Consider Relocation as a Remediation Option

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Northeast Oklahoma is home to the nation's No. 1 environmental problem site. And now, finally, after many years of frustrating results and no real solution in sight — a relocation option is among remedies being considered to address the existing concerns and minimize or eliminate future problems.

The Tar Creek Superfund Site in far northeastern Oklahoma consists of a 40-square mile area (which encompasses five small mining communities) that was mined heavily for lead and zinc from 1891 until early 1970. Mining companies employed the room-and-pillar method whereby large amounts of material were excavated from underground and moved to the surface for processing. Over the mining period, more than 1.7 million tons of lead and 8.8 million tons of zinc were removed from the Picher field alone. At some point during this time, the area was the leading producer of lead and zinc in the United States supplying nearly 27 percent of the nation's lead and zinc products.

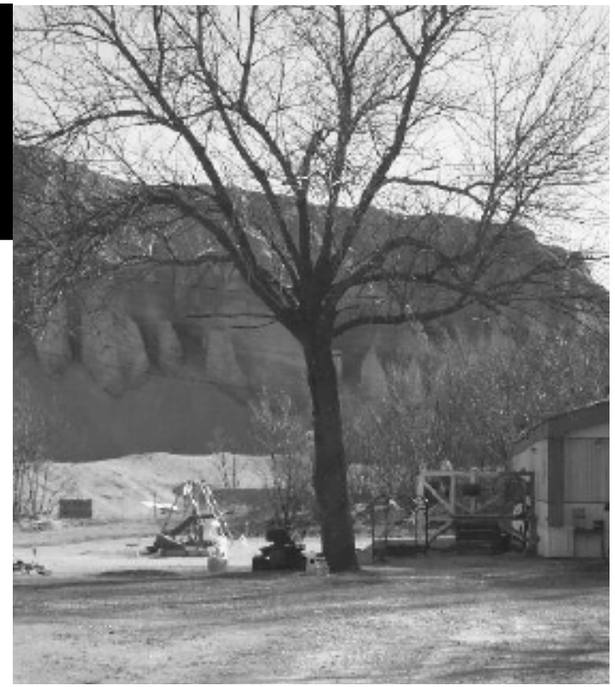
The mining activity, however, left many hazards on the land:
- 300 miles of underground tunnels
- 165 million tons of tailings ("chat") piles spread over the entire site
- Over 1,320 mine shafts
- Thousands of drill holes

As surface water runoff filled the tunnels, mine shafts, drill holes, and ran off of the chat piles, sulfide minerals in the strata dissolved creating acid mine water. This acid mine water contains high concentrations of heavy metals including lead, cadmium and zinc. The first of the problems became evident in 1979 when acid mine water began discharging into Tar Creek from natural springs, boreholes and open mine shafts.

The site was proposed for inclusion on the Superfund National Priorities List (NPL) in 1981 and was listed on the original list in 1983. Early efforts associated with remediation included attempts to control mine seepage (operable unit 1 – acid mine water discharge and protection of regional water supply aquifer). The results of these efforts were disappointing. One sign of more problems came from a study in 1993 which showed that blood lead levels (BLL) were above regulatory limits in an alarming percentage of the children in the area.

The cleanup focus changed to addressing lead exposure. EPA created operable unit 2 (OU2) primarily for residential areas. Under OU2, soil and sod have been removed from the yards of nearly 2,000 residences, churches, schools, day care centers, recreation areas, and other high access areas. And although OU2 has achieved documented success, it is already evident that the notorious Oklahoma winds blowing toxic dust from the chat piles will recontaminate these areas.

The chat piles remain a major source of lead exposure and are literally everywhere including in backyards, near schools and playgrounds, and surrounding residential and commercial areas. Ironically, in an effort to reduce the amount of chat in piles, local officials have used the tailings to improve county and municipal roads. The method used to "pave" the roads, however, did not fully encase the chat. As a result, vehicle traffic creates more and continuous dust sending the airborne toxins all over already contaminated areas.



