

DWR CYMRU WELSH WATER - BOLTON HILL WTW

Analysis of water clarification sludge cake

Sampling Point No: 120038

Sample ID: 8444337

Date: 10/07/2025

Application rate (t/ha)	41.0
Application rate (t/acre)	16.6
pH	6.7
Dry solids (%)	15.6

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.27	0.20	%	2.0	81	0.2	8
Ammonium N	82.6	12.89	mg/kg	0.0	1		
Phosphorus (P)	3430	535.08	mg/kg	0.5	22		
Phosphate (P ₂ O ₅)		0.00		1.2	50	0.2	10
Potassium (K)	482	75.19	mg/kg	0.1	3		
Potash (K ₂ O)		0.00		0.1	4	0.0	1
Magnesium (Mg)	717	111.85	mg/kg	0.1	5		
Magnesium (MgO)		0.00		0.2	8	0.0	2
Sulphur (S)	5120	798.72	mg/kg	0.8	33		
Sulphur (SO ₃)		0.00		2.0	82	0.2	8

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	83	12.95	mg/kg	12.95	0.53	15.00	4%
Copper	47.5	7.41	mg/kg	7.41	0.30	7.50	4%
Nickel	23.2	3.62	mg/kg	3.62	0.15	3.00	5%
Lead	20.4	3.18	mg/kg	3.18	0.13	15.00	1%
Cadmium	0.36	0.06	mg/kg	0.06	0.00	0.15	2%
Chromium	14.1	2.20	mg/kg	2.20	0.09	15.00	1%
Arsenic	20.6	3.21	mg/kg	3.21	0.13	0.70	19%
Mercury	0.66	0.10	mg/kg	0.10	0.00	0.10	4%
Other Elements							
Iron	17700	2761.20	mg/kg	2761.20	113		
Aluminium	168000	26208.00	mg/kg	26208.00	1075		

DWR CYMRU WELSH WATER - BOLTON HILL WTW

Analysis of water clarification sludge cake

Sampling Point No: 120038

Sample ID: 8444337

Date: 10/07/2025

Application rate (t/ha)	50.0
Application rate (t/acre)	20.2
pH	6.7
Dry solids (%)	15.6

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.27	0.20	%	2.0	99	0.2	10
Ammonium N	82.6	12.89	mg/kg	0.0	1		
Phosphorus (P)	3430	535.08	mg/kg	0.5	27		
Phosphate (P ₂ O ₅)		0.00		1.2	61	0.2	12
Potassium (K)	482	75.19	mg/kg	0.1	4		
Potash (K ₂ O)		0.00		0.1	5	0.0	1
Magnesium (Mg)	717	111.85	mg/kg	0.1	6		
Magnesium (MgO)		0.00		0.2	9	0.0	2
Sulphur (S)	5120	798.72	mg/kg	0.8	40		
Sulphur (SO ₃)		0.00		2.0	100	0.2	10

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	83	12.95	mg/kg	12.95	0.65	15.00	4%
Copper	47.5	7.41	mg/kg	7.41	0.37	7.50	5%
Nickel	23.2	3.62	mg/kg	3.62	0.18	3.00	6%
Lead	20.4	3.18	mg/kg	3.18	0.16	15.00	1%
Cadmium	0.36	0.06	mg/kg	0.06	0.00	0.15	2%
Chromium	14.1	2.20	mg/kg	2.20	0.11	15.00	1%
Arsenic	20.6	3.21	mg/kg	3.21	0.16	0.70	23%
Mercury	0.66	0.10	mg/kg	0.10	0.01	0.10	5%
Other Elements							
Iron	17700	2761.20	mg/kg	2761.20	138		
Aluminium	168000	26208.00	mg/kg	26208.00	1310		

Sampling Point No:	120038	Location:	BOLTON HILL Sludge Tankering Point
Date Sampled:	10/07/2025	Time Taken:	10:09
Laboratory:	ALS	Sample ID:	8444337
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results



Code	Result	Units	Qualifier	Lower Limit
238 Magnesium	717	mg/kg		
288 Aluminium	168000	mg/kg		
357 Arsenic	20.6	mg/kg		
4620 pH	6.7	pH		
7774 Mercury	0.66	mg/kg	<	
8241 Volatile solids	45.9	%		
9233 Ammoniacal nitrogen	82.6	mg/kg		
9234 Sulphur	5120	mg/kg		
9271 Cadmium	0.36	mg/kg	<	
9272 Chromium	14.1	mg/kg	<	
9273 Copper	47.5	mg/kg		
9275 Nickel	23.2	mg/kg		
9276 Lead	20.4	mg/kg	<	
9277 Zinc	83.0	mg/kg		
9278 Iron	17700	mg/kg		
9281 % Dry solids	15.6	%		
9282 % Minerals	54.1	%		
9283 % K (dry weight)	0.0482	mg/kg		
9284 % P (dry weight)	0.343	%		
9285 % N (dry weight)	1.27	%		

Comments:

Signed:

Approved by:

Position:

Upper Limit

DWR CYMRU WELSH WATER - PRESELI WTW

Analysis of water clarification sludge cake

Sampling Point No: 100506

Sample ID: 8189080

Date: 26/11/2024

Application rate (t/ha)	67.0
Application rate (t/acre)	27.1
pH	7.2
Dry solids (%)	16.2

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	0.988	0.16	%	1.6	107	0.2	11
Ammonium N	18.8	3.05	mg/kg	0.0	0		
Phosphorus (P)	699	113.24	mg/kg	0.1	8		
Phosphate (P ₂ O ₅)		0.00		0.3	17	0.1	3
Potassium (K)	116	18.79	mg/kg	0.0	1		
Potash (K ₂ O)		0.00		0.0	2	0.0	0
Magnesium (Mg)	328	53.14	mg/kg	0.1	4		
Magnesium (MgO)		0.00		0.1	6	0.0	1
Sulphur (S)	7230	1171.26	mg/kg	1.2	78		
Sulphur (SO ₃)		0.00		2.9	196	0.3	20

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	58.1	9.41	mg/kg	9.41	0.63	15.00	4%
Copper	32.7	5.30	mg/kg	5.30	0.35	7.50	5%
Nickel	10.1	1.64	mg/kg	1.64	0.11	3.00	4%
Lead	1.99	0.32	mg/kg	0.32	0.02	15.00	0%
Cadmium	0.49	0.08	mg/kg	0.08	0.01	0.15	4%
Chromium	1.04	0.17	mg/kg	0.17	0.01	15.00	0%
Arsenic	61.2	9.91	mg/kg	9.91	0.66	0.70	95%
Mercury	0.62	0.10	mg/kg	0.10	0.01	0.10	7%
<u>Other Elements</u>							
Iron	7020	1137.24	mg/kg	1137.24	76		
Aluminium	186000	30132.00	mg/kg	30132.00	2019		

Sampling Point No:	100506	Location:	PRESELI WTW SLUDGE Tankering Point (New Works)
Date Sampled:	26/11/2024	Time Taken:	10:45
Laboratory:	ALS	Sample ID:	8189080
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results



