



# ENERGY

**VECTA**

**FORWARD THINKING**

Our people have expertise that has centred around the Energy Industry in Australia, with skills in the development of green field and brown plants.

Our people have core competencies in the following areas:

- ✓ **Refining and Petrochemicals**
- ✓ **Coal Seam Gas**
- ✓ **Onshore Gas Facilities**
- ✓ **Renewables**

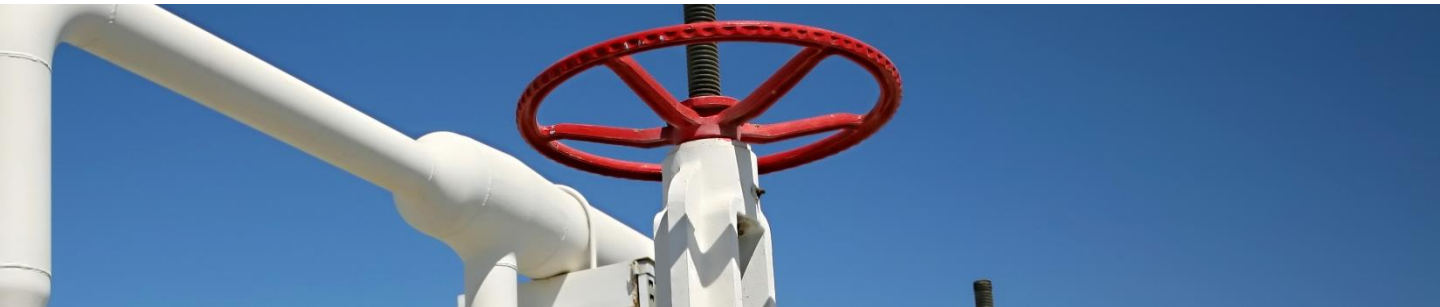
## REFINING AND PETROCHEMICALS

- Conversion from gas oil to a mixed LPG/ethane feed which included:
  - Project Design Specification (FEED) and detail design phases of the project.
  - Modifications to the main processing plant, offsites and utilities
  - New and replacement equipment in greenfield and brownfield areas
- Study to develop capital costs for OSBL items at 4 sites for a new grassroots 400,000 BPSD export refinery and associated petrochemical complex.
- Study for Proposed New Grassroots Refinery, Southern African Region
- Market analysis of product supply and demand in the region, to determine refinery throughput and configuration to satisfy market including:
  - Definition of all processing, auxiliary, & utility units to the level of sized equipment lists,
  - Tankage / product movement facilities,
  - Infrastructure requirements,
  - Developing capital cost estimate to +/-30% accuracy,
  - Financial analysis to assess viability of venture.



## COAL SEAM GAS

- Managing 120,000 manhour FEED for Upstream Surface Facilities
- Design of domestic field infrastructure facilities including Dehydration Units, Compressors (centrifugal, reciprocating and screws), separators, knock out drums, flare systems
  - Dispersion and radiation calculations using Phast
  - Rotating equipment maintenance and reliability programmes
  - Specialist rotating equipment advice for gas turbines and compressors
  - Concept study for the addition of 14 new well sites, an HDPE gas gathering system and spine line,
- Gas Project Expansion Project which included:
  - Concept study for the expansion of the existing operation through the addition of 14 new well sites,
  - 26kmHDPE has gathering system and spine line,
  - Infield 32TJ/day Booster Station compression station and new pipeline to the existing gas plant
  - Establish the MAOP for HDPE gathering system and pipelines as per AS4130 and AS2566.1,
  - Basis of design and Concept Selection reports,
  - Preliminary pipeline, piping, valve and major equipment MTO's,
  - TIC estimate for HDPE gathering system and pipelines.
- Gas Injection Storage Project which included:
  - FEED and Detail Design for a new DN200 CL600 interconnect pipeline and DN150 CL1500 re-injection pipeline to AS2885.1 and associated station piping and mechanical equipment for new compressor station;
  - Concept Design, FEED and Detail Design of a 32TJ/day coal seam gas underground plant.





## ONSHORE GAS FACILITIES

- Gas Storage Withdrawal Project FEED and Detailed Design:
  - Assessment and design of suitable gas treatment equipment to direct gas from the Processing Plant to the LPG plant.
  - Review of existing flare / blowdown system capacity and sizing of a new vent header / stack.
  - Hydraulic calculations and line sizing of new blowdown piping and liquids handling system
  - Sizing of PSV's and blowdown / flare system capacity
  - Development of HYSYS process models
  - Control valve sizing
  - Pump sizing
  - Development of PFDs and P&IDs
  - Three-phase Separator Sizing
- Ethane Disposition Study
  - Assess alternative short and long term dispositions for ethane produced at the gas plant.
  - Analysis of plant operating data to determine ethane, propane and butane recovery into LPG under different operating modes from maximum recovery to rejection,
  - Process simulation of a Gas Plant and assessment of their operation with new deethaniser Preparation of sized equipment lists for deethaniser trains and associated refrigeration equipment,
  - Developing capital cost estimate to +/-30% accuracy.



- Amine Plant conversion
  - Amine Plant conversion to MDEA in place of DGA to maximise on specification sales gas production including redesign of plant control system,
  - development of the Design Basis Memorandum, front end and detail engineering design,
  - process design for a variable speed drive pump and permanent condensate transfer line from a gas plant to a crude pipeline.
- Gas Storage
  - Concept design for the upgrade of the compression facilities at a gas plant,
  - development of dynamic models of pipeline feeding the gas plant and liquids handling section of the plant to assess liquids handling capacity,
  - evaluation of the gas plant capacity to accommodate unprocessed feed gas while maintaining sales gas to specification.
- Gas Development Project Concept Engineering
  - Selection and assessment of suitable gas treatment technology to upgrade the existing gas plant to accept fluid from the gas field,
  - process capacity checks of existing equipment,
  - development of HYSYS (dynamics) process models,
  - assessing environmental regulations and requirements for the disposal of gas containing H<sub>2</sub>S,
  - wastewater treatment,
  - review of existing flare / blowdown system and introduction of a staggered blowdown system
- Gas Export Compressor Station
  - Assessment and selection of suitable compression infrastructure,
  - Review of existing flare / blowdown system capacity and sizing of a new vent header / stack.
  - Hydraulic calculations and line sizing of new blowdown piping and liquids handling system
  - Sizing of PSV's
- Gas Satellite Upgrade
  - Assessed the requirements of the existing gas satellite facilities in order to accommodate the infill drilling program,
  - Bulk liquid-gas separation,
  - Metering and compression
  - Relief and blowdown system tied into the existing facilities.

## RENEWABLES

- Technology assessment for Solar PV and Thermal
- Equipment sizing and layout design
- Civil infrastructure and footing design for Solar panels and equipment
- Steam turbine sizing and selection
- Molten Salt material selection for piping and equipment
- Electrical substation design and specification
- Connection to grid

