



**Matthew L. Fuller, C.P.G., L.E.G., P.Geo, QP**  
Principal Engineering Geologist

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## Education

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BS, Geology, Colorado State University, 1982  
University of Hawaii, Manoa 1980  
Western Connecticut State College, 1978-1979

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## Registrations/Certifications

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Professional Geoscientist (P.Geo); British Columbia (2018)  
Certified Professional Geologist (CPG): American Institute of Professional Geologists (#8757, 1992)  
Licensed Engineering Geologist (LEG): Washington (#2135, 2003)  
Professional Geologist (PG): Wyoming (#3366, 1999)  
Registered Geologist: Kansas (RG) (#550, 2004)  
Registered Environmental Professional (REP): Ministerio del Medio Ambiente y Recursos Naturales, El Salvador (#0155, 1995)  
NI-4301 Qualified Person (QP) – Tailings and Geotechnics

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## Experience Summary

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Mr. Fuller is Tierra Group International, Ltd.'s Licensed Professional Engineering Geologist and Qualified Person. Matt's professional technical experience spans more than 30 years providing geological, geotechnical, geo-environmental and geological hazards design and consulting services to the international mining industry. Matt is Tierra Group's Chief Tailings Steward specializing in designing, constructing, operating, decommissioning, closing, and reclaiming more than 50 tailings storage facilities (TSF) around the world. Matt serves on Independent Tailings Review Boards (ITRB, per the Canadian Ministry of Energy and Mines) and specializes in performing due diligence, forensic studies, and expert peer reviews for mining companies, private equity firms and/or their legal counsel. Matt's versatility and broad experience base includes managing projects ranging from large, international, mine development projects (feasibility through final design and construction, involving multi-national, multi-discipline firms), to providing life-of-mine (LOM) assistance to junior mining company owners. In addition to development and operations, Mr. Fuller is well versed in the Equator Principles, and has worked with international regulatory agencies to ensure socially sustainable mine development, operations, closure, and reclamation.

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## Project Experience

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### ***Tailings Storage Facilities***

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#### **EAGLE MINE DUE DILIGENCE TECHNICAL REVIEW | YUKON TERRITORY, CANADA**

Led an independent due diligence technical review for a private equity investment firm. The technical review included geology and resources, mining, metallurgy and process, infrastructure, cost estimating, and execution plan for a new mine's construction, commissioning, and operations. The technical review supported an economic analysis and investment risk analysis. (Tierra Group, 2018)

#### **PIRQUITAS MINE TAILINGS OPERATIONS REVIEW | JUJUY PROVINCE, ARGENTINA**

Reviewed tailings deposition and operations plan for maximizing tailings storage in the final stages (pre-closure) of operations. A site visit and TSF inspection resulted in multiple recommendations for optimizing tailings deposition and water management practices to extend the TSF operational life. (Tierra Group, 2018)

**STILLWATER MINE INDEPENDENT REVIEW PANEL (IRP) | MONTANA**

Serving on an independent, three-expert, tailings review panel adding assurances to tailings dam design and operations safety in accordance with Montana Code Annotated (MCA) 2015 Title 82. Minerals, Oil, and Gas Chapter 4. Reclamation Part 3. Metal Mine Reclamation (specifically 82-4-377 IRP). Project includes annual inspections, performing design, and operations reviews and reporting to the State of Montana. (Tierra Group, 2017 to Present)

**EQUITY MINE INDEPENDENT TAILINGS REVIEW BOARD (ITRB) | BRITISH COLUMBIA, CANADA**

Serving on a four-person ITRB for the Equity Mine in British Columbia. Equity Mine is in closure; care and maintenance status. Activities include treating water to mitigate acid rock drainage and water/tailings management. Annual condition-opinion reports are authored and submitted to the B.C. Ministry of Energy and Mines. (Tierra Group, 2017 to Present)

**GOLDCORP INC. CORPORATE TAILINGS STEWARDSHIP STRATEGY | LATIN AMERICA**

Chief Tailings Steward for all of Goldcorp's TSF in located in Latin American, which include Peñasquito and Los Filos (Mexico), Marlin (Guatemala), and Cerro Negro (Argentina) mines. Tailings Stewardship required independently evaluating the design, operations and safety of all tailings and water dams, which included performing hazards classifications, facilitated risk assessments, systems and processes reviews, operations Team training, Dam Safety Inspections and preparing a 5-year Dam Safety Review Report consistent with Canadian Dam Association and guidelines. This multi-year role requires that updates be prepared annually. (Tierra Group, 2015 to Present)

**NYRSTAR, INC. CORPORATE TAILINGS STEWARDSHIP STRATEGY | U.S., CANADA, MEXICO**

Chief Tailings Steward responsible for overseeing the independent review and preparation of a 5-year Dam Safety Review Report for the Myra Falls (Canada), Tennessee Mines (U.S.), and Campo Morado TSFs in accordance with Canadian Dam Association and guidelines. The Dam Safety Reviews were performed as part of an internal corporate due diligence effort. (Tierra Group, 2016)