Code	Result	Units	Qualifier	Lower Limit
238 Magnesium	328	mg/kg		
288 Aluminium	186000	mg/kg		
357 Arsenic	61.2	mg/kg		
4620 pH	7.2	pH		
7774 Mercury	0.62	mg/kg	<	
8241 Volatile solids	59	%		
9233 Ammoniacal nitrogen	18.8	mg/kg		
9234 Sulphur	7230	mg/kg		
9271 Cadmium	0.49	mg/kg		
9272 Chromium	1.04	mg/kg	<	
9273 Copper	32.7	mg/kg		
9275 Nickel	10.1	mg/kg		
9276 Lead	1.99	mg/kg	<	
9277 Zinc	58.1	mg/kg		
9278 Iron	7020	mg/kg		
9281 % Dry solids	16.2	%		
9282 % Minerals	41	%		
9283 % K (dry weight)	0.0116	mg/kg		
9284 % P (dry weight)	0.0699	%		
9285 % N (dry weight)	0.988	%		

Comments:

Signed:

Approved by:

Position:

Upper Limit

DWR CYMRU WELSH WATER - LLECHRYD WTW

Analysis of water clarification sludge cake

Sampling Point No: 100504

Sample ID: 8065264

Date: 12/08/2024

Application rate (t/ha)	28.0
Application rate (t/acre)	11.3
pH	6.5
Dry solids (%)	24.10

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	0.879	0.21	%	2.1	59	0.2	6
Ammonium N	56	13.50	mg/kg	0.0	0		
Phosphorus (P)	3200	771.20	mg/kg	0.8	22		
Phosphate (P ₂ O ₅)		0.00		1.8	49	0.4	10
Potassium (K)	227	54.71	mg/kg	0.1	2		
Potash (K ₂ O)		0.00		0.1	2	0.0	0
Magnesium (Mg)	696	167.74	mg/kg	0.2	5		
Magnesium (MgO)		0.00		0.3	8	0.1	2
Sulphur (S)	2730	657.93	mg/kg	0.7	18		
Sulphur (SO ₃)		0.00		1.6	46	0.2	5

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	153	36.87	mg/kg	36.87	1.03	15.00	7%
Copper	26.5	6.39	mg/kg	6.39	0.18	7.50	2%
Nickel	22	5.30	mg/kg	5.30	0.15	3.00	5%
Lead	26.3	6.34	mg/kg	6.34	0.18	15.00	1%
Cadmium	0.11	0.03	mg/kg	0.03	0.00	0.15	0%
Chromium	9.29	2.24	mg/kg	2.24	0.06	15.00	0%
Arsenic	24.1	5.81	mg/kg	5.81	0.16	0.70	23%
Mercury	0.42	0.10	mg/kg	0.10	0.00	0.10	3%
Other Elements							
Iron	246000	59286.00	mg/kg	59286.00	1660		
Aluminium	3150	759.15	mg/kg	759.15	21		

DWR CYMRU WELSH WATER - LLECHRYD WTW

Analysis of water clarification sludge cake

Sampling Point No: 100504

Sample ID: 8065264

Date: 12/08/2024

Application rate (t/ha)	35.0
Application rate (t/acre)	14.2
pH	6.5
Dry solids (%)	24.10

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	0.879	0.21	%	2.1	74	0.2	7
Ammonium N	56	13.50	mg/kg	0.0	0		
Phosphorus (P)	3200	771.20	mg/kg	0.8	27		
Phosphate (P ₂ O ₅)		0.00		1.8	62	0.4	12
Potassium (K)	227	54.71	mg/kg	0.1	2		
Potash (K ₂ O)		0.00		0.1	2	0.0	0
Magnesium (Mg)	696	167.74	mg/kg	0.2	6		
Magnesium (MgO)		0.00		0.3	10	0.1	2
Sulphur (S)	2730	657.93	mg/kg	0.7	23		
Sulphur (SO ₃)		0.00		1.6	58	0.2	6

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	153	36.87	mg/kg	36.87	1.29	15.00	9%
Copper	26.5	6.39	mg/kg	6.39	0.22	7.50	3%
Nickel	22	5.30	mg/kg	5.30	0.19	3.00	6%
Lead	26.3	6.34	mg/kg	6.34	0.22	15.00	1%
Cadmium	0.11	0.03	mg/kg	0.03	0.00	0.15	1%
Chromium	9.29	2.24	mg/kg	2.24	0.08	15.00	1%
Arsenic	24.1	5.81	mg/kg	5.81	0.20	0.70	29%
Mercury	0.42	0.10	mg/kg	0.10	0.00	0.10	4%
Other Elements							
Iron	246000	59286.00	mg/kg	59286.00	2075		
Aluminium	3150	759.15	mg/kg	759.15	27		

DWR CYMRU WELSH WATER - LLECHRYD WTW

Analysis of water clarification sludge cake

Sampling Point No: 100504

Sample ID: 8065264

Date: 12/08/2024

Application rate (t/ha)	45.0
Application rate (t/acre)	18.2
pH	6.5
Dry solids (%)	24.10

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	0.879	0.21	%	2.1	95	0.2	10
Ammonium N	56	13.50	mg/kg	0.0	1		
Phosphorus (P)	3200	771.20	mg/kg	0.8	35		
Phosphate (P ₂ O ₅)		0.00		1.8	79	0.4	16
Potassium (K)	227	54.71	mg/kg	0.1	2		
Potash (K ₂ O)		0.00		0.1	3	0.0	1
Magnesium (Mg)	696	167.74	mg/kg	0.2	8		
Magnesium (MgO)		0.00		0.3	13	0.1	3
Sulphur (S)	2730	657.93	mg/kg	0.7	30		
Sulphur (SO ₃)		0.00		1.6	74	0.2	7

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	153	36.87	mg/kg	36.87	1.66	15.00	11%
Copper	26.5	6.39	mg/kg	6.39	0.29	7.50	4%
Nickel	22	5.30	mg/kg	5.30	0.24	3.00	8%
Lead	26.3	6.34	mg/kg	6.34	0.29	15.00	2%
Cadmium	0.11	0.03	mg/kg	0.03	0.00	0.15	1%
Chromium	9.29	2.24	mg/kg	2.24	0.10	15.00	1%
Arsenic	24.1	5.81	mg/kg	5.81	0.26	0.70	37%
Mercury	0.42	0.10	mg/kg	0.10	0.00	0.10	5%
Other Elements							
Iron	246000	59286.00	mg/kg	59286.00	2668		
Aluminium	3150	759.15	mg/kg	759.15	34		

Sampling Point No:	100504	Location:	LLECHRYD WTW SLUDGE TANKERING POINT
Date Sampled:	12/08/2024	Time Taken:	12:10
Laboratory:	ALS	Sample ID:	8065264
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results



Code	Result	Units	Qualifier	Lower Limit
238 Magnesium	696	mg/kg		
288 Aluminium	3150	mg/kg		
357 Arsenic	24.1	mg/kg		
4620 pH	6.5	pH		
7774 Mercury	0.42	mg/kg	<	
8241 Volatile solids	55.8	%		
9233 Ammoniacal nitrogen	56	mg/kg		
9234 Sulphur	2730	mg/kg		
9271 Cadmium	0.11	mg/kg	<	
9272 Chromium	9.29	mg/kg		
9273 Copper	26.5	mg/kg		
9275 Nickel	22	mg/kg		
9276 Lead	26.3	mg/kg		
9277 Zinc	153	mg/kg		
9278 Iron	246000	mg/kg		
9281 % Dry solids	24.1	%		
9282 % Minerals	44.2	%		
9283 % K (dry weight)	0.0227	mg/kg		
9284 % P (dry weight)	0.32	%		
9285 % N (dry weight)	0.879	%		

