Interreg North-West Europe
NWE-REGENERATIS
European Regional Development Fund

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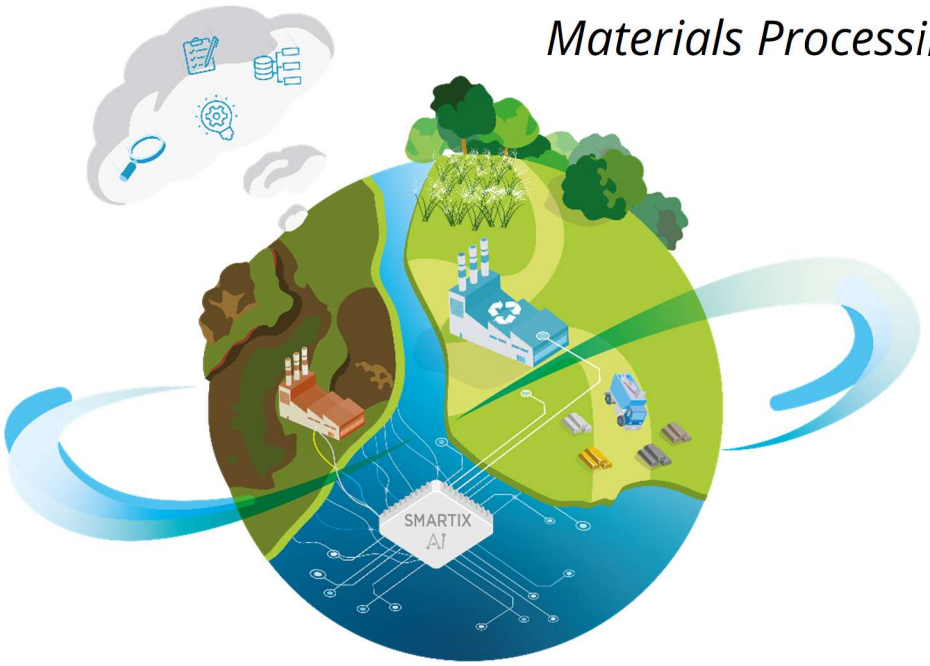
# Del. I1.4.1 Terms of reference for site works - Teesworks

Tutu Sebastian, Stuart Higson

*Materials Processing Institute*

*Version 3.0*



# SUMMARY



The Materials Processing Institute together with its project partners has the objective of achieving a systematic, long-term beneficial outcome from recovery and regeneration of Past Metallurgical Sites and Deposits (PMSD) in the INTERREG region of Europe under an EU funded REGENERATIS project. Its aims are the innovative circularity to recover raw materials while regenerating the polluted sites.

This report is submitted in fulfilment of the requirements of work package I1

# 1 INTRODUCTION

With the help of urban mining techniques, the NWE-REGENERATIS project (Interreg North-West Europe) seeks to salvage (metals, minerals, and land) from PMSDs and valorise the location. Three trial locations were chosen in the northwest Europe, one of which was Teesside's historic integrated steelworks. There were several recognised places utilised for the storage of waste products dating back to the 1900s as an integrated steelworks that processed from raw materials to completed products.

The area of former industrial activity is distinguished by a number of noteworthy regions, each of which is essential to the industrial landscape. The Redcar Works Complex, which includes many crucial sections like the blast furnace, coke ovens, sinter plant and materials handling areas, is one significant location. These facilities were essential to the Redcar Works complex's general operation and production procedures.

The Lackenby steelmaking complex, which included the continuous casting and basic oxygen steel factories, is another important location. These facilities were essential to the creation of high-quality steel products and played a crucial part in the steelmaking process. The Lackenby steelmaking complex played a crucial role in the region's industrial operations and served as a key hub for the manufacture of steel.

The Grangetown Prairie, which was the previous location of the Cleveland Iron Works, is significant historically in addition to the Redcar and Lackenby complexes. This region's industrial legacy was greatly influenced by the iron production that was concentrated in this area. The Cleveland Iron Works made a substantial contribution to the manufacturing of iron and its subsequent application in a number of industries.

One other significant component of the industrial environment was the region classified as Landfill and Waste Management Facilities. The High Tip Landfill, the SLEMS waste management plant, and a metals recovery area were all located in this location. These facilities concentrated on the effective management and disposal of waste products produced by industrial activities, with a focus on resource recovery and environmental sustainability.

The Clay Lane furnaces and the South Bank Coke Ovens were lastly located in the South Bank zone. Coke, a crucial fuel used in numerous industrial processes, was produced at these plants. The South Bank Coke Ovens and Clay Lane Furnaces played a crucial role in providing the area with the fuel resources required to keep the area's industrial activity running smoothly.

These key historical industrial hubs worked together to construct the region's industrial infrastructure. From processing raw materials to managing waste and producing energy, each location was essential at various points in the production process. Knowing these locations' historical significance offers important insights into the region's industrial past and its contributions to economic development.

In the UK, steel industries that handle, manage and recycle industrial waste typically require an Environmental Permit. This permit is issued under the Environmental Permitting Regulations

and is administered by the Environment Agency. The Environmental Permit sets out the conditions and requirements for the operation, storage, and disposal of industrial waste and standard rules to follow are explained in Chapter 4, The Environmental Permitting (England and Wales) Regulations 2016 "Standard rules SR2015 No16 - Metal recycling site" on the website of Environmental Agency [1].

In this project, a particular landfill area was chosen to extract as much metal and minerals as possible by various technologies available among the project partners. The Materials Processing Institute will be focussing on pyrometallurgical recovery of metals whereas CTP and Cranfield University will work on the hydrometallurgical recovery of metals.

# 2 GENERAL DESCRIPTION OF THE AREA

A number of areas were identified for consideration all of which have been used for waste management. These are shown in Figure 1.

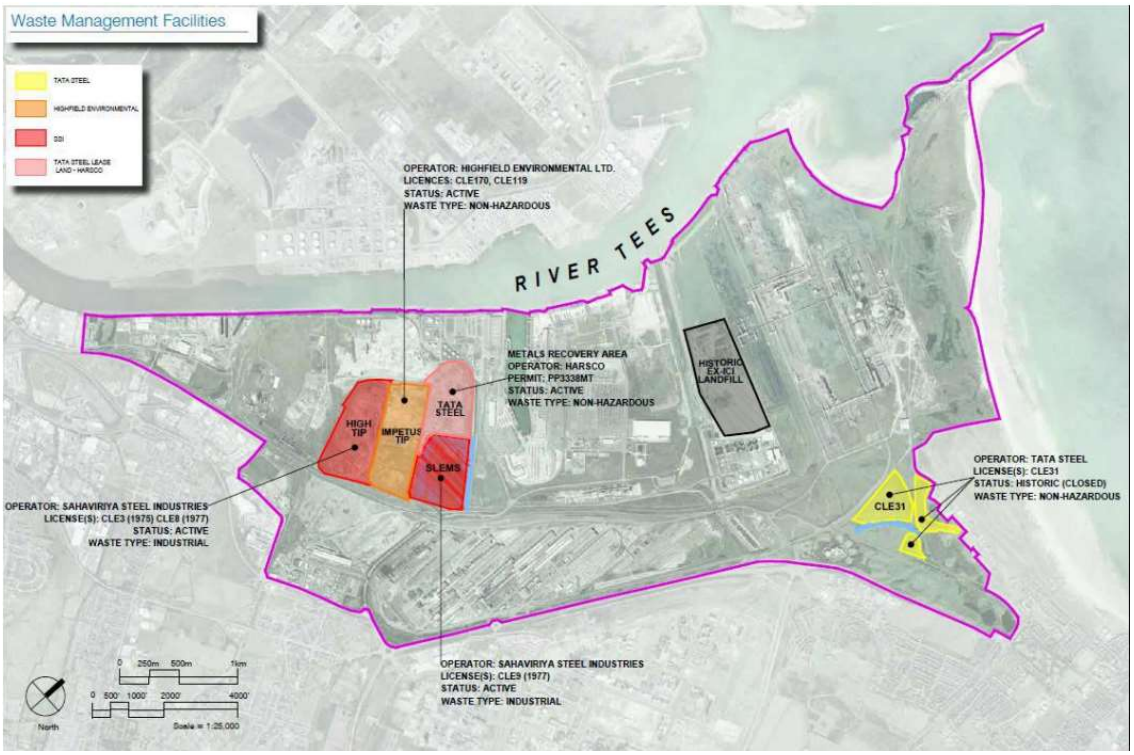



*Figure 1: Waste management facilities within PMSD-I1 Teesworks.*

The area initially selected was the South Lackenby Effluent Management System (SLEMS) landfill site, shown in Figure 2. The main objective of SLEMS is to treat and handle industrial wastewater or effluent in order to guarantee adherence to environmental norms and regulations. Before being released, effluent from various businesses is gathered, treated, and monitored to reduce its environmental impact. This entails using a variety of treatment techniques to remove impurities and pollutants from the effluent, such as filtering, chemical reactions, and biological treatment. An area of 22 hectares, this is a waste handling and treatment facility for Basic Oxygen Steelmaking (BOS) oxide waste. It comprises a series of settling ponds in the southern

section of the site. An aqueous suspension of BOS oxide and blast-furnace waste (slurry) was pumped from the BOS plant into these ponds.

