

Oil & Gas



“Providing oil and gas industry support with practical local solutions”

OTEK is a member of the
ARCADIS Alliance Partner Program





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Corporate Overview

OTEK & ARCADIS

Leading consulting companies, OTEK Australia and ARCADIS provide engineering, environmental, and project management services to the top tiered private and public sector clients.

ARCADIS Oil & Gas global clients with presence in Australia/New Zealand have seen historic growth and have desired an ARCADIS quality approach to their growing environmental and engineering needs. OTEK Australia a local consultancy with a 20+ year history in Australia/New Zealand has been engaged as ARCADIS strategic partner to supplement and support the demands for superior expert service.

Through this new partnership, OTEK and ARCADIS will share their capabilities and expertise to the Australian and New Zealand marketplace.

With more than 15,000 employees worldwide and \$2.4 billion in revenue, ARCADIS has an extensive international network that is supported by strong local market positions.

Together, OTEK and ARCADIS embrace all aspects of the engineering and environmental consultancy solutions sector with an innovative and dynamic team in strategically located offices around Australia to ensure the ability to provide efficient service to clients in Australia, New Zealand and adjacent countries.

Together, we possess extensive experience with employees who pride themselves in offering quality and practical environmental solutions to the petroleum, chemical, agricultural, communication, utility, defense, aviation, transport, marine, manufacturing and mining industries.

Expert Capabilities

The diverse experience of our scientists, engineers and managers has given us a broad perspective on the unique issues and problems facing our clients in matters of health, safety and the environment.

Our management, staff and selected advisors assist in having some of the most extensive worldwide practical environmental experience in the oil, gas and petroleum industry.

Our advisors and senior technical associates are recognised experts in petroleum engineering and environmental risk management services worldwide.

We have performed thousands of projects within the industrial sector including mining, chemical, automotive, pharmaceutical, and oil and gas throughout Australia and internationally.

Our ability to provide practical, cost effective, expert consulting services has resulted in many years of long-term client relationships.

Together, we have demonstrated world's best practice in environmental projects utilising innovative technologies not used previously in Australia. This has led to defining benchmarks for environmental regulators throughout Australia.

ARCADIS is ranked among the top 10 management and engineering consultancies in the world. In Europe, Brazil and Chile they have a top 5 position. In the global environmental market they are positioned in the top 3. Likewise, OTEK is recognised as one of the top consultancies in Australia and the Asia Pacific region. ARCADIS and OTEK combine a deep knowledge of the local conditions where they work with fresh global perspectives for unique, integrated solutions.

Please note that case studies are available upon request.



Global Oil & Gas



The oil and gas sector is one of our largest service areas.

The challenges faced by the oil and gas industry in today's business environment are increasing in scope and complexity.

By combining specialised expertise in the environmental, health, safety and infrastructure fields with a working knowledge of industrial processes, OTEK and ARCADIS deliver tailored business strategies that meet your specific needs and make good business practice.

We offer a keen understanding of the oil and gas business. We:

- Have provided cost-effective solutions to our oil and gas clients for more than 60 years.
- Have successfully negotiated with regulatory agencies and government bodies on behalf of our oil and gas clients.
- Have served in key roles in oil and gas trade associations.
- Employ former oil and gas industry professionals.

As such, we function as a true partner in addressing important issues that impact and shape your business.

Our experience and expertise in the oil and gas industry enables us to serve you in the many operating units that comprise your business.

We have assisted many oil and gas clients develop solutions to industry-related challenges throughout the world.

Some of our global clients include:

- Anadarko
- BHP Petroleum
- BP
- Chevron
- ConocoPhillips
- EnCana
- EnerSea Corporation
- ExxonMobil
- Marathon Oil Company
- MB Petroleum Services
- PanCanadian Petroleum Company
- PDO (Oman)
- Petrobras
- Santos Petroleum
- Shell International
- Sibneft
- Sunoco
- Talisman
- Tecpetrol
- Total
- Valero
- Yukos

Oil & Gas Services

Together, we have partnered with global organisations on a variety of projects for more than 60 years and has a proven track record in the upstream and downstream markets.

We have supported the environmental and compliance needs of more than a dozen clients in Australia. The majority of these have been oil & gas clients.

We recognise that multinational clients desire, and expect, continuity in approach, technical service, quality, and health and safety, regardless of the geographic location of a project. In addition to providing a common work product, this consistency minimises risk as consultants understand the client, as well as their related policies and procedures.

We offer a full service environmental firm providing a wide range of professional services, including but not limited to: Environmental Impact Assessments (EIAs), auditing, regulatory compliance, permitting, due diligence, hydrogeological assessments, emergency incident response and waste classification and management.

- **More than 60 years of oil and gas industry experience.** From permitting issues in the development phase to regulatory compliance at production operations, we have the institutional knowledge that serves as the backbone of our current services to the oil and gas industry.

