

ARON R. TAYLOR, M.S., P.G., C.E.G.
Principal Engineering Geologist



PROFESSION

Engineering Geologist

REGISTRATIONS

Professional Geologist

– State of California

Certified Engineering Geologist

– State of California

EDUCATION

M.S. Geological Sciences, 2006

California State University,
Fullerton.

Thesis: “*Geomorphology and
Geochronology of the San Juan
Creek Terraces: Implications for
Quaternary Uplift of the Santa Ana
Mountain Foothills*”

B.S. Geological Sciences, 2001,
Summa Cum Laude – California
State University, Fullerton.

Thesis: “*Evaluation of the Long-
Term Segmentation of the Wasatch
Fault Footwall Using (U-Th)/He
Thermochronometry*”

**PROFESSIONAL
EXPERIENCE**

GMU Geotechnical, Inc.

(2001-Present)

Principal Engineering Geologist
and Project Manager, Rancho
Santa Margarita, California

AFFILIATIONS

Building Industry Association
Geological Society of America
South Coast Geological Society
California Geotechnical Engineers
Association

SUMMARY OF EXPERIENCE & QUALIFICATIONS

Mr. Taylor has 10 years of experience on a wide variety of geotechnical projects. His experience includes work with a number of residential and master-planned community developers, commercial developers, water districts, and public agencies. He has worked successfully as project manager and engineering geologist for a wide variety of projects, as outlined below. His specific engineering geological experience includes large-scale grading jobs, geologic mapping, subsurface exploration, foundation investigations, landslide evaluations, liquefaction studies, groundwater investigations, seismic hazard analyses, seismic refraction and rippability studies, fault investigations, and debris flow analyses. Mr. Taylor is also proficient in the use of AutoCAD and GIS for geotechnical applications. Selected projects representative of Mr. Taylor’s experience are subdivided into the following categories:

- Master-Planned Communities
- Miscellaneous Residential and Custom Lot Projects
- Major Roadways
- Bridges
- Commercial, Industrial, and Retail Projects
- Groundwater Studies
- Water Resources Projects
- Landslide/Slope Stability Investigations & Slope Repairs
- Fault Investigations
- Miscellaneous Utility Projects
- Seismic Hazard Analyses
- Seismic Refraction and Rippability Studies

PROJECT EXPERIENCE

MASTER-PLANNED COMMUNITIES:

- < Ortega Gateway Planned Community – Rancho Mission Viejo, Orange County, CA (2005-Present): Geotechnical investigation and reporting for 550-acre master-planned community addressed numerous issues including large-scale 160-foot-deep ancient landslides, liquefaction hazards, time-delayed settlement, shallow groundwater, debris flow potential, aggregate mining, existing infrastructure, and scour protection for the adjacent San Juan Creek.
- < The Ranch Plan – Rancho Mission Viejo, Orange County, CA (2001-Present): Project covers 23,000 acres of southeastern Orange County and is characterized by complex geologic terrain that includes the Cristianitos fault, the Mission Viejo fault, and numerous Quaternary to Jurassic geologic formations. Preliminary geologic investigations for the Ranch Plan Environmental Impact Report included long-term groundwater monitoring studies, geologic mapping, subsurface exploration, fault trenching, and seismic refraction studies. Geotechnical studies are on-going for long-term planning and design of the sequenced 14,000-unit development.
- < Ladera Ranch Planned Community – Rancho Mission Viejo, Orange County, CA (2001-2004): Geologic mapping, grading observation, and reporting for a portion of the 8000+ unit master-planned development. Major hillside grading operations involved complex geologic structure and large-scale ancient landslides.
- < Talega, Village 5 – City of San Clemente, Orange County, CA (2003-2006): Geotechnical investigation, design, and construction services for master planned community. Geologic mapping during grading included complex geologic structure, including the Cristianitos Fault zone and numerous ancient landslides.
- < Crystal Cove – Newport Beach, Orange County, CA (2003-2006): Geotechnical investigation and geologic mapping during hillside grading for residential development. Geologic structure included the Pelican Hills fault zone and numerous large-scale ancient landslides.
- < Newport Banning Ranch – Newport Beach, Orange County, CA (2007-Present): Geotechnical studies and design consultation for master-planned residential development. Studies addressed active traces of the Newport-Inglewood fault zone, bluff stability, large-scale grading operations, and groundwater.