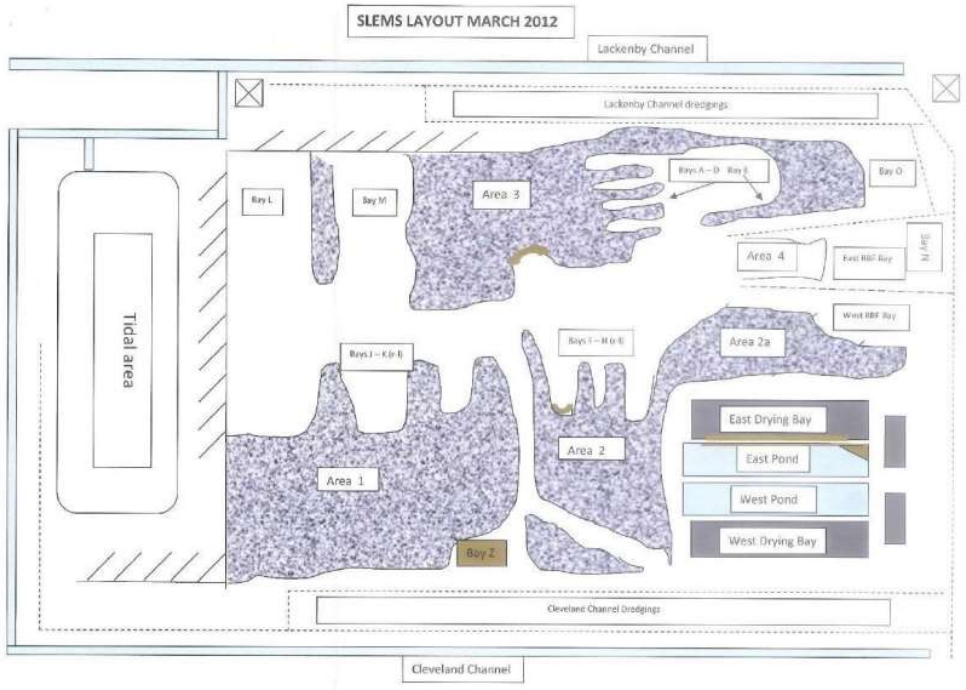



*Figure 2: SLEMS site plan*

Settled material was dredged from the ponds and deposited in adjacent drying bays before being placed at a final deposition point within the landfill.

After samples were taken for laboratory work, during the preparation for geophysical examination, the SLEMS landfill was repurposed for work involving land development at Teesworks. Although a temporary site, the time scales were such that it was not feasible to perform any site work at this location during the project. An alternative area for geophysical study was sought within Teesworks. Following site visits to identify potential sites it was agreed that the CLE31 landfill site would be a suitable location, see Figure 3.

CLE31 is a closed waste disposal site located within the north-east of the Teesworks site, centred on National Grid Reference NZ 57673 24707. The location is a land rise landfill built on a byproduct of slag, with a possible layer of clay at the foot of the landfill, though this hasn't been confirmed. Approximately from 1977 to 2002, when disposal operations came to an end fully, waste was deposited at the site. Approximately one million cubic metres of rubbish were reportedly dumped in the landfill; the most of it was steelmaking slag, with very small amounts of paper and what is known as "canteen waste" also present. Most of the slag within the landfill is from the former Basic Oxygen Steelmaking (BOS) plant.

*Figure 3: CLE31 landfill site*

# 3 TERMS OF REFERENCE FOR EXTRACTION CAMPAIGN

Prior to geophysical survey at CLE31, a comprehensive risk assessment method statements were developed and recorded, see Appendix 1. Based on that, Geophysical fieldwork took place at CLE31 between the 16th and 25th of May 2022 successfully. Different techniques were deployed on the site such as Electromagnetic (EM) survey using a Dualem 421 EMI, Magnetic (MAG) survey, Bartington MS2D susceptibility measurement, Electrical resistivity tomography and induced polarization using an Syscal Terra and Topographic surveying using GPS equipment and/or drone acquisition.

The operation of drones is strictly controlled within the boundaries of the Teesworks site. In order to pilot a drone at this location the pilot must follow local site rules which require the operator to have:

- Permission from the Civil Aviation Authority.
- Permission from the owner, manager, or authority for the land from which the aircraft will be taking off and landing.
- Control over the area you intend to fly the aircraft, including any persons, vessels, or vehicles in the area over which you intend to operate.
- SUA specific insurance.
- Pilot certification.
- Flight plan.

A hazard ID form was required to use drone at the site for image capture. The copy of Hazard ID from is documented in Appendix 2.

Based on the geophysical survey and analysis it was concluded that 5 bore holes need to be drilled at various strategic locations at CLE31 to obtain a complete picture of the location.

A contractor (ATKINS) has been approached for Construction Quality Assurance (CQA) services relating to the drilling of boreholes at CLE31 site. An initial discussion with the local Environment Agency (EA) Officer resulted in the conclusion that a formal CQA is not necessary since the permit for the site is not a "Landfill Directive" permit. With the EA, it was decided that a "light" touch CQA would be preferable, consisting of issuing to them a plan/method statement outlining the works and how the boreholes would be reinstated, a verification report summarising the results of the works, and site supervision that did not require the presence of a CQA engineer or inspector who had been approved.

The full scope of work, as discussed with EA consisted of:

- A pre-construction site walkover to evaluate the work site and finalise the position of bore holes.
- Preparation of a comprehensive plan, design proposals, risk assessments and method statement of the proposed drilling work and reinstatement of boreholes. This need to be submitted to EA for the approval, prior to drilling work.
- Analysing risk assessments and method statements from the drilling contractors and the Institute, updating them in accordance with the demands of the method statement.
- A daily site inspection by an Environmental consultant was also proposed to provide assurance to the Environment Agency and Teesworks that works are undertaken in accordance with the Plan / Method Statement.
- Borehole logs, and a factual report of site activities will be provided by the drilling contractor including details on reinstatement, and that a topographical survey of the borehole installations will also be provided. A verification report will be prepared outlining the borehole drilling and subsequent installation and reinstatement works undertaken and will be submitted to EA.

Additionally, a drilling contractor (Allied Exploration Geotechnics Ltd.) was also approached for the actual drilling work at the CLE31. A quote for £47469.75 was obtained for 2 working weeks of work.

Full scope of work consisted of:

- An investigation will be conducted by a qualified geologist/engineering geologist, using one crawler-mounted LS250 crawler-mounted rotary sonic drilling rig, attendant Marooka type support vehicle and 'Toyota Hilux' type 4WD vehicle.
- A full time, appropriately qualified (WAMITAD certificate)/experienced site engineer will be present on site during the excavation work to liaise with Teesworks.
- The site operation was anticipated to require around two working weeks based on an 8-hour working day shift within the permitted working hours (Mon-Fri 0800-1700 or dusk whichever is earlier).

- It is proposed that drilling will be carried out using rotary sonic drilling techniques in order to obtain a continuous sample from each borehole.
- Samples will be obtained in either heavy-duty plastic "sausage" bags or semi-rigid plastic liner tube.
- Allowance was made for backfilling each borehole with hydrated bentonite pellets upon completion of drilling.

## 3.1 TIMELINE

It is expected that the drilling works for boreholes and the reinstatement of the site will take approximately 2 working weeks. The anticipated delivery time for each document is provided in Table 1 .

*Table 1:Work completion and document delivery times*

| | |
|---|---|
| Preparation of design proposals, risk assessments and method statement | Two weeks |
| Production and submission of overarching plan / method statement to the EA | Four weeks |
| Drilling work and reinstatement | Two weeks |
| Production and submission of verification plan to EA | Two weeks |

## 3.2 COSTINGS

*Table 2 and*

Table 3 provides a breakdown cost by activity by each contractor.

*Table 2: Costings summary from ATKINS*

| Activity | Fee (£) |
|---|---|
| Project management | 524 |
| Plan/Method Statement | 6020 |
| Site supervision | 4561 |
| Verification report | 3124 |
| **Total** | **14230** |

*Table 3: Costings summary from Allied Exploration Geotechnics Ltd.*

| Activity | Fee (£) |
|---|---|
| General items and provisional sums | 26991 |
| Rotary drilling | 18293.75 |
| Additional items | 2185 |
| **Total** | **47469.75** |

A detailed breakdown of costs from Allied Exploration Geotechnics Ltd. Is given in Appendix 3. However, the borehole drilling work could not be complete due to the unanticipated huge costs involved in the CQA services and the excavation work. Also, it was realised that the site work could not be completed within the project timeline.

