

# Michael E. Williams, Ph.D., P.E.

Williams Engineering Services Company, Inc.  
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## Background Summary

- Over 12 years of experience with waste management and compliance, site remediation, waste and facility characterization, membrane technology development and application, project/process engineering, technology development
- Membrane process development, design, testing, modeling, and sizing
- Project/process engineering for development and installation of wastewater treatment and desalination systems
- Direction of treatability studies and preparation of treatability study reports
- Product design, development, and engineering
- Hazardous and radioactive waste management, characterization, compliance, and treatment and disposal support
- CERCLA site characterization, remediation, and disposal support, including RCRA, PCB, and radiological characterization guidance and spatial analysis (ArcGIS) of characterization data
- Decontamination & Decommissioning (D&D) facility characterization support
- Verification, validation, and assessment of radiological and chemical data
- Data set management and evaluation and custom database application development
- Technical and economic feasibility and due diligence investigations

## Education

Ph.D. Chemical Engineering, University of Kentucky, 1993  
M.S. Chemical Engineering, University of Kentucky, 1989  
B.S. Chemical Engineering, University of Kentucky, 1987

## Employment History

### August/2000 - Present    **President, Williams Engineering Services Company, Inc., Albany, KY**

- Process engineering support for commercial clients in development of treatment and recycling systems for antifreeze and various wastewater and desalination applications. Activities include support for design, testing, and modeling, equipment selection and sizing, cost modeling, application evaluation, and patent application submittals.
- Direction of treatability studies for desalination and wastewater treatment applications (e.g., arsenic removal from high TDS groundwater). Activities include development of estimates, test plans, analysis of data, preparation of reports and flowsheets, system scale-up, and capital and operating cost estimation.
- Waste management and waste characterization support for DOE Oak Ridge Reservation (ORR) subcontractors, with activities including treatment and disposal planning and support, development of sampling and analysis strategies and plans for waste management and D&D activities, facility characterization, waste certification program support (including for Nevada Test Site (NTS) waste shipments), waste disposition support, and radiological and chemical data verification, validation, and assessment.
- Site remediation support for DOE ORR subcontractors, including development of characterization plans, spatial and statistical analysis (using ArcGIS) and reporting of characterization data, development of waste disposal profiles, and technical audit of project engineering and data management. Projects required the management of large data sets and interface of these data sets with ArcGIS in support of remediation and disposal decisions.
- Waste management, characterization, and other technical support to DOE subcontractor at the Paducah Gaseous Diffusion Plant (PGDP), with activities including radiological and chemical data validation, support for mixed waste treatment statements of work, preparation of characterization reports and data assessments, and Site Treatment Plan (STP) inventory reconciliation.
- Waste management planning support for subcontractors at DOE's Fernald Environmental Management Plant (FEMP).
- Testing and engineering support for material selection and development of innovative waste stabilization and transport containers for low-level radioactive and mixed (hazardous/radioactive) waste for commercial clients.
- Hazardous, mixed waste, and environmental sampling training for commercial clients and DOE subcontractors.

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- Design and programming services for customized database applications used by DOE subcontractors on the ORR and at the PGDP. These applications include an activity hazard analysis (AHA) system, a field work request (FWR) management system, a document tracking application, and a training tracking application.

### **1996 - August/2000      Project Engineer / Project Manager / Senior Environmental Specialist EET Corporation, Knoxville, TN**

- Project/process engineering services for commercial client in development and installation of treatment and recycling systems for various wastewater applications. Activities included support for verification of design applicability and capacity, research of unit operation and process alternatives, formulation of test plans, laboratory verification of processes, procurement of process equipment, preparation of system user manuals and waste acceptance criteria, and preparation of schedules, preliminary designs, and cost estimates for proposed \$5K to \$3M processes.
- Co-development and co-design for EET's Drum Web (U.S. Patents 5,988,017 and 6,058,808), a harness-type lifting and safety device for standard open top drums. Activities included concept origination, planning and scheduling of development activities, prototype development and production model testing, development of product specifications, user manuals, and marketing materials, procurement of materials and vendors for production, and distributor and customer support.
- Technical and economic evaluation for proposed and existing innovative and conventional waste treatment technologies for commercial clients. Activities included serving as expert witness for engineering issues related to a worker's compensation lawsuit, acting as lead reviewer for technical and production cost due diligence investigation of a recycling facility prior to acquisition in a multimillion dollar stock trade, expert witness for evaluating innovativeness and uniqueness of a recycling technology, and technical lead for evaluation of a waste solidification technology for an investment firm.
- Project management for \$2M subcontract (October 1996 – March 2000) supporting regulatory-driven STP implementation activities at the PGDP. Responsibilities and support activities included:
  - serving as project point of contact, interfacing with multifaceted PGDP departments, organizations, and personnel, and oversight of up to 6 EET task personnel;
  - developing and reviewing databases, procedures, sampling and analysis strategies and plans, and other documents necessary to support meeting schedules and milestones and satisfying regulatory compliance requirements;
  - supporting compilation, assessment, and verification of characterization information and data;
  - providing RCRA, TSCA, radiological, and mixed waste compliance recommendations;
  - writing progress and regulatory-driven quarterly and annual reports (including STP updates);
  - investigating waste treatment and disposal alternatives at commercial and DOE facilities;
  - disposal facility waste profiling for off-site waste shipments, preparing radiological manifest forms (540/541/542), and supporting waste shipment readiness assessments; and,
  - preparing statements of work for treatability studies and treatment and disposal.
- Radiological and chemical data validation for ORR mixed waste incinerator residuals.
- Database development and technical support for energetic and reactive materials evaluation.

### **1993 - 1996      Environmental Specialist, EET Corporation, Knoxville, TN**

- Field coordination for Federal Facility Compliance Agreement characterization activities subcontract (\$450K) at the PGDP (March 1994 – October 1996). Responsibilities and support activities included formulation of waste sampling and analysis strategies and plans, technical oversight of sampling projects, project coordination with various site personnel and organizations, and formulation of project analytical statements of work to ensure analytical data obtained would meet required data quality objectives and waste treatment and disposal needs.
- Formulation, assignment, and review of treatment technology process schemes and treatment study groups for ORR and PGDP mixed wastes without existing treatment. Assigned these wastes to populations to allow

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statistical sampling for characterization, performance of bench and pilot scale treatability studies, and treatment and disposal option evaluation.

- Development support for soft combustibile debris sampling methodology to produce representative, homogeneous samples for laboratory analyses. Method was implemented at the ORR TSCAI.

### **1987 - 1993      Research Assistant, Univ. of Kentucky Chemical Engineering Dept., Lexington, KY**

- Performed research on M.S. Thesis and Ph.D. Dissertation topics involving the characterization and mathematical modeling of organic pollutant separation by reverse osmosis/nanofiltration membrane processes.

### **Certification**

Professional Engineer, Kentucky (License No. 21243) and Tennessee (Registration No. 106271).

### **Publications and Patents**

Fourteen technical publications and sixteen presentations at technical meetings; four U.S. Patent awards (5,988,017, 6,058,808, 6,274,020, 6,537,436).