

MINUTES OF MEETING

Wakefield, England

1. List of attendees:

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|---|---|
| – Jorge Loredó, Universidad de Oviedo | – Juan Enrique ÁlvarezArecos, HUNOSA |
| – Nieves Roqueñí, Universidad de Oviedo | – Keith Parker, Alkane Energy |
| – Covadonga Loredó, Universidad de Oviedo | – Anup Athresh, Alkane Energy |
| – David Banks, University of Glasgow | – Amin Al-Habaibeh, Nottingham Trent University |
| – Paul Younger, University of Glasgow | – Grzegorz Gzyl, GIG |
| – Neil Burnside, University of Glasgow | – Marcin Głodniok, GIG |
| – Adrián Peña Fernández, HUNOSA | |

2. Main conclusions

Work session 1 and 2 – WP 1

Task 1.1 Discussion & conclusion on further task progress involving UOVE, GIG and UGLW representatives

- Dave Banks have raised up the problem of non-compatibleness of the calculation approaches used by Ogata & Banks with the ones used in Rodriguez & Diaz.
- Covadonga Loredó have proposed the new calculation approach, that could possibly replace Rodriguez & Diaz.
- Paul Younger have proposed to use a simple weighing factor (as in the paper distributed via e-mail) as a switch between any of two competitive calculation approaches inside the prepared tool
- All Partners have agreed that Scenario 1 (as proposed by Dave) is ready in the alpha version – now it should be only tested and fine tuned
- GIG will send a test report to Dave Banks, especially as regards strange behaviour of mixed temperature after choosing the option to insert temperature vertical profile by hand (as opposed to using directly geothermal gradient)
- As regards Scenario 2 (as proposed by Dave) – GIG will tackle hydraulic distribution and Oviedo will tackle heat transfer using Rodriguez & Diaz approach

The work on the coupled tool is going to be finalized during one-full-day joint workshop to be held in Glasgow on 1st December 2015. Participants are going to be: Covadonga, Dave Banks, GrzegorzGzyl and Pawełabaj. Paul Younger will also participate as far as possible.

Task 1.2 Feedback from ongoing field monitoring in Poland (lessons, problems solutions)

- Monitoring in Bytom in ongoing. O & H isotopes seem to show the delta values very typical for recently infiltrated waters. On the other hand S isotopes show variable values – some of them very high. Conclusions are going to be drawn up after more data are available.

Task 1.3 Demonstration of new tools on a system in development

- The task has started according to schedule. Several variants for Bytom are under consideration and input data for them are gathered. The variants are going to be modeled in the modeling tool from task 1.1 just after the final version of the tool is ready.

Work session 4- WP2 & WP3

Task 2.1. Preventative strategies for ochre clogging-Work progress within the task with relation to workplan as in the technical annex

- The results from Markham and Caphouse were discussed. Markham has a low Fe content level (0,31 mg/l) and water is not oxygenated, meanwhile Caphouse has a 30 mg/l Fe content, water is partially oxygenated in the shaft. Chemical dosing trials are going to be conducted.
- In the pilot plant, filter requires cleaning on a daily base. A permission from the Environment Agency have been obtained to conduct trials using sodium dithionite.
- There was a discussion on how to measure dissolved gas.
- A containerised open loop heat pump with chemical dosing facility has been installed at the Caphouse colliery, National Coal Mining Museum, Wakefield .
- The plant has been in operation since the end of March 2015.
- Two Heatmeters are installed to measure the flow rates, temperatures and energy generated
- The ochre accumulation on the filters has been noticed.
- The closed loop Energy Blades were also connected recently, the plant can run both on open and closed loop configurations by easy switching of the valves.
- Further sensors and instrumentation will be installed to measure the water qualities.
- Further tests and trails will be conducted measure the dissolved gases .

Task 2.2. Closed-loop strategies for oxidized, ochre precipitating mine waters- Work progress within the task with relation to workplan as in the technical annex

- Installation of close loop in Caphouse has been already prepared with a heat pump of 10,5 kW and an Energy Blade (rated at c. 8 kW) for extract heat has been installed in the 1st aeration lagoon. The sampling process was explained. Temperature, pressure, conductivity and water level are measured in 4 sampling points for thermal response tests.
- A literature review onthermodynamics of iron oxidation, hydrolysis and precipitation has to be done.
- Nottingham will do a laboratory set of experiments with artificial minewater for studying the influence of temperature and iron oxidation/hydrolysis reactions.

