

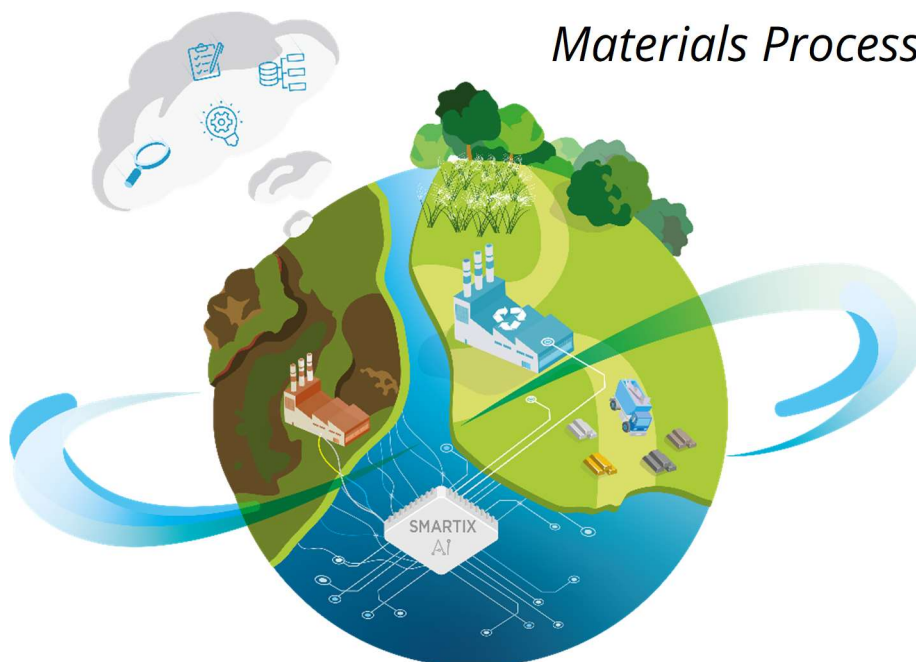
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Del. I1.4.2 As-built document, restoration works report - Teesworks

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SUMMARY

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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

The NWE-REGENERATIS project (Interreg North-West Europe) aims to recover (metals, minerals, and land) from PMSDs using urban mining methods and valorise the site. Three pilot sites were selected one of which was the former integrated steelworks at Teesside.

Following the closure of the steelworks the land has come under control of the South Tees Development Corporation (STDC). The STDC site is a large site (1500 ha) with a 160-year history of iron and steel production and the processing of finished products. It comprises large areas of Redcar, Lackenby, Grangetown and South Bank to the South of the river Tees.

As an integrated steelworks which processed from raw materials to finished product there was a number of known areas used for the storage of waste products dating back as far as the 1900s. The significant areas of previous industrial activity are those of the Redcar works complex (comprising the blast furnace, coke ovens, sinter plant and materials handling areas), the Lackenby steelmaking complex (comprising the basic oxygen steel and continuous casting plants), the Grangetown Prairie (site of the Cleveland Iron Works), the zone designated as Landfill and Waste Management Facilities (comprising the SLEMS waste management facility, the High Tip Landfill and a metals recovery area) and the South Bank zone (site of the Clay Lane furnaces and the South Bank Coke Ovens).

This report describes the work that was proposed to be done in connection to the geophysical investigation to corroborate the data obtained. Unfortunately, it was not possible to complete the work within the project.

2 SELECTION OF THE STUDY AREA

The area initially selected was the South Lackenby Effluent Management System (SLEMS) landfill site, shown in Figure 1. 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 use the time scales were such that it was not feasible to perform any site work at this location during the project. This combined with the Covid pandemic resulted in a significant delay to the performance of a geophysical study on Teesside.

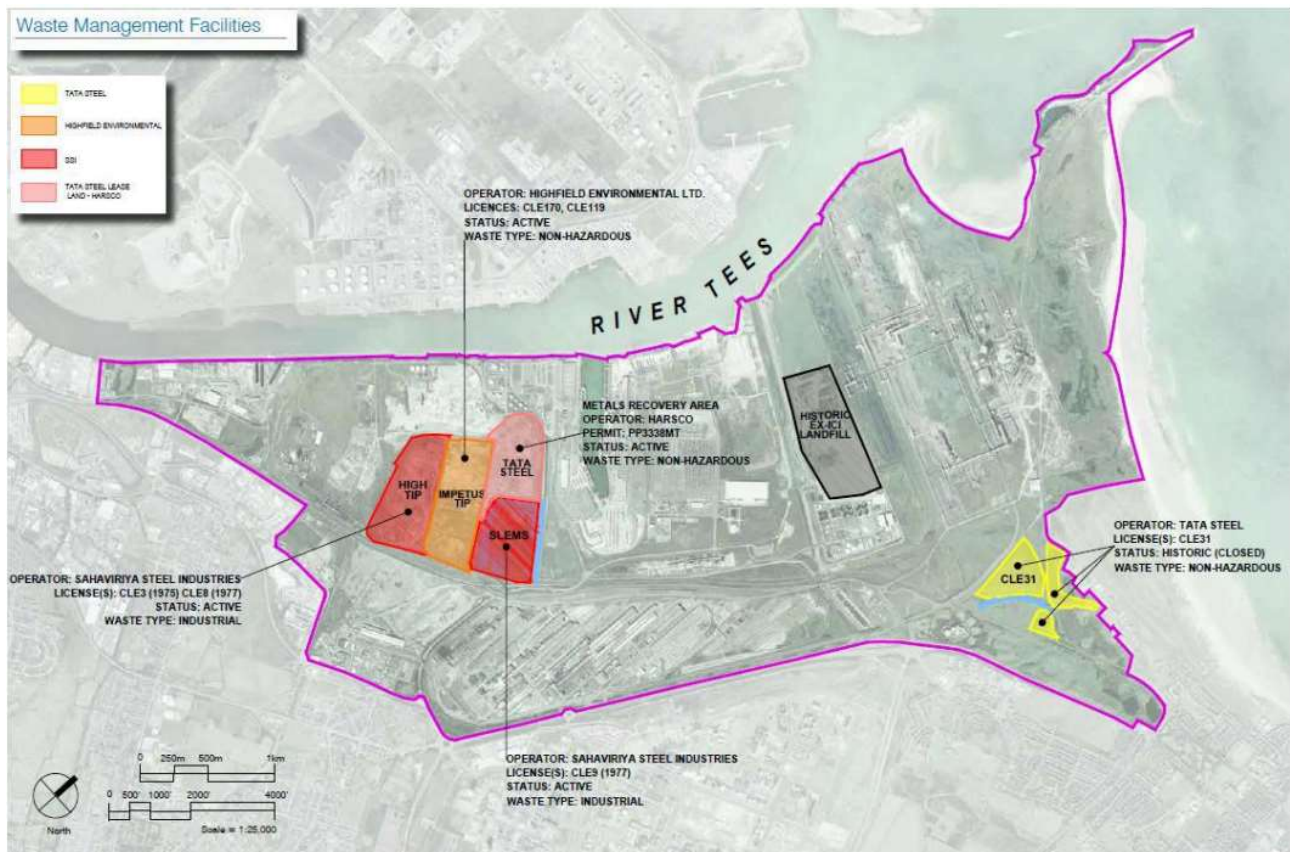


Figure 1 - Waste management facilities within PMSD-I1 Teesworks.

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 1.



Figure 2 - CLE31 landfill site

CLE31 (Fig.2) is a closed waste disposal site and was used primarily for the disposal of blast furnace and steelmaking slag with a small percentage of general site waste. The site was used from the 1930s until it was closed in 2002.

3 GEOPHYSICAL SURVEY

A non-invasive geophysics campaign was carried out on the CLE31 site in May 2022. The results of this are reported in deliverable report D. I1.2.1 Site specific report on geophysical survey on Teesside site. Analysis of the result has highlighted areas of interest in terms of the measured chargeability and resistivity of the subsurface deposits. To interpret these results and identify the nature of these deposits it was proposed that physical samples be obtained from selected locations on the site. These locations can be seen in figure 3.

