



Odour consultancy services

Identifying needs

Environmental amenity is a growing concern for communities and this concern is increasingly reflected in environmental regulations. Being a cause of odour nuisance can harm a business in terms of direct costs, delays to production plans, impact on asset life, and strained relations with the environmental regulator and the local community.

Being a good neighbour is important to your business, and odour management should be a primary business consideration, particularly if your business is by nature odorous, such as waste-water treatment and conveyance, solid-waste landfilling, green-waste composting, intensive animal husbandry, oil refining, petrochemical production or food manufacture.

Effective odour management can be difficult, and requires holistic consideration of source elimination, source minimisation, and emission capture and treatment.

We can deliver odour management solutions that are cost-effective, proven, reliable, robust, flexible, and sustainable.

Services

GHD provides a comprehensive service to address every element of odour management that our clients may need. These services include:

- Problem investigation and solution identification
- Strategy and feasibility studies
- Multi-disciplinary studies
- Design and specification of chemical dosing systems
- Design and specification of ventilation and extraction
- Design and specification of odour treatment systems
- Construction phase services

- Community consultation
- Environmental approvals
- Assessment of compliance with regulations
- Monitoring and operational advice

Some of the special techniques that we use in providing these services include:

- Source elimination and minimisation
- Dispersion modelling (CALPUFF, AERMOD, AUSPLUME)
- Meteorological data analysis and synthesis (TAPM, CALMET, MM5, WRF)
- Sulphide generation modelling in sewers
- Modelling foul-air flow in extraction systems
- Emission sampling and analysis
- Site-specific and default buffer distance assessments
- Odour audits, assessments and mitigation plans
- Structural, mechanical, electrical design

Benefits

By engaging GHD, you will receive a cost-effective, project-specific solution that lets you focus on the business you would rather be doing.

Our solution will be backed by the experience of a global network of professionals. Hence, should unexpected challenges arise or unusual technical problems present themselves, we will have staff who can deal with them.

You will be working with professionals who understand the regulatory and business environment you work in, and who know the importance of budget, timeliness and effective communication.

Experience

GHD is a global leader in odour management, delivering innovative cost-effective solutions to suit a wide range of situations. For each project, GHD applies its client relationship focus and in-depth technical experience to work closely with client representatives to address key concerns, constraints, and issues. Once identified and analysed, sound engineering alternatives are developed to provide tailored solutions to suit the project at hand. Using the experience gained from the design of more than 100 odour control systems and from undertaking numerous modelling, mitigation strategies and odour impact assessments, our diverse staff can deliver project-specific odour management solutions.

The following are examples of recent, specific GHD project experience in odour management.



Eastern Treatment Plant – Review and Modelling of Foul Air System Melbourne Water Corporation (MWC) – Melbourne, Victoria, Australia

The Eastern Treatment Plant (350 ML/d) has a foul air collection facility (FACS) to contain and transfer foul air to an odour treatment unit. MWC engaged GHD to model the FACS so as to gain a better understanding of why the FACS was not achieving design intent, and to simulate its performance under various operating conditions and proposed upgrades. GHD provided a calibrated air-flow model that met MWC's requirements, and trained MWC to use and modify the model. GHD made numerous recommendations for the improvement of the FACS. MWC is using the model to guide development of a program of works for FACS optimization.



Holloway Road Branch Sewer Odour Investigation and Odour Control Yarra Valley Water (YVW) – Melbourne, Victoria, Australia

YVW engaged GHD to advise it about options for managing the odour impact of the Holloway Road Branch Sewer in Melbourne's hilly eastern suburbs. GHD found that upstream "piggy-back" pumping and the steep grade of the sewer were making the sewer's headspace very odorous, and that the combination of sewage injection into the sewer, restricted venting along the sewer, and dry-weather surcharging downstream of the sewer were working to force out odorous air. GHD recommended a combination of downstream civil works to reduce the frequency of surcharging, chemical dosing upstream, and forced ventilation and treatment. YVW is now implementing these recommendations.



