

# Exhibit A-57: Resume of Dan McShane

**DAN McSHANE, M.Sc., L.E.G.**  
**GEOLOGIST and ENGINEERING GEOLOGIST**



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Dan McShane has worked as a geologist and engineering geologist since 1983. His primary work at Stratum Group is conducting and overseeing geology hazard investigations. Geology hazard projects have included evaluation of channel migration zones, debris flows, alluvial fan hazards, steep slope/landslide areas, shoreline areas, dam relicensing, forest practice application prescriptions, and mine hazards.

In addition to his scientific and technical background and experience, Mr. McShane has extensive public policy background from various perspectives. From the public perspective, he served for eight years on the Whatcom County Council as well as serving on the Puget Sound Action Team, the Washington State Energy Facility Site Evaluation Council, and Mount Baker-Snoqualmie National Forest Resource Advisory Committee, Lake Whatcom Landscape Planning Committee, Whatcom County Flood District Advisory Committee, Whatcom County Surface Mining Advisory Committee and Whatcom County Critical Areas Technical Committee. As a consulting geologist, Mr. McShane has been the lead geologist in developing geology hazard regulations and policy, Federal Energy Regulatory Commission licensing projects for both project proponents and citizen groups participating in the review of projects, public housing development projects, Forest Practices for both project proponents and appellants to proposed practices, and Federal Emergency Management Act repair project evaluations.

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### **Selected Relevant Project Experience**

***Oso Landslide, Snohomish County, WA:*** Retained by plaintiffs in the landslide case to provide expert opinions on the landslide, river processes and review other expert reports that were developed for the defendants in the case. A settlement between the plaintiffs and the defendant Washington State and the defendant timber company was reached prior to trial.

***Clay Banks Landslide, Nooksack River, WA:*** Dan was brought on as an expert witness in the cause of a landslide along a high bluff along the Nooksack River. Previous reports implicated forest practices causing elevated ground water as the primary cause of the failure. However, evaluation of the geology of the site led to a determination that the causal factor was river erosion enhanced by flood and erosion control projects on the opposite bank from the landslide site with forest practices being a contributing factor but not the primary causes of slope instability. The case settled after depositions.

***Port of Tillamook Bay Railroad Repair Project, Coast Range of Oregon, OR:*** Technical lead in evaluating alternatives for the Environmental Assessment of proposed repairs on the Tillamook Railroad. The Railroad was severely damaged from debris flows, debris floods and landslides associated with the December 2007 storm that impacted the area. The damage to the railroad also caused severe damage to fish habitat in the river valley. The geology assessment evaluated stream and river channel conditions and the impacts of repair work on geologic processes on the streams and river and those impacts on fish bearing streams. The assessment also included evaluation of the impacts on geologic processes of doing no repair work on the railroad.

***Dale Face Harvest, Sumas Mountain, Whatcom County, WA:*** Represented Friend of Sumas Mountain as a geologist in an appeal of a forest practice application. Evaluation led to an agreement on adjusting the timber harvest boundary and a much more detailed evaluation of a proposed forest road within an inner gorge of Powers Creek. The mitigation for the road was increased and a record for the required monitoring and maintenance of the road was established. Failure to properly follow all the mitigation led to three separate debris flows and the rerouting of a stream since the harvest was completed. As a follow up acted as the lead geology expert witness in two federal civil cases associated with property damages both of which settled after depositions.

***Boundary Dam Federal Energy Regulatory Commission Relicensing Project, Seattle City Light, Metalline, WA:*** Dan met with stakeholders and other technical leads and wrote the erosion study plan for the relicensing of Seattle City Light's Boundary Dam and the 20 mile long reservoir. The study plan required the coordination with all of the other relicensing studies and passed through Seattle City Light approval process prior to submittal to the Federal Energy Regulatory Commission. The study plan was accepted positively by the United States Forest Service and local Indian tribes. The study was successfully completed in June 2008.

***Boistfort Water Association, Boistfort, WA:*** Assessed a proposed forest practice in the Mill Creek watershed and the potential impacts of the proposed harvest on the water association water intake system infrastructure. Prepared a report with tiered recommendations of high to medium to low priority for alteration of the forest harvest. All recommendations were adopted by the forest property owner by adjustment of forest harvest boundaries including a boundary adjustment out of the groundwater recharge area to a deep-seated landslide that was identified during the field investigation.

