Proposal for DESNZ subsurface heat geospatial platform (SHGP)

Statement: The British Geological Survey (BGS) confirms that we can meet the requirements outlined in the specification to the timeline presented and within the maximum budget allocated. Some ownership/publication/IPR points are at the end of this document.

Approach and Methodology

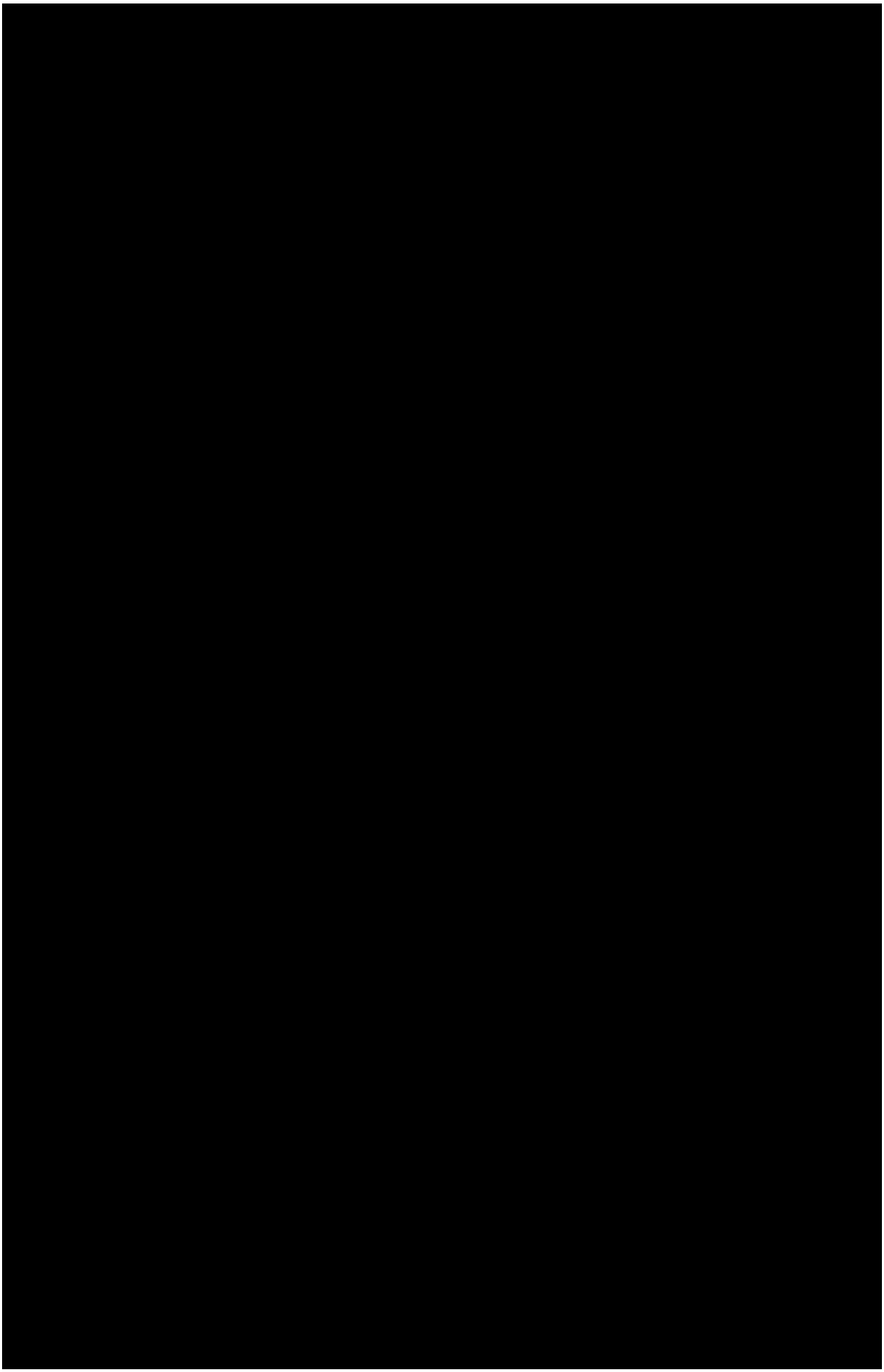
Rationale: Decarbonisation of heat and power are a key part of reaching UK Net Zero targets by 2050[1]. Geothermal energy technologies offer significant potential for renewable heating, cooling and power in the UK, within a future, decentralised energy mix[2]. The small number of operational geothermal schemes in the UK, coupled with a lack of digitally accessible information on technical and economic feasibility are identified as barriers in unlocking investment in geothermal energy[3]. This applies to Government/DESNZ policy makers as it does to industry and researchers.

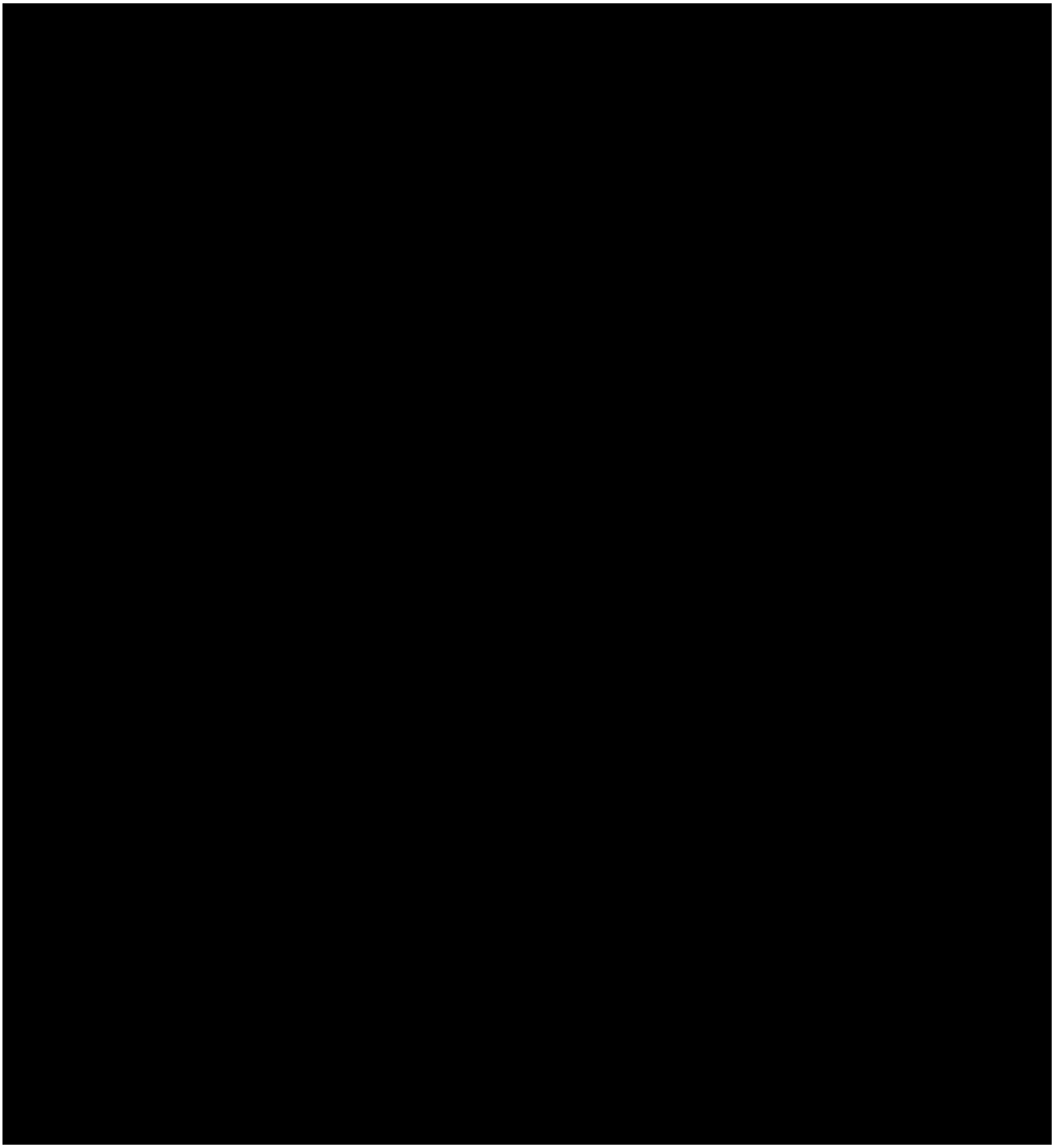
The rationale for this project is to fill key evidence gaps to inform heat policy teams on the technically viable opportunities for geothermal energy that could be included in heat network zoning policy, and link these to cost-effectiveness results from an allied project. This will be delivered as a web-based geospatial platform to make accessible currently disparate sources of geothermal data and information. In addition, a tool will be developed to interrogate, summarise and screen geothermal energy technologies for pre-feasibility stage assessments. This will allow heat policy and analysis teams in DESNZ to include geothermal energy in modelling and strategy development for their priority in heat decarbonisation, for example, the renewable heat policy and strategy due by 2026[4]. It will also support analysts assessing Green Heat Network funding applications and the Heat Network Development Unit, as well as being available for public sector bodies, industry, researchers and the general public, that may lead to innovative uses of geothermal energy in the UK.

Approach, plan and methodology:

The approach is to follow the logical sequence of outputs detailed in the specification (see also Annex Gannt Chart), structured as a series of subtasks with experienced leads.

[redacted]





Risk and mitigations *(See also Risk register, Annex C)*

To enable active risk management in line with achieving objectives (as opposed to being risk averse), the risk register will be actively used throughout the project for a structured approach:

[redacted]

Working arrangements

The active delivery and management of this research project will be through the Project Manager [redacted], who will be the central point of contact. [redacted] will work closely with the DESNZ project manager. The project team is split across the Keyworth and Edinburgh BGS offices with established working practices for split-site and hybrid working arrangements.

Plan for reporting to the project management team:

- BGS project staff will meet regularly as well as communicating in person, on Teams and via email. Frequency and attendance will be appropriate to the stage of work and staff involved at that stage
- [redacted]
- The slides will form an updating report of project progress.

- The specification and contract also mention reporting to the Advisory Board at key milestones. For avoidance of doubt BGS has budgeted for no more than 3 online meetings of 1 hour each in [redacted]

BGS internal resource management risks will be managed by task leads in regular communication with staff. BGS operates a resource management system where staff record their time on projects in hours in a digital system. The delivery of tasks will be managed through this system, for example tracking time used and time remaining.

A Gannt chart is supplied as an Annex to complement Annex D. This contains the estimated time required for each task, key dependencies, and the likely start and end dates of the tasks.

External organisations procurement: [redacted] been set aside for organisations external to BGS to enable work to be completed to supply geothermal data and information to be included within the SHGP. Following prioritisation of datasets and information to be included, 1 to 1 meetings (BGS/Subcontractor) will be needed to find out more details of the dataset/ information and work to be done. BGS Procurement will ensure that any subcontractors have Cyber Essentials certification and follow all due diligence procedures set out by DESNZ, using UKSBS before commencing procurement. As the work will be below £10,000 the UKRI process for procurement to be followed is:

- The subcontractor needs to be set up on the UKSBS system (this can take a few weeks and includes bank details etc.) The subcontractor needs to provide a formal quote
- The standard UKRI PO Terms and Conditions will need to be accepted by the subcontractor. This contract allows for prior IPR for the subcontractor, though results resulting from the contract shall vest with UKRI/BGS. No changes to the contract are allowed for under £10,000. Unless the subcontractor wishes to assign IPR to BGS, this mechanism will only be appropriate for datasets existing and owned by the subcontractor (their IPR), where the funding is used to enable formats/metadata etc. for inclusion in the SHGP.
- BGS can then raise a requisition to the corresponding quote
- The work takes places, BGS receipts the work and the supplier is paid

External stakeholder engagement and management

[redacted]

[redacted]

Data Management

Working and final files associated with this project will be held on a shared, secure BGS network space[redacted] well as in corporate repositories, databases and systems as needed. The descriptions of the datasets, including map layers and external data sources will be documented in accordance with the UK-GEMINI where possible metadata standard: UK-GEMINI Introduction (agiorguk.github.io) as recomended by the UK Geospatial Data Standards Register - GOV.UK (www.gov.uk).

Quality Assurance

BGS have accredited ISO9001:2015 management systems for controlling the quality of output. Quality assurance processes that will be followed prior to delivery of outputs to DESNZ:

Data Approvals: Workflows have been designed specifically for the approval and release of BGS data. The data approval process is structured to ensure that the data we release meets the consistency, accuracy, scientific robustness and quality associated with data provision as well as alignment to corporate data policies. Examples of data specifically include spatial data delivered via a platform such as a web map viewer, that is to be made available externally and delivered as an agreed deliverable for an external client. The approval workflow is in place to ensure good data governance and provides a robust audit trail to demonstrate that BGS has taken all necessary steps to ensure that all data released is fit for purpose, with mitigations in place to reduce any potential risks associated with the publication of the data. The process is designed to ensure that the purpose of the data is understood and releasing the data enhances the reputation of our organisations. Any new initiatives have to go through an introductory stage in order to engage with the BGS Informatics and Digital Products Team so they are aware of the project and the stakeholder need. The workflow then details all the necessary supporting information that is required to be able to release a data product or tool. This work will be led by the[redacted]. The sign off then has scientific and technical reviews (for example in Output 3 the scientists will check outputs) an IPR and management check.