MISCELLANEOUS RESIDENTIAL AND CUSTOM LOT PROJECTS:

- < Via Terracaleta – Coto de Caza, Orange County, CA: Geotechnical investigation for a 7-lot custom home development on about 15 acres of partially developed land.

- < Newport Beach Country Club – Newport Beach, Orange County, CA: Geotechnical investigation and design services for future grading and construction of residential development at the Newport Beach Country Club.
- < Westar Goleta Mixed Use Project – Goleta, CA: Geotechnical studies, fault investigation, and percolation testing for 23-acre mixed use site with apartments and retail buildings.
- < Capriotti Residence – Coto de Caza, Orange County, CA: Geotechnical investigation, design, and construction services for grading and construction of a large custom home on a 14-acre property. Improvements include the main residence, pool house, guest house, ponds, pool, 17-foot-high MSE walls, etc.
- < McFadden Residence – Coto de Caza, Orange County, CA: Geotechnical investigation and design services for proposed grading and construction of multiple MSE walls and a large residential addition.
- < Marlin Residence – Shady Canyon, Orange County, CA: Geotechnical investigation design, and construction services for grading and construction of a custom home with full basement on a previously rough graded pad.

MAJOR ROADWAYS:

- < Ortega Highway (SR 74) Widening – San Juan Capistrano and Rancho Mission Viejo, Orange County, CA: Geotechnical and materials investigation for widening the existing 2-lane highway to 4 lanes. Project spans from within the City of San Juan Capistrano to about ½-mile east of the intersection with Antonio Parkway. Design effort required extensive coordination and review with Caltrans and the County of Orange. Also served as project manager and field geologist for geotechnical and materials testing services during construction of County portion of project, including extensive inspection and testing on jet grouting and soil cement revetments around the San Juan Creek bridge.
- < Antonio Parkway Widening – Orange County, CA: Geotechnical and pavement investigation for widening the existing 4-lane arterial roadway to 6 lanes. Project spans from the southern portion of Ladera Ranch to about ½-mile south of intersection with Ortega Highway.
- < Laguna Canyon Road Shoulder Widening – Orange County, CA: Subsurface investigation and preparation of Geotechnical Design Report for proposed road widening between El Toro and SR-73.
- < Lincoln Avenue Widening – Anaheim and Orange, CA: Geotechnical investigation for proposed roadway widening, retaining walls, and bridge widening over Santa Ana River.
- < Cow Camp Road – Rancho Mission Viejo, Orange County, CA: Geotechnical investigation for proposed 6-lane arterial roadway between Antonio Parkway and Ortega Highway on the north side of San Juan Creek.

- < La Pata Gap Closure Project – Orange County, CA: Geotechnical investigation and design services to support project report and environmental document for gap closure between San Juan Capistrano and San Clement.
- < La Pata Avenue Extension – City of San Clemente, Orange County, CA: Geologic mapping and grading observation during grading of the extension within Talega.

BRIDGES:

- < Antonio Parkway Bridge Widening – Orange County, CA (2006-2009): Geotechnical investigation and design services for widening of existing bridge over San Juan Creek. Geotechnical studies addressed liquefaction potential, updated seismic design, foundation design, and revetment design.
- < San Juan Creek Bridge, Ortega Highway (SR74) - Orange County, CA (2005-2009): Geotechnical investigation and design services for construction of a new 3-lane bridge adjacent to the existing 2-lane bridge. Geotechnical studies addressed liquefaction potential, foundation design, scour protection, and new abutment grading. Also served as project manager and field geologist for geotechnical and materials testing services during construction of bridge, including extensive inspection and testing of jet grouting and soil cement revetments around the bridge.
- < Lincoln Avenue Bridge Widening – Anaheim and Orange, CA (2009): Geotechnical investigation for proposed bridge widening over the Santa Ana River.
- < Cow Camp Road Bridges – Rancho Mission Viejo, Orange County, CA (2005-2008): Two major 6-lane bridges proposed to span approximately 1,400 and 1,700 feet over Chiquita and Gobernadora Canyons, respectively. Geologic conditions are characterized by up to 80 feet of saturated alluvial soils with high liquefaction potential. Geotechnical studies for roadway and bridge foundation design addressed liquefaction issues such as seismic settlement, lateral spreading, flow failures, downdrag on columns, decreased lateral and vertical capacity, and potential ground improvement/liquefaction remediation.
- < Antonio Wildlife Crossing Bridge – Ladera Ranch, Orange County, CA (2008) – Geotechnical observation of foundation construction, including excavation of large-diameter shafts for bent construction.

