

Notice of variation with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

United Utilities Water Limited
Davyhulme Wastewater Treatment Works
Rivers Lane
Urmston
Manchester
M41 7JB

Variation application number

EPR/HP3931LJ/V009

Permit number

EPR/HP3931LJ

Davyhulme Wastewater Treatment Works

Permit number EPR/HP3931LJ

Introductory note

This introductory note does not form a part of the notice

The following notice gives notice of the variation of an environmental permit.

This variation authorises the installation of a biogas upgrading plant (BUP) at the Davyhulme Wastewater Treatment Works. Installation of the BUP will reduce the amount of biogas being sent to the standby flare for combustion. The excess biogas produced will be upgraded via BUP to meet the quality protocol for biomethane and will be injected into the mains gas distribution network. The BUP will carry out the following functions: biogas pre-cleaning, carbon dioxide removal, biomethane quality monitoring, injection into the gas grid and odour control. This variation will add the following new plant items: biogas dehumidification, gas boosters, carbon filters, biomethane plant, including carbon dioxide removal, propane storage, gas to grid and quality station, dedicated stand-by flare and a two stage odour control unit.

The biogas upgrading operation will start from removing the moisture from the gas by cooling the gas in the dehumidifier. The dry biogas will be pre-cleaned by a carbon filter to remove trace components including siloxanes, long chain organic compounds, etc. Following pre-treatment, the biogas will be upgraded by the removal of CO₂ using a high pressure water scrubber. The CO₂ will be desorbed from the water, which will be re-circulated, with the exhaust gas passing to the odour control unit prior to discharge to air. After the upgrading stage, the biogas will comprise of 97-98% methane with the remaining constituents being CO₂, N₂ and trace quantities of O₂. The gas quality will be checked and if required propane will be added to increase the calorific value prior to injection into the gas distribution network.

There will be two additional point source emissions to air from the biogas upgrading plant – the flare and the odour control unit. There are no direct emissions to surface water. The condensate produced during the biogas upgrading operation will be sent to adjacent wastewater treatment works for further treatment before being discharged. This condensate will contribute a very small proportion of the material treated by WwTW (less than 0.006%).

Odour from the BUP will be controlled and mitigated by the use of the odour control unit (OCU). The OCU will treat the exhaust gases (primarily CO₂ and H₂S) produced during the biogas upgrading stage with a biological odour treatment system and a final activated polishing filter. The biological odour treatment system comprises the bioscrubber with a bed of pumice stone supporting microorganisms. The system is designed to remove the 98% of H₂S via bioscrubber. The gas will then be passed through to the final polishing activated carbon filter to further reduce H₂S. The treated exhaust gas will be released to the atmosphere via a 3-metre high stack.

The operator has assessed the emissions from the biogas upgrading plant. The Environment Agency considers that emissions from the BUP will not have a significant impact on the environment and human health.

The schedules specify the changes made to the original permit.

The status log of a permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	Date	Comments
Application SP3931LL (EPR/SP3931LJ/A001)	Duly made 30/06/06	
Request for further information	23/08/06 – 04/09/07	22/09/06 – 15/10/07

Status log of the permit		
Description	Date	Comments
Additional information received	09/02/07 – 24/10/07	
Permit HP3931LJ determined (EPR/HP3931LJ)	24/10/07	
Application for Variation LP3839GF	Duly made 19/11/08	
Additional information received	Notice served 03/12/08	29/12/08
Variation EPR/HP3931LJ/V002	Issued 26/02/09	
Application for variation EPR/HP3931LJ/V003	Duly made 11/03/09	
Request for further information via e-mail	12/05/09	21/05/09, 25/08/09
Variation notice EPR/HP3931LJ/V003	Issued 15/10/09	
Variation application EPR/HP3931LJ/V004	31/12/09	
Additional information	29/04/10	28/05/10
Variation notice EPR/HP3931LJ/V004	Issued 02/07/10	
Further information Schedule 5	17/02/11	25/03/11
Additional information received	01/12/11 Document No 16666-51-A-00000-22 166661-88-A-00002-20 166661-51-A-00000-29	
Variation notice EPR/HP3931LJ/V005	Issued 01/03/12	
Variation Application EPR/HP3931LJ/V006	Duly made 12/07/12	
Variation notice EPR/HP3931LJ/V006	Issued 08/08/12	
Agency variation determined EPR/HP3931LJ/V007	19/06/13	Agency variation to implement the changes introduced by IED.
Notified of change of company name	10/11/14	Name changed to United Utilities Water Limited.
Variation issued EPR/HP3931LJ/V008	13/01/15	Varied permit issued to United Utilities Water Limited.
Variation application EPR/HP3931LJ/V009	Duly made 02/10/15	Variation to add a biogas upgrading plant.
Variation determined EPR/HP3931LJ (Billing ref. MP3036AK)	15/01/16	Varied permit issued.

