Steven Bond and Associates
CONSULTING GEOLOGISTS, GROUNDWATER, HYDROLOGY, AND WATER QUALITY EXPERTS
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30 September 2019

Michael Schaller, Senior Planner
San Mateo County Planning Department
455 County Center, 2nd Floor
Redwood City, CA 94063

RE: Gray Whale Cove Pedestrian Crossing

Dear Mr. Schaller,

I am a professional geologist specializing in engineering geology, hydrogeology, and aqueous geochemistry. As an engineering geologist and hydrogeologist I evaluate the stability of slopes and the erosion potential of soils. I hold professional licenses and certifications issued by the State of California for these practices and have over 30 years experience in these fields. My CV is attached.

I have reviewed the following documents: "Notice of Intent to Adopt Revised Mitigated Negative Declaration" and the "Initial Study Environmental Evaluation Checklist' ("Initial Study") for the Gray Whale Cove Pedestrian Crossing, which is approximately 0.5 miles south of the Tom Lantos Tunnel at Devils Slide.

I have several areas of concern that have led me to conclude that this project is likely to result in significant impacts to the environment, particularly impacts resulting from coastal instability, as well as erosion – even with mitigations proposed. These areas include the fact that the project is located in an area well-know for landslides, and that the project is to be built atop an existing engineered reinforced slope. The west face of the 40-degree slope below the highway is a constructed slope-stability structure. Aerial imagery shows what appears to be an engineered crib-wall, refer to Figure 2, attached. While the Initial Study indicated that the Highway and parking lot are located on a constructed bench, it did not discuss the role of the constructed slope buttress built at the west face of the constructed bench.

My conclusion of significant impacts is also based on the fact that the Initial Study's evaluation of the project was done without acknowledging that the project is proposed to be built on a slope stability structure. Further, the Initial Study actually misrepresented coastal bluff erosion below the project site as well as the presence of fissures and escarpments from a failing slope a few hundred feet from the project.

The Initial Study acknowledges the high erosion potential of the soils and yet only gives casual recognition to the landslides in the area. The Initial Study incorrectly states that the coastal bluffs do not show signs of instability or erosion.

Although not directly acknowledged in the Initial Study, the project is in the location of rainfall induced landslides on maps published by The Association of Bay Area Governments/Resilience Program << http://gis.abag.ca.gov/website/Hazards/?hlyr=debrisFlowSource >> Refer to Figure 1, attached.

The Initial Study incorrectly states that "the adjacent coastal bluff has not shown signs of instability or erosion. The toe of the bluff is sufficiently upslope from the mean high tide line to avoid substantial wave action which could lead to bluff erosion." However, 400 feet west from the project the coastal bluff is undergoing active erosion. The slope is unstable as evidenced by landslide escarpments and fissures less than 200 feet from the project where the slope is sliding into the ocean and boulder debris at the base where the ocean waves meet the bluffs. Refer to Figure 2 attached.

While the proposed project is located adjacent to existing landslides it is directly atop an engineered crib-wall acting to stabilize the slope below the highway which sits atop the constructed bench. See photo Figure 2.

This element of the project was not discussed in the Initial Study. The Initial Study does not identify the fact that that the project is being built on an artificial buttress built to stabilize the slope constructed approximately 15 years ago. (Google Earth historical imagery (1993 through 2017).

The project intends to modify parts of this engineered reinforced slope, but does not discuss the implications. Where the Initial Study states that the contouring of disturbed lands will be done, it does not state specifically where this is anticipated. However, a graphic figure in Appendix A shows portions of the project involve modifying the structure and altering the contours of the slope at the north end of the structure, refer to Figures EC-2 Erosion Control and G-2 Contour Grading of the Initial Study. Modification of the slope contours will affect runoff velocities and erosional forces which can adversely affect the reinforced slope. Despite this potentially significant erosion impact, the Initial Study neither contemplates modifying the existing slope stability structure, nor does it address what impacts this may have on the overall function of the existing slope mitigations.

