

Altia Energy Ltd - Tee Pee Creek

- Design and project management of a 3 MMSCFD sour facility.

Anadarko Canada Corporation (now CNRL) - Junior

- Design, material and equipment specifications, procurement and project management for the construction of a new separation/dehydration station with capabilities for future compressor installation. Design capacity 28 MMSCFD sour gas.
- Design, material and equipment specifications, procurement and project management for the construction of a two wellsites and associated pipeline. Design Capacity: 8 MMSCFD sour gas each.
- Design, material and equipment specifications, procurement and project management for the construction of a new wellsite and associated pipeline. Design Capacity: 12 MMSCFD sour gas.

Anderson Exploration Ltd.(now Devon Canada Corporation) - Valhalla

- Design and project management of a 40 MMSCFD gas refrigeration facility including 4500 HP compression.

APL Oil & Gas Ltd. - Niton

- Design and project management of a refrigeration plant: 27 MMSCFD, 624 B/D LPG mix.

ATCO Midstream - Golden Spike

- Preliminary engineering and technical auditing of the detailed design for a 1127 e3m3/day (40 MMSCFD) sour gas plant involving 333 kW (450 HP) acid gas (50% H₂S) injection, turbo expander and coldbox, ethane extraction, mole sieve, and mercaptan removal. Project management and engineering management, EPC contract development and administration, start-up services.
- Process design, permitting, and project management for a sacrificial sweetening system. Project included Solar turbine upgrades, replacement of trays with structured packing and construction management.
- Study for third party gas processing, slug control and processing options.

Aux Sable Canada Inc - Whitecourt

- Conceptual, DBM and front end design of a 4,000 bbl/d fractionation and truck unloading facility.

Banagas JGC - Bahrain

- Project management and commissioning of two 55 MMSCFD and one 110 MMSCFD dehydrators.

BHP Petroleum (Canada) Inc.

Cecil Lake

- Design and project management of a sweet gas plant: 3.5 MMSCFD, 600 HP compression, refrigeration, 105 B/D LPG mix.

West Pembina

- Design and project management of a sweet gas plant: 600 MSCFD, 125 HP compression, refrigeration, 15 B/D LPG mix.

Blue Range Resource Corporation - Joffre

- Design and project management of a 10 MMSCFD gas plant comprised of inlet separation, compression, refrigeration, liquids fractionation and LPG storage.
- Plant expansion to 17 MMSCFD.

Border Midstream Services - Calgary

- Acquisition evaluation of multiple gas plants processing 1,000 MMSCFD incorporating amine plants, turbo-expanders and acid gas injection.

Canada Northwest Energy Limited (now Sherritt International Corporation)

Boca de Jaruco, Cuba

- Conceptual design and project logistics for a 4 MMSCFD gas plant involving air blending scheme, 65 USGPM amine plant, 1200 HP compression and a 150 HP refrigeration system.
- Completion, workovers, production and operations management for a 17 well oil field (30° API) including liaison with Cuban regional officials. Responsibilities included co-ordination of office, field and contract services.

Oldman

- Design and project management of a new gas plant: 18 MMSCFD, refrigeration, sweetening, 300 B/D LPG Mix, 600 HP compression.

Varadero, Cuba

- Waste Heat Recovery System Study: fuel gas used to feed turbine driven electric generator which fed major tourist needs at Veradero beach. The soft water from the battery would be pumped to recover heat from the turbine exhaust and the produced steam would be used at the battery for process needs.
- 10 MMSCFD Gas Plant Study: 300 gpm amine sweetening, refrigeration, compression, 35 T/D sulphur plant.
- Completion, workovers, production and operations management for an 11 well field (10° API) including liaison with Cuban regional officials. Responsibilities included co-ordination of office, field and contract services.
- Responsible for the detailed engineering for a 10,000 B/D facilities upgrade comprising a gathering system, test/metering/pump stations and major treating facility c/w ship loading facilities. Also, a comprehensive feasibility study was done that examined the economic scenarios for phased expansions to 40,000 B/D.
- Operations review and troubleshooting on and amine and IFPEX facility.

Chancellor Energy Resources Ltd. - Garrington

- Gas plant construction supervision.