Comments:

Signed:

Approved by:

Position:

Upper Limit

DWR CYMRU WELSH WATER - STRATA FLORIDA WTW

Analysis of water clarification sludge cake

Sampling Point No: 100519

Sample ID: 8207136

Date: 03/12/2024

Application rate (t/ha)	50.0
Application rate (t/acre)	20.2
pH	6.5
Dry solids (%)	17.30

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.21	0.21	%	2.1	105	0.2	10
Ammonium N	77	13.32	mg/kg	0.0	1		
Phosphorus (P)	1990	344.27	mg/kg	0.3	17		
Phosphate (P ₂ O ₅)		0.00		0.8	39	0.2	8
Potassium (K)	159	27.51	mg/kg	0.0	1		
Potash (K ₂ O)		0.00		0.0	2	0.0	0
Magnesium (Mg)	272	47.06	mg/kg	0.0	2		
Magnesium (MgO)		0.00		0.1	4	0.0	1
Sulphur (S)	4770	825.21	mg/kg	0.8	41		
Sulphur (SO ₃)		0.00		2.1	103	0.2	10

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	64.2	11.11	mg/kg	11.11	0.56	15.00	4%
Copper	21.1	3.65	mg/kg	3.65	0.18	7.50	2%
Nickel	6.8	1.18	mg/kg	1.18	0.06	3.00	2%
Lead	7.2	1.25	mg/kg	1.25	0.06	15.00	0%
Cadmium	0.31	0.05	mg/kg	0.05	0.00	0.15	2%
Chromium	4.3	0.74	mg/kg	0.74	0.04	15.00	0%
Arsenic	42.4	7.34	mg/kg	7.34	0.37	0.70	52%
Mercury	0.57	0.10	mg/kg	0.10	0.00	0.10	5%
Other Elements							
Iron	18200	3148.60	mg/kg	3148.60	157		
Aluminium	125000	21625.00	mg/kg	21625.00	1081		

DWR CYMRU WELSH WATER - STRATA FLORIDA WTW

Analysis of water clarification sludge cake

Sampling Point No: 100519

Sample ID: 8207136

Date: 03/12/2024

Application rate (t/ha)	64.0
Application rate (t/acre)	25.9
pH	6.5
Dry solids (%)	17.30

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.21	0.21	%	2.1	134	0.2	13
Ammonium N	77	13.32	mg/kg	0.0	1		
Phosphorus (P)	1990	344.27	mg/kg	0.3	22		
Phosphate (P ₂ O ₅)		0.00		0.8	50	0.2	10
Potassium (K)	159	27.51	mg/kg	0.0	2		
Potash (K ₂ O)		0.00		0.0	2	0.0	0
Magnesium (Mg)	272	47.06	mg/kg	0.0	3		
Magnesium (MgO)		0.00		0.1	5	0.0	1
Sulphur (S)	4770	825.21	mg/kg	0.8	53		
Sulphur (SO ₃)		0.00		2.1	132	0.2	13

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	64.2	11.11	mg/kg	11.11	0.71	15.00	5%
Copper	21.1	3.65	mg/kg	3.65	0.23	7.50	3%
Nickel	6.8	1.18	mg/kg	1.18	0.08	3.00	3%
Lead	7.2	1.25	mg/kg	1.25	0.08	15.00	1%
Cadmium	0.31	0.05	mg/kg	0.05	0.00	0.15	2%
Chromium	4.3	0.74	mg/kg	0.74	0.05	15.00	0%
Arsenic	42.4	7.34	mg/kg	7.34	0.47	0.70	67%
Mercury	0.57	0.10	mg/kg	0.10	0.01	0.10	6%
<u>Other Elements</u>							
Iron	18200	3148.60	mg/kg	3148.60	202		
Aluminium	125000	21625.00	mg/kg	21625.00	1384		

DWR CYMRU WELSH WATER - STRATA FLORIDA WTW

Analysis of water clarification sludge cake

Sampling Point No: 100519

Sample ID: 8207136

Date: 03/12/2024

Application rate (t/ha)	79.0
Application rate (t/acre)	32.0
pH	6.5
Dry solids (%)	17.30

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.21	0.21	%	2.1	165	0.2	17
Ammonium N	77	13.32	mg/kg	0.0	1		
Phosphorus (P)	1990	344.27	mg/kg	0.3	27		
Phosphate (P ₂ O ₅)		0.00		0.8	62	0.2	12
Potassium (K)	159	27.51	mg/kg	0.0	2		
Potash (K ₂ O)		0.00		0.0	3	0.0	1
Magnesium (Mg)	272	47.06	mg/kg	0.0	4		
Magnesium (MgO)		0.00		0.1	6	0.0	1
Sulphur (S)	4770	825.21	mg/kg	0.8	65		
Sulphur (SO ₃)		0.00		2.1	163	0.2	16

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	64.2	11.11	mg/kg	11.11	0.88	15.00	6%
Copper	21.1	3.65	mg/kg	3.65	0.29	7.50	4%
Nickel	6.8	1.18	mg/kg	1.18	0.09	3.00	3%
Lead	7.2	1.25	mg/kg	1.25	0.10	15.00	1%
Cadmium	0.31	0.05	mg/kg	0.05	0.00	0.15	3%
Chromium	4.3	0.74	mg/kg	0.74	0.06	15.00	0%
Arsenic	42.4	7.34	mg/kg	7.34	0.58	0.70	83%
Mercury	0.57	0.10	mg/kg	0.10	0.01	0.10	8%
Other Elements							
Iron	18200	3148.60	mg/kg	3148.60	249		
Aluminium	125000	21625.00	mg/kg	21625.00	1708		

Sampling Point No:	100519	Location:	STRATA FLORIDA WTW SLUDGE TANKERING POINT
Date Sampled:	03/12/2024	Time Taken:	12:05
Laboratory:	ALS	Sample ID:	8207136
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results



Code	Result	Units	Qualifier	Lower Limit
238 Magnesium	272	mg/kg		
288 Aluminium	125000	mg/kg		
357 Arsenic	42.4	mg/kg		
4620 pH	6.5	pH		
7774 Mercury	0.57	mg/kg	<	
8241 Volatile solids	59.7	%		
9233 Ammoniacal nitrogen	77	mg/kg		
9234 Sulphur	4770	mg/kg		
9271 Cadmium	0.31	mg/kg		
9272 Chromium	4.3	mg/kg	<	
9273 Copper	21.1	mg/kg		
9275 Nickel	6.8	mg/kg		
9276 Lead	7.2	mg/kg		
9277 Zinc	64.2	mg/kg		
9278 Iron	18200	mg/kg		
9281 % Dry solids	17.3	%		
9282 % Minerals	40.3	%		
9283 % K (dry weight)	0.0159	mg/kg		
9284 % P (dry weight)	0.199	%		
9285 % N (dry weight)	1.21	%		

