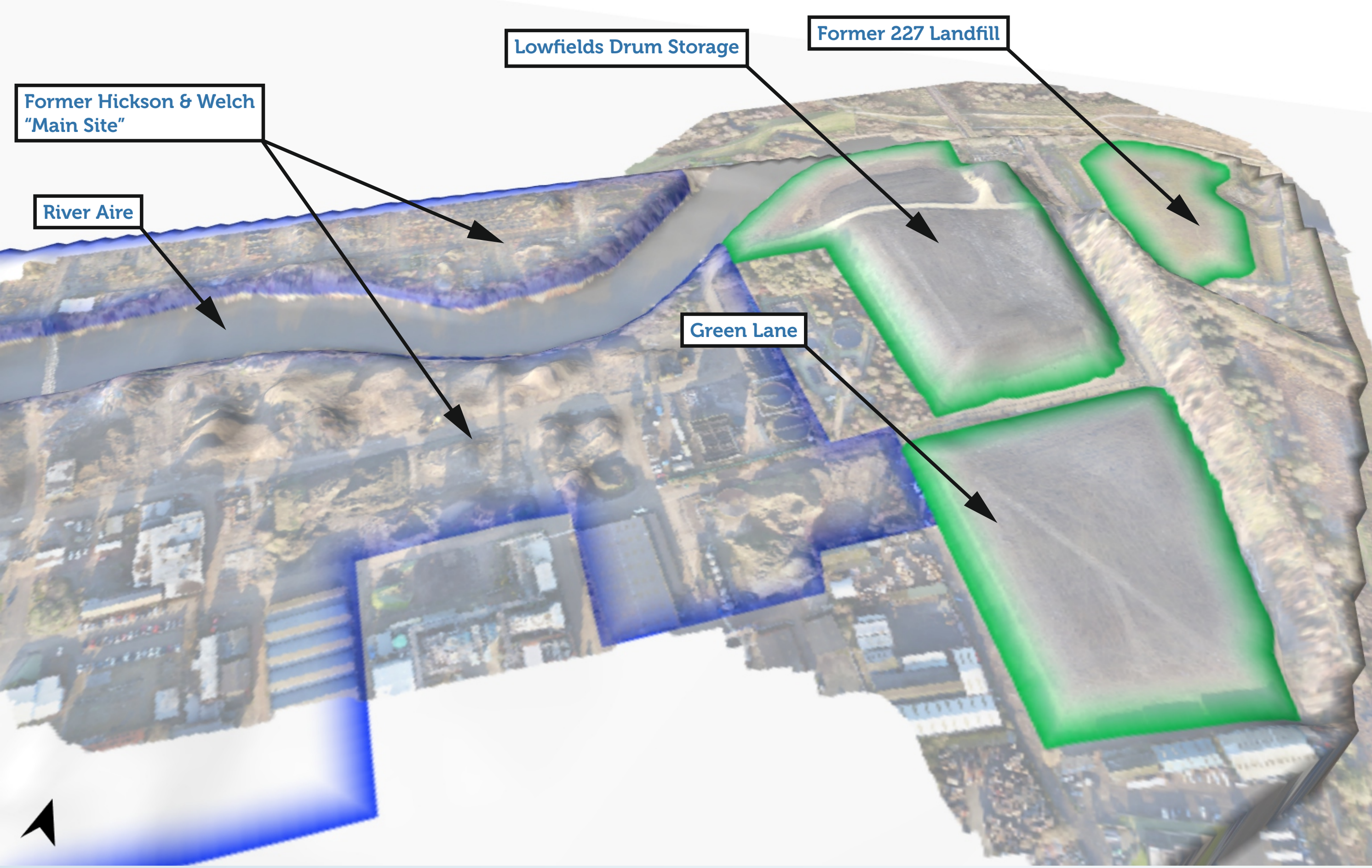


# Hickson & Welch Project: Solving the “Impossible” Site

The Hickson and Welch site was a chemical manufacturing site for over 100 years, until its closure in 2005. During its lifetime, it operated two private chemical waste landfills and one chemical drum storage area, which, since the site closed, have been identified as contaminated land sites. These sites are adjacent to the River Aire and within a 100-year flood zone.



