LETTERS

Remediating Rocky Flats

IN THEIR POLICY FORUM "AVOIDING DESTRUCtive remediation at DOE sites" (12 Mar., p. 1615), F. W. Whicker and colleagues applaud the "risk-based" cleanup of U.S. Department of Energy (DOE) sites and point to Rocky Flats near Denver as a success story. Unfortunately, various assumptions about risk as well as certain features of the Rocky Flats cleanup show the risk-based approach to be seriously flawed.

Those who assess risk and set radiation exposure standards have systematically excluded affected populations from every step of the process. Risk calculation, particularly as encoded in U.S. standards, is weighted against the most vulnerable populations.

The Rocky Flats nuclear weapons plant in 1979. The Rocky Flats site is undergoing cleanup by the Department of Energy.

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Rocky Flats will become a wildlife refuge after cleanup. Thus, the plutonium-contaminated site is being cleaned on the surface to protect wildlife refuge workers. The DOE will rely on not-yet-specified institutional controls to contain larger quantities left below a depth of 3 feet. The National Academy of Sciences says such controls will not last (*1*). Given the 24,400-year half-life of plutonium, the Rocky Flats cleanup is a short-term response to a long-term problem. Whicker *et al.* say "natural attenuation" will take care of smaller concentrations left behind. But plutonium left in the environment constitutes an essentially permanent danger in particles too small to see but not too small to inhale, ingest, or otherwise take into the body. Although Whicker *et al.* are sanguine about wildlife, genetic effects on such populations are poorly understood.

Whicker and his colleagues say risk-based cleanup will save money. A closed-door decision that imposed fiscal limits on activities at Rocky Flats made cost, not risk, the real driver for cleanup. No one can predict what costs, monetary and otherwise, future generations may face. Contrary to Whicker and colleagues' comments, what is happening at Rocky Flats sets a poor precedent for other sites.

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Reference

1. T. Leschine *et al.*, *Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites* (National Academies Press, Washington, DC, 2000).

Response

IN OUR POLICY FORUM, WE POINTED TO THE Rocky Flats Environmental Technology Site as a case where a portion of a plutonium-contaminated but ecologically valuable grassland ecosystem was spared from costly and damaging remediation because of congressional legislation converting much of the site to a wildlife refuge. This meant that cleanup standards were based on a less stringent scenario, namely, a wildlife refuge worker, rather than a site resident.

Moore states that "[t]hose who assess risk and set radiation exposure standards have systematically excluded affected populations from every step of the process." In the case of Rocky Flats, a Citizens Advisory Board (www.rfcab.org/PI.html) and several other organizations have sought to involve and inform the local public and to provide opportunities for public input to cleanup criteria and environmental decisions at Rocky Flats. We also cannot agree with Moore's blanket statement that "[r]isk calculation, particularly as encoded in standards, is freighted against the most vulnerable populations." In our experience, when precise knowledge is lacking, worst-case assumptions erring toward the side of conservatism tend to be the rule, rather than the exception, in setting governmental radiation protection standards and in risk assessments related to development of cleanup criteria.

Indeed, we endorse most of the broad principles about the need for effective public involvement as outlined in a recent article co-authored by Moore (*1*). Our main argument is that the cleanup process itself can also create human health risks by mobilizing contaminants to air and water and causing construction accidents, as well as producing environmental degradation and instability at both the cleanup and disposal sites.

Moore also states that "plutonium left in the environment constitutes an essentially permanent danger…" The danger is related to the concentrations in the environment and the amounts that get into and decay in the body, not just the fact that it is there. Plutonium from

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