# 4 CONCLUSIONS

The elaborated Terms of Reference presented in this report provide a comprehensive framework for the extraction activities from a metallurgical waste land. The TOR ensures that the extraction process is carried out in a safe, environmentally responsible, and ethically sound manner. It outlines the necessary steps, considerations, and guidelines for successful implementation of the project, with a focus on resource recovery, environmental remediation, and waste reduction. By adhering to these TOR, the extraction activities can contribute to the sustainable management of metallurgical waste lands and facilitate the transition towards a circular economy.

The general site area section defines the boundaries of the PMSD, CLE31 where the metallurgical extraction activity could be undertaken. The laboratory chemical analysis at the Materials Processing Institute identifies the specific elements to be targeted for extraction, taking into consideration their economic value, recyclability, or potential for reuse. Moreover, the extraction methods and procedures to be applied, considering the nature of the waste materials and the site conditions were recognized. Safety procedures and safeguards necessary to protect the workers, nearby communities, and the environment were also considered. Additionally, any permits, licenses, or regulatory requirements needed for the extraction activities were identified, along with the actions required to get them.

A geophysical survey was performed on the site to get a theoretical understanding of the site value. Based on this borehole extraction was suggested to verify this further. However, this could not be completed due to time constraints and financial non-viability.

# 5 REFERENCES

[1]. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/793739/SR2015-No16.pdf

# Appendix 1: Risk Assessment Method Statements for geophysical survey at CLE31

| | | | |
|---|---|---|---|
| **Country or countries** | United Kingdom | **Ref No** | **Teesside** |
| **Precise location[s]** | Lat : 54.613538°, Long : -1.106613° | **Version** | **1.0** |
| **Directorate** | **Geophysics** | | |
| **Brief description of activities** | Geophysical fieldwork at the Teesside site is going to take place between the 16th and 25th of May 2022. Different techniques are planned to be deployed on the site:<br>• Electromagnetic (EM) survey using a Dualem 421 EMI.<br>• Magnetic (MAG) survey<br>• Bartington MS2D susceptibilitymeter<br>• Electrical resitivity tomography and induced polarization using an Syscal Terra<br>• Topographic surveying using GPS equipment and/or drone acquisition<br>All equipment is designed for outdoor use and safe to operate in wet conditions.<br>Hand auguring and digging into the waste material are NOT planned within this survey. | | |

| | | | |
|---|---|---|---|
| **Country or countries** | United Kingdom | **Ref No** | **Teesside** |
| **Precise location[s]** | Lat : 54.613538°, Long : -1.106613° | **Version** | **1.0** |
| **Directorate** | **Geophysics** | | |
| **Persons who may be affected** | U. Liege: Marc Dumont (+33 650 66 44 05)<br>BRGM: Jean Christophe Gourry (+33 672 92 60 37), Alison Colombain (+33 648 36 77 60)<br>U. Cranfield: Niall Marsay<br>MPI: Stuart Higson, Tutu Sebastian<br><br>Other contractors may visit site<br><br>Responsible person geophysical investigation: Marc Dumont (ULiege) | | |
| **Major residual risks**<br>*(risk rating ≥6, after controls, see p.4)* | **RR ≥ 6:** None<br>**RR ≥ 3:**<br>• Driving/use of vehicles<br>• Outdoor working/weather conditions | | |

- **Sign-off and authorization**

| | **Name** | Signature | **Role** |
|---|---|---|---|
| **ULiege field Team** *(activity/project staff)* | Marc Dumont | | **Research geophysicist** |
| Agreed by *(project/team/activity leader)* | Frédéric Nguyen | | **Team Leader** |
| BRGM field Team *(activity/project staff)* | Jean-Christophe Gourry |  | **Research geophysicist** |
| | Alison Colombain | | **Research geophysicist** |
| MPI field Team *(activity/project staff)* | Stuart Higson | | **Senior Researcher** |
| | Tutu Sebastian | | |
| Cranfield field Team *(activity/project staff)* | | | |

- **Itinerary of fieldwork activities**

| **Where relevant provide an outline of your fieldwork itinerary, including maps, in the box below**.<br><br>*Expand the box as required* |
|---|
| The fieldwork is provided in annex A. It could evolve during the field survey in function of the first results. Two geophysical teams will come from BRGM (Orléans – France) and ULiège (Liège – Belgique). The first will come by car carrying the geophysical equipment, while the second will transfer to Middlesbrough by plane renting a car in England. The team will come to Middlesbrough the 16$^{th}$ of May 2022 and come back the 25$^{th}$. Cranfield University and Materials Processing Institute teams will join during the survey to support the geophysical acquisition. |

**Where relevant provide an outline of your fieldwork itinerary, including maps, in the box below.**

*Expand the box as required*


The geophysical prospection will take place on CLE31 site only (orange limit in the map below) from the 17th to the 24th of May, 2022. During the field work several measurements are planned (see Annex A for more details):

- Electromagnetic and magnetic mapping;
- 2D Electrical Resistivity and Induced polarization Tomography;
- 3D Electrical Resistivity and Induced polarization Tomography.

- **Risk assessment**

The risk assessment should include consideration of all issues which present significant hazards, and which are not addressed sufficiently by the underlying generic procedures. The checklists provided below are intended to assist thinking during the assessment process but are not exhaustive. Most of the usual issues have been listed but there may be other factors associated with specific activities which have not been recognized; these should be identified here.

Review the control measures to identify any actions which need to be completed before a suitable Safe System of Work can be established and implemented.

Those generic issues indicated below in bold **must** be included explicitly in all assessments.

- **Identified hazard, control measures and risk rating**

| Activity or hazard | Potential hazard effect | Initial risk rating S | L | R | Control measures | Residual risk rating S | L | R |
|---|---|---|---|---|---|---|---|---|
| **Team work during a pandemic** | Contracting a highly contagious disease (COVID-19) | 3 | 1 | 9 | • Access to buildings: fill in google sheets and communicate presence to the Administrative director of the building and supervisor<br>• Wear appropriate safety equipment in closed area: masks<br>• Change masks/gloves frequently (at least 2 masks a<br>• day)<br>• Carry out hydroalcoholic gel and use regularly<br>• Respect social distancing at all times (exception for loading/unloading heavy equipment)<br>• Possibly sick attendants to the field stay home | 3 | 1 | 3 |

| Activity or hazard | Potential hazard effect | Initial risk rating S | L | R | Control measures | Residual risk rating S | L | R |
|---|---|---|---|---|---|---|---|---|
| **Manual Handling** | Back/muscle injury and strain through lifting and operating equipment, loading unloading vehicle | 3 | 2 | 6 | • Vehicle parked as close as possible to site<br>• Mechanical and manual aids/trolleys used where possible<br>• Staff to advise the Team/Activity Leader of any problems that may affect their ability to carry out manual handling tasks. | 3 | 1 | 3 |
| **Operation of geoelectrical equipment (resistivity, electromagnetic)** | Electric shock | 3 | 1 | 3 | • Only suitable trained and authorised staff to install and operate equipment<br>• Weatherproof instruments used where appropriate<br>• Portable appliance testing (PAT) in date and visual pre-use check carried out<br>• Faulty equipment is not used and reported for repair/replacement as appropriate | 2 | 1 | 2 |

| Activity or hazard | Potential hazard effect | Initial risk rating S | L | R | Control measures | Residual risk rating S | L | R |
|---|---|---|---|---|---|---|---|---|
| **Driving to/from site** | Road traffic accident<br>Collision with vehicles/objects, pedestrians/livestock causing fatal/serious injury or damage<br>Vehicle overturning, shift of load | 3 | 3 | 9 | • Suitable vehicle and pre-use check carried out<br>• Authorised drivers only/license checked<br>• Sufficient rest time allowed/driver rotation<br>• Drivers alternated where possible and end of day review of abilities/fatigue level and route<br>• Seat belts are worn at all times<br>• Vehicle will not be overloaded<br>• Driver is responsible for checking the load is secure<br>• Drivers must follow all local site driving rules | 3 | 2 | 4 |

| Activity or hazard | Potential hazard effect | Initial risk rating S | L | R | Control measures | Residual risk rating S | L | R |
|---|---|---|---|---|---|---|---|---|
| **Survey Work/Outdoor working, rough/soft ground** | Slip, trip or fall, sharp objects in the ground, uneven, difficult, overgrown ground<br><br>Weather extremes, sunburn, hypothermia, temperature fatigue, thunderstorms | 3 | 2 | 6 | • Suitable PPE<br>• Familiarisation of surroundings before starting work<br>• Keep work area clear, free of unnecessary equipment<br>• Dress according to conditions and guidance | 2 | 2 | 4 |