Other Part A installation permits relating to this installation		
Operator	Permit number	Date of issue
United Utilities Water Limited	XP3533HX	04/10/10

End of introductory note

Notice of variation

The Environmental Permitting (England and Wales) Regulations 2010

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2010 varies

Permit number

EPR/HP3931LJ

Issued to

United Utilities Water Limited (“the operator”)

whose registered office is

Haweswater House

Lingley Mere Business Park

Lingley Green Avenue

Great Sankey

Warrington

WA5 3LP

company registration number 02366678

to operate a regulated facility at

Davyhulme Wastewater Treatment Works

Rivers Lane

Urmston

Manchester

M41 7JB

to the extent set out in the schedules.

The notice shall take effect from 15/01/2016.

Name	Date
Claire Roberts	15/01/2016

Authorised on behalf of the Environment Agency

Schedule 1 – conditions to be deleted

None

Schedule 2 – conditions to be amended

The following conditions are amended as a result of the application made by the operator

- Table S1.1, as referenced in conditions 2.1.1 and 2.3.3 is amended to reflect the addition of the biogas upgrading plant including odour control unit and flare The table now reads:

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
A1	S5.4 Part A(1) a) (ii) Disposal of non hazardous waste in a facility with a capacity of more than 50 tonnes per day involving physico-chemical treatment	D9: Physical and chemical treatment of sludge for the purpose of disposal	From receipt of the waste to the transfer to storage including treatment of the waste which is limited to the following plant:- 5 Sludge Strain Presses; 4 Gravity Belt Thickeners; 3 Sludge Screening; 6 Sludge Dewatering (centrifuges); DAF Plant Thermal Hydrolysis (4 no. pulper vessels, 20 no. reactor vessels, 4 no. flash tanks)
A2	Section 5.4 A(1) a) (i) Disposal of non hazardous waste in a facility with a capacity of more than 50 tonnes per day involving biological treatment.	D8: Biological treatment (anaerobic digestion) of sludge for the purpose of disposal	From receipt of the waste to the transfer to storage, including the digestion of the waste which is limited to the following plant:- 8 Primary digesters; 12 Secondary digesters Waste types and quantities as specified in Table S3.3
Directly Associated Activity			
A3	Gas Combustion	The combustion of fuel (biogas) for the purpose of generating electricity and heat for use within the installation	From the receipt and storage of Biogas to the delivery of heat to the digesters and electricity to the Wastewater Treatment Works and National Grid. The combustion units are limited to 5 CHP engines and 3 dual fuel boilers with a combined thermal input (gross) of approximately 45MW. The combined number of engines/boilers running at any one time are limited to the assessment scenario of 4 gas engines

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity and WFD Annex I and II operations	Limits of specified activity and waste types
			and one boiler (or equivalent thereof) and therefore cannot produce more than 4.815grams/second NO ₂ (ref Table 2.4 Air Modelling Report November 2011)
A4	Siloxane unit	Siloxane removal system	Filtration of siloxane compounds from biogas and associated filter regeneration
A5	Storage of Waste	Cake import and export handling facility	Storage of cake before and after treatment prior to dispatch off site.
A6	Degassing Tank	Degassing	Remove excess CO ₂ and minimise residual anaerobic activity in downstream pipes.
A7	Combustion of standby gas oil	Burning of gas oil (standby fuel) for use in the 3 dual fuel boilers	From receipt of gas oil, to combustion of fuel and delivery of heat to the digesters. Gas oil is only to be used where there is either: <ul style="list-style-type: none"> • Insufficient biogas available for use • Poor quality biogas being produced; or • Operational malfunction which prevents biogas usage
A8	Gas Flares (3 in number)	Flaring of bio-gas	From receipt of gas at flare, to combustion of gas and discharge of combustion products. Biogas only to be flared where it is unable to be used for the production of heat and energy.
A9	Odour abatement plants (4 in number)	Abatement of odour emissions to air	From receipt of odours from Gravity Belt Thickeners and sludge storage and processing equipment and biogas upgrading plant, to emissions to air.
A10	Biogas upgrading plant	Upgrading of biogas to biomethane (including the removal of moisture and other substances such as carbon dioxide, hydrogen sulphide, volatile organic compounds) for injection into the National Grid.	From the receipt of biogas produced at the on-site anaerobic digestion process to injection into the National Grid. This includes return of off-specification biogas for combustion to the on-site CHP engines and/or standby flare.

