

An Bord Pleanála Oral Hearing

Irish Water

Greater Dublin Drainage

Brief of Evidence

of Eoin Wyse

Soils and Geology

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Qualifications and Role on the Proposed Project

- 1 I, Eoin Wyse hold a Bachelor of Science (BSc) degree in Environmental Geochemistry from University College Dublin (2000). I am a Professional Geologist (PGeo) with the Institute of Geologists of Ireland and a Chartered European Geologist (EurGeol) with the European Federation of Geologists.
- 2 I am currently a non-Executive board member of the Institute of Geologists of Ireland since 2016. I am also on the IGI Pyrite Panel of Experts and a member of the Institute of Geologists of Ireland Register of Professional Qualified Geoscientists/Competent persons (in respect of environmental risk assessment for regulated and unregulated waste disposal and contaminated land) 2015.
- 3 I am currently employed as a Senior Engineering Geologist in Arup and have fourteen years' professional engineering experience in the design and construction of large building projects and in the geo-environmental assessment of contaminated land. In my role as a senior engineering geologist I have also been responsible for the preparation of other Land and Soils chapters for Environmental Impact Assessment Reports (EIAR).
- 4 I have been involved in the Arklow Wastewater Treatment Plant (WwTP) Project and I was responsible for the design of the ground investigations (both onshore and offshore) for that project, along with the preparation of the Land and Soils Chapter for the EIAR for that project.
- 5 I have also provided input into the following Land and Soils Chapters of EIARs for the following projects:
 - Parnell Square Cultural Quarter;
 - Irish Cement – Alternative Fuels Project – Platin; and
 - Irish Cement – Alternative Fuels Project – Castlemungret.
- 6 Additionally, I was involved in the preparation of the Closure Remediation and Aftercare Management Plan (CRAMP) and other documents associated with the following projects:
 - Diageo St Frances Abbey IEL Surrender; and
 - Irish Glass Bottle Company Ringsend Integrated Pollution Prevention and Control (IPPC) Licence Surrender.
- 7 My role in the Proposed Project involved the preparation of Chapter 18 Soils and Geology in Volume 3 Part A of the EIAR relevant to the proposed orbital sewer route, Abbotstown pumping station, WwTP and outfall pipeline route (land based section and marine section). I was also involved in the preparation and design of the ground investigations for the Proposed Project and the offshore ground investigation for the proposed outfall pipeline route (marine section).
- 8 I have been working on the Proposed Project since 2013. The work that I have undertaken in relation to the Proposed Project includes:
 - Design of the offshore ground investigation
 - Design of the onshore ground investigation;
 - Preparation of the Tender documents for the geophysical and geotechnical offshore investigation; and

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- Preparation of the elements of Chapter 18 in Volume 3 Part A of the EIAR relevant to the elements of the Proposed Project, including an assessment of the likely impacts and relevant mitigation measures required in relation to both the Construction Phase and the Operational Phase of the Proposed Project.

Summary of Likely Significant Impacts and Mitigation Measures

- 9 Chapter 18 Soils and Geology in Volume 3 Part A of the EIAR assessed the potential impacts on soils and geology for the Construction Phase and Operational Phase of the Proposed Project in line with the Institute of Geologists of Ireland's (2013) *Guidelines for the Preparation of Soil, Geology and Hydrogeology Chapters of Environmental Impact Statements*. The assessment was supported by the results obtained from Ground Investigation (GI) works, publicly available information and historical information, as outlined in Section 18.2 in Chapter 18 in Volume 3 Part A of the EIAR.
- 10 As outlined in Section 18.2.4 in Chapter 18 in Volume 3 Part A of the EIAR, the soils and geology study area for the Proposed Project extends 100m either side of the proposed orbital sewer route and outfall pipeline route (land based section and marine section), and within 2km of the proposed Abbotstown pumping station and the proposed WwTP.
- 11 Ground conditions across the site have been described according to the headings provided in the EIAR. The ground conditions for the following are described in the EIAR Soils and Geology chapter under the following headings:
- **Abbotstown Pumping station** - The ground conditions at Abbotstown are notable for the shallow bedrock observed on site. The ground conditions consist of glacial tills over limestone. Limestone is located at approximately 1.6m below ground level.
 - **Orbital Sewer Route** - This section includes some isolated pockets of anthropogenic sediments (also known as made ground). Generally, the ground conditions consist of glacial tills overlying limestones at depths from 2.5m below ground level. The bedrock appears to be becoming deeper to the east.
 - **Wastewater Treatment Plant and North Fringe Sewer Diversion Sewer** – No bedrock was encountered on the site of the proposed WwTP. Boreholes were carried out to a depth of 7m below ground level and no bedrock was encountered. The soils present were observed to consist of glacial tills overlying fluvio-glacial gravels.
 - **Proposed Outfall Pipeline Route** – The onshore section of the outfall route appears very similar to the ground conditions noted to date, with glacial tills overlying limestones at a depth of approximately 4.5m below ground level in some locations. At Portmarnock we see a transition into estuarine deposits progressing into marine deposits consisting of sands, silts and gravels. These were observed to overlie glacial tills over bedrock along the alignment of the outfall.
- 12 Typically, the bedrock beneath land-based sections of the proposed project was described as carboniferous limestones originating from the Tober Colleen, Waulsortian, Lucan and Malahide formations.
- 13 Bedrock in the offshore area was identified as carboniferous limestones, originating from the Malahide Formation. One of the boreholes during the offshore ground investigation encountered highly weathered sandstone, siltstones and mudstones, which contrasted with the limestones encountered in the other offshore boreholes. The reason for this was attributed to the presence of a fault or fracture in the bedrock to the south of the alignment, trending in a north-west southeast direction.
- 14 These ground conditions were considered in the selection of construction methodologies assessed, yet they did not dictate the use of any specialised construction techniques. Any negative impacts identified will be