Reports are signed off via a publication worksheet. This encompasses a science/technical review, IPR and management check. [redacted]will undergo the science/technical review prior to supply of draft version to DESNZ, and the IPR and management check for the final versions. It is expected that the [redacted] will be published on NERC Open Research Archive (or similar) so it is openly available for users.[redacted] will undergo a check by the Project Manager (or one of the project task leads if written by the PM) before supply to DESNZ

Website: Before publishing, BGS has a sign-off process and checklists covering sensitive information, legal, the internal publication process, security, resiliency, logging, testing, back ups, supervising (vulnerability/crashes) and deployment status tracking. The quality assurance on [redacted] will conform to the corporate publication worksheet procedure ensuring that the content, software and accessibility quality are reviewed and signed off by the appropriate chief scientists and technical leads. The introductory website will follow

accessibility best practice that exceed WCAG2.2 accessibility guidelines in line with the styling illustrated in the BGS hosted UK Critical Minerals Intelligence Centre (ukcmic.org).

DESNZ and Advisory Board comments will be taken on board in two ways. For the platform, as a result stakeholder workshop/user testing in [redacted] For reports and presentation materials, these are scheduled to be supplied in draft form. Comments received will be incorporated into the final versions using normal professional practice to adapt text and respond to queries as appropriate.

Derivation of analytical outputs for the screening [redacted] along with assumptions, reasoning for choice of given assumption including the assumption source. Limitations will be summarised as needed along with units of measurement and the information needed to interpret outputs.

Team to deliver

[redacted]

The project will be led by four Principal Scientists with extensive relevant experience: **Project Manager -** [redacted] at BGS, with [redacted] experience across multidisciplinary geology and geoenergy projects with provision of open data. Examples include leadership of the £1.3m [redacted] which produced 15 datasets/reports across the UKCS, available through the BGS Offshore Geoindex, and the science leadership of the £9m [redacted] will lead this [redacted] contribute to the incorporation of BGS and external datasets, IPR aspects [redacted] contribute to the method and logic for the screening layer [redacted] and look ahead to incorporation of data in future and in presentation materials/ dissemination [redacted]. **Digital Lead-** [redacted] coordinating a

team to deliver data networking, transmission, storage, management and lead on the public engagement digital platform in close collaboration with scientists and science communication team. [redacted] will oversee the five developers of the [redacted] as well as coordinating closely with the web editor and [redacted] to ensure the end result is an accessible, user friendly solution where all three elements are well integrated and meet the stakeholder needs captured through Output 1 and relevant tasks in Outputs 2 and 4. **Stakeholder Engagement Lead** [redacted] has developed [redacted] GIS-based decision support tools for the public sector to inform the redevelopment of [redacted] has a wide range of stakeholder engagement experience including as a technical lead on the [redacted] between 2021 and 2023. [redacted] will lead the stakeholder engagement tasks for the DESNZ SHGP [redacted]), building on [redacted] will interface closely with [redacted] to ensure user requirements feed into the tool design and development tasks, leading the stakeholder engagement parts of the work in [redacted] **Data Lead -** [redacted] years of experience in geological appraisal and GIS innovation. He has developed several screening models and decision support tools for different sectors, including: [redacted] days in total) will lead the screening layer and data development tasks [redacted] to create appropriate spatial content for the SHGP and will work closely with leads on [redacted] and Data Architect - [redacted] by using geospatial data standards to better align with FAIR data principles. [redacted] a member of the [redacted] days) will implement the GeoNetwork metadata catalogue and provide the science team with guidance on best practice for population of the metadata catalogue as part of [redacted] of experience geospatial web development. [redacted] a key strategic priority for BGS, and the foundation of the next generation of BGS Map Viewers (https://www.bgs.ac.uk/geological-data/map-viewers/) that will underpin services such as GeoIndex and the geothermal webGIS [redacted] 4 of this project and the metrics in [redacted] will support the stakeholder engagement activities with a specific focus on translating user needs into the design for the [redacted] and organising the user testing activities. [redacted] will support [redacted] in hosting the stakeholder workshops and implementing a mechanism for platform-

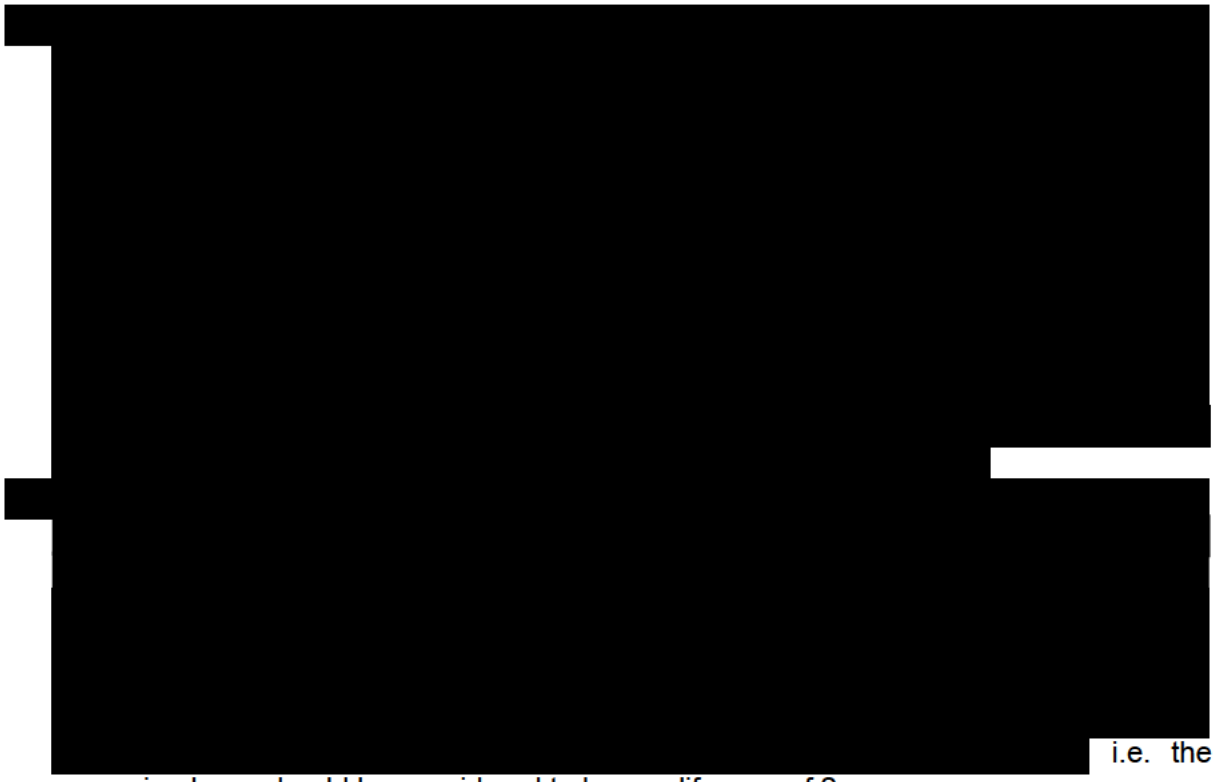
usage metrics to understand sector engagement and user value in [redacted] **National Geosciences Data Centre staff**, who receive all the data coming into BGS, will support in [redacted] nd the BGS Project Team will also have input from a Data Architect, Web Editor, Data Management and GIS/coding specialists in delivery of [redacted] A group of **geoscientists** with specialism in management of geothermal datasets and/or in calculation and modelling of geothermal resources will provide the technical input to [redacted] release of the legacy geothermal catalogue under OGL.

Budget

Budget and pricing information are provided in Annex A and Annex D. The budget includes [redacted] to be allocated to other organisations to enable seamless integration of relevant geothermal information/data that is not yet publicly available (to follow UKRI procurement process described above). BGS will submit invoices to DESNZ in line with Annex D after successful delivery at the agreed deliverable dates and in discussion with the DESNZ Project Manager. [redacted]

Ownership and Publication, plus Schedule 36 IPR

[redacted]



i.e. the screening layer should be considered to have a lifespan of 2 years.