Devon Canada Corp (formerly Anderson)

Birley Creek, BC

- Process design for 8 MMSCFD gas separation, 740 HP compression and 8 MMSCFD dehydration. Provided permitting, engineering, project management and commissioning including mechanical design, equipment specification, procurement, expediting, instrumentation and controls design.
- Permitting, process design and project management for the installation of compressor station.
- Process design for dehydration and amine sweetening of fuel gas (300 MSCFD).

Gunderson

- Project Manager for a sour gas plant: 1409 e³m³/day (50 MMSCFD), 15% H₂S, mole sieve, inlet slug catching, two 400 kW power generators, a 1110 kW (1500 HP) compressor, operations camp, infrastructure, 2 wellsites tie-ins, vapour recovery system. The equipment included the piping, instrumentation and controls, compressors, towers, heat exchangers, pumps and vessels. Responsible for operating manuals, commissioning and start-up.

Normandville

- Permitting, engineering, drafting and project management of a sour gas plant: 20 MMSCFD, 3000 HP compression (inlet and sales), 200 HP refrigeration, 20 USGPM amine sweetening, 50 HP acid gas re-injection compression.
- 2002 Expansion: Stabilizer, LPG bullet and pump skid.
- Acid gas composition: 10% H₂S and 90% CO₂. Acid gas compressor: 50 HP @ 2000 psig discharge. Acid gas pipeline: 1.5km with wellhead pressure of 1750 psig. Acid gas rate: 135 kg/hr.
- 2004 Expansion: Installation of condensate flash tank.

North Cecil

- Permitting, engineering, drafting and project management of a sour gas plant: 45 MMSCFD, 6000 HP compression, 450 HP refrigeration, 65 USGPM amine sweetening, recycle compression, acid gas incineration.

Pica

- Permitting, design and project management of a sweet gas plant: 16 MMSCFD, 740 HP compression, 150 HP refrigeration, condensate product.

Puskwaskau

- Design and project management of a sour gas plant: 20 MMSCFD, 1,478 HP compression, 200 HP refrigeration, 20 USGPM amine sweetening, 125 HP (57% H₂S, 43% CO₂) acid gas re-injection compression, 50 HP water disposal pump, and 40 HP recycle compression.
- Permitting and public consultation.
- Plant modifications including incinerator installation and replacement of heat exchangers.

Rycroft

- Design and project management of a 24 MMSCFD sour gas plant including 125 USGPM amine sweetening, 350 HP refrigeration, C₅₊ production, 3000 HP primary gas compression, 250 HP acid gas injection and 1200 KW power generation.
- Acid gas composition: 70% H₂S, 29% CO₂. Acid gas compression: 250 HP at 1220 psia discharge. Acid gas pipeline: 500m with 1218 psia wellhead pressure.

South Eaglesham

- Design and project management of a 20 MMSCFD sweet gas plant including gas gathering, inlet separation, compression, refrigeration, liquids fractionation, NGL and LPG storage producing 400 BBL/D LPG mix, 465 BBL/D oil.

West Culp

- Design and project management of a 20 MMSCFD sour gas plant including 125 USGPM amine sweetening, 350 HP refrigeration, LPG production, oil battery modifications, solution gas compression, 3000 HP primary gas compression, 250 HP acid gas injection and power generation.
- AENV permit application.
- AEUB permit application and audit manual.
- Acid gas rate: 2190 lb/hr. Acid gas composition: 53% H₂S, 45% CO₂. Acid gas compression: 250 HP at 1220 psig. Wellhead pressure 800 psi.

Duke Midstream (now Spectra Energy Midstream, formerly Canrock)

Fourth Creek

- Project management of the design, procurement and construction of a sour gas plant, 69 MMSCFD, 10 t/d sulphur inlet, two 30 & 45 GPM mixed amine processes, 200 HP (-10 deg F) and 500 HP (-45 deg F) refrigeration units, 1800 HP Paddy compression scheme, 3,000 HP plant sales compression, 150 HP acid gas (30% H₂S) re-injection compression. Acid gas pipeline: 3830m.
- Equipment and piping layout for a refrigeration skid addition.
- Design and project management of a 2145 HP installation.
- Design and project management of a pipeline installation.
- MOC approvals.

Other (Alberta)

- Installation, filed testing and troubleshooting of MassTrak on gas plants.

