

Permit Reference Number : EPR/BV5386IX Operator : GS Yuasa Battery Manufacturing UK Ltd Installation : GS Yuasa Battery Manufacturing UK Ltd

Form Number : MR1 Reporting of Mass Emissions to Sewer for the period from ...1 January 2017 to...31 December 2017

Emission Point	Substance / Parameter	Emission Limit Value	Result (1)	Annual mass (2)
S1 and S2	Mercury and its compounds	0.005 mg/l	<0.00010mg/l	
S1 and S2	Mercury and its compounds	0.9 g		0.0001104 g/m ³
S1 and S2	Cadmium and its compounds	0.01 mg/l	<0.0006mg/l	
S1 and S2	Cadmium and its compounds	0.3 g		0.0006647 g/m ³

[1] The result is given as a mass balance calculation, definition as given in condition 6.1.1

[2] The Annual Mass is given as a mass balance calculation, definition as given in condition 6.1.1

Signed Date 5/2/18
(authorised to sign as representative of the Operator)

Form Number : R1 Reporting of Waste Disposal for the year 2017

Waste Disposal & Recovery			
Waste Description	Disposal Route	Tonnes	Recovery Tonnes
1) Hazardous Wastes			
Lead and lead oxide waste	H.J.Enthoven	1284.0	1284.0
Other hazardous waste	See below	120.312	14.753
Total hazardous waste		1404.312	1298.753
2) Non-Hazardous Wastes			
Total non-hazardous waste	See below	240.796	142.99
		240.796	142.99
TOTAL WASTE	-	1645.108	1441.743

Trends in Waste Disposal and Recovery				
Year	Parameter	Total Waste		
	Hazardous waste	Tonnes		
	Tonnes	per unit output ⁽¹⁾	Tonnes	per unit output ⁽¹⁾
2009	1054.98	0.0727888	1362.11	0.0939794
2010	1344.89	0.0824059	1691.32	0.1036328
2011	1250.885	0.0719975	1542.276	0.0887692
2012	686.0394	0.0429621	923.3654	0.0578243
2013	1053.352	0.0542732	1264.863	0.0651712
2014	1054.71	0.0653937	1260.908	0.0781783
2015	1088.849	0.0649330	1249.611	0.0745200
2016	1116.079	0.0649365	1276.536	0.0742724
2017	1404.312	0.0794441	1645.108	0.0930663

⁽¹⁾ Waste per unit output should be quoted in units of waste produced from battery process / tonnes of battery produced per year.

Operator's comments :

A review of waste has again been undertaken throughout 2017 to ensure improved accuracy of the figures reported.

The main reason for the increase over the previous year relates to the amount of Lead plates, cells and off-cuts which couldn't be recycled due to the stock levels accumulated on site, therefore, they had to be returned to the smelter. In addition, there has been an increase in the amount of wood due to changes made to the packaging arrangements of a major component which are now supplied on single-use wooden pallets.

Returnable packaging materials were also included in 2016, therefore, the performance indicators should settle over the next year or so. Waste will continue to be targeted for improvement in 2018.

Due to the expansion and improved categorisation of wastes, the list is unable to be written here so is appended to this report along with a detailed waste analysis between 2016/17.

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Permit Reference Number : EPR/BV5386IX Operator : GS Yuasa Battery Manufacturing UK Ltd Installation : GS Yuasa Battery Manufacturing UK Ltd

Form Number : WU1 Reporting of Water Usage for the year ...2017.....

Water Usage		
Water Source	Annual Usage (m ³)	Water per unit output ^[1] (m ³ /t)
Abstraction Borehole	69021.0m ³	
Mains water	7689.0m ³	
Recycled Effluent	21270.0m ³	
TOTAL WATER USAGE	97980.0m³	5.5428841

Trends in Water Usage		
Year	Parameter	Water per unit output ^[1]
2012	Total Water usage	5.9856768
2013		
2014		
2015		
2016		
2017		

[1] Water per unit output should be quoted in units of total water use / tonnes of battery produced per year.

