

Comments on the applicant's Response to the Examining Authority's First Written Questions (EN070008/EXAM/9.9) on behalf of the residents of Corner Farm

(These are submitted at this deadline to simplify unavoidable cross-references with comments on the applicant's Comments on Written Representations below.)

Interested Party reference number: 2004715

Deadline 3

1.3.10 – The applicant's answer to ExQ1 1.3.10 appears to be that the reason for not considering a short connection to the Immingham section of the Northern Endurance network, as opposed to a 55 km pipeline down to Theddlethorpe, was specifically in order to connect emitters to the LOGGS pipeline and thereby use the depleted Viking gas field for storage. Is there a compelling case in the public interest for pursuing that particular objective, distinct from the applicant's commercial interest and sufficient to justify a DCO with powers of compulsory purchase, or does the public interest lie in decarbonisation of the Humber industries? Is there present local (South Humber) demand for carbon storage which Endurance cannot absorb? Is there projected national demand that would actually require the on-shore section of the Viking pipeline?

Given that the Endurance reservoir appears to have capacity to accommodate Viking's existing partners and more, and assuming the principle that land take in the public interest should be minimised, is there a public interest case for the Theddlethorpe pipeline? Does the applicant mean to imply that in the absence of the 55 km Theddlethorpe pipeline, emitters on the South Bank of the Humber would be left without options to decarbonise, or would they in fact inevitably be appended to the established Endurance project? The Northern Endurance Partnership appears to be planning with that in mind.

1.3.11 – The applicant's answer to ExQ1 1.3.11 is that "there are no residential properties within the Order Limits", which either misunderstands or disregards the question. The ExA is referred to the answer to ExQ1 1.1.22.

1.1.22 – The applicant's answer to ExQ1 1.1.22 is yet more PR-speak. We are simply asked to trust to their expertise in a novel industry to which experience in the handling of hydrocarbons is not necessarily applicable, and to adherence to standards which are a work in progress. A technical exposition with relevant figures would be more pertinent.

The applicant asserts adherence to BSI PD 8010-1:2015, which, as it applies to dense phase CO₂ transport, is described in Cooper et al. (2016). A Minimum Distance to Occupied Buildings (MDOB) and routing corridor are defined at 10 chances per million (cpm) of a dangerous dose and 0.3 cpm, consistent with the HSE's inner and outer zone distances. The pipeline is engineered to keep the predicted risk below the MDOB threshold defined in this standard. Note: this mitigates the chance of an event, but not the consequences. There is, however, considerable uncertainty in the estimation of risk; for instance, Lyons et al. (2019) concluded "that the applicability of the existing failure frequency models to typical dense phase CO₂ pipelines may be beyond the known range of applicability for the pipeline failure equations used within existing failure frequency models due to the high wall thickness linepipe requirements of typical CO₂ pipelines". Cooper et al. (2016) note that "the distances to 0.3 cpm can be very much smaller than the maximum hazard distance [...]. This indicates that it may not be sufficiently cautious to take the individual risk distance approach to defining the separation distance for the pipeline and a corridor width over which to assess the local population and the use of this approach may result in a route which may not meet the ALARP requirement." They recommend a QRA approach, described in Cooper and Barnett (2014). We assume/hope that the applicant has attempted a similar approach. However, as we showed in our Relevant Representation (REP1-137), this approach can still leave the residents of isolated dwellings and small clusters at imminent risk of death in the event of a rupture, with no safe refuge. It is therefore inadequate.

The applicant refers to the HSE's "Reducing Risks, Protecting People" framework document to justify its minimalist approach to mitigating the consequences of pipeline rupture, while relying principally on engineered safety to control risk. (This approach is similar to that taken when the brilliantly-engineered Titanic was launched with only half the necessary number of lifeboats.) However, in Reducing Risks, Protecting People (p. 27), the HSE draws attention to the need to mitigate the consequences of a hazard through Inherently Safer Design, particularly where there is uncertainty in risk: "HSE will press for the incorporation of inherently safer design features, where these are possible, to reduce the reliance on engineered safety systems or operational procedures, to control risk." It highlights the need for "defence in depth, redundancy, diversity and segregation [...]", being "fundamental to ensuring safety". In the relevant case, segregation by safe distance would be the simplest practicable measure to control consequences and achieve inherently safer design. The applicant states that "the Health and Safety Executive does not usually require further action to reduce risks in [the] lowest classification [of risk] unless reasonably practicable measures are available, such as developing comprehensive emergency response plans. The Applicant will work with all relevant local authorities to develop such plans."

