Kintore Hydrogen Facility

Appendix 13.1: Water Quality Monitoring Data

Kintore Hydrogen Ltd

Prepared by:

SLR Consulting Limited

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FK8 2DZ

SLR Project No.: 428.013099.00001

Planning Application No: ENQ/2024/0415

18 July 2024

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	18 July 2024	J Turnbull	K Rainford	G Robb
	Click to enter a date.			
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1.0 Water Quality Monitoring Data

This Appendix presents the water quality data which has been collected by SLR Consulting Limited at the consented abstraction point from the River Don (see Figure 13.1). Monthly monitoring has been undertaken between November 2022 and July 2023.

Plots of the monitoring data are shown in Annex A, laboratory test certificates in Annex B and a piper diagram as Annex C. A summary of the data collected is given in Table 1-1.

Table 1-1: Summary of Water Quality Monitoring Data

Analytical Parameter	Units	EQS	16/11/2022	05/12/2022	17/01/2023	09/03/2023	11/05/2023	06/07/2023	01/08/2023	07/09/2023	11/10/2023	16/11/2023	18/12/2023	23/01/2024	22/02/2024	21/03/2024	17/04/2024	23/05/2024	20/06/2024	02/07/2024
pH	pH Units	5.10 (humic)	7.20	7.80	7.60	7.40	7.80	7.70	7.50	7.60	7.20	7.50	7.40	7.40	6.90	7.20	7.50	7.30	6.90	7.60
		6.60 (Clear)																		
Electrical Conductivity at 20 °C	µS/cm	-	160	200	180	270	170	190	180	190	150	140	170	130	177	173	147	181	145	190
Turbidity	NTU	-	17.00	< 1.0	< 1.0	1.40	2.10	1.70	2.80	< 1.0	1.00	1.60	< 1.0	6.20	< 1.0	< 1.0	6.00	8.60	< 1.0	2.00
Sulphate as SO4	µg/l	400	8360	9830	8820	11000	9630	9350	9160	9390	8810	7090	9040	7800	10100	8430	7520	8510	7940	9220
Sulphate as SO4	mg/l	250	8.36	9.83	8.82	11.00	9.63	9.35	9.16	9.40	8.81	7.09	9.04	7.80	10.10	8.43	7.52	8.51	7.94	9.22
Chloride	mg/l	-	18	25	23	40	20	21	19	22	18	18	18	19	20	21	18	20	17	20
Silicon (total)	µg/l	-	5600	6600	7100	6500	5200	6200	3600	6800	3700	2500	2000	1700	2400	7200	6500	7000	4900	7000
Fluoride	µg/l	500	76	82	55	68	60	53	57	53	67	62	59	< 50	62	69	<50	57	< 50	59
Ammoniacal Nitrogen as NH4	µg/l	-	< 15	86	110	84	110	610	58	85	190	5700	46	39	61	58	6300	57	170	< 15
Total Organic Carbon (TOC)	mg/l	-	12.30	4.28	3.82	2.58	6.97	2.57	3.30	2.78	9.16	6.18	3.45	5.50	2.85	3.02	4.00	2.69	6.00	2.49
Nitrate as N	mg/l	-	2.16	3.26	3.40	2.83	2.51	2.33	2.03	2.48	2.25	2.47	3.21	1.84	3.19	3.17	2.19	2.41	2.07	2.77
Nitrate as NO3	mg/l	-	9.54	14.40	15.10	12.50	11.10	10.30	8.97	11.00	9.96	10.90	14.20	8.15	14.10	14.10	9.69	10.70	9.17	12.30
Nitrite as N	µg/l	-	17.0	12.0	25.0	8.8	16.0	34.0	60	27	6.3	2.3	3.9	2.5	7.5	17	6.3	27.0	19.0	69.0
Nitrite as NO2	µg/l	-	54.0	40.0	81.0	29.0	52.0	110.0	200.0	87.0	21.0	7.4	13.0	8.4	25.0	55.0	21.0	88.0	63.0	230.0
Alkalinity as CaCO3 (titration)	mg/l	-	24	33	45	58	45	52	51	56	36	36	38	18	28	29	35	51	28	50
Alkalinity as CaCO3	mg/l	-	22	22	35	42	35	50	53	59	31	35	37	17	22	25	29	43	24	41
Chemical Oxygen Demand (Total)	mg/l	-	38.0	21.0	14.0	12.0	13.0	13.0	13.0	5.4	20.0	16.0	8.4	21.0	6.7	12.0	14.0	3.6	11.0	7.6
Total Oxidised Nitrogen (TON)	mg/l	25	2.2	3.3	3.4	2.8	2.5	2.4	2.1	2.5	2.3	2.5	3.2	1.8	3.2	3.2	2.2	2.4	2.1	2.8
Total Suspended Solids	mg/l	-	58	< 2.0	4	< 2.0	21	2	4	4	9	6	< 2.0	9	5	< 2.0	9	< 2.0	7	2
Total Dissolved Solids (Gravimetric)	mg/l	-	100	140	130	200	130	160	120	120	120	58	110	72	130	150	14	120	98	100
Dissolved Organic Carbon (DOC)	mg/l	-	10.30	4.24	3.62	2.56	6.35	2.55	3.26	2.41	9.45	5.82	3.10	5.18	2.57	2.67	3.89	2.54	5.98	2.36
Hardness - Total	mg-CaCO3/l	-	48.6	55.8	55.7	66.6	61.2	66.5	62.5	69.3	48.0	44.6	55.0	43.6	56.8	55.2	48.1	57.8	49.6	64.9
Bicarbonate as HCO3 (titration)	mg/l	-	30	41	54	71	54	64	62	69	44	43	46	22	34	30	36	52	29	50
Bromide	mg/l	-	0.03	0.05	0.04	0.10	0.04	0.04	0.037	0.038	0.026	0.046	0.044	0.040	0.055	< 0.002	0.04	0.046	0.021	0.033
Bromate by IC	mg/l	-	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Carbonate Alkalinity as CO3	mg-CO3/l	-	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Boron (dissolved)	µg/l	-	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	11	< 10	11.00	11.00	11.00	< 10	< 10	< 10	< 10	< 10

Analytical Parameter	Units	EQS	16/11/2022	05/12/2022	17/01/2023	09/03/2023	11/05/2023	06/07/2023	01/08/2023	07/09/2023	11/10/2023	16/11/2023	18/12/2023	23/01/2024	22/02/2024	21/03/2024	17/04/2024	23/05/2024	20/06/2024	02/07/2024
Calcium (dissolved)	mg/l	-	13	15	14	17	16	18	16	18	13	12	14	11	15	14	12	15	13	17
Iron (dissolved)	mg/l	1	0.09	0.04	0.03	0.04	0.06	0.03	0.05	0.03	0.09	0.08	0.05	0.09	0.06	0.04	0.04	0.02	0.07	0.01
Magnesium (dissolved)	mg/l	-	3.9	4.7	4.9	5.6	5.1	5.5	5.3	5.8	4.0	3.7	4.7	3.8	4.9	4.7	4.1	4.9	4.2	5.4
Potassium (dissolved)	mg/l	-	3.0	1.8	1.3	1.7	1.4	1.5	2.0	1.4	1.7	1.3	1.4	1.6	1.5	1.2	1.2	1.4	1.2	1.2
Sodium (dissolved)	mg/l	-	10	14	13	24	13	13	14	14.0	11	9.2	11	13	14.0	11	11	12.0	10.0	13.0
Aluminium (total)	mg/l	-	0.280	0.0968	0.0517	0.0356	0.157	0.0382	0.075	0.0167	0.0604	0.0772	0.0684	0.101	0.058	0.052	0.043	0.038	0.067	0.014
Antimony (total)	µg/l	-	0.50	0.70	0.70	0.40	0.70	< 0.4	0.70	0.40	< 0.4	< 0.4	0.40	< 0.4	0.80	< 0.4	0.90	< 0.4	0.90	0.50
Arsenic (total)	µg/l	-	0.48	0.29	0.21	0.20	0.30	0.31	0.40	0.29	0.33	0.25	0.31	0.21	0.24	0.26	0.26	0.30	0.28	0.25
Barium (total)	µg/l	-	52	45	40	41	37	40	34	33	31	38	45	30	34	34	28	30	24	30
Boron (total)	µg/l	2000	13	12	11	< 10	11	< 10	13	< 10	15	< 10	11	18	13	< 10	< 10	< 10	< 10	< 10
Cadmium (total)	µg/l	-	0.07	0.05	0.03	0.03	0.03	< 0.02	0.04	< 0.02	< 0.02	0.03	0.04	0.03	< 0.02	< 0.02	0.02	< 0.02	< 0.02	< 0.02
Chromium (total)	µg/l	-	0.70	0.50	0.40	0.60	0.50	1.00	0.70	0.60	1.10	0.60	1.10	0.90	0.80	0.80	0.80	0.40	0.40	1.20
Iron (total)	mg/l	-	0.15	0.25	0.15	0.19	0.35	0.11	0.18	0.11	0.33	0.18	0.17	0.24	0.21	0.26	0.30	0.37	0.33	0.13
Manganese (total)	µg/l	123	89	24	23	23	28	22	33	12	12	18	28	21	33	23	17	1	20	19
Molybdenum (total)	µg/l	-	0.41	0.49	0.39	0.92	0.26	0.56	0.80	0.58	0.49	0.63	0.22	0.65	0.19	0.53	0.35	0.32	0.24	0.30
Nickel (total)	µg/l	4	3.1	1.6	1.4	1.0	1.4	1.3	1.7	1.1	1.9	1.7	1.4	2.5	1.8	1.1	1.5	1.0	1.2	0.7
Selenium (total)	µg/l	-	< 0.6	< 0.6	< 0.6	0.60	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Tin (total)	µg/l	25	0.43	0.29	0.51	0.96	0.30	2.00	0.73	1.80	< 0.20	< 0.20	0.40	3.30	<1.0	1.20	0.82	0.97	1.10	2.10
Zinc (total)	µg/l	10.9	13	17	10	11	21	13	27	5.40	9.50	50	14	22	4	9	23	3	6	12
Calcium (total)	mg/l	-	14	15	15	18	16	18	17	19	13	12	15	12	15	15	14	16	13	18
Magnesium (total)	mg/l	-	4.1	4.8	5.0	5.9	5.2	5.8	5.5	6.1	4.2	3.9	5.0	3.7	5.0	5.0	4.7	5.4	4.2	5.7
Potassium (total)	mg/l	-	3.7	2.6	1.5	2.0	1.6	1.5	2.3	1.4	1.9	1.4	1.5	1.4	1.8	2.0	1.3	1.4	1.3	1.1
Sodium (total)	mg/l	-	12	15	13	25	13	14	17	14	12	9	11	12	15	14	13	13	11	13
Aluminium (dissolved)	mg/l	-	0.047	0.022	0.020	0.012	0.032	0.006	0.011	0.0042	0.039	0.062	0.021	0.042	0.018	0.013	0.015	0.006	0.025	0.006
Aluminium (dissolved)	µg/l	-	47	22	20	12	32	6	11	4.2	39	62	21	42	18	13	15	6	25	6
Antimony (dissolved)	µg/l	-	< 0.4	0.50	< 0.4	< 0.4	< 0.4	< 0.4	0.50	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	0.80	< 0.4	0.40	< 0.4	0.40	0.50
Arsenic (dissolved)	µg/l	50	0.28	0.22	0.18	0.16	0.24	0.30	0.33	0.28	0.30	0.22	0.20	0.18	0.20	0.21	0.19	0.24	0.22	0.22
Barium (dissolved)	µg/l	-	36	40	38	38	33	38	30	33	30	32	34	27	32	34	26	30	23	32
Cadmium (dissolved)	µg/l	≤0.45	0.03	< 0.02	0.02	< 0.02	0.02	0.02	0.03	< 0.02	< 0.02	< 0.02	< 0.02	0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Chromium (dissolved)	µg/l	3.4	0.3	0.3	0.3	0.4	0.4	0.8	0.5	0.4	0.7	0.6	1.1	0.5	0.6	0.7	0.4	0.4	0.3	0.5
Copper (dissolved)	µg/l	1	2.4	2.5	4.5	1.9	3.2	10.0	6.9	3.8	14.0	6.7	3.0	3.0	2.3	2.4	4.2	1.3	3.3	3.1
Manganese (dissolved)	µg/l	123	1.30	4.90	12.00	13.00	4.70	1.30	1.90	0.78	3.80	9.70	9.10	8.50	13.00	7.30	4.80	0.71	1.00	0.26
Molybdenum (dissolved)	µg/l	-	0.37	0.37	0.33	0.31	0.25	0.46	0.78	0.33	0.46	0.23	0.21	0.24	0.19	0.25	0.22	0.31	0.23	0.25
Nickel (dissolved)	µg/l	4	1.4	1.0	1.2	0.8	1.1	1.0	1.1	0.7	1.8	1.4	1.1	1.3	1.0	0.9	1.0	0.6	0.8	0.6
Selenium (dissolved)	µg/l	-	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Tin (dissolved)	µg/l	-	0.40	< 0.20	0.40	0.44	0.23	0.76	0.97	0.58	< 0.20	< 0.20	0.23	0.20	0.33	0.27	< 0.20	0.23	0.82	< 0.20
Zinc (dissolved)	µg/l	10.9	2.8	2.0	4.2	3.0	8.9	7.8	13.0	4.9	1.7	11.0	7.2	4.4	2.7	4.8	7.4	1.6	2.3	2.5
Copper (total)	µg/l	1	15.0	15.0	5.2	6.9	4.9	16.0	63.0	10.0	26.0	10.0	13.0	18.0	10.0	11.0	7.9	3.4	35.0	4.4

Analytical Parameter	Units	EQS	16/11/2022	05/12/2022	17/01/2023	09/03/2023	11/05/2023	06/07/2023	01/08/2023	07/09/2023	11/10/2023	16/11/2023	18/12/2023	23/01/2024	22/02/2024	21/03/2024	17/04/2024	23/05/2024	20/06/2024	02/07/2024
Field Data																				
pH	pH Units	-	7.27	7.09	6.55	7.67	7.18	7.47	7.60	7.90	7.03	6.79	7.93	6.97	7.43	7.81	6.88	7.56	7.30	7.61
Electrical Conductivity	µS/cm	-	154.71	203.82	193.34	264.47	193.08	209.43	177.90	219.59	157.25	156.29	182.31	154.91	201.27	188.34	175.26	212.79	153.11	197.23
Temperature	°C	-	8.80	5.56	1.77	2.72	11.86	15.81	14.85	17.27	10.99	5.82	7.40	3.81	5.26	6.74	6.21	12.97	14.30	13.61
Oxydation Reduction Potential (mV)	mV	-	91.90	160.20	190.35	164.45	160.30	172.50	135.26	178.50	275.50	191.20	178.30	200.45	149.00	134.60	221.60	111.32	171.30	190.90
Dissolved Oxygen	mg/l	-	10.60	12.50	13.51	14.16	10.69	10.74	9.84	9.97	10.01	12.09	11.72	12.73	12.19	12.19	12.24	9.98	9.78	10.56
	%	-	93.92	97.72	100.33	106.27	98.80	109.37	99.09	103.03	91.75	97.16	98.17	98.99	100.31	100.76	104.24	95.37	95.50	101.93
Turbidity	NTU	-	12.62	6.40	3.02	2.17	23.25	5.30	0.00	0.00	6.80	3.90	5.25	6.79	0.89	5.04	2.82	4.93	6.48	2.87
Total Dissolved Solids	ppt	-	0.10	0.13	0.12	0.17	0.13	0.14	0.12	0.14	0.10	0.10	0.12	0.10	0.13	0.12	0.11	0.14	0.10	0.13
Colour		-	STRAW	CLEAR	STRAW	STRAW	STRAW	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	CLEAR	PALE BROWN	CLEAR	CLEAR
Flow / Water Level		-	M - H	M	M	M	M	L - M	L - M	L - M	H	H	M - H	H	M	M	M	M	L - M	L - M

Annex A Water Quality Graphs

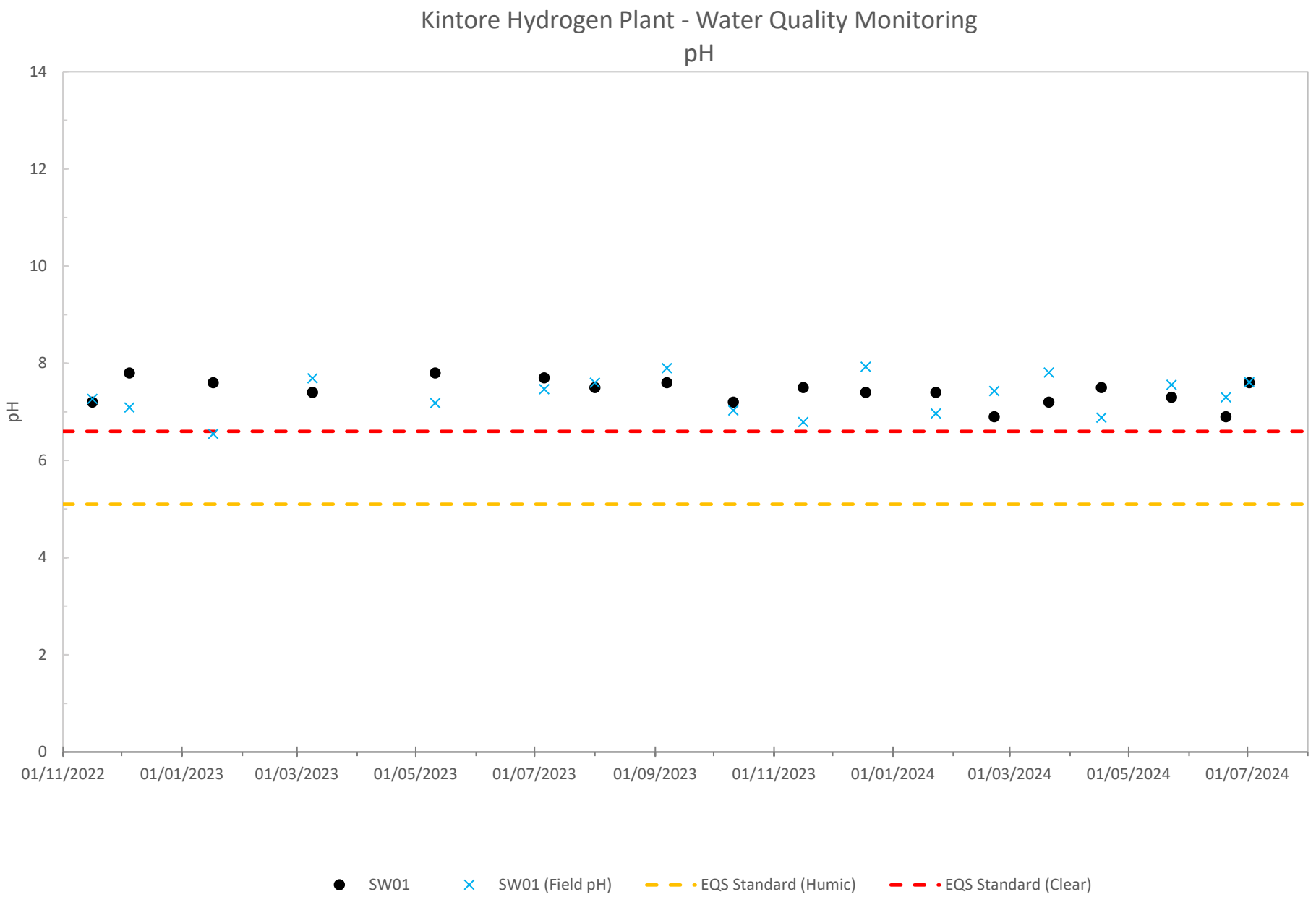
Kintore Hydrogen Facility

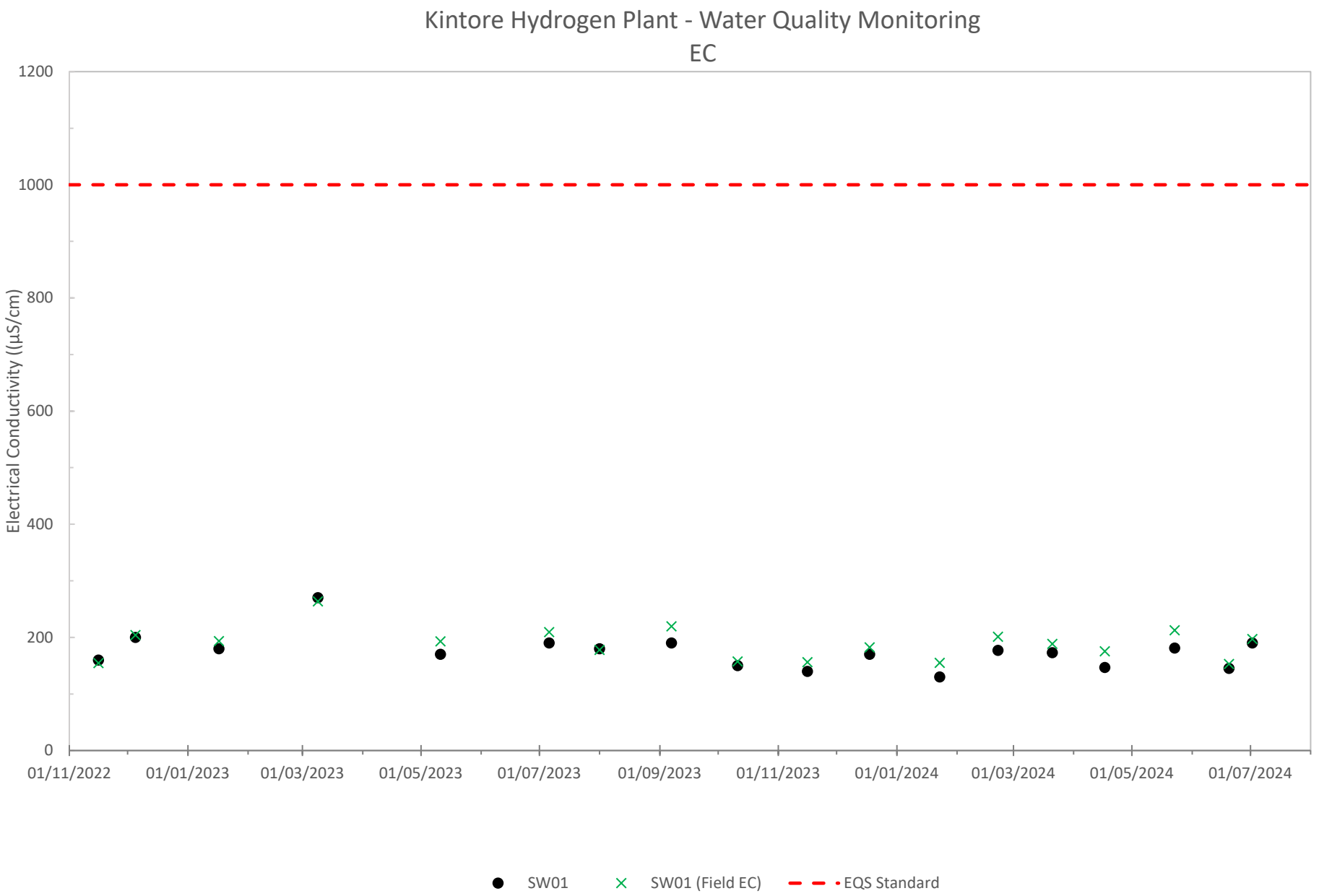
Appendix 13.1: Water Quality Monitoring Data

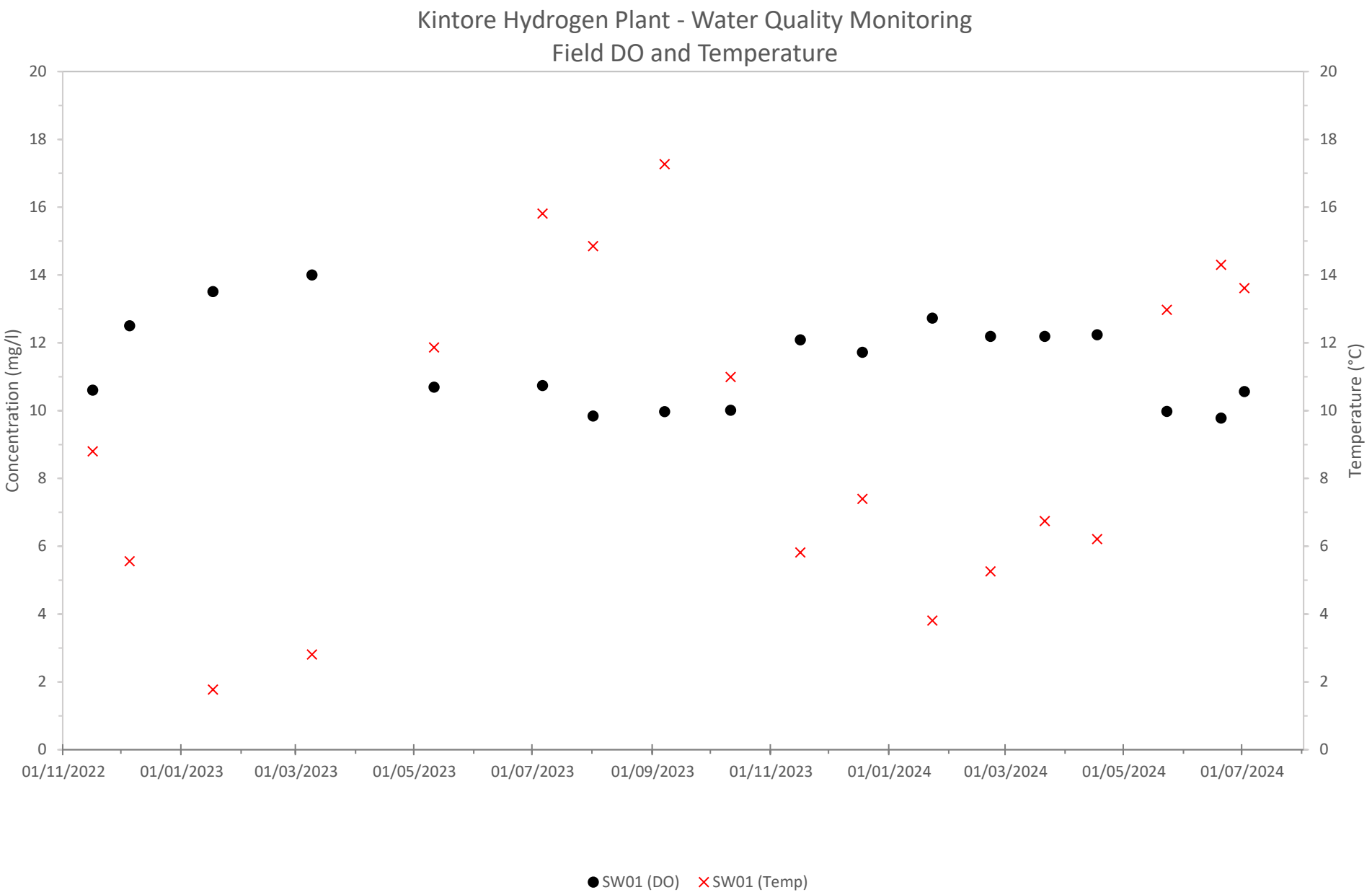
Kintore Hydrogen Ltd

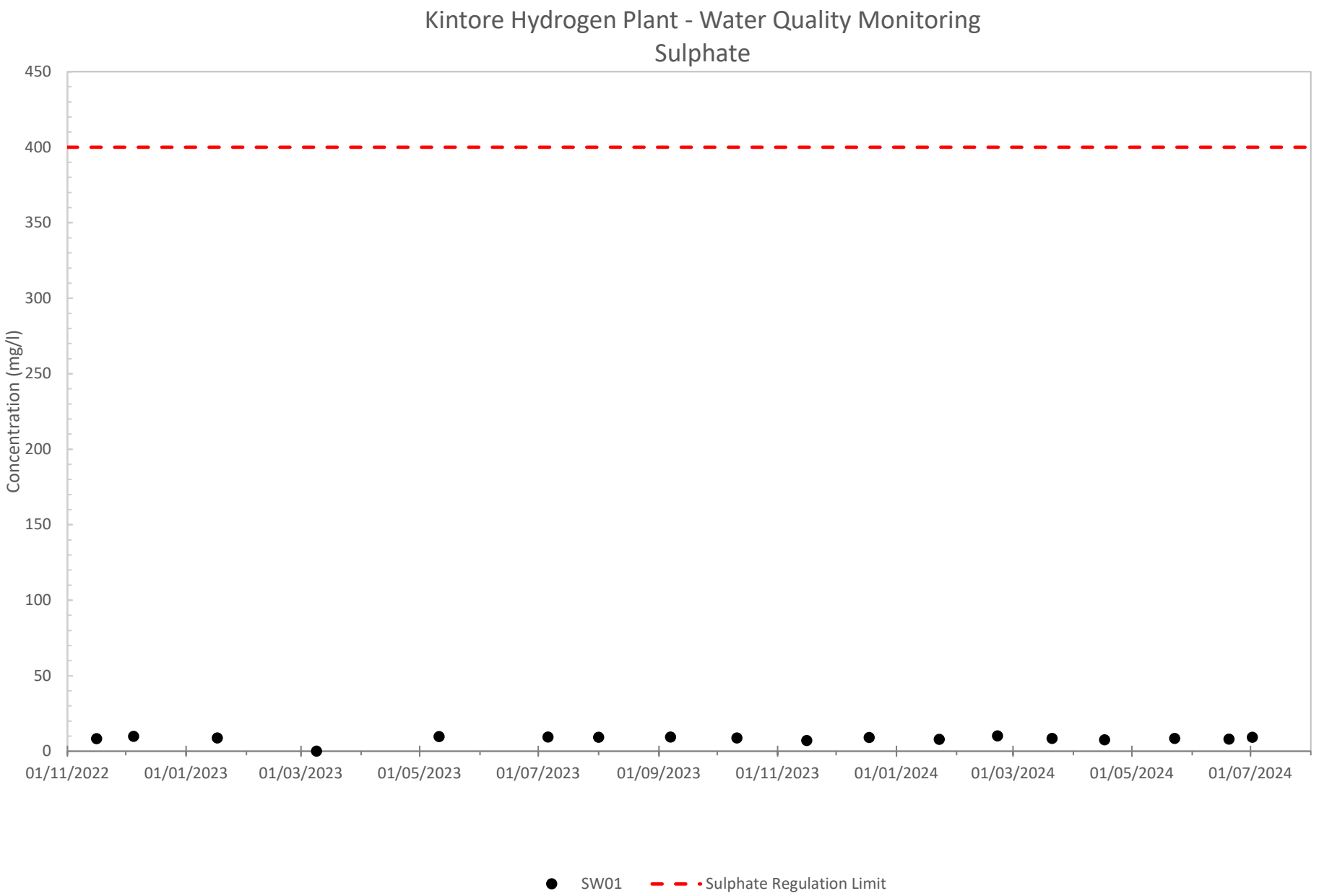
SLR Project No.: 428.013099.00001

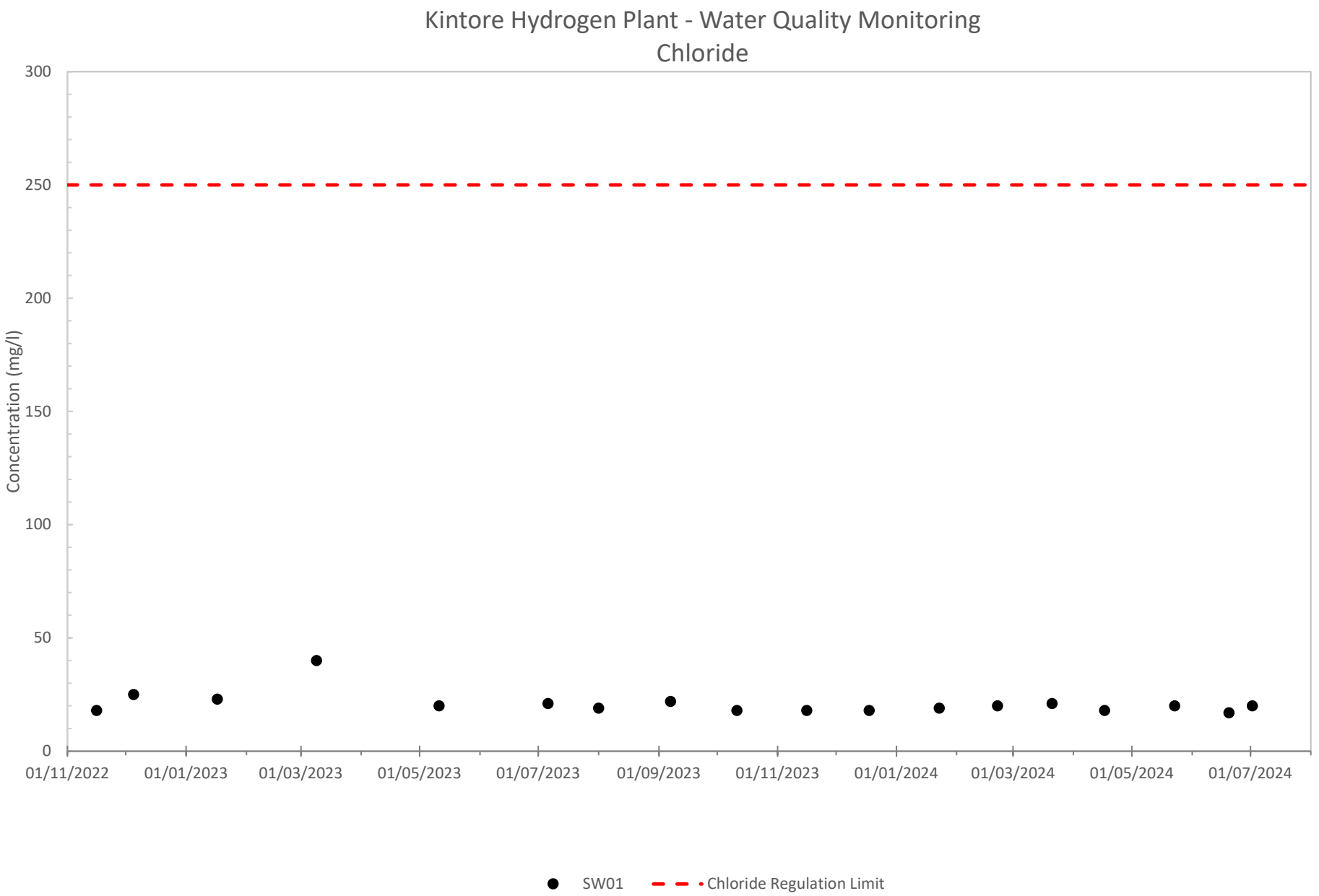
18 July 2024

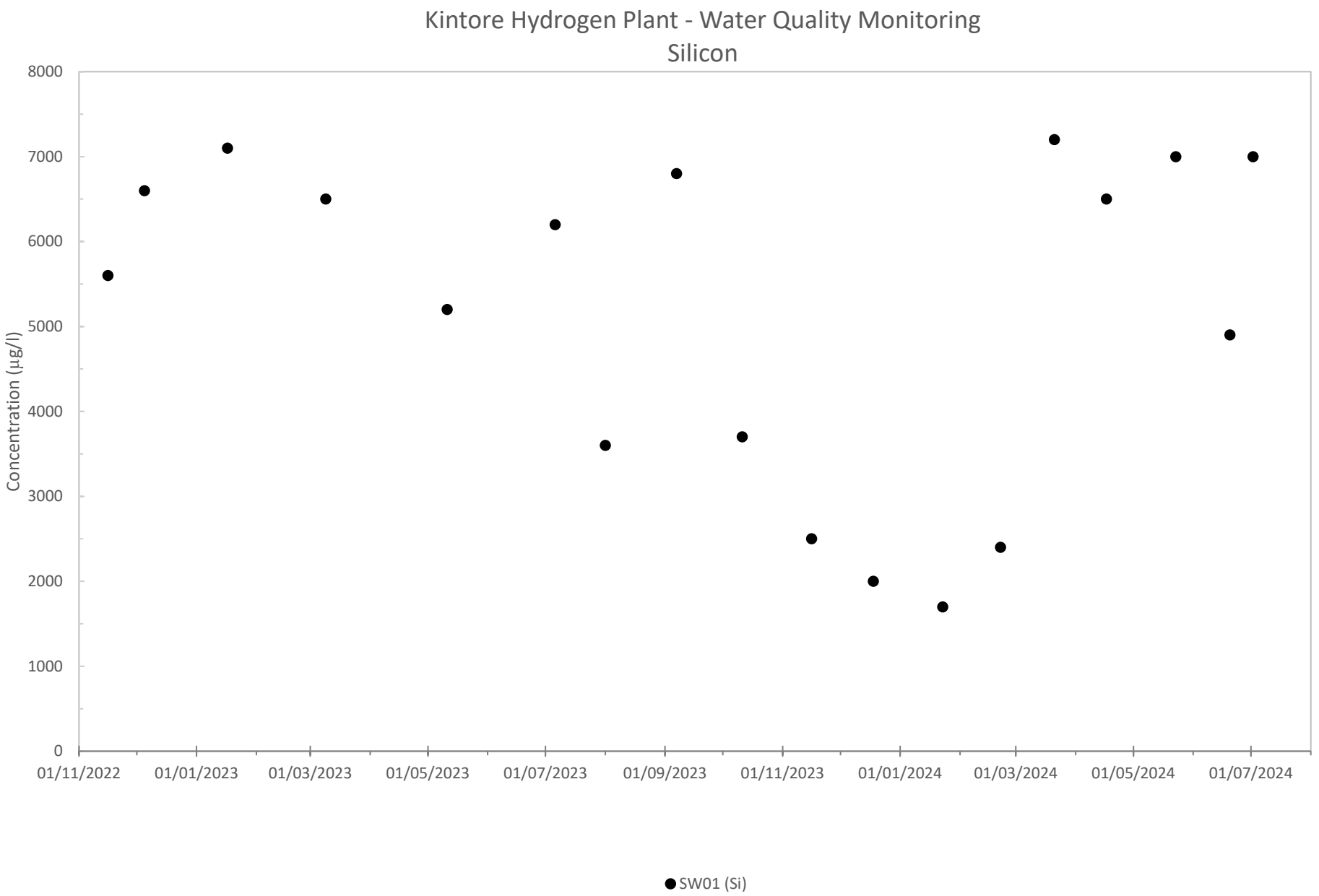

Kintore Hydrogen Plant - Water Quality Monitoring
pH
pH
14
12
10
8
6
4
2
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01
SW01 (Field pH)
EQS Standard (Humic)
EQS Standard (Clear)

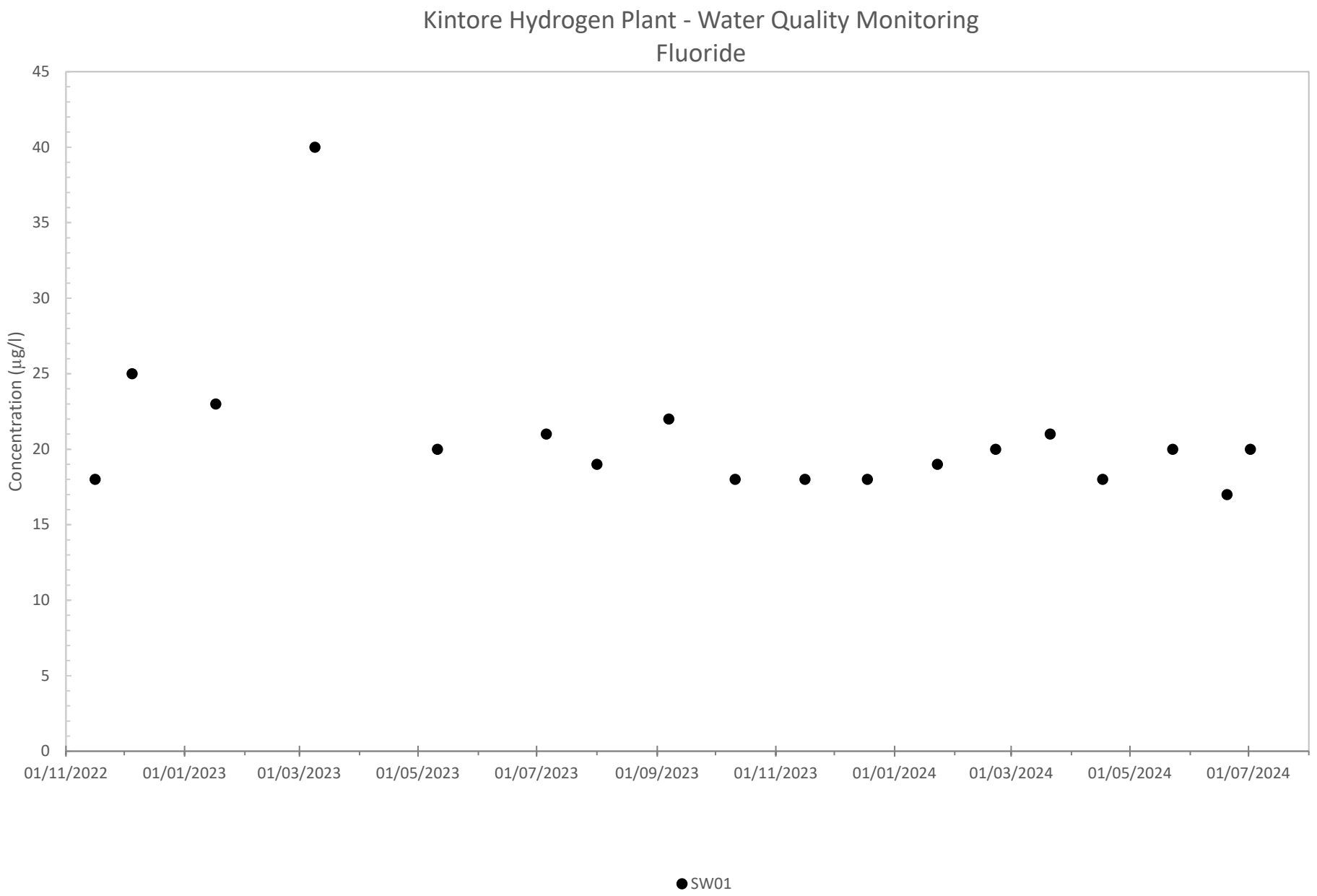

Kintore Hydrogen Plant - Water Quality Monitoring
EC
Electrical Conductivity ((µS/cm)
1200
1000
800
600
400
200
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01
SW01 (Field EC)
EQS Standard

