|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Variable influence on process** | | | **Process influence on variables** | | |
| **Influence present? (Yes/No Description)** | **Time period/Climate domain** | **Handling of influence (How/If not - Why)** | **Influence present? (Yes/No Description)** | **Time period/Climate domain** | **Handling of influence (How/If not - Why)** |
| Temperature in bedrock | Yes | Excavation/operation | Process neglected; no significant generation of gaseous species expected. Reactions including CO2 and H2S are included in the geochemical calculations but the temperature changes in the rock are small, and the effects are negligible. | Yes | Excavation/operation | Process neglected; little heat effect from most gaseous processes except perhaps combustion. |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Groundwater flow | Yes | Excavation/operation | Process neglected; no significant generation of gaseous species expected. Reactions including CO2 and H2S are included in the geochemical calculations. | No | Excavation/operation | — |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Evaluation of the influence of inflow of oxygen with glacial melt waters. Reactions including CO2 and H2S are also included in the geochemical calculations. | Glacial |
| Groundwater pressure | Yes | Excavation/operation | Influence neglected; small pressure effects. | Yes | Excavation/operation | The influence on groundwater pressure from the generation of gaseous species in the geosphere will be negligible. |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Gas phase flow | Yes | Excavation/operation | Influence neglected; little significance. Main gas phase would perhaps be hydrogen released from corrosion in the repository. This is considered when estimating bacterial sulfate reduction. | Yes | Excavation/operation | Considered in scoping calculations of the capability of the geosphere to transport gas (see Section 3.2). |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Repository geometry | No | Excavation/operation | — | No | Excavation/operation | — |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Fracture geometry | No | Excavation/operation | — | No | Excavation/operation | — |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Rock stresses | No | Excavation/operation | — | No | Excavation/operation | See Section 3.2. |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Matrix minerals | Yes | Excavation/operation | The geochemical models consider some reactions with carbon dioxide. Reactions of dissolved O2 with matrix minerals are considered during glacial periods. | Yes | Excavation/operation | Neglected: observations of drillcores show that the matrix minerals are negligibly influence by reactions with gaseous species. |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Fracture minerals | Yes | Excavation/operation | The geochemical models consider some reactions with carbon dioxide. Reactions of dissolved O2 with fracture minerals are considered during glacial periods. | Yes | Excavation/operation | The fate of fracture filling minerals has not been evaluated directly. In geochemical calculations the amounts of minerals precipitating or dissolving have been calculated, and found to be of no significance. |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Groundwater composition | Yes | Excavation/operation | Process neglected; little significance. | Yes | Excavation/operation | Process neglected; little significance. |
| Temperate | Reactions including CO2 and H2S are included in the geochemical calculations. | Temperate | Reactions including CO2 and H2S are included in the geochemical calculations. Generation of H2 by corrosion of rock reinforcements taken into account in the description of the reference evolution. |
| Periglacial | Periglacial |
| Glacial | Considered in evaluation of oxygen consumption in glacial melt water. Reactions including CO2 and H2S are included in the geochemical calculations. | Glacial | Evaluation of oxygen consumption in glacial melt water. Reactions including CO2 and H2S are included in the geochemical calculations. |
| Gas composition | Yes | Excavation/operation | Neglected; main gas could perhaps be hydrogen released from corrosion in the repository. This is considered when estimating bacterial sulfate reduction. | Yes | Excavation/operation | Neglected; little significance. |
| Temperate | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Structural and stray materials | Yes | Excavation/operation | Process neglected; little significance. | No | Excavation/operation | — |
| Temperate | H2 released from corrosion in the repository considered when estimating bacterial sulfate reduction. | Temperate |
| Periglacial | Periglacial |
| Glacial | Glacial |
| Saturation | Yes | Excavation/operation | Process neglected; little significance. | Yes | Excavation/operation | Neglected; too small amounts of gaseous species are generated or consumed in the geosphere. |
| Temperate | Neglected; little significance. Main gas would be H2 released from corrosion in the repository. This is considered when estimating bacterial sulfate reduction. | Temperate |
| Periglacial | Process not handled: it is assumed that the rock volume is fully saturated. | Periglacial |
| Glacial | Glacial |