Elk Point Resources Inc. - Saddle Hills

- Detailed design, procurement and construction management for an 8 MMSCFD MDEA amine gas sweetening plant with 2 stage 700 HP inlet / sales compression, CO₂ removal and glycol dehydration.
- Equipment and piping layout for the addition of inlet compression, amine sweetening and dehydration facilities.

Enco Gas Ltd. - Shekilie

- Design and project management of a 8.5 MMSCFD gas plant and gathering system.

Find Energy Ltd. – Blue Rapids

- Design and project management of a 30.0 MMSCFD gas plant including compression, refrigeration, stabilization, and fractionation to produce a frac fluid.

Gardiner Oil and Gas - Caroline

- Design and project management of a 5 MMSCFD gas plant: - 40 deg F refrigeration, 220 B/D LPG mix.

Gas Liquids Engineering Ltd. - Calgary

- Developer and programmer of MassTrak, on-line real time monitoring and balance analysis of the inlet and outlet streams of sour gas plants.

Gascome Oils Ltd. - Turin

- Design and project management of a 25 MMSCFD gas plant, 430 gpm DEA amine plant, 200 B/D LPG mix.

Grad & Walker Resources Ltd. - Granum

- Design and pipeline installation management.
- Sweet gas plant permit, 5 MMSCFD.

Grand Banks Energy Corp. – Tower Creek

- EPCM of a sour gas plant project: 1409 e3m3/day (50 MMSCFD), 15% H₂S, mole sieve, inlet slug catching, two 300 kW power generators, infrastructure, sour water stripping, and incineration. The equipment included the piping, instrumentation and controls, compressors, towers, heat exchangers, pumps and vessels. Responsible for operating manuals, commissioning and start-up.
- Single well tie in for 705 e3m3/day of 15% H₂S sour natural gas, 35 MPa piping design, choke line heater, heat string, 1400 m insulated pipeline and pigging facilities.

Hillcrest Resources - Enchant

- Field construction supervision for gas plant.

Hudson's Bay Oil and Gas Company Limited - West Edson

- Design and project management of a 15 MMSCFD gas plant with 150 HP refrigeration.

Husky Oil Operations Ltd. - Blackstone

- Air dispersion modeling and environmental approval for a 200 MMSCFD acid gas facility.
- VRU and acid gas compression (300 HP) addition.

Kinder Morgan CO₂ Company – Texas, USA

- Kinder Morgan CO₂ Company is the leading U.S. transporter and marketer of carbon dioxide for Enhanced Oil Recovery (EOR). A key asset, the SACROC Unit located in West Texas, is one of the largest oilfields and one of the oldest operating CO₂ capture and injection projects in the U.S.
- The SACROC Unit processes over 620 MMSCFD of gas for CO₂ capture and injection while recovering over 30,000 bpd of oil and 15,000 bpd of NGL liquids. Kinder Morgan desired to maximize production and thus requested Gas Liquids Engineering Ltd. to carryout the following two projects.

Capacity Increase Project

- Identified an additional 90 MMSCFD capacity with minor equipment modifications.
- The primary scope involved process review, simulation, major equipment rating and cost estimation for modifications for inlet separation, dehydration, filtration, chilling/separation, booster compression, gas and liquid amine treating, NGL recovery and condensate stabilization.

Expansion Project

- Generated the FEED for a 240 MMSCFD expansion train for CO₂ capture, injection and liquids recovery.
- The primary scope involved design basis memorandum generation, engineering process design, capital cost estimation and data sheet package development involving inlet separation, dehydration, filtration, refrigeration, liquids separation, heating and water-cooling.
- The secondary scope involved to varying degrees process review, cost estimation and data sheet package generation for modifications of all affected downstream processes such as molecular sieves, amine systems, NGL recovery, condensate stabilization and Puraspec. Process design review of MEA liquid/liquid contactor replacement internals, technical consultation for amine systems change-out.
- Process design review of MEA liquid/liquid contactor replacement internals, technical consultation for amine systems change-out.
- Provided economic consultation for the 240 MMSCFD membrane design including financial perspectives and strategic advice.

