Appendix 12.1

IGI Guidelines and Impact Significance

IGI rating criteria uses the same significance terminology as the EPA, however it has intermediate steps to justify using that terminology:

- Step 1: Quantify the Importance of a feature for geology (**Table A12.1.1**) and hydrogeology (**Table A12.1.2**);
- Step 2: Estimate the Magnitude of the impact on the feature from the proposed development (**Table A12.1.3**: Geology, **Table A12.1.4**: Hydrogeology);
- Step 3: Determine the Significance of the impact on the feature from the matrix (Table 5) based on the Importance of the feature and the Magnitude of the impact.

Table A12.1.1 - Criteria for Rating Site Importance of Geological Features

Importance	Criteria	Typical Example
Very high	Attribute has a high quality, significance or value on a regional or national scale Degree or extent of soil contamination is significant on a national or regional scale Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale	Geological feature rare on a regional or national scale (NHA) Large existing quarry or pit Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale Degree or extent of soil contamination is significant on a local scale Volume of peat and/or soft organic soil underlying route is significant on a local scale	Contaminated soil on site with previous heavy industrial usage Large recent landfill site for mixed wastes Geological feature of high value on a local scale (County Geological Site) Well drained and/or high fertility soils Moderately sized existing quarry or pit Marginally economic extractable mineral resource
Medium	Attribute has a medium quality, significance or value on a local scale Degree or extent of soil contamination is moderate on a local scale Volume of peat and/or soft organic soil underlying route is moderate on a local scale	Contaminated soil on site with previous light industrial usage Small recent landfill site for mixed wastes Moderately drained and/or moderate fertility soils Small existing quarry or pit Sub-economic extractable mineral resource
Low	Attribute has a low quality, significance or value on a local scale Degree or extent of soil contamination is minor on a local scale	Large historical and/or recent site for construction and demolition wastes Small historical and/or recent landfill site for construction and demolition wastes Poorly drained and/or low fertility soils

Importance	Criteria	Typical Example
	Volume of peat and/or soft organic soil underlying route is small on a local scale	Uneconomically extractable mineral resource

Table A12.1.2 - Criteria for Rating Site Importance of Hydrogeological Features

Importance	Criteria	Typical Example
Extremely high	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very high	Attribute has a high quality or value on a regional or national scale	Regionally Important Aquifer with multiple wellfields. Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – e.g. NHA status. Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer. Potable water source supplying <50 homes.

Table A12.1.3 - Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Geology Attribute

Importance	Criteria	Typical Example
Large adverse	Results in loss of attribute	Loss of high proportion of future quarry or pit reserves Irreversible loss of high proportion of local high fertility soils Removal of entirety of geological heritage feature Requirement to excavate / remediate entire waste site Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath alignment
Moderate adverse	Results in impact on integrity of attribute or loss of part of attribute	Loss of moderate proportion of future quarry or pit reserves Removal of part of geological heritage feature Irreversible loss of moderate proportion of local high fertility soils Requirement to excavate / remediate significant proportion of waste site Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment
Small adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Loss of small proportion of future quarry or pit reserves Removal of small part of geological heritage feature Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils Requirement to excavate / remediate small proportion of waste site Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	No measurable changes in attributes
Minor beneficial	Results in minor improvement of attribute quality	Minor enhancement of geological heritage feature
Moderate beneficial	Results in moderate improvement of attribute quality	Moderate enhancement of geological heritage feature

Importance	Criteria	Typical Example
Major beneficial	Results in major improvement of attribute quality	Major enhancement of geological heritage feature

Table A12.1.4 - Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeology Attribute

Importance	Criteria	Typical Example
Large adverse	Results in loss of attribute and /or quality and integrity of attribute	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run-off1. Calculated risk of serious pollution incident >2% annually.
Moderate adverse	Results in impact on integrity of attribute or loss of part of attribute	Removal of moderate proportion of aquifer. Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. Potential medium risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >1% annually.
Small adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Removal of small proportion of aquifer. Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk of pollution to groundwater from routine run-off1. Calculated risk of serious pollution incident >0.5% annually.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Calculated risk of serious pollution incident <0.5% annually

Table A12.1.5 - Rating of Significant Environmental Impacts at EIS Stage

Importance of attribute	**Magnitude of impact**			
	Negligible	**Small adverse**	**Moderate adverse**	**Large adverse**
Extremely high	Imperceptible	Significant	Profound	Profound
Very high	Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
High	Imperceptible	Moderate/ Slight	Significant/ Moderate	Profound/ Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate