

P.K. Morton

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California Registered Geologist No. 1377 California Engineering Geologist: California No. E.G .657

PROFESSIONAL RESUME

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- EDUCATION** B.A. Geology, UCLA - 1953
Postgraduate studies included ore microscopy (UCLA - 1961); engineering geology (USC, 1967, 1968); oil immersion microscopy (USC, 1968); mining geophysics
- EXPERIENCE** 1999-2001 Jointly established TerraMins, Inc., Consulting Economic Geologists, as Principal.
TerraMins specializes in exploration, evaluation, and marketing of industrial minerals.
- 1994-1998 MORHOL, Inc., Geoscience Consulting, Anaheim, CA. President and Principal Economic Geologist.
Management and supervision of widely diversified geotechnical engineering, geological engineering, mineral resource evaluation, and mine reclamation projects.
- 1982-1993 P.K. Morton, Consulting Economic Geologist, Costa Mesa, CA.
Independent mining and geological consultant engaged in mineral property evaluation, exploration, mine appraisal, marketing analysis, and other mining-related studies. Also included geological hazards and engineering geology (Please see *Representative Projects* and *Partial List of Clients*).
- 1981-1982 ESCA-TECH CORPORATION, Costa Mesa, CA.
Manager of Geosciences
Directed geological consulting activities of company. Projects included environmental assessments and a survey of world sources of coal for the U.S. Department of Commerce.
- 1957-1981 CALIFORNIA DIVISION OF MINES AND GEOLOGY
(San Francisco, Los Angeles, Santa Ana Offices)
Senior Geologist
1977-1981: **Minerals Officer** in charge of state-wide management of the Mineral Resources Inventory and Mineral Land Classification efforts of CDMG activities. This involved planning supervision, and active participation in projects designed to provide basic data on California mineral resource potential.
1978-1980: **Co-investigator of a U.S. Department of Energy** -supported grant to evaluate the favorability for occurrence of economic concentration of uranium in the region contained on the 1E X 2E AMS series Trona quadrangle, part of a nationwide program under the National Uranium Resource Evaluation program.
1975-1977: **Assistant District Geologist**, Los Angeles District, a senior post involving administrative duties and supervision of activities of the Los Angeles District Office of CDMG. Position included review of nuclear siting, geological hazards and mineral reports.
1957-1977:**Geologist**: Geological mapping and investigations of Orange County.; Reconnaissance geologic mapping; state geologic mapping in the Sierra Nevada and Mojave Desert areas; countywide survey of the economic geology of Imperial County; detailed study of the Queen of Sheba Lead mine, Death Valley, CA; countywide survey of the economic geology of Kern County.
- 1954-1957 WAH CHANG MINING CORPORATION, Black Rock Mine, Mono County, & MAGMA COPPER COMPANY, Magma Mine, Superior, AZ

PROFESSIONAL AFFILIATIONS

American Institute of Professional Geologists (AIPG) Certificate # 491
California Mining Association
Geological Society of America
Mineral Producers of California
Society of Mining, Metallurgical and Exploration Engineers (SME)
South Coast Geological Society

Mojave Desert Mining Advisory Council

P.K. MORTON REPRESENTATIVE PAST PROJECTS

Industrial Minerals Investigations

- Pre-development studies of three major construction aggregate deposits in southern California which included determination of the extent, tonnage, quality, economics and marketing aspects.
- Exploration to locate supplementary rock source suitable for use in crushed construction aggregate and rip-rap for a major operator in southern California.
- Study of the long-term availability of sand and gravel and its economic implications for the County of Sacramento, California.
- Preliminary marketing study for undeveloped industrial sand deposit in the Salton Sea area.
- Evaluation of byproduct potential for construction aggregate, industrial sand, and quartz pebbles for a major placer gold deposit in central California.
- Evaluation of reserves and quality of major operating high-purity limestone deposit in the southern California region.
- Preliminary evaluation of the extent and reserves of feldspar deposit in the western Mojave Desert.
- Conducted regional exploration to locate iron deposits suitable for development of iron ore for use in cement production.
- Conducted drilling exploration and ore reserve determination for two iron deposits in the Mojave Desert.
- Recommendations for royalty terms and minimum lease rental fees for construction aggregate deposits in Orange and San Bernardino counties, California.
- Determination of reserves, quality and fair market value for two operating construction aggregate deposits in the San Joaquin Valley.
- Preliminary evaluation of gypsum deposits in the Mojave Desert.
- Prepared an exploration program to locate glass sand deposits in California and Nevada for a major mining company.
- Conducted two regional-scaled exploration programs for construction aggregate in Arizona and New Mexico for the U.S. Department of Defense.
- Valuation and marketing survey for an operating talc and clay mine in the California desert area.
- Evaluation and estimation of quality and reserves of a major quarry site for crushed construction aggregate in the Los

