

Neil Summer, Ph.D.

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SUMMARY OF QUALIFICATIONS

Geologist and Project Manager with over 35 years of varied offshore and onshore experience spanning construction as a saturation diver in the early 70's North Sea, to present day multifaceted involvement to mitigate risk. Broad experience in projects such as pipeline surveys, construction and repair, offshore geophysical, geotechnical and geochemical exploration surveys, pipeline routing and deepwater oil and gas development layout in difficult terrains, Geohazard assessments, onshore LNG plant and port development, and bacterial fouling abatement.

Neil has managed and safely completed numerous projects around the world, notably in west and east Africa. He has extensive experience in upstream operations, geologic and geohazard interpretation, risk mitigated gathering system layouts, as well as hands on offshore and onshore construction. He works well as part of a team, or managing the team and he has over 25 years of management experience. His field experience includes sea time many different types of vessels, and onshore reconnaissance in undeveloped areas.

Neil is a generalist with broad geological knowledge spanning volcanology, seismicity, meteorology and understands the need to apply combinations of geohazards to mitigate risk. Additionally, he comprehends the pervasive nature of the biological sphere and effects on man and his constructs.

EDUCATION

- AB (Earth Sciences), 1983, University of California, Berkeley
- MS (Geology), 1987, University of California, Davis
- PhD (Geology), 1994, Hebrew University, Jerusalem

PROFESSIONAL MEMBERSHIPS

- American Association of Petroleum Geologists
- Geological Society of America.

PROFESSIONAL EXPERIENCE

Summer Consulting. **2014- present**

TDI-Brooks – Director, Shallow Water and Onshore Operations. **2015- present**

Neil Summer, Ph.D.

Develop business, and manage shallow water geotechnical projects.

Anadarko Mozambique LNG Project – *Geohazard Technical Advisor.* 2014- 2015

Interface with onshore and offshore teams during bid evaluation and provide ongoing support and mentoring on risk mitigation and tasks related to early works construction, site improvements, demining, onshore and offshore engineering and design, shallow water pipelay constructability, and temporary and permanent docks (Material Offloading Facilities).

Anadarko Mozambique LNG Project - *Delivery Manager - Site Characterization* 2011- 2014

From earliest reconnaissance for site evaluation, final selection and design. Acquire greenfield data and evaluate all aspects (topographic, bathymetric, geotechnical, geological, geophysical, LIDAR, weather, currents, tides, earth quake and tsunami potential) to assess geohazard extremes and combinations to provide the design basis for construction. Multiple projects totaling over \$180 million. Deep involvement with the two separate onshore and offshore design teams, and their three competitive FEED contractors; one laying out the onshore LNG plant and separately the other offshore gas gathering system and tieback pipelines. In the process, managed many simultaneous projects, delegating authority and mentoring as part of the overall effort. The sub projects comprised data gathering on land, sea and air, and integrating all data into a GIS database using ARCMAP. The GIS team under my management provided electronic and paper maps to field teams doing resettlement surveys, for team use for the evolving project, and to management for planning and presentations. Made many presentations; monthly to Partners and executives, occasional to high level government ministers and advisors, public and focused stakeholder meetings.

Anadarko Mozambique LNG Project - *Delivery Manager – Early Works* 2011- 2014

Field Installation manager; primarily overseeing pioneer camp construction and management, development of a fit for purpose road system; resettlement surveys; and demining activities. Member of the Anadarko Mozambique incident team, and either in the field as overall field manager of response team, or in the Anadarko Crisis and Emergency Management war-room as a support technical advisor. Assisted in dealing with a wide range of incidents such as flooding, worker unrest, political visits, lion, hippo and other game incidents and a wide range of work injuries, malaria and the necessary medivacs.

Ecolyse – *President and Founder.* 2007- present

- Biotechnology, microbial assessment, chemical treatment optimization
 - Field sampling and MIC assessments; Shell Pinedale, ExxonMobil Grand Isle, Newfield Eagle Pass. Wastewater facilities at Bryan, Willis, College Station and Houston.
- Independent engineering project consulting
 - Tullow/Geosyntec – Develop scopes of work and Takoradi Harbor survey advisement.
 - Ghana National Petroleum Corporation – Jubilee gas export pipeline planning and survey facilitation. Survey project management for FEED.

Neil Summer, Ph.D.

- Intecsea / Worleyparsons – General oil and Gas development planning, geophysical and Geotechnical survey support. Client representation. Ghana and Gulf of Mexico.
- Tullow Oil – Deep Water Tano development (Ghana) Project Manger: Contracting Metocean data gathering moorings, hind cast data studies and overall FEED support.
- BP Macondo blowout (GOM), Chief Scientist on R/V Gyre. Tasked with assessing mudline oil contamination (the “missing” oil), and discriminating Macondo oil from background natural seeps. Full vessel and project management. Mobilization of specialized multicorer and high end laboratory including GC-MS, bacterial DNA and trace chemical analytical areas. Assist BP in mobilization of second vessel for data verification by NOAA.