| Activity or hazard | Potential hazard effect | Initial risk rating S | L | R | Control measures | Residual risk rating S | L | R |
|---|---|---|---|---|---|---|---|---|
| **Lone working** | Accident/incident whilst alone, unable to communicate to get help<br><br>No back up for activities, fatigue and exceeding limits of personal capabilities | 3 | 2 | 6 | • Lone working will be avoided where possible<br>• Lone working may only be carried out during low risk activities and then only following a suitable assessment of the proposed activity and individual<br>• Agreed departure/return times and specific contact/emergency procedures will be established before work starts<br>• Site contacts will be made aware of movements<br>• Mobile phone/method of contact established and available at all times<br>• Regular contact will be maintained between the lone worker and colleagues/site/line manager | 3 | 1 | 3 |

| Activity or hazard | Potential hazard effect | Initial risk rating S | L | R | Control measures | Residual risk rating S | L | R |
|---|---|---|---|---|---|---|---|---|
| **Working in the vicinity of others** | Injury through crossing unfamiliar working areas into unrecognised hazards, obstructions, space limitations, clash of working procedures/timings or distraction by others | 1 | 2 | 2 | • All staff will familiarise themselves with the site layout, emergency procedures and be aware of others on site<br>• Staff will warn others of known hazards<br>• Staff will fully co-operate and communicate with the landowner/site manager, contractors and others on site | 1 | 2 | 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Contact with animals, insects, ticks, etc. whilst in the field** | Bites, stings, allergic reaction,<br>Lyme Disease<br>Contact with biocides | 2 | 2 | 4 | • Information sought from the owner prior to visit<br>• Staff will avoid approaching animals where possible, especially those who appear behaving strangely<br>• Behave confidently in the presence of domestic animals, especially dogs<br>• Suitable clothing will be worn, arms and legs covered, trousers tucked in socks or gaiters worn<br>• Insect repellent used where appropriate<br>• Information will be given regarding Lyme Disease and other specific hazards known to the area<br>• Staff are instructed to remove all ticks immediately and to clean the skin area<br>• Staff are requested to give medical/allergy information to their contacts<br>• Stay upwind of recently sprayed fields | 2 | 1 | 2 |

| Activity or hazard | Potential hazard effect | Initial risk rating S | L | R | Control measures | Residual risk rating S | L | R |
|---|---|---|---|---|---|---|---|---|
| | | | | | • Leave the area immediately if pesticide is smelt | | | |
| **Contact with waste material or gas** | Intoxication | 2 | 2 | 2 | • Manual contact with waste material must be avoided.<br>• Hand auguring and digging into the waste material are not planned within this activity. Such activities must be previously assessed and supervised by the landfill management.<br>• Unusual odours must be reported to the landfill manager. Present gas production is very low at the site, therefore no additional action has to be taken? | 2 | 1 | 2 |

- **Checklist of possible hazards**

| **Country/Travel** | **Environment/location** | **Operational/activity** | **Equipment** | **Substances** |
|---|---|---|---|---|
| • Political situation<br>• Threat of terrorism<br>• Social unrest<br>• Personal security<br>• Arrangements on arrival – meeting host, onward travel<br>• Internal travel arrangements – including on-going security<br>• Security of accommodation – locking doors, windows<br>• Emergency arrangements – | • Weather conditions: cold, hot, rain, snow, sun, wind<br>• Mountain, desert, jungle remote or wild country<br>• Cliffs, pits and quarry faces<br>• On/in/near standing or flowing water<br>• Coastal or tidal areas<br>• Roadside working<br>• Urban or industrial areas<br>• Contaminated ground | • Driving to and from site<br>• Driving off-road<br>• Health, fitness, stamina<br>• Manual handling<br>• Lone working<br>• Proximity of plant/machinery<br>• Slips and trips<br>• Falling from heights/falling objects<br>• Working with contractors or | • Drill-rigs<br>• Augers<br>• Digging tools<br>• Rock hammers<br>• Generators and electrical equipment<br>• Lifting equipment<br>• Machinery<br>• Operation of vehicles | • Biological hazards<br>• Chemical hazards<br>• Dust<br>• Explosive materials<br>• Flammable materials<br>• Radiation (ionising or non-ionising) |

| | | | | |
|---|---|---|---|---|
| illness, injury, attack, loss | • Wild animals, livestock or insects<br>• Access to welfare facilities | collaborative researchers<br>• Cable installations<br>• Failing light<br>• Public protests and demonstrations | | |

- **Checklist of possible control measures**

| **Preparation for travel** | **Communications & emergency** | **Personal protective clothing** | **Safety equipment** | **Training** |
|---|---|---|---|---|
| • Vaccinations/medical advice<br>• Belgian foreign affairs guidance<br>• Protective clothing/equipment<br>• First Aid kit and medication<br>• Personal/OHS health check | • Mobile phone/communication device<br>• Communication plan<br>• Maps/sat-nav/directional aids<br>• Emergency response plan (ERP)<br>• Emergency contact list<br>• Location of A & E/medical facilities | • Weatherproof jacket & trousers<br>• Protective/non-slip footwear<br>• Weatherproof or hard hat<br>• Gloves/gauntlets<br>• Overalls/disposable suits<br>• High-visibility wear<br>• Sun protection clothing<br>• Safety glasses/goggles | • First-aid kit and medication<br>• Food & drink<br>• Sun protection cream<br>• Insect repellant<br>• Safety glasses/goggles<br>• Ear plugs/ear defenders<br>• Torch | • Off-road driving<br>• Emergency first-aid<br>• Sigma mobile<br>• SUPHT Personal Security Guidance |

| | | | | |
|---|---|---|---|---|
| | | • Ear plugs/ear defenders | | |

- **Risk scoring system**

The precise scores are not of critical importance. The scoring system is provided as a tool to help structure thinking about assessments and to provide a framework for identifying which are the most serious risks requiring attention, and why.

Risk Rating = Severity × Likelihood

| Guidance | Field | Rating | Score | Description |
|---|---|---|---|---|
| **Consider** each activity involved in the trip/project & the hazards that may arise from them; include any equipment that may be used, individual & team capabilities, and any potential health issues.<br>**Think** about what could happen; how severe could the outcome be (S) & how likely is it to occur (L)?<br>**Use the guide** opposite to score each S & L.<br>**Multiply S x L** to give the Initial Risk rating (IR). | Severity | High | 3 | Hazard capable of resulting in death, severe injury or illness, or major loss/damage to equipment, buildings or the environment. |
| | | Moderate | 2 | Hazard capable of resulting in injury or illness requiring absence from work, or damage to equipment/environmental. |
| | | Low | 1 | Hazard capable of resulting in minor injury requiring first aid, or inconsequential loss of equipment or environmental impact. |
| | Likelihood | High | 3 | Likely to occur frequently or the hazard exists permanently. |
| | | Moderate | 2 | May occur in time – hazard exists intermittently, or the operation occurs occasionally. |
| | | Low | 1 | Unlikely to occur – hazard exists infrequently and there is a low expectation of occurrence. |

| | | | | |
|---|---|---|---|---|
| **Where the IR is 3 or above**, appropriate measures must be put in place to reduce to an acceptable level of risk.<br><br>**With the control measures in place,** review the S & L ratings & multiply these to give a Residual Risk rating (RR). | | None | 0 | Hazard removed completely or effect of potential hazard made impossible by design (applies only to residual rating). |
| | Risk Rating | High | 6, 9 | Priority risk. Must be reduced to a level that is acceptable through practical and effective control measures. |
| | | Moderate | 3, 4 | Lesser priority risk. Should be assessed to see if further control measures can be applied to reduce to low risk. |
| | | Low | 0, 1, 2 | No further action is required but should continue to be monitored. |

## 4 Safe system of work

The Safe System of Work (SSW) describes succinctly the working procedure to be followed in order to carry out the activity safely, taking into account the issues identified in the risk assessment above and highlighting key steps or precautions. It is **not** necessary to be comprehensive or repeat material if suitable procedures already exist elsewhere; refer to other documents where appropriate. The layout and subheadings below are provided as prompts only and can be restructured as required.

| | |
|---|---|
| **Existing & standard guidance** | Guidances developed by the « Service Universitaire de Protection et d'Hygiène du Travail » available at (only for University employees) :<br>• https://www.ulg.ac.be/cms/c_193296/fr/documentation-utile<br>A list of existing guidances is presented in Annex B. |
| **Safety equipment required** | • High-visibility clothing (jacket and trousers), if appropriate<br>• Long sleeves<br>• Steel-toe boots (not rigger style) , if appropriate<br>• Safety helmets, goggles, if appropriate<br>• Sun cream, if appropriate<br>• Waterproof Clothing when required |
| **Working procedure**<br>*(requirements in addition to standard guidance above)* | • No additional requirements |
| **Emergency procedure**<br>*(specific to this activity and not covered in* | • **Injury:** Either ambulance called, or individual taken to A&E or minor injuries unit. First aid kit to be used as required |

| | |
|---|---|
| *corporate procedures)* | • **Change in conditions (e.g. ground movement or adverse weather):** Personnel to leave site<br><br>Phone number of ambulances of firefighters: 112 |
| **Environmental considerations** | • No obvious considerations |

**Annex A**

**Geophysical survey schedule Teesside**

**Objectives of the mission**

The objective of the field mission is to carry out multi-method geophysical measurements at the Teesside CLE31 site. Two categories of measurements are scheduled: (i) magnetic and electromagnetic measurements to map variations in the metallurgical deposit, and (ii) 2D and 3D measurements to image vertical variations. The geophysical measurements will allow the estimation of the physical properties of the slag (electrical conductivity/resistivity, chargeability, magnetic susceptibility) which can be related to the geochemical properties of the steel deposits.

**Team composition**

- Jean-Christophe Gourry – BRGM (geophysicist) – 17 $^{th}$ to 24$^{th}$ of may
- Alison Colombain – BRGM (geophysicist) – 17 $^{th}$ to 24$^{th}$ of may
- Marc Dumont – ULiege (geophysicist) – 17 $^{th}$ to 24$^{th}$ of may
- Stuart Higson, Tutu Sebastian Materials Processing Institute
- Cranfield

**Geophysical equipment**

- ERT/IP: IRIS instrument Syscal Terra and Pro + stainless electrodes, connectors, batteries and cables.
- EMI: Georeva DUALEM 421S
- Mag: Geometrics G858 (rover probe) + G856 (reference probe) + Sensys FGM3D
- Drone: DJI Phantom 4
- Magnetic susceptibility: Kappameter Bartington MS2D
- Positioning : Trimble Geo7X (x2)

**16/05/2022**

- The BRGM team is bringing the geophysical equipment by road and will arrive in Middlesbrough at the end of the day.

- The ULiège team will arrive by plane and will visit the MPI team and go to Teesside site entrance to discuss with the security team.

**17/05/2022**

- Site visit.

- Electromagnetic Induction mapping (EMI) using the DUALEM instrument. The instrument continuously emits an electromagnetic field and measures the response of the subsurface. The mapping consists of passing the instrument over the entire site while towing it on a trolley behind a vehicle - Magnetic mapping (Mag) using G858 and G856 Geometrics instrument, as well as Sensys FGM3D. The instrument measure the geomagnetic field while the operator walk in the field.

- A drone photogrammetry fly will be proceeded to obtain a precise 3D elevation model of the CLE31 site.

Both methods are non-invasive and do not present a risk to on-site personnel. The BRGM/ULiege geophysical team does not need reinforcement to carry out these measurements.

**18/05/2022**

During the morning, EMI and Mag survey will be ended.

During the afternoon the lateral 2D ERT/IP profile will be done at the northern part of the site (see Figure 4) with 96 electrodes with 2.5 m spacing. The acquisition is divided in 7 parts:

1. The line is set-up using decameters;
2. The stainless electrodes are set-up following the defined spacing; 0.5L saline water or bentonite will be added at each electrode to improve the electrical ground contact, if necessary;
3. The cable are put in the ground and connected to the electrodes using clip-on connectors;
4. The cables are connected together and with the main instrument at the center of the profile;
5. When everything is connected and on-site personal gathered, the instrument is connected to a battery and power on;
6. ERT and IP measurements are done during the same sequence. Two different sequences are made (reciprocal and normal one) in order to estimate measurements error. The measurement takes about 2h30;
7. At the end of the measurement, the instrument is turned off and the battery disconnected. The on-site team can then take back the cables, connectors and electrodes.

During the ERT/IP measurement are running, the Cranfield team could proceed to Niton and Kappameters measurements with BRGM/ULiege support. This dual measurement could be of interest for the interpretation of the geophysical results.

**19/05/2022**

Using the same methodology than previously, the longitudinal ERT/IP profiles will be acquired. In order to reach the length up to 472.5 m (i.e. 192 electrodes with 2.5 spacing). The regular resistivity-meter unit (96 electrodes) is extended with a 96-electrodes switch unit (Switch Terra 96 unit) along the profile in order to carry out the tomography in a single step. The total duration for the acquisition with a 20-channel resistivity-meter (Syscal Terra) is estimated around 4h30.

The longitudinal acquisition will be made during Thursday 19$^{th}$ . Any reinforcement will help to fasten the installation of the profile.

During the ERT/IP measurement are running, the Cranfield team could continue the acquisition of Niton and Kappameters measurements with BRGM/ULiege support.

**20/05/2022**

A 3D survey will be set-up. This part will be defined in function of the mapping results (EMI and Mag). The aim is to provide a precise 3D characterization over area of interest.

The 3D acquisition consist of the implementation of four 2D parallel ERT/IP lines (see ). The electrode spacing will be 2.5 m. The set of 192 electrodes is divided in two parts: each part is a sub-set composed of 2 lines (i.e. 96 electrodes) separated by 5m, and the spacing between sub-sets is 25 m After the first acquisition, the whole set is removed and is shifted 30m from the previous set. Using this grid pattern, it is possible to measure the resistivity contrasts along the lines and between the lines.

During the ERT/IP measurement are running, the Cranfield team could continue the acquisition of Niton and Kappameters measurements with BRGM/ULiege support.

**21 and 23/05/2022**

These two days will be focused on the finalization of the 3D set-up.

**24/05/2022**

The last day will be used to finalise the measurements made and to pack up the equipment for the return journey Wednesday 25$^{th}$.

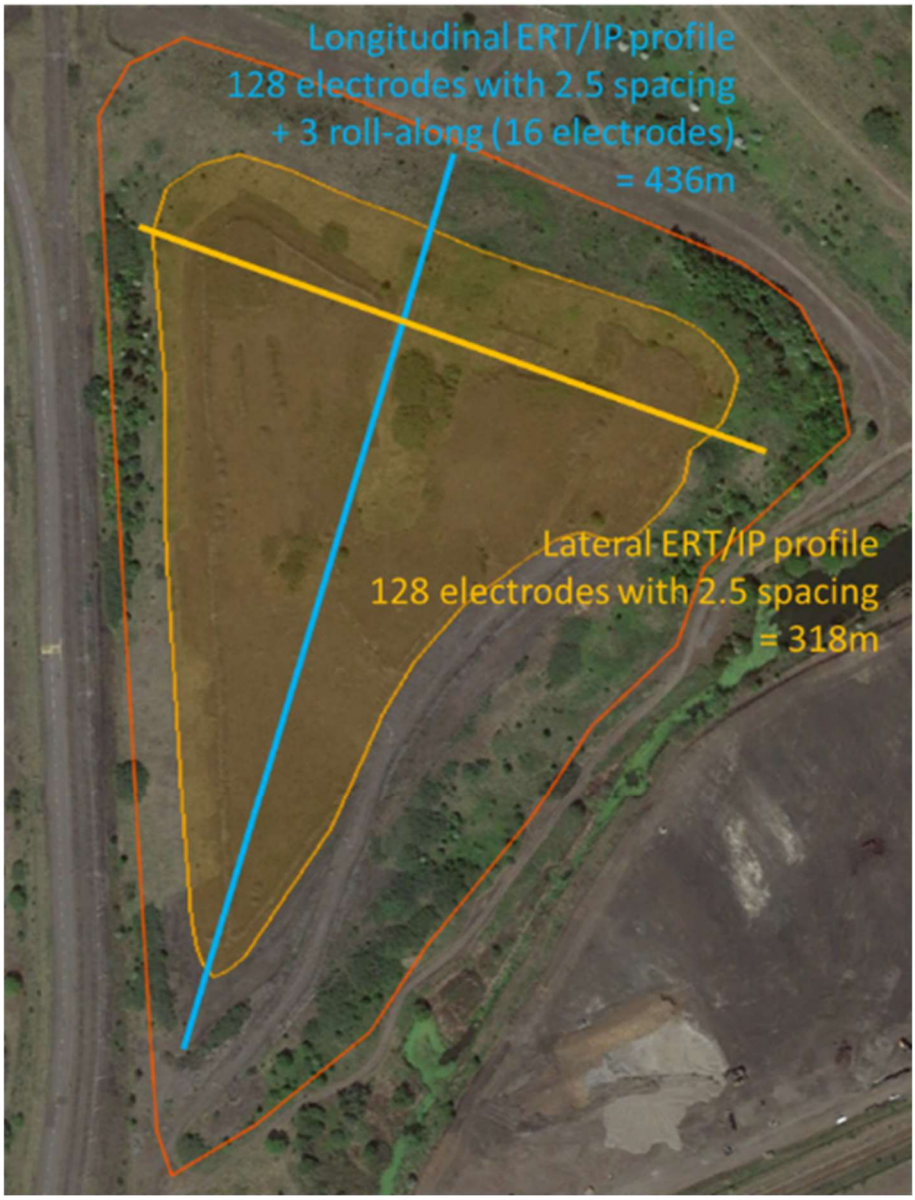



*Figure 4 - Longitudinal and lateral ERT/IP profile (Electrical Resistivity Tomography and Induced Polarisation).The aim of these profiles is to obtain an overview of the structure from the surface to the natural ground. Their location could be adapted during the survey.*

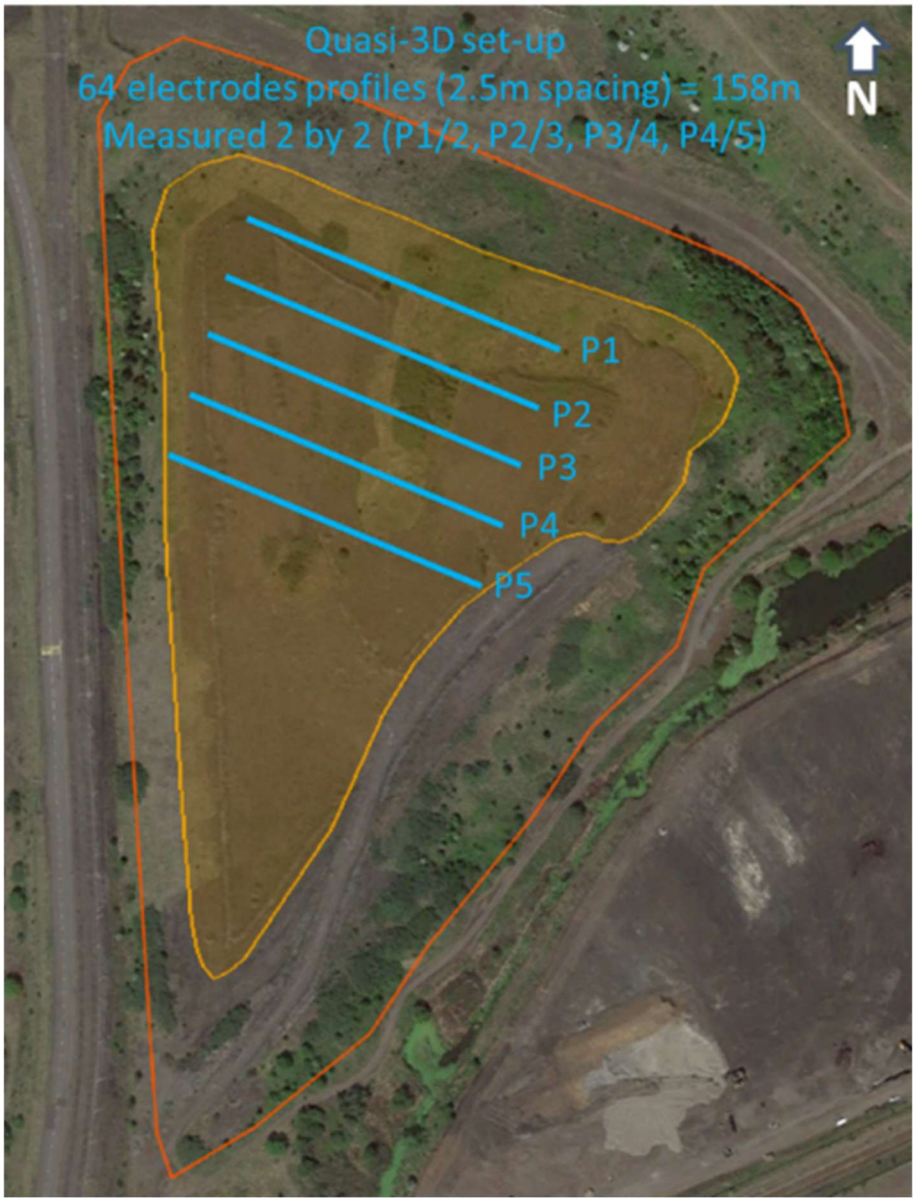
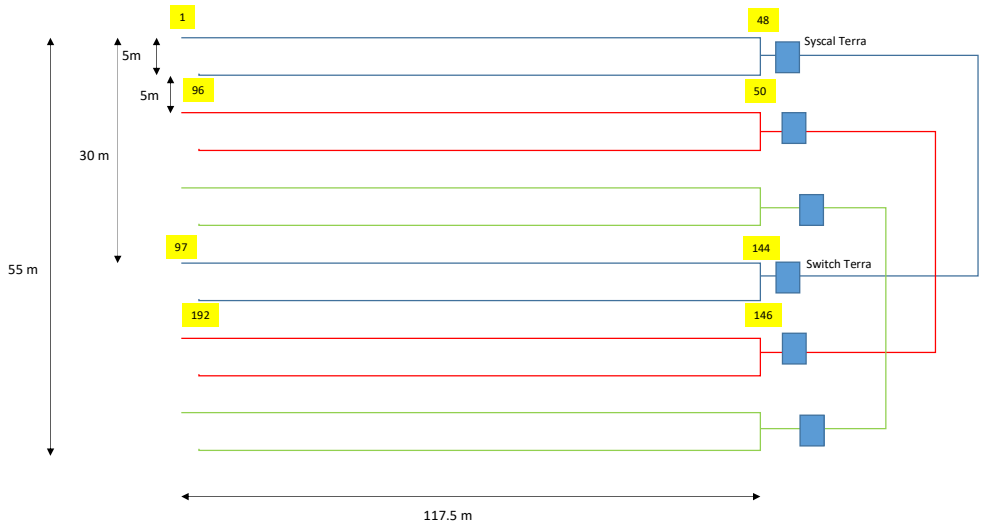
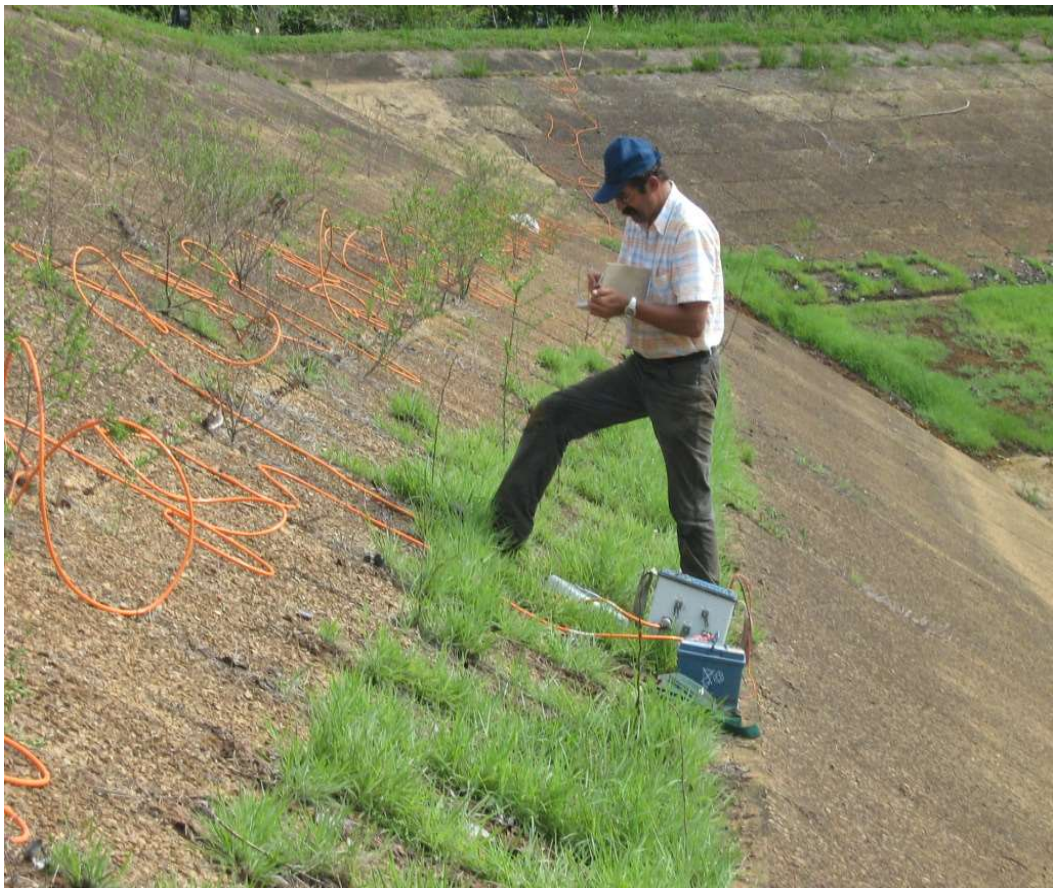



*Figure 5 – example of 3D ERT/IP set-up (Electrical Resistivity Tomography and Induced Polarisation). In this example, first profile P1 and P2 will be measured simultaneously. Then, P1 is moved to P3 location to proceed the second measurement, and so on until P4/P5 profiles are measured. Their location would be defined according to EMI and Mag survey.*




ERT configuration for the 3D survey

EMI instrument towed behind a vehicle



Electrical resistivity tomography survey

Magnetic survey

**Annex B**

Within the framework of the dynamic risk management system imposed by the legislation (Code of Labour Welfare), the employer must determine a risk analysis strategy on the basis of which prevention measures are determined.

