



CLIENTS | PEOPLE | PERFORMANCE

# CONTAMINATED LAND MANAGEMENT



GHD IS AN INTERNATIONAL PROFESSIONAL SERVICES COMPANY. OUR PEOPLE DELIVER INNOVATIVE SOLUTIONS BY COMBINING TECHNICAL SKILL AND EXPERIENCE WITH AN UNDERSTANDING OF OUR CLIENTS' OBJECTIVES AND ASPIRATIONS.

GHD is an industry leader in the rehabilitation and management of contaminated land, delivering innovative and cost-effective solutions to benefit our clients.

Our reputation for excellence and integrity, and delivery of sound financial and environmental outcomes for clients, allows us to maximise the value of their assets.

## OUR CAPABILITIES

### MANAGEMENT OF PROPERTY

Effective property portfolio management strategies include the handling of contamination issues to reduce liability. GHD develops property portfolio management systems integrated with existing business management systems and based on sound risk management principles. We also develop GIS and web-based systems which simplify management of geographically diverse sites and voluminous technical information.

Our clients include BHP Steel for over 1,000 Steel Group sites; Defence for 300-400 sites with contamination issues; and a cement manufacturer for managing and storing large sets of reports, data and statutory requirements.

### SALE OR PURCHASE OF LAND

Acquiring or parting with an asset presents a risk to business and can inflict financial and legal harm. Site contamination is often a major determinant of liability. Our experience ranges from due diligence with tight time frames on large global divestment programs to due diligence on individual sites and business operations. Clients include former Telstra line depot and telephone

exchange sites in Australia; Ansett for proposed divestment; South Pacific Tyres for many Australian sites; Defence for RAAF Base Amberley, Maribyrnong Naval Depot, Maralinga nuclear test facility and Gona Barracks, and explosives and munitions manufacturing facilities; the Coca-Cola System for real estate transactions in Australia, New Zealand and the Philippines; the power industry for substations and depots for Australian utilities; the gas industry for gasworks; and the chemical industry for manufacturing facilities.

### DECOMMISSIONING/REDEVELOPMENT OF OLD INDUSTRIAL SITES

As demand for residential land intensifies, old inner-city industrial sites have been decommissioned. While development can offer an excellent return on investment, it is critical to properly manage land and groundwater contamination issues. GHD has assisted with such industrial sites as: Mile End Railyard in Adelaide; East Perth Gasworks; West Melbourne gasworks; Mack Trucks in Brisbane; Mackay Rail Yards; Queensland Cement Darra; and a battery factory and pesticide manufacturing plant in New Zealand.

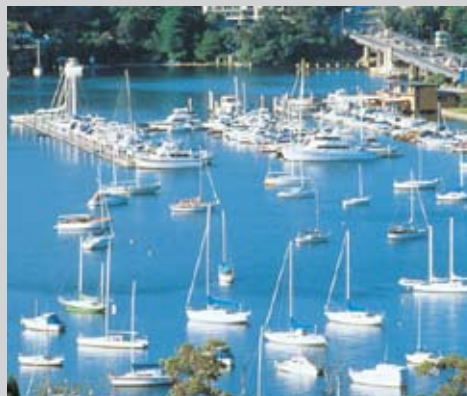
### MANAGEMENT OF SITE ASSESSMENT AND REMEDIATION

Assessment and remediation are major direct costs of dealing with land and groundwater contamination. GHD's teams include project managers, contract administrators, project schedulers and community consultation specialists.

Our well-established management systems support the approvals process and make sure the remedial plan is properly formulated and necessary approvals are won. Remediation project management can involve potentially hazardous wastes



Remediation of fuel facilities.



Assessment of marina sites.



Soil testing at Maralinga Defence site.



and disposal costs. GHD has good long-term relationships with several waste receivers, often leading to preferential rates for clients.

GHD's experience ranges from small-scale spillage clean-up work through to multi-million dollar project management, including an AUD50 million clean-up of the West Melbourne gasworks site, remediation of a former asphalt plant in Geelong, a munitions firing range in Broome returned to public open space standard, and remediation of soil and groundwater of the 25-hectare Bulimba precinct in Brisbane for residential use.

#### MINIMUM COST REMEDIAL SOLUTIONS

GHD combines the skills of engineers, process engineers, chemists, geotechnical engineers and hydrogeologists to develop minimum-cost solutions.

Our teams have dealt with difficult contaminants, including Scheduled Wastes such as pesticides and PCBs, dioxins, gasworks contamination, and hydrocarbons and metals. This experience extends to both soils and groundwater and includes bioremediation, thermal methods (such as thermal desorption and Plasma Arc treatment), chemical methods of Base Catalysed Dechlorination and oxidation, innovative methods such as ball milling dechlorination, in-situ treatment, natural attenuation, enhanced natural attenuation, containment, and simple excavation and landfilling.

#### LANDFILLS AND WASTE DISPOSAL

GHD is one of Australia's leading service providers in feasibility studies and the design and management of

landfills. This work includes the assessment of existing landfills and development of management strategies, and the redevelopment of old landfills for high value use, such as residential.

