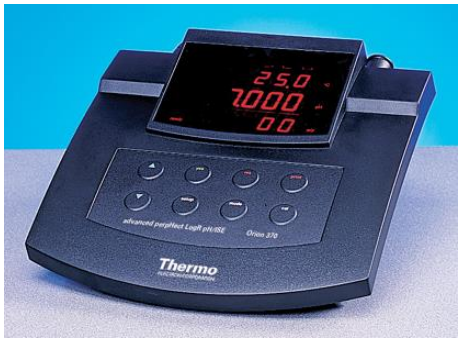

Figure 6 - Orion 370 pH meter

1.5.4 Water Compositional Analysis

ICP is used to identify and quantify the positive ions present in water samples.

A standard measurement as presented in a water analysis report consists of the following elements: Ca, Mg, Fe, Na, Sr, Al, Ba, K, Borium, Silicium, Lithium, Phosphorous, Sulphate, Chloride by Titration, Carbonate and Bicarbonate.

- The content of chloride, carbonate and bicarbonate is measured by titration.
- The sulfate content is measured by turbidity method or a spectrophotometer.
- The hardness of the water samples is calculated by based on the content of Calcium and Magnesium. Values will be reported as $CaCO_3$ content in ppm, grains per gallon and Degrees German (G.D.H.)

1.5.5 Laser Particle Size Analysis (LPSA)

Particle size distribution analysis, based on laser diffraction, can be conducted on a large variety of sample types such as; powders, emulsions, suspensions and particles in liquids.

Advances in sophisticated data processing and automation have allowed this to become the dominant method used for determining the Particle Size Distribution (PSD). Corrections can be applied for the shape factors of specific sample types, which make it possible to correlate the particle size distribution directly with sieve analyses results. Analyses conducted with the Malvern MastersizerX can be measured in four size ranges: 0.1-80 µm, 0.5-180 µm, 1.2-600 µm and 4.0-2000 µm.

A total of 32 size bands are available throughout these ranges.

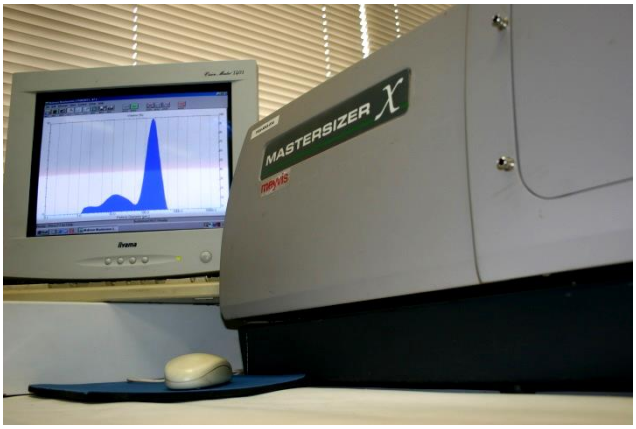

Figure 7 - LPSA equipment

2 Analysis Results

2.1 QC Data

Table 1 - QC Data

Sample no.	Opening Pressure	Opening Temperature	Sample Volume	Observations
	psi	C	cc	
Surface - 32138	140	18.5	675	
Surface 31233-72	133	17	690	
Surface - F80009/156	128	18	675	

2.2 Bubble Point Measurement

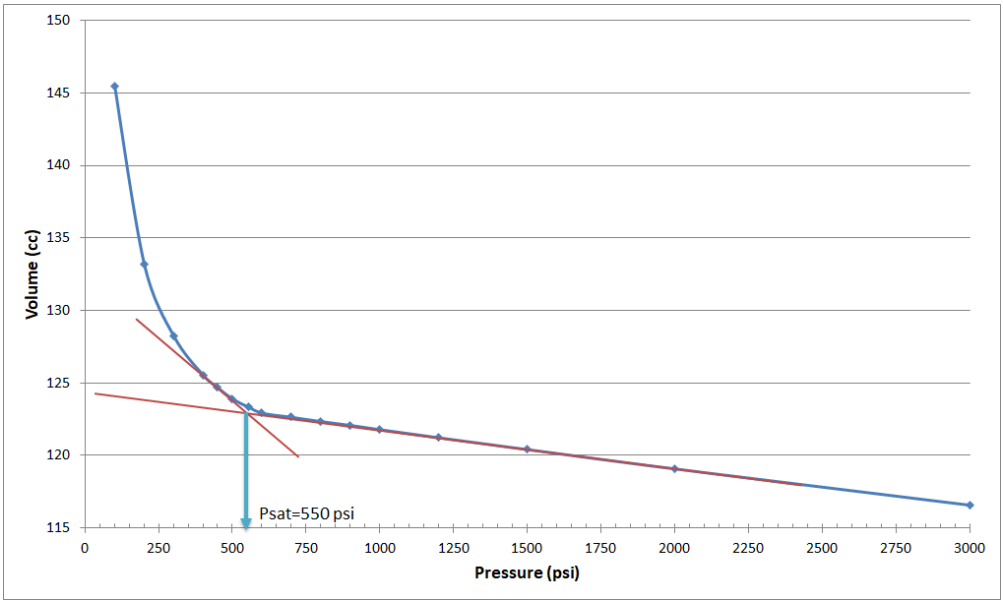

Figure 8 - Sample Volume vs Pressure (Bubble Point) at 80.1^{0}C Sample no. 32138

