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Eron Dodak, R.G., L.H.G.
Senior Hydrogeologist

PROFESSIONAL PROFILE

Mr. Eron J. Dodak is a licensed hydrogeologist and geologist with more than 10 years of consulting experience in the environmental field. His primary focus is in hydrogeology, especially in the area of contaminant fate and transport. Mr. Dodak has experience in groundwater flow and solute transport modeling using both deterministic and stochastic techniques. Mr. Dodak also has extensive knowledge and experience related to health and safety issues, and he manages Integral Consulting's corporate health and safety program.

Mr. Dodak has extensive experience conducting soil, groundwater, sediment, and surface water investigations at sites using a wide variety of sampling techniques. He has experience working on sites affected by a number of chemicals including petroleum hydrocarbons, wood-treating chemicals, chlorinated solvents, pesticides, and metals. Mr. Dodak has led and coordinated fieldwork involving multiple subcontractors, consultants, and regulatory oversight personnel. He has excellent problem-solving skills and uses his combination of field experience, common sense, and a strong mechanical background to see investigations through completion.

Mr. Dodak prepares work plans, reports, and other regulatory compliance documents; manages projects, including budgeting and cost tracking; and coordinates with subcontractors and other consultants. He has conducted a broad range of data evaluation and analysis tasks and his experience includes preparing high resolution geologic maps and hydrogeologic cross sections.

CREDENTIALS AND PROFESSIONAL HONORS

M.S., Geology, University of North Dakota, 1996

B.S., Geology, Portland State University, 1993

Registered Geologist (Oregon #G2023); Licensed Hydrogeologist (Washington #2643)

CONTINUING EDUCATION AND TRAINING

Hazardous Waste Operations and Emergency Response 40-hour Certification

Hazardous Waste Operations and Emergency Response Supervisor 8-hour Certification

First Aid/CPR Training, Confined Space Entry and Work Practices

GPS Mapping for GIS with TerraSync and Pathfinder Office

PROFESSIONAL AFFILIATIONS

Member of the National Groundwater Association

RELEVANT EXPERIENCE

Health and Safety Management, Integral Consulting Inc.—Currently managing the corporate health and safety program for Integral Consulting Inc. with eight offices throughout the United States. Developed medical surveillance program to protect the health and safety of employees conducting fieldwork at sites with various combinations of hazardous chemicals. Finalized the corporate health and safety plan and developed a site-specific health and safety plan template. Providing guidance to employees related to health and safety procedures and policies. Serving on the corporate health and safety committee.

Soil and Groundwater Investigation, Tacoma, Washington—Managed soil and groundwater investigations that were conducted to delineate historical chemicals of potential concern (COPCs) at the Pier 23 facility, including volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), metals, and petroleum-range hydrocarbons. Another purpose of the groundwater investigation was to determine if COPCs exceeding screening level values (SLVs) in groundwater pose a recontamination risk to sediments following a removal action at the site. The groundwater investigation included the installation, development, and sampling of five monitoring well pairs screened in two groundwater zones. Aquifer tests were conducted on the monitoring wells to estimate the hydraulic conductivity of the shallow groundwater zone and transmissivity of the deep groundwater zone. A tidal influence study was conducted to calculate the mean hydraulic head at each well to estimate the groundwater flow direction and hydraulic gradient. These data were used as input parameters in the EPA BIOSCREEN groundwater model to estimate the mobility of a PAH that exceeded the corresponding SLV in a shallow zone well. The modeling demonstrated there was no recontamination risk to sediments from this PAH.

Environmental Monitoring at a Former Wood-Waste Landfill Facility, Oakridge, Oregon—Managed the environmental monitoring program at a former wood waste landfill facility. Analyzed field and analytical data to modify an existing environmental monitoring plan for the site that included a reduced list of analytes. Performed groundwater and surface water sampling. Prepared annual environmental monitoring reports (AEMR) that included statistical analysis in accordance with the solid waste disposal site closure permit. Based on the recommendations provided in the 2007 AEMR, Oregon Department of Environmental Quality (DEQ) allowed the landfill owner to discontinue all groundwater and surface water monitoring at the site and reduce the frequency of landfill cap inspections.

Acid Rock Drainage Investigation, Prince of Wales Island, Alaska—Managed a quick turn-around time project that consisted of reviewing reports and providing recommendations on a groundwater study to delineate the extent of acid rock drainage issues associated with the fill beneath a road.