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managed through tried and tested traditional construction techniques. Negligible impacts were identified for the operational phase of the Proposed Project.

15 Based on the proposed construction methodologies, the main impacts are:

- Loss of agricultural soils across the Proposed Project area,
- the sterilisation of any potential aggregate or bedrock resources,
- encountering soft ground,
- encountering potentially contaminated soils,
- encountering soft marine sediments and
- impacting upon the marine environment and ecology at the location of the proposed outfall pipeline route (marine section), which is within the Baldoyle Bay proposed Natural Heritage Area/Special Area of Conservation/Special Protection Area, Ireland's Eye Special Area of Conservation and Rockabill to Dalkey Island Special Area of Conservation.

16 The impacts identified in the EIAR will be mitigated during the Construction Phase through the preparation of the Construction Environmental Management Plan. This document includes the recommended mitigation measures outlined in the EIAR. Excavations shall be kept to a minimum across the alignment, using methods which would be considered standard construction methodology, i.e. open cut, trenching and/or microtunnelling. Where possible, excavated materials shall be reused on-site to minimise the amount of materials requiring disposal or re-use off-site. Materials unsuitable for reuse and therefore requiring disposal off-site shall be sent to a suitably permitted or licenced facility. Further details in relation to this are included in Chapter 20 in Volume 3 Part A of the EIAR Commonly implemented best practice guidelines such as those outlined in BS6349-5 - Maritime works – Part 5: Code of practice for dredging and land reclamation (2016) will be adhered to as a minimum for any dredging exercises to be carried out. Measures to minimise disruption to the seabed and mobilisation of sediments will be applied. Seabed conditions will be taken into account when selecting the method of dredging.

17 Beyond the Construction Phase, no residual issues relating to soils and geology are predicted. No specific Operational Phase mitigation measures are required.

Responses to Issues Raised in Submissions

18 One submission from Councillor Alison Gilliland raised an issue in relation to the potential impacts arising from:

“... the mass movement of soil on the site and along the sewer route and into the wastewater treatment facility...”

19 Mass movement of soils is a common issue in relation to any project involving earthworks and extensive guidance and literature is available to assist in the management of these works.

20 Mass movement has been assessed as part of Chapter 18 Soils and Geology in Volume 3 Part A of the EIAR under the title Earthworks Haulage, and mitigation measures have been put in place in relation to the impacts related to the transport of soils both off-site and within the site as per Section 18.7.2 of Chapter 18 in Volume 3 Part A of the EIAR.

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21 Additionally, the impact of truck movements associated with the construction of the Proposed Project on traffic in the area are dealt with in detail in Chapter 13 Traffic and Transport in Volume 3 Part A of the EIAR.

22 Such measures include:

- **Material Reuse:** All excavated material will, where possible, be reused as construction fill. Acceptability of the material for reuse within the Proposed Project may be possible with appropriate handling, processing and segregation of the material. This material would be subject to appropriate control and testing according to the Earthworks Specification(s) designed based on the TII Specification for Roadworks with relevant amendments. These excavated soil materials will be stockpiled using an appropriate method to minimise the impacts of weathering as illustrated in Figure 9 of the Outline CEMP. Care will be taken in reworking this material to minimise dust generation, groundwater infiltration and generation of runoff. Any surplus suitable material excavated that is not required elsewhere for the Proposed Project shall be disposed of or re-used off-site. This is the usual approach successfully adopted on most infrastructure projects across the country;
- **Traffic:** Earthworks haulage will be along agreed predetermined routes along existing national, regional and local routes. Where rutting or damage occurs due to truck movements and other construction activities on unfinished surfaces, remediation works will be undertaken to reinstate the ground to its original condition. Where practicable, rutting or damage of any soil or subsoil which is to remain *in situ* along the sites will be avoided. These works will typically be successfully managed using guidance documents such as the TII Specification for Roadworks; and
- **Surface Drainage:** Earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe runoff and prevent ponding and flooding. Runoff will be controlled through erosion and sediment control structures appropriate to minimise the water impacts in outfall areas. Care will be taken to ensure that the bank surfaces are stable to minimise erosion.

Conclusion

23 The potential impacts on soils and geology beneath the Proposed Project, including those noted in the submission of Councillor Alison Gilliland, have been adequately assessed in the EIAR. The residual impacts of the construction phase and the operational phase will be negligible, in circumstances where a suite of appropriate and effective mitigation measures will be deployed.