

Response from the British Geological Survey to the Consultation on:

- **Disposal facilities for solid radioactive waste: Guidance on the Requirements for Authorisation (GRA);**
- **Geological disposal facilities for solid radioactive waste: Staged Regulation guidance**

The British Geological Survey (BGS) is a world leading applied geoscience research organisation, which provides objective and authoritative geoscientific data, information, and knowledge to inform UK Government and other stakeholders on the opportunities and challenges of the subsurface environment. The BGS has undertaken research related to the nuclear industry since the early 1940s, and radioactive waste disposal for over 60 years, working with waste management organisations and regulators, both in the UK and internationally. Our work has contributed to safety cases for deep geological disposal, and we have extensive experience in characterising the subsurface, through non-intrusive methods (e.g. seismic and electro-resistivity tomography methods), and intrusive methods including borehole investigations. The BGS also have expertise in laboratory testing, and in-situ underground testing, related to safety-case research and understanding Thermal-Hydraulic-Mechanical-Chemical (THMC) processes. Our experience includes, for example, the large scale in-situ gas injection tests (LASGIT) for SKB in the Äspo Underground Research Laboratory (URL) which logged data for nearly 16 years. We were involved in the NIREX siting programme, the National Screening Programme, and are contributing to the current Nuclear Waste Services (NWS) siting programme. BGS is the UK national provider of geological information, both for surface geology and the understanding of the deep subsurface as well as groundwater behaviour in both the shallow and deep subsurface.

The BGS are happy to be contacted to further discuss our comments if required.

Document 1: Disposal facilities for solid radioactive waste: guidance on the requirements for authorisation (GRA).

1. The document as a whole.

We understand that this document is guidance and not instruction, and that the document has been written with flexibility, which is essential when dealing with a programme which is likely to have as yet unknown challenges, and which will evolve as it progresses. With this in mind, we have identified areas where opportunities exist for improving this document.

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| <ol style="list-style-type: none">1. To enhance readability and clarity, the document would benefit from the inclusion of both an acronym list and a comprehensive glossary. Without these, it may be challenging for readers to fully grasp the content. Additionally, the existing glossary appears to be incomplete and we would recommend that it be reviewed for accuracy and completeness. Furthermore, a thorough review of the document is recommended to identify and correct any typographical errors and reduce excessive spacing.2. We observe that the document uses some informal language that may not be appropriate for a formal document as well as some terminology which is not clearly defined. This gives rise to the potential for ambiguity. As an example, the document refers to baselines and states that the preliminary environmental safety evaluation (PESE) will “demonstrate sufficient understanding of the baseline”. “Baseline” being a broad term, we would welcome more information as to what the regulator expects these baselines to comprise of, and what information, as a minimum, should be |
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included and some clarification on what is considered “appropriate” or “adequate” understanding, and how will this be assessed.

3. We would further welcome more information that enables a Waste Management Organisation (WMO) to understand the regulator’s intentions. For example, in the case of establishing a groundwater baseline, it is assumed that monitoring is expected to form part of this, so what does the regulator consider an acceptable minimum monitoring period? 1, 2, 5 or more years? Such details are currently missing from the document.

This guidance could be further enhanced by incorporating additional definitions, clear expectations, and illustrative diagrams. The Environment Agency’s *Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water* is a good example of how these elements can support clarity and understanding.

4. The document indicates that there will be an apparent “full stop” between the stage of intrusive-surface investigations (boreholes) and the start of underground investigations. It is not clear from the document if all activities stop, or whether further surface investigations can be carried out during the application for underground investigations, or in parallel to carrying out underground investigations. We recommend that this is clarified, as it will have both time and cost implications.
5. The PESE is required to provide details on GRA requirements 2,4,5 and 8. We would like to highlight that it is entirely plausible that these GRA requirements cannot be adequately addressed prior to underground investigations commencing. Our experience of working with international WMOs indicates these GRA requirements might require more understanding of the site specific geology, hydrogeology, hydromechanical behaviour, fluid flow and the coupling of processes in order to be addressed, than can be determined from surface-intrusive characterisation alone. The impact of these factors on the design and performance of associated engineering components should be considered. The importance of progressing to long-term, underground in-situ testing, in order to ensure scientific understanding around the performance of a disposal site and engineered barriers cannot be underestimated, as well as the timescales involved in running the required experiments (Lasgit for example, was ~20 years including set-up, running, dismantling and write up, (Cuss et al. 2022)). Other international WMOs have carried out decades of URL research alongside surface and borehole investigations e.g. SKB, Posiva, Andra, Nagra, Ondraf-Niras.

