



# Innovative solutions for upstream oil and gas

INDUSTRIES AND ENVIRONMENT

[WWW.SGS.COM.AU](http://WWW.SGS.COM.AU)

**SGS**

# SGS Upstream Services cover the complete process of well exploration and development.

Our robust technology, knowledge-based approach and dedication to quality and safety allow us to provide innovative solutions to every part of the oil and gas industry. Our services for the upstream sector help you locate, analyse and extract oil and natural gas from onshore and offshore fields.

## SGS OVERALL OFFERINGS

- Surface Well Testing
- Flowback Services
- Slickline Services
- Well Integrity Services
- Gearhart Manufacturing and Machining Services
- Field Sampling and Analysis
- Microbial Monitoring
- Multiphase Tracer Testing
- Isokinetic CGR and WGR Measurements
- Production Optimisation and Flow Assurance
- Papua New Guinea Services

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*“SGS provides a deep portfolio of upstream field services with an unrivalled track record in the Australian oil and gas sector. This experience, coupled with long standing business partners throughout Australia and Papua New Guinea makes SGS Australia a dependable service provider in uncertain times.”*

**ZACH SPARK**  
BUSINESS DEVELOPMENT MANAGER  
AUSTRALIA AND PNG

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**SGS PROVIDES A FULL SUITE OF UPSTREAM SOLUTIONS BASED ON EXTENSIVE FIELD EXPERIENCE, A RELIABLE TRACK RECORD AND A FULL UNDERSTANDING OF YOUR REQUIREMENTS, ENABLING YOU TO ACHIEVE OPERATIONAL PROFITABILITY AND EFFICIENCY.**

#### **SURFACE WELL TEST SERVICES**

Surface well test data guides you in process optimisation, ultimately maximising your production from a well. The tests and subsequent controls that are run to support the exploration, development and production of wells are essential, without them it would not be possible to ascertain the potential oil and gas fields that are being discovered and developed. When you explore new wells this information minimises the time it takes to get the wells into operation.

#### **WELL TEST DESIGN**

SGS assists you with well test designs including equipping and commissioning on-site laboratories, cost analysis, acceptance testing and calibration. When it comes to interpreting the results and making decisions based on them, the SGS data interpretation service offers a follow up process, making surface well test services comprehensive from end-to-end.

Each test package begins in the exploration stage and continues as the well develops into production, with a wide range of secondary gas, oil and water treatment options, allowing fast track production from new wells and fields.

#### **ISOKINETIC CGR AND WGR MEASUREMENTS**

Primarily used on lean gas-condensate systems where accurate measurement of Condensate to Gas Ratio (CGR) and Water to Gas Ratio (WGR) can better determine the viability of a reservoir versus traditional test separator systems that may struggle for accuracy; this custom solution uses a modified choke manifold with flow mixer and an isokinetic sampling probe to take a representative side stream of the produced gas and fluids from a well at an isokinetic rate.

This side stream is channelled to a small separation mini-laboratory that includes metering and a high efficiency separator that measures the CGR and WGR. Due to its much higher retention time and ability to have the separator temperature controlled independently of the flow line, more accurate measurements of the CGR and WGR are possible, along with real-time investigation of temperature effects on condensate yield. PVT samples can also be obtained from the system for onsite or offsite PVT analysis.

## FLOWBACK SERVICES

In addition to Surface Well Testing Services, the requirements for safe, robust and reliable flowback solutions exists on most hydraulic stimulation projects, coil tubing projects and other rigless activities. SGS provides you with a full suite of flowback services that have the ability to transition into Surface Well Testing activities should there be a project requirement to do so. Our highly trained personnel manage flowback activities for post stimulation and coil tubing projects with a variety of customisable surface equipment layouts ranging from simple iron packages through to multi-stage separation packages.