Comments:

Signed:

Approved by:

Position:

Upper Limit

DWR CYMRU WELSH WATER - BONTGOCH WTW

Analysis of water clarification sludge cake

Sampling Point No: 100521

Sample ID: 8443893

Date: 10/07/2025

Application rate (t/ha)	15.0
Application rate (t/acre)	6.1
pH	6.3
Dry solids (%)	20.30

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.43	0.29	%	2.9	44	0.3	4
Ammonium N	153	31.06	mg/kg	0.0	0		
Phosphorus (P)	7100	1441.30	mg/kg	1.4	22		
Phosphate (P ₂ O ₅)		0.00		3.3	50	0.7	10
Potassium (K)	209	42.43	mg/kg	0.0	1		
Potash (K ₂ O)		0.00		0.1	1	0.0	0
Magnesium (Mg)	698	141.69	mg/kg	0.1	2		
Magnesium (MgO)		0.00		0.2	4	0.0	1
Sulphur (S)	3360	682.08	mg/kg	0.7	10		
Sulphur (SO ₃)		0.00		1.7	26	0.2	3

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	475	96.43	mg/kg	96.43	1.45	15.00	10%
Copper	24.9	5.05	mg/kg	5.05	0.08	7.50	1%
Nickel	26.4	5.36	mg/kg	5.36	0.08	3.00	3%
Lead	109	22.13	mg/kg	22.13	0.33	15.00	2%
Cadmium	0.96	0.19	mg/kg	0.19	0.00	0.15	2%
Chromium	17	3.45	mg/kg	3.45	0.05	15.00	0%
Arsenic	67.9	13.78	mg/kg	13.78	0.21	0.70	30%
Mercury	0.24	0.05	mg/kg	0.05	0.00	0.10	1%
<u>Other Elements</u>							
Iron	379000	76937.00	mg/kg	76937.00	1154		
Aluminium	8010	1626.03	mg/kg	1626.03	24		

DWR CYMRU WELSH WATER - BONTGOCH WTW

Analysis of water clarification sludge cake

Sampling Point No: 100521

Sample ID: 8443893

Date: 10/07/2025

Application rate (t/ha)	19.0
Application rate (t/acre)	7.7
pH	6.3
Dry solids (%)	20.30

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.43	0.29	%	2.9	55	0.3	6
Ammonium N	153	31.06	mg/kg	0.0	1		
Phosphorus (P)	7100	1441.30	mg/kg	1.4	27		
Phosphate (P ₂ O ₅)		0.00		3.3	63	0.7	13
Potassium (K)	209	42.43	mg/kg	0.0	1		
Potash (K ₂ O)		0.00		0.1	1	0.0	0
Magnesium (Mg)	698	141.69	mg/kg	0.1	3		
Magnesium (MgO)		0.00		0.2	4	0.0	1
Sulphur (S)	3360	682.08	mg/kg	0.7	13		
Sulphur (SO ₃)		0.00		1.7	32	0.2	3

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	475	96.43	mg/kg	96.43	1.83	15.00	12%
Copper	24.9	5.05	mg/kg	5.05	0.10	7.50	1%
Nickel	26.4	5.36	mg/kg	5.36	0.10	3.00	3%
Lead	109	22.13	mg/kg	22.13	0.42	15.00	3%
Cadmium	0.96	0.19	mg/kg	0.19	0.00	0.15	2%
Chromium	17	3.45	mg/kg	3.45	0.07	15.00	0%
Arsenic	67.9	13.78	mg/kg	13.78	0.26	0.70	37%
Mercury	0.24	0.05	mg/kg	0.05	0.00	0.10	1%
<u>Other Elements</u>							
Iron	379000	76937.00	mg/kg	76937.00	1462		
Aluminium	8010	1626.03	mg/kg	1626.03	31		

DWR CYMRU WELSH WATER - BONTGOCH WTW

Analysis of water clarification sludge cake

Sampling Point No: 100521

Sample ID: 8443893

Date: 10/07/2025

Application rate (t/ha)	24.0
Application rate (t/acre)	9.7
pH	6.3
Dry solids (%)	20.30

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.43	0.29	%	2.9	70	0.3	7
Ammonium N	153	31.06	mg/kg	0.0	1		
Phosphorus (P)	7100	1441.30	mg/kg	1.4	35		
Phosphate (P ₂ O ₅)		0.00		3.3	79	0.7	16
Potassium (K)	209	42.43	mg/kg	0.0	1		
Potash (K ₂ O)		0.00		0.1	1	0.0	0
Magnesium (Mg)	698	141.69	mg/kg	0.1	3		
Magnesium (MgO)		0.00		0.2	6	0.0	1
Sulphur (S)	3360	682.08	mg/kg	0.7	16		
Sulphur (SO ₃)		0.00		1.7	41	0.2	4

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	475	96.43	mg/kg	96.43	2.31	15.00	15%
Copper	24.9	5.05	mg/kg	5.05	0.12	7.50	2%
Nickel	26.4	5.36	mg/kg	5.36	0.13	3.00	4%
Lead	109	22.13	mg/kg	22.13	0.53	15.00	4%
Cadmium	0.96	0.19	mg/kg	0.19	0.00	0.15	3%
Chromium	17	3.45	mg/kg	3.45	0.08	15.00	1%
Arsenic	67.9	13.78	mg/kg	13.78	0.33	0.70	47%
Mercury	0.24	0.05	mg/kg	0.05	0.00	0.10	1%
Other Elements							
Iron	379000	76937.00	mg/kg	76937.00	1846		
Aluminium	8010	1626.03	mg/kg	1626.03	39		

Sampling Point No:	100521	Location:	BONTGOCH WTW SLUDGE TANKERING POINT
Date Sampled:	10/07/2025	Time Taken:	10:04
Laboratory:	ALS	Sample ID:	8443893
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results



Code	Result	Units	Qualifier	Lower Limit
238 Magnesium	698	mg/kg		
288 Aluminium	8010	mg/kg		
357 Arsenic	67.9	mg/kg		
4620 pH	6.3	pH		
7774 Mercury	0.24	mg/kg	<	
8241 Volatile solids	36.7	%		
9233 Ammoniacal nitrogen	153	mg/kg		
9234 Sulphur	3360	mg/kg		
9271 Cadmium	0.96	mg/kg		
9272 Chromium	17.0	mg/kg		
9273 Copper	24.9	mg/kg		
9275 Nickel	26.4	mg/kg		
9276 Lead	109	mg/kg		
9277 Zinc	475	mg/kg		
9278 Iron	379000	mg/kg		
9281 % Dry solids	20.3	%		
9282 % Minerals	63.3	%		
9283 % K (dry weight)	0.0209	mg/kg	<	
9284 % P (dry weight)	0.710	%		
9285 % N (dry weight)	1.43	%		

Comments:

Signed:

Approved by:

Position:

Upper Limit

DWR CYMRU WELSH WATER - BOLTON HILL WTW

Analysis of liquid water clarification sludge

Sampling Point No: 120038

Sample ID: 8443907

Date: 10/07/2025

Application rate (t/ha)	150.0
Application rate (t/acre)	60.7
pH	6.6
Dry solids (%)	3.34

