Adrian McJunkin, PE

- 32 years of experience in the design and analysis of Telecommunication structures, including lattice towers, monopoles, rooftop structures, wall mounts, and custom structures used for microwave, cellular, and two-way radio communication applications.
- 15 years of experience in the design and analysis of steel Utility structures, including transmission poles and electrical substation structures.
- Currently licensed in 13 states as a Professional Civil Engineer.

Employment:
1990 - 2001 – Valmomt/Microflect – Project Engineer responsible for the design and analysis of various communications structures. Performed onsite evaluations and took field measurements as required by project scope of work. For the last three years, lead and managed a team of engineers for structure sizing for bidding and final design. Reviewed structural design reviews and certifications as needed.

2001 – 2010 – Owner/President of Wireless Structures Consulting, PC - Established engineering consulting business to perform structural designs and analysis services for the Telecommunications industry. Services included design/analysis of lattice towers (self-supporting and guyed), monopoles, and customer structures such as cellular concealment structures (i.e. Faux Pine & Palm trees, Faux Water Tanks, Bell Towers, etc.).

2010 – Present - Owner/President of Western Utility Telecom, Inc. – Officially known as Wireless Structures Consulting, Inc. DBA Western Utility Telecom, Inc. once engineering services included transmission pole and substation structures around 2010. Also, started manufacturing structures we designed. Western Utility Telecom, Inc. is the largest designer and manufacturer of telecommunication and utility structures in the Pacific Northwest.

Resume for Allan S. Felsot

RANK: Professor, Department of Entomology Washington State University

ASSIGNED RESPONSIBILITIES: 77.78% Teaching, 12.22% Research, 10% Extension

EDUCATION:				
	Ph.D.	Iowa State University	Entomology	1978
	M.S.	University of Florida	Entomology	1974
	B.S.	Tulane University	Biology	1972

PROFESSIONAL EXPERIENCE (Currently at Washington State University):

2018-2020: Academic Director for Math & Science, WSU Tri-Cities
2015-2017: Interim Academic Director for Arts & Sciences, WSU Tri-Cities
2014-2015: WSU Tri-Cities Program Lead for Sciences & Math
2010-present: Graduate Coordinator, Environmental Sciences Program @ WSU Tri-Cities; Affiliate Professor, School of the Environment
1999-present: Professor and Extension Specialist, Dept. of Entomology, Washington State University & College of Agriculture Food & Environmental Quality Lab
1998-1999: Professor and Extension Specialist, Dept. of Crop & Soil Sciences, Washington State University & College of Agriculture Food & Environmental Quality Lab
1993- 1998: Associate Professor, Dept. of Crop & Soil Sciences, Washington State University; Extension Specialist for Environmental Chemistry & Toxicology
1978-1993: Assistant & Associate Professor, Office of Agricultural Entomology, Illinois Agricultural Experiment Station and Illinois Natural History Survey, University of Illinois; Pesticide Chemistry & Toxicology Lab (project leader)

AWARDS

- 2020 Washington State University President's Teaching Academy Appointment
- 2019 Entomological Society of America Distinguished Achievement Award in Teaching
- 2019 Pacific Branch Entomological Society of America Award for Excellence in Teaching
- 2017 Washington State University, College of Agricultural, Human & Natural Resource Sciences, RM Wade Foundation Excellence in Teaching Award
- 2015 Faculty Recruiter of the Year Award, WSU Tri-Cities
- 2009 Washington State University College of Agricultural Human & Natural Resource Sciences Team Interdisciplinary Award (Urban IPM and Pesticide Safety Education Team)
- 2008 Entomological Society of America Founders Memorial Award
- 2008 American Chemical Society Agrochemical Division Fellow Award
- 2001 Washington State University College of Agriculture & Home Economics Award for Excellence in Extension
- 2000 Honorary Member, Washington State Weed Association
- 1999 North Star Award, sponsored by the Western Crop Protection Association
- 1991 Fulbright Scholar (lecturing and research in Cyprus, January-June 1992)
- 1973 Graduate Council Fellowship, University of Florida

CURRENT RESEARCH ACTIVITIES

Probabilistic risk characterization of contaminants; hazard assessment of pesticide drift; hazard assessment of agricultural biotechnology and plant-manufactured pharmaceuticals; risk assessment to determine buffer zone requirements; pesticide toxicology

EXTENSION RESPONSIBILITIES

Specialist in environmental chemistry & toxicology; pesticide safety & applicator training; hazard assessments for agencies and other governmental organizations, risk communication

TEACHING RESPONSIBILITIES ***Currently Active Teaching Responsibilities (Instructor Role):***

- BIOL 420, Plant Physiology (3 cr) (Fall 2018-2021)
- ENTOM 343 (3 cr.), General Entomology, Fall 2015-2021 (designated Writing in the Major course)
- ENTOM 351 (3 cr.) Ecological and Integrated Pest Management (Spring 2015-2021); also Global Campus online version (Spring 2017-2022)

- ENTOM 460/ENVR_SCI 460 (3 cr.) Biotechnology & the Environment (Fall 2016-2021)
- ENTOM 555 (3 cr.), Agricultural Chemical Technology for Crop Protection and Production (online course, WSU Global Campus); (Spring, Summer, Fall 2012-2022)
- ENTOM 590 (1 cr) Special Topics-Biotechnology for Integrated Pest Management (Fall 2021)
- IPM 452/552 (3 cr) Pesticides and the Environment (Spring 2014-2022); also, WSU Global Campus online version (Spring, Summer 2015-2022)
- SOE 404 (3 cr) The Ecosystem (Spring 2019, 2021) (designated Capstone and Writing in the major course)

GRADUATE STUDENT & UNDERGRADUATE INTERN ADVISING

Graduate Research Committee Chair & Advisor for 53 M.S. students and 8 PhD students, graduating between 1993 and 2022 from WSU

SELECTED RESEARCH, CREATIVE, AND OTHER SCHOLARLY ACTIVITIES

Published over 400 peer reviewed and non-peer reviewed scientific articles, abstracts, newsletter essays, and technical reports between 1978 and 2022. Selected peer-reviewed book chapters and journal articles follow.

1. Felsot, A. S. 2020. Chemicals: Pesticides. Chapter 20 in Information Resources in Toxicology, 5th Edition. Wexler, P. et al. (Ed.); Elsevier (ISBN: 9780128137246), 940 pp

2. Lawrence, T. J., Culbert, E., **Felsot, A. S**., Hebert, V., Sheppard, W. S. 2016. Survey and Risk Assessment of *Apis mellifera* Exposure to Neonicotinoid Pesticides in Urban, Rural, and Agricultural Settings. Journal of Economic Entomology 109(2): 520-528.

3. Felsot, A. S. 2011. Pesticides & Health-Myths vs. Realities. American Council on Science and Health, New York, NY. 107 pp.

4. Felsot, A. S. 2010. Communicating safe pesticide use. Chapter 55 In Krieger, R. (ed.) Handbook of Pesticide Toxicology. Elsevier, Inc. pp. 1173-1187.

5. Felsot, A. S., J. B. Unsworth, J. B. H. J. Linders, G. Roberts, D. Rautman, C. Harris, and E. Carazo. 2010. Agrochemical spray drift; assessment and mitigation—A review. J. Environ. Sci. Health Part B 45:889-911.

6. **Felsot, A. S.**, and K. D. Racke. 2007. Chemical pest control technology: Benefits, disadvantages, and continuing roles in crop production systems. In Crop Protection Products for Organic Agriculture. Environmental, Health, and Efficacy Assessment. Felsot, A.S., K. D. Racke (ed.); American Chemical Society Symposium Series 947, Am. Chem. Soc., Washington, DC. pp. 1-18.

7. Steffey, K. L., M. Venditti, B. R. Barrido, and **A. S. Felsot**. 2004. Effects of Bt corn on natural enemies of the European Corn Borer. In Agricultural Biotechnology: Challenges and Prospects, Bhalgat, M. M., W. P. Ridley, **A. S. Felsot**, J. N. Seiber (Ed.). American Chemical Society Symposia Series 866, Am. Chem. Soc., Washington, DC. pp. 139-150. ISBN# 0-8412-3815-4

8. **Felsot, A. S**., S. Foss, J. Yu. 2003. Deposition of pesticides in riparian buffer zones following aerial applications to Christmas tree plantations. Chapter 14 (pp. 241-260) in Environmental Fate & Effects of Pesticides. J. Coats and H. Yamamoto (Ed.), American Chemical Society Symposium Series 853, Am. Chem. Soc., Washington, DC. (ISBN 0-8412-3722-0)

9. **Felsot, A. S.,** R. G. Evans, and J. R. Ruppert. 2003. Field studies of imidacloprid distribution following application to soil through a drip irrigation system. Chapter 13 (pp. 189-205) in Terrestrial Field Dissipation Studies: Purpose, Design and Interpretation. E. L. Arthur, A. C. Barefoot, and V. E. Clay eds. ACS Symposium Series No. 842, American Chemical Society, Washington, DC. 368 pp. (ISBN# 0-8412-3769-7)

10. **Felsot, A. S.,** K. D. Racke, D. J. Hamilton. 2003. Disposal and degradation of pesticide waste. Reviews of Environmental Contamination and Toxicology 177:123-200.

11. **Felsot, A. S.** and J. R. Ruppert. 2002. Imidacloprid residues in Willapa Bay (Washington State) water and sediment following application for control of burrowing shrimp. Journal of Agricultural and Food Chemistry 50:4417-4423.

12. **Felsot, A. S.** 2002. WEB resources for pesticide toxicology, environmental chemistry, and policy: a utilitarian perspective. Toxicology 173:153-166.

13. **Felsot, A. S.** 1998. User sites and the generation of pesticide waste. In Pesticide Remediation in Soils and Water, P. C. Kearney, and T. Roberts, eds. Wiley Series in Agrochemicals & Plant Protection, John Wiley & Sons, New York. pp. 1-19.

14. **Felsot, A. S.** 1998. Landfarming pesticide-contaminated soil. . In Pesticide Remediation in Soils and Water, P. C. Kearney, and T. Roberts, eds. Wiley Series in Agrochemicals & Plant Protection, John Wiley & Sons, New York. pp. 129-160.

15. **Felsot, A. S.** 1998. Numbers, numbers everywhere—and not a drop of meaning. J. Environmental Law and Litigation 13:91-113.
16. **Felsot, A. S.,** M. A. Bhatti, and G. I. Mink. 1996. Using sentinel plants as biomonitors of herbicide drift and deposition. J. Environmental Science & Health, B31 (4):831-845.
17. **Felsot, A. S.**, M. A. Bhatti, G. I. Mink, and G. Reisenauer. 1996. Biomonitoring with sentinel plants to assess exposure of nontarget crops to atmospheric deposition of herbicide residues. Environmental Toxicology & Chemistry 15(4): 452-459.
18. **Felsot, A. S.**, and D. Shelton. 1993. Enhanced biodegradation of soil pesticides: interactions between physicochemical processes & microbial ecology. p. 227-251 In Sorption and Degradation of Pesticides and Organic Chemicals in Soil. Soil Sci. Soc. Am. Spec. Publ. no. 32.
19. **Felsot, A. S.**, and W. L. Pedersen. 1991. Pesticidal activity of degradation products. In Pesticide Transformation Products: Fate and Significance in the Environment, L. Somasundaram, and J. R. Coats, eds. Am. Chem. Soc. Symp. Ser. No. 459, Am. Chem. Soc., Washington, D.C. pp. 172-187.
20. **Felsot, A. S.**, and E. K. Dzantor. 1990. Enhancing biodegradation for detoxification of herbicide waste in soil. In Enhanced Biodegradation of Pesticides in the Environment, Racke, K. D., and J. R. Coats, eds. Am. Chem. Soc. Symp. Ser. No. 426, Am. Chem. Soc., Washington, D.C. pp. 192-213.

SEMINARS, CONFERENCE AND EXTENSION PRESENTATIONS:

Over 1100 documented extension and scientific conference presentations between 1978 and 2022
Selected titles of presentations during the last five years:

1. **Felsot, A. S.** 2021. Are seed treatments with neonicotinoid insecticides too risky for bees? 2021 Farwest Agribusiness Association Winter Conference. Kennewick, WA. 15 December.
2. **Felsot, A. S.** 2021. Physiological effects of herbicides within plants. PNW Vegetation Management Conference (via ZOOM). 8 December.
3. **Felsot, A. S.** 2021. Pesticide toxicology: What do field studies of neonicotinoid insecticide applications reveal? Pacific Northwest Vegetable Association Annual Conference & Trade Show. Kennewick, WA. 18 November.
4. **Felsot, A. S.** 2020. Human and Environmental Toxicology of Pesticide Formulations and Spray Adjuvants. PNW Forest Vegetation Management Conference (virtual conf). 2 December
5. **Felsot, A. S.** 2020. Basic toxicological research is informative but not adequate alone for risk assessment and management. Invited lead presentation in the Symposium "How It Works: Science Used in Regulatory Decision Making", Entomological Society of America national meeting (virtual conference), November 16-19, 2020
6. **Felsot, A. S.** 2020. Does a Liability Jury Decision Change the Toxicology of Roundup. 2020 Inland Empire Reforestation Council, Western Forestry and Conservation Association. Coeur d'Alene, ID. 03 Mar
7. **Felsot, A. S.** 2020. Glyphosate's role in supporting sustainable agriculture. Abstract & Paper No. AGRO 163, PICOGRAM Volume 98, p. 49 (**https://www.agrodiv.org/picogram/**); presented in the virtual national meeting of the American Chemical Society, August 17-20, 2020.
8. **Felsot, A. S.** 2018. Using pesticide residue detections in *Cannabis* products to reverse engineer identification of pest problems. Program Abstract #0067. Entomological Society of America Symposium: Connecting Hemp and Insects: Where No Entomologist Has Gone Before! Vancouver, Canada. 11-15 November.
9. **Felsot, A. S.** 2019. The Agricultural Health Study: A Quarter Century of Epidemiology Focused on Work-Related Pesticide Use. Washington State University Extension Pesticide Education Recertification Program. Kennewick, WA 12 December
10. **Felsot, A.S.** 2019. Insect control kaleidoscope from bronze age to digital era: Status with respect to farm to fork to health. Invited Symposium Presentation (How to Advocate for the Science of Insect Control). Annual Mtg of the Entomological Society of America. St. Louis, MO. 17-20 November. [40]

RECENT PROFESSIONAL & PUBLIC SERVICE

- Editorial Board Member, American Chemical Society's Journal of Agricultural Science & Technology (2020-)
- Member, USDA Grant Review Panel for the BRAG (Biological Risk Assessment Grants) Program (2017, 2018)
- Entomological Society of America Subject Matter Expert Liaison to the Environmental Protection Agency, Office of Pesticide Programs (appointed 2016 for three year term; renewed 2019 for three years)
- Member, Entomological Society of America Science Policy Committee (2016-present)
- Professional Society Memberships: American Chemical Society, Entomological Society of America, Society of Environmental Toxicology & Chemistry

ANITA CATE SMYTH, SPWS

Professional Employment

- **Environmental Scientist**, *Winterbrook Planning*, Portland, OR, 2010-present.
- **Principal**, *Westbrook Science & Design, LLC*, Beaverton, OR, 2005-present.
- **Environmental Scientist**, WH Pacific, Portland, OR, 1996-2005.
- **Engineering Technician**, *Clackamas County DTD*, Oregon City, OR, 1993-1996.

Education

- **Professional Master's Degree, Environmental Science**, Oregon State University, 2004.
- **Bachelor of Arts**, Willamette University, 1993.

Professional Membership

- **Society of Wetland Scientists**
  Sr. Professional Wetland Scientist

Anita has over 25 years of professional environmental science experience with emphasis on environmental inventories and permitting of projects with potential impacts to ecologically sensitive areas. Anita has executed numerous studies of wetlands, riparian corridors, and wildlife habitats, including local wetland inventories and riparian habitat assessments for several Oregon cities. She is a Senior Professional Wetland Scientist (SPWS) and has completed numerous wetland delineations, functional assessments, and mitigation plans as stand-alone projects and as part of Joint Permit Applications (JPAs). Anita has worked with public and private clients to navigate their projects' environmental and regulatory challenges, emphasizing creative site planning with clients and agency staff to find mutually acceptable solutions early in the design process.

With Winterbrook Planning, she collaborates on work including an array of large capital projects for the Portland Water Bureau with associated parks and natural areas, baseline studies for land acquired by Tualatin Hills Parks and Recreation and Metro, and various private development projects. Her project portfolio includes a broad spectrum of inventory, infrastructure, and development projects.

Selected Environmental & Natural Resources Projects

- Columbia County ESEE Analysis
- Catlin Gabel School Master Plan
- Sam Barlow High School Sanitary Line Improvement
- City of McMinnville Tree Grove Inventory
- City of Eugene ESEE Analysis
- Portland Water Bureau Force Lake Pump Station
- City of Portland, Lower Slough Refugia JPA
- Metro, Baseline Studies for Madsen, West Linn Oak Savanna, Boardman, and other sites.
- Multnomah County Drainage District Boat Ramp Improvements
- Blue Lake Regional Park Boardwalk and Trail Replacement JPA
- WHPacific, Inc. on-call natural resources services, including wetland delineation, Joint and local agency permitting on several projects including JPA for Nike Corporate Headquarters Master Plan
- Portland Water Bureau, Kelly Butte Reservoir
- Portland Water Bureau, Bull Run Treatment Improvement Project
- Portland Water Bureau, Powell Butte Reservoir Phase 2
- City of Tigard, Tree Grove Inventory for the River Terrace annexation
- Local Wetland Inventories for McMinnville, Pendleton, and Damascus
- Wetland delineation and/or JPA preparation in Multnomah, Washington, Clatsop, Columbia, Lincoln, Tillamook and Hood River Counties in the past two years.

Basel Jurdy

Principal, Acoustics
32 years of experience · Seattle, Washington

Basel Jurdy has worked professionally in mechanical equipment noise and vibration control, architectural acoustics, and environmental noise assessment for more than 30 years. He is responsible for acoustical design work in wastewater, industrial, healthcare, education, performing arts centers, mixed-use building, libraries, specialized office environments, and high technology facilities. Basel has worked on major projects throughout North America with results that have greatly exceeded client expectations.

EDUCATION

Master of Science, Mechanical Engineering, Santa Clara University, Santa Clara, California, 1989

Bachelor of Science, Mechanical Engineering, Northern Arizona University, Flagstaff, Arizona, 1987

MEMBERSHIPS

Member, Acoustical Society of America

PROJECT EXPERIENCE

WASTEWATER

Portland Water Bureau Filtration Facility Noise Assessment | Portland, Oregon | Principal, Acoustics

Assessment of potential noise impacts on the surrounding community from a new Filtration Facility. The project included identifying potential noise issues, provided mitigation options, noise modeling, a report, and final design of the mitigation measures.

Cogen and Brown Grease Receiving | Durham Advanced Waste Water Treatment Facility | Tigard, Oregon

Basel provided environmental noise monitoring review noise levels from pertinent noise sources, closest receivers, and intervening topography.

Lift Station Noise Monitoring | Washington

Environmental noise and vibration monitoring and mitigation measures for multiple municipalities. Projects included: Everett Lift Station, Everett, Washington; Redmond Lift Station No. 4 and No. 7, Redmond, Washington; Redmond Ridge 97th Street Sewage Pump Station, Redmond, Washington; and Lakota Wastewater Treatment Plant, Federal Way, Washington

Cedar River Noise Monitoring | Cedar River Watershed | North Bend, Washington

Basel has been working on monitoring the noise level for this area for more than 15 years. His task is to measure levels for compliance twice per year.

Clearview Pump Station, Environmental | Clearview, Washington

Seattle Public Utilities Drainage Wastewater Operations Center - Refresh | Seattle, Washington

Basel provided interior acoustics, acoustical separation, and mechanical systems noise and vibration control consultation for the basic warehouse space, locker rooms, workspace, conference rooms, and other miscellaneous spaces.

HEALTHCARE

Seattle Children's Hospital Annual Site Survey for Ambient Nighttime Noise | Seattle, Washington

INDUSTRIAL

ACME Foods HVAC System Noise Control Measures | Seattle, Washington

PACCAR Noise/Vibration Study | Mt. Vernon, Washington

PACCAR Truck Manufacturing Plant | PACCAR | Mt. Vernon, Washington

PACCAR Parts Building | PACCAR | Renton, Washington

Industrial Air System, Noise Measurement | Seattle, Washington

Weyerhaeuser Corporation Finishing Room | Federal Way, Washington

Years of Experience

- 36 years

Education

- B.S., Agricultural Engineering, Washington State University

Registrations

- Professional Engineer: Oregon (No. 14333), Washington (No. 25331), Idaho (No. 6187)

Demonstrated Performance

- Industry leader with 36 years of experience delivering large-scale water supply projects on schedule and within budget
- Proven problem-solving leadership through collaborative communication and strong decision processes
- Successful delivery of over 200 miles of various sizes to 96" welded steel pipeline
- A Trusted partner with a strong understanding of PWB procedures and processes for rapid start up and delivery
- Over 15 years of successful CM/GC program delivery for local large-scale water supply projects
- Experience with VDC including BIM, Primavera P6, and Bentley tools to better monitor and address budget and schedule issues

Brad Phelps, PE | Project Manager

Brad Phelps is an industry leader in delivering large-scale design and construction of water system infrastructure projects. He brings a "client first" attitude and uses a collaborative, solution-based process to keep clients informed and projects on track. With over 20 years of experience delivering Portland metro area projects he has gained familiarity with the region's water supply needs and permitting processes.

