



Work Order ES2037860

Sampling Date/Time 28-Oct-20
 Sampling Classification ES2037860-011

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Laboratory testing undertaken by ALS Environmental.

Drilling Fluid waste water analysis from the Carpentaria-1 Wellsite

EMP document reference: **IMP2-6.1**

Condition 5: The interest holder must provide to DEPWS within six weeks of completion of drilling operations at the Carpentaria-1 well site, a laboratory analysis of drilling wastewater that may be contained in the drilling sump. The laboratory analysis must comply with the Code of Practice: Onshore Petroleum Activities in the Northern Territory, Table C.8: Wastewater Chemistry analytes.

Lab #	LAB DATA - CARP 1	LOR	Units	Waste Water A	Waste Water B
1	pH	0.01	pH Unit	7.19	7.1
2	Electrical Conductivity	1	µS/cm	60600	60700
3	TDS	10	mg/L	43100	45000
4	Suspended solids	5	mg/L	136	129
5	Hydroxide Alkalinity	1	mg/L	<1	<1
6	Carbonate Alkalinity as CaCO ₃	1	mg/L	<1	<1
7	Bicarbonate Alkalinity as CaCO ₃	1	mg/L	843	845
8	Total Alkalinity as CaCO ₃	1	mg/L	843	845
9	Sulfate	1	mg/L	529	517
10	Chloride	1	mg/L	17900	17300
11	Calcium	1	mg/L	167	178
12	Magnesium	1	mg/L	179	189
13	Sodium	1	mg/L	6160	6620
14	Potassium	1	mg/L	9930	10800
15	SAR	1	mg/L	1150	1220
16	Aluminium	0.01	mg/L	<0.10	<0.10
17	Arsenic	0.001	mg/L	<0.010	<0.010
18	Beryllium	0.001	mg/L	<0.010	<0.010
19	Barium	0.001	mg/L	0.884	0.959
20	Cadmium	0.0001	mg/L	<0.0010	<0.0010
21	Chromium	0.001	mg/L	0.048	0.063
22	Cobalt	0.001	mg/L	<0.010	<0.010
23	Copper	0.001	mg/L	<0.010	<0.010
24	Antimony	0.001	mg/L	0.015	0.015
25	Tin	0.001	mg/L	<0.010	<0.010
26	Lead	0.001	mg/L	<0.010	<0.010
27	Manganese	0.001	mg/L	0.137	0.15

Table C8 - Wastewater Chemistry Analytes Requirements

pH
Electrical Conductivity Lab
Total Dissolved Solids
Total Suspended Solids
Hydroxide Alkalinity
Carbonate
Bicarbonate Alkalinity
Total Alkalinity
Sulphate
Chloride
Calcium
Magnesium
Sodium
Potassium
Sodium Adsorption Ratio
Aluminium
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Antimony
Tin
Lead
Manganese

28	Molybdenum	0.001	mg/L	0.115	0.122
29	Nickel	0.001	mg/L	0.085	0.089
30	Selenium	0.01	mg/L	<0.10	<0.10
31	Silver	0.001	mg/L	<0.010	<0.010
32	Strontium	0.001	mg/L	1.59	1.69
33	Thorium	0.001	mg/L	<0.010	<0.010
34	Uranium	0.001	mg/L	<0.010	<0.010
35	Vanadium	0.01	mg/L	<0.10	<0.10
36	Zinc	0.005	mg/L	<0.05	<0.05
37	Boron	0.05	mg/L	<0.10	<0.10
38	Iron	0.05	mg/L	0.96	1.04
39	Bromide	0.1	mg/L	20.9	22.9
40	Mercury	0.0001	mg/L	<0.00010	<0.00010
41	Silica	0.05	mg/L	36.6	36.9
42	Total residual chlorine	0.02	mg/L	<0.08	<0.08
48	Total cyanide	0.004	mg/L	<0.004	<0.004
49	Fluoride	0.1	mg/L	0.2	0.2
50	Ammonia	0.01	mg/L	<0.10	<0.01
51	Nitrite	0.01	mg/L	<0.01	<0.01
52	Nitrate	0.01	mg/L	0.14	<0.01
54	Total Kjeldahl Nitrogen	0.1	mg/L	20.2	14.9
55	Total Nitrogen as N	0.1	mg/L	20.3	14.9
56	Total Phosphorus	0.01	mg/L	0.31	0.27
57	Reactive phosphorus	0.01	mg/L	0.02	0.03
61	Dissolved Organic Carbon	1	mg/L	1670	1710
62	Total Organic Carbon	1	mg/L	2040	2000
64	Formaldehyde	0.1	mg/L	0.7	0.7
65	Phenol	1	µg/L	7.1	5.8
66	2-Chlorophenol	1	µg/L	<1.0	<1.0
69	2-Nitrophenol	1	µg/L	<1.0	<1.0
70	2,4-Dimethylphenol	1	µg/L	<1.0	<1.0
71	2,4-Dichlorophenol	1	µg/L	<1.0	<1.0
72	2,6-Dichlorophenol	1	µg/L	<1.0	<1.0
73	4-Chloro-3-methylphenol	1	µg/L	<1.0	<1.0
74	2,4,6-Trichlorophenol	1	µg/L	<1.0	<1.0
75	2,4,5-Trichlorophenol	1	µg/L	<1.0	<1.0
76	Pentachlorophenol	2	µg/L	<2.0	<2.0
82	TRH C6-C10	20	µg/L	50	60
83	^ C6 - C10 Fraction minus BTEX	20	µg/L	50	60
84	>C10 - C16 Fraction	100	µg/L	1030	910
85	>C16 - C34 Fraction	100	µg/L	790	790
86	>C34 - C40 Fraction	100	µg/L	<100	<100
87	^ >C10 - C40 Fraction (sum)	100	µg/L	1820	1610
88	^ >C10 - C16 Fraction minus Naphthalene(F2)	100	µg/L	1030	910