- Table S1.2, as referenced in conditions 2.3.1, 3.4.2 and 3.4.3 is amended to:

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application	The response to section 2.1, excluding 2.1.3 and 2.1.5, and 2.2 in the Application but excluding 2.1.2, 2.1.18, 2.2.10, 2.2.12, 2.2.13-2.2.15, 2.2.24, 2.2.27-2.2.37, 2.10.22 and 2.10.28	30/06/06
Letter from Amanda Molyneux of United Utilities Water PLC dated 22/09/06. RE: Agency letter dated 23/08/06	Answers 1,2, 3, 5, 6, 10, 11 and 12	26/09/06
Letter from Amanda Molyneux of United Utilities Water PLC dated 22/09/06. RE: Agency letter dated 08/09/06	Answers 7, 8, 13 and Davyhulme answers 1, 2, 3 and 4	26/09/06
Letter from Amanda Molyneux of United Utilities Water PLC dated 29 September 2006	Answers for Davyhulme only 1, 2, 3, 4, 5 and 6	29/09/06
Email from Amanda Molyneux dated 29/09/09	Response for Davyhulme only	29/09/09
Letter from Amanda Molyneux of United Utilities Water PLC dated 28 September 2006	Answers to Davyhulme only	26/10/06
Letter from Amanda Molyneux of United Utilities Water PLC dated 16 October 2006	Answers 1 and 3 only	16/10/06
Letter from Amanda Molyneux of United Utilities Water PLC dated 25 October 2006	Responses to parts 1-8 and the response to Davyhulme only	25/10/06
Email from Amanda Molyneux of United Utilities Water PLC dated 26 October 2006	All	26/10/06
Letter from Amanda Molyneux of United Utilities Water PLC dated 24 November 2006	All	24/11/06
Letter from Amanda Molyneux of United Utilities Water PLC dated 6 December 2006	Actions 1-3, 5 and 7 for Davyhulme only	06/12/06
Email from Amanda Molyneux of United	Answers for Davyhulme only	11/12/06

Table S1.2 Operating techniques		
Description	Parts	Date Received
Utilities Water PLC dated 11 December 2006		
Email from Amanda Molyneux of United Utilities Water PLC dated 02 January 2007	Answers relating to Davyhulme only	02/01/07
Variation Application	All of section B2 in variation application – techniques	17/11/08
Response to notice requesting further information dated 23.12.08	All parts	29/12/08
Response to e mail 13.1.09	All parts	29/01/09
Variation application EPR/HP3931LJ/v003	All of Part C variation application	11/03/09
Request for additional information – email to Lynda Fellows on the 12/05/09	All	21/05/09 & 25/08/09
Variation application EPR/HP3931LJ/V004	All of Part C variation application	31/12/09
Additional information Requested 29/4/2010	All	28/05/10
Application	Sections 3, 3a, and 3b of the application document in response to section 3 – operating techniques , Part C of the application form	30/06/10
Response to Schedule 5 Notice dated 17/02/11	All Parts	25/03/11
Application for variation EPR/HP3931LJ/V006	Parts C2 and C3 (and the supplementary information supplied with these parts), and the responses to requests for further information (dated 19/06/12 and 02/07/12).	28/05/12 19/06/12, and 12/07/12
Variation application EPR/HP3931LJ/V009	Parts C2 and C3 (and the supplementary information supplied with these parts - Environmental Permit Application Final Report 15384i1).	04/08/15
Variation application EPR/HP3931LJ/V009	Response to request for further information – all sections including Odour Management Plan Issue 8 September 2015.	02/10/15

- Table S4.1, as referenced in conditions 3.1.1, 3.6.1 and 3.6.4 is amended to:

Table S4.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method (see Note 1)
A2 CHP Engine exhaust stack	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	Bio-gas engine	650mg/m ³	4 Hourly average*	Quarterly	BS EN 14792
A2 CHP Engine exhaust stack	CO	Bio-gas engine	1,500mg/m ³	Hourly average	Annually	BS EN 15058
A2 CHP Engine exhaust stack	Total VOC's	Bio-gas engine	1,750mg/m ³	Hourly average	Annually	BS EN 12619 or BS EN 13526 dependant upon concentration
A2 CHP Engine exhaust stack	NMVOC	Bio-gas engine	150mg/m ³	Hourly average	Annually	BS EN 13649:2002
A3 CHP Engine exhaust stack	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	Bio-gas engine	650mg/m ³	4 Hourly average*	Quarterly	BS EN 14792
A3 CHP Engine exhaust stack	CO	Bio-gas engine	1,500mg/m ³	Hourly average	Annually	BS EN 15058
A3 CHP Engine exhaust stack	Total VOC's	Bio-gas engine	1,750mg/m ³	Hourly average	Annually	BS EN 12619 or BS EN 13526 dependant upon concentration
A3 CHP Engine exhaust stack	NMVOC	Bio-gas engine	150mg/m ³	Hourly average	Annually	BS EN 13649:2002
A4 CHP Engine exhaust stack	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	Bio-gas engine	650mg/m ³	4 Hourly average*	Quarterly	BS EN 14792
A4 CHP Engine exhaust stack	CO	Bio-gas engine	1,500mg/m ³	Hourly average	Annually	BS EN 15058
A4 CHP Engine exhaust stack	Total VOC's	Bio-gas engine	1,750mg/m ³	Hourly average	Annually	BS EN 12619 or BS EN 13526 dependant upon concentration
A4 CHP Engine exhaust stack	NMVOC	Bio-gas engine	150mg/m ³	Hourly average	Annually	BS EN 13649:2002
A21 CHP Engine exhaust stack	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	Bio-gas engine	500mg/m ³	4 Hourly average*	Quarterly	BS EN 14792
A21 CHP Engine exhaust stack	CO	Bio-gas engine	1,400mg/m ³	Hourly average	Annually	BS EN 15058
A21 CHP Engine exhaust stack	Total VOC's	Bio-gas engine	1,000mg/m ³	Hourly average	Annually	BS EN 12619 or BS EN 13526 dependant upon concentration

Table S4.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method (see Note 1)
A21 CHP Engine exhaust stack	NM VOC	Bio-gas engine	75mg/m ³	Hourly average	Annually	BS EN 13649:2002
A22 CHP Engine exhaust stack	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	Bio-gas engine	500mg/m ³	4 Hourly average*	Quarterly	BS EN 14792
A22 CHP Engine exhaust stack	CO	Bio-gas engine	1,400mg/m ³	Hourly average	Annually	BS EN 15058
A22 CHP Engine exhaust stack	Total VOC's	Bio-gas engine	1,000mg/m ³	Hourly average	Annually	BS EN 12619 or BS EN 13526 dependant upon concentration
A22 CHP Engine exhaust stack	NM VOC	Bio-gas engine	75mg/m ³	Hourly average	Annually	BS EN 13649:2002
A23 Composite Boiler Exhaust Stack	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 14792
A23 Composite Boiler Exhaust Stack	CO	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 15058
A23 Composite Boiler Exhaust Stack	Total VOC	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 12619 or BS EN 13526 dependant upon concentration
A23 Composite Boiler Exhaust Stack	NM VOC	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 13649:2002
A24 Composite Boiler Exhaust Stack	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 14792
A24 Composite Boiler Exhaust Stack	CO	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 15058
A24 Composite Boiler Exhaust Stack	Total VOC	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 12619 or BS EN 13526 dependant upon concentration
A24 Composite Boiler Exhaust Stack	NM VOC	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 13649:2002
A25 Composite Boiler Exhaust Stack	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 14792
A25 Composite Boiler Exhaust Stack	CO	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 15058
A25 Composite Boiler Exhaust Stack	Total VOC	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 12619 or BS EN 13526 dependant upon concentration