As a proven manager, Brad understands how to successfully charter and manage large, multi-discipline teams involving coordination with outside entities to complete projects on time and within budget. He has expertise in all major components including large-scale management, budget/schedule control, large diameter pipeline design and support services, hydraulics and modeling, interties, cathodic protection systems, geologic hazards, cost estimating, construction staging, construction management/general contractor (CM/GC), and easements and environmental permitting. Brad has a proven track record of managing risk and adapting to changes providing innovative solutions to issues to minimize impacts.

Relevant Experience

Project Manager; Fernhill Reservoir and Near-Term Improvements (NTI), Joint Water Commission, Portland, OR. This project involved CM/GC delivery of a new 2,013 LF 72-inch finish water pipeline, 400 LF of 54" finish water pipeline, 2,300 LF 30-inch overflow/drain system, a five (5) valve large pipeline intertie vault, and surge control as part of the $26 M design a of 75-mgd treatment plant upgrade. Responsible for the unique land trade/negotiation to purchase 56 acres between three different parties. Able to re-use of the spoils from reservoir excavation to create a new backwash water drying beds saving the project over $3M.

Project Manager; Powell Butte Reservoir # 2; Portland Water Bureau; Portland, OR. This project involved 3,500 LF of 90-inch pressure transmission pipeline 1,500 LF of 78-inch gravity pipeline, three large Flowmeter Vaults, and four intertie vaults. Managed this multifaceted, $100M+, two-phased project including excavation for a future 50MG reservoir (Phase 1), and design/construction support of improvements (Phase 2) within a 345-acre urban nature park. Managed a large, multi-disciplinary team including 18 subconsultants to deliver the final design within 14 months – including complete permitting of 48- to 90-inch welded steel pipelines and associated facilities. The project included an expedited public involvement process. Supported the Type III Land Use Application, which was the largest ever received by the development services bureau. The regulatory agency only had three comments and involved considerable citizen acceptance. It was approved without appeals.

Project Manager; Water Treatment Plant Expansion to 85 MGD; Joint Water Commission; Forest Grove, OR. Managed the five-year program to deliver a 48-inch ERDIP pipe and associated water treatment plan upgrades via CM/GC. Improvements included: life safety seismic improvements, raw water pump replacements (4 ea 400Hp), rapid mix and flow control replacement, plate settlers, two new filters, new surge basin, and new solids drying beds. Led the land use permitting.

Project Director; Kinsman Road Pipeline; Willamette Water Supply Program; Wilsonville, OR. This project involved 3,000-feet of 66-inch water supply pipeline combined with a road development project. Responsible for plans and specifications development, pipeline structural design, geotechnical design, and corrosion design. Also coordinated the work with the Willamette Water Supply Partners, their Program Management team, the Oregon Department of Transportation, the roadway design consultant, and the City of Wilsonville. The design schedule was highly compressed. Brad led the team meet the unanticipated and unique design requirements imposed by ODOT, while still meeting the design delivery schedule.

PROFESSIONAL DEVELOPMENT

- American Water Works Association Northwest Section, Former Board Member, Chairman of Bylaws Committee
- American Water Works Association, AWWA D110 Standards Committee Member
- American Water Works Association, George Warren Fuller Award Recipient (2013)

Brent Keller
Senior Forester/ MB&G Associate

Brent has 30 years of experience in forest management, including 24-years at MB&G and five years in private industry. His land management, project management, and forest inventory experience is extensive and includes projects across the Western United States, Alaska, and Canada. Brent manages forestland for a variety of clients, including non-industrial forestland owners, local municipalities, and institutional timberland investors. He works directly with all aspects of forestland management and has hands-on experience with harvest planning, timber sale layout, log marketing, contracts, timber sale administration, road maintenance, silviculture, inventory, and budgeting. He currently serves on several advisory committees, providing forestry expertise to local schools and Counties including the Clackamas County Forest Program.

Education

B.S., Forest Management, Oregon State University

A.A.S., Forestry, Mt. Hood Community College

Years of Experience

30 years

Certificates and Memberships

- Clackamas County Timber Sale Advisory Committee (Chair)
- Clackamas County Forest Advisory Board (Chair)
- Sabin Schellenberg (HS Vocational) Center Forestry Advisory Committee
- Mt. Hood Community College Forest Resources Technology Advisory Committee (Chair)
- Clatsop Working Watersheds Cooperative
- Certified Timber Cruiser – Region-10

Proficiencies

- Forestland Management
- Project Management
- Inventory Program Management
- Inventory Program Development
- Biometrics
- Data Analysis
- Expert Witness

MB&G Project Experience Highlights 2011-Present

Forest Management – Haskins Creek Watershed, McMinnville Water & Light Department, Oregon. Overall forestland management of 6,400-acre municipal watershed. Develop and manage budgets. Prepare harvest plans, layout timber sales, market timber, and develop contracts. Supervise harvest operations and audit monetary receipts. Manage road and silviculture projects. Monitor environmental protection projects. Manage both spatial and tabular forest inventory. Monthly reports to Water & Light Commission.

Forest Management – Milton Creek Watershed, City of St Helens, Oregon. Overall forestland management of 2,500 acres. Develop and manage budgets. Prepare harvest plans, layout timber sales, market timber, and develop contracts. Supervise harvest operations and audit monetary receipts. Manage road and silviculture projects. Monitor environmental protection projects. Manage both spatial and tabular forest inventory. Periodic reports to City Council.

Forest Management – Bob's Creek Watershed, Nehalem, Oregon. Overall forestland management of 1,000-acre municipal watershed. Develop and manage budgets. Prepare harvest plans, layout timber sales, market timber, and develop contracts. Supervise harvest operations and audit monetary receipts. Manage road and silviculture projects. Monitor environmental protection projects. Manage both spatial and tabular forest inventory. Periodic reports to City Council.

Forest Management – Necanicum River Watershed, Seaside, Oregon. Overall forestland management of 1,000-acre municipal watershed. Manage a variety of forestry related projects as needed. Periodic reports to City Council.

Forest Management – TIMO Timberlands, Washington and Oregon. Overall timberland management of 20,000 acres of investment property. Develop and manage both annual and long-term budgets and cash flow reports. Prepare harvest plans, layout timber sales, market timber, and develop contracts. Supervise harvest operations and audit monetary receipts. Manage road and silviculture projects. Manage Road Management and Abandonment Plan (RMAP) in concert with local agencies. Monitor environmental protection projects. Manage alternative forest products sales.

Forest Management – Non-Industrial Landowners, Washington and Oregon. Full-scale forestry services for numerous small non-industrial forestland owners. Timber sales, silviculture, road maintenance, valuations, management plans, inventory. Chief Forester of Woodland Forest Management; a wholly owned subsidiary of MB&G.

Experience Prior to Current Employment with MB&G

2006-2011, Hancock Forest Management-Northwest, Vancouver, Washington.

Inventory Forester. Inventory management of 775,000 acres of timberland in Canada, Washington, Oregon, and California.

Inventory Program Management. Responsibilities included large-scale database management, reporting for appraisals and operations, and ongoing inventory maintenance and updates.

Inventory Program Development. Responsibilities included inventory procedures and user guides, work plan, software development, and tracking system.

Project Management. Responsibilities included annual inventory, acquisition, and disposition cruising contract administration; project bidding and budget management; quality control (check cruising).

Biometrics. Responsibilities included cruise design, cruise planning, cruise data compilation and reporting, statistics, acquisition and disposition analyses and field inspections, cost analysis, timberland valuation, cutout and depletion reporting, silviculture decision making tools, biodiversity index reporting, and FSC & SFI reporting.

1993-2006, Mason, Bruce & Girard, Inc., Portland, Oregon.

Project Management. Responsibilities included project administration, contract coordination, project bidding and budget management, quality control, management and supervision of field personnel, and recruitment and hiring of field personnel.

Property Management. Responsibilities included timber sale layout and permitting, prospectus development, bidding oversight, contract administration, silviculture, road maintenance, forest practices compliance, land records, and property tours.

Biometrics. Responsibilities included multi-resource forest inventory and timber cruising, cruise design, and cruise data compilation and reporting.

Data Analysis. Responsibilities included database construction and management, and timberland valuation.

Software Development and Support. Responsibilities included handheld data-recorder application development, and inventory and cruising software support.

Environmental Services. Responsibilities included wetland delineation and owl surveys.

Curriculum Vitae for

BRUCE A. PRENGUBER

PROFESSIONAL ECONOMIST

Professional Experience:

President, Globalwise, Inc.
1996 -- Present

- Manage a successful, diversified economic consulting practice with a portfolio of over 100 clients in the government, non-profit and private business sectors.
- Analyze and recommend actions for clients that result in new business formation and business expansion, based on recommendations for objective management decision-making.
- Analyze economic damages and lost earnings capacity for attorneys and their clients in the Pacific Northwest with court testimony and depositions as required.

Executive Director, Western U.S. Agricultural Trade Association
2000 -- 2002

- Managed 13 member state export program in cooperation with private companies. Improved overall federal funding for states and companies despite declining availability of federal funding. Annual federal funding of over $6.3 million secured for the association through the USDA competitive allocation process.
- Led the staff in development and implementation of a project tracking and reporting system that provided new management information and documented credible results for the largest number of companies assisted in the history of the association.
- Evaluated and proposed projects in new federal programs that resulted in $600,000 of new program funding to the association.
- Increased association reserve funds by 15 percent and led the Board to adopt new reserve fund investment policies.

Assistant Director, Western U.S. Agricultural Trade Association
1980 -- 2000

- Initiated and managed international market development programs in 10 countries that introduced over 100 U.S. companies to importers and distributors. These programs had sales of over $10 million for U.S. companies.
- Managed program reviews and evaluation contracts that led to elimination of low performing activities and additional funding and management support to high success programs.

Officer and Principal, Northwest Economic Associates
1978 -- 1996

- Proposed and managed over 100 economic and marketing consulting projects with a total contract value in excess of $2.5 million. Many clients were repeat customers.

Research Economist, Washington Department of Natural Resources
1976 -- 1978

- Forecasted stumpage prices, evaluated agricultural leases and performed cost-benefit economic evaluations on public trust lands managed by the agency.

Education:

University of Wisconsin
Madison, Wisconsin
M.S.--Agricultural Economics, 1975

Washington State University
Pullman, Washington
B.S.--Agricultural Economics, 1973

Teaching:

Adjunct Instructor of Economics, Washington State University-Vancouver, WA Campus, 2004-2005

Other Activities:

Founding Member, Clark County (Washington) Food System Council
Member & Past Chair, Friends of Washington State University School of Economic Sciences

Selected Publications and Analyses

Recent Work

"Economic Impacts for Pacific Northwest Apples, Pears, and Sweet Cherries" for Washington Apple Commission, Northwest Cherry Growers, and Northwest Pear Bureau (in association with Belrose, Inc.), May 2021.

"The Built Envirnoment (Agriculture Sections) for Draft Programmatic Environmental Impact Statement: Lower Green River Corridor Flood Hazard Management Plan" for King County Flood Control District (in association with Parametrix), December 2020.

"City of Sandy WSFP Detailed Discharge Alternatives Evaluation: Market Potential for Sandy's Recycled Water" for City of Sandy Oregon (in association with Barney & Worth), May 2020.

"Planning and Workshop Facilitation for Understanding Farmland Protection Priorities in the North and South Puget Sound Region" for PCC Farmland Trust, April 12 and 17, 2019.

"Major Economic Factors in the Purchase Analysis of Broetje Orchards" for Ontario Canada Teachers Pension Plan (in association with Belrose, Inc.), December 2018.

"Strategic Implementation of the British Columbia Tree Fruits Industry Competitiveness Fund" for BC Fruit Growers' Association, July 2018.

"Task Reports Evaluating the Potential for Land Improvement for Grazing and Crop Production at the Westby Cattle Ranch in New Meadows, Idaho" for David and Carrie Westby, January, 2018.

"Testimony of Bruce Prenguber on Behalf of the Friends of the Columbia Gorge in the Appeal od Clark County Decision Approving Clark County Case No. GOR2016-00002," for Friends of the Columbia Gorge, August 2017.

"Testimony of Bruce Prenguber on Behalf of the Friends of the Columbia Gorge in the Appeal od Clark County Decision Approving Clark County Case No. GOR2016-00004," for Friends of the Columbia Gorge, August 2017.

"Cowlitz County Agriculture: Profile and Analysis of Current Conditions" for Cowlitz County Planning Department, August 2017.

"Proposed Bikeway Impacts on Agricultural Land Owners in Benton County, Oregon" for Benton County Oregon (prepared in association with Barney & Worth), May 2017.

"Analysis of B.C. Ambrosia Marketing" for British Columbia New Tree Fruit Varieties Development Council, (in association with Belrose Inc.), December 2016.

"Economic Conditions for Agriculture in Pierce County: An Update Assessment to Evaluate Agricultural Zoning" for Pierce County Audit Committee, July 2016.

"Agricultural Resource Land Analysis of the Gustafson Property Along NE 152nd Avenue in Clark County" A Review of Agricultural Land Resource Conditions Under the Washington Growth Management Act" for Gustafson Investment LLC, June 2015.

"Agricultural Resource Land Analysis of the Fudge Property at the La Center Junction: A Determination of De-Designation Under the Washington Growth Management Act" for the City of La Center, April 2015.

"Strategic Development of B.C. Apple and Sweet Cherry Varieties" for the British Columbia Ministry of Agriculture, (in association with Belrose Inc.), March 2015.

"Agricultural Resource Land Analysis of the Subject Properties Near NW 31st Avenue in Ridgefield, WA: A Determination of De-Designation under the Washington Growth Management Act" for 18 LLC Property Owners, December 2014.

"The Washington Apple Industry: Updated Evaluation of Contributions to the State Economy and the Important Role of Exports" co-authored with Belrose, Inc. for the Washington Apple Commission, June, 2014.

"Oregon Property Tax on Machinery & Equipment: Impacts of Extending the Exemption to the Bakery and Dairy Food Processing Sectors to Boost the State Economy" for Oregon FoodPac, April, 2014.

"Analysis of Maris Farms Crop Loss Damages from Elk Intrusion" for Michael Schwartz, Law Offices of Michael Schwartz, in Administrative Appeals Hearing, Washington Department of Fish & Wildlife, hearing testimony, August 5, 2013.

"A First Look at Produce Safety Practices and Costs on Oregon's Small and Medium Sized Fresh Fruit and Vegetable Farms" co-author with Amy Gilroy for the National Network of Public Health Institutes, June 2013.

"The Orting Study Area: Metrics and Economic Analysis of Organic and Sustainable Agriculture" for PCC Farmland Trust and The Trust for Public Land, February 25, 2013.

"British Columbia Apple Industry: Strategic Choices and Directions for the Next Decade" co-authored with Belrose, Inc. for the B.C. Fruit Growers' Association, (in association with Belrose Inc.), September, 2012.

"Literature Review on Food Safety Adherence and Cost Among Small and Medium Size Produce Growers" co-authored with Oregon Public Health Institute for the National Network of Public Health Institutes, September 2012.

"The Washington Apple Industry: Contributions to the State Economy and the Important Role of Exports" co-authored with Belrose, Inc. for the Washington Apple Commission, August 29, 2012.

"Washington Business & Occupation Tax: Impacts of Removing the Exemption on the Food Processing Industry and State Economy" for Washington FoodPac, January 2012.

"Apple Industry Cost and Returns Analysis for British Columbia and North Central Washington" co-author with Dr. Desmond O'Rourke for British Columbia Fruit Growers Association, July 2011.

"Electrical Energy Efficiency and Emerging Technologies in Northwest Agriculure" co-author with Cascade Economics and MetaResource Group for Northwest Energy Efficiency Alliance, July 29, 2011.

"Economic Feasibility of Organic Fertilizer Produced fron Chicken Manure in Snohomish County, Washington" for Renewable Farming Group of Washington, June 2011.

"Market Research and Strategic Initiatives for the Oregon Turfgrass Industry in U.S. Markets" co-authored with Dr. Don Roupe for the Oregon Seed Council, April 2011.

Resource Economics

"Cowlitz County Agriculture: Profile and Analysis of Current Conditions" for Cowlitz County Planning Department, August 2017.

"Proposed Bikeway Impacts on Agricultural Land Owners in Benton County, Oregon" for Benton County Oregon (conducted with Barney & Worth), May 2017.

"Economic Conditions for Agriculture in Pierce County: An Update Assessment to Evaluate Agricultural Zoning" for Pierce County Audit Committee, July 2016.

"Agricultural Resource Land Analysis of the Gustafson Property Along NE 152nd Avenue in Clark County" A Review of Agricultural Land Resource Conditions Under the Washington Growth Management Act" for Gustafson Investment LLC, June 2015.

"Agricultural Resource Land Analysis of the Fudge Property at the La Center Junction: A Determination of De-Designation Under the Washington Growth Management Act" for the City of La Center, April 2015.

"Agricultural Resource Land Analysis of the Subject Properties Near NW 31st Avenue in Ridgefield, WA: A Determination of De-Designation under the Washington Growth Management Act" for 18 LLC Property Owners, December 2014.

"The Orting Study Area: Metrics and Economic Analysis of Organic and Sustainable Agriculture" for PCC Farmland Trust and The Trust for Public Land, February 25, 2013.

"A Profile of Agriculture in the Pacific Northwest: Implications for Electric Utilities" co-author with Cascade Economics for Northwest Energy Efficiency Alliance, August 17, 2010.

"Hood River Working Farmland Study: Summary of Grower & Agri-Business Interviews" for Columbia Land Trust, February 2009.

"The Future for Agriculture in Yamhill County (Oregon)" for State of Oregon and Yamhill County, McMinnville, Oregon, December 2008.

"A Profile of Yamhill County (Oregon) Agriculture" for State of Oregon and Yamhill County, McMinnville, Oregon, November 2008.

"Pierce County Agricultural Production Capacity Study" for Pierce Conservation District, Puyallup, Washington, June 2008.

"The Prospect for Expanding Portland's Farmers Markets: Are Growers Ready to Ramp Up the Supply?" for the Office of Sustainable Development, City of Portland, Oregon, May 2008.

"Summary of Farmer / Producer Survey" (Survey of 52 farmers in Oregon and Washington), for the Office of Sustainable Development, City of Portland, Oregon, May 2008.

"Animal Byproduct Technology Assessment and Market Analysis: Options for Oregon" co-author with consultant team for Oregon Department of Agriculture and a consortium of Oregon industries and other government agencies, Portland, Oregon September 2007.

"Analysis of the Agricultural Economic Trends and Conditions in Clark County, Washington (preliminary report), for Clark County, April 2007.

"Analysis of the Agricultural Economic Trends and Conditions in Clark County, Washington (preliminary report), for Clark County, April 2007.

"Local Economic Contributions by Processors of Groundfish and Pacific Whiting in California, Oregon and Washington" for West Coast Seafood Processors Association, March 2007.

"Analysis of Rural Clark County Property for Re-Zone Request from AG-20 to R-5: Why the Coleman Property is Not Agricultural Resource Land Under Definition of the Washington Growth Management Act" for Landerholm, Memovich, Lansverk & Whitesides, P.S. and Monty Coleman, June 2006.

"Preserving Farmland and Farmers: Pierce County Agriculture Strategic Plan" Summary Report for Pierce County Economic Development Division, January 2006 (co-authored with Barney & Worth).

"Agriculture Industry Trends" Task 4 Technical Memorandum for Pierce County Economic Development Division, December 2005.

"Quantative and Qualitative Assessment of Pierce County Agriclture" Task 2 Technical Memorandum for Pierce County Economic Development Division, December 2005.

"Barriers to Entry for Farmers" Task 6 Technical Memorandum for Pierce County Economic Development Division, December 2005.

"Aggregate Rock Markets in Southeast Alaska, British Columbia Canada, and Seattle, Washington" for Metlakatla Indian Community, Metlakatla, Alaska, May 2000.

"Market Analysis for Metlakatla Native Plant Seed Enterprise" for Metlakatla Indian Community, Metlakatla, Alaska, September 1998.

"Licensing Conditions and Annual Charges Related to Milford Hydroelectric Project FERC Application" for the U.S. Department of Interior, Bureau of Indian Affairs, Eastern Area Office, Arlington, Virginia, 1995-1996.

