

Lucid Consultants Capability Statement

Located in Perth Western Australia, Lucid is an Energy Consultancy providing services to the major Petroleum and Geothermal Companies in Australia. Founded in 2004, the consultancy has emerged with an excellent reputation with 30 professionals working in the office and in the field, with diverse expertise such as:

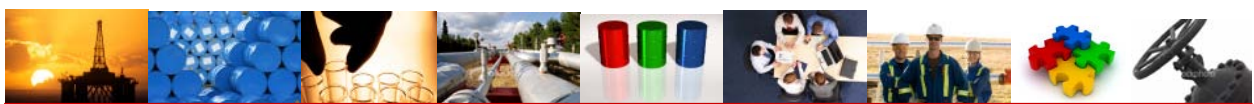
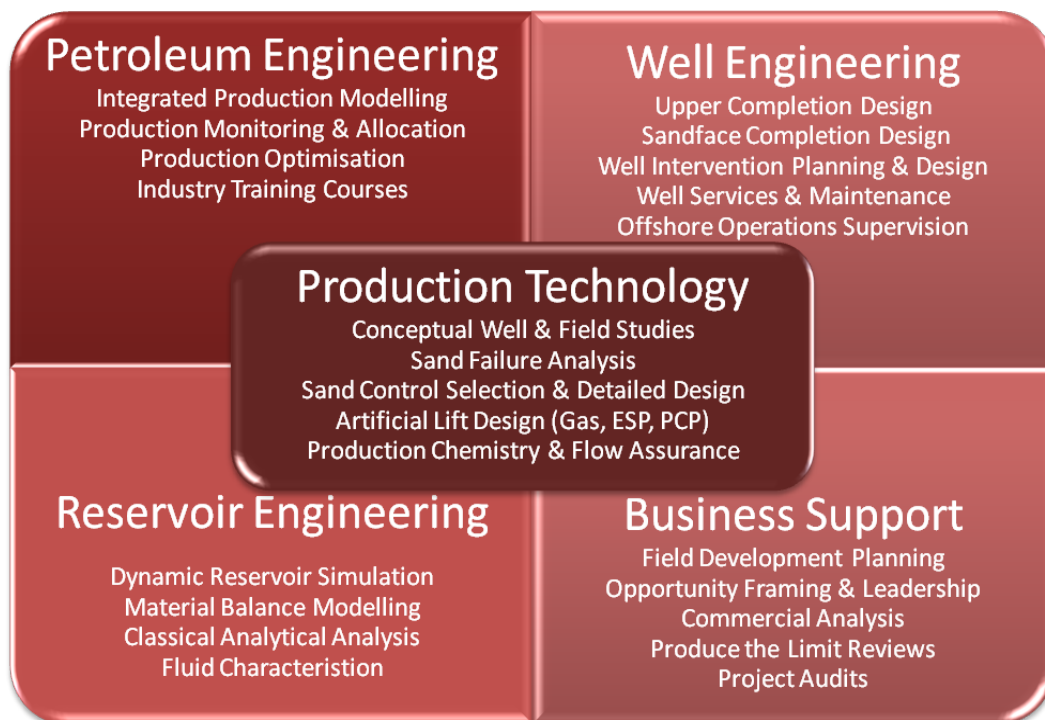
- ▶ Production Modelling from Reservoir to Separator
- ▶ Production Technology
- ▶ Reservoir Engineering
- ▶ Detailed Petroleum & Geothermal Well Design and Installation
- ▶ Well Site Services.

The message to our clients and prospective employees is simple:

- ▶ Lucid has good people
- ▶ We set ourselves high standards and are proud of our work
- ▶ We do what we say
- ▶ We enjoy what we do

Company Capability

With combined capabilities spanning a broad range of disciplines, Lucid can support any Petroleum Engineering or Geothermal project for our clients. Our services can be represented by these 5 key disciplines:



Production Modelling and Optimisation

Lucid are advanced users of Petroleum Experts suite of software:

- MBal™: Reservoir Material Balance
- PROSPER™: Detailed well modelling (horizontal, subsea, platform, big bore gas wells, artificial lift)
- GAP™: Subsea or surface flowlines, pipelines, manifolds, compressors, platforms, Separators.
- PVTP™: Fluid characterisation, validation of samples and laboratory results
- RESOLVE™: Apply sophisticated constraints to control and optimise production from the gathering system
- IFM™: Real-Time Production Monitoring and Optimisation

Our strengths in modelling the entire production system allows us to be involved throughout the **entire life cycle** of the wells and fields, from **conceptual** well design, to **detailed** sandface, lower and upper completion design, field development **screening** options, pipeline sizing, through to production **monitoring, optimisation** and **troubleshooting**.