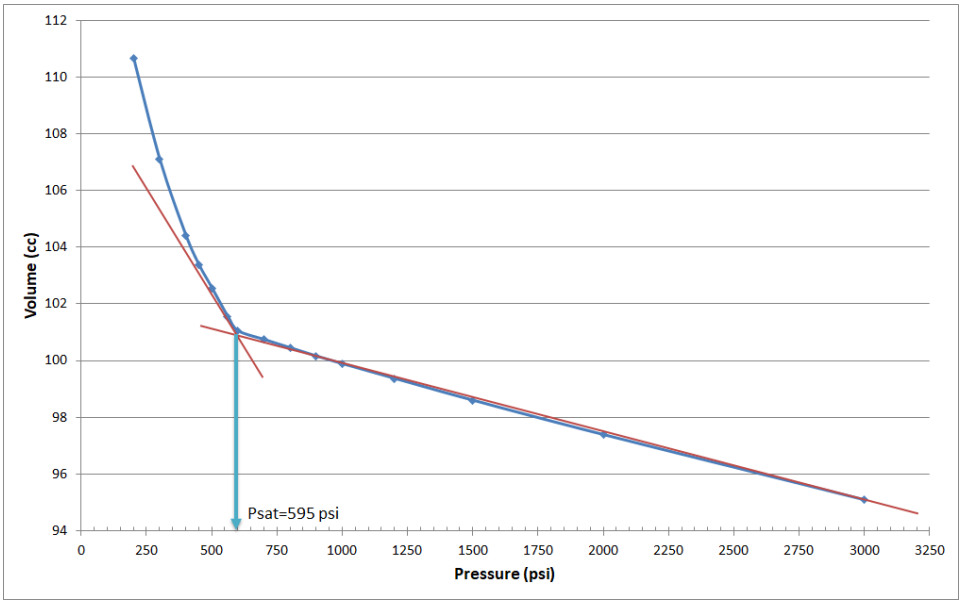

Figure 9 - Sample Volume vs Pressure (Bubble Point) at 80.1^{0}C Sample no. 32133-72

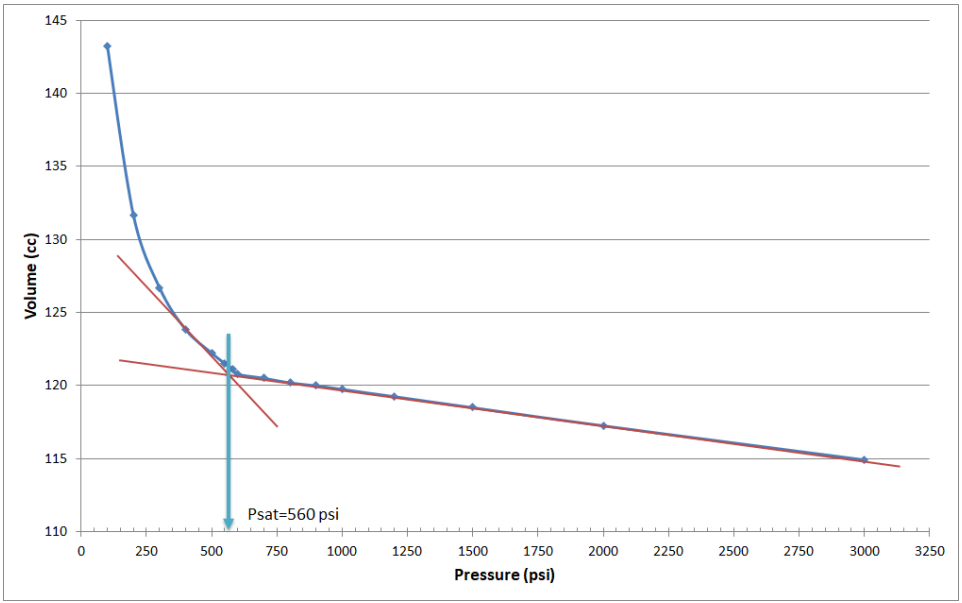

Figure 10 - Sample Volume vs Pressure (Bubble Point) at 80.1^{0}C Sample no. F80009-156

2.3 Gas Compositional Analysis

Table 2 - Composition of Gas from Surface Sample no. 32138 - Corrected for Air Content

Component		Mole%	Weight%
H_2	Hydrogen	0.000	0.000
H_2S	Hydrogen Sulphide	0.000	0.000
CO_2	Carbon Dioxide	10.077	21.627
N_2	Nitrogen	12.016	16.414
C1	Methane	76.890	60.153
C2	Ethane	0.847	1.242
C3	Propane	0.084	0.180
C4	i-Butane	0.015	0.042
C4	n-Butane	0.015	0.042
C5	i-Pentane	0.005	0.019
C5	n-Pentane	0.008	0.028
C6	Hexanes	0.006	0.026
	MC Pentane	0.001	0.003
	Benzene	0.001	0.004
	Cyclohexane	0.001	0.004
C7	Heptanes	0.002	0.009
	MC Hexane	0.001	0.005
	Toluene	0.001	0.004
C8	Octanes	0.005	0.028
	E-Benzene	0.000	0.000
	M/P Xylene	0.001	0.005
	O-Xylene	0.001	0.004
C9	Nonanes	0.001	0.009
	1,2,4 TMB	0.001	0.007
C10	Decanes	0.001	0.006
C11+	Undecanes +	0.020	0.140
	Total	100.000	100.000