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.21	0.04	%	0.4	61	0.0	6
Ammonium N	183	6.11	mg/kg	0.0	1		
Phosphorus (P)	3470	115.90	mg/kg	0.1	17		
Phosphate (P ₂ O ₅)		0.00		0.3	40	0.1	8
Potassium (K)	865	28.89	mg/kg	0.0	4		
Potash (K ₂ O)		0.00		0.0	5	0.0	1
Magnesium (Mg)	1490	49.77	mg/kg	0.0	7		
Magnesium (MgO)		0.00		0.1	12	0.0	2
Sulphur (S)	6120	204.41	mg/kg	0.2	31		
Sulphur (SO ₃)		0.00		0.5	77	0.1	8

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	108	3.61	mg/kg	3.61	0.54	15.00	4%
Copper	60.8	2.03	mg/kg	2.03	0.30	7.50	4%
Nickel	30.3	1.01	mg/kg	1.01	0.15	3.00	5%
Lead	36.8	1.23	mg/kg	1.23	0.18	15.00	1%
Cadmium	0.65	0.02	mg/kg	0.02	0.00	0.15	2%
Chromium	25.5	0.85	mg/kg	0.85	0.13	15.00	1%
Arsenic	16.4	0.55	mg/kg	0.55	0.08	0.70	12%
Mercury	0.59	0.02	mg/kg	0.02	0.00	0.10	3%
Other Elements							
Iron	24000	801.60	mg/kg	801.60	120		
Aluminium	140000	4676.00	mg/kg	4676.00	701		

DWR CYMRU WELSH WATER - BOLTON HILL WTW

Analysis of liquid water clarification sludge

Sampling Point No: 120038

Sample ID: 8443907

Date: 10/07/2025

Application rate (t/ha)	250.0
Application rate (t/acre)	101.2
pH	6.6
Dry solids (%)	3.34

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.21	0.04	%	0.4	101	0.0	10
Ammonium N	183	6.11	mg/kg	0.0	2		
Phosphorus (P)	3470	115.90	mg/kg	0.1	29		
Phosphate (P ₂ O ₅)		0.00		0.3	66	0.1	13
Potassium (K)	865	28.89	mg/kg	0.0	7		
Potash (K ₂ O)		0.00		0.0	9	0.0	2
Magnesium (Mg)	1490	49.77	mg/kg	0.0	12		
Magnesium (MgO)		0.00		0.1	21	0.0	4
Sulphur (S)	6120	204.41	mg/kg	0.2	51		
Sulphur (SO ₃)		0.00		0.5	128	0.1	13

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	108	3.61	mg/kg	3.61	0.90	15.00	6%
Copper	60.8	2.03	mg/kg	2.03	0.51	7.50	7%
Nickel	30.3	1.01	mg/kg	1.01	0.25	3.00	8%
Lead	36.8	1.23	mg/kg	1.23	0.31	15.00	2%
Cadmium	0.65	0.02	mg/kg	0.02	0.01	0.15	4%
Chromium	25.5	0.85	mg/kg	0.85	0.21	15.00	1%
Arsenic	16.4	0.55	mg/kg	0.55	0.14	0.70	20%
Mercury	0.59	0.02	mg/kg	0.02	0.00	0.10	5%
Other Elements							
Iron	24000	801.60	mg/kg	801.60	200		
Aluminium	140000	4676.00	mg/kg	4676.00	1169		

Sampling Point No:	120038	Location:	BOLTON HILL Sludge Tankering Point
Date Sampled:	10/07/2025	Time Taken:	10:10
Laboratory:	ALS	Sample ID:	8443907
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results



Code	Result	Units	Qualifier	Lower Limit
238 Magnesium	1490	mg/kg		
288 Aluminium	140000	mg/kg		
357 Arsenic	16.4	mg/kg		
4620 pH	6.6	pH		
7774 Mercury	0.59	mg/kg	<	
8241 Volatile solids	40.7	%		
9233 Ammoniacal nitrogen	183	mg/kg	<	
9234 Sulphur	6120	mg/kg		
9271 Cadmium	0.65	mg/kg	<	
9272 Chromium	25.5	mg/kg	<	
9273 Copper	60.8	mg/kg		
9275 Nickel	30.3	mg/kg	<	
9276 Lead	36.8	mg/kg	<	
9277 Zinc	108	mg/kg		
9278 Iron	24000	mg/kg		
9281 % Dry solids	3.34	%		
9282 % Minerals	59.3	%		
9283 % K (dry weight)	0.0865	mg/kg		
9284 % P (dry weight)	0.347	%	<	
9285 % N (dry weight)	1.21	%		

Comments:

Signed:

Approved by:

Position:

Upper Limit

DWR CYMRU WELSH WATER - PRESELI WTW

Analysis of liquid water clarification sludge

Sampling Point No: 100506

Sample ID: 8189084

Date: 26/11/2024

Application rate (t/ha)	150.0
Application rate (t/acre)	60.7
pH	7.2
Dry solids (%)	2.81

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.05	0.03	%	0.3	44	0.0	4
Ammonium N	6	0.17	mg/kg	0.0	0		
Phosphorus (P)	669	18.80	mg/kg	0.0	3		
Phosphate (P ₂ O ₅)		0.00		0.0	6	0.0	1
Potassium (K)	116	3.26	mg/kg	0.0	0		
Potash (K ₂ O)		0.00		0.0	1	0.0	0
Magnesium (Mg)	356	10.00	mg/kg	0.0	2		
Magnesium (MgO)		0.00		0.0	2	0.0	0
Sulphur (S)	8360	234.92	mg/kg	0.2	35		
Sulphur (SO ₃)		0.00		0.6	88	0.1	9

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	47.4	1.33	mg/kg	1.33	0.20	15.00	1%
Copper	33.7	0.95	mg/kg	0.95	0.14	7.50	2%
Nickel	5.1	0.14	mg/kg	0.14	0.02	3.00	1%
Lead	4.64	0.13	mg/kg	0.13	0.02	15.00	0%
Cadmium	0.4	0.01	mg/kg	0.01	0.00	0.15	1%
Chromium	2.43	0.07	mg/kg	0.07	0.01	15.00	0%
Arsenic	70	1.97	mg/kg	1.97	0.30	0.70	42%
Mercury	1.43	0.04	mg/kg	0.04	0.01	0.10	6%
<u>Other Elements</u>							
Iron	7780	218.62	mg/kg	218.62	33		
Aluminium	191000	5367.10	mg/kg	5367.10	805		

DWR CYMRU WELSH WATER - PRESELI WTW

Analysis of liquid water clarification sludge

Sampling Point No: 100506

Sample ID: 8189084

Date: 26/11/2024

Application rate (t/ha)	250.0
Application rate (t/acre)	101.2
pH	7.2
Dry solids (%)	2.81

