



CURTIS J. KOGER, L.G., L.E.G., L.Hg.

Senior Principal Geologist/Hydrogeologist

EDUCATION

B.S., Earth Sciences (Geology): Pacific Lutheran University

M.S., Geology: Baylor University

REGISTRATION/CERTIFICATION

Licensed Professional Geologist: Washington

Licensed Professional Engineering Geologist: Washington

Licensed Professional Hydrogeologist: Washington

Certified Professional Geologist: American Institute of Professional Geologists

PROFESSIONAL ASSOCIATIONS

American Institute of Professional Geologists

American Water Works Association

Geological Society of America

National Ground Water Association

Northwest Geological Society

PROFESSIONAL SUMMARY

Mr. Koger has 35 years of geologic practice experience in a wide variety of geologic settings and disciplines. His experience and expertise have been derived from extensive subsurface stratigraphic exploration evaluations, ground water projects, and from economic and geologic hazards studies. He has extensive SEPA/EIS experience and has worked on many of the largest development projects in Washington. His experience in ground water resource development includes regional hydrogeologic and wellhead protection evaluations, design and analysis of aquifer pumping tests, aquifer characterization, well siting studies, drill rig supervision, and geologic logging. He has prepared comprehensive reports documenting hydrogeologic conditions for Environmental Impact Studies and has provided expert testimony on ground water issues. He has been an invited guest speaker on the design and analysis of stormwater infiltration facilities for continuing education courses at the University of Washington, the American Society of Civil Engineers, Lorman Seminars, Built Green seminars, and numerous civil engineering firms in the Puget Sound Region. He served on the Advisory Committee for the 2005 Low Impact Development (LID) Technical Guidance Manual for Puget Sound. He was selected to serve on the Washington State Department of Ecology's Technical Advisory Committee for the Development of LID Standards for Municipal Stormwater General Permits.

RELEVANT EXPERIENCE

Brightwater Conveyance Tunnel Geologic/Hydrogeologic Consultation

Bothell, Washington

Mr. Koger was selected to be a member of an expert peer review panel to evaluate geotechnical issues associated with damaged tunnel boring machines along the BT-2 and BT-3 alignments of King County's Brightwater sewage treatment Conveyance System. Mr. Koger identified key geologic/hydrogeologic considerations after review of geotechnical data reports and tunnel boring records, and provided recommendations for supplemental exploration and characterization of subsurface conditions. Subsequent drilling and testing confirmed geologic/hydrogeologic factors critical to successful completion.

Snoqualmie Ridge and Snoqualmie Ridge II

Snoqualmie, Washington

Performed geologic, geologic hazards and hydrogeologic characterization evaluations for the 1,340-acre Snoqualmie Ridge and 736-acre Snoqualmie Ridge II projects. Completed hydrogeologic evaluation of a new well field to supply water for the combined 4,000-dwelling-unit master planned development. Managed well drilling and aquifer testing tasks, analyzed test data and prepared report documenting hydrogeologic conditions in support of a water rights application. Managed and prepared hydrogeologic documentation for source approval by Washington State Department of Health for Group A public water systems, including susceptibility assessment, preliminary wellhead protection area delineation, and inventory of potential contamination sources. Prepared ground water resource impact assessment report for the Lake Alice Aquifer. Assisted in development of a state-of-the-art erosion hazards and sediment transport study in five major drainage basins.

Redmond Ridge and Redmond Ridge East

King County, Washington

Prepared technical analysis of hydrogeology and potential ground water quantity impacts for a 1,046-acre Redmond Ridge Urban Planned Development (UPD) consisting of 1,300 dwelling units, 8 acres of retail, and 122 acres of business park. Integrated regional geology from outcrops, on-site wells, radiocarbon age dates, lithologic and water level data to assist in development of conceptual hydrogeologic framework, and to demonstrate effectiveness of proposed recharge mitigation. Directed technical studies of geology, geologic hazards and ground water resources for the 460-acre Redmond Ridge East project. AESI developed recommendations for design of the facility and incorporated the use of point drains to enhance infiltration performance. Full scale infiltration testing was performed using in excess of ten million gallons of water to verify full-scale pond performance would meet design criteria. Subsequent multi-year monitoring of full-scale performance since build-out of the site confirms that facility performance meets the design requirements. In addition, no long term decline in infiltration performance has been detected during the first decade of on-line monitoring of the ECW-1C facility.