Detailed models, calibrated to real production data, enable the quantification of opportunities to **increase production** from mature assets through **debottlenecking, well interventions** and applying **production technology**.

Production Technology

Detailed selection and modelling of **artificial lift** (such as gas lift, multiphase pumps and ESPs)

Sand failure analysis enables us to determine down-hole sand control requirements and detailed selection of the optimum **sand control technique**.

Passive and active **downhole chokes** such as inflow control devices and valves for controlling the inflow performance in heterogeneous formations and managing coning issues

Reservoir stimulation design such as hydraulic fracturing to bypass formation damage or to improve deliverability and recovery from tight reservoirs.

Full life-cycle tubing selection by conducting **tubing stress analysis**.

Flow assurance; issues such as production chemistry, hydrate formation, erosion and corrosion analysis

Reservoir Engineering

Dynamic reservoir simulation studies using Eclipse™. Either develop simulation models for generating production **forecasting** for development planning or **history match** production data to identify **in-fill well** opportunities

Reservoir dynamic simulation and surface network **coupling** using either Petroleum Experts (RESOLVE) or Schlumberger (AVOCET IAM) software. This incorporates the dynamic reservoir simulation with wells and the surface pipe-work and facilities at each time step during the prediction phase resulting in more accurate predictions.

Use classical **material balance** calculations in tank models of the reservoir (especially for reservoirs containing gas and retrograde condensate) to identify hydrocarbons in place, major drive mechanisms and ultimate recovery.



Decline curve analysis to extrapolate well or field performance to ultimate recoveries.

Fluid characterisation as inputs to simulation studies, validation of samples and laboratory results.

Detailed Completion Design and Intervention

Detailed design of the **sandface completion** including all types of **sand control** (ESS, premium stand-alone screens, open hole gravel packing, chemical consolidation, frac. & pack).

Upper completion design including all completion components, tubing sizing, safety valve selection, artificial lift components (gas lift mandrels & valves, ESP), production and liner packer selection, PBR, nipples, etc ...)

Designing the completion components to facilitate **well interventions** and re-entries for logging and data acquisition.

Well construction **cost estimating** and budgeting.

Liaison with **service companies** to select the **best technology** for the job.

Application of **smart completion** technology such as adjustable chokes, sliding sleeves for multiple, isolated production intervals. Downhole gauge technology and distributed temperature sensors.

Well Site Services

All **planning, equipment procurement and assembling, testing, logistics and execution** of:

- New completion installations or **work-overs** (tubing replacement)
- **Well Services Supervision** such as slick-line logging, e-line tractor, perforating, gas lift installation, tubing conveyed perforating, plug setting and retrieval.
- All aspects of **Platform Wellhead Maintenance**.

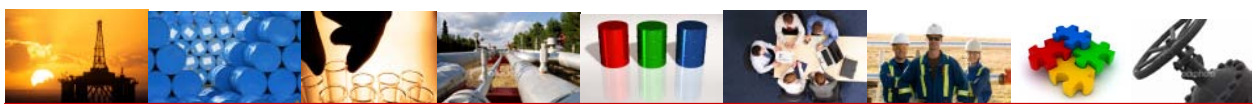
All completion programme writing and **government and regulatory liaison** for approvals.

Field Development Planning & Opportunity Framing

Our knowledge of the full production system (reservoir to separator) enables us to advise clients during the Field Development Planning phase of a project.

Specific services can apply throughout the overall lifecycle of a field:

- Field development plan screening and optimisation
- Opportunity framing and management
- Short, sharp and focused reviews of producing assets for value improvement
- Independent, expert review of existing and new business challenges
- Independent, expert technical and strategic assurance advice



Track Record

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|  | <p>North West Shelf Joint Venture Browse LNG Development Greater Gorgon LNG Development WA Oil Asset</p> |
|  | <p>North West Shelf Joint Venture Browse LNG Development Sunrise Gas Development Laverda Oil Development Otway Gas Development Industry Training</p> |
|  | <p>Habanero Proof of Concept Project</p> |
|  | <p>Data Room Analysis</p> |
|  | <p>North West Shelf Joint Venture</p> |
|  | <p>Montara & Skua Oil Developments</p> |
|  | <p>NWS Exploration Campaign</p> |
|  | <p>Browse LNG Development</p> |
|  | <p>Harriet Joint Venture STAG & Legendre Oil Developments Van Gogh Oil Development Brunello & Julimar Gas Developments Industry Training</p> |



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|---|--|
|  | <p>Industry Training</p> |
|  | <p>West Erregulla Gas Development</p> |
|  | <p>Manutahi Oil Development Kupe Gas Field</p> |
|  | <p>Wandoo Oil Development</p> |
|  | <p>Mondarra</p> |
|  | <p>Industry Training</p> |
|  | <p>Expert Advice</p> |

