

Metals Characterisation by Facility Characterisation in support of Site Remediation and Decommissioning Projects

Facility Characterisation

- ❖ Facility Characterisation is a Centre of Expertise (CoE) on the Sellafield Site, which has the capability to deliver characterisation projects and provide Intelligent Customer support to Operating Units and Major Projects.
- ❖ Facility Characterisation provides a characterisation process that defines the elements, responsibilities and outputs necessary to ensure that the characterisation of facilities, materials and wastes is completed compliantly.
- ❖ The Facility Characterisation team sits within Site Remediation & Decommissioning Projects in the Decommissioning directorate.
- ❖ Facility Characterisation have delivered approximately 500 Characterisation Projects since 2010 supporting decommissioning planning, waste routing and disposal across all Operational, Infrastructure and Decommissioning areas of the Sellafield Site.

Electrical Transformers



Project Overview

- ❖ 10 transformers from various locations across the Sellafield site have been classified as Exempt (Out of scope of EPR), based on sampling and analysis.



Key challenges

- ❖ External paint layers were found to be contaminated to greater than exemption limits.
- ❖ Characterisation of the transformer internals based on sampling of the associated oil rather than sampling the metalwork.

Benefits & Successes

- ❖ Approximately 576te of metal was classified as exempt (out of scope of EPR).
- ❖ Bulk assessment of the metal with firmly adhered paint demonstrated exemption against RP89 to support smelting.
- ❖ This material was processed direct to the recycling facility.
- ❖ Classification as exempt avoided sentencing of the metal via LLW Segregated Services.
- ❖ The metal types classified as part of these projects included 411te of mild steel, 4te of stainless steel and 161te copper.

FHP Crane Wires



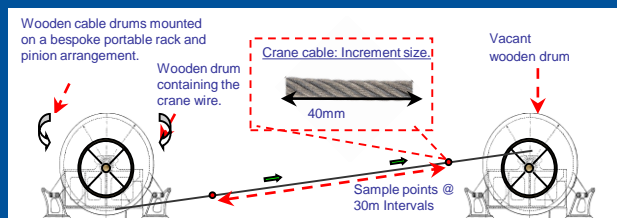
Project Overview

- ❖ 3000 metres of stainless steel crane wire from within an active facility of the Fuel Handling Plant (FHP) was classified as Exempt (Out of Scope of EPR), based on sampling and analysis.



Key challenges

- ❖ Taking representative samples given the nature of the material.



Benefits & Successes

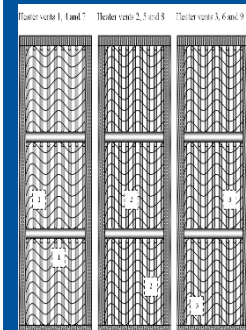
- ❖ Justification to support the sentencing of future steel crane wire cable arisings with similar provenance was produced.
- ❖ A total cost saving of £56,000 was achieved for this project.
- ❖ The cost for treatment of LLW metal via Segregated Services estimated at £3500/te was avoided.

Air Intake Heater Vents



Project Overview

- ❖ 23 copper heater vent units were classified as Exempt (Out of Scope of EPR), based on sampling and analysis.



Sample Operations

- ❖ A schematic of the heater vents was included in the sample plan illustrating the sample locations on each of the heater vents.
- ❖ 3 sample populations were deemed representative of the 9 heater vents that required characterisation.
- ❖ Monitoring data was used to confirm that sampling approach was appropriate.

Key challenges

- ❖ Data assessment was based on leachate results as only surface contamination was expected.
- ❖ Ensuring that the systems were isolated and drained of any residual fluids.
- ❖ Does not support the sentencing of heater vent units which are contaminated by putrescible waste.

Benefits & Successes

- ❖ Assessment of the 9 heater vents enables 14 additional units to be sentenced as exempt if HP&S provenance supports this).
- ❖ Cost saving of £7000 compared with LLW disposal and cost gained of £7000 based on copper scrap metal price.
- ❖ Characterisation of this material allows the project to sentence the material via an appropriate route with support from the Waste OU.

The Characterisation Process

- ❖ Effective characterisation is facilitated by applying the principles of the Data Quality Objectives (DQO) process in order to make defensible decisions.
- ❖ A standard process is followed that defines the elements, responsibilities and outputs necessary to ensure that the characterisation is controlled / underpinned.
- ❖ The defined steps in the process are; Agree Scope of Work, Define Sample Strategy, Perform Sample Operations, Assess Data, Report Findings.
- ❖ Findings are reported in the form of Characterisation Reports, Technical Justifications to support Exemption, or Wastestream Characterisation Documents

Since 2010, comprehensive characterisation has enabled in excess of **700m³** of metal to be sentenced as exempt material with no or limited treatment, enabling significant safety, environmental and cost savings to be realised. **(Cost Savings in excess of £14 million)**