Bothell Gateway Dewatering Design

Bothell, Washington

AESI provided integrated dewatering and geotechnical engineering design recommendations for the proposed Bothell Gateway project located on an 8½ acre site near the University of Washington, Bothell Campus. The proposed development will include four mixed use office/retail and residential buildings up to 6-stories in height with underground parking. Mr. Koger directed the dewatering evaluation and provided technical review of subsurface exploration, water level monitoring and aquifer testing programs which documented the presence of a confined aquifer system beneath the site. Excavation depths of approximately 50 feet are proposed, requiring installation of both temporary construction and permanent dewatering systems. Due to a steep easterly ground water flow gradient a series of 8 dewatering wells along the upgradient periphery of the site are required to dewater up to 40 feet below existing water levels to allow excavation and shoring construction to proceed. Interior well points are planned from the base of the main excavation subgrade to dewater the deepest most distant portions of the excavation.

The permanent drainage system is designed to minimize seepage into the underground parking structure, and to prevent detrimental uplift pressures beneath the foundation. The permanent system incorporates: 1) blanket drains beneath the foundation footprint, 2) interceptor drains near the toe of the upslope retaining wall and interior cut faces, and 3) pressure relief wells to lower piezometric pressures in the underlying confined sand unit beneath the structures to prevent piping and uplift forces.

Suncadia Master Planned Resort EIS

Kittitas County, Washington

Directed AESI's characterization of site geology, ground water, and geologic hazards studies for preparation of an Environmental Impact Study for the 6000 acre proposed Suncadia Master Planned Resort near Cle Elum, Washington. The objective of these studies was to characterize existing site conditions and evaluate potential impacts resulting from several development alternatives proposed by the applicant. AESI reviewed and compiled regional geologic, hydrogeologic, and soils data to develop a framework for on site studies. Completed activities include: geomorphic analysis of river and stream channels; evaluation of ground water depths, fluctuations, and flow directions; and development of surficial geology and soils maps. AESI's studies also included the development of a numerical ground water flow model, evaluation of several water supply alternatives, assessing potential impacts to nearby water supply wells, modeling of soil erosion and sediment transport, and analysis of storm water infiltration facilities relative to aquifer recharge and flow in the Cle Elum and Yakima Rivers.

Bay Vista Redevelopment

Bremerton, Washington

The Bay Vista Redevelopment site is located in West Bremerton, Washington and incorporates an area of approximately 83 acres. Site redevelopment includes the demolition of public housing (Westpark) currently owned and operated by the Bremerton Housing Authority, and closure of an abandoned landfill. Redevelopment will consist of a mixed-use, mixed-income pedestrian-oriented community. Mr. Koger directed AESI's hydrogeologic characterization studies and analyses. Deep exploration borings encountered a thick sequence of very low permeability lodgement till overlying outwash deposits. A thick unsaturated zone is present beneath the site and separates landfill leachate from the underlying aquifer. Ground water beneath the site flows to the north towards Oyster Bay and is tidally influenced. AESI's investigation demonstrated that deep stormwater infiltration is feasible and can be conveyed into the subsurface without influencing landfill leachate.

Desert Claim Wind Power Project EIS

Kittitas County, Washington

Directed geologic, geologic hazards, ground water and surface water characterization studies for the 5,237-acre Desert Claim Wind Power Project. Geologic conditions were evaluated using data obtained from field explorations, reconnaissance mapping, and comprehensive review of literature resources. Determined potential erosion, landslide, and seismic hazard impacts resulting from the proposal. AESI characterized ground water flow, recharge and discharge, and evaluated potential impacts to ground water quality and water supply wells.