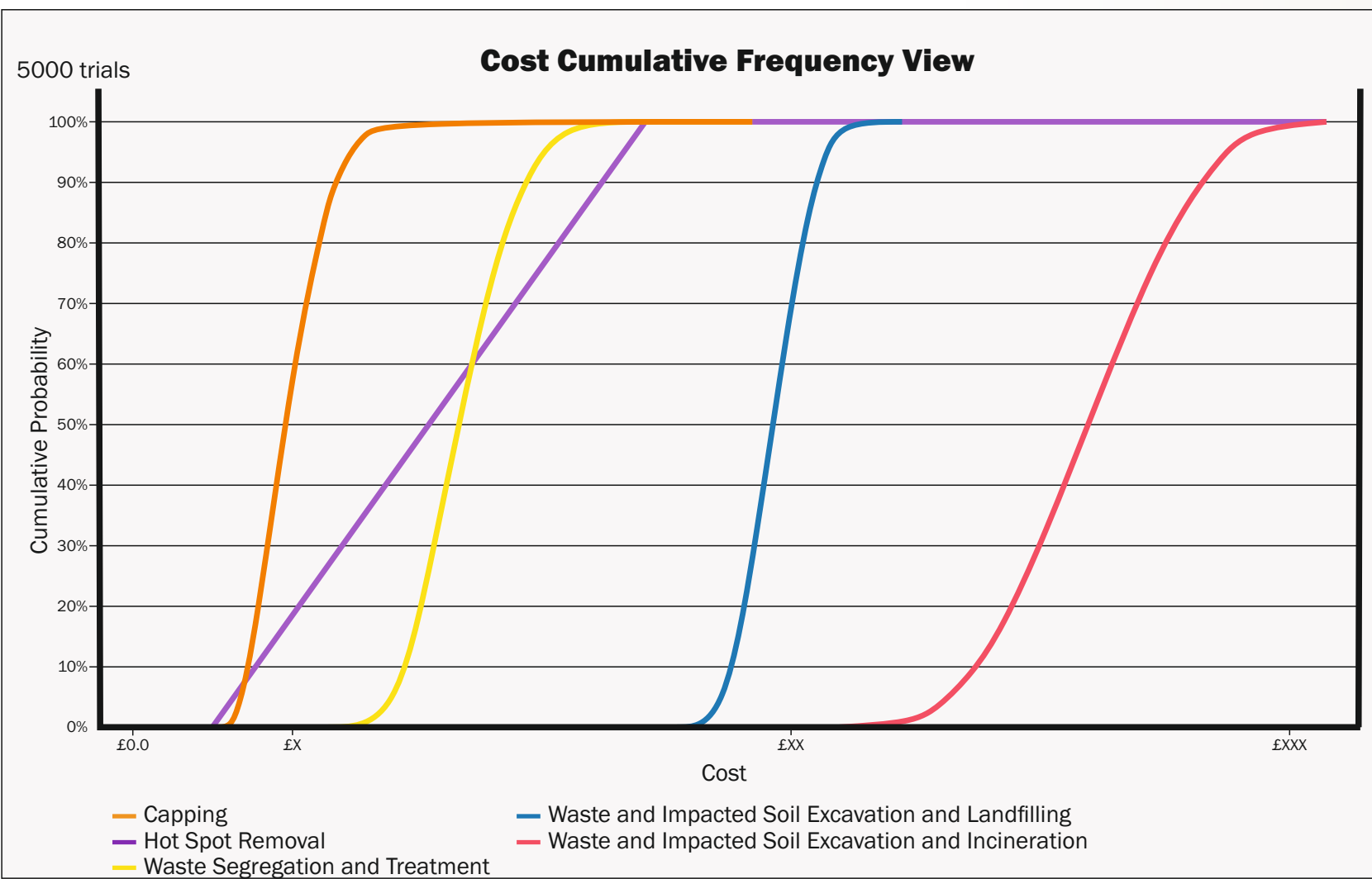
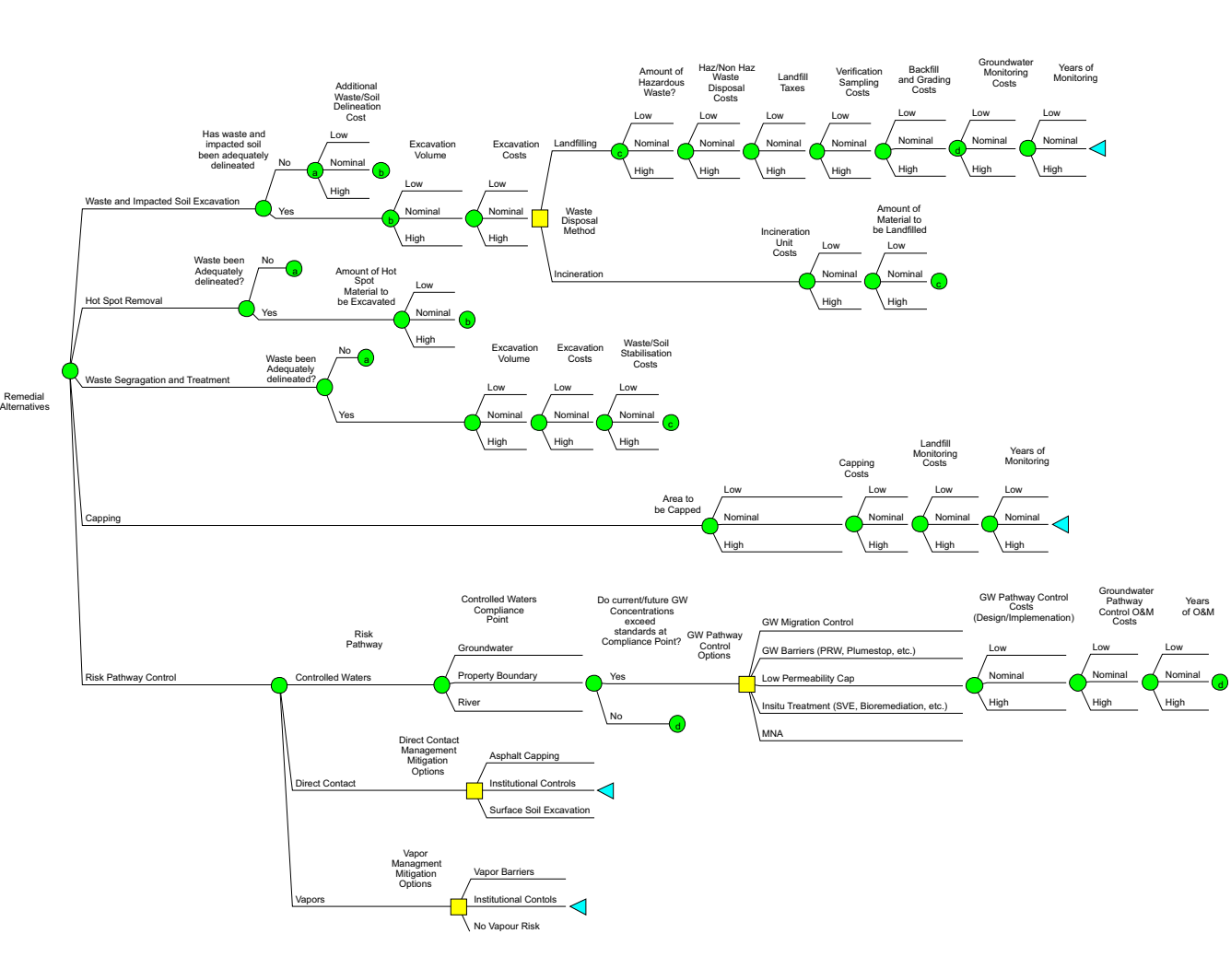
## Challenge One: The fog of data.

