WIPP and EPA's Experience

Background

The Waste Isolation Pilot Plant (WIPP) is a disposal system for transuranic (TRU) radioactive waste. Developed by the Department of Energy (DOE), WIPP is located near Carlsbad in southeastern New Mexico. At WIPP, radioactive waste is disposed of ~2,150 feet underground in an ancient layer of salt which will eventually "creep" and encapsulate the waste.

Congress authorized the development and construction of WIPP in 1980 "for the express purpose of providing a research and development facility to demonstrate the safe disposal of radioactive wastes resulting from the defense activities and programs of the United States." The waste which may be emplaced in the WIPP is limited to TRU radioactive waste generated by defense activities associated with nuclear weapons; no high-level waste or spent nuclear fuel from commercial power plants may be disposed of at the WIPP. TRU waste is defined as materials containing alpha-emitting radioisotopes, with half lives greater than twenty years and atomic numbers above 92, in concentrations greater than 100 nanocuries per gram of waste. Much of the TRU waste destined for WIPP consists of items contaminated as a result of activities associated with the production of nuclear weapons (or with the clean-up of weapons production facilities), e.g., rags, equipment, tools, protective gear, and sludges.

The WIPP Land Withdrawal Act (LWA), passed initially by Congress in 1992 and amended in 1996, provides EPA the authority to oversee and regulate the WIPP. The WIPP LWA delegated to EPA three main tasks, to be completed sequentially, for reaching an initial compliance certification decision. First, EPA was required to finalize general regulations which apply to all sites—except Yucca Mountain—for the disposal of highly radioactive waste. These disposal regulations, located at Subparts B and C of 40 CFR Part 191, were published in the Federal Register in 1985 and 1993. Second, EPA was to develop criteria, by rulemaking, to implement and interpret the general radioactive waste disposal regulations specifically for the WIPP. In 1996, the Agency issued the WIPP Compliance Criteria, which are found at 40 CFR Part 194. Third, EPA was to review the information submitted by DOE and publish a certification decision. The Agency issued its certification decision on May 18, 1998, as required by Section 8 of the WIPP LWA (63 FR 27354–27406). The first shipment of TRU waste was received at WIPP on March 26, 1999.

Observations on the Process

EPA's review of WIPP and regulatory development began soon after EPA was given the authority by Congress. EPA staff learned about the disposal system, waste characterization program, and the quality assurance approach used by DOE and was able to use that knowledge when developing the 40 CFR part 194 WIPP Compliance Criteria. During this process interaction with outside experts and interested stakeholders was very important and helped to shape the final Compliance Criteria. While many individuals and groups supported WIPP, many did not and some groups are still trying to stop WIPP. For example, even though the Governor did not actively oppose the opening of WIPP, the New Mexico Attorney's General Office was one of the groups that tried to stop EPA's initial certification of WIPP.

In the process of reviewing and certifying WIPP, EPA staff had to consider three main areas. First, EPA had to determine whether the information DOE had developed was technically adequate, that the site characterization information was reasonable, that the data and modeling adequately represented the disposal system, and that DOE provided the necessary documentation. Second, EPA had to understand and ensure that public concerns were understood and appropriately addressed. Lastly, EPA had to ensure that the process and decision were legally defensible.

Importantly, the issues EPA dealt with in developing the Compliance Criteria were with the implementation of the standards, not the environmental standards themselves. DOE had a reasonable understanding of the standards that they had to achieve relatively early, unlike at Yucca Mountain. EPA did not have to debate what the release limits or individual protection should be, but could focus on ensuring what was necessary from DOE in order to determine if WIPP met the environmental standards. As it was, developing the implementation criteria posed a substantial and controversial effort on their own.

From our participation in the certification of WIPP and our observation of similar activities, we have identified a number of different issues that are important in a successful repository site, assuming that the site is adequately studied and is a "good" site (modified from unpublished EPA Radiation Protection Division report "The WIPP Experience" Workshop Manual, May 2002, by Charles Byrum, R. Thomas Peake, and Rafaela Ferguson):

1) There needs to be a national commitment to safe disposal of waste. If there is not a commitment to dispose of the waste then resources would be wasted trying to develop a site, even if the site is adequate.

2) A known, structured regulatory process with environmental standards and implementation is important to establish benchmarks for the site developer to analyze and the regulator to assess.

3) Constructive interactions between the site developer and regulator are necessary because even if guidance materials are present, there will always be questions from the site developer on how much is enough and what will be acceptable.

4) The site developer and the regulator need to be focused. The site developer needs to focus on developing good, quality assured, data and documentation, a good understanding of the site and ensuring that the modeling is representative and implemented appropriately. The regulator needs toensure that what the site developer provides is defensible and is safe.

5) Both the regulator and site developer need to have constructive interactions with the public and forthrightly address issues that are brought up by the public and others. Reasonable public concerns can't just be dismissed without a response.

Post-certification WIPP survey results (modified from unpublished EPA Radiation Protection Division report "The WIPP Experience" Workshop Manual, May 2002, by Charles Byrum, R. Thomas Peake, and Rafaela Ferguson)
Because the Agency is required to recertify the WIPP facility every five years, at the end of the certification process EPA decided to document lessons learned in an effort to ensure that the experience gained from the compliance certification process can be used to effectively manage subsequent recertification of the WIPP facility. This section identifies and examines the major lessons learned by participants in the WIPP-related rulemakings. These were distilled primarily through telephone interviews conducted with individuals directly involved in EPA's rulemaking efforts. Interviews were conducted with members of EPA's WIPP staff in Washington D.C. and other EPA staff involved in the rulemakings; staff from DOE and their contractors; scientists who served on independent scientific panels established to provide review of the WIPP Project: staff from other types of oversight groups; and staff from EPA's contractors. A total of 32 interviews were conducted.

A review of the interview results reveals that nearly all respondents considered the compliance certification process to have been a success. Most considered the experience a positive one and were proud to have played a part in it. Many noted the historical significance of the certification approval by EPA and felt that this was a factor in inspiring a high level of commitment and dedication among the staff working on the project. Although the interview data covered a broad range of diverse ideas and observations, multiple themes emerged, including those listed below:

1. The staff associated with the compliance certification process were exceptional.

2. EPA management was instrumental to the success of the project.

3. The documentation developed by EPA was effective in supporting the Agency's conclusions.

4. Stakeholder involvement was and is critical to the process.

5. Contractors played an important role in the compliance certification process but the ways in which they are managed could be improved.