GEO-ENVIRONMENT
Unlocking the potential of development sites and identifying potential risks and liabilities associated with land is essential to ensure that projects can proceed quickly and efficiently. We provide robust and pragmatic technical advice, based on a clear understanding of our clients’ specific needs. We ensure our clients regulatory and commercial issues are central to any solutions proposed, allowing the value of the development land to be maximised.

Our team of geotechnical and geo-environmental specialists are technically and commercially astute and provide a range of services to clients across the public and private sectors. We are also providers on a number of long-standing framework agreements.

Our work often involves collaborating on multidisciplinary projects, which creates efficiency and value for the client by delivering a holistic, joined-up approach.

With 100 qualified specialists operating from a network of offices throughout the UK we are able to provide local knowledge on a national scale in the following areas:

- Brownfield regeneration
- Contaminated land and groundwater assessment and remediation
- Ground investigation
- Geotechnical design
- Hydrogeology
- Environmental Due Diligence.
The constraints presented by Brownfield sites can be many and varied which often creates uncertainty about the cost, timescale and feasibility of site remediation and its relationship with other mitigation measures and development design.

Our integrated in-house engineering, environment and planning experts have a proven track record in Brownfield regeneration having been involved in developments for over 30 years. Our specialists reduce uncertainties quickly and effectively, developing pragmatic, innovative, cost effective and sustainable solutions to enable our clients’ developments to proceed on programme and within budget.

Our multidisciplinary teams bring an in-depth understanding of regulatory and commercial considerations for Brownfield redevelopment that will maximise a site’s commercial value.

Our Brownfield reclamation and regeneration services include:

- site assessment
- in-house site investigation
- remediation and reclamation design, management and delivery
- geotechnical and earthworks design, both in traditional and design & build arrangements.
THE MAZE/LONG KEH SITE
COUNTY ANTRIM, NORTHERN IRELAND
We provided geo-environmental services at the Maze/Long Kesh site which comprises approximately 141 hectares of land in the Lisburn City Council area of County Antrim.

The historical uses of the site included a prison and army and air force base which left a legacy of ground contamination including asbestos, fuel related hydrocarbons and metals, such as lead, associated with the prison and army shooting and firing ranges. We managed the project from ground investigation through to two separate phases of remediation.

Our team produced two phased tender packages for the client under an NEC option B contract. Our geo-environment experts led the process utilising in-house quantity surveyors for the production of Bills of Quantities as well as a CDM coordinator. We also provided ecology services to ensure all relevant guidance and legislation was adhered to and any potential risks identified and mitigated for.

We were Highly Commended for ‘Best Use of a Combination of Remediation Techniques’ at the Brownfield Briefing Awards 2013.

KIRKSTALL FORGE
LEEDS, WEST YORKSHIRE
Our experts have been working on this 25 hectare riverside project since 2006. The project is a major development in the region which will provide approximately 1,000 homes, a new school, commercial offices, retail units and leisure facilities, served by a new railway station just 6 minutes away from Leeds City Centre.

Appointed by the developer, our geo-environmental specialists initially provided assessment and interpretation of historic data before completing a robust and comprehensive site investigation to fill geotechnical and contamination data gaps. Detailed quantitative risk assessment (dQRA) was then undertaken to determine the extent of the risks contamination on the site posed to controlled waters and human health and to focus the scope of the remediation works.

Extensive geotechnical design services were also provided, including earthworks strategies, GIR and GDR development for the LA, AIP submission for a new bridge, retaining walls and cantilever platform and retaining wall and foundation design. A detailed remediation strategy for contamination and obstruction removal was designed specifically to enable a flexible approach to the development whereby any area could be used for either residential or commercial development, allowing for variations in future market demands and masterplanning. This approach was agreed with the Environment Agency and Leeds City Council.

REDEVELOPMENT OF FORMER BRICKWORKS
NORTH WALES
This 20-hectare, former brickworks and colliery site included disused brickworks buildings and associated hardstanding, a partially in-filled quarry, a large lagoon and backfilled opencast mine workings. We carried out a detailed geo-environmental and engineering assessment to facilitate the construction of around 300 new houses together with a series of ecological landscape improvements to an area designated as a Site of Special Scientific Interest (SSSI).