Annapolis Water Reclamation Facility (WRF) Anne Arundel County, Maryland, USA

GHD conducted extensive odour evaluations and pilot testing at the Annapolis WRF before finalizing the decision to collect odorous air from the primary clarifiers, gravity thickeners, and dewatering building and to blow that air through the fine bubble diffusers in the bottom of the aeration tanks in what was, at the time, one of the first applications in the Mid-Atlantic of activated sludge diffusion odorous air control. The project has been a complete success.



Bellarine Peninsula Sewerage Systems Odour Strategy Barwon Water (BW) – Geelong, Victoria, Australia

The Bellarine Peninsula northern and southern sewerage systems have a history of odour issues, owing to a combination of seasonally varying populations, "piggy-back" pumping, and conveyance along long rising mains. BW engaged GHD to revise its existing odour / septicity management strategy with regard for the significant population growth expected and the major system upgrades that were about to commence. GHD reviewed the performance of the existing strategy, and proposed revisions, which included new treatment facilities and the staged renewal of oxygen dosing units. The revised strategy has proven successful.



Elkton Wastewater Treatment Plant (WWTP) Design Elkton, Maryland, USA

GHD designed a new low-profile horizontal chemical wet scrubber for the new Biosolids Handling Building. GHD also designed an engineered biofilter for the headworks at this facility and a separate engineered biofilter to provide dedicated odour control for the sludge drier off-gas stack. The project was completed in 2008 and has significantly reduced odour complaints at the facility.





Hyannis Water Pollution Control Facility (WPCF) Barnstable, Maryland, USA

The 16.6 MLD (4.4 mgd) Hyannis WPCF is located in the middle of a commercial and residential area in Hyannis, a village in the town of Barnstable. Odour complaints prompted the Town to hire GHD to perform an odour survey of the plant to determine indicated which areas of the plant required odour control. As a result, the Town implemented chemical odour control (hydrogen peroxide) of the raw sewage, and installed a pre-engineered biofilter to treat air from the anoxic zone of the aeration tanks and distribution boxes. The project was completed in 2008.



Odour measurement to determine emission rates from Broiler farms Numerous clients – Australia

GHD has conducted odour emission rate (OER) measurements for numerous broiler sheds across Australia. The consolidated data have been used to develop an innovative, validated OER model that takes into account critical variables such as ambient temperatures, shed ventilation rates, bird stocking rates and litter condition. The OER model is then used with odour dispersion modelling to more accurately characterise the extent of off-site odour impact than was previously possible. The models are customisable to ensure accurate representation of impacts from existing and proposed facilities. Measurement of shed OER during the litter cleanout at the end of the grow-out batch has also been conducted and included in the simulation.



Odour & Septicity Management Strategy Gosford Regional Sewerage Scheme Gosford City Council – New South Wales, Australia

GHD formulated a Master Plan for the Scheme, which includes 184 pumping stations and 2 WWTPs. A key task was to review the existing odour/ septicity management strategy, which is based on iron-salts dosing. GHD identified the major drivers as corrosion risk, odour complaint frequency, and cost-effectiveness, then assessed the effectiveness of the current strategy. Key achievements included providing advice on the Scheme sulphide build-up model, advising on planned changes to the dosing arrangements, and recommending a staged strategy for cost-effective odour / septicity management to 2051.



Blue Plains Wastewater Treatment Plant (WWTP) Washington DC, USA

GHD was responsible for the design of the new odour control facilities which serve the Blue Plains WWTP influent pumping station and headworks facilities. The WWTP is designed for average and peak daily flows of 1400 MLD (370 mgd) and 4073 MLD (1,076 mgd), respectively. The odour control system consists of covers, extraction fans, ductwork, caustic/hypochlorite scrubbers, and chemical feed systems. Two separate two-chemical, single-stage wet scrubber systems were installed to meet 99.9% removal of hydrogen sulphide at a flowrate of 204000 m³/h (120,000 cfm).



