Current status

At present the Coal Authority have, and continue to, collect temperature data. This is from a variety of different sources (see Table 1) and for different purposes. The data is stored in multiple sources and is not collated in to a single place (e.g. database).

Data collected and information known at present

The data collected and the information known is summarised below.

**Site Details**

* Site name
* Site location (e.g. region and national grid reference)
* Type of site being monitored (e.g. pumped, discharge)
* Comments and other details on the site (e.g. shaft depth, depth of pump)

**Source and type of temperature data**

* Location of measurement point (e.g. borehole water level, cascade)
* Type of measurement (e.g. temperature logger, on site testing)
* Location of data-files (e.g. J drive or Wisdom location)

**Temperature data**

* Date(s) and time(s) of reading(s)
* Date range of data
* Amount of data in range
* Summary of temperature (e.g. min, max, average)

**Hydrogeological data**

* Summary of flow rate (e.g. average) for the site
* Approximate water level during date range

**Chemistry data**

* Approximate values for the water being measured for: Iron, Chloride, Sulphate, Conductivity, pH

Table 1: Sources of mine water temperature data

|  |  |  |
| --- | --- | --- |
| Data Type | Estimated number of sites/types of data | Type of data and comments |
| Pumping Tests | 15 to 20 | Data taken by contractor on a frequent basis. Often over at least a 3 month time period. Reliability of data depends on testing method |
| Temperature loggers | 5 to 10 | Loggers installed to measure the ‘raw’ mine water temperature. In some instances this may be a cascade. Data typically recorded every 30 minutes and for a period of at least 1 month. |
| Water loggers | 100 to 150 | Logger installed primarily to measure water level or flow rates. A secondary function is to measure water temperature. Depends on location / depth of logger installed |
| Spot on site measurements | 150 to 200 | Data typically taken by CA on an ad-hoc basis, but may be as part of a trial. |
| EC-Temperature logging | 40 to 50 | This is a specific test done on an ad-hoc basis. The test is a log of temperature (and chemistry) changes with depth. The temperature is recorded continuously in the log. |
| CA mine water heat schemes | 1 | CA operated mine water heat scheme. These collect extra data such as COP. At present the only site is Dawdon. |
| 3rd Party heat schemes | Unknown (<5?) | There are other mine water heat schemes and trials, which are not CA operated. These have other useful data such as COP |
| Other (published data) | Unknown (<10?) | There is 3rd party data available of mine water heat and groundwater heat from around the UK and worldwide. |

Note: Some sites have more than one data source / data type. For instance Bates has data for: on site readings, water lever logger, logger in the cascade and EC-Temp log

The problem

The Coal Authority (and 3rd parties) request information about temperature data and other key parameters (e.g. flow rate). The information is to help assess ground source heat potential along with other possible benefits. At present the data is not readily available, nor is it in the correct format where is can be easily assessed. Because the temperature data has not been (and is not) kept as a specific requirement, there is no single point of reference for the data. To retrieve the data requires knowledge of the data collated and where it is kept.

Requirements

The temperature data over the past few years has progressively become a more valuable resource. Along with the CA innovation aspects for this data, the CA may also want to promote the data and use of mine water as a heat source. To meet this, the following requirements are needed:

* All data is readily and easily available for all the CA
* The data is in the correct format
* The data is spatially referenced (x, y co-ords are a minimum)
* Other information about the mine water is available
* The information can be assessed with other CA assets (e.g. mine shafts, scheme)
* The information can be assessed as part of innovation (e.g. heat demand against mine water availability)
* The data can be made readily available (subject to costs etc.) to 3rd parties
* The data and mine water heat potential is promoted as a resource
* Management and update of database and summaries

The solution

Whilst there is not an appropriate database and data management system, there is a need for this data to be managed. The solution presented here may be a short to mid-term solution, which allows the CA to meet demands and better manage its assets. A longer term solution should be a centralised data management system from which this data can be reported.

The short to mid-term solution is to:

* Store the data-files in a single, accessible and appropriate location (location TBC)
* Compile a summary report of all the data
* Add the data to a corporate GIS system (e.g. Prospect)
* Regular updates and management of the data and reports

Resource / timescale

Collate all the information in to a single location (Data admin and hydro): Total 3 to 10 days

Compile the summary table (Data admin and hydro): Total 2 to 5 days

Add the summary to a GIS system (Mining information / GIS analyst): Total 1 day