JOMAS | ENGINEERING ENVIRONMENTAL

PROJECT PROFILES

LAND CONTAMINATION ASSESSMENTS & REMEDIATION

MILL ROAD

MALDON, ESSEX

REMEDIATION OF FORMER PETROL FILLING STATION

Jomas Associates Ltd were commissioned to manage the demolition and remediation of the former petrol filling station, presenting a site suitable for residential development, on completion.

Jomas carried out a Site Reconnaissance, followed by the supplementary Ground Investigation, Remediation and Verification of Remedial works. Jomas were responsible for liaising with the Environmental Health Department at Maldon District Council, to enable the discharge of planning conditions relating to Land Contamination.

Desk Study and Site Investigation

The site comprised a vacant petrol filling station with 3No buildings and several buried fuel tanks, filled with concrete.
A previous Environmental Investigation Report identified elevated concentrations of metals, polyaromatic and total petroleum hydrocarbons made ground soils, and groundwater within the site.

Land Contamination Assessment and Remediation

Jomas Associates Ltd worked closely with a demolition team. Buildings on the site were demolished.
Jomas' engineers carried out site visits post demolition to assess underside of hardstanding. Trial pits were excavated to delineate areas of contamination. Samples were collected for laboratory testing. These were informed by on-site analysis using a photo ionisation detector, which provides an indication of significant volatiles in the ground.

Jomas Associates subsequently supervised the removal of the underground fuel storage tanks, an oil / water interceptor; and associated contaminated soils.

Verification Report

Upon confirmation that contamination soils were sufficiently removed, the resultant voids were backfilled with clean crushed concrete/brick derived from demolition works, and levelled. A verification report was produced for sign off by Maldon District Council.

Value Added – the critical cost saving achieved by Jomas Associates, was minimising the excavation of soils unless deemed absolutely necessary. Jomas were also able to obtain timely discharge of relevant planning conditions through close contact with the EHO during the process.

MOVERS LANE

BARKING

REMEDIATION OF FORMER PETROL FILLING STATION

Jomas Associates Ltd were commissioned to manage the demolition and remediation of the former fuel station, presenting a site suitable for residential development, on completion. The proposed development comprised of demolition of the existing buildings and constructing new residential apartments, with associated areas of public open space. Jomas carried out a Desk Study, Preliminary Risk Assessment and Intrusive Investigation.

Desk Study, Preliminary Risk Assessment

During Jomas' desk study, it was discovered that the site was historically used for vehicle refuelling. Information obtained indicated that there were five underground fuel tanks at the site.

Ground Investigation

Jomas completed windowless sampling and cable percussion holes across the site to enable soil and groundwater sampling as well as soil gas/vapour analysis.
During the ground investigation, evidence of contamination (staining / odour) was reported within several boreholes.
Following generic risk assessments and statistical analysis, elevated concentrations of a number of polyaromatic and total petroleum hydrocarbons were identified, along with the presence of localised asbestos in soil. Quantification of asbestos revealed concentrations below the hazardous waste threshold.

Detailed Quantitative Risk Assessment (DQRA)

Jomas completed a Controlled Waters DQRA, which demonstrated that groundwater remediation was not necessary.

Land Contamination Remediation

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Jomas Associates subsequently supervised the removal of the underground fuel storage tanks, an oil / water interceptor; and associated contaminated soils.

Verification Report

Upon confirmation that contamination soils were sufficiently removed, the resultant voids were backfilled with clean crushed concrete/brick derived from demolition works, and levelled. A verification report was produced for sign off by London Borough of Barking & Dagenham.

Value Added – the critical cost saving achieved by Jomas Associates, was minimising the excavation of soils unless deemed absolutely necessary. The DQRA demonstrated that groundwater remediation was not necessary. Jomas were also able to obtain timely discharge of relevant planning conditions through close contact with the EHO during the process.

MONIER ROAD

HACKNEY

REMEDIATION OF FORMER PAINT WORKS - CHEMICAL OXIDATION

Jomas Associates Ltd were appointed to undertake a full Site Investigation at the site for Land Contamination and Geotechnical Engineering Purposes.

