B.S., Geology, Michigan State University
Dresser Atlas Log Interpretation Fundamentals Course
Schlumberger Log Interpretation and Quality Control Course
Stratigraphic factors in Oil & Gas Exploration - Williston Basin

MARK A. SMITH
Geologist

- Active Member: American Association of Petroleum Geologists (1980)
- Active Member: RMAG

Over thirty years of applying geological, geophysical, and petrophysical concepts to petroleum exploration, including prospect generation and wellsite consulting. Prospect generation experience includes regional studies, initial analysis of prospective areas, geological correlation and mapping of plays, and economic evaluation of individual prospects. I am currently involved in several plays located in the American Midwest including fractured shale oil and gas plays, a deep tight sand gas play, fractured carbonate oil resource plays, and a shallow turbidite oil play. Extensive wellsite experience including: Geo-steering of horizontal, multilateral, and deviated wells. Use of cutting edge MWD/LWD technology to geo-steer complex wells, evaluation of seismic interpretations and seismic continuity presentations for addressing changes in geo-steering targets. This experience is not only diverse in the different aspects of Petroleum Geology but includes a variety of different geological provinces. These include, but are not limited to: very porous carbonate reef complexes to dense highly fractured carbonates, very porous sandstone reservoirs to very tight highly fractured sandstone reservoirs, unconventional fractured oil shale, unconventional fractured carbonates and tight gas sands, coal bed methane, and a variety of others.

PROFESSIONAL EXPERIENCE

2000 – Present Consulting Geologist-Petrotechnical Resources of Alaska-Anchorage, Alaska
Intensive North Slope Alaska drilling program: This program includes complex infield horizontal drilling to recover bypassed hydrocarbons in the older declining fields and the use of cutting edge technology to evaluate and define the extent of hydrocarbons in the newer Satellite Fields of Prudhoe Bay, Kuparuk and Alpine. While involved in the Satellite Fields my experience includes the use of some of the latest developed petroleum technology for the drilling and evaluation of complex multi-lateral wells in highly faulted, thin, and complex formations, this is facilitated by the formulation of cross-sections on the fly using offset well data, excel spreadsheets and charts, and seismic data. As a valued team member, involved in first: tri-lateral, quad-lateral, penta-lateral, and hexa-lateral wells in Alaska. The last five years has found me involved in a cutting edge managed pressure coiled tubing drilling program including the first octa-lateral well in Alaska.

2005 – Present Consulting Geologist-MAS Geological Services-Portage, Michigan
Pursue evaluation of geologic prospects, including initial evaluation of prospective areas, develop cross-sections, and interpret petrophysical data: regarding gas/oil/water content, stratigraphic variations between wells and areas of interest, and formation correlations used for map and cross-section generation. Generate maps depicting: structure, isopachs, fluid characteristics, and other pertinent data in order to formulate drilling prospects. Evaluate economics of formulated prospects, and create a summary of prospect highlights to be included with a presentation of the prospect.

1981 - 2000 Consulting Geologist-Petroleum Exploration, Independent Wellsite Consultant
Responsibilities included: Supervision and management of all geologic wellsite activity. Experience includes: geo-steering of horizontal, multilateral, and deviated wells; and familiarization with engineering aspects of these wells. On many occasions this experience has included supervision of multiple wells simultaneously. Involved in the initial phases for several fields and technologies, including Horizontal drilling in the Bakken (1980's), Elm Coulee Field (Bakken Horizontal), Horizontal Nisku wells, Horizontal Ratcliffe wells, multi-laterals (1990's), Coal Bed Methane, Fractured Shale Reservoirs, and many others.

