

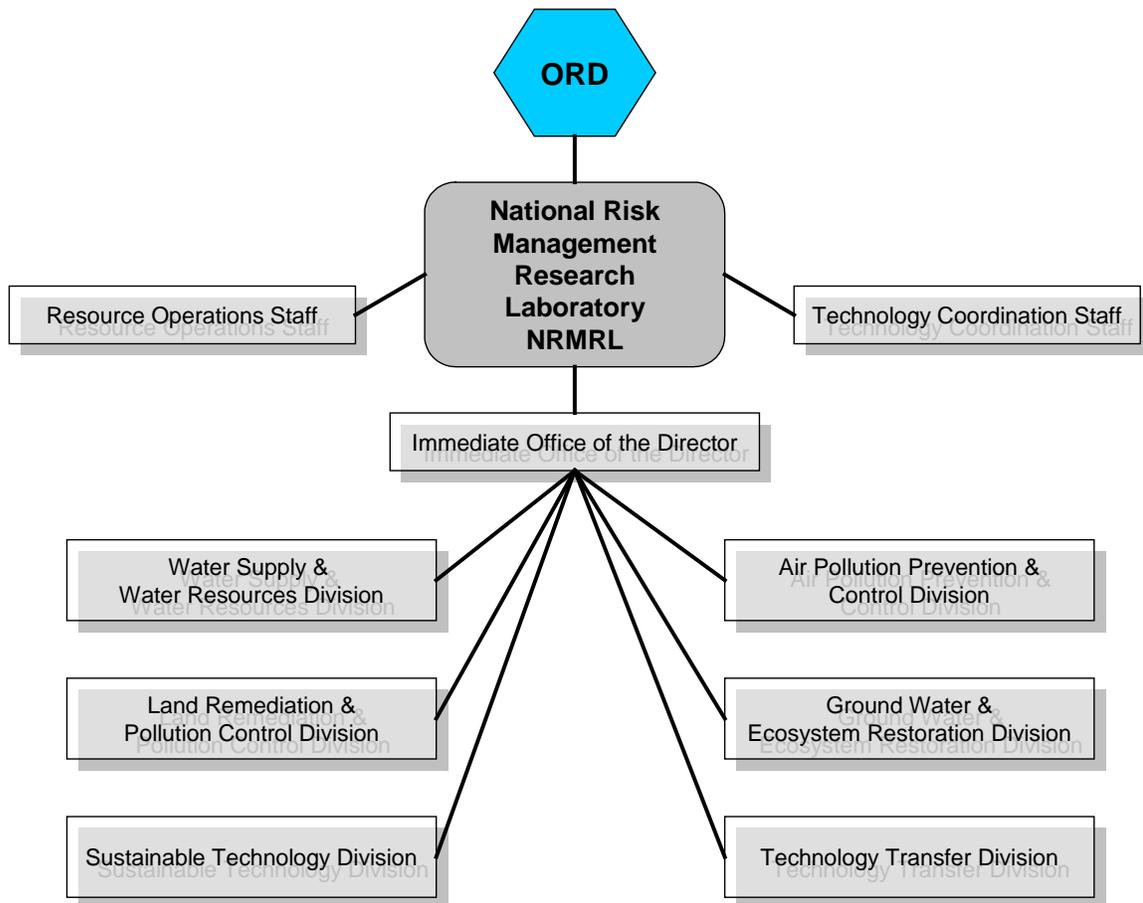
US EPA ARCHIVE DOCUMENT

# The National Risk Management Research Laboratory: Overview

## Organizational Structure

The National Risk Management Research Laboratory (NRMRL), one of seven Laboratories and Centers within the Environmental Protection Agency's (EPA's) Office of Research and Development (ORD), is staffed by nearly 400 federal employees at various facilities across the country. The current organizational structure is depicted in Figure 1. NRMRL, based in Cincinnati, Ohio, has six divisions that work together to characterize releases to land, water, and air; identify approaches to minimize or eliminate these releases; and transfer the results in forms that can be used by a variety of customers including other offices within EPA, states, Regions, and other Federal agencies. The Land Remediation and Pollution Control, Water Supply and Water Resources, Sustainable Technology, and Technology Transfer and Support Divisions are located in Cincinnati, Ohio. The Air Pollution Prevention and Control Division (APPCD) is located in Research Triangle Park, North Carolina and the Ground Water and Ecosystem Restoration Division is located in Ada, Oklahoma. The NRMRL component of the overall Particulate Matter Research Program is conducted through APPCD.