The references to an unspecified water treatment plan for the project and proposed grading drainage improvements above of the slope buttress (Attachment-A, Figure-1) further indicate the potential for significant adverse hydraulic destabilization.

Thank you for your attention to these issues.

Steven Bond PG, CEG CHG

FIGURE 1

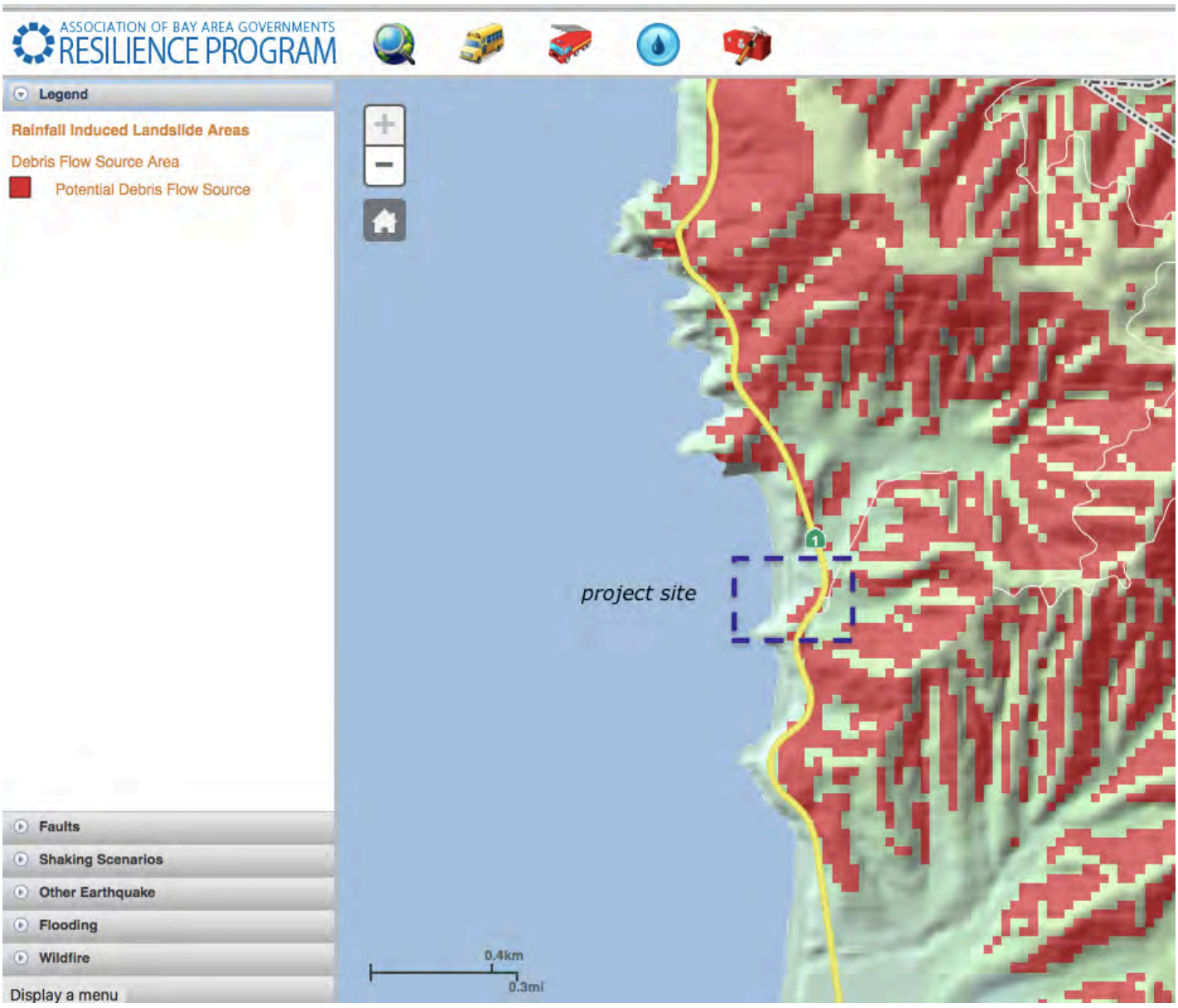
ASSOCIATION OF BAY AREA GOVERNMENTS
RESILIENCE PROGRAM
Legend
Rainfall Induced Landslide Areas
Debris Flow Source Area
Potential Debris Flow Source
Faults
Shaking Scenarios
Other Earthquake
Flooding
Wildfire
Display a menu
project site
0.4km
0.3mi