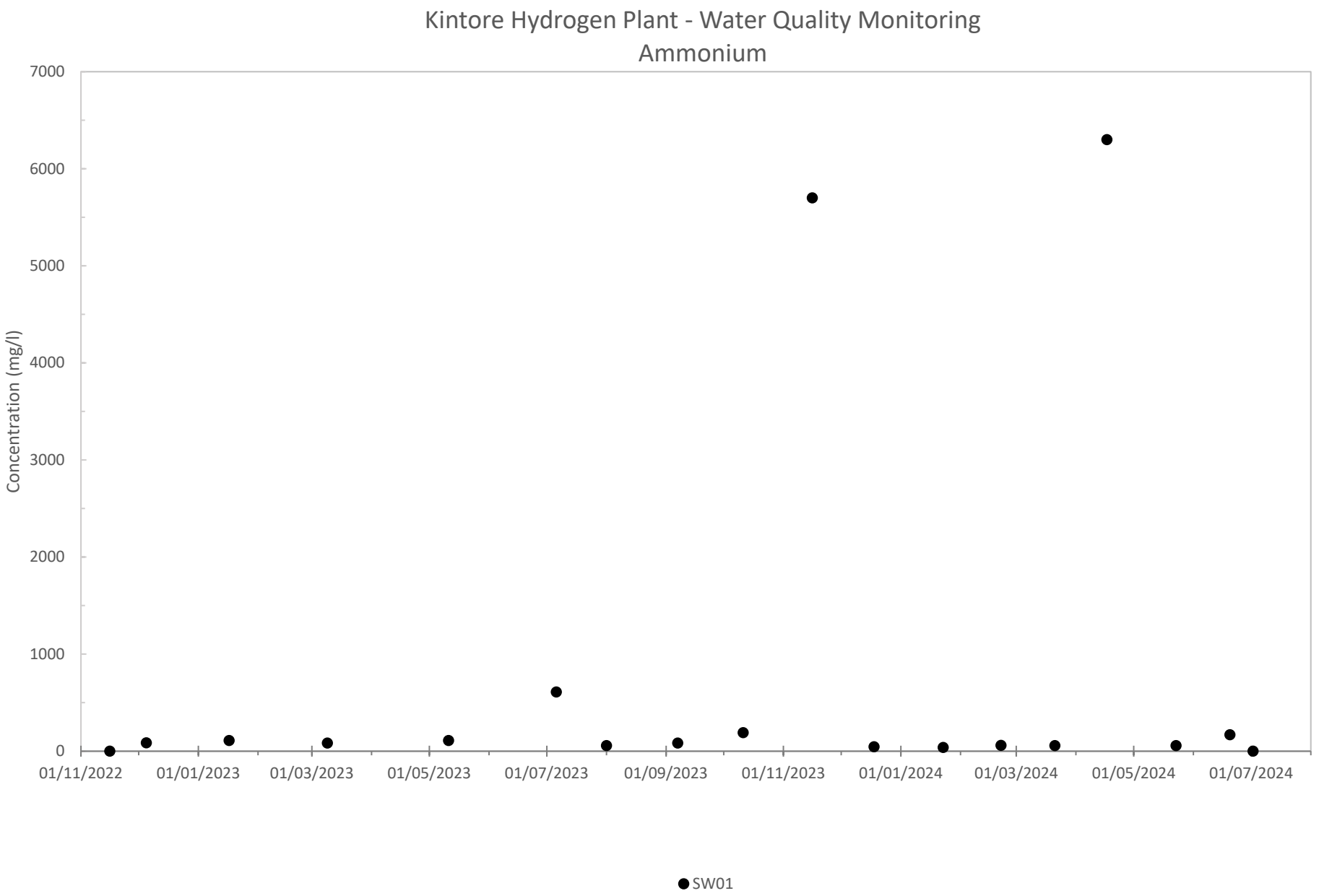

Kintore Hydrogen Plant - Water Quality Monitoring
Field DO and Temperature
Concentration (mg/l)
Temperature (°C)
0
2
4
6
8
10
12
14
16
18
20
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (DO)
SW01 (Temp)

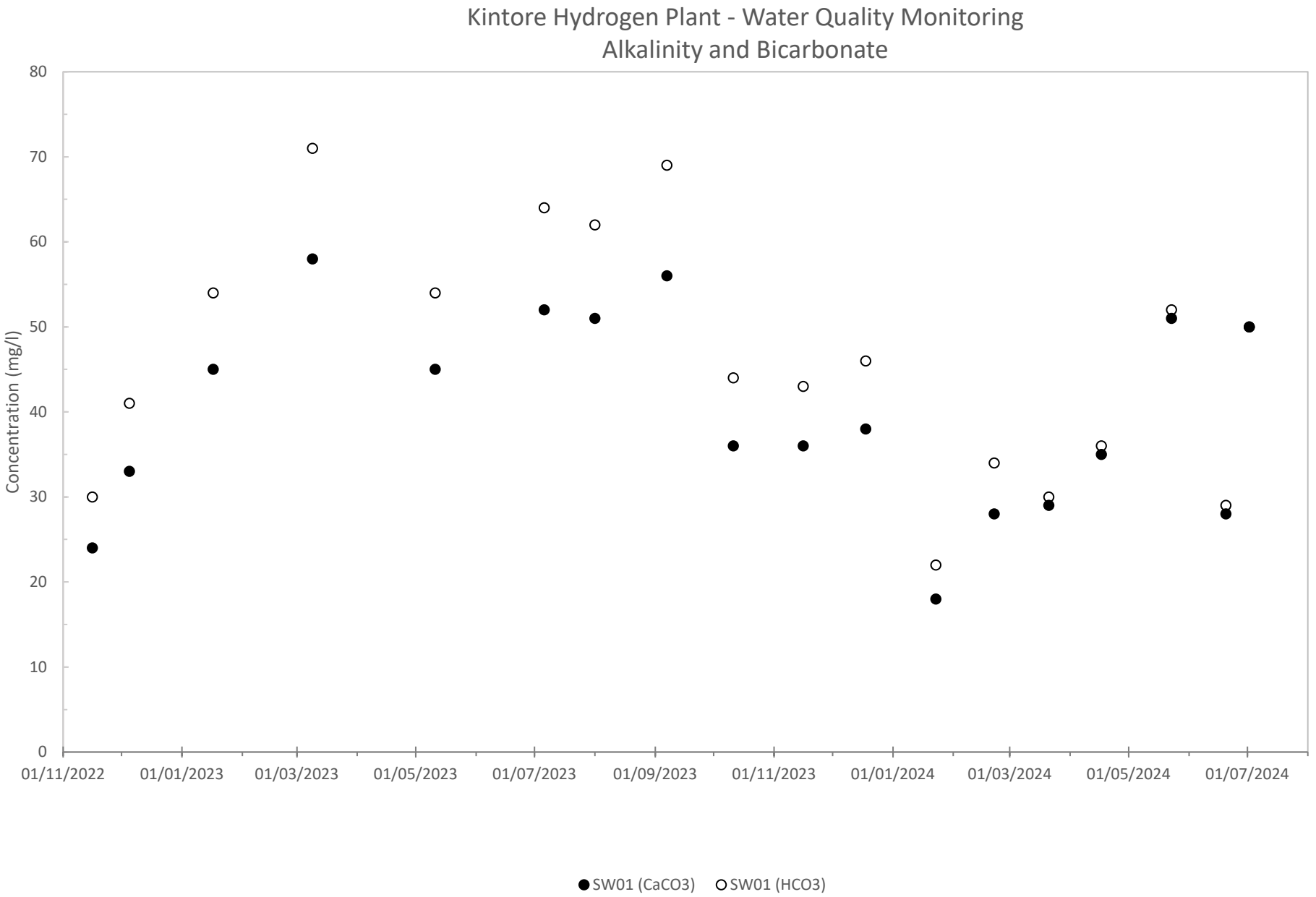

Kintore Hydrogen Plant - Water Quality Monitoring
Sulphate
Concentration (mg/l)
450
400
350
300
250
200
150
100
50
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01
Sulphate Regulation Limit

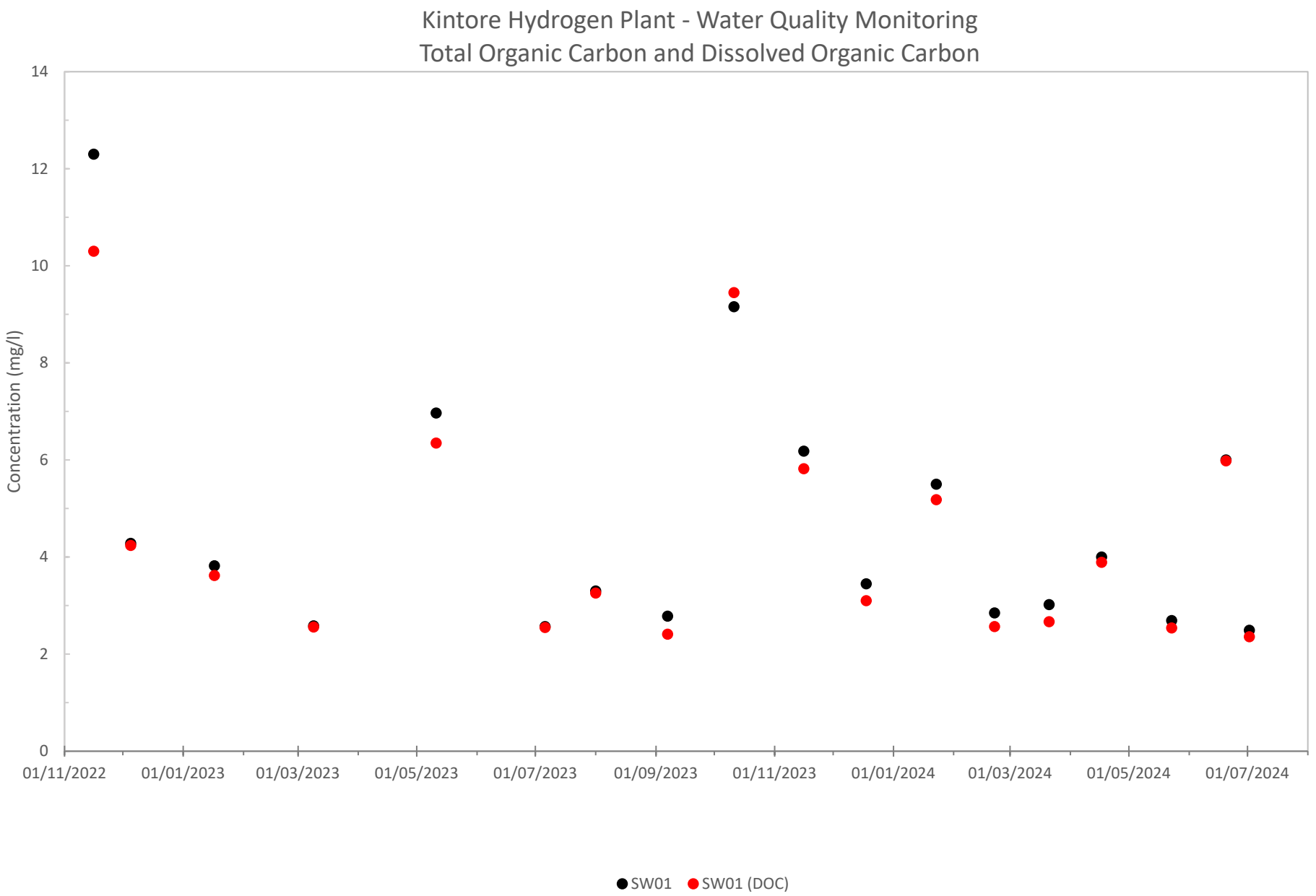

Kintore Hydrogen Plant - Water Quality Monitoring
Chloride
Concentration (mg/l)
300
250
200
150
100
50
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01
Chloride Regulation Limit

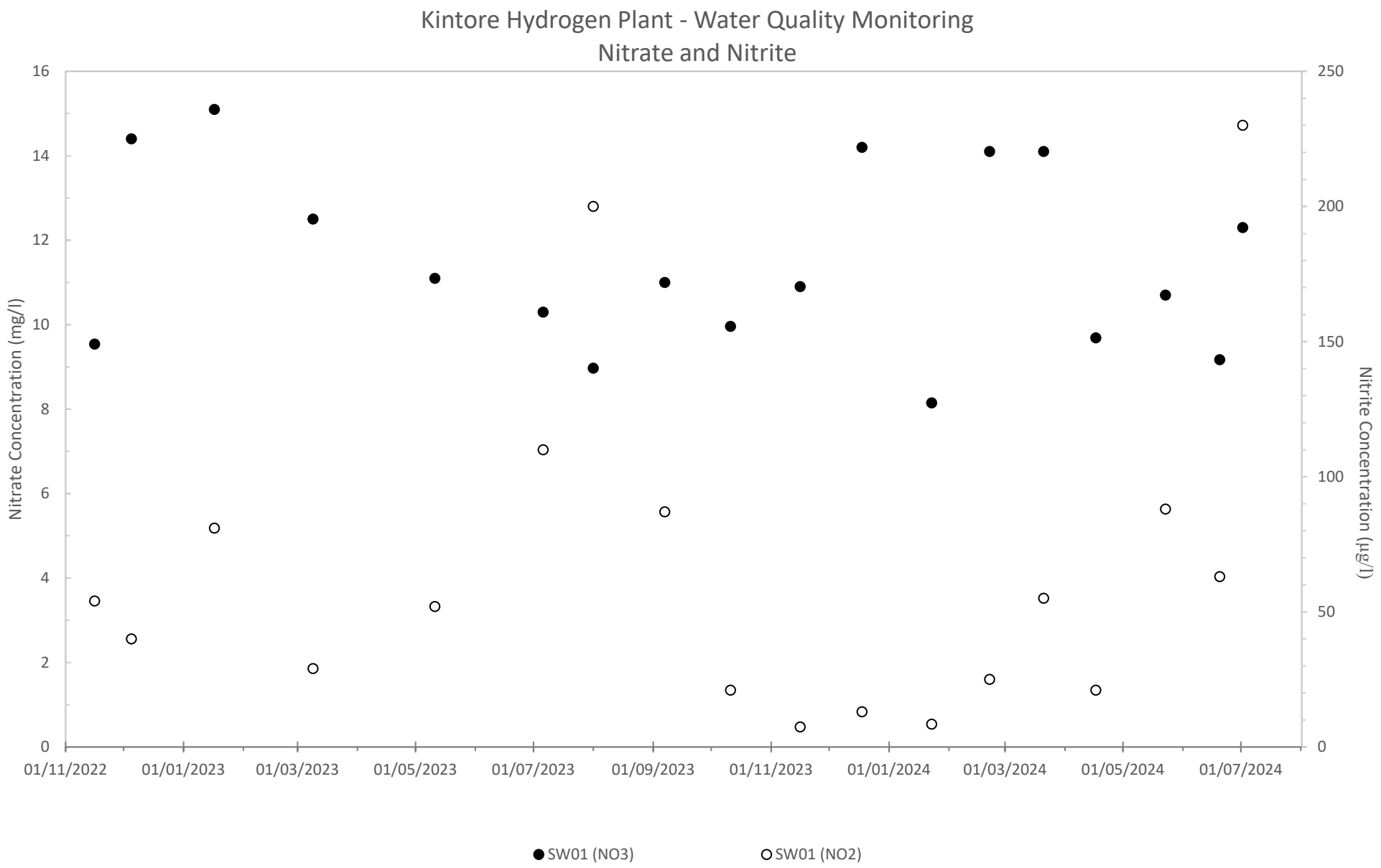

Kintore Hydrogen Plant - Water Quality Monitoring
Silicon
Concentration (µg/l)
8000
7000
6000
5000
4000
3000
2000
1000
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Si)

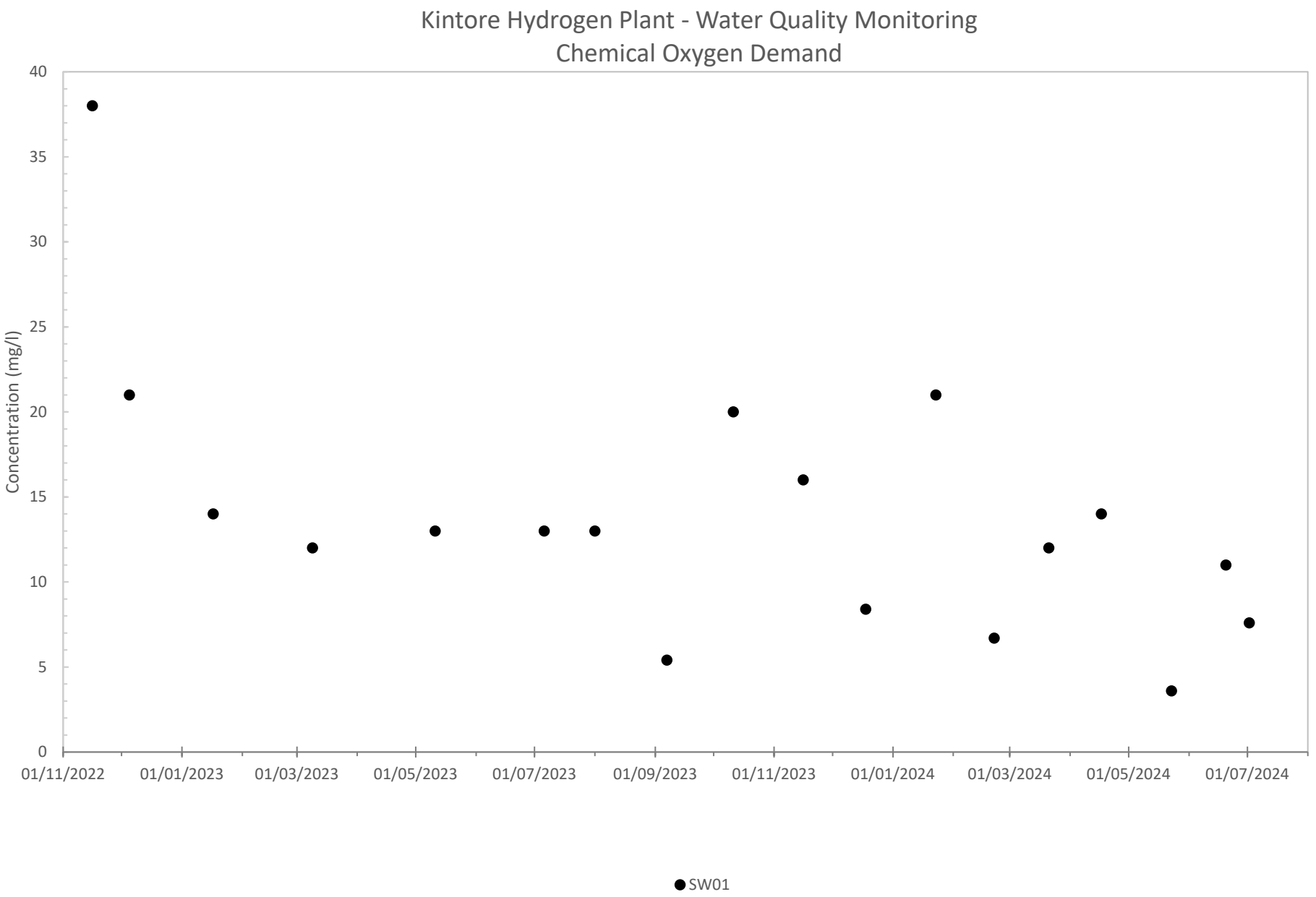

Kintore Hydrogen Plant - Water Quality Monitoring
Fluoride
Concentration (µg/l)
45
40
35
30
25
20
15
10
5
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01

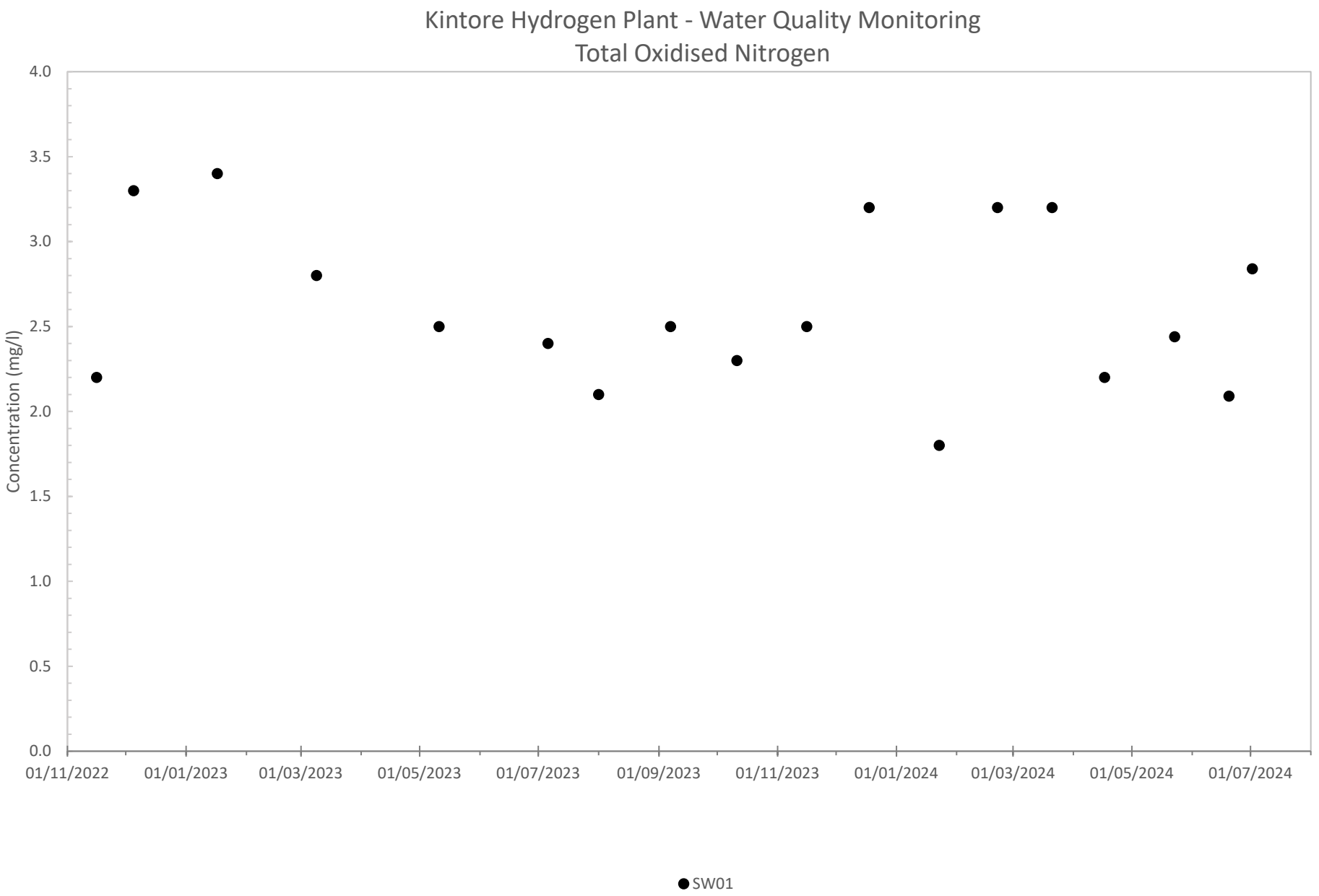

Kintore Hydrogen Plant - Water Quality Monitoring
Ammonium
Concentration (mg/l)
7000
6000
5000
4000
3000
2000
1000
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01

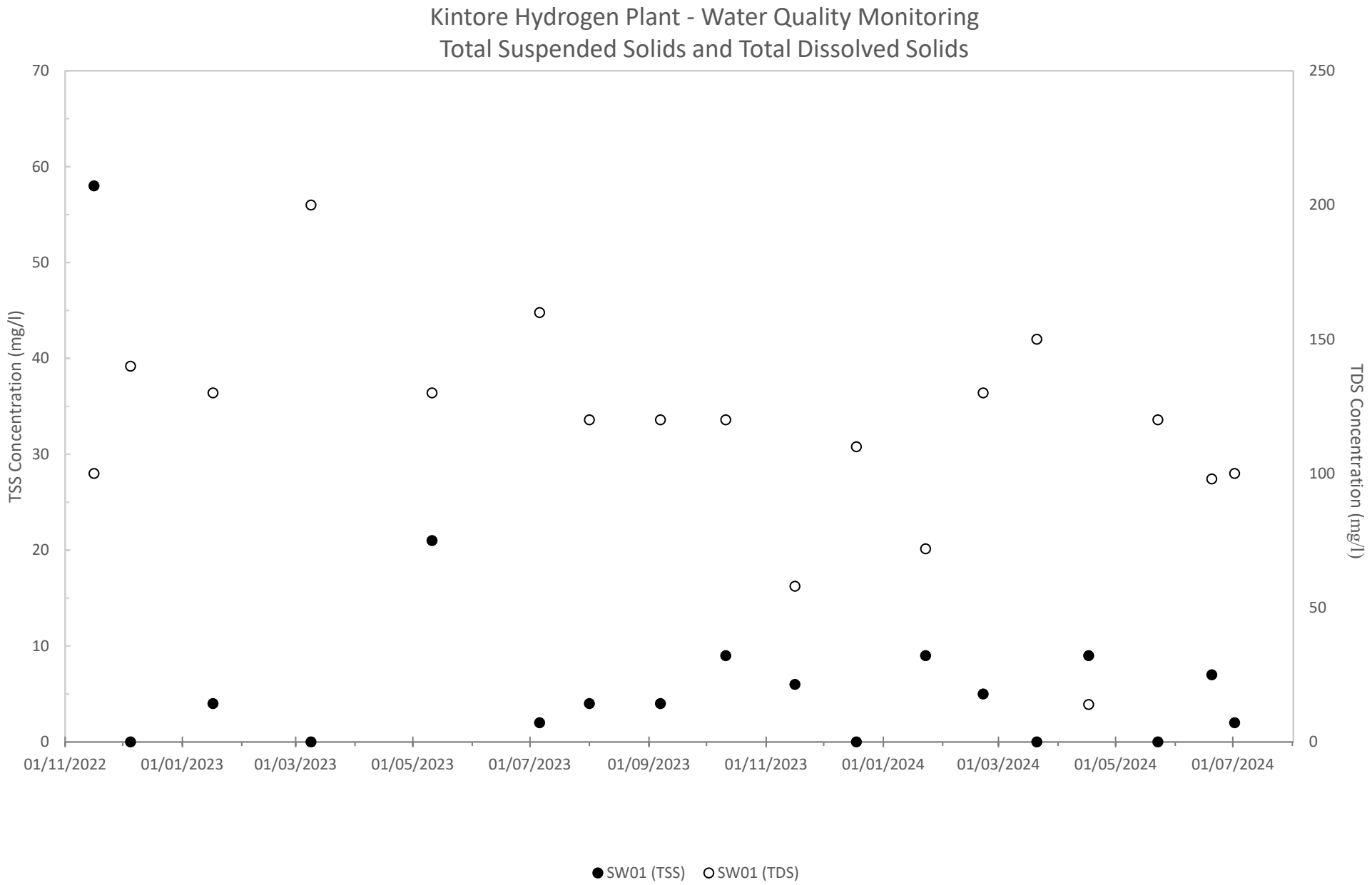

Kintore Hydrogen Plant - Water Quality Monitoring
Alkalinity and Bicarbonate
Concentration (mg/l)
80
70
60
50
40
30
20
10
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (CaCO3)
SW01 (HCO3)

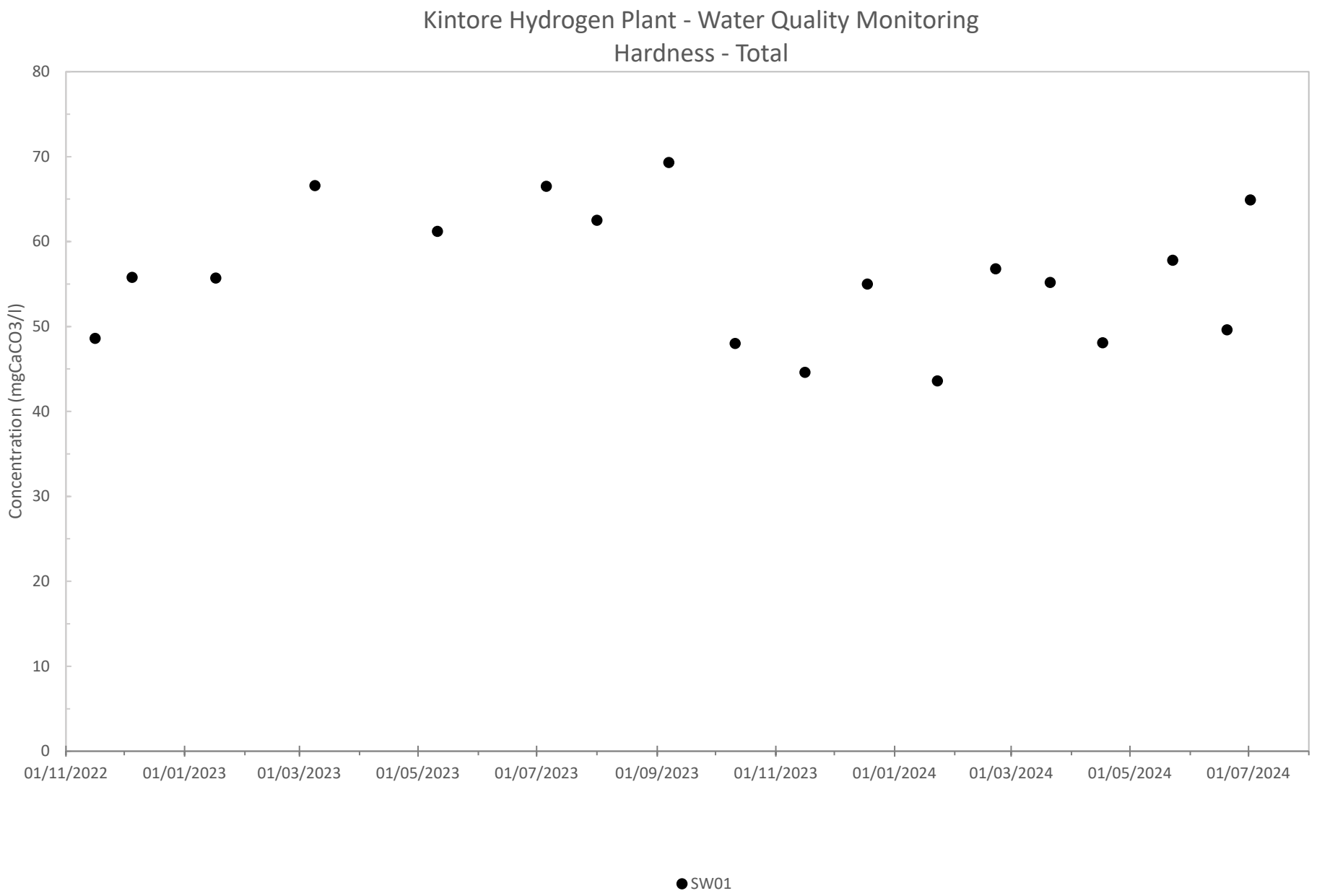

Kintore Hydrogen Plant - Water Quality Monitoring
Total Organic Carbon and Dissolved Organic Carbon
Concentration (mg/l)
0
2
4
6
8
10
12
14
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01
SW01 (DOC)

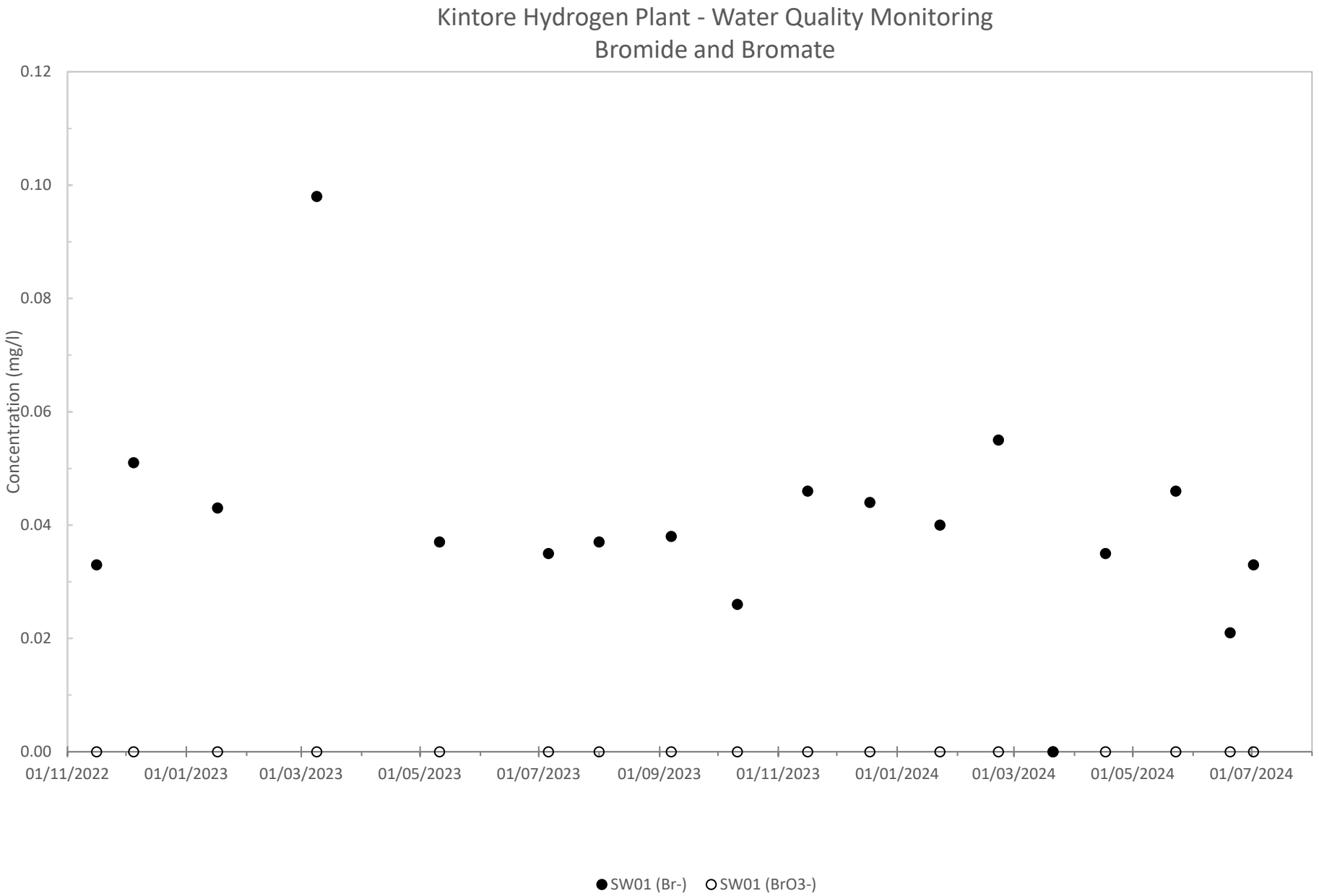

Kintore Hydrogen Plant - Water Quality Monitoring
Nitrate and Nitrite
Nitrate Concentration (mg/l)
Nitrite Concentration (µg/l)
0
2
4
6
8
10
12
14
16
0
50
100
150
200
250
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (NO3)
SW01 (NO2)

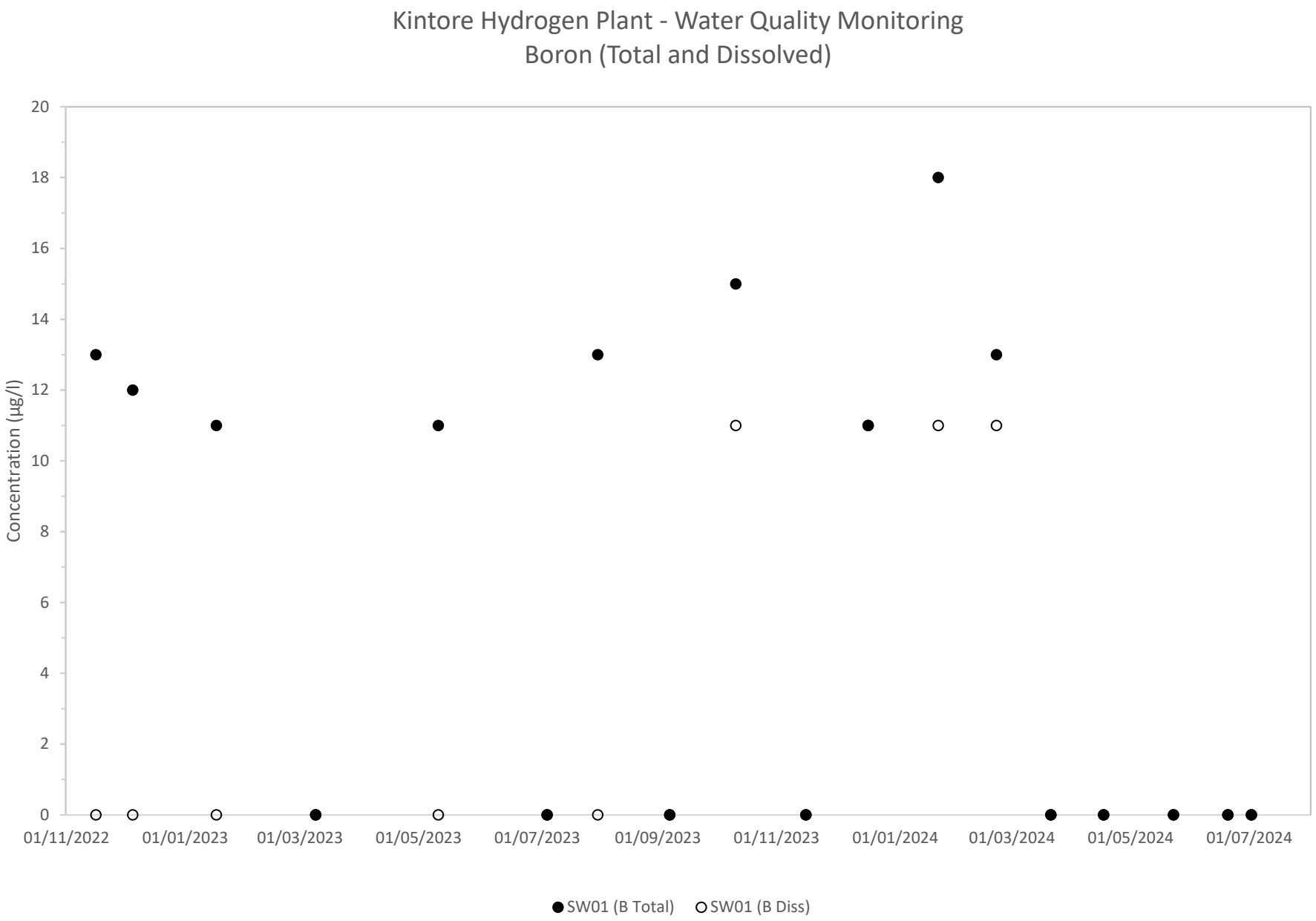

Kintore Hydrogen Plant - Water Quality Monitoring
Chemical Oxygen Demand
Concentration (mg/l)
40
35
30
25
20
15
10
5
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01

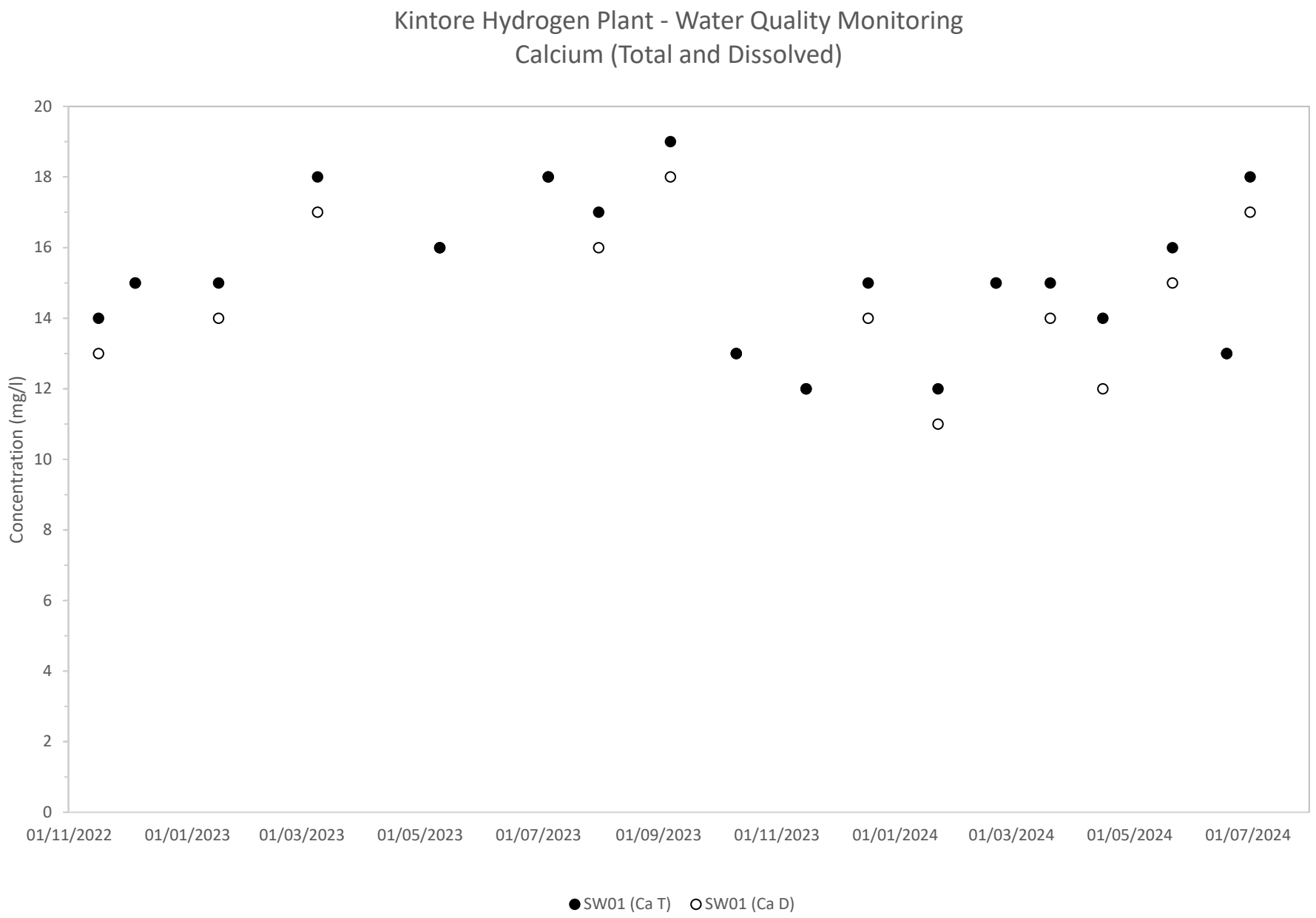

Kintore Hydrogen Plant - Water Quality Monitoring
Total Oxidised Nitrogen
Concentration (mg/l)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01

