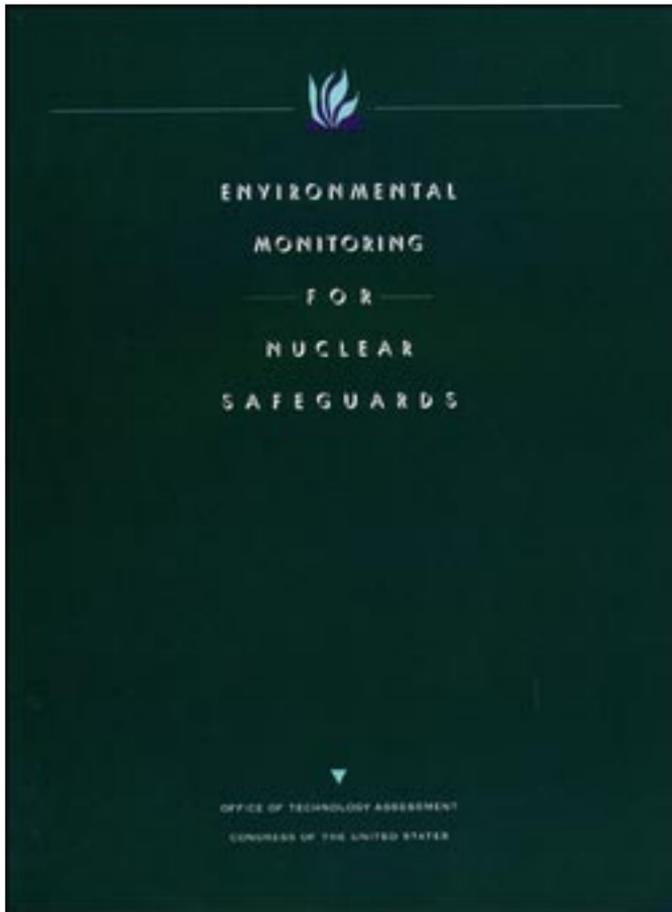


*Environmental Monitoring for Nuclear
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Foreword

In June 1995, the Office of Technology Assessment published the report *Nuclear Safeguards and the International Atomic Energy Agency*, the sixth in OTA's series of publications on the proliferation of weapons of mass destruction. That report found that the International Atomic Energy Agency's traditional mission of detecting the misuse of known nuclear materials and facilities addressed only part—and probably not the most important part—of the proliferation problem. To assure that states are not violating their Non-Proliferation Treaty commitments, the International Atomic Energy Agency (IAEA) must also verify that states do not possess *covert* nuclear facilities—a mission that prior to the 1991 Gulf War, it had neither the political backing nor the resources to conduct. In the June report, OTA concluded that providing the IAEA with the resources, the information, and the political support it needs to look for such sites may turn out to be the most important aspect of a reinvigorated safeguards regime.

The IAEA recognizes the importance of this new mission and is in the process of assuming it. One of the tools it is exploring to provide some indication of the presence of secret, or undeclared, nuclear activities and facilities is *environmental monitoring*. Modern sampling and analysis technologies provide powerful tools to detect the presence of characteristic substances that are likely to be emitted by such illicit activities. This background paper examines the prospects for such technologies to improve nuclear safeguards. It concludes that environmental monitoring can greatly increase the ability to detect undeclared activity at declared, or known, sites, and it can significantly increase the chances of detecting and locating undeclared sites.

Completed in the last month of the Office of Technology Assessment's existence, this paper will be the last OTA publication related to the proliferation of weapons of mass destruction. OTA appreciates the invaluable advice and assistance of the people who contributed to this project and reviewed the draft material.



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