Figure 2, Site of Proposed Gray Whale Pedestrian Bridge

STEVEN R. BOND

Curriculum Vita

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Profile

Geologist / Engineering Geologist / Hydrogeologist / Aqueous-geochemist

- More than thirty years experience evaluating industrial impacts to ground and surface water quality and pollution treatment technologies.
- More than thirty years applied experience in groundwater and engineering geology.
- Twenty years practical experience defining hydrogeologic flow systems in crystalline, fractured rock systems, and porous sedimentary aquifers.
- More than thirty years practical experience evaluating natural and contaminant water chemistry issues.
- Twenty years practice of geochemical analysis of humid and semiarid hydrogeologic regimes, including water supply, and contaminant fate and transport.
- More than twenty years experience investigating and evaluating geologic and hydrogeologic hazards related to slope stability, seismic hazards, hazardous materials, mine wastes, and soil and groundwater contamination.
- More than fifteen years experience defining and modeling stream and river flow, flooding analyses, sediment transport systems, and rainfall distribution.
- Eleven years as a CA State regulator implementing California and U. S. water quality laws and regulations.

Professional Licenses	Professional Geologist, *California, USA*	# 5411
	Certified Engineering Geologist, *California, USA*	# 1841
	Certified Hydrogeologist, *California, USA*	# 0238

Professional Experience

January 1999 to Present

Steven Bond and Associates, Santa Cruz, CA, President, Principal Geologist

Conducted investigations and assessments of geologic hazards, threats to surface water and groundwater quality from various industrial and natural sources, and groundwater supply investigations. Performed litigation support in cases involving potential impacts of geologic hazards, groundwater supply and pollution, surface water pollution, and State water quality policy review. Examples of such activities and projects include the following:

- *Engineering Geology*: Conducted investigations of geologic hazards, foundation studies, liquefaction potential assessments, fault trace analyses, slope stability assessments and prepared the associated engineering geology investigation reports for development and industrial projects in Monterey, San Mateo, Mendocino, and Santa Cruz Counties. ◊ Conducted foundation suitability study, seismic evaluation, and fault trace study for resort development, Big Sur (Monterey Co.) ◊ Conducted analysis of debris-slide hazard potential of properties near Loma Mar (San Mateo Co.) ◊ Did technical analysis of slope stability and soil erosion potential of timber harvest operations, and evaluated surface-water monitoring practices (Humboldt Co.) for permitting dispute. ◊ Evaluated landslide activation hazard analysis of cliff side development in Brisbane (San Mateo Co.) ◊ Evaluated potential erosion hazards and drafted technical remedies from impacts of extrajudicial logging activities (Mendocino, Co.) ◊ Prepared engineering geologic reports for various residential development projects (Santa Cruz Co., San Mateo Co.).
- *Groundwater Investigations, Modeling, and Remediation System Design:* Designed and implemented original subsurface investigation technics, and remediation systems for a complex hydrogeologic environment of volcanic sediments, for Sierra Nevada Mt. community drinking water contamination (Volcano, CA). ◊ Did aquifer analysis and computer simulation (Modflow) of contaminant flow and remediation system design (groundwater extraction) for MTBE site in Turlock, CA. ◊ Did groundwater transport and pollutant fate analysis of landfill for litigation support (Colma, CA).

