THE UNIVERSITY OF NEW MEXICO®

UNM BUREAU OF BUSINESS AND ECONOMIC RESEARCH

Mixing Methods to Address Complicated Research Questions:
Lessons from the BBER Uranium Mine Remediation Study

Prepared for the New Mexico Data User's Conference
November 2019
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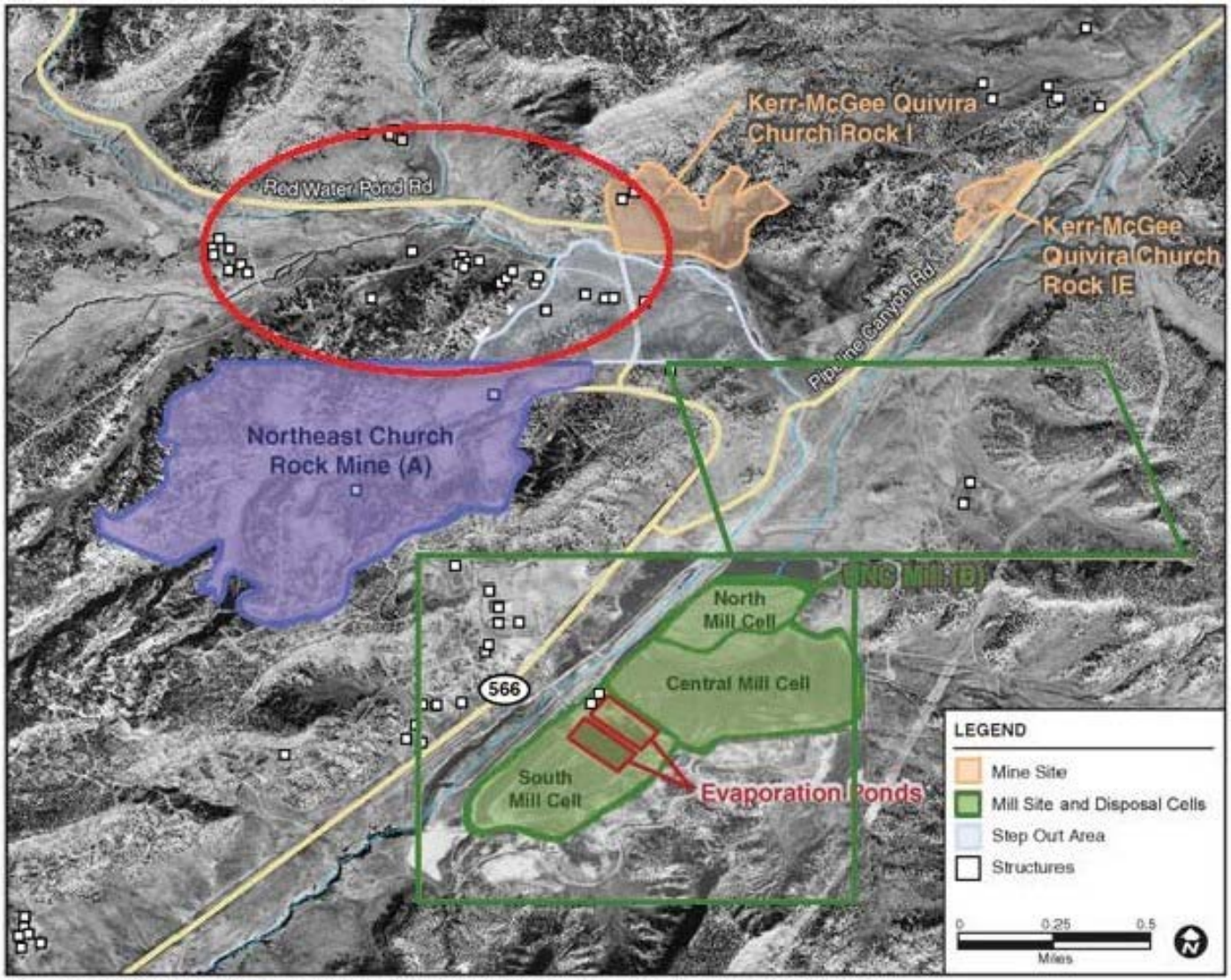
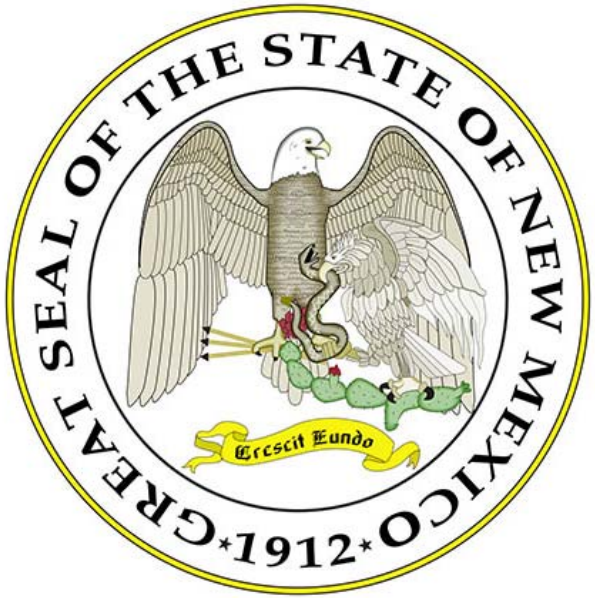