Calculated Gas Properties	
Gas Density (kg m^{-3} @ 15°C)	0.916
Gas Mole Weight (g mol^{-1})	20.507
Real Relative (to air) Density of Gas	0.708
Mole weight of Heptanes Plus (g mol^{-1})	127.403
Density of Heptanes plus (g cm^{-3} at 60°F)	0.784
Mole Weight of Undecanes plus (g mol^{-1})	147.000
Density of Undecanes plus (g cm^{-3} at 60°F)	0.789
Calorific Value (MJ m^{-3})	31.410

Air Content: 6.2715%

Gas Water Ratio: 0.9127 sm^3/m^3

Table 3 - Composition of Gas from Surface Sample no. 31233 - Corrected for Air Content

Component		Mole%	Weight%
H_2	Hydrogen	0.000	0.000
H_2S	Hydrogen Sulphide	0.000	0.000
CO_2	Carbon Dioxide	10.099	21.664
N_2	Nitrogen	12.031	16.427
C1	Methane	76.853	60.095
C2	Ethane	0.844	1.237
C3	Propane	0.080	0.172
C4	i-Butane	0.017	0.048
C4	n-Butane	0.016	0.045
C5	i-Pentane	0.006	0.022
C5	n-Pentane	0.009	0.033
C6	Hexanes	0.008	0.031
	MC Pentane	0.001	0.005
	Benzene	0.002	0.007
	Cyclohexane	0.001	0.005
C7	Heptanes	0.002	0.011
	MC Hexane	0.001	0.006
	Toluene	0.001	0.005
C8	Octanes	0.002	0.008
	E-Benzene	0.000	0.000
	M/P Xylene	0.001	0.007
	O-Xylene	0.001	0.004
C9	Nonanes	0.001	0.003
	1,2,4 TMB	0.001	0.009
C10	Decanes	0.003	0.017
C11+	Undecanes +	0.019	0.137
	Total	100.000	100.000

Calculated Gas Properties	
Gas Density (kg m^{-3} @ 15°C)	0.916
Gas Mole Weight (g mol^{-1})	20.517
Real Relative (to air) Density of Gas	0.709
Mole weight of Heptanes Plus (g mol^{-1})	126.649
Density of Heptanes plus (g cm^{-3} at 60°F)	0.789
Mole Weight of Undecanes plus (g mol^{-1})	147.000
Density of Undecanes plus (g cm^{-3} at 60°F)	0.789
Calorific Value (MJ m^{-3})	31.399

Air content : 6.2261 %

Gas Water Ratio : 0.9234 sm^3/m^3

Table 4 - Composition of Gas from Surface Sample no. F80009/156 - Corrected for Air Content

Component		Mole%	Weight%
H_2	Hydrogen	0.000	0.000
H_2S	Hydrogen Sulphide	0.000	0.000
CO_2	Carbon Dioxide	9.147	19.837
N_2	Nitrogen	11.487	15.857
C1	Methane	77.935	61.612
C2	Ethane	1.052	1.559
C3	Propane	0.184	0.401
C4	i-Butane	0.028	0.080
C4	n-Butane	0.059	0.168
C5	i-Pentane	0.016	0.059
C5	n-Pentane	0.027	0.096
C6	Hexanes	0.020	0.084
	MC Pentane	0.004	0.015
	Benzene	0.006	0.022
	Cyclohexane	0.004	0.015
C7	Heptanes	0.006	0.027
	MC Hexane	0.002	0.010
	Toluene	0.001	0.005
C8	Octanes	0.001	0.006
	E-Benzene	0.001	0.004
	M/P Xylene	0.000	0.002
	O-Xylene	0.001	0.004
C9	Nonanes	0.000	0.002
	1,2,4 TMB	0.000	0.003
C10	Decanes	0.001	0.007
C11+	Undecanes +	0.017	0.125
	Total	100.000	100.000

Calculated Gas Properties	
Gas Density (kg m^{-3} @ 15°C)	0.906
Gas Mole Weight (g mol^{-1})	20.293
Real Relative (to air) Density of Gas	0.701
Mole weight of Heptanes Plus (g mol^{-1})	113.979
Density of Heptanes plus (g cm^{-3} at 60°F)	0.788
Mole Weight of Undecanes plus (g mol^{-1})	147.000
Density of Undecanes plus (g cm^{-3} at 60°F)	0.789
Calorific Value (MJ m^{-3})	32.232