- *Surface Water and Groundwater Flow and Supply:* Conducted groundwater use sustainability study for a Sonoma Valley winery. ◊ Did evaluation of sustainability potential and impacts from groundwater extraction in Sierra Valley (Sierra and Plumas Counties) for litigation support. ◊ Water budget analysis for groundwater supply of coastal development (Big Sur). ◊ Analysis of flooding return, determine ordinary high water mark (Outlet Creek, Mendocino County) for litigation support. ◊ Conducted a comprehensive water budget analysis of the Mana Plain Watershed in western Kauai, HI for litigation support.
- *Policy Review and Regional Studies:* Conducted technical review and analysis of CA State water policy (State Implementation Plan, California Toxics Rule) for litigation support. ◊ Technical consultant and committee member for San Francisco Bay Copper-Nickel TMDL impairment studies (north and south). ◊ Conducted technical analysis of proposed monitoring and reporting programs for the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands within the Central Valley Region, providing testimony before the before the Regional Board on behalf of stakeholders. ◊ Conducted technical analysis of rainfall distribution statistics and prepared comments on design storm standards for treatment control of BMP's in the California Statewide draft Industrial Storm Water Permit.
- *Storm Water:* Conducted technical reviews, and did litigation support in cases of storm water pollution regarding the adequacy of monitoring programs, BMPs, and treatment technology application (Alameda, Humboldt, Placer, Sacramento, San Joaquin, San Mateo, San Francisco, Monterey, Sonoma, Santa Cruz, and Yuba counties) for the following types of industry: aggregate, cement, asphalt, metal fabrication, metal forging, steel casting, scrap metal, recycling, ship breaking, wood treatment, sawmills, CAFO's, food processing, vehicle maintenance, auto wrecking, POTW, precious and heavy metal mines, landfills, fueling facilities, and port loading facilities for ammonia, fertilizer and petroleum coke.
- *Mining Projects:* Evaluated drinking water quality hazards posed to confined prisoners at an operating copper mine (United Nations ICTY, Bosnia-Herzegovina). ◊ Evaluated geochemical potential to produce acid and release arsenic from re-activated gold mine (Sutter Ck. CA), acid mine drainage water quality impacts. ◊ Evaluated WQ pollution potential from abandoned mercury and gold mines (Coastal Mts, central & north CA, Sierra Nev. Mts) for litigation purposes.
- *Land Discharge Projects:* Evaluated compliance with CCR Title 23, Title 22, Chapter 15 (CA) regulations for Winery wastes (Amador County), dredging spoils disposal (Port of Stockton), Class III landfill (San Mateo Co., Shasta Co., Lake Co.). Designed monitoring programs and budgets.

March 1998 - January 1999

Fall Creek Engineering, Inc., Santa Cruz, CA, Principal Geologist

Hydrologic and Groundwater Investigations: Evaluated the risk from surface and groundwater contamination to public groundwater supplies (Big Sur); performed computer simulations of flow and geochemistry of ground and surface water interaction using Modflow, Minteq. Did hydrologic studies to evaluate the flood stages, water surface profiles, and erosion potentials; constructed a computer-based hydraulic model of the river using HEC-RAS (Salinas River, Monterey Co.); prepared water quality and flood control management plans (Pajaro River). Designed and conducted soil and groundwater sampling analysis programs at various sites in Monterey and Santa Cruz Counties (luft and wastewater systems).

March 1997 - January 1998

Water For People, Denver Colorado, Consulting Hydrogeologist

Conducted a synoptic hydrogeological survey of the Bay Islands, Honduras, Central America for the Bay Island Environmental Project. Evaluated the islands' resources and prepared guidance for a comprehensive water supply investigation of the three main islands comprised primarily of fractured metamorphic rock. Conducted local interviews, literature review and a reconnaissance level survey, field trued geology in selected areas. Evaluated island-available drilling technology, characterized water quality and supply issues for several of the island communities, prepared investigative criteria for future work, wrote report.