INTECSEA Engineering, INC., Houston, Texas

2006 to 2010

Focus group leader; Survey and Geosciences (2007- 2010)

- Project Management
 - Chevron, Walker Ridge Development (GOM). Deputy project manager, responsible for pipeline routing and generation of Survey Specification Documents.
 - BP, MPOG pipeline remediation (GOM). Responsible for understanding mass flow, slope instability and pipeline movement under hurricane conditions. Managed Geotechnical survey and engineers simulating pipe loading, metocean conditions and slope failure. Developed successful remediation options, and executed.
 - ASIG, Safe Harbor Deepwater LNG Port off Long Island, (New York). Unique FEED and permit application. 20 mile pipeline route, from artificial island, to a shallow water hot-tap into an existing pipeline, or onshore to a main gas line in Brooklyn. Management of all USCG permit documentation and studies including flow assurance and pipeline surveys.
 - Jubilee Development (Ghana): responsible for layout across an active submarine canyon. Managing all survey components; geophysical, geotechnical and metocean.
- Numerous further assignments; proposal and business development. Senior client representative both offshore and onshore; Woodside –Bayu Undan; Hess - Tubular Bells; BP – Mardi Gras construction and Caesar/Cleopatra hydrate remediation, and more.

TDI-Brooks International Inc., College Station, Texas.

1998-2006

Field Operations Manager, Chief Scientist and Field HSE Officer. Numerous international geochemical exploration, geophysical, geotechnical and baseline surveys.

Department of Geology, University of Florida, Gainesville.

1996-2000

- Research Professor; managed Stable Isotope laboratory. Taught introductory geology courses. Supervised three masters students.

Neil Summer, Ph.D.

Department of Geological Sciences, University of South Carolina, Columbia. 1993-1996

- Research Assistant Professor; managed electron microprobe facility. Directed research in the Microprobe, XRF, XRD and stable isotope facilities. Taught intro geology courses.

Johns Hopkins University, Baltimore, Maryland. 1992-1993

- Post-Doctoral Researcher; Earth & Planetary Sciences; shallow magma emplacement

Department of Geology, University of California, Davis 1986-1987

- Post-Graduate Researcher petroleum maturation mechanisms.

Hrubetz Oil Company, Walnut Creek, CA 1984

- Technical Assistant, Seismic interpretation, well log correlations, exploration play development.

Department of Geology, University of California, Berkeley 1981-1983

- Laboratory Technician, KAr dating laboratory, Mineral separations.

Diving Instructor, Red Sea 1978-1979

- Diving safari leader and company owner, Sinai Peninsula.

Commercial Diver, North Sea, South Africa, UK 1971-1979

- Ekofisk development construction off DB15 during Summer, and standby diver on anchored drill rigs in winter.

PUBLICATIONS (Selected)

Summer, N.S., Summer, E. J., Gill J. and Young R., (2008). Phage Remediation of Microbe-Induced Corrosion, International Corrosion Conference, Las Vegas.

Kumar A., B. McShane, N. Summer, (2008). Hurricane - induced pipeline displacement and remediation options in areas with seabed, Proceedings of the 3rd International Offshore Pipeline Forum. IOPF2008-910.

Nagihara, S., J.M. Brooks, B.B. Bernard, G.A. Cole, N.S. Summer, and T. Lewis, (2002). Application of marine heat flow data important in oil and gas exploration: Oil and Gas Journal. July 8, p. 43-49.

Summer, N.S., P.L. Taylor, R.L. Nussbaum, and A.K. Fronabarger, (1996), Magnetic spherules in coastal plain sediments, Sullivans Island, South Carolina, USA: Meteoritics and Planetary Science, v. 31, p. 77-80.

Summer, N.S., A. Ayalon, and Y. Kolodny, (1995), Oxygen isotope systematics of a sandstone-quartzite transition in contact zones: Israel Journal of Earth Sciences, v. 44, p. 169-181.

Summer, N.S., B. Kohn, H. Ito, A. Ayalon, and Y. Kolodny, (1995), Isotopic and chronological constraints on dyke emplacement and alteration, Makhtesh Ramon, Southern Israel: in Physics and Chemistry of Dykes, G. Baer and A. Heiman (eds.), Balkema, Rotterdam, p. 305-312.

Neil Summer, Ph.D.

Summer, N.S. and A. Ayalon, (1995), Dike intrusion into unconsolidated sandstone and the development of quartzite contact zones: *Journal of Structural Geology*, v. 17, n. 7, 997-1010.

Summer, N.S. and K.L. Verosub, (1992), Diagenesis and organic maturation of sedimentary rocks under volcanic strata, Oregon: *American Association of Petroleum Geologists Bulletin*, v. 76, n. 8, p. 1190-1199.

Summer, N.S. and K.L. Verosub, (1989), A low-temperature hydrothermal maturation mechanism for sedimentary basins in geologically active areas: in *The origin and evolution of sedimentary basins and their economic potential*, R.A. Price (ed.), *Geophysical Monograph #48*, IUGG Volume #3, p 129-136.

Summer, N.S. & K.L. Verosub, (1987), Maturation anomalies in sediments underlying thick volcanic strata, Oregon: Evidence for a thermal event: *Geology*, v. 15, n. 1, p. 30-33.

PATENTS

5 awarded and 3 provisional patents covering Microbially Induced Corrosion and petroleum industry bio-fouling treatments.

VOLUNTEER ACTIVITY:

Firefighter II - South Brazos County Fire Department Department