Air Content: 1.0835%

Gas Water Ratio: 0.9123 sm^3/m^3

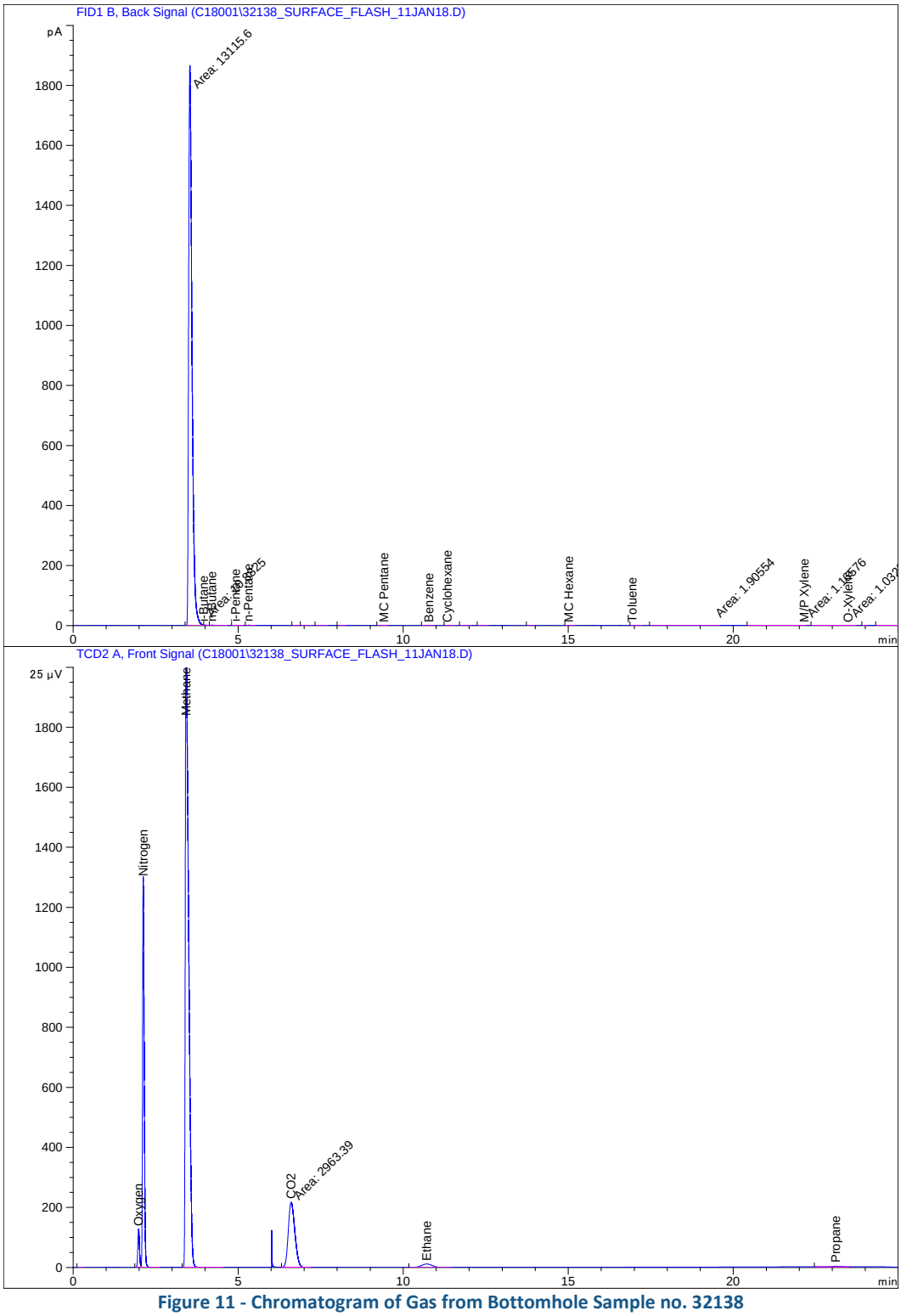

Figure 11 - Chromatogram of Gas from Bottomhole Sample no. 32138

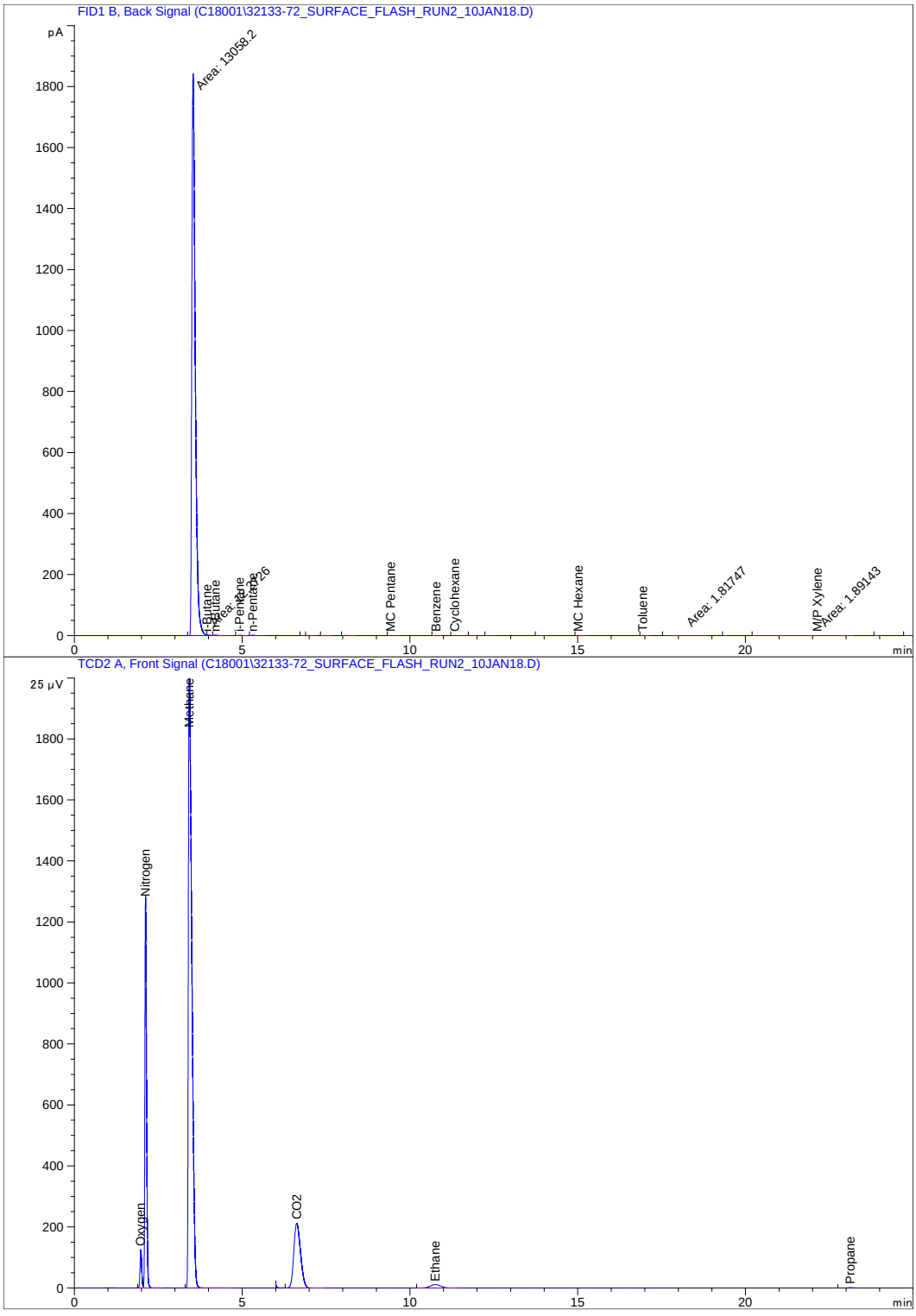

Figure 12 - Chromatogram of Gas from Surface Sample no. 31233-72

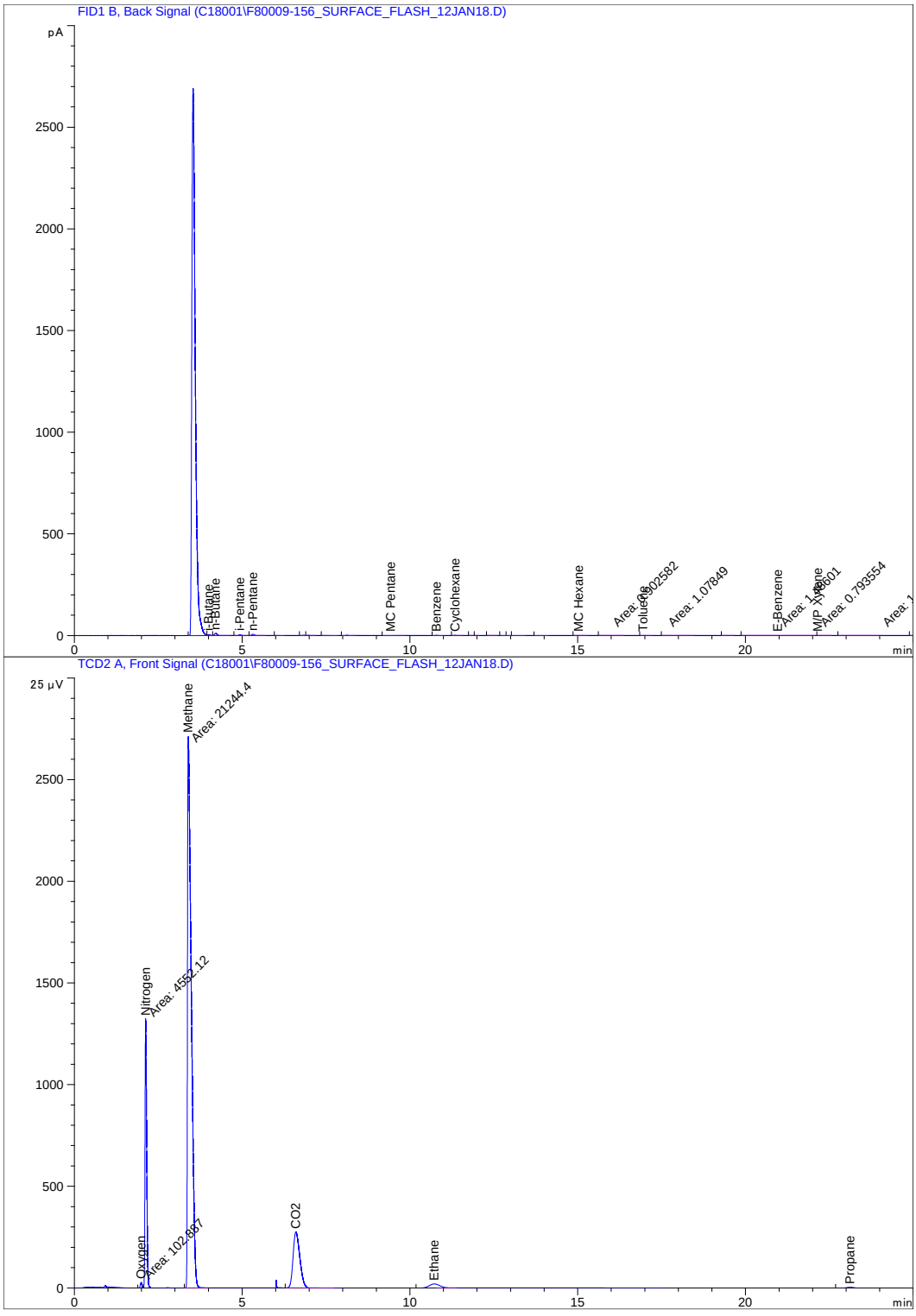

Figure 13 - Chromatogram of Gas from Surface Sample no. F80009/156

2.4 Physical Properties

Table 5 - Physical Properties

Sample no.	GWR	Density @ 15C	pH	Resistivity
	Scm^3/cm^3	g/cm^3	-	Ωm
Surface - 32138	0.9127	1.1201	5.68	0.053
Surface 31233-72	0.9234	1.1203	5.59	0.053
Surface - F80009/156	0.9123	1.1197	5.74	0.052
Stock tank	n/a	1.1201	5.45	0.052