- **Responsive service.** Our expertise is only valuable to you if we provide it in a highly responsive manner. Our service record is demonstrated by the high rate – over 87% – of our clients who return to us for additional service. We have been rewarded repeat business by our oil and gas clients due to our responsive and safe service. We remain responsive to our oil and gas client needs through a Client Satisfaction Program that routinely monitors our performance through client interviews.
- **Client advocacy.** We are your advocates in communities and during negotiations with regulatory agencies. Through our active involvement in industry associations and task groups, we are aware of upcoming developments before they occur. This allows us to represent your interests through every stage of a project.
- **Health and Safety.** We have adopted Occupational Health and Safety as one of our company priorities. We have implemented a behavior-based system that integrates health and safety into our daily operations. Safety comes first. We work with our clients to ensure safe work conditions with an ultimate goal of zero incidents. Our safety record on oil and gas projects has been consistently better than the industry average for many years.



Together, we offer all aspects of quality services to the oil & gas industry in a diverse range of areas.

Petroleum Engineering Consulting Services

- Petroleum production engineering
- Reservoir stimulation including hydraulic fracturing and matrix stimulation
- Advanced fracture mechanics
- Horizontal well performance and completion
- Training in Petroleum Engineering

Environmental Assessment - Risk Modelling

- Environmental Impact Assessment (EIA)
- Public Environmental Report (PER)
- Environmental Aspect Registers
- Environmental sensitivities and ecological impact assessment
- Risk mitigation measures
- Hazard identification

Oil Spill Planning & Response Services

- Environmental risk analysis
- Emergency planning
- Marine and coastal surveys, including sensitivity assessments and mapping programmes
- Pre- Spill and post-spill impact investigations
- Development of contingency plans and response manuals
- Evaluation of mechanical cleanup equipment

Marine, Coastal & Terrestrial Surveys

- Hydrology and Oceanography
- Physical geography, geomorphology and coastal processes
- Computer modelling
- Air Quality
- Geochemistry

- Remote Sensing or Aerial/Satellite Mapping Services
- Laboratory services & toxicity testing
- Spill Response Support
- GIS mapping
- Spill Trajectory modelling

Air & Water Quality and Atmospheric Dispersion Modelling

- Workplace, industrial and transportation of air pollution and monitoring
- Odour emissions and dust disposition
- Technical review and of air and water pollution control equipment
- Consequence dispersion modelling for accident scenarios

Management Programs

- Integrated Risk Management System (IRMS)
- Safety Case (offshore) and Safety Report (onshore)
- Safety management System (SMS)
- Environmental Management System (EMS)

Auditing

- Environmental Management Systems (EMS)
- Safety Management Systems (SMS)
- Quality

Training

- Risk Management
- Emergency Management and Incident Investigation
- Spill Response Training
- OH&S Training
- Hazard and Operability (HAZOP) & Multistage Risk Assessment
- Hazard and Operability (HAZOP) Leader
- Change Control



Upstream Services



Upstream Services

Regulatory scrutiny for exploration and production as well as landowner litigation has increased substantially as of late.

The recent economic boom saw a rapid rise in oil costs and an increased demand in exploration and production.

Whether it is planning and permitting, compliance support, garnering public support of new upstream initiatives, or management of environmental risk, together we are one of the leading firms in the upstream sector.

When starting new activities or upgrading existing ones, it is often necessary to apply for permits. These permits might require supporting environmental studies or even an EIA.

Furthermore, these activities can be socially sensitive and can drag on for years, thus costing time and money. Process management and stakeholder involvement can create a social basis for these types of projects, saving time and litigation costs.

This partnership is ready and able to deliver all the products and services required for your permitting projects. Products and services vary from field work to stakeholder management.

Typical services in this realm are:

- Environmental surveys for soil, waste, waste water, energy, noise, air quality, emissions, external safety, landscape, ecology and biodiversity, etc.
- Preparing EIA and permit applications.
- Strategic consultancy regarding environmental, social and spatial issues.

- Process management including liaising with authorities and stakeholders.

We coordinate our services to achieve effectiveness. Services like permit applications, environmental assessments and stakeholder management can be implemented independently if desired. However, they are often combined to efficiently achieve all objectives.

Our approach is to:

- Engage with clients from the beginning to understand needs and drivers.
- Create a team with the experience and capability to assist our clients in meeting all planning and environmental challenges.
- Present a clear methodology to meet project demands.
- Review relevant background data, including policy evaluation and legislative framework.
- Collect necessary baseline data, including field surveys.
- Evaluate constraints, risks and opportunities.
- Provide necessary planning and environmental input to develop a solution that balances cost, environmental, safety and quality aspects.
- Communicate with those who are directly affected, such as stakeholders.
- Develop environmental assessments and permitting applications to facilitate the decision making process.



Environmental Impact Assessments

Most projects require an evaluation of a proposed project's potential environmental effects before project initiation.

An EIA is a planning tool often used to conduct an interdisciplinary analysis of the potential environmental, social, and economic effects of a proposed action, such as granting a specific permit for a project.

Developing an EIA helps decision makers systematically and comprehensively consider potential effects of the proposed action before they make a decision to endorse an action.