Operator's comments :

Abstracted water:-

Borehole A = 53305m³ , Borehole B = 15716m³ , Total = 69,021m³

Total water consumption has increased in 2017, however, the amount recycled has also increased by 2,164 m³.
Total water has been listed for improvement in 2018.

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Form Number : E1 Reporting of Energy Usage for the year ...2017.....

Energy Usage			
Energy Source	Energy Usage		CO ₂ Produced (tonnes)
	Quantity	Primary Energy (MWh)	
Electricity *	20858.762 MWh	50061.028	7956.783
Natural Gas	6196.690 MWh	6196.690	1139.014
TOTAL	27055.452 MWh	56257.718	9095.797

* Conversion factor for delivered electricity to primary energy = 2.4

[1] CO₂ per unit output should be quoted in units of total CO₂ produced / tonnes of battery produced per year.

Operator's comments :

I would add that CO₂ emissions are calculated using the DECC CO₂ emission factors, including transmission and distribution emissions. Primary energy has continued to be calculated using the 2.4 conversion factor above.

Energy efficiency continues to be an objective and target for continued improvement.

Trends in Energy Usage			
Year	Parameter	CO ₂ produced	CO ₂ per unit output [1]
2014	Primary Energy usage	50154.654	0.5259158
2015	Primary Energy usage	51490.111	0.5188205
2016	Primary Energy usage	52442.174	0.5669703
2016	Primary Energy usage	52442.174	0.5669703
2017	Primary Energy usage	56257.718	0.5145636

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Annual Production/Treatment	
Production of batteries produced per year	17676.718 tonnes

Environmental Performance Indicators

Performance Indicators			Trends in Environmental Performance		
Parameter (1)	Annual Mass	Units	Year	Parameter (1)	
COD	0.1018004	kg/tonne	2010	0.0719370	0.0031003
Mass of lead released from A1 - A7 and A9 - A26	0.0027847	kg/tonne	2011	0.0878032	0.0040374
			2012	0.1057535	0.0037291
Mass of lead released to sewer	0.0081119	kg/tonne	2013	0.0610321	0.0043773
			2014	0.1252405	0.0048269
			2015	0.1387867	0.0051848
			2016	0.0687224	0.0028735
			2017	0.1018004	0.0027847

[1] Performance indicators should be quoted in units of parameter / tonnes of battery produced per year

Operator's comments:

COD mass to sewer = 1799.4985 kg/year / 17676.718 tonnes of battery produced = 0.1018004 kg/tonne.

Lead mass from stacks = 49.226 kg/year / 17676.718 tonnes of battery produced = 0.0027847 kg/tonne.

Lead mass to sewer = 143.3911 kg/year / 17676.718 tonnes of battery produced = 0.0081119 kg/tonne.

COD:- I would add that the annual COD release has been calculated from the average of the maximum monthly figures recorded from both Dwr Cymru and GS Yuasa quarterly samples. Samples were taken in each month of January to December inclusive for factory No. 2 (S1) and February, March, May, June, August, September, October, and November for factory No.4 (S2).

Stacks:- In 2017, there has been a slight decrease in the Lead mass from stacks against 2016, but is broadly very similar.

Stack operational hours have increased due to production requirements, however, the Lead recycling plant in factory No.2 did not operate in 2017.

As in previous years, all LEV systems continue to be shut-down at break times.

Sewer:- The annual Lead release for S1 has been calculated from the average of the maximum monthly GS Yuasa figures recorded for each month of 2017, and for S2, has been calculated from the maximum monthly GS Yuasa figures recorded in February, March, May, June, August, September, October and November 2017.

Total Lead to sewer has increased in 2017 which is mainly due to an increase in the total volume of trade effluent discharged as it includes the processing of a greater volume of rain water than in 2016 and also continuous flushing of two curing ovens to prevent the formation of bacteria in the water systems.

COD and Lead in trade effluent will be targeted for improvement in 2018.

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