"Market Analysis of Metlakatla Bottled Water for Sales in Asia" for Metlakatla Indian Community, September 1995.

"Market Analysis of Metlakatla Bottled Water for Domestic U.S. Sales" for Metlakatla Indian Community, April 1995.

"Market Analysis for Metlakatla Water—Phase I Report" for Metlakatla Indian Community, June 1994.

"The Economic Impacts of Drawdown for Columbia River Salmon Mitigation Analysis" two chapters in a report for the Pacific Northwest Power Planning Council, March 1994.

"Economic Analysis of the Proposed Duckwater Shoshone Indian Land Rights Act" for the Duckwater Tribe in support of their land claim, January 1994.

"Economic Impacts of the 1991 California Drought on San Joaquin Agriculture and Related Industries" for the San Joaquin Valley Agricultural Water Committee, March 1992.

"Emergency Water Hazard and Industry Emergency Water Requirements Study" for U.S. Army Corps of Engineers, June 1985.

"North Santiam River Flood Plain Land and Improvements Valuation Study" for U.S. Army Corps of Engineers, June 1985.

""Malheur Lake Basin Economic Analysis of Flood Damages and Benefits" for U.S. Army Corps of Engineers, January 1985.

"Mill Creek Flood Plain Valuation Study" for the U.S. Army Corps of Engineers, August 1984

"Mill Creek Flood Plain Valuation Study" for the U.S. Army Corps of Engineers, August 1984.

Food & Agricultural Product Marketing

"Analysis of B.C. Ambrosia Marketing" for British Columbia New Tree Fruit Varieties Development Council, December 2016.

"Market Research and Strategic Initiatives for the Oregon Turfgrass Industry in U.S. Markets" co-authored with Dr. Don Roupe for the Oregon Seed Council, April 2011.

"Exploratory Market Research for the Oregon Turfgrass Industry: Phase I Report – Depth Interviews, Formal Discussions & Secondary Analysis" for Oregon Seed Council, July 2010.

"West Coast Food Service Markets for Fresh Organic Fruits and Vegetables", proprietary market research for a west coast organic food distributor, June 2009.

"Market Feasibility of a Food Processing Facility in Port of Skagit (Washington State)" in association with Dr. Hector Saez, Washington State University, for Northwest Agri-Business Council and private investors, December 2008.

"The Prospect for Expanding Portland's Farmers Markets: Are Growers Ready to Ramp Up the Supply?" for the Office of Sustainable Development, City of Portland, Oregon, May 2008.

"Animal Byproduct Technology Assessment and Market Analysis: Options for Oregon" co-author with consultant team for Oregon Department of Agriculture and a consortium of Oregon industries and other government agencies, Portland, Oregon September 2007.

"Case Ready Beef: Evaluation of the Pacific Northwest Retail Market Channel" for proprietary client, April 2003.

"2002 Unified Export Strategy and Application" to the U.S. Department of Agriculture by the Western U.S. Agricultural Trade Association, Vancouver Washington, March 2002.

"Value-Added Agriculture and U.S. Competitiveness: A Western U.S. Viewpoint" Analysis and speech presented at the USDA Agricultural Outlook Forum 2002, February 21, 2002, Washington D.C.

"U.S. Food Trends: An Import Trade Data Comparative Analysis" for Alberta Department of Economic Development, Edmonton Alberta, Canada, April 2002.

"Western U.S. Organic Livestock Feed Market Potentials" for Alberta Department of Economic Development, Edmonton Alberta, Canada, April 2001.

"Crops and Marketing Opportunities For Agricultural Producers at the Former Wind River Nursery, Skamania County, Washington" analysis presented in "Wind River Nursery Site and Facility Plan" for Skamania County Wind River Redevelopment Team, Stevenson Washington, June 1, 2000.

"Implications of Changes in the Food Supply Chain for Small and Medium-Sized Produce Firms in the Pacific Northwest" for USDA Agricultural Marketing Service, May 2000.

"Food Service Development in China and Vietnam" for Emerging Markets Program, USDA, November 1999.

"International Market Information Network for High-Value Food—Phase II Grant Report" for USDA Small Business Innovative Research Program, September 1999.

"Organic Food Markets in Washington and Oregon—Trends and Opportunities" for Alberta Department of Agriculture & Rural Development, Edmonton, Alberta Canada, October 1999.

"Final Evaluation of Agricultural Showcase 1995 & Recommendations for Planning Future Events" for Yakima County, Washington, February 1996.

"International Market Information Network for High-Value Food" USDA Small Business Innovation Research Grant Report, November 1995.

"Survey and Analysis of Fresh Produce Purchasing Decisions of Consumers in Washington State" for the Washington Department of Agriculture, January 1992.

Labor Economics and Regional Economic Impacts

"Cowlitz County Agriculture: Profile and Analysis of Current Conditions" for Cowlitz County Planning Department, August 2017.

"The Washington Apple Industry: Updated Evaluation of Contributions to the State Economy and the Important Role of Exports" co-authored with Belrose, Inc. for the Washington Apple Commission, June, 2014.

"The Washington Apple Industry: Contributions to the State Economy and the Important Role of Exports" co-authored with Belrose, Inc. for the Washington Apple Commission, August 29, 2012.

"Jobs and Wages for Oregonians: Impacts of Productivity Gains from the Proposed VIP Center" for Northwest Food Processors Association", August 2006.

"Economic Impact of Food Plant Closure: Analysis of the J. R. Simplot Plant in Hermiston, Oregon" for Oregon Food Processors Council, September 2004.

"Employment, Production and Business Growth Benchmarks for the Pacific Northwest Food Processing Industry" for Northwest Food Processors Association, March 2004.

"Economic Impacts of Food Plant Closure: Analysis of the Pacific Coast Seafood Plant in Warrenton, Oregon" for Pacific Seafood Group, February 2004.

"Economic Impacts of Food Plant Closure: Analysis of the Seneca Plant in Dayton, Washington" for Washington Foods Processors Council, September 2003.

"Projections of Oregon's Minimum Wage to the Year 2013 Under Ballot Measure 25" for Oregon FOODPAC, September 2002.

"Economic Analysis of Seasonal Worker Health Insurance Coverage in the Washington Fruit and Vegetable Industry" for the Washington Food Processors Council, January 1994.

Food Processing, Transportation and Storage Studies

"Oregon Property Tax on Machinery & Equipment: Impacts of Extending the Exemption to the Bakery and Dairy Food Processing Sectors to Boost the State Economy" for Oregon FoodPac, April, 2014.

"Washington Business & Occupation Tax: Impacts of Removing the Exemption on the Food Processing Industry and State Economy" for Washington FoodPac, January 2012.

"Review of Northwest Food Processing Market Characterization Report" for The Cadmus Group, Inc., January 2010.

"Economic Performance of the Northwest Food Processing Industry: Trends and Analysis from the Benchmark Data" for Northwest Food Processors Association, July 2009 (the 6th benchmark analysis for NWPFA dating back to 2003).

"Market Feasibility of a Food Processing Facility in Port of Skagit (Washington State)" in association with Dr. Hector Saez, Washington State University, for Northwest Agri-Business Council and private investors, December 2008.

"Energy Use by Food Processors in Idaho, Montana, Oregon & Washington" for the Northwest Energy Efficiency Alliance, Portland Oregon, October 2008.

"The Future of Farming in Washington: Review of the State's Food Processing Industry" for the Washington State Department of Agriculture, Olympia, Washington, June 2008.

"Analysis of Cold Storage Rates and Strategic Business Opportunities", a proprietary analysis for a private client, July 2006.

"West Coast U.S. Organic and Natural Product Markets for Alberta Agricultural Producers and Processors" for Province of Alberta Canada - Agriculture, Food and Rural Development, April 2006.

"Business Plan for Advantage Oregon" for Oregon Association of Nurseries, January 2006 (co-author with Cambium Strategies and Nobis Logistics).

"Long-Haul Transportation of Oregon Nursery Products: Economic Conditions and Actions for Improved Performance" for Oregon Association of Nurseries, January 2005.

Litigation Support/Expert Witness

"Economic Loss to the Estate of Sammuel Sheperd" for Steven Kahn, Kahn & Kahn PC, February, 2022.

"Economic Loss to the Estate of Nicholas Irwin" for Andrew Glascock, Glascock, Street, Waxler, LLP, January, 2022.

"Economic Loss of Dwight T. Barnes" for Douglas Foley, Douglas Foley and Associates, perpetual trial testimony, July 2021.

"Analysis of Economic Loss of Jason Walker" for Sean Lanz, Barger Law Group, October, 2020.

"Analysis of Economic Loss of Jason Jaros" for Sean Lanz, Barger Law Group, May, 2020.

"Economc Loss of Jaimie Reed Discounted to Present Value" for Mila Boyd, Wheeler Montgomery & Boyd PLLC, July, 2019.

"Economic Loss to the Estate of Bailey Dixon" for Mila Boyd, Wheeler Montgomery & Boyd PLLC, April, 2019.

"Analysis of Earnings Loss of Kenneth Henson" for Douglas Foley, Douglas Foley and Associates, March, 2019.

"Analysis of Earnings Loss and Present Value of Life Care Plan of Aart Lovenstein" for Stephen Hendricks, Hendricks Law Firm, court testimony, September, 2018.

"Economic Loss of Kyle Thorson Sr." for Andrew Glascock, Glascock Street Waxler LLP, trial testimony, March 2018.

"Summary of Economic Losses of Tyler Holmes" for Amy I. Paden, Bauer Moynihan & Johnson LLP, January 2018.

"Economic Loss of Christopher Karl LaDue, Jr." for Lawrence Peterson, Glazer, Maurer & Peterson, PC, September 2017.

"Analysis of Economic Losses of Brian Clark" for Ryan McLellan, Smith Freed and Eberhard PC, August 2017.

"Analysis of Earnings Losses of Kenneth V. Thomas" for Christopher R. Best, The Gatti Law Firm, June 2017.

"Analysis of Earnings and Household Services Losses to the Estate of Kerri E. Drake" for Gregory Price, Law Office of Gregory E. Price, June 2017.

"Economic Loss of Julie Clark" for Jane Clark, Law Offices of Jane Clark, trial testimony, May 2017.

"Economic Loss to the Estate of Evelyn Croon" for William Nelson, Baumgartner, Nelson & Wagner PLLC, deposition testimony, December 2016.

"Economic Loss of Betty Bishop" for Douglas Foley, Douglas Foley and Associates, court testimony, November 2016.

"Analysis of Economic Losses of Charlene S. Nelson" for Gregory Price, Law Office of Gregory E. Price, P.S., deposition testimony, September 2016.

"Economic Loss of Household Services to the Estate of Daniel Roberts" for Jane Clark, Law Offices of Jane Clark, August 2016.

"Economic Loss of Daniel Englund" for Douglas Foley, Douglas Foley and Associates, August 2016.

"Analysis of Economic Losses of Marcia L. Johns" for Gregory Price, Law Office of Gregory E. Price, March 2016.

"Economic Loss of the Estate of David Huynh" for Michael Jacobs and Joe Traylor, Hart Wagner LLP, January 2016.

"Economic Loss to the Estate of Dustin Blake" for Steven Kahn, Kahn & Kahn, December 2015.

"Economic Loss of the Estate of Judith Wolff" for Ryan McLellan and Sean Conner, Smith Freed & Eberhard P.C. November, 2015.

"Analysis of Earnings Loss of Mary Delucco" for Karen O'Kasey, Hart Wagner LLP, October 2015.

"Economic Loss of James Deck" for Elizabeth Lampson and Christoper Parker, Davis Rothwell Earle & Xochihua P.C., October 2015.

"Analysis of Earnings, Personal Consumption and Household Services Losses to the Estate of Matthew S. Scott" for George Curtis, Zbinden & Curtis, September 2015.

"Analysis of Earnings, Personal Consumption and Household Services Losses to the Estate of Chuck Watson" for Jeffrey Thayer; Gatti, Gatti, Maier, Sayer, Thayer, Smith and Associates, court testimony, September 2015.

"Analysis of Business Losses of Glenda and Randal Miles" for John Alexander, The John Alexander Law Firm PLLC, July 2015.

"Economic Loss of the Estate of Jason Moe v. Margaret Snow McDonnell" for Douglas Foley, Douglas Foley & Associates, July 2015.

"Summary Analysis of Economic Loss of Alan Babb" for Diane Lehn, State Farm Mutual Automobile Insurance Company, April 2015.

"Household Services Loss of the Estate of Sandra Ryder" for Jane Clark, Law Offices of Jane Clark, deposition testimony, April 2015.

"Analysis of the Present Value of Future Medical Costs of Bruce Coleman" for Eugene Tennyson, Attorney at Law, March 2015.

"Analysis of the Earnings Loss of Cary McClain" for Douglas Foley, Douglas Foley & Associates, September 2014.

"Economic Loss of the Estate of James Orr" for William Nelson, Baumgartner, Nelson & Wagner PLLC, August, 2014.

"Economic Loss of James Schwartz" for William Nelson, Baumgartner, Nelson & Wagner PLLC, perpetual deposition testimony, June 2014.

"Economic Loss of John Bechtold" for Loren Entengoff, Law Offices of Loren S. Etengoff, deposition testimony, April 2014.

"Analysis of the Past Medical Costs,Future Life Care Costs and Earnings Loss of Justice 'Coe' Cagle" for William Thayer; Schauermann, Thayer, Jacobs & Staples, P.S., deposition testimony, March 2014.

"Economic Loss to the Estate of Kathryn L. Rickson" for James Gidley, Perkins Coie LLP, trial testimony, February, 2014.

"Economic Loss to the Estate of Diego Reyes Climaco" for Ryan McLellan, Smith Freed & Eberhard P.C., November, 2013.

"Economic Loss of Michael Mott" for Paul Henderson, Henderson Law Offices, court testimony, November, 2013.

"Present Value of Medical Care for John Lewis" for William Thayer; Schauermann, Thayer, Jacobs & Staples, P.S., August 2013.

"Analysis of Maris Farms Crop Loss Damages from Elk Intrusion" for Michael Schwartz, Law Offices of Michael Schwartz, in Administrative Appeals Hearing, Washington Department of Fish & Wildlife, hearing testimony, August 5, 2013.

"Analysis of Business Losses of Valerie & Bryan Griggs" for Douglas Foley & Associates, PLLC, court testimony, March 2013.

"Economic Loss to the Estate of Steven Neva" for Thomas McDermott, Lindsay Hart LLP, March 2013.

"Economic Loss of James Collins" for William Thayer, Schauermann, Thayer, Jacobs & Staples, P.S., October, 2012.

"Economic Loss to the Estate of Jerry Brown" for Stephen Hendricks, Hendricks Law Firm PC, October, 2012.

"Economic Loss of Deborah Armstrong Leek" for Craig Schauermann, Schauermann, Thayer, Jacobs & Staples, P.S., deposition testimony, July 2012.

"Analysis of the Economic Loss to the Estate of Edwin Lee Cain" for Kitri Ford, Bryant Lovlien & Jarvis, Attorneys at Law, June 2012.

"Value of Economic Loss and Present Value of Medical Costs for Karla Staub" for William K. Thayer, Schauermann, Thayer, Jacobs & Staples, P.S., June 2012.

"Economc Loss of Earl and Jane Steinhoff" for Steven Kraemer, Hoffman Hart & Wagner, September, 2011.

"Economic Loss of Randy Bierbrauer" for Mark Hiefield, Hiefield Foster & Glascock LLP, representing State Farm Insurance, July 2011.

"Economic Loss of Cara Graves" for Stephen C. Hendricks, Hendricks Law Firm P.C., June 2011.

"Value of Household Services Loss of Mary Harrell" for Quinn Posner, Law Offices of Andersen & Nyburg (Liberty Mutual Insurance Company), May 2011.

"Economic Loss of Roberta Ells-Christ" for William Robison, Caron, Colvin, Robison & Shafton, P.C., February 2011.

"Analysis of the Net Earnings Loss of Austin Putnam" for Glenn E. Barger, Smith Freed & Eberhard P.C., January 2011.

"Value of Household Services Loss of Michelle Riehl" for Wendell Belknap, Belknap Law Offices, November 2010.

"Economic Losss to the Estate of Michael Hendrix" for Stephen C. Hendricks, Hendricks Law Firm P.C., September 2010.

"Economic Loss to the Estate of Sara R. Stokes" for William Richardson, Smith Freed & Eberhard P.C., August 2010.

"Analysis of the Household Services Loss of Rebecca Hildebrant" for Devin Robinson, Stewart, Shadduck & Robinson, May 2010.

"Analysis of the Household Services Loss to the Estate of Jeffrey Helgeson" for Dean Heiling, Heiling Dwyer & Associates, April 2010.

"Economic Losses of Susan Pearson" for Kenneth Friedman, Friedman Rubin, March 2010.

"Economic Losses of Nickolas Ynba" for William Nelson, Baumgartner, Nelson & Price, PLLC, March 2010.

"Economic Losss to the Estate of Jessica Blanck & the Estate of Kristyne Shaddix" for Jeff Eberhard, Smith Freed & Eberhard P.C., February 2010.

"Economic Losses to the Estates of Clinton Shultz and Kendra Shultz" for Glenn Barger, Smith Freed & Eberhard P.C., February 2010.

"Economic Losses of Sandra Winn" for William Robison, Caron, Colvin, Robison & Shafton, P.C., Analysis, deposition and arbitration testimony, January 2010.

"Economic Losses of Steve Lehman" for Steve Kraemer, Hoffman Hart and Wagner, January 2010.

"Economic Losses of Elaine Hale" for Thomas J. Foley, Attorney at Law, December 2009.

"Analysis of Loss of Business Income of Charles Collins" for William Robison, Caron Colvin Robison & Shafton, P.C., Analysis and court testimony, November 2009.

"Economic Losses to the Estate of Tara Lynne Hall" for Vicki L. Smith, Lane Powell P.C., October, 2009.

"Analysis of the Household Services Losses to the Estate of Jeffrey Helgeson" for Dean Heiling, Heiling Dwyer & Associates, October 2009.

"Economic Losses to the Estate of Cynthia Von Tungeln" for Dennis Freed and Ryan McLellan, Smith Freed & Eberhard, P.C., August 2009.

"Economic Losses to the Estate of Gary Phillips" for Glenn Barger, Smith Freed & Eberhard, P.C., June 2009.

"Economic Losses of the Estate of Lourdes Hernandez" for John Eickelberg, In-house Council for Farmers Insurance, April 2009.

"Economic Losses of the Estate of Curtis Claflin" for Vicki L. Smith, Lane Powell P.C., January 2009.

"Analysis of the Household Services Losses to the Estate of Kathleen Holt" for Bernard Jolles, Bernard Jolles Law Offices, November 2008.

"Present Value of the Life Care Costs and Lost Earnings Capacity for Timothy Renner" for Donald Templeton, Dunn Carney Allen Higgins & Tongue LLP, September 2008.

"Economic Losses of the Estate of Gretchen Burris" for Ryan McLellan, Smith Freed & Eberhard, P.C., July 2008.

"Economic Losses of the Estate of David Johnston" for Dennis Freed, Smith Freed & Eberhard, P.C., May 2008.

"Economic Losses of Janet Muirhede" for Mark Hiefield, Bodyfelt Mount Stroup and Chamberlain LLP, April 2008.

"Present Value of Future Life Care Costs for Bonnie Jones" for Eugene H. Tennyson, February 2008.

"Economic Losses of Timothy O'Neill from Wrongful Termination by Hanger Prosthetics" for Lisanne M. Butterfield, Carr Schwartz and Butterfield, Analysis and court testimony, January 2008.

"Response to Comments of Cowlitz County Planning Commission Regarding the Willow Grove Proposed Residential Development" for Michael Simon, Landerholm Memovich Lansverk & Whitesides, P.S., December 2007.

"Economic Losses of the Estate of Briana Schwesinger" for Beau Harlan, Harlan and Associates, October 2007.

"Economic Losses of Sandra Winn" for William Robison, Caron, Colvin, Robison & Shafton, P.C., September 2007.

"Analysis of the Economic Losses to the Estate of Mr. Aaron Markovich-Koyfman" for Brown & Hutchinson, February 2007

"Economic Losses of Petr Burunov, Jr." for Baumgartner, Nelson and Price, PLLC, February 2007.

"Analysis of the Economic Losses of Patrick Holyk" for Law Offices of Stanley Horak, August 2006.

"Analysis of Economic Losses to the Estate of Mitchell Anderson" for Brophy Mills, Schmor, Gerking, Brophy & Paradis, LLP, July 2006.

"Household Services Loss Estimates for the Estate of Stacey Paxton", for Michael Rosenbaum Law Offices, June 2006.

"Analysis of Rural Clark County Property for Re-Zone Request from AG-20 to R-5: Why the Coleman Property is Not Agricultural Resource Land Under Definition of the Washington Growth Management Act" for Randall Printz, Landerholm Memovich Lansverk & Whitesides, P.S., June 2006. (Analysis and testimony before Clark County Planning Commission.)