Figure 1: Northeast Church Rock Mine and United Nuclear Corporation site map

Overview

1. Project Description
2. Translating Messy Quantitative Data
3. Beyond the Numbers
4. Mixing Methods
5. Discussion

Project Description



Project Description

In 2019, Representative Wonda Johnson introduced HB0233 “for a study of the education and training programs needed to build a workforce sufficient to meet the demand for uranium mine site cleanup in New Mexico.”

Although HB0233 did not pass, the study was included in the junior appropriations bill, which gave funding to UNM BBER for the purposes of conducting the work.

Project Description

The specifics in the original legislation asked BBER to

- analyze the economic effects on the state and local communities associated with cleanup,
- assess current workforce capacity, and
- evaluate training and education courses potentially needed to meet workforce demands.

Translating Messy Quantitative Data

Translating Messy Quantitative Data

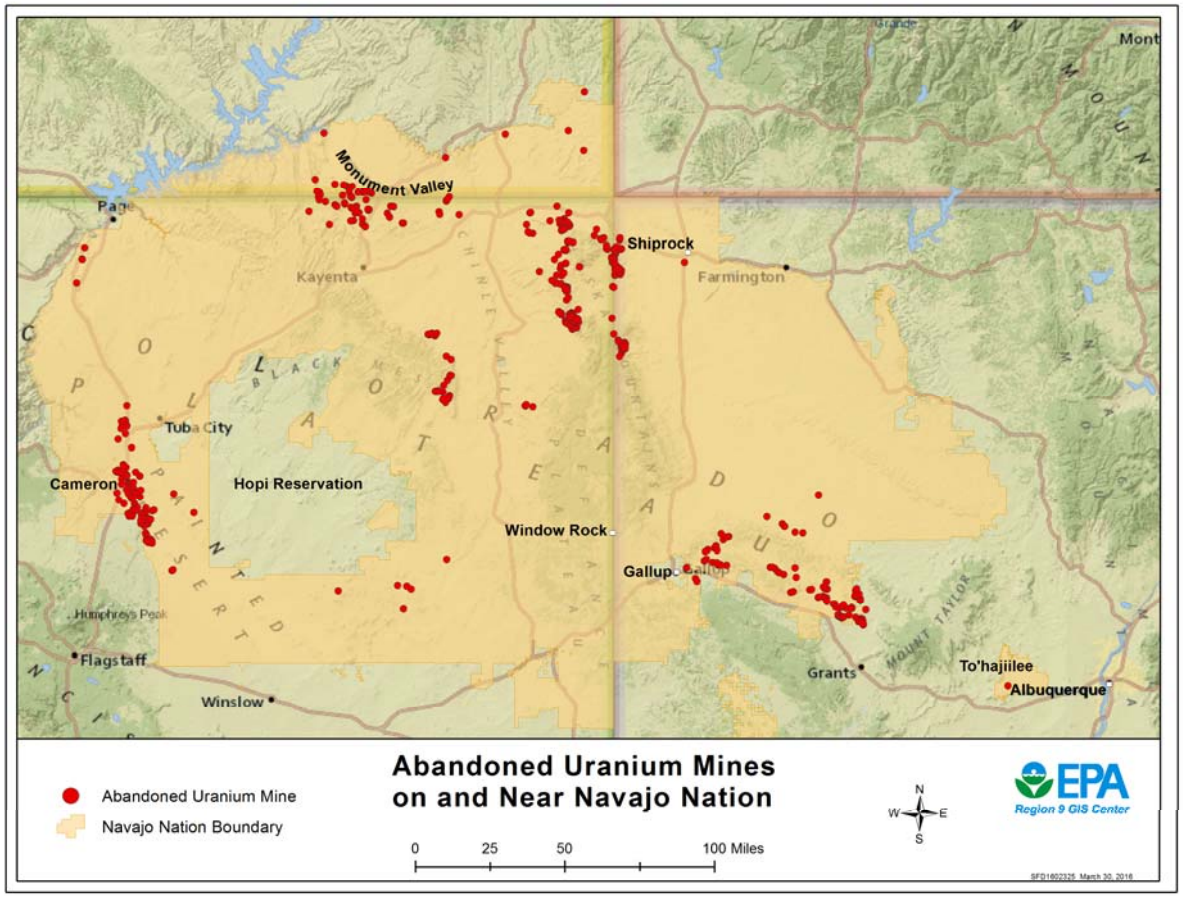
Finding the right documentation

- In the case of uranium mine cleanup, we found varying levels of cost estimate documentation.
- We spoke to dozens of stakeholders to obtain all possible documents that tied equipment and labor costs to cleanup efforts.

Translating Messy Quantitative Data

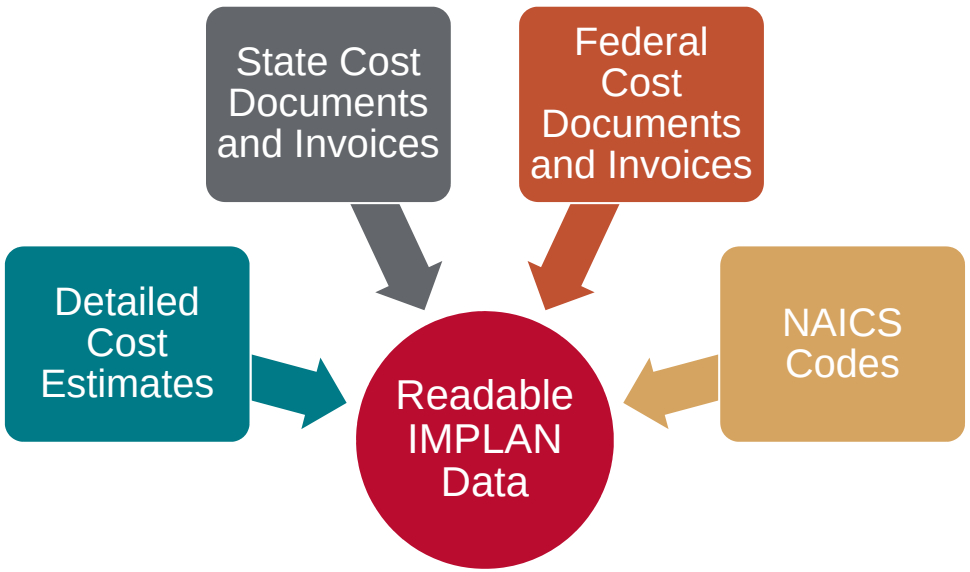
Triangulation of information is key

- With the technical assistance from geological engineers and project managers associated with the cleanup cases, we created a schema to generalize tasks from one project to the next.
- By including expert voices in our data coding process, we increased confidence in our generalization process.



