

DeGolyer and MacNaughton's founders were pioneers in petroleum consulting. Today, the firm's employees offer unbiased and expert counsel to guide exploration, development, and production decisions worldwide.

By uniting knowledge with a commitment to integrity and a determination to provide superior service, D&M has proven itself ready and able to effectively address client needs through the decades.



DeGolyer and MacNaughton

A proven provider of consulting services for the petroleum industry worldwide

The D&M Advantage

Since 1936, DeGolyer and MacNaughton has been a pioneer in providing accurate, reliable, and independent petroleum evaluations worldwide. The firm's international reputation as a premier oil and gas consulting firm is grounded in the legacy and vision of its founders, who valued Knowledge, Integrity, and Service above all.

Knowledge

<u>People</u>

Our professionals have decades of experience in the industry. D&M's petroleum engineers, geoscientists, and economists have completed more than 21,000 projects in more than 100 countries through the years. This experience is a valuable commodity for the firm and has helped D&M attract clients and maintain long-term relationships. Some D&M clients believe so strongly in the firm that they have remained continuous customers for more than 40 years. Petrol-eum companies see D&M as a respected and responsive ally for consulting projects.

Technology

D&M has invested significantly in computing resources that enable it to analyze data to deliver the most accurate reports for clients. The firm develops its own software to enhance its consulting capabilities, and it was one of the first consulting companies to invest heavily in reservoir simulation technology. Through its Reservoir Studies Division, it has completed thousands of reservoir simulation studies to help clients enhance development and recovery efforts. The company's commitment to technological development has continually ensured that its services are the most accurate and advanced in its field.

Integrity

D&M's founders built the company on the singular belief that accurate, objective consultation was crucial to the future of the oil and gas industry, and that providing this service would be the firm's most valued purpose.

D&M professionals adhere to a strict code of conduct, and the firm restricts its activities exclusively to consultation. It does not work on a contingency basis, nor does D&M own operating interests in oil, gas, or mineral properties. In serving the petroleum industry and financial services sector, the firm's experienced staff provides independent, reliable, and confidential guidance.

Service

The firm maintains offices in key locations around the globe in order to provide clients with easy access to its experts:

- Dallas
- Houston
- Algiers
- Astana
- Buenos Aires
- Moscow

In addition to these offices, D&M positions select personnel in the most relevant producing regions to provide even more immediate assistance with new projects that arise.

D&M's personnel are organized into five service divisions. This specialized focus ensures that each team continually cultivates knowledge in its specific areas of expertise and enhances the level of service the company can provide.

D&M divisions:

- Asia-Pacific and Latin America Division
- Central Europe and Asia Division
- Europe and Africa Division
- North America Division
- Reservoir Studies Division

By maintaining offices around the globe, and assigning dedicated teams to each specific job, D&M is able to deploy resources to ensure that each client can leverage skilled professionals to meet project objectives in the most efficient manner.

Services

Reserves Assessments and Appraisals

- Reservoir engineering: Estimation of oil, condensate, gas, and natural gas liquids reserves
- Undeveloped reserves potential and classification
- Development planning assistance and expertise in both undeveloped and underdeveloped fields
- Appraisals
- Stock exchange registrations and filings for all major exchanges
- Reserves audit evaluations
- Gas certifications and deliverability studies
- Unitization studies
- Expert witness testimonies
- Mergers and acquisitions
- Divestitures
- Joint ventures
- Ad valorem, income, estate and, probate taxes
- Data room representation
- Technical data preparation, gathering, and interpretation
- Equity redeterminations

Prospective Resources Assessments

- Probabilistic geologic and economic chance factor assessment
- Probabilistic volumes estimations
 Probabilistic portfolio appraisal estimations (fully risked potential present worth at various discount factors)

Unconventional Resources Assessments

- Training and mentoring via courses, workshops and peer reviews
- Integrated analyses of geological, petrophysical, geochemical, and geophysical data
- Well performance analyses using diagnostics and analytical/numerical methods
- Evaluations to characterize basin potential and identify sweet spots
- Appraisal and development planning
- Estimates of oil and gas in place
- Estimates of reserves and contingent and prospective resources

Contingent Resources Assessments

Production contingencies

- Development of structural and stratigraphic reservoir and volumetric models
- Determination of fluid properties, recoverable volumes, and projected producing rates
- Development plans
- Capital and operating expense profiles
- Potential revenue projections

Reservoir Simulation

- Subsurface modeling
- Complex descriptions
- Geostatistics
- Corner-point gridding
- Enhanced recovery studies
- Field development studies
- Field rehabilitation studies
- Exploitation studies
- Surface network simulation

Engineering Analysis

- Fluid injection
- Cycling
- Waterflood technology
- Gas deliverability studies
- Wellhead compression studies
- Pipeline compression studies
- Pipeline capacity studies
- Operating problems
- Drilling engineering
- Underground gas storage
- Oil shales
- Subsurface disposal of liquid waste
- Expert witness testimonies

Petrophysical Studies

- Net pay, porosity, permeability, and water saturation estimates
- Clastic, carbonate and unconventional reservoir studies
- Field studies encompassing thousands of wells
- Advanced fluid level contact determination
- Missed-pay identification

development and recovery of petroleum resources.

- Reservoirs of all ages, Precambrian through Tertiary
- Petrophysical database creation and verification
- Geocellular model properties, rock types, and petrofacies estimations
- Integrated petrophysical, geological, and engineering studies

service to help thousands of clients make smarter decisions about

Since 1936, DeGolyer and MacNaughton has been uniting knowledge with its commitment to integrity and a determination to offer the highest level of

 Integration of core data, including capillary pressure and other SCAL data into the analysis

DEGOLYER

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reach our personnel,

• Evaluation of Russian logs and all logs from the 1950s forward

Geophysical Studies

- Two-dimensional and threedimensional studies
- Seismic reservoir characterization
- Basin evaluation
- Direct hydrocarbon indicator evaluations
- Seismic attribute analysis
- AVO/AVA analysis
- Post-stack and pre-stack inversion
- Rock physics
- Vertical seismic profile analysis
- Velocity model building
- Data processing workflow design and QC
- Acquisition design
- Seismic workstation data management

Geological Studies

- Basin evaluation
- Structural assessment and subsurface mapping
- Fault and fracture interpretation and modeling
- Lithostratigraphy and sequence stratigraphy
- Core description: interpretation of sedimentary processes, depositional environments, and controls on rock properties
- Petrography
- Geocellular model construction
- Unconventional resources consulting
- Exploration and prospect assessments
- Volumetric estimates and uncertainty analysis
- Equity determination

Economic Modeling

Cost analysis

Seminars/training

 Fiscal modeling: production sharing contracts, risk service contracts, and concession agreements

• Market supply/demand studies