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**SUMMARY**

Senior level geoscientist proficient in the integrated use of seismic, well log, paleontology, geochemistry, and potential field data to generate exploration prospects or execute the evaluation and field development of existing discoveries. More than 35 years experience in geological and geophysical mapping; from reservoir to regional scale.

- Experienced 2D and 3D seismic interpreter
- Expert Seismic/Sequence Stratigrapher
- Current in Landmark, GeoGraphix, ArcMap, Petrel
- Past experience in SMT Kingdom, GeoQuest/GeoFrame, PetroSys, PetroMod, BasinMod, Zetaware
- Extensive international and US Domestic experience
- Extensive experience developing petroleum systems models
- Facies analysis at any scale from wildcat to reservoir
- Able to work effectively in almost any cultural environment

**EXPERIENCE**

**Senior Geological Advisor, Occidental Petroleum, 2009 – Present**

**Permian Basin, 2014 – Present**

Development Geologist responsible for execution of development drilling program consisting of multiple horizontal wells, expanding the program with new locations in the same trend, and identifying and proposing new trends for development in SE New Mexico. Responsibilities also include mentoring and coaching Early Career Geologists.

**Hugoton Basin, 2011 – 2014**

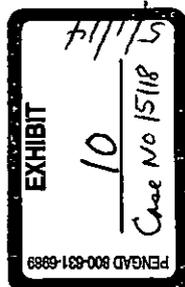
Development Geologist responsible for surveillance of several thousand producing wells, generation of 70+ drillable step-out and infill locations, geologic input into design and expansion of multiple new and existing Water Floods, and operations for between 1 and 2 rigs drilling an average of 1 well every 8 days each. Testified before the Oklahoma Commerce Commerce concerning Well Spacing and Density and proposed Water Floods numerous times. Activities also included mentoring and coaching Summer Interns and Early Career Geologists, Geophysicists, Reservoir Engineers, and Production Engineers on an as-needed basis. Asset sold in February 2014.

**World-Wide Exploration, 2009 - 2010**

Libya Exploration Program Support – Conducted Drilling Program failure analysis and contributed to redirection of Exploration efforts, resulting in a 6-well program that was in progress at the start of the revolution. Activities included Reservoir facies mapping in the Ghadames Basin, Basin Modeling in the Ghadames, Sirte, and Cyrenaica areas, 2D Seismic Survey design in the Ghadames Basin, and Prospect Generation in the Ghadames and Sirte basins. Contributed to and participated in two TCMs and a Seminar/Workshop with the NOC to explain why we redirected resources from non-prospective areas.

**Geological Advisor, Murphy Exploration and Production Co., 2008  
Gulf of Mexico Basin and Play Evaluation Team**

Senior geoscientist in small team of specialists responsible for providing regional perspective for Lease Sale/Prospecting Team and for identifying and developing new plays in the eastern and central Gulf of Mexico. Responsible for integrating paleontology, including introduction of graphic correlation and the creation of a regionally consistent stratigraphic column with correctly aged



tops, into the evaluations leading to participation in lease sales and picking well locations as well as into a regional structural and stratigraphic framework. Responsible for technical lead in the design and implementation of programs in structural and stratigraphic seismic interpretation, purchase and interpretation of potential fields data, paleontologic

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analysis of drilling wells, providing model parameter input for contract Basin Modeler, identifying, purchasing, and integrating information from geologically related areas outside

the United States. Responsible for integration of all data sets into a Gulf of Mexico 4 dimensional "model" high-grading potential plays on a geologic time unit basis, with special emphasis on the Mesozoic of the Eastern Gulf of Mexico.

Primary point of contact for a 3 year project sponsored by Murphy and conducted by the faculty and students of the University of Alabama designed to provide Murphy with a means of acquiring information and analyses more effectively developed by an academic institution, while exposing those students to the Petroleum Industry.

**Senior Geological Advisor, Occidental Petroleum, 2005 - 2007**  
**World-Wide New Ventures**

Walton Basin, Jamaica - Preparation for Jamaica offshore bid round, 2005. Dry hole analysis followed by structural and stratigraphic mapping on 2D seismic data which identified several leads in offshore southern Jamaica. Tied in potential fields study contracted to AOA Geophysical to aid in hydrocarbon maturation modeling. Assisted in economic analysis and Risk evaluation. Recommended no participation, and documented project.

Campos Basin, Brazil - Reconnaissance scale structural and stratigraphic mapping of 2D seismic data to identify structural leads and attempt to predict reservoir fairways, in advance of license round held in late 2005.