We have prepared hundreds of EIAs to satisfy a range of regulatory communities; these are commonly documented in environmental assessments, environmental impact statements, or environmental impact reports.

Consequently, we are well acquainted with current guidance and understand how it applies to and impacts resource management projects.

OTEK and ARCADIS have prepared EIAs related to oil and gas projects, pipelines, underground gas storage, roads,

mines, transmission lines, power generation projects, and communication projects.

Together we leverage our substantial EIA experience and understanding provide EIA services to help clients with approvals needed under the local environmental legislation and the federal Environment Protection and Biodiversity Conservation Act in Australia and development applications where other regulatory legislation requires an EIA to be completed.

We work with professional leaders to perform a range of EIA activities and assessments to help find solutions to meet your development needs.

Our team conducts field investigations for a wide variety of environmental resources.

Studies include baseline data collection, assessments to evaluate potential impacts and the implementation of monitoring plans to measure changing environmental conditions and the effectiveness of applied mitigation measures.

Water Resources	<ul style="list-style-type: none"> • Groundwater Well Installation/Monitoring • Water Quality Sampling/Analysis • Stream Gauging/Flow Measurement
Ecological Resources	<ul style="list-style-type: none"> • Threatened, Endangered & Special-Status Species Surveys • Wildlife Surveys • Fisheries/Aquatic Surveys • Wetlands Delineation and Vegetation Mapping
Air Resources	<ul style="list-style-type: none"> • Monitoring Station Establishment • Meteorological Monitoring • Air Quality and Emission Monitoring
Soils/Geological Resources	<ul style="list-style-type: none"> • Survey and Mapping • Profile/Log Descriptions • Sampling/Analysis
Cultural Resources	<ul style="list-style-type: none"> • Surveys and Testing/Monitoring
Land Use	<ul style="list-style-type: none"> • Land Use Mapping and Recreation Surveys
Visual Resources	<ul style="list-style-type: none"> • Key Observation Point Assessments and Visual Sensitivity Mapping
Noise	<ul style="list-style-type: none"> • Noise Monitoring and Vibration Studies

The following are illustrations of EIA projects. Further case studies are available upon request.

EIA Case Histories



EIA at a Former Gasworks

We performed an EIA at a former Gasworks prior to proposed remediation in preparation for redevelopment of the site. Previous investigations had indicated widespread PAH, heavy metals and cyanide contamination in soil and groundwater. The purpose of the EIA was to provide additional site data on which to base a site remediation plan. The investigation involved review of the results of several previous investigation and monitoring reports; identification of data gaps; preparation of a sampling and analysis plan targeting data gaps, potential sources of impact and potential COCs; and a soil boring program. Based on the results of the EIA, we prepared a report detailing and comparing remediation options such as thermal desorption and a lined landfill for disposal considering logistical, environmental, risk and costs.



Australian University - EIA

The client is one of Australia's most successful tertiary institutions. We were engaged in 2009 to conduct an EIA of specified sites, which involved: the identification of sources of environmental risk, including those risks that have the potential to have a significant impact on the environment; determination of the exposure of environmental risk (level of inherent and residual environmental risk) and the adequacy of control measures; noting the existing rationale, management practices, procedures and activities that contribute to Environmental Management at the university; conduct of an environmental legal compliance assessment to evaluate the client's compliance with environmental legal obligations and other pertinent requirements to which the client subscribes; ascertaining the client's current environmental performance and compliance with the International ISO 14001 Standard to facilitate the development of an EMS; identification and recommendation of measures for improvement; and a written report and verbal presentations of findings.



Community Consultation

Our staff recently travelled to Port Hedland and conducted a number of site inspections and public interviews with interested parties (including Aboriginal representatives and Council Planners) to ascertain the most appropriate location for the construction of large communication platforms. We were able to assist our client identify an alternative site for the platforms and then realise a significant cost saving in annual lease fees for the alternative site.



EIA for Development of Exploratory Oil and Gas Wells

We prepared an EIA that evaluates the development of three exploratory oil and gas wells on National Forest System (NFS) lands. The proposed wells would evaluate production potential and if these wells proved productive, a Master Development Plan would be implemented with the addition of 16 well pads. In support of this EIA, we performed a baseline survey for sensitive and management indicator species (MIS) of amphibians in June of 2010. The objective of the amphibian survey was to confirm whether breeding populations of sensitive or MIS amphibians occur within the project area. This amphibian survey confirmed that breeding populations of two USFS MIS amphibians are present within the project area, and that project activities affecting riparian areas or ephemeral ponds have the potential to affect these amphibians.

EIA Case Histories



EIA of a Lake Recreation Area

We managed a long-range planning effort and associated EIA for a lake recreation area, which is an extremely popular recreation resource. We conducted a Roads Analysis that involved a detailed field survey and characterisation of social and designated roads and trails. More than 150 road and trail segments were surveyed, inventoried for environmental features, and analysed for potential future uses. Because of the intense public scrutiny, facilitating a proactive and interactive dialogue with the interested public was a key component of successful project implementation. We delicately handled the public's concern and created a realm for effective stakeholder engagement. This project required intensive field data collection in very remote areas. Extensive logistical staffing plans and schedules were developed. We developed a process where field data could be easily captured and uploaded into GIS to perform the roads analysis and complete the EIA.