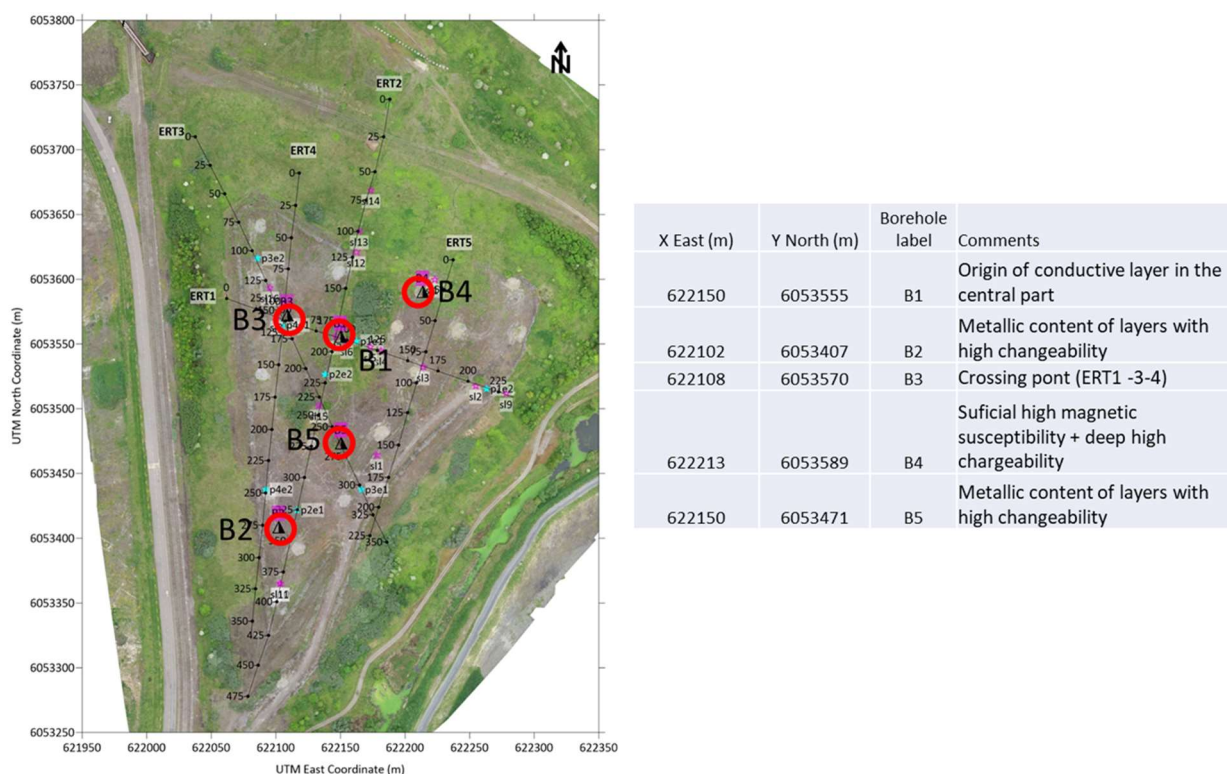


Figure 3 – Suggested locations for sampling on CLE 31

4 PHYSICAL SAMPLING

it was proposed by the geophysics team that physical samples could be taken in the form of bore holes. This would result in core samples to a depth of approximately 15m.

4.1 LEGAL ASPECTS

The legal aspects of the proposed sampling were investigated.

The CLE31 site where the Geophysics was performed is classed as “Closed” and the site remains in “Aftercare”. This legally means that although closed the site is still managed under an active waste management licence. Any works undertaken which is invasive to the landfill and could lead to a disturbance in the stable landfill and potentially result in a release of contamination

to the local environment such as drilling boreholes must be managed under CQA (Construction Quality Assurance) regulations. This requires the operator to gain approvals from the UK Environment Agency to drill into a permitted landfill.

To obtain the appropriate approval it would be necessary to submit work plan and a method statement for the works outlining exactly what work is to be performed and how the area would be subsequently reinstated. This must be submitted by a trained, specialist consultant.

During the work a CQA approved person must supervise the site to ensure that the work is proceeding to plan, and that the method statement is being followed. Following the work, a verification report detailing the outcome of the works must be produced and submitted to the Environment Agency.

A meeting was held with the site owners and a CQA consultancy which is currently used for work on the Teesworks site. They suggested that although the site is permitted, it is not a "landfill directive" permit. The proposed sampling is by bore hole rather than a full excavation therefore it may be possible to perform the excavations by a "light" touch CQA. This would still be a formal exercise and would require prior agreement with the Environment Agency.

If agreed the "light" touch would take the form of a formal email to the Environment Agency rather than the full written application. It would still need to include:

- A plan of works and method statement.
- Verification report detail the outcome of the works.
- Site supervision, but we might be able to reduce the time needed / and not have to use a CQA approved engineer.

The "light touch" approach would significantly reduce the cost for consultancy support also mean the process of producing this documentation and approval process won't be as lengthy.

4.2 BORE HOLES

To carry out the Bore holes it will be necessary to use a specialist drilling company. Discussions were held with a potential contractor.

The holes must be monitored during the process to ensure that they stop before drilling into the underlying natural strata beneath the waste, so not to introduce a potential preferential pathway for leachate.

It was proposed that the bore hole drilling be carried out using rotary sonic drilling techniques in order to obtain a continuous sample from each borehole. Samples would be obtained in either heavy-duty plastic "sausage" bags or semi-rigid plastic liner tube.

Once the samples have been taken it will be part of the CQA requirement that the site must be reinstated by backfilling. Each hole must be backfilled from the base using a bentonite grout as sealing medium. This would be pumped as a liquid from the base to ensure that the hole is sealed and that there is no chance of a subsequent leak to the environment. This will be expected as part of the in compliance with EA requirements.

4.3 QUOTATIONS

A formal quotation for the work described was request from both the CQA consultancy and the recommended drilling contractor assuming that he light touch approach would be accepted by the Environment agency.

The consultancy costs were estimated at £14,200 for the light touch CQA approach.

The drilling costs were estimated at base cost of £47,500 which may increase with local conditions.

Total cost approximately £62,000 (70,200 Euros)

The work would also require a lead time to prepare the documentation and obtain the relevant permissions from the Environment Agency.

It was decided that it was not feasible to proceed with the sampling both in terms of timescales and financially within the remaining project time and budget.