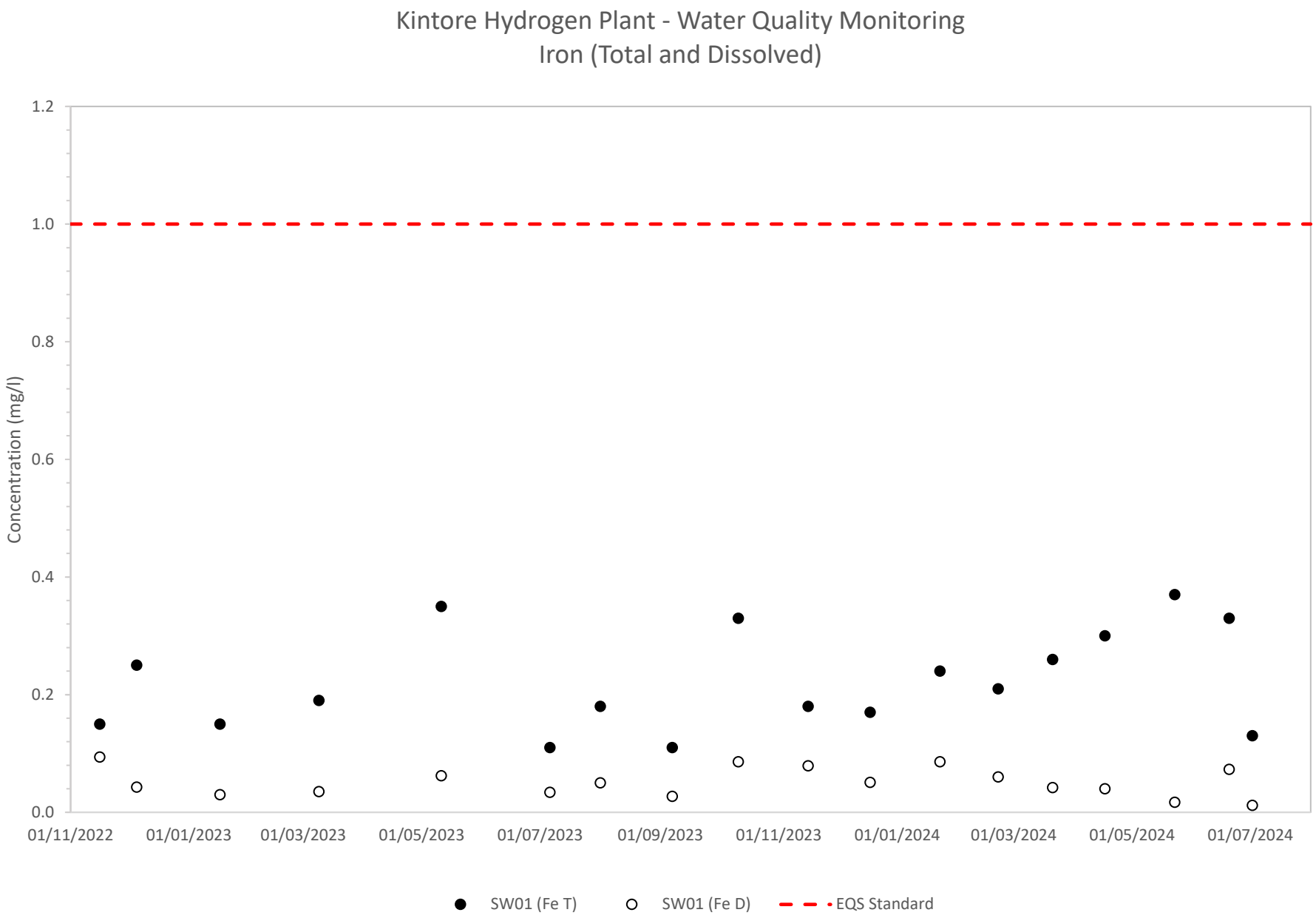

Kintore Hydrogen Plant - Water Quality Monitoring
Total Suspended Solids and Total Dissolved Solids
TSS Concentration (mg/l)
TDS Concentration (mg/l)
70
60
50
40
30
20
10
0
250
200
150
100
50
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (TSS)
SW01 (TDS)

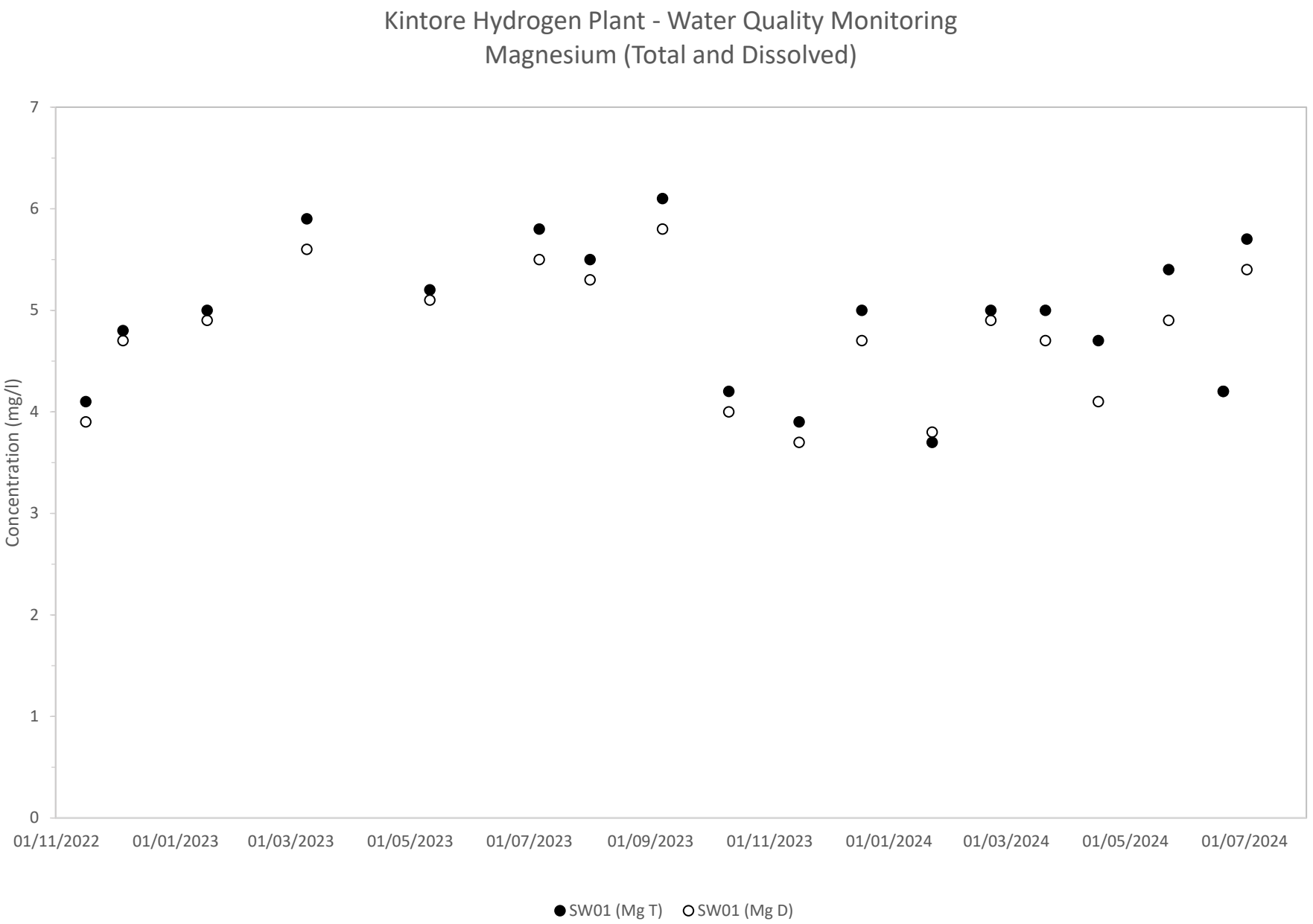

Kintore Hydrogen Plant - Water Quality Monitoring
Hardness - Total
Concentration (mgCaCO3/l)
80
70
60
50
40
30
20
10
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01

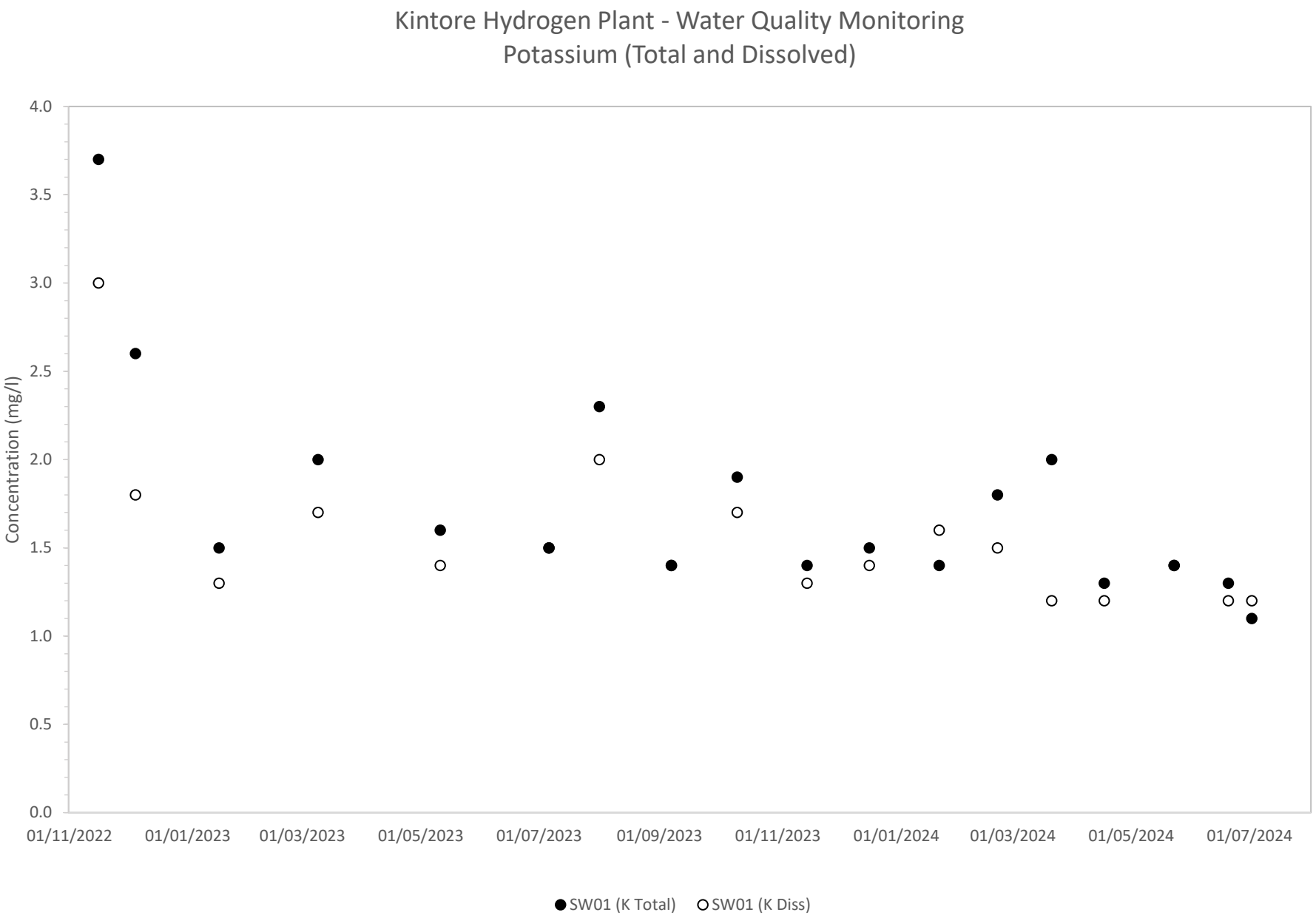

Kintore Hydrogen Plant - Water Quality Monitoring
Bromide and Bromate
Concentration (mg/l)
0.12
0.10
0.08
0.06
0.04
0.02
0.00
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Br-)
SW01 (BrO3-)

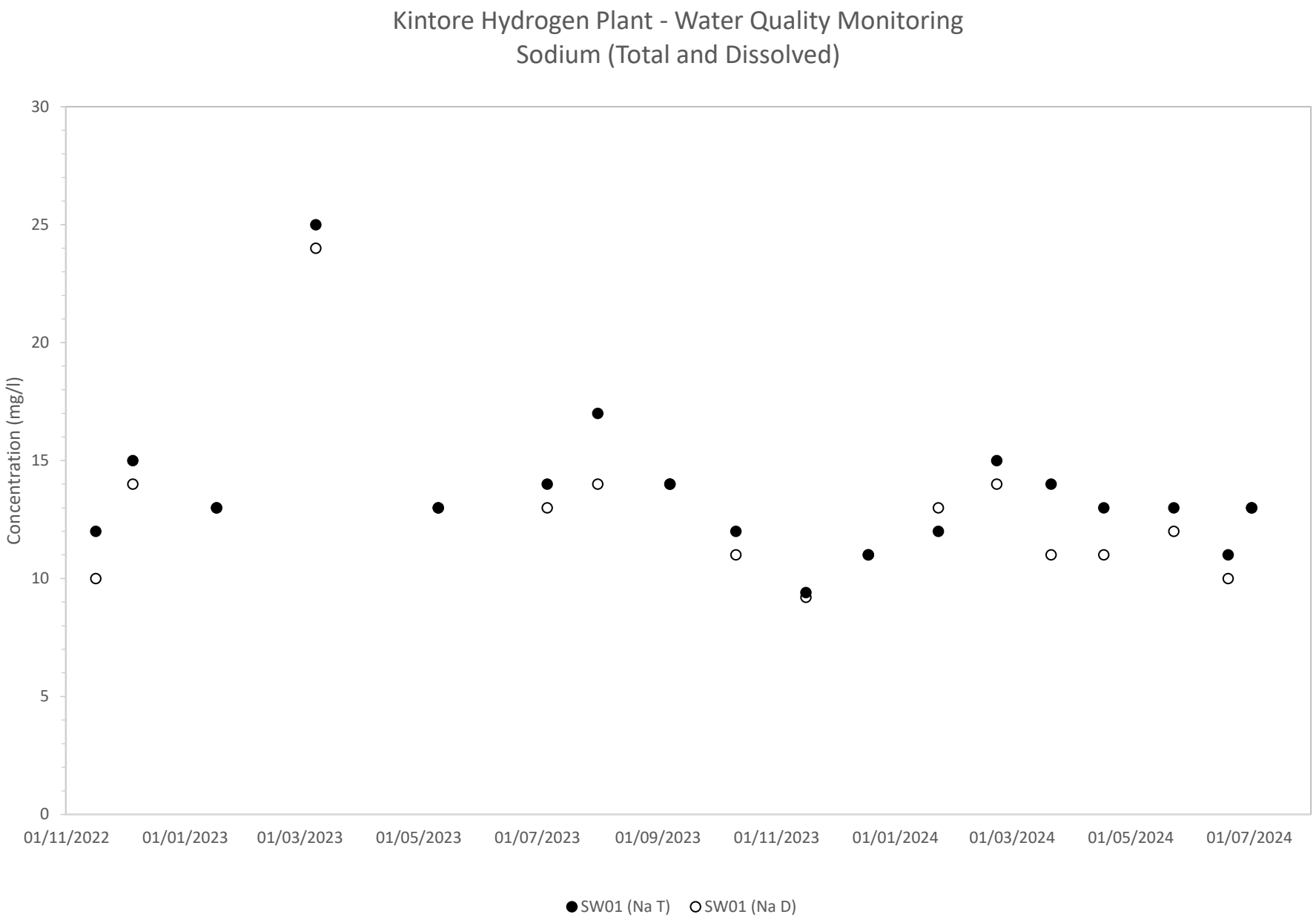

Kintore Hydrogen Plant - Water Quality Monitoring
Boron (Total and Dissolved)
Concentration (µg/l)
20
18
16
14
12
10
8
6
4
2
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (B Total)
SW01 (B Diss)

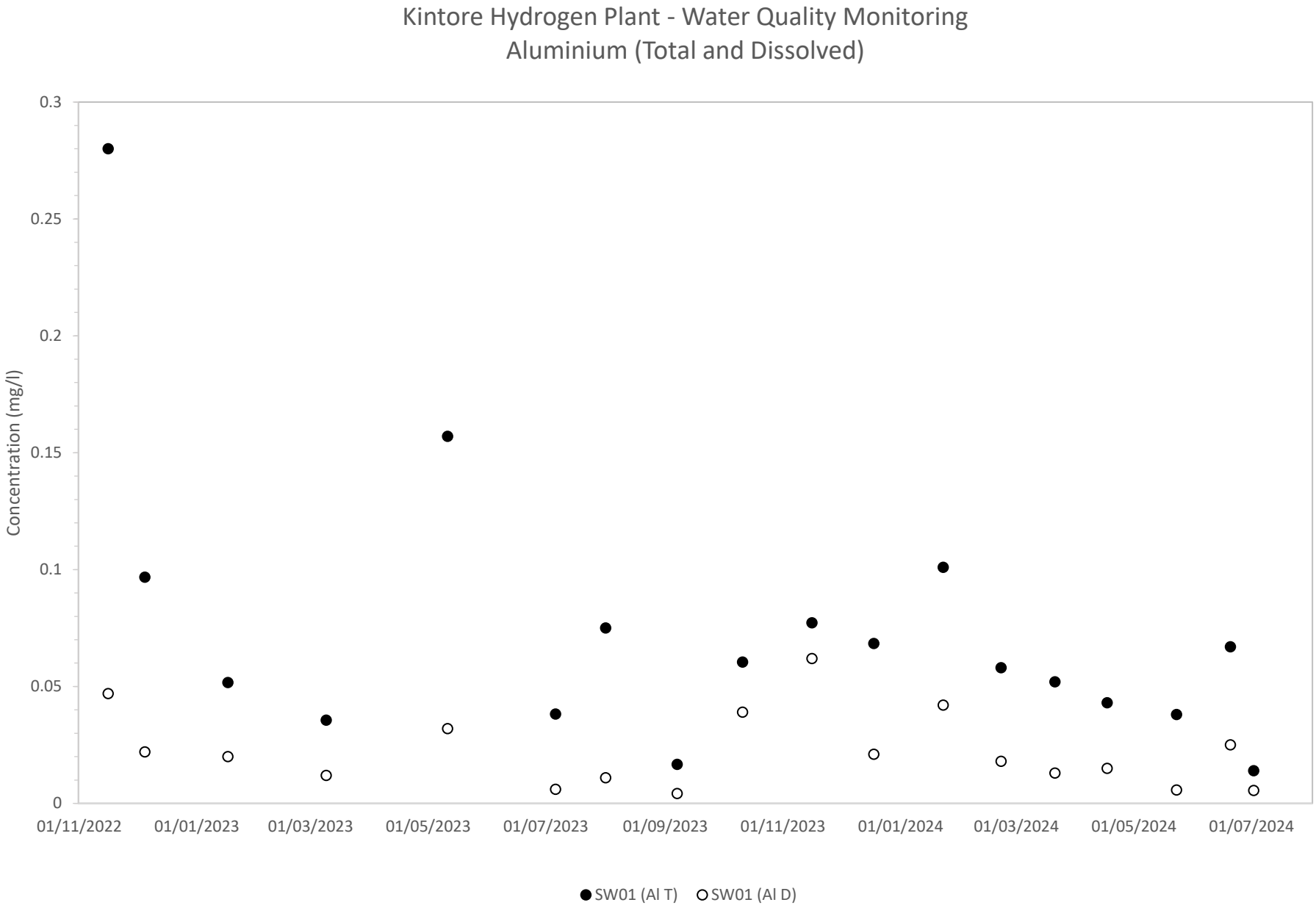

Kintore Hydrogen Plant - Water Quality Monitoring
Calcium (Total and Dissolved)
Concentration (mg/l)
0
2
4
6
8
10
12
14
16
18
20
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Ca T)
SW01 (Ca D)

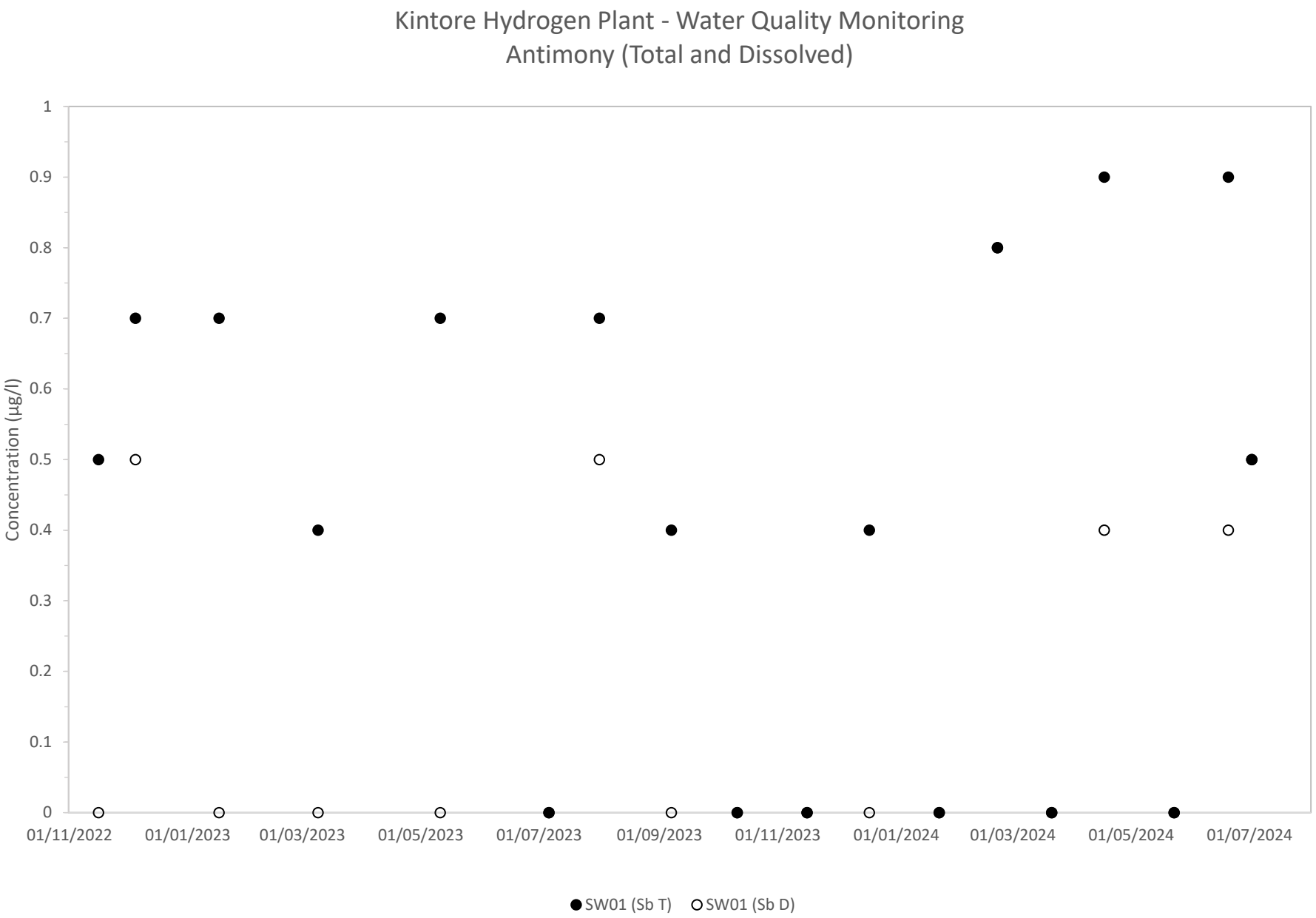

Kintore Hydrogen Plant - Water Quality Monitoring
Iron (Total and Dissolved)
Concentration (mg/l)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Fe T)
SW01 (Fe D)
EQS Standard

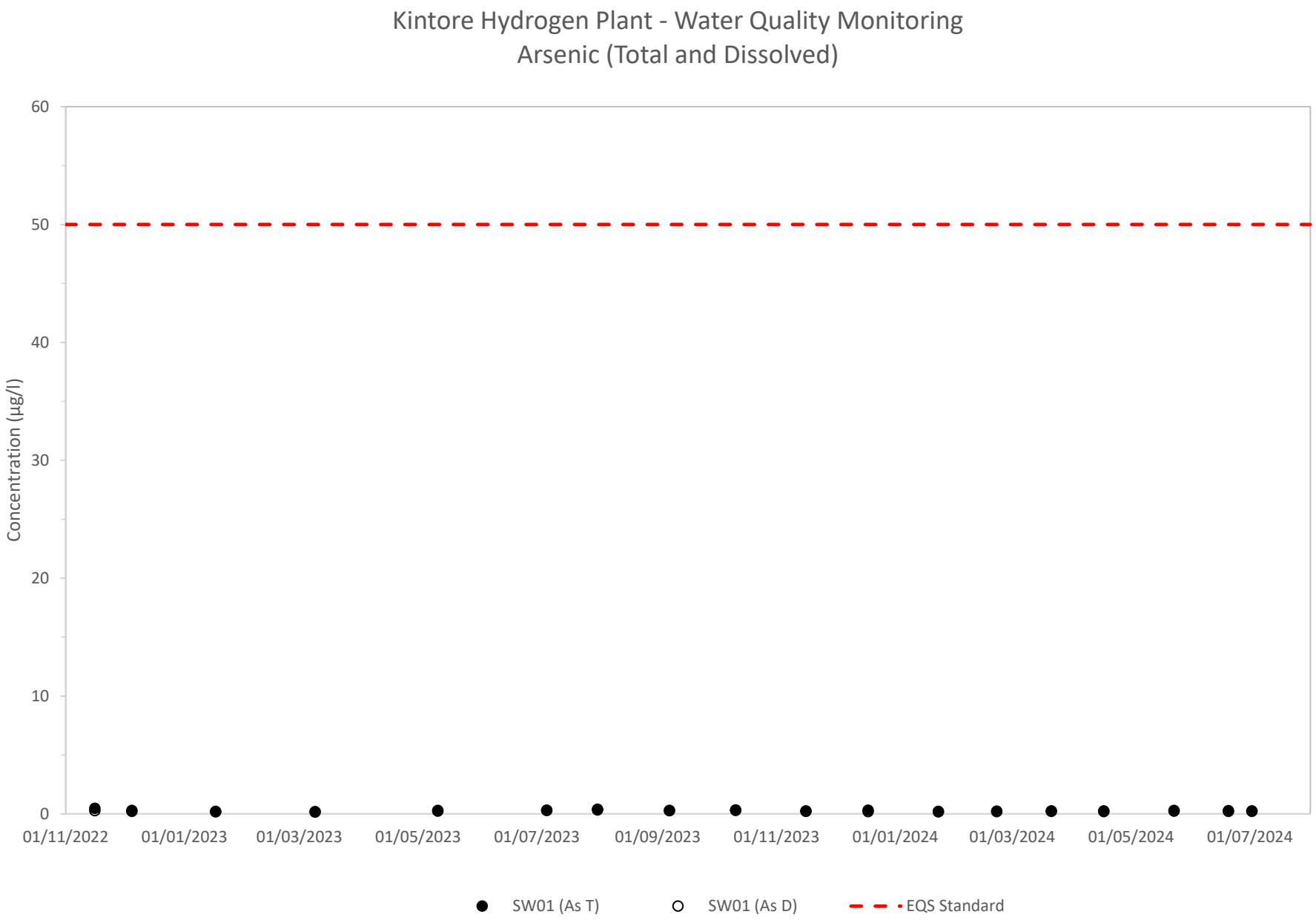

Kintore Hydrogen Plant - Water Quality Monitoring
Magnesium (Total and Dissolved)
Concentration (mg/l)
0
1
2
3
4
5
6
7
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Mg T)
SW01 (Mg D)

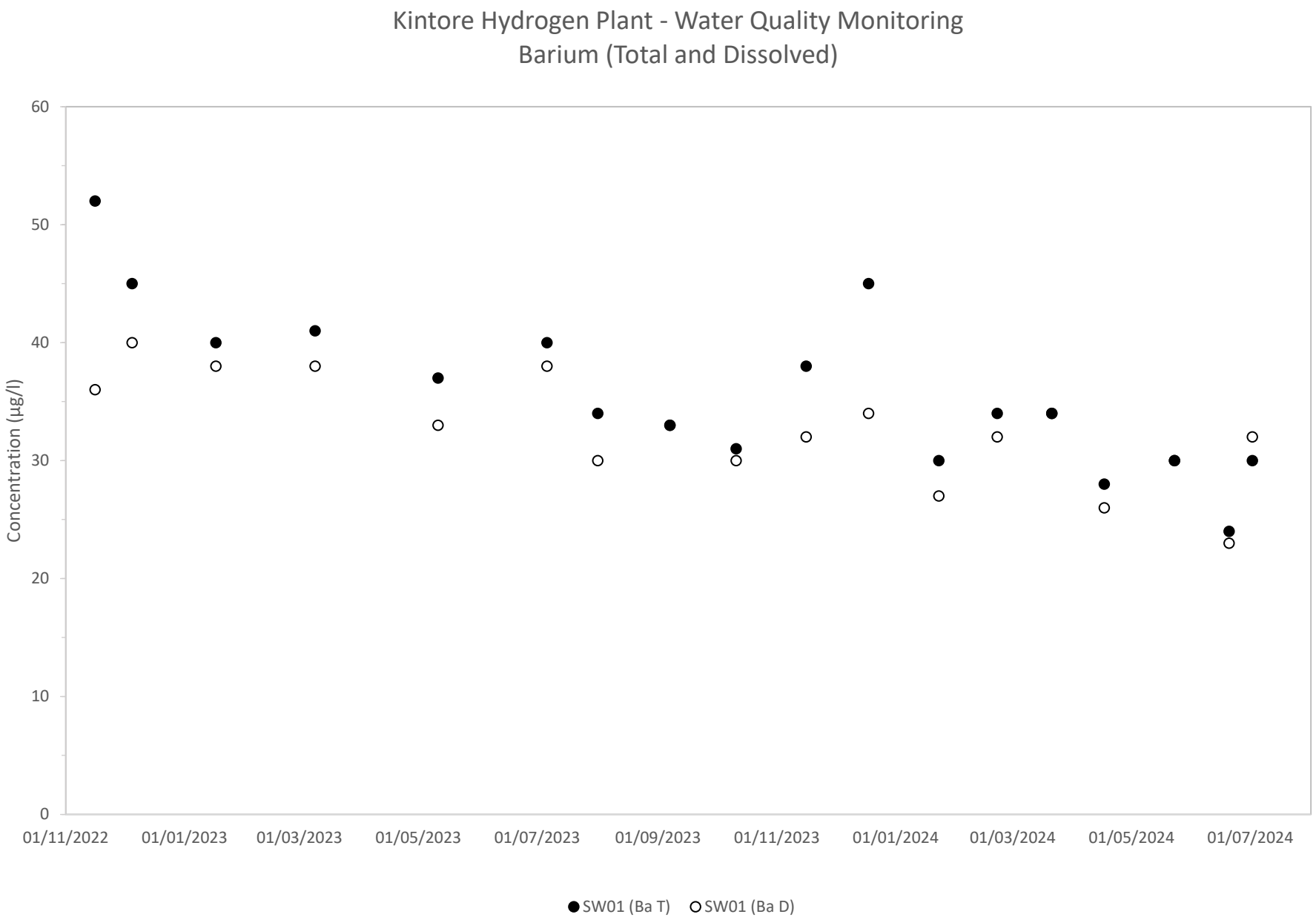

Kintore Hydrogen Plant - Water Quality Monitoring
Potassium (Total and Dissolved)
Concentration (mg/l)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (K Total)
SW01 (K Diss)

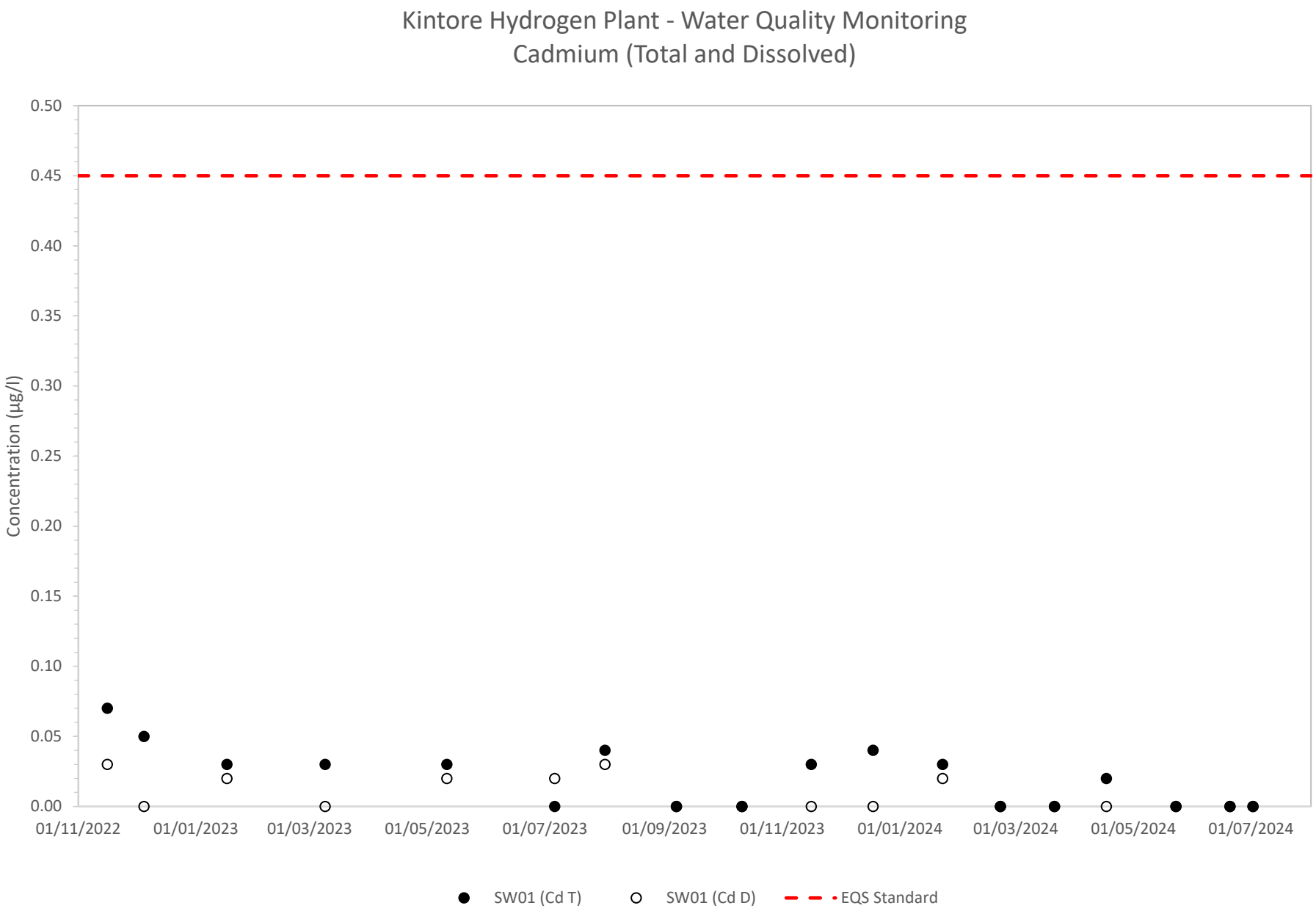

Kintore Hydrogen Plant - Water Quality Monitoring
Sodium (Total and Dissolved)
Concentration (mg/l)
30
25
20
15
10
5
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Na T)
SW01 (Na D)

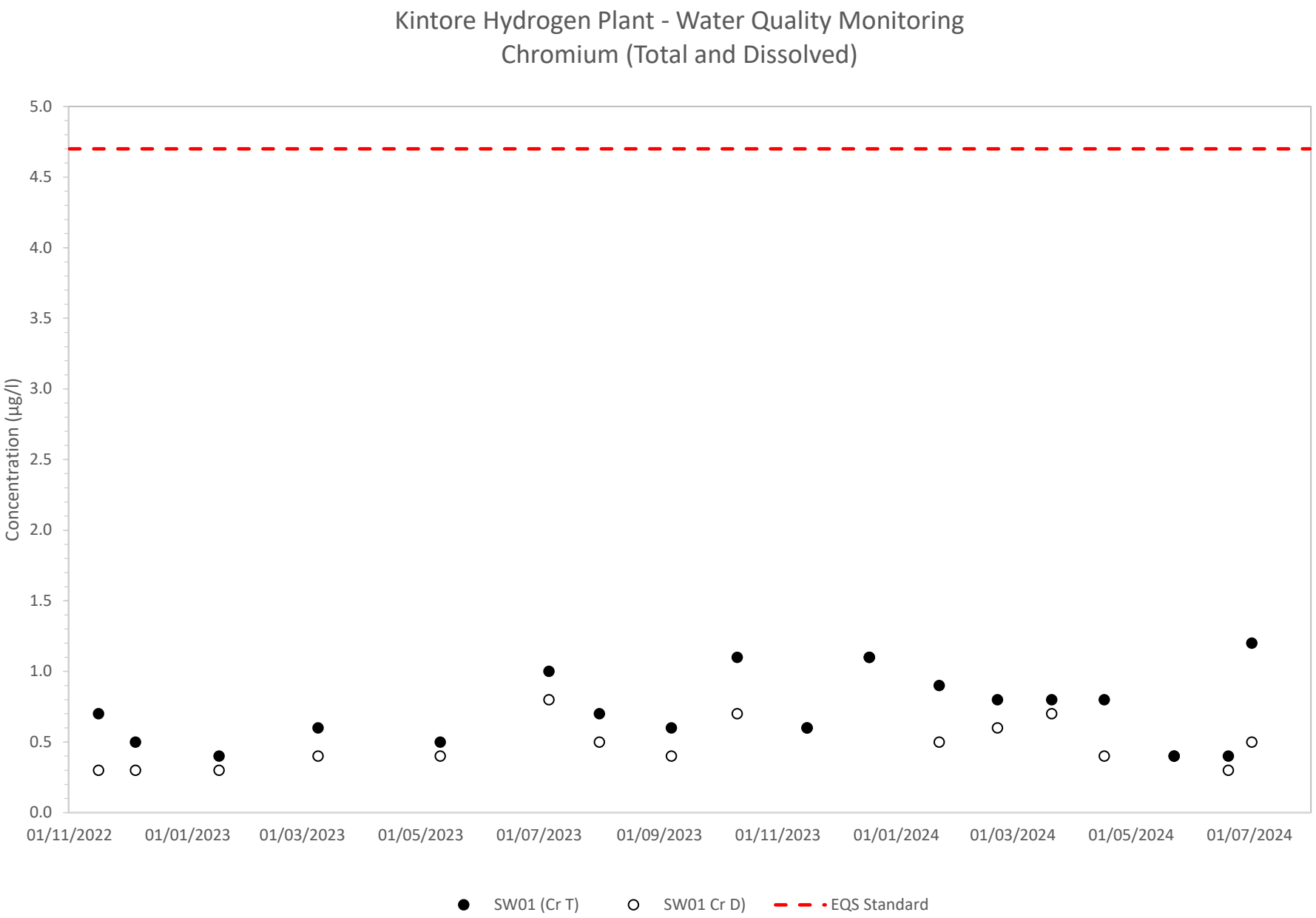

Kintore Hydrogen Plant - Water Quality Monitoring
Aluminium (Total and Dissolved)
Concentration (mg/l)
0.3
0.25
0.2
0.15
0.1
0.05
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Al T)
SW01 (Al D)

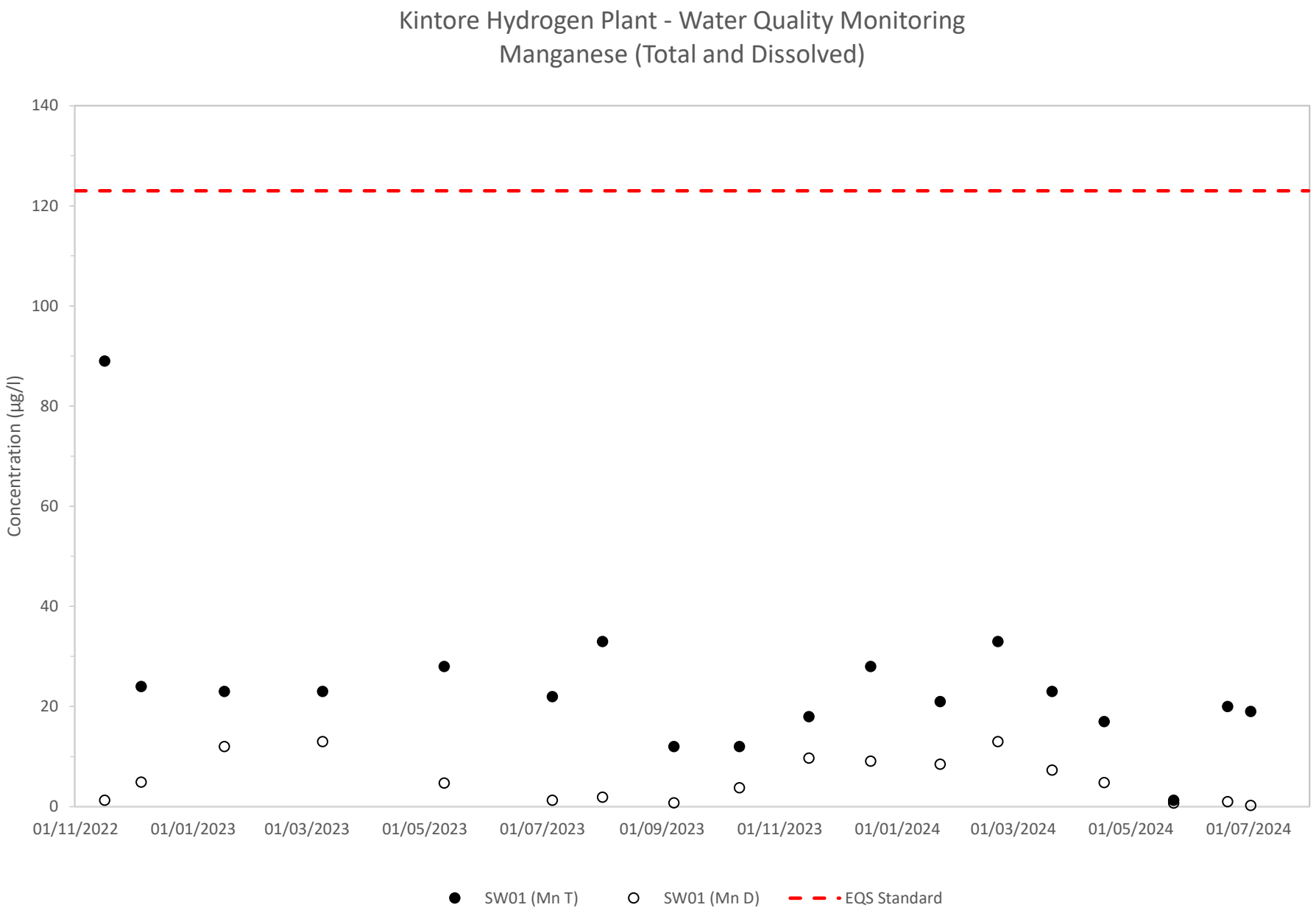

Kintore Hydrogen Plant - Water Quality Monitoring
Antimony (Total and Dissolved)
Concentration (µg/l)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Sb T)
SW01 (Sb D)