More than 25 years of site investigations have produced large amounts of environmental data (in the tens of thousands of data points), covering differing aspects of the site and spread across numerous reports, excel files and lab reports. Despite the wealth of data, all previous work provided conflicting and/or unrealistic remediation options and strategies that failed to provide a way forward to stakeholders. The data was not being used correctly, nor was it in a format that could be understood and used for strategic decision making.

## Solution: Compile all the data into a single, usable database.

NewFields integrated all data into our bespoke environmental database and GIS allowing a comprehensive review of the site data. This allowed the development of an accurate and detailed Conceptual Site Model (CSM) for the sites and the identification of data gaps.

➤ NewFields approach provided and agreed understanding of sites conditions between all project stakeholders.



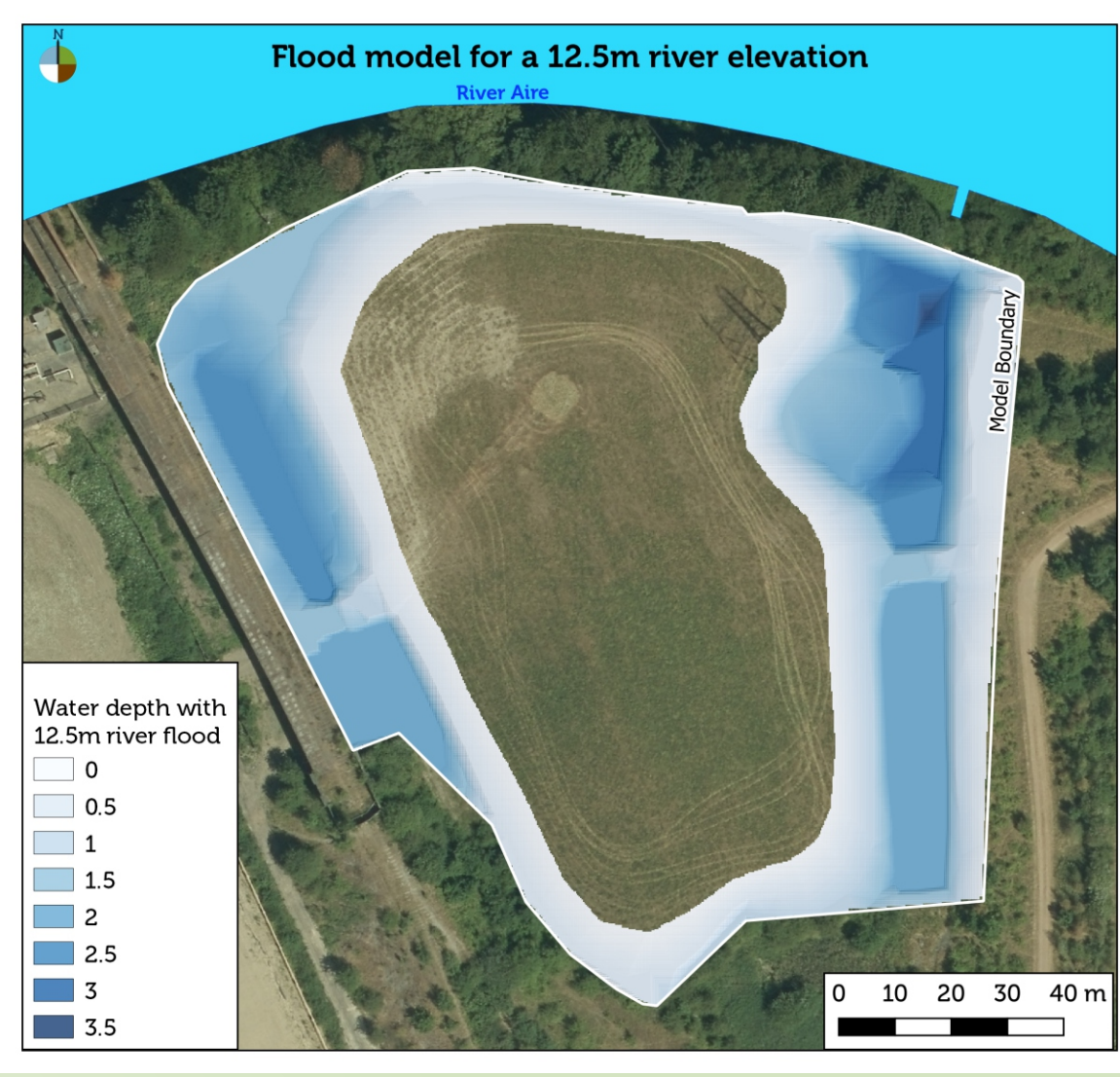
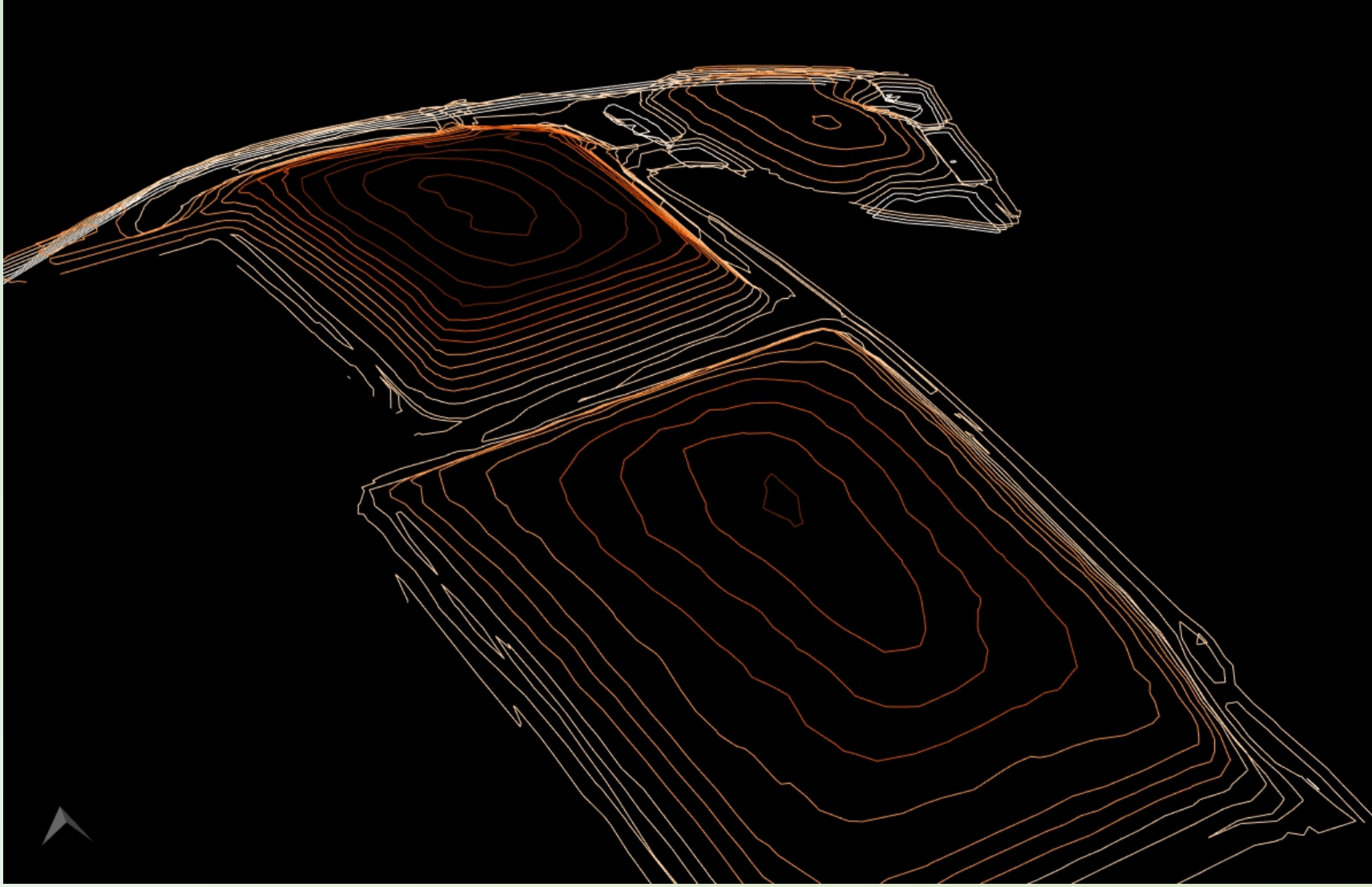
## Challenge Two: Identify the optimal way to achieve our client's business goals.