***Bertrand Creek Channel Migration, Lynden, WA:*** Assessed channel migration hazards along Bertrand Creek in northern Whatcom County. Historically there had been very little change to the stream channels, but field evidence and stream conditions indicated rapid change was taking place on the stream and the potential for rapid stream migration had increased substantially. Causes of stream morphology change were associated with development in the upper watershed on the Canadian side of the border and the reestablishment of beaver within the watershed. The study resulted in alteration of development plans along the creek to avoid stream bank erosion and stream induced landslide hazards.

***Fee Property, Klickitat County, WA:*** Evaluated proposed timber harvest impacts to an in-stream spring water source for a water association and a home/ranch site in the White Salmon River Valley in Klickitat County, WA. The evaluation assisted in a Forest Practice Appeals Board appeal that determined that the proposed harvest should be reevaluated. The client and timber company were subsequently able to reach an agreement on harvest buffers on the stream that would protect the spring water source and reduce hazards to a downstream home site.

***Balfour Village, Kendal, Washington:*** Evaluated ten coalescing alluvial fans in a proposed development area for 800 homes. Delineated debris flow, debris flood and stream avulsion hazard zones and provided an estimate for the maximum credible event peak discharge for each of the ten streams. Maximum credible event estimates were based on alluvial fan morphology, stream processes and slope stability analyses throughout each watershed. This approach to alluvial fan evaluations was subsequently adopted by Whatcom County under the County's Critical Areas Ordinance.

***Glacier Springs, Canyon Creek, Whatcom County, WA:*** Evaluated and delineated hazard zones on Canyon Creek in Whatcom County. The stream morphology had undergone significant changes due to two large-scale landslides in the drainage basin. The evaluation included an assessment of two large deep-seated landslides, smaller deep-seated landslides and potential shallow surface slides and how those slides would impact the stream morphology downstream from the slide areas. The existing flood control structure on the fan was evaluated relative to the potential sediment and landslide impacts as well as clear water flooding. The study concluded that the flood control structure increased the overall risk of channel avulsion and damaging floods to properties west of Canyon Creek. Subsequent work established a buy out policy within the identified hazard areas versus construction of flood/erosion control structures.

***Proposed RV Campground, Brinnon, WA:*** Completed a channel migration and avulsion hazard assessment on the lower Duckabush River in Brinnon, Washington for a proposed RV park. The assessment included a detailed assessment of the impacts of previous bank work along the river and the impact of those works on the river geomorphic processes and consideration of extreme weather events for determining the hazards on the river.

***Lake Cavanaugh Parcels, Skagit County, WA:*** Have conducted numerous alluvial fan investigations on creeks that flow into Lake Cavanaugh to assess the risk posed by debris flows, erosion and flooding hazards to proposed home sites and existing homes. Assisted a geotechnical engineer in the design of mitigation for the locating a home adjacent to a stream near the lake as risk from erosion of the stream banks. Provided comments on proposed forest practice timber harvests and road building within the watersheds of the streams.

***Deep-Seated Landslide Synthesis Reports, Washington State Department of Natural Resources, WA:*** Worked with a team of geologist led by M2 Consultants to provide a synthesis literature review of glacial deep-seated landslides and non glacial deep-seated landslides relative to forest practices. Developed an Appendix to the report that identified several locations where forest practices and deep-seated landslide movement had taken place where further evaluation may inform the role of forest practices on deep-seated failures. Both reports were reviewed by a

panel of scientific and forestry experts and will be utilized for further research and forest practice guidance and potentially forest practice regulations.

***City of Edmonds Geologic Hazardous Areas, Edmonds, WA:*** Dan was the lead geologist on the writing of the best available science section related to geology and geology hazards for the City of Edmonds. He completed a gap analysis of the geology hazard code and wrote the amended draft version of the geologic hazard areas section of the Critical Areas regulations for geology hazardous areas and was in charge of the geology section of the public workshops and participated in presentations of the draft ordinance to the City Planning Commission and City Council.

***City of Duval Geologic Hazardous Areas, Duval, WA:*** Dan was the lead geologist on the update of the city geologic hazard areas regulations. The update including incorporating the city tree retention and stormwater planning. Post updating the code Dan was the lead geologist in producing potential geologic hazard maps for the city implementation of the geologic hazardous areas regulations.