We have been involved in all stages of the project including initial pre-acquisition surveys, input into the Environmental Statement, supporting planning consents, expert advice at public inquiry, desk study, geo-environmental ground investigation, remedial works design, supervision and monitoring of earthworks, settlement monitoring, drainage design and completion reports.
Contaminated land can create environmental hazards plus financial and legal liabilities that must be fully understood and managed when you are redeveloping, transacting or continuing to occupy property. Risks from chemicals in the ground to the environment and people can be complex. Providing a technical solution that meets both regulatory and client needs is key to managing these issues and to a successful outcome.

We are experienced in successfully managing risks and liabilities and in planning and delivering large, complex projects. We undertake risk assessments based on a sound conceptual and regulatory understanding of a site. Our remediation specialists have undertaken a variety of remedial options and solutions in-situ and ex-situ for soils and groundwater. We devise comprehensive and pragmatic remediation schemes using appropriate and innovative technologies to comply with legislative frameworks and consents, often in regulated environments.

Projects have covered pre and post land transactions, redevelopment support, works to address environmental liabilities and works that form part of site decommissioning and demolition.

Our services include:
- site investigation
- contaminated land risk assessment
- regulatory liaison
- remediation options appraisals
- remediation design, management and supervision
- remediation tender management and validation
- liability assessments
- pollution response management.
FORMER PRINT WORKS
WEST MIDLANDS
This project involved the design and remediation of an area of solvent (toluene) contamination derived from a recovery plant associated with an industrial printing works. Site inspections, ground investigations, detailed quantitative risk assessment and groundwater modelling identified several ways in which pollution was likely to be impacting the environment. These included hazardous vapour emissions to an adjacent site basement, solvent seepage migrating from the site to neighbouring land and impacts to groundwater.

Our experts undertook the role of Principal Contractor for the remediation works which comprised dual phase vapour extraction and ex-situ bioremediation, providing a single point of contact for the client. The works were undertaken in order to meet the client’s legal obligations under the Environment Permitting Regime and Part 2a of the Environmental Protection Act.

CONFIDENTIAL MILITARY BASE
LINCOLNSHIRE
Commissioned by the Ministry of Defence Environmental Liability Management Team, our specialists carried out a Phase 1 desk study and Phase 2 intrusive ground investigation at a bulk fuel storage facility to characterise an aviation fuel leak. A hydrogeological risk assessment was subsequently used to inform and refine the scope of the remedial strategy for the site.

Our appointment included the detailed design, management and supervision of the remediation works including a verification strategy which was ultimately used to secure regulatory sign-off. The remediation comprised excavation and ex-situ bioremediation of the aviation fuel contaminated soils to maximise the reuse of materials along with in-situ bioremediation in two areas constrained by ongoing operations.

GRANTON GAS WORKS
EDINBURGH
Our specialists undertook the design, supervision and verification of remediation works at Scotland’s largest former gasworks site in Edinburgh. The site extended over 47 hectares with contamination remediated as part of the redevelopment of 180 hectares of Edinburgh’s waterfront. This has successfully led to the ongoing redevelopment of the site for mixed land-uses including residential developments, commercial developments, educational centres and a landscaped community park with water features. This achievement involved the multidisciplinary services of other in-house teams.
Ground investigation is used to collect data on ground conditions to inform the assessment or development of land. Designing and implementing an investigation is often a critical enabler to a project’s success.

Our dedicated in-house ground investigation specialists have extensive experience across a range of sectors including heavily controlled and regulated environments such as railways, highways and operational energy sites.

We provide a bespoke and cost-effective service, with site-specific, professional and pragmatic advice. We select the most suitable investigation techniques and incorporate innovative methods of managing and undertaking works. Our experts are able to integrate this seamlessly into wider project requirements as well as operating as a standalone ground investigation contractor.

Our trained and accredited employees provide a comprehensive ground investigation contracting service including organisation, management, supervision, factual and interpretative reporting and expert technical advice.