**Figure 1. Organizational Structure of NRMRL**



**Table 1: Overview of NRMRL's Divisions**

DIVISION	LOCATION	RESEARCH FOCUS
<b>Air Pollution Prevention and Control Division (APPCD)</b>	<b>Research Triangle Park, NC</b>	<b>Characterizes emissions from major air pollution sources (e.g., power plants, incinerators, materials used indoors); develops and demonstrates techniques to prevent or control emissions from these sources; and verifies technology performance. APPCD works closely with trade and professional organizations, industry, and academia in all these areas. The Division concentrates its efforts in six main program areas: Air Toxics, Fine Particles, Indoor Air Quality, Ozone, and Global Climate Change.</b>
Ground Water & Ecosystem Restoration Division (GWERD)	Ada, Oklahoma	Conducts research and provides technical assistance to establish the scientific basis to support the development of strategies and technologies to protect and restore ground water, surface water, and ecosystems impacted by man-made and natural processes.
Land Remediation & Pollution Control Division (LRPCD)	Cincinnati, Ohio	Conducts research to explore innovative solutions to current and future land pollution problems. Its programs include field evaluation and demonstration of innovative technologies; verification of externally-acquired data; development, testing of management techniques and disposal practices for municipal waste sites, and restoration of Browfield sites for beneficial and sustainable uses. LRPCD has a strong technical assistance capability that is applied to both Superfund and non-Superfund contaminated sites. Through these programs, LRPCD encourages the development of reliable and cost-effective alternatives for the domestic, federal, and international markets.
Sustainable Technology Division (STD)	Cincinnati, Ohio	Conducts research to advance clean industrial production methods and processes by developing and applying process design and assessment tools and methods including life cycle assessments, environmental impact assessment, and property estimation; develops approaches and tools for sustainable environmental management of urban watershed and ecosystems. All of the research is done considering the multi-media implications of risk management approaches.
Technology Transfer and Support Division (TTSD)	Cincinnati, Ohio	Communicates information about EPA scientific advances through technology transfer publications, software, multimedia products, and technical meetings to inform the regulated community, environmental consultants, and local decision-makers.
Water Supply & Water Resources Division (WSWRD)	Cincinnati, Ohio	Conducts research to help prepare the primary and secondary regulations for drinking water and to develop technologies and strategies for controlling waterborne contaminants. The program integrates chemistry, engineering, microbiology, computer modeling, and cost analysis to provide effective, reliable and cost-effective techniques. WSWR programs include research on urban & non-urban storm water runoff; combined & sanitary sewer overflows; underground & aboveground storage tanks and oil spills; and contaminated sediments.

## **NRMRL=s Mission**

NRMRL is a problem-solving organization. We characterize releases of environmental stressors and approaches to prevent and reduce pollution risks associated with them. The laboratory contributes to public health and ecosystem protection through control, prevention, and remediation of pollution of air, land, and water and to restore ecosystems. Our mission is to (1) understand and develop ways to quantify or estimate pollutant releases from various source types; (2) investigate technologies and other risk management approaches that can reduce or eliminate releases; (3) provide the scientific and engineering information to support regulatory and policy decisions; (4) ensure effective implementation of environmental regulations through technical support and information transfer; and (5) collaborate with partners in the public and private sector to foster technologies that reduce compliance costs.