**JAGUAR MINES TAILINGS DAM LIQUEFACTION AND WATER MANAGEMENT STUDY | MINAS GERAIS, BRAZIL**

Principal in Charge for investigating the liquefaction potential and water management practices for tailings disposal at two mine sites in Minas Gerais following the Fundão tailings dam failure. Tierra Group performed a tailings geotechnical investigation, performed a liquefaction analyses, and developed detailed site-wide water management plans to optimize water usage and reduce liquefaction potential at Jaguar's Caeté and Turmalina mines. (Tierra Group, 2016)

**DON MARIO TSF DAM RAISE | SANTA CRUZ, BOLIVIA**

Principal in Charge overseeing the design and construction of an innovative means to reduce tailings dam construction costs, without compromising dam integrity that included developing a unique and innovative dam raise design incorporating a mechanically stabilized earth (MSE) dam-crest raise combined with using sterile waste rock to increase tailings storage capacity while reducing construction volumes, construction time, and costs. (Tierra Group, 2014 to Present)

**DOUGLAS TSF DESIGN | SANTA BARBARA, HONDURAS**

Principal in Charge of field investigations, feasibility, and final design for an earthfill tailings dam at Mina El Mochito. Douglas Dam represents the fourth TSF that Tierra Group is responsible for over the course of 28 years of continuous service at El Mochito. (Tierra Group, 2014 to Present)

**BRUSHY CREEK TSF RAISE DESIGN | VIBURNUM, MISSOURI**

Principal in Charge responsible for a 17-foot dam raise design for an existing TSF at Doe Run's Brushy Creek Mine. The dam was built in stages starting in 1973 using tailings cyclone underflow (coarse tailings) and the upstream construction method. The raise design required CPT, a liquefaction triggering analysis, seepage modeling, and slope stability modeling. In addition to the dam raise, a spillway raise was designed requiring hydrology and hydraulic modeling and riprap design. The design was approved by the Missouri Department of Natural Resources (MDNR) Dam and Reservoir Safety Council in February 2015. (Tierra Group, 2014 to Present)

**BRUSHY CREEK 2 TSF | VIBURNUM, MISSOURI**

Principal in Charge Manager responsible for a new TSF design at Doe Run's Brushy Creek Mine capable of storing 36 million tons (Mt) of tailings solids. The new TSF requires a 185-foot tall dam planned for

construction in four stages including a clay starter dam and three raises using tailings cyclone underflow. Hydrology and Hydraulic modeling was performed to design four spillways and a water balance was completed providing a planning tool for use throughout facility life. A geotechnical investigation was carried out which utilized both hollow stem auger and diamond coring techniques. The Brushy Creek 2 TSF design is currently under review by MDNR. (Tierra Group, 2014 to Present)

#### **PITARILLA FEASIBILITY STUDY | DURANGO, MÉXICO**

Principal in charge for designing a 112-Mt TSF, developing a mine-wide water management plan (MWWMP) and writing contributing sections for the Manifestación de Impacto Ambiental (MIA). Both the TSF and the MWWMP were included in a NI 43-101 report. (Tierra Group, 2012 to 2013)

#### **MINA EL TOQUI TAILINGS DAM | PATAGONIA, CHILE**

Principal in charge for the geotechnical investigations, alternatives site selection, engineering design and permitting for a 1,500-tonne-per-day (tpd) zinc mine in the Patagonia region. Historically, El Toqui has operated centerline tailings dam construction. This alternative, as well as others, are being considered for expansion of an existing facility versus constructing a new one. (Vector Colorado, 2005 to 2007)

#### **SOLEDAD TAILINGS DAM, MINA EL MOCHITO | LAS VEGAS, HONDURAS**

Principal in charge for the geotechnical investigation, engineering design, and construction of a 60-meter (m) high zoned earthfill tailings dam for a 2,000-tpd zinc mine. The project included alternatives site(s) geotechnical risk assessment and siting study, a 7-kilometer (km) tailings delivery and water reclaim pipeline design, low-density polyethylene liner installation in steep terrain, and dam construction utilizing saprolite and laterite soils over karstic bedrock in a tropical region that receives approximately 3 m of rainfall annually. (Olsson Associates, 2003; Vector Colorado, 2003 to 2007; Tetra Tech, 2007 to 2011; Tierra Group, 2012 to Present)

#### **PUCARRAJO AND CONTONGA TSFs | HUARES, PERÚ**

Principal in charge directing a team of engineers in the expansion design and recommissioning of two conventional TSFs in northern Perú. (Tetra Tech, 2010 to 2011)

#### **CHINCHÁN TSF DESIGN | SAN MATEO, PERÚ**

Principal in charge for the siting, investigation, design and construction of a dry-stack TSF located at 3,800-m elevation in the Peruvian Andes. (Tetra Tech, 2009 to 2011)

#### **CERRO QUEMA TSF DESIGN | LA PITALOZA, PANAMÁ**

Principal in Charge for the siting, investigation, and design of a co-mingled gold tailings and waste rock storage facility located in a high rainfall region in the tropics. (Tetra Tech, 2007)

