

## *Services to industry*

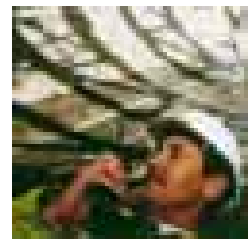
*In a fast moving industrial business, commercial pressures are relentless. Managing the reliability of the production process, its yields, the unit cost of production, currency exchange rates, capital available for investment and pressure from the supply chain are all critical.*

Businesses must also deal with the pressures of changing legislation and regulation, changing production requirements, corporate policy and direct pressure from shareholders, neighbours, customers and staff.

Companies which identify and manage these issues before the pressure affects their business can turn potential future costs into a source of competitive advantage. However, staff time is often concentrated on core production activities, and the resources and expertise are not always readily available in-house.

Bringing on board an external, impartial and expert view of business challenges can be a distinct advantage. This is especially so when this partner has the capability to design and implement changes in management systems, reporting, training, equipment and facilities that may be required.

Such expertise, advice and delivery capability is available from Entec.



## *Capability statement*

# Entec

*Entec is one of the UK's largest environmental and engineering consultancies. Our technical and business skills are dedicated to delivering strategic, technical and engineering solutions which bring commercial benefit to customers at home and overseas. This know-how is based on over 60 years' consulting experience in the public and private sectors.*



Certificate No. EMS 69090

Certificate No. FS13881

Entec operates a Quality Management System in accordance with the latest requirements of the international standard BS EN ISO 9001 and an Environmental Management System compliant with BS EN ISO 14001. Both are audited by BSI Management Systems.



## Services to industry

Entec has been recognised as employing the most comprehensive range of environmental, engineering, risk, health and safety skills available from a single source. Through our wide range of project experience, applied research and development of best practice guidelines for blue chip companies, as well as the DTI, DEFRA, Environment Agency and Health and Safety Executive, we are in an excellent position to offer leading edge advice to industry.

*From the  
boardroom to  
the shop floor*



The pressure to achieve strong financial performance is central to industrial businesses like all others. Entec can help ease the operational, management and strategic pressures in your business so you can concentrate on delivering the financial results that shareholders demand.



*Entec's  
approach*



We concentrate on establishing relationships with customers who value service delivery based on partnership. That is why we spend time ensuring that our people demonstrate the right qualities and we help them to develop personally.

Communication is extremely important to our business strategy: we listen to our customers and we act on their opinions and ideas. We provide information at the point of need, and we are open and honest in what we say and do.

Flexibility means different things to different people and we appreciate this. As a customer, you have access to all of our resources, not just our project dedicated team members and managers. Our breadth of skills and experience creates a comprehensive matrix of support to enable us to respond to your changing needs. Entec's experience and knowledge of industrial businesses has been built upon delivering our assignments to our customers in policy, regulation, contract design, risk management, compliance and the design and engineering of process systems and assets.



## *Services to industry*



## *What are the benefits of our approach?*

Many and various - and all help the bottom line. Here are some examples:

- Maximising the value of capital investment by anticipating the impacts of environmental regulations, taxes and business trends on existing programmes;
- Increasing operating efficiency through reduced production costs and increasing productivity;
- Maximising opportunities for cost avoidance by developing effective systems for legal compliance, improved productivity and performance;
- Improving stakeholder confidence through effective risk management, contingency planning, disaster recovery strategies, better market positioning and reporting.

Providing single-source, managed, access to a wide set of skills that can span problem identification and problem definition to solutions delivery in the fields of environment, risk, health, safety and infrastructure engineering.



## The service

Our consulting staff specialise in understanding health, safety and environmental regulation and pressures, and their impact on industry. Their output might include high level reports designed to build confidence amongst investors, customers, suppliers, or staff. Alternatively it could be direct support with permit applications or regulatory compliance such as PPC and EIA, or analysis of operations to identify risks and compliance issues or to deliver cost cutting opportunities.

Entec's in-house engineering expertise ensures that our recommendations are pragmatic and our capital cost projections are realistic. The capability to provide engineering understanding in conjunction with regulatory, business and environmental skills differentiates Entec from many competitors.

Our engineering staff carry out activities from feasibility studies to detailed design and construction management. We provide a wide range of project management services and handle numerous projects from start to finish. Our technical specialists support industrial infrastructure developments including water systems, pollution abatement systems for effluent or air emissions, power systems, control systems, civil and mechanical works, raw material or product storage and other infrastructure systems.

We have a growing number of clients who now use our services to support their more regular engineering requirements such as replacement of ageing infrastructure, modifications of systems to support changing manufacturing processes as well as developments brought about by regulation and other external forces.



**Entec's engineering skills span virtually all systems and facilities required to support your proprietary processes.**

### Project teams

Many clients see the benefit of tackling problems by forming a combined team of Entec and their own staff. As well as making best use of the client's own resources, the mix of specific knowledge of the client's business and operation and the specialist expertise and help available from Entec makes a powerful combination for solving straightforward or complex environmental and engineering problems.

### Customer satisfaction

However varied our approach to problem solving, each of our project managers is charged with ensuring that the client gets the highest possible satisfaction. Entec continually seeks client feedback on performance, to ensure that we keep improving on our delivery.

### Long-term relationships

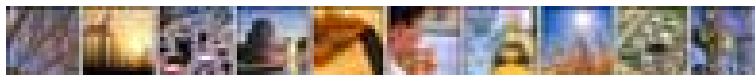
Entec's approach to business is geared around building long term relationships. Over 90% of our business is from clients we have previously worked for and who trust Entec to look after their interests. By providing a wide range of services from our numerous offices we seek to become a trusted and regular service provider who is never far away. These long-lasting relationships built on mutual trust allow us to learn more about our clients' business and so create real commercial and competitive advantage in our work for them.



*Profitable, compliant,  
and appropriate solutions*



*Entec understands the regulatory pressures facing industry; we help our clients to develop profitable, compliant and appropriate business solutions.*



## Supporting industry with a comprehensive service

Entec's success is based on fitting our services to your requirements, therefore the following list of services is indicative only, please contact us to see how we can help you.

### Engineering

- Water Treatment
- Distribution and Storage
- Cooling Systems
- Liquid Recycling
- Waste Water Drainage
- Waste Water Treatment
- Sludge Disposal
- Sludge Treatment
- Atmospheric Pollution Abatement Systems
- Fire Mains
- Tank Farms
- Site Decommissioning and Demolition
- Instruments and Process Control Systems
- Asset Management Planning
- Site Infrastructure
- Building and Civil Works
- Power Systems
- Pilot Plant Work
- CDM, Planning Supervisor

### Water Management

- Resource Management
- Hydrology
- Hydrogeology
- Private Water Supplies
- Aquifer Contamination and Remediation
- Borehole Development

### PPC

- Environmental Management Systems
- Waste Minimisation
- BAT Justification
- Site Condition Report
- Energy Audit
- Noise and Vibration
- Impact Assessment
- Waste Handling
- Odour
- Improvement Programmes
- PPC Support
- Supportive Environment Agency Discussions

### Environmental Management

- Environmental Audit
- Due Diligence
- Environmental Reporting
- Training
- Waste Minimisation
- Air Quality
- ISO 14001
- Integrated Management Systems

### Air Quality

- Emission Monitoring
- Air Quality Assessment
- Dispersion Modelling
- Policy, Legislation and Regulation
- Process Emission Reduction
- Odour Control
- Odour Tests

### Waste Management

- Waste Strategy
- Recycling Projects
- Leachate Treatment
- Environmental Technology
- Environmental Economics
- Pollution Abatement
- Leachate Treatment
- Landfill Gas
- Landfill Design
- Landfill Liner Testing

### Contaminated Land

- Site Investigation
- Risk Assessment
- Geophysics
- Geotechnics
- Site Remediation
- Groundwater Remediation
- Site Redevelopment

### Risk Management

- Technical Risk Analysis
- Accident Enquiries
- Risk Assessment
- Safety Audits
- COMAH
- HAZOP Studies
- QRA
- ERA
- Corporate Risk
- Corporate Governance
- Safe Manning Levels

### Environmental Assessment

- Environmental Studies
- Impact Studies
- Atmospheric Pollution
- Archaeology
- Noise
- Sustainability
- Energy Management
- Computer Visualisation
- Landscaping
- Planning

## Case studies

*The following pages demonstrate Entec's capabilities in the area services for industry, using case study examples. ►*



## **'ECO-ordinated' - The SMEs and the Environment Programme** The Birmingham Centre for Manufacturing



Photo provided  
courtesy of Anopol Ltd



Photo provided courtesy of Stanley Smith Wire

### *Birmingham SMEs profit from environmental management and waste minimisation*

The Birmingham Centre for Manufacturing (BCM) is dedicated to the support and world class development of midlands-based manufacturers. It is a partnership between the Birmingham Training and Enterprise Council, Birmingham City Council and the University of Central England. In 1999 BCM won funding from the EC and Birmingham City Council to run a two-year programme of subsidised environmental support for small and medium-sized enterprises (SMEs) in Birmingham. Thus was born 'ECO-ordinated' - The SMEs and the Environment Programme.

Impressed by Entec's expertise both in waste minimisation and environmental management systems consultancy, BCM chose Entec to deliver the ECO-ordinated programme, beginning in 2000. The objectives of the programme for the participating SMEs are two-fold:

- to develop an environmental management system (EMS); and
- to achieve waste minimisation and energy efficiency savings.

The goal of the EMS part of the programme is for the companies either to reach certification to ISO 14001 or to install an EMS that enables them to comply with legislation and achieve continual improvement in their environmental performance. Entec works with the participants to develop an EMS that fits their company structure and culture. Through the waste minimisation part of the programme Entec trains and leads the companies to identify, quantify and realise cost saving opportunities. Essential for both elements of the programme is helping the SMEs to set up procedures, monitoring systems and management structures. Entec delivers the programme through a series of alternating training workshops and individual

consultancy visits. This approach provides motivation and technical help, both to encourage and enable the participants to take action.

The companies are all well on course for achieving the installation of their EMS by the end of the programme. They have already achieved savings through waste minimisation and have identified 5-10 projects each that they are developing to yield future savings.



## **Peer Review of Accident Investigation and Risk Assessment** Gutteridge, Haskins and Davey

Entec was commissioned to perform a 'peer review' of the accident investigation and risk assessment carried out by a contractor, following an incident during the remediation of the former Maralinga nuclear weapon test site in Australia.

During application of the in situ vitrification (ISV) process on pit 17 at the Maralinga site, an explosion occurred in 1999 which caused severe damage to the ISV equipment, and expelled some of the contents of the melt.

The operator of the process, Geosafe, was asked to provide an incident review report. A team from Entec and RobSearch Australia Pty Ltd. (Robsearch), was commissioned by Gutteridge, Haskins and Davey Pty Ltd. (GHD), the project manager for clean-up of the site, to review the incident report and undertake a risk assessment of the ISV process.

The approach taken was to:

- review initial information (including historical information, witness statements geological data, video footage of the incident, etc.);
- review the approach taken by Geosafe and its consultants in carrying out the incident investigation;
- review the arguments put forward for causes of the accident; and
- review the conclusions of the investigation.



*Independent review of accident investigation  
on behalf of the Government of Australia*



## **Paper Mill PPC Licence Application** Sunderland Paper Mill



Under the PPC Regulations, Sunderland Paper Mill (SPM) was faced with the requirement to submit a permit application by the end of February 2001. The paper and pulp sector was the first in the UK to undergo this process. SPM had not been subject to IPC and was seeking support from Entec to help them through the permit application process.

A key aspect of the work was the collation and use of existing information at the site, and the identification of other data requirements. This allowed Entec to undertake a review of the existing 'best available techniques' and see where the conditions at the mill met these standards. A desk study (the 1 (a) report) covering current and historical ground conditions at the site was produced, together with proposals for the 1(b) intrusive investigation. Other key elements included a mass balance for the site (concentrating on water and chemical consumption), and an overview of impact assessment and the improvement plan.

The relationship with site senior staff was important in ensuring full understanding of the Environment Agency's requirements for the permit application, the data collection exercise and the scope of the improvement plan. Entec undertook periodic discussions with the Agency to ensure the content of the application continued to meet their requirements.