Desk Study, Preliminary Risk Assessment

During the desk study, it was discovered that the site was a former paint works. Vent pipes noted during the site walkover, indicated the presence of buried fuel tanks.
It was proposed that Land Contamination (human health, controlled waters and soil gas) risk assessments, as well as Geotechnical Engineering Investigations, were undertaken.

Land Contamination Remediation

Remediation comprised the removal of buried fuel tanks and immediately surrounding grossly impacted soils. Detailed Quantitative Risk Assessments (DQRA) were undertaken to demonstrate that full scale groundwater remediation was not necessary across the site. The DQRA showed that the site had elevated concentrations of Benzene and TCE in the groundwater on part of the site, which required remediation. Groundwater remediation comprised the application of chemical oxidation additive directly to the contamination in the dissolved phase groundwater, which reduced the chemical concentrations. Application was via a combination of direct tank void application, existing monitoring wells and direct push application on a 3m x 3m grid in the vicinity of the highest concentrations.

In consideration of the site setting, the remediation ‘end point’ was not to achieve the target criteria (RTCs) detailed in the Remediation Strategy, but to show a reducing trend of contaminant concentrations in the groundwater during the post application monitoring period.
This was followed by validation testing and production of a verification report for LLDC sign off.

Soil gas risk assessments were also completed by Jomas, and vapour mitigation measures were designed.

WOOLWICH ROAD

GREENWICH

REMEDIATION OF FORMER PETROL FILLING STATION

Jomas Associates Ltd were appointed to undertake a Site Investigation at the site for Land Contamination and Geotechnical Engineering Purposes.

The proposed development comprised the construction of a five storey structure with a mixed commercial and residential use and associated parking.

Site Investigation

In 2008, a desk study was issued for the site (prior to Jomas' involvement). This desk study highlighted the presence of a number of buried tanks on site, connected with the site's former use as a petrol station. No information was presented relating to the location or condition / contents of these tanks, or whether any decommissioning works had been undertaken. Jomas were commissioned to undertake an updated desk study and site reconnaissance, followed by intrusive investigations.

Jomas Associates Ltd carried out windowless sampling, and cable percussion drilling across the site, with subsequent soil, groundwater and gas sampling. The findings of the investigation enabled the location of the fuel tank farm, to be determined.

Remediation

Remediation comprised the removal of 4No water filled underground fuel tanks. Samples were taken at the bases and sides of excavations, and screened by photo-ionisation detector as part of the verification process. It was determined that impacted soil removal was not necessary. A clean cover system was recommended in areas of soft landscaping.

HEPSCOTT ROAD

HACKNEY WICK

Jomas Associates Ltd were commissioned to undertake a Geo-environmental and Geotechnical ground investigation at former landscape gardening depot located at Hepscott Road, London. The proposed development comprised the construction of a five storey structure for a mixed commercial and residential use and associated parking.

Desk Study & Site Investigation

A phase 1 desk study and site walkover was undertaken on site. A review of the historical maps indicated commercial and industrial uses including tar & chemical works, tallow works, dye works, engineering and electrical works. A review of geological maps indicated the site to be underlain by superficial alluvial deposits overlying solid deposits of the Lambeth Group. A phase 2 intrusive investigation was reccommended.

Ground Investigation

Jomas completed windowless sampling and cable percussion boreholes across the site to enable soil and groundwater sampling as well as soil gas/vapour analysis. Groundwater was encountered in both of the cable percussive boreholes and four of the windowless sampler holes during the course of the investigation. Following generic risk assessments and statistical analysis, elevated concentrations of chromium, lead, mercury and a number of polyaromatic and total petroleum hydrocarbon fractions were reported in excess of Generic Assessment Critera (GAC). A detailed quantitative risk assessment was undertaken in order to derive site specific remedial targets for the validation of soil removal works and for the protection of controlled waters receptors, to be used within the validation process.

Remediation

The remediation strategy required a 3x3m area to be excavated until groundwater was encountered. Contaminated soils were removed for offsite disposal. Validation samples were then obtained from the focus of the void and scheduled for validation testing. The results were compared to generic criteria for the protection of human health and site specific criteria for the protection of controlled waters.

DOCK ROAD

TILBURY

REMEDIATION OF FORMER PETROL FILLING STATION

Jomas Associates Ltd was commissioned to manage a tank removal at Dock Road, Tilbury, prior to the erection of a four storey residential building.