The range of services we offer includes:

- tailored, practical, intrusive investigations including overwater, low headroom, overland and underground rail investigations
- mine workings and mine shaft investigations
- oil spill investigations
- installation of groundwater, ground gas and ground stability instrumentation and monitoring
- site supervision by ground investigation specialists
- production of exploratory hole logs (to British Standard 5930 and Eurocodes) using Holebase/AGS4 software
- geotechnical and chemical laboratory testing
- factual and interpretative reporting.
**BOSTON BARRIER**  
**BOSTON, LINCOLNSHIRE**

Our experts carried out two phases of ground investigation for the Environment Agency. This comprised a complex overwater and land based project for the construction of the Boston Barrier to reduce the risk of tidal flooding.

As Principal Contractor, our works comprised overwater drilling from a jack-up barge, high quality coring and in-situ testing, concrete coring of the dock-wall and river sediment sampling from a specially adapted spud leg tug. This was carried out utilising a mixture of continuous 24 hour shift workings over a combined field work period of 15 weeks.

Innovation was also brought to the concrete coring of the quay wall and window sampling of the soft river sediment. Coring of the quay wall within the River Haven was carried out from an underbridge truck mounted unit from the quay side in order to avoid high tidal swells and to maximise productivity. Window sampling was carried out from a tracked window sampling rig, positioned over a moon pool created on a suitably configured floating platform manoeuvered into place by a tug boat.

**M25**  
**LONDON**

We undertook a ground investigation comprising 92 exploratory holes and over 1400 samples to provide data for the realignment and widening of the approaches to the M25, Junction 30 and A13 Corridor on behalf of the Highways Agency. The majority of the work was undertaken during night time possessions of sections of the motorway. Trial pitting and drilling operations were coordinated and supervised onsite by 'white listed' (over 5 years experience and IOSH accredited) engineers from our in-house team. On completion of the project all boreholes were fully reinstated to highways specification to allow the motorway to be safely utilised.

The reduced working hours presented considerable logistical challenges, particularly where extensive clean up and containment of drill arisings was required to enable the return of the carriageway to fully operational status at the end of the possession. Our extensive resource pool and flexibility ensured that the considerable disruption to programmed possessions outside of our control did not impact on the overall program and work was completed within the scheduled dates.

**LONDON UNDERGROUND**  
**LONDON**

Acting as Principal Contractor we provided ground investigation services in order to assess earth structures including railway cuttings, embankments and ground movements, and settlements that may have impacted track, platforms or buildings across the London Underground network. To date, we have completed over 70 ground investigations on some very challenging sites in terms of ground conditions and access.

We are able to carry out the works in engineering hours, traffic hours and possessions (closures) providing a complete package, which includes planning, organisation, project management and supervision of intrusive works. We also provide a proactive SHEQ (Safety, Health, Environment, Quality) management system.
Fully assessing ground and groundwater conditions for development, building or civil engineering projects is essential to reduce uncertainty and enable design work to start.

Our integrated ground investigation and geotechnical design service provides the confidence that geotechnical risks have been identified and will be appropriately addressed so projects can proceed assuredly without delay. Using current modeling and analytical tools we provide practical design advice on foundations, retaining walls, embankments, earthworks, and other structures such as bridges and tunnels.

Our experts are regularly involved in rail and highways projects, offering comprehensive support in design, Category 3 assessments, management and maintenance. We are also involved in assessing mining and other ground hazards. Our ground engineering service is designed to manage ground risks that may arise as a scheme proceeds.

The range of services we provide includes:

- ground investigation design and interpretation
- advanced analysis techniques such as finite element and soil-structure interaction
- earthworks assessment and design
- slope stability assessments
- ground improvement
- soil reinforcement
- retaining structures
- foundation and pavement design
- earthquake engineering assessments including liquefaction
- temporary works design
- settlement and ground movement analysis
- mining risk assessments and design, supervision and validation of ground stabilisation
- regulator and stakeholder liaison
- expert witness
- dispute resolution.
WHESSEOE
VARIOUS PROJECTS WORLDWIDE

For 10 years we have provided Whesoe Engineering with advanced geotechnical design and analysis for specialist oil and gas site structures. These high risk structures are required to maintain structural integrity to prevent leakage and explosions under extreme load case conditions. The sensitivity of the tank structures to movement is frequently combined with the challenge of large thicknesses of poor coastal ground. This requires practical solutions, backed up by advanced ground modelling techniques for sub-structure design.