"Estimate of Economic Losses of William Boyd" for Bodyfelt, Mount, Stroup & Chamberlain LLP, April 2006.

"Analysis of Economic Losses to the Estate of George Green" for Smith Freed & Eberhard PC, November 2005.

"Analysis of the Food Industry: Litigation Support for Kenyon Zero Cold Storage" for Lane Powell, October 2005. (Analysis and deposition)

"Analysis of the Economic Losses of Ms. Cynthia Comstock" for Smith Freed & Eberhard PC, October 2004.

"Analysis of the Economic Losses for Ms. Darby Rucker" for Yturri Rose LLP, Analysis and court testimony, May/October 2004. (Analysis and testimony in Federal District Court, Portland)

"Review of Plaintiff Expert Methodology and Procedures to Estimate Lost Wages of Ronald L. Kramer" for Davis Wright Tremaine LLP, August 2004

"Analysis of Loss of Business Income of Jerry Presses" for Caron Colven Robison & Shafton P.S., May 2004. (Analysis and testimony at arbitration).

"Economic Losses of Damon Renfrow" for Lindsay Hart Neil & Weigler LLP, April 2004. (Analysis and testimony in Federal District Court, Eugene).

"Present Value of Future Chiropractic Care Costs for Stacey Bailey" for Harlan and Brace, December 2003. (Analysis and testimony in Multnomah County Circuit Court).

"Analysis of Economic Losses to the Estate of Vernon White" for Hoffman Hart & Wagner LLP, December 2003.

"Analysis of Economic Losses to the Estate of Bryan Macklem" for Hornecker Cowling Hassen & Heysell, LLP, November 2003.

"Analysis of the Plaintiff Damage Claim for Economic Losses to the Estate of Michael McCaffrey" for Keating Jones Bildstein & Hughes, P.C., October 2003.

"Analysis of the Economic Losses of Barbara Huson From Termination of Employment" for Hoffman Hart and Wagner, LLP, September 2003.

"Impaired Earning Capacity of Steven Fuller" for Lindsay, Hart, Neil and Weigler, LLP, November 2002.

"Impaired Earning Capacity of Evelyn Wynn" for Boivin, Uerlings & DiIaconi, P.C., Analysis and court testimony, July 2002.

"Economic Analysis of Crop Damages from Chemical Spray Drift, Re Morgan v. E.I. DuPont, et. al." for Smith, Free, Heald, & Chock, Attorneys at Law, 1996.

Special Studies

"Task Reports Evaluating the Potential for Land Improvement for Grazing and Crop Production at the Westby Cattle Ranch in New Meadows, Idaho" for David and Carrie Westby, January, 2018.

"Proposed Bikeway Impacts on Agricultural Land Owners in Benton County, Oregon" for Benton County Oregon (prepared in association with Barney & Worth), May 2017.

"Strategic Development of B.C. Apple and Sweet Cherry Varieties" for the British Columbia Ministry of Agriculture, March 2015.

"Apple Industry Cost and Returns Analysis for British Columbia and North Central Washington" co-author with Dr. Desmond O'Rourke for British Columbia Fruit Growers Association, July 2011.

"Electrical Energy Efficiency and Emerging Technologies in Northwest Agriculure" co-author with Cascade Economics and MetaResource Group for Northwest Energy Efficiency Alliance, July 29, 2011.

"Economic Feasibility of Organic Fertilizer Produced fron Chicken Manure in Snohomish County, Washington" for Renewable Farming Group of Washington, June 2011.

"Economic Benchmarks for the Northwest Food Processing Industry" for Northwest Food Processors Association, July 2009 (with previous annual updates in 2003 - 2008).

“Benchmarks to Measure the Agriculture Sector’s Economic Viability” Task 8 Technical Memorandum for Pierce County Economic Development Division, January 2006.

"Competitiveness in Agriculture and Food Processing" (Presentation to Washington State House of Representatives Committee on Agriculture and Natural Resources) for Washington Food Processors Council, December 2004.

"Washington State Compost Marketing Plan" for the Clean Washington Center, June 1993.

“Economic Benefits and Costs of Navigation Improvements for Yaquina Bay and River at Newport and Toledo, Oregon” for Section 107 Reconnaissance Phase Study for the U.S. Army Corps of Engineers, April 1993.

“Indirect Economic Impacts of Alternative Columbia River Dam Operations” for an Environmental Impact Statement issued by the U.S. Army Corps of Engineers and other Federal Agencies, February 1993.

"City of Spokane Pilot Compost Project Final Report" for the City of Spokane Solid Waste Management Department, September 1992.

"Classifying The Food Waste Stream" BioCycle: Journal of Waste Recycling, October 1991.

"Economic Analysis of Benefits of Coastal Projects Authorized for Commercial Fishing and Navigation Purposes" for U.S. Army Corps of Engineers, January 1988

"Agriculture and Food Processing Electricity Sales Outlook, Pacific Power and Light Co. Service Area" for Pacific Power and Light Co., September 1985.

"Pacific Northwest Irrigation Wholesale and Retail Rates and Designs" for Bonneville Power Administration, June 1984.

"Economic Study of Transportation Pricing" for U.S. Army Corps of Engineers, September 1983.

"Economic Analysis of a Ban on Log Exports in Washington State" for Washington Citizens for World Trade, July 1981.

"Agricultural Land Resources of the Pacific Northwest" for the Northwest Agricultural Development Project, Information Report No. 13, December, 1979.

"Transfer of Development Rights as a Land Use Control Mechanism" M.S. Thesis, University of Wisconsin, 1974.

Dana M. Beckwith, PE, PTOE
Principal Senior Transportation Engineer

Years of Experience: 26

Education: MS, Transportation Engineering, Oregon State University, 1996
BS, Civil Engineering, Oregon State University, 1995

Professional Registration: Oregon Professional Civil Engineer No. 53044
Idaho Professional Civil Engineer No. 12085
Washington Professional Civil Engineer No. 39179
Professional Traffic Operations Engineer® No. 2206

Dana Beckwith, PE, PTOE is a founding principal of GTEng and has extensive experience in supporting public agencies and private development in evaluating transportation systems and Master Planning. Dana has supported the City as a lead traffic engineer in the original Main Street Improvements and ODOT more recently on the OR99E Railroad Tunnel Illumination and ITS upgrades and the I-205 Abernathy Bridge Replacement Project. These projects have allowed Dana to work with key stakeholders associated with the project and gain an understanding of traffic concerns within the area. Dana's areas of expertise include: Traffic signal design and operations; intelligent transportation systems operations and design; roadway lighting; parking analysis; pedestrian and bikeway operations, planning and design; regional trail design; roundabouts; safety studies; neighborhood traffic calming; traffic operations analysis; roadway geometrics; roadway signing and striping; traffic management plans; temporary traffic control; construction management; and rail crossing orders.

SR502 / SR503 Improvements-Battle Ground, WA. Dana was the traffic lead for the analysis and safety evaluation of the SR502 / SR503 intersection improvements. The analysis evaluated four options for intersection design and included traffic impacts to adjacent intersections along the SR502 corridor. The evaluation included the WSDOT practical design process to develop intersection improvements that balance benefits for motorists, freight and pedestrian traffic. Key elements of the project included facilitating pedestrian and bike movements from a new trail alignment on the northeast corner of the intersection to commercial and residential developments to the west and south legs of the intersection. Safe movements across right turn lanes was a key consideration and evaluation component of the project. The project also included design of the new traffic signal system to meet WSDOT standards, roadway lighting analysis and design; signing/striping improvements; and coordination with the City and WSDOT.

NW and NE Urban Growth Area Land Use, Washougal, WA. As the traffic lead, GTEng managed the traffic analysis to determine the effect land use changes would have on the transportation network and key intersections within the City. The study included collaborating with RTC and the Region's Travel Demand Forecast Model to evaluate traffic pattern changes from the present to the future year 2035. The study included a safety review of the existing and proposed transportation network, operational evaluation using the Synchro Traffic Operations Software for key intersections, turn lane warrants, traffic signal warrants, mitigation measures where necessary, identification of new roadway connections and mitigation measures. GTEng facilitate TAC and City Council Workshops with results from the traffic analysis.

OR 8 Pedestrian Crossing Analysis-Cornelius, OR. Dana was the project manager for the analysis and safety evaluation of a pedestrian crossing at the Adair St (OR8)/14th Ave and Baseline St (OR8)/14th Ave intersections. The evaluation included NCHRP 562 analysis, pedestrian origin and destination study, crash data evaluation, volume profiles over a 14-hour period, gap analysis and sight distance field reviews. Recommended treatments were presented during key project development meetings to the City and ODOT. ODOT subsequently identified the Adair St crossing for future pedestrian flasher treatments.

McLoughlin Complete Streets Pilot Project, Vancouver, WA. As traffic lead Dana lead the existing conditions analysis to include a parking utilization and access study, collision analysis, speed and volume evaluations. The parking evaluation identified utilization and acceptable levels of reduction that would still allow for peak parking demand along the corridor. Dana supported the design team in developing bike and pedestrian treatment concepts that support the City's vision of those facilities being for all ages and abilities. The concept development was iterative in process to accommodate changes in City needs and incorporate valuable public input into the design. Dana provided technical support during open house events.

Ilwaco Transportation Element Update, Ilwaco, WA. As the lead transportation engineer, Dana led the development of the traffic analysis to support the six-year update to the Transportation Element of the City's Comprehensive Plan. The update included evaluating the existing Plan, comparing the plan and its integration into those of the surrounding agencies, conducting operational analysis based on economic forecasts at key intersections, and developing updates to the capital improvement plan. A key element of the project included developing pedestrian and bike facility plans to upgrade connectivity to key historic and recreational sites. Dana supported the City and team and City Planning and Council teams to adopt the plan and its findings.

Dennis L. Mengel

Principal Habitat Management and Planning Technologist

Education

Ph.D., Soil Science, North Carolina State University – 12/90
M.S., Forest Resources, University of Idaho 8/85
B.S., Wildlife Biology, University of Idaho 5/79

Professional Registrations

Certified Professional Soil Scientist - 1991
ARCPACS Registration No. 03391

Certified Forester
Society of American Foresters Certification No. 3322 – 1991

Membership in Professional Organizations

Society of America Foresters
National Association of Environmental Professionals
Idaho Association of Environmental Professionals (Idaho State Rep on the National Board)

Distinguishing Qualifications

- Directed restoration and creation of terrestrial ecosystems
- Managed wetland ecology and treatment evaluations
- Managed analyses of impacts to wetland and riparian, wildlife, and sensitive species resources
- Managed preparation of NEPA documents
- Conducted studies and prepared Biological Assessments for Endangered Species Act evaluations

Relevant Experience

Dr. Mengel specializes in ecological restoration and mitigation, Section 7 consultation, environmental assessment, NEPA documentation, soil management, terrestrial and wetland ecology, forestry, and wildlife biology. While with CH2M HILL, Dr. Mengel spent 3 years managing the terrestrial restoration component of the Saudi Arabia Gulf War Remediation and Restoration Program out of the Al-Khobar office. He has over 35 years of experience in public and private natural resource management.

Wetland/Riparian and Restoration Ecology

Restoration projects have included both wetland/riparian and upland restoration designs, primarily in the arid western U.S and the Middle East. Many of these designs have included preparation of design drawings and specifications for installation of the designs, as well as assisting clients in selecting contractors and providing services during construction.

Dennis L. Mengel

Wetland/riparian restoration and mitigation projects have included design of wet meadow and riparian habitat along the Provo River in Utah; design of a 1-mile stream restoration project in southern Idaho; creating a design for wetland habitat along a lake shore in Texas; development of designs for emergent, wet meadow, and riparian habitat in the Uintah Basin, Utah; riparian habitat development near Sacramento, California; restoration of salt marsh habitat at Seale Beach Naval Base, California; and Best Slough channel realignment and riparian habitat establishment at Beale AFB, California. Approximately 1,200 feet of Best Slough was realigned to avoid a hazardous waste site on Beale AFB. The previously degraded riparian area habitat was restored to reflect natural, undisturbed conditions. The design included development of 1.02 acres of emergent marsh, 0.4 acres of shrub riparian, 2.6 acres of mixed riparian, and 4 acres of valley oak riparian habitat. Bio-engineering techniques were employed for bank stabilization and numerous aquatic habitat components including, bush mats, digger logs, root wads, and deep pools, were installed. The design included two islands for wildlife and a marsh system with channels specifically created for fish nursery habitat. Extensive surface and groundwater hydrologic modeling was performed to match the new channel's hydrologic characteristics to the existing stream's morphology to appropriately site the vegetative communities, protect banks from erosion, and accommodate flood events. Installation is complete and the plant communities are flourishing after many growing seasons.

Dr. Mengel's has completed design drawings and specifications for a 6 acre wetland mitigation sites with 1.4 acres of upland buffer. Wetland types at this high altitude wetland in Utah include wet meadow, scrub/shrub, and forested. Design drawings and specifications were also recently prepared for a 14-acre mitigation site in Mosier OR that included wetland, riparian, and upland habitats. He is also prepared the conceptual mitigation plan for the Missouri River WWTP 404 permit in Omaha. He has prepared construction design drawings and specifications for wetlands in Colorado Springs and Boise. He has served as the Riparian Restoration Specialist for the Trinity River Restoration project for the City of Dallas. This is an extensive design to re-route the Trinity River in Dallas to restore the natural river sinuosity and ecosystem functions and then develop the river corridor into a major recreational asset.

Upland restoration has included a variety of projects including developing coastal sage/scrub, upland, and marsh habitat in southern California and designing oak woodland habitat restoration in central California. Dr. Mengel designed a 3-year desert restoration project in Saudi Arabia. The project involves remediation of the effects of the first gulf war on the desert environment. Design elements include demolition of military structures constructed from native soils such as berms and trenches of various sizes; de-compaction of soils from military traffic; removal of tarmacs and facilities from helicopter operations; and re-establishment of native plant and animal communities to restore ecosystem functions to the affected environment.

He has prepared design drawings and specifications for a desert restoration project on a landfill closure cap in Henderson, Nevada. The Henderson site involved restoration of Mohave Desert vegetation using a variety of native shrubs and grasses. Cactii were established using vegetative propagules. Other desert restoration experience has included conceptual restoration for several pipeline projects in Utah, Nevada, Texas, and New

Mexico; numerous landfill cap designs using native vegetation in California; and dryland oak establishment in central California and Utah.

Dr. Mengel implemented his design of an upland restoration program for 1,200 acres of lead and zinc contaminated soil in north Idaho. The design involved an initial extensive soil sampling (>2000 samples) to evaluate soil chemical and physical characteristics including a full agronomic analysis plus selected metals specific to the site. The soil analysis was used to design and implement a soil rehabilitation plan that is restoring soil productivity to the steep, eroded, acidic, smelter-affected soils. Extensive tissue sampling also occurred to correlate plant nutrient deficiencies with soil sufficiency levels. A demonstration study was established to evaluate several soil amendments to determine the best approach for restoration. The design involved extensive statistical analysis of the demonstration plot data. Soil amendments evaluated include fly-ash amended biosolids, compost, fertilizer, and two commercially available organic soil amendment products. A large liming program was developed and implemented to raise the pH over the entire 1,200 acres using site-specific liming recommendations for each 5-acre management block. All lime was applied from the air using hydro-liming techniques, because slope steepness prevented land-based equipment. Native herbaceous vegetation was applied to the site using aerial hydroseeding, based on results from the demonstration plots and operational monitoring. A majority of the site has now successfully met the performance criteria developed to evaluate success. Native woody plant establishment began in 2000 to re-establish native forests over the site. A comprehensive monitoring and testing program was conducted at the site. Monitoring included evaluation of operationally seeded areas, establishment and testing of several tackifier products, measurement of the demonstration plots, regeneration surveys, and water quality sampling. Plant cover monitoring involved annual evaluation of infra-red aerial photos to determine cover classes, followed by extensive ground truthing. This was one of the largest upland revegetation projects in the world that began in 1998, using unique hydroseeding applications developed by CH2M HILL, using Erickson Air Crane helicopters.

Other reclamation work has included the following. He developed the Reclamation and Re-vegetation Basis of Design for the Bullion Mine Operable Unit 6 Site Remedial Design in Idaho and then prepared the specifications to conduct the work. Dr. Mengel prepared specification and design drawings for soil preparation and revegetation for the Crystal Mine site in MT. He helped develop wetland mitigation design for restoration of the ASARCO complex in East Helena, Montana. He also oversaw Section 404 compliance at the Bullion Mine site in Idaho. He conducted endangered plant surveys in support of Pilot Testing of Design Elements for Incremental Thin Layer Capping in the Lower Coeur d'Alene Basin in Idaho. Dr. Mengel provided senior review for ecosystem monitoring and tissue analysis at the Mountain Fuels and Champ Mines in Idaho. He helped develop the biological sampling program for the Freeport Minerals mine closure project in Utah and Colorado, as well as conducting Mexican spotted owl surveys. His is now serving as a senior scientist on that project. He prepared the bird and amphibian monitoring protocols for the Regional Monitoring Program to Assess the Effects of Oil Sands Development on Wetland Communities in Canada. He has developed evapotranspiration covers for spoil piles and vegetation covers on reclaimed land at several reclamation sites including ASARCO in Montana and the Wilson Mine in Arkansas.

Dennis L. Mengel

Soils

As a soil scientist, Dr. Mengel has implemented a restoration program, as discussed above, for a 1,200-acre mine reclamation project (Bunker Hill) in northern Idaho. He also oversaw work on a similar project in Oklahoma to remediate lead, cadmium, and zinc contaminated soils using bioaccumulation processes.

Dr. Mengel has conducted soil physical and chemical analyses in support of many land application/wetland wastewater treatment systems and in support of NEPA activities. NEPA support has included preparation of soil sections to describe existing conditions and impacts for projects in arid areas of Zion National Park, the Uintah Basin, Utah, and El Paso, Texas. He has assessed erosion impacts and control along Ririe and Cascade Reservoirs, Idaho. He mapped soils and evaluated the hydrologic condition of soil on a 100,000-acre ranch in Colorado. He has evaluated the physical and chemical condition of soil for wastewater application at four food processing facilities and three municipalities in Idaho and Washington, and for a prison in Oregon. Soil phosphorus studies were conducted in Idaho involving development of phosphorous isotherms and bench leaching studies to develop release curves. He also evaluated soils in support of an ecosystem management plan for a training range in Washington.

He has conducted a soils evaluation for the Yakima National Guard Training Center in the high desert region of central Washington. The guard uses many large tracked vehicles on the training range for which an evaluation of soil effects that would hinder re-establishment of natural vegetation was needed. Effects of compaction and soil disturbance were evaluated. Dr. Mengel also explored the environmental effects of military training activities in the Utah desert at the Utah Test and Training Range. Soil disturbance was mostly related to ordnance use.

Dr. Mengel has provided technical support for research projects in forested wetlands restoration such as TVA embankment plantings on Kentucky Lakes Reservoir and an upland conversion to a forested wetland as part of the 404 mitigation process for phosphate mining in North Carolina. He has served as editor of the soils section of an EPA-funded publication titled MIST: Mitigation Site Type Classification. MIST classifies pre-project mitigation sites based on their environmental characteristics and develops performance standards for construction and restoration of forested wetlands following disturbance. This mitigation planning method includes a monitoring system, based on an undisturbed reference ecosystem, designed to follow ecosystem recovery after restoration activities have been completed.

He is currently assisting Idaho Power in preparing expert testimony related to soil impacts from construction of a proposed transmission line in Idaho and Oregon. Issues being evaluated are effects of the proposed project on soil carbon, soil productivity, and soil compaction.

Environmental Evaluation/NEPA

Dr Mengel has completed managing 5 EISs for the US Forest Service in Idaho, Utah, and Wyoming for timber management, grazing allotments, and noxious weed control. Each NEPA document had an accompanying Biological Assessment (BA) prepared for it. He also managed preparation of an EIS and BA for a highway project in central Montana and was

the project manager for an EIS, BA, and amendments to the Resource Management Plans project for development of Coalbed Methane in the Powder River and Billings Districts for BLM in the high desert plains of Montana. Dr. Mengel has managed development of 2 other EAs for Mt. Home AFB, an EA for the Bonneville Power Administration, and has finished EAs for the Bureau of Reclamation and the US Forest Service in Idaho.

