



The Coal
Authority

**PROJECT TITLE: Metal Mines Programme
Remediation Feasibility Study of
Killhope Park Level**

PROJECT REF: CA18/2311/Instruction 172

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Project Scope General Engineering Contract





The Coal Authority

Section	Content	Page No.
1	Background to the Metal Mines Programme	3
2	Overview	3
3	Scheme Background	3
4	Feasibility Study	4
5	Scope of Services	5
6	Project Deliverables	10
7	Accruals and Invoice Information to be provided by the Consultant	10
8	Programme	10
9	PSC Award	10
10	Project Documents	11

1. Background to the Metal Mines Programme

Historic metal mines impact approximately 6% of the water bodies in England and contribute up to 50% of the metal loads in surface waters. The WAMM (WFD Abandoned Metal Mines) project is investigating the extent of the problem with the objective to implement measures that deliver good chemical and ecological status in water bodies polluted by metals from abandoned metal mines.

DEFRA have allocated funds for the Coal Authority and the Environment Agency to implement a programme of site assessment and remediation. Each site requires a phased approach to establish the nature and extent of the problem and whether it is feasible to implement remedial measures.

Initially, the Environment Agency will carry out a characterisation study of the catchment(s). These studies require data collection in relation to flow, water quality and ecological status in order to help identify likely pollution sources. Those characterisation studies that highlight a significant impact, can identify the source and conclude that treatment is a feasible option are then passed to the Coal Authority. The Coal Authority will then further evaluate the impact and consider the feasibility of management options.

Following on from the preliminary catchment characterisation phase, a feasibility study is typically required to assess the possible remedial options for the identified mine water pollution. This scoping document details the activities required for such a study and provides guidance on delivering the required outputs.

Assuming this phase of work demonstrates that remedial action is technically feasible and represents value for money, the next phase would be to carry out a feasibility study and outline design of the preferred remedial option.

2. Overview

This Scope is issued in accordance with the conditions of the Coal Authority's General Engineering Services Contract CA18/2311. A consultant will be appointed through the NEC 3 Professional Services Contract (PSC), Option E - Cost Reimbursable to:

- complete a feasibility study to evaluate the identified option(s) to capture, transfer, treat and discharge mine water at Killhope (Park Level), County Durham.
- confirm that there is a viable treatment option for the discharge
- highlight any constraints to taking the scheme forward
- recommend the option to take through to outline design stage for agreement by the Coal Authority.

3. Scheme Background

There is a point source discharge from Park Level at Killhope Lead Mining Centre. Some of this water is used in interactive exhibits for crushing and washing ore and the remainder is diverted into Killhope Burn. All the water is ultimately discharged to the watercourse at or downstream of the main exhibits.

Any capture and treatment of the discharge from Park Level would be subject to agreement with the custodians of the Killhope Lead Mining Centre. Key constraints include the availability of guided tours and use of mine waste/water as part of the exhibit.



Further background information can be found in Section 10 Ref : A to F.

4. Feasibility Study

Following on from the scoping Study by Atkins, a feasibility study is required to assess the remedial options for the identified mine water pollution at Killhope Park Level. This feasibility scoping document details the activities associated with such a study and provides guidance on delivering the required outputs.

4.1 Site location and Constraints

The Grid Reference for Park level is SX(NY 82594,43091);

The Park Level discharge is at the Killhope Mining Museum (SAM).



Entrance to Lead Mine, Park Level

5. Scope of Services

5.1 Objectives and Purpose of Study

The feasibility study is to appraise all available information and provide evidence based conclusions to enable the Coal Authority to determine whether remediation is a feasible option for the sources of contamination.

If remediation is considered feasible, a clear appraisal of the potential options should result in a preferred approach with recommendations detailing work required to enable detailed design and subsequent implementation.

The key questions that must be addressed include:

1. Do we understand the source term(s) sufficiently?
2. Can the mine water be treated?
3. Can the mine water be captured?
4. Is suitable land for a treatment system likely to be available?
5. Is diffuse pollution (e.g. spoil heaps, tailings ponds) a significant source of pollution?
6. What options are feasible to deal with diffuse sources of metals?

5.2 Tasks

The Tasks required for this Remediation Feasibility study are:

Task No.	Task Requirement
F1	Start Up Meeting Discussion and clarification of the requirements of the Killhope Park Level Scheme including agreeing the approach to the required deliverables.
F2	Site Visit One site visit to gain a better understanding of the immediate environment and any associated site constraints. This visit should be arranged in discussion with the Coal Authority's Project Manager, and ideally should take place after initial review of the existing information. The Consultant shall consider the locations of raw discharge, capture, optional sites for treatment and point for outfall. Any capture and treatment of the discharge from Park Level would need to be sympathetic to existing operation of the museum, including the current use of Park Level water to explain how the miners processed wastes.
F3	Stakeholder Communication Plan (no direct contact is to be made with stakeholders without the Coal Authority's permission). The Consultant shall undertake research to identify the Key Stakeholders associated with the Project along with details of suitable contact details. Details to be included in the Communication Plan. See Ref. E in Section 10.
F4	Review of the Existing Information and Data Review the attached documents and provide a focused and succinct summary of the key points. We do not expect extensive duplication of information already provided.

Task No.	Task Requirement
	<ol style="list-style-type: none"> 1. Atkins Reports (Section 10, Ref. A) 2. MSc Project on Mass Loading of Zinc in the Killhope Burn Catchment (Section 10, Ref. B) 3. Killhope Burn Non-Coal Fact Sheet (Section 10, Ref. C) 4. Mine Plans and related information. 5. Environment Agency monitoring data for Park Level. <p>This assessment should provide a thorough understanding and refinement of the conceptual site model which will form the basis for the Capture Structure and remedial feasibility stage.</p> <p>Outputs required:</p> <ul style="list-style-type: none"> • Site location and setting • WFD catchment boundaries and status • Nature of the problem and drivers for remediation • Treatment objectives i.e. target water quality • Key contributing sources and potential improvements • Urgent issues e.g. unstable spoil or tailings, outbreak risks, blocked adits etc. • Recommendation for a Capture Structure
<p>F5</p>	<p>Appraisal of remedial options</p> <p>A review of key pollution sources (as identified in the refined conceptual site model) and a screening assessment of the most appropriate remedial options for each. The source zones must be prioritised in order of importance i.e. nature and extent of impact.</p> <p>Outputs required:</p> <ul style="list-style-type: none"> • Review and refinement of the conceptual site model including any constraints and sensitivities • Identification of data gaps • Evaluation all suitable remedial techniques and technologies to address identified pollution • Evaluation of the practicability of the technology (in terms of technical, site, time and regulatory constraints) • Assessment of the effectiveness of the technology • Assessment of the durability of technology • Appraisal of costs and benefit (both monetary and non-monetary i.e. multi criteria analysis) • Identify the associated risks of each approach • Provide an explanation as to why technologies have been rejected • Any barriers to implementing a scheme • Summarise the results <p>Following evaluation of each option, we require selection of the preferred option with full justification. Consideration should be given to any uncertainties or data gaps associated with the preferred approach.</p>

Task No.	Task Requirement
F6	<p>Sampling and Monitoring</p> <p>The Consultant shall assess all available sampling and monitoring data associated with the mine water and make suitable reference in the Feasibility Report.</p> <p>The Consultant should identify at an early stage if additional monitoring data is required to complete the study. The Consultant will not be required to undertake any monitoring directly unless specifically instructed.</p>
F7	<p>Ground Investigations</p> <p>The Consultant shall consider the nature of ground and land in the vicinity of the site and include descriptions within the Feasibility Study to help inform the subsequent Outline Design.</p>
F8	<p>Environment and Ecological Surveys</p> <p>The Consultant shall provide details of the site and features to be surveyed by one of the Authority's framework surveyors.</p>
F9	<p>Utilities and Services</p> <p>The Consultant shall obtain details of utilities and services in the vicinity of the site under consideration along with the likely requirements for connections to accommodate development of a solution. A composite services plan shall be included in the Report.</p> <p>The Feasibility Report shall include a brief summary of likely service requirements for developing a solution and an indication of the extent of works to establish any required connections.</p>
F10	<p>Health & Safety</p> <p>Ensure a Site Visit Risk Assessment is completed prior to any site visit. This should be reviewed post site visit and amended as necessary. Please include this as an Appendix to the Feasibility Report as it will form the basis of a live document.</p>
F11	<p>Risk Register</p> <p>The Consultant shall develop the Project Risk Register and at regular intervals record risk mitigation and identify new risks that become apparent. The risk register should be appended to the Feasibility Report.</p>
F12	<p>Feasibility Report Content</p> <p>For this feasibility study, the Coal Authority requires the Consultant as a minimum to address the following points:</p> <ul style="list-style-type: none"> • Assess the likelihood of risks to surface waters due to mine water/tip runoff waters, including risk areas. • Assess the likelihood of risks to aquifers from mine water, including potential areas at risk. • The likelihood and potential for other significant risks (i.e. mine gas) due to mine water and any areas where these are likely to occur. • Highlight any unknowns in the mine water areas, and other unknowns against mine water regimes and risks of mine water. • Recommendations to address any of the unknowns highlighted above.