#### **MOLEJÓN GOLD TSF DESIGN | COLÓN PROVINCE, PANAMÁ**

Principal in Charge for the siting, investigation, design, and construction of conventional gold TSF located in the tropics and receiving 5-m of rainfall per year. (Vector Colorado, 2005 to 2007)

#### **EL DORADO TAILINGS DAM DESIGN | SENSUTEPEQUE, EL SALVADOR**

Principal in charge for a geotechnical investigation and engineering design of a 35-m high rockfill tailings dam for a 1,500-tpd underground gold mine. A challenging aspect of this project was construction sequencing that would allow the rock used to construct the dam to be excavated from the impoundment basin while also permitting a high-density polyethylene liner system to be installed across the 27-hectare impoundment area. The liner system included leak detection and a recirculating underdrain system to assure that cyanide-laden water would not impact the environment. (Vector Colorado, 2005 to 2007; Tetra Tech, 2007)

#### **EL DORADO MINE ANIMATION | SENSUTEPEQUE, EL SALVADOR**

Produced and Directed a Mine-Life-Cycle video animation of the proposed development of this underground gold mine, which was used as a public communications media. (Vector Colorado, 2006)

#### **SANTA ROSA TAILINGS DAM EXPANSION, EL LIMÓN MINE | LEÓN, NICARAGUA**

Principal in charge for the geotechnical investigation, engineering design, and construction of two 3-m tailings dam crest rises. A unique design utilizing geogrid reinforced earth allowed the crest to be raised at a near vertical upstream slope, which reduced the downstream rockfill volume by 40% over a conventional downstream raise significantly reducing the time and cost for construction. Co-authored and presented a

professional paper on the unique project design at Tailings and Mine Waste 2004. (Vector Colorado, 2003 to 2006)

**POZO AZUL TAILINGS DAM UPSTREAM RAISE DESIGN, MINA EL MOCHITO | LAS VEGAS, HONDURAS**

Project Manager/Principal Designer for a project to maximize storage capacity in the Pozo Azul tailings impoundment by raising the 165-foot high earthfill tailings embankment crest utilizing cycloned tailings. Engineering activities performed to complete the upstream raise design included determining design storm events and impounded tailings densities, liquefaction analyses, a seismic risk analysis, static and pseudo-static slope stability, seepage analyses, slurry distribution management, embankment construction phasing, and expanding the decant system. The innovative design concept raised the embankment crest by 45 feet and saved the client more than \$3M in construction costs (over a downstream earthfill option) while increasing the impoundment life by 6 plus years. (Hydro-Triad, Ltd., 1995 to 1999)

**GORO NICKEL MINE BANKABLE FEASIBILITY STUDY | NEW CALEDONIA**

Technical Design/Field Investigation Team Leader for determining the technical and economic feasibility of developing tailings and mine waste disposal facilities and water supply system for a 120M-pound per year nickel mine. Project included geotechnical and geophysical field investigations, soil sampling and laboratory testing and analyses, and compilation. Integrated data into an engineering feasibility design for a rockfill tailings dam and impoundment, a water supply dam and reservoir, a mine waste disposal buttress and storage area, and water diversion, control and management facilities. Developed a design report and engineering drawings to support the bankable document prepared for the project. (Hydro-Triad, Ltd., 1999; SRK Consulting, 1999 to 2000)

**MINA COBRIZA TAILINGS THICKENER REHABILITATION STUDY | CHURCAMPÁ, PERÚ**

Project Manager investigating the failure mode for a 100-m diameter conventional tailings thickener and determining the feasibility of its rehabilitation. Activities included on-site forensic investigations and site surveying. A failure mode analysis determined unsuitable foundation preparation led to the thickener settling. Ground modification alternatives such as deep dynamic compaction, vibratory compaction, and pre-consolidation were determined to be economically infeasible. Provided recommendations for replacing the conventional thickener with a high capacity, cone thickener. (Hydro-Triad, Ltd., 1998)

**REY DE PLATA TAILINGS DAM DESIGN | TELOLOAPÁN, MÉXICO**

Project Manager/Design Team Leader for the final design of a 60-m high rockfill tailings embankment in a high seismic area of México. Project included geological and geotechnical investigations, sampling, and laboratory testing for characterizing the foundation and identifying borrow materials for embankment construction. Engineering analyses included a seismic risk analysis, static and pseudo-static slope stability, hydrological site characterization, and determining design storm events and other related design criteria. Supervised preparation of a design report and 17 construction drawings, all of which were prepared in Spanish. (Hydro-Triad, Ltd., 1998)

**SWEETWATER MINE PERMITTING | VIBURNUM, MISSOURI**

Project Manager responsible for managing mine permitting process and developing tailings impoundment management strategies for the mine. Successfully designed and installed an innovative internal seal for repair of the mine's damaged decant discharge conduit. (Hydro-Triad, Ltd., 1993 to 1997)