Translating Messy Quantitative Data

Creating bridges



- After verifying the interpretation of the data is accurate, how do you then generate something the analysis software (IMPLAN) can read?
- To do this, we had to link our data to both NAICS (North American Industry Classification System) codes and IMPLAN codes.

Beyond the Numbers

Beyond the Numbers

- Analyzing the economic impact and the workforce skills required for uranium cleanup alone would not answer all of the points made in the legislation.
- Beyond that, the conversations we have had with stakeholders have unveiled a much more complicated relationship between cleanup efforts and community interests.

Qualitative analyses can provide powerful explanations.

Beyond the Numbers

- Variety and quantity of relevant sources
- Meticulous notetaking
- Coding notes reflectively into larger themes
- Reliability checks
- Careful documentation of analytic decisions
- Optional: utilization of software to aid in analysis

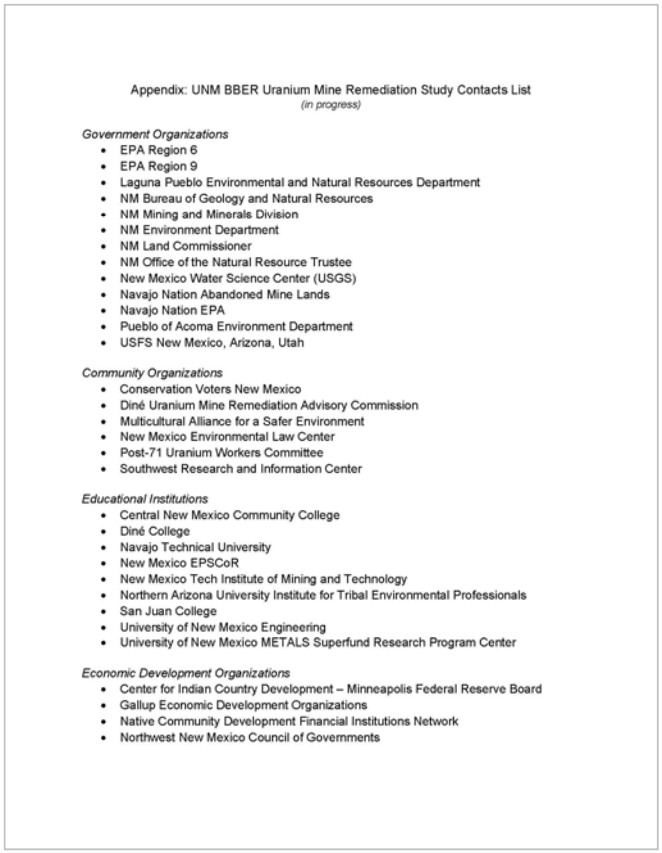
Keys to rigorous qualitative analyses

Beyond the Numbers

This is our current, frequently updated contact list.

We have had, have scheduled, or are planning to have conversations with each of the groups listed on these pages.

Key to our accurate representation of stakeholders' interests is being in touch with as many different groups as possible.



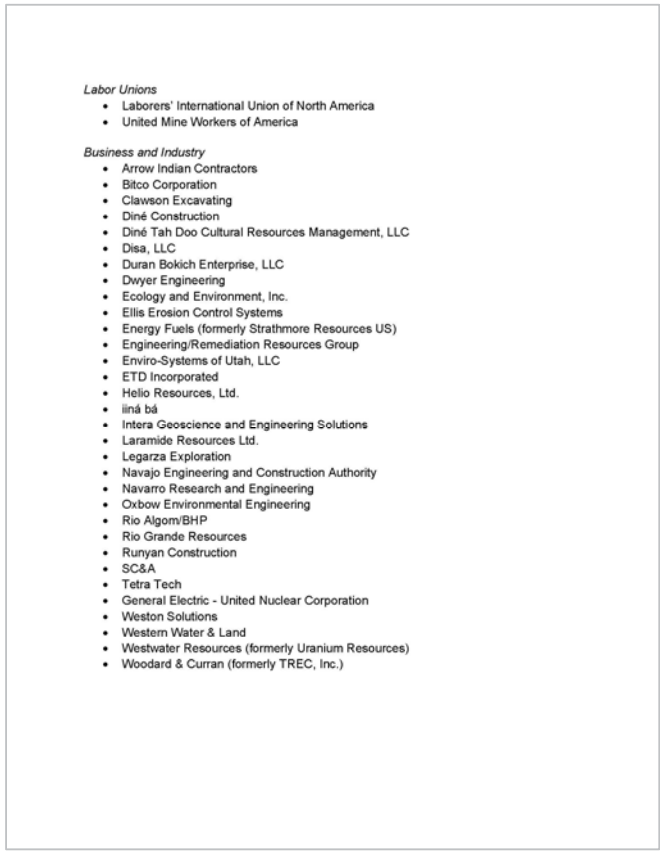
Appendix: UNM BBER Uranium Mine Remediation Study Contacts List
(in progress)