Facility Expansion - EIA and permitting

The client planned to expand its core business of storage and shipment of class 3 and 4 liquids for 3 sites. In support of the planned development, we implemented the EIA process, permit applications under the Environmental Management Act and Pollution of Surface Waters Act, performed a QRA analyses, and developed other relevant permit applications for the proposed expansion. The EIA and permit application prepared by us offered the client flexibility in their future operations, with assessments for a range of storage materials. Project challenges included collecting a sufficient quantity and level of survey information for safety, ecology, noise and air, despite an early stage of (pre-) engineering. We liaised successfully with relevant authorities and engineers to deliver a suitably flexible end result.



EIA and Permitting For Two Gas-fired Power Plants

A new Combined Cycle Gas Turbine (CCGT) of approximately 500 MW will replace an existing gas-fired plant. In addition, our client intends to build a similar CCGT in another area which will provide heating and electricity. We were retained to prepare the EIAs and various permit applications for both projects. The challenge of these types of projects resided in presenting technical information to the public in a simple, non patronising manner, thereby helping to speed up the decision-making process. The information presented by us included the objectives of both projects and the choices that formed their basis. We also clarified the environmental impact by means of air, noise and ecological studies, and organised the application process for three permits: an environmental permit, a permit under the Pollution of Surface Waters Act, and a Nature Conservation permit.



EIA for a Gas Transport Service

Our client is installing a 48" natural gas pipeline. This expansion of the gas transport network is necessary to meet the need for gas in the region. The pipeline is more than 400 kilometers long, crosses 9 provinces, more than 50 municipalities and 10 water boards. For that reason the trace was divided into 9 sections, each requiring its own EIA. We formulated an initial memorandum and an EIA for each trace section. We also provided communications regarding the EIA reporting. Each EIA was approved by the regulatory authority and construction of the pipeline started in 2008. Complete construction is expected to be completed in 2012.

EIA Case Histories



Permitting for new Biocenter

Our client was challenged with obtaining a permit, then creating and operating a “biocenter” site, where hydrocarbon-contaminated soil would be treated. The treatment capacity was 20,000 tonnes per year, and the facility would handle waste from 11 locations. In support of this project, we performed a regulatory study, comprising 5 documents: a letter, a project presentation, an EIA, an Industrial Risk study and a Health and Safety study. Upon submission of all documents, the local administration accepted the studies and provided a permit for a site of 2 hectares located in an unused quarry, in accordance with federal regulation and the air/waste/water control regulations.



Project Highlight: EIA for Biomass Plant

The client intends to develop, install, commission and operate a green power plant using renewable fuel (biomass) capable of supplying electricity to 50,000 homes. The plant will generate 50MW and will employ the best available technology to comply with the requirements of its IPPC (Integrated Pollution, Prevention and Control) authorisation and will be extremely efficient. In support of this groundbreaking project, we provided a combined engineering and EIAs from inception to completion. The Planning Application received full consent in January 2009. Pre-construction site works including erection of an acoustic barrier fence and the relocation of plants and insects to a nature reserve area began in 2010.



Production site EIA

Regulatory changes required the existing EIA associated with all installations at this location, a chemical and pharmaceutical production site, to be reviewed, updated and documented by a neutral expert. We deployed a systematic and complete evaluation of environmental impacts from the facility. This documentation formed the basis for the simplification of future approval procedures and was facilitated by active dialogue between the client, its neighbors and the public.



EIA, permitting and safety studies for underground gas storage project

The oil and gas client is extending a large underground gas storage (UGS) near the municipality of a large major city. Therefore the gas field and the UGS must be connected by a new 48” gas pipeline. An EIA is required because of the size of the project and the impact of the pipeline on the very sensitive environment. We were responsible for the EIA, the permitting, communication with stakeholders and the safety studies for the tie-in at the gas field. The project started in 2009 and was completed in 2010.



EIA for Natural Gas Pipeline

We prepared an EIA that evaluated the effects of a 50-mile long pipeline project designed to supply natural gas to a major city. The proposed route follows an existing highway through a steep, narrow canyon just outside a wilderness area. Key issues include: effects on the city river and existing highway, river crossings, slope stability, soils and hydrology, wildlife habitats, scenic byway, scenic integrity and visual impacts, and conflicts with recreation use and traffic.

Related Services

In addition to direct EIA support, we routinely provide related and complementary services as summarised below.

Community Affairs and Public Involvement

We recognise public involvement as one of the most effective tools in designing a plan, program, or project that can be implemented with the support of the community.

Direct involvement of key stakeholders in the planning and design of public services and facilities enables the product to work for the public served.