Recent NEPA activities include EA Task Lead for the Jerome Readiness Center EA for the Idaho Army National Guard and Threatened and Endangered Species and Invasive Species sections of the Boise River Basin (Storage) – Anderson Ranch Dam Raise EIS. He was the EA Task Lead and Assistant Project Manager for the Clark Fork River Delta (Lake Pend Oreille) Restoration EA for Bonneville Power Administration in Idaho. He lead the preparation of an EA to evaluate anticipated effects of shoreline stabilization and riparian and wetland restoration of the Clark Fork River Delta. The project involves major excavation (1M CY) and listed fish species. He was recently the Deputy Task Order lead for an EA evaluating the effects of rehabilitating power generating units at Grand Coulee Dam and Project Manager for development of an EA evaluating the Lewiston Orchards Water Exchange and Title Transfer for Reclamation. Dr. Mengel was the NEPA Lead for preparation of an Environmental Assessment (EA) in Haiti for USAID where he lead preparation of and was primary author of an EA evaluating rehabilitating an irrigation water diversion, the canal system, and a local farm to market road. The project involved field reconnaissance and in-county agency coordination.

Dr. Mengel conducted a study to evaluate the effect of the Yukon to Kuskokwim Freight and Energy Corridor Plan on valued environmental components and valued socioeconomic components. Several potential routes were developed and examined during the corridor study to identify the least impactive route on environmental and human resources. The project was being developed by Alaskan Native Corporations, therefore Native Alaskan values and culture were an important component of the evaluation.

Dr. Mengel was assigned full-time to the Central Utah Project from 1992 through 1995. His duties included assistant to the Project Manager, Environmental Impact Statement (EIS) Biological Task Leader, and regulatory/resource agencies coordinator. Biological studies included wildlife (big game winter range, nesting raptors, HEP studies), aquatic biology (benthic invertebrates, fish habitat, IFIM), wetlands and riparian, and threatened and endangered species. He was also directly responsible for the wetlands and riparian systems and threatened and endangered species studies, including preparation of the BA. Wetland studies involved identification of wetland and riparian vegetation types from aerial photographs over a 2,000 square mile area. Data was ground-truthed and then input into a GIS database for analysis.

Dr. Mengel managed the Duchesne County Salinity Control Environmental Assessment (EA) and the Uintah County Combined Canals EA, which included extensive evaluation of biological resources in high desert and riparian ecosystems. He also managed the Biological Resources Task for the El Paso-Las Cruces Sustainable Water Development Project EIS in arid Colorado River areas of Texas and New Mexico.

Other EA projects include project manager and co-author for four Air Force EAs in Utah: a natural gas filling station; a CERCLA site; relocation of a M60/M203 firing range; and development of a grazing allotment. Additional NEPA experience includes revision to the

wildlife section of the Colombia Basin EIS; biological planning activities for a water development project EIS in Albuquerque, New Mexico, which included agency coordination, preliminary assessment of impacts, and alternatives evaluation for selection; task manager for the sensitive species, wildlife, and vegetation sections for a water development project EIS in Coos Bay, Oregon; task manager for wetlands, vegetation, wildlife, and threatened and endangered species sections of the Trinity River Restoration EIS in California; wildlife, vegetation, and wetland task leader for a U.S. Park Service EA to repair a landslide into a river.

Railroad Permitting

Mitigation Wetland Design; Second Mainline Track Project; Union Pacific Railroad (UPPR); Moiser, OR; 2017. Performed wetland mitigation design which consisted of enhancement of 1.58 acres of other waters, and creation of 2.55 acres of wetland habitat, 0.34 acre of other waters, and 0.34 acre of riparian habitat. Design drawings and specifications for site preparation and plantings were developed.

Wetland Delineation/Permitting; Chausse Siding project; UPPR; Idaho; 2005. Delineated wetlands and prepared the Section 404 permit application and researched and identified potential wetland mitigation sites.

Senior Technical Review; Various Bridge Replacement Projects; UPPR; Various Locations; 2011-2017. Served as senior technical reviewers for wetland delineation and biological resources reports for three projects in the Lordsburg Subdivision, AZ; and for bridge replacement projects in the Roseville Subdivision, Fresno Subdivision, and the Yuma Subdivision in CA.

Clean Water Act Permitting. Dr. Mengel was trained in wetland delineation techniques in 1992 in Seattle WA. He attended the Eastern Washington Wetland Rating System training in 2018. Follow-up training specific to identifying hydric soils was also completed. He has delineated wetlands in WA, OR, ID, MT, WY, NV, UT, AZ, NM, AK, and CA. He prepared CWA 404/401 permit applications WA, OR, ID, NV, UT, AZ, AK, and HI. His most recent CWA permitting was for Boise's Lander Street Water Renewal Facility upgrade, US 93 Re-pavement project, and Mallard Bride project in Boise, including wetland delineation, mitigation planning, and Section 404 permit approval.

Construction Permitting. Currently managing all permitting activities for construction the Nampa Wastewater Treatment Plant. This a design/build project and permitting includes all construction and environmental related permits.

Section 7 ESA Consultation. Dr. Mengel has recently prepared a Biological Assessment (BA) for the Boise River Basin (Storage) - Anderson Ranch Dam Raise. Recent Section 7 projects include preparation of a BA for the Reno Spaghetti Bowl reconstruction project; BA and Letter of no Significance for 7 bridge reconstruction projects on U.S. 95 in Idaho; two years of Mexican spotted owl surveys in Colorado for mining projects; and surveys for North Idaho ground squirrels at Lost Valley Reservoir for a proposed reservoir enlargement project. He has a USFWS permit to monitor for Mexican spotted owls through the Phoenix and Albuquerque Regional Offices. He has attended Mexican Spotted Owl survey protocol training in Region 6 (4/12/17 in Flagstaff and 3/8/19 in Moab). Dr. Mengel has also

attended Federal ESA training workshops in UT and MT, and most recently in ID with the Idaho Transportation Department. He has prepared BAs for projects in WA, OR, ID, MT, WY, UT, and NV.

Prior to becoming an environmental consultant, Dr. Mengel surveyed northern spotted owls for 2 years on the Gifford Pinchot NF. Night time calling surveys were conducted each year throughout the spring, summer, and early fall. Occupied habitat was visited the following day to identify nest sites. Core areas and foraging areas were identified and mapped around spotted owl activity centers. He then prepared the first Interim Spotted Owl Management Plan for National Forests in the Pacific NW to protect identified habitat units.

Wastewater Evaluations. He has prepared Idaho DEQ Environmental Information Documents (EIDs) for the Eagle Sewer District's Wastewater Treatment Plant, Twin Fall Wastewater Treatment Plant Expansion, for the Jerome Wastewater Treatment Plant expansion, for the City of Salmon Water Treatment Plant upgrade, and for the Wilderness Ranch Water Treatment Plant Upgrade. He served as the senior reviewer on preparation of EIDs for the cities of Lewiston, Boise, and Twin Falls as part of their facility plan updates. Dr. Mengel has also assisted in the design of several wetland natural treatment systems.

International

Dr. Mengel recently served as the environmental specialist for a water pipeline project in Liberia. He prepared the environmental portion of an Environmental and Social Impact Analysis in accordance with Word Bank guidance to determine and address impacts from installation of the pipeline. This involved on-the-ground evaluations and stakeholder engagement activities.

He also recently served as the agricultural specialist for a feasibility and effects analysis of urban and rural electrification in Ghana. He evaluated the agricultural demand and potential effects of agricultural expansion in relation to providing upgraded and new electrical connections to the national grid. This involved review of on-the-ground agricultural operations and the surveys to determine possible environmental impacts.

Dr. Mengel worked as the Biodiversity Specialist to evaluate the effects of an urban and rural electrification programme in Tanzania. A variety of projects are being proposed through various regions of the country. Dr. Mengel conducted biodiversity surveys and ground-truthing the GIS land-cover data prepared for the project.

In 2014, Dr. Mengel served as the Biodiversity / Ecology Senior Reviewer for two Environmental Impact Assessments evaluating development of the Jery Al Samur Logistics City and the Al Wakrah Logistics City in Qatar. In order to support the Qatar 2022 FIFA World Cup™ programme, it is necessary to construct logistics hubs to temporarily store materials arriving from the Doha Port, Airport or freight rail. This project evaluated the impact of constructing those facilities.

Also in 2014, he served as the Biodiversity/Ecology specialist for the AR NGL Project in Iraq. This project will process natural gas collected to remove contaminants and heavier components and then primarily used to meet domestic demand (largely for power generation). Environmental surveys were conducted to evaluate environmental impacts of the project.

Dennis L. Mengel

Dr. Mengel completed an environmental assessment in 2013 for U.S.A.I.D. to assess the impacts of constructing a river diversion structure to divert water for irrigation, rehabilitation of the Cul de Sac Irrigation System, and rehabilitation of the Dumay Road. The project is located on the Rivière Grise in Haiti. In addition to writing the EA, he is evaluating the environmental impacts to terrestrial resources.

In 2012, he assisted in the development of an Environmental Impact Assessment (EIA) for the Saudi Elastomers Project (plant expansion), located in the Jubail Industrial City, Saudi Arabia. He served as the local point of contact to manage and oversee the work being conducted by sub-contractors and coordinated with the client. Work included traffic, biologic, marine, hydrologic, hazardous waste, and socioeconomic studies. Scoping activities with Jubail City was also included.

Dr. Mengel managed the terrestrial restoration component of the $47 million Kingdom of Saudi Arabia Restoration and Remediation Program project from 2009-2012. The project involves remediation of the physical effects of the first gulf war on the desert environment followed by restoration of desert environments. Design elements include demolition of military structures constructed from native soils such as berms and trenches of various sizes and re-establishment of native plant and animal communities to restore ecosystem functions to the affected environment. Dr. Mengel's primary project role was to direct the design of restoration to restore habitats and ecological functions to the desert ecosystem. The design is focused on establishment of 10 revegetation islands, each 36 km^2 in size. The design includes combinations of solar powered, efficient drip irrigation of shrub and tree seedlings with many hectares of direct seeding of herbaceous and shrub species. Design and development of a large native plant nursery and a smaller satellite nursery accompanied by an ambitious seed collection and production effort are part of the restoration program. The program will result in the largest terrestrial restoration effort to restore degraded desert in the Kingdom.

As part of his dissertation work, Dr. Mengel researched site soil management techniques to improve hardwood plantation growth in Colombia, South America. This project explored how soil physical properties, such as bulk density, soil strength, and water relations responded to a range of tillage practices and addition of organic mulch. The work focused on soil water/heavy clay soil interactions. Other international projects conducted while on the NC State University's research faculty included productivity site-classification in Honduras, establishment of a computer system and training for database management at the National School of Forestry Sciences (ESNACIFOR) in Honduras, plantation growth and yield in Burkina Faso, technology transfer plan for mahogany line-planting techniques applicable to Central America and the Caribbean, and a feasibility study of restoration ecology research in Ecuador. He also helped to design an irrigation project for a forest products company in Colombia.

Dr. Mengel developed and taught several courses and seminars at NC State University in International Forestry. He has also studied tropical soils at NC State University and tropical dendrology/ecology at the University of Idaho. Course work included field study in Honduras.

Update 10/15/2021

valmont STRUCTURES

9/29/21

3575 25TH Street – Salem, OR

JEFFREY E. GRASSMAN, PE

(OR PE LICENSE #16,620)

CURRENT POSITION

Senior Professional Engineer, Salem

WORK EXPERIENCE

2019 – Present

Valmont Structures Salem, OR

Senior Professional Engineer, Salem

2011 – 2019

Valmont Structures Salem, OR

Manager of Engineering, Salem

2000 – 2011 Valmont Structures

Salem, OR

Tower Engineer, Team Lead

1992 – 2000 Valmont Structures
Salem, OR

Chief Engineer

1989 – 1992 Valmont Structures

Salem, OR

Engineer

valmont STRUCTURES

EDUCATION

1988 — Portland State University
Portland, OR

B.S.- Civil Engineering

1989 — Portland State University
Portland, OR

M.S.- Civil Engineering

ACCREDITATIONS

Licensed Professional Engineer in the following states;

Arizona, Arkansas, California, Connecticut, Florida, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, Ohio, Oklahoma, Oregon, Pennsylvania, Puerto Rico, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming.

PROFESSIONAL MEMBERSHIPS

EIA/TIA, AISC, ASCE, ACI, NSPE and SEAO

Ken Ackerman, PE

Ken Ackerman, an engineering manager with Portland Water Bureau, has thirty years of experience in civil engineering. He has experience with design, construction, maintenance of water piping and roadways.

EDUCATION:

- Bachelor of Science in Civil Engineering with a Minor in Mathematics - University of Alaska Anchorage, August 1992

CERTIFICATIONS & LICENSES:

- PE #19424 OR and #33693 WA

Relevant Work Experience:

- **Design Project Manager for the Bull Run Pipelines**

Ken was project manager for the design of the new large diameter pipelines from the existing conduits to the treatment facility and from the treatment facility to the existing pipes. The design included a total of seven miles of pipe ranging in size from 42-inch to 72-inch steel. Major elements included connections to existing live conduits, locations of new access and accessories, and identification of property impacts.

- **2020 City of Portland Specification Update, PWB Co-Lead**

Worked with PBOT, BES, Parks and OMF staff to review and update all technical sections in the 2010 Standard Construction Specifications. Work with other City Bureaus on review and editing/rewriting of technical sections and coordinating PWB staff review on sections as appropriate. Also worked with PWB staff from Design and Construction Management to updating/rewriting thirteen sections based on current practices and technical standards of the PWB and AWWA. Updates included technical and operation input from Maintenance and Construction and inspection staff. PWB completed the work within the schedule required.

- **Contract Mains Manager**

Ken supervised and mentored three engineers and engineering associates working on inter-agency and contract mains projects. Worked with staff to develop work plans, including project schedules, FY- budgets, and scopes. Worked to develop a database of bid tabs to allow better estimating of project costs. Help develop the first drafts of a design exception form for a short time frame interagency with a large number of impacts to key PWB infrastructure.

- **Road 10E Project Manager**

Lead the design, permitting and bidding of infrastructure improvements on a 2-mile segment of USFS Road 10 in the Bull Run Watershed. The design included 24 new culverts including six aquatic organism passage stream culverts requiring USFS approval, the largest being an 18-foot arch. Work also included 15 retaining walls, varying from 5 feet to 12 feet tall. The project required coordination with Resource Protection, Operation staff, and USFS. The project was the first multi-season bid project.

- **Columbia Palisades Development**

Ken was the project manager for the Columbia Palisades development in Vancouver Washington. The design includes twelve thousand feet of new six-to-twelve-inch water lines in two from two difference water districts with difference pressure zones. Design included working directly with City maintenance staff to identify long term maintenance and operation needs.

- **Sunnybrook Blvd Clackamas County**

Ken was the project manager for the 4,000-foot new roadway. Ken worked closely with county maintenance staff to develop methods and schedules to perform annual maintenance on the new stormwater treatment system. The system was the 1st of its kind in the county at the time of installation

ELCON ASSOCIATES, INC.

MARILEE KLIMEK, LC

Lighting Specialist

Years of Experience: 33

Registration(s):
National Council on Qualifications for Lighting Professions (NCQLP) Lighting Certified (LC), 2003

Education:
BFA, Industrial Design, University of Washington

BA, Art, University of Washington

Professional Affiliations:
Illuminating Engineering Society of North America (IESNA), 1998, member

Key Skills:

- Luminaire Selection
- Light Level Calculations
- 3-Dimensional Computer Modeling
- State Energy Code Compliance
- Branch Circuiting
- Lighting Cost Estimates
- AutoCAD Drafting

PROFILE

Marilee Klimek, LC, an NCQLP Lighting Certified designer, melds 33 years of experience in energy efficient lighting, industrial design, and fine art to create precise, energy-efficient, and often award-winning lighting systems. Using AGi32 software she models point-by-point lighting calculations and produces computer simulations that demonstrate visual impact and compliance with all standards and requirements of the project. Marilee is a hands-on lighting specialist that is known for her strong communication throughout projects.

HIGHLIGHTED EXPERIENCE

City of Portland Parks & Recreation, Eastbank Esplanade Lighting Evaluation, Portland, OR
Lighting designer responsible for conducting lighting calculations for the recommendation of a replacement luminaire and an alternative fixture. The recommendations met City of Portland sustainability requirements and provide even illumination across the pavement.

TriMet, Red Line Airport Extension Project, Portland, OR
Provided lighting design for Gateway and Airport (PDX) light rail station improvements. Gateway Station included linear LED shelter and decorative pole lighting at the plaza areas, modifying existing pole lights with LED retrofit kits at the Providence Hospital parking lot, utilizing cobrahead fixtures at the TriMet parking lot, and lighting a pathway to adjoin with the existing multi-use pathway (MUP) owned by Oregon Department of Transportation (ODOT). There were also modifications to the ODOT MUP to accommodate the new light rail trestle to the Gateway station using a light pole and canopy fixtures mounted to the underside of the track structure. The trestle bridge passed over I-84, which required modifications/additions to the cobrahead light pole locations to improve the uniformity on the freeway from the new structure obstructions. Provided temporary lighting calculations along I-205 and the ODOT MUP for the phased construction and MUP detours which affected the freeway light pole locations. Airport Station included linear LED shelter and decorative pole lighting at the plaza areas, and illuminating a mile-long MUP on airport property. The MUP fixtures are at varying heights: taller 35-39-foot poles to also light the adjacent two-lane roadways, and lower 20-foot poles with safety and security light levels for areas away from arterials. Included parking lot lighting modifications to accommodate the new shape of the MUP. All Port of Portland (Airport) owned fixtures include an individual Wi-Fi node per pole to meld into the existing lighting control system.

TriMet, Westside Operations Facility, Portland, OR
Provided high bay metal halide luminaires for train maintenance area, and fluorescent pit lighting. Office areas lit with fluorescent troffer and downlight luminaires. Exterior yard lighting provided by high mast cutoff luminaires. Designed lighting for compliance with current Oregon State Nonresidential Energy Code.

City of Bellingham, Whatcom Waterway Park, Bellingham, WA
Lighting designer for an urban waterfront park with water views, seating, landscaping, and trails. Design included pedestrian level lighting of a walkway, extending from Central Avenue Pier to Granary Avenue. Project required point-by-point lighting calculations using AGi32 computer modeling software to yield precise values that verified lighting levels, spread, code compliance, and demonstrate control of light trespass and glare.

City of Bellingham, Granary Avenue and Laurel Street Lighting, Bellingham, WA
Lighting designer for Bellingham's downtown, waterfront redevelopment. The project established the relationship with Whatcom Waterway Park. Included roadway lighting for Granary Avenue and Laurel Streets, pedestrian corridor with a cycle track along vacated Chestnut Avenue, and a pedestrian corridor with a cycle track along Maple Ave and Laurel Ave. Design of this project included coordination with the landscape architect for placement of decorative pedestrian height light poles at the mid-block crossings and intersections.

King County, Green River to Cedar River Regional Trail, Maple Valley, WA
Lighting designer for new road crossings that meet current standards for security and safety. This project required point-by-point lighting calculations using AGi32 Computer Modeling software to yield precise values to verify lighting levels, spread, code compliance, and demonstrate controls to minimize light trespass and glare. Coordinated with Puget Sound Energy's lighting division and City of Maple Valley' Public Works Department for lighting and lighting controls requirements.

City of Lake Stevens, North Cove Plaza Lighting, Lake Stevens, WA
Lighting designer for the North Cove Plaza and Park area, including trail, War Memorial, pathways, landscaping, plaza, and Main Street. Project required point-by-point lighting calculations using AGi32 computer modeling software to yield precise values that verified lighting levels, spread, code compliance, and demonstrate control of light trespass and glare. Specified all LED light fixtures on light poles or bollards depending on locations.

Seattle City Light, 2nd Avenue and Washington Street, Seattle, WA
Lighting designer to refurbish eight (8) City Standard decorative pedestrian height pole fixtures along 2nd Avenue in the historic Pioneer Square area. Historic decorative bases and recently retrofitted LED globe lights to be reused, pole and bracket arm to be replaced. Elcon is also responsible for project planning and administration, coordination with SCL, site visits, final design, plans, and specifications, plan review, bid support, and construction administration.

Seattle City Light, Shelby-Hamlin Lighting Upgrade, Seattle, WA
Lighting Specialist for this project to replace all existing decorative pole lighting along Shelby and Hamlin Streets in a residential neighborhood near Portage Bay in Seattle. Existing lighting was deficient, and the vicinity had become a high-crime area. Marilee utilized AGi32 computer modeling to provide more uniform street and sidewalk illuminance. All poles, luminaires, conduit, and handholes replaced following Seattle City Light's standards. LED fixtures replace metal-halide (MH) fixtures to ensure load capacity for additional pole locations and low maintenance. Marilee was able to overcome the challenging pole placement with a 20-foot clear zone around all trees in the right-of-way and irregular spacing for driveway entrances

Sound Transit, Bellevue Transit Center, Bellevue, WA
Selected exterior luminaires to illuminate a large canopied structure on a bus waiting island. Flood uplights highlight the exposed wood ceiling, while pendant downlights provide illumination at the ground level to meet Sound Transit's 10 fc requirement at loading zones. Flood uplights were concealed in column capitals with protective mesh above to keep garbage from accumulating. Downlights were hung between double beams to be less conspicuous. All downlight conduit routing was concealed behind removable panels between the double beams, and in rectangular wireways designed to blend in with the structure. Interior luminaires were used for the site office. Computer modeling aided in determining aesthetics and indirect lighting contribution to the ground. – *"Winner of the IESNA Puget Sound Sectional and Northwest Regional Paul Waterbury Awards for outdoor lighting design".*

Sound Transit, Federal Way Transit Center. **Federal Way, WA**
Calculated illumination levels by computer modeling a five-story parking garage with a skybridge to a covered passenger waiting pavilion. Garage lighting controls provide day and night settings for entry and ramps as recommended in IESNA RP-20-98 for Parking Facilities. Emergency lighting system provides 2.5 fc average on the egress paths throughout garage per Sound Transit standards. Passenger waiting area is illuminated using metal halide floodlights highlighting the canopy, and beam mounted downlights providing required light levels at load/unload zones. Lighting controls include peak and off-peak illumination levels for energy conservation. Also provided roadway, landscape, and garage facade lighting.