**WEST FORK UNIT TAILINGS EMBANKMENT DESIGN AND PERMITTING | MISSOURI**

Design Team Leader/Project Manager for designing a 20-foot downstream cycloned tailings embankment raise, and an earthen-cut emergency spillway. Prepared and submitted design and operating reports to the State of Missouri Department of Dam Safety and acted as the Lead Technical Advisor during state dam inspections. Developed a long-term tailings impoundment management plan, which led to obtaining a State of Missouri 5-year operating permit. Renewed National Pollution Discharge Elimination System permits for the impoundment. Provided recommendations for tailings spigot patterns and schedules, impoundment water discharges, embankment design, slope stability, and construction schedule. (Hydro-Triad, Ltd., 1993 to 1997)

**MINA EL DORADO PRE-FEASIBILITY STUDY | SENSUNTAPEQUE, EL SALVADOR**

Project Manager responsible for determining pre-feasibility of water and mine tailings management possibilities for a 1,000-tpd gold mine and milling operation. Performed geotechnical field investigations, laboratory testing, and analyses for siting and designing a tailings embankment and impoundment, slurry

delivery system, and mine waste rock dumps. Acid mine drainage potential of the waste rock, water supply, water quality, and water management systems for reclamation were addressed in the study. (Hydro-Triad, Ltd., 1995)

**RIO CHIQUITO MINE TAILINGS IMPOUNDMENT FEASIBILITY STUDY | TILARÁN, COSTA RICA**

As Project Geologist, participated in a thorough geological, geotechnical, and environmental evaluation to determine the feasibility of constructing a tailings impoundment within a reasonable distance of the Rio Chiquito Mine. Required reconnaissance level through detailed investigations of the surrounding area. Implemented a baseline water quality monitoring program, and performed a thorough geological, hydrological, and geotechnical evaluation prior to recommending siting of an impoundment in an environmentally sensitive area. (Hydro-Triad, Ltd., 1994)

**VILLA SANTA CRUZ TAILINGS EMBANKMENT GEOTECHNICAL INVESTIGATION | COLQUIRI, BOLIVIA**

As Geologist, performed geotechnical field investigations for a 260-foot high rockfill tailings embankment. Work included surficial geological mapping, exploratory drilling, core logging, dam siting analysis, and reporting. (Hydro-Triad, Ltd., 1993)

**QUIRUVILCA MINE TAILINGS IMPOUNDMENT SLOPE STABILITY ANALYSIS | LA LIBERTAD, PERÚ**

As Project Geologist, performed computer-aided slope stability modeling to determine the feasibility of embankment slope stabilization by constructing a rock toe berm at the downstream embankment. Stabilization of the embankment was a pre-requisite to raising the embankment crest. (Hydro-Triad, Ltd., 1992)

**POZO AZUL TAILINGS EMBANKMENT, EL MOCHITO MINE | LAS VEGAS, HONDURAS**

Project Geologist responsible for installing approximately 45,000 square feet of impoundment liner and grouting cracks in the decant system. Managed a crew of 40 indigenous Hondurans installing the liner, which alleviated seepage through karst terrain. Sealed cracks in a decant system with chemical grout. (Hydro-Triad, Ltd., 1991)

***Environmental / Mine Closure and Reclamation***

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**EL DORADO MINE ENVIRONMENTAL IMPACT ASSESSMENT | SENSUTEPEQUE, EL SALVADOR**

Project Director/Principal in charge responsible for producing an environmental impact assessment for El Dorado Gold Mine. Utilized a multi-national team of expert consultants and organizations to assess the impacts of a 1,500-tpd underground gold mine. Developed environmental management plans to assure impacts to the environment are minimized. Developed a detailed cyanide management plan and post-cyanide destruction passive water balance and dilution model to assure the community water supplies were not adversely affected. Presented an educational seminar to the Ministerio del Medio Ambiente y Recursos Naturales, non-governmental agencies, and the public. Scheduled over 11 public meetings to solicit comment and community awareness and address the social concerns of the region. (Vector Colorado, 2004 to 2007)

**PAREONES MINE ANIMATION | BAJA SUR CALIFORNIA, MÉXICO**

Produced and Directed a Mine-Life-Cycle video animation of the proposed development of this open-pit gold mine. (Tetra Tech, 2008)

**AKYEM MINE ANIMATION | GHANA, AFRICA**

Produced and Directed a Mine-Life-Cycle video animation of the proposed development of this open-pit gold mine. Project included building two scale dioramas of the project for public education. (Vector Colorado, 2006)

**MINA EL MOCHITO CLOSURE AND RECLAMATION PLAN | LAS VEGAS, HONDURAS**

Project Director responsible for developing a closure and reclamation plan and engineers cost estimate for an underground mine in operation for over 50 years. Closure plan included reclamation designs for the underground mine and portals, mill and site infrastructure, three TSFs, and a tailings delivery system. Closure plan and cost estimate were used for corporate planning and budgeting. Based on the results of the study, a progressive reclamation plan was implemented and an accrual budget developed to finance the ultimate mine closure. (Vector Colorado, 2004)

#### **MINA EL LIMÓN CLOSURE AND RECLAMATION PLAN | LEÓN, NICARAGUA**

Project Director responsible for developing a closure plan and engineer's cost estimate for an underground gold mine in operation for over 50 years. Closure plan and estimate were used for corporate planning and budgeting. Based on the results of the study, a progressive reclamation plan was implemented and an accrual budget was developed to finance the ultimate closure. (Vector Colorado, 2004)