Comprehensive emergency response plans become irrelevant when a pipeline passes so close to isolated dwellings that, in the event of a rupture, occupants could have only seconds to live. This is not remotely an adequate approach to mitigating the consequences of pipeline rupture. Other reasonably practicable measures are readily available, primarily segregation by safe distance. We would regard a distance sufficient to ensure safe refuge in an occupied building to be a bare minimum (see our Relevant Representation (REP1-137) paragraphs 8 and 12), and, on the ALARP principle, wherever practicable, to control outdoor exposure below the SLOT DTL. Achieving nominal ALARP purely by engineered safety is thoroughly inadequate.

Comments on the Applicant's Comments on Written Representations (EN070008/EXAM/9.18) on behalf of the residents of Corner Farm

Interested Party reference number: 2004715

Deadline 3

2.20.1-3 – In its response to our Relevant Representation, the applicant repeats the same PR-speak from its answer to ExQ1 1.1.22 in answer to all points concerning safety. It fails to address any of the substantive points, preferring to restate the claim that it has ticked relevant boxes than to demonstrate a serious approach to safety. Please see our response to the applicant's answer to ExQ1 1.1.22 above.

2.20.4 – no further comment.

2.20.5 – The impression of the adequacy of the consultation given by the applicant is not shared by a significant number of those consulted.

2.20.6 – The applicant restates its case, but fails to address the point regarding the inadvisability of the specific use of CCS in this project.

2.20.8-9 – On safety, we are referred to the same inadequate response given to sections 2.20.1-3. Please see our response to the applicant's answer to ExQ1 1.1.22 above.

2.20.10 – We are not sure how the applicant's comments are supposed to be pertinent. They fail to address the points made in relation to the severity and range of the hazards that the project poses to the public.

2.20.11-14 – On safety we are again referred to the same inadequate response given to sections 2.20.1-3. Please see our response to the applicant's answer to ExQ1 1.1.22 above. The applicant fails to address the points made in relation to the severity and range of the hazard it poses to the public. It fails to follow the science or relevant industry guidance, preferring to tick the minimum number of boxes to comply with legislation.

2.20.15-18 – Stating that "EN-1 makes it clear that there is no general requirement to consider alternatives or establish whether the proposed project represents the 'best option' from a policy perspective" rather emphasises the applicant's cynical approach to consultation and examination.

The applicant quotes: "In determining compliance, HSE expects pipeline operators to apply relevant good practice as a minimum." As we have shown above and in REP1-137, the applicant has failed to apply relevant good practice.

The applicant fails to address any of the substantive points relating to routing as a means to mitigate the consequences of pipeline rupture. Please see also our response to the applicant's answer to ExQ1 1.1.22 above.

2.20.19 – The applicant fails to say why it would not consider reversing the "minor diversion to the east" on route E-2 in the interests of safety. It has shown only mitigation of risk and not of consequences. Safe distance is intended to mitigate consequences. The applicant's determination not to address the consequences of pipeline rupture shows a somewhat cavalier attitude to public safety.

As previously pointed out to the applicant, the marginal incursion into flood zones 2 and 3 along route E-1B is small compared to the great swathe of flood zone encountered after their preferred route crosses the B1200. This argument is specious. If the applicant was so concerned about flood-zone incursion, it would not have countenanced the "minor diversion to the east". The "risk to people working within the flood plain" is routinely controlled and will need to be after the route crosses the B1200. This is not a substantive objection.

2.20.20-21 – The slight additional incursion into flood zones 2 and 3 on the suggested blue and green alternatives (REP1-132) is as nothing compared to the great swathe of flood zone encountered after the preferred route crosses the B1200. This objection is specious, as are the rest. An additional incursion has already been accepted by the applicant on its "minor diversion to the east". We can't think where the supposed area of floodplain grazing marsh could be on these routes. The last area of floodplain grazing marsh in the area was drained by our family in the early part of the last century. Could the applicant be relying upon very old maps again?

2.20.22-4 – The applicant simply fails to address any of the substantive points relating to odorisation, venting, or pipeline depth. Again, it appears frankly blasé about public safety.

2.20.26 – Please see our response to 2.20.5 above.

2.20.27-30 – The applicant restates its case, but fails to address any of the substantive points regarding fossil fuel lock-in, economic damage, enhanced recovery, or incompatibility with nuclear GDF at Theddlethorpe.

2.20.31 – The applicant repeats its answer to ExQ1 1.3.10. Please see our response above.

Overall, the applicant's responses are predictable and inadequate.

References:

Russell Cooper, Julian Barnett, Jane Haswell, Harry Hopkins, Phil Cleaver & Karen Warhurst, "Routeing of Dense Phase CO2 Pipelines in the UK", In: Hazards 26. Institution of Chemical Engineers Symposium Series, 161 . The Institution of Chemical Engineers, GBR (2016).

C.J. Lyons, J.M. Race, B. Wetenhall, E. Chang, H.F. Hopkins, & J. Barnett, "Assessment of the Applicability of Failure Frequency Models for Dense Phase Carbon Dioxide Pipelines", International Journal of Greenhouse Gas Control 87 (2019) 112-120.