



Environmental Management Services

Metal Plating Plant Decommissioning Case Study

Summary

Following the closure of a chrome plating facility we were commissioned to research and design a means of effectively decontaminating and decommissioning the facility.

The building was successfully decontaminated and a full validation report presented to the client to help facilitate the future sale of the property. Works included an initial screening investigation, human health risk assessments, treatment feasibility testing, multi-facet treatment application, validation testing, hazardous waste management, reporting and continual liaison with the Health and Safety executive and other regulatory bodies.



Health & Safety

The chrome plating process requires the use of Chromic acid a particularly hazardous substance which can cause lung cancer.

Due to the hazardous nature of the works a thorough background search of relevant literature and liaison with the Health & Safety Executive (HSE) was conducted ensuring all legislative requirements were met.

The United States Occupational Safety & Health Administration (OSHA) and the United States National Institute for Occupational Safety and Health (NIOSH) were also contacted as the worlds highest authority on the chrome plating process to ensure worldwide best practise was implemented.

Initial Screening

Screening works were needed to quantify the level of residual contamination deposited within the building to allow an informed Human Health Risk Assessment to be completed.

Swab sampling and analysis showed significantly high levels of Chrome 6 deposited throughout the site posing an unsatisfactory health risk to future users.

Human Health Risk Assessment

To identify human health risks it was essential all pollutant linkages were assessed. A pollutant linkage comprises three components: a contaminant (source), which has a mechanism (Pathway) by which it can cause an adverse impact on a human (Receptor). If one component of the pollutant linkage is missing then there is no viable risk, i.e. no pathway, no risk.

For the purposes of this human health risk assessment the contaminant of concern is Hexavalent Chromium (CrVI). The pre decontamination task based risk assessment indicated that it was not possible to declare the building free from potential human health risks due to the high levels of CrVI and a lack of data relating to potential hazards. There were potentially significant human health risks for all potential users of the site i.e. decommissioning operatives, future on-site workforce and maintenance contractors.





Decontamination

Feasibility tests were carried out to assess the effectiveness of different treatment approaches on a range of surfaces in keeping with the materials encountered at the site.

Treatment approaches were adjusted and refined through an iterative assessment process. The main forms of treatment which were tested were:

- High Pressure Jet Spraying (7000PSI)
- High Pressure Jet Spraying (7000PSI) followed by brush scrubbing
- Fine spray with Acetic Acid (1% Volume)
- Fine spray with Sodium Metabisulphite solution (20% Volume, 10% Volume and 5% Volume)

Waste Classification & Validation

All wastes arising from the decontamination and decommissioning works were classified in accordance with the "hazardous waste regulations (England & Wales) 2005". Correct waste classifications allowed the waste to be disposed of in line with regulations in the most cost effective manner.

Decontamination works were undertaken on all specified open building surfaces. Validation swab tests revealed an average reduction in CrVI concentrations of 99.3%.

Based on findings of the TBRA following decontamination works there is no significant human health risks to the "future on-site workforce".

The site was safely decontaminated and decommissioned in line with client specification and was successfully sold to a new business.