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.05	0.03	%	0.3	74	0.0	7
Ammonium N	6	0.17	mg/kg	0.0	0		
Phosphorus (P)	669	18.80	mg/kg	0.0	5		
Phosphate (P ₂ O ₅)		0.00		0.0	11	0.0	2
Potassium (K)	116	3.26	mg/kg	0.0	1		
Potash (K ₂ O)		0.00		0.0	1	0.0	0
Magnesium (Mg)	356	10.00	mg/kg	0.0	3		
Magnesium (MgO)		0.00		0.0	4	0.0	1
Sulphur (S)	8360	234.92	mg/kg	0.2	59		
Sulphur (SO ₃)		0.00		0.6	147	0.1	15

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	47.4	1.33	mg/kg	1.33	0.33	15.00	2%
Copper	33.7	0.95	mg/kg	0.95	0.24	7.50	3%
Nickel	5.1	0.14	mg/kg	0.14	0.04	3.00	1%
Lead	4.64	0.13	mg/kg	0.13	0.03	15.00	0%
Cadmium	0.4	0.01	mg/kg	0.01	0.00	0.15	2%
Chromium	2.43	0.07	mg/kg	0.07	0.02	15.00	0%
Arsenic	70	1.97	mg/kg	1.97	0.49	0.70	70%
Mercury	1.43	0.04	mg/kg	0.04	0.01	0.10	10%
<u>Other Elements</u>							
Iron	7780	218.62	mg/kg	218.62	55		
Aluminium	191000	5367.10	mg/kg	5367.10	1342		

Sampling Point No:	100506	Location:	PRESELI WTW SLUDGE Tankering Point (New Works)
Date Sampled:	26/11/2024	Time Taken:	10:47
Laboratory:	ALS	Sample ID:	8189084
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results



Code	Result	Units	Qualifier	Lower Limit
238 Magnesium	356	mg/kg		
288 Aluminium	191000	mg/kg		
357 Arsenic	70	mg/kg		
4620 pH	7.2	pH		
7774 Mercury	1.43	mg/kg	<	
8241 Volatile solids	57	%		
9233 Ammoniacal nitrogen	6	mg/kg	<	
9234 Sulphur	8360	mg/kg		
9271 Cadmium	0.4	mg/kg		
9272 Chromium	2.43	mg/kg	<	
9273 Copper	33.7	mg/kg		
9275 Nickel	5.1	mg/kg	<	
9276 Lead	4.64	mg/kg	<	
9277 Zinc	47.4	mg/kg		
9278 Iron	7780	mg/kg		
9281 % Dry solids	2.81	%		
9282 % Minerals	43	%		
9283 % K (dry weight)	0.0116	mg/kg		
9284 % P (dry weight)	0.0669	%		
9285 % N (dry weight)	1.05	%		

Comments:

Signed:

Approved by:

Position:

Upper Limit

DWR CYMRU WELSH WATER - LLECHRYD WTW

Analysis of liquid water clarification sludge

Sampling Point No: 100504

Sample ID: 8065260

Date: 12/08/2024

Application rate (t/ha)	89.0
Application rate (t/acre)	36.0
pH	6.5
Dry solids (%)	6.95

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	0.935	0.06	%	0.6	58	0.1	6
Ammonium N	99.3	6.90	mg/kg	0.0	1		
Phosphorus (P)	3590	249.51	mg/kg	0.2	22		
Phosphate (P ₂ O ₅)		0.00		0.6	51	0.1	10
Potassium (K)	281	19.53	mg/kg	0.0	2		
Potash (K ₂ O)		0.00		0.0	2	0.0	0
Magnesium (Mg)	764	53.10	mg/kg	0.1	5		
Magnesium (MgO)		0.00		0.1	8	0.0	2
Sulphur (S)	3130	217.54	mg/kg	0.2	19		
Sulphur (SO ₃)		0.00		0.5	48	0.1	5

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	170	11.82	mg/kg	11.82	1.05	15.00	7%
Copper	28.8	2.00	mg/kg	2.00	0.18	7.50	2%
Nickel	24.2	1.68	mg/kg	1.68	0.15	3.00	5%
Lead	28.8	2.00	mg/kg	2.00	0.18	15.00	1%
Cadmium	0.11	0.01	mg/kg	0.01	0.00	0.15	0%
Chromium	9.98	0.69	mg/kg	0.69	0.06	15.00	0%
Arsenic	27.3	1.90	mg/kg	1.90	0.17	0.70	24%
Mercury	0.59	0.04	mg/kg	0.04	0.00	0.10	4%
Other Elements							
Iron	261000	18139.50	mg/kg	18139.50	1614		
Aluminium	3500	243.25	mg/kg	243.25	22		

DWR CYMRU WELSH WATER - LLECHRYD WTW

Analysis of liquid water clarification sludge

Sampling Point No: 100504

Sample ID: 8065260

Date: 12/08/2024

Application rate (t/ha)	110.0
Application rate (t/acre)	44.5
pH	6.5
Dry solids (%)	6.95

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	0.935	0.06	%	0.6	71	0.1	7
Ammonium N	99.3	6.90	mg/kg	0.0	1		
Phosphorus (P)	3590	249.51	mg/kg	0.2	27		
Phosphate (P ₂ O ₅)		0.00		0.6	63	0.1	13
Potassium (K)	281	19.53	mg/kg	0.0	2		
Potash (K ₂ O)		0.00		0.0	3	0.0	1
Magnesium (Mg)	764	53.10	mg/kg	0.1	6		
Magnesium (MgO)		0.00		0.1	10	0.0	2
Sulphur (S)	3130	217.54	mg/kg	0.2	24		
Sulphur (SO ₃)		0.00		0.5	60	0.1	6

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	170	11.82	mg/kg	11.82	1.30	15.00	9%
Copper	28.8	2.00	mg/kg	2.00	0.22	7.50	3%
Nickel	24.2	1.68	mg/kg	1.68	0.19	3.00	6%
Lead	28.8	2.00	mg/kg	2.00	0.22	15.00	1%
Cadmium	0.11	0.01	mg/kg	0.01	0.00	0.15	1%
Chromium	9.98	0.69	mg/kg	0.69	0.08	15.00	1%
Arsenic	27.3	1.90	mg/kg	1.90	0.21	0.70	30%
Mercury	0.59	0.04	mg/kg	0.04	0.00	0.10	5%
<u>Other Elements</u>							
Iron	261000	18139.50	mg/kg	18139.50	1995		
Aluminium	3500	243.25	mg/kg	243.25	27		

DWR CYMRU WELSH WATER - LLECHRYD WTW

Analysis of liquid water clarification sludge

Sampling Point No: 100504

Sample ID: 8065260

Date: 12/08/2024

Application rate (t/ha)	140.0
Application rate (t/acre)	56.7
pH	6.5
Dry solids (%)	6.95

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	0.935	0.06	%	0.6	91	0.1	9
Ammonium N	99.3	6.90	mg/kg	0.0	1		
Phosphorus (P)	3590	249.51	mg/kg	0.2	35		
Phosphate (P ₂ O ₅)		0.00		0.6	80	0.1	16
Potassium (K)	281	19.53	mg/kg	0.0	3		
Potash (K ₂ O)		0.00		0.0	3	0.0	1
Magnesium (Mg)	764	53.10	mg/kg	0.1	7		
Magnesium (MgO)		0.00		0.1	12	0.0	2
Sulphur (S)	3130	217.54	mg/kg	0.2	30		
Sulphur (SO ₃)		0.00		0.5	76	0.1	8