JACOBS

Mark Bastasch, P.E., INCE Bd. Cert.

PRINCIPAL ACOUSTICAL ENGINEER

Mr. Bastasch has more than 20 years of experience conducting acoustical evaluations and working with multimedia environmental permitting and design teams. For over a decade, Mr. Bastasch has provided technical leadership on acoustical matters related to renewable energy facilities. He has been an invited speaker to organizations such as Harvard Law School's Consensus Building Institute, the U.S. Department of Energy's (USDOE) Wind Powering America, the International Energy Agency/USDOE National Renewable Energy Laboratory, National Wind Coordinating Council, Law Seminars International, Midwest Energy Bar Association, American Wind Energy Association, and USDOE's New England Wind Energy Education Project; and he has served as plenary speaker or session chair at conferences in Australia, Japan, Italy, and England. Mr. Bastasch has acoustical permitting and design experience in the U.S. power and infrastructure sectors and he has supported multiple design and engineer, procure, construct (EPC) efforts both domestically and internationally, each of which has fully complied with applicable regulatory limits. He served as lead acoustical consultant on Australia's largest coal seam, gas-fueled, air-cooled, combined-cycle power plant and on Power Engineering's Best Gas-fired Project for 2013 (the Empire Generating Project in Rensselaer, New York).

Areas of Expertise

- Specializes in industrial noise measurements, modeling, and control for power, industrial, and transportation clients.
- Has prepared acoustical analyses or expert testimony for more than 15,000 megawatts (MW) from gas-fired power facilities and more than 5,000 MW from wind generation facilities.
- Appointed by Oregon State Board of Examiners for Engineering and Land Surveyors to develop and grade the Professional Engineering (P.E.) exam in Acoustics. Oregon was the only state to issue a P.E. in acoustics.
- Experienced in analyzing noise levels for no-build and build alternatives; supporting feasibility, design, and siting analyses of industrial, high-tech, and data center facilities; and preparing noise and vibration impact assessment reports.
- Has served as an acoustical technical lead for numerous transportation projects in Alaska, California, Colorado, Oregon, Washington, and Idaho; tasks include monitoring, modeling, and mitigation recommendations in accordance with applicable state laws.
- Has conducted numerous noise studies in conjunction with National Environmental Policy Act (NEPA) documents and the energy facility siting requirements of various states.

EDUCATION/QUALIFICATIONS

M.S., Environmental Engineering, William Marsh Rice University, Houston, Texas, 1997

B.S. (*cum laude*), Environmental Engineering, Cal Poly, San Luis Obispo, California, 1994

PROFESSIONAL REGISTRATIONS

Professional Acoustical Engineer: Oregon (No. 58990AC)

Professional Environmental Engineer: Oregon (No. 58990EN)

Professional Civil Engineer: Oregon, (No. 58990PE)

Board Certified, Institute of Noise Control Engineering (INCE Bd. Cert.)

MEMBERSHIPS AND AFFILIATIONS

Member, Institute of Noise Control Engineering (INCE)

Member, Acoustical Society of America

Organizer, INCE-E Wind Turbine Noise Conference Series

Member, United States National Technical Advisory Group for the IEC Technical Committee on wind energy generation systems (TC88)

US National Committee TAG TC43/SC1 representative of ISO/TC 43/SC 1/WG 6 (ISO 9613-2)

AWARDS/HONORS

2010 CEO Excellence Team Award Winner

2016 CEO Excellence Career Achievement Award Nominee

2018 Joseph J. Jacobs Master Builder Award Project Team Member

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Representative Project Experience

Wind and Solar Energy Projects

Lead Acoustical Engineer; South Fork Wind Farm; Deepwater Wind; Offshore Massachusetts, Rhode Island, and New York. Subject matter expert on noise evaluations and documentation. Conducted senior technical review of noise-related impact analysis focusing on in-air noise from the proposed construction and operation activities.

Lead Acoustical Engineer; Stateline Wind Project; Oregon and Washington. Led acoustical analysis for a 263-MW wind farm and prepared environmental documentation to comply with both Oregon and Washington standards. At the time of permitting, this was the largest wind project in the world.

Lead Acoustical Engineer; Biglow Canyon Wind Farm; Orion Renewable Energy and Portland General Electric; Oregon. Provided acoustical analysis and regulatory assistance to support the permitting and construction of the Biglow facilities. Efforts included monitoring, modeling, regulatory review, and preparation of compliance filings.

Lead Acoustical Engineer; Massachusetts Military Reservation, United States Air Force. Prepared acoustical analysis to support NEPA environmental assessments (EAs) for the addition of on-base wind turbines.

Lead Acoustical Engineer; High Plains Wind Project, Seven Mile Hill Wind Project, and Glenrock Wind Project; Wyoming. Prepared technical noise analysis for submittal in support of the Industrial Development Information permitting process. Developed noise models and contours to assess potential acoustical compliance with multiple turbine types and layouts.

Lead Acoustical Engineer; Kittitas Valley Wind Project; Washington. Led the successful filing of an acoustical analysis for the Washington Energy Facility Siting Evaluation Council (EFSEC) for a 121-turbine wind energy project. This was the first time Washington's EFSEC siting process had been used for a wind project. Provided expert testimony at state and local level. Project permit was upheld by State of Washington's highest court.

Lead Acoustical Engineer; Wild Horse Wind Project; Washington. Led environmental and engineering noise studies to support a 158-wind-turbine project with an installed nameplate capacity of up to 312 MW and associated transmission, substation, roads, and operation and maintenance facility.

Lead Acoustical Engineer; Palouse Wind Project; First Wind; Washington. Prepared acoustical analysis in support of State Environmental Policy Act Environmental Impact Statement (EIS) and conditional use permit application efforts for this 100-MW project in Whitman County. Tasks included attending public meetings, preparing expert witness testimony, and supporting the public hearing.

Lead Acoustical Engineer; Lower Snake River Wind Project; RES Americas and Puget Sound Energy; Washington. Prepared permitting analysis, expert reporting, and testimony to support the permitting of this 1,400-MW wind farm. Tasks included supporting extensive public

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outreach at various open house and other forums as well as responding to multiple acoustical comments from the public and agencies during the permitting process. The second phase of this project was recently constructed and is now owned by Portland General Electric.

Lead Acoustical Engineer; Boardman Solar Energy Facility; Invenergy, Oregon. Prepared acoustical analysis for the 800-acre Boardman Solar Energy Facility, which is a 75-MW, photovoltaic solar energy generation facility. Authored Exhibit X, Noise, for the facility's Application for Site Certificate to the Oregon Energy Facility Siting Council. Responded to agency information request. The Site Certificate was issued for the facility in February 2018.

Acoustical Engineer; Carty Generating Station and Carty Solar; Portland General Electric; Boardman, Oregon. Responsible for developing the acoustical analysis to support Exhibit X for the proposed expansion of the Carty Generating Station and Carty Solar, a 50-MW photovoltaic project.

Power Plants

Lead Acoustical Engineer; Application for Certification; Alamitos Energy Center; AES Southland Development LLC; California. Authored acoustical analysis for a 1,040-MW repower of the existing Alamitos Beach Generating Station located within the coastal zone of Long Beach, California. Tasks included ambient monitoring, acoustical modeling of operational and construction noise, regulatory evaluation, and participation in California Energy Commission (CEC) workshops. The CEC issued the final decision for the project in May 2017.

Lead Acoustical Engineer; Application for Certification; Huntington Beach Energy Project; AES Southland Development LLC; California. Authored acoustical analysis for an 840-MW repower of the existing Huntington Beach Generating Station located within the coastal zone of Huntington Beach, California. Tasks included operational monitoring, acoustical modeling of operational and construction noise, regulatory evaluation, and participation in CEC workshops. Mobilized team to provide expert testimony on potential impacts of sound levels on sensitive species. The CEC issued the final decision for the project in May 2017.

Acoustical Engineer; Empire Generating Project; Rensselaer, New York. Comprehensive acoustical analysis, design, specification, and compliance assessment of the new 535-MW combined-cycle Empire Generating Plant engineered and constructed by CH2M HILL. The project, formerly known as BESI Corp., was named the Best Gas-Fired Project by Power Engineering in 2013. The project underwent extensive permitting under New York's Article X, which required detailed analysis during the bid, design, construction, and compliance phases.

Acoustical Engineer; Port Westward Generating Project (1 and 2); Portland General Electric; Oregon. Comprehensive acoustical permitting and compliance assessment of a new 425-MW combined-cycle facility and subsequent amendment for 200-MW additional peaking capacity. Provided owners acoustical engineering services in support of the Port Westward combined-cycle facility and peaking facility. Project experience included facility noise modeling and operational compliance

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assessment for submittal to the Oregon Energy Facility Siting Council. After the successful operation of the combined-cycle facility, multiple options for peaking options were evaluated. Developed acoustical mitigation in consultation with OEMs and PGE to satisfy overall facility permitting requirements.

Lead Acoustical Engineer; Licensing and Permitting for San Francisco Electric Reliability Project (SFERP); San Francisco Public Utilities Commission. Led acoustical tasks to develop a 145-MW simple-cycle plant in southeast San Francisco, using three LM 6000 turbines.

Lead Acoustical Engineer; Hermiston Power Project, Calpine Corporation, Hermiston, Oregon. Conducted acoustical and vibration monitoring to determine if steam turbine generator, heat recovery steam generators, stacks, and combustion turbine generators complied with warranted levels within a time critical schedule. Prepared detailed environmental noise monitoring to demonstrate that the facility complied with permit conditions and minimized the time full load operation was needed during off-peak hours. Oregon Department of Energy accepted the report without comment.

Lead Acoustical Engineer; Walnut Energy Center; Turlock Irrigation District; Turlock, California. Led acoustical tasks for a combined-cycle power plant, which included developing detailed noise model; comparing expected noise levels with the city of Turlock, County of Stanislaus, and the CEC's noise guidelines; and preparing Application for Certification and subsequent amendments submitted to the CEC.

Lead Acoustical Engineer; MEGS; Modesto Irrigation District; Ripon, California. Led acoustics for a LM6000 (Norway package) power plant. Tasks included coordinating measurements of operating Norway Package with General Electric; developing detailed noise model; comparing expected noise levels with the City of Ripon, County of Stanislaus, and CEC noise guidelines; preparing Application for Certification and subsequent amendments submitted to the CEC; and reviewing Conditions of Certification as well as testimony at CEC evidentiary hearings.

Lead Acoustical Engineer; Humboldt Bay Repowering Project; Pacific Gas & Electric; Humboldt, California. Prepared application for certification to the CEC. Facility is a load-following power plant consisting of 10 natural gas-fired Wärtsilä 18V50DF 16.3-MW reciprocating engine-generator sets and associated equipment with a combined nominal generating capacity of 163 MW. Developed and executed operational compliance monitoring strategy. Compliance assessment was accepted by the CEC without comment.

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Transportation

Lead Acoustical Engineer; Interstate 5 Delta Park to Lombard; Oregon Department of Transportation; Portland, Oregon. Prepared noise analysis, technical report, and input for the EA/EIR as well as final noise wall design for this heavily traveled section of interstate highway.

Lead Acoustical Engineer; Reconstruction of Hyampom Road; Shasta Trinity National Forest; Trinity County, California. Prepared noise analysis, technical report, and input for the EA/EIR for the Federal Highway Administration Central Federal Lands Highway Division. Analysis cost and timeline was reduced by performing a desktop analysis given remote project site, low traffic volumes, and few residential receptors.

Lead Acoustical Engineer; Idaho 16, I-84 to SH-44 Environmental Study; Idaho Transportation Department. Led noise review on this highly visible project with a 3-year accelerated schedule studying a new 6.5-mile route connecting I-84 to SH-44. The project encompasses a river crossing and connections across the valley with impacts to farmlands, residential subdivisions, wetlands, and commercial areas.

Task Manager; Huffman Road Reconstruction Project Noise Studies and Mitigation Design; Alaska Department of Transportation and Public Facilities. Prepared preliminary noise analysis for noise measurements collected at seven locations in the project area. Estimated future build noise levels and developed preliminary mitigation measures in accordance with the Alaska Department of Transportation and Public Facilities.

Noise Analysis for Various Sectors

Acoustical Engineer, General Dynamics Electric Boat Project, Groton, Connecticut. Prepared acoustical analysis to support the design and permitting of an additional manufacturing facility for construction of the new Columbia class of submarines. Analysis was reviewed by the Authority Having Jurisdiction (AHJ) as well as their acoustical consultant and no changes were requested. Project was approved.

Acoustical Engineer, Boardman to Hemingway Transmission Line Project, Idaho Power, Oregon. Responsible for preparing an updated acoustical analysis of this 500-kV transmission line between Boardman, Oregon and Melba, Idaho. Provided senior review for Exhibit AA (EMF) and DD (Induced Currents) and facilitate appropriate level of acoustical discussion in other exhibits.

Acoustic Lead, Embarcadero-Potrero 230 kV Transmission Project. PG&E, San Francisco County, California. Acoustical technical lead for the development and filing of the Proponent's Environmental Assessment (PEA) for a new 3.5-mile, 230-kV underground and submarine cable. This critical infrastructure project is designed to maintain power to San Francisco under a major seismic event scenario.

Lead Acoustical Engineer; Oregon LNG Bidirectional Terminal and Pipeline Project, Oregon. Acoustical engineering lead supporting permitting and preparation of numerous applications to federal, state, and local permitting agencies. The project consists of a liquefied natural gas

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(LNG) terminal with a base load liquefaction capacity of 9.6 million metric tons per year requiring and a base load regasification capacity of 0.5 Bscf/d. The terminal included a slip and berth for loading and offloading LNG carriers, and onshore facilities consisting of natural gas pretreatment, natural gas liquefaction, LNG vaporization, LNG storage, and associated support facilities. Prepared the requisite environmental resource reports in support of the project application to the Federal Energy Regulatory Commission as well as acoustical analysis in support of the biological assessment of marine and terrestrial species submitted to National Marine Fisheries Service and U.S. Fish and Wildlife Service.

Lead Acoustical Engineer; Tacoma LNG Project; Puget Sound Energy; Pierce County, Washington. Responsible for supporting acoustical permitting aspects related to the construction and operation of an LNG fueling facility to serve various industries in the Pacific Northwest. The proposed project includes the LNG fueling facility on approximately 36 acres and numerous improvements to an existing natural gas distribution system throughout Pierce County, Washington. Tasks included supporting a Supplemental Environmental Impact Statement in compliance with the Washington State Environmental Policy Act.

Acoustical Engineer; Water Storage Reservoir; Windsor, California. Prepared acoustical analysis of the construction and operation of the reservoir to support the supplemental environmental impact report for CEQA compliance. Also developed responses to comments received during the permitting process. Project involved comprehensive preliminary engineering and environmental services for a new water storage reservoir to provide seasonal storage needed by the Town's recycled water system.

Acoustical Task Leader; Tehachapi Transmission Line; Southern California Edison; California. Prepared acoustical analysis to support regulatory permitting requirements. This multimillion-dollar proponent's environmental assessment (PEA) included preparation of and support activities for a PEA submitted to the California Public Utilities Commission for an approximate 170-mile transmission line and substation project on federal, state, and private property.

Acoustical Task Lead; Odessa Environmental Impact Statement; Eastern Washington. Prepared acoustical analysis to support regulatory permitting requirements. Tasks included modeling and preparing required environmental documentation. The EIS evaluated alternatives to deliver surface water from the Columbia Basin Project to irrigated lands that currently rely on a declining groundwater supply from the Odessa Groundwater Management Subarea in eastern Washington.

Representative Publications and Presentations

"Hot Topics in Acoustics." InterNoise. August 2021

"Tonality content analyzed with both 1/3 octave band and narrowband methods with comparison to listening test." Søndergaard and Bastasch. 9th International Conference on Wind Turbine Noise. May 2021.

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"Establishing Sound Limits for Wind Energy: What is the Role of Annoyance?" Ollson and Bastasch. 9th International Conference on Wind Turbine Noise. May 2021.

"Regulating and predicting wind turbine sound in the U.S." Kaliski, Bastasch and O'Neal. InterNoise. August 2018.

Moderator, Conference Organizer, and Instructor for "Introduction to Acoustics" at INCE-Europe Wind Turbine Noise 2017. Rotterdam, Netherlands. May 2017.

Plenary Speaker. Acoustics 2016. "Wind Turbine Sound: Past, Present and Future." Brisbane, Australia. November 2016.

"Glad to Hear It! A Brief Update on Wind Turbine Sound." Canadian Wind Energy Association Annual Conference. Calgary, Alberta. November 2016.

"Glad to Hear It! Wind Turbine Sound." American Wind Energy Association Wind Power Project Siting and Environmental Compliance Conference and Wind Power Conference. March and May 2016.

Wind Turbine Noise Topic Organizer. InterNoise 2014. Melbourne, Australia. November 2014.

Plenary Speaker. INCE-USA Noise-Con 2013. Denver, Colorado. August 28, 2013.

Instructor: "Introduction to Acoustics." INCE-Europe Wind Turbine Noise 2013. Denver, Colorado. August 27, 2013.

"Criteria." Wind Turbine Noise. Bowdler & Leventhall, editors. Multi-Science Publishing Co. Ltd. ISBN 978-1-907132-30-8. January 2012.

"AWEA/CanWEA Expert Sound Panel and Wind Turbine Sound Regulations." University of Tokyo, Tokyo, Japan. September 12, 2011.

"Wind Turbine Sound." Consensus Building Institute Workshop of Facilitating Wind Energy Siting, Harvard Law School, Cambridge, MA. March 23-25, 2011.

"Wind Turbine Sound and Health – An Expert Panel Review." American Wind Energy Association, Windpower 2010. Dallas, TX, May 24-27, 2011.

"Wind Turbine Noise." American Wind Energy Association Wind Power Project Siting Workshop, Milwaukee, WI. February 28 – March 2, 2007.

"Wind Turbine Noise – An Overview." Mark Bastasch, Jeroen van Dam, Bo Søndergaard, and Anthony Rogers. *Journal of the Canadian Acoustical Association*. June 2006. Vol. 34 No. 2.

"Wind Turbine Generator Noise Prediction - Comparison of Computer Models." Tickell, C. E., J. T. Ellis, and M. Bastasch. Proceedings of ACOUSTICS 2004, 3-5 November 2004, Gold Coast, Australia.

Mark Graham PE, PMP

Mark Graham has over 25 years of broad water industry experience, with specific technical expertise in water quality and water treatment. He has provided planning, engineering, project management, and quality reviews for drinking water treatment plants throughout Washington, Oregon, and California.

Mark has prepared master plans for water treatment plants and helped clients prioritize their capital improvement programs. He has managed pilot studies involving conventional sedimentation and filtration, dissolved air flotation (DAF), Actiflo, and both pressurized and submerged membranes. He has prepared detailed designs and specifications for drinking water treatment plants using most commonly-employed processes – including conventional sedimentation, plate settlers, DAF, Actiflo, granular media filtration, membrane filtration, and ozonation. He has led designs of belt presses, centrifuges and screw presses for dewatering. He has assisted water agencies with startup and testing of new and existing water treatment plants, and developed and implemented coagulation optimization and testing programs.

EDUCATION

Master of Science, Environmental Engineering, University of Cincinnati, 1996

Bachelor of Science, Civil Engineering, Stanford University, 1992

LICENSES/REGISTRATIONS

Professional Engineer, Civil, WA, OR, ND, CO, CA

Project Management Professional, PMI

MEMBERSHIPS

American Water Works Association

Project Management Institute

PROJECT EXPERIENCE

Drinking Water Treatment

Bull Run Treatment Program Filtration Facility Design, Portland Water Bureau, Portland, OR (Project Manager)

To comply with State and Federal drinking water regulations, the City of Portland will filter their currently unfiltered Bull Run water supply. Mark is project manager for the Stantec team leading the design of this greenfield 135 MGD facility that will include ozone, conventional floc/sed basins, granular media filtration and mechanical dewatering of process residuals. The project is currently in the detailed design phase.