Desk Study, Preliminary Risk Assessment

Jomas' desk study indicated that the site was previously licenced for 4 underground fuel tanks, associated with its previous use as a petrol filling site.

Ground Investigation

Jomas completed windowless sampling and cable percussive boreholes across the site to enable soil and groundwater sampling as well as soil gas/vapour analysis. Soil and Groundwater analysis indicated a range of contaminants to be present in excess of their respective screening criteria within samples from across the site. A controlled waters DQRA was undertaken to derive site specific remedial targets this reduces the ammount of soil needing to be removed while still protecting the identified sensitive receptors.

Land Contamination Remediation & Verification Report

Jomas Associates subsequently supervised the removal of the underground fuel storage tanks, interceptors, associated infrastructure, and hydrocarbon impacted soils, as well as the removal and off-site disposal of a concrete foundation slab with embedded asbestos cement.

Upon confirmation that tanks and soils were sufficiently removed, The excavation were backfilled with suitable granular clean material. A verification report was produced for regulatory sign off.

Value Added – By undertaking a DQRA to derive site specific remedial targets Jomas can save client costs by minimising the ammount of soil needing to be removed while still protecting the identified sensitive receptors.

BROOK STREET

TRING

REMEDIATION OF FORMER GAS WORKS

Lilygate Developments commissioned Jomas Associates Ltd to undertake a Geo-environmental and Geotechnical ground investigation at the site Brook Street, Tring. The proposed development comprised the construction of new residential apartments with an associated partial basement car park.

Desk Study & Site Investigation

Historically, the site was part of a former Gas works. The results of Jomas' investigation indicated the site to be overlain by an initial covering of Made Ground up to 2.0m bgl in depth, overlying a structureless clayey chalk. Evidence of contamination in the form of visual staining and a noticeable hydrocarbon odour was reported within the majority of trial pits and boreholes, at depths ranging from 1.0m to 6.0m bgl.

The basement construction was undertaken under the supervision of Jomas Associates, to ensure remnants of the gas works, as well as impacted soils were removed and validate. The site was underlain by a Principal Aquifer, contained within the Chalk underlying the site.

Remediation

Jomas carried out risk assessments to determine if remediation was required for the protection of controlled waters.
Jomas liaised with the Environment Agency to obtain sign off of the conclusions of the risk assessments, which concluded that a pollutant linkage did not exist related to controlled waters, and the Principal Aquifer.

Value Added - Risk Assessments were undertaken to demonstrate that a pollutant linage did not exist with regards to controlled waters, and the underlying CHALK Principal Aquifer. This was signed off by the Environment Agency.

Significant Remediation costs were avoided.

OPUS BUSINESS PARK

GUILDFORD

ASBESTOS IN SOIL REMEDIATION

Jomas were commissioned to assess and remediate approximately 1000m3 of demolition material present on the site in Guildford.

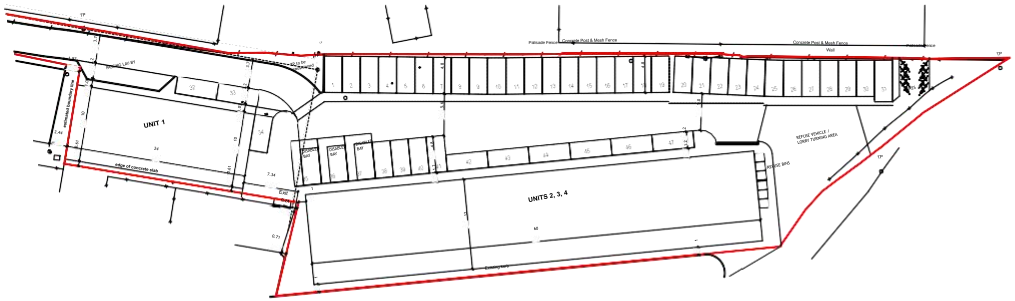
The client had previously been quoted for the removal of the materials as Hazardous Waste.

Jomas mobilised a team to site to undertake a hand picking exercise, to remove visible asbestos fragments within the materials.

A notification was made to the HSE prior to commencement due to the presence of notifiable asbestos materials.
Following treatment by the Jomas' team, the resultant soils were signed off as non-hazardous waste, if considered surplus for the development works.

