

Not Duly Made Reference	Issue	Specific actions	Response	Information Reference
1	Noise Management Plan (NMP) and associated application charge	<p>The noise impact assessment submitted with the application (as part of the Environmental Statement) shows a potential for significant adverse impacts associated with the operations of the CCS project activities if mitigations and management measures are not implemented. Furthermore it is likely to underestimate the impacts, due to incorrect methodology in determining the background noise to BS 4142 (refer to item 4. below for more details). Hence the application should have included an updated NMP for the installation addressing in detail the noise mitigation measures for the equipment in the scope of this variation (i.e. the CCS project), along with the existing mitigations for noise generated by existing activities at the installation.</p> <p>The review of the NMP attracts a charge of £1,246.</p>	<p>A Noise Management Plan has been prepared and is included in the application documentation.</p> <p>The associated fee for review of the NMP has been paid.</p>	<p>Main Supporting Document, Appendix I.</p> <p>Form F fee work up.</p>
2a	Air emission risk assessment - solvent	<p>Provide the identities of the solvent components (chemical names) for the emission associated with use of the CANSOLV DC-103 solvent within the carbon capture absorption column (i.e. speciated amines and associated degradation products). This information is necessary to begin and progress the determination of the application as it is essential to ascertain the risks associated with emissions to air.</p>	<p>Information on the chemical names of the species released from the PCC plant stacks have been included in the Air Impact Assessment.</p>	<p>Main Supporting Document, Appendix F, Annex A.</p>
		<p>It may be possible for an applicant to try to demonstrate that some or all those components may not be released to the environment through control measures such as abatement, but this is highly unlikely. An applicant would need to provide us with many hours of pilot plant monitoring data using the same solvent and abatement configuration to be able to demonstrate this. From the information included in the application, pilot plant has not been carried out on the flue gases from the CCS.</p>	<p>Information on the chemical names of the species released from the PCC plant stacks have been included in the Air Impact Assessment.</p>	<p>Main Supporting Document, Appendix F, Annex A.</p>
2b	Air emission risk assessment - Environmental Assessment Levels	<p>The application does not include an assessment of the emitted pollutants against the EALs. The application has assessed the emissions of the undisclosed amines present in the solvent and associated degradation products against the available EALs for Monoethanolamine (MEA) and Nnitrosodimethylamine (NDMA). However, it is understood that the proposed solvent does not consist of MEA, hence the use of the EAL for MEA is not justified. Similarly, the use of the EAL for NDMA has not been justified based on the degradation chemistry of the proposed solvent and supporting toxicological data and research.</p>	<p>Supporting information has been included in the Air Impact Assessment to demonstrate that the application of the proposed EALs is appropriate to ensure that the risk is adequately assessed.</p>	<p>Main Supporting Document, Appendix F, Annex A.</p>
2c	Air emissions risk assessment - Amines chemistry module model parameters	<p>The application claims that the kinetic constants k1, k2, k3 and k4 for the amines chemistry module model set-up are commercially sensitive, hence these have not been provided. We need all the input parameters used in the amines chemistry module to begin the audit the air dispersion modelling study, therefore we need this information to begin the determination of the application. The reaction parameters are substance specific and the identities of the released amine (and N-amines) species are not provided. Provide and justify all input parameters used in the amines chemistry module in the context of the uncertainty evaluation and the air emissions risk assessment.</p>	<p>Supporting information for the kinetic factors applied to the assessment has been provided in the Air Impact Assessment.</p>	<p>Main Supporting Document, Appendix F, Table 5-3 and Annex A.</p>