We offer a full range of public involvement and communication skills. We utilise these capabilities to perpetuate effective and ongoing communications with the public. This provides our clients with meaningful and effective public input that can impact the decision-making process and result in community-supported solutions.

Recognising issues such as impacts to local government emergency action/response plans and addressing these issues early is important to achieve a safe and practical balance within the affected community.

Reaching within the community to understand compliance with local ordinances, mitigation of unintended nuisances, and providing the least amount of negative visual impacts builds community support and keeps the project on schedule.

Public involvement is more than public meetings and newsletters – a proactive approach is necessary to reach each segment of the population, recognising that there are different audiences ranging from agency staff to elected officials, community leaders, and the general public. Text, graphics, and other tools must be designed to inform and involve each group most effectively.

We have professional staff trained in effective communication techniques, and our staff includes communications specialists experienced in developing and implementing public involvement and education programs. Outreach specialists on our staff have knowledge of local issues and your program, and, above all, a passion for communicating and building consensus with all parties.

Regulatory Planning & Permitting

We provide comprehensive full-service planning and permitting for oil and gas operations.

Our services include all facets of planning for large development projects down to single well locations. We provide upfront environmental constraints analyses to aid in the strategic planning for all scales of development.

We also have the internal capabilities to acquire all necessary permits required for drilling and production. We are well versed in permitting requirements and have prepared POD's, GAP's, EA's, EIS's and EIR's for numerous oil and gas development projects.

We provide the full range of services for developing all supporting elements required for drilling permits. This includes Master Development Plans, Drilling Plans, Water Management Plans, Integrated Pest Management Plans, Interim and Final Closure Reclamation Plans, Wildlife Habitat Mitigation Plans, EA's and EIS's.

Serving as advocate and facilitator for our clients, we work with our clients to acquire all necessary permits, including air permits, storm water permits, and other state and local permits.

Air Quality Consulting Capability

The comprehensive range of expertise that we offer makes us exceptionally qualified to successfully meet our client's air quality needs.

We have the capability and resources to perform a full array of air quality services, including support in the following areas: permitting; emission control technology analysis; dispersion modelling; source characterisation/testing; ambient air monitoring; continuous emissions monitoring; multi pathway health risk assessments; air emissions control system design, construction, and maintenance; indoor air/ industrial hygiene; facility siting and due diligence.

For more than 15 years we have provided industry with best-practice air quality services. We have helped hundreds of facilities develop and negotiate permit conditions and compliance issues. We understand the requirements and compliance planning implications of virtually all related regulations.



Engineering & Surveying

Our engineers have worked on numerous oil and gas field development projects to design the safest and most cost-effective roads, well pads, and gathering systems while minimizing the overall disturbance to critical habitat areas.

We have designed single-bore well pads, large scale, multi-bore well pads, and access roads in areas of extreme terrain. Our engineers also work with our clients to develop the most effective gathering systems while taking environmental constraints into consideration.

Together, we provide all aspects of engineering design and survey to accommodate exploration and production project needs while incorporating best management practices to mitigate overall environmental impacts.

In addition to road and well pad design, we develop effective storm water and erosion control features to be installed during construction, production and the interim reclamation phases of exploration and production sites.



Ecological Resources

In many regulatory environments, oil and gas development-related impacts on ecological resources are a significant driver affecting proposed operations.

Regulatory agencies have increased oversight/management related to preserving critical habitat areas.

OTEK and ARCADIS are at the forefront in addressing these issues related to endangered, threatened, and sensitive species, working to develop mitigation measures for the oil and gas industry.

We have a well-versed team of experts with extensive experience to address these challenges.

We go beyond the traditional wildlife and wetland requirements by working with our clients to develop mitigation measures in areas with critical habitat to continue with development in a responsible manner, helping to limit restrictions.

We provide biological surveys, wetland delineation, habitat management plans and work with our clients to develop stewardship programs.



Cultural & Paleontological Resources

Many oil & gas development projects require cultural and paleontological resource management. This may include assessments, field surveys, testing, monitoring and mitigation.

We have developed key relationships with regulatory agencies, which allows us to ensure our clients receive the most cost-effective and acceptable management for these resources in association with their development projects.

We have a dedicated team of archaeologists and paleontologists that realise our client's goals and priorities. They work directly with our clients on development projects to provide the most suitable resource management recommendations while complying with the appropriate regulations.

We have experienced, in-house staff that can fulfill any agency mandated monitoring requirements for your projects.

Water and Waste Water

We provide comprehensive solutions for produced water management associated with upstream oil and gas exploration and production operations.

We work directly with operators to develop the most cost effective methods for handling produced water, whether through beneficial use or disposal.

The key components of our successful produced water management strategies include our thorough knowledge of regulatory agency requirements as well as our positive working relationships with regulators, accounting for water use agreements between operators and private landowners, and the integration of classic methods with our innovative solutions.

We provide the following services in regards to produced water management:

- Water Management Plans for large scale Plans of Development.
- Injection well design and permitting.
- Aquifer testing and modeling for proposed injection zones.
- Point source discharge permitting, sampling and compliance monitoring.
- Water and wastewater treatment facility design and permitting.
- Watershed studies (including modeling) and wetland delineations.