Reservoir Sediment Investigation, Pueblo of Santa Ana, New Mexico—Led the accumulated sediment investigation throughout a dry reservoir bed covering an area of approximately 2 to 3 square miles. Samples of accumulated sediment were collected to a depth of 20 ft below ground surface from two decision units using direct-push techniques. Large-volume sediment samples were collected from selected boreholes for toxicity tests. The work was conducted under close oversight of U.S. Army Corps of Engineers personnel. In addition to leading the fieldwork, prepared SLV exceedance figures and borehole logs and drafted sections of the field sampling and data screening report.

Remedial Investigation at a City Park, Bellingham, Washington—Led the fieldwork for the remedial investigation of a site with wood treatment chemical contamination (i.e., creosote, diesel, pentachlorophenol) and a historical municipal landfill in a city park down-slope of a wood treatment facility. Supervised and logged boreholes in and adjacent to a creek with very limited access to characterize soil, sediment, and shallow groundwater contamination using portable, track, and rubber tire mounted hollow-stem auger drill rigs. Installed, developed, and sampled monitoring wells and piezometers. Supervised the excavation of reconnaissance test pits to delineate the boundaries of a historical municipal landfill. Supervised and logged the excavation of test pits for soil sampling to characterize shallow soil contamination throughout the site. Prepared portions of the remedial investigation report, detailed hydrogeologic cross-sections, conceptual site model diagrams, and addenda to work plans.

Remedial Investigation at a Chlorinated Solvent Site, Milwaukie, Oregon—Provided field team leadership and technical support for the remedial investigation of a site with chlorinated solvent contamination (i.e., TCE, *cis*-1,2-DCE, vinyl chloride) in separate shallow and deep groundwater systems. Prepared detailed documentation in support of ongoing litigation. Supervised and logged direct-push probes (Geoprobe®), cable tool drilling, and monitoring well installation to characterize both shallow and deep zone contamination. Supervised the excavation of possible contaminant source area locations. Conducted quarterly groundwater monitoring using low-flow purging techniques with peristaltic pumps. Scheduled and coordinated field activities conducted by two consulting firms and multiple subcontractors. Prepared letters, quarterly groundwater monitoring reports, memoranda, and other documentation in support of the remedial investigation and other litigation support activities. Researched regional TCE contamination sources in the vicinity of two municipal drinking water wells located near the site.

In-Water Engineering Evaluation/Cost Analysis at a Former Chemical Manufacturing Facility, Portland, Oregon—Managed and led the engineering evaluation/cost analysis (EE/CA) for a sediment investigation and surface debris survey. The EE/CA work included revising the field sampling plan, quality assurance project plan, and health and safety plan based on EPA comments, cost projecting and budgeting, selecting and coordinating with subcontractors, performing 8 weeks of fieldwork, and coordinating with another consulting firm to provide a seamless transition into the geotechnical portion of the investigation. The work was conducted in several phases. Initially, supervised and logged direct-push

boreholes through conductor casing from river docks for collection of grab groundwater samples from river sediments. During a later phase, supervised and logged direct-push boreholes using the dual tube method from a barge in the Willamette River for collection of reconnaissance groundwater and sediment samples from river sediments. During the last phase, a barge mounted roto-sonic rig was used to advance 36 boreholes to continuously collect river sediments down to bedrock.

Upland Remedial Investigation at a Former Chemical Manufacturing Facility, Portland, Oregon— Provided field team leadership on the upland remedial investigation at the site. Installed an array of monitoring wells using the hollow-stem auger method for a sodium persulfate remedial pilot study at the site. Installed temporary piezometers using the direct-push method to precisely determine the groundwater flow direction in a specific area for placement of permanent monitoring wells. Installed a monitoring well in fractured basalt using cable tool drilling and line coring techniques that included three casing step-downs to prevent the vertical migration of chlorobenzene dense nonaqueous phase liquid (DNAPL) and dissolved-phase DDT to the bedrock groundwater zones. Installed a monitoring well using the temporary conductor-casing, hollow-stem auger method. Conducted quarterly groundwater monitoring using low-flow purging techniques and bladder pumps. Constructed detailed hydrogeologic cross-sections delineating the distribution of thin silt layers that govern the distribution of DNAPL in the shallow and intermediate groundwater zones. Analyzed data and prepared portions of an EE/CA work plan for the in-water portion of the site. Collected sediment samples from a number of catch basins and stormwater samples from the Parshall Flume structures on the outfalls in support of a stormwater interim remedial measure. Prepared a groundwater source control evaluation following Oregon DEQ's Joint Source Control Strategy guidance document.