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	170	11.82	mg/kg	11.82	1.65	15.00	11%
Copper	28.8	2.00	mg/kg	2.00	0.28	7.50	4%
Nickel	24.2	1.68	mg/kg	1.68	0.24	3.00	8%
Lead	28.8	2.00	mg/kg	2.00	0.28	15.00	2%
Cadmium	0.11	0.01	mg/kg	0.01	0.00	0.15	1%
Chromium	9.98	0.69	mg/kg	0.69	0.10	15.00	1%
Arsenic	27.3	1.90	mg/kg	1.90	0.27	0.70	38%
Mercury	0.59	0.04	mg/kg	0.04	0.01	0.10	6%
<u>Other Elements</u>							
Iron	261000	18139.50	mg/kg	18139.50	2540		
Aluminium	3500	243.25	mg/kg	243.25	34		

Sampling Point No:	100504	Location:	LLECHRYD WTW SLUDGE TANKERING POINT
Date Sampled:	12/08/2024	Time Taken:	12:09
Laboratory:	ALS	Sample ID:	8065260
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results



Code	Result	Units	Qualifier	Lower Limit
238 Magnesium	764	mg/kg		
288 Aluminium	3500	mg/kg		
357 Arsenic	27.3	mg/kg		
4620 pH	6.5	pH		
7774 Mercury	0.59	mg/kg	<	
8241 Volatile solids	54.6	%		
9233 Ammoniacal nitrogen	99.3	mg/kg		
9234 Sulphur	3130	mg/kg		
9271 Cadmium	0.11	mg/kg	<	
9272 Chromium	9.98	mg/kg		
9273 Copper	28.8	mg/kg		
9275 Nickel	24.2	mg/kg		
9276 Lead	28.8	mg/kg		
9277 Zinc	170	mg/kg		
9278 Iron	261000	mg/kg		
9281 % Dry solids	6.95	%		
9282 % Minerals	45.4	%		
9283 % K (dry weight)	0.0281	mg/kg		
9284 % P (dry weight)	0.359	%		
9285 % N (dry weight)	0.935	%		

Comments:

Signed:

Approved by:

Position:

Upper Limit

DWR CYMRU WELSH WATER - STRATA FLORIDA WTW

Analysis of liquid water clarification sludge

Sampling Point No: 100519

Sample ID: 8207138

Date: 03/12/2024

Application rate (t/ha)	150.0
Application rate (t/acre)	60.7
pH	6.6
Dry solids (%)	2.88

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.38	0.04	%	0.4	60	0.0	6
Ammonium N	213	6.13	mg/kg	0.0	1		
Phosphorus (P)	1640	47.23	mg/kg	0.0	7		
Phosphate (P ₂ O ₅)		0.00		0.1	16	0.0	3
Potassium (K)	186	5.36	mg/kg	0.0	1		
Potash (K ₂ O)		0.00		0.0	1	0.0	0
Magnesium (Mg)	249	7.17	mg/kg	0.0	1		
Magnesium (MgO)		0.00		0.0	2	0.0	0
Sulphur (S)	4350	125.28	mg/kg	0.1	19		
Sulphur (SO ₃)		0.00		0.3	47	0.0	5

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	44.5	1.28	mg/kg	1.28	0.19	15.00	1%
Copper	13.7	0.39	mg/kg	0.39	0.06	7.50	1%
Nickel	3	0.09	mg/kg	0.09	0.01	3.00	0%
Lead	4.53	0.13	mg/kg	0.13	0.02	15.00	0%
Cadmium	0.33	0.01	mg/kg	0.01	0.00	0.15	1%
Chromium	2.37	0.07	mg/kg	0.07	0.01	15.00	0%
Arsenic	33.3	0.96	mg/kg	0.96	0.14	0.70	21%
Mercury	1.4	0.04	mg/kg	0.04	0.01	0.10	6%
Other Elements							
Iron	16000	460.80	mg/kg	460.80	69		
Aluminium	105000	3024.00	mg/kg	3024.00	454		

DWR CYMRU WELSH WATER - STRATA FLORIDA WTW

Analysis of liquid water clarification sludge

Sampling Point No: 100519

Sample ID: 8207138

Date: 03/12/2024

Application rate (t/ha)	250.0
Application rate (t/acre)	101.2
pH	6.6
Dry solids (%)	2.88

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	1.38	0.04	%	0.4	99	0.0	10
Ammonium N	213	6.13	mg/kg	0.0	2		
Phosphorus (P)	1640	47.23	mg/kg	0.0	12		
Phosphate (P ₂ O ₅)		0.00		0.1	27	0.0	5
Potassium (K)	186	5.36	mg/kg	0.0	1		
Potash (K ₂ O)		0.00		0.0	2	0.0	0
Magnesium (Mg)	249	7.17	mg/kg	0.0	2		
Magnesium (MgO)		0.00		0.0	3	0.0	1
Sulphur (S)	4350	125.28	mg/kg	0.1	31		
Sulphur (SO ₃)		0.00		0.3	78	0.0	8

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	44.5	1.28	mg/kg	1.28	0.32	15.00	2%
Copper	13.7	0.39	mg/kg	0.39	0.10	7.50	1%
Nickel	3	0.09	mg/kg	0.09	0.02	3.00	1%
Lead	4.53	0.13	mg/kg	0.13	0.03	15.00	0%
Cadmium	0.33	0.01	mg/kg	0.01	0.00	0.15	2%
Chromium	2.37	0.07	mg/kg	0.07	0.02	15.00	0%
Arsenic	33.3	0.96	mg/kg	0.96	0.24	0.70	34%
Mercury	1.4	0.04	mg/kg	0.04	0.01	0.10	10%
Other Elements							
Iron	16000	460.80	mg/kg	460.80	115		
Aluminium	105000	3024.00	mg/kg	3024.00	756		

Sampling Point No:	100519	Location:	STRATA FLORIDA WTW SLUDGE TANKERING POINT
Date Sampled:	03/12/2024	Time Taken:	12:06
Laboratory:	ALS	Sample ID:	8207138
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results



Code	Result	Units	Qualifier	Lower Limit
238 Magnesium	249	mg/kg		
288 Aluminium	105000	mg/kg		
357 Arsenic	33.3	mg/kg		
4620 pH	6.6	pH		
7774 Mercury	1.4	mg/kg	<	
8241 Volatile solids	58	%		
9233 Ammoniacal nitrogen	213	mg/kg	<	
9234 Sulphur	4350	mg/kg		
9271 Cadmium	0.33	mg/kg	<	
9272 Chromium	2.37	mg/kg	<	
9273 Copper	13.7	mg/kg		
9275 Nickel	3	mg/kg	<	
9276 Lead	4.53	mg/kg	<	
9277 Zinc	44.5	mg/kg		
9278 Iron	16000	mg/kg		
9281 % Dry solids	2.88	%		
9282 % Minerals	42	%		
9283 % K (dry weight)	0.0186	mg/kg		
9284 % P (dry weight)	0.164	%		
9285 % N (dry weight)	1.38	%		

Comments:

Signed:

Approved by:

Position:

