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A Clash Over Mining and Water

By ERICA GIES

SAN FRANCISCO — A plan to dig a vast copper mine in arid southern Arizona is pitting the needs of American industry — and arguably the national economy — against a coalition of local residents and environmentalists.

Opponents say the mine will destroy an area of outstanding ecological importance and, perhaps more important, threaten the area's most valuable resource: Water.

Both sides are actively lobbying the U.S. regulators who will determine whether the project goes ahead.

Rosemont Copper, a subsidiary based in Tucson, Arizona, of the Canadian company Augusta Resource, hopes to build the open-pit mine and a mineral processing facility about 30 miles, or 48 kilometers, southeast of Tucson in Pima County, Arizona.

Kathy Arnold, Rosemont's vice president of environmental and regulatory affairs, said the company planned to process 75,000 tons of ore per day, producing more than 600,000 pounds, or 270,000 kilograms, of copper per day, as well as molybdenum and some silver, and creating about 400 local jobs.

Defending itself against environmental critics, Rosemont says that copper is a key ingredient in the clean-energy economy, used in hybrid cars, solar panels, [wind turbines](#), and transmission and distribution lines. And Arizona is already an important source of U.S. copper, supplying 63 percent of the nation's domestic production in 2010 and meeting demand for 40 percent of its consumption, according to the Copper Development Association, a U.S industry lobby group.

Mining is typically a water-intensive endeavor, but Rosemont says technologies it plans to use would require only half as much water as a conventional mine. The pit would be one of the nation's largest copper producers, "and, yet, it will have one of the smallest footprints of any of the currently

operating open-pit mines in the United States,” Ms. Arnold said.

The mine’s operations would cause “no net loss of water” to the local ecosystem, she added.

Local conservation organizations dispute that, contending that the operation would draw down the wells of local farmers and residents, change the region’s hydrology, increase air pollution and traffic, and possibly contaminate groundwater.

Rosemont plans to use a method for producing and storing waste from the pit called dry-stack tailings.

Tailings are the mounds of crushed rock, mixed with trace amounts of chemicals, that remain after ore is processed. Conventional tailings are mixed with water and stored as a slurry, about 50 percent liquid, Ms. Arnold said. Rosemont’s dry-stack tailings, with most of the water squeezed out and recycled, would be only about 15 percent moisture.

The dry-stack technology is intended to conserve water — the company says it would recycle 85 percent of all water it used — and keep pollution from seeping into the ground. A filtering process would remove the chemicals used for treating the ore.

Still, Roger Featherstone, director of the Arizona Mining Reform Coalition, said in an e-mail, the trace remains of heavy metals and sulfur naturally occurring in ore-bearing rocks “are virtually impossible to remove.”

“Even if Augusta did a good job of it, the sheer mass of the tailings leave enough heavy metals to cause pollution to migrate into surface and groundwater,” he said.

The mine is planned for the east side of the Santa Rita Mountains in what is known as the “Sky Islands” wildlife habitat, where mountains jutting up from a plateau create isolated pockets with diverse plant and animal life. The area also includes the Davidson Canyon Wash and Cienega Creek, unusual and sensitive wetlands. Altogether the area is home to 10 threatened and endangered species, while the wetlands are designated by the state as “Outstanding Arizona Waters,” a category that affords them the highest protection under the U.S. Clean Water Act.

Also at risk of disturbance would be more than 60 sites sacred to the Tohono O’odham American Indian nation, including some with human remains.

Pima and Santa Cruz Counties bring in about \$2.95 billion annually from recreation and ecotourism, according to a 2008 study by the Sonoran Institute, a land-use advocacy group based in Tucson.

The boards of supervisors of both counties have passed unanimous resolutions against the proposed mine, as have the mayor and City Council of Tucson. Also against it are U.S. Representative Raúl M. Grijalva and farmers, hoteliers, and other business owners in nearby towns, including Sahuarita, Sonoita, Elgin, Patagonia, and Green Valley.