COMMERCIAL, INDUSTRIAL, AND RETAIL PROJECTS:

- < Koll Co. Calabasas Office Park II – Calabasas, Los Angeles County, CA (2008-2009): Geotechnical investigation and reporting for a three-story office building and four-story parking garage with subterranean level. Geotechnical studies addressed slope stability, foundation design, and consolidation of up to 70 feet of existing artificial fill.
- < Capistrano Mixed Use Site (Plaza Banderas) – San Juan Capistrano, CA (2009): Geotechnical investigation and design services for proposed hotel and retail site.

- < Koll Co. Railroad Industrial Complex – City of Industry, Los Angeles County, CA (2008 - 2009): Geotechnical investigation and reporting for three industrial buildings. Geotechnical studies addressed liquefaction hazards, settlement, and foundation design.
- < Koll Co. San Juan – San Juan Capistrano, Orange County, CA (2008): Geotechnical investigation and reporting for 10 single- and two-story commercial office buildings on an undeveloped hillside site. Project involves significant rough grading and construction of numerous retaining walls, including MSE walls, soil nail walls, and conventional walls. Geotechnical studies addressed slope stability, foundation design, and significant grading operation.
- < Crean Lutheran South High School – Irvine, CA (2009): Provided geotechnical investigation and design services for 15-acre high school with 2-story administrative building, 3-story classroom building, performing arts building, gymnasium, parking structure, and track and field area.
- < Westar Goleta Mixed Use Project – Goleta, CA (2007-Present): Geotechnical studies, fault investigation, and percolation testing for 23-acre mixed use site with apartments and retail buildings.
- < CR&R Materials Reclamation Facility – Orange County, CA (2007-2008): Geotechnical investigation for a potential MRF Site on 14 acres of undeveloped property. Geotechnical studies addressed complex landslides and geologic conditions, slope stability, and numerous grading configurations.

GROUNDWATER STUDIES:

- < The Ranch Plan Groundwater Studies – Rancho Mission Viejo, Orange County, CA: Long-term groundwater studies to support EIR for The Ranch Plan, a long-range development plan for the 23,000-acre property in southeastern Orange County. Groundwater studies included the installation and monitoring of over 60 monitoring wells. Water level and water chemistry monitoring was performed using manual measurements, pneumatic piezometers, and data loggers.
- < Groundwater Study for Trabuco Canyon Water District – Trabuco Canyon, Orange County, CA: Drilled and installed two monitoring wells to depth of 200 feet in order to evaluate shallow unconfined aquifer and deep bedrock aquifer.
- < Gabino Canyon Groundwater Study – Rancho Mission Viejo, Orange County, CA: Performed a seismic refraction study and geologic mapping to evaluate depth to groundwater and depth to bedrock for use in determining optimum locations and depths for groundwater production wells. Sited shallow and deep wells for agricultural groundwater production. 500-foot deep production well yielded artesian conditions.

- < Mission Viejo Golf Course Groundwater Studies – Mission Viejo, Orange County, CA: Drilled and installed four monitoring wells to evaluate shallow groundwater and impacts to a proposed lake facility.
- < Groundwater Study for San Juan Creek Revetment – Rancho Mission Viejo, Orange County, CA: Excavated numerous borings and test pits to observe groundwater levels adjacent to San Juan Creek. Groundwater data was utilized for design of revetment system which included jet grouting and soil cement.
- < Koll Co. La Costa Meadows Groundwater Study – San Marcos, San Diego County, CA: Geologic oversight for drilling and installation of eight monitoring wells to evaluate artesian conditions and fracture flow within volcanic bedrock materials. Groundwater distress was related to upward migration of groundwater through floor slabs of commercial buildings.

