

Exhibit 22 -1(MP-1)

Michael E. Pappalardo
Environmental Planner/Register Professional Geologist

Education

BS, Geology, University of Oregon

Professional Registrations

Registered Professional Geologist: Oregon (#G1696)

Relevant Experience

Mr. Pappalardo has more than 14 years of experience in environmental planning, permitting water resources, and geologic services. His background includes watershed planning and hydraulic studies; dam decommissioning; surface water intake and National Pollutant Discharge Elimination System (NPDES) outfall and stormwater permitting; anadromous fish passage improvement projects; wind energy facility and transportation project permitting; environmental monitoring and monitoring plans; National Environmental Policy Act (NEPA) compliance and Environmental Impact Statements (EIS); Environmental Assessments (EA), Habitat Conservation Plans (HCPs), Storm Water Pollution Prevention Plans (SWPPP) and Spill Prevention Control and Countermeasures (SPCC) plans. He develops site-specific Sediment and Erosion Control Best Management Practices (BMP). He has also conducted a number of geologic and hydrogeologic investigations, environmental audits, hazardous waste site investigations and remedial actions, and is a large mine permitting specialist.

Representative Projects

NEPA / CEQA Project Management

Task Lead, EPA Point Thomson Environmental Impact Statement (EIS), Alaska.

Responsible for delivering the EIS for ExxonMobil's proposed gas cycling facility at Point Thomson on the north slope of Alaska.

NEPA Coordinator, Trinity River Fishery Restoration Final EIS/EIR, U.S. Fish and Wildlife Service.

Principal Project Author, Imperial Irrigation District (IID) Water Conservation and Transfer Project DEIS/EIR, and HCP, California. Assessed impacts to water quality and hydrology in drains and rivers in the 500,000 acre IID area and the Salton Sea resulting from the transfer of 300,000 acre-feet of water to the City of San Diego and Los Angeles

Metropolitan Water District. This project is the largest water transfer attempted in the State of California.

Principal Project Author, Geology Sections, Simpson Timber Company Aquatic HCP and DEIS, California. Described geology on 500,000 acres of Simpson forestland in the Klamath and Coast Ranges Geologic Provinces in northwest California. Evaluated proposed changes to Simpson land management practices (timber harvesting and road construction and reclamation) and the predicted impacts these practices would have on geology and soils i.e., mass wasting and sediment discharge to coastal streams and rivers in the region.

Permit Coordinator and Author, TCCA Red Bluff Diversion Dam Decommissioning and Intake Facility Design DEIS/EIR. Hydrology, water quality, hazardous materials, geology and hydrogeology sections for the DEIS/EIR.

Project Author And Permitting Assistant, Clear Creek/Saeltzer Dam Removal Environmental Assessment (EA). Geology, hydrogeology, mineral resources and hazardous materials (mercury contaminated sediment investigation) sections.

EIS Analyst, Canarc Resources New Polaris Gold Mine and Proposed Transportation Corridor and Port Facility, British Columbia and Southeast Alaska. Provided an analysis of the need for an EIS, cost projections for baseline studies, EIS development, and project permitting. Initiated baseline studies with project contractors.

Technical Resources Team Leader And Project Coordinator, EIS, Yarnell Mine Project, Arizona. Preparation of an EIS for the Yarnell Mine Project.

Supplemental EIS and Public Scoping Documents, Echo Bay Mine, A.J. Mine Project, Juneau, Alaska. Wrote sections of the Supplemental EIS and public scoping documents for Echo Bay Mine's A.J. Mine project. Conducted watershed management studies of selected basins in the Juneau/Gastineau Channel area. Developed descriptions for alternative mine tailing disposal option and analyzed net present value costs for each option.

Permitting

Project Coordinator, Preparation of the Oleson Road Constraints Report. Coordinated the development of a constraints report for the widening of a transportation corridor through Multnomah and Washington Counties in the Portland metropolitan area in Oregon.

Task Lead, Westside Interceptor Project, Redding, California. Wrote project

environmental monitoring and compliance plan for a sewer line construction project within city transportation corridors in downtown Redding.