2d	Air emissions risk assessment Other points on completeness checks carried out on Appendix F	Provide the amines modelling files used to derive the Process Contributions (PCs) presented in the air quality assessment, including the additional input files with the amines reaction parameters.	The amine model files have been provided in the electronic file with the Air Impact Assessment.	Electronic file Appendix F - Air Impact Assessment
		For the baseline scenario, we note the modelling approach to group flues. Justify that your approach to group flues within a single windshield is appropriate.	The existing flues are in a single windshield and therefore the approach is deemed appropriate. Additional text explaining the approach applied is provided in the Air Impact Assessment.	Main Supporting Document, Appendix F, Section 4.1.1.
		In Table 5-3, we note there are no reference conditions in the emission concentrations and we were unable to replicate the mass emission rates. We also note an inconsistency in amine mass emissions between tables 4-2 and 5-3. Provide emission concentrations reference conditions and clarify the derivation of the mass emission rates used in the modelling.	Reference conditions have now been specified in the notes for Table 5-3. Clarification on the mass emission rate is also provided (previous inconsistencies were due to rounding).	Main Supporting Document, Appendix F, Table 5-3.
		Backgrounds already exceed nutrient nitrogen critical loads at ecological sites. Although numerical predictions indicate that PCs are insignificant, there is the potential for unreacted amines to contribute to nutrient nitrogen deposition (subject to atmospheric reactions; missing parameters k1, k2, and k3 and the site-specific air dispersion conditions). Provide contour plots of the annual nutrient nitrogen PCs.	Figures of the nutrient nitrogen have been provided. Amines have been included in the calculation of N-deposition, assuming a conversion factor equivalent to that of ammonia, which is considered to represent a worst case, as the actual conversion factor is likely to be lower than this. However, it should be noted that the actual contribution of the amines to overall N-deposition is minor, given that the released concentration is only 0.3mg/Nm ³ , compared to an ammonia emission concentration of 2mg/Nm ³ .	Main Supporting Document, Appendix F, Annex A, Figures 6.5 and 6.6.
2e	Air emissions risk assessment Abnormal venting emissions of concentrated carbon dioxide (CO ₂)	The application does not include a risk assessment for abnormal venting emissions of concentrated carbon dioxide during other than normal operating conditions. Applicants should detail their venting scenarios to assess these risks in order to demonstrate their designs are protective of human health. This is a key area of risk that has not been addressed in the application and is necessary to begin the determination of the application.	A CO ₂ Venting dispersion modelling assessment has been carried out and is included in the permit application.	Main Supporting Document, Appendix G.
3a	Water Discharges	Provide the national grid reference of all emission points.	Were included in the original application and in the reapplication.	Main Supporting Document, Section 5.2.1.
3b		If the proposed emission is just 'clean surface water run-off' then we won't need a risk assessment/modelling to be submitted.	Direct discharges will be of surface water from areas with no risk of contamination. Where there is a risk of surface water being contamination, then checks to ensure there is no contamination present will be carried out prior to discharge. Any waste waters that are contaminated will be collected separately and be disposed of via a licenced third party waste contractor. As such no risk assessment has been carried out. Further explanation of the drainage systems and an updated figure showing this more clearly are provided.	Main Supporting Document, Section 5.2.1 and Appendix A, Figure 6.
3b		If the discharge is also of non-contaminated waters (even if levels are less than the limits). A risk assessment is not required if the proposed emission is "clean surface water". The risk assessment should be prepared as detailed in our guidance H1 annex D2: assessment of sanitary and other pollutants in surface water discharges. The necessity/detail of the risk assessment may also be impacted by the following: * pH 6 – 9 * temperature 30C - thermal plume modelling * Oil 5 mg/l * Ammoniacal Nitrogen * TSS 50mg/l / COD 200 mg/l / Dissolved Oxygen >50%: * COD 200 mg/l		

4a	Noise Impact Assessment(NIA)	Background sound levels at all measurement locations include existing operational noise. This assessment does not comply with EA guidance, which requires a background sound level without contributions from the existing site.	The Noise Impact Assessment provided with the application now applies the correct methodology.	Main Supporting Document, Appendix H.	
4b		The assessment has not considered existing operations and how the proposed variation developments would compare to the existing conditions. BS 4142 assessments have been presented for the two proposed developments (VPI and Phillips 66) separately and in combination. The EA guidance requires the existing operations to be considered as well as the proposed variation operations - the existing and proposed operations are to be presented individually and then combined together to form an overall site sound level.			
4c		When it is not possible to carry out a noise background survey at the specific noise receptors without the contribution of the existing operations of the site, surrogate locations which are representative of noise sensitive receptors should be considered (see Clause 8.1.2 of BS4142: 2014+A1: 2019).			
4d		Raw survey data from baseline survey have not been provided (however, survey data would have been unsuitable due to methodology issue explained in items a. and b.).	Raw data has been provided with the Permit application.		Electronic file Appendix H - Noise Impact Assessment.
4e		Raw weather station data not provided (however, survey data would have been unsuitable due to methodology issue explained in items a. and b.).			
5	Containment Measures	Although reference is made in the application to CIRIA 736 report, the application does not provide sufficient detail on the proposed specifications for the primary, secondary and tertiary containment infrastructure and drainage systems in the areas of the installation interested by the scope of the variation application.	Additional information has been provided on containment measures in the Permit application.	Main Supporting Document Section 4.10.	
6	PCC Indicative BAT assessment	The impact of NOx in the flue gas will vary significantly with the solvent composition. If the amine blend will form significant amounts of stable nitrosamines with NOx in the flue gas, then you must reduce NOx to as low a level as practicably possible using selective catalytic reduction (SCR). If necessary, it is expected that ammonia (NH3) slip from the SCR unit could be addressed in a suitably designed PCC unit. In all cases, you must assess the effects of NOx in the flue gas on atmospheric degradation reactions and this may also affect the need for SCR. The assessment states "Based on the current NOx emissions from GT1, GT2 and the Aux Boilers it is not considered necessary to include SCR for NOx reduction when using the CANSOLV DC-103 solvent." Based on the requirements detailed in 2a. we don't have the information we require to support this conclusion. Provide evidence and justification to support this conclusion.	A full explanation of why SCR is not required to reduce NO2 emissions further is now provided in the application. Note that it is NO2, not NOx that leads to the formation of nitrosamines and the current NO2 concentrations in the flue gas are very low. It is considered that the application of SCR would result in minimal reductions in NO2, and therefore would have limited affect on nitrosamine emissions.	Main Supporting Document Section 4.2.2.	