Litigation and Technical Support for a Chemical Distribution Facility, Santa Ana, California (confidential ongoing litigation)— Reviewed reports and provided litigation support that included preparation of materials in support of deposition of the plaintiff's expert. Provided oversight of well installation, soil sampling, and operations and maintenance work at the facility. Utilized a simple analytical model to estimate a steady-state capture zone of an extraction well in a confined aquifer. The analytical model was successfully verified using type curves to estimate the extraction well's capture zone. The simple analytical model was a cost-effective method to quickly determine, based on simplifying assumptions, if chlorinated solvents from a nearby site would be captured by the extraction well.

Groundwater Remediation Support at a Former Zinc Smelter Site, Blackwell, Oklahoma— Designed, installed, and developed a number of 6-in. diameter groundwater extraction wells to capture contaminated groundwater that was infiltrating sewer pipes. Conducted step draw-down pump tests on the extraction wells to estimate well efficiency and calculate aquifer parameters. Wrote a well completion report for the installation and development of the extraction wells and associated piezometers. Collected soil samples containing *in situ*

aquifer pore water using direct-push probing methods. Installed an array of injection and multi-port monitoring wells and injection wells for a glucose injection pilot study to remediate zinc and cadmium in shallow groundwater. Wrote a scope of work and budget for the installation of multi-level monitoring wells to ascertain the vertical hydraulic gradient in shale bedrock. Provided oversight of an elevation survey of storm sewer pipe inverts in approximately 50 manholes to determine the elevation of a storm sewer pipe system and to assess the potential vulnerability of the system to infiltration of shallow groundwater contaminated with metals. Oversaw a smoke test conducted along a section of storm sewer pipe slated for decommissioning to determine how the pipes, inverts, and catch basins were connected.

Background Monitoring at a Copper and Gold Prospect, Prince of Wales Island, Alaska—Installed, developed, and sampled bedrock monitoring wells at a copper- and gold-rich volcanogenic massive sulfide prospect. The wells were installed to ascertain background metal concentrations in groundwater. Provided support to the client on well design issues and groundwater sampling procedures.

Road Extension Investigation, Bellingham, Washington—Conducted an environmental site assessment in support of a proposed road extension. Advanced two boreholes to assess soil quality in the vicinity of a box culvert and excavated six test pits to assess shallow soil quality adjacent to existing railroad tracks along the proposed road alignment. Prepared a report summarizing the results of the investigation.

Nitrate Study Sampling Plan, Olympia, Washington—Provided technical support on a preliminary sampling plan and cost estimate for a study to assess the impacts of using nitrate-containing fertilizers and the cycling of nitrate through the hydrogeologic systems near municipal drinking water wells in Olympia, Washington.

Transition Zone Water Study at the Portland Harbor Superfund Site, Portland, Oregon—Constructed a manometer to measure differences in hydraulic head between surface water and transition zone groundwater in the Willamette River in Portland, Oregon. Assembled modified Hesslein *in situ* water samplers and constructed an argon-sparging system to remove oxygen from the samplers.

Terrestrial and Aquatic Biota and Sediment Investigation, Cass Lake, Minnesota—Collected collocated soil/sediment and biota samples for a human health and ecological risk assessment at a former wood treatment facility. Led a sediment investigation along a small creek with limited access to fill data gaps in support of the human health risk assessment. Located the sample stations using a Trimble® differential global positioning system unit.

West Bay Berth Deeping and Remediation Project, Olympia, Washington—Logged and sampled surface sediment for chemical analysis and subsurface cores for chemical and geotechnical analysis.

Phase I Environmental Site Assessments, Tualatin, Oregon—Conducted Phase I environmental site assessments that followed the ASTM guidance standard at a printing and graphics facility and a vacant land site. The printing and graphics facility consisted of approximate

4.5 acres that included a small undeveloped parcel and approximately 49,000 square feet of manufacturing and office space. The vacant land site was bordered by railroad tracks and a high-traffic road.