2. Is the document clear and easy to read?

The document deals with a complex subject, which in the case of a Geological Disposal Facility (GDF) in particular, is non-site specific. To assist the reader in grasping the implications of such a complex subject matter we propose to include an acronym list (as stated above) and the addition of more informative figures (for example refer to Figures 2-1 and 2-2, EA (2003)), and in particular workflow diagrams (for example refer to Figures 3-1 and 3-2, EA (2003)).

The use of internationally accepted terms would ensure consistency with the industry as a whole and aid understanding and interpretation of the supplied information. For example, we propose use of the term Waste Management Organisation (WMO) to refer to Nuclear Waste Services, rather than “developer”.

More consistent use of language would help in understanding the complex information presented in this document. For example, the terms surface-based intrusive investigations, surface investigations and intrusive investigations are used

interchangeably throughout. In other parts of the document, there are references indicating the developer should have “an adequate understanding” – but there is a lack of clarity as to what constitutes “an adequate understanding” or how this will be measured, assessed, or if necessary, monitored.

The ordering of some sections would benefit from further consideration. For example, it would aid readability and understanding if Req 5 – para 2 on baseline monitoring preceded para 1 on operational monitoring. More considered use of numbered headings would assist with navigating around the report structure, as otherwise some of the more lengthy sections are difficult to follow.

We recommend implementing additional tools (diagrams, figures, workflows, definitions etc.) for illustrating the presented ideas and concepts of the GRA. Examples of such tools can be found in the Environment Agency “Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water” document which we regard as an example of good practise when it comes to clearly presenting complex guidance and ideas. We would also encourage discussions with European WMOs (such as Nagra, Posiva, SKB, Ondraf-Niras) as well as their corresponding regulators, in order to gain insight into their learnings and best practice.

3. Are there any inconsistencies in the guidance? If so, please give examples.

We have identified several inconsistencies throughout the document. Some examples have been captured below:

1. There appears to be a conflict with regards to wording on modelling on page 83 of the GRA. Paragraph 4 states: *“To the extent possible, you should verify and validate your models. The effort you expend on model validation should be proportionate to the importance of the model to demonstrating the environmental safety of your disposal system. You should describe your approach to verification and validation, and justify that you have sufficient confidence in your model results for the role they play in your ESC. You should establish that there are no significant errors in your models”*. In our view, this conflicts with paragraph 5 which states: *“Full validation of a mathematical model is not possible. For example, it may not be practicable or possible to collect the necessary experimental or monitoring data, or processes that will only occur far in the future, and cannot be measured, may be being modelled”*.

In this context, it should be considered that if dealing with very long timescales, it will never be possible to accurately validate model outputs – and as such, it will never be possible to definitively establish that *“... there are no significant errors ...”* in the model outputs, and as such is effectively setting up a model for failure.

2. Page 20 “changes in guidance over time” provides some examples but does not include societal changes which seem to be key in other parts of the document. On page 31, for example, the document discusses a proposal for a period of control beyond 300 yrs post closure being unacceptable due to societal changes. However, page 31 raises the question of what is to happen after this period of 300 yrs. The document appears unclear on this point. If unknown, or outside of this guidance, this should be stated. The document also appears to assume the post closure safety case, which has to look at long term geological processes such as glaciation which might affect the GDF for up to 1 million years post closure, will be adequate and will not be further revised post closure? Is this the case?
3. We also note several potential areas of omission in the document, for example related to natural hazards. We would recommend inclusion of a section on

“protecting against inadvertent contamination through natural disaster”. Natural disasters may be of particular concern while the intended final barrier system is open during the emplacement and acceptance phases of disposal, particularly given the expected length (+150 years) that a GDF may be open and operational.