Molybdenum
Nickel
Selenium
Silver
Strontium
Thorium
Uranium
Vanadium
Zinc
Boron
Iron
Bromide
Mercury
Silica
Chlorine
Total Cyanide
Fluoride
Ammonia
Nitrate
Nitrite
Total Kjeldahl Nitrogen
Total Nitrogen
Total Phosphorus
Reactive Phosphorus
Dissolved Organic Carbon (DOC)
Total Organic Carbon (TOC)
Formaldehyde
Phenol
2-Chlorophenol
2-Nitrophenol
2,4-Dimethylphenol
2,4-Dichlorophenol
2,6-Dichlorophenol
4-Chloro-3-methylphenol
2,4,6-Trichlorophenol
2,4,5-Trichlorophenol
Pentachlorophenol
TRH C6-C10
TRH C6-C10 minus BTEX (F1)
TRH C10-C16
TRH C16-C34
TRH C34-C40
Total TRH C6-C40
TRH C10-C16 minus Naphthalene (F2)

89	Benzene	1	µg/L	<1	<1
90	Toluene	2	µg/L	<2	<2
91	Ethylbenzene	2	µg/L	<2	<2
92	meta- & para-Xylene	2	µg/L	<2	<2
93	ortho-Xylene	2	µg/L	<2	<2
94	^ Total Xylenes	2	µg/L	<2	<2
97	3 Methylcholanthrene	0.1	µg/L	<0.1	<0.1
98	2-Methylnaphthalene	0.1	µg/L	<0.1	<0.1
99	Acenaphthene	0.1	µg/L	<0.1	<0.1
100	Acenaphthylene	0.1	µg/L	<0.1	<0.1
101	Anthracene	0.1	µg/L	<0.1	<0.1
102	Benz(a)anthracene	0.1	µg/L	<0.1	<0.1
103	Benzo(a)pyrene	0.05	µg/L	<0.05	<0.05
104	Benzo(b+j)fluoranthene	0.1	µg/L	<0.1	<0.1
105	Benzo(g,h,i)perylene	0.1	µg/L	<0.1	<0.1
107	Benzo(k)fluoranthene	0.1	µg/L	<0.1	<0.1
108	Chrysene	0.1	µg/L	<0.1	<0.1
109	Dibenz(a,h)anthracene	0.1	µg/L	<0.1	<0.1
111	Fluoranthene	0.1	µg/L	<0.1	<0.1
112	Fluorene	0.1	µg/L	<0.1	<0.1
113	Indeno(1.2.3.cd)pyrene	0.1	µg/L	<0.1	<0.1
114	Naphthalene	0.1	µg/L	<0.1	<0.1
115	Phenanthrene	0.1	µg/L	<0.1	<0.1
117	Pyrene	0.1	µg/L	<0.1	<0.1
118	^ Sum of PAHs	0.05	µg/L	<0.05	<0.05
119	^ Benzo(a)pyrene TEQ (zero)	0.05	µg/L	<0.05	<0.05
120	2,4 Dinitrophenol	0.01	µg/L	<0.01	<0.01
121	2-Methyl-4,6-dinitrophenol	0.05	µg/L	<0.05	<0.05
122	Dinoseb	0.1	µg/L	<0.10	<0.10
123	Gross alpha	0.05	Bq/l	<0.96	<0.70
125	Gross beta activity - 40K	0.1	Bq/l	32.3	<1.39
126	Temperature (field)			Criteria not recorded	
127	Dissolved Oxygen (field)			Criteria not recorded	
128	Hexachlorophene			Criteria not recorded	
129	m- and p-Cresol			Criteria not recorded	

Benzene
Toluene
Ethylbenzene
m- and p-Xylene
Ortho-xylene
Total Xylenes
3-Methylcholanthrene
2-Dimethylbenz(a)anthracene
Acenaphthene
Acenaphthylene
Anthracene
Benzo (a) anthracene
Benzo(a)pyrene
Benzo(b+j)fluoranthene
Benzo(ghi)perylene
Benzo(k)fluoranthene
Chrysene
Dibenzo(ah)anthracene
Fluoranthene
Fluorene
Indeno(123-cd)pyrene
Naphthalene
Phenanthrene
Pyrene
Carcinogenic PAHs (benzo(a)pyrene
Carcinogenic PAHs (benzo(a)pyrene
2,4-Dinitrophenol
2-Methyl-4,6-dinitrophenol
Dinoseb
Gross Alpha
Gross Beta
Temperature
Dissolved Oxygen
Hexachlorophene
m- and p-Cresol