Government Organizations
- EPA Region 6
- EPA Region 9
- Laguna Pueblo Environmental and Natural Resources Department
- NM Bureau of Geology and Natural Resources
- NM Mining and Minerals Division
- NM Environment Department
- NM Land Commissioner
- NM Office of the Natural Resource Trustee
- New Mexico Water Science Center (USGS)
- Navajo Nation Abandoned Mine Lands
- Navajo Nation EPA
- Pueblo of Acoma Environment Department
- USFS New Mexico, Arizona, Utah

Community Organizations
- Conservation Voters New Mexico
- Diné Uranium Mine Remediation Advisory Commission
- Multicultural Alliance for a Safer Environment
- New Mexico Environmental Law Center
- Post-71 Uranium Workers Committee
- Southwest Research and Information Center

Educational Institutions
- Central New Mexico Community College
- Diné College
- Navajo Technical University
- New Mexico EPSCoR
- New Mexico Tech Institute of Mining and Technology
- Northern Arizona University Institute for Tribal Environmental Professionals
- San Juan College
- University of New Mexico Engineering
- University of New Mexico METALS Superfund Research Program Center

Economic Development Organizations
- Center for Indian Country Development – Minneapolis Federal Reserve Board
- Gallup Economic Development Organizations
- Native Community Development Financial Institutions Network
- Northwest New Mexico Council of Governments



Labor Unions
- Laborers' International Union of North America
- United Mine Workers of America

Business and Industry
- Arrow Indian Contractors
- Bitco Corporation
- Clawson Excavating
- Diné Construction
- Diné Tah Doo Cultural Resources Management, LLC
- Disa, LLC
- Duran Bokich Enterprise, LLC
- Dwyer Engineering
- Ecology and Environment, Inc.
- Ellis Erosion Control Systems
- Energy Fuels (formerly Strathmore Resources US)
- Engineering/Remediation Resources Group
- Enviro-Systems of Utah, LLC
- ETD Incorporated
- Helio Resources, Ltd.
- iiná bá
- Intera Geoscience and Engineering Solutions
- Laramide Resources Ltd.
- Legarza Exploration
- Navajo Engineering and Construction Authority
- Navarro Research and Engineering
- Oxbow Environmental Engineering
- Rio Algom/BHP
- Rio Grande Resources
- Runyan Construction
- SC&A
- Tetra Tech
- General Electric - United Nuclear Corporation
- Weston Solutions
- Western Water & Land
- Westwater Resources (formerly Uranium Resources)
- Woodard & Curran (formerly TREC, Inc.)

Mixing Methods

Mixing Methods

Quantitative Data

- Economic impact
- Generalizations about workforce needs and capacity
- Numbers of certified workers in New Mexico
- Cost estimates for mine cleanup
- Businesses holding required licenses within New Mexico

Qualitative Data

- Concerns among stakeholders about the cleanup process
- Assets and needs of workforce training programs
- Ways to improve communication and collaboration across institutions
- Experiences of stakeholders engaged in the cleanup process

Discussion

Discussion

The complicated nature of generating data requires time, research, and input from experts.

Without combining qualitative and quantitative methods, we would not be conducting a study that represents all stakeholders well.

Thank You!

Contact:

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