Among the objections listed by the project's opponents are the increase in truck traffic and the effects on views, air quality, and tourism. But the most important issue is the risk to water.

"In Southern Arizona, the most important resource is water, not copper," said Gayle Hartmann, president of Save the Scenic Santa Ritas, a local environmental advocacy group.

Water concerns recently prompted the regional office of the U.S. Environmental Protection Agency to send strongly worded letters to the U.S. Army Corps of Engineers, which is considering a permit to allow the mine to fill nearby washes with rock, and the U.S. Forest Service, the lead agency on the project because most of the 4,755-acre, or 1,924-hectare, mine site would be on land within the Coronado National Forest.

In its letter to the Forest Service, the Region 9 office of the E.P.A., in San Francisco, gave Rosemont's environmental impact statement on the project its lowest possible rating. Its letter to the Army Corps of Engineers warned that permit approval would have "substantial and unacceptable impacts to aquatic resources of national importance."

In a phone interview this month, Jason Brush, wetlands office supervisor for EPA Region 9 said: "They're planning direct fill of 40 acres and some 150-odd individual stream drainages on site." Although these were dry most of the time, they filled with water when it rained, he said.

"These are very large impacts," Mr. Brush said. Rosemont "don't have adequate alternative analysis of impacts to surface and groundwater, they don't have an analysis of the impacts to endangered species and they don't have a mitigation plan," he added.

The use of dry-stack tailings is untested in the conditions of the Santa Rita area. "This method of tailings disposal has never been done in the dry desert climate of Arizona," said Mr. Featherstone,

of the mining reform coalition. “For Augusta, a company that has no track record of operating any kind of mine, to use an experimental technique is problematic,” he added. “The chance for disaster is too high.”

In addition, the tailings would not stay dry, he said. The mine’s critics say rain would be likely to infiltrate, leaching toxic pollutants into the groundwater.

Ms. Arnold disagreed, saying that with 16 to 18 inches of rain a year and 72 inches of evaporation, “you always have a deficit of water, a loss.”

But Thomas Meixner, an associate professor of hydrology at the University of Arizona who reviewed separate groundwater models created for both Rosemont Copper and Pima County, disputed that assertion. “Annual evaporation does vastly outstrip precipitation,” he said. “But it’s all a question of timing. We can get two inches during summer rainstorms.

“That water can percolate pretty deep into the soil,” Mr. Meixner said, “and is likely to continue percolating through.”

Mr. Meixner said he was skeptical about the claim that no water would drain through the tailings. “I would prefer to see them support that statement with observations at existing tailings in similar climates — which don’t exist,” he said.

To achieve no net water loss in the local ecosystem Rosemont proposes to compensate for the approximately 1.6 billion gallons, or 6 billion liters, that it plans to use annually by buying water from the Central Arizona Project, an aqueduct that diverts water from the Colorado River to central and southern Arizona, and injecting it into the ground near its proposed project. But perhaps not near enough, critics worry.

In a trial program, Rosemont “were recharging water north of here, in the Avra Valley,” said Ms. Hartmann, noting there was no pipeline to the proposed mine site. “Water here flows north, up toward the Gila River, so this water was going out of the area.”

Even the environmental impact statement says nearby wells would see some drawing down. “They’re making it very difficult for people in those areas to survive,” said Ms. Hartmann. Another concern is the pit that the mine would create by digging ore, more than a mile wide and a half-mile mile deep, according to the environmental impact statement. “That hole creates a cone of

depression, a low point, where all the groundwater is going to flow instead of moving out through the network that used to be there,” Mr. Brush said. “It’s like when you dig a hole in the sand at the beach and it fills with water.” The pit would be likely to draw water away from Davidson Canyon Wash and Cienega Creek, according to both Mr. Brush and Mr. Meixner. The Forest Service and the Army Corps of Engineers are reviewing thousands of public comments before deciding how to proceