

### CLIENT

Stewart Milne Homes

### TIMEFRAME

6 months

### SITE AREA

15ha

### LOCATION

Hooton, near Ellesmere Port



### OUR SERVICES

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

## EXTENSIVE REMEDIATION AND EARTHWORKS ON THE 15HA SITE OF A FORMER ROYAL ORDNANCE FACILITY

### THE CHALLENGE

Geostream UK and McAuliffe were tasked with remediation and earthworks on the 15ha site of a former Royal Ordnance facility, in preparation for 265 new homes.

The site had sat derelict for five years, after preliminary site investigations identified extensive zinc contamination of soils up to 52,000 mg/kg. Although incomplete, these findings had led the EA to set a remediation target value of 1,000mg/kg.

Our team gave Stewart Milne confidence to purchase the site, advising on abnormal costs from land acquisition stage. On top of extensive zinc contamination, challenges included:

- 25,000m<sup>3</sup> of asbestos-contaminated stockpiles
- Indeterminate TPH contamination
- Significant underground structures, hardstandings and USTs
- Large holes in site data, due to the preliminary nature of initial SI
- A limited and impractical remediation options appraisal

### SOLUTION

#### Supplementary SI

Additional SI was needed to indicate remediation volumes and determine scheme viability. We delineated the site by computer-generating a 30m x 30m grid, which was later delineated into a 15m x 15m grid for precise sampling.

Using our in-house 3D GPS-enabled equipment, the team could show how this delineation method would be applied in the field, reducing the predicted contamination zone by 50%.

After conducting technology trials, we proposed a 125ug/l leachate treatment target, selecting stabilisation/solidification to achieve it. The team also carried out analysis and risk assessment of asbestos-impacted soils under CAR:SOIL.

Data was fed into the remediation strategy and RMS, and informed deployment of McAuliffe's environmental permit.

#### Remediation

Computer-generated 15m x 15m grids were uploaded onto a digital terrain model of the site, which was viewable in the in-cab display of 3D GPS-enabled excavators. This clearly marked out known zinc hotspots for machine operators.

Once excavated, contaminated soil was placed into 100m<sup>3</sup> stockpiles under McAuliffe's Environmental Permit. This enabled classification, subsequent S/S treatment and re-use of all 29,429m<sup>2</sup> of zinc-impacted soil.

Our team also bioremediated 933m<sup>3</sup> of TPH/VOC-impacted soils, after discovery of USTs during made ground turnover.

#### Materials management

Concurrent to remediation, we broke out and processed extensive hardstandings, converting 12,106m<sup>3</sup> of hard materials into 6F2 and Type 1 aggregate for re-use in the development.

Our team removed 19 tonnes of asbestos from 25,000m<sup>3</sup> of material, and used treated soil to fill allocated areas in accordance with the MMP and RMS.

### RESULTS

- ✓ Created a cost-effective, compliant methodology that made the project viable
- ✓ Used delineation to reduce the predicted contaminated zone by 50%
- ✓ Re-used 117,500m<sup>3</sup> (99.88%) of material, which was originally destined to go to landfill
- ✓ Processed concrete into 10,606m<sup>3</sup> of 6F2, and highways-compliant Type 1, for re-use on site



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