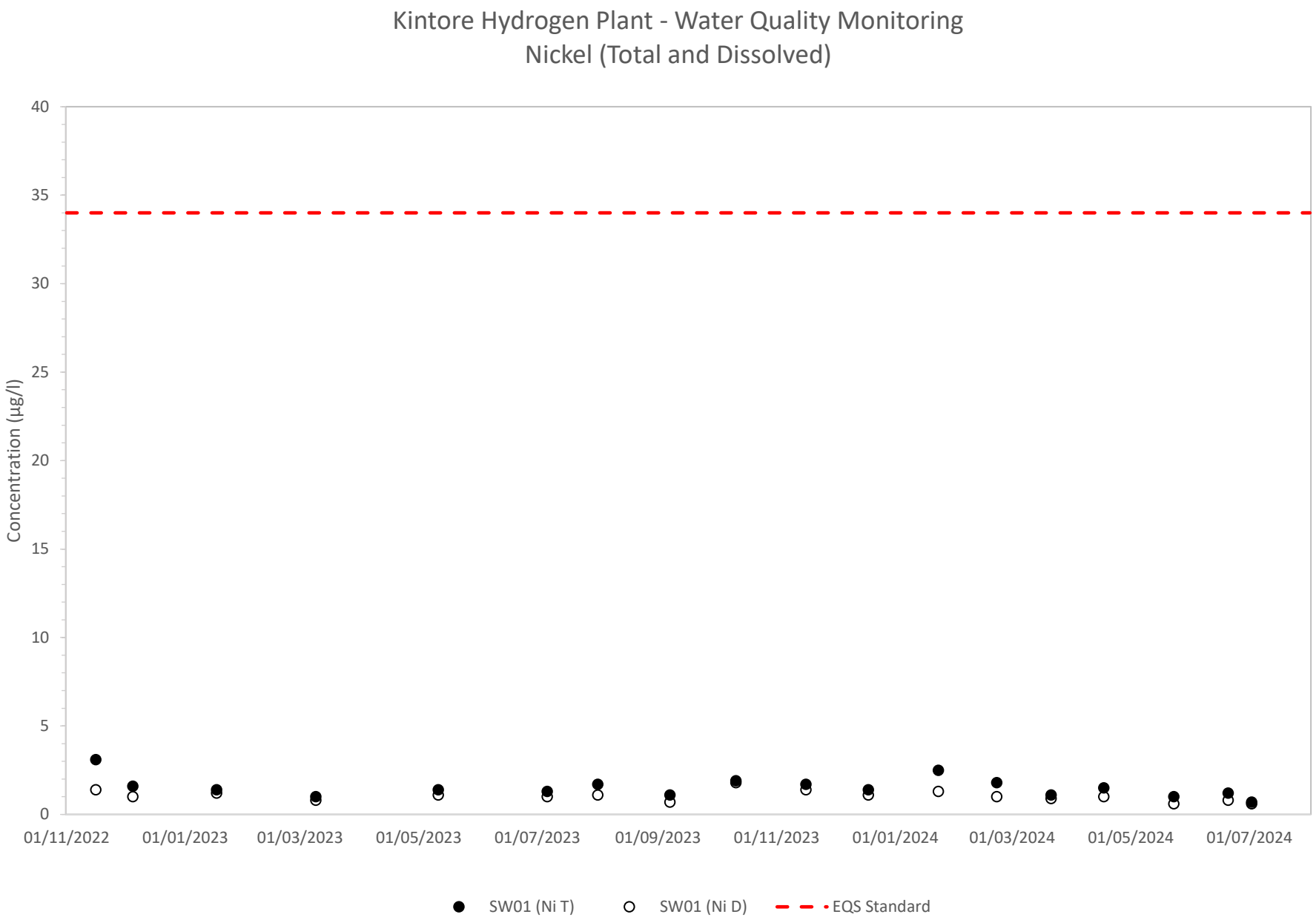

Kintore Hydrogen Plant - Water Quality Monitoring
Arsenic (Total and Dissolved)
Concentration (µg/l)
60
50
40
30
20
10
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (As T)
SW01 (As D)
EQS Standard

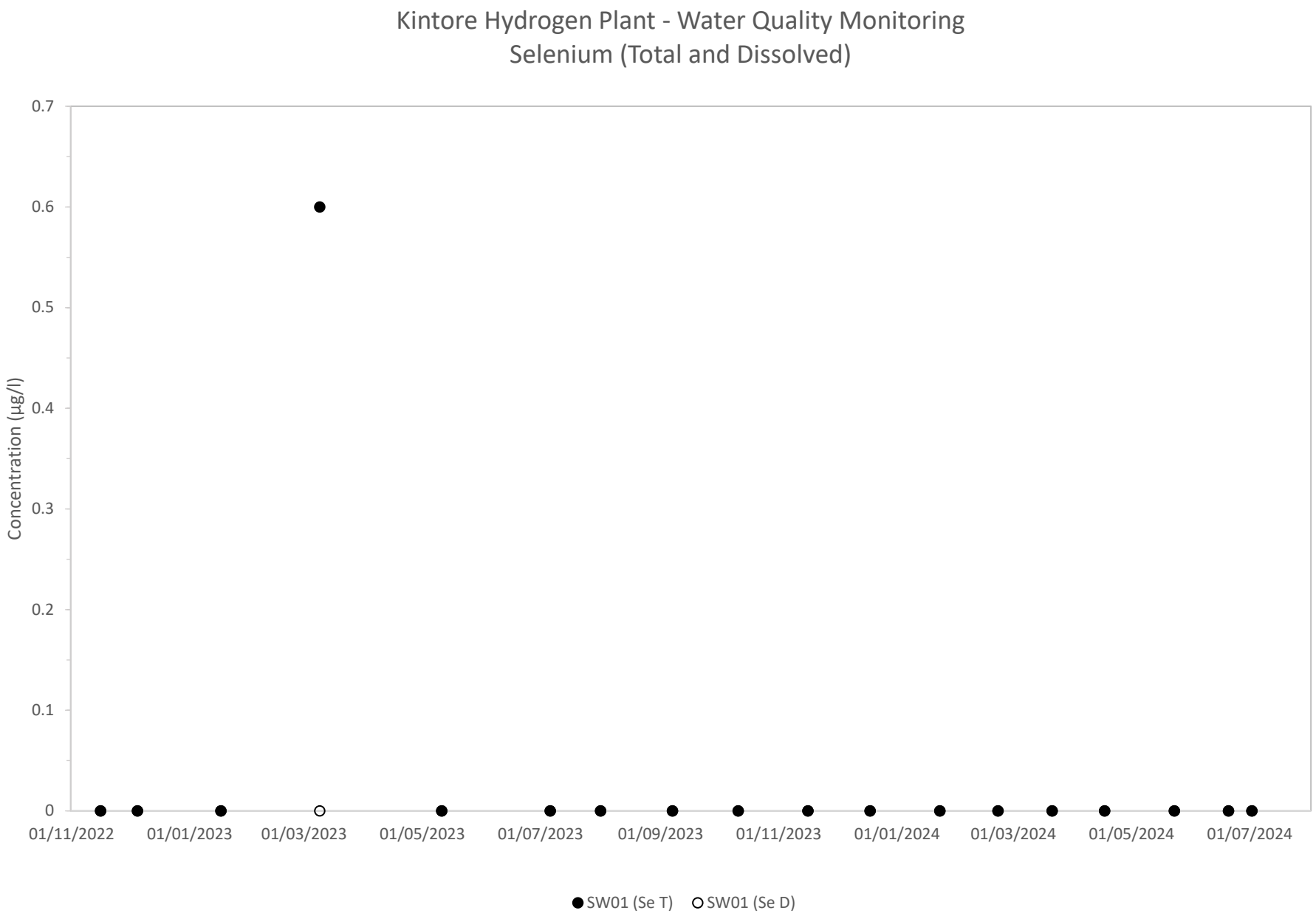

Kintore Hydrogen Plant - Water Quality Monitoring
Barium (Total and Dissolved)
Concentration (µg/l)
60
50
40
30
20
10
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Ba T)
SW01 (Ba D)

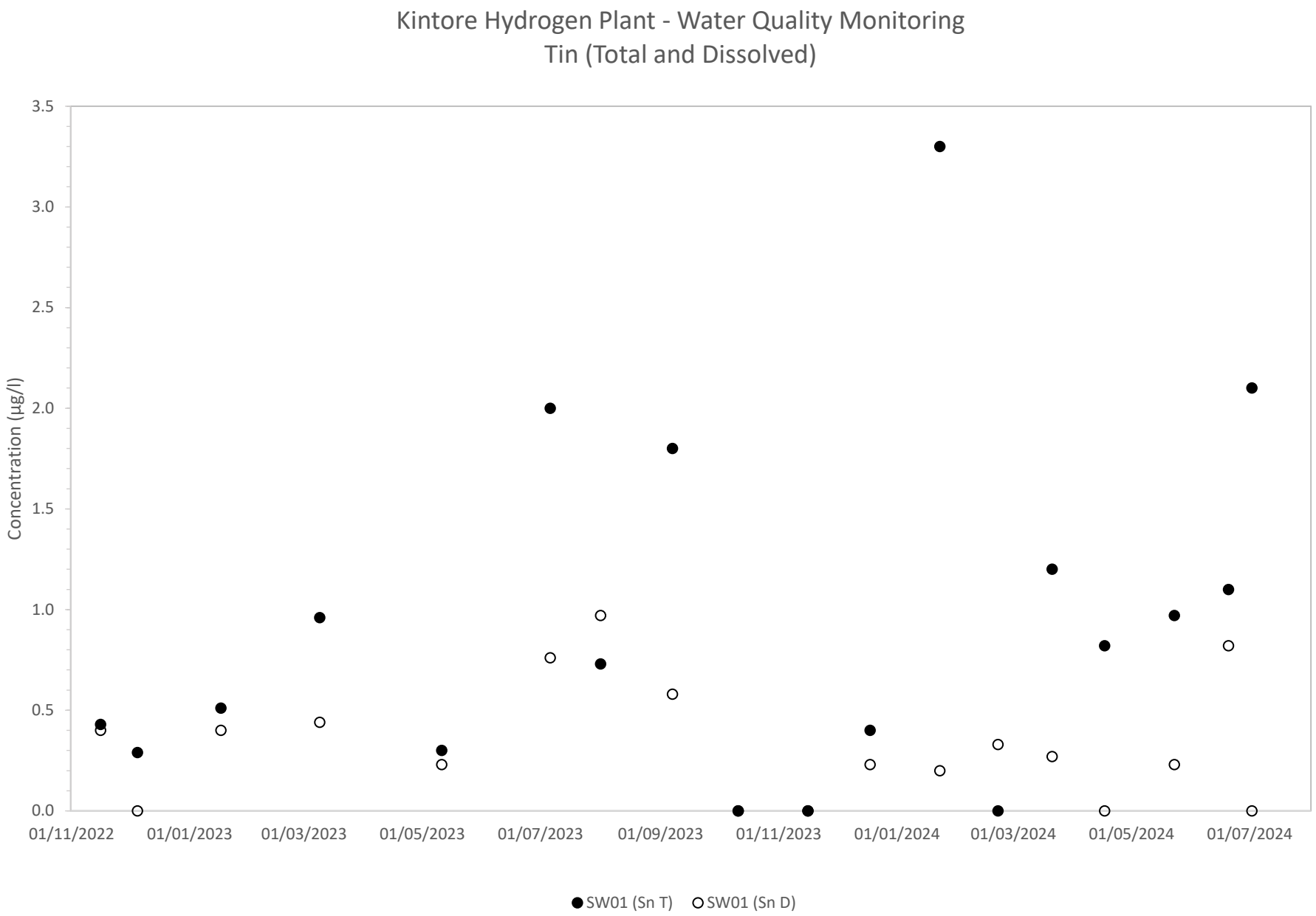

Kintore Hydrogen Plant - Water Quality Monitoring
Cadmium (Total and Dissolved)
Concentration (µg/l)
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Cd T)
SW01 (Cd D)
EQS Standard

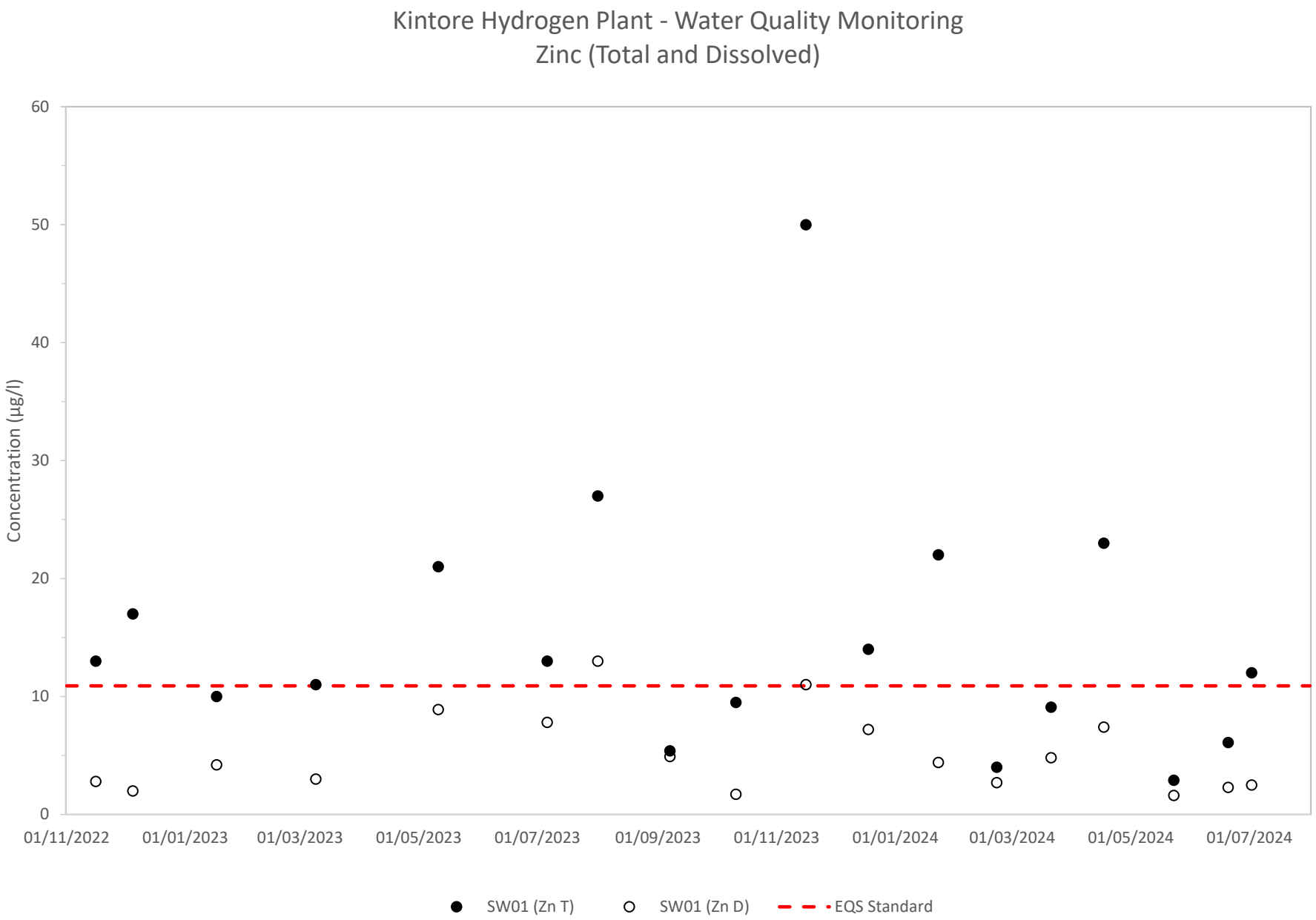

Kintore Hydrogen Plant - Water Quality Monitoring
Chromium (Total and Dissolved)
Concentration (µg/l)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Cr T)
SW01 Cr D)
EQS Standard

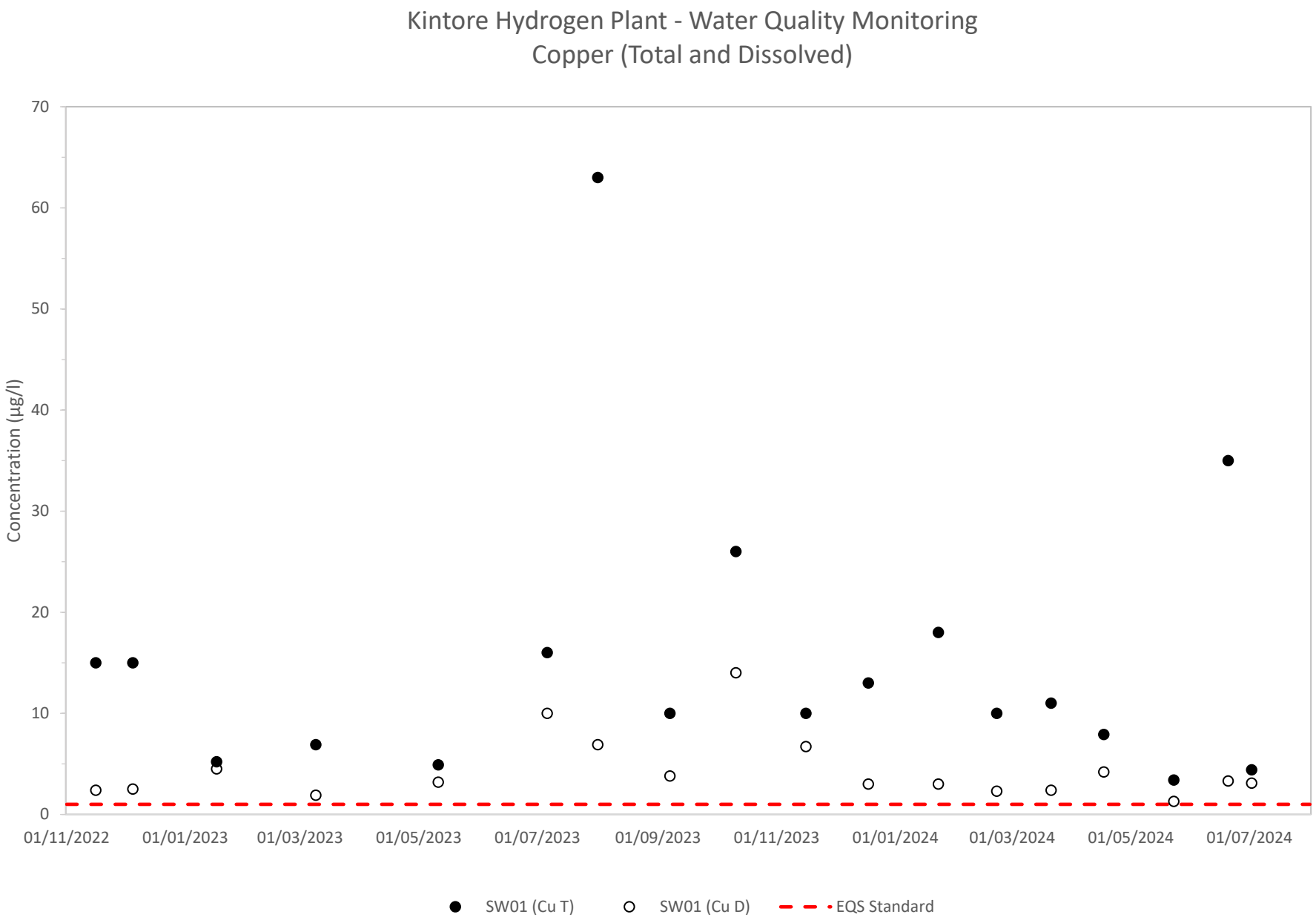

Kintore Hydrogen Plant - Water Quality Monitoring
Manganese (Total and Dissolved)
Concentration (µg/l)
140
120
100
80
60
40
20
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Mn T)
SW01 (Mn D)
EQS Standard


Kintore Hydrogen Plant - Water Quality Monitoring
Nickel (Total and Dissolved)
Concentration (µg/l)
40
35
30
25
20
15
10
5
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Ni T)
SW01 (Ni D)
EQS Standard


Kintore Hydrogen Plant - Water Quality Monitoring
Selenium (Total and Dissolved)
Concentration (µg/l)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Se T)
SW01 (Se D)


Kintore Hydrogen Plant - Water Quality Monitoring
Tin (Total and Dissolved)
Concentration (µg/l)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Sn T)
SW01 (Sn D)


Kintore Hydrogen Plant - Water Quality Monitoring
Zinc (Total and Dissolved)
Concentration (µg/l)
60
50
40
30
20
10
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Zn T)
SW01 (Zn D)
EQS Standard


Kintore Hydrogen Plant - Water Quality Monitoring
Copper (Total and Dissolved)
Concentration (µg/l)
70
60
50
40
30
20
10
0
01/11/2022
01/01/2023
01/03/2023
01/05/2023
01/07/2023
01/09/2023
01/11/2023
01/01/2024
01/03/2024
01/05/2024
01/07/2024
SW01 (Cu T)
SW01 (Cu D)
EQS Standard

Annex B Laboratory Certificates

Kintore Hydrogen Facility

Appendix 13.1: Water Quality Monitoring Data

Kintore Hydrogen Ltd

SLR Project No.: 428.013099.00001

18 July 2024

4041

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Analytical Report Number : 22-97432

Project / Site name:	Kintore-Hydrogen Plant	**Samples received on:**	17/11/2022
Your job number:	428.04707.00035	**Samples instructed on/ Analysis started on:**	17/11/2022
Your order number:	000999-405	**Analysis completed by:**	24/11/2022
Report Issue Number:	1	**Report issued on:**	24/11/2022
Samples Analysed:	1 water sample		

Signed: Ashleigh Cunningham

Ashleigh Cunningham
Customer Service Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate

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Analytical Report Number: 22-97432
Project / Site name: Kintore-Hydrogen Plant

Your Order No: 000999-405

Lab Sample Number				2503511
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				16/11/2022
Time Taken				1350
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH	pH Units	N/A	ISO 17025	7.2
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	160
Turbidity	NTU	1	NONE	17
Sulphate as SO4	mg/l	0.045	ISO 17025	8.36
Chloride	mg/l	0.15	ISO 17025	18
Silicon (total)	µg/l	50	NONE	5600
Fluoride	µg/l	50	ISO 17025	76
Ammonium as NH4	µg/l	15	ISO 17025	< 15
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	10.3
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	12.3
Nitrate as N	mg/l	0.01	ISO 17025	2.16
Nitrate as NO3	mg/l	0.05	ISO 17025	9.54
Nitrite as N	µg/l	1	ISO 17025	17
Nitrite as NO2	µg/l	5	ISO 17025	54
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	24
Alkalinity as CaCO3	mg/l	3	ISO 17025	22
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	38
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.2
Total Suspended Solids	mg/l	2	ISO 17025	58
Total Dissolved Solids (Gravimetric)	mg/l	4	ISO 17025	100
Hardness - Total	mgCaCO3/l	1	ISO 17025	48.6
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	30
Bromide	mg/l	0.001	ISO 17025	0.033
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	13
Iron (dissolved)	mg/l	0.004	ISO 17025	0.094
Magnesium (dissolved)	mg/l	0.005	ISO 17025	3.9
Potassium (dissolved)	mg/l	0.025	ISO 17025	3
Sodium (dissolved)	mg/l	0.01	ISO 17025	10
Aluminium (total)	mg/l	0.001	ISO 17025	0.28
Antimony (total)	µg/l	0.4	ISO 17025	0.5
Arsenic (total)	µg/l	0.15	ISO 17025	0.48
Barium (total)	µg/l	0.06	ISO 17025	52
Boron (total)	µg/l	10	ISO 17025	13
Cadmium (total)	µg/l	0.02	ISO 17025	0.07
Chromium (total)	µg/l	0.2	ISO 17025	0.7
Iron (total)	mg/l	0.004	ISO 17025	0.15
Manganese (total)	µg/l	0.05	ISO 17025	89
Molybdenum (total)	µg/l	0.05	ISO 17025	0.41
Nickel (total)	µg/l	0.5	ISO 17025	3.1
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	0.43
Zinc (total)	µg/l	0.5	ISO 17025	13

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Analytical Report Number: 22-97432
Project / Site name: Kintore-Hydrogen Plant

Your Order No: 000999-405

Lab Sample Number	2503511
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	16/11/2022
Time Taken	1350

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Calcium (total)	mg/l	0.012	ISO 17025	14
Magnesium (total)	mg/l	0.005	ISO 17025	4.1
Potassium (total)	mg/l	0.025	ISO 17025	3.7
Sodium (total)	mg/l	0.01	ISO 17025	12
Aluminium (dissolved)	µg/l	1	ISO 17025	47
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.28
Barium (dissolved)	µg/l	0.06	ISO 17025	36
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.03
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3
Copper (dissolved)	µg/l	0.5	ISO 17025	2.4
Manganese (dissolved)	µg/l	0.05	ISO 17025	1.3
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.37
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.4
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.4
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.8
Copper (total)	µg/l	0.5	ISO 17025	15

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-97432
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration (colorimetry).	In house method based on MEWAM & USEPA Method 310.2.	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE

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Analytical Report Number : 22-97432
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 22-11802

Project / Site name:	Kintore	**Samples received on:**	07/12/2022
Your job number:	428.V04707.00035	**Samples instructed on/ Analysis started on:**	07/12/2022
Your order number:	001541-405	**Analysis completed by:**	14/12/2022
Report Issue Number:	1	**Report issued on:**	14/12/2022
Samples Analysed:	1 water sample		

Signed:

Adam Fenwick
Technical Reviewer
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 22-11802
Project / Site name: Kintore

Your Order No: 001541-405

Lab Sample Number	2524262
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	05/12/2022
Time Taken	1210

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH	pH Units	N/A	ISO 17025	7.8
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	200
Turbidity	NTU	1	NONE	< 1.0
Sulphate as SO4	µg/l	45	ISO 17025	9830
Sulphate as SO4	mg/l	0.045	ISO 17025	9.83
Chloride	mg/l	0.15	ISO 17025	25
Silicon (total)	µg/l	50	NONE	6600
Fluoride	µg/l	50	ISO 17025	82
Ammoniacal Nitrogen as NH4	µg/l	15	ISO 17025	86
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	4.24
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	4.28
Nitrate as N	mg/l	0.01	ISO 17025	3.26
Nitrate as NO3	mg/l	0.05	ISO 17025	14.4
Nitrite as N	µg/l	1	ISO 17025	12
Nitrite as NO2	µg/l	5	ISO 17025	40
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	33
Alkalinity as CaCO3	mg/l	3	ISO 17025	22
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	21
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	3.3
Total Suspended Solids	mg/l	2	ISO 17025	< 2.0
Total Dissolved Solids (Gravimetric)	mg/l	4	ISO 17025	140
Hardness - Total	mgCaCO3/l	1	ISO 17025	55.8
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	41
Bromide	mg/l	0.001	ISO 17025	0.051
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	15
Iron (dissolved)	mg/l	0.004	ISO 17025	0.043
Magnesium (dissolved)	mg/l	0.005	ISO 17025	4.7
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.8
Sodium (dissolved)	mg/l	0.01	ISO 17025	14
Aluminium (total)	mg/l	0.001	ISO 17025	0.0968
Antimony (total)	µg/l	0.4	ISO 17025	0.7
Arsenic (total)	µg/l	0.15	ISO 17025	0.29
Barium (total)	µg/l	0.06	ISO 17025	45
Boron (total)	µg/l	10	ISO 17025	12
Cadmium (total)	µg/l	0.02	ISO 17025	0.05
Chromium (total)	µg/l	0.2	ISO 17025	0.5
Iron (total)	mg/l	0.004	ISO 17025	0.25
Manganese (total)	µg/l	0.05	ISO 17025	24
Molybdenum (total)	µg/l	0.05	ISO 17025	0.49
Nickel (total)	µg/l	0.5	ISO 17025	1.6
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	0.29
Zinc (total)	µg/l	0.5	ISO 17025	17

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Analytical Report Number: 22-11802
Project / Site name: Kintore

Your Order No: 001541-405

Lab Sample Number				2524262
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				05/12/2022
Time Taken				1210
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Calcium (total)	mg/l	0.012	ISO 17025	15
Magnesium (total)	mg/l	0.005	ISO 17025	4.8
Potassium (total)	mg/l	0.025	ISO 17025	2.6
Sodium (total)	mg/l	0.01	ISO 17025	15
Aluminium (dissolved)	µg/l	1	ISO 17025	22
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.5
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.22
Barium (dissolved)	µg/l	0.06	ISO 17025	40
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3
Copper (dissolved)	µg/l	0.5	ISO 17025	2.5
Manganese (dissolved)	µg/l	0.05	ISO 17025	4.9
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.37
Nickel (dissolved)	µg/l	0.5	ISO 17025	1
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20
Zinc (dissolved)	µg/l	0.5	ISO 17025	2
Copper (total)	µg/l	0.5	ISO 17025	15

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-11802
Project / Site name: Kintore

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration (colorimetry).	In house method based on MEWAM & USEPA Method 310.2.	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025

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Analytical Report Number : 22-11802
Project / Site name: Kintore

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 23-12925

Project / Site name:	Kintore- Hydrogen Plant	**Samples received on:**	19/01/2023
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	19/01/2023
Your order number:	002140-405	**Analysis completed by:**	27/01/2023
Report Issue Number:	1	**Report issued on:**	27/01/2023
Samples Analysed:	1 water sample		

Signed: Ashleigh Cunningham

Ashleigh Cunningham
Customer Service Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate

Analytical Report Number: 23-12925
Project / Site name: Kintore- Hydrogen Plant

Your Order No: 002140-405

Lab Sample Number	2560146
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	17/01/2023
Time Taken	1315

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (L005B)	pH Units	N/A	ISO 17025	7.6
Electrical Conductivity at 20 °C (L031B)	µS/cm	10	ISO 17025	180
Turbidity	NTU	1	NONE	< 1.0
Sulphate as SO4	µg/l	45	ISO 17025	8820
Sulphate as SO4	mg/l	0.045	ISO 17025	8.82
Chloride	mg/l	0.15	ISO 17025	23
Silicon (total)	µg/l	50	NONE	7100
Fluoride	µg/l	50	ISO 17025	55
Ammonium as NH4	µg/l	15	ISO 17025	110
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	3.62
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	3.82
Nitrate as N	mg/l	0.01	ISO 17025	3.4
Nitrate as NO3	mg/l	0.05	ISO 17025	15.1
Nitrite as N	µg/l	1	ISO 17025	25
Nitrite as NO2	µg/l	5	ISO 17025	81
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	45
Alkalinity as CaCO3	mg/l	3	ISO 17025	35
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	14
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	3.4
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	4
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	130
Hardness - Total	mgCaCO3/l	1	ISO 17025	55.7
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	54
Bromide	mg/l	0.001	ISO 17025	0.043
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	14
Iron (dissolved)	mg/l	0.004	ISO 17025	0.03
Magnesium (dissolved)	mg/l	0.005	ISO 17025	4.9
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.3
Sodium (dissolved)	mg/l	0.01	ISO 17025	13
Aluminium (total)	mg/l	0.001	ISO 17025	0.0517
Antimony (total)	µg/l	0.4	ISO 17025	0.7
Arsenic (total)	µg/l	0.15	ISO 17025	0.21
Barium (total)	µg/l	0.06	ISO 17025	40
Boron (total)	µg/l	10	ISO 17025	11
Cadmium (total)	µg/l	0.02	ISO 17025	0.03
Chromium (total)	µg/l	0.2	ISO 17025	0.4
Iron (total)	mg/l	0.004	ISO 17025	0.15
Manganese (total)	µg/l	0.05	ISO 17025	23
Molybdenum (total)	µg/l	0.05	ISO 17025	0.39
Nickel (total)	µg/l	0.5	ISO 17025	1.4
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	0.51
Zinc (total)	µg/l	0.5	ISO 17025	10

Analytical Report Number: 23-12925
Project / Site name: Kintore- Hydrogen Plant

Your Order No: 002140-405

Lab Sample Number				2560146
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				17/01/2023
Time Taken				1315
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Calcium (total)	mg/l	0.012	ISO 17025	15
Magnesium (total)	mg/l	0.005	ISO 17025	5
Potassium (total)	mg/l	0.025	ISO 17025	1.5
Sodium (total)	mg/l	0.01	ISO 17025	13
Aluminium (dissolved)	µg/l	1	ISO 17025	20
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.18
Barium (dissolved)	µg/l	0.06	ISO 17025	38
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3
Copper (dissolved)	µg/l	0.5	ISO 17025	4.5
Manganese (dissolved)	µg/l	0.05	ISO 17025	12
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.33
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.2
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.4
Zinc (dissolved)	µg/l	0.5	ISO 17025	4.2
Copper (total)	µg/l	0.5	ISO 17025	5.2

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not Detected

Analytical Report Number : 23-12925
Project / Site name: Kintore- Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration (colorimetry).	In house method based on MEWAM & USEPA Method 310.2.	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025

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Environmental Science

Analytical Report Number : 23-12925
Project / Site name: Kintore- Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

UKAS TESTING
4041

Environmental Science

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Analytical Report Number : 23-22267

Project / Site name:	Kintore - Hydrogen Plant	**Samples received on:**	10/03/2023
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	10/03/2023
Your order number:	002957-405	**Analysis completed by:**	20/03/2023
Report Issue Number:	1	**Report issued on:**	21/03/2023
Samples Analysed:	1 water sample		

Signed:

Alyssa Brown
Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate

Analytical Report Number: 23-22267
Project / Site name: Kintore - Hydrogen Plant

Your Order No: 002957-405

Lab Sample Number	2612431
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	09/03/2023
Time Taken	1445

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (L005B)	pH Units	N/A	ISO 17025	7.4
Electrical Conductivity at 20 °C (L031B)	µS/cm	10	ISO 17025	270
Turbidity	NTU	1	NONE	1.4
Sulphate as SO4	mg/l	0.045	ISO 17025	11
Chloride	mg/l	0.15	ISO 17025	40
Silicon (total)	µg/l	50	NONE	6500
Fluoride	µg/l	50	ISO 17025	68
Ammonium as NH4	µg/l	15	ISO 17025	84
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	2.56
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	2.58
Nitrate as N	mg/l	0.01	ISO 17025	2.83
Nitrate as NO3	mg/l	0.05	ISO 17025	12.5
Nitrite as N	µg/l	1	ISO 17025	8.8
Nitrite as NO2	µg/l	5	ISO 17025	29
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	58
Alkalinity as CaCO3	mg/l	3	ISO 17025	42
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	12
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.8
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	< 2.0
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	200
Hardness - Total	mgCaCO3/l	1	ISO 17025	66.6
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	71
Bromide	mg/l	0.001	ISO 17025	0.098
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	17
Iron (dissolved)	mg/l	0.004	ISO 17025	0.035
Magnesium (dissolved)	mg/l	0.005	ISO 17025	5.6
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.7
Sodium (dissolved)	mg/l	0.01	ISO 17025	24
Aluminium (total)	mg/l	0.001	ISO 17025	0.0356
Antimony (total)	µg/l	0.4	ISO 17025	0.4
Arsenic (total)	µg/l	0.15	ISO 17025	0.2
Barium (total)	µg/l	0.06	ISO 17025	41
Boron (total)	µg/l	10	ISO 17025	< 10
Cadmium (total)	µg/l	0.02	ISO 17025	0.03
Chromium (total)	µg/l	0.2	ISO 17025	0.6
Iron (total)	mg/l	0.004	ISO 17025	0.19
Manganese (total)	µg/l	0.05	ISO 17025	23
Molybdenum (total)	µg/l	0.05	ISO 17025	0.92
Nickel (total)	µg/l	0.5	ISO 17025	1
Selenium (total)	µg/l	0.6	ISO 17025	0.6
Tin (total)	µg/l	0.2	ISO 17025	0.96
Zinc (total)	µg/l	0.5	ISO 17025	11

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Analytical Report Number: 23-22267
Project / Site name: Kintore - Hydrogen Plant

Your Order No: 002957-405

Lab Sample Number				2612431
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				09/03/2023
Time Taken				1445
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Calcium (total)	mg/l	0.012	ISO 17025	18
Magnesium (total)	mg/l	0.005	ISO 17025	5.9
Potassium (total)	mg/l	0.025	ISO 17025	2
Sodium (total)	mg/l	0.01	ISO 17025	25
Aluminium (dissolved)	µg/l	1	ISO 17025	12
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.16
Barium (dissolved)	µg/l	0.06	ISO 17025	38
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.4
Copper (dissolved)	µg/l	0.5	ISO 17025	1.9
Manganese (dissolved)	µg/l	0.05	ISO 17025	13
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.31
Nickel (dissolved)	µg/l	0.5	ISO 17025	0.8
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.44
Zinc (dissolved)	µg/l	0.5	ISO 17025	3
Copper (total)	µg/l	0.5	ISO 17025	6.9

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not Detected

Analytical Report Number : 23-22267
Project / Site name: Kintore - Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration (colorimetry).	In house method based on MEWAM & USEPA Method 310.2.	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025

Analytical Report Number : 23-22267
Project / Site name: Kintore - Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 23-22267

Project / Site name: Kintore - Hydrogen Plant

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
SW01	None Supplied	W	2612431	c	Electrical conductivity at 20oC of water	L031-PL	c
SW01	None Supplied	W	2612431	c	Turbidity of in water	L083-PL	c
SW01	None Supplied	W	2612431	c	pH at 20oC in water (automated)	L099-PL	c

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Analytical Report Number : 23-33670

Project / Site name:	Kintore-Hydrogen Plant	**Samples received on:**	15/05/2023
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	15/05/2023
Your order number:	003895-405	**Analysis completed by:**	23/05/2023
Report Issue Number:	1	**Report issued on:**	23/05/2023
Samples Analysed:	1 water sample		

Signed:

Alyssa Brown
Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate

Analytical Report Number: 23-33670
Project / Site name: Kintore-Hydrogen Plant

Lab Sample Number				2678453
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				11/05/2023
Time Taken				1330
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (L005B)	pH Units	N/A	ISO 17025	7.8
Electrical Conductivity at 20 °C (L031B)	µS/cm	10	ISO 17025	170
Turbidity	NTU	1	NONE	2.1
Sulphate as SO4	µg/l	45	ISO 17025	9630
Sulphate as SO4	mg/l	0.045	ISO 17025	9.63
Chloride	mg/l	0.15	ISO 17025	20
Silicon (total)	µg/l	50	NONE	5200
Fluoride	µg/l	50	ISO 17025	60
Ammonium as NH4	µg/l	15	ISO 17025	110
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	6.35
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	6.97
Nitrate as N	mg/l	0.01	ISO 17025	2.51
Nitrate as NO3	mg/l	0.05	ISO 17025	11.1
Nitrite as N	µg/l	1	ISO 17025	16
Nitrite as NO2	µg/l	5	ISO 17025	52
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	45
Alkalinity as CaCO3	mg/l	3	ISO 17025	35
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	13
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.5
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	21
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	130
Hardness - Total	mgCaCO3/l	1	ISO 17025	61.2
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	54
Bromide	mg/l	0.001	ISO 17025	0.037
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	16
Iron (dissolved)	mg/l	0.004	ISO 17025	0.062
Magnesium (dissolved)	mg/l	0.005	ISO 17025	5.1
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.4
Sodium (dissolved)	mg/l	0.01	ISO 17025	13
Aluminium (total)	mg/l	0.001	ISO 17025	0.157
Antimony (total)	µg/l	0.4	ISO 17025	0.7
Arsenic (total)	µg/l	0.15	ISO 17025	0.3
Barium (total)	µg/l	0.06	ISO 17025	37
Boron (total)	µg/l	10	ISO 17025	11
Cadmium (total)	µg/l	0.02	ISO 17025	0.03
Chromium (total)	µg/l	0.2	ISO 17025	0.5
Iron (total)	mg/l	0.004	ISO 17025	0.35
Manganese (total)	µg/l	0.05	ISO 17025	28
Molybdenum (total)	µg/l	0.05	ISO 17025	0.26
Nickel (total)	µg/l	0.5	ISO 17025	1.4
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	0.3
Zinc (total)	µg/l	0.5	ISO 17025	21
Calcium (total)	mg/l	0.012	ISO 17025	16
Magnesium (total)	mg/l	0.005	ISO 17025	5.2
Potassium (total)	mg/l	0.025	ISO 17025	1.6

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Analytical Report Number: 23-33670
Project / Site name: Kintore-Hydrogen Plant

Lab Sample Number				2678453
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				11/05/2023
Time Taken				1330
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Sodium (total)	mg/l	0.01	ISO 17025	13
Aluminium (dissolved)	µg/l	1	ISO 17025	32
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.24
Barium (dissolved)	µg/l	0.06	ISO 17025	33
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.4
Copper (dissolved)	µg/l	0.5	ISO 17025	3.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	4.7
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.25
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.1
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.23
Zinc (dissolved)	µg/l	0.5	ISO 17025	8.9
Copper (total)	µg/l	0.5	ISO 17025	4.9

