

**POSTDOCTORAL RESEARCH PROGRAM
U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL RISK MANAGEMENT RESEARCH LABORATORY
AIR POLLUTION PREVENTION AND CONTROL DIVISION
Research Triangle Park, North Carolina**

***Research Environmental Engineer*
Project # NRMRL/APPCD 2004-02**

The U.S. Environmental Protection Agency (EPA) National Risk Management Research Laboratory's Air Pollution Prevention and Control Division (NRMRL/APPCD) located in Research Triangle Park, North Carolina, is currently seeking a postdoctoral research chemical/environmental engineer.

The proposed primary research is to develop and apply quantitative methods to support the NRMRL's assessment of waste management including transportation, collection, packaging, treatment, combustion and landfilling. Decisions regarding how best to collect, transport, and treat or dispose of the material is often made without an adequate understanding of the potential environmental tradeoffs. NRMRL is conducting research that will help state and local government, industry, the public, trade associations, NGOs, and academia better understand the multi-media, multi-pollutant tradeoffs in making waste management decisions. The technical approach is based on taking a more holistic approach that considers all stages of waste management including transportation, collection, packaging/transport, recycling, combustion, and landfilling.

The research being conducted addresses issues with the management of decontaminated building debris resulting from potential terrorist attacks using chemical and/or biological agents. The available options and issues vary by location, by agent, by decontamination method, and over time. A decision support tool is under development to help provide emergency responders with the data and information that they will need to make informed and effective decisions on how best to manage the debris. This research also includes evaluating the fate and transport of chemical/biological agents that might be on landfilled debris including landfill gas and leachate. This analysis includes understanding the potential emissions over the life-cycle that environmental releases may occur.

NRMRL has also developed a tool for municipal solid waste management that incorporates full cost-accounting and calculation of the life-cycle environmental tradeoffs. This tool is being updated to provide web-access. Applications of the tool are being conducted in communities across the United States. NRMRL will be updating the tool with information on new technology and strategies for waste management. This includes operation of landfills as a bioreactor. Research underway will help to quantify any differences in the environmental releases from bioreactors as compared to conventional landfilling operation.

The participant will contribute to this research by being involved in developing and applying quantitative methods to support these research activities. Specific activities may include:

- Developing and applying methodologies for conducting assessment and comparison of the environmental and energy impacts for solid waste management including transportation, collection, treatment, and landfilling.

- Developing case studies that are location specific using decision support tools for decontaminated building debris and municipal waste.
- Providing interpretation of the outputs of the assessments using uncertainty and variable input data
- Developing/refining decision support tools to link disposal scenarios with environmental assessments and economics

In addition, the participant may be involved in the analyses of the uncertainty issues with quantitative assessment of the environmental tradeoffs associated with waste disposal. This would enhance the branch's assessment products, including:

- Ensuring that outputs best meet the needs of the intended users through interaction with stakeholders including those in solid waste management and state and local government;
- Investigating technological changes and incorporating into assessment tools through linking process models and decision support tools; and
- Analyzing and interpreting results to ensure that information is being communicated to emergency responders and others to allow communications to be more informative and accurate. This will ultimately lead to a greater sense that the appropriate steps are being taken to respond to an attack.

Additional areas of research may include developing models or procedures that will allow reduced uncertainty in data and/or better estimates of data and/or improved decision making from use of the data and models for solid waste management.

Qualifications

Applicants should have received a doctoral degree in environmental engineering or a closely related field within three years of the desired starting date, or completion of all requirements for the degree should be expected prior to the starting date. The program is open to all qualified individuals without regard to race, sex, religion, color, age, physical or mental disability, national origin, or status as a Vietnam era or disabled veteran.

The participants will be selected based on academic records, recommendations, research interests, compatibility of background and interests with research programs and projects at NRMRL/APPCD, and the availability of funds, staff, programs, and equipment.

The appointment is for one year and may be renewed for up to two additional years upon recommendation of NRMRL/APPCD and subject to availability of funds. The appointment is full time at NRMRL/APPCD. The appointee will not be considered an employee of EPA

The participant will receive a stipend ranging from \$4,080 to \$4,890 per month, depending on experience. Limited inbound travel and moving expenses may be reimbursed according to established policies.

The participant must show proof of health and medical insurance. This can be obtained through ORISE.

The Postdoctoral Research Program for NRMRL is administered by the Oak Ridge Institute for Science and Education. ***Please reference Project # NRMRL/APPCD 2004-02 when calling or writing for information.*** For additional information and application materials contact: Postdoctoral Research Program/NRMRL, Attn: Betty Bowling, Science and Engineering Education - MS 36, Oak Ridge Institute for Science and Education, P.O. Box 117, Oak Ridge, Tennessee 37831-0117, Phone: (865) 576-8503 FAX: (865) 241-5219, e-mail: bowlingb@ornl.gov.

An application can be found at <http://www.ornl.gov/orise/edu/EPA/app-gugrgpd.pdf>