Environment Agency permitting decisions

Variation

We have decided to issue the variation for Melton Ross Lime Works operated by Singleton Birch Limited.

The variation number is EPR/BL8805IZ/V007

This variation was duly made on 18/08/14.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

This variation authorises the following changes to the Permit:

- A sixth combined heat and power (CHP) combustion unit is added for the use of resultant biogas from the anaerobic digestion (AD) plant, emission point A14.
- A digestate drier is added to dry AD digestate into a higher value fertiliser. The capacity of the drying plant is approximately 6,000m^3 of liquid per year. The thermal input to the plant will be 900kWT, supplied from waste heat from the six CHP engines. The drier has four emission points to air A20-A23. The resulting exhaust gases will pass through a wet sulphuric acid scrubber to reduce odour and dust emissions.
- The addition of a bunded 60m^3 heated glycerol tank
- The addition of a bunded 60m^3 slurry tank, fitted with a carbon filter on the air displacement vent to minimise odour.
- Purpose grown crops are added to the raw materials table S2.1 for use in the anaerobic digestion plant.

Structure of this document

- Key issues
- Annex 1 the decision checklist

Key issues of the decision

The key issues associated with this variation are:

- Odour associated with the digestate drier and slurry tank
- Noise emissions associated with the additional CHP unit and the new digestate drier
- Emissions to air associated with the additional CHP unit and the digestate drier
- Bunding and emergency controls for the new glycerol and slurry tank.

Sixth Gas Engine
The sixth gas engine is identical to the current five added within the last variation dated 12/05/14. The additional engine will bring the AD plant up to 1590kW thermal input, and electrical generating up to 1497kWe. The addition of the sixth gas engine will ensure the operator can use all the bio-gas available and maximise electricity production. See the emissions to air section for further information.

Digestate Drier
The drying plant will treat the digestate to make it into a higher value fertiliser. The process involves drying the digestate over a moving double belt with hot air to evaporate the moisture content. The resultant exhaust gases will pass through a wet scrubber of sulphuric acid to reduce odour, ammonia and dust. The by-product of the scrubbing processes is liquid ammonium sulphate, which can be used as a fertiliser. The capacity of the plant is 6,000m^3 per year. The thermal input to the plant will be 900kWT, supplied from the waste heat from the six CHP engines.

The dried digestate will be easier for transport, handling and storage, the drying process will reduce the number of vehicle movements by reducing the water content of the digestate. The drier has four exhausts, see the emissions to air section for considerations of particulates and ammonia.

Odour
There is no history of odour complaints associated with the site. The new drier and slurry tank are new potential odour sources associated with this variation. The operator has provided a revision to the odour management plan which includes the slurry tank and drier.

Drier
The resultant exhaust gases from drying the digestate will pass through a wet scrubber of sulphuric acid to reduce odour, ammonia and dust. The by-product of the scrubbing processes is liquid ammonium sulphate which can have a slight ammonia odour. The operator has visited similar driers in operation and no odour was identified.

Slurry Tank
The slurry tank air vent (A25) will be fitted with a carbon filter. The vent will only release air from displacement from filling the slurry tank.

Conclusion
The operator has proposed that the odour will be monitored at the site boundary each working day. The attachment of carbon filters on the slurry tank vent and the odour controls proposed for the drier we believe are suitable and appropriate. We do not believe there is a significant risk of odour from the new drier and slurry tank.

Noise
There is no history of noise complaints at the site. The operator has identified the new potential noise sources following this variation to be:-

- One additional CHP unit
- Installation of a new digestate drier

Sixth CHP
The 6th CHP unit will be identical to the current 5 located at the site, situated within an acoustic enclosure achieving 62dB(A) at 10 meters. 6 units at 62dB(A) equates to a noise rating of 69dB(A), which is approximately a one decibel increase from 5 units. The nearest sensitive receptor for the CHP engines is 600 meters away. We agree that the likelihood of a one decibel increase would not be noticeable at the nearest sensitive receptors.

Drier
By addition of all the component noise parts of the drier the calculated noise level equates to 69dB(A) at 1m. The drier is to be located adjacent to the six CHP units, of which will also have a combined calculated noise level of 69dB(A). The nearest residential receptor is 600m, using the rule of a 6dB reduction in sound for each doubling of distance at this distance the noise levels would be reduced to below 40dB(A) at the nearest residential receptor.

Conclusion
Given the location and predicted noise levels of the Drier and CHP units, the relatively high background noise from the existing lime manufacturing process, proximity of the sensitive receptors and history of no previous complaints we consider the appropriate mitigating methods have been identified by the operator and conclude that noise complaints are unlikely from the installation of the sixth CHP unit and drier.