WATER RESOURCES PROJECTS:

- < San Juan Creek Revetment – Rancho Mission Viejo, Orange County, CA: Geotechnical investigation and studies to support design of proposed revetment (i.e., scour protection system) along San Juan Creek near Ortega Highway and Antonio Parkway. Studies included subsurface investigation, materials testing, revetment stability analyses, groundwater evaluation, and assistance with design of jet grouting and soil cement components of the revetment.
- < Trabuco Creek Channel Levee Improvement Project – Orange County Flood Control District/Materials Laboratory: Provided geotechnical investigation and design services for proposed sheet pile walls within channel levees. Sheet pile walls will be approximately 30 feet deep and will provide additional scour protection for concrete-lined levees.
- < Rose Canyon and Lang Wells Groundwater Treatment Facility – Trabuco Canyon Water District, CA: Provided geotechnical investigation, design, and construction services for groundwater treatment facility in Trabuco Canyon. Managed construction services including materials testing and special inspection for concrete, grout, mortar, rebar, welding, etc.
- < South County Pipeline Protection Project – Santa Margarita Water District, Orange County, CA: Geotechnical services to support design and construction of scour protection for the South County Pipeline (48-inch water main) crossing at San Juan Creek. Protection included sheet piles and rip rap. Vibration monitoring was utilized by GMU due to pile driving near existing 48-inch water main.
- < Stormwater Testing for SWPP Compliance – Ladera Ranch, Orange County, CA: Sampled stormwater runoff at locations in and around Ladera Ranch during rain events. Analyzed water samples for chemical parameters related to water quality.
- < San Juan Creek Forcemain Replacement – Santa Margarita Water District, Orange County, CA: Geotechnical investigation for jack and bore replacement of damaged sewer forcemain that crosses San Juan Creek.

- < Domestic and Non-Domestic Reservoirs – Santa Margarita Water District, Orange County, CA: Geotechnical investigation for five proposed reservoir sites within Rancho Mission Viejo.
- < Gobernadora Basin – Santa Margarita Water District, Orange County, CA: Geotechnical investigation for proposed water detention and water quality basin in Gobernadora Canyon, south of Coto de Caza. Investigation included liquefaction analyses and groundwater studies.
- < Water Quality Testing for Birtcher Development, General Drive Project – Riverside, CA: Collected water samples within jurisdictional drainages that are tributary to the Santa Ana River. Analyzed samples for water chemistry, with a focus on fecal and total coliform in an attempt to assess water quality changes throughout the drainages.

LANDSLIDE/SLOPE STABILITY INVESTIGATIONS AND SLOPE REPAIRS:

- < Various Landslide Investigations – Orange County, CA: Investigation, analysis, and remediation of dozens of landslides related to development of several master-planned communities.
- < Hillcrest Drive Landslide, Los Angeles, CA: Geotechnical investigation of landslide and design of slope repair behind residences. Also managed preparation of survey work, grading plans, erosion control plans, and landscape plans.
- < Canyon Wren Street Distress and Slope Movement, Aliso Viejo, CA: Geotechnical investigation of street distress and potential slope movement. Study included subsurface exploration and installation of three slope inclinometers.
- < Woodview Road Landslide Repair – City of Chino Hills, CA: Geotechnical investigation of two landslides that destroyed half of the roadway.
- < Debris Flow Analysis, Talega Village 5 – San Clemente, CA: Calculations and analysis of debris flow hazards affecting residential development. Also assisted with design of detention facilities to mitigate debris flow hazard.
- < Debris Flow Analysis, Ortega Gateway – Rancho Mission Viejo, CA: Calculations and analysis of debris flow hazards affecting residential development. Also assisted with design of detention facilities to mitigate debris flow hazard.
- < Mission Gorge Quarry Slope Stability Evaluation – Superior Ready Mix, San Diego, CA: Geologic mapping and structural geologic analysis of multiple intersecting joint sets within a quarry slope comprised of Santiago Peak Volcanics.