December 1986 - May 1998

California Regional Water Quality Control Board, Sacramento, CA. Associate Engineering Geologist

Conducted investigations of all aspects of pollutant transport in the vadose zone and groundwater and surface water. Reviewed and evaluated the geologic, hydrogeologic, geochemical, and geophysical content of professional reports. Evaluated thoroughness of surface and groundwater investigations, the completeness of remedial efforts, and validity of monitoring programs. Provided expert technical assistance to State and local agencies on issues of geochemical fate and transport of pollutants, well-head protection strategies, abandoned mine investigation and remediation methods, and contaminated groundwater and soil cleanup technics. Examples of such projects include the following:

- Analysis of groundwater impacts from organic solvents and fuels in sedimentary and fractured rock terrain. Evaluated investigative methods including drilling techniques, soil, water, and vapor sampling methods, and in situ and ex-situ remedial technologies using vapor transport, groundwater capture, extraction and treatment. Did deterministic computer modeling. Technical advisor and regulator for hundreds of facilities under authority of Federal and State underground tank statutes in the counties of Alpine, Amador, El Dorado, Calaveras, Lake, Napa, Mariposa, Placer, Sierra, Solano, Stanislaus, and Tuolumne California, and in Yosemite National Park.
- Analysis of groundwater flow and pollutant transport characteristics of polluted, high density waste water (industrial acids and heavy-metals) at Davis, CA. Evaluated water quality impacts, effectiveness of groundwater extraction schemes using numerical modeling methodologies for flow, and chemical fate and transport. Co-developed in situ leaching methods of contaminated soils to accelerate cleanup rates.
- Analysis of the underlying, geochemical causes of acid mine drainage at the Penn Mine in Calaveras Co., CA. Identified and evaluated groundwater flow paths in a faulted crystalline-rock aquifer and the applicability of water quality and hazardous waste laws to the toxic discharges. Conducted a geologic and fracture mapping project and developed conceptual flow groundwater model. Evaluated acid-mine and acid-rock drainage remedial alternatives and made recommendations for their use. Developed and composed work plan for the investigation of fractured-rock hydrogeological transport, and aquatic geochemical fate of heavy metals from Penn Mine to the adjacent Camanche Reservoir. Authored numerous reports and a series of successful grant proposals, prepared annual budget and obtained funding for detailed groundwater and remedial waste rock investigations.
- In companion project to the above mine waste project, developed a conceptual model for the transport mechanisms of heavy-metal laden sediment in the Camanche water-supply reservoir, developed the conceptual methodology of investigation, and managed the project. Assembled a team of limnologists from the University of California at Davis and fluid mechanical engineers specializing in sediment re-suspension from University of California at Santa Barbara. Wrote a successful Federal Clean Lakes Grant proposal, and implemented the investigation at Camanche reservoir, California.

May 1986 - September 1986

U.S. Army Corps of Engineers, Sacramento, California, Engineering Geologist.

Conducted geologic and hydrogeologic investigations preparatory to the design of Deer Creek Water Supply Reservoir, Utah. Drafted groundwater investigation plan. Conducted geologic mapping. Designed monitoring wells, supervised drilling crews and well construction, conducted aquifer pumping tests.

October 1983 - September 1984

Dames and Moore, Los Angeles, California, Sedimentary Petrologist.

Conducted sedimentological investigation of near-shore sediments in western Arabian Gulf. Characterized sediment transport systems in the Arabian Gulf area of United Arab Emirates for Abu Dhabi National Oil Company.

May 1982 - April 1983

U.S. Army Corps of Engineers, Portland, Oregon, Engineering Geologist.

Conducted geologic, geophysical and hydrogeologic investigations in the Columbia Gorge near Bonneville, Oregon. Conducted geophysical borehole investigation of Bonneville New Navigation Lock. Did detailed mapping of landslides, and drill core logging. Designed passive de-watering systems, and monitoring wells. Supervised drilling and construction of water supply and monitoring wells; conducted and interpreted aquifer pumping tests.