The risk analysis must be carried out at the level of the organization as a whole, at the level of each group of workplaces or functions and at the level of the individual.

It consists successively of:

- The identification of the dangers for the well-being of the workers during the execution of their work;
- The definition and determination of risks to the well-being of workers in the performance of their work;
- The assessment of risks to the well-being of workers in the performance of their work.

The preventive measures to be taken on the basis of the risk analysis are taken at the level of the organization as a whole, at the level of each group of workplaces or functions and at the level of the individual, taking into account the following order:

- Preventive measures whose objective is to avoid risks ;
- Preventive measures whose objective is to avoid damage;
- Preventive measures whose objective is to limit the damage.

In function of this risk assessment procedure, ULiege provide applicable instructions per risk type:

- Emergencies/accidents;
- Waste management;
- Chemical risk;
- Liquid nitrogen;
- Dry ice;
- Use of fume hoods;
- Ergonomics;
- Worker training;
- Work equipment;
- Explosive Atmosphere Zone;
- Maternity protection;
- Risk analysis;
- Others.
-

# Appendix 2: Hazard ID form for drone use at CLE31

| | | | |
|---|---|---|---|
| **Request Doc. Ref No.** | Uliege/CLE31/01 | **Approved contractor** | No |
| **Plant/Area** | Teesworks – Redcar Site – CLE31 (land fill area) | | |
| **Task Location** |  | | Land fill tip area to the East of Teesworks Orange Main<br><br>TOL marked as red star |
| **Proposed Start Date** | between the 17th and 20th May 2022 (in function of wind condition) | | |
| **Duration** | 1 Day with a flight time expectation of approx. 30mins | | |

**Task Description**

To take RGB photographs of the ground in order to create a 3D elevation model via drone (DJI Phantom 4) of the land fill area designated as CLE31 between Redcar Orange Main and Warrenby Marsh.

| | | | |
|---|---|---|---|
| **Task Owner** | Stuart Higson | **Contact Number** | stuart.higson@mpiuk.com |
| **Party Requesting Access** | Uliege | **Main Contact** | f.nguyen@uliege.be |
| **Client** | As above | **Main Contact** | N/A |
| **Contractor** | As above | **Main Contact** | N/A |
| **Working Party Leader/pilot** | Marc Dumont<br>Uliege<br><br>GBR-RP-JQ5N3X6P2VTJ | **Contact No.**<br><br>**Safety Passport No.** | mdumont@uliege.be<br><br>???? |

| | | | |
|---|---|---|---|
| **Landowner granting Permission** | South Tees Developments Ltd. & STDC | **Name & Contact Details** | Neil Thomas I Riley |

**For this task, the Party Requesting Access and any appointed contractors/sub-contractors have requested access to areas controlled by STDL/STDC. The work has not been requested by STDL/STDC. As owner-occupier, STDL/STDC will identify to the best of its knowledge the hazards within the work area, which are known prior to the commencement of work and appropriate to the scope identified by the Party Requesting Access and any appointed contractors/sub-contractors. This action will allow the Party Requesting Access and any appointed contractors/sub-contractors to use this information to create risk assessments and method statements for their work.**

**The Task Owner will communicate the site conditions and site safety standards to all relevant parties and communicate to the Party Requesting Access, any issues, which in the Task Owners view are required to be rectified thus ensuring no legacy liability issues arise in the future.**

| | |
|---|---|
| Copy and paste the tick as req. | ✓ |

**2. HAZARD IDENTIFICATION**

**COMAH Dangerous Substances – Select relevant COMAH substances from the list below**

Please ensure you fully understand the required scope and possible safety implications of this task as the nature of any failure may result in harm to personnel, environment or damage to business assets and reputation.

**All hazards selected in this section must be taken forward for assessment. If in any doubt please consult your supervisor.**

| **COMAH DANGEROUS SUBSTANCES** | | | | | | | |
|---|---|---|---|---|---|---|---|
| Benzole Absorbing Oil/Creosote | | Diesel/Gas Oil | | Pyrophoric Materials | | Crude Benzole | |
| Coal Tar | | Gasholder Sealant | | Heavy Fuel Oil | | | |
| **FURTHER RELEVANT JOB HAZARDS** | | | | | | | |
| Access and Egress | ✓ | Dust | | Interface | ✓ | Pressurised Systems | |
| Adverse Weather | ✓ | Electrical | | Jetting Operations | | Rail Traffic | |
| Asbestos | | Electromagnetic interference | | Lead/Lead-Based Work | | Road Traffic | ✓ |
| Asphyxiant Gas | | Environmental Impact | | Lifting/Slinging | | Redundant Structures | |
| Auto Fire Systems | | Excavation Work | | Light Levels | | Remote Controlled Plant | |
| Biological Agents | | Falling Objects | | Manual Handling | | Scaffolding | |
| Birds | ✓ | Fire/Explosion | | MEWPs | | Toxic Gas | |
| Bunker/Silo Work | | Forklift Trucks | | Moving Machinery | | Transport/Vehicles | |
| Cellars/Tunnels | | Fragile Structures/Roof | | Noise | | Underground Work | |
| Chemicals | | Fume | | Openings/Edges | | Vapour | |
| Commissioning | | Ground Conditions | ✓ | Open water/waterways | | COV-19 | ✓ |
| Confined Space | | Hazardous Substances | | Overhead pylons - HV Cables | | Public | ✓ |
| Crane | | Height Work | | Piped Services | | Restricted flight zone/Area | |
| Demolition/Dismantling | ✓ | Hot Work | | Power Tools | | | |

**3. SAFETY CONSIDERATIONS RELATING TO HAZARDS IDENTIFIED**

Teesworks Task owner: Use this space to provide specific information (if required)

**Access/Egress** and Accounting for People - All personnel will be site inducted and hold a valid safety passport or equivalent unless dispensation has been given from the Works Manager or director level. If the working party is working under a dispensation, then they must be accompanied by an Teesworks ST or DC Supervisor. EDC control to be informed of presence on site & when leaving site.
All personnel will use the Teesworks disc (tagging) system in EDC for accounting for personnel on site/CDM areas are controlled locally.

In the event of an injury, or fire, call 01642 402222 and ask for assistance.
In the event of the site containment alarm, leave site by your vehicle and account for personnel, inform EDC by telephone that all personnel are accounted for (01642 408297.

**Adverse weather** – Beware of air born dust in windy conditions, No work will be allowed during lightning storms or if the forecast is lightening risk 1 (see EDC for weather forecast). Drone Pilots must check weather reports prior to flights and remain within the max wind speed specified for the drone.
**Birds** – Nesting birds are evident on all site areas.
**Demolition work** – be advised that the site is under CDM demolition though this work is not currently affecting CLE31.
**Ground Conditions** – waste ground areas are deemed to be rough terrain, be aware of conditions underfoot.
**Interface/public** – Be aware that dog walkers frequent the area to the East of CLE31 and have been known to stray even up to Orange main (Road).
**Road Traffic** – Be aware of heavy plant vehicles, HGV's and rail traffic operating on this site. Max speed for the site is 30mph or less in some instances.
**COV-19 –** Government and Teesworks COVID – 19 Protocols to be strictly followed

**General info**
**Any road closures** must be requested in advance (see task owner who will notify other users and security)
**Redundant structures/fenced areas** – Do not enter any areas fenced off or have warning signs signposted – seek advice from the Asset Dept
**Tools / equipment** in good condition / working order.
**All Drone operations** - to be carried out under CAA (rules of the air)

**It is the responsibility of the drone operator to contact any nearby businesses or local councils regarding any intended flight path outside of the Teesworks site.**