2.5 Water Analysis

Table 6 - Water Compositional Analysis Results

Parameter	Unit	Samples no.			
		ADK-GT-01 No: 32138 Surface Sample	ADK-GT-01 No: 32133/72 Surface Sample	ADK-GT-01 No: F80009/156 Surface Sample	ADK-GT-01 Stocktank last bottle phase 2
Metals [According to ISO 17294-2]					
E Aluminium	µg/l	330	99	97	260
Q/E Cadmium	µg/l	15	15	15	14
Q/E Lead	µg/l	770	790	770	590
Q/E Nickel	µg/l	710	310	230	13
Sodium	µg/l	44000000	43000000	49000000	36000000
Strontium	µg/l	380000	370000	370000	370000
Metals [According to NEN 6966 (EN-ISO 11885)]					
Q Barium	µg/l	2800	2600	2600	2300
Q Calcium	µg/l	8400000	8200000	9200000	7200000
Q Iron	µg/l	72000	64000	62000	58000
Lithium	µg/l	12000	16000	10000	12000
Q Magnesium	µg/l	1100000	1400000	980000	1100000
Q Potassium	µg/l	930000	1100000	810000	900000
Q Zinc	µg/l	7000	7000	6600	6900
Mercury [According to ISO 12846]					
Q Mercury	µg/l	<0.050	<0.050	<0.050	<0.050
Hardness (calculated)					
Hardness	mg CaCO3/L	25660	26128	26942	22652
Conductivity [According to NEN-ISO 7888]					
Q Ec at 25°C after automatic temperature correction	µS/cm	69000	70000	69000	70000
Q Temperature Ec measurement	°C	19.2	19.5	19.4	19.5
pH [According to ISO 10523]					
Q pH	-	6.1	6.1	6.3	5.8
Q Temperature pH-measurement	°C	18.8	19.3	18.2	19.6
Volatile compounds [According to CMA/3/E & WAC/IV/A/016]					
Q/E 1,2,3-Trichlorobenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,2,4-Trichlorobenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,2-Dichlorobenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,3,5-Trichlorobenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,3-Dichlorobenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,4-Dichlorobenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Monochlorobenzene	µg/l	<0.50	<0.50	<0.50	<0.50
E - Sum Trichlorobenzenes	µg/l	<1.5	<1.5	<1.5	<1.5
Q/E 1,1,1,2-Tetrachloroethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,1,1-Trichloroethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,1,2,2-Tetrachloorethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,1,2-Trichloroethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,1-Dichloroethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,1-Dichloroethene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,1-Dichloropropene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,2,3-Trichloropropane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,2-Dichloroethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,2-Dichloropropane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,3-Dichloropropane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 2,2-Dichloropropane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Chloroethane	µg/l	<0.50	<0.50	<0.50	<0.50
E Chloromethane	µg/l	3.8	4.1	4	4.1
Q/E Cis-1,3-dichloropropene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Cis-1,2-Dichloroethene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Dichloromethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Tetrachloroethene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Tetrachloromethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Trans-1,3-Dichloropropene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E trans-1,2-Dichloroethene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Trichloroethene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Trichloromethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,2-Dibromo-3-chloropropane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,2-Dibromoethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Bromobenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Bromochloromethane	µg/l	<1.0	<1.0	<1.0	<1.0
Q/E Bromodichloromethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Bromomethane	µg/l	<1.0	<1.0	<1.0	<1.0
Q/E Dibromochloromethane	µg/l	<0.50	<0.50	<0.50	<0.50

Q/E Dibromomethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Dichlorodifluoromethane	µg/l	<1.0	<1.0	<1.0	<1.0
Q/E Tribromomethane	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Trichlorofluoromethane	µg/l	<1.0	<1.0	<1.0	<1.0
Q/E Heptane	µg/l	<1.0	<1.0	<1.0	<1.0
Q/E Hexane	µg/l	<1.0	<1.0	<1.0	<1.0
Q/E Octane	µg/l	<1.0	<1.0	<1.0	<1.0
Q/E MTBE	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,2,4-Trimethylbenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 1,3,5-Trimethylbenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Butylbenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Isopropylbenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E p-Isopropyltoluene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Propylbenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E sec-Butylbenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E tert-Butylbenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Benzene	µg/l	74	23	79	36
Q/E Ethylbenzene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E m- + p-Xylenes	µg/l	0.46	<0.30	0.95	<0.30
Q/E o-Xylene	µg/l	0.67	<0.15	1.2	<0.15
Q/E Styrene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Toluene	µg/l	11	<0.50	19	<0.50
Q/E Vinylchloride	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 2-Chlorotoluene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E 4-Chlorotoluene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Hexachlorobutadiene	µg/l	<0.50	<0.50	<0.50	<0.50
Q/E Naphtalene	µg/l	0.74	<0.50	1.2	<0.50
Hexachloroethane	µg/l	<1.0	<1.0	<1.0	<1.0
Total suspended solids [According to NEN 6621]					
Total suspended solids	mg/l	81	80	95	28
Acidity/Alkalinity [According to WAC/III/A/006 (based on ISO 9963-1)]					
Q/E Alkalinity up to pH 4.5	mmol/l	2.8	3.2	2.4	1.8
Q/E Alkalinity up to pH 8.3	mmol/l	<0.10	0.05	<0.050	<0.050
Q Bicarbonate same as HCO3	mg/l	170	200	150	110
Q/E Carbonate same as CO3	mg/l	<2.5	<2.5	<2.5	<2.5
Q/E Hydroxyl content same as OH	mg/l	<0.85	<0.85	<0.85	<0.85
Mineral Oil Fractions [According to OSPAR 2005-15]					
Gedispergeerde olie	mg/l	5.1	3.4	2.8	0.21
T.O.C. / T.I.C. / T.C. [According to NEN-EN 1484]					
Q Total Organic Carbon	mg/l	58	60	59	61
Anionen [According to ISO 10304-1]					
Q Chloride	mg/l	110000	110000	110000	110000
Q Nitrate as N	mg/l	<5.0	<5.0	<5.0	<5.0
Q Nitrite as N	mg/l	<0.50	<0.50	<0.50	<0.50
Q Sulphate	mg/l	500	500	500	510