Offshore Argentina and Uruguay. - Basin scale reconnaissance project of entire offshore Argentina and Uruguay region. Conducted extensive literature search, contracted out potential fields project covering shelf and adjacent oceanic basin, ranked basins by resource potential and risk.

North Falklands Basin - Basin screening including multiple farm-in evaluations to determine prospectivity of the area. Dry hole analysis, seismic structure and stratigraphic mapping, hydrocarbon maturation modeling, economic and risk analysis.

South Falklands Basin - Farm-in evaluation of frontier basin, utilizing seismic and potential fields data and source rock information from DSDP cores tied in seismically from the east and wells in the Malvinas Basin tied in from the west. Included seismic structural and stratigraphic interpretation, hydrocarbon maturation modeling, plate tectonic history reconstruction. Team evaluation lead to play and prospect evaluation and ranking, incorporating technical potential and risk and economics.

Cuyo Basin Argentina - Assisted in Occidental's integration and expansion of Vintage Petroleum Argentina's operations upon their purchase in early 2006. Activities included evaluation of farm-in opportunities and extensive work characterizing the reservoirs in Vintage's operated blocks. Mapped vertical and lateral reservoir potential variations, using SP based sand counts, log pattern based facies distribution patterns, and log and seismic based isopach maps. Team recommended 4 exploration wells within an existing field targeting untapped reservoirs, all of which were subsequently drilled.

Summer intern mentor, Summer 2006. Designed, directed, and evaluated project conducted by Master's candidate level geologist which was similar to and complemented the reservoir characterization project I was conducting, but done on an adjacent area and for a deeper reservoir. Trained the intern in the methodologies needed and acted as a mentor/advisor. Project was very successful, added significantly to our knowledge of the area, and aided in

our design of a work program for the block. Recommended hiring the intern on completion of the degree, which subsequently happened.

Neuquen Basin Argentina - Screened blocks offered by the Rio Negro Province for exploration potential using existing seismic and log data base, supplemented by data packages prepared by the Province, resulting in multi-level time structure maps, lead maps, and recommendations for level of participation in the bid rounds.

Worked with Business Development to screen opportunities in the Middle East and former CIS. Worked with Oman Team to evaluate Encana Oman which was available for purchase.

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Provided technical perspective towards determination of advisability of country entry into several Central Asian and Eastern European countries of the former CIS.

**Senior Technical Consulting Geoscientist -- 1994 - 2000, 2002 - 2004**

***Recent projects include:***

Pakistan – New Ventures team member for large independent. Mapped large area using well and seismic data, with positive results. Contributed to gravity model, detailed plate tectonic model, reservoir distribution prediction, and potential charge determination.

NW India - License Block and Field Appraisal and Field Development for a multi-field block in onshore NW India. Primary responsibility was as appraisal and development geophysicist for multi-field area. Guided reprocessing, mapped multiple horizons in area with complex structure and difficult seismic acquisition characteristics, identified and recommended well locations. Also assisted in recognition of additional exploration opportunities, including utilization of geologic expertise in seismic/sequence stratigraphy, fluid migration, and tectonic history determination. Results included discovery of 800 MMBO field in combination structure/stratigraphic trap

Northern Egypt – Farm-out evaluation of large block extending from onshore into deep water. Tied seismic data to several area wells and mapped key horizons on 2D (approx. 100 lines, 1000 miles and 500 intersections) and 3D (320 sq. mi.). Evaluated three potential plays, with a negative recommendation because of geologic constraints on size and charge.

Southern Pakistan - Reservoir Quality Distribution determination, using log response patterns, core and cuttings descriptions, limited paleo data. Mapped productive facies distribution for 4 intervals based on original depositional patterns and predicted diagenetic patterns. Results used in design of 17-well exploration program.

Veracruz Basin, Mexico – Used 3D seismic and well log data to conduct a field structure mapping and reservoir facies distribution prediction project for a deep water conglomerate reservoir as part of a field re-evaluation project for PEMEX. Resulted in identification of several new prospective areas and one new play trend.