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not Detected

Analytical Report Number : 23-33670
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration (colorimetry).	In house method based on MEWAM & USEPA Method 310.2.	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025

Analytical Report Number : 23-33670
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 23-33670

Project / Site name: Kintore-Hydrogen Plant

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
SW01	None Supplied	W	2678453	c	Ammoniacal Nitrogen as N in water	L082-PL	c
SW01	None Supplied	W	2678453	c	Ammonium as NH4 in water	L082-PL	c
SW01	None Supplied	W	2678453	c	Electrical conductivity at 20oC of water	L031-PL	c
SW01	None Supplied	W	2678453	c	Turbidity of in water	L083-PL	c
SW01	None Supplied	W	2678453	c	pH at 20oC in water (automated)	L099-PL	c

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Analytical Report Number : 23-33670

Project / Site name:	Kintore-Hydrogen Plant	**Samples received on:**	15/05/2023
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	15/05/2023
Your order number:	003895-405	**Analysis completed by:**	23/05/2023
Report Issue Number:	1	**Report issued on:**	23/05/2023
Samples Analysed:	1 water sample		

Signed:

Alyssa Brown
Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate

Analytical Report Number: 23-33670
Project / Site name: Kintore-Hydrogen Plant

Lab Sample Number				2678453
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				11/05/2023
Time Taken				1330
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (L005B)	pH Units	N/A	ISO 17025	7.8
Electrical Conductivity at 20 °C (L031B)	µS/cm	10	ISO 17025	170
Turbidity	NTU	1	NONE	2.1
Sulphate as SO4	µg/l	45	ISO 17025	9630
Sulphate as SO4	mg/l	0.045	ISO 17025	9.63
Chloride	mg/l	0.15	ISO 17025	20
Silicon (total)	µg/l	50	NONE	5200
Fluoride	µg/l	50	ISO 17025	60
Ammonium as NH4	µg/l	15	ISO 17025	110
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	6.35
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	6.97
Nitrate as N	mg/l	0.01	ISO 17025	2.51
Nitrate as NO3	mg/l	0.05	ISO 17025	11.1
Nitrite as N	µg/l	1	ISO 17025	16
Nitrite as NO2	µg/l	5	ISO 17025	52
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	45
Alkalinity as CaCO3	mg/l	3	ISO 17025	35
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	13
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.5
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	21
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	130
Hardness - Total	mgCaCO3/l	1	ISO 17025	61.2
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	54
Bromide	mg/l	0.001	ISO 17025	0.037
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	16
Iron (dissolved)	mg/l	0.004	ISO 17025	0.062
Magnesium (dissolved)	mg/l	0.005	ISO 17025	5.1
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.4
Sodium (dissolved)	mg/l	0.01	ISO 17025	13
Aluminium (total)	mg/l	0.001	ISO 17025	0.157
Antimony (total)	µg/l	0.4	ISO 17025	0.7
Arsenic (total)	µg/l	0.15	ISO 17025	0.3
Barium (total)	µg/l	0.06	ISO 17025	37
Boron (total)	µg/l	10	ISO 17025	11
Cadmium (total)	µg/l	0.02	ISO 17025	0.03
Chromium (total)	µg/l	0.2	ISO 17025	0.5
Iron (total)	mg/l	0.004	ISO 17025	0.35
Manganese (total)	µg/l	0.05	ISO 17025	28
Molybdenum (total)	µg/l	0.05	ISO 17025	0.26
Nickel (total)	µg/l	0.5	ISO 17025	1.4
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	0.3
Zinc (total)	µg/l	0.5	ISO 17025	21
Calcium (total)	mg/l	0.012	ISO 17025	16
Magnesium (total)	mg/l	0.005	ISO 17025	5.2
Potassium (total)	mg/l	0.025	ISO 17025	1.6

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Analytical Report Number: 23-33670
Project / Site name: Kintore-Hydrogen Plant

Lab Sample Number				2678453
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				11/05/2023
Time Taken				1330
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Sodium (total)	mg/l	0.01	ISO 17025	13
Aluminium (dissolved)	µg/l	1	ISO 17025	32
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.24
Barium (dissolved)	µg/l	0.06	ISO 17025	33
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.4
Copper (dissolved)	µg/l	0.5	ISO 17025	3.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	4.7
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.25
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.1
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.23
Zinc (dissolved)	µg/l	0.5	ISO 17025	8.9
Copper (total)	µg/l	0.5	ISO 17025	4.9

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not Detected

Analytical Report Number : 23-33670
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration (colorimetry).	In house method based on MEWAM & USEPA Method 310.2.	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025

Analytical Report Number : 23-33670
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Analytical Report Number : 23-33670

Project / Site name: Kintore-Hydrogen Plant

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
SW01	None Supplied	W	2678453	c	Ammoniacal Nitrogen as N in water	L082-PL	c
SW01	None Supplied	W	2678453	c	Ammonium as NH4 in water	L082-PL	c
SW01	None Supplied	W	2678453	c	Electrical conductivity at 20oC of water	L031-PL	c
SW01	None Supplied	W	2678453	c	Turbidity of in water	L083-PL	c
SW01	None Supplied	W	2678453	c	pH at 20oC in water (automated)	L099-PL	c

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e: reception@i2analytical.com

Analytical Report Number : 23-43811

Project / Site name:	Kintore - Hydrogen Plant	**Samples received on:**	07/07/2023
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	07/07/2023
Your order number:	004968.405	**Analysis completed by:**	19/07/2023
Report Issue Number:	1	**Report issued on:**	19/07/2023
Samples Analysed:	1 water sample		

Signed:

Anna Goc
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 23-43811
Project / Site name: Kintore - Hydrogen Plant

Your Order No: 004968.405

Lab Sample Number				2740627
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				06/07/2023
Time Taken				1345
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
Turbidity	NTU	1	NONE	1.7
Sulphate as SO4	mg/l	0.045	ISO 17025	9.35
Chloride	mg/l	0.15	ISO 17025	21
Silicon (total)	µg/l	50	NONE	6200
Fluoride	µg/l	50	ISO 17025	53
Ammoniacal Nitrogen as NH4	µg/l	15	ISO 17025	610
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	2.55
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	2.57
Nitrate as N	mg/l	0.01	ISO 17025	2.33
Nitrate as NO3	mg/l	0.05	ISO 17025	10.3
Nitrite as N	µg/l	1	ISO 17025	34
Nitrite as NO2	µg/l	5	ISO 17025	110
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	52
Alkalinity as CaCO3	mg/l	3	ISO 17025	50
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	13
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.4
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	2
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	160
Hardness - Total	mgCaCO3/l	1	ISO 17025	66.5
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	64
Bromide	mg/l	0.001	ISO 17025	0.035
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002

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Analytical Report Number: 23-43811
Project / Site name: Kintore - Hydrogen Plant

Your Order No: 004968.405

Lab Sample Number				2740627
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				06/07/2023
Time Taken				1345
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	18
Iron (dissolved)	mg/l	0.004	ISO 17025	0.034
Magnesium (dissolved)	mg/l	0.005	ISO 17025	5.5
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.5
Sodium (dissolved)	mg/l	0.01	ISO 17025	13
Aluminium (total)	mg/l	0.001	ISO 17025	0.0382
Antimony (total)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (total)	µg/l	0.15	ISO 17025	0.31
Barium (total)	µg/l	0.06	ISO 17025	40
Cadmium (total)	µg/l	0.02	ISO 17025	< 0.02
Chromium (total)	µg/l	0.2	ISO 17025	1
Iron (total)	mg/l	0.004	ISO 17025	0.11
Manganese (total)	µg/l	0.05	ISO 17025	22
Molybdenum (total)	µg/l	0.05	ISO 17025	0.56
Nickel (total)	µg/l	0.5	ISO 17025	1.3
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	2
Zinc (total)	µg/l	0.5	ISO 17025	13
Calcium (total)	mg/l	0.012	ISO 17025	18
Magnesium (total)	mg/l	0.005	ISO 17025	5.8
Potassium (total)	mg/l	0.025	ISO 17025	1.5
Sodium (total)	mg/l	0.01	ISO 17025	14
Aluminium (dissolved)	µg/l	1	ISO 17025	6
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.3
Barium (dissolved)	µg/l	0.06	ISO 17025	38
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.8
Copper (dissolved)	µg/l	0.5	ISO 17025	10
Manganese (dissolved)	µg/l	0.05	ISO 17025	1.3
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.46
Nickel (dissolved)	µg/l	0.5	ISO 17025	1
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.76
Zinc (dissolved)	µg/l	0.5	ISO 17025	7.8
Boron (total)	µg/l	10	ISO 17025	< 10
Copper (total)	µg/l	0.5	ISO 17025	16

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 23-43811
Project / Site name: Kintore - Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025

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Analytical Report Number : 23-43811
Project / Site name: Kintore - Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L005F	W	ISO 17025
Electrical conductivity of water	Determination of electrical conductivity in water by electrometric measurement. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031F	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 23-43811
Project / Site name: Kintore - Hydrogen Plant

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
SW01	None Supplied	W	2740627	c	Ammoniacal Nitrogen as N in water	L082-PL	c
SW01	None Supplied	W	2740627	c	Ammonium as NH4 in water	L082-PL	c
SW01	None Supplied	W	2740627	c	Electrical conductivity of water	L031F	c
SW01	None Supplied	W	2740627	c	Turbidity of in water	L083-PL	c
SW01	None Supplied	W	2740627	c	pH in water	L005F	c

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Analytical Report Number : 23-48637

Project / Site name:	Kintore-Hydrogen Plant	**Samples received on:**	02/08/2023
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	02/08/2023
Your order number:	005485-405	**Analysis completed by:**	11/08/2023
Report Issue Number:	1	**Report issued on:**	11/08/2023
Samples Analysed:	1 water sample		

Signed:

Alyssa Brown
Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate

Analytical Report Number: 23-48637
Project / Site name: Kintore-Hydrogen Plant

Lab Sample Number				2768586
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				01/08/2023
Time Taken				1330
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH in water (L005F)	pH Units	0.1	ISO 17025	7.5
Electrical conductivity of water (L031F)	µS/cm	10	ISO 17025	180
Turbidity	NTU	1	NONE	2.8
Sulphate as SO4	µg/l	45	ISO 17025	9160
Sulphate as SO4	mg/l	0.045	ISO 17025	9.16
Chloride	mg/l	0.15	ISO 17025	19
Silicon (total)	µg/l	50	NONE	3600
Fluoride	µg/l	50	ISO 17025	57
Ammonium as NH4	µg/l	15	ISO 17025	58
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	3.26
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	3.3
Nitrate as N	mg/l	0.01	ISO 17025	2.03
Nitrate as NO3	mg/l	0.05	ISO 17025	8.97
Nitrite as N	µg/l	1	ISO 17025	60
Nitrite as NO2	µg/l	5	ISO 17025	200
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	51
Alkalinity as CaCO3	mg/l	3	ISO 17025	53
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	13
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.1
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	4
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	120
Hardness - Total	mgCaCO3/l	1	ISO 17025	62.5
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	62
Bromide	mg/l	0.001	ISO 17025	0.037
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	16
Iron (dissolved)	mg/l	0.004	ISO 17025	0.05
Magnesium (dissolved)	mg/l	0.005	ISO 17025	5.3
Potassium (dissolved)	mg/l	0.025	ISO 17025	2
Sodium (dissolved)	mg/l	0.01	ISO 17025	14
Aluminium (total)	mg/l	0.001	ISO 17025	0.075
Antimony (total)	µg/l	0.4	ISO 17025	0.7
Arsenic (total)	µg/l	0.15	ISO 17025	0.4
Barium (total)	µg/l	0.06	ISO 17025	34
Boron (total)	µg/l	10	ISO 17025	13
Cadmium (total)	µg/l	0.02	ISO 17025	0.04
Chromium (total)	µg/l	0.2	ISO 17025	0.7
Iron (total)	mg/l	0.004	ISO 17025	0.18
Manganese (total)	µg/l	0.05	ISO 17025	33
Molybdenum (total)	µg/l	0.05	ISO 17025	0.8
Nickel (total)	µg/l	0.5	ISO 17025	1.7
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	0.73
Zinc (total)	µg/l	0.5	ISO 17025	27

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Analytical Report Number: 23-48637
Project / Site name: Kintore-Hydrogen Plant

Lab Sample Number				2768586
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				01/08/2023
Time Taken				1330
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Calcium (total)	mg/l	0.012	ISO 17025	17
Magnesium (total)	mg/l	0.005	ISO 17025	5.5
Potassium (total)	mg/l	0.025	ISO 17025	2.3
Sodium (total)	mg/l	0.01	ISO 17025	17
Aluminium (dissolved)	µg/l	1	ISO 17025	11
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.5
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.33
Barium (dissolved)	µg/l	0.06	ISO 17025	30
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.03
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.5
Copper (dissolved)	µg/l	0.5	ISO 17025	6.9
Manganese (dissolved)	µg/l	0.05	ISO 17025	1.9
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.78
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.1
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.97
Zinc (dissolved)	µg/l	0.5	ISO 17025	13
Copper (total)	µg/l	0.5	ISO 17025	63

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not Detected

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Analytical Report Number : 23-48637
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025

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Analytical Report Number : 23-48637
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L005F	W	ISO 17025
Electrical conductivity of water	Determination of electrical conductivity in water by electrometric measurement. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031F	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 23-55523

Project / Site name:	Kintore-Hydrogen Plant	**Samples received on:**	08/09/2023
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	08/09/2023
Your order number:	005821-405	**Analysis completed by:**	19/09/2023
Report Issue Number:	1	**Report issued on:**	19/09/2023
Samples Analysed:	1 water sample		

Signed:

Alyssa Brown
Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-55523
Project / Site name: Kintore-Hydrogen Plant

Your Order No: 005821-405

Lab Sample Number	2805854
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	07/09/2023
Time Taken	1215

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH in water (L005F)	pH Units	0.1	ISO 17025	7.6
Electrical conductivity of water (L031F)	µS/cm	10	ISO 17025	190
Turbidity	NTU	1	NONE	< 1.0
Sulphate as SO4	µg/l	45	ISO 17025	9390
Sulphate as SO4	mg/l	0.045	ISO 17025	9.4
Chloride	mg/l	0.15	ISO 17025	22
Silicon (total)	µg/l	50	NONE	6800
Fluoride	µg/l	50	ISO 17025	53
Ammonium as NH4	µg/l	15	ISO 17025	85
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	2.41
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	2.78
Nitrate as N	mg/l	0.01	ISO 17025	2.48
Nitrate as NO3	mg/l	0.05	ISO 17025	11
Nitrite as N	µg/l	1	ISO 17025	27
Nitrite as NO2	µg/l	5	ISO 17025	87
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	56
Alkalinity as CaCO3	mg/l	3	ISO 17025	59
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	5.4
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.5
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	4
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	120
Hardness - Total	mgCaCO3/l	1	ISO 17025	69.3
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	69
Bromide	mg/l	0.001	ISO 17025	0.038
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	18
Iron (dissolved)	mg/l	0.004	ISO 17025	0.027
Magnesium (dissolved)	mg/l	0.005	ISO 17025	5.8
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.4
Sodium (dissolved)	mg/l	0.01	ISO 17025	14
Aluminium (total)	mg/l	0.001	ISO 17025	0.0167
Antimony (total)	µg/l	0.4	ISO 17025	0.4
Arsenic (total)	µg/l	0.15	ISO 17025	0.29
Barium (total)	µg/l	0.06	ISO 17025	33
Boron (total)	µg/l	10	ISO 17025	< 10
Cadmium (total)	µg/l	0.02	ISO 17025	< 0.02
Chromium (total)	µg/l	0.2	ISO 17025	0.6
Iron (total)	mg/l	0.004	ISO 17025	0.11
Manganese (total)	µg/l	0.05	ISO 17025	12
Molybdenum (total)	µg/l	0.05	ISO 17025	0.58
Nickel (total)	µg/l	0.5	ISO 17025	1.1
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	1.8
Zinc (total)	µg/l	0.5	ISO 17025	5.4

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Analytical Report Number: 23-55523
Project / Site name: Kintore-Hydrogen Plant

Your Order No: 005821-405

Lab Sample Number				2805854
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				07/09/2023
Time Taken				1215
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Calcium (total)	mg/l	0.012	ISO 17025	19
Magnesium (total)	mg/l	0.005	ISO 17025	6.1
Potassium (total)	mg/l	0.025	ISO 17025	1.4
Sodium (total)	mg/l	0.01	ISO 17025	14
Aluminium (dissolved)	µg/l	1	ISO 17025	4.2
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.28
Barium (dissolved)	µg/l	0.06	ISO 17025	33
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.4
Copper (dissolved)	µg/l	0.5	ISO 17025	3.8
Manganese (dissolved)	µg/l	0.05	ISO 17025	0.78
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.33
Nickel (dissolved)	µg/l	0.5	ISO 17025	0.7
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.58
Zinc (dissolved)	µg/l	0.5	ISO 17025	4.9
Copper (total)	µg/l	0.5	ISO 17025	10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not Detected

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Analytical Report Number : 23-55523
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025

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Analytical Report Number : 23-55523
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L005F	W	ISO 17025
Electrical conductivity of water	Determination of electrical conductivity in water by electrometric measurement. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031F	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 23-55523
Project / Site name: Kintore-Hydrogen Plant

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
SW01	None Supplied	W	2805854	c	Ammoniacal Nitrogen as N in water	L082-PL	c
SW01	None Supplied	W	2805854	c	Ammonium as NH4 in water	L082-PL	c
SW01	None Supplied	W	2805854	c	Electrical conductivity of water	L031F	c
SW01	None Supplied	W	2805854	c	Turbidity of in water	L083-PL	c
SW01	None Supplied	W	2805854	c	pH in water	L005F	c

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Analytical Report Number : 23-62126

Project / Site name:	Kintore - Hydrogen Plant	**Samples received on:**	12/10/2023
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	12/10/2023
Your order number:	006581-405	**Analysis completed by:**	23/10/2023
Report Issue Number:	1	**Report issued on:**	26/10/2023
Samples Analysed:	1 water sample		

Signed:

Alyssa Brown
Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 23-62126
Project / Site name: Kintore - Hydrogen Plant

Lab Sample Number				2842852
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				11/10/2023
Time Taken				1400
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH in water (L005F)	pH Units	0.1	ISO 17025	7.2
Electrical conductivity of water (L031F)	µS/cm	10	ISO 17025	150
Turbidity	NTU	1	NONE	1
Sulphate as SO4	µg/l	45	ISO 17025	8810
Sulphate as SO4	mg/l	0.045	ISO 17025	8.81
Chloride	mg/l	0.15	ISO 17025	18
Silicon (total)	µg/l	50	NONE	3700
Fluoride	µg/l	50	ISO 17025	67
Ammonium as NH4	µg/l	15	ISO 17025	190
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	9.45
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	9.16
Nitrate as N	mg/l	0.01	ISO 17025	2.25
Nitrate as NO3	mg/l	0.05	ISO 17025	9.96
Nitrite as N	µg/l	1	ISO 17025	6.3
Nitrite as NO2	µg/l	5	ISO 17025	21
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	36
Alkalinity as CaCO3	mg/l	3	ISO 17025	31
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	20
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.3
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	9
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	120
Hardness - Total	mgCaCO3/l	1	ISO 17025	48
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	44
Bromide	mg/l	0.001	ISO 17025	0.026
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	11
Calcium (dissolved)	mg/l	0.012	ISO 17025	13
Iron (dissolved)	mg/l	0.004	ISO 17025	0.086
Magnesium (dissolved)	mg/l	0.005	ISO 17025	4
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.7
Sodium (dissolved)	mg/l	0.01	ISO 17025	11
Aluminium (total)	mg/l	0.001	ISO 17025	0.0604
Antimony (total)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (total)	µg/l	0.15	ISO 17025	0.33
Barium (total)	µg/l	0.06	ISO 17025	31
Boron (total)	µg/l	10	ISO 17025	15
Cadmium (total)	µg/l	0.02	ISO 17025	< 0.02
Chromium (total)	µg/l	0.2	ISO 17025	1.1
Iron (total)	mg/l	0.004	ISO 17025	0.33
Manganese (total)	µg/l	0.05	ISO 17025	12
Molybdenum (total)	µg/l	0.05	ISO 17025	0.49
Nickel (total)	µg/l	0.5	ISO 17025	1.9
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	< 0.20
Zinc (total)	µg/l	0.5	ISO 17025	9.5

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Analytical Report Number: 23-62126
Project / Site name: Kintore - Hydrogen Plant

Lab Sample Number				2842852
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				11/10/2023
Time Taken				1400
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Calcium (total)	mg/l	0.012	ISO 17025	13
Magnesium (total)	mg/l	0.005	ISO 17025	4.2
Potassium (total)	mg/l	0.025	ISO 17025	1.9
Sodium (total)	mg/l	0.01	ISO 17025	12
Aluminium (dissolved)	µg/l	1	ISO 17025	39
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.3
Barium (dissolved)	µg/l	0.06	ISO 17025	30
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.7
Copper (dissolved)	µg/l	0.5	ISO 17025	14
Manganese (dissolved)	µg/l	0.05	ISO 17025	3.8
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.46
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.8
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20
Zinc (dissolved)	µg/l	0.5	ISO 17025	1.7
Copper (total)	µg/l	0.5	ISO 17025	26

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not Detected

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Analytical Report Number : 23-62126
Project / Site name: Kintore - Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025

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Analytical Report Number : 23-62126
Project / Site name: Kintore - Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L005F	W	ISO 17025
Electrical conductivity of water	Determination of electrical conductivity in water by electrometric measurement. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031F	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 23-69660

Project / Site name:	Kintore Hydrogen Plant	**Samples received on:**	17/11/2023
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	17/11/2023
Your order number:	006958.405	**Analysis completed by:**	29/11/2023
Report Issue Number:	1	**Report issued on:**	29/11/2023
Samples Analysed:	1 water sample		

Signed: Ashleigh Cunningham

Ashleigh Cunningham
Customer Service Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Sample Deviation Report

Analytical Report Number: 23-69660
Project / Site name: Kintore Hydrogen Plant

Your Order No: 006958.405

Lab Sample Number	2882797
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	16/11/2023
Time Taken	1420

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (L099)	pH Units	N/A	ISO 17025	7.5
Electrical Conductivity at 20 °C (L031B)	µS/cm	10	ISO 17025	140
Turbidity	NTU	1	NONE	1.6
Sulphate as SO4	µg/l	45	ISO 17025	7090
Sulphate as SO4	mg/l	0.045	ISO 17025	7.09
Chloride	mg/l	0.15	ISO 17025	18
Silicon (total)	µg/l	50	NONE	2500
Fluoride	µg/l	50	ISO 17025	62
Ammonium as NH4	µg/l	15	ISO 17025	5700
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	5.82
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	6.18
Nitrate as N	mg/l	0.01	ISO 17025	2.47
Nitrate as NO3	mg/l	0.05	ISO 17025	10.9
Nitrite as N	µg/l	1	ISO 17025	2.3
Nitrite as NO2	µg/l	5	ISO 17025	7.4
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	36
Alkalinity as CaCO3	mg/l	3	ISO 17025	35
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	16
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.5
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	6
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	58
Hardness - Total	mgCaCO3/l	1	ISO 17025	44.6
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	43
Bromide	mg/l	0.001	ISO 17025	0.046
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	12
Iron (dissolved)	mg/l	0.004	ISO 17025	0.079
Magnesium (dissolved)	mg/l	0.005	ISO 17025	3.7
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.3
Sodium (dissolved)	mg/l	0.01	ISO 17025	9.2
Aluminium (total)	mg/l	0.001	ISO 17025	0.0772
Antimony (total)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (total)	µg/l	0.15	ISO 17025	0.25
Barium (total)	µg/l	0.06	ISO 17025	38
Boron (total)	µg/l	10	ISO 17025	< 10
Cadmium (total)	µg/l	0.02	ISO 17025	0.03
Chromium (total)	µg/l	0.2	ISO 17025	0.6
Iron (total)	mg/l	0.004	ISO 17025	0.18
Manganese (total)	µg/l	0.05	ISO 17025	18
Molybdenum (total)	µg/l	0.05	ISO 17025	0.63
Nickel (total)	µg/l	0.5	ISO 17025	1.7
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	< 0.20
Zinc (total)	µg/l	0.5	ISO 17025	50

Sample Deviation Report

Analytical Report Number: 23-69660
Project / Site name: Kintore Hydrogen Plant

Your Order No: 006958.405

Lab Sample Number				2882797
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				16/11/2023
Time Taken				1420
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Calcium (total)	mg/l	0.012	ISO 17025	12
Magnesium (total)	mg/l	0.005	ISO 17025	3.9
Potassium (total)	mg/l	0.025	ISO 17025	1.4
Sodium (total)	mg/l	0.01	ISO 17025	9.4
Aluminium (dissolved)	µg/l	1	ISO 17025	62
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.22
Barium (dissolved)	µg/l	0.06	ISO 17025	32
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.6
Copper (dissolved)	µg/l	0.5	ISO 17025	6.7
Manganese (dissolved)	µg/l	0.05	ISO 17025	9.7
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.23
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.4
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20
Zinc (dissolved)	µg/l	0.5	ISO 17025	11
Copper (total)	µg/l	0.5	ISO 17025	10

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not Detected

Sample Deviation Report

Analytical Report Number : 23-69660
Project / Site name: Kintore Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE

Sample Deviation Report

Analytical Report Number : 23-69660
Project / Site name: Kintore Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 23-69660
Project / Site name: Kintore Hydrogen Plant

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

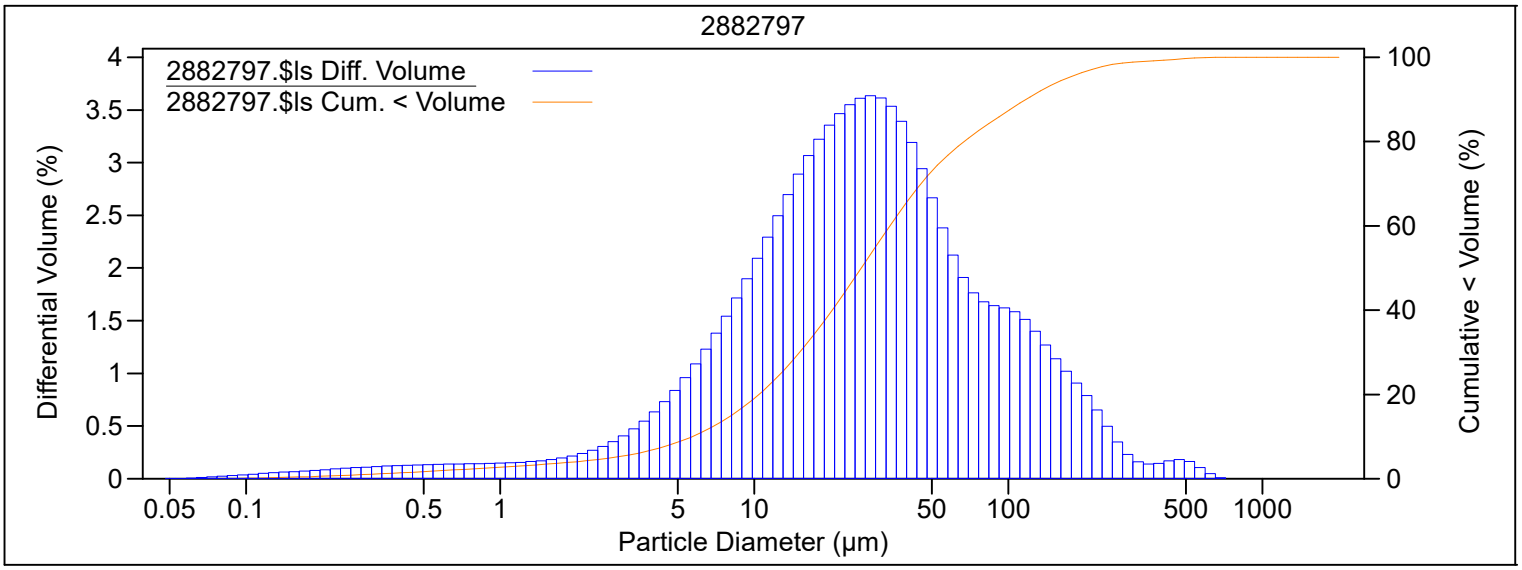
Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
SW01	None Supplied	W	2882797	c	Electrical conductivity at 20oC of water	L031-PL	c
SW01	None Supplied	W	2882797	c	Turbidity of in water	L083-PL	c
SW01	None Supplied	W	2882797	c	pH at 20oC in water (automated)	L099-PL	c

Beckman Coulter LS Particle Size Analyzer

27 Nov 2023

Kenneth Pye Associates Ltd

File name:	C:\LS13320\Analyses\i2 Analytical\27-11-2023 23-69660\2882797.$ls 2882797.$ls		
File ID:	2882797		
Sample ID:	2882797		
Operator:	sjb		
Run number:	6017		
Comment 1:	Job No: 23-69660		
Comment 2:	SW01 16/11/2023 14:20 SLR Kintore		
Optical model:	NMBAQC.rf780d PIDS included		
Fluid R.I.:	1.333	Sample R.I.:	1.55 i0.1
Residual:	0.20%		
LS 13 320	Universal Liquid Module		
Start time:	10:17 27 Nov 2023	Run length:	53 seconds
Pump speed:	50%		
Obscuration:	4%	PIDS Obscur:	38%
Fluid:	Water		
Software:	6.01	Firmware:	4.00



Beckman Coulter LS Particle Size Analyzer

27 Nov 2023

Kenneth Pye Associates Ltd

Volume Statistics (Geometric) 2882797.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	24.45 µm	S.D.:	3.664
Median:	26.44 µm	Variance:	13.42
D(3,2):	6.097 µm	Skewness:	-0.864 Left skewed
Mean/Median ratio:	0.925	Kurtosis:	2.109 Leptokurtic
Mode:	28.70 µm		

d_{10}: 5.703 µm d_{50}: 26.44 µm d_{90}: 117.4 µm

Folk and Ward Statistics (Phi)

Mean:	5.23	Median:	5.24	Deviation:	1.72
Skewness:	0.04	Kurtosis:	1.17		

<10%	<25%	<50%	<75%	<90%
5.703 µm	12.73 µm	26.44 µm	53.94 µm	117.4 µm

<2 µm	<63 µm	<2000 µm
4.04%	78.7%	100%

2882797.$ls

Particle Diameter µm	Volume %
0.043	0.0021
0.051	0.0074
0.061	0.024
0.073	0.042
0.086	0.068
0.103	0.086
0.122	0.11
0.145	0.13
0.173	0.15
0.205	0.17
0.244	0.19
0.29	0.21
0.345	0.23
0.411	0.24
0.488	0.25
0.581	0.26
0.691	0.26
0.821	0.27
0.977	0.28
1.161	0.30
1.381	0.33
1.642	0.38
1.953	0.45
2.323	0.57
2.762	0.74
3.285	0.97
3.906	1.27
4.645	1.65
5.524	2.09
6.57	2.60
7.813	3.18
9.291	3.83
11.05	4.52
13.14	5.22
15.63	5.80
18.58	6.28
22.1	6.59
26.28	6.73
31.25	6.58
37.16	6.06
44.19	5.21
52.56	4.38
63	3.46
75	3.27
90	2.83
106	2.69
125	2.55
150	2.07
180	1.49
212	1.05
250	0.65
300	0.31
355	0.29
425	0.31
500	0.25
600	0.052
710	0.0019
850	0
1000	0
1180	0
1400	0
1700	0
2000	

Beckman Coulter LS Particle Size Analyzer

27 Nov 2023

Kenneth Pye Associates Ltd

2882797.$ls

Channel Diameter (Lower) µm	Diff. Volume %	Cum. < Volume %
0.040	0.00075	0
0.044	0.00099	0.00075
0.048	0.0016	0.0017
0.053	0.0033	0.0033
0.058	0.0068	0.0066
0.064	0.012	0.013
0.070	0.019	0.026
0.077	0.025	0.045
0.084	0.031	0.070
0.093	0.037	0.10
0.102	0.044	0.14
0.112	0.050	0.18
0.122	0.056	0.23
0.134	0.062	0.29
0.148	0.068	0.35
0.162	0.074	0.42
0.178	0.080	0.49
0.195	0.086	0.57
0.214	0.093	0.66
0.235	0.099	0.75
0.258	0.10	0.85
0.284	0.11	0.96
0.311	0.12	1.07
0.342	0.12	1.18
0.375	0.12	1.30
0.412	0.13	1.43
0.452	0.13	1.56
0.496	0.13	1.69
0.545	0.14	1.82
0.598	0.14	1.96
0.656	0.14	2.10
0.721	0.14	2.24
0.791	0.14	2.38
0.868	0.15	2.52
0.953	0.15	2.67
1.047	0.15	2.82
1.149	0.16	2.97
1.261	0.16	3.12
1.385	0.17	3.29
1.520	0.18	3.46
1.668	0.20	3.64
1.832	0.22	3.84
2.011	0.24	4.05
2.207	0.27	4.29
2.423	0.31	4.56
2.660	0.35	4.87
2.920	0.41	5.22
3.205	0.47	5.63
3.519	0.55	6.10
3.863	0.63	6.65
4.240	0.73	7.29
4.655	0.84	8.02
5.110	0.96	8.86
5.610	1.09	9.81
6.158	1.23	10.9
6.760	1.38	12.1
7.421	1.54	13.5
8.147	1.71	15.1
8.943	1.90	16.8
9.817	2.09	18.7
10.78	2.29	20.8
11.83	2.50	23.1
12.99	2.70	25.5
14.26	2.89	28.2
15.65	3.07	31.1
17.18	3.22	34.2
18.86	3.36	37.4
20.70	3.46	40.8
22.73	3.55	44.2
24.95	3.61	47.8
27.39	3.64	51.4
30.07	3.61	55.0
33.01	3.54	58.7
36.24	3.39	62.2
39.78	3.19	65.6
43.67	2.94	68.8
47.94	2.66	71.7
52.62	2.38	74.4
57.77	2.12	76.8
63.41	1.91	78.9
69.61	1.76	80.8
76.42	1.68	82.6
83.89	1.64	84.2
92.09	1.62	85.9
101.1	1.59	87.5
111.0	1.51	89.1
121.8	1.40	90.6
133.7	1.27	92.0
146.8	1.14	93.3
161.2	1.02	94.4
176.9	0.91	95.4
194.2	0.79	96.3
213.2	0.65	97.1
234.1	0.50	97.8
256.9	0.35	98.3
282.1	0.23	98.6
309.6	0.16	98.9
339.9	0.14	99.0
373.1	0.15	99.2
409.6	0.17	99.3
449.7	0.18	99.5
493.6	0.16	99.7
541.9	0.11	99.8
594.9	0.047	99.9
653.0	0.0098	99.99
716.8	0.00085	99.999
786.9	0	100
863.9	0	100
948.3	0	100
1041	0	100
1143	0	100
1255	0	100
1377	0	100
1512	0	100
1660	0	100
1822	0	100
2000		100

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t: 01355202915
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Analytical Report Number : 23-75814

Project / Site name:	Kintore Hydrogent Plant	**Samples received on:**	19/12/2023
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	19/12/2023
Your order number:	007367-405	**Analysis completed by:**	05/01/2024
Report Issue Number:	1	**Report issued on:**	05/01/2024
Samples Analysed:	1 water sample		

Signed: Ashleigh Cunningham

Ashleigh Cunningham
Customer Service Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 23-75814
Project / Site name: Kintore Hydrogent Plant

Your Order No: 007367-405

Lab Sample Number	2916042
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	18/12/2023
Time Taken	1455

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (L099)	pH Units	N/A	ISO 17025	7.4
Electrical Conductivity at 20 °C (L031B)	µS/cm	10	ISO 17025	170
Turbidity	NTU	1	NONE	< 1.0
Sulphate as SO4	µg/l	45	ISO 17025	9040
Sulphate as SO4	mg/l	0.045	ISO 17025	9.04
Chloride	mg/l	0.15	ISO 17025	18
Silicon (total)	µg/l	50	NONE	2000
Fluoride	µg/l	50	ISO 17025	59
Ammonium as NH4	µg/l	15	ISO 17025	46
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	3.1
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	3.45
Nitrate as N	mg/l	0.01	ISO 17025	3.21
Nitrate as NO3	mg/l	0.05	ISO 17025	14.2
Nitrite as N	µg/l	1	ISO 17025	3.9
Nitrite as NO2	µg/l	5	ISO 17025	13
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	38
Alkalinity as CaCO3	mg/l	3	ISO 17025	37
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	8.4
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	3.2
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	< 2.0
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	110
Hardness - Total	mgCaCO3/l	1	ISO 17025	55
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	46
Bromide	mg/l	0.001	ISO 17025	0.044
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	11
Calcium (dissolved)	mg/l	0.012	ISO 17025	14
Iron (dissolved)	mg/l	0.004	ISO 17025	0.051
Magnesium (dissolved)	mg/l	0.005	ISO 17025	4.7
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.4
Sodium (dissolved)	mg/l	0.01	ISO 17025	11
Aluminium (total)	mg/l	0.001	ISO 17025	0.0684
Antimony (total)	µg/l	0.4	ISO 17025	0.4
Arsenic (total)	µg/l	0.15	ISO 17025	0.31
Barium (total)	µg/l	0.06	ISO 17025	45
Boron (total)	µg/l	10	ISO 17025	11
Cadmium (total)	µg/l	0.02	ISO 17025	0.04
Chromium (total)	µg/l	0.2	ISO 17025	1.1
Iron (total)	mg/l	0.004	ISO 17025	0.17
Manganese (total)	µg/l	0.05	ISO 17025	28
Molybdenum (total)	µg/l	0.05	ISO 17025	0.22
Nickel (total)	µg/l	0.5	ISO 17025	1.4
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	0.4
Zinc (total)	µg/l	0.5	ISO 17025	14

UKAS TESTING
4041

Analytical Environmental Science

Analytical Report Number: 23-75814
Project / Site name: Kintore Hydrogent Plant

Your Order No: 007367-405

Lab Sample Number	2916042
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	18/12/2023
Time Taken	1455

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Calcium (total)	mg/l	0.012	ISO 17025	15
Magnesium (total)	mg/l	0.005	ISO 17025	5
Potassium (total)	mg/l	0.025	ISO 17025	1.5
Sodium (total)	mg/l	0.01	ISO 17025	11
Aluminium (dissolved)	µg/l	1	ISO 17025	21
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.2
Barium (dissolved)	µg/l	0.06	ISO 17025	34
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	1.1
Copper (dissolved)	µg/l	0.5	ISO 17025	3
Manganese (dissolved)	µg/l	0.05	ISO 17025	9.1
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.21
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.1
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.23
Zinc (dissolved)	µg/l	0.5	ISO 17025	7.2
Copper (total)	µg/l	0.5	ISO 17025	13

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not Detected

UKAS TESTING
4041

Analytical Environmental Science

Analytical Report Number : 23-75814
Project / Site name: Kintore Hydrogent Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.Accredited Matrices PW, SW, GW, FSE, PrW, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025

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Analytical Report Number : 23-75814
Project / Site name: Kintore Hydrogent Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

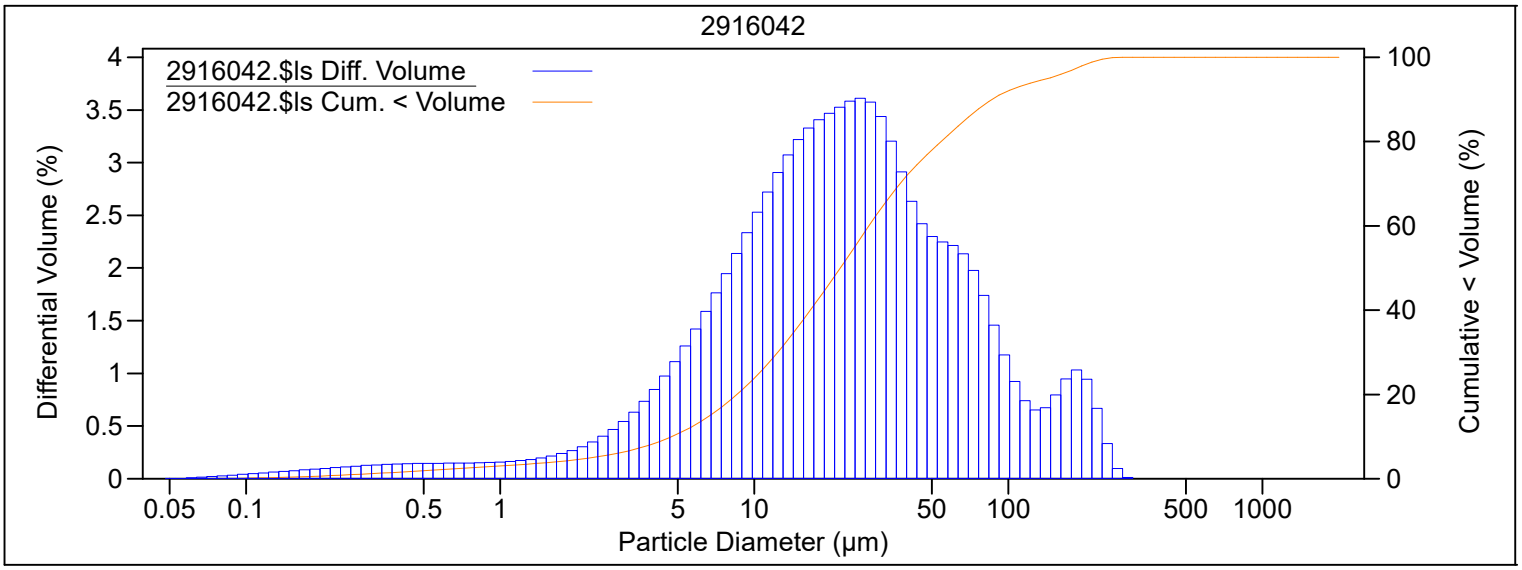
For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Beckman Coulter LS Particle Size Analyzer

21 Dec 2023

Kenneth Pye Associates Ltd

File name:	C:\LS13320\Analyses\i2 Analytical\21-12-2023 23-75814\2916042.$ls 2916042.$ls		
File ID:	2916042		
Sample ID:	2916042		
Operator:	sjb		
Run number:	6207		
Comment 1:	Job No: 23-75814		
Comment 2:	SW01 18/12/2023		
Optical model:	NMBAQC.rf780d PIDS included		
Fluid R.I.:	1.333	Sample R.I.:	1.55 i0.1
Residual:	0.74%		
LS 13 320	Universal Liquid Module		
Start time:	13:41 21 Dec 2023	Run length:	51 seconds
Pump speed:	51%		
Obscuration:	5%	PIDS Obscur:	31%
Fluid:	Water		
Software:	6.01	Firmware:	4.00