Water Resource Planning, BHP Copper Inc., Superior, Pinto Valley, Miami, and Copper Cities Mines, Arizona. Helped BHP to consolidate and reduce its surface water point source discharges and eliminate unnecessary EPA NPDES process discharge permits during mine closure. Conducted an analysis of EPA jurisdiction over surface waters contained in drainage basins located within the patented and unpatented areas of the mines in the immediate area of some of the largest open-pit mining operations in the U.S. Developed SWPPPs and Sediment and Erosion Control BMP plans for the facilities. Helped BHP to be among the first U.S. companies to develop SWPPPs that comply with EPA's Storm Water Multi-Sector General Discharge Permit for the mining industry.

Environmental Consultant, Permit Coordination and Environmental Compliance Management, Echo Bay Mine, A.J. Mine Project, Juneau, Alaska. Filed NPDES and Water Rights applications; developed an EPA-approved NPDES Quality Assurance Project Plan for monitoring mine water discharge; and wrote a comprehensive environmental monitoring manual for predevelopment, operational, and closure phases of the project. Coordinated project monitoring schedules and developed techniques for statistical analysis of environmental data. Designed underground cleanup and BMP plans for implementing corrective action procedures for underground cleanup of a petroleum spill in the mine. Negotiated environmental monitoring criteria with local, state and federal regulatory agencies and assisted in setting up an environmental compliance program for the mine. Developed SWPPP and SPCC plans for the project.

Environmental Consultant, Kensington Venture, Juneau, Alaska. Prepared a comprehensive environmental monitoring manual for the proposed 5,000-ton-per-day Kensington Mine Project located within an environmentally sensitive area, Lynn Canal, in the Tongas National Forest in southeast Alaska. Areas covered in the manual include, groundwater, seawater, freshwater, wildlife, and marine biological monitoring. Wrote an Emergency Action Plan/Facility Response Plan, SPCC Plan, and U.S. Coast Guard Marine Transfer Related (MTR) plan for ship-to-shore transfer of petroleum products to the site. Wrote mine site SWPPP and BMP plans and filed NPDES discharge permit applications for project pre-operational and operational requirements. Negotiated environmental monitoring criteria with state and federal regulatory agencies. Conducted watershed management studies of selected drainage basins surrounding the mine.

Consulting Hydrogeologist, Hydro-Geo Consultants and Fluor Daniel, Minera Alumbrera Copper Mine Project, Northwest Argentina. Consulting hydrogeologist for the 80,000-ton-per-day, \$1.4 billion Minera Alumbrera copper mine project in the Catamarca Province, Northwest Argentina.

Environmental Consultant, Kennecott Greens Creek Mine, Juneau, Alaska. Conducted water balance and hydrogeologic study for the Greens Creek Mine.

Designed comprehensive SWPPP plan for the mine and related mill facilities in a format that Kennecott replicated for its other mine facilities throughout the U.S. Assisted in designing reclamation procedures for restoring waste rock piles located at the mine.

Environmental Consultant, Amax Fort Knox Gold, Fairbanks, Alaska. Assisting in development of a water resources report/baseline study for the 32,000-ton-per-day Fort Knox Gold Mine near Fairbanks, Alaska. Conducted overview of current and projected regulatory issues, analyzed existing watershed conditions and available water supply, and supervised water quality modeling efforts. Modeling efforts included low temperature mixing and aqueous geochemistry and dilution modeling of waste, process, mine pit, and surface water.

Exploration Geologist, Cambior U.S.A. Precious metals exploration in Nevada.

Permit Coordinator, Clearlake Oaks County Water District, Lake County California. Developed project description and managed federal, state and local permitting activities (USACE 404, California State Water Resources Control Board 401 Certification, CA Department of Fish and Game Section 1600 Streambed Alteration Permit and ESA consultation, Lake County local grading and building permits and permit exclusion and exemptions).