The Villages at Black Diamond

Black Diamond, Washington

Principal-in-charge for ongoing technical analysis of site geologic and hydrogeologic conditions underlying an approximately 1,190-acre master planned development in the initial stages of entitlement. The technical analysis will be used to focus development plans and storm water management strategies, and to assess potential impacts on ground water, surface water, seeps and wetlands for proposed development alternatives.

Lakeland Hills South EIS

Pierce County, Washington

Prepared technical reports on geology, geologic hazards, and ground water resources for a 685-acre Master Planned Development consisting of 3,400 dwelling units, and retail and commercial uses. Performed geologic analyses to determine type, thickness, distribution, and physical properties of subsurface sediments. Conducted geologic hazard studies to identify potential impacts and provided mitigation recommendations. Reviewed well logs, correlated subsurface stratigraphy, managed drilling and aquifer testing of a deep test well, and documented results.

173 AND 620 Acre McCormick Woods Residential Developments

Kitsap County, Washington

AESI was retained to provide geotechnical and hydrogeologic services for two residential development projects at McCormick Woods in Kitsap County. The McCormick Woods Phase V and McCormick Woods West projects comprise 173 and 620 total acres. Our comprehensive geotechnical and hydrogeologic evaluations have included exploration pits, exploration borings, monitoring wells, and geologic reconnaissance, borrow source studies, dam safety engineering evaluations for two large storm water retention/detention ponds, ground water level monitoring using data loggers, storm water infiltration testing using a modification of Washington State Department of Ecology's pilot infiltration test (PIT) method, and ground water mounding analysis using the MODRET computer program. Mr. Koger served as Principal-in-Charge of AESI's infiltration testing and exploration program of a proposed 37 acre-foot infiltration facility. The exploration identified wide variability in the thickness of glacial till sediments overlying the outwash receptor sediments. AESI worked with the project team to design an effective infiltration facility that included the use of point drain techniques to penetrate through the till to access the receptor horizon. The MODRET ground water mounding simulation program was used to assist with sizing infiltration facilities and to model the effects of the infiltrated storm water on the ground water table.

Plateau 465

Pierce County, Washington

Directed AESI's geologic, hydrogeologic, and geotechnical engineering services in support of existing conditions documentation and potential impacts analyses for an approximately 465-acre residential development in Pierce County. Mr. Koger directed the preparation of technical studies documenting geology, geologic hazards, and ground water conditions. As well as, developed conceptual hydrogeologic model to evaluate potential ground water quantity impacts from the proposed development on nearby springs and streams, which supply water to a fish hatchery and drinking water for the City of Bonney Lake.

Olympic View

Snohomish County, Washington

Completed geologic, geologic hazard and hydrogeologic characterization for the 480-acre Olympic View project located in Snohomish County northwest of Marysville. Determined nitrate-loading potential to ground water from proposed on-site septic drainfields, evaluated development related changes in recharge potential and provided mitigation recommendations to avoid significant adverse impacts. Characterized soils, geology and geologic hazards, and identified location for storm water infiltration facilities.

Skagit Highlands

Mount Vernon, Washington

Directed geologic, geologic hazard and hydrogeologic characterization studies for the 209-acre Skagit Highlands project located in Mount Vernon, Washington. AESI's comprehensive evaluation of stratigraphic and ground water relationships was documented in Technical Reports in support of the project Environmental Impact Statement. Provided expert testimony for multiple public meetings and hearings.

Boeing Renton EIS

Renton, Washington

Directed geologic and hydrogeologic studies of the 290-acre Boeing Renton site. AESI's study documented existing soils, geology, geologic hazards, and ground water conditions; geotechnical issues regarding mass grading, suitability of reuse of fill soils, and reuse or placement of pile foundations; and locations within the site area with known ground water and/or soil contamination.