**WIREFLINE IS A CABLING TECHNOLOGY USED TO LOWER EQUIPMENT OR MEASUREING DEVICES INTO A WELL FOR THE PURPOSES OF WELL INTERVENTIONS AND RESERVOIR EVALUATION.**

## WIREFLINE AND SLICKLINE SERVICES

Slickline operations involve maintenance, such as the removal of wax, scale, sand and fill build-ups, terminating flow and setting hydraulic packers using sealing plugs, gauge cutting, setting or removing plugs, deploying or removing wireline, retrievable valves and memory logging of down-hole logs using Memory Production Logging Tools (MPLT) and down-hole vision (using run cameras).

The use of SGS slickline units provides you with a variety of well intervention services and measurements that are essential during the time a well is in production. SGS slickline services include the control of sliding sleeves to open and close access to zones and the replacement of gas lift valves. Additionally they can measure the depth of the well and well perforation (using run gun assemblies) and down-hole pressures and temperatures (using run gauges).

Our slickline units are tried and tested and we have cased hole equipment packages available throughout Australia and Papua New Guinea.

## WELL TEST INTERPRETATION

Well tests are a costly form of data acquisition. Our services ensure that all the data available for a well and reservoir is acquired and taken into account during well test interpretation. This maximises the value of your well tests and delivers you a high quality interpretation.

Our well test interpretation services provide you with:

- Opportunities to enhance well productivity
- Increased understanding of your reservoir characteristics, with integrated and effective multidisciplinary interpretation
- Confidence in developing your discoveries





## WELL INTEGRITY SERVICES

Assure your well integrity and maximise the value of your well test with independent high quality services from SGS.

Producing wells are primary assets that need to be maintained effectively. Furthermore, both regulatory requirements and risks to environment and safety require that well integrity is a key focus area. At SGS, we perform independent monitoring, evaluation and verification of well integrity to the highest standards.

Our well integrity reviews will ensure:

- Assurance of compliance with regulations and industry standards, backed by SGS quality standards
- Risk and integrity management
- Cost-effective well intervention and remediation measures

## ONE OF AUSTRALIA'S LEADING DESIGNERS AND MANUFACTURERS OF OILFIELD EQUIPMENT

Part of SGS, Gearhart United is a leading designer and manufacturer of oilfield equipment in Australia. We offer you unrivaled expertise and a reputation for providing quality precision machining equipment from our manufacturing facility located on a 2.2 acre site in Wingfield, South Australia. We can help you:

- Get quality equipment, on time, every time: as a leading oilfield equipment engineering and design provider, we offer you the convenience of a full turnkey service to deliver what you need, when you need it. From a single product or full design, through to development and testing of new products, we provide equipment for use in the oil, gas and geothermal industries.

- Reduce risk by using the highest quality equipment: our products are manufactured under a Quality Management System, audited and certified to API and ISO 9001:2000 international specifications. All materials used in the manufacture of your products are certified and traceable, so you can be certain of the highest levels of quality.
- Access viable hydrocarbon reserves: we offer you a comprehensive range of drilling and completion engineering and production technology studies. We can help you optimise your projects and create value by drilling fit-for-purpose wells linked to subsurface needs, surface capacity and constraints. We cover the whole spectrum – from design, to final programs and well delivery.



## FLOW ASSURANCE

SGS' consultancy team supports its clients in maximizing value from their assets through integrated well and facility integrity and flow assurance studies, covering production chemicals and corrosion / scaling / wax and asphaltene deposition risk evaluation.

To maximise value from an asset, the optimum uptime and availability of wells and facilities must be ensured, and therefore maintaining well and facility integrity coupled with assuring fluid flow from reservoir to export is essential.

Our experts cover a wide range of topics and aim to deliver practical and efficient solutions for our clients' challenges involving independent assessment of options and scenarios.

SGS consultants can develop wellbooks and carry out full well integrity reviews covering technical assessments involving the generation of well barrier diagrams to independent verification of well barriers, and qualitative risk assessment aimed at the development of mitigation plans.

Topics covered include amongst others:

- Advice, development and implementation of Well Integrity Management Systems (WIMS)
- Work-over and well intervention program design and review
- Well Monitoring plan design and review
- MAASP review and calculations
- Well construction and barrier review

In terms of flow assurance, SGS consultants can recommend a suitable laboratory analysis program, carry out thermodynamic modelling of fluids to obtain precipitation envelopes, conduct hydraulic analysis (e.g. line and slug sizes) and perform an evaluation of operational procedures considering flow assurance risks. Topics covered include amongst others, the determination of wax appearance temperatures (WAT), asphaltene solubility boundaries, hydrate association (or disassociation) boundaries, and scale solubility boundaries.