Onshore, Pakistan - Lead geologist in a year long re-evaluation of a producing basin. Responsible for integration of multiple data sets into a complete petroleum system evaluation, leading to identification of new plays and prospective areas for existing plays. Compiled paleontologic data and integrated with area lithostratigraphy. Compiled and re-evaluated information on source intervals leading to a modification in modeled source characteristics. Used BasinMod to refine the heat flow model for the area, and then built and ran 35 well and pseudowell models to define variations in source maturation and expulsion patterns throughout the concession. Identified kitchen areas through time and calculated hydrocarbon volumes expelled. Constructed a series of hydrocarbon migration maps tracing probable flow paths from kitchen areas to potential traps or loss from the system using paleostructure and present structure maps of the source and two major carrier beds. Identified prospective areas and assisted in planning the work needed for their evaluation.

Western Desert, Egypt -- Constructed basin framework by mapping 11 stratigraphically and structurally significant horizons tied to nearby well control, identified and mapped primary and secondary fault trends, deciphered structural history of basin including when each fault trend

was initiated and active. Identified major play types, their origins and subsequent structural modification. Provided input on hydrocarbon kitchen locations and stratigraphy to Basin Mod, used results to determine migration paths. High-graded plays based on kitchen locations, migration paths, expulsion, and trap timing and complexity culminating in a well location.

Offshore West Africa -- Delineated and mapped out play consisting of a deep water fan complex, including evaluation of structure and stratigraphic closure to determine prospectivity. Made drill/no drill recommendation.

Technical hands-on Geoscience Manager in startup company. Responsibilities included staff planning and hiring, project work flow design. Concept tested new technology for determining salt configuration by tying it to Gulf of Mexico subsalt discoveries while conducting projects for client companies.

Provided expert geological analysis for prospect generation and detailed geological and geophysical interpretations worldwide. Representative areas include Gulf of Suez, North Sea, Russia, North Africa, and E. Canadian basins. Reviewed and evaluated prospectivity

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of petroleum farm-in prospects for small operators, including interpretation accuracy, economics, and reserve estimates.

Designed and taught a course in the use of SeisStrat, an advanced geological interpretation work station software program. The two day course teaches interpreters the use of all the functionalities in the program in a work flow format and has been taught in the US, Canada, and Nigeria.

#### ***Chief Geoscientist, 2001, Orient Petroleum***

Joined Orient in January 2001 following a nine month contractual affiliation. Duties included delineation of an existing field, generation of prospects in Kazakhstan and their presentation to potential partners, evaluation of outside submittals world-wide, technical assistance for a nineteen well exploration program in Pakistan, and technology transfer to Pakistani geoscientists.

Loss of funding following the WTC attack led to dissolution of the International Exploration branch of the company along with the all positions in it. Continued to assist the drilling program for two years as a consultant.

South Turgay Basin, Kazakhstan - Used a multi-vintage Soviet 2D data set and logs and reports from nine wells (two discoveries) to define the structural configuration of the Doshan Field and to develop six additional exploration prospects on the block.

Lower Indus Basin, Pakistan - Provided oversight, guidance, and technical input for a nineteen well exploration program. Technical contributions included determination of source maturation patterns using BasinMod, assistance in delineating reservoir presence and characteristics using logs, well and core reports, and recommendations for logging and core programs. Trained OPI Pakistan Chief Geophysicist on Landmark work station. Represented OPI at The Conference on Optimizing Exploration Success in Pakistan, August 21, 2001. Presented paper on new technology in AVO analysis.

New Ventures Evaluations, Worldwide - Conducted technical evaluation of New Ventures opportunities in the Caspian Basin of Kazakhstan, Bohai Basin of China, and Lower Indus Basin of Pakistan.

#### ***Senior Exploration Geologist, 1986-1990, Amoco Production Company Deep Water Gulf Of Mexico Group, U.S. Gulf Coast Region***

Conducted a regional scale sequence stratigraphic analysis of the outer shelf through deep basin area of offshore Louisiana for the Upper Pliocene through Pleistocene age section.

Constructed a series of regional scale maps for key time intervals, indicating sub-basin configurations on the slope and their internal facies distributions. Mapped reservoir and seal facies distribution patterns to high-grade prospective areas. Maps were used by entire 10-person deep water team for starting points and reality checks, and provided a framework for all subsequent lease-sale and farm-in evaluations.

As sole geologist working in 3 separate geophysicist/geologist teams, used the results of the regional framework described above to generate over 20 drillable deep water and subsalt prospects over a period of 3 lease-sales while simultaneously evaluating numerous farm in offerings.

Conducted post-appraisal for Amoco's first subsalt well. Determined cause of pressure problems, recommended drilling program modifications which were adopted for later wells. Developed geologic model for salt sill emplacement which explains and predicts subsalt reservoir and seal facies distribution patterns, and pressure and hydrocarbon charge distributions as controlled by subsalt hydraulics. Re-mapped salt sill configuration and provided geologic model input to geophysicist team which developed a new method to process subsalt data, currently marketed commercially.

