



Experts in Mexico

**Gaffney,
Cline &
Associates**

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Gaffney, Cline & Associates (GCA) is a global consultancy that has been offering technical, commercial, and strategic advice to the oil and gas sector for more than 50 years. GCA is well known as one of the leading suppliers of Reserves and Resources assessments, which are required for many purposes including statutory reporting, stock exchange listing, development planning, project finance, and asset valuation. In addition, GCA offers a full range of upstream, midstream and downstream consultancy services. These include seismic interpretation, static and dynamic reservoir modelling, field development planning, facilities and pipeline engineering, gas monetization, LNG/GTL, mergers and acquisitions, economics and project finance, unitization and redetermination, and expert witness work. GCA operates worldwide from three main offices in London, Houston and Singapore, supported by regional offices in Buenos Aires, Sydney and elsewhere.

Mexico

Mexico's ambitious program to attract foreign investment into the oil and gas sector is now well underway. Round One has so far resulted in a total of 30 exploration and extraction blocks awarded to 18 different operators. Pemex has recently announced it will seek JV partners for operations in the deepwater field areas as part of Round 1.4. Additionally, the National Hydrocarbon Commission (CNH) has just released the opening of Round Two with the introduction of 15 new shallow water exploration blocks available to be bid on in March of 2017 (Round 2.1). There are strong indications that another bidding package (Round 2.2) will be released in Q3 of 2016. As you can clearly see, Mexico is heating up!

Gaffney, Cline & Associates (GCA) has performed numerous projects in Mexico, some of which are outlined in the following brief descriptions. Let GCA help you understand the key issues when looking at how to invest.

Assist in the Evaluation of Mexico's 2015 Round 1.3 Onshore Bidding Round. GCA's client hired GCA to oversee its entire evaluation workflow for the bid round. This included:

- Pre-Screening Blocks
- Original Interpretation of Seismic
- Review and Validation of Estimates of Reserves
- Development of Mexico Economic Model

GCA worked with our client to develop commercial bidding strategies designed to make an informed decisions regarding appropriate bids for the selected blocks.

Independent Review of Reserves and Resources for Mexico's 2015 Round 1.3 Onshore Bidding Round.

GCA was tasked to review 6 blocks being evaluated by a newly formed Mexican E&P company. Our approach was to validate the interpretations used by the clients technical team and apply our knowledge and experience in the prospective areas. In areas where significant differences appeared, we looked to resolve these issues using a structured process. This process identified the key uncertainties underlying the assumptions and interpretation enabling the client's technical team to expand their understanding of the asset.

The client was successful in becoming pre-qualified and placed several bids in the Round 1.3. While unsuccessful in winning any of the blocks, the client was very satisfied with the work performed by GCA and this lead to further work being contracted for later rounds.

Evaluation of Pemex Bid Package of Santuario Assets. GCA's client was planning to participate in Pemex's 2011 licensing round. This first round, under Mexico's new contractual regime (Integrated E&P Contracts), included licenses for the Santuario, Carrizo and Magallanes Blocks in the Chiapas-Tabasco region. Each license contained approximately six mature fields.

GCA was engaged to conduct a technical evaluation of the Santuario block in the Chiapas-Tabasco region of Mexico to assist an international O&G company to prepare bids, including:

- Conducted a high-level review of all the wells in the assets, and categorized them based on their level of performance. GCA investigated why many of the wells were shut-in.
- Reviewed the status and current state of the facilities.
- Reviewed the current operational capacities and identified any operational problems that could be optimized to increase operational performance.
- Reviewed the operational costs and expenditures including maintenance of facilities, if they were available. Based on GCA's past experience and knowledge, GCA identified areas where operational cost savings could be applied.
- Provided a high level report on the present status of the infrastructure.

Identify and Rank Potential Supply Acquisition Strategies

to assist a large US electric power company to identify and rank options for a power project in Mexico. GCA also identified (a) key contractual terms for any supply agreement as they would relate to expected operations of the power plant, (b) Mexican regulatory framework for gas and electricity dispatch and (c) any other power sales terms that the Client required. The scope of work included:

- Assessment of the risks and rewards associated with each strategy, through validation with various Texas market participants, South Texas producers and others.
- Pros and cons of purchasing gas at the border vs. upstream.
- Advice on gas quality specifications.
- Issues related to obtaining Department of Energy (DOE) gas export permits.
- Risk identification and mitigation.
- Recent trends in gas supply agreements in South Texas (such as players, long vs. short-term, basis for pricing, remarketing of unused gas, etc.).
- Key contractual terms for supply agreements and Mexico rules for gas and electricity dispatch, with negotiation support.

Provide an Overview of the Geology and Petroleum Industry of Mexico

based on data available in the public domain, including:

Regional geology of Mexico with emphasis on its petroleum accumulations and major petroleum basins, including the following:

- Sureste
- Salina del Istmo
- Macuspana
- Tampico-Misantla
- Burgos
- Veracruz
- Sabinas
- Sierra de Chiapas
- Purisima-Iray
- Sebastian-Vizcaino

A summary of PEMEX including history, organizational structure (domestic and international), exploration and development, refining and petrochemicals, energy supply and demand, oil and gas markets, and finance and investments. Likely investment requirements, including secondary petrochemicals, water-flooding and secondary recovery, enhanced oil recovery (EOR), natural gas and non-associated gas.

