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## 6 Soils and Geology

### 6.1 Executive Summary

1. This rebuttal addresses points raised in Statements of Case prepared by other parties in respect of soils, geology and groundwater. These issues are raised in the Statements of Case submitted by SEAT and by James McNally.
2. The SEAT submission (paragraphs 118 and 119), alleges that the Soils and Geology Chapter is poorly written and sub-standard. In response it is concluded that the Chapter is not poorly-written or sub-standard and contains all the information necessary to enable a robust assessment of the proposed scheme to be made.
3. In respect of the potential impact of the scheme on Drumcarn Area of Special Scientific Interest (ASSI), identified in the submission by James McNally, it is concluded that the wetland area is a sufficient distance from the closest tower (No.102) that any effects of dewatering, if required, will have no impact on the wetland.
4. Nothing in the objectors' Statements of Case and representations in respect of soils, geology and groundwater serves to undermine the conclusions set out in the SONI Statement of Case and this supporting Technical Report. As stated in SONI's Main Rebuttal Document, the proposed Tyrone - Cavan Interconnector remains clearly acceptable in planning terms and there are no adverse residual impacts for soils, geology and groundwater.

### 6.2 About the Author

5. Chapter 9 of the Consolidated ES, Statement of Case Technical Report 7 and this rebuttal were prepared by Philip Smart, a Technical Director with AECOM, responsible for the geological and hydrogeological expertise of the Company in the UK with more than 40 years' experience in hydrogeological matters. The background of the author is set out in the Technical Report 7 addressing this subject matter, as appended to SONI's Statement of Case.

6. He is a Chartered Geologist and has more than 40 years' hydrogeological experience in both groundwater contamination and groundwater resources. He has wide experience in the assessment of the impact on surface and groundwater resources and of dewatering associated with major infrastructure developments together with the design of mitigation measures. He has prepared technical reports in support of applications for planning permission, including Environmental Statements, for more than 20 years.
7. He is a registered Expert Witness and has acted in legal disputes. He also has presented expert evidence at Public Inquiries and arbitration hearings on a number of schemes and prepared evidence for Planning Inquiries for major developments in a variety of hydrogeological conditions.

### 6.3 Policy

8. No Policy issues have been raised in relation to Soils and Geology.

### 6.4 Guidance

9. No Guidance issues have been raised in relation to Soils and Geology.

### 6.5 Further Environmental Information for the Purposes of the Inquiry

10. It is not necessary to introduce new information to address any point made by third parties or the Department and its consultees in relation to Soils and Geology.

## 6.6 Comments on the Quality of the Soils and Geology Assessment

11. In the SEAT Statement of Case, Page 22, Paragraphs 118 and 119 state:

*“SONI present a broad qualitative overview of assessment of soils and geology at proposed tower sites over the area of the development, based largely on limited desk studies. The area of the project is very extensive, but no in depth study has been undertaken and the ES is clearly inadequate in the provision of information to allow for a proper assessment in this regard.*

*SEAT is informed by an Expert Witness that there are several geological issues which appear to have been generally overlooked in the documentation presented by SONI. In addition the Geology Chapter is considered to be poorly written and sub-standard to that expected from a professional geoscientist and exhibits a number of basic errors and omissions.”*

### **Response**

12. Paragraph 118 of the SEAT Statement of Case questions the adequacy of the soils and geology assessment undertaken over the area of the project. However, no details or specific examples have been provided to substantiate the bald assertions made. It is assumed that the statements relate to the absence of a ground investigation at the proposed tower locations.
13. For the proposed Tyrone-Cavan Interconnector, the soils and geological conditions only are relevant where excavations are required. Excavations only are required for the sub-station at the northern end of the scheme and at each tower location for the tower foundations.
14. The excavations required for the sub-station cover an area of approximately 25,860m<sup>2</sup>. Due to the extensive area of the proposed sub-station a ground investigation was carried out in 2006 to clarify the ground and groundwater conditions on the site. The ground investigation comprised:-
- The excavation of six trial pits; and,
  - The drilling of eight boreholes to depths of 17.2m to 30m.
15. As stated in Section 9.23 of the Consolidated ES (page 255), the ground conditions are highly variable. On the higher ground, fluvio-glacial, superficial deposits of clay, silt and sand between 3.9m and 7m thick overlie

the reddish-brown and grey silt and clay of the Mercia Mudstone Formation. On the lower ground, the superficial deposits are in excess of 30m thick.

16. The proposed area for the tower foundations is only approximately 20m x 20m, with the excavations being restricted to the four corners of this area. In the event that permission is obtained for the scheme, a ground investigation will be carried out, prior to the commencement of site works, at each tower location to confirm the ground and groundwater conditions. As a minimum, the investigation at each tower site will comprise one borehole and four trial pits, one at each tower footing.
17. Based on a desk study of the available geological information for the tower locations (Section 9.3.1 of the Consolidated ES), it is considered that the majority of the foundations will be within the superficial deposits which form an extensive cover over the bedrock across most of the area. It is likely that for some of the towers in the southern part of the scheme, where the superficial deposits locally are thin the foundations may intercept the bedrock.
18. The absence of a detailed interpretation of the ground conditions at each tower location is considered not to be a deficiency of the assessment, as a number of foundation designs have been prepared to cater for the anticipated variable ground conditions. These are outlined in Chapter 5 of the Consolidated ES.
19. In addition, there is no evidence to suggest that the towers are located on areas of contaminated ground, as discussed in Section 9.3.5 of the Consolidated ES (pages 266 - 270). Should the assessment have identified the potential for contaminated ground on any of the tower sites, a ground investigation would have been carried out as part of the assessment to clarify the conditions and the need for any remedial measures.
20. A similar approach to ground investigations for the proposed Tyrone – Cavan Interconnector prior to the approval of the scheme was followed in the

EirGrid application Interconnector in Ireland<sup>1</sup>, which received planning approval on 21<sup>st</sup> December 2016.