Angeles urban area.

- Evaluation and estimation of quality and reserves of a construction sand deposit in San Diego County.
- Evaluation and estimation of reserves for purchase of several properties in southern California by a major gravel company.
- Evaluation of several major rivers for gravel development in Mexico.
- Determination of fair market royalty for construction aggregates in the Palm Springs marketing area.
- Exploration for new gravel deposits in the Los Angeles region for an international Company.
- Valuation of an operating high alumina clay mine in Riverside County.
- Valuation of an operating aggregate mine in urban San Diego county.
- Valuation of an aggregate resource in the El Centro-Brawley marketing region.
- Conducted drilling program to identify new reserves for clay roofing tile producer.
- Study to recommend Fair Market Royalty Value of an aggregate deposit in San Diego county, California for the U.S. Department of the Navy.
- Expert witness for litigation involving loss of industrial sand due to negligence.
- Detailed investigations, including managing drilling program, for major cement company to explore resources acquisitions and determine existing resources .
- Estimation of remaining reserves for potential purchaser of operating sand and gravel plant in Temecula area.

Economic Geology of Metallic Deposits

- Evaluation of several lode gold and silver deposits in the U.S. and Mexico.
- Regional exploration for gold deposits in California for an independent petroleum company in the Klamath Mountains and the Mother Lode of the Sierra Nevada foothills.
- Evaluation of placer gold deposits in the Canadian Yukon Territory and in Montana.
- Detailed underground and surface investigations of an operating copper mine in Arizona, and operating tungsten mine in California, and two silver-lead mines in California.
- Regional studies involving county and district-wide geology, occurrence, and ore controls of all commodities occurring in Kern and Imperial Counties, California for the State of California.
- Regional studies of the occurrence and potential for uranium in a 2,000 -square mile area of the Mojave Desert for the Department of Energy.
- Economic feasibility and marketing study for a large titanium deposit having byproduct potential for iron, phosphates, zirconium, and rare earths.
- Planning and supervision of an exploratory drilling program of a lode gold deposit, San Gabriel Mountains, California. Subsequent underground mapping during development and production.

Engineering Geology and Mine Reclamation

- Detailed regional geologic mapping of several areas to identify and evaluate geologic hazards in southern California.
- Determination of the feasibility for reclaiming an old industrial sand quarry, including locating and estimating the volume of fill materials needed, in Riverside County, California.
- Preparation of mine reclamation plan on a metal mine in the Sierra Nevada.
- Preliminary engineering geology for a 100 -acre hillside area in Orange County.
- Preliminary site investigating for cellular phone tower sites in the Mojave Desert.
- Conducted slope stabilization studies for mine waste dump sites in Southern California.

Miscellaneous Investigations

- Regional geologic mapping in the Sierra Nevada, Colorado Desert, and the Mojave Desert.
- Mineral resource potential evaluation of 7,680 acres in the Transverse Ranges, California.
- Evaluation of mineral potential of more than 36,000 acres of State land in the California Coast Ranges, the Modoc Plateau, and the eastern Mojave Desert preliminary to land exchanges with the U.S. Bureau of Land Management and the U.S. Forest Service.
- Mineral potential evaluation studies of several parcels for conveyance of federally owned mineral rights and for land exchanges.
- Regional mineral evaluation and classification of 800,000 acres of private land in the Mojave and Colorado Deserts for a large corporation.
- Expert witness for case involving claims validity of a volcanic cinders producer..
- Expert witness for case involving eminent domain of an operating gravel deposit.
- Expert witness for a common varieties case and the U.S. Bureau of Land Management.