Project Manager, Indian Valley Watershed Management and Riparian Restoration Project, Plumas County, California. Principal author of the Indian Valley Water Resources Management Plan, technical liaison for Upper Indian Creek Watershed Hydrology Study and Indian Valley Hydraulic Model Report. Member of the Indian Valley Technical Advisory Committee.

Project Manager, Grants Pass Irrigation District Savage Rapids Dam Decommissioning Project.

Project Coordinator, Barrack Ranch Streambed and Riparian Restoration Project, Monterey County, California. Wrote construction SWPPP for the Barrack Ranch Streambed and Riparian Restoration Project in Monterey County.

Permit Coordinator, Murphy Crossing Water Supply Water Intake Facility, Pajaro Valley Water Management Agency in Santa Cruz County, California.

Permit Coordinator, Harkins Slough Intake Facility Construction Project, Pajaro Valley Water Management Agency, Santa Cruz County, California.

Assistant Project Manager, Zilkha Renewable Energy, 121-Turbine Wind Energy Project, Kittitas Valley, Washington. Application to the Washington Energy Facility

Siting Evaluation Council for a 121-turbine wind energy project in the Kittitas Valley of central Washington.

Task Manger, Stateline Wind Project Phase II Supplemental EIS, Walla Walla County Washington. Responsible for the management of key task leaders and the development of the SEIS for a 126-turbine expansion of the project. Principal author of the geology and soils sections of the document.

Task Manger, Phase III Amendment Application, Stateline Wind Project, Umatilla County, Oregon. Task manager for the Phase III amendment application to the Oregon Energy Facility Siting Council for a 180-turbine expansion of the Stateline Wind Project in Umatilla County.

Other Relevant Environmental Experience / Employment History

Environmental Technical Advisor, Stoel Rives, Portland, Oregon. Environmental technical advisor to the law firm's 30-plus member Environmental Practice Group. Knowledge and interpretation of local, state and federal environmental codes and statutes on water quality (Clean Water Act), solid and hazardous waste (CERCLA and RCRA), and air permitting. Understanding of chemical release reporting requirements and liability and enforcement issues. Understanding of Endangered Species Act issues and Section 7 and Section 10 consultation and conferencing requirements. Background in legal affairs and legal writing. Legal research coordinator on Lexis Nexis, Westlaw, and Internet databases.

Environmental Consultant, Willamette Valley Company, Oregon. Developed Stormwater Pollution Prevention Plan (SWPPP) and Spill Prevention Control Countermeasure (SPCC) for this wood products chemical manufacturer in Eugene, Oregon. The SWPPP was singled out by the City of Eugene as an example plan for other industrial facilities within City jurisdiction.

Environmental Consultant, Weyerhaeuser, Oregon. Assisted Weyerhaeuser in developing a comprehensive stormwater pollution prevention program for the company's 450-acre wood products and pulp mill facility in Springfield, Oregon.

Environmental Consultant, Alaska Forest Association. Filed NPDES Storm Water Discharge permits for 26 members of the Alaska Forest Association (AFA). Developed SWPPPs for saw mill, pulp and paper mills, and remote logging operations for AFA members throughout Alaska.

Associate Geologist, Brown and Caldwell Consultants. Conducted site investigations for leaking underground storage tanks and solid waste landfill facilities throughout

Oregon, Washington, Idaho, and California. Conducted hazardous waste site assessments, environmental audits, and hydrogeologic investigations for wood product manufacturers and pentachlorophenol-contaminated wood product treatment facilities.

U.S. Geological Survey, Clark County, Washington. Participated in Regional Aquifer Survey Assessment (RASA) for groundwater resources underlying the Portland Basin and Clark County. Developed unique statistical approach to facilitate use of a regional deep percolation model for current and future regional aquifer studies.

Professional Affiliations

National Water Well Association/Association of Groundwater Scientists and Engineers
Northwest Mining Association SME/Short Course Lecturer: Storm Water Management Planning at Mining Projects, SME Convention, Denver, Colorado

Specialized Education and Training

OSHA - 40 Hour Hazardous Material Health and Safety Training