Table S4.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method (see Note 1)
A25 Composite Boiler Exhaust Stack	NMVOC	Dual Fuel Boiler	No limit	Hourly average	Annually	BS EN 13649:2002
A26 Siloxane Removal System Vent Air Burner Exhaust Stack	H2S	Siloxane unit	To be agreed with Agency	To be agreed with Agency	To be agreed with Agency	To be agreed with Agency
A26 Siloxane Removal System Vent Air Burner Exhaust Stack	NMVOC	Siloxane unit	To be agreed with Agency	To be agreed with Agency	To be agreed with Agency	To be agreed with Agency
A26 Siloxane Removal System Vent Air Burner Exhaust Stack	Total VOC	Siloxane unit	To be agreed with Agency	To be agreed with Agency	To be agreed with Agency	To be agreed with Agency
A27 Flare Stack	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)		No limit	-	-	-
A27 Flare Stack	CO		No limit	-	-	-
A27 Flare Stack	SO ₂		No limit	-	-	-
A27 Flare Stack	NMVOC		No limit	-	-	-
A27 Flare Stack	Total VOC		No limit	-	-	-
A27B Flare Stack	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂)		No limit	-	-	-
A27B Flare Stack	CO		No limit	-	-	-
A27B Flare Stack	SO ₂		No limit	-	-	-
A27B Flare Stack	NMVOC		No limit	-	-	-
A27B Flare Stack	Total VOC		No limit	-	-	-
A28 Gasholder	No parameters set	PRV	No limit	-	-	-
A29 Gasholder	No parameters set	PRV	No limit	-	-	-
A30-A57 Thermal Hydrolysis vessel	No parameters set	PRV's	No limit	-	-	-
A58 Biogas upgrading plant as shown on the site plan Fig 3.1 in the application EPR/HP3931LJ/V009	Oxides of Nitrogen (NO and NO ₂ expressed as NO ₂) CO Total VOCs	Flare	No limit set	-	[note1]	-

Table S4.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method (see Note 1)
A59 Biogas upgrading plant as shown on the site plan Fig 3.1 in the application EPR/HP3931LJ/V009	No parameter set	Odour control unit stack	No limit set	-	[note 2]	-
O1 – as detailed on figure 6 of the application, issue C (dated 08/04/07)	No parameters set	General odour control unit (wet scrubber)	No limit set	-	-	-
O2 – as detailed on figure 6 of the application, issue C (dated 08/04/07)	No parameters set	General odour control unit (dry scrubber)	No limit set	-	-	-
O3t – as detailed on the plan submitted by email in response to request for further info dated 02/07/12	No parameters set	Temporary odour control unit (catalytic iron filter and carbon filter)	No limit set	-	-	-
<p>Note 1 - Monitoring to be undertaken 12 months after commissioning of the standby flare. Following commissioning, monitoring to be undertaken in the event the standby flare has been operational for more than 10 per cent of a year (876 hours).</p> <p>Note 2 – see improvement conditions 1 and 2</p>						

Schedule 3 – conditions to be added

The following conditions are added as a result of the application made by the operator:

- Improvement Conditions IP1 and IP2 are added to Table S1.3 which requires a monitoring study and submission of an impact assessment of emissions from the biogas upgrading plant. Table S1.3 now reads as follows:

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IP1 – IP16	Improvement conditions IP1-IP16 from the original permit EPR/HP3931LJ are completed.	Completed
IP1 – IP5	Improvement conditions IP1-IP5 from the variation EPR/HP3931LJ/V005 are completed.	Completed
IP1	<p>The operator shall carry out a monitoring study to verify the assumptions made in the application in relation to the releases of pollutants to air. The study shall include the monitoring of point source releases to air from the biogas upgrading plant emission point A59 during normal operation, having regard to the Environment Agency technical guidance M2 and to MCERTS standards. As a minimum, two separate monitoring campaigns in a year shall be completed (one monitoring survey six months following commencement of the upgrading plant).</p> <p>The pollutants to be monitored shall include:</p>	30/06/17 or as otherwise agreed with the Environment Agency

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	<ul style="list-style-type: none"> • total volatile organic compounds; and • hydrogen sulphide 	
IP2	<p>Following the completion of IP1, the operator shall undertake an environmental impact assessment of point source releases to air from the biogas upgrading plant, using the information obtained through the emissions monitoring. The environmental impact assessment report and all associated monitoring reports and assessments shall be submitted in writing to the Environment Agency for review.</p> <p>The environmental impact assessment shall include:</p> <ul style="list-style-type: none"> • reports showing details of the monitoring undertaken and the results obtained; • results of the assessment of long and short term impacts from the emissions in accordance with Environment Agency Guidance Note H1, Annex F – Air emissions • a completed H1 assessment software tool <p>If the H1 assessment shows potential long or short term impacts from the emissions, the operator shall propose an action plan to reduce the impacts of the substances identified.</p>	31/07/17 or as otherwise agreed with the Environment Agency