HURST RESERVOIR
GLOSSOP

The project was to decommission Hurst Impounding Reservoir in Derbyshire in order to remove it from the scope of the Reservoirs Act on behalf of United Utilities. We were appointed by Principal Contractor Cheetham Hill Construction to design an earthworks scheme which would allow the reservoir sediment and earth embankment materials to be retained onsite. They also needed to be placed on the valley sides in a manner that would replicate as closely as possible the original natural valley profile before the reservoir was built around 1840.

Our experts provided detailed design services for a bespoke retaining wall solution for the ‘gravel trap’ area downstream of the former embankment and an earthworks embankment design for a Fire Operations Group (FOG) pool in the upstream area. The FOG pool was required to provide a permanent water supply for helicopters to use when fighting fires in the moorland areas of the Peak District.

This project won the Sustainability Award at the Ground Engineering Awards 2015.

WALESWOOD EMBANKMENT FAILURE
NEAR SHEFFIELD

Our experts provided emergency geotechnical design advice for the reconstruction of this 150m long failed railway embankment. The embankment failure was caused by localised flooding, resulting in water overtopping the embankment and leading to numerous wash out in a number of areas.

With the nature of emergency reconstruction works, design queries had to be dealt with by our resident geotechnical engineer on site to enable the works to progress in conjunction with the planned timescale and track hand back date. We provided a reactive 24hr supervision of the works during the remediation. Construction works proved challenging as design specifications changed and more information was gathered regarding the nature of the failure. This allowed us to provide a new structure that included many design aspects to mitigate future potential failure within the timescales set out by Network Rail.
Groundwater is an important natural resource which, if managed appropriately, can provide significant benefit both as a cost effective water supply and for its thermogeological properties. It must also be protected so evaluating potential impacts and developing suitable protection and remediation measures where necessary are essential.

Our hydrogeological team has extensive technical expertise that is drawn from working on major groundwater projects both for the public and private sector. Our capability allows us to provide solutions for sustainable water supplies to our clients for either potable or geothermal use, to remediate polluted groundwater, to assess the environmental impact of major projects and to provide aquifer catchment management.

Our breadth of experience enables us to complete a diverse range of projects right through from initial characterisation, detailed assessment, design and implementation to ongoing monitoring and management.

Our range of services includes:
- groundwater resource development
- private water supply
- source protection zone assessments
- geothermal feasibility and design
- de-watering design
- quarry impact assessment
- hydrogeological risk assessments
- landfill monitoring
- cemetery assessments
- contaminant flow and transport modelling
- hydro-ecology
- design, installation, and operation of local and national groundwater monitoring strategies
- groundwater flood risk assessments.
BOREHOLE REHABILITATION AND REPLACEMENT WORKS
WALES

We were appointed to undertake the rehabilitation of existing, and drilling of new water wells across a portfolio of sites in Wales for a Water Utility Provider. The work involved the completion of borehole condition assessments, the design of new wells, drilling, installation and commissioning of the new water abstraction network hubs and treatment systems.

In addition to the procurement and supervision of the physical works, we provided specialist hydrogeological support in completing abstraction risk assessments for each of the new supply points, assessing aquifer yields and potential environmental impacts.

GEOTHERMAL OPEN LOOP BOREHOLE SYSTEM
BELFAST

We provided hydrogeological technical support to the design and implementation of an open loop geothermal system at Royal Victoria Hospital, Belfast. Groundwater abstracted from the Sherwood Sandstone aquifer passes through heat plate exchangers and is used to supplement the heating and cooling needs of the new building. Our work involved the development of a site conceptual model, drilling of onsite wells, stakeholder and statutory body liaison, testing and, hydrogeological impact assessment to support the successful licence application.

The testing phase involved undertaking step drawdown and recovery pumping tests alongside a reinjection trial test to ensure we had confidence in the aquifers abstraction and reinjection capabilities as well a thermogeological properties.