Expert Testimony

- Brightwater Conveyance Tunnel Geologic/Hydrogeologic Consultation | King County, Washington 2012
- Water Rights Review - Thurston Highlands MPC | Yelm, Washington 2009

Publications/Abstracts

- Nguyen, L.S., Saltonstall, J.H., Brown, J.M., **Koger, C.J.**, 2014, Evaluation of the relationship between saturated hydraulic conductivity and grain-size distribution of glacio-fluvial deposits, Puget lowland, Washington: Geological Society of America Abstracts with Programs, v. 46, no. 6, p.118.
- Dragovich, J. D.; Frattali, C. L.; Anderson, M. L.; Mahan, S. A.; MacDonald, Jr., J. H.; Stoker, B. A.; Smith, D. T.; **Koger, C. J.**; Cakir, R.; DuFrane, S. A.; Sauer, K. B., 2014, Geologic map of the Lake Chaplain 7.5-minute quadrangle, Snohomish County, Washington: Washington Division of Geology and Earth Resources Map Series 2014-01, 1 sheet, scale 1:24,000, 51 p. text.
- Dragovich, J. D.; Mahan, S. A.; Anderson, M.; Macdonald, J. H., Jr.; Frattali, C.; Littke, H. A.; Stoker, H. A.; **Koger, C. J.**; Smith, D. T.; Dufrane, S. A., 2014, The Monroe fault, anticline, and synclinal basin—A potentially active fault and fold system in the Skykomish River Valley, Snohomish County, Washington: Geological Society of America Abstracts with Programs, v. 46, no. 6, p. 779.
- MacDonald, J. H., Jr.; Dragovich, J. D.; Frattali, C. L.; Anderson, M.; Stoker, B. A.; Littke, H. A.; Dufrane, S. A.; Sauer, K.; Smith, D. T.; **Koger, C. J.**, 2014, Geochemistry and metaigneous rocks from the western mélange belt, Lake Chaplain, Snoqualmie, and Sultan 7.5-minute quadrangles, western Cascades, Washington: Evidence for a predominantly volcanic arc setting: Geological Society of America, Abstracts with Programs, v. 46, no. 6, p. 363.
- **Koger, C.J.**, Associated Earth Sciences, Inc. and Schaefer, R., Tetra Tech, Inc.: Urban Watershed Retrofit: Perrinville Creek: Washington State APWA Conference, Wenatchee, WA. Oral Presentation. October 9, 2014.
- **Koger, C.J.**, Beckham, S., Saltonstall, J.H., Massie, J., Lo, M., 2013, Hydrogeologic assessment report for deep UIC wells Venema natural drainage system: WEFTEC 2013 Technical Exhibition and Conference, McCormick Place, Chicago Illinois, Session 220 Stormwater BMP Design, 27 p.
- Dragovich, J. D.; Littke, H.A.; Mahan, S. A.; Anderson, M. L.; MacDonald, Jr., J. H.; Cakir, R.; Stoker, B. A.; **Koger, C. J.**; Bethel, J.P.; DuFrane, S. A.; Smith, D. T.; Villeneuve, N.M., 2013, Geologic map of the Sultan 7.5-minute quadrangle, King and Snohomish Counties, Washington: Washington Division of Geology and Earth Resources Map Series 2013-01, 1 sheet, scale 1:24,000, 52 p. text.
- **Koger, C.J.**, Saltonstall, J.H., Beckham, S.B., Massie, J., Lo, M. and Gwilym, K., 2012, Hydrogeologic Evaluation of a Combined GSI and Deep UIC Well Infiltration System for Flow Control – Venema NDS Project, Seattle, Washington: Oregon Section ASCE-EWRG & APWA biennial Sustainable Stormwater Symposium, Portland, Oregon. Oral presentation. September 19-20, 2012.
- Saltonstall, J.H. and **Koger, C.J.**, 2012, Hydrogeologic Evaluation of GSI and Deep UIC Well Infiltration Systems to reduce CSO events, Barton Basin, Seattle, Washington; Oregon Section ASCE-EWRG & APWA biennial Sustainable Stormwater Symposium, Portland, Oregon. Poster presentation. September 19-20, 2012.
- Dragovich, J. D.; Anderson, M. L.; Mahan, S. A.; **Koger, C. J.**; Saltonstall, J. H.; MacDonald, J. H., Jr.; Wessel, G. R.; Stoker, B. A.; Bethel, J. P.; Labadie, J. E.; Cakir, Recep; Bowman, J. D.; DuFrane, S. A., 2011, Geologic map of the Monroe 7.5-minute quadrangle, King and Snohomish Counties, Washington: Washington Division of Geology and Earth Resources Open File Report 2011-1, 1 sheet, scale 1:24,000, with 24 p. text.
- Dragovich, J. D.; Littke, H. A.; Anderson, M. L.; Wessel, G. R.; **Koger, C. J.**; Saltonstall, J. H.; MacDonald Jr., J. H.; Mahan S. A.; and DuFrane, S. A., 2010, Geologic map of the Carnation 7.5-minute quadrangle, King County, Washington: Washington Division of Geology and Earth Resources Open File Report 2010-01, 42 x 36 in. color sheet, scale 1:24,000, with 21 p. text.
- Dragovich, J. D.; Anderson, M. L.; MacDonald Jr., J. H.; Mahan S. A.; DuFrane, S. A.; Littke, H. A.; Wessel, G. R.; Saltonstall, J. H.; **Koger, C. J.**; and Cakir, Recep, 2010, Supplement to the geologic map of the Carnation 7.5-minute quadrangle, King County, Washington—Geochronologic, geochemical, point count, geophysical, earthquake, fault, and neotectonic data: Washington Division of Geology and Earth Resources Open File Report 2010-02, 42 p. text with 8 digital appendices.