Determine the Price of LNG Imports into the West Coast and Central regions of Mexico, and the impact on gas prices as a result of importing LNG, including:

- Forecast of the demand for natural gas, by sector in Mexico, natural gas prices and the pricing mechanism.
- Analysis of how LNG imports may change the flow of natural gas between regions of Mexico vs. the existing pipeline infrastructure.
- Strategy for supplying LNG to the West Coast of Mexico.

Survey of the Geological and Operating Conditions in South Texas Gas Fields. An operating company was considering participating in Mexico's forthcoming "opening" of the Burgos Basin to produce non-associated natural gas. GCA provided a document (based on public domain information) that summarized the geological and operating conditions of certain South Texas gas fields to assist the client to decide whether to participate, and the parameters of such an investment.

Description of the Region's Geology:

- This included a description of the major plays (Vicksburg, Yegua, Frio, Wilcox, etc.) from publicly available information, including source rock, trap types, etc. and other reservoir parameters.

Operating Conditions:

- This included aspects related to the operation of the reservoirs (i.e., gas quality, processing and treatment needs, and well completion methods).

Economic Analysis:

- Economic parameters were provided for three "generic" fields, which were considered to be representative of the fields in the region. The analysis was done before taxes as a way to illustrate the ceiling return.

Evaluation of Four Blocks for Baker Hughes Bidding in Mexico's 3rd Round. As part of a bidding process for Field Development of Oil Fields in Mexico (3rd Round: Chicontepec), GCA provided technical assistance to Baker Hughes, Inc., with the study and evaluation of four blocks including preparation of a Field Development Plan (FDP) to increase production and enhance the ultimate oil recovery in Soledad Block.

The work included the following activities:

- Geological and Geophysical (G&G) Review including the review of the recoverable volumes, understanding of the reservoir heterogeneity and the identification of prospective areas.
- Production Data Analysis including the definition of the type wells and their forecast based on the historical field performance and potential technology productivity improvement.
- Field Development Planning.
- Identification of Surface Facilities and Infrastructure appropriate to the FDP scenarios.

Analysis of the Average Well Performance and Review of PEMEX Incentive Proposal on behalf of Baker Hughes, Inc., GCA work included the following aspects:

- Review of the received proposal and the recommendation of amendments based on historic performance of well stimulation.
- Production analysis including the review of average well performance (initial rate, total cumulative production) for approximately 100 wells, for all sands in the field.
- Recommended terms for a proposal for a multi well stimulation package.

Reserves Audit, Onshore Mexico. For a company holding a Service Agreement with PEMEX, GCA completed an independent audit of Reserves for a producing oil field in the Tampico Basin, coastal Gulf of Mexico. As part of their agreement, the holding company must provide independently audited Reserves on the field on an annual basis. GCA reviewed technical and commercial information on the field and provided a statement of Proved, Probable and Possible gross field oil reserves.



Reservoir Evaluation - Offshore IXTAL Field. Assisted the client in the evaluation of two blocks for PEMEX, including:

- Gathered all available information from PEMEX's AbkatunPol Chuc Asset to create the field database for the following areas:
 - Seismic
 - Stratigraphy-Sedimentology
 - Petrophysics
 - Geomechanics
 - Reservoir delineation and characterization
 - Production history
 - Drilling engineering and reports
 - Completion engineering and reports
 - Cementing
 - Stimulations
 - Artificial lift operations
 - Technical limit
 - Risk evaluations
- Development of a reliable database for the IXTAL and YAXCHE fields to help understand the following:
 - Dynamic behavior of the reservoir
 - Drive mechanisms
 - Rock-fluid interaction
 - Material balance and reservoir pressure response
- Production analysis
 - Water cut/GOR evolution
 - Well architecture
 - Completion programs
 - Historical drilling performance
- Reviewed the current structural geological model to determine the reservoir geometry, define the boundaries for stratigraphic control and to evaluate the extent of the hydrocarbon accumulation.

Reserves and Resources Assessments

GCA has extensive experience in conducting independent resources assessments utilizing SEC, SPE-PRMS, and COGEH definitions. Most of GCA's work is confidential and, therefore, it is not possible in many instances to name clients and specific field assessments.

In Mexico GCA has also conducted resources assessments in the following:

- Burgos Basin, including Comitas, Mision, Monclova, Monterrey, Reynosa Blocks and the Pimienta shale.
- Sabinas Basin, Pirineos Block.
- Tampico-Misantla Basin, Arenque, Atun, Ebano, Panuco, San Andres, Tierra Blanca Blocks.

Assist in the Evaluation and Bidding of a Burgos Basin asset in Mexico for a large E&P company, to facilitate the development of resources, infrastructure and their maintenance, establishing screening criteria for the blocks and recommendations, prioritizing the opportunities.

Additional Information

For more information about GCA's integrated services, please contact your local GCA office.

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