RURAL BOREWELL SCHEME
NORTHERN IRELAND

Since 2013 we have acted as the scheme hydrogeologist employed by DARNI, managing the Rural Borewell Scheme. The scheme involves the provision of circa 200 new borewell water supplies to private homes across Northern Ireland that have no access to mains water. To date, we have designed, constructed, tested (quality and quantity) and commissioned circa 120 of these. We also developed a bespoke GIS database to assist with capture of site specific data and manage this major groundwater scheme.
Environmental Due Diligence (EDD) is an increasingly significant component of the overall due diligence undertaken in support of any transaction, investment, divestment or refinancing of any business. Effectively undertaken, EDD not only allows the quantification of any environmental liabilities that could materially impact the transaction, but also enables the identification of areas of environmental performance where value can be added post transaction.

We have extensive experience in delivering a range of EDD projects for legal, financial, industrial and development clients ranging from simple single site property/land condition assessment through to multi-site, multi-jurisdiction, detailed process compliance audits and assessment.

The purpose of EDD is to evaluate potential liability costs associated with environmental issues. To meet these objectives we can, depending on client requirements, adopt relevant standards or develop a bespoke approach, tailored to the individual characteristics of the transaction and the client’s requirements.

Key elements of our EDD services include:

- pre-acquisition & vendor due diligence
- review of site history and environmental setting
- dataroom review
- target management interviews
- environmental audit of facilities and operations
- assessment of environmental compliance against contemporary and known pending legislation
- quantification of any identified environmental liabilities
- strategic advice in SPA negotiations
- present clear cost assessments for each identified liability and assessment of CAPEX for environmental issues.

In addition we can provide a range of services post transaction ranging from input to the 100 day plan through to liability reduction and assistance with business integration.
PROJECT APPLE
REFINANCING A PORTFOLIO OF 44 SITES
We were engaged by a real estate investment firm to undertake EDD on a portfolio of 44 commercial and potential development sites across the UK. We identified any potential land quality liabilities associated with the portfolio that could have a material impact on the financing decision. The sites had varied previous uses including former quarries, residential portfolios, shopping centres, a 120 acre former chemical factory and various commercial/industrial sites. The diverse experience of our large team allowed us to identify liabilities across the portfolio despite the differences in sites.

The timeframe for the project was six weeks and our experts delivered concise reports which clearly outlined financial liabilities for the various land parcels. This provided the confidence to enable the refinancing to proceed within the project deadlines.

ACQUISITION OF A BULK STORAGE BUSINESS WORLDWIDE
We undertook the environmental and engineering due diligence for the acquisition of a global bulk storage business. This consisted of a review of 23 sites situated within ports across the UK, Ireland, Europe, Mauritius, Trinidad and Tobago, and South Korea.

The scope of work included a detailed review and critique of vendor-supplied environmental reports along with audits of priority and ‘high risk’ sites. We developed a bespoke access database report template to ensure consistency, and also ensure that critical land quality and operational data was captured on each site that met with the client’s objectives. The reporting template enabled the client to rapidly quantify capex and opex costs with regard to environmental issues and our reporting was completed within the 8 week timeframe to enable the acquisition to proceed.

PROJECT DOMINION
ACQUISITION OF A GB DEVELOPMENT COMPANY
We were engaged by a private equity firm to undertake an EDD assessment of 27 sites across England & Scotland owned by a specialist Brownfield development company they were purchasing. The focus of the EDD was to identify constraints and environmental liability issues associated with land quality/remediation costs, abnormal geotechnical issues, mining and flooding and prepare a CAPEX summary report for each site in these issues.

The EDD process involved reviewing detailed reports within the vendor supplied dataroom and sourcing additional data from various public and private sector organisations to provide sufficient confidence in the process. The project was completed within the 6 week programme required by the client.
OUR MARKETS

PROVIDING SERVICES TO PRIVATE AND PUBLIC SECTOR CLIENTS

TRANSPORT & INFRASTRUCTURE

Improving transport capacity in cities and ensuring better connectivity between places is a key aim for our clients in this market. Our geo-environment teams are a fundamental part of the route selection stage of transport and infrastructure projects enabling the key ground engineering issues to be determined and designed for. We have a wealth of experience in all types of rail, road and river projects including new road and rail schemes, earth asset management of existing transport networks and flood alleviation schemes.