- **Koger, C.J.** and Saltonstall, J.H., 2009, maintaining ground water recharge in Master Planned Communities: Case histories from eastern King County, Washington: Geological Society of America Abstracts with Programs, Vol. 41, No. 7 (abstract 76-2).
- Saltonstall, J.H., and **Koger, C.J.**, 2009, Complex glaciofluvial stratigraphic controls on ground water and surface water in Horseshoe Lake, King County, Washington: Geological Society of America Abstracts with Programs, Vol. 41, No. 7 (Abstract 170-16).
- **Koger, C.J.** and Saltonstall, J.H., 2009, Maximizing Groundwater Recharge Opportunities in Glaciated Terrain through Basin-Level Stormwater Planning: Case Histories from eastern King County, Washington: American Water Resources Association Annual Water Resources Conference, Seattle, Washington, Session 37.
- Kindred, J. Scott and **Koger, C.J.**, 2009, Underground Injection Control (UIC) Wells for Stormwater Infiltration: American Water Resources Association Annual Water Resources Conference, Seattle, Washington, Session 44.
- **Koger, C. J.** and Koger, L.B., 2009, Hydrogeology of the Cascadia Sewer Bore Alignment, Pierce County, Washington: 7th Washington Hydrogeology Symposium, Tacoma, Washington, (Abstract p. 35).
- Saltonstall, J. H., **Koger, C. J.**, August, B. A., 2009, Ground water controls on surface water in Horseshoe Lake, King County, Washington: 7th Washington Hydrogeology Symposium, Tacoma, Washington, (Abstract p. 79).
- Saltonstall, J.H. and **Koger C.J.**, 2008, Practical L.I.D. Infiltration/Raingarden/Bioswale Opportunities for Puget Sound Developers Based on the Underlying Geologic/Soil Properties of the Site: Conference Proceedings, ASCE-EWRI 2008 International Low Impact Development Conference, Seattle, Washington. November 16-19, 2008.
- **Koger, C.J.** and Saltonstall, J.H., 2007, Subsurface Geology of the Lake Alice Plateau, King County, Washington: Abstract No. 18-9 from the 2007 GSA Cordilleran Section Meeting Bellingham, Washington.
- **Koger, C.J.**, Saltonstall, J.H., and Baumgarten, D.J., 2003, Hydrogeology of the Eastern Bear Creek Plateau, King County, Washington: Abstract No. 201-11 from the 2003 GSA Annual Meeting Seattle, Washington.
- Saltonstall, J.H., **Koger, C.J.**, Sweet, S., and Thompson, S.S., Olympia Age Paleotopographic Influences on Vashon Glaciofluvial Sedimentation beneath the Eastern Bear Creek Plateau, King County, Washington: Abstract No. 42-4 from the 2003 GSA Annual Meeting Seattle, Washington.
- Baumgarten, D.J., **Koger, C.J.**, and Saltonstall, J.H., 2003, Intraformational Controls on Vashon Advance Outwash Water Levels, Bear Creek Plateau, King County, Washington: Abstract No. 234-18 from the 2003 GSA Annual Meeting Seattle, Washington.
- Paris, O.K., **Koger, C.J.**, and Stevens, G.R., 2000, Hydrogeology and Potential Water Supply Sources within the Cle Elum River Valley, Washington: Abstracts from the 3rd Symposium on the Hydrogeology of Washington State.
- Kindig, A.C., and **Koger, C.J.**, 1999, Environmentally Constrained Properties and the Project Approval Process: 1999 National CLE Conference 7 Environmental and Land Use Law, Law Education Institute, Inc. Milwaukee, WI., p. 739-753.