Local officials have created intensive child hygiene programs in an effort to reduce lead exposure. The primary cause of high BLL has been determined to be direct ingestion. Imagine a baseball or basketball rolling across a dusty road and then being held in the hands of a young child. What's on that hand inevitably ends up in the mouth.

The seriousness of the problem caused the governor of Oklahoma to create a task force in 2000 to study the site and develop recommendations. The task force created eight subcommittees to study and develop recommendations for specific areas including:

- Health effects – from exposure to heavy metals
- Mine shafts – open or poorly sealed
- Subsidence – "settling" areas or "sink holes" due to cave-in of underground tunnels and mines/mine shafts

- Chat – large piles of mine tailings
- Drainage and chronic flooding – poor community overall drainage problems
- Water quality – continuing contamination of waters
- Native American issues – as 80 percent of the land within the Superfund site is owned by tribal members
- Natural Resource Damage Assessments – slow progress on related claims

The main resulting recommendation from the task force was:

To establish a world-class wetlands area and wildlife refuge within the boundaries of the Tar Creek Superfund Site that will serve as an ecological solution to the majority of the most pressing health, safety, environmental and aesthetic concerns.

Associated with this recommendation is the relocation of residents in the Oklahoma communities of Picher and Cardin which total approximately 800 residences, schools, churches and businesses.

The relocation or "buy-out" option has been extremely controversial with residents, politicians and the general public. Many believe that public funds should not be spent for this type of activity and continue to support appropriation of funds for the various clean up options. Others argue that relocation of residents and construction of wetlands make the most sense because of the perceived fiscal and physical futility of an eventual complete clean up (more than $100 million has already been spent on clean up). Meanwhile, EPA has created additional operable units to address other problems at the site. Further testing of children has shown a decrease in the percentage with BLL above acceptable standards but it is still well above the national average. This indicates that the residential yard replacement program and other measures instituted have helped but not solved one of the problems. Some residents argue that until the chat piles are removed, BLL will never decrease to acceptable levels because of the constant exposure from multiple sources.

New water supply wells have been drilled to provide acceptable quality water for area residents while others are being plugged to prevent downward migration of the acid mine water.

In May 2003, some of the differing opinions of options became evident as politicians aligned themselves with various issues at public meetings at the site. The relocation of the Picher and Cardin residents was a major topic of discussion and the issue remains highly emotional and very political. As with any relocation project, some residents want to be relocated to avoid the hazards present in the area while others did not want to be displaced from their homes and the history and heritage of their communities.

In early June 2004, the Governor of Oklahoma signed a "voluntary" relocation bill that pays to relocate families that have lived in the area since December 1, 2003 that wish to move, and are either expecting a baby or have a child age 6 or younger. The bill contains $5 million with which to perform the relocation activities that will benefit homeowners, renters and landlords. All involved parties are anxious to see what kind of participation the bill generates and how well things work.

However, the voluntary relocation bill is not the final outcome for this site. It is only a measure that addresses a portion of the problems and the ultimate solution is yet to be determined. But relocation will be considered as a strong option and is probably dependant on the results of the voluntary relocation bill recently signed.

While the environmental buzzwords today in the right of way business are brownfields, mold, and other hazardous materials (asbestos, hydrocarbons, PCBs, etc.), relocation is a tool that can often be an alternative or integrated among other remediation measures. In certain instances, relocation makes perfect sense both from an economical and technical standpoint and should clearly be considered.

Who knows this project could be the start of anew market for relocation service companies. ❖

REFERENCES

Governor Frank Keating's Tar Creek Superfund Task Force Final Report, Office of the Secretary of Environment of the State of Oklahoma, October 1, 2000

Tar Creek EPA Region 6 Superfund Update Report, Environmental Protection Agency, March 5, 2003