As SPM had only a small management team, Entec's role was valuable in providing the necessary resource and expertise to ensure an appropriate and valid application was made.

*One of the first PPC applications in the UK*



## Corporate Environmental Risk Review

### Alvis



The Alvis group of companies operates in the UK (as Alvis Vehicles Limited) and Scandinavia (Hägglunds Vehicle Group). The group manufactures armoured fighting vehicles and other specialist vehicles employing high quality applications, engineering and project management skills and exporting to over 60 countries.

In response to the requirements of the Turnbull Committee's report on corporate governance and internal risk control, Alvis commissioned Entec to undertake a corporate environmental risk review, which looked at the environmental impacts and risks associated with the of the UK, Swedish and Norwegian manufacturing sites.

Any key environmental risks and liabilities were identified and reported to the board, along with an action plan containing recommendations for further improving environmental risk management.

The findings were also used to draft a corporate environmental policy statement for introduction across the Alvis group of companies. With Entec's support, Alvis has been able to reassure its stakeholders that there are adequate controls in place to minimise risks, both to the environment and to the organisation itself.

This study led to the request for Entec to provide environmental management system (EMS) scoping and development support at the UK site.

*Helping to reassure stakeholders through an assessment of environmental risks*



## **Process Emissions from Electronics Industry and IPPC Support** Power Innovations, a Bourns Company



*Measuring VOC  
emissions for major  
UK electronics  
manufacturer*

As part of an annual contract which Power Innovations, a Bourns company, has placed with Entec, emissions from the wafer fabrication plant are monitored on a quarterly basis in accordance with the operating licence. Entec has developed a monitoring procedure and a quality assurance programme for volatile organic compounds (VOCs) and acid gases. A range of VOCs is monitored with the results presented as total VOC and individual component emissions as a concentration and annual mass emission.

Entec has started to provide support to Power Innovations with the forthcoming introduction of IPPC. This will involve a multidisciplinary project team from Entec. This support will assist Power Innovations with their phase 1 site audit, assessment of impacts against the habitats directive and dispersion modelling.



## **Redevelopment of the Former Aberdeen Gasworks and Chemical Works Scotoil Services**

Scotoil offer services to the offshore oil industry. Their operations are based at the site of the former Aberdeen chemical and town gas works. A proportion of their land bordering on a new leisure development was surplus to operational requirements and the remaining operational area required refurbishment. The redevelopment of non-operational land was considered to be the optimum solution to deal with legacy of soil and groundwater contamination and to secure an efficient site operational area.

Entec provided environmental advice to Scotoil, reviewed all available information and completed site investigations over the proposed redevelopment area. Reclamation strategies were drawn up together with remedial cost estimates. Clean up costs were greater than the commercial redevelopment value of the land but planning regulations would not allow retail redevelopment which would attract higher land values. Entec provided technical assistance for retail use planning applications and a contaminated land expert witness at a successful planning appeal.

The Scotoil site had a potential negative value, which could have affected the prosperity of the company. Entec contributed realistic, defensible clean up cost estimates to enable higher redevelopment land values to be realised and the successful regeneration of old industrial land.

*Enabling the realisation of  
higher redevelopment land values*



## **Bottled Water Source Advice** Highland Spring



### *Meeting consumer demands for bottled water*

Highland Spring is one of Britain's largest producers of bottled natural mineral water. Their development plans forecast a substantial increase in production capacity to meet the projected increases in consumer demand.

To provide the necessary additional high quality water, it became clear that new boreholes would be required. Entec was commissioned by Highland Spring to obtain increased yields from a secure and sustainable source. Our team of hydrogeologists provided all the necessary knowledge, experience and most importantly, results, having been involved in similar projects both in the UK and abroad.

Entec continues to provide ongoing advice and support thereby ensuring the continued safe management of this important resource.



## Investigation of Effluent Treatment Options Synpac Pharmaceuticals

The effluent produced by the Synpac Pharmaceuticals site in Northumberland was being discharged untreated directly into the sea through a dedicated short outfall. Although the quality of the effluent was well within the required discharge consent limits, Synpac was concerned that future legislation would mean that the COD and suspended solids (SS) concentrations within their effluent would have to be dramatically reduced in order to continue being disposed via this route.