#### **EL BOSQUE TAILINGS IMPOUNDMENT CLOSURE PLAN DESIGN, MINA EL MOCHITO | LAS VEGAS, HONDURAS**

Principal Designer/Design Team Leader for developing a closure plan for the decommissioned El Bosque tailings impoundment. Design components included impoundment surface grading, a permanent emergency spillway, embankment erosion control, and decommissioning of over-flow type vertical decant and emergency spillway intake and discharge conduits. (SRK Consulting, 2001)

### ***Water Dams/Resources***

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#### **MASBATE WATER TREATMENT PLANT DESIGN AND CONSTRUCTION | MASBATE, PHILIPPINES**

As Project Principal, oversaw design and provided construction and commissioning support to a 15,000 cubic meters (m<sup>3</sup>) per day water treatment plant (WTP) and over 7 km of pipelines. The WTP incorporates INCO and microfiltration processes to treat TSF supernatant water to Philippine discharge standards. The design team completed a geotechnical investigation and foundation design, pipeline design, and full WTP design including structural, chemical, and process engineering. (Tierra Group, 2013 to 2015)

#### **MONYWA COPPER PROJECT / SABETAUNG-KYISINTAUNG AND LETPADAUNG ORE BODIES FEASIBILITY AND PRE-FEASIBILITY STUDIES | MONYWA, MYANMAR (BURMA)**

As Project Manager, analyzed historical, regional, and site-specific climatology data and established design criteria for constructing two open pit mines within 7 km of the Chindwin River, a major tributary to the Ayeyarwady. River flow regimes and flood stages were analyzed with respect to pit flooding and pit dewatering. Analyzed hydrogeology data and performed hydrologic modeling for designing the 160-m deep, open-pit, dewatering system. Designed a water supply system to supply a 15,000-tpd heap leach pad operation. Developed an overall water balance model satisfying facilities demands including quantifying excess water, water treatment rates and methods for achieving World Bank discharge limits. Installed a surface and groundwater quality monitoring program and established baseline or pre-mining environmental conditions. Designed the overall water management system, including a river intake gallery, water distribution and treatment systems, surface runoff diversion, sedimentation control ponds, process and potable water supply, and discharging effluent. Determined the acid-generating potential for waste rock and designed an acid drainage treatment facility to treat waters that seeped through the waste dumps. Designed a reclamation phase water resource management plan including a passive, low maintenance, acid drainage treatment facility. Prepared two bankable feasibility study reports, which led to project funding and construction of an open pit mine producing 25,000 tonnes per year of cathode copper. (Hydro-Triad, Ltd., 1995 to 1996)

#### **STANDLEY LAKE DAM MONITORING | COLORADO**

Project Geologist responsible for collecting and analyzing strain gage, inclinometer and piezometer data; vertical and underwater monitoring surveys; and site inspections. Prepared an annual monitoring report and budget. (Hydro-Triad, Ltd., 1990 to 1998)

#### **DA LORD DAM MAINTENANCE REHABILITATION | COLORADO**

Project Manager responsible for engineering design, construction management, quality control/assurance, and reporting for replacing the outlet conduit of this earthfill dam. A 24-inch steel conduit was replaced with 30-inch reinforced concrete pipe to accommodate potential enlargement of the irrigation reservoir dam. (Hydro-Triad, Ltd., 1993)

#### **STANDLEY LAKE DAM SLOPE STABILITY ANALYSIS | COLORADO**

Project Geologist responsible for performing a subsurface geologic investigation, sampling and laboratory testing for soils properties, and modeling slope stability utilizing a computer model to determine factors of safety under differing piezometric surfaces. Performed in conjunction with ongoing safety monitoring for this high hazard dam. (Hydro-Triad, Ltd., 1993)

**STANDLEY LAKE DAM GEOTECHNICAL MONITORING PROGRAM | COLORADO**

Project Geologist responsible for fieldwork coordination of support services for drilling and installation of inclinometers and valve house anchor tendons and strain gages. Performed continued monitoring and data reporting as necessary for compiling an annual monitoring report to the State Engineer's Office. (Hydro-Triad, Ltd., 1992)

**CONTINENTAL DAM REHABILITATION | COLORADO**

Resident Geologist responsible for supervising the general contractor rehabilitating a 200-foot high earthfill dam, concrete outlet conduit and gate house access shaft. Project involved reconstructing portions of the dam, installing a synthetic liner to minimize seepage, and chemical grouting to seal cracks and conduit joints. Prepared a project completion report for the State Engineer's Office. (Hydro-Triad, Ltd. 1990)

**SANTA MARIA DAM REHABILITATION | MINERAL COUNTY, COLORADO**

As Resident Geologist, supervised rehabilitation work of a 102-foot high hydraulic fill dam. The work included geological investigations to identify probable seepage mechanisms, installation of a polyethylene geomembrane, and a chemical grouting program to control seepage through the embankment. (Hydro-Triad, Ltd., 1990)