SGS Production Chemists also carry out independent reviews of production chemicals cost and performance optimisation to increase production and reduce OPEX for chemical expenditure.

Moreover, we also integrate SGS laboratory analysis capabilities and innovative workflows (e.g. Microbial Risk Assessment Services) with well and facility integrity, flow assurance, production optimisation and production chemistry expertise. These services are all underpinned by state-of-the-art data analytics workflows in order to provide a powerful toolkit to maximise value to you.

## **MULTIPHASE FLOW METERING CONTINUOUSLY MEASURES THE INDIVIDUAL FLOW RATES OF OIL, WATER AND GAS DURING A WELL'S PRODUCTION.**

### **MULTIPHASE MEASUREMENT**

The need for the measurement of flow rates has increased during recent decades as the industry has been forced to explore the economic viability of reservoirs that were previously drilled

Today, multiphase technology can provide better accuracy and more reliable results than previous traditional technologies that were used during early exploration campaigns and developmental phases. The multiphase flowmeter (MPFM) gives you a full understanding of your well's performance, with quick well diagnostics and lower costs per well test than with other methodologies.

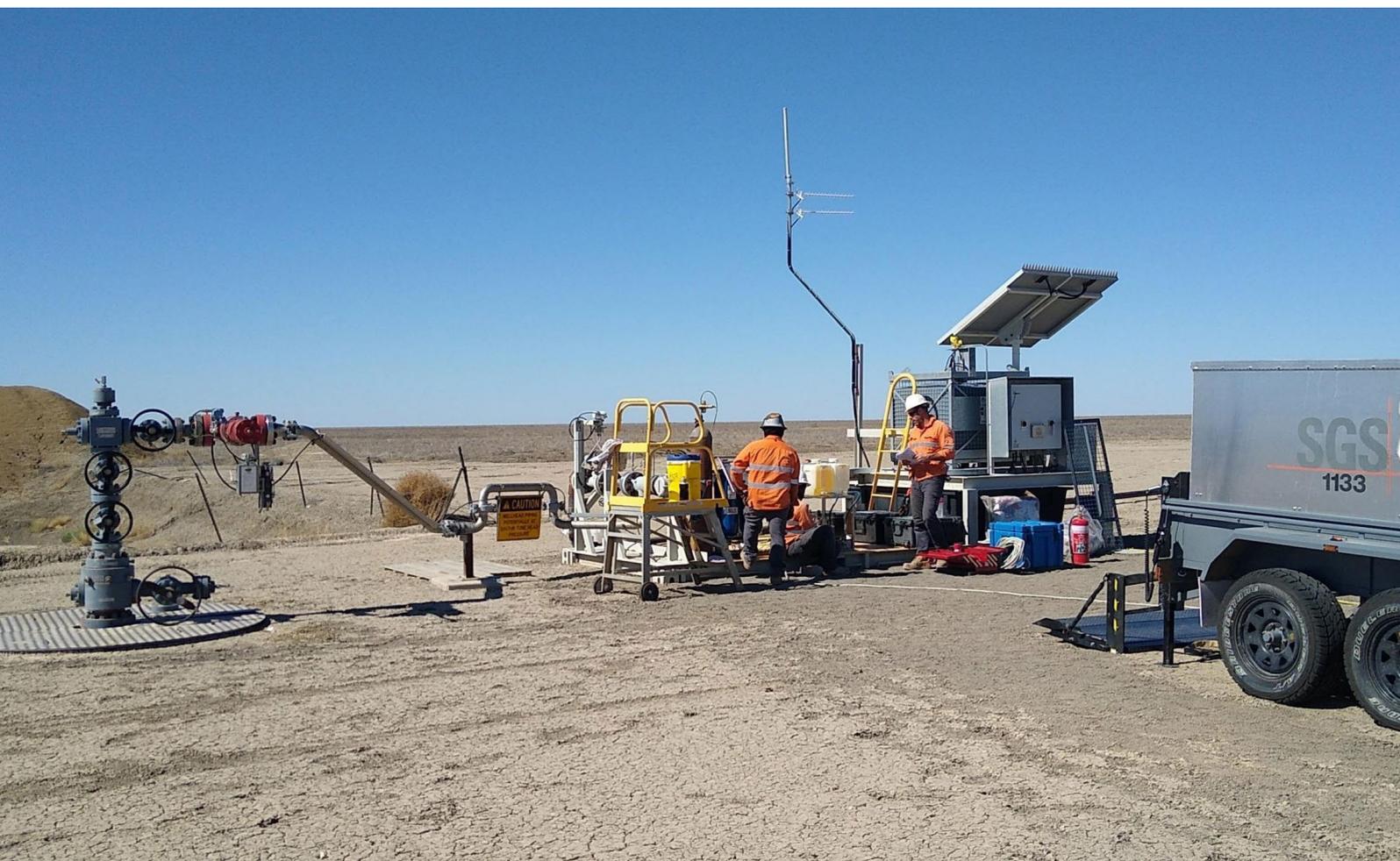
### **MULTIPHASE TRACER TESTING**

Tracer dilution testing allows determination of multiphase flow where individual gas, water and oil/condensate flow rates is measured independently without disruption to flow or production. It involves injection of suitable non-radioactive tracers into the flow line, followed by subsequent sampling of gas and liquid downstream of the injection point. Subsequently determination of the tracer dilution ratio provides accurate calculations of the gas, water and oil condensate flow rates.

This exciting technique is a highly mobile service with a low footprint for onshore and offshore testing of your oil and gas producing assets, or in tandem with conventional well testing techniques on developing projects.

### **MULTIPHASE METER**

SGS uses the Roxar 2600 third generation MPFM as a mobile unit that has a simple light weight design, weighing 80 percent less than its predecessor. With its innovative Zector technology (advanced signal processing, new field electronics and electrode geometry) it provides accurate flow characterisation and has integrated measurement of pressure, differential pressure and temperature. A non-radioactive version covers most operating conditions and there is a gamma version available for special applications and high GVF.