FAULT INVESTIGATIONS:

- < Newport Banning Ranch – Newport Beach, Orange County, CA (2007-Present): Geotechnical analyses and design consultation for master-planned residential development near the Newport-Inglewood fault zone. Extensive fault trenching program addressed multiple traces of the Newport-Inglewood fault zone.
- < North Ellwood Fault Investigation – Westar, Goleta, CA: Geologic investigation of a potentially active fault that was mapped through a proposed development. Investigation included air photo analysis, geophysical survey, and fault trenching to determine location and inactivity of postulated fault.
- < Mission Viejo Fault – Rancho Mission Viejo, CA: Investigated Mission Viejo fault in two locations for EIR studies.

MISCELLANEOUS UTILITY PROJECTS:

- < KMEP Jet Fuel Line Relocation, PA-1 – Kinder Morgan Energy Partners, Orange County, CA: Geotechnical investigation for relocation of existing jet fuel line within Planning Area 1 of Rancho Mission Viejo.
- < KMEP Jet Fuel Line Relocation, Ortega Highway – Kinder Morgan Energy Partners, Orange County, CA: Geotechnical services for jack-and-bore relocation of existing jet fuel line below Ortega Highway.
- < Cellular Sites at Tree of Life and Color Spot Nurseries – RMV Telecom, Orange County, CA: Geotechnical investigation for two proposed cellular sites.

SEISMIC HAZARD ANALYSES:

- < Probabilistic (PSHA) and Deterministic (DSHA) Seismic Hazard Analyses – Seismic hazard analyses performed for a wide variety of projects, including residential and commercial developments, roadways and bridges, reservoirs, slope deformation analyses, etc. Seismic hazard analyses are focused on generating Peak Ground Acceleration (PGA), UBC and site-specific response spectra curves, and deaggregated analyses for use in liquefaction calculations.
- < CALTRANS-Based Seismic Hazard Analyses – Seismic hazard analyses performed according to Caltrans Seismic Design Criteria for use in bridge design.

SEISMIC REFRACTION AND RIPPABILITY STUDIES:

- < Rancho Mission Viejo Rippability Studies – Rancho Mission Viejo, Orange County, CA: Performed three separate refraction and rippability studies in Planning Areas 3, 4, and 5 to evaluate Tertiary and Cretaceous sedimentary bedrock of the San Onofre Breccia, Silverado, and Williams Formations.

- < Gabino Canyon Refraction Study – Rancho Mission Viejo, Orange County, CA: Performed refraction study to evaluate depth to groundwater and depth to bedrock for use in determining optimum locations and depths for groundwater production wells.
- < Murrieta Hills Rippability Study – Pulte Homes, Murrieta, CA: Seismic refraction and rippability study to evaluate granitic rock in area of proposed housing development.
- < Alessandro Rippability Study – Riverside, CA: Seismic refraction and rippability study to evaluate granitic rock in area of proposed commercial development.
- < Elephant Hill Rippability Study – Centex Homes, Pomona, CA: Seismic refraction and rippability study to evaluate volcanic rock in area of proposed housing development.
- < Palomar Pointe Rippability Study – Western Realco, San Diego County, CA: Seismic refraction and rippability study to evaluate volcanic rock in area of proposed development.

PUBLICATIONS:

Armstrong, P. A., Taylor, A. R., and Ehlers, T. A., 2004, Is the Wasatch fault footwall (Utah, United States) segmented over million-year time scales?: *Geology*, v. 32, No. 5, p. 385-388; doi: 1130/G2042.1.

Taylor, A. R., Armstrong, P. A., and Farley, K. A., 2001, Evaluation of the long-term segmentation of the Wasatch fault footwall using (U-Th)/He thermochronometry: *EOS Trans. AGU*, 82(47), Fall Meeting Suppl.

Taylor, A. R., Armstrong, P. A., and Knott, J. R., 2006, Geomorphology and geochronology of the San Juan Creek Terraces: Implications for uplift of the Santa Ana Mountain foothills, Orange County, California: *Geology of the Orange County Region, Southern California*; South Coast Geological Society Annual Field Trip Guide No. 33.