## **Research Approach**

NRMRL has a flexible research program that can apply a set of core expertise and facilities to a wide spectrum of environmental problems. From research through field evaluation, risk management research activities combine in-house work, extramural activities, and federal/state partnerships. NRMRL's activities range from bench-scale experiments of innovative concepts to full-scale field testing of the most promising technologies. Evaluation and verification of technologies developed by others and all types of engineering and economic modeling are also used to address many of the priority research questions. Laboratory and field studies to quantify pollutant releases are also regularly conducted and are often translated into models that predict these releases at various spatial scales under different operating and environmental conditions. Much of the work is carried out by principal investigators and technicians with varied backgrounds such as chemical engineering, economics, and forestry. The results of the research are transferred to customers in various forms ranging from direct technical assistance to peer reviewed journal articles. The organization constantly evaluates emerging issues that may impact future environmental risk management and regularly adjusts the balance between problem-driven research and more "core" research to investigate these emerging areas.

## **Leadership**

NRMRL provides vital leadership in the environmental research arena, and its engineers and scientists are proactive in the scientific community at many levels. Within the Agency, we help shape the research agenda by participating on cross laboratory and EPA committees, and we participate in the development of ORD Research Plans and Strategies. Our engineers and scientists represent the Agency at workshops and on task forces that address major risk management issues. Outside EPA, we influence the direction and priorities of environmental research worldwide. We steer collaborative research efforts at both national and international levels; we are members of national and international planning committees and research review panels, and we serve on advisory boards of other major agencies and organizations.

## **Scientific and Technical Assistance**

As part of our mission, NRMRL responds to diverse requests for scientific advice and technical consultation, both within and outside EPA. We provide technical support to the Agency by

advising EPA Program Offices and Regional Offices on scientific matters, by participating on Agency workgroups, and by helping develop testing protocols and risk management guidance. We bring our expertise to bear at the national and international level by organizing scientific workgroups and symposia and by serving in professional and scientific societies and on publication boards. We provide guidance to local, state, tribal, and international governments and other federal agencies, informing them on issues of environmental importance and enabling them to implement more effective environmental management strategies. We work to establish partnerships with the corporate, public, private, and educational sectors and assist them set and achieve environmental goals. By sharing our skills and knowledge, we enhance the ability of other organizations to protect public health and the environment, and we serve as an important catalyst for scientific and technological progress and innovation.

## NRMRL PM/Ozone Research Capabilities

NRMRL uses its air emissions characterization and control technology facilities and expertise to support the goals and objectives of the ORD PM and ozone research programs. Examples of these capabilities are listed below:

- **In-house and on-road characterization of emissions from heavy and medium duty vehicles:** A chassis dynamometer facility capable of simulating various operating conditions and driving cycles is available to quantify emissions from heavy-duty diesel vehicles. The facility can test various engines with different fuels and be used to develop testing methods that correlate well with on-road testing. NRMRL's on-road capability includes a fully instrumented tractor trailer that can measure the full plume of PM from diesel trucks while on the road. This Diesel Emissions Aerosol Laboratory (DEAL) can be used to evaluate the effects of natural cooling and dilution on the formation of PM.
- **Emissions Modeling:** NRMRL has the in-house expertise required to develop new or upgrade existing models that estimate emissions, taking into account factors that influence the rate of emissions and amount of emissions. Areas of particular expertise are mobile and stationary sources.
- **Open-path Measurement Techniques to Quantify Emissions:** Extensive expertise exists within NRMRL to apply optical measurement techniques to characterize emissions from area and fugitive sources. These techniques use multiple laser paths and real-time processing to generate spatially resolved emissions measurements. Applications include sources such as animal feeding operations, landfills, and highways.
- **Chemical Analysis and Dilution Sampling:** A state-of-the-art facility is available to characterize the organic fraction of collected particle samples. This facility also works on developing innovative sample analysis techniques. The samples are collected with a dilution sampler system which simulates aerosol formation conditions downwind of a source by providing increased cooling and residence times for aerosols from a variety of

sources.

- **Combustion Research Facility:** Several different combustor designs capable of burning various fuels, including coal and diesel fuel, are available to support emissions characterization and control technology evaluations. Provisions for direct inhalation exposures to diluted combustion exhaust allow coordinated testing of emissions and toxicological characteristics from NRMRL's pilot-scale units, enabling studies to link source emissions directly to health outcomes. The newest system has the flexibility to evaluate a variety of multi-pollutant control technology options.