Designed and taught three day internal Amoco seminar on practical use of sequence stratigraphy in Gulf of Mexico exploration, in cooperation with another senior level sequence stratigrapher. Seminar was conducted several times for first level managers and front-line explorationists

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Development geologist for 100-well infill drilling program. Only geoscientist on team responsible for expanding three East Texas gas fields. Responsible for providing geologic input on well spacing and locations, uphole and downhole potential, and developing supporting documentation for Texas Railroad Commission hearing. Testified as Expert Witness in a contested but successful bid to change the development well spacing.

***Amoco Production Co., cont'd, 1991 - 1994***  
***Senior Petroleum Geologist, Asia/Far East Group***

In-house consultant in sequence stratigraphy, fluid flow and entrapment, hydrocarbon generation modeling, and exploration risk analysis.

Major projects included:

- **NW Shelf, Australia**-- sequence stratigraphic analysis to predict and evaluate reservoir, seal, and source rock potential.
- **New Zealand, North Island** -- sequence stratigraphy and tectonostratigraphy to predict the presence and distribution of Miocene reservoir facies.
- **Offshore China, South China Sea** -- identified and predicted reservoir, seal, and hydrocarbon migration pathway. Interpretation confirmed by drilling.
- **Tarim Basin, China** -- evaluated utility of seismic stratigraphy for reservoir and trap delineation in a large, frontier basin in interior China.
- **Vietnam** -- identified hydrocarbon system elements, play types and critical areas (reservoir, seal, migration path) needing additional study for each play type. Evaluated farm-ins while constructing overall basin framework interpretation.
- **Pakistan** -- delineated structural style and stratigraphic evolution of basin through time.
- **Myanmar** -- analyzed potential reservoir presence, quantity and quality, based on seismic stratigraphy, well logs, outcrop data, tectonic history, and fluid migration paths.

- **Indonesia** -- consulted on reservoir and source rock presence in an inverted basin regime.
- **Australia/Indonesia Timor Sea Zone of Co-operation** -- Used seismic/sequence stratigraphy to predict reservoir and seal distribution presence, potential migration pathways, and trap configuration.
- **Other international projects**-- analyzed several prospects for reservoir and seal presence and quality, source rock quality and maturity, tectonic timing, hydrocarbon migration pathways.

Technology Transfer activities included:

- **Sequence Stratigraphy Training Class** -- With two other senior level sequence stratigraphers designed and taught a five day course in the use of sequence stratigraphy in hydrocarbon exploration and production, team taught for a large group of Pemex geoscientists.
- **Applied Paleontology Course** - Designed and taught 1 day of a 5 day in-house Amoco course developed by the Amoco Paleontology department for the exploration and production geoscientists. Provided a theoretical framework illustrated by real life examples of how paleontology is used as part of an integrated sequence stratigraphic approach to exploration and production problems. Course was conducted several times and presented to more than a hundred participants.
- **Sequence Stratigraphy User's Group** - Founding member and coordinator for several years of a large in-house group, responsible for arranging and conducting monthly meetings and seminars, frequently with guest speakers from other companies and academia.

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***Geologist and team leader, NW Colombia, S.A. -- 1983-85, Gulf Oil Company***

Evaluated prospectivity of San Jorge Basin in Northwestern Colombia as part of two year joint project with Ecopetrol to evaluate the Lower Magdalena onshore and offshore area. Set up geological, geophysical, and engineering data management for entire project. Conducted Sequence Stratigraphic analysis of entire basin and used the resulting

framework to evaluate basin history and potential reservoir distribution patterns for each potentially prospective time interval. Trained senior geologists in methods of analysis for sequence stratigraphy and paleotectonics.

***Senior Geologist -- 1980-82, Law Engineering Testing Co.***

***Staff Geologist -- 1978-80, Soil Systems Inc.***

**EDUCATION**

M. S. Geology, 1978

University of Florida, Gainesville, Florida

B. S. Geology, 1975, B. A. Anthropology, 1977

Florida Atlantic University, Boca Raton, Florida

***PROFESSIONAL AFFILIATIONS***

American Association of Petroleum Geologists  
Houston Geological Society  
Registered Geologist, State of Texas

***PROFESSIONAL REFERENCES***

Professional and personal references available on request