Perchlorate and Chlorinated Solvent Investigation, Santa Clarita, California—Provided technical support in the planning of a subsurface investigation into the occurrence of perchlorate and chlorinated solvents that have contaminated municipal groundwater wells throughout a city in southern California. Located boreholes throughout the city to identify potential multiple sources of perchlorate and chlorinated solvents. Wrote field sampling and health and safety plans associated with the subsurface investigation. Planned and coordinated fieldwork with multiple subcontractors.

Remedial Investigation at a Steel Mill, Portland, Oregon—Supervised and logged direct-push boreholes for collection of soil and grab groundwater samples to delineate a number of contaminants at the site. Logged, installed, and developed a number of shallow groundwater monitoring wells. Conducted groundwater sampling using bladder and peristaltic pumps. Located, designed, and installed a stilling well on a dock in the Willamette River. Constructed a cross section delineating the shallow hydrogeologic units across the site.

Environmental Investigation at a Paint Mixing Facility, Portland, Oregon—Supervised, logged, installed, developed, and sampled several wells at the site using direct-push probing techniques. Collected soil samples to ascertain the vertical and horizontal distribution of VOCs in the subsurface. Analyzed the data and wrote a site investigation report for the facility.

Groundwater Monitoring at a Former Mercury Processing and Reclamation Plant, Carlstadt, New Jersey—Provided oversight for groundwater monitoring using the “clean hands” technique for attaining low detection limits. Modified a number of cross sections constructed throughout the site to include additional stratigraphic detail.

Soil Sampling at a Former Bulb Farm, Sandy, Oregon—Supervised and logged direct-push boreholes for collection of soil samples to delineate organochlorine pesticides at the site.

Geotechnical and Environmental Investigation at a Former Ship Manufacturing Site, Portland, Oregon—Provided support on a geotechnical and environmental investigation at the site. Supervised mud rotary drilling to determine the depth of a specific geologic formation, collected Shelby tube samples for *in situ* physical soil analyses, and collected soil samples using a standard penetrometer test sampler for grain size analysis.

Leaking Underground Storage Tank Investigations, Oregon and Washington—Provided support work on subsurface investigations of leaking underground storage tank sites in northwestern Oregon and southwestern Washington. Supervised and assisted in monitoring well installation using hollow-stem auger, hand auger, and direct-push methods. Collected environmental and geotechnical soil samples and logged soil borings using the ASTM soil classification system. Collected confirmation soil samples for decommissioning underground storage tanks. Wrote a leaking underground storage tank

decommissioning and investigation report for a site in West Linn, Oregon. Conducted quarterly groundwater monitoring and prepared groundwater monitoring reports. Produced scaled site maps and borehole logs for several sites using Visio drawing software.

Soil and Groundwater Remediation System Maintenance, Portland, Oregon—Performed routine maintenance on soil and groundwater remediation systems including vapor extraction, air sparging, and pump-and-treat systems. Assisted in the installation of a vapor extraction system at a site with a deep petroleum-impacted vadose zone.

Stochastic Groundwater Modeling, Grand Forks, North Dakota—Conducted groundwater modeling at the University of North Dakota as a part of a research assistantship for a master's thesis. Performed a Monte Carlo analysis to evaluate the effects of non-linear adsorption on plume spreading. Developed the groundwater models to simulate natural gradient tracer tests in weakly and strongly heterogeneous flow systems. Wrote a number of FORTRAN programs to calculate various parameters and edit large files associated with this work. Performed null hypothesis testing on ensemble means to evaluate the effects of sorption on plume spreading.

PUBLICATIONS

Korom, S.F., and E.J. Dodak. 2009. Numerical study of bromide as a tracer for aquifer macrodispersivity tests: comparing conservative behavior to mildly nonlinear adsorption. *Journal of Hydrologic Engineering*. 14(12):1383–1389.

Dodak, E.J. 1996. The effects on non-linear bromide adsorption on apparent macrodispersivity. M.S. Thesis, Department of Geology and Geological Engineering, University of North Dakota, pp. 241.

PRESENTATIONS/POSTERS

Strandhagen, E., E. Dodak, and D. Livermore. 2008. Modeling and analyzing mass and volume of DDx contamination in sediment for environmental remediation. American Society of Photogrammetry and Remote Sensing Annual Conference, Portland, OR.

Dodak, E.J., and S.F. Korom. 1996. Numerical evaluation of bromide as a tracer for macrodispersivity experiments in anion-sorbing sediments. Poster presentation at the American Geophysical Union Spring Meeting, #H12A-7, Baltimore, MD.