21. An Bord Pleanála Inspector's Report<sup>2</sup> for the North-South 400kV Interconnection Development was published on 21st December 2016. That report, supported by the Board's Direction, confirmed the planning approval of the proposed Interconnector in Ireland. The Inspector's Report states (Page 237):

*"In all cases [other overhead line projects listed by the Inspector in her report] detailed site investigations were carried out post approval. This approach would suggest that foundation design can be reasonably predicted from desk top research (which includes high resolution aerial photography and LiDAR) and walkover survey and is a practice which has been accepted by the Board.*

*Having regard to the established practice of the Board in relation to similar applications for electricity infrastructure, I would accept that the applicant has demonstrated that the extent of survey work undertaken for the proposed tower sites is sufficient to predict likely ground conditions."*

22. In summary, it is considered that the desk study of the geological conditions was sufficient to allow an appropriate and adequate assessment to be carried out of the ground conditions at the tower locations to assess the impact of the scheme on the soils and geology and to identify any constraints that the ground conditions posed on the construction of the proposed Tyrone-Cavan Interconnector.

#### Alleged Issues with the Soils and Geology Assessment

23. Paragraph 119 of the SEAT Statement of Case indicates that in the opinion of an unnamed "Expert Witness" from whom no evidence is exhibited, there are several geological issues that '*appear to have been overlooked*' and that '*in addition the Geology Chapter is considered to be poorly written and sub-standard to that expected from a professional geoscientist and exhibits a number of basic errors and omissions.*' However, as with the comments in paragraph 118, no evidence has been presented to substantiate these bald assertions.

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<sup>1</sup> Also called the Republic of Ireland.

<sup>2</sup> <http://www.pleanala.ie/news/VA0017.htm>

24. The experience of the author is provided in Sections 5 to 7 of this rebuttal. He regularly is involved in the preparation of detailed groundwater risk assessments for a variety of proposed developments to satisfy both regulatory requirements and for specialised input to Environmental Impact Assessments. Therefore, he is experienced in the approach required to undertake environmental impact assessments on soils, geology and groundwater and of the information that needs to be included in the assessment.
25. It should be noted that none of the Statutory Consultees, including the Northern Ireland Environment Agency (NIEA), raised any concerns regarding the contents and adequacy of the soils and geology chapter submitted in the Consolidated ES.
26. AECOM is a compliant registrant of the Institute of Environmental Management & Assessment (IEMA). IEMA is an independent and international organisation which provides support to individuals and organisations to set, recognise and achieve global standards and practice. AECOM has IEMA's Quality Mark for Environmental Impact Assessments (EIAs). The EIA for the proposed Tyrone-Cavan Interconnector was prepared in accordance with AECOM's standard approach to such assessments.
27. In summary, it is concluded that the Soils and Geology Chapter is not poorly written or sub-standard as alleged by SEAT, nor does it exhibit a number of basic errors and omissions. It is concluded that the Chapter contains all the information required to enable a robust assessment to be made.

## 6.7 Impact on Drumcarn ASSI

28. Amongst the issues raised in the Statement of Case of Mr James McNally is the potential impact of the scheme on Drumcarn ASSI. Drumcarn ASSI is designated an area of special scientific interest because of its wetland flora and fauna. The site covers an area of 26.25 hectares, centred on Irish Grid Reference H 810287. The designation identifies '*lowering of the water-table, permanently or temporarily*' as an operation that would affect the wetland.

## Response

29. The ASSI is at least 2km east-south-east of the closest tower (No.102) on the SONI section of the proposed Tyrone-Cavan Interconnector. Should dewatering be required to facilitate the construction of the foundations to Tower 102, it is considered that any effects on the water table will not extend this distance. Accordingly, it is concluded that construction of the proposed Tyrone-Cavan Interconnector will have no adverse impact on Drumcarn ASSI. Further rebuttal on this point is provided in the Rebuttal Technical Report for Ecology. In summary, there will be no ecological impacts to the designated site.
30. Additionally, the site was assessed as part of the EirGrid application in Ireland and it was determined that there would be no significant effects to the site. An Bord Pleanála Inspector's Report states (Page 346):

*"...Marsh Fritillary has been recorded in Drumcarn Fen (the part of Drumgallan Bog that occurs in N. Ireland). Having regard to the separation distance to the alignment (600m), I consider that the alignment is sufficiently far removed from the alignment to avoid any potential impacts."*

## 6.8 Conclusion

31. In conclusion, nothing in the objectors' Statements of Case and representations in respect of soils, geology and groundwater serves to undermine the conclusions set out in the SONI Statement of Case and the supporting Technical Report. As stated in SONI's Main Rebuttal Document, the proposed Tyrone - Cavan Interconnector remains clearly acceptable in planning terms and there are no adverse residual impacts for soils, geology and groundwater.