Beckman Coulter LS Particle Size Analyzer

21 Dec 2023

Kenneth Pye Associates Ltd

Volume Statistics (Geometric) 2916042.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	19.90 µm	S.D.:	3.554
Median:	21.84 µm	Variance:	12.63
D(3,2):	5.372 µm	Skewness:	-0.909 Left skewed
Mean/Median ratio:	0.911	Kurtosis:	2.025 Leptokurtic
Mode:	26.14 µm		

d_{10}: 4.734 µm d_{50}: 21.84 µm d_{90}: 86.48 µm

Folk and Ward Statistics (Phi)

Mean:	5.54	Median:	5.52	Deviation:	1.70
Skewness:	0.06	Kurtosis:	1.17		

<10%	<25%	<50%	<75%	<90%
4.734 µm	10.43 µm	21.84 µm	44.54 µm	86.48 µm

<2 µm	<63 µm	<2000 µm
4.53%	83.5%	100%

2916042.$ls

Particle Diameter µm	Volume %
0.043	0.0023
0.051	0.0083
0.061	0.027
0.073	0.046
0.086	0.075
0.103	0.096
0.122	0.12
0.145	0.15
0.173	0.17
0.205	0.20
0.244	0.22
0.29	0.24
0.345	0.26
0.411	0.26
0.488	0.27
0.581	0.28
0.691	0.28
0.821	0.29
0.977	0.30
1.161	0.33
1.381	0.38
1.642	0.46
1.953	0.58
2.323	0.75
2.762	0.99
3.285	1.30
3.906	1.70
4.645	2.18
5.524	2.72
6.57	3.32
7.813	3.96
9.291	4.64
11.05	5.29
13.14	5.87
15.63	6.21
18.58	6.47
22.1	6.65
26.28	6.60
31.25	6.02
37.16	5.08
44.19	4.39
52.56	4.33
63	3.86
75	3.24
90	2.01
106	1.38
125	1.33
150	1.75
180	1.73
212	0.96
250	0.21
300	0.0051
355	0
425	0
500	0
600	0
710	0
850	0
1000	0
1180	0
1400	0
1700	0
2000	

Beckman Coulter LS Particle Size Analyzer

21 Dec 2023

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2916042.$ls

Channel Diameter (Lower) µm	Diff. Volume %	Cum. < Volume %
0.040	0.00081	0
0.044	0.0011	0.00081
0.048	0.0018	0.0019
0.053	0.0037	0.0037
0.058	0.0076	0.0074
0.064	0.014	0.015
0.070	0.021	0.029
0.077	0.028	0.050
0.084	0.034	0.077
0.093	0.041	0.11
0.102	0.049	0.15
0.112	0.056	0.20
0.122	0.063	0.26
0.134	0.070	0.32
0.148	0.077	0.39
0.162	0.084	0.47
0.178	0.091	0.55
0.195	0.098	0.64
0.214	0.11	0.74
0.235	0.11	0.85
0.258	0.12	0.96
0.284	0.13	1.08
0.311	0.13	1.21
0.342	0.14	1.34
0.375	0.14	1.47
0.412	0.14	1.61
0.452	0.14	1.76
0.496	0.15	1.90
0.545	0.15	2.05
0.598	0.15	2.19
0.656	0.15	2.34
0.721	0.15	2.49
0.791	0.15	2.64
0.868	0.15	2.79
0.953	0.16	2.95
1.047	0.16	3.11
1.149	0.17	3.27
1.261	0.18	3.44
1.385	0.20	3.63
1.520	0.22	3.82
1.668	0.24	4.04
1.832	0.27	4.28
2.011	0.31	4.55
2.207	0.35	4.85
2.423	0.40	5.20
2.660	0.47	5.61
2.920	0.54	6.07
3.205	0.63	6.62
3.519	0.73	7.25
3.863	0.85	7.99
4.240	0.97	8.83
4.655	1.11	9.81
5.110	1.26	10.9
5.610	1.42	12.2
6.158	1.59	13.6
6.760	1.76	15.2
7.421	1.95	17.0
8.147	2.14	18.9
8.943	2.34	21.0
9.817	2.53	23.4
10.78	2.72	25.9
11.83	2.91	28.6
12.99	3.07	31.5
14.26	3.22	34.6
15.65	3.33	37.8
17.18	3.41	41.2
18.86	3.47	44.6
20.70	3.53	48.0
22.73	3.58	51.6
24.95	3.61	55.1
27.39	3.57	58.8
30.07	3.44	62.3
33.01	3.20	65.8
36.24	2.91	69.0
39.78	2.63	71.9
43.67	2.42	74.5
47.94	2.30	76.9
52.62	2.25	79.2
57.77	2.21	81.5
63.41	2.14	83.7
69.61	1.98	85.8
76.42	1.74	87.8
83.89	1.46	89.5
92.09	1.18	91.0
101.1	0.92	92.2
111.0	0.74	93.1
121.8	0.65	93.8
133.7	0.68	94.5
146.8	0.80	95.2
161.2	0.95	96.0
176.9	1.03	96.9
194.2	0.95	97.9
213.2	0.67	98.9
234.1	0.33	99.6
256.9	0.096	99.9
282.1	0.013	99.99
309.6	0.00041	100
339.9	0	100
373.1	0	100
409.6	0	100
449.7	0	100
493.6	0	100
541.9	0	100
594.9	0	100
653.0	0	100
716.8	0	100
786.9	0	100
863.9	0	100
948.3	0	100
1041	0	100
1143	0	100
1255	0	100
1377	0	100
1512	0	100
1660	0	100
1822	0	100
2000		100

UKAS TESTING
4041

Analytical i2 Environmental Science

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e: scotland@i2analytical.com

Analytical Report Number : 24-79446

Project / Site name:	Kintore - Hydrogen Plant	**Samples received on:**	23/01/2024
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	23/01/2024
Your order number:	007730-405	**Analysis completed by:**	01/02/2024
Report Issue Number:	1	**Report issued on:**	06/02/2024
Samples Analysed:	1 water sample		

Signed: Ashleigh Cunningham

Ashleigh Cunningham
Customer Service Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

UKAS TESTING
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Analytical i2 Environmental Science

Analytical Report Number: 24-79446
Project / Site name: Kintore - Hydrogen Plant

Lab Sample Number				2934942
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				23/01/2024
Time Taken				1055
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (L099)	pH Units	N/A	ISO 17025	7.4
Electrical Conductivity at 20 °C (L031B)	µS/cm	10	ISO 17025	130
Turbidity	NTU	1	NONE	6.2
Sulphate as SO4	µg/l	45	ISO 17025	7800
Sulphate as SO4	mg/l	0.045	ISO 17025	7.8
Chloride	mg/l	0.15	ISO 17025	19
Silicon (total)	µg/l	50	NONE	1700
Fluoride	µg/l	50	ISO 17025	< 50
Ammonium as NH4	µg/l	15	ISO 17025	39
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	5.18
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	5.5
Nitrate as N	mg/l	0.01	ISO 17025	1.84
Nitrate as NO3	mg/l	0.05	ISO 17025	8.15
Nitrite as N	µg/l	1	ISO 17025	2.5
Nitrite as NO2	µg/l	5	ISO 17025	8.4
Alkalinity as CaCO3 (titration)	mg/l	3	NONE	18
Alkalinity as CaCO3	mg/l	3	ISO 17025	17
Chemical Oxygen Demand (Total) (L065B)	mg/l	2	ISO 17025	21
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	1.8
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	9
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	72
Hardness - Total	mgCaCO3/l	1	ISO 17025	43.6
Bicarbonate as HCO3 (titration)	mg/l	10	NONE	22
Bromide	mg/l	0.001	ISO 17025	0.04
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Boron (dissolved)	µg/l	10	ISO 17025	11
Calcium (dissolved)	mg/l	0.012	ISO 17025	11
Iron (dissolved)	mg/l	0.004	ISO 17025	0.086
Magnesium (dissolved)	mg/l	0.005	ISO 17025	3.8
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.6
Sodium (dissolved)	mg/l	0.01	ISO 17025	13
Aluminium (total)	mg/l	0.001	ISO 17025	0.101
Antimony (total)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (total)	µg/l	0.15	ISO 17025	0.21
Barium (total)	µg/l	0.06	ISO 17025	30
Boron (total)	µg/l	10	ISO 17025	18
Cadmium (total)	µg/l	0.02	ISO 17025	0.03
Chromium (total)	µg/l	0.2	ISO 17025	0.9
Iron (total)	mg/l	0.004	ISO 17025	0.24
Manganese (total)	µg/l	0.05	ISO 17025	21
Molybdenum (total)	µg/l	0.05	ISO 17025	0.65
Nickel (total)	µg/l	0.5	ISO 17025	2.5
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (total)	µg/l	0.2	ISO 17025	3.3

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Analytical Report Number: 24-79446
Project / Site name: Kintore - Hydrogen Plant

Lab Sample Number				2934942
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				23/01/2024
Time Taken				1055
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Zinc (total)	µg/l	0.5	ISO 17025	22
Calcium (total)	mg/l	0.012	ISO 17025	12
Magnesium (total)	mg/l	0.005	ISO 17025	3.7
Potassium (total)	mg/l	0.025	ISO 17025	1.4
Sodium (total)	mg/l	0.01	ISO 17025	12
Aluminium (dissolved)	µg/l	1	ISO 17025	42
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.18
Barium (dissolved)	µg/l	0.06	ISO 17025	27
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.5
Copper (dissolved)	µg/l	0.5	ISO 17025	3
Manganese (dissolved)	µg/l	0.05	ISO 17025	8.5
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.24
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.3
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	4.4
Copper (total)	µg/l	0.5	ISO 17025	18

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not Detected

4041

Analytical Report Number : 24-79446
Project / Site name: Kintore - Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW (Al, Fe, Cu, Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Alkalinity in Water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025-PL	W	NONE
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Suspended solids in water	Determined gravimetrically with GFC filtration papers.Accredited Matrices PW, SW, GW, FSE, PrW, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025
Total organic carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR analyser. Accredited matrices: SW PW GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/82-PL	W	NONE

4041

Analytical Report Number : 24-79446
Project / Site name: Kintore - Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples.	In-house method based on Standard Method 8237	L083-PL	W	NONE
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry.	In house method based on BSEN 15216:2007	L004-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
Chloride in water	Determination of Chloride (diissolved) colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Alkalinity in Water (by discreet analyser)	Determination of Alkalinity by discreet analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025

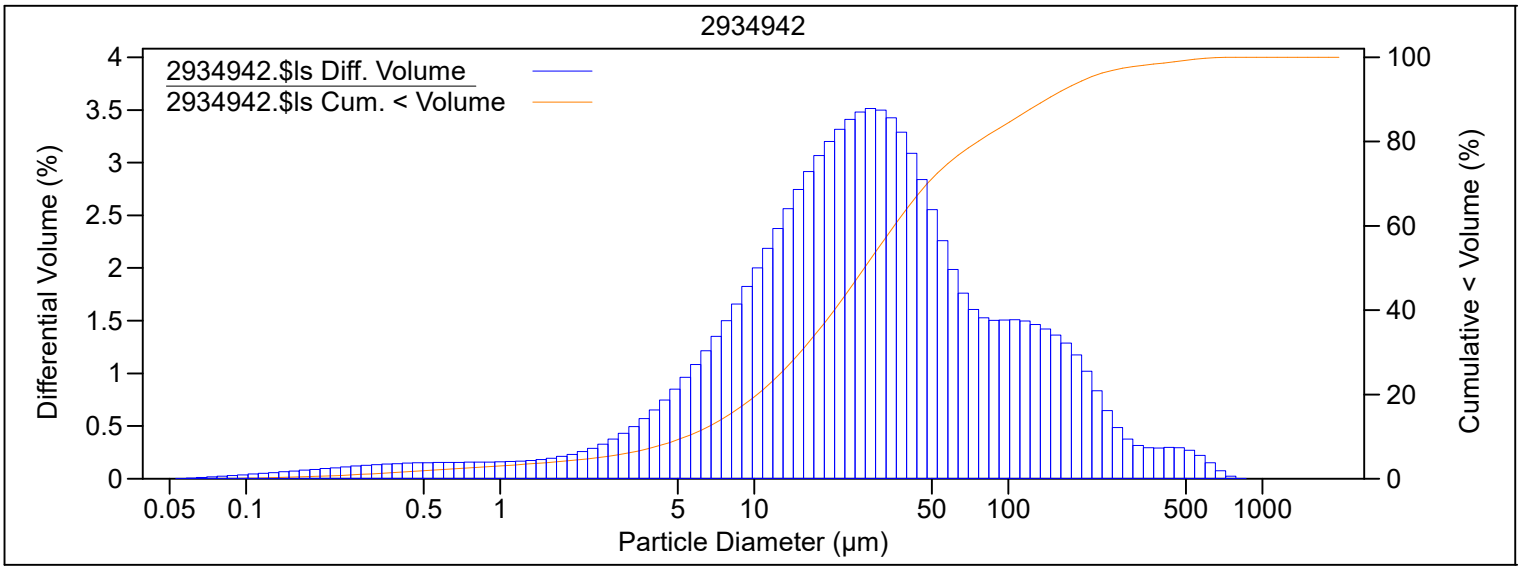
For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Beckman Coulter LS Particle Size Analyzer

31 Jan 2024

Kenneth Pye Associates Ltd

File name:	C:\LS13320\Analyses\i2 Analytical\31-01-2024 24-79446\2934942.$ls 2934942.$ls		
File ID:	2934942		
Sample ID:	2934942		
Operator:	sjb		
Run number:	6536		
Comment 1:	Job No: 24-79446		
Comment 2:	SW01 23/01/2024		
Optical model:	NMBAQC.rf780d PIDS included		
Fluid R.I.:	1.333	Sample R.I.:	1.55 i0.1
Residual:	0.18%		
LS 13 320	Universal Liquid Module		
Start time:	8:22 31 Jan 2024	Run length:	52 seconds
Pump speed:	50%		
Obscuration:	12%	PIDS Obscur:	71%
Fluid:	Water		
Software:	6.01	Firmware:	4.00



Beckman Coulter LS Particle Size Analyzer

31 Jan 2024

Kenneth Pye Associates Ltd

Volume Statistics (Geometric) 2934942.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	25.54 µm	S.D.:	3.975
Median:	27.17 µm	Variance:	15.80
D(3,2):	5.820 µm	Skewness:	-0.743 Left skewed
Mean/Median ratio:	0.940	Kurtosis:	1.690 Leptokurtic
Mode:	28.70 µm		

d_{10}: 5.393 µm d_{50}: 27.17 µm d_{90}: 141.6 µm

Folk and Ward Statistics (Phi)

Mean:	5.16	Median:	5.20	Deviation:	1.86
Skewness:	0.03	Kurtosis:	1.19		

<10%	<25%	<50%	<75%	<90%
5.393 µm	12.69 µm	27.17 µm	58.39 µm	141.6 µm

<2 µm	<63 µm	<2000 µm
4.44%	76.6%	100%

2934942.$ls

Particle Diameter µm	Volume %
0.043	0.0019
0.051	0.0061
0.061	0.021
0.073	0.040
0.086	0.068
0.103	0.088
0.122	0.11
0.145	0.14
0.173	0.16
0.205	0.19
0.244	0.22
0.29	0.25
0.345	0.27
0.411	0.27
0.488	0.29
0.581	0.29
0.691	0.29
0.821	0.30
0.977	0.30
1.161	0.32
1.381	0.35
1.642	0.40
1.953	0.49
2.323	0.61
2.762	0.79
3.285	1.02
3.906	1.31
4.645	1.66
5.524	2.08
6.57	2.55
7.813	3.07
9.291	3.67
11.05	4.30
13.14	4.96
15.63	5.51
18.58	6.00
22.1	6.34
26.28	6.50
31.25	6.38
37.16	5.87
44.19	5.01
52.56	4.13
63	3.18
75	2.98
90	2.64
106	2.65
125	2.80
150	2.56
180	1.92
212	1.35
250	0.93
300	0.58
355	0.57
425	0.51
500	0.47
600	0.21
710	0.037
850	0.00099
1000	0
1180	0
1400	0
1700	0
2000	

Beckman Coulter LS Particle Size Analyzer

31 Jan 2024

Kenneth Pye Associates Ltd

2934942.$ls

Channel Diameter (Lower) µm	Diff. Volume %	Cum. < Volume %
0.040	0.00073	0
0.044	0.00092	0.00073
0.048	0.0014	0.0017
0.053	0.0027	0.0030
0.058	0.0056	0.0057
0.064	0.011	0.011
0.070	0.018	0.022
0.077	0.024	0.040
0.084	0.031	0.064
0.093	0.037	0.095
0.102	0.045	0.13
0.112	0.052	0.18
0.122	0.059	0.23
0.134	0.066	0.29
0.148	0.073	0.35
0.162	0.081	0.43
0.178	0.088	0.51
0.195	0.096	0.60
0.214	0.10	0.69
0.235	0.11	0.80
0.258	0.12	0.91
0.284	0.13	1.03
0.311	0.13	1.16
0.342	0.14	1.29
0.375	0.14	1.43
0.412	0.15	1.58
0.452	0.15	1.72
0.496	0.15	1.87
0.545	0.15	2.03
0.598	0.16	2.18
0.656	0.16	2.34
0.721	0.16	2.49
0.791	0.16	2.65
0.868	0.16	2.81
0.953	0.16	2.96
1.047	0.16	3.12
1.149	0.17	3.29
1.261	0.17	3.46
1.385	0.18	3.63
1.520	0.20	3.81
1.668	0.21	4.01
1.832	0.23	4.22
2.011	0.26	4.45
2.207	0.29	4.71
2.423	0.33	5.00
2.660	0.38	5.33
2.920	0.43	5.71
3.205	0.50	6.14
3.519	0.57	6.63
3.863	0.65	7.20
4.240	0.75	7.86
4.655	0.85	8.61
5.110	0.96	9.46
5.610	1.08	10.4
6.158	1.21	11.5
6.760	1.35	12.7
7.421	1.50	14.1
8.147	1.66	15.6
8.943	1.83	17.2
9.817	2.00	19.0
10.78	2.19	21.1
11.83	2.38	23.2
12.99	2.56	25.6
14.26	2.75	28.2
15.65	2.92	30.9
17.18	3.07	33.8
18.86	3.20	36.9
20.70	3.32	40.1
22.73	3.41	43.4
24.95	3.48	46.8
27.39	3.51	50.3
30.07	3.50	53.8
33.01	3.42	57.3
36.24	3.29	60.8
39.78	3.09	64.0
43.67	2.84	67.1
47.94	2.55	70.0
52.62	2.26	72.5
57.77	1.98	74.8
63.41	1.76	76.8
69.61	1.61	78.5
76.42	1.53	80.1
83.89	1.50	81.7
92.09	1.51	83.2
101.1	1.51	84.7
111.0	1.50	86.2
121.8	1.46	87.7
133.7	1.42	89.1
146.8	1.36	90.6
161.2	1.29	91.9
176.9	1.18	93.2
194.2	1.02	94.4
213.2	0.83	95.4
234.1	0.65	96.2
256.9	0.49	96.9
282.1	0.38	97.4
309.6	0.32	97.8
339.9	0.29	98.1
373.1	0.29	98.4
409.6	0.30	98.7
449.7	0.29	99.0
493.6	0.27	99.3
541.9	0.22	99.5
594.9	0.15	99.7
653.0	0.077	99.9
716.8	0.025	99.97
786.9	0.0042	99.996
863.9	0.00025	100
948.3	0	100
1041	0	100
1143	0	100
1255	0	100
1377	0	100
1512	0	100
1660	0	100
1822	0	100
2000		100

4041

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Analytical Report Number : 24-005368

Replaces Analytical Report Number: 24-005368, issue no. 2
Additional analysis undertaken.

Project / Site name:	Kintore Hydrogen Plant	**Samples received on:**	23/02/2024
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	23/02/2024
Your order number:	008598-405	**Analysis completed by:**	19/03/2024
Report Issue Number:	3	**Report issued on:**	20/03/2024
Samples Analysed:	1 water sample		

Signed:

Alyssa Brown
Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 24-005368
Project / Site name: Kintore Hydrogen Plant

Your Order No: 008598-405

Lab Sample Number	127663
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	22/02/2024
Time Taken	1305

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
Turbidity	NTU	1	NONE	< 1.0
Sulphate as SO4	mg/l	0.045	ISO 17025	10.1
Chloride	mg/l	0.15	ISO 17025	20
Silicon (total)	µg/l	50	NONE	2400
Fluoride	µg/l	50	ISO 17025	62
Ammoniacal Nitrogen as NH4	µg/l	15	ISO 17025	61
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	2.57
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	2.85
Nitrate as N	mg/l	0.01	ISO 17025	3.19
Nitrate as NO3	mg/l	0.05	ISO 17025	14.1
Nitrite as N	µg/l	1	ISO 17025	7.5
Nitrite as NO2	µg/l	5	ISO 17025	25
Alkalinity as CaCO3 (titration)	mgCaCO3/l	3	NONE	28
Alkalinity as CaCO3	mgCaCO3/l	3	ISO 17025	22
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	6.7
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	3.2
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	5
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	130
Hardness - Total	mgCaCO3/l	1	ISO 17025	56.8
Bicarbonate as HCO3 (titration)	mgHCO3/l	10	NONE	34
Carbonate as CaCO3 (titration)	mgCaCO3/l	10	NONE	< 10
Bicarbonate Alkalinity (as CaCO3)	mgCaCO3/l	3	NONE	26
Carbonate Alkalinity as CO3	mgCO3/l	3	NONE	< 3.0
Bromide	mg/l	0.002	ISO 17025	0.055
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
pH	pH Units	N/A	ISO 17025	6.9
Electrical Conductivity	µS/cm	10	ISO 17025	177
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	1	ISO 17025	18
Aluminium (total)	µg/l	1	ISO 17025	58
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.8
Antimony (total)	µg/l	0.4	ISO 17025	0.8
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.2
Arsenic (total)	µg/l	0.15	ISO 17025	0.24
Barium (dissolved)	µg/l	0.06	ISO 17025	32
Barium (total)	µg/l	0.06	ISO 17025	34
Cadmium (total)	µg/l	0.02	ISO 17025	< 0.02
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.6
Chromium (total)	µg/l	0.2	ISO 17025	0.8
Copper (dissolved)	µg/l	0.5	ISO 17025	2.3
Copper (total)	µg/l	0.5	ISO 17025	10
Manganese (dissolved)	µg/l	0.05	ISO 17025	13
Manganese (total)	µg/l	0.05	ISO 17025	33
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.19

4041

Analytical Report Number: 24-005368
Project / Site name: Kintore Hydrogen Plant

Your Order No: 008598-405

Lab Sample Number				127663
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				22/02/2024
Time Taken				1305
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Molybdenum (total)	µg/l	0.05	ISO 17025	0.19
Nickel (dissolved)	µg/l	0.5	ISO 17025	1
Nickel (total)	µg/l	0.5	ISO 17025	1.8
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Silicon (dissolved)	µg/l	50	NONE	6100
Tin (dissolved)	µg/l	0.2	ISO 17025	0.33
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.7
Zinc (total)	µg/l	0.5	ISO 17025	4
Boron (dissolved)	µg/l	10	ISO 17025	11
Boron (total)	µg/l	10	ISO 17025	13
Calcium (dissolved)	mg/l	0.012	ISO 17025	15
Calcium (total)	mg/l	0.012	ISO 17025	15
Iron (dissolved)	mg/l	0.004	ISO 17025	0.06
Iron (total)	mg/l	0.004	ISO 17025	0.21
Magnesium (dissolved)	mg/l	0.005	ISO 17025	4.9
Magnesium (total)	mg/l	0.005	ISO 17025	5
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.5
Potassium (total)	mg/l	0.025	ISO 17025	1.8
Sodium (dissolved)	mg/l	0.01	ISO 17025	14
Sodium (total)	mg/l	0.01	ISO 17025	15
Tin (total)	µg/l	1	ISO 17025	< 1.0

Subcontracted Analysis

PSD Laser Diffraction (Subcontracted)		N/A	NONE	See Attached

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-005368
Project / Site name: Kintore Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry	In-house method based on BSEN 15216:2007	L004B	W	ISO 17025
Suspended Solids in water	Determined gravimetrically with GFC filtration papers	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004B	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Bromate in water by IC	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Exotic metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Exotic metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Alkalinity in water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW, GW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Total organic carbon in water	Determination of total organic carbon in water by TOC/DOC NDIR analyser.Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW (Al, Fe, Cu, Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Chemical Oxygen Demand in water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065	W	ISO 17025

4041

Analytical Report Number : 24-005368
Project / Site name: Kintore Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/L082B	W	NONE
Alkalinity in water (by discreet analyser)	Determination of Alkalinity by discrete analyser (colorimetry). Accredited matrices: SW, PW, GW	In-house method based on MEWAM & USEPA Method 310.2	L082B	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples	In-house method based on Standard Method 8237	L083B	W	NONE
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Subcontracted analysis (water)	Subcontracted analysis - see attached subcon report.	Subcontracted analysis - see attached subcon report.			NONE
EK pH at 20°C in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method	L005B	W	ISO 17025
EK Electrical conductivity at 20°C of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031B	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 24-005368
Project / Site name: Kintore Hydrogen Plant

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

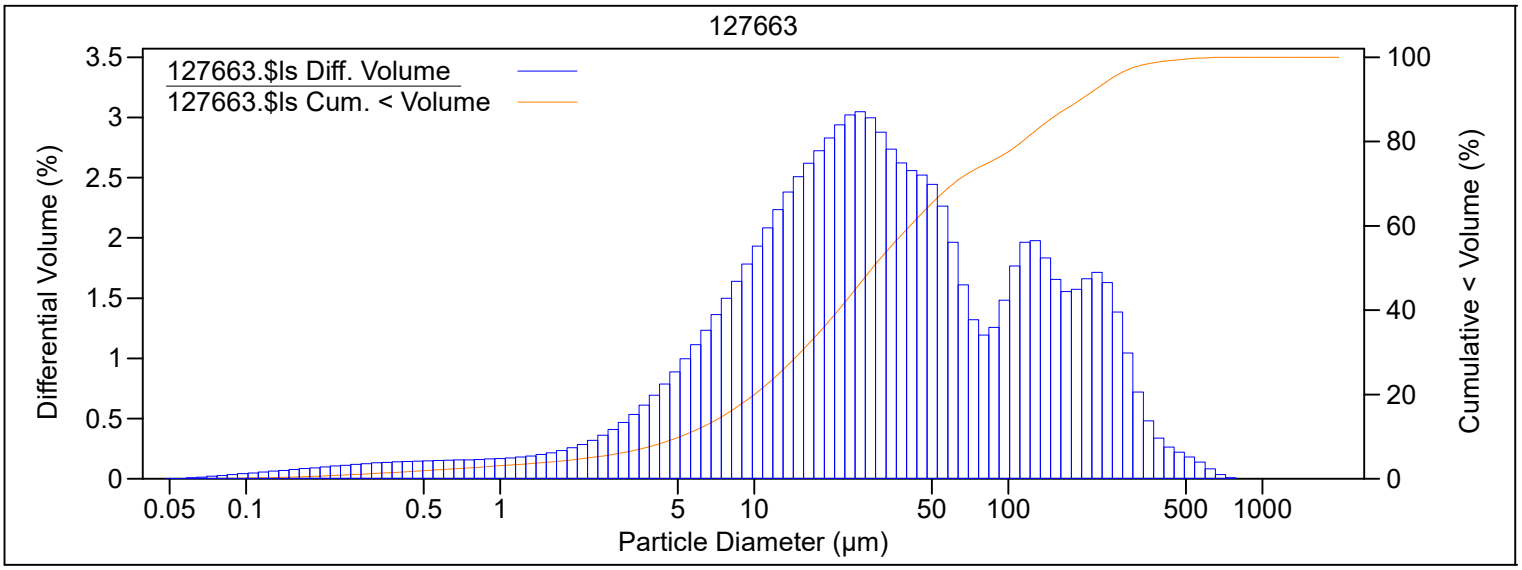
Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
SW01	None Supplied	W	127663	c	pH in water	L005B	c
SW01	None Supplied	W	127663	c	EK Electrical conductivity at 20°C of water	L031B	c

Beckman Coulter LS Particle Size Analyzer

4 Mar 2024

Kenneth Pye Associates Ltd

File name:	C:\LS13320\Analyses\i2 Analytical\04-03-2024 24-005368\127663.$ls 127663.$ls		
File ID:	127663		
Sample ID:	127663		
Operator:	sjb		
Run number:	6699		
Comment 1:	24-005368		
Comment 2:	SW01 Sampled 22/02/2024		
Optical model:	NMBAQC.rf780d PIDS included		
Fluid R.I.:	1.333	Sample R.I.:	1.55 i0.1
Residual:	0.65%		
LS 13 320	Universal Liquid Module		
Start time:	13:15 4 Mar 2024	Run length:	51 seconds
Pump speed:	50%		
Obscuration:	3%	PIDS Obscur:	35%
Fluid:	Water		
Software:	6.01	Firmware:	4.00



Beckman Coulter LS Particle Size Analyzer

4 Mar 2024

Kenneth Pye Associates Ltd

Volume Statistics (Geometric) 127663.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	28.56 µm	S.D.:	4.401
Median:	29.24 µm	Variance:	19.37
D(3,2):	5.682 µm	Skewness:	-0.689 Left skewed
Mean/Median ratio:	0.977	Kurtosis:	1.067 Leptokurtic
Mode:	26.14 µm		

d_{10}: 5.123 µm d_{50}: 29.24 µm d_{90}: 193.1 µm

Folk and Ward Statistics (Phi)

Mean:	4.97	Median:	5.10	Deviation:	2.05
Skewness:	-0.00	Kurtosis:	1.02		

<10%	<25%	<50%	<75%	<90%
5.123 µm	12.55 µm	29.24 µm	83.63 µm	193.1 µm

<2 µm	<63 µm	<2000 µm
4.60%	70.8%	100%

127663.$ls

Particle Diameter µm	Volume %
0.043	0.0024
0.051	0.0083
0.061	0.027
0.073	0.046
0.086	0.076
0.103	0.096
0.122	0.12
0.145	0.15
0.173	0.17
0.205	0.20
0.244	0.22
0.29	0.24
0.345	0.26
0.411	0.27
0.488	0.28
0.581	0.29
0.691	0.29
0.821	0.30
0.977	0.32
1.161	0.34
1.381	0.38
1.642	0.45
1.953	0.54
2.323	0.67
2.762	0.85
3.285	1.09
3.906	1.38
4.645	1.73
5.524	2.13
6.57	2.56
7.813	3.04
9.291	3.55
11.05	4.07
13.14	4.57
15.63	4.93
18.58	5.31
22.1	5.60
26.28	5.54
31.25	5.14
37.16	4.81
44.19	4.63
52.56	4.12
63	2.80
75	2.40
90	2.68
106	3.38
125	3.65
150	3.12
180	2.85
212	2.95
250	2.56
300	1.30
355	0.70
425	0.41
500	0.30
600	0.11
710	0.012
850	0.00013
1000	0
1180	0
1400	0
1700	0
2000	

Beckman Coulter LS Particle Size Analyzer

4 Mar 2024

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Channel Diameter (Lower) µm	Diff. Volume %	Cum. < Volume %
0.040	0.00082	0
0.044	0.0011	0.00082
0.048	0.0018	0.0019
0.053	0.0036	0.0037
0.058	0.0076	0.0073
0.064	0.014	0.015
0.070	0.021	0.029
0.077	0.028	0.050
0.084	0.034	0.078
0.093	0.042	0.11
0.102	0.049	0.15
0.112	0.056	0.20
0.122	0.063	0.26
0.134	0.070	0.32
0.148	0.077	0.39
0.162	0.084	0.47
0.178	0.091	0.55
0.195	0.098	0.64
0.214	0.11	0.74
0.235	0.11	0.85
0.258	0.12	0.96
0.284	0.13	1.08
0.311	0.13	1.21
0.342	0.14	1.34
0.375	0.14	1.47
0.412	0.14	1.61
0.452	0.15	1.76
0.496	0.15	1.91
0.545	0.15	2.06
0.598	0.15	2.21
0.656	0.16	2.36
0.721	0.16	2.52
0.791	0.16	2.68
0.868	0.16	2.84
0.953	0.17	3.00
1.047	0.17	3.17
1.149	0.18	3.34
1.261	0.19	3.52
1.385	0.20	3.71
1.520	0.22	3.91
1.668	0.23	4.12
1.832	0.26	4.36
2.011	0.29	4.62
2.207	0.32	4.90
2.423	0.36	5.22
2.660	0.41	5.58
2.920	0.47	5.99
3.205	0.54	6.46
3.519	0.61	6.99
3.863	0.69	7.60
4.240	0.79	8.30
4.655	0.89	9.09
5.110	1.00	9.98
5.610	1.11	11.0
6.158	1.23	12.1
6.760	1.36	13.3
7.421	1.50	14.7
8.147	1.64	16.2
8.943	1.78	17.8
9.817	1.93	19.6
10.78	2.08	21.5
11.83	2.24	23.6
12.99	2.38	25.9
14.26	2.51	28.2
15.65	2.62	30.7
17.18	2.72	33.4
18.86	2.83	36.1
20.70	2.94	38.9
22.73	3.02	41.9
24.95	3.05	44.9
27.39	3.00	47.9
30.07	2.88	50.9
33.01	2.74	53.8
36.24	2.62	56.5
39.78	2.56	59.2
43.67	2.52	61.7
47.94	2.45	64.2
52.62	2.26	66.7
57.77	1.96	69.0
63.41	1.61	70.9
69.61	1.32	72.5
76.42	1.19	73.8
83.89	1.26	75.0
92.09	1.48	76.3
101.1	1.77	77.8
111.0	1.96	79.5
121.8	1.98	81.5
133.7	1.83	83.5
146.8	1.66	85.3
161.2	1.55	87.0
176.9	1.57	88.5
194.2	1.66	90.1
213.2	1.71	91.8
234.1	1.63	93.5
256.9	1.38	95.1
282.1	1.05	96.5
309.6	0.72	97.5
339.9	0.48	98.3
373.1	0.34	98.7
409.6	0.26	99.1
449.7	0.22	99.3
493.6	0.18	99.6
541.9	0.14	99.7
594.9	0.082	99.9
653.0	0.035	99.96
716.8	0.0074	99.99
786.9	0.00071	99.999
863.9	0	100
948.3	0	100
1041	0	100
1143	0	100
1255	0	100
1377	0	100
1512	0	100
1660	0	100
1822	0	100
2000		100

UKAS TESTING
4041

Environmental Science

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Analytical Report Number : 24-010628

Replaces Analytical Report Number: 24-010628, issue no. 1

Project / Site name:	Kintore Hydrogen Plant	**Samples received on:**	22/03/2024
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	22/03/2024
Your order number:	008602-405	**Analysis completed by:**	23/04/2024
Report Issue Number:	2	**Report issued on:**	23/04/2024
Samples Analysed:	1 water sample		

Signed:

Nicola Jupp
Senior Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Environmental Science

Analytical Report Number: 24-010628
Project / Site name: Kintore Hydrogen Plant

Your Order No: 008602-405

Lab Sample Number	152668
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	21/03/2024
Time Taken	1200

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
Turbidity	NTU	1	NONE	< 1.0
Sulphate as SO4	mg/l	0.045	ISO 17025	8.43
Chloride	mg/l	0.15	ISO 17025	21
Silicon (total)	µg/l	50	NONE	7200
Fluoride	µg/l	50	ISO 17025	69
Ammoniacal Nitrogen as NH4	µg/l	15	ISO 17025	58
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	2.67
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	3.02
Nitrate as N	mg/l	0.01	ISO 17025	3.17
Nitrate as NO3	mg/l	0.05	ISO 17025	14.1
Nitrite as N	µg/l	1	ISO 17025	17
Nitrite as NO2	µg/l	5	ISO 17025	55
Alkalinity as CaCO3 (titration)	mgCaCO3/l	3	NONE	29
Alkalinity as CaCO3	mgCaCO3/l	3	ISO 17025	25
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	12
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	3.2
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	< 2.0
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	150
Hardness - Total	mgCaCO3/l	1	ISO 17025	55.2
Bicarbonate as HCO3	mgHCO3/l	10	NONE	30
Carbonate Alkalinity as CO3	mgCO3/l	3	NONE	< 3.0
Bromide	mg/l	0.002	ISO 17025	< 0.002
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
pH	pH Units	N/A	ISO 17025	7.2
Electrical Conductivity	µS/cm	10	ISO 17025	173
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	1	ISO 17025	13
Aluminium (total)	µg/l	1	ISO 17025	52
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Antimony (total)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.21
Arsenic (total)	µg/l	0.15	ISO 17025	0.26
Barium (dissolved)	µg/l	0.06	ISO 17025	34
Barium (total)	µg/l	0.06	ISO 17025	34
Cadmium (total)	µg/l	0.02	ISO 17025	< 0.02
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.7
Chromium (total)	µg/l	0.2	ISO 17025	0.8
Copper (dissolved)	µg/l	0.5	ISO 17025	2.4
Copper (total)	µg/l	0.5	ISO 17025	11
Manganese (dissolved)	µg/l	0.05	ISO 17025	7.3
Manganese (total)	µg/l	0.05	ISO 17025	23
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.25
Molybdenum (total)	µg/l	0.05	ISO 17025	0.53
Nickel (dissolved)	µg/l	0.5	ISO 17025	0.9
Nickel (total)	µg/l	0.5	ISO 17025	1.1

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Analytical Report Number: 24-010628
Project / Site name: Kintore Hydrogen Plant

Your Order No: 008602-405

Lab Sample Number				152668
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				21/03/2024
Time Taken				1200
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Silicon (dissolved)	µg/l	50	NONE	1400
Tin (dissolved)	µg/l	0.2	ISO 17025	0.27
Tin (total)	µg/l	0.2	ISO 17025	1.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	4.8
Zinc (total)	µg/l	0.5	ISO 17025	9.1
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Boron (total)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	14
Calcium (total)	µg/l	12	ISO 17025	15000
Iron (dissolved)	mg/l	0.004	ISO 17025	0.042
Iron (total)	mg/l	0.004	ISO 17025	0.26
Magnesium (dissolved)	mg/l	0.005	ISO 17025	4.7
Magnesium (total)	mg/l	0.005	ISO 17025	5
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.2
Potassium (total)	mg/l	0.025	ISO 17025	2
Sodium (dissolved)	mg/l	0.01	ISO 17025	11
Sodium (total)	mg/l	0.01	ISO 17025	14

Subcontracted Analysis

PSD Laser Diffraction (Subcontracted)		N/A	NONE	See Attached

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-010628
Project / Site name: Kintore Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry	In-house method based on BSEN 15216:2007	L004B	W	ISO 17025
Suspended Solids in water	Determined gravimetrically with GFC filtration papers	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004B	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Bromate in water by IC	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Exotic metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Exotic metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Alkalinity in water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW, GW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Total organic carbon in water	Determination of total organic carbon in water by TOC/DOC NDIR analyser.Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW (Al, Fe, Cu, Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Chemical Oxygen Demand in water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065	W	ISO 17025

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Analytical Report Number : 24-010628
Project / Site name: Kintore Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/L082B	W	NONE
Alkalinity in water (by discreet analyser)	Determination of Alkalinity by discrete analyser (colorimetry). Accredited matrices: SW,PW, GW,FSE,LL	In-house method based on MEWAM & USEPA Method 310.2	L082B	W	ISO 17025
Bicarbonate as HCO3 in water	Determination of Bicarbonate by discrete analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Chloride in water	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW,PW, GW,FSE,LL	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples	In-house method based on Standard Method 8237	L083B	W	NONE
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Subcontracted analysis (water)	Subcontracted analysis - see attached subcon report.	Subcontracted analysis - see attached subcon report.			NONE
EK pH at 20°C in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW, [LL]	In-house method	L005F	W	ISO 17025
EK Electrical conductivity at 20°C of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031F	W	ISO 17025

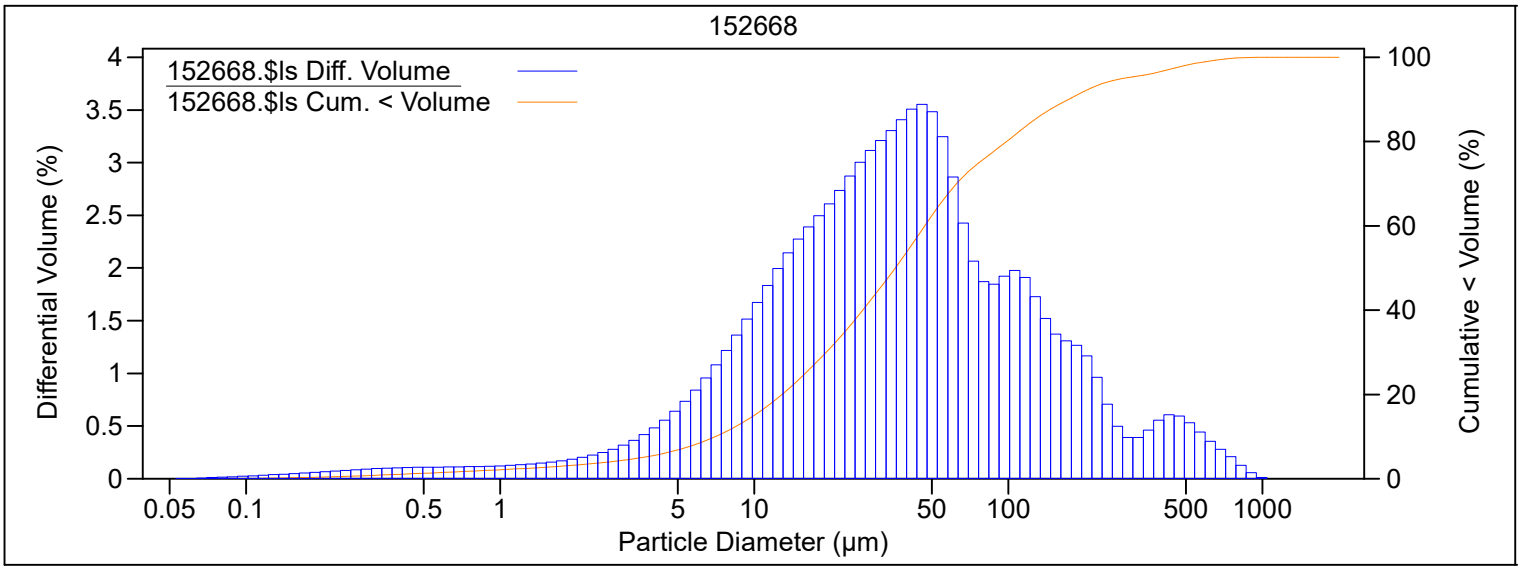
For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Beckman Coulter LS Particle Size Analyzer