**RIDGEWAY DAM ABUTMENT GROUTING | COLORADO**

As Assistant Project Manager, directly accountable for coordinating grout quantities and billing schedule with the US Bureau of Reclamation for this two-season, 24-hour-a-day project. A very large extensive abutment void-grouting program was directed by the BOR to prevent foundation seepage in karst terrain. More than 1,600 holes were pressure grouted with slurry cement, in two stages on a primary and secondary tertiary grid pattern. (Hayward Baker, Co., 1985)

***Due Diligence / Audits / Expert Testimony***

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**EL DORADO MINE ARBITRATION | WORLD BANK COURT, NEW YORK**

Provided expert witness statement for arbitration hearings between Pacific Rim Mining and the country of El Salvador in dispute over the Ministry Ambiental y Recursos Naturales failure to issue an Environmental Permit for an underground gold mine. (Tierra Group, 2014 to 2015)

**MASBATE MINE GEOTECHNICAL DUE DILIGENCE AUDIT | MASBATE, PHILIPPINES**

Principal in charge for geotechnical due diligence audit of an 18-Mt TSF. Project entailed reviewing design reports, field investigations, and preparing a Technical Audit Report for a potential buyer. (Tierra Group, 2013)

**MINA EL CUBO TSF GEOTECHNICAL AUDIT AND MITIGATION DESIGN | GUANAJUATO, MÉXICO**

Principal in Charge of a TSF stability analysis and stabilization design. Project included a structural analysis of a subterranean decant conduit gallery underlying the facility. (Tetra Tech, 2009)

**SAN VICENTE TSF PEER REVIEW | SAN VICENTE, BOLIVIA**

Performed an expert peer review of a conventional silver TSF in southern Bolivia. (Tetra Tech, 2009)

**NUESTRA SEÑORA TSF EXPERT PEER REVIEW | SINALOA, MÉXICO**

Performed expert peer review of a poly-metallic TSF design being constructed in karstic environment. Recommendations led to the designer ultimately selecting, designing, and implementing a thickened/paste tailings disposal system for the facility. (Tetra Tech, 2008)

**CONFIDENTIAL MINE DUE DILIGENCE | AREQUIPA, PERÚ**

Performed an early-stage environmental/geotechnical due diligence review for a copper project development plan in this highly, socially-sensitive region of Perú for a potential acquisition. (Tetra Tech, 2011)

**MINAS AGUAS TEÑIDAS TSF AUDIT | HUELVA PROVINCE, SPAIN**

Performed a geotechnical and construction peer review of a paste tailings/rockfill tailings dam design in Spain's historical "Pyrite Belt". The design was being hyper-scrutinized as a result of a contemporary tailings dam failure (not at or by the owner of, this property) in the region that caused nearly catastrophic environmental damages. (Tetra Tech, 2010)

**TROY MINE DUE DILIGENCE | MONTANA**

Geotechnical lead on a project team performing a due diligence review for a potential acquisition of this underground silver mine in western Montana. (Tetra Tech, 2009)

**YARBICOYA MINE DUE DILIGENCE | YARBICOYA, BOLIVIA**

Performed an early-stage due diligence review for a copper project development plan located at 4,300-m elevation in the Bolivian Andes for a potential acquisition. (Tetra Tech, 2009)

**MINA BELLAVISTA ENVIRONMENTAL AUDIT | MIRAMAR, COSTA RICA**

Principal in Charge of a team of experts performing an environmental audit and assessment of impacts caused by a mega-landslide resulting in the suspension of mining at this surface gold mine located adjacent to a national preserve in Costa Rica. The study was commissioned by and performed for SETENA (Secretaría Técnica Nacional Ambiental). (Tetra Tech, 2008)

**CERRO MAIMÓN TSF PEER REVIEW | MAIMÓN, DOMINICAN REPUBLIC**

Performed a peer review of a waste rock/tailings co-disposal facility and mine development plan in a high rainfall region of the Caribbean. (Vector Colorado, LLC, 2006)

**MINA SAN ANDRÉS EXPERT GEOTECHNICAL PEER REVIEW | COPÁN, HONDURAS**

Performed a geotechnical forensics assessment, which determined that spent ore from an on-off leach pad operation had liquefied causing a debris flow to threaten inundating a major river basin. Subsequently a preventative detention buttress was designed, which obviated continued mass movement. (SRK Consulting, 2000 to 2001)

***Geological Hazards***

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**MINA EL MOCHITO GEOLOGIC HAZARDS ABATEMENT | LAS VEGAS, HONDURAS**

Mr. Fuller has served as Mina El Mochito's principle geotechnical project director since 1990. In this capacity, he has identified, investigated, and led engineering teams in the design and mitigation of a multitude of landslides, debris flows, karstic features, flooding and seismic events responses ranging in size from 24-hour operational upsets to multi-month, multi-million-dollar construction delays. Despite the multitude of geologic hazards threatening El Mochito's tropical operations over the past two decades, Matt's engineering design team combined with El Mochito's operations personnel has allowed Mina El Mochito to maintain continuous operations without significant down time. (Hydro-Triad, Ltd., 1990 to 1999; SRK Consulting, 1999 to 2001; Olsson Associates, 2001 to 2003; Vector Colorado, 2003 to 2007; Tetra Tech, 2007 to 2011; Tierra Group, 2012 to Present)