## FIELD SAMPLING AND ANALYSIS - MICROBIAL MONITORING (MIRAS)

SGS offers several microbial analysis techniques that are deployed globally. We offer techniques that can be deployed on-site and off-site on both fluids and solids. Some technologies focus on instant quantification of microbes, while the others provide specific details based on DNA analysis. Typically we deploy a combination of the following Microbial Monitoring techniques:

- Adenosine triphosphate (ATP) allows for onsite enumeration of all active microbes.
- Most Probable Number or serial dilution technique (MPN) SGS offer a variety of growth media to quantify specific microbial groups in varied salinity and pH levels.
- Quantitative Polymerase Chain Reaction (qPCR) is a DNA based technology to enumerate specific microbial groups and SGS offers a variety of assays (microbial target groups) both on-site and off-site.

- Next Generation Sequencing (NGS) is a very powerful technology that allows for the identification of all microbes present in a sample.

Our team can design specific monitoring programs and will make sure the techniques deployed are effective for the specific operating conditions and operational constraints.

### PAPUA NEW GUINEA SERVICES

SGS has been providing a large range of upstream field services in Papua New Guinea since 2007. Our custom built packages are completely heli-portable, allowing operation in the challenging terrain and conditions that Papua New Guinea present. Ranging from 3 phase Separator packages with cutting edge Data Acquisition systems, remote Heli-portable camps, through to Cased Hole Services packages, we have the equipment in country that ensures your operations continue on schedule.

With a modern fleet of equipment, experienced personnel and committed management, SGS ensures high service quality and a commitment to operations.

We are SGS – the world's leading testing, inspection and certification company. We are recognized as the global benchmark for quality and integrity. Our 89,000 employees operate a network of 2,600 offices and laboratories, working together to enable a better, safer and more interconnected world.

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WHEN YOU NEED TO BE SURE