4. In the “Management of uncertainty” chapter, we recommend that a section on expert knowledge and epistemic uncertainty is included. Given the complexity of the systems involved, in the early phases and long-term forward modelling, expert knowledge will need to be reconsidered, in the light of new emerging data i.e. it is an iterative process.
5. “Requirement 5: Monitoring” – a section on what needs to be done post monitoring is required, especially with regards any intrusive investigations. Further information should be added here regarding the restoration and sealing of boreholes and any subsequent monitoring. Furthermore, the section on “Radiological environmental safety assessment for the period of RSR” should state explicitly natural disasters, including tsunamis, seismic hazard etc.

4. Are the requirements set out in the guidance clear, and do they cover all the areas that should be addressed?

It would be beneficial to review the document to ensure guidance is given more clearly and consistently, particularly in relation to definitions. Below are a few examples where a review may be helpful:

Clarity / integration:

The groundwater protection section is comprehensive, but some clarity around the interaction between different parts of the regulation would be helpful. A graphical description of the different schedules in the EPR (2016) linked to groundwater would help clarify this: e.g. how does the Radioactive Substances Activities (Schedule 23) interact with Groundwater Activities (Schedule 22). This is in addition to how the water framework directive (WFD) 2017 regulations will be applied.

There could also be better integration between the Part 4 and Requirements 5 and 14.

Definitions:

As stated in our responses in previous sections, the definitions (and lack thereof) in the document should be reviewed. In addition to the points raised above, P95 – the “*definition of pollution*” is not clear. The document should explain how the definition in relation to pollution is different between the two regulatory regimes i.e. between radioactive substances activity and groundwater activity. The following points have been grouped by subject matter for ease:

Geographical extent:

- Geographical extent of groundwater / Definition of groundwater is a key definition and some graphical explanations may be useful in communicating this;
- Challenges in removing all offshore groundwater from the legislative process could include areas where; an aquifer crosses the coastal zone and where there may be the presence of fresh water offshore, and onshore activities which may draw in water from the coastal zone where groundwater is not protected. For the EA Saline intrusion test, EA guidance states 5 km from coastline has to be taken into account (Groundwater_chemical_status_assessment_and_trend_assessment_2022.odt);

- EC guidance (2003) states that groundwater bodies should be defined on geological boundaries or groundwater flow lines, not just by the coastline as currently stated;
- Even if a facility/drilling is offshore, there should be a requirement for any operators to carry out an underpinning assessment of the regional/catchment scale hydrogeological system to evidence that something is not a groundwater activity. We question whether this is covered appropriately in the document;
- Groundwater monitoring does not seem to be required offshore / no compliance points provided;
- Given national and global growing interest in offshore aquifers, it is likely that a current definition of groundwater only as onshore will be out of step and required to be revised in the future;
- If groundwater in aquifers offshore is not covered in the EPR (2016) and is not classed as 'groundwater' there should be some additional terminology used to distinguish this;
- The document currently appears to suggest that no offshore drilling activity can constitute a groundwater / Schedule 22 activity? This has the potential to be an issue if boreholes are drilled close to the coast, and has the potential to impact on onshore GW regimes;
- Although there has been limited research on the potential for fresh sub-marine groundwater discharges in the UK, this is a growing area of focus internationally, in terms of the potential for freshwater offshore aquifers and the importance of sub-marine groundwater discharges for ecosystem services (e.g. Taniguchi et al., 2019). The implications, therefore, of the EPR (2016) definition should be considered in this wider context.

Depth of groundwater definition

- If the definition of groundwater onshore has no depth limit, some consideration should be given to if and how it could be demonstrated that a host rock did not contain groundwater.
- Consideration of groundwater in host rocks, with regards to re-saturation of bentonites/cement buffer etc. There are potential terminology issues related to the distinction between pore water versus groundwater. Definitions are required here for clarity.
- Some clarification is required on if and how it can be defined which geological formations at depth contain groundwater and therefore, need to be protected, and also on how this will be evaluated. The definition does not include a depth restriction for what is considered groundwater, while aquifer designations are not appropriate either at greater depth or offshore.
- Clarification on what is meant by "relatively immobile" is required. Something is either mobile or immobile, it cannot be relatively immobile. However, something can have restricted or low mobility.
- Clarification on what is meant by "highly impermeable" is required. See logic above.