**TAMBORAQUE LANDSLIDE PEER REVIEW | SAN MATEO, PERÚ**

Performed industry peer review of a Peruvian consulting firm's work, investigation, engineering analyses, and mitigation recommendations for a large landslide that threatened the stability of a dry-stack TSF. (Vector Colorado, 2006 to 2007; Tetra Tech, 2007 to 2008)

**BELLAVISTA MINE LANDSLIDE CHARACTERIZATION | MIRAMAR, COSTA RICA**

Led a team of international experts in an investigation into the probable cause of ground disturbances experienced at the Bellavista Mine property. Matt's team hypothesized that the ground disturbances were likely being caused by a deep-seated failure mechanism requiring immediate investigative action. Subsequent investigations proved the existence of a large scale (35,000,000 cm) landslide underlying the project site. (Tetra Tech, 2007)

**FALCONBRIDGE NICKEL MINE GEOTECHNICAL RISK EVALUATION | BONAÑO, DOMINICAN REPUBLIC**

Principal in charge for a site-wide geotechnical risk assessment for a 40-year old operating nickel mine. The risk assessment encompassed 10 massive waste rock dumps and six sediment control dams located across a 40-km long mine property. Performed slope stability and dam breach flood inundation analyses to prioritize these structures in terms of geohazard risk and liability. Recommendations for remedial action were taken for the priority structures. Developed engineering designs for mitigating the potential risks. (Olsson Associates, 2003; Vector Colorado, 2003 to 2006)

#### **CERRO MOJÓN LANDSLIDE CHARACTERIZATION | LA LIBERTAD, NICARAGUA**

Project Geologist responsible for identifying the cause for cracks in the slopes of recently excavated heap leach facility solution ponds. Geologic mapping and interpretation of aerial photographs revealed that excavation of the toe of a paleo-landslide caused the landslide to remobilize and reinitiated down slope creep. Accurate site characterizations led to a successful mitigation design for the solution ponds and ancillary facilities. (Hydro-Triad, Ltd., 1998)

#### **TRAPPERS RUN ROCKFALL / DEBRIS FLOW EVALUATION | COLORADO**

Project Geologist responsible for geological analysis of potential hazards associated with rockfalls and debris flow impacting specific designs of the proposed Trappers Run residential development. Determined the hazards classification and zoning of the proposed development, as defined by the town of Vail; assessed the potential impact of geological hazards associated with constructing the proposed development; and recommended three mitigation alternatives for alleviating the debris flow. (Hydro-Triad, Ltd., 1996)

#### **STANDLEY LAKE DAM BEDROCK GEOLOGY STUDY | COLORADO**

Project Geologist responsible for research data analysis, reduction, interpretation, and preparation of a report interpreting the bedrock geology underlying Standley Lake Dam. (Hydro-Triad, Ltd., 1994)

#### **EL BOSQUE WEST ABUTMENT SLIDE STABILIZATION, TAILINGS EMBANKMENT, EL MOCHITO MINE | LAS VEGAS, HONDURAS**

Project Geologist responsible for design and construction management of the stabilization of a large landslide undermining the west abutment of the El Bosque tailings embankment. Project design included construction of vertical draw-down drains, installation of erosion control matting, surface runoff control, geomembrane liner installation, and extensive revegetation. (Hydro-Triad, Ltd., 1990)

### ***Geotechnics***

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#### **ANGOSTURA DIRECTIONAL STUDY | ANTIOQUIA, COLOMBIA**

Principal in Charge of a senior discipline-led team charged with identifying a critical path-forward plan to developing a Feasibility Study and permitting a combination underground/open-pit mine located in northern Colombia. This project resulted in drafting Terms of Reference for a detailed proposal to advance the project. (Tetra Tech, 2007)

#### **KORI KOLLO PLANT EXPANSION | ORURO, BOLIVIA**

As Project Manager, performed geotechnical investigations and directed a laboratory soils testing program to facilitate making foundation design recommendations for a carbon-in-pulp mill expansion. The expansion required constructing 12 additional 7-m diameter holding tanks over an area overlain by silt. Removing the silt and constructing concrete rings over imported, compacted sand and gravel were recommended and constructed for the foundations. Supervised the quality assurance/quality control (QA/QC) program during construction. (Hydro-Triad, Ltd., 1994)

#### **HETCH HETCHY RESERVOIR PENSTOCK SLOPE STABILIZATION | CALIFORNIA**

Field Superintendent responsible for project implementation, construction, and completion. Pressure-injected a cement grout through the concrete penstock foundation walls to depths of 60 feet. Utilized void intrusion of the slurry mixture to increase the strength and stability of the 50° slope at depth. (Hayward Baker, Co., 1985)

#### **VALENCIA WATER TREATMENT PLANT | CALIFORNIA**

Assistant Project Manager responsible for project implementation, coordination, contractor supervision, and contract administration. The foundation for a water treatment facility required vibratory compaction to effectively reduce the liquefaction potential of sandy and cohesionless foundation soils. (Hayward Baker, Co., 1985)

