



Eric W. Mogren. *Warm Sands: Uranium Mill Tailings Policy in the Atomic West.* Albuquerque: University of New Mexico Press, 2002. x + 264 pp. \$34.95 (cloth), ISBN 978-0-8263-2280-7.

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Published on H-Environment (December, 2003)

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According to Eric Mogren, the use of uranium has a long though sporadic history. Used by the Romans to tint glass and by pre-contact Native Americans as a pigment for body painting, pictographs, and clothing, uranium was a nineteenth-century “scientific curiosity” because of its chemical properties, while some homeopaths claimed that ingesting small amounts could cure diabetes. The use of uranium for tinting glass resumed around 1830; it was also used for tinting ceramics, in ink and photographic printing, and as filaments and mantles in lamps and lighters. These varied applications used only small amounts of uranium—obtained as a by-product of other types of mining—so there was no need to develop large-scale uranium mining and processing enterprises. But with the advent of the Nuclear Age, uranium became one of the most valuable minerals in the world and the uranium mining and milling industries took off.

Curiously, uranium mining and milling have been largely understudied by historians, despite a wealth of literature on other types of mining, especially gold, silver, copper, and coal. Western and environmental historians in particular have begun to address this omission because of uranium’s regional and ecological impact. Mogren’s *Warm Sands: Uranium Mill Tailings Policy in the Atomic West* is a welcome addition to the field and has much to recommend it. *Warm Sands* gives an institutional analysis of how the debates over legal and political authority, scientific expertise, and public health and safety both delayed and shaped the formation of mill tailings policy in the United States.

The first three chapters of *Warm Sands* give a clear overview of the history of the mining, milling, and use of uranium and related elements from the late-eighteenth century to the mid-twentieth century. The next four chapters examine the debates between

western states and the federal government over liability for environmental contamination from mill tailings. Both mine and mill sites were tremendously contaminated, and Mogren identifies mill tailings as the chief source of pollution from uranium processing. Tailings contain both unreclaimed radioactive material as well as toxic minerals and pollutants. Dry tailings were piled up at mill sites where they leached into the ground or were swept away by the wind, while liquid tailings were often dumped directly into water sources. Alarming, dry tailings were also used as building materials throughout the west, with Grand Junction, Colorado, suffering the worst contamination with approximately 4,000 buildings constructed between 1952 and 1966.

Mogren shows that public concern over the tailings began as early as 1950 when it was discovered that the Colorado River Basin was becoming significantly contaminated. As workers, residents, and state and local government officials increasingly questioned the safety of the tailings, the Atomic Energy Commission (AEC) and the U.S. Public Health Service (USPHS) each denied responsibility for the tailings and tried to force the problem back on the states. The debate over who was responsible for cleaning up the mess continued over the next two decades, as first water contamination, then air pollution and radon exposure brought the question to the fore. It was finally resolved by the Uranium Mill Tailings Radiation Control Act (UMTRCA) in 1978, which “acknowledged federal responsibility for remedial measures ... and dispelled any remaining doubts that the public health and environmental hazards from tailings were serious enough to warrant cleanup and federal regulatory control” (p. 157). However, as Mogren shows in the final chapter, though UMTRCA removed almost forty million cubic yards of mill tailings and decontaminated over five thousand properties, the imple-

mentation of UMTRCA was not an unqualified success.

Mogren argues that the debate over mill tailings and the AEC's repeated denial of liability added to the growing suspicions that the AEC did not take its regulatory responsibilities or public health and safety very seriously. Though the story of AEC neglect and intransigence is a familiar one, Mogren tells the institutional and uranium industry aspects of it very well. His focus on mill tailings reminds us that the danger of the nuclear enterprise was not limited to bombs and power plants. The most glaring problem with *Warm Sands* is its complete lack of maps. The story of mill tailings pollution and policy revolves around

geography and environment, and I frequently found myself pulling out the atlas to find the locations mentioned. I would also have liked to learn more about the affected communities. Mogren writes that an increasingly vociferous public protest finally forced the government to develop a mill tailings policy, but we are not given a clear picture of who "the public" is, nor the form those protests took. The strength of the book is its clear description of policy debates, institutional infighting, and technological processes. It is well written, often with an eye for the telling detail. The general reader will shy away from its institutional focus, but scholars of nuclear history, mining, public health, policy studies, and environmental history will find much of interest.

Citation: Mara Drogan. Review of Mogren, Eric W., *Warm Sands: Uranium Mill Tailings Policy in the Atomic West*. H-Environment, H-Net Reviews. December, 2003.

URL: <http://www.h-net.org/reviews/showrev.php?id=8572>

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