Our client's goal was to remove all their existing liabilities for the site, which meant remediating the site so they could surrender their landfill permits in the most cost-effective way possible. The existing strategy for the site proposed a £40 million remediation operation, which was too expensive, and was likely to not achieve the landfill closure requirements. There were several different remedial options that varied in terms of cost and uncertainty. NewFields performed a Decision Consequence Analysis of the available options to identify the most cost-effective option.

## NewFields proposed alternative approach achieved our client's goal whilst saving approximately £10 M.

NewFields integrated data analysis determined that the only control receptor was River Aire, an assessment endorsed by the regulators. By performing detailed hydrological risk assessments as well as human health risk assessments, we determined that a composite cap and effective surface water drainage system would satisfy the remedial targets and allow the client to eliminate their liability in a cost-effective way

➤ NewFields approach reduced irrelevant scope and provided a bespoke cost-effective remedial option.



## Challenge Three: To design the capping and surface water management system within a flood risk zone.

Despite their close proximity and similar contamination profile all three areas presented different design challenges. Given that the sites are within the flood zone, a comprehensive flood compensation program had to be developed.

This was the first project approved by the Environment Agency involving the capping of chemical landfills in proximity to a major river.

## Solution: Determine precise measurable benefits.

NewFields designed an integrated flood and stormwater management system that improved flood water retention . All three areas were capped using a specific combination of natural and synthetic materials achieving long term environmental betterment and optimal cost-benefit. Advanced 3D modelling techniques were used to design the topographical reshaping of each of the three areas, minimizing the amount of excavation, material import and respecting boundary constraints.

➤ NewFields focus on precise measurable benefits for each action resulted in remediation design with improved environmental betterment in a cost-effective way.



## Challenge Four: Construction of the capping system and construction verification

NewFields managed the bid process, the contractors and was the principal designer for the construction of the three caps and ancillary structures. NewFields is monitoring the site post-construction, providing effective feedback to the regulators and the client. By managing the monitoring results in centralized database and GIS, NewFields has optimized the number of samples and sampling events. Post-construction monitoring has confirmed groundwater improvement, and our client is on the correct path to surrendering their permits.

NewFields expertise in data management, GIS and DCA, resulted in a remediation strategy 40% cheaper than those proposed by other consultancies, and identified a viable solution to what was considered an “impossible site”.