Synpac asked Entec to investigate the treatment options that would be appropriate for improving the quality of their discharged effluent. In order to do this Entec undertook a series of bench scale trials to determine the toxicity, settleability and treatability of the effluent. The biological treatability of the effluent was assessed using both aerobic and anaerobic bench scale processes.

The results of these bench scale trials indicated that an aerobic biological process with incoming flow balancing would be the most appropriate treatment technique for removal of both the COD and SS in the effluent. Therefore, a pilot scale trial was undertaken at the Synpac site to demonstrate that this was the case on a larger scale.

The results from the pilot trial were used by Entec, in conjunction with Northumbrian Water Limited (NWL), as the basis for a feasibility study. This feasibility study compared the cost of on-site treatment with other options available to Synpac, such as transfer of their effluent to the local NWL sewage treatment works.

The overall project has made Synpac aware of the options that are available to them so that they can make an informed choice should they need to improve the quality of their discharged effluent in the future.

### Facts and Figures

**Project**

Effluent Treatment Study

**Client**

Synpac Pharmaceuticals Limited/  
Northumbrian Water

**Location**

Northumberland, UK

**Entec Services**

- Toxicity Testing
- Settleability Testing
- Aerobic and Anaerobic Bench Scale Treatability Trials
- Aerobic Pilot Scale Trial
- Feasibility Study



*Helping Synpac  
select the most  
appropriate effluent  
disposal option*



## **Due Diligence Audits in Romania Cargill**



*Auditing the  
environmental  
credentials of grain  
and cereal facilities*

As part of the wider due diligence process, Entec undertook the environmental audit of three grain and cereal storage and distribution facilities in Romania, on behalf of Cargill. In addition to the review of each site's environmental management and performance, the audits specifically considered compliance with local environmental regulations and Cargill corporate operating practice; potential liabilities associated with fuel storage; past practices and ground / groundwater quality.

The nature of the former state ownership of private industrial activity in Romania required the careful assessment of the legal position of share ownership and the ensuing responsibility for ownership transfer and environmental compliance. Given these requirements, Entec worked with a local environmental consultancy (Radal) who were familiar with Romanian regulations and company law.



## Management of Process Emissions from Food Processing Facility Confidential Client



The food processing facility is one of the largest in Europe. As such, the client wanted to measure all pollutant discharges from the site and employed Entec to undertake monitoring.

During the sampling phase Entec monitored 45 stacks for over 130 organic compounds, particulates, combustion

gases, halogens, and metal emissions. The results were provided to the client in two parts, firstly as a full reference document, for the technical library and secondly as a presentation pack for Board members. Subsequently, Entec completed the inventory of sources and releases for the company to submit to the Environment Agency.

*Stack emission  
monitoring*



## *Services to industry*

### *Sample client list*

Air Products	Grace Dearborn
Alexander Drew	Heinz
Applied Materials (Europe)	Hotpoint
Armstrong World Industries	ICI
Aventis	Intel
Avon Cosmetics	Kimberley Clark
Aylesford Newsprint	Kraft Jacobs Suchard
BASF	Marley Building Materials
Baxter International	Marshalls
BETZ Dearbourne	Mattel Toys
Birds Eye Walls	Metal Box
BP	Mobil
Britannia Zinc	Motorola
Bush Boake Allen	Nestlé
Cable & Wireless	Omni-Pac
Cadbury	Owens Corning
Campact	Pitney Bowes
Cargill	Power Innovation
ChevronTexaco	Quantum
Coates Lorrileaux	Roche
Contract Chemicals	Rolls Royce
Cookson Group	Rohm and Haas
Corus	Salt Union
Crown Products	Seagate
Dalgety	Shotton Paper
De La Rue	Simon Engineering
Dunlop	Synpac
DuPont	Thorn EMI
FKI	TotalFinaElf
Ford Motors	Unilever
Fujitsu	Union Camp
GKN	VSEL
GlaxoSmithKline	Warwick Chemicals



*Services to industry*

# **Entec**

*For further details on  
Entec's full range of environmental and engineering services:*

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