2.6 Laser Particle Size Analysis

PANterra GEO CONSULTANTS BV

Result: Analysis Report

Sample Details

Sample ID: G1251b#1
Sample File: PAN2018
Sample Path: C:\SIZERX\DATA\
Sample Notes: Project: G1251b/c18001
Client: WEP
Watersamples Andijk
Phase 1: mix bottles 18,19,20,21

Run Number: 1
Record Number: 13

Measured: Tue Jan 9 2018 2:01PM
Analysed: Tue Jan 9 2018 2:01PM
Result Source: Analysed

System Details

Range Lens: 1000 mm
Presentation: 2OHD
Analysis Model: Polydisperse
Modifications: Active --

Beam Length: 2.40 mm
[Particle R.I. = (1.5295, 0.1000); Dispersant R.I. = 1.3300]
Killed Result Channels: < 1.80 um; > 919.73 um.

Sampler: None

Obscuration: 16.0 %
Residual: 1.577 %

Result Statistics

Distribution Type: Volume
Mean Diameters:
D [4, 3] = 246.12 um

Concentration = 0.1597 %Vol
D (v, 0.1) = 15.28 um
D [3, 2] = 47.11 um

Density = 1.000 g / cub. cm
D (v, 0.5) = 243.44 um
Span = 1.968E+00

Specific S.A. = 0.1274 sq. m / g
D (v, 0.9) = 494.45 um
Uniformity = 6.371E-01

Size Low (um)	In %	Size High (um)	Under%	Size Low (um)	In %	Size High (um)	Under%
1.80	0.47	4.86	0.48	89.44	2.58	108.61	30.92
4.86	1.25	5.90	1.72	108.61	2.97	131.90	33.89
5.90	1.73	7.16	3.45	131.90	3.63	160.17	37.52
7.16	1.86	8.70	5.32	160.17	4.76	194.50	42.28
8.70	1.75	10.56	7.06	194.50	6.50	236.19	48.79
10.56	1.58	12.83	8.64	236.19	8.78	286.82	57.57
12.83	1.52	15.58	10.15	286.82	11.10	348.29	68.67
15.58	1.64	18.91	11.80	348.29	12.33	422.95	80.99
18.91	1.87	22.97	13.67	422.95	10.96	513.61	91.94
22.97	2.04	27.89	15.71	513.61	6.66	623.70	98.61
27.89	2.08	33.87	17.79	623.70	1.39	757.38	99.99
33.87	2.06	41.13	19.85	757.38	0.00	919.73	100.00
41.13	2.02	49.95	21.87	919.73	0.00	1116.87	100.00
49.95	2.03	60.65	23.90	1116.87	0.00	1356.26	100.00
60.65	2.13	73.66	26.03	1356.26	0.00	1646.98	100.00
73.66	2.31	89.44	28.34	1646.98	0.00	2000.00	100.00

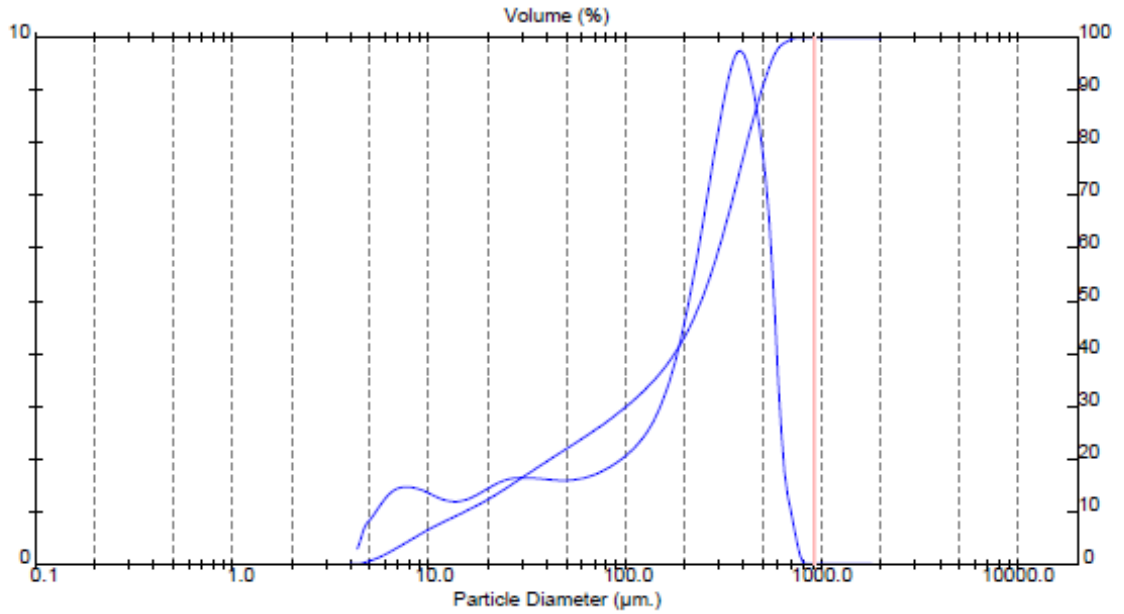

Figure 14 - LPSA Chart Sample ADK-GT-01, Mixed Bottles 18, 19, 20, 21

PANterra GEO CONSULTANTS BV

Result: Analysis Report

Sample Details

Sample ID: G1251b#2
Sample File: PAN2018
Sample Path: C:\SIZERX\DATA\
Sample Notes: Project: G1251b/c18001
Client: WEP
Watersamples Andijk
Phase 2: mix botties 11,12,13 & 14

