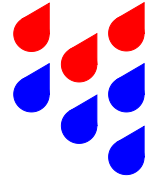


Geo & Hydro – K8 Ltd



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The Company

Geo & Hydro Services Ltd was incorporated in New Zealand in 1988 by Drs. Ben Keet. In 1990 he branched out to Australia where Geo & Hydro Consultants Ltd and later Geo & Hydro Environmental Management Pty Ltd became leading consultants in the contaminated sites field in 4 States rehabilitating well over 1000 commercial and industrial properties. Drs Keet started a remediation R&D company in Holland in 1994 which carried out work all over Europe, South America and the Middle and Far East for Departments of Defence and multinationals like AKZO-NOBEL and Phillips. In 2003 he returned to New Zealand, initially working alone, however since 2007 joined by Royston Gillett a chemist with 25 years experience. Geo & Hydro has undertaken over 80% of all re-zoning remedial works in Hawkes Bay since 2006, assisted with the remediation of the Grey Lynn brickworks in Auckland, audited the remedial strategy report for the Rotowara Carbonisation plant for Environment Waikato, edited the Sheep-dip Guideline for local councils for the Ministry for the Environment and the Handbook for Natural Attenuation of Hydrocarbons. We have assisted developers, surveyors and engineers with subdivisions on old horticultural land (Hawke's Bay, Waikato, Canterbury), on old landfill sites (Greater Wellington, Taupo DC) and commercial properties (Hawke's Bay, Waikato, Christchurch and Auckland).

Why choose Geo & Hydro to manage the contaminated land aspects of your next project?

- No junior personnel on the job ensures every aspect gets done efficiently and without delay
- **Many parts of our projects are subcontracted back to the surveyors / engineers who engage us.**
- Huge amount of experience in leading/managing contractors significantly reduces costs
- Lateral thinking has become second nature and if cost cutting is possible we'll be the first to mention it
- Many of our clients and clients of the surveyors / engineers we have worked with have learned to understand the value of experience – references on request from engineers, surveyors, small and very large developers.
- Anyone can take a sample – few understand where to take it.
- **See me as the senior staff member of your team managing the contaminated land issues, without you having the liability for this work**
- During courses and workshops Ben has trained over 400 consultants and government officials in Europe, over 100 in the Middle East (through the UN) and over 200 in New Zealand – if in doubt; ask the teacher.

The right tools

Geo & Hydro is the only consulting company in New Zealand owning a portable XRF analyser. Determining levels of arsenic, lead and 20 other heavy metals in orchard soil, around sheep-dips, on commercial properties or sites with buried waste (landfills) can be done in *20 seconds per soil sample*, on-site – real time!, with the accuracy of the laboratory. Equally in 1988 Geo & Hydro was the first to invest in a PID (Photo Ionisation Detector) for the analysis of petrol in soils at service stations and we still have one today as well as other detectors and spectrophotometers for a wide variety of field analyses of soil and water. This speeds up the site assessment tremendously and during remediation having these allows fast decisions so the contractor is never held up.

Finally – International Network

Having worked 24 years in the contaminated sites field, often over 100 hours/week, on 5 continents have gained Drs Ben Keet a wide network of specialists, many of whom he has engaged in projects over the last few years while back in New Zealand. This ensures, even more than with large consulting companies, that top-expertise will be available for those difficult jobs, jobs many shy away from. Not us, we have carried thousands of projects, hundreds of R&D assignments and have completed all of these to the full satisfaction of our customers.

Try us, you will not regret it.

Regards, Drs. Ben Keet FRSC, MRSNZ

No travel time and costs charged anywhere in the North Island for 2 days or more field work till 31-12-2012

Examples of Environmental Site work relating to subdivision and property rezoning.

Pre-purchase survey

Focus is on potential major costs to make the property suitable for its intended use. The investigation focuses on potential hotspots which are identified using historical aerial photographs, dangerous goods consents, historical site use based on photographs and anecdotal information, followed by field sampling and analysis and laboratory analysis. The report identifies the problem areas and provides cost estimates to clean-up the property to desired standards. This is provided in an 'environmental damages' table listing the cost for each area and the clean-up cost to meet commercial and/or residential guidelines. Contamination may have entered from a next door property; if the neighbour is insolvent the cost for remediation will be the responsibility of the new owner.

Cost range: \$ 4,000 to \$ 8,000+, main variables: size, historical complexity, number of contaminants.

Surveyor assistance: Collect consent information, old maps, aerial photos, peg out sample points, survey and make sample maps.

Pre-subdivision

Before consent application the cost of a subdivision is determined. A pre-subdivision survey contains most elements of the pre-purchase survey. In addition it identifies important planning implications: for example if 20,000 ton of soil is contaminated, this may be allowed to be buried or used in a reserve. Creating a reserve may be more cost effective than carting the soil to landfill. Areas may be too contaminated to be remediated (sheep-dip), ensuring this area becomes a reserve section may need prior negotiation with the council.

Cost range: \$ 5,000 to \$ 10,000+. Main variables: size, details required by council, historical complexity, number of contaminants, compulsory analytical requirements (council).

Surveyor assistance: Current consent conditions, collect historical consent information, old maps, aerial photos, peg out sample points, survey and make sample maps.

Detailed Investigation – Remediation Plan

These investigations are very site specific. For example if soil blending is an option for an orchard the detailed survey needs to focus on marking out the hot spots and establishing the blending depth for each sub area of the site. When buried waste is suspected the potential on site re-use (as road base) needs to be assessed. When liquid contaminants are suspected their migration pathways need to be investigated. Often overlooked contaminated areas are: underground tanks on orchards, near glass houses, burning areas, (removed or burned down) sheds or houses, filled trenches or valleys, fence lines, o/h power lines, positions of fixed or mobile sheep / cattle dips, tip sites, ag-chem storage, sprayer fill area, etc.

The remediation plan describes the steps of the site decontamination. It is the basis for the earthworks consent and often used as base for the contractor tender document.

Cost range: \$ 6,000 to \$ 12,000+ Main variables: size, complexity, number of hot spots and contaminants.

Surveyor assistance: Collect consent information, survey and make hot spot and blending area maps.

Remediation and Validation

Site supervision during remediation means directing the contractor to optimise equipment deployment, minimising off-site disposal, ensuring all activities meet consent conditions and recording all activities to be presented in the remediation report. Validation often takes place section by section, while the remediation activity progresses over the property. Focus of the validation is to collect evidence of the effect of the remediation (removal of hot spots, soil blending operation or groundwater remediation). The two reports are often combined into one.

Cost range: \$ 4,000 to \$ 20,000+. Main variables: size, historical complexity, number of contaminants.

Surveyor assistance: Survey all cut and fill areas, volumetric, construct maps of remediated areas (depth to uncontaminated base, thickness of blended layers).