Emissions to air (H1 risk assessment)

Sixth CHP Unit (Nitrogen Dioxide, Carbon Monoxide and Sulphur Dioxide)

The operator has completed a H1 risk assessment for the emission to air from the six CHP units. Six stacks for combustion of biogas were screened for nitrogen dioxide, carbon monoxide and sulphur dioxide using H1. The table below shows the result of the H1 assessment.

Substance	Short Term			Long Term		
	EAL µg/l	PC µg/l	% of EAL	EAL µg/l	PC µg/l	% of EAL
Nitrogen Dioxide	200	55.9	**28%**	40	6.05	**15.2%**
Carbon Monoxide	10,000	366	3.66%	-	-	-
Sulphur Dioxide	350	4.17	1.20%	-	-	-

Our guidance document H1 Annex F states that process contributions can be considered insignificant if:

- the long term process contribution is <1 percent of the long term environmental standard
- the short term process contributions is <10 percent of the short term environmental standard.

Using the guidance both carbon monoxide and sulphur dioxide screen out as an insignificant emission to air from the combustion of biogas generated from the anaerobic digestion process.

Nitrogen dioxide does not screen out as insignificant for short or long term process contributions against the relevant standards. However taking the existing background concentration of 19 ug/m^3 (Defra, 2012) for nitrogen dioxide into account and the conservative nature of H1 we are confident that there is sufficient headroom such that there will not will not be any breach of the relevant air quality standard for long term nitrogen dioxide.

Digestate Drier (Ammonia and Particulates)

The operator has completed a H1 risk assessment for the emission to air from the new digestate drier. Four stacks were screened for Ammonia and Particulates (PM_{10}) using H1. The table below shows the result of the H1 assessment.

Substance	Short Term			Long Term		
	EAL µg/l	PC µg/l	% of EAL	EAL µg/l	PC µg/l	% of EAL
Ammonia	2,500	577	**23.1%**	180	17.8	**9.87%**
Particulates (PM_{10})	-	-	-	40	2.07	**5.16%**

Using the guidance both Ammonia and Particulates (PM_{10}) do not screen out as insignificant process contributions against the relevant standards.

Taking the existing background concentration of 20.89 ug/m^3 (Defra, 2012) for Particulates (PM_{10}) and 2.7ug/m^3 (Apis, 2010-12) for Ammonia into account and the conservative nature of H1 we are confident that there is sufficient headroom such that there will not will not be any breach of the relevant air quality standard for either short or long term particulate or ammonia emissions.

Habitats

Sixth CHP Unit (Nitrogen Dioxide, Carbon Monoxide and Sulphur Dioxide)
The combined total of the six CHP combustion processes is 1.5MW thermal input. Our guidance document 'AQTAG014: Guidance on identifying '*relevance'* for assessment under the Habitats Regulations for installations with combustion processes' states that combustion processes less than 5MW do not need assessment irrelevant of the distance from a European site due to the size of the combustion process.

The combustion process at the PPC installation is not considered '*relevant'* for assessment under the Agency's procedures which cover the Conservation (Natural Habitats &c.) Regulations 1994 (Habitats Regulations). This was determined by referring to the Agency's guidance 'AQTAG014: Guidance on identifying '*relevance'* for assessment under the Habitats Regulations for installations with combustion processes.' Thus no detailed assessment of the effect of the releases from this installation is required.

We have adopted the emission limits to air from the standard rules permit SR 2012 No.12. We are confident the CHP engine performance burning biogas can achieve these standards for Oxides of Nitrogen, Carbon Monoxide, Volatile Organic Carbons and Sulphur Dioxide.

Drier - Ammonia Assesssment - SSSIs
There is a Site of Special Scientific Interest (SSSI), Kirmington Pits located approximately 1.5km from the site. This site is only designated for its geological features and therefore not relevant for this assessment.

Drier - Ammonia Assessment - LWSs
Three Local Wildlife Sites (LWS) are located within 2,000m of the installation: Melton Ross Quarry, Melton Ross Road Verges and New Barnetby Road Verges. The closest site is Melton Ross Quarry located approximately 150m from the site stacks, we have modelled this site only as worse case.

Site	**Critical level ammonia µg/m^3**	**Predicted PC µg/m^3**	**PC % of critical level**
Melton Ross Quarry	3[1]	0.21	7%

[Note1:] CLe 3 applied as no protected lichen or bryophytes species were found when checking easimap

The predicted process contribution on the LWS for ammonia from the application site are under the 100% significance threshold and can be screened out as having no likely significant effect.

Bunding and Emergency Controls

The glycerol tank will be heated and lagged with heat traced piping to allow free pumping into the digestate tank. The tank has 60m^3 capacity and will be fitted with a high level alarm.