Water Treatment Plant Residuals Management Planning Study, Public Utilities Department, San Diego, CA (Subject Matter Expert)

The City of San Diego's three WTPs currently discharge process residuals back to their respective source water reservoirs. As part of the Pure Water San Diego Program, the City commissioned a study to evaluate options to eliminate these discharges. Mark served as a subject matter expert in this study, participating in the development and evaluation of alternatives and reviewing work products as they were produced.

Rinconada WTP Residuals Management Remediation, Santa Clara Valley Water District, San Jose, CA (Conceptual Design and Process Lead)

Due to deficiencies in the previous design, changes in the raw water quality, and a proposed expansion from 80 MGD to 100 MGD, the solids handling capability of the existing thickeners and centrifuges will need to be doubled to meet the District's performance and reliability goals. Project is currently in construction.

Corrosion Control Improvements Project, Portland Water Bureau, OR (Project Manager)

Mark led preliminary and detailed design of new soda ash and carbon dioxide feed systems, which are sized to treat up to 160 MGD of unfiltered water from the City's Bull Run water supply. The project is a response to regulatory requirements to reduce lead levels at customer's taps, and is currently under construction.

Mark Graham PE, PMP

Green River Filtration Facility, Tacoma Water, WA (Deputy Project Manager, Project Manager)
Provided planning and design of this new 150 mgd hybrid direct/conventional WTP. The design included an innovative process layout with allows use of plate settlers during periods of high turbidity, and direct filtration during normal, low-turbidity raw water conditions. Processes included deep-bed granular media filters rated at 12 gpm/sf, and mechanical dewatering of process residuals using screw presses.

South Fork WTP, City of Nanaimo, Nanaimo, B.C. (Subconsultant Project Manager)
As a subconsultant to another firm, conducted pilot testing and alternatives analysis, and designed processes including the submerged membranes and the centrifuges for the City's 116 MLD South Fork WTP.

WTP Upgrades and Expansion, Cities of Lake Oswego and Tigard, OR (Technical Advisor)
Provided technical oversight and guidance for this project to upgrade and expand the existing WTP from 16 to 38 MGD. Replaced nearly all of the process facilities on a tightly-constrained site, adding high-rate clarification (Actiflo), intermediate ozonation, high-rate filtration, and screw presses for dewatering.

Predesign for New Water Treatment Plant, Eugene Water and Electric Board, Eugene, OR (Design Manager)
Developed a preliminary design and project implementation plan for a new WTP. The new plant will serve as a second source of drinking water for EWEB, as part of their program to improve overall water supply resiliency. Several technologies and phasing scenarios were evaluated, resulting in a recommendation for a plant capable of providing an initial capacity of 16 MGD, expandable to 30 MGD, using plate settlers and GAC filtration.

New WTP Preliminary Design, Eugene Water & Electric Board, Eugene, OR (Design Manager)
Preliminary design of a new 19 MGD drinking WTP for the Eugene Water & Electric Board. The new WTP will provide EWEB with a second source of water supply, significantly improving the agency's water supply resiliency. The project is currently in progress.

WTP Master Plan, City of Grants Pass, OR (Technical Advisor)
Evaluated two options: repair and upgrade the existing 20 MGD WTP or construct a new facility on a new site. The project included condition assessment, conceptual design of treatment process, cost estimating, and pilot testing of ballasted flocculation and high-rate filtration.

Grants Pass Water Supply Improvement Project, City of Grants Pass, Oregon (Project Manager)
Task order contract to support facility improvements and process optimization at the historic Grants Pass WTP. Tasks included: evaluation and preliminary design of flash mixing, flocculation, sedimentation and solids handling improvements; addition of a backwash pump to an existing pump station, and repairs to existing sedimentation basins.

Master Plan for MMWD's Drinking WTPs, Marin Municipal Water District, Marin County, California (Project Controls, Technical Advisor)
Evaluated the condition and criticality of existing facilities and developed risk-based long-term master plans for MMWD's Bon Tempe and San Geronimo Treatment Plants.

Wells 4 & 11 Treatment Facility, Sammamish Plateau Water and Sewer District, Sammamish, WA (Project Manager)
Detailed design of a 3,500 gpm groundwater supply system, including a new well pump, on-site generation of sodium hypochlorite to oxidize dissolved manganese, sand filtration, and coagulation and sedimentation of filter backwash.

Stillaguamish River WTP, City of Marysville, WA (Technical Advisor)
Provided engineering support during construction and led commissioning and startup of the 3.2-mgd membrane treatment system, including a tracer study of the 200,000 gallon clearwell.

Mark Graham PE, PMP

Del Valle WTP Clarification Improvement Project, Zone 7 Water Agency, CA (Project Manager)
Evaluated options for providing effective, reliable clarification at Zone 7's Del Valle WTP. Completed pilot-scale evaluation of Actiflo and DAF, and evaluation of alternatives for integrating new clarification technology into existing plant, including conceptual designs for retrofitting horizontal sedimentation, DAF, Actiflo, and membranes into 40 MGD surface WTP. The project included a tailored collaboration with AwwaRF, resulting in the publication of a report titled "Screening and Evaluation of Treatment Alternatives for Challenging Waters."

10 MGD DAF Project, Zone 7 Water Agency, CA (Project Manager)
Designed a 10 MGD dissolved air flotation basin and other plant reliability and capacity improvements for the existing 40 MGD Del Valle WTP. Provided on-site startup support and, worked closely with operations staff in trouble-shooting and optimizing the DAF treatment chain.

Gibson Island Advanced WTP, Queensland, Australia (Technical Advisor)
Provided technical advice and oversight for preliminary and final design of the chemical feed systems at the 100 MLD (26 mgd) Gibson Island Advanced WTP. Chemical feed systems included aqueous ammonia, carbon dioxide, caustic soda, ferric chloride, sodium hypochlorite, and sulfuric acid.

Roseville WTP Expansion, City of Roseville, CA (Project Engineer)
Preliminary design for expansion of the Roseville WTP from 60 to 85 mgd. New treatment processes included a 25-mgd, horizontal sedimentation basin, new high-rate anthracite/sand filters, expansion of a lime feed system and a new solids handling system including a gravity thickener and centrifuges.

Randall-Bold WTP High-Rate Testing, Contra Costa Water District, Concord, CA (Project Engineer)
Conducted pilot- and full-scale testing at RBWTP to evaluate the effects of increasing filtration rate to 7.5 gpm/sq. ft. to increase plant capacity. Optimized treatment processes and designed modifications to chemical feed systems and waste washwater handling systems.

Wastewater Treatment
North Fort and South Fort WwTPs, American Water, Ft. Polk, Louisiana (Project Manager)
Design-build replacement of nearly all process facilities at two existing WwTPs on Fort Polk. Both plants used identical activated sludge treatment process, but the North and South Plants were designed for peak wet weather flows of 30 MLD and 53 MLD (8.0 MGD and 14 MGD), respectively.

Design Services for McLoughlin Point WwTP, Victoria, BC (Project Manager)
Prepared 30% design documents to support a design-build proposal for the 124 MLD Biostyr BAF treatment facility for the Capital Regional District on Vancouver Island, B.C.

Mary Hofbeck

Acoustician
23 years of experience · Lynnwood, Washington

Mary has more than 23 years of acoustical experience in a variety of environments including civic, health care, educational, amphitheater, television studio, high-end residential, and aeronautical spaces. Mary is a life-long learner with a diverse education including a Master of Science degree in Acoustical Engineering and a Master of Business Administration with emphasis in Technology Management. She is a flexible professional with excellent communication skills and attention to detail who adapts seamlessly to constantly evolving processes and technologies. Her areas of expertise include mechanical system noise and vibration control, environmental noise control, and architectural acoustics.

EDUCATION

Master Business Administration, Technology Management, University of Washington, Michael G. Foster School of Business, Seattle, Washington, 2011

Master of Science, Acoustic Engineering, Pennsylvania State University School of Engineering, State College, Pennsylvania, 1995

Bachelor of Science, Physics/Mathematics, Adrian College, Adrian, Michigan, 1992

MEMBERSHIPS

Member, American Institute of Aeronautics and Astronautics

Member, Society of Automotive Engineers

Member, Acoustical Society of America

PROJECT EXPERIENCE

ENVIRONMENTAL NOISE MANAGEMENT

Bull Run Filtration Facility | Gresham, Oregon

Environmental noise monitoring and mitigation measures for a new water filtration plant.

Cedar River Noise Monitoring | North Bend, Washington

Environmental noise monitoring for the Cedar River Watershed, task is to measure levels for compliance twice per year. Stantec has been providing this service for more than 15 years.

Highline School District Third Runway Project* | Highline School District | Burien, Washington

As noise engineer for the Highline School District, SeaTac Airport third runway environmental noise project, Mary ensured that various elementary school classrooms were acoustically desirable by treating walls, ceilings, and window types to reduce intrusive airplane noise from the low flying aircraft.

White River Amphitheater* | Auburn, Washington

Mary utilized topographic data and ray tracing software to estimate surrounding community impact of this 20,000-person capacity amphitheater, located near Auburn, Washington.

Aircraft Mechanical System Noise Control* | The Boeing Company | Everett, Washington

Mary used noise analyst experience to design standards and implement noise mitigation solutions to improve the noise environment within large aircraft cabins. This was done through treatments of return air grilles, air conditioning systems, and air ducting throughout large commercial aircraft. Mary traveled internationally for on-site noise testing procedure verification of various pieces of mechanical equipment. In addition, she managed projects that involved controlling exterior noise environments surrounding various large aircraft models to ensure safe noise levels for airline and airport employees.

ENERGY

Burro Energy Storage Project | San Benito, Texas

Environmental noise monitoring for a battery energy storage system project.

Llano Estacado Energy Storage Project | Big Spring, Texas

Environmental noise monitoring for a battery energy storage system project.

TRANSPORTATION

OCTA Transit Security & Operations Center | Anaheim, California

Acoustical design for 32,000 SF, two-story building on a 2.9 acre site, that houses OCTA's Emergency Operations Center (EOC), Central Communications (Dispatch), and Transit Police (TPS). The project specifically address the needs and requirements of OCTA's operations with the goal of supporting job duties, efficiency, functionality, communication, and operations.

** denotes projects completed with other firms*

Education

BS Civil and Environmental Engineering in Hydrodynamics and Hydrology, University of Washington, 2019

BS Civil and Environmental Engineering, University of Washington, 2018

Organizations

Society of Women in Engineering (SWE) Member

Michelle Horio

Michelle Horio is a staff engineer and has four years experience working on water and wastewater planning and design projects.

Water Treatment Experience

AStaff professional for the development of Water Treatment Plant Electronic Operations Manual (EOM) for Skagit County, Washington. The EOM will reflect the current operational practices at the WTP and that can be referenced, revised, and updated by operators and other Skagit PUD staff moving forward. Responsibilities included digitizing the Operations and Maintenance manual on Sharepoint. Developed process flow diagrams of various water treatment processes based on existing equipment and schematic. Conducted on site assessments with current operators to confirm equipment configuration and operator processes.

Water Infrastructure Experience

→ Staff professional for the Water System Plan Update for the Woodinville Water District, Washington. Developed a new demand projection approach that resulted in more realistic demand projections for the District. Responsibilities included assisting document processing in production of report. Production included inserting each section into binders and confirming that each plan contained all necessary information. Packed and delivered plans.

→ Staff professional for the City of Lacey, Washington's 337 Facilities and Pressure Zone (PZ) Study and 400 PZ Storage Study. The Study focuses on improving the level of service in the College Street Corridor and addresses PZ-wide needs. The Study evaluates the impact of existing and new facilities on water quality, storage, and transmission capacity. Responsibilities included integrating record of comment changes into the Study. Assisted document processing in production of final print

→ Staff professional for the Water System Master Plan for the Clackamas River Water Authority, Oregon. This comprehensive evaluation of the District's water distribution and supply system identified system deficiencies, determined future supply requirements, and recommended facility improvements. The Plan will include a 20-year CIP. Responsibilities included compiling comments into a record of comments table. Incorporated record of changes in chapter 6 for both north and south reports. Back checked consistency in figure numbering and labeling.

→ Staff professional for the City of Renton's Water System Plan Update. This project involves an update to the City's 20-year demand forecast with input on future development from the City's Community and Economic Development Department. Carollo updated the City's all-pipe InfoWater model that includes 16 pressure zones and nearly 310 miles of pipe and calibrate the model for both static and extended period simulation (EPS) conditions. Custom diurnal curves created using the City's AMI data will be used for an EPS model analysis of the water system. Carollo incorporated all of the recommended projects identified by the system analysis into an electronic CIP tool that is integrated with a financial forecast tool. Responsibilities included supervising hydrant flushing to record system pressure data and flushing capacity. Transferred data from data loggers collected in field to Excel. Developed field reports of data and pictures collected in field for each site visited. Compiled SCADA data from various pressure zones in Renton. Used InfoWater to match hydrants used during testing with its corresponding node. Determined locations in model that did not align with structures in the field.

Wastewater Treatment Experience

→ Staff professional for the Spring Street Sewage Treatment Plant Upgrade for the City of Klamath Falls, OR. The improvements include the expansion and/or improvement to the headworks facilities, primary treatment facilities, activated sludge process, addition of tertiary treatment, solids stabilization, and rehabilitation or design of new digesters. Responsibilities included back

Michelle Horio

checking record of comments changes to ensure all necessary changes were made prior to the final 100% submittal.

Wastewater Infrastructure Experience

→ Staff engineer for the Kennydale Lakeline Sewer System Analysis for the City of Renton, Washington. The team provided a comprehensive system analysis for the Kennydale Lakeline that addressed the City's short- and long-term issues concerning the system. Responsibilities included analyzing CCTV of pipe to determine pipe condition. Developed project timelines and post cleaning budget calculations for future project estimates. Determined sections of pipe that were improperly cleaned to provide recommendations for future maintenance of Lakeline pipe. Developed recommendations for vacuum sewer, slipline pipe, or full pipe replacement.

→ Staff professional for the Long-Range Wastewater Management Plan for the City of Renton, Washington. The plan results from an evaluation of the existing sanitary sewer system and recommendations to resolve existing deficiencies and concerns, and to accommodate growth. Flow monitoring was performed at 18 locations to validate collection system deficiencies identified in previous studies. The model was recalibrated to identify improvements. The completed Plan included a new operations and maintenance program, review of policies and standards, and a financial analysis. Responsibilities included collecting flow monitored data from each manhole and calculating dry weather flow for both weekdays and weekends. Developed dry weather flow and wet weather flow sheets to calibrate the model.

→ Carollo was retained by King County to rehabilitate approximately 3,900 feet of severely corroded 96-inch diameter reinforced concrete pipe located in a densely populated commercial area in Renton, WA which included Boeing's 737 commercial airline facility and the mixed use developments. The County had previously completed an alternatives analysis and had selected Linabond as the preferred rehabilitation technology. To construct the project during summer 2019, Carollo expedited preliminary and final design over a 14 month period. Responsibilities included developing details of road to show cross-section of pipe installation. Drafted detail showing rebar connection of old and new concrete slabs. Compiled and checked submittal review transmittal to client.

→ Staff engineer for the National Fire Protection Association (NFPA) Pump Station Review and Analysis for the City and County of Honolulu, Hawaii. She developed an air change calculation spreadsheet for pump stations to support NFPA 820 compliance evaluation.

→ Staff professional for the Sewer System Lake Line and Pump Station Access Evaluation for the City of Mercer Island, Washington. Responsibilities included digitizing Lakeline profile from Blueprint to Excel. Performed access and condition assessment for special catch basins in the field. Utilized GIS to better understand location of Lakeline and determine potential new manhole locations. Created pump station and special catch basin figures containing potential access recommendations.

→ Staff professional for the Update to the Long Term Control Plan to inform the Systemwide Comprehensive Plan for King County, Washington. This project includes analysis of the existing LTCP alternatives identified in previous phases. The LTCP alternatives will be supplemented with a list of new water quality investments, programs, and policies. The combined list of prioritized LTCP alternatives will meet long-term regulatory obligations and maximize the investment in CSOs to increase water quality improvements regionally.

Morgan MacRostie

ELECTRICAL ENGINEER

EDUCATION/QUALIFICATIONS

B.S., Electrical Engineering, Rose-Hulman Institute of Technology, 1995.

REGISTRATIONS/ CERTIFICATIONS

Professional Engineer:

OR, WA, AZ

Morgan has over 26 years' experience in electrical and instrumentation and control design related to water and wastewater treatment / conveyance facilities of all types. He has designed electrical distribution systems at both low and medium voltages, paralleled and stand-alone generation systems, and alternative energy sources such as microturbines and photovoltaic systems.

Morgan has also lead many alternative design projects, including Design-Build, Design-Build-Operate, and Progressive Design-Build, CMAR, and CMGC. He has experience in designing to cost, working with electrical subcontractors during the design phase, and providing close supervision during construction.

Areas of Expertise

- Electrical Distribution Design – low and medium voltage.
- Large motors and adjustable frequency drive systems
- Stand alone and paralleled generation systems
- Electrical Construction Contractor Coordination

Relevant Project Experience

Leonard Water Treatment Plant, Leonard, TX

Title: Lead Electrical Engineer

Scope/Description: Design of new 70 MGD water treatment facility, expandable to 280 MGD.

Responsibilities: Utility coordination, electrical distribution system, including specifications, calculations, and equipment selection. Responsible for all aspects of the electrical design, from medium voltage distribution to lighting design throughout all facilities.

Grants Pass WWTP Upgrade, Grants Pass, OR

Title: Lead Electrical Engineer

Scope/Description: Upgrade of the Grants Pass Waste Water Treatment Plant, delivered as Design-Build Project.

Responsibilities: Utility coordination, electrical distribution system, including specifications, calculations, and equipment selection. Responsible for all aspects of the electrical design, from full replacement of the electrical distribution system, to lighting design throughout all facilities. Provided

close coordination with the electrical subcontractor as part of the design-build contract.

Davis-Woodland Advanced Water Treatment Facility, Woodland, CA

Title: Lead Electrical Engineer

Scope/Description: Design of a new 30 MGD Advanced Water Treatment Facility, delivered as a Design-Build Project.

Responsibilities: Utility coordination, electrical distribution system, including specifications, calculations, and equipment selection. Responsible for all aspects of the electrical design, from medium voltage distribution and standby generation, to lighting design throughout all facilities. Provided close coordination with the electrical subcontractor as part of the design-build contract.

Agua Nueva Water Reclamation Facility (WRF), Tucson, AZ

Title: Lead Electrical Engineer

Scope/Description: Design of a new 30 MGD Water Reclamation Facility, delivered as a Design-Build-Operate Project.

Responsibilities: Utility coordination, electrical distribution system, including specifications, calculations, and equipment selection. Responsible for all aspects of the electrical design, from medium voltage distribution, to lighting design throughout all facilities. Provided close coordination with the electrical subcontractor and long-term operations support as part of the design-build-operate contract.

Spokane County Water Reclamation Facility (WRF), Spokane, WA

Title: Lead Electrical Engineer

Scope/Description: Design of a new 10 MGD Water Reclamation Facility, delivered as a Design-Build-Operate Project.

Responsibilities: Utility coordination, electrical distribution system, including specifications, calculations, and equipment selection. Responsible for all aspects of the electrical design, from medium voltage distribution, to lighting design throughout all facilities. Provided close coordination with the electrical subcontractor and long-term operations support as part of the design-build contract.

Aurora Reservoir Water Purification Facility, Aurora, CO

Title: Lead Electrical Engineer

Scope/Description: Design of a new 30 MGD Water Purification Facility.

Responsibilities: Utility coordination, electrical distribution system, including specifications, calculations, and equipment selection. Responsible for all aspects of the electrical design, from medium voltage distribution

and standby parallel generation, to lighting design throughout all facilities. Provided close coordination with the electrical subcontractor as part of the design-build contract.

PAT TORTORA, PE

Stormwater Lead

Bio

Pat has 29 years of civil engineering experience on multidisciplinary projects, providing management, planning, design, and construction engineering solutions to public agencies and private entities throughout the Western US. His experience includes Rails to Trails, public utility infrastructure, roadways, marine facilities, and site design for K-12 schools, higher education, commercial and industrial sites, and residential and commercial subdivisions. As a LEED AP (Leadership in Energy and Environmental Design Accredited Professional), Pat has advanced knowledge in green building and LEED rating systems, providing expertise in sustainable site infrastructure including storm drainage facilities and sanitary sewer and water pipe conveyance.

Education

BS, Civil Engineering,
Oregon State University

Registration

Professional Engineer OR#50400, WA #42517, CA #80067, ID #17342

Accreditation

Leadership in Energy and Environmental Design Accredited Professional (LEED AP)

Relevant Experience

Water Environmental Services

Fuller Station, Clackamas, OR

Project Manager for this six-story, 100-unit affordable housing project. Pat was responsible for coordinating Emerio's services including design of sanitary and storm sewer systems, erosion control, inspection, and land surveying. This project included the design of extensive on-site multi-planter storm system, sanitary, fire suppression supply, and domestic water system.