June 1981 - December 1981

XCO, Denver Colorado, Petroleum Field Geologist

Did drill core logging, conducted field screening of chemical composition of drill cores, interpreted geologic strata, and prepared drilling reports in several depositional basins in North Dakota, Colorado, and Oklahoma.

September 1976 - September 1977

U. S. Geological Survey, Menlo Park, California. Geologic Field Assistant.

Conducted geologic mapping and did geochemical sampling for Continentally Unified Strategic Assessment Program which evaluated economic potential of proposed Federal Wilderness areas and abandoned mines. The region included the Kalmiopsis Wilderness of southwestern Oregon; an ophiolite suite and recent volcanic terrain.

Education & Training

Master of Science (ABT) in Hydrogeology, Special Studies Program, California State University, Chico, California, 1985-1986

Bachelor of Arts in Geology, Humboldt State University, California, 1979 - 1981

Annual NWWA courses in Aqueous Geochemistry, Fluid Flow through Fractured Rock, In situ Fluid Extraction Systems, Ground-Water Isotope Geochemistry. 1987-1991.

Computer Modeling. EPA CEAM: MINTEQ geochemical speciation, 1990, 1991; WASP surface water flow and transport, 1991. General Sciences Corp.: SESOIL vadose zone pollutant transport, 1994, 1996; AT 123D groundwater pollutant transport, 1994, 1996; NWWA: Visual Modflow, Flowtrans, groundwater flow and transport, 1996. WHI: Modflow 2000, MTD3, groundwater and contaminant transport, 2002.

Constructed Wetlands Workshop and Seminar Series, Humboldt State University, California, 2002.

Soil Slope Stabilization, Embankment Design, National Highway Institute, Vail, CO, 2007

40 hour OSHA Health and Safety for Hazardous Waste Operations and 8 hour refresher courses.

Professional Associations

Association of Engineering Geologists;
Groundwater Resources Association of California

Nonprofit Affiliations

Valley Air Trust, Central Valley, Stockton California, Board Member 1993 - 1997.
BayKeeper San Francisco Bay-Sacramento Delta, Technical Advisory Committee Member 1996 - present.
California Sportfishing Protection Alliance, Technical Advisory Committee Member 2000 - present
The Abandoned Mine Alliance, Sierra City, California, Board Member 2005 - present.
The Santa Cruz Flying Club, Watsonville, CA, Board Member 2009 - 2017.

Expert Testimony

- Before the United States District Court, District Of Hawai'I, concerning the Clean Water Act agricultural exemption involving mixed sources of polluted waters discharged to jurisdictional waters of the U.S., in the case of Na Kia'I Kai, Surfrider Foundation, and Pesticide Action Network North America, vs State Of Hawai'I Agribusiness Development Corporation, April 2019
- Before the United States Northern District Of California Court, on issues related to determination of the active channel and ordinary high water mark of a jurisdictional water of the U.S., in the case of Friends Of Outlet Creek vs Grist Creek Aggregates, Llc, October 2017
- Before the Superior Court of the State of California in and for the County of Alameda, on issues of water quality contamination by domestic garbage and litter in the case of Paul Ghysels, and Katy Ghysels, vs. Interfraternity Council, et al. December 2016.
- Before the United States Eastern District of California Court, on issues of selenium contamination transport in surface and groundwater from formerly irrigated lands to jurisdictional waters in the case of Pacific Coast Federation of Fishermen's Association; et al. vs U.S. Bureau of Reclamation and San Luis & Delta Mendota Water Authority, September 2015.
- Before the United States Eastern District of California Court, on issues of storm water pollutants associated with industrial scrap metal processing operations in the case of California Sport Fishing Protection Alliance vs Chico Scrap Metal, Inc., February 2015.
- Before the United States Eastern District of California Court, on issues of storm water pollutants associated with industrial structural metal fabrication in the case of California Sport Fishing Protection Alliance vs MCM Construction Inc., May 2014.
- Before the California Superior Court on issues of surface water pollution and recreational vehicle use at Carnegie State Park in the case of California Sport Fishing Protection Alliance et. al. vs California Department of Parks and Recreation Company, September 2009.
- Before the United States Northern District of California Court, on issues of storm water pollutants associated with industrial ammonia and urea fertilizer production and storage operations in the case of California Sport Fishing Protection Alliance vs California Ammonia Company, September 2006.
- Before the United States Northern District of California Court, on issues of surface water pollution associated with logging practices in the case of EPIC vs Pacific Lumber Company, May 2006.
- Before the United States Northern District of California Court, on issues of groundwater and storm water pollution associated with lumber milling and wood treatment operations in the case of Ecological Rights Foundation vs Sierra Pacific Industries, April, October, 2002.
- Before the United States Eastern California District Court, on issues of storm water pollution, confined animal feeding operations and industrial activities in the case of WaterKeeper of Northern CA. vs L. Vandhoef, Chancellor, University of California, Davis, June, August 2001.
- Before the CA State Water Resources Control Board hearing on the Appeal of Regional Water Quality Board's Actions regarding Pacific Lumber and the Elk Creek Timber Harvest Monitoring, July 2001.
- Before the United States Northern District of California Court, on issues of storm water pollution and ship-breaking in the case of WaterKeepers of Northern CA. et al. vs U.S. Dept. of Navy and Astoria Metals Corporation, June, August 2000.
- Before the California Superior Court on issues of groundwater pollution and crude oil in the case of Thompson Chevrolet vs Chevron Corporation et al., January, July, and November 1996.
- Before the California Superior Court on issues of acid mine drainage, water pollution, and groundwater flow through fractured crystalline rock in the case of California Sport Fishing Protection Alliance vs State Water Resources Control Board, June 1994.