The slurry tank will be located on the site to hold 60m^3 of animal slurry, the tank will improve feeding into the digester. The air displacement vent is fitted with a carbon filter to reduce odours. The tank will be equipped with a high level alarm.

The slurry and glycol tanks are situated adjacent to one another within one shared bund. The bund is 72m^3, equating to 120% of the largest tank capacity which exceeds the 110% requirement within our guidance.

Both tanks will be filled by pipe from the delivery vehicle. The loading point pipework is located within a loading sump, which is designed to catch any spillages from pipe drainage. The slurry is fed from the tank directly into the AD plant by pipework, this pipework will be subject to regular pressure testing for integrity checks.

The area where the tanks are located is impermeable ground and all drainage is connected to the dirty water tank. The dirty water tank has the option to be pumped to the digester, digester storage or emptied and removed from site if required.

We agree with the operator that the tank, infrastructure and spill protection are adequate for the size of the tanks and the nature of the products stored.

Annex 1: decision checklist

This document should be read in conjunction with the Duly Making checklist, the application and supporting information and permit/ notice.

Aspect considered	Justification / Detail	Criteria met Yes
Operator		
Control of the facility	We are satisfied that the applicant is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with Environmental Permitting Regulations Regulatory Guidance Note 1 Understanding the meaning of operator.	✓
European Directives		
Applicable directives	All applicable European directives have been considered in the determination of the application.	✓
The site		
Extent of the site of the facility	The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility. An updated emissions to air plan 'EA Layout' was submitted with the application, referenced to Table S3.2.	✓
Biodiversity, Heritage, Landscape and Nature Conservation	The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat . One Site of Special Scientific Interest (SSSI) is located within 2,000m of the installation, Kirmington Pits. Three Local Wildlife Sites (LWS) are located within 2,000m of the installation: Melton Ross Quarry, Melton Ross Road Verges and New Barnetby Road Verges. We consider that the application will not affect the features of the site and habitat. We have not formally consulted on the application. The decision was taken in accordance with our guidance. See key issues for further information.	✓
Environmental Risk Assessment and operating techniques		
Environmental	We have reviewed the operator's assessment of the	✓

Aspect considered	Justification / Detail	Criteria met Yes
risk	environmental risk from the facility. The operator's risk assessment is satisfactory. The assessment shows that, applying the conservative criteria in our guidance on Environmental Risk Assessment, all emissions may be categorised as unlikely to be environmentally significant. See key issues section for further information.	
Operating techniques	We have reviewed the techniques used by the operator and compared these with the relevant guidance notes: • How to comply with your environmental permit: additional guidance for the cement industry (EPR 3.01a) • How to comply with your Environmental Permit: additional guidance for combustion activities (EPR 1.01) • Sector guidance note 5.06: recovery and disposal of hazardous and non-hazardous waste. • Standard rules SR2012 No.12 Anaerobic digestion facility with the use of resultant biogas The following operating techniques are proposed by the operator to minimise environmental impact of the activities carried out at the installation: • Acoustic enclosure around the CHP unit • Ammonia suppression system on the digestate drier (sulphuric acid) • Carbon filter on the slurry air displacement tank The proposed techniques/ emission levels for priorities for control are in line with the benchmark levels contained in the TGN and we consider them to represent appropriate techniques for the facility.	✓
The permit conditions		
Incorporating the application	We have specified that the applicant must operate the permit in accordance with descriptions in the application, including all additional information received as part of the determination process.	✓

Aspect considered	Justification / Detail	Criteria met Yes
	These descriptions are specified in the Operating Techniques table in the permit.	
Emission limits	We have decided that emission limits should be set for the parameters listed in the permit. We have set limits for Oxides of Nitrogen, Carbon Monoxide, Sulphur Dioxide and Total Volatile Organic Compounds for the sixth CHP stack (emission point A14). The limits mirror those within our Standard Rules SR2012 No.12 Anaerobic digestion facility with the use of resultant biogas. We have not set limits for Particulates and Ammonia from the digestate drier. See key issues for further information.	✓
Monitoring	We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified. These monitoring requirements have been imposed in order to annually monitor emission to air from the sixth CHP engine stack (emission point A14). The monitoring requirements mirror our standard rules requirements for SR2012 No.12 Anaerobic digestion facility with the use of resultant biogas. Based on the information in the application we satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.	✓
Reporting	We have specified reporting in the permit. Reporting form Air 1 has been updated for the permit variation to include the new emission points to air.	✓
Operator Competence		
Environment management	There is no known reason to consider that the operator will not have the management systems to enable it to	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
system	comply with the permit conditions. The decision was taken in accordance with RGN 5 on Operator Competence.	