DEFENCE

The very nature of defence work means that we are often called upon to investigate and advise on the contamination assessment and remediation of current and former military bases. However, our involvement in the defence sector doesn't stop there as we work under framework appointments for the Defence Infrastructure Organisation (DIO), engaged as part of a wider multidisciplinary team managing data to ensure it meets their strict requirements.

We provide a range of services associated with assessment studies of new build development on existing bases such as the provision of living accommodation on barracks and reconfiguration of ammunition storage depots.

INDUSTRIAL

We provide a full spectrum of services to a variety of clients including National Grid Property. We have been a framework consultant for over 20 years providing specialist geo-environmental services on their portfolio of hundreds of sites, many of which have significant legacy issues associated with former gasworks activities. We also have significant experience of dealing with large chemical, industrial and former industrial sites both in terms of decommissioning works and new phases of development.
COMMERCIAL DEVELOPMENT
From initial due diligence and investigation to assessment, remedial design and final verification, our team are adept at supporting commercial clients to deliver projects in a safe and sustainable way whilst ensuring that developments proceed within tight timeframes and operations are not affected. We work in conjunction with our engineering design teams to ensure efficiencies are maximised where possible and transfer of information is optimised.

RESIDENTIAL AND RETAIL
The use of Brownfield sites to support growth in the retail sector, and to provide land for the rising need for new homes, is common. Often in conjunction with our town planning colleagues, our specialists unlock Brownfield and Greenfield sites to allow developments to progress ensuring that all geo-environmental aspects have been taken care of to avoid unnecessary risks or delays.

The input of geo-environmental specialists at an early stage can assist in determining the financial viability of proposed schemes and be beneficial when negotiating land deals.

ENERGY
We provide a broad range of environmental consultancy services to support the various sectors of the energy industry ranging from the renewables sector such as wind farms, solar PV farms and ground source energy, through to the nuclear industry, including both new build and decommissioning existing facilities.

Our specialists integrate into large engineering teams and liaise with the many specialists required by these projects. Support includes Environmental Impact Assessments, ground investigation services and geotechnical design. We are also able to provide specialist advice in relation to shale gas fracking such as EIA, hydrogeological studies and ground gas risk assessments.
WYG EXPERTISE ACROSS A RANGE OF SERVICES

PLANNING
- Planning Applications
- Planning Obligations & CIL
- Compulsory Purchase Orders
- Project Management & EIA Coordination
- Site Assessment & Planning Strategy
- Development
- Plan Representations
- Planning Appeals & Expert Witness
- Planning Policy & Development Management
- Stakeholder & Community Consultation

URBAN & LANDSCAPE DESIGN
- Masterplanning
- Urban Design
- Landscape Architecture
- Landscape & Visual Impact Assessment (LVIA)
- Building Design
- Regeneration
- Visualisation Services & GIS

TRANSPORT
- Transport Assessment & Modelling
- Sustainable Transport
- Road Safety
- Highway, Bridge & Drainage Design
- Highway
- Construction Supervision
- Pedestrian, Cycle & Public Transport Schemes
- Intelligent Transport Solutions
- Planning Appeals & Expert Witness Services
- Policy Advice and Compliance
- Public Realm Infrastructure Design

ENVIRONMENT
- Ecology
- Environmental Impact Assessment (EIA) & Environmental Permitting
- Sustainability Appraisal & Strategic Environmental Assessment (SEA)
- Noise, Air, Light, Vibration and Odour Assessments
- Archaeology & Heritage
- Hydrogeology & Water Quality
- Geotechnical Design & Assessment
- Site Investigation
- Contaminated Land & Land Quality Assessment
- Environmental Due Diligence & Expert Witness
- Pollution Response & Management
- Remediation Design & Management
- Waste & Resource Management
- Local Authority Waste Services
- Minerals Planning
Our people are designers, project managers, engineers, planners, environmental specialists and business service professionals who together form the teams our clients need to make their project ambitions come to life.

Working from the earliest project stages we offer all the expertise needed to make challenging concepts possible. We then bring together the right teams whenever and wherever our clients need them to make projects happen.

We believe our ability to make a difference through our work and leave a lasting positive legacy is what sets us apart.
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