Upper Limit

DWR CYMRU WELSH WATER - BONTGOCH WTW

Analysis of liquid water clarification sludge

Sampling Point No: 100521

Sample ID: 8065268

Date: 12/08/2024

Application rate (t/ha)	61.0
Application rate (t/acre)	24.7
pH	6.2
Dry solids (%)	2.87

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	2.31	0.07	%	0.7	40	0.1	4
Ammonium N	43.4	1.25	mg/kg	0.0	0		
Phosphorus (P)	12700	364.49	mg/kg	0.4	22		
Phosphate (P ₂ O ₅)		0.00		0.8	51	0.2	10
Potassium (K)	125	3.59	mg/kg	0.0	0		
Potash (K ₂ O)		0.00		0.0	0	0.0	0
Magnesium (Mg)	1220	35.01	mg/kg	0.0	2		
Magnesium (MgO)		0.00		0.1	4	0.0	1
Sulphur (S)	4410	126.57	mg/kg	0.1	8		
Sulphur (SO ₃)		0.00		0.3	19	0.0	2

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	398	11.42	mg/kg	11.42	0.70	15.00	5%
Copper	17.2	0.49	mg/kg	0.49	0.03	7.50	0%
Nickel	31.9	0.92	mg/kg	0.92	0.06	3.00	2%
Lead	60	1.72	mg/kg	1.72	0.11	15.00	1%
Cadmium	0.46	0.01	mg/kg	0.01	0.00	0.15	1%
Chromium	16.5	0.47	mg/kg	0.47	0.03	15.00	0%
Arsenic	32.8	0.94	mg/kg	0.94	0.06	0.70	8%
Mercury	1.41	0.04	mg/kg	0.04	0.00	0.10	2%
Other Elements							
Iron	477000	13689.90	mg/kg	13689.90	835		
Aluminium	9180	263.47	mg/kg	263.47	16		

DWR CYMRU WELSH WATER - BONTGOCH WTW

Analysis of liquid water clarification sludge

Sampling Point No: 100521

Sample ID: 8065268

Date: 12/08/2024

Application rate (t/ha)	75.0
Application rate (t/acre)	30.4
pH	6.2
Dry solids (%)	2.87

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	2.31	0.07	%	0.7	50	0.1	5
Ammonium N	43.4	1.25	mg/kg	0.0	0		
Phosphorus (P)	12700	364.49	mg/kg	0.4	27		
Phosphate (P ₂ O ₅)		0.00		0.8	63	0.2	13
Potassium (K)	125	3.59	mg/kg	0.0	0		
Potash (K ₂ O)		0.00		0.0	0	0.0	0
Magnesium (Mg)	1220	35.01	mg/kg	0.0	3		
Magnesium (MgO)		0.00		0.1	4	0.0	1
Sulphur (S)	4410	126.57	mg/kg	0.1	9		
Sulphur (SO ₃)		0.00		0.3	24	0.0	2

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	398	11.42	mg/kg	11.42	0.86	15.00	6%
Copper	17.2	0.49	mg/kg	0.49	0.04	7.50	0%
Nickel	31.9	0.92	mg/kg	0.92	0.07	3.00	2%
Lead	60	1.72	mg/kg	1.72	0.13	15.00	1%
Cadmium	0.46	0.01	mg/kg	0.01	0.00	0.15	1%
Chromium	16.5	0.47	mg/kg	0.47	0.04	15.00	0%
Arsenic	32.8	0.94	mg/kg	0.94	0.07	0.70	10%
Mercury	1.41	0.04	mg/kg	0.04	0.00	0.10	3%
Other Elements							
Iron	477000	13689.90	mg/kg	13689.90	1027		
Aluminium	9180	263.47	mg/kg	263.47	20		

DWR CYMRU WELSH WATER - BONTGOCH WTW

Analysis of liquid water clarification sludge

Sampling Point No: 100521

Sample ID: 8065268

Date: 12/08/2024

Application rate (t/ha)	95.0
Application rate (t/acre)	38.4
pH	6.2
Dry solids (%)	2.87

NUTRIENT CONTENT

	Dry Wt result	Wet Wt result	Units	Total		Available	
				(kg/t)	(kg/ha)	(kg/t)	(kg/ha)
Nitrogen (N)	2.31	0.07	%	0.7	63	0.1	6
Ammonium N	43.4	1.25	mg/kg	0.0	0		
Phosphorus (P)	12700	364.49	mg/kg	0.4	35		
Phosphate (P ₂ O ₅)		0.00		0.8	79	0.2	16
Potassium (K)	125	3.59	mg/kg	0.0	0		
Potash (K ₂ O)		0.00		0.0	0	0.0	0
Magnesium (Mg)	1220	35.01	mg/kg	0.0	3		
Magnesium (MgO)		0.00		0.1	6	0.0	1
Sulphur (S)	4410	126.57	mg/kg	0.1	12		
Sulphur (SO ₃)		0.00		0.3	30	0.0	3

POTENTIALLY TOXIC ELEMENTS

	Dry Wt result	Wet Wt result	Units	Rate		Limit	% of Annual Addition Limit
				(g/tonne)	(kg/ha)	(kg/ha/yr)	
Zinc	398	11.42	mg/kg	11.42	1.09	15.00	7%
Copper	17.2	0.49	mg/kg	0.49	0.05	7.50	1%
Nickel	31.9	0.92	mg/kg	0.92	0.09	3.00	3%
Lead	60	1.72	mg/kg	1.72	0.16	15.00	1%
Cadmium	0.46	0.01	mg/kg	0.01	0.00	0.15	1%
Chromium	16.5	0.47	mg/kg	0.47	0.04	15.00	0%
Arsenic	32.8	0.94	mg/kg	0.94	0.09	0.70	13%
Mercury	1.41	0.04	mg/kg	0.04	0.00	0.10	4%
<u>Other Elements</u>							
Iron	477000	13689.90	mg/kg	13689.90	1301		
Aluminium	9180	263.47	mg/kg	263.47	25		

Sampling Point No:	100521	Location:	BONTGOCH WTW SLUDGE TANKERING POINT
Date Sampled:	12/08/2024	Time Taken:	12:12
Laboratory:	ALS	Sample ID:	8065268
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results



Code	Result	Units	Qualifier	Lower Limit
238 Magnesium	1220	mg/kg		
288 Aluminium	9180	mg/kg		
357 Arsenic	32.8	mg/kg		
4620 pH	6.2	pH		
7774 Mercury	1.41	mg/kg	<	
8241 Volatile solids	44.7	%		
9233 Ammoniacal nitrogen	43.4	mg/kg		
9234 Sulphur	4410	mg/kg		
9271 Cadmium	0.46	mg/kg		
9272 Chromium	16.5	mg/kg		
9273 Copper	17.2	mg/kg		
9275 Nickel	31.9	mg/kg		
9276 Lead	60	mg/kg		
9277 Zinc	398	mg/kg		
9278 Iron	477000	mg/kg		
9281 % Dry solids	2.87	%		
9282 % Minerals	55.3	%		
9283 % K (dry weight)	0.0125	mg/kg		
9284 % P (dry weight)	1.27	%		
9285 % N (dry weight)	2.31	%		

Comments:

Signed:

Approved by:

Position:

Upper Limit