General:

- There is limited discussion around compliance points for radiological/non-radiological contaminants, and it is unclear to us if this is only relevant if the activity is a Schedule 22 activity. We also observe that Source-Pathway-Receptor assessments

are not mentioned in the document, whereas these are typically a foundation of the risk assessment process for environmental permits. • We feel there is insufficient consideration given to the impact, constructional longevity etc., of accessways through aquifers and potential risk during the 150 + yrs of operation?
5. <i>Should a specific requirement be added about sustainability and how that should be considered in the development and operation of a radioactive waste disposal facility?</i>
Not answered
6. <i>Are the requirements and guidance on isolation and containment (requirements 8 and 9) clear and sufficient? If not, what improvements would you suggest?</i>
Not answered
7. <i>Are the requirements and guidance on assessing natural disruptive processes (requirement 17 and 17a) clear?</i>
These sections deal with potentially long term processes such as glaciation and permafrost for the ~1 Myr lifespan of a GDF post closure in order to show long-term isolation. However, section 3 (Environmental Safety Case (ESC)) states that the EA would not accept a proposal for a period of control for radiological protection for longer than 300 years after closure due to societal change. It is unclear, therefore, how the long term post closure safety lifespan of the GDF is being addressed and whether the EA will be expecting updated ESC beyond the 300 years. Natural hazards / disasters and long term processes such as tsunamis, earthquakes, floods, glaciation etc., also need to be considered.
8. <i>Is the guidance on groundwater protection (part 4) clear and sufficient and is it well enough integrated with the rest of the guidance? If not, what improvements would you suggest?</i>
The document is not completely clear around the regulation of groundwater, especially in the transition from onshore to offshore. Further discussion using simpler language would avoid ambiguity. Some specific points are listed below: • P97/98 - The definition of porewater as distinct from groundwater should be made clearer (p97 seems to contradict p98 in whether porewater is in scope as "groundwater"). • P100 - "Prevent and limit requirements and justifications" – add these terms to the glossary to ensure they are clearly defined and understood. • P100 – "radioactive waste can contain non-radioactive hazardous substances" (and reference to the UK Technical Advisory Group (UKTAG) list of hazardous substances). An example is uranium which has greater chemical toxicity than radiological hazard. Uranium is not included in the UKTAG list of hazardous/non-hazardous substances but is in 2020/2184 quality of water intended for human consumption directive (might become included in UKTAG later?). • P109 – Stipulates a baseline groundwater monitoring requirement of a minimum of 12 months to assess temporal change, but in reality a baseline should provide monitoring evidence running up to the point of development (i.e. a 'modern' or current baseline).

9. *Does the section titled 'Guidance on modelling' (in part 3) contain useful information at a suitable level of detail?*

We note that this section could be improved. It currently has several gaps and lacks broader consideration of the modelling process and data requirements, including inputs, model design, the numerical implementation and outputs. The following points highlight some of our concerns.

- The text of this section is overly biased towards the actual running of models (procedures used, assumptions etc.) rather than the “front end” of the modelling – i.e. accurately defining coupled processes, input parameters, data etc., which we consider far more important.
- More consideration needs to be given to the robustness of the underlying data upon which the modelling is based. For example, accurate results cannot be obtained where the underlying data are poor or missing, thereby introducing uncertainties or unknowns into the modelling process. Such deficiencies cannot be compensated even if the modelling code is very accurate. Availability of data of appropriate quality for model parameterisation, calibration and validation is key to demonstrating that the model can accurately predict the site evolution.
- Comments in the document around uncertainty within the modelling section only relate to the actual models rather than the originating and underpinning data (the inputs). The data and related uncertainties must be recorded and understood, as these will have an impact on the model outputs. Equally, uncertainties in model outputs must be recognised, relating to simplification of processes to facilitate tractable computation times (i.e. loss of spatial and temporal resolution) as well as approximation of underlying physics/processes within the code. The role of deterministic and stochastic processes will also impact accuracy and confidence in model predications. Therefore, the document would benefit from inclusion of a section on expert knowledge and uncertainty (i.e. identification and mitigation), possibly linked back to the section on “Management of uncertainty”. This would also need to link to epistemic uncertainty.
- We suggest including a greater focus on the grounding of the models, with an emphasis on ensuring that basic underpinning data within the models are the best available (or at least the most appropriate), verified and traceable (the “golden thread”). Previous BGS experience has shown the importance of this. Using external models where insufficient consideration was given to the source and quality of “basic data” and its implications to the model and its outputs resulted in additional work, significant time delays and additional expense. In this case, the model used data from several geochemical modelling packages to define specific thermodynamic data relating to specific elemental phases. These data were subsequently found to be unverified and not based on experimental results. As a result, BGS had to undertake additional specific experiments to obtain the necessary data to support modelling.
- Depending on the model, such data could include (but are not limited to): geochemistry (thermodynamics and kinetics of minerals etc.), physical properties (multi-phase (gas water and solutes) coupled flow behaviour, heat capacities, strength etc), or relate to the rock volume being considered for a site, and how that has been obtained and interpreted (e.g. sonic velocities of rock units being imaged by geophysical techniques such as seismics).
- Where utilising studies by other WMOs, consideration should be given to the appropriateness and robustness of these models across different systems in different countries. The document does state “comparing your mathematical model results to the results of other models”, but this statement is vague and should be more specific.