- Off-channel pit and on-channel reservoir design and permitting for produced water containment.
- Ground water investigations and permitting for unlined produced water storage impoundments.
- Erosion and sediment control plans associated with construction of production facilities.

Compliance

We provide comprehensive compliance monitoring and oversight for all phases of oil and gas development, including exploration, construction, drilling, and production.

Our compliance services support a wide array of permit conditions including storm water runoff, wetland mitigation, wildlife stipulations, cultural and paleontological resource impacts, site safety oversight and management, air monitoring, and specific surface use agreement conditions.

In addition, we provide compliance audits and due diligence to facilitate lease exchanges, asset sales, acquisitions and mergers.

We provide compliance monitoring and audits for all applicable permit stipulations associated with oil and gas exploration and production facilities. Our compliance team has an in-depth understanding of compliance regulations and works directly with our clients to ensure compliance with regulatory stipulations.

We have a proven track record of assisting oil and gas clients with compliance issues such as planning, auditing, permitting and reporting, environmental assessment, waste minimisation, air management pollution prevention, and wetlands delineation/permit assistance.



Downstream Services



Downstream Services

OTEK and ARCADIS have noted expertise servicing the downstream oil and gas sector.

We offer services including the processing, storage and transportation of crude oil and natural gas to refining, distribution and retail services, to maximise quality and efficiency and decrease the risk of liability.

Downstream services are offered to a range of sectors including oil refineries, petrochemical plants, petroleum product distribution, retail outlets and natural gas distribution companies.

The downstream industry touches consumers through thousands of products such as petrol, diesel, jet fuel, heating oil, asphalt, lubricants, synthetic rubber, plastics, fertilizers, antifreeze, pesticides, pharmaceuticals, natural gas and propane.

Key downstream services OTEK and ARCADIS can assist with are:

Approvals

- Licensing and preparation of applications
- Council applications
- Preliminary hazard analysis
- Transport study

Risk Assessments

- Hazard identification, Hazop
- Risk assessment, control of risks
- Qualitative and quantitative risk assessments

Legislative Compliance Audits and Advice

- Gaps analysis and design options
- Commercial feasibilities of engineering controls and management systems

Design and Engineering

- Drafting, specifications
- Tender packages

Project Management

- Construction management
- Work permits
- Inspection and test plans

Operating and Maintenance Systems

- Operating and maintenance procedures
- Hot work permits
- Health and safety plans
- Job safety analysis

Transport and handling of Dangerous Goods

- Compliance assessments to ADG code
- Transport of DG by road and rail
- Design of road and rail containers
- Labelling and placarding

Training

- Safe handling of product and equipment
- Responsibilities and duties of operators and maintainers
- Customised training packages

Our environmental, sustainability and remediation divisions can provide a range of downstream services to complement any project.

These include environmental site assessments, waste classification and disposal, health and ecological risk assessments, groundwater and soil remediation and carbon footprint consulting services.

We take the time to understand your business, understand your problems, identify your requirements and provide cost effective solutions.



Dangerous Goods & Fuel Storage

We offer a comprehensive strategy to minimise the risks associated with the storage and handling of dangerous goods in the whole of life of a facility.

We can assist clients that are considering a new storage facility, those whose facility may be subject to legislation changes requiring upgrades and those considering decommissioning a facility in a safe and environmentally friendly manner.

Dangerous Goods are substances that may be corrosive, flammable, explosive, spontaneously combustible, toxic, oxidising or water reactive.

Dangerous Goods can cause serious injury or death and significant damage to property and the environment.

Our Dangerous Goods experts have a combined industry experience of over 100 years in fuels, LPG and hydrocarbon areas. Over the years our team has acquired expertise in dealing with a variety of issues relating to the following classes:

- Class 2.1 Flammable Gasses
- Class 2.2 Compressed Gasses
- Class 2.3 Toxic Gasses
- Combustible Liquid Class C 1, C2
- Class 3 Flammable Liquids
- Class 4.1 Flammable Solids
- Class 5.2 Organic Peroxide
- Class 5.1 Oxidising Agents
- Class 6.1 Toxic Substances
- Class 8 Corrosive Substances
- Class 9 Miscellaneous

In addition to the above, we have managed licensing and storage of Ammonium Nitrate, Emulsions, Detonators and magazines for mine sites.

Underground Petroleum Storage Systems

Underground Petroleum Storage Systems (known as UPSS) have long been a focus of environmental investigation, as they can leak fuel into the subsurface.

Groundwater can also transport fuels outside a property boundary, causing offsite contamination and larger environmental liability.

We have consulted in many enforcement notices and audits by State Government Environmental Regulatory bodies, as well as legal cases where fines and law suits apply due to

this off-site migration.

In many states there are increasing amounts of legislative requirements for managers, owners and operators of UPSS, and large penalties that apply for not complying with the new requirements that apply to both individuals, as well as companies.