#### MEETING STATUTORY REQUIREMENTS

Negotiating contaminated land regulations is critical because costs and time loss can be severe. GHD's highly qualified, experienced practitioners advise on statutory requirements and negotiate the regulatory maze. Teams include certified contaminated land auditors in each state recognised by the relevant Government Environmental Agency. GHD has six accredited environmental auditors in Victoria and New South Wales, the highest number of any other consultancy.

GHD has carried out statutory audits of international sites for such clients as Telstra, Department of Defence, BHP Steel, Melbourne Water, Gas and Fuel Corporation and Baulderstone Hornibrook.

#### ECOLOGICAL/HUMAN HEALTH RISK ASSESSMENT

Risk assessment can save considerable cost and time by showing that the risk with contamination is low and remediation can be avoided or reduced. Risk assessment can also be part of the approvals process.

GHD's risk assessment specialists have developed national riskbased guidelines for such industry groups as the oil and gas industry in Australia and New Zealand (NZ) and the timber industry in NZ.

### OUR SERVICES

- ▶ Project management
- ▶ Risk management
- ▶ Approvals management
- ▶ Contaminated site master planning
- ▶ Statutory approvals management
- ▶ Due Diligence for sale or purchase
- ▶ Specialised contaminant studies
- ▶ Specialised groundwater investigations
- ▶ Geophysical investigations
- ▶ Geotechnical investigations
- ▶ Demolition and decommissioning
- ▶ Human health risk assessment
- ▶ Ecological risk assessment
- ▶ Design, specification and management of remedial works
- ▶ Independent review of work by others
- ▶ Statutory audits
- ▶ Statutory monitoring
- ▶ Expert witness and litigation support
- ▶ Statutory and strategic town planning

## GROUNDWATER AND CONTAMINANT HYDROGEOLOGY

GHD provides hydrogeological services including installation of monitoring wells, assessment and remediation of groundwater contamination and contamination sources, preparation of EPA submissions and obtaining statutory approval for groundwater contamination management. Our hydrogeologists have an advanced groundwater contaminant modelling capability.

Recent sites include: gasworks in Melbourne Docklands, petroleum industry sites, redevelopment of the Qatar Vinyl Company petrochemical and fertiliser plant in Qatar, Defence sites, airports, old industrial land, and natural regional contamination.

## MINING

We can advise on contamination impacts of tailing dams, ash management and ash burial approval, remediation and management of fuel spillage, groundwater assessment and remediation, mine rehabilitation (strategy and implementation), plantation trials, environmental governance and reporting, and audits. This work has included preparation of a booklet on Contaminated Land Management as part of Environment Australia's series of Best Practice Environmental Management booklets for the mining industry.

Recent sites worked on by GHD include: BHP titanium minerals mine at Beenup in Western Australia (WA), Nargalu mineral separation plant at the Enneaba East Mine in WA, and a proposed lead-silver-zinc plant in Victoria.

In addition, GHD has delivered coastal resource management and local environmental studies in the Philippines, conducted soil and groundwater assessment and remediation at a battery manufacturing facility in Chile, and performed an environmental audit for an Australian Government-funded project for mining waste disposal in China.

## PETROLEUM INDUSTRY

GHD has assessed and remediated former service stations and depots, and has experience in assessment, risk assessment, remediation and management requirements for petroleum industry sites.

We are a preferred supplier of remediation services to Caltex Australia and BP for diverse environmental projects such as over 60 remediation projects on Caltex Australia divestment sites, and a five-year contract for the statutory monitoring of BP terminals in Queensland and the Northern Territory.



## ABOUT GHD

GHD is an international professional services company. Our people deliver innovative solutions by combining technical skill and experience with an understanding of our clients' objectives and aspirations.

With more than 6000 people in a network of 100-plus offices throughout Australia, New Zealand, Asia, the Middle East, the Americas and Europe, we serve clients in the global market sectors of infrastructure, mining and industry, defence, property and buildings and the environment.

Central to our clients' prosperity and GHD's success are forward-thinking engineers, architects, planners, scientists, drafters, project managers, economists and supporting staff. Our people embrace the core values that have sustained the company since inception – **Teamwork, Respect and Integrity.**

Established in 1928, GHD is ranked as one of the world's leading engineering, architecture and consultancy firms. We are dedicated to our clients and their stakeholders, to being a responsible corporate citizen and to improving the quality of life around the world.

We contribute to the goals of sustainable development and are committed to managing the social, economic and environmental impacts of our operations and assisting our clients to manage theirs in the provision of our technical consulting services. We recognise innovation as the key to realising this objective.

As a member of the World Business Council for Sustainable Development (WBCSD), GHD actively participates in the public debate on the role business has to play in managing climate change, energy, development and ecosystems.

GHD operates under a Practice Quality Management System that is certified to AS/NZS ISO 9001:2000 and our Environmental Management System (EMS) is accredited to international standard ISO 14001 by NATA Certification Services International (NCSI).

For more information, visit [www.ghd.com.au](http://www.ghd.com.au)



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