- Studies of natural analogues, which have a useful role to play in the understanding of processes over the 1 Myr lifetime of a GDF, appear to be understated in the GRA. They can provide key data over long-term evolution, as well insights into processes that may need to be considered, that are not revealed by short scale experience alone. However, natural analogues should only be considered as a representation of some of the process that may be occurring over such scales. There is mention of “using your models to model analogues of your disposal system”, but this is ambiguous, and could be interpreted as referring to laboratory experimental systems only. The text does not specifically mention the potential importance of natural systems for conceptual model improvement, or even the use of actual model test cases (see also response to question 3).
- Guidance could include the use of peer review as part of the modelling workflow to ensure balances and checks.
- It is difficult to succinctly summarise in any one document such a broad field as radionuclide transport, its best practice, and the approaches that should be adopted. Similarly to the comments above there are several existing documents that could be referenced to provide guidance for the reader. Commonly used international guides include the Australian groundwater Modelling guidelines (Barnett et al., 2012). The Environment Agency has produced their own guide for regional groundwater models (see Brown and Hulme, 2001) and summarised in a paper (Whiteman et al., 2012). Further, good practice from the NIREX programme and international model intercomparison such as HYDROCOIN could be referenced, e.g. Larsson, 1992).

Document 2: Geological disposal facilities for solid radioactive wastes: Staged regulation guidance

1. The document as whole

We note that reading the GRA before the Staged regulation guidance could have answered many questions associated with the Staged regulation guidance. As such, we would encourage clearer signposting between the two documents in the opening section of the staged regulation as this would assist the reader. The use of figures and tables would further help with clarity e.g. some of the conditions and desirable information could be separated into tables to make reading easier. We found the appendix easier to read than the body of the text. We note that some wording used in the document does not reflect language in use by international WMOs, which may cause some confusion.

The need for a staged approach is understood. However, in its current form, it seems restrictive and not reflective of international WMO's experiences to date. It is not clear if underground investigations can proceed prior to completion of surface intrusive investigations. If not, this would potentially add significant delay to any GDF programme. A PESE is required to provide details on GRA R2, R4, R5, R8-10 prior to progressing to underground investigations. It is entirely plausible that that in particular, R8 and R9 cannot be adequately addressed prior to underground investigations i.e. these would require more understanding of the in-situ geology, hydrogeology, fluid flow and coupled processes than is possible to glean from boreholes and laboratory experiments alone, hence the requirement for underground investigations. This should be borne in mind by the regulator when assessing the PESE. Other WMOs have carried out decades of URL research alongside surface and borehole investigations (e.g. SKB, Posiva, Andra, Nagra and JAEA).

Regarding page 22, paragraph starting “We will expect the developer to be certain....”, it should be noted that until underground investigations start, the full implications of the geology at that site e.g. faulting, heterogeneity, opening flowing features, will not be known, and therefore the statement “this should be sited so that it does not introduce unusual or unexpected conditions that are detrimental...” cannot be absolute or definite. It is also important to recognise that the coupling of repository processes and the coupling between infrastructure, waste forms and engineered barriers with actual geological conditions cannot be guaranteed a priori. This should also be recognised in the phasing of work and the timing of decisions for addition/complimentary studies/investigations.

The statement on page 12 “Detailed investigations may take several years or more...” is extremely optimistic – it will likely take decades. Refer to the international GDF programmes.