***Kittitas County Geologic Hazardous Areas, Kittitas County, WA:*** Reviewed the County draft geologic hazardous areas regulations and made recommendations for changes and recommendations for developing policy guidance for some sections of the proposed regulations on alluvial fan hazard areas in regards to flood hazard reduction planning.

***Island County Geologic Hazardous Areas, Island County, WA:*** Assembled and wrote the best available science section related to geology and geology hazards in Island County. This included sections on deep-seated landslides and landslide run out. Completed a needs assessment and gap analysis of the existing County regulations regarding geologic hazards and have begun the development of county policy options for approaching geologic hazards.

***City of Port Orchard Geologic Hazardous Areas, Port Orchard, WA:*** Completed a gap analysis of the existing Port Orchard geologic hazardous areas regulations and drafted new geologic hazard regulations for the city.

***City of Port Townsend Jefferson Street Improvement Project and Taylor Street Slope Restoration, Port Townsend, WA:*** Conducted a geology hazard review of the proposed Jefferson Street improvements and worked with City Public Works in assessing alternative land street improvement alignments and widths based on the underlying geology. Assessed a steep slope that had been on above the Taylor Street Stairs and provided recommendations for revegetation of the slope for slope stability.

***Whatcom County Flood Hazard Reduction Plan Environmental Impact Statement, Whatcom County, WA:*** Participated in the scoping, writing and review of Whatcom County's Flood Hazard Plan Environmental Impact Statement. Wrote the geology and geomorphology sections of the EIS and reviewed and edited the overflow channel and channel migration sections of the report.

***Larson Bridge, South Fork Nooksack River, Crown-Pacific, Skagit County, WA:*** Conducted a geotechnical investigation for the bridge abutments at a replacement bridge crossing the South Fork Nooksack River in northern Skagit County. The investigation involved a bedrock evaluation of the north abutment, test pit and boring investigation to determine bearing capabilities of soil and depth to bedrock at the proposed south abutment, and an evaluation of river bank stability upstream of the proposed bridge location.

***Lake Whatcom Landscape Plan, Lake Whatcom, WA:*** Dan served on the planning committee that made recommendations to the Department of Natural Resources for the development of the Lake Whatcom Landscape Plan. The committee reached consensus with the Department of Natural Resources on all major components of the plan related to geology hazards and stream protections in a lake watershed setting. Dan ensured that all public comments and technical comments during the EIS process were incorporated into the plan.

***Frost Creek, Trillium Corporation, Whatcom County, WA:*** Evaluated the stability of abandoned logging roads and the feasibility of reopening the roads to access a proposed timber harvest within the Frost Creek drainage adjacent to the Canadian border. Recommended rehabilitating one road and accessing other areas by helicopter. Evaluated proposed harvest slopes and soil conditions and defined cut/leave boundaries. Participated in determining appropriate setbacks in incised stream valleys with the DNR during the site ID team meeting. Follow-up work evaluating a past debris event on Frost Creek resulted in the reduction of setbacks adjacent to Frost Creek.

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## EDUCATION

M.Sc. Geology	Western Washington University, 1991
B.Sc. Geology	Western Washington University, 1983
B.Sc. Education	Western Washington University, 1984

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## PUBLICATIONS

- McShane, D., 1991, Structure and Petrology of the Eldorado Peak area, North Cascades: M.S. thesis, Western Washington University, Bellingham, Washington.
- McShane, D. and Brown, E.H., 1991, Age of loading of the Skagit Gneiss and implications for orogeny in the North Cascades crystalline core: Geologic Society of America Abstracts with Programs, v. 23, no. 2, p. 78.
- Miller, R.B., Brown, E.H., McShane, D., and Whitney, D.L., 1993, Intra-arc crustal loading and its tectonic implications, North Cascades crystalline core, Washington and British Columbia: Geology, v. 21, p. 255-258.
- Brown, E.H., Cary, J.A., Dougan, B.D., Dragovich, B.D., Fluke, S.M., McShane, D., 1994, Tectonic evolution of the Cascades Crystalline Core in the Cascade River Area, Washington: Regional Geology Of Washington State, Washington Division of Geology and Earth Resources, Bulletin 80, p. 93-113.
- Whittaker, K.A. and McShane, D., 2012, Comparison of slope stability screening tools following a large storm event and application to forest management and policy: Geomorphology: 145-146, (2012), p. 115-122.