Alternatively, it was considered that the resultant materials could be retained under areas of permanent hardstanding.

Value Added – Significant Cost Savings for the development



CORBRIDGE CRESCENT

LONDON, E2

Pre-Purchase Desk Study and Ground Investigation

A Desk Study was first produced by Jomas pre-purchase, which highlighted potential sources of contamination, primarily associated with the storage of fuel on site as part of the historic coachworks.

This desk study was followed by a preliminary ground investigation, working around ongoing site use, and consisting of windowless sampler boreholes, cable percussion boreholes and installation of gas and groundwater monitoring wells.

Visual and olfactory evidence of contamination was encountered across the site, but particularly in proximity to known buried tank locations. Assessment of chemical testing results against generic assessment criteria indicated elevated levels of lead, mercury, a range of polyaromatic hydrocarbons and all petroleum hydrocarbon fractions. Groundwater sampling indicated the presence of free-phase hydrocarbons on the surface of the water table and subsequent analysis reported elevated levels of petroleum hydrocarbons and volatile organic compounds.

The report concluded that remedial measures would be required, namely removal of below ground tanks and impacted soils and possible treatment of the groundwater. Cost estimates were provided for remediation to inform the land purchase.

Supplementary Investigation & Detailed Soil Vapour Quantitative Risk Assessment (DQRA)

Further detailed investigations were undertaken post purchase

A soil vapour DQRA was undertaken to derive site-specific assessment criteria against which to compare the vapour analytical results. Through this assessment, we were able to show that the concentrations of vapours present in the subsurface do not pose a risk to end users, and therefore the remediation could be focussed on and validated against criteria protective of controlled waters receptors. Given the site setting and limited identified controlled waters receptors, removing the potential vapour source-pathway-receptor linkage allowed a significant reduction in the scope of remedial excavations required.

WALLIS ROAD

HACKNEY WICK

Jomas Associates were commissioned to undertake phased land contamination risk assessments, and geotechnical investigations, for a proposed redevelopment of a historic oil refinery and chemical works at Wallis Road, Hackney Wick, in East London.

Preliminary Risk Assessment / Phase 1 Desk Study

Jomas Associates undertook an in-depth Phase 1 Desk Study, which included a review of previous reports undertaken at the site, historical maps, aerial photographs online history archives, environmental database searches, and liaison with local stakeholders such as local environmental health officers and the London Fire Brigade.

From investigations undertaken by Jomas Associates and others on adjacent sites, it was considered likely that significant contamination was present in the soil and groundwater underlying the site.

A detailed Conceptual Model was produced, on which a Scheme of Investigation was based, which outlined Jomas' intended approach to further investigate the site and assess identified pollutant linkages. All works were approved by LLDC.

Ground Investigation

An intrusive ground investigation was undertaken which included a series of window sampler boreholes and cable percussive boreholes. The investigation identified significant contamination, within shallow soils, as well as perched groundwater and the underlying aquifer within the Alluvial soils & River Terrace Deposits underlying the site.

Detailed Quantitative Risk Assessments

Detailed risk assessments were then undertaken by Jomas Associates, in consultation with the LLDC and Environment Agency.
An assessment of chronic vapour risks concluded that despite the extent and severity of the contamination beneath the site, chronic risks to future users of the site and adjacent site users did not require specific remediation (although it was noted that remediation would be driven by removal of free phase product and reducing risks to controlled waters, which would achieve a simultaneous reduction in potential risk to human health receptors).
A detailed assessment of acute and sub-chronic vapour risks and nuisance odour risks was also undertaken, considering short term effects associated with short to medium term ground disturbance (such as remediation and ground works). The results of this assessment allowed for formulation of robust management plans and controls to limit vapour and odour releases during such works, and monitor such releases to ensure all persons involved are not exposed to potentially unsafe vapour concentrations or offensive odour levels.
Remediation Strategy
A Remediation Strategy was derived to remediate the site to render it suitable for the proposed use. The methodologies to be employed include excavation of grossly contaminated soils, skimming and pumping of free phase product, and chemical oxidation of contaminated groundwater. Ex-situ on site remediation was not considered appropriate due to time constraints for development to progress, and odour sensitivity of the site.