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Project Description

In my project, I will explore the ideas and practice of contamination detection and how the technology of detecting chemicals in the environment has influenced how humans created laws and methods to confront environmental pollution. Specifically, I want to understand how these technologies determined where, when, and how the United States government addressed contamination at uncontrolled hazardous waste sites. Many of these sites are located in urban areas where persons of color and poor people lived and worked and continue to live and work.

Until the late 1960s, there were few methods to detect and measure environmental pollution. Most technologies involved taste, odor, and smell. Lawmakers and industrial representatives acknowledged that seemingly clean water, air, and land contained pollutants, but they had few direct tests to determine the type or level of the contaminant. As technology advanced, new techniques gave decision makers and citizens the ability to incorporate numerical standards for environmental regulations. Gas chromatography / mass spectrometry and other methods allowed scientists to detect and measure contamination that humans could not see, smell, or taste. This shift forced policy makers to ask the question: “How clean is clean?” (I.e., what level of contamination provides protection for the humans, plants, and animals that come into contact with soil, air, and water?) No longer did the primary senses guide the answers.

In the late 1980s, this question was the title of a short guidance document that outlined for an Environmental Protection Agency inspector the questions to ask and the data to review to determine whether a toxic waste site needed to be investigated or remediated (i.e., cleaned up). From that twenty-page document, risk assessors developed hundreds of thousands of documents that try to answer: “How clean is clean enough?”; “Is the risk low enough that additional actions do not need to be planned for or funded?”; “Where and when do you apply the standard of clean?”

The emergence of risk assessment and analysis in determining the extent of contamination and the methods to clean up toxic waste sites caused the changes. In the early 1990s, policymakers used these tools to prioritize sites based on level and extent of contamination, but not to decide how and when to remove the contamination. As risk assessment techniques became more uniform, “clean” no longer meant uncontaminated. It introduced ideas such as exposure pathways, chemicals of concern, cancer risk, and hazard quotient. Clean was now based on direct chemical exposure to the community and the data collected about the site contamination. Therefore, the proximity of the site to residents, and the number and type of samples became the driving force for prioritization and remediation.

During my stay, I will consider the idea of “clean” as it pertains to environmental contamination. I want to explore how different academic disciplines—including the natural sciences—understand the concept. Additionally, I will develop a comprehensive chapter that details the regulatory process—including risk assessment practices and the specific practices of uncontrolled hazardous waste cleanups in the United States—to begin to understand how ideas of risk and contamination have evolved since the 1970s.