**3a. Other considerations**

- **Excavation work - Excavation is defined as any surface removal, compaction, indentation, penetration, or disturbance of any ground surface. Therefore, no excavation work can be undertaken at Teesworks without an approved Permit to Excavate being issued.**
- **Proximities – Site survey must be carried out (consider items such as: PowerStation's, Airports, obstacles, and site equipment such as overhead power lines etc.**
- **Disclosure – No photographs or videos should be taken depicting SSI logos or security equipment without the express permission of Teesworks.**
- **Landowners and adjacent CDM sites – Please follow the protocol of informing any adjacent neighbouring companies or CDM site managers of any drone flights over or in close proximity to their personnel, equipment or buildings.**

| **4. PLANT/EQUIPMENT** | | |
|---|---|---|
| Is the contractor authorised to use any STSC Tools, Equipment, Services or Stores? | No | If Yes please state items below to be used |
| N/A | | |

| **5. PERSONAL PROTECTIVE EQUIPMENT** | | | | | | | |
|---|---|---|---|---|---|---|---|
| Safety Helmets | ✓ | Hearing Protection | | Flame-Retardant Wear | | Safety Harness | |
| Safety Footwear | ✓ | Personal Danger Board | | Chemical Suit | | Fixed Barriers / Fencing | |
| Overalls | ✓ | Gas Monitor | | Disposable Coveralls | | Bunting / Notices | |
| Eye Protection | ✓ | Respiratory Protection | | Waterproofs | | Breathing Apparatus | |
| Hand Protection | | Torch | | High-Visibility Wear | ✓ | COV-19 face masks | |

| **6. SUPPORTING DOCUMENTATION** | | | | | | | |
|---|---|---|---|---|---|---|---|
| Atmospheric Clearance Cert | | Gas Clearance Cert | | Hot Work Cert | | Railway Track Permit | |
| Confined Space Cert | | Gas Purge Cert | | Isolation / Immobilisation Cert | | Roof Permit | |
| Excavation Permit | | High Voltage Permit | | Permit to Access (Cranes) | | Safety Harness Cert | |

| 6a. DRONE/SUA SPECIFIC DOCUMENTATION | | | | | |
|---|---|---|---|---|---|
| Required Documents | ✓ | Reference No | Expiry date: | Checked by: | |
| CAA Permission for Commercial Operations | X | N/A 'open class due to low commercial risk. Flier ID ref GBR-RP-JQ5N3X6P2VTJ | 11/05/2027 | Derogation request accepted by K Dickinson | ✓ |
| Flight Plan or flight Ref Card | ✓ | 2205RT | | | ✓ |
| Operations Manual (SUA) | X | N/A – company do not hold commercial CAA approval. K Dickinson authorisation granted. | N/A | Derogation request accepted by K Dickinson | ✓ |
| Drone opp Insurance | ✓ | Ethias Assurance- 45.425.334. | 31/12/2022 | | ✓ |
| Nuclear Exemption (Hartlepool P/Station) | X | N/A | | | |

**7. SAFETY PASSPORT**

All who work on the STSC site must be in possession of a Safety Passport. The following are acceptable examples:

- CCNSG/ECITB (Client Contractor National Safety Group/Engineering Construction Industry Training Board)
- EMSS (Essential Minimum Safety Standard)
- SPA (Safety Pass Alliance)
- IOSH/NEBOSH (Qualifications supersede Safety Passports)
- CSCS (Construction Skills Certificate Scheme)
- CPCS (Construction Plant Competency Scheme)
- NOTS (National Training Operators Scheme)

It is recognised that other, equivalent qualifications exist. Should member(s) of the working party hold a safety-related qualification that is not listed above, Procurement can be contacted for advice on 01642 408077.

**8. REFERENCE – Have you considered?**

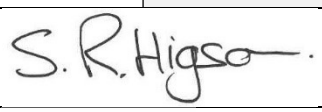
**Have you considered the following before commencing the task?**

| | |
|---|---|
| • **COSHH** | • Are the COSHH Regulations relevant to this work?<br>• Have COSHH assessments been supplied? |
| • **ENVIRONMENTAL ISSUES** | • Will the work involve wastes discharge into drains or water courses?<br>• Will the work involve any air pollution?<br>• Will any form of wastes get onto ground or land surfaces?<br>• Will there be any excessive noise pollution with this work? |
| • **FIRE PREVENTION** | • Will the work involve bringing onto site any flammable liquids or gases?<br>• Will the work require any fire extinguishers?<br>• Who will supply the fire extinguishers and how many will they need? |
| • **HOUSEKEEPING** | • Will there be any storage necessary on site for this work?<br>• Will there be any cabins, offices, or workshops on site? |
| • **PROXIMITY WORKING** | • Will the work be on or near the following;<br>• Chemical Plant, Conveyors, Excavations, Hot Substances, Cranes, Overhead Cables, Rail Tracks, Road/Walkways |
| • **WELFARE** | • Have welfare facilities been provided? |

**9. APPROVAL SIGNATURES**

STSC Task Owner shall sign where it is established that a department representative's signature is not required.

| | | | | |
|---|---|---|---|---|
| South Tees Developments Ltd. & STDC (Landowner) | Name | Neil Thomas | Approval Signature | required |
| DC Asset & Estate Manager | Name | I Riley | Approval Signature | Not required |
| STSC Inspection Engineer & Drone Manager. | Name | Stephen Wilson | Approval Signature |  |
| STSC Drone Operator/Director | Name | Karl Dickinson | Approval Signature | required |

| **10. TASK DOCUMENTATION** | | | | | |
|---|---|---|---|---|---|
| Risk Assessment No. | 2205RT | Method Statement / SWP No. | See R/A | COSHH Assessment | N/A |
| Task Owner Signature |  | | | | |
| Working Party Leader Signature |  | | | | |
| The Task Owner Signature is to verify that the hazards identified have been included in RAMs of the party requesting access and any appointed contractors/sub-contractors. | | | | | |
| The Working Party Leader Signature is to verify that the RAMS created for the task are suitable and sufficient for the task. | | | | | |

# Appendix 3: cost breakdown of borehole drilling reinstatement work by Allied Exploration Geotechnics Ltd.

**Allied Exploration Geotechnics Ltd** 27/03/2023

**Teesworks CLE31**

| Number | Item Description | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|
| **A** | **General items and provisional sums** | | | | |
| A1 | Welfare and lockable storage for the Contractor | sum | 1 | 2,100.00 | 2,100.00 |
| A2 | Establish on site and remove on completion, rotary sonic drilling rig, crew and equipment | sum | 1 | 18,165.00 | 18,165.00 |
| A3 | Engineering attendance on site | day | 10 | 470.00 | 4,700.00 |
| A4 | Establish the location and elevation of the ground at each exploratory hole | sum | 1 | 475.00 | 475.00 |
| A9 | Health & Safety documentation | sum | 1 | 380.00 | 380.00 |
| A11 | Temporary fencing around each operational exploratory hole -- if required by Teesworks | sum | rate only | 807.50 | |
| A12 | One copy of the Factual Report in PDF format including AGS data | sum | 1 | 985.00 | 985.00 |
| A17 | Photograph | nr | 40 | 4.65 | 186.00 |
| | **Total section A carried to summary** | | | | 26,991.00 |

| Number | Item Description | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|
| **B** | **Boreholes** | | | | |
| | **Total section B carried to summary** | | | | - |

| Number | Item Description | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|
| **C** | **Rotary drilling** | | | | |
| C49 | Move sonic drilling rig, equipment and crew to the site of each borehole and set up | no | 5 | 680.00 | 3,400.00 |
| C55 | Standing time and time spent backfilling boreholes for sonic drilling rig, equipment and crew | h | 5 | 305.00 | 1,525.00 |
| C67 | Sonic drill, from which continuous samples are required, between existing ground level and 10m depth | m | 50 | 172.50 | 8,625.00 |
| C68 | As item C67 but between 10m and 20m depth | m | 25 | 189.75 | 4,743.75 |
| | **Total section C carried to summary** | | | | 18,293.75 |

| Number | Item Description | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|
| **D** | **Pits and Trenches** | | | | |
| | **Total section D carried to summary** | | | | - |

**Allied Exploration Geotechnics Ltd** 27/03/2023

**Teesworks CLE31**

| Number | Item Description | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|
| E | Sampling | | | | |
| | Total section E carried to summary | | | | - |

| Number | Item Description | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|
| F | In situ testing | | | | |
| | Total section F carried to summary | | | | - |

| Number | Item Description | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|
| G | Instrumentation and monitoring | | | | |
| | Total section G carried to summary | | | | - |

| Number | Item Description | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|
| K | Laboratory testing | | | | |
| | Total section K carried to summary | | | | - |

| Number | Item Description | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|
| L | Chemical testing for contaminated ground | | | | |
| | Total section I carried to summary | | | | - |

| Number | Item Description | Unit | Quantity | Rate | Amount |
|---|---|---|---|---|---|
| X | Additional Items | | | | |
| X1 | Provide water company standpipe | week | 2 | 115.00 | 230.00 |
| X2 | Provide fuel storage for white diesel | week | 2 | 115.00 | 230.00 |
| X3 | Provide and maintain on site, Detertech or similar remote access security devices at site compound | week | 2 | 862.50 | 1,725.00 |
| X4 | UXO mitigation -- if required by Teesworks | day | rate only | 485.00 | |
| | Total section X carried to summary | | | | 2,185.00 |

**Allied Exploration Geotechnics Ltd** 27/03/2023

**Teesworks CLE31**

**Summary of Bill of Quantities**

| Sched. | Description | | Amount |
|---|---|---|---|
| A | General Items and provisional sums | | 26,991.00 |
| B | Boreholes | | - |
| C | Rotary Drilling | | 18,293.75 |
| D | Pits and Trenches | | - |
| E | Sampling | | - |
| F | In-situ Testing | | - |
| G | Instrumentation and monitoring | | - |
| H | Laboratory Testing | | - |
| I | Chemical testing for contaminated ground | | - |
| X | Additional Items | | 2,185.00 |
| | | Total, subject to re-measurement | 47,469.75 |