Kuwait Oil Company - Kuwait

- Assigned for review of overall facility design (# trains, vessels, pieces of major equipment) and mechanical design and datasheets (vessels, internals, externals, diagrams). Project is underway.

Luscar Oil & Gas Ltd. - Granlea

- Design and project management of a 2 MMSCFD sour amine plant.

Murphy Oil Corp. – Tupper West, N.E.B.C.

- Engineering, procurement and construction management (EPCM) currently underway for a 180 MMSCF/d sour natural gas processing plant near Dawson Creek, British Columbia. Design features of the plant include:
 - Inlet slug catching and separation on three separate inlet gathering systems
 - Inlet and sales compression – Four (4) 3-stage Ariel JGZ/6 packages, each with 6500 HP electric drives
 - Amine sweetening – 215 USGPM of MDEA circulation
 - Dewpoint control utilizing mechanical refrigeration (300 USTR and 700 HP refrigeration compressors) and glycol injection (17.5 USGPM of 80/20 ethylene glycol)
 - Condensate stabilization and condensate storage (800 BBL of storage)
 - Sour water stripping and produced water storage (10000 BBL of storage)
 - Acid gas compression – 300 HP electric drive, 5-stage reciprocating compressors
 - Acid gas dehydration – 0.5 USGPM of TEG circulation, stainless steel construction
 - Mixing of acid gas and sweet sales gas to produce a sour sales gas stream including sweet mix compressors (250 HP reciprocating compressors)
 - Vapor recovery (tank and dehydrator still vents) and recycle compression (200 HP electric drive)
 - High pressure, low pressure and acid gas flare systems
 - 25 km long 18” diameter sweet sales gas pipeline and a 5 km long 3” diameter sour sales gas pipeline
 - Full plant utilities including:
 - High and low pressure fuel gas
 - Process heat medium – 1125 USGPM of 60/40 TEG, heater duty of 22 MMBtu/hr
 - Utility heat medium – 265 USGPM of 50/50 EG, heater duty of 6 MMBtu/hr
 - Instrument air and nitrogen purge systems
 - Underground drain and storage systems for closed hydrocarbon drains, floor drains, amine drains and glycol drains
 - Integrated plant control system, including plant DCS, unit control systems and ESD system
 - Plant 13800 V, 6900 V, 600 V, 208 V, 24 V electrical systems including switchgear, MCCs, VFDs and distribution
 - Site civil design and work including grading plans, retention pond design, office/warehouse buildings, site roads, foundations and structural steel
 - Integration with the nearby 23 MW power generation station

North Canadian Oils Limited - Delia

- Design and project management of a 20 MMSCFD gas plant: 250 HP compression, dehydration.

North Canadian Oils Limited

Ansell

- Design and project management of a greenfield gas plant: 16 MMSCFD, 2000 HP compression, refrigeration (-25° F), 500 B/D LPG mix, 500 B/D condensate.

Medicine Lodge

- Pipeline design and installation management.

Whitecourt

- 7.5 MMSCFD amine plant process design and evaluation, specification and bid review.

Northridge Exploration Ltd.- McLeod River

- Design and project management of an 18 MMSCFD gas plant: 700 HP refrigeration, 2,300 HP compression, 250 B/D condensate, 700 B/D LPG mix.
- Supervision of a plant relocation; permitting for a compressor packages with a low noise level design and for pipeline relocation.
- Procurement, construction inspection, commissioning and start-up responsibilities.

Pan Canadian Petroleum Ltd.(now EnCana) - Dimsdale

- Design and project management of a 30 MMSCFD, 1200 HP compression sweet gas facility including dehydration and hydrocarbon dew point control.
- Three field dehydrators - design and installation management.

Paragon Petroleum Corporation - Rochester, Ontario

- Design and project management of a grassroots 3000 B/D oil and 2 MMSCFD sweet gas plant (refrigeration, 300 HP compression).

Paragon Petroleum Corporation - Wildwood

- Grassroots design and project management of a 17 MMSCFD amine facility involving 1160 HP compression, refrigeration, wellsite facilities and gathering system.

Petrolia Oil and Gas Ltd. - Antelope

- Design and project management of a 10 MMSCFD, 750 HP gas compression and choke plant including H₂S treating and gathering system.