8 Apr 2024

Kenneth Pye Associates Ltd

File name:	C:\LS13320\Analyses\i2 Analytical\08-04-2024 24-010628\152668.$ls 152668.$ls		
File ID:	152668		
Sample ID:	152668		
Operator:	sjb		
Run number:	7074		
Comment 1:	Job No: 24-010628		
Comment 2:	SW01 Kintire 21/03/2024 12:00		
Optical model:	NMBAQC.rf780d PIDS included		
Fluid R.I.:	1.333	Sample R.I.:	1.55 i0.1
Residual:	0.44%		
LS 13 320	Universal Liquid Module		
Start time:	10:31 8 Apr 2024	Run length:	52 seconds
Pump speed:	50%		
Obscuration:	9%	PIDS Obscur:	42%
Fluid:	Water		
Software:	6.01	Firmware:	4.00



Beckman Coulter LS Particle Size Analyzer

8 Apr 2024

Kenneth Pye Associates Ltd

Volume Statistics (Geometric) 152668.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	33.43 µm	S.D.:	3.913
Median:	35.88 µm	Variance:	15.31
D(3,2):	7.843 µm	Skewness:	-0.658 Left skewed
Mean/Median ratio:	0.932	Kurtosis:	1.678 Leptokurtic
Mode:	45.75 µm		

d_{10}: 7.045 µm d_{50}: 35.88 µm d_{90}: 172.3 µm

Folk and Ward Statistics (Phi)

Mean:	4.81	Median:	4.80	Deviation:	1.83
Skewness:	0.03	Kurtosis:	1.14		

<10%	<25%	<50%	<75%	<90%
7.045 µm	15.89 µm	35.88 µm	76.74 µm	172.3 µm

<2 µm	<63 µm	<2000 µm
3.26%	70.2%	100%

152668.$ls

Particle Diameter µm	Volume %
0.043	0.0012
0.051	0.0042
0.061	0.014
0.073	0.025
0.086	0.042
0.103	0.056
0.122	0.074
0.145	0.094
0.173	0.11
0.205	0.13
0.244	0.16
0.29	0.18
0.345	0.19
0.411	0.20
0.488	0.20
0.581	0.21
0.691	0.21
0.821	0.22
0.977	0.23
1.161	0.25
1.381	0.28
1.642	0.32
1.953	0.38
2.323	0.46
2.762	0.58
3.285	0.74
3.906	0.97
4.645	1.26
5.524	1.62
6.57	2.04
7.813	2.53
9.291	3.06
11.05	3.61
13.14	4.13
15.63	4.50
18.58	4.91
22.1	5.36
26.28	5.77
31.25	6.11
37.16	6.46
44.19	6.56
52.56	5.95
63	4.27
75	3.68
90	3.38
106	3.37
125	3.09
150	2.60
180	2.13
212	1.53
250	0.97
300	0.74
355	1.04
425	1.04
500	0.93
600	0.57
710	0.34
850	0.087
1000	0.0065
1180	0
1400	0
1700	0
2000	

Beckman Coulter LS Particle Size Analyzer

8 Apr 2024

Kenneth Pye Associates Ltd

152668.$ls

Channel Diameter (Lower) µm	Diff. Volume %	Cum. < Volume %
0.040	0.00042	0
0.044	0.00056	0.00042
0.048	0.00092	0.00098
0.053	0.0019	0.0019
0.058	0.0039	0.0038
0.064	0.0072	0.0076
0.070	0.011	0.015
0.077	0.015	0.026
0.084	0.019	0.041
0.093	0.023	0.060
0.102	0.028	0.083
0.112	0.033	0.11
0.122	0.038	0.14
0.134	0.043	0.18
0.148	0.048	0.23
0.162	0.054	0.27
0.178	0.060	0.33
0.195	0.066	0.39
0.214	0.072	0.45
0.235	0.079	0.53
0.258	0.085	0.61
0.284	0.091	0.69
0.311	0.096	0.78
0.342	0.10	0.88
0.375	0.10	0.98
0.412	0.11	1.08
0.452	0.11	1.19
0.496	0.11	1.29
0.545	0.11	1.40
0.598	0.11	1.51
0.656	0.11	1.63
0.721	0.11	1.74
0.791	0.12	1.85
0.868	0.12	1.97
0.953	0.12	2.09
1.047	0.13	2.21
1.149	0.13	2.33
1.261	0.14	2.47
1.385	0.15	2.61
1.520	0.16	2.75
1.668	0.17	2.91
1.832	0.19	3.08
2.011	0.20	3.27
2.207	0.22	3.47
2.423	0.25	3.69
2.660	0.28	3.94
2.920	0.32	4.22
3.205	0.36	4.54
3.519	0.42	4.91
3.863	0.48	5.32
4.240	0.56	5.80
4.655	0.64	6.36
5.110	0.74	7.00
5.610	0.84	7.74
6.158	0.96	8.58
6.760	1.08	9.53
7.421	1.22	10.6
8.147	1.36	11.8
8.943	1.52	13.2
9.817	1.67	14.7
10.78	1.83	16.4
11.83	1.99	18.2
12.99	2.14	20.2
14.26	2.27	22.4
15.65	2.39	24.6
17.18	2.50	27.0
18.86	2.61	29.5
20.70	2.74	32.1
22.73	2.87	34.9
24.95	3.00	37.7
27.39	3.11	40.7
30.07	3.21	43.9
33.01	3.30	47.1
36.24	3.41	50.4
39.78	3.51	53.8
43.67	3.55	57.3
47.94	3.48	60.8
52.62	3.25	64.3
57.77	2.86	67.6
63.41	2.43	70.4
69.61	2.07	72.9
76.42	1.87	74.9
83.89	1.85	76.8
92.09	1.92	78.6
101.1	1.98	80.6
111.0	1.91	82.5
121.8	1.73	84.4
133.7	1.52	86.2
146.8	1.37	87.7
161.2	1.31	89.1
176.9	1.27	90.4
194.2	1.17	91.6
213.2	0.96	92.8
234.1	0.71	93.8
256.9	0.50	94.5
282.1	0.39	95.0
309.6	0.39	95.4
339.9	0.46	95.8
373.1	0.55	96.2
409.6	0.61	96.8
449.7	0.60	97.4
493.6	0.53	98.0
541.9	0.44	98.5
594.9	0.35	99.0
653.0	0.28	99.3
716.8	0.21	99.6
786.9	0.13	99.8
863.9	0.057	99.9
948.3	0.012	99.99
1041	0.0011	99.999
1143	0	100
1255	0	100
1377	0	100
1512	0	100
1660	0	100
1822	0	100
2000		100

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Analytical Report Number : 24-015122

Replaces Analytical Report Number: 24-015122, issue no. 1
Additional analysis undertaken.

Project / Site name:	Kintore Hydrogen Plant	**Samples received on:**	18/04/2024
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	18/04/2024
Your order number:	00974-405	**Analysis completed by:**	02/05/2024
Report Issue Number:	2	**Report issued on:**	08/05/2024
Samples Analysed:	1 water sample		

Signed:

Nicola Jupp
Senior Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 24-015122
Project / Site name: Kintore Hydrogen Plant

Your Order No: 00974-405

Lab Sample Number	175582
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	17/04/2024
Time Taken	0820

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
Turbidity	NTU	1	NONE	6
Sulphate as SO4	mg/l	0.045	ISO 17025	7.52
Chloride	mg/l	0.15	ISO 17025	18
Silicon (total)	µg/l	50	NONE	6500
Fluoride	µg/l	50	ISO 17025	< 50
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	4900
Ammoniacal Nitrogen as NH3	µg/l	15	ISO 17025	6000
Ammoniacal Nitrogen as NH4	µg/l	15	ISO 17025	6300
Ammoniacal Nitrogen as NH4	mg/l	0.015	ISO 17025	6.3
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	3.89
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	4
Nitrate as N	mg/l	0.01	ISO 17025	2.19
Nitrate as NO3	mg/l	0.05	ISO 17025	9.69
Nitrite as N	µg/l	1	ISO 17025	6.3
Nitrite as NO2	µg/l	5	ISO 17025	21
Alkalinity as CaCO3 (titration)	mgCaCO3/l	3	NONE	35
Alkalinity as CaCO3	mgCaCO3/l	3	ISO 17025	29
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	14
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.2
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	9
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	14
Hardness - Total	mgCaCO3/l	1	ISO 17025	48.1
Bicarbonate as HCO3	mgHCO3/l	10	NONE	36
Carbonate Alkalinity as CO3	mgCO3/l	3	NONE	< 3.0
Bromide	mg/l	0.002	ISO 17025	0.035
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
pH	pH Units	N/A	ISO 17025	7.5
Electrical Conductivity	µS/cm	10	ISO 17025	147
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	1	ISO 17025	15
Aluminium (total)	µg/l	1	ISO 17025	43
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.4
Antimony (total)	µg/l	0.4	ISO 17025	0.9
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.19
Arsenic (total)	µg/l	0.15	ISO 17025	0.26
Barium (dissolved)	µg/l	0.06	ISO 17025	26
Barium (total)	µg/l	0.06	ISO 17025	28
Cadmium (total)	µg/l	0.02	ISO 17025	0.02
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.4
Chromium (total)	µg/l	0.2	ISO 17025	0.8
Copper (dissolved)	µg/l	0.5	ISO 17025	4.2
Copper (total)	µg/l	0.5	ISO 17025	7.9
Manganese (dissolved)	µg/l	0.05	ISO 17025	4.8
Manganese (total)	µg/l	0.05	ISO 17025	17
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.22

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Analytical Report Number: 24-015122
Project / Site name: Kintore Hydrogen Plant

Your Order No: 00974-405

Lab Sample Number				175582
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				17/04/2024
Time Taken				0820
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Molybdenum (total)	µg/l	0.05	ISO 17025	0.35
Nickel (dissolved)	µg/l	0.5	ISO 17025	1
Nickel (total)	µg/l	0.5	ISO 17025	1.5
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20
Tin (total)	µg/l	0.2	ISO 17025	0.82
Zinc (dissolved)	µg/l	0.5	ISO 17025	7.4
Zinc (total)	µg/l	0.5	ISO 17025	23
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Boron (total)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	12
Calcium (total)	µg/l	12	ISO 17025	14000
Iron (dissolved)	mg/l	0.004	ISO 17025	0.04
Iron (total)	mg/l	0.004	ISO 17025	0.3
Magnesium (dissolved)	mg/l	0.005	ISO 17025	4.1
Magnesium (total)	mg/l	0.005	ISO 17025	4.7
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.2
Potassium (total)	mg/l	0.025	ISO 17025	1.3
Sodium (dissolved)	mg/l	0.01	ISO 17025	11
Sodium (total)	mg/l	0.01	ISO 17025	13

Subcontracted Analysis

PSD Laser Diffraction (Subcontracted)		N/A	NONE	See Attached

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-015122
Project / Site name: Kintore Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry	In-house method based on BSEN 15216:2007	L004B	W	ISO 17025
Suspended Solids in water	Determined gravimetrically with GFC filtration papers	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004B	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Bromate in water by IC	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Exotic metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Alkalinity in water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW, GW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Total organic carbon in water	Determination of total organic carbon in water by TOC/DOC NDIR analyser.Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW (Al, Fe, Cu, Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Chemical Oxygen Demand in water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025

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Environmental Science

Analytical Report Number : 24-015122
Project / Site name: Kintore Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/L082B	W	NONE
Alkalinity in water (by discreet analyser)	Determination of Alkalinity by discrete analyser (colorimetry). Accredited matrices: SW,PW, GW,FSE,LL	In-house method based on MEWAM & USEPA Method 310.2	L082B	W	ISO 17025
Bicarbonate as HCO3 in water	Determination of Bicarbonate by discrete analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Chloride in water	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW,PW, GW,FSE,LL	L082B	W	ISO 17025
Ammonia as NH3 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples	In-house method based on Standard Method 8237	L083B	W	NONE
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Subcontracted analysis (water)	Subcontracted analysis - see attached subcon report.	Subcontracted analysis - see attached subcon report.			NONE
EK pH at 20°C in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW, [LL]	In-house method	L005F	W	ISO 17025
EK Electrical conductivity at 20°C of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031F	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

4041

Analytical Report Number : 24-015122
Project / Site name: Kintore Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

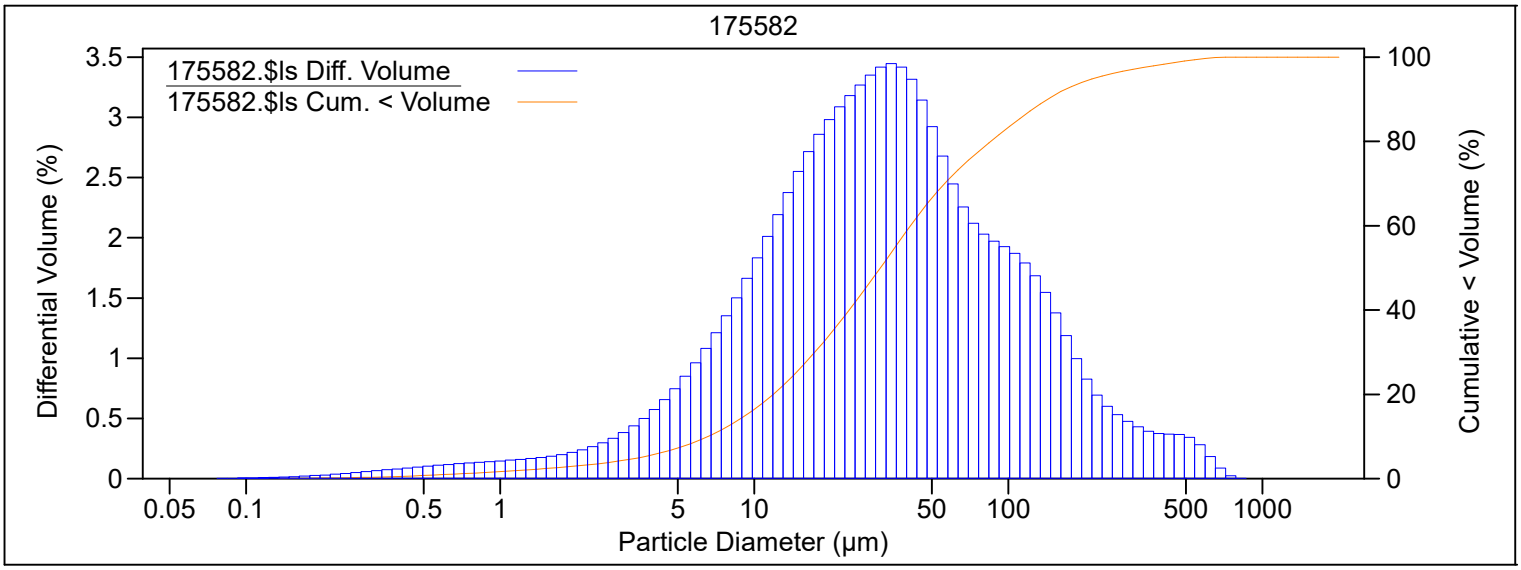
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Beckman Coulter LS Particle Size Analyzer

30 Apr 2024

Kenneth Pye Associates Ltd

File name:	C:\LS13320\Analyses\i2 Analytical\30-04-2024 24-015122\175582.$ls		
	175582.$ls		
File ID:	175582		
Sample ID:	175582		
Operator:	sjb		
Run number:	7156		
Comment 1:	Job No: 24-015122		
Comment 2:	SW01 Kintore 17/04/2024 08:20		
Optical model:	Fraunhofer.rf780d PIDS included		
Residual:	0.23%		
LS 13 320	Universal Liquid Module		
Start time:	8:03 30 Apr 2024	Run length:	51 seconds
Pump speed:	50%		
Obscuration:	9%	PIDS Obscur:	49%
Fluid:	Water		
Software:	6.01	Firmware:	4.00



Volume Statistics (Geometric) 175582.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	29.99 µm	S.D.:	3.580
Median:	31.39 µm	Variance:	12.82
D(3,2):	9.848 µm	Skewness:	-0.508 Left skewed
Mean/Median ratio:	0.955	Kurtosis:	1.079 Leptokurtic
Mode:	34.59 µm		

d_{10}: 6.576 µm d_{50}: 31.39 µm d_{90}: 143.0 µm

Folk and Ward Statistics (Phi)

Mean:	4.98	Median:	4.99	Deviation:	1.75
Skewness:	0.02	Kurtosis:	1.09		

<10%	<25%	<50%	<75%	<90%
6.576 µm	14.55 µm	31.39 µm	68.22 µm	143.0 µm

<2 µm	<63 µm	<2000 µm
2.99%	73.1%	100%

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175582.$ls

Particle Diameter µm	Volume %
0.043	0.000086
0.051	0.00038
0.061	0.0013
0.073	0.0032
0.086	0.0077
0.103	0.013
0.122	0.022
0.145	0.034
0.173	0.047
0.205	0.068
0.244	0.091
0.29	0.12
0.345	0.15
0.411	0.17
0.488	0.20
0.581	0.22
0.691	0.24
0.821	0.26
0.977	0.28
1.161	0.30
1.381	0.33
1.642	0.38
1.953	0.45
2.323	0.55
2.762	0.70
3.285	0.89
3.906	1.15
4.645	1.47
5.524	1.85
6.57	2.28
7.813	2.78
9.291	3.35
11.05	3.97
13.14	4.60
15.63	5.13
18.58	5.59
22.1	5.92
26.28	6.21
31.25	6.38
37.16	6.23
44.19	5.64
52.56	4.99
63	4.11
75	3.94
90	3.36
106	3.18
125	3.09
150	2.44
180	1.59
212	1.17
250	1.02
300	0.77
355	0.73
425	0.64
500	0.60
600	0.25
710	0.036
850	0.00069
1000	0
1180	0
1400	0
1700	0
2000	

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Channel Diameter (Lower) µm	Diff. Volume %	Cum. < Volume %
0.040	0.000017	0
0.044	0.000035	0.000017
0.048	0.000080	0.000052
0.053	0.00018	0.00013
0.058	0.00034	0.00031
0.064	0.00064	0.00065
0.070	0.0012	0.0013
0.077	0.0019	0.0024
0.084	0.0030	0.0044
0.093	0.0044	0.0074
0.102	0.0062	0.012
0.112	0.0084	0.018
0.123	0.011	0.026
0.134	0.014	0.037
0.148	0.017	0.051
0.162	0.021	0.068
0.178	0.025	0.089
0.195	0.031	0.11
0.214	0.036	0.14
0.235	0.043	0.18
0.258	0.050	0.22
0.284	0.058	0.27
0.311	0.066	0.33
0.342	0.073	0.40
0.375	0.081	0.47
0.412	0.089	0.55
0.452	0.096	0.64
0.496	0.10	0.74
0.545	0.11	0.84
0.598	0.12	0.95
0.657	0.12	1.07
0.721	0.13	1.19
0.791	0.14	1.32
0.869	0.14	1.46
0.954	0.15	1.60
1.047	0.15	1.75
1.149	0.16	1.90
1.261	0.17	2.06
1.385	0.18	2.23
1.520	0.19	2.40
1.669	0.20	2.59
1.832	0.22	2.79
2.011	0.24	3.01
2.208	0.26	3.24
2.423	0.30	3.51
2.660	0.34	3.81
2.920	0.38	4.14
3.206	0.44	4.53
3.519	0.50	4.96
3.863	0.57	5.46
4.241	0.66	6.04
4.656	0.75	6.69
5.111	0.85	7.44
5.611	0.96	8.29
6.159	1.08	9.25
6.761	1.21	10.3
7.422	1.35	11.5
8.148	1.50	12.9
8.944	1.66	14.4
9.819	1.83	16.1
10.78	2.01	17.9
11.83	2.19	19.9
12.99	2.38	22.1
14.26	2.55	24.5
15.65	2.71	27.0
17.18	2.86	29.7
18.86	2.98	32.6
20.71	3.09	35.6
22.73	3.18	38.7
24.95	3.27	41.8
27.39	3.35	45.1
30.07	3.42	48.5
33.01	3.45	51.9
36.24	3.42	55.3
39.78	3.32	58.7
43.67	3.14	62.1
47.94	2.92	65.2
52.63	2.68	68.1
57.77	2.45	70.8
63.42	2.26	73.3
69.62	2.12	75.5
76.43	2.03	77.6
83.90	1.97	79.7
92.10	1.93	81.6
101.1	1.87	83.6
111.0	1.79	85.4
121.8	1.69	87.2
133.7	1.55	88.9
146.8	1.38	90.5
161.2	1.19	91.8
176.9	1.00	93.0
194.2	0.83	94.0
213.2	0.69	94.8
234.1	0.60	95.5
256.9	0.53	96.1
282.1	0.48	96.7
309.6	0.43	97.1
339.9	0.39	97.6
373.1	0.37	98.0
409.6	0.37	98.3
449.7	0.37	98.7
493.6	0.34	99.1
541.9	0.28	99.4
594.9	0.18	99.7
653.0	0.087	99.9
716.9	0.024	99.97
786.9	0.0033	99.997
863.9	0.00011	100
948.3	0	100
1041	0	100
1143	0	100
1255	0	100
1377	0	100
1512	0	100
1660	0	100
1822	0	100
2000		100

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Analytical Report Number : 24-004782

Project / Site name:	Kintore H2	**Samples received on:**	22/02/2024
Your job number:		**Samples instructed on/ Analysis started on:**	22/02/2024
Your order number:		**Analysis completed by:**	23/02/2024
Report Issue Number:	1	**Report issued on:**	23/02/2024
Samples Analysed:	12 water samples		

Signed:

Kimberley Macmaster
Laboratory Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 24-004782
Project / Site name: Kintore H2

Lab Sample Number				124908	124909	124910	124911	124912
Sample Reference				2503511 SW01	2524262 SW01	2560146 SW01	2612431 SW01	2678453 SW01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/11/2022	05/12/2022	17/01/2023	09/03/2023	11/05/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
Carbonate Alkalinity as CO3	mgCO3/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-004782
Project / Site name: Kintore H2

Lab Sample Number				124913	124914	124915	124916	124917
Sample Reference				2740627 SW01	2768586 SW01	2805854 SW01	2842852 SW01	2882797 SW01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/07/2023	01/08/2023	07/09/2023	11/10/2023	16/11/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
Carbonate Alkalinity as CO3	mgCO3/l	3	NONE	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 24-004782
Project / Site name: Kintore H2

Lab Sample Number				124918	124919
Sample Reference				2916042 SW01	2934942 SW01
Sample Number				None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied
Date Sampled				18/12/2023	23/01/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
General Inorganics					
Carbonate Alkalinity as CO3	mgCO3/l	3	NONE	< 3.0	< 3.0

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number : 24-004782
Project / Site name: Kintore H2

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Alkalinity in water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

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Analytical Report Number : 24-021378

Project / Site name:	Kintore-Hydrogen Plant	**Samples received on:**	23/05/2024
Your job number:	428.012991.00001	**Samples instructed on/ Analysis started on:**	23/05/2024
Your order number:	009628-405	**Analysis completed by:**	04/06/2024
Report Issue Number:	1	**Report issued on:**	04/06/2024
Samples Analysed:	1 water sample		

Signed:

Nicola Jupp
Senior Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 24-021378
Project / Site name: Kintore-Hydrogen Plant

Your Order No: 009628-405

Lab Sample Number	208887
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	23/05/2024
Time Taken	1055

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
Turbidity	NTU	1	NONE	8.6
Sulphate as SO_4	mg/l	0.045	ISO 17025	8.51
Chloride	mg/l	0.15	ISO 17025	20
Silicon (total)	µg/l	50	NONE	7000
Fluoride	µg/l	50	ISO 17025	57
Ammoniacal Nitrogen as NH_4^+	µg/l	15	ISO 17025	57
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	2.54
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	2.69
Nitrate as N	mg/l	0.01	ISO 17025	2.41
Nitrate as NO_3	mg/l	0.05	ISO 17025	10.7
Nitrite as N	µg/l	1	ISO 17025	27
Nitrite as NO_2	µg/l	5	ISO 17025	88
Alkalinity as $CaCO_3$ (titration)	mgCaCO3/l	3	NONE	51
Alkalinity as $CaCO_3$	mgCaCO3/l	3	ISO 17025	43
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	3.6
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.44
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	< 2.0
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	120
Hardness - Total	mgCaCO3/l	1	ISO 17025	57.8
Bicarbonate as HCO_3	mgHCO3/l	10	NONE	52
Carbonate Alkalinity as CO3	mgCO3/l	3	NONE	< 3.0
Bromide	mg/l	0.002	ISO 17025	0.046
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
pH	pH Units	N/A	ISO 17025	7.3
Electrical Conductivity	µS/cm	10	ISO 17025	181
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	1	ISO 17025	5.7
Aluminium (total)	µg/l	1	ISO 17025	38
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Antimony (total)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.24
Arsenic (total)	µg/l	0.15	ISO 17025	0.3
Barium (dissolved)	µg/l	0.06	ISO 17025	30
Barium (total)	µg/l	0.06	ISO 17025	30
Cadmium (total)	µg/l	0.02	ISO 17025	< 0.02
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.4
Chromium (total)	µg/l	0.2	ISO 17025	0.4
Copper (dissolved)	µg/l	0.5	ISO 17025	1.3
Copper (total)	µg/l	0.5	ISO 17025	3.4
Manganese (dissolved)	µg/l	0.05	ISO 17025	0.71
Manganese (total)	µg/l	0.05	ISO 17025	1.3
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.31
Molybdenum (total)	µg/l	0.05	ISO 17025	0.32
Nickel (dissolved)	µg/l	0.5	ISO 17025	0.6
Nickel (total)	µg/l	0.5	ISO 17025	1

UKAS TESTING
4041

Analytical i2 Environmental Science

Analytical Report Number: 24-021378
Project / Site name: Kintore-Hydrogen Plant

Your Order No: 009628-405

Lab Sample Number				208887
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				23/05/2024
Time Taken				1055
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.23
Tin (total)	µg/l	0.2	ISO 17025	0.97
Zinc (dissolved)	µg/l	0.5	ISO 17025	1.6
Zinc (total)	µg/l	0.5	ISO 17025	2.9
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Boron (total)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	15
Calcium (total)	µg/l	12	ISO 17025	16000
Iron (dissolved)	mg/l	0.004	ISO 17025	0.017
Iron (total)	mg/l	0.004	ISO 17025	0.37
Magnesium (dissolved)	mg/l	0.005	ISO 17025	4.9
Magnesium (total)	mg/l	0.005	ISO 17025	5.4
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.4
Potassium (total)	mg/l	0.025	ISO 17025	1.4
Sodium (dissolved)	mg/l	0.01	ISO 17025	12
Sodium (total)	mg/l	0.01	ISO 17025	13

Subcontracted Analysis

PSD Laser Diffraction (Subcontracted)		N/A	NONE	See Attached

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-021378
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry	In-house method based on BSEN 15216:2007	L004B	W	ISO 17025
Suspended Solids in water	Determined gravimetrically with GFC filtration papers	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004B	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Bromate in water by IC	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Exotic metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Alkalinity in water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW, GW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Total organic carbon in water	Determination of total organic carbon in water by TOC/DOC NDIR analyser.Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW (Al, Fe, Cu, Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Chemical Oxygen Demand in water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065	W	ISO 17025

Analytical Report Number : 24-021378
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/L082B	W	NONE
Alkalinity in water (by discreet analyser)	Determination of Alkalinity by discrete analyser (colorimetry). Accredited matrices: SW,PW, GW,FSE,LL	In-house method based on MEWAM & USEPA Method 310.2	L082B	W	ISO 17025
Bicarbonate as HCO3 in water	Determination of Bicarbonate by discrete analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Chloride in water	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW,PW, GW,FSE,LL	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples	In-house method based on Standard Method 8237	L083B	W	NONE
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Subcontracted analysis (water)	Subcontracted analysis - see attached subcon report.	Subcontracted analysis - see attached subcon report.			NONE
EK pH at 20°C in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW, [LL]	In-house method	L005F	W	ISO 17025
EK Electrical conductivity at 20°C of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031F	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 24-021378
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

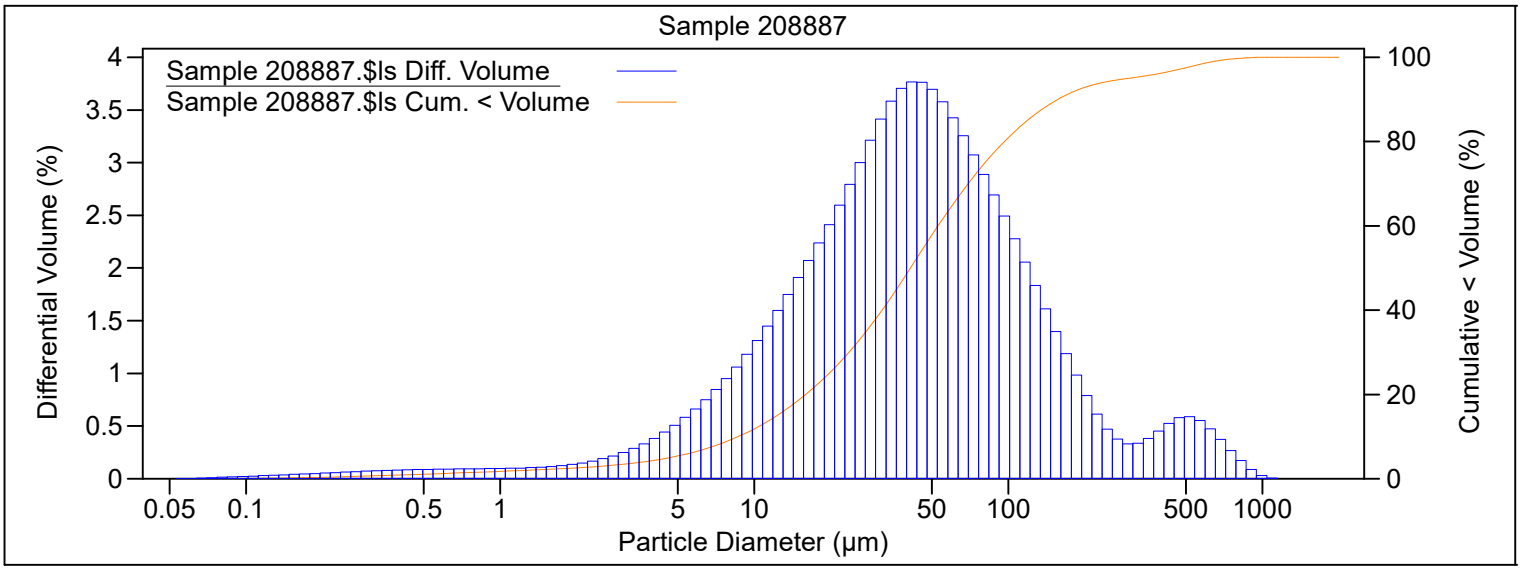
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Beckman Coulter LS Particle Size Analyzer

29 May 2024

Kenneth Pye Associates Ltd

File name:	C:\LS13320\Analyses\i2 Analytical\29-05-2024 24-021378\Sample 208887.$ls		
	Sample 208887.$ls		
File ID:	Sample 208887		
Sample ID:	Sample 208887		
Operator:	sjb		
Run number:	7348		
Comment 1:	Job No: 24-021378		
Comment 2:	SW01 Kintyre 23/05/2024		
Optical model:	NMBAQC.rf780d PIDS included		
Fluid R.I.:	1.333	Sample R.I.:	1.55 i0.1
Residual:	0.20%		
LS 13 320	Universal Liquid Module		
Start time:	14:57 29 May 2024	Run length:	51 seconds
Pump speed:	50%		
Obscuration:	11%	PIDS Obscur:	62%
Fluid:	Water		
Software:	6.01	Firmware:	4.00



Beckman Coulter LS Particle Size Analyzer

29 May 2024

Kenneth Pye Associates Ltd

Volume Statistics (Geometric) Sample 208887.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	37.90 µm	S.D.:	3.624
Median:	41.22 µm	Variance:	13.13
D(3,2):	9.265 µm	Skewness:	-0.766 Left skewed
Mean/Median ratio:	0.920	Kurtosis:	2.364 Leptokurtic
Mode:	41.68 µm		

d_{10}: 8.659 µm d_{50}: 41.22 µm d_{90}: 156.9 µm

Folk and Ward Statistics (Phi)

Mean:	4.67	Median:	4.60	Deviation:	1.69
Skewness:	0.06	Kurtosis:	1.20		

<10%	<25%	<50%	<75%	<90%
8.659 µm	19.71 µm	41.22 µm	81.17 µm	156.9 µm

<2 µm	<63 µm	<2000 µm
2.59%	66.6%	100%

Sample 208887.$ls

Particle Diameter µm	Volume %
0.043	0.0011
0.051	0.0037
0.061	0.013
0.073	0.023
0.086	0.039
0.103	0.050
0.122	0.064
0.145	0.080
0.173	0.091
0.205	0.11
0.244	0.12
0.29	0.14
0.345	0.15
0.411	0.16
0.488	0.17
0.581	0.17
0.691	0.17
0.821	0.18
0.977	0.18
1.161	0.19
1.381	0.21
1.642	0.24
1.953	0.28
2.323	0.35
2.762	0.45
3.285	0.59
3.906	0.77
4.645	1.00
5.524	1.28
6.57	1.60
7.813	1.97
9.291	2.40
11.05	2.88
13.14	3.42
15.63	3.97
18.58	4.58
22.1	5.24
26.28	5.95
31.25	6.59
37.16	6.97
44.19	6.95
52.56	6.80
63	5.94
75	5.54
90	4.31
106	3.69
125	3.27
150	2.45
180	1.55
212	0.99
250	0.73
300	0.63
355	0.86
425	0.98
500	1.11
600	0.76
710	0.45
850	0.14
1000	0.020
1180	0.00026
1400	0
1700	0
2000	

Beckman Coulter LS Particle Size Analyzer

29 May 2024

Kenneth Pye Associates Ltd

Sample 208887.$ls

Channel Diameter (Lower) µm	Diff. Volume %	Cum. < Volume %
0.040	0.00042	0
0.044	0.00053	0.00042
0.048	0.00082	0.00095
0.053	0.0016	0.0018
0.058	0.0034	0.0034
0.064	0.0064	0.0068
0.070	0.010	0.013
0.077	0.014	0.023
0.084	0.017	0.037
0.093	0.021	0.055
0.102	0.025	0.076
0.112	0.029	0.10
0.122	0.033	0.13
0.134	0.037	0.16
0.148	0.041	0.20
0.162	0.045	0.24
0.178	0.049	0.29
0.195	0.054	0.34
0.214	0.058	0.39
0.235	0.063	0.45
0.258	0.068	0.51
0.284	0.072	0.58
0.311	0.076	0.65
0.342	0.079	0.73
0.375	0.082	0.81
0.412	0.085	0.89
0.452	0.087	0.97
0.496	0.089	1.06
0.545	0.090	1.15
0.598	0.092	1.24
0.656	0.093	1.33
0.721	0.094	1.42
0.791	0.095	1.52
0.868	0.096	1.61
0.953	0.097	1.71
1.047	0.099	1.80
1.149	0.10	1.90
1.261	0.11	2.00
1.385	0.11	2.11
1.520	0.12	2.22
1.668	0.13	2.34
1.832	0.14	2.46
2.011	0.15	2.60
2.207	0.17	2.75
2.423	0.19	2.92
2.660	0.22	3.11
2.920	0.25	3.32
3.205	0.29	3.57
3.519	0.33	3.86
3.863	0.38	4.19
4.240	0.44	4.58
4.655	0.51	5.02
5.110	0.58	5.53
5.610	0.66	6.11
6.158	0.75	6.77
6.760	0.85	7.52
7.421	0.95	8.37
8.147	1.06	9.32
8.943	1.18	10.4
9.817	1.31	11.6
10.78	1.45	12.9
11.83	1.60	14.3
12.99	1.75	15.9
14.26	1.91	17.7
15.65	2.07	19.6
17.18	2.24	21.6
18.86	2.41	23.9
20.70	2.60	26.3
22.73	2.79	28.9
24.95	3.00	31.7
27.39	3.21	34.7
30.07	3.41	37.9
33.01	3.58	41.3
36.24	3.71	44.9
39.78	3.77	48.6
43.67	3.76	52.4
47.94	3.69	56.1
52.62	3.58	59.8
57.77	3.43	63.4
63.41	3.26	66.8
69.61	3.07	70.1
76.42	2.89	73.2
83.89	2.69	76.1
92.09	2.49	78.7
101.1	2.28	81.2
111.0	2.06	83.5
121.8	1.83	85.6
133.7	1.61	87.4
146.8	1.40	89.0
161.2	1.19	90.4
176.9	0.98	91.6
194.2	0.79	92.6
213.2	0.61	93.4
234.1	0.47	94.0
256.9	0.38	94.5
282.1	0.33	94.8
309.6	0.34	95.2
339.9	0.38	95.5
373.1	0.45	95.9
409.6	0.53	96.3
449.7	0.58	96.9
493.6	0.59	97.4
541.9	0.55	98.0
594.9	0.47	98.6
653.0	0.37	99.1
716.8	0.27	99.4
786.9	0.17	99.7
863.9	0.088	99.9
948.3	0.031	99.96
1041	0.0057	99.99
1143	0.00039	100
1255	0	100
1377	0	100
1512	0	100
1660	0	100
1822	0	100
2000		100

4041

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f: 01923237404
e: scotland@i2analytical.com

Analytical Report Number : 24-026641

Project / Site name:	Kintore-Hydrogen Plant	**Samples received on:**	21/06/2024
Your job number:	428.013099.00001	**Samples instructed on/ Analysis started on:**	21/06/2024
Your order number:	010414-405	**Analysis completed by:**	02/07/2024
Report Issue Number:	1	**Report issued on:**	02/07/2024
Samples Analysed:	1 water sample		

Signed:

Nicola Jupp
Senior Customer Service Advisor
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

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Analytical Report Number: 24-026641
Project / Site name: Kintore-Hydrogen Plant

Your Order No: 010414-405

Lab Sample Number				235724
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				20/06/2024
Time Taken				0850
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
Turbidity	NTU	1	NONE	< 1.0
Sulphate as SO_4	mg/l	0.045	ISO 17025	7.94
Chloride	mg/l	0.15	ISO 17025	17
Silicon (total)	µg/l	50	NONE	4900
Fluoride	µg/l	50	ISO 17025	< 50
Ammoniacal Nitrogen as NH_4^+	µg/l	15	ISO 17025	170
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	5.98
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	6
Nitrate as N	mg/l	0.01	ISO 17025	2.07
Nitrate as NO_3	mg/l	0.05	ISO 17025	9.17
Nitrite as N	µg/l	1	ISO 17025	19
Nitrite as NO_2	µg/l	5	ISO 17025	63
Alkalinity as $CaCO_3$ (titration)	mgCaCO3/l	3	NONE	28
Alkalinity as $CaCO_3$	mgCaCO3/l	3	ISO 17025	24
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	11
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.09
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	7
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	98
Hardness - Total	mgCaCO3/l	1	ISO 17025	49.6
Bicarbonate as HCO_3	mgHCO3/l	10	NONE	29
Carbonate Alkalinity as CO3	mgCO3/l	3	NONE	< 3.0
Bromide	mg/l	0.002	ISO 17025	0.021
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
pH	pH Units	N/A	ISO 17025	6.9
Electrical Conductivity	µS/cm	10	ISO 17025	145
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	1	ISO 17025	25
Aluminium (total)	µg/l	1	ISO 17025	67
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.4
Antimony (total)	µg/l	0.4	ISO 17025	0.9
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.22
Arsenic (total)	µg/l	0.15	ISO 17025	0.28
Barium (dissolved)	µg/l	0.06	ISO 17025	23
Barium (total)	µg/l	0.06	ISO 17025	24
Cadmium (total)	µg/l	0.02	ISO 17025	< 0.02
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3
Chromium (total)	µg/l	0.2	ISO 17025	0.4
Copper (dissolved)	µg/l	0.5	ISO 17025	3.3
Copper (total)	µg/l	0.5	ISO 17025	35
Manganese (dissolved)	µg/l	0.05	ISO 17025	1
Manganese (total)	µg/l	0.05	ISO 17025	20
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.23
Molybdenum (total)	µg/l	0.05	ISO 17025	0.24
Nickel (dissolved)	µg/l	0.5	ISO 17025	0.8
Nickel (total)	µg/l	0.5	ISO 17025	1.2

4041

Analytical Report Number: 24-026641
Project / Site name: Kintore-Hydrogen Plant

Your Order No: 010414-405

Lab Sample Number				235724
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				20/06/2024
Time Taken				0850
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	0.82
Tin (total)	µg/l	0.2	ISO 17025	1.1
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.3
Zinc (total)	µg/l	0.5	ISO 17025	6.1
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Boron (total)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	13
Calcium (total)	µg/l	12	ISO 17025	13000
Iron (dissolved)	mg/l	0.004	ISO 17025	0.073
Iron (total)	mg/l	0.004	ISO 17025	0.33
Magnesium (dissolved)	mg/l	0.005	ISO 17025	4.2
Magnesium (total)	mg/l	0.005	ISO 17025	4.2
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.2
Potassium (total)	mg/l	0.025	ISO 17025	1.3
Sodium (dissolved)	mg/l	0.01	ISO 17025	10
Sodium (total)	mg/l	0.01	ISO 17025	11

Subcontracted Analysis

PSD Laser Diffraction (Subcontracted)		N/A	NONE	See Attached

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number : 24-026641
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry	In-house method based on BSEN 15216:2007	L004B	W	ISO 17025
Suspended Solids in water	Determined gravimetrically with GFC filtration papers	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004B	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Bromate in water by IC	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Exotic metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Alkalinity in water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW, GW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Total organic carbon in water	Determination of total organic carbon in water by TOC/DOC NDIR analyser.Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW (Al, Fe, Cu, Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Chemical Oxygen Demand in water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025