Berrima Feed Mill - Biofilter Odour Control Design Ingham Enterprises – Berrima, NSW, Australia

GHD was engaged to undertake odour modelling for the Berrima feed mill to determine the extent of its odour impact. GHD then undertook conceptual design followed by detailed design of the odour control system (soil-bed biofilter) sized for 83000 m³/h (49,000 cfm). GHD also prepared specifications and was involved in project management assistance during construction.



Odour Impact from Green Waste Composting Numerous clients – Australia

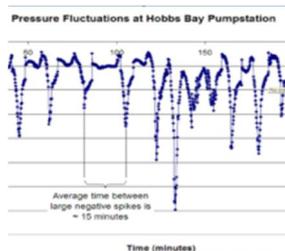
GHD has developed an innovative 'draped tunnel' method to measure odour emission rates from composting windrows after demonstrating that the standard method (EPA/600/8-86/008) using an isolation flux chamber (IFC) results in a significant under-estimate of windrow OER, especially in young Stage 1 windrows. The 'draped tunnel' method avoids the under-estimation and accounts for any variability of windrow OER between crest and inclined sides. Predicted off-site odour impact for several composting facilities has since been conducted by post-correcting OER data formerly measured using IFCs.





Buffer Distance Determination Numerous clients – Australia

GHD has developed innovative methodologies to vary the default radial buffer to: (i) account for local meteorology, and (ii) to take account of the process-specific upsets/malfunctions that give rise to off-site odour (or dust) impacts. These techniques have been applied to many projects, including wastewater treatment plants, transfer stations, rendering plants and abattoirs. The benefit gained is a much better understanding of the facility's impact on surrounding land during plant-upset conditions, which is invaluable to those trying to develop nearby land without exacerbating the odour nuisance risk.



Hibiscus Coast Odour and Corrosion Control Rodney District Council – Orewa, New Zealand

Rodney District Council commissioned GHD to conduct a review of the Hibiscus Coast main trunk line and contributing catchments with regards to odour, septicity and corrosion. The project included technical appraisal and development of solutions for a program of short and medium term improvements based on modifications to the operational procedures and reorganizing existing assets. Little capital expenditure was required. The result successfully reduced community complaints and improved the trunk system performance.



Cradle Mountain Resort – Odour Control Systems National Parks and Wildlife Services – Cradle Mountain, Tasmania, Australia

GHD undertook design and operational review of odour control systems for two sewage pump stations and the sewage treatment plant. These were all based on a soil-bed biofilter concept. Our scope included foul air extraction, civil and mechanical design, and specification of soil mix and vegetative cover. The key considerations in design involved catering for a cold climate in a world heritage area which required special vegetation species and aesthetic components.



Alkimos Wastewater Treatment Plant (WWTP) Stage 1 Detailed Design Water Corporation– Perth, WA, Australia

GHD was appointed by the Alkimos Water Alliance, made up of Brookfield Multiplex, McMahon, Zublin and the client, to deliver the \$80 million stage 1 of this new WWTP. The first stage of the project provides an initial treatment capacity of 20 MLD, with provision for growth over the next 80 years to increase to an ultimate capacity of 160 MLD. Odour emissions from the inlet works, DAF sludge thickener, Bioselector and sludge storage tank are captured and treated by photo-ionisation – the first unit of its kind at this scale in Australia. Odour emissions from the oxidation ditch are captured and dispersed from a 50 m high stack. The project was completed in 2010, and the odour management measures are helping our client to meet community and regulator expectations for odour impact.



Contribution of diffuse area sources to total VOCs and odour emissions Alcoa World Aluminium – Wagerup Alumina Refinery, WA, Australia

Alcoa engaged GHD to determine the rates of emission from the Residue Drying Areas and associated liquor storage areas, for inclusion in the Refinery Emissions Inventory and for use in modelling the odour impact of the facility. GHD met Alcoa's requirements with a study carried out in two phases, the first to prioritise sources for detailed investigation, the second to intensively measure emissions from those priority areas. By quantifying the variation of emission rate with factors such as hour of the day, residue wetness and lake temperature, GHD provided, for the first time, a realistic model of odour and VOC emissions from these sources.

To talk Odour Investigation, Management and Control, contact:

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