Petrorep (Canada) Ltd. - Provost

- Design and project management of a 25 MMSCFD gas plant: 2,400 HP compression, refrigeration, desiccant dehydration, 105 B/D LPG mix.
- Design for the non-destructive desiccant screen modification thereby permitting continued operation of the existing unit.

Poco Petroleums Ltd

McLeod River

- Project Manager for the EPCM execution for a gas plant expansion: 450.8 e3m3/day (16 MMSCFD), -32°C (-25°F) refrigeration, 86 m3/day (540 B/D) LPG mix, 28.6 m3/day (180 B/D) condensate. This involved adding pumps, converting from gas to electric drives, retrofitting subcoolers, and conducting an oil handling study.

Wolf South

- 30 MMSCFD gas plant design and engineering of refrigeration (-35°F), 1900 BBL/D LPG product, inlet compression.

Polish Oil and Gas Company - Dębno, Poland

- Design basis memorandum and project specifications for a 55 MMSCFD sour gas plant including fractionation and sulphur plants. Economic evaluation of 200 cum/d fractionation train options.
- Project management of a US \$70 million gas plant development involving 21 wells and the production of 45 MMSCFD gas, 6000 BPD oil, 120 t/d sulphur, 600 BPD LPG and 200 BPD condensate.
- Fabrication and construction inspection.
- Pipeline system design and evaluation.
- HAZOP evaluation. Start-up and operations support.
- Training – plant management and Debno Plant Operations personnel.



Polish Oil and Gas Company – Dębno, Poland

Poltava Petroleum - Poltava, Ukraine

- Scoping, design, procurement and HAZOP for a 795 m³/day (5000 B/D) condensate fractionation system. On-site scoping, process design, and fabrication inspection.

Potash Corporation Saskatchewan - Sussex, New Brunswick

- Design and project management of the first onshore gas production facility in New Brunswick, Canada.
- Engineering, project management, procurement, construction management, operation training and commissioning of a 4.3 MMSCFD sweet gas plant.
- Customized hydrate course prior to project implementation.
- On going operation support.

Red Mountain Energy – Minnibai, Russia

- Process design and basic engineering for a 45 MMSCFD cryogenic facility to separate nitrogen, sales gas and C2+ products from a mixed stream of these components. The plant embodies a relatively simple two (2) tower design, without the need of external refrigeration, with effective nitrogen rejection, high purity sales gas, and 95-99% recovery of ethane in the C2+ stream
- Project highlights include 7000 hp of sales product compression, a 240 hp turboexpander to provide all process cooling, stainless steel nitrogen rejection and demethanizer towers, and brazed aluminum heat exchangers. Spec products included a spec nitrogen vent stream, methane stream, and liquid ethane stream. Process temperatures under -184°C necessitated numerous specialized instrumentation features.

Resman Holdings Ltd. - Eckville

- Design and project management of a 3 MMSCFD gas plant including inlet separation, compression, refrigeration, liquids fractionation, and LPG storage.

Rio Alto Exploration – Galloway

- Design and project management of a 75 MMSCFD gas plant c/w 9000 HP compression , 1500 HP refrigeration c/w LPG mix, and stabilization of inlet condensate.

Roan Resources - Mahaska

- Design and project management of a gas plant.

Rozsa Petroleum Ltd. - Keho

- Design and project management of an 8 MMSCFD sweetening, refrigeration and LPG recovery facility.
- ERCB hearing preparation and owner representative on hearing panel.

Sherritt International Corporation

Puerto Escondido, Cuba

- 3,200 cum/d heavy oil and 500,000 cum/d solution gas collection battery with oil treating, water treating and disposal facility.
- Project Management - budget, schedule, packaging, shipping, stevedore, load management/storage, cost controls, inventory management, quality control. Sherritt/CUPET liaison, manuals (equipment, operating, training) and operator training.
- Design & Drafting - process, civil, mechanical, electrical, instrumentation, controls, environmental, safety, specifications (equipment and materials): detailed civil, mechanical and electrical construction drawings.
- Procurement - procure and expedite equipment, mechanical and electrical materials, construction tools and materials.
- Start-up support and on-going technical advice.
- Preliminary design of facility expansion (sales oil and solution gas pipelines, compressor/dehydration station, fuel conditioning). National facility infrastructure study.