#### **WASHINGTON, DC SUBWAY EXPANSION | DISTRICT OF COLUMBIA**

Field Technician responsible for monitoring grouting quantities through a 12-port terminal. Expanding subway tunnels required soil stabilization prior to tunneling. Injected a silicate grout to create a structurally sound subsurface medium prior to excavation. (Hayward Baker, Co., 1984)

### AMTRAK TRAIN STATION REHABILITATION | NEW JERSEY

Assistant Project Manager responsible for daily project coordination. Injected low slump compaction grout bulbs beneath existing pedestrian loading and unloading platforms to compact the soils and function as mini piles for later rehabilitation of the platforms. (Hayward Baker, Co., 1984)

### SOUTH TEXAS NUCLEAR PROJECT | TEXAS

Field Technician responsible for monitoring grout quantities, travel, and communication of a chemical grout around a water release box-culvert to control radioactive-contaminated water seepage. Work required daily Nuclear Energy Regulatory Commission security clearance and safety training. (Hayward Baker, Co., 1984)

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## Professional Affiliations

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American Avalanche Association, Member  
American Institute of Professional Geologists, Member  
Canadian Dam Association, Member  
Colorado Mining Association, Member  
Geological Society of America, Member  
International Association of Engineering Geologists, Member  
Nevada Mining Association (NMA), Member  
Society for Mining, Metallurgy and Exploration (SME), Registered Member (#4116803RM)  
Prospectors & Developers Association of Canada, Member

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## Publications / Presentations

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- Fuller ML**, 2018. *In-Pit Tailings Storage – Converting Liabilities Into Assets*. The Mining Record, Vol. 129, No. 6, June 2018 Reprint.
- Fuller ML**, 2017. *Tailings Stewardship: Training from the Tailings Beach to the Board Room*. The Mining Record, Vol. 128, No. 6, June 2017 Reprint.
- Fuller ML**, Shultz, J, 2016. *Tailings Stewardship – Adding Value to Due Diligence*. The Mining Record publication, 2016.
- Fuller ML**, Jacobs M, 2015. *Tailings Stewardship – Genuine Corporate Responsibility*, Tailings and Mine Waste 2015 Conference, Vancouver, British Columbia, Canada, 2015.
- Fuller ML**, 2012. *Lining Steep Rock Slopes with a Geomembrane Liner to Facilitate Tailings Facility Expansion*, 16<sup>th</sup> Annual International Conference on Tailings and Mine Waste, Keystone, Colorado, 2012.
- Fuller ML**, 2004. *Cerro Santa Rosa tailings dam: storage capacity increased using a unique mechanically stabilized earth design*, 11<sup>th</sup> Annual International Conference on Tailings and Mine Waste, Vail, Colorado, 2004.
- Fuller ML**, 2005. *Virtual reality animation of the proposed El Dorado Mine in El Salvador assists regulators in reviewing an EIA*, Society of Mining Engineering Annual Meeting, Salt Lake City, Utah, 2005.
- Fuller ML**, 2002. *Pozo Azul tailings impoundment: design modifications made to utilize a difficult site*, 9<sup>th</sup> Annual International Conference on Tailings and Mine Waste, Fort Collins, Colorado, 2002.

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## Employment History

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<b>CURRENT EMPLOYER</b>	<b>TIERRA GROUP INTERNATIONAL, LTD.</b>
<b>POSITION</b>	Founding Principal
<b>YEARS</b>	2012 to Present

<b>EMPLOYER</b>	<b>TETRA TECH, INC.</b>
<b>POSITION</b>	Vice President / International Mining, Latin America
<b>YEARS</b>	2007 to 2011
<b>EMPLOYER</b>	<b>VECTOR COLORADO, LLC</b>
<b>POSITION</b>	Founder / Principal Engineering Geologist
<b>YEARS</b>	2003 to 2007
<b>EMPLOYER</b>	<b>OLSSON ASSOCIATES</b>
<b>POSITION</b>	Mining Group Manager
<b>YEARS</b>	2001 to 2003
<b>EMPLOYER</b>	<b>STEFFEN ROBERTSON AND KIRSTEN (US), INC.</b>
<b>POSITION</b>	Principal Engineering Geologist / Project Manager
<b>YEARS</b>	1999 to 2001
<b>EMPLOYER</b>	<b>HYDRO-TRIAD, LTD.</b>
<b>POSITION</b>	Senior Engineering Geologist / Project Manager
<b>YEARS</b>	1990 to 1999
<b>EMPLOYER</b>	<b>HAYWARD BAKER, CO.</b>
<b>POSITION</b>	Project Superintendent
<b>YEARS</b>	1984 to 1986
<b>EMPLOYER</b>	<b>AMOCO MINERALS, INC.</b>
<b>POSITION</b>	Exploration Geologist
<b>YEARS</b>	1980, 1983 to 1984

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## Language Proficiency

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English:           Fluent  
Spanish:           Conversational (spoken, written)