Canby School District

Stormwater Management Plan, Canby, OR*

Project Manager responsible for developing a stormwater management plan for the permitting of the school district's underground injection control systems.

City of Wilsonville

Rivergreen Stormwater Outfall, Phases I and II, Wilsonville, OR*

Project Engineer responsible for modifying the existing stormwater outfall and spreader from the municipal storm sewer and reconfiguring the structure and downstream swale.

West Linn-Wilsonville School District

Bolton Creek and Stormwater Outfall Slope Stabilization, Wilsonville, OR*

Project Engineer working with the West Linn-Wilsonville School District and city staff to develop several alternative approaches to addressing the slope instability and the erosion created by the stormwater outfall. A preferred alternative was identified and developed, incorporating a combination of bioengineering and habitat restoration to stabilize the slopes and restore native plant species to the creek corridor.

Port of Portland

Terminal 4 Bulk Liquid Pipe Rack Infrastructure, Portland, OR*

Project Engineer for design of a new pipe rack and storm drainage outfall for Terminal 4. The storm drainage design included a new 24-inch outfall and a new Gabion wall to stabilize the failing slope. Pat prepared supporting documents for the permitting process.

West Linn-Wilsonville School District

2008 Bond Measure Projects, West Linn and Wilsonville, OR*

Project Engineer for several school improvement projects including:

- Lowrie Primary School – Complete civil design of a new 10-acre green field site for a 600-student elementary school
- Cedaroak Park Primary School – Parking reconfiguration and drainage system renovation
- West Linn High School – Athletic field and bleachers, new restroom and concession facility, pedestrian pathways, fencing, utilities, and stormwater improvements

*Previous firm experience

Education

MS Civil Engineering, North Carolina State University, 2010

BE Environmental Engineering, Sichuan University, 2008

Licenses

Civil Engineer, California

Qianru Deng, P.E.

Qianru Deng, a supervising engineer with Carollo Engineers, has twelve years of experience in civil and environmental engineering. She has experience with design and construction of conventional water treatment plants (WTPs), with an emphasis on chemical systems and disinfection.

Relevant Experience

→ Process lead for the Bull Run Filtration Facility, Portland Water Bureau, Oregon. This is an on-going project for designing the 135-mgd Bull Run Filtration Facility. Ms. Deng is leading the chemical system design including the disinfection chemicals.

→ Process engineer for the Judy Reservoir Water Treatment Plant Facility Plan for Skagit County PUD No. 1, Washington. Provided engineering support in evaluating risks to the WTP and formulating improvements. Ms. Deng identified process capacity bottlenecks and performed alternative analysis for their long-term water supply.

→ Technical lead for the expansion of the Northeast Water Purification Plant (NEWPP) Expansion, Houston, Texas. Qianru managed the technical review for the $1.5+ billion NEWPP expansion project. This progressive design-build project expands the existing 80-MGD conventional water treatment plant to 400 MGD. Ms. Deng served as the technical lead, regularly communicating with O&M staff on project updates and voicing their needs, as well as facilitating workshops to communicate with a large group of stakeholders and the design team. Her work also included performing technical review of engineering design documents and manage reviews by over 50 technical advisors.

→ Process engineer for the Arcadia WTP Improvements for City of Edmond, Oklahoma. Project included design of mostly new facilities on the same site as the existing treatment plant for construction while plant remained under operation. Supported detailed design of chemical facilities.

→ Staff engineer for the for the preliminary design of a new Water Treatment Plant (WTP) on the Willamette River for the Eugene Water and Electric Board, Oregon. The preliminary design of this WTP provided provisions for an initial treatment capacity of 10 mgd with the space allocated to expand to 20 mgd in the future. In order to provide a robust treatment scheme that provided both high quality drinking water as well as specific barriers for emerging contaminants of concern, the new WTP facility included flocculation and sedimentation with plates, intermediate ozone, and deep bed GAC filters. The WTP, when constructed, will provide a resilient secondary source of supply and treatment for the City of Eugene.

→ Process engineer, for the comprehensive filter evaluation for all 120 filters at the four water treatment plants that encompass the 770 mgd Wylie Water Treatment Plant. The project team conducted a physical evaluation of the filters, reviewed the PLC/SCADA/communications architecture, observed backwash procedures at all four plants, and evaluated filter operations and backwash control strategies. The project identified specific recommendations to streamline filter operation and maintenance, improve filter performance, reduce media loss, and ultimately improve treated water quality.

→ Process engineer, WA-33 Water Treatment Plant Improvements, City of West Palm Beach, Florida. Led process design for a UV disinfection project for a 50 mgd WTP. Ms. Deng prepared a technical memorandum for UV disinfection unit, including review of regulatory requirements for disinfection and potential of using UV mediated AOP, establishing design criteria for UV system, evaluating available UV systems and technology, and performing life cycle analysis for equipment selection. She also led the process design of the UV system during the design phase and prepared the UV specification.

→ Process engineer, Hap Cremean Water Plant UV Disinfection, City of Columbus, Ohio. Supported the preliminary design for the UV disinfection upgrade project for a 149 mgd filtration plant. Ms. Deng

performed hydraulic analysis to estimate limitations of the existing system and will provide support throughout the preliminary design and design phase, including but not limited to performing life cycle cost analysis and hydraulic calculations, analyzing alternative installation locations, preparing technical memorandum, and QA/QC review for process design.

→ Project engineer, Green River Filtration Facility, Tacoma Water, Washington. Supported design, construction and management for the 168-mgd Green River Filtration Facility. Ms. Deng provided engineering support for design of various processes such as solids handling and pipework. She served as the task lead during construction, including reviewing construction submittals and providing responses to RFIs. Ms. Deng also led several training sessions for plant operations staff during start-up and prepared standard operating procedures (SOPs) for various areas.

→ Project engineer, Edward Springs UV System Engineering Report, City of Marysville, Washington. Performed evaluation of the client's design of Edward Springs UV system with a capacity of 2 mgd, and wrote an engineering report for permitting and regulation agency's approval of installation. She provided analysis of water quality data and established design and operating conditions, and helped the client identify control philosophy and key monitoring elements. She also provided power quality analysis and recommended the client of proper UPS for power conditioning. The client successfully obtained approval from Department of Health of their UV system installation.

→ Project engineer, Warren Ave. Bridge Watermain Replacement and Flow Control & Seismic Valve Project, City of Bremerton, Washington. Served as the project engineer for the flow control & seismic valve project, and led the design for the flow control & seismic valves at three crossings to improve the water quality and reduce seismic vulnerability of downstream water system. She was responsible for preparing construction documents, coordination with the City and within the design team, and managing the design process. She also supported the design for replacement of a 1,800 ft 20-inch steel pipe attached to the Warren Ave. Bridget with Ductile Iron pipe throughout preliminary design and detailed design phase.

Publications/Presentations

→ Deng, Q., Drew, M , Garza, E., Walker, P. and Domonoske, A. "From 80 MGD to 400 MGD: Operational Challenges for Houston NEWPP Expansion and Ways to Conquer Them." Proceedings of the 2019 American Water Works Annual Conference and Exposition, Denver, CO, June 9-12, 2019.

→ Domonoske, A., Molly, A., Zambrano, J., Singh, R., Walker, P , von Bucher, P., and Deng, Q. "Zeta Meter: The Closest Thing to a Crystal Ball for Houston's $1.4B Expansion Project to Address Challenging Water Quality." Poster presented at the 2018 American Water Works Annual Conference and Exposition, Las Vegas, NV, June 11-14, 2018.

→ Deng, Q.; Schers, G J. et al. "How to Design for Unusually Low UVT and Ways to improve it". In Proc. Of the IUVA World Congress, Vancouver, BC, January 31-February 3, 2016.

→ Deng, Q.; Ohno, K.; Knappe, D. "Removal of Pharmaceuticals by Powdered Activated Carbon Adsorption: Effect of Particle Size and Point of Addition". In Proc. of the AWWA Annual Conference, Chicago, IL, June 20-24, 2010.

→ Kim, J , Deng, Q. & Benjamin, M. "Simultaneous removal of phosphorus and foulants in a hybrid coagulation/membrane filtration system". Water Research, 2008; 42(8-9): 2017-24.

RhinoOne GEOTECHNICAL

Rajiv Ali, PE, GE

GEOTECHNICAL ENGINEER

Years Experience | +26

Education | PhD, Geotechnical Engineering; MTech, Geotechnical Engineering; BE, Civil Engineering

Professional Registrations | Professional Civil Engineer: WA; Professional Civil and Geotechnical Engineer: OR

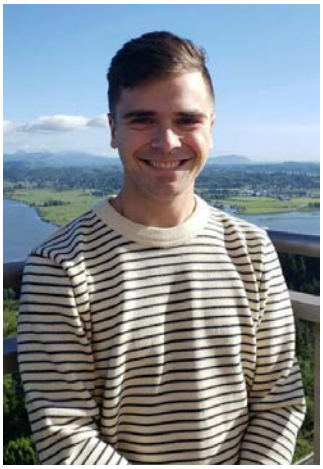
Experience Overview:

Dr. Ali has more than 26 years of experience involving soil mechanics, earthquake hazard evaluations, foundation design, static and dynamic loading analysis, and slope-stability analysis in support of various projects. He has worked on several notable projects supporting transportation infrastructure; water, wastewater, and pipelines; government, commercial, and industrial facilities; land development; soil and rock slope stability; and ground support. These projects have involved to various degrees scoping, project management, field investigation (including difficult access and over water drilling), foundation analysis, abutment settlement, roadway and abutment stability, soil and rock cut slope stability, and seismic design. Dr. Ali is familiar with appropriate design methods and criteria required by various local jurisdictions like City of Portland, IBC, FHWA, WSDOT, and ODOT. Mr. Ali has also worked with various state of art computer programs like LPile, Group, XStabl, Plaxis, AASHTOWare Darwin 3.01, SHAFT, CTShoring, Shake, MSEW, GoldNail, and SNail.

Project List:

- Bull Run Filtration Facility, **City of Portland** PWB
- Columbia Boulevard Waste Water Treatment Plant – STEP Expansion, **City of Portland**, BES
- Gresham Conduit Trestle Upgrade, Gresham, Oregon, **City of Portland** PWB
- Camp Namamu Landslide Repair for Conduit 3, **City of Portland** PWB
- Sandy River Station Facilities Plan, **City of Portland** PWB
- Taggart Outfall 30 Sewer Pipe Rehabilitation**, City of Portland BES**
- Oceanside Water District Improvement Project**, Oceanside Water District, Cape Meares, Oregon**
- Willow Lake Waste Water Treatment Plant, Keizer, **for City of Salem**
- Sellwood Bridge Project, **Multnomah County, Oregon**
- City of Coquille Waste Water Treatment Plant**, Coquille, Oregon.**
- City of Riddle Waste Water Treatment Plant**, Riddle, Oregon**
- Washington Park Sinkhole Repair, **City of Portland Bureau of Water Works**
- Road 10 and 1010 Stabilization**, City of Portland Bureau of Water Works**
- Bull Run Conduit Trestle System Vulnerability Reduction Study, **City of Portland Bureau of Water Works, Oregon**
- Gold Beach Waste Water Treatment Plant**, Gold Beach, Oregon**
- City of Sutherlin Water Treatment Plant, **Cooper Creek, Sutherlin**
- BES OF 30 HDD Rehabilitation**, Portland, Oregon**
- Biosolids Processing Facility for Cowlitz Sewer Operating Board, **Longview, Washington**

Richard C Martin, EIT
Transportation Engineering Associate



Years of Experience: 4 Years

Education: BS, Civil Engineering, Oregon State University, Corvallis, Oregon, 2013

Registrations: Oregon Engineering Intern No. 87730EI;

Areas of Expertise: Planning and design; transportation safety studies; traffic operations analysis; temporary traffic control design; traffic management plans.

Background: Richard has extensive experience throughout Washington and Oregon in temporary traffic control during construction, traffic operations analysis, roadway and pathway lighting, traffic signal operations, capacity analysis, traffic impact studies, and safety studies.

EXPERIENCE

PBOT Transit Priority Spot Improvements, City of Portland, OR. As a project analyst, Richard developed capacity analyses based on existing and alternative lane/control configurations for six different intersections within the City of Portland with the goal of improving bus delays for TriMet bus lines 6, 71, and 77. Alternative lane and signal control options were examined to determine the impacts of prioritizing public transit at these intersections. Richard worked closely with PBOT and City of Portland staff throughout the project to develop sound engineering solutions.

PBOT NE 97th and NE Couch/Davis LID Area Improvements, City of Portland, OR. As project analyst, Richard developed a traffic impact study that included analysis of existing conditions, trip generation and distribution for a multifamily development, diversion analysis for changes to intersection control, 2020 and 2040 capacity analyses, safety analysis, queueing analysis, and warrants analyses. Richard coordinated with the project team and PBOT staff throughout the project.

Portland VA Hospital Parking and TDM Analysis, City of Portland, OR. As a project analyst, Richard developed a traffic analysis for a proposed parking structure to be developed at the Veterans Hospital in Portland, Oregon. This analysis included existing conditions analysis, crash data analysis, trip generation and distribution, capacity analyses for 2019 existing conditions, 2029 background conditions, and 2029 buildout conditions, traffic signal warrants, and an analysis to determine conformance with the PBOT Transportation Element of the Comprehensive Plan. This analysis included site access, on-street parking impacts, transit service and connectivity, impacts to pedestrian and bicycle facilities, neighborhood impacts, and safety for all modes. The report also evaluated Transportation Demand Management strategies.

PBOT NW Streetcar TIA - NW 23rd Wilson Vaughn Couplet Analysis, City of Portland, OR. As a project analyst, Richard developed capacity analyses based on existing and alternative lane/control configurations for a proposed Portland Streetcar alignment in NW Portland. The analysis included 2020 existing conditions and 2040 alternative conditions, as well as background growth and queueing analyses, based on standards established by the City of Portland. Richard coordinated with the project team and PBOT staff throughout the project to develop sound engineering solutions.

Transportation Management Plan for Parcel 3 Project, City of Portland, OR. As a project analyst, Richard developed the transportation management plan for a development project at 2065 S River Parkway in the South Waterfront district. This analysis included developing detour routes for different modes of transportation and consulting with governing agencies to work around a streetcar schedule to develop the safest and most efficient transportation management plan. The plan consisted of a project description, proposed construction phases, work zone impacts management, detour figures, impacts to traffic signals and lighting, and a queueing analysis.

E. ROBIN SMYTH, PE
President and Principal Engineer

AREAS OF EXPERTISE

Project Management

Communication System and Installation Engineering

Factory and Field Testing Specifications

SCADA, Controls and Protection

EDUCATION

BS, Electrical Engineering, Montana State University, 1973

Westinghouse Protective Relay School, 1978

Apprentice Electrician Instructor Training School, University of Wyoming, 1988-89

REGISTERED PROFESSIONAL ENGINEER IN:

Alaska, #8325

California, #E 22849

Hawaii, #11365

Idaho, #14124

Iowa, #20003

Montana, #4291

Nevada, #013202

Oregon, #15180

South Dakota, #8996

Utah, #7549965-2202

Washington, #28102

(Certified NCEES #28866)

CAREER EXPERIENCE

GP&A, Inc., 1990-present

Montana Power Company, 1973-1990

Westinghouse Service Corp., 1977

PROFESSIONAL AFFILIATIONS

Institute of Electrical & Electronic Engineers

Utilities Telecom Council

Robin Smyth is the owner and president of GP&A and also serves as one of the company's principal engineers specializing in telecommunication systems design. Mr. Smyth joined GP&A in 1990 and assumed his present position in 2002. He has been working in the field of electric, natural gas, water and wireless / telephone utility and telecommunications engineering since completion of his Bachelor of Science degree in Electrical Engineering in 1973.

REPRESENTATIVE SKILLS AND EXPERIENCE

- Communication Site and System Infrastructure

  Mr. Smyth has extensive experience in the design, procurement and installation of communications site infrastructure. He has calculated the requirements for, specified, and monitored the installation, turn-up, and test of utility telecommunications systems and ancillary systems associated with telecommunications sites, including but not limited to:

  – Microwave and Fiber Optic transport systems
  – Voice and Data Wireless systems
  – Building specifications
  – Tower specifications
  – HVAC (heating, ventilation, and air conditioning)
  – Emergency generators
  – DC power systems
  – Network management (SCADA and provisioning)

- Electrical Power Transmission and Distribution Automation and Operation

  Protective relaying

  Mr. Smyth prepared detailed protective relay drawings for electrical transmission lines, substation buses and distribution circuits. In addition, Mr. Smyth supervised the protective relay technicians who construct, install and test protective relay systems including the placement of in-house designed and constructed micro-processor SCADA units with industry leading capabilities.

  Transmission and distribution operations and management:

  Mr. Smyth was responsible for design, O&M, and construction of distribution lines, substations, and transmission facilities in Montana Power's Butte Division. Tasks included distribution line layout, maintenance planning, budgeting for plant additions, and job supervision of line crews and contractors. He was also responsible for work compliance with National Electrical Safety Code and Utility Standards, as well as engineering load growth studies on distribution feeders and substations.

ELCON ASSOCIATES, INC.

TRAVIS ARNZEN, PE

Senior Electrical Engineer

Years of Experience: 12

Registrations:
Licensed professional engineer (electrical):

OR #84324
WA # 21006672
CA #23431
MN #58942
PA #087331

Education:
BS, Electrical & Computer Engineering, Oregon State University, 2010

Key Skills:

- Lighting Design
  - Luminaire Selection
  - Light Level Calculations
  - 3-Dimensional Computer Modeling
  - State Energy Code Compliance
  - Branch Circuiting
  - Lighting Cost Estimates
- Power Distribution Design
- Computer Applications
- 3D Modeling
- Quality Assessment & Control

PROFILE

Travis Arnzen is a principal, project manager, and electrical engineer with twelve years of experience in the design of park and trail facilities, transit facilities, and industrial electrical systems. Travis regularly provides designs which include equipment layout, one-line diagrams, conduit/cable schedules, medium and low-voltage power distribution systems, exterior lighting, and CCTV. Travis serves as project manager for Elcon's electrical engineering contracts with Portland Parks & Recreation, Oregon Metro, and TriMet.

HIGHLIGHTED EXPERIENCE

City of Portland Parks and Recreation, Eastbank Esplanade Lighting Evaluation, Portland, OR
Electrical engineer responsible for the design recommendation of a replacement luminaire and an alternative fixture along the Eastbank Esplanade, a bike and pedestrian pathway adjacent to the Willamette River and I-5. This task order is part of Elcon's electrical engineering on-call contract with City of Portland Parks & Recreation. The recommendations met City of Portland sustainability requirements and will provide even illumination across the pavement.

TriMet, Shared Use Path Improvements for MAX Red Line Extension Airport, Portland, OR
Senior electrical engineer responsible for the station power design and communication raceways, lighting studies, providing lighting recommendations for the shared use path (SUP) adjacent to I-205 included as a mitigation action element. The SUP crosses along various properties owned by the City of Portland, TriMet, and the Port of Portland.

TriMet, Lafayette Pedestrian Bridge Lighting Design, Portland, OR
Engineer responsible for lighting design for new pedestrian bridge over a trackway. Responsibilities included creation of a 3D model for layout of luminaires and lighting calculations. The site was challenging due to the need to meet lighting requirements for multiple areas (elevators, stairs, interior rooms, site, etc.) but was achievable by selecting multiple luminaires that were correct for the specific applications.

Oregon Metro, Newell Creek Canyon Natural Area Electrical Upgrades, Oregon City, OR
Project manager and electrical engineer responsible for the electrical design of the day use area which includes site power distribution, power and interconnection wiring of gate (operator, keypad, roadway loop detection), and security lights for the park entrance and new restroom building.

Oregon Metro, Blue Lake Park Electrical Site Investigation Report, Fairview OR
Project manager responsible for conducting an electrical and lighting site investigation report for Blue Lake Park facilities. The focus of this report was to review the premises wiring systems to assess the existing condition and suggest time frames for possible replacements, as part of an overall planning strategy as future electrical upgrades are planned for the park.

TriMet, West Portal Lighting Improvements, Portland, OR
Electrical engineer responsible for the design to improve the lighting at the entrance of the West Portal of the Robertson Tunnel.

TriMet, Ruby Junction Lighting Improvements Project, Portland, OR
Project engineer responsible for creating a set of biddable construction drawings and specifications for the exterior lighting improvements at Ruby Junction. Travis completed the design based upon the conceptual design previously submitted for this site.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION CERTIFICATION PROGRAMS

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THAT SUCCESSFULLY MEET THE QUALITY CERTIFICATION REQUIREMENTS FOR

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CERTIFICATION NUMBER	ISSUED	VALID THROUGH
C-00019508	September 23, 2021	November 30, 2022