Danika M. Globokar, E.I.T., G.I.T.

Senior Staff Geotechnical Engineer

Education

B.S., Geotechnical Engineering – University of Florida

M.S., Earth and Space Sciences – University of Washington

Registrations and Certifications

Registered Engineer In Training (E.I.T.) | Florida #1100014941

Registered Geologist In Training (G.I.T.) | Washington

Professional Summary

Ms. Globokar has been performing geotechnical investigations and construction observation in the Puget Sound since 2013. She has completed numerous projects requiring field exploration, identification of soil types, determination of soil permeability and infiltration rates, characterization of geologic stratification, documentation of water levels, detailed soil classification, engineering design and report preparation. During this time she has completed several projects in the Redmond area that have focused on the effects of groundwater infiltration interaction with slope stability, as well as impacts to local aquifer water quality and quantity resulting from proposed construction. She has successfully completed multiple projects requiring comprehensive geotechnical analysis, subsurface correlation, and offsite impacts analysis.

Relevant Work Experience

Perrinville Creek Stormwater Flow Reduction Study | Edmonds, Washington

Tetra Tech, Inc.

Rose Hill Cottages (Bergstrom Property) | Redmond, Washington

Wilmoor Development Corporation

Marysville Assisted Living Facility | Marysville, Washington

LPA, Inc.

The Heron/The Carter | Redmond, Washington

MSPT XII, Inc.

Si View Estates | North Bend, Washington

Select Homes, Inc.

Redmond Elementary School | Redmond, Washington

Lake Washington School District

Jarvis Property | Sammamish, Washington

Conner Homes Group, LLC

Smokey Point Boulevard | Arlington, Washington

Herrera Environmental Consultants, Inc.

Green Alley | Port Angeles, Washington

Herrera Environmental Consultants, Inc.

Renton Middle School #4 | Renton, Washington

Renton School District Capital Projects

Port Angeles Decant Facility | Port Angeles, Washington

Herrera Environmental Consultants, Inc.

Rainsong Development Phase I and II | Redmond, Washington

IS Property Investments, LLC