We particularly agree with the statement on page 38 that an initial site evaluation (ISE), if using generic models and data, should avoid giving a false impression of how much is actually known about a candidate premises. Overinterpretation must absolutely be avoided. There could be more flexibility in the guidelines for a re-evaluation of the borehole campaign, if the first boreholes provide unexpected results.

2. Is the document clear and easy to read?

Without having read the GRA through first, information within the Staged guidance is unclear or appears ambiguous. The document is very difficult to read with repetition and the lack of a glossary (particularly of acronyms). It would benefit from diagrams to illustrate the process. Some of the conditions and desirable information could be separated into tables to make reading easier. The appendix is clearer than the body of the text.

3. Are there any inconsistencies in the guidance? If so, please give examples.

More clarity as to which regulatory body is leading and responsible for, the onshore and the offshore, and how this will be managed, is required.
We note that the discussion on the interaction of the different organisations involved e.g. Marine Management Organisation (MMO), Environment Agency (EA), Office for Nuclear Regulation (ONR) could be improved. These interactions are described very well in the GRA in “Roles of other organisations” but the description is less clear in the staged regulation guidance.

We also noted some inconsistencies between closure and return of permit, and the need for long term monitoring, possibly through boreholes.

4. Are the stages set out in the guidance clear, and do they cover all the areas that should be addressed?

A diagram including expectations and limitation at each stage would assist understanding. It is currently unclear exactly how a license for a previous stage will carry forward into a subsequent stage i.e. is there a full stop at the end of each stage, or can stages continue in parallel? For example, can surface intrusive investigations still be carried out once underground investigations start, or do surface intrusive investigations cease prior to the start of underground investigations? This is unclear and could be more clearly stated.

As previously noted, we found that some of the terminology is ambiguous and unclear. For example, establishing baselines is mentioned in several different contexts throughout the document but without clarification of what is understood by the different

baselines, what they need to comprise of, if monitoring is required as a component of this and what the minimum period for collecting data is (e.g. 1 yr, 2 yrs or 5+ yrs).

Another example is that the document states that there is an “*expectation* that a PESE will demonstrate *sufficient understanding* of the baseline conditions” which raises some questions: For example, if it is only an expectation, what happens if the PESE does not meet this expectation? And, what defines “sufficient understanding”? It is also unclear as to how the regulator will assess documentation from the WMO, i.e. what is deemed to be “adequate”, and what documentation or understanding meets a GRA. A more detailed statement on how this will be assessed would assist understanding and help to set expectations.

We also observe that the regulator requires the WMO to “describe the proposed approach and include a plan for determining environmental baseline conditions” rather than the regulator defining what they require. In other regulatory domains, baseline requirements tend to be stipulated by the regulator, while the onus on compliance is the responsibility of the operator – i.e. the WMO. We recommend that some rationale is given to explain the roles and difference in approach.

5. Is the scope of our regulation of the surface-based intrusive investigation stage clear and does it cover all areas that should be addressed?

Not answered.

6. Is our approach to permitting the sites for drilling boreholes during the surface-based intrusive investigations stage transparent?

Not answered.

7. Is our approach to regulating the initial and subsequent borehole drilling activities during the surface-based intrusive investigations stage clear and fit for purpose?

Covered in response to question 1.

8. Is it clear which construction activities we would permit during the underground investigations stage?

Only when the staged guidance is read in conjunction with the GRA document.

9. Is guidance on the supporting information required for permitting each stage clear and does it cover all the areas that should be addressed?

In our view, the following points are lacking or insufficiently addressed, and we recommend that they are included:

- Faults and natural fracture characterisation of the ground during ISE
- Other hazard identification during desk based and ISE including tsunami, seismic, land movement e.g. subsidence
- Better definition on expected baseline monitoring and minimum periods of monitoring. Link to R5 in GRA
- Peer-review of the different safety evaluations and safety cases prior to submission would add another level of scrutiny
- Better capture of epistemic uncertainty required and use of expert knowledge especially in the earlier stages where less data is available. This is particularly important in model driven decisions.

10. Are permit surrender requirements for the investigatory and post-operational stages clear and relevant to each stage?

To us, it is not clear how the storage and disposal of waste material (including borehole material, spoil from adits, shafts and tunnels, etc) produced during each stage of the construction of a GDF will be regulated.

Our understanding is that permit surrender will end all monitoring. We are not clear if the regulator foresees exceptions that would allow or potentially require long term monitoring post closure.

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