Run Number: 5
Record Number: 16

Measured: Tue Jan 9 2018 2:22PM
Analysed: Tue Jan 9 2018 2:22PM
Result Source: Analysed

System Details

Range Lens: 300 mm
Presentation: 2OHD
Analysis Model: Polydisperse
Modifications: None

Beam Length: 2.40 mm
[Particle R.I. = (1.5295, 0.1000); Dispersant R.I. = 1.3300]

Sampler: None

Obscuration: 15.7 %
Residual: 0.196 %

Result Statistics

Distribution Type: Volume
Mean Diameters:
D [4, 3] = 27.84 um

Concentration = 0.0197 %Vol
D (v, 0.1) = 3.39 um
D [3, 2] = 9.11 um

Density = 1.000 g / cub. cm
D (v, 0.5) = 19.06 um
Span = 2.696E+00

Specific S.A. = 0.6589 sq. m / g
D (v, 0.9) = 54.77 um
Uniformity = 9.777E-01

Size Low (um)	In %	Size High (um)	Under%	Size Low (um)	In %	Size High (um)	Under%
0.50	0.34	1.32	0.34	25.46	8.48	31.01	70.99
1.32	1.28	1.60	1.62	31.01	7.76	37.79	78.75
1.60	1.95	1.95	3.57	37.79	6.61	46.03	85.35
1.95	2.28	2.38	5.85	46.03	5.19	56.09	90.54
2.38	2.34	2.90	8.19	56.09	3.67	68.33	94.21
2.90	2.30	3.53	10.49	68.33	2.28	83.26	96.49
3.53	2.33	4.30	12.82	83.26	1.22	101.44	97.71
4.30	2.58	5.24	15.40	101.44	0.54	123.59	98.25
5.24	3.06	6.39	18.46	123.59	0.19	150.57	98.45
6.39	3.71	7.78	22.17	150.57	0.14	183.44	98.59
7.78	4.44	9.48	26.62	183.44	0.28	223.51	98.87
9.48	5.34	11.55	31.95	223.51	0.45	272.31	99.32
11.55	6.36	14.08	38.31	272.31	0.48	331.77	99.80
14.08	7.38	17.15	45.69	331.77	0.20	404.21	100.00
17.15	8.21	20.90	53.90	404.21	0.00	492.47	100.00
20.90	8.61	25.46	62.51	492.47	0.00	600.00	100.00

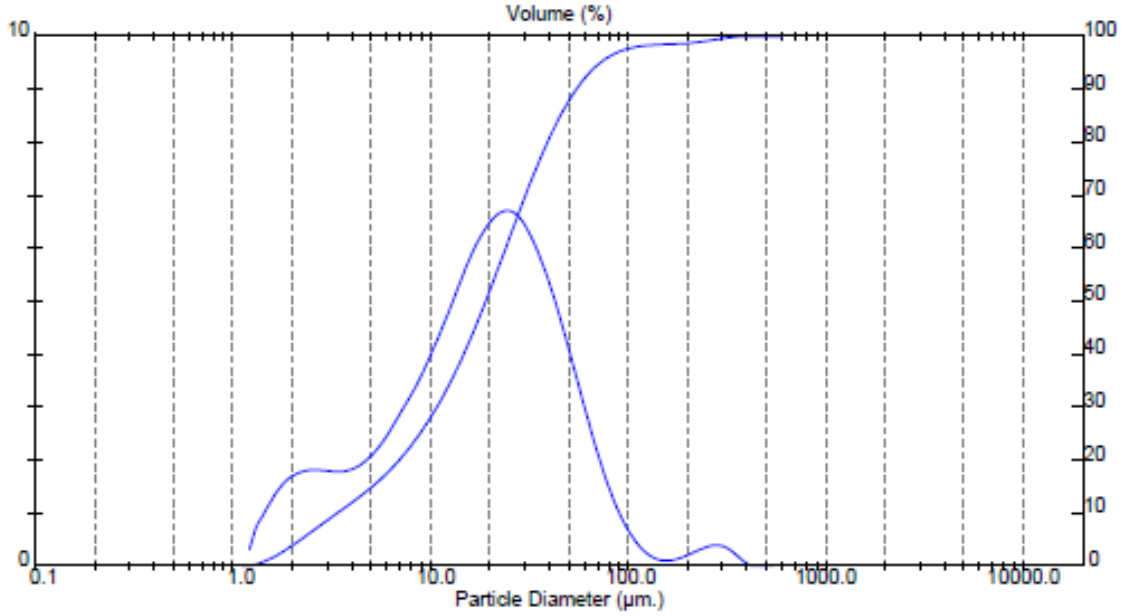

Figure 15 - LPSA Chart Sample ADK-GT-01, Mixed Bottles 11, 12, 13, 14