Analytical Report Number : 24-026641
Project / Site name: Kintore-Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/L082B	W	NONE
Alkalinity in water (by discreet analyser)	Determination of Alkalinity by discrete analyser (colorimetry). Accredited matrices: SW,PW, GW,FSE,LL	In-house method based on MEWAM & USEPA Method 310.2	L082B	W	ISO 17025
Bicarbonate as HCO3 in water	Determination of Bicarbonate by discrete analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Chloride in water	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW,PW, GW,FSE,LL	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples	In-house method based on Standard Method 8237	L083B	W	NONE
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Subcontracted analysis (water)	Subcontracted analysis - see attached subcon report.	Subcontracted analysis - see attached subcon report.			NONE
EK pH at 20°C in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW, [LL]	In-house method	L005F	W	ISO 17025
EK Electrical conductivity at 20°C of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031F	W	ISO 17025

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.
Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

Analytical Report Number :
Project / Site name:

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Key: a - No sampling date b - Incorrect container c - Holding time d - Headspace e - Temperature

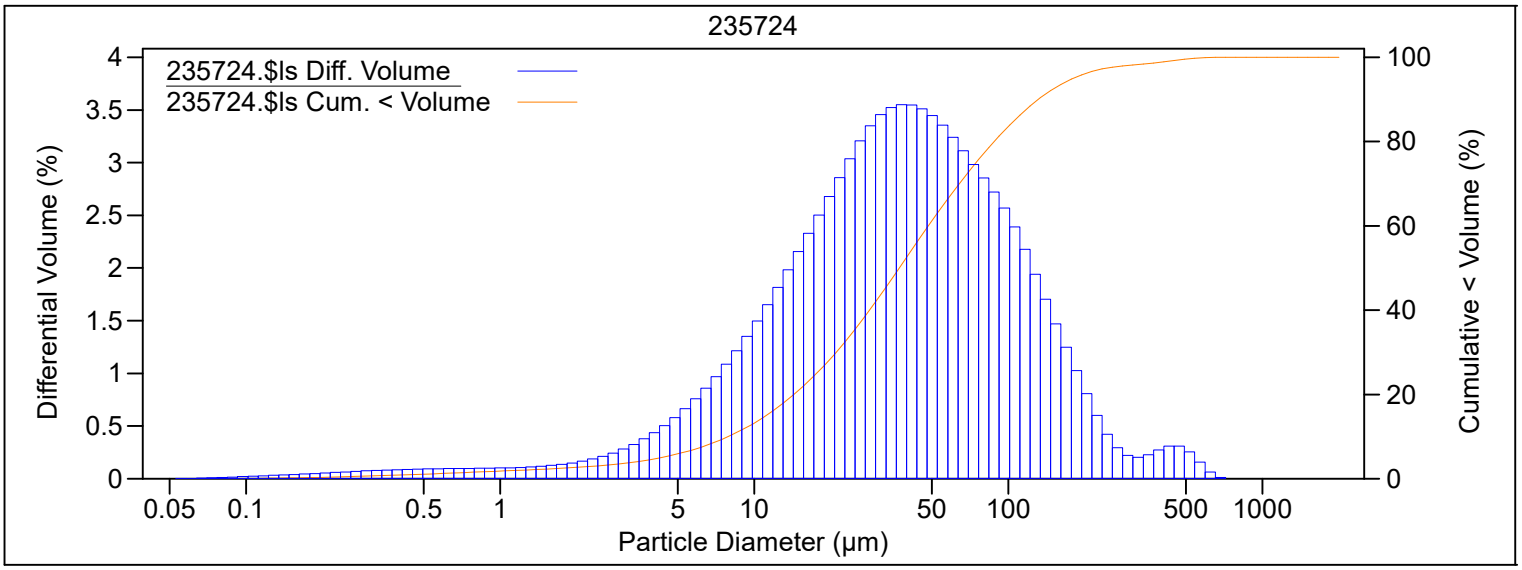
Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
SW01	N/A	W	235724	C	EK pH at 20°C in water	L099	C
SW01	N/A	W	235724	C	EK Electrical conductivity at 20°C of water	L031F	C

Beckman Coulter LS Particle Size Analyzer

28 Jun 2024

Kenneth Pye Associates Ltd

File name:	C:\LS13320\Analyses\i2 Analytical\28-06-2024 24-026641\235724.$ls		
	235724.$ls		
File ID:	235724		
Sample ID:	235724		
Operator:	sjb		
Run number:	7574		
Comment 1:	Job Number: 24-026641		
Comment 2:	SW01 Kintore 20/06/2024 08:50		
Optical model:	NMBAQC.rf780d PIDS included		
Fluid R.I.:	1.333	Sample R.I.:	1.55 i0.1
Residual:	0.17%		
LS 13 320	Universal Liquid Module		
Start time:	8:08 28 Jun 2024	Run length:	52 seconds
Pump speed:	50%		
Obscuration:	8%	PIDS Obscur:	53%
Fluid:	Water		
Software:	6.01	Firmware:	4.00



Beckman Coulter LS Particle Size Analyzer

28 Jun 2024

Kenneth Pye Associates Ltd

Volume Statistics (Geometric) 235724.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	33.24 µm	S.D.:	3.403
Median:	37.24 µm	Variance:	11.58
D(3,2):	8.896 µm	Skewness:	-0.990 Left skewed
Mean/Median ratio:	0.892	Kurtosis:	2.485 Leptokurtic
Mode:	37.97 µm		

d_{10}: 7.894 µm d_{50}: 37.24 µm d_{90}: 131.3 µm

Folk and Ward Statistics (Phi)

Mean:	4.82	Median:	4.75	Deviation:	1.59
Skewness:	0.11	Kurtosis:	1.06		

<10%	<25%	<50%	<75%	<90%
7.894 µm	17.60 µm	37.24 µm	74.74 µm	131.3 µm

<2 µm	<63 µm	<2000 µm
2.71%	69.4%	100%

235724.$ls

Particle Diameter µm	Volume %
0.043	0.0010
0.051	0.0035
0.061	0.012
0.073	0.021
0.086	0.036
0.103	0.048
0.122	0.062
0.145	0.079
0.173	0.091
0.205	0.11
0.244	0.13
0.29	0.15
0.345	0.16
0.411	0.17
0.488	0.17
0.581	0.18
0.691	0.18
0.821	0.19
0.977	0.19
1.161	0.21
1.381	0.23
1.642	0.26
1.953	0.32
2.323	0.40
2.762	0.51
3.285	0.67
3.906	0.88
4.645	1.15
5.524	1.46
6.57	1.83
7.813	2.25
9.291	2.74
11.05	3.28
13.14	3.87
15.63	4.45
18.58	5.07
22.1	5.67
26.28	6.20
31.25	6.52
37.16	6.60
44.19	6.48
52.56	6.40
63	5.71
75	5.50
90	4.45
106	3.90
125	3.45
150	2.57
180	1.60
212	0.95
250	0.57
300	0.39
355	0.52
425	0.53
500	0.38
600	0.070
710	0.0024
850	0
1000	0
1180	0
1400	0
1700	0
2000	

Beckman Coulter LS Particle Size Analyzer

28 Jun 2024

Kenneth Pye Associates Ltd

235724.$ls

Channel Diameter (Lower) µm	Diff. Volume %	Cum. < Volume %
0.040	0.00037	0
0.044	0.00049	0.00037
0.048	0.00078	0.00086
0.053	0.0015	0.0016
0.058	0.0032	0.0032
0.064	0.0060	0.0064
0.070	0.0095	0.012
0.077	0.013	0.022
0.084	0.016	0.035
0.093	0.020	0.051
0.102	0.024	0.071
0.112	0.028	0.095
0.122	0.032	0.12
0.134	0.036	0.16
0.148	0.041	0.19
0.162	0.045	0.23
0.178	0.050	0.28
0.195	0.055	0.33
0.214	0.060	0.38
0.235	0.065	0.44
0.258	0.070	0.51
0.284	0.075	0.58
0.311	0.080	0.65
0.342	0.083	0.73
0.375	0.086	0.81
0.412	0.089	0.90
0.452	0.091	0.99
0.496	0.093	1.08
0.545	0.095	1.17
0.598	0.096	1.27
0.656	0.097	1.37
0.721	0.098	1.46
0.791	0.099	1.56
0.868	0.10	1.66
0.953	0.10	1.76
1.047	0.10	1.86
1.149	0.11	1.97
1.261	0.11	2.07
1.385	0.12	2.19
1.520	0.13	2.30
1.668	0.14	2.43
1.832	0.15	2.57
2.011	0.17	2.72
2.207	0.19	2.88
2.423	0.21	3.07
2.660	0.24	3.28
2.920	0.28	3.53
3.205	0.33	3.81
3.519	0.38	4.14
3.863	0.44	4.51
4.240	0.51	4.95
4.655	0.58	5.46
5.110	0.67	6.04
5.610	0.76	6.70
6.158	0.86	7.46
6.760	0.97	8.32
7.421	1.09	9.29
8.147	1.21	10.4
8.943	1.35	11.6
9.817	1.50	12.9
10.78	1.65	14.4
11.83	1.82	16.1
12.99	1.98	17.9
14.26	2.16	19.9
15.65	2.33	22.0
17.18	2.50	24.4
18.86	2.68	26.9
20.70	2.86	29.6
22.73	3.04	32.4
24.95	3.21	35.5
27.39	3.35	38.7
30.07	3.46	42.0
33.01	3.52	45.5
36.24	3.55	49.0
39.78	3.55	52.5
43.67	3.51	56.1
47.94	3.45	59.6
52.62	3.35	63.0
57.77	3.24	66.4
63.41	3.11	69.6
69.61	2.98	72.8
76.42	2.85	75.7
83.89	2.72	78.6
92.09	2.57	81.3
101.1	2.39	83.9
111.0	2.18	86.3
121.8	1.94	88.4
133.7	1.70	90.4
146.8	1.47	92.1
161.2	1.25	93.6
176.9	1.03	94.8
194.2	0.81	95.8
213.2	0.60	96.6
234.1	0.42	97.2
256.9	0.29	97.7
282.1	0.22	98.0
309.6	0.20	98.2
339.9	0.23	98.4
373.1	0.27	98.6
409.6	0.31	98.9
449.7	0.31	99.2
493.6	0.26	99.5
541.9	0.16	99.8
594.9	0.064	99.9
653.0	0.013	99.99
716.8	0.0010	99.999
786.9	0	100
863.9	0	100
948.3	0	100
1041	0	100
1143	0	100
1255	0	100
1377	0	100
1512	0	100
1660	0	100
1822	0	100
2000		100

4041

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East Kilbride,
G75 0YF

t: 01355202915
f: 01923237404
e: scotland@i2analytical.com

Analytical Report Number : 24-029231

Project / Site name:	Kintore - Hydrogen Plant	**Samples received on:**	04/07/2024
Your job number:	428.013099.00001	**Samples instructed on/ Analysis started on:**	04/07/2024
Your order number:	010558-405	**Analysis completed by:**	15/07/2024
Report Issue Number:	1	**Report issued on:**	16/07/2024
Samples Analysed:	1 water sample		

Signed: Ashleigh Cunningham

Ashleigh Cunningham
Customer Service Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41-711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

UKAS TESTING
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Analytical Environmental Science

Analytical Report Number: 24-029231
Project / Site name: Kintore - Hydrogen Plant

Your Order No: 010558-405

Lab Sample Number	249121
Sample Reference	SW01
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	02/07/2024
Time Taken	1010

Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (L099)	pH Units	N/A	ISO 17025	7.6
Electrical Conductivity at 20°C	µS/cm	10	ISO 17025	190
Turbidity	NTU	1	NONE	2
Sulphate as SO_4	mg/l	0.045	ISO 17025	9.22
Chloride	mg/l	0.15	ISO 17025	20
Silicon (total)	µg/l	50	NONE	7000
Fluoride	µg/l	50	ISO 17025	59
Ammoniacal Nitrogen as NH_4^+	µg/l	15	ISO 17025	< 15
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	2.36
Total Organic Carbon (TOC)	mg/l	0.1	ISO 17025	2.49
Nitrate as N	mg/l	0.01	ISO 17025	2.77
Nitrate as NO_3	mg/l	0.05	ISO 17025	12.3
Nitrite as N	µg/l	1	ISO 17025	69
Nitrite as NO_2	µg/l	5	ISO 17025	230
Alkalinity as $CaCO_3$ (titration)	mgCaCO3/l	3	NONE	50
Alkalinity as $CaCO_3$	mgCaCO3/l	3	ISO 17025	41
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	7.6
Total Oxidised Nitrogen (TON)	mg/l	0.02	NONE	2.84
Total Suspended Solids (L004B)	mg/l	2	ISO 17025	2
Total Dissolved Solids (Gravimetric) (L004B)	mg/l	4	ISO 17025	100
Hardness - Total	mgCaCO3/l	1	ISO 17025	64.9
Bicarbonate as HCO_3	mgHCO3/l	10	NONE	50
Carbonate Alkalinity as CO3	mgCO3/l	3	NONE	< 3.0
Bromide	mg/l	0.002	ISO 17025	0.033
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	1	ISO 17025	5.5
Aluminium (total)	µg/l	1	ISO 17025	14
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.5
Antimony (total)	µg/l	0.4	ISO 17025	0.5
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.22
Arsenic (total)	µg/l	0.15	ISO 17025	0.25
Barium (dissolved)	µg/l	0.06	ISO 17025	32
Barium (total)	µg/l	0.06	ISO 17025	30
Cadmium (total)	µg/l	0.02	ISO 17025	< 0.02
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.5
Chromium (total)	µg/l	0.2	ISO 17025	1.2
Copper (dissolved)	µg/l	0.5	ISO 17025	3.1
Copper (total)	µg/l	0.5	ISO 17025	4.4
Manganese (dissolved)	µg/l	0.05	ISO 17025	0.26
Manganese (total)	µg/l	0.05	ISO 17025	19
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.25
Molybdenum (total)	µg/l	0.05	ISO 17025	0.3
Nickel (dissolved)	µg/l	0.5	ISO 17025	0.6
Nickel (total)	µg/l	0.5	ISO 17025	0.7
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6

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Analytical Report Number: 24-029231
Project / Site name: Kintore - Hydrogen Plant

Your Order No: 010558-405

Lab Sample Number				249121
Sample Reference				SW01
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				02/07/2024
Time Taken				1010
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Selenium (total)	µg/l	0.6	ISO 17025	< 0.6
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20
Tin (total)	µg/l	0.2	ISO 17025	2.1
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.5
Zinc (total)	µg/l	0.5	ISO 17025	12
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Boron (total)	µg/l	10	ISO 17025	< 10
Calcium (dissolved)	mg/l	0.012	ISO 17025	17
Calcium (total)	µg/l	12	ISO 17025	18000
Iron (dissolved)	mg/l	0.004	ISO 17025	0.012
Iron (total)	mg/l	0.004	ISO 17025	0.13
Magnesium (dissolved)	mg/l	0.005	ISO 17025	5.4
Magnesium (total)	mg/l	0.005	ISO 17025	5.7
Potassium (dissolved)	mg/l	0.025	ISO 17025	1.2
Potassium (total)	mg/l	0.025	ISO 17025	1.1
Sodium (dissolved)	mg/l	0.01	ISO 17025	13
Sodium (total)	mg/l	0.01	ISO 17025	13

Subcontracted Analysis

PSD Laser Diffraction (Subcontracted)		N/A	NONE	See Attached

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number : 24-029231
Project / Site name: Kintore - Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total dissolved solids in water (Gravimetric)	Determination of total dissolved solids in water by gravimetry	In-house method based on BSEN 15216:2007	L004B	W	ISO 17025
Suspended Solids in water	Determined gravimetrically with GFC filtration papers	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004B	W	ISO 17025
Bromide in water by IC	Determination of bromide in waters by ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Bromate in water by IC	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Exotic metals in water by ICP-MS (total)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Alkalinity in water (by titration)	Determination of Alkalinity by titration	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L025	W	NONE
Electrical conductivity at 20°C of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031B	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW, GW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Total organic carbon in water	Determination of total organic carbon in water by TOC/DOC NDIR analyser.Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Metals in water by ICP-OES (total)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW, PW, GW, PrW (Al, Fe, Cu, Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Chemical Oxygen Demand in water (Total)	Determination of total COD in water by reflux oxidation with acidified K2Cr2O7 followed by colorimetry. Accredited matrices: SW, PW, GW	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065	W	ISO 17025

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Analytical Report Number : 24-029231
Project / Site name: Kintore - Hydrogen Plant

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Total oxidised nitrogen in water	Calculation from nitrate and nitrite	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L078/L082B	W	NONE
Alkalinity in water (by discreet analyser)	Determination of Alkalinity by discrete analyser (colorimetry). Accredited matrices: SW,PW, GW,FSE,LL	In-house method based on MEWAM & USEPA Method 310.2	L082B	W	ISO 17025
Bicarbonate as HCO3 in water	Determination of Bicarbonate by discrete analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Chloride in water	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW,PW, GW,FSE,LL	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Turbidity of in water	Determination of sample turbidity by colorimeter and comparison with standard reference samples	In-house method based on Standard Method 8237	L083B	W	NONE
pH at 20°C in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method	L099	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Subcontracted analysis (water)	Subcontracted analysis - see attached subcon report.	Subcontracted analysis - see attached subcon report.			NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

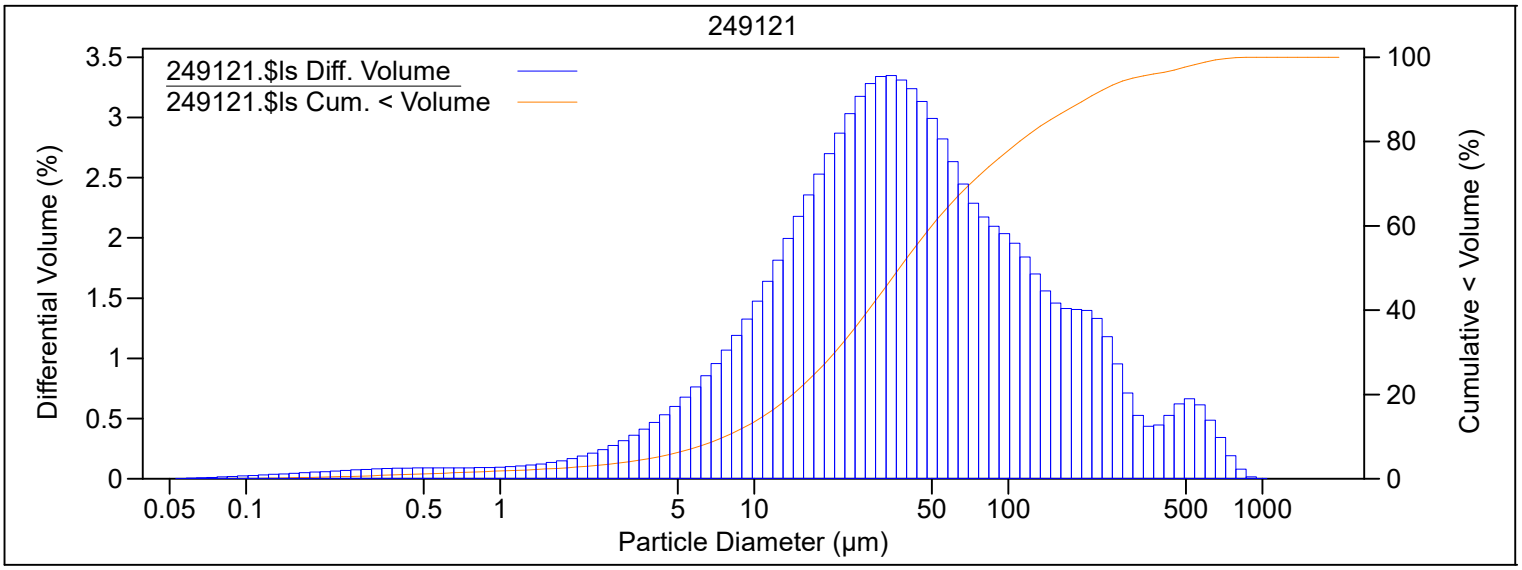
Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

Beckman Coulter LS Particle Size Analyzer

10 Jul 2024

Kenneth Pye Associates Ltd

File name:	C:\LS13320\Analyses\i2 Analytical\10-07-2024 24-029231\249121.$ls		
	249121.$ls		
File ID:	249121		
Sample ID:	249121		
Operator:	sjb		
Run number:	7659		
Comment 1:	Job No: 24-029231		
Comment 2:	SW01 Kintore 02/07/2024 10:10		
Optical model:	NMBAQC.rf780d PIDS included		
Fluid R.I.:	1.333	Sample R.I.:	1.55 i0.1
Residual:	0.19%		
LS 13 320	Universal Liquid Module		
Start time:	9:35 10 Jul 2024	Run length:	51 seconds
Pump speed:	50%		
Obscuration:	6%	PIDS Obscur:	25%
Fluid:	Water		
Software:	6.01	Firmware:	4.00



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Volume Statistics (Geometric) 249121.$ls

Calculations from 0.040 µm to 2000 µm

Volume:	100%		
Mean:	36.64 µm	S.D.:	3.903
Median:	37.34 µm	Variance:	15.23
D(3,2):	8.557 µm	Skewness:	-0.630 Left skewed
Mean/Median ratio:	0.981	Kurtosis:	1.605 Leptokurtic
Mode:	34.58 µm		

d_{10}: 7.670 µm d_{50}: 37.34 µm d_{90}: 201.4 µm

Folk and Ward Statistics (Phi)

Mean:	4.68	Median:	4.74	Deviation:	1.84
Skewness:	-0.01	Kurtosis:	1.10		

<10%	<25%	<50%	<75%	<90%
7.670 µm	17.39 µm	37.34 µm	87.78 µm	201.4 µm

<2 µm	<63 µm	<2000 µm
2.76%	66.9%	100%

249121.$ls

Particle Diameter µm	Volume %
0.043	0.0013
0.051	0.0046
0.061	0.015
0.073	0.026
0.086	0.042
0.103	0.054
0.122	0.070
0.145	0.088
0.173	0.10
0.205	0.12
0.244	0.14
0.29	0.15
0.345	0.16
0.411	0.16
0.488	0.17
0.581	0.17
0.691	0.17
0.821	0.17
0.977	0.18
1.161	0.20
1.381	0.24
1.642	0.29
1.953	0.36
2.323	0.45
2.762	0.57
3.285	0.73
3.906	0.93
4.645	1.18
5.524	1.46
6.57	1.80
7.813	2.21
9.291	2.70
11.05	3.27
13.14	3.90
15.63	4.50
18.58	5.10
22.1	5.65
26.28	6.07
31.25	6.21
37.16	6.07
44.19	5.70
52.56	5.30
63	4.45
75	4.21
90	3.54
106	3.28
125	3.13
150	2.80
180	2.46
212	2.24
250	1.77
300	0.97
355	0.89
425	1.03
500	1.23
600	0.75
710	0.29
850	0.032
1000	0.00072
1180	0
1400	0
1700	0
2000	

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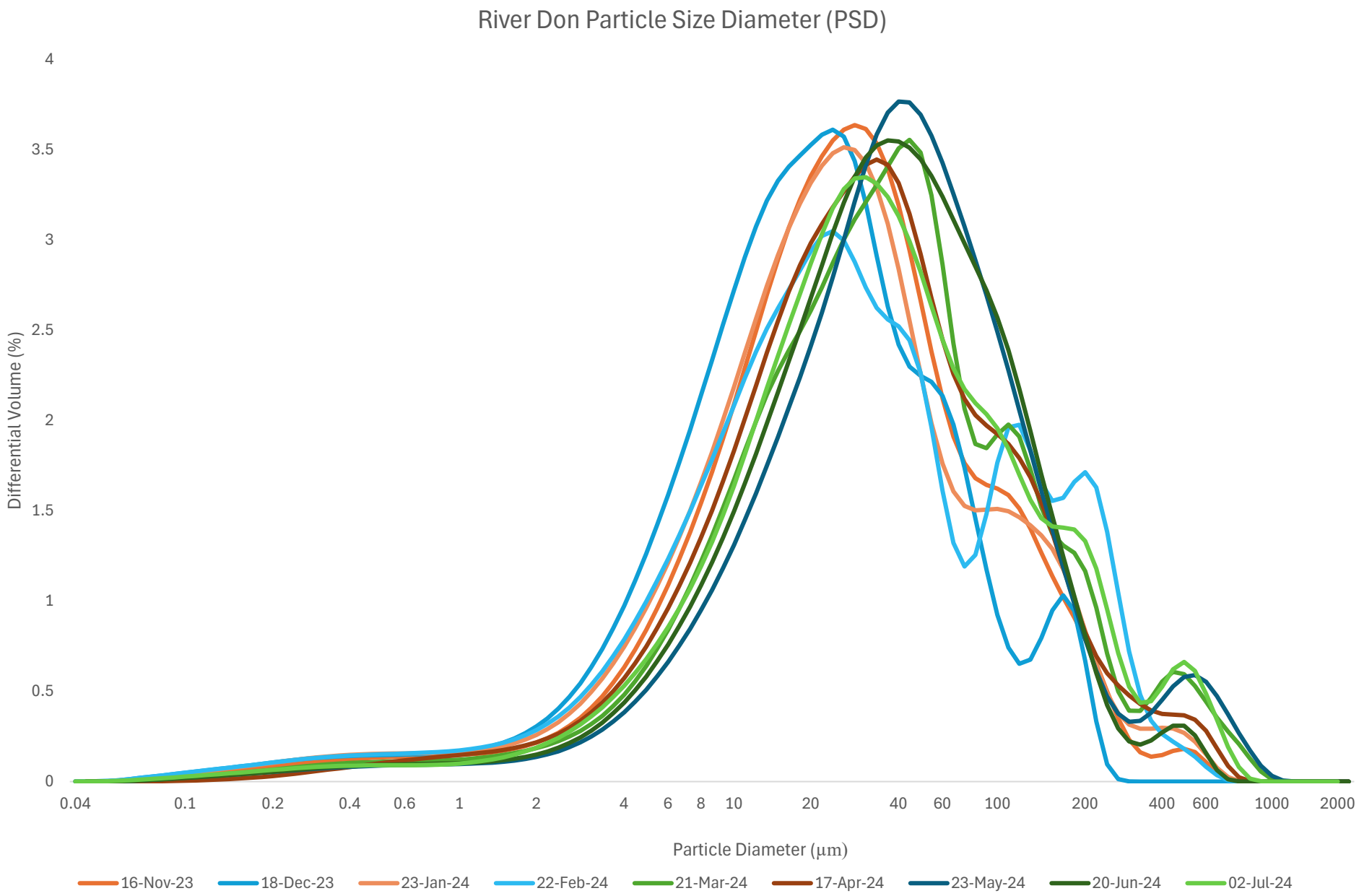
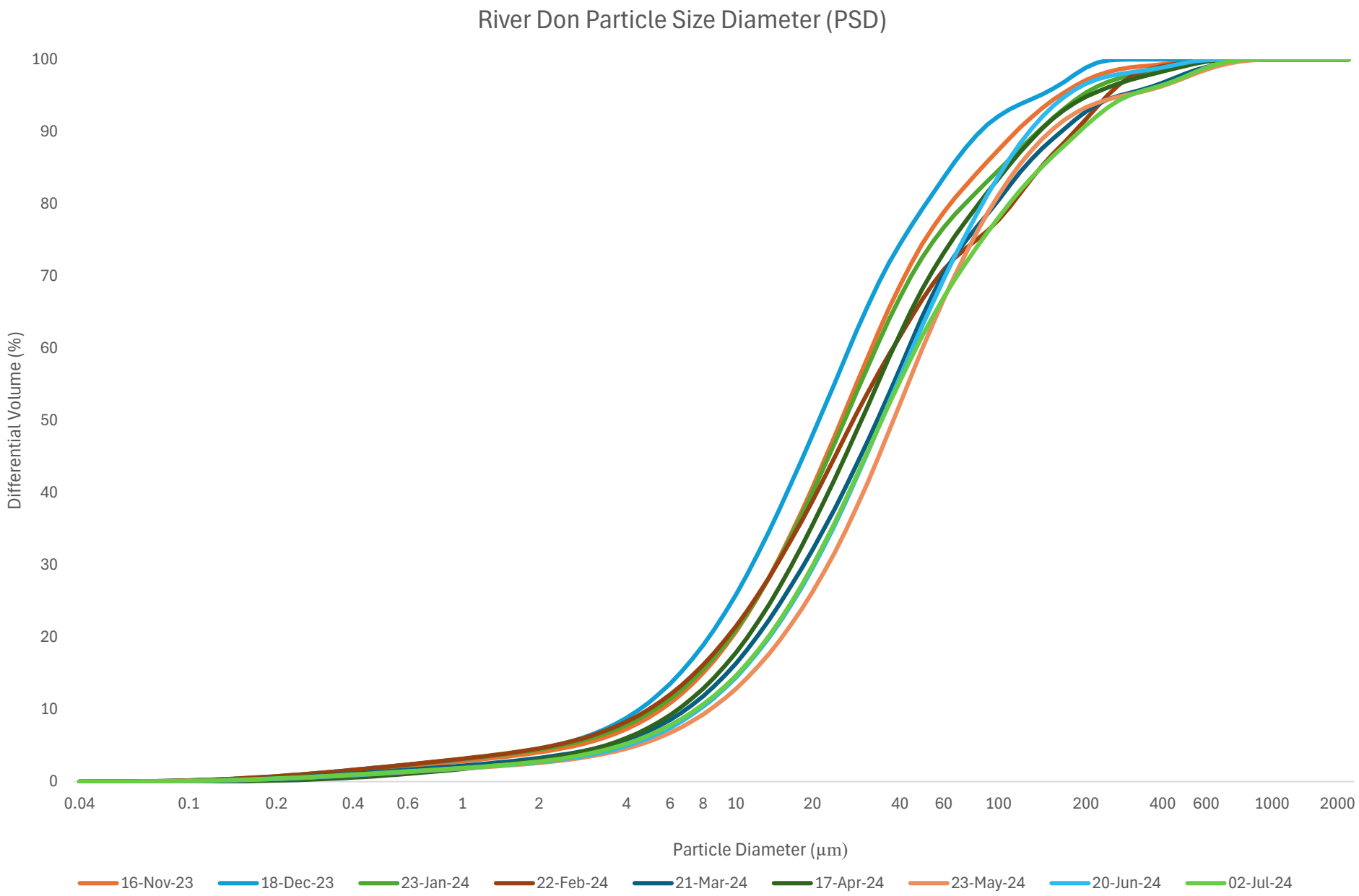
Channel Diameter (Lower) µm	Diff. Volume %	Cum. < Volume %
0.040	0.00043	0
0.044	0.00059	0.00043
0.048	0.00099	0.0010
0.053	0.0021	0.0020
0.058	0.0042	0.0041
0.064	0.0077	0.0083
0.070	0.012	0.016
0.077	0.015	0.028
0.084	0.019	0.043
0.093	0.023	0.062
0.102	0.028	0.085
0.112	0.032	0.11
0.122	0.036	0.14
0.134	0.041	0.18
0.148	0.045	0.22
0.162	0.050	0.27
0.178	0.055	0.32
0.195	0.060	0.37
0.214	0.065	0.43
0.235	0.069	0.50
0.258	0.074	0.57
0.284	0.078	0.64
0.311	0.082	0.72
0.342	0.085	0.80
0.375	0.087	0.88
0.412	0.088	0.97
0.452	0.089	1.06
0.496	0.090	1.15
0.545	0.090	1.24
0.598	0.090	1.33
0.656	0.091	1.42
0.721	0.091	1.51
0.791	0.092	1.60
0.868	0.093	1.69
0.953	0.096	1.79
1.047	0.10	1.88
1.149	0.11	1.98
1.261	0.11	2.09
1.385	0.12	2.20
1.520	0.13	2.32
1.668	0.15	2.46
1.832	0.17	2.61
2.011	0.19	2.77
2.207	0.21	2.96
2.423	0.24	3.18
2.660	0.28	3.42
2.920	0.32	3.69
3.205	0.36	4.01
3.519	0.41	4.37
3.863	0.47	4.78
4.240	0.53	5.25
4.655	0.60	5.78
5.110	0.68	6.38
5.610	0.76	7.06
6.158	0.86	7.82
6.760	0.96	8.68
7.421	1.07	9.63
8.147	1.19	10.7
8.943	1.33	11.9
9.817	1.48	13.2
10.78	1.64	14.7
11.83	1.81	16.3
12.99	2.00	18.1
14.26	2.18	20.1
15.65	2.36	22.3
17.18	2.53	24.7
18.86	2.70	27.2
20.70	2.87	29.9
22.73	3.03	32.8
24.95	3.18	35.8
27.39	3.28	39.0
30.07	3.34	42.3
33.01	3.35	45.6
36.24	3.31	49.0
39.78	3.24	52.3
43.67	3.13	55.5
47.94	2.99	58.6
52.62	2.82	61.6
57.77	2.63	64.5
63.41	2.45	67.1
69.61	2.29	69.5
76.42	2.17	71.8
83.89	2.10	74.0
92.09	2.03	76.1
101.1	1.96	78.1
111.0	1.84	80.1
121.8	1.70	81.9
133.7	1.56	83.6
146.8	1.46	85.2
161.2	1.41	86.7
176.9	1.41	88.1
194.2	1.40	89.5
213.2	1.33	90.9
234.1	1.18	92.2
256.9	0.95	93.4
282.1	0.71	94.3
309.6	0.53	95.0
339.9	0.44	95.6
373.1	0.45	96.0
409.6	0.53	96.5
449.7	0.62	97.0
493.6	0.66	97.6
541.9	0.61	98.3
594.9	0.49	98.9
653.0	0.34	99.4
716.8	0.19	99.7
786.9	0.081	99.9
863.9	0.017	99.98
948.3	0.0016	99.998
1041	0	100
1143	0	100
1255	0	100
1377	0	100
1512	0	100
1660	0	100
1822	0	100
2000		100


River Don Particle Size Diameter (PSD)
Differential Volume (%)
4
3.5
3
2.5
2
1.5
1
0.5
0
0.04
0.1
0.2
0.4
0.6
1
2
4
6
8
10
20
40
60
100
200
400
600
1000
2000
Particle Diameter (µm)
16-Nov-23
18-Dec-23
23-Jan-24
22-Feb-24
21-Mar-24
17-Apr-24
23-May-24
20-Jun-24
02-Jul-24


River Don Particle Size Diameter (PSD)
Differential Volume (%)
100
90
80
70
60
50
40
30
20
10
0
0.04
0.1
0.2
0.4
0.6
1
2
4
6
8
10
20
40
60
100
200
400
600
1000
2000
Particle Diameter (µm)
16-Nov-23
18-Dec-23
23-Jan-24
22-Feb-24
21-Mar-24
17-Apr-24
23-May-24
20-Jun-24
02-Jul-24

Annex C Piper Diagram

Kintore Hydrogen Facility

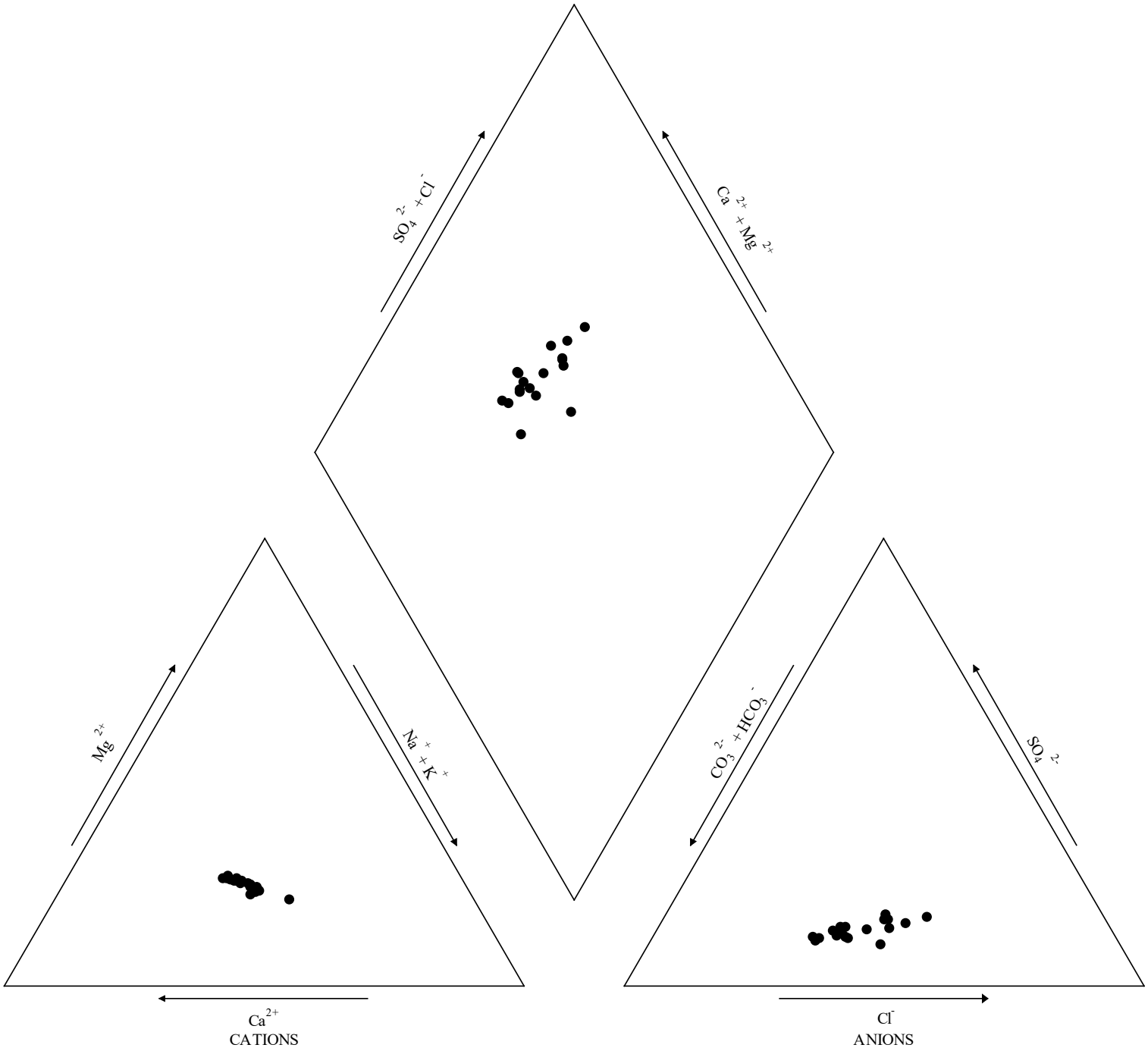
Appendix 13.1: Water Quality Monitoring Data

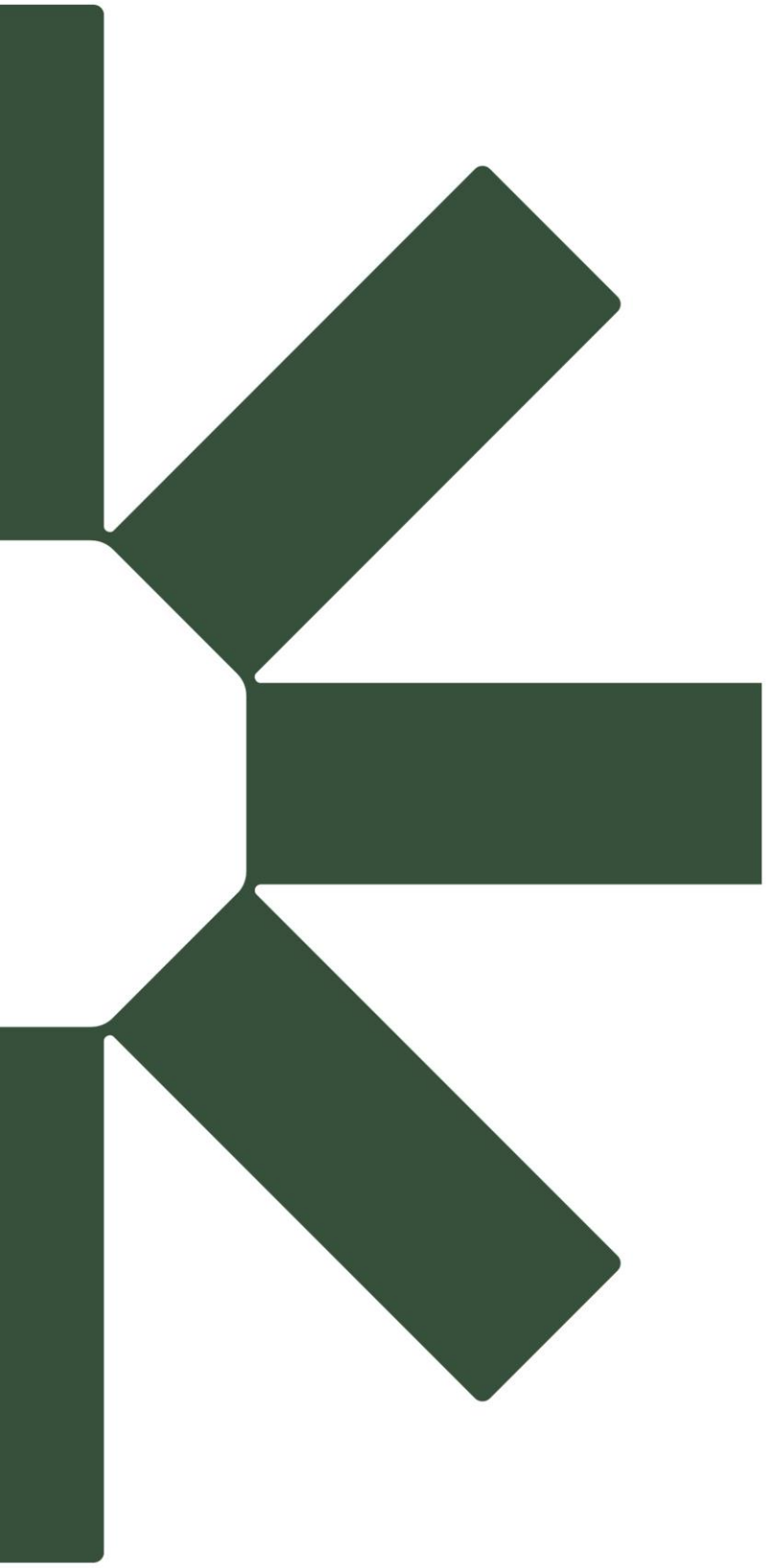
Kintore Hydrogen Ltd

SLR Project No.: 428.013099.00001

18 July 2024

River Don Water Chemistry Piper Diagram





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