- Before the California Senate Natural Resource and Wildlife Committee Investigative Hearing on Conflicts of Interest in the California Environmental Regulatory System, June 1992.
- Before the California Senate Natural Resource and Wildlife Committee Investigative Hearing on Acid Mine Drainage, Water Pollution, and the California Regulatory Environment, Jan. 1992.
- Before the California State Water Resources Control Board hearing on the Appeal of Regional Water Quality Boards Actions regarding the Penn Mine, October 1991.

Public Speaking and Presentations

Presentations before the State Water Resources and Regional Water Quality Control Boards.

- Presented testimony and briefs before the State and Regional Boards on specific cases of regulatory enforcement actions, policy enactment, and permit adoptions (1990 - 2011).
- Mediator of formal discussions between responsible parties regarding disputed technical issues involving groundwater quality (1988 - 1998).

Workshop Presentations before professional societies, and local and State regulatory agencies:

- The application and interpretation of discreet groundwater sampling methods and data collection.
- The use and interpretation of computer modeling simulations for vadose transport and mineral equilibria
- The effects and determination of vertical gradients on pollutant transport in groundwater.
- Contaminated soil cleanup criteria based on California State Water Code, regulations and policies.
- Acid Mine Drainage issues: the geology, mineralogy, and chemistry, the environmental effects, remediation, policies, and politics.

Writings

Author of scores of reports for private organizations, NGO's, Federal, State and local Agencies, on the subjects of (a. organic and inorganic pollutant transport in surface and groundwaters, (b. polluted groundwater remediation, (c. the investigation and analysis of the potential transport of soil contamination (metals, fuels, solvents) through the vadose zone, (d. unsaturated zone characterization including vapor-phase transport and cleanup technologies, (e. acid mine drainage causes, fate, and mitigation, (f. the logical elements of water quality monitoring, (g. regulatory compliance of state and federal environmental laws by federal, state and private parties, (h. metal mobility and mineral equilibria, (i. net-vertical transport of groundwater pollutants, (j. surface water and groundwater resource protection, (k. water budget accounting in mixed geologic environments with multiple density fluid interfaces, (l. groundwater supply evaluations, (m. reconciliation of threats to water resources and risks to human health, (n. engineering geology, geological hazard analysis, (o. rainfall distribution and design storm treatment objectives for storm water BMP's.