- Prospect Generating Experience: Conduct research on target areas and formation characteristics. Collect and interpret data and generate maps from interpreted data. Perform economic analysis on generated drilling prospects.
- Petrophysical Experience: Direct, interpret, and perform quality control on state of the art LWD/MWD logs real-time and recorded while Geo-steering complex horizontal, multilateral, and high angle extended reach wells. These LWD logs include: Gamma, Resistivity, Density, Neutron, Sonic, and state of the art RFT while drilling tools. Generate cross-sections, interpret fluid and/or gas content, comparing results with and making adjustments to pre-drill mapping/seismic continuity presentations real-time for use in GeoSteering these complex wells. Proficient in the interpretation and quality control of most wireline logs used in the petroleum industry. Perform water saturation calculations to evaluate zones of interest and make recommendations regarding reservoir characteristics. Direct, perform quality control, and interpret RFT & MDT data.
- Wellsite Experience: Obtain bids for services, select service companies, and coordinate drill crew and service company representatives to client's specifications. Select intervals, manage implementation, and interpret coring and DST operations. Direct and interpret wireline logging operations. Perform total hydrocarbon evaluation, and formulate subsurface correlations (real-

time and after wireline logging is completed). Communicate daily with client, inform client of any activities affecting the ability to gather geologic data. Prepare detailed reports for each well. Directed completion and plugging operations to state's requirements. Interpret petrophysical data, mud logging data, and DST pressures and fluid recovery data, to make estimates regarding reservoir characteristics. Have experience in H2S prone areas, including actual use of air-packs during H2S events.

- Computer Experience: Routinely use personal computers to create real-time borehole profile presentations, vertical section presentations, and state plane mapping presentations of the interpreted LWD data using excel spreadsheets and graphs. The data and graphs are updated real-time to aid in geo-steering operations and to depict the real-time interpretations for updating the client. The computer is also used in preparation of digital well logs, word processing, other data base manipulation, spread sheets, and graphs.
- Miscellaneous Experience: Surface mapping for precious metals exploration and involvement in an intensive sulfur exploration program (gravity and total station EDM survey, and geochemical sample collection and analysis). Project Manager for environmental cleanup: Routinely communicate with clients and government regulators, managed and performed hydrogeologic investigative activities, and evaluated and implemented corrective remedies. Hazwoper training, an intensive course in working with hazardous materials required by the US government for cleanup personnel.

1980 – 1981 Consulting Geologist- GX Consultants Division of XCO, Denver, Colorado
Principle duties included: Promoted from X-Pert Logging Division. Supervision of all geologic wellsite activities. Obtained experience in all aspects of wellsite consulting.

1979 – 1980 Logging Geologist- X-Pert Logging, Division of XCO, Denver, Colorado
Principal duties included: Formation logging, subsurface correlation, monitoring of drilling parameters, core and sample descriptions, and monitoring all forms of gas detection equipment.

AREAS OF GEOLOGIC EXPERIENCE:

Alaska: The older fields of: Prudhoe Bay, Kuparuk (Kuparuk & West Sak targets), Milne Point (Kuparuk and Schrader Bluff targets), Niakuk, and Point McIntyre. The new Satellite fields: Aurora, Borealis, Orion, and Polaris. Exploration between the Satellite fields and Milne Point field. Alpine field (near the Alaska Petroleum Reserve).

Rocky Mountains: Extensive experience in most Sedimentary Basins within the Rocky Mountain Region including: The Bighorn Basin, The Denver-Julesburg Basin, The Green River Basin, The Hanna Basin (including Coal Bed Methane), The Kaiparowits Basin, The Great Divide Basin, The Overthrust Belt, The Paradox Basin, The Powder River Basin (including Coal Bed Methane), The Williston Basin (including Horizontal: Bakken, Nisku, Mission Canyon, and Ratcliffe Wells), The Wind River Basin, Central Idaho (for precious metals), Central Nevada (for precious metals).

Other Areas of Experience: The Anadarko Basin, The Hugoton Embayment, Indiana, The Illinois Basin, The Michigan Basin (Including Antrim Shale and Prairie du Chein), The Permian Basin and West Texas (Including Wolfcamp Reef and Ellenburger).