GeoStream UK
SOLUTIONS & TECHNOLOGIES FOR THE ENVIRONMENT

CLIENT
Large Italian utilities provider

SITE AREA
3 Hectares

LOCATION
Bologna, Italy

JOB TYPE
In situ chemical oxidation

SERVICES

- DESIGN & BUILD SERVICES
- PROCESS EQUIPMENT
- CHEMICAL & BIOLOGICAL TECHNOLOGIES
- PHYSICAL REMEDIATION

LARGE-SCALE IN SITU CHEMICAL OXIDATION TO TARGET HYDROCARBONS

CHALLENGE

Geostream was contracted for the environmental reclamation of a 3ha site for one of Italy's largest utilities providers.

During multiple phases of site characterisation, the following contaminants were identified:

- Light and heavy end hydrocarbons
- Polycyclic Aromatic Hydrocarbons (particularly Naphthalene)

Two areas on the site also had different land use objectives, which meant two different sets of remediation targets had to be met.

SOLUTION

In situ chemical oxidation was determined the safest, most effective treatment method. This requires reagent to be injected directly into the contaminated area through direct-push technology, activating oxidation of the polluting organic complexes.

Following bench testing on both contaminated and non-contaminated soils and groundwater from the site, Geostream identified Potassium Permanganate as the most suitable reagent, selecting premium Carus product, RemOx S.

To reach the desired contamination reduction levels within the required timeframe, RemOx S was specified at quantities of 7kg/m3 of land to be treated (69 tonnes in total). As RemOx S is a powdered product, approx. 2,286m3 of water was needed to dilute the reagent to produce the project design concentration of 3% solution. Geostream used its own bespoke, mobile on-site mixing trailer to produce the reagent solution, reducing transport costs and associated environmental impact.

Dissolved reagent was injected via our in-house direct-push rig at specific intervals across the plume to maximise the radius of influence, optimising its distribution across the site. Mixed reagent was injected using a top-down approach at the required project quantities. Geostream used pumps able to generate injection pressures of over 20 bar, which were manufactured in-house to ensure they would resist the corrosive properties of the reagent.

These injections were carried out over two separate events, with two months left between the first and second injections to treat residual contamination rebound.

RESULTS

- Significant reduction in contaminant mass has been achieved.

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