Our team of scientists and engineers help provide solutions for UPSS, including:

- Advice on regulatory requirements
- Risk assessment
- Dangerous goods audit
- Leak and Integrity testing
- Groundwater monitoring
- Tank removal and validation
- New system design and modification of existing systems to meet requirements
- Environmental investigations
- Remediation of impacted soil and groundwater



Audit

Audits provide an independent, expert view of a particular situation which provides insight and adds value to a company.

We perform many such audits including:

- Contaminated Sites
- Due Diligence
- Environmental Management Systems (EMS)
- Engineering Dangerous Goods
- Risk and Performance
- Specialist Audits

Our Auditors have performed audits on a wide variety of agricultural, residential, commercial and industrial sites both inland and coastal including: market gardens, landfills, manufacturing plants, steel recycling plants and foundries, sports stadiums, waste treatment facilities, concrete batching plants, service stations and fuel depots in many states.

Our Auditors are accredited in all States and Territories, have completed statutory and non-statutory audits and have been serving the Australia environmental industry for over 20 years.

Contaminated Site Audits

Contaminated site audits can be required by legislation (statutory audits) for redevelopment or rectification and/ or management of spills.

Contaminated site audits have become the most reliable method of ensuring compliance in developing contaminated sites in all of Australia with all states and territories now recognising the role and position.

The collective aims of the contaminated site auditing rationale is to provide a means for providing confidence in ensuring protection of human health and the environment from pollutants.

The various audit systems adopted by the states and territories provide a somewhat even basis for development of contaminated sites, using consultants, auditors, planning departments, local and state government to ensure

assessment and remediation methods are appropriate for the situation.

Common land uses which can cause contamination requiring investigations and audits include service stations, cattle dips, tanneries, wood treatment sites, landfills, fuel storage, industrial facilities and refuse tips.

Contaminated site audits are performed for many reasons, including:

- Change of land use (development opportunities);
- Response to a regulator notice (leaks, spills, license violations);
- In compliance with an voluntary assessment or remediation agreement (with the government);
- Migration of contaminants off the subject site; and
- Due diligence.

The auditor plays an important role in ensuring appropriate guidelines are followed. Done properly, audited sites can be the most effective and protective means for site development projects.

Our auditors work to the highest standards, with statutory approved Audits to legislative recognised levels in all states and territories.

They are able to provide the definitive technical review, with Certificates or Statements of Audits required for a property 'change of use' in the various jurisdictions.

Our auditors have specialised and proven auditing capabilities. Their decisions have a significant potential impact on public health and/or the environment. To this end, site auditors are considered to be the top level of contaminated land practitioners in the country.

There exist specific requirements and guidelines for statutory site audits (and other non-statutory site audits) by which the site auditor must abide, including notification, adherence to applicable laws and guidelines and independence. Failure to comply with the legal requirements as a site auditor can result in significant monetary fines to the site auditor.

We have site auditors capable of performing statutory site audits.



Environmental Management Systems (EMS) Auditing

Our specialists have developed, advised and audited numerous Environmental Management Systems (EMS) across a wide range of organisations and industries in all Australian states and overseas. The level of experience and expertise within our company enables us to:

- Rapidly identify where elements of a company's EMS do not fully meet the requirements of the international standard ISO 14001 (GAP Analysis)
- Focus on high risk areas that represent real and substantive exposures;
- Readily advise on system implementation and maintenance problems within a company's EMS; and
- Evaluate the likely success of integration of the EMS with the company's existing business management systems (e.g. existing quality and/or safety systems)

Auditing of our diverse range of clients has required selected staff to perform ISO 14001 and ISO 9001 based audits on numerous clients ranging from maritime construction industries, trucking and transport factories and general aviation fire fighting establishments.

Whilst audits can be structured to be traditional third party audits, they can also be arranged so that they can be recognised as on the job training audits (second party audits).

Risk Performance Auditing

Risk based audits can incorporate environmental, safety and quality related risks using the methodology of AS 4360 (2004) standard with special emphasis placed on residual risk and contemporary alternatives for limiting corporate and future liabilities.

Performance audits provide independent verification that pollution control equipment and/or discharge streams of solid, liquid or gaseous waste to the environment or to sewer comply with licence limits and other regulatory conditions.

The audits can also be used to confirm that conditions in the neighbouring environs comply with air quality and other standards.

Engineering Management & Dangerous Goods Audits

Our Engineering team provides:

- Site Safety Audits
- Compliance Audits to regulatory requirements
- Compliance Audits to Australian Standards

- Compliance Audits to Industry Codes of Practice
- Health and Risk based audits
- Environmental audits for plants and factories
- Energy Audits

International Cyanide Code – Auditing

In mid 2004 the International Cyanide Management Institute released a voluntary Code of Practice for the transport, storage, use and management of cyanide and cyanide solutions in the gold mining industry.

The Code aims to facilitate improvement in the global management of cyanide in the industry, to enhance the protection of communities and the natural environment near gold mining operations. Signatories to the Code are required to undertake periodic independent audits of cyanide use at their operations.