Varadero, Cuba

- Phase 1 (US 20 million) - Responsible for the re-engineering, 25% of the procurement, 50% of project management, 100% of construction troubleshooting, commissioning and start-up for a 35 MW gas-fired power generation facility involving a 110 kV substation, a GEMS6001 turbine, and two 25 km transmission lines. A 15.5 MMSCFD gas plant - 25% mechanical design, 50% of the procurement, commissioning and start-up by GLE. The design provided recovery of 192 bbl/d of LPG and 133 bbl/d of condensate as well as 40 t/d sulphur.
- Phase II (US 30 million) - Responsible for 75% of the engineering, 75% of the procurement, 75% of the project management and 100% of the commissioning and start-up for a 70 MW gas-fired power generation facility involving two GEMS6001 turbines and a 25 km transmission line. A 27.5 MMSCFD plant - 25% of mechanical design, 50% of procurement, commissioning and start-up by GLE - supplied the gas feed. The design provided recovery of 413 bbl/d of LPG and 286 bbl/d of condensate as well as 70 t/d sulphur.
- Phase III (US 100 million) - Responsible for the detailed engineering of the interfaces between three supplemental fired 400+ MMBTU/hr waste heat recovery boilers and the three GE-MS6001 gas-fired turbine generators. Also primary responsibility for engineering of the reverse osmosis (176 US gpm) water treatment system and its interface with the steam generation system, detailed engineering of the interfaces between the steam turbine generator/condenser/cooling water, and detailed engineering of the sea water intake and water desalination make-up. Field procurement of the equipment.

Boca de Jaruco, Cuba

- Phase IV - Responsible for the engineering, procurement, project management, commissioning and start-up for a US\$ 15 million, 35 MW gas-fired power generation facility involving a 110 kV substation, a GEMS6001 turbine and a 5 km transmission line. A 15 MMSCFD gas plant designed by GLE supplied the gas feed. The design provided for recovery of 166 bbl/d of LPG (C₃ & C₄) and 115 bbl/d of condensate as well as 15 t/d sulphur.
- Integrated within the Cuba projects were the interconnection of the substations into the UNE National grid and the upgrading of the communications link to microwave. This modification became the backbone of a whole new system in Cuba and involved the MMI remote control interface in Havana, towers and the transmission system.

Suncor Inc.

Ojay

- Managed the EPCM of a 40 MMSCFD mole sieve dehydration facility (\$ 15 MM).
- Coordinated the various engineering disciplines.
- Prepared the project Design Basis, cost estimate and schedule. Managed these items throughout the execution for project control.
- Managed and solved engineering design issues.
- Prepared RFQ's and evaluated bids for all the plant equipment including equipment packages, pipe, valves, fittings, instrumentation, buildings, piling and freight.
- Issued purchase orders for equipment and services and managed equipment and 3rd party contractor invoicing for the project.
- Managed equipment design and construction post order including: review of vendor drawings and calculations, resolving technical issues, managing delivery schedule and change orders.
- Prepared, evaluated and awarded the mechanical construction contract; managed the contract through to completion.

Phoenix

- Design and project management of a 3.6 MMSCFD auto-refrigeration plant, 230 B/D LPG mix.

Rosevear

- Preliminary and detailed engineering, procurement and construction of a 140.8 e3m3/day (5 MMSCFD) acid gas (50% H₂S) injection facility requiring two 600 kW (800 HP) variable speed electric drive compressors, acid gas chilling, associated pipelines and the addition of an auxiliary steam boiler and sour water flash tank. Responsible for regulatory, project management, construction management, commissioning, and operations support.
- Installation of 2nd stabilizer and associated equipment from the North Rosevear facility.

Total Austral S. A. - Aguada Pichana, Argentina

- Design/fabrication co-ordination, commissioning and performance testing for a 280 MMSCFD dew point control plant with refrigeration and 9 MW power generation.

Transwest Gas Systems Ltd. - Chandler

- Design and project management of a 15 MMSCFD sweet gas compression (1478 HP) and dehydration facility including a mix of 3", 4" and 6" diameter pipe in a 56 km gathering system.

Triton Canada Resources - Fort McMurray

- Design and project management of a 20 MMSCFD, 1500 HP gas plant including dehydration and gathering system.