

Peer Review Report

Review Report on Time zero for Net Zero: a coal mine baseline for decarbonising heat

Original Research, Earth Sci. Syst. Soc.

Reviewer: Charlotte Adams

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Article DOI: 10.3389/esss.2022.10054

EVALUATION

Q 1 Please summarize the main findings of the study.

This study describes the baseline sampling undertaken prior to and during the UKGEOS mine water observatory. This has facilitated thorough characterisation of the site and enhanced understanding of the soil chemistry, ground gas, surface water and groundwater characteristics coupled with an elucidation of the interactions (hydrogeological and geochemical) between the 3 identified geological settings, man made superficial deposits, aquifer overlying the worked coal seams and the coal seams. It also includes biochemical considerations which are often overlooked in this type of study

Q 2 Please highlight the limitations and strengths.

Limitations

This level of sampling/monitoring could be costly for scheme developers – what aspects should regulators highlight when requesting monitoring

Clearly this is a very detailed analysis of one site – how site specific are the findings – which would you expect to be relevant to other coalfields – what is transferable if not indicative?

Strengths

This work has relevance for ongoing monitoring both at this site and future mine water heat development

The work provides a good checklist and methodology for the type of modelling that could be taken – plus the approach that could be used

The work highlights gaps and unknowns so it cognisant of the limitations but shares these for future researchers to adopt

Q 3 Please comment on the methods, results and data interpretation. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.

The methods used and the results gained are appropriate and achieved the objective of gathering baseline monitoring for the site. I have indicated on the manuscript where authors can comment as to whether some of their findings were as expected or not. Data has been well interpreted through the used of figures and tables and backed up within the text, I have no concerns

Q 4 Check List

Is the English language of sufficient quality?

Yes.

Is the quality of the figures and tables satisfactory?

Yes.

Does the reference list cover the relevant literature adequately and in an unbiased manner?

Yes.

Are the statistical methods valid and correctly applied? (e.g. sample size, choice of test)

Yes.

If relevant, are the methods sufficiently documented to allow replication studies?

Yes.

Are the data underlying the study available in either the article, supplement, or deposited in a repository? (Sequence/expression data, protein/molecule characterizations, annotations, and taxonomy data are required to be deposited in public repositories prior to publication)

Yes.

Does the study adhere to ethical standards including ethics committee approval and consent procedure?

Yes.

If relevant, have standard biosecurity and institutional safety procedures been adhered to?

Not Applicable.

Q 5 Please provide your detailed review report to the editor and authors (including any comments on the Q4 Check List):

This is a well written and valuable piece of practical research, it is interesting to read and well laid out an appropriately supported with figures and tables. It is sharing newly acquired data that will be of interest to others in the mine water heat field. It also highlights sources of shared data and avenues for further research. Please find comments within the attached

QUALITY ASSESSMENT

Q 6 Originality	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Q 7 Rigor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Q 8 Significance to the field	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Q 9 Interest to a general audience	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Q 10 Quality of the writing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Q 11 Overall quality of the study	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>