Task 3.4. Ownership, management and financial models - Work progress within the task with relation to workplan as in the technical annex

- Marcin Głodniok has presented a general conception and vision of models elaboration and its use for potential beneficiaries.
- Proposition of road map has been raised.
- Keith Parker has send materials concerning road map elaboration.
- Survey prepared by GIG has been discussed; comments from OVIEDO will be implemented.
- Refined survey will be sent to partners who operate the pilot plants (HUNOSA, ALKANE) with kind ask for update – HUNOSA or fill in – ALKANE.

Work session 7 – WP3& WP4

Task 3.1 Technical, legal and management STEEP/ cost-benefit analysis of various types of decentralised heat pump system, versus centralised plant room system

LoCAL

Low-Carbon After-Life (LoCAL): sustainable use of flooded coal mine voids as a thermal energy source - a baseline activity for minimising post-closure environmental risks

- Marcin Głodniok has presented a draft materials elaborated with GIG Team containing factors for STEEP analysis. Hard copies of it were given to all meeting participants, with kind ask for feedback and comments.
- Electronic version will be also uploaded at Dropbox with all meeting materials.
- Amin Al-Habaibeh has raised an issue that elaborated factors might be a good starting point for a scientific paper.
- Keith Parker has send some material concerning STEEP analysis as a potential input for factors elaboration.
- Further discussion about the steep analysis will be conducted via Skype conferences.

Summary of WP3 Work progress with relation to workplan as in the technical annex

- So far, works planned in WP3 are ongoing without any problems. Most of the works have started recently so the first milestone will be at the end of 2015.

Work session 8 –WP4 &WP5

Task 4.1 Pilot implementation at Markham and Manvers

Manvers:

- Have obtained the permission from the Rotherham council to drill a borehole.
- Have applied to get a supplemental license from the Coal Authority to extract the mine water from the Meltonfield seam and discharge into the Swallow Wood seam.
- Once the Supplemental license is obtained, Consent to conduct pump tests will be obtained.
- The drilling is likely to be in first quarter of next year, provided there is no delay in getting the permission from the necessary agencies.

Markham

- The GSHP plant was run throughout the winter and spring months.
- No ochre clogging of the was noticed during the period checks.
- The iron content in the water was less than 1 mg/l.
- The mine water level in the shaft has risen to 142.5 m below the ground level.
- There are further proposals to extend the GSHP heating scheme to supply heat to a neighbouring building, talks are going on in this regard.

Task 4.3 Pilot implementation at pilot site in Bytom (PL) - Work progress within the task with relation to workplan as in the technical annex

- ARMADA is now at the stage of selecting final contractor for pilot implementation.
- We have a half year delay due to administrative problems with obtaining permits and agreements.
- Planned start for construction works – November 2015.

WP5 Reporting - discussion on first annual report feedback from the commission

- Attention to mid-term reporting is needed. Details included in WP5 presentation by G.Gzyl.

WP5 Scientific dissemination – discussion on progress of publishing process



LoCAL

Low-Carbon After-Life (LoCAL): sustainable use of flooded coal mine voids as a thermal energy source - a baseline activity for minimising post-closure environmental risks



- Deadline for submission a paper to special issue of International Journal of Coal Geology is 1st November 2015.
- Overall LoCAL general paper based on the Technical Annex (LoCAL application) is going to be coordinated by GrzegorzGzyl.
- Another paper on geology, mining conditions, hydrochemistry and first lessons from chemistry & field parameters at Bytom site coordinated by Ewa Janson is under consideration.

WP5 Broad public dissemination

- Proposition of newsletters has been shown.
- David Banks has raised discussion about potential target groups of newsletters.
- GIG proposition was to raise general awareness according geothermic, especially focusing on SME sector.

All partners were asked to send comments and proposals about the shape of public dissemination.

Work session 9: WP 5 Conclusions and future works

Conclusions & to do list

- Next project coordination meeting is going to be held in Poland: 6-7 April 2016.
In meantime task working groups are strongly encouraged to meet via skype or in person in task-related workshops (e.g. like Task 1.1 workshop in Glasgow on 1st December 2015)