

Thesis Project Portfolio

Jackson Cleaners Environmental Remediation

(Technical Report)

Injustice Through Inaction: A Case Study of the Tar Creek Superfund Site

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

A dry cleaning business, Jackson Cleaners, began operating near the corner of West Michigan Avenue and North Huron Street in Ypsilanti, Michigan in 1919. Jackson Cleaners used perchloroethylene (PCE) during its operations which is a volatile organic compound. Presently, the soil and groundwater beneath the site are contaminated with PCE and its byproducts, trichloroethylene (TCE), dichloroethylene (DCE), and vinyl chloride (VC) which pose a risk to public health due to their toxicity and prevalence.

My capstone team designed a remediation plan to address this contamination. First, a conceptual site model (CSM) was created to gain a better understanding of the extent of contamination at the site. The site was also characterized using GIS tools to visualize the site. Next, a technology matrix was created to find the best combination of remediation technologies to deploy at the site. Finally, the team designed institutional controls, a permeable reactive barrier, and a soil vapor extraction system to address the contamination.

It is important to consider the human and social aspects of the remediation process because the community that has been impacted by the contamination also experiences the impacts of the remediation process. One of our chosen technologies, a permeable reactive barrier, requires the excavation of soil for the placement of an underground barrier. The placement of the barrier could involve the excavation of peoples' homes and businesses, which is something that our design team would like to avoid.

One STS theory that applies to our problem solving approach is David Pellow's Environmental Justice Framework. This framework considers the history of the EJ conflict, the roles of the stakeholders, the social inequalities, and the agency of the stakeholders. I used a case study method to conduct my STS research. Through my STS research I found how the delayed identification and remediation of the Tar Creek superfund site has exacerbated environmental injustice in Ottawa County, Oklahoma. The implication of this undergraduate thesis points to the need for swift identification and timely remediation of contaminated sites across the United States.