We have engineering, chemical and environmental experts experienced in the gold mining industry, whom are qualified to both advise clients as they work towards compliance with the Code, and whom can undertake independent audits against the Cyanide Code.

Laboratory Audits

Decisions on the need for contamination assessments and remediation can cost many hundreds of thousands of dollars and are based on data generated by analytical laboratories.

Whilst we perform periodic audits of laboratories used, we also offer a targeted lab auditing service to major lab users who require confidence that their laboratory expenditures are yielding the desired data quality.

A laboratory audit consists of a site visit to assess or follow the trail of sample handling, analysis and reporting procedures from arrival at the laboratory to the final issued report.

We can conduct a laboratory audit specific to client or laboratory requests to determine whether:

- Laboratory method procedures and/or NATA accredited testing is being undertaken as stated.
- Laboratory methods used are appropriate for the analysis requested (this includes checks of internal laboratory quality)

Quality issues resulting from the audit are forwarded to both the laboratory and to the audit requestor allowing the requestor to understand the degree of confidence that can be placed on data received from the laboratory. It also provides a mechanism to improve laboratory performance.

Occupational Health & Safety

Our Occupational Health & Safety (OH&S) program is developed to support the critical needs of our global industrial clients.

It is designed to protect our employees through proactive injury, illness and risk prevention. It goes further by also focusing on our clients, our subcontractors, our families and the general public.

It requires personal commitment from each and every employee, as well as visible, outward leadership by all levels of management.

The OH&S Vision and OH&S Policy, both endorsed by OTEK's and ARCADIS's Executive Boards, are founded in the strong belief that we have a responsibility to protect the health and safety of our own staff, our subcontractors and the visitors to our assets and worksites and to protect the interests of clients, shareholders and other stakeholders.

We are committed to providing a healthy and safe work environment for all our employees and we reflect a proactive and preventative behavior-based approach that integrates OH&S into our culture, values and the way we do business.

We recognise that in order to protect our staff and other stakeholders from injury, illness and other loss, we must value health and safety as much as our other core values and make it an integral part of the solutions we provide to our clients.

We provide professional advice and guidance to clients in the following areas for the purpose of achieving a safe and healthy workplace:

- Occupational health and safety management systems
- Hazard identification and risk assessment
- Training
- Chemical safety management

OH&S Management Systems

Our OH&S Management System focuses on proactive hazard recognition, risk assessment and control to prevent accidents.

Lessons learned and best practices are regularly shared globally through our formal process and informal networking of staff.

Our system empowers staff to conduct their work in such a way to protect themselves and others. It gives them the tools to implement healthy and safe work practices at all times and encourages them to use these tools off-the-job to maintain a healthy and safe personal lifestyle.

We can undertake a robust audit to identify any gaps and can assist businesses to document their OH&S programs through the development of:

- OH&S Policies and Procedures
- Health and Safety Plans
- Safe Work Method Statements (particularly for construction activities)
- Standard Operating Procedures, Safe Work Instructions
- Occupational Health and Safety Management System Manuals
- Emergency Response Plans





Hazard Identification and Risk Assessment

Failure to identify hazards on a regular basis can be cause for prosecution.

Thorough inspection programs and conduct of risk assessments can keep employees safe and your managers free of consequences.

We have experienced safety practitioners that can conduct comprehensive analyses of work environments and can develop OH&S risk assessments specific to activities, tasks, work areas or plant/equipment.

We use risk assessment guides and tools that comply with Statutory guidelines, Codes of Practice and the Australian Standard 4360.

A robust process should include the following steps:

- The identification of factors that may be contributing to the risk;
- A review health and safety information that is relevant to the particular hazard;
- Evaluation of the likelihood of an injury or illness occurring and the likely severity of an injury or illness that may occur; and
- Identification of the actions necessary to eliminate or control the risk.

Together, we can establish a user friendly system of regular hazard identification/risk assessment that can be self-monitored or have ongoing assistance such as annual inspection by one of our expert team.

Training

We can provide your business with OH&S training services when you need them, tailored to your business requirements, at competitive rates.

Training delivered by our expert team will enable you to further strengthen in-house expertise and assist your business to achieve and maintain compliance with Statutory Occupational Health and Safety requirements.

We can also offer a selection of OH&S training related services including training needs analysis and OH&S course design and development.

Chemical Safety Management

Where any activity in the workplace requires the use of chemicals that are hazardous, dangerous, corrosive, flammable or otherwise harmful to human health or the environment, certain legislative and other requirements for the storage, handling and disposal must be met.

As a result, we can:

- Conduct chemical and dangerous goods audits, including compliance audits
- Prepare hazardous substance registers and dangerous goods registers/manifests
- Conduct assessments to ensure storage and disposal of hazardous substances and dangerous goods is consistent with local, State and National legislation, Standards, Codes or Practices and Licences/Permits
- Collate Material Safety Data Sheet (MSDS) folders for the workplace place and specific work areas
- Complete hazardous substance risk assessments
- Provide placarding advice

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