Task No.	Task Requirement
	<ul style="list-style-type: none"> • Recommended strategy (or strategies) (with some approximation of lifetime (25 year) costs) for additional requirements for the Coal Authority to successfully manage the Park Level discharge and any associated risks. This should include possibility of borehole requirements and any potential sites for mine water control (i.e. pumping; gravity discharge and/or treatment). Specific issues should include the potential effluent quality of the mine water and thus potential discharge locations. • Where possible any recommendations / actions required should be prioritised based on risk. • Identify and give a brief assessment of potential benefits for any areas/sites where there is potential for opportunities to re-use the water, or use the mine water as a resource (i.e. co-treatment, ground source heat). <p>To achieve the above points, the Authority expects the following activities to be undertaken:-</p> <ul style="list-style-type: none"> • Review of historical reports and published papers and documents. • Review the monitoring data • Review of mining plans. • Update any conceptual models based on the reviews of mining information and monitoring data. • Assess any risks and develop any mitigation strategies.
<p>F13</p>	<p>Draft Feasibility Report</p> <p>The draft feasibility report should incorporate all the tasks above plus recommendations for a subsequent phase outline design to refine the selected remedial approach, in readiness for outline design and implementation.</p> <p>In addition the following should also be included:</p> <ul style="list-style-type: none"> • A review of all available mining plans associated with the location and make suitable reference in the Feasibility Report detailing the mining history local to the site. • Obtain an Envirocheck report and make suitable reference in the Feasibility Report. • Consider preliminary land requirements to accommodate the preferred option and engage the Authority's Property team. • A review of the local plan to identify any joint funding opportunities. • A review of the potential for renewables. <p>Provide a fully itemised and costed scope for this next phase of work i.e. outline design. This will need to include a detailed description of all activities to be undertaken, including any necessary site works plus a programme e.g. on-site evaluation of geotechnical and geoenvironmental parameters. This scope should be sufficiently detailed to allow tendering of service providers.</p> <p>Reports should be delivered in electronic format to enable review by the Coal Authority. The report should be sent to Chrissie Mittenshaw-Hodge (christinamittenshaw-hodge@coal.gov.uk) at least two weeks before the Review Meeting in Task F14.</p>

Task No.	Task Requirement
F14	<p>Review Meeting</p> <p>Presentation of the draft feasibility report – focusing on submission of the refined conceptual model, the options appraisal and the justification behind the preferred remedial strategy and recommendations for additional work. This will allow technical discussion and comment prior to the finalisation of this feasibility report.</p> <p>The feasibility report will be reviewed against the objectives & purpose of the study to ensure the questions in section 5.1 of this project scope have been fully addressed.</p> <p>This meeting will either take the form of a live meeting via computer and telephone, or a face-to-face meeting.</p>
F15	<p>Final Scoping Document</p> <p>Taking into account the comments made under Task F14 the Consultant will produce the final report.</p> <p>Reports should be delivered in electronic format to enable review by the Coal Authority for final approval.</p>
F16	<p>Project Management</p> <p>The consultant must nominate a lead member of staff who will act as their Project Manager responsible for delivering this scheme.</p> <p>Monthly progress reports should be submitted to the Coal Authority with an interim fortnightly telecom.</p>

6. Project Deliverables and Timescales

The appointed Consultant will produce the deliverables detailed in the table below. These deliverables are to be identified within the programme that forms part of the Fee Proposal.

Description	Latest Submission Date
Monthly progress reports Interim fortnightly telecom.	Commencing from x Within x days of
Programme of deliverable for the Feasibility Report	With Fee Submission
Stakeholder Communications Plan	3 weeks after the Consultant's appointment
Draft Feasibility Report, including all elements described in section 5.2 above	12 weeks after the Consultants' appointment
Review Meeting	2 weeks after submission of draft feasibility report.

Description	Latest Submission Date
Final Feasibility Report	2 weeks after Review Meeting

The Coal Authority reserves the right to award further stages of the project to alternative consultants. Following completion of the feasibility study, the project milestones will be:

- Outline Design – Late 2015

7. Accruals and Invoice Information to be provided by the Consultant

The appointed Consultant shall:

- submit via email (financedepartment@coal.gov.uk) either an accrual or invoice value for this project by the close of business of working day minus five; whereby working day one is the first working day of the calendar month. The Coal Authority will write to the appointed Consultant with the reporting requirements for the end of financial year. The Coal Authority is content for the appointed Consultant to target +/-10% between the accrual and invoice values.
- provide invoices that clearly detail:
 - breakdown of hours spent by each member of staff
 - Contract / order reference
 - Project title, including the site name
 - The Coal Authority Project Manager

Please submit a DRAFT invoice via Conject to the Project Manager for Approval prior to submission to the finance department.

8. Programme

- The PSC award date is planned for w/c 30th March 2015.

9. PSC Award

The Consultant will be appointed based upon their financial and quality submissions via Lot 11 of the Coal Authority's General Engineering Services Contract 2013-2017 (2311) through Option E - Cost Reimbursable of the NEC 3 Professional Services Contract (PSC).

A financial ceiling will be set, based upon the appointed Consultant's financial submission. The financial ceiling will not be exceeded by the appointed Consultant without prior justification and the written authorisation of the Coal Authority's Project Manager.

Change will be managed on this project by the Coal Authority and the appointed Consultant through the NEC 3 Early Warning and Compensation Event process.

10. Project Documents

Ref	Title	Date	Author
A	Killhope Burn Feasibility Study	2012	Atkins
	Killhope High Level Scoping Study	2013	Atkins
B	Characterisation Report MSc Examination of the Mass Loading of Zinc in the Killhope Burn Catchment by Chris Hood	August 2011	MSc Sponsored by the Environment Agency
C	Non-Technical Summary	2011	The Coal Authority
D	Working With Others – EA Guide for Staff	-	Environment Agency
E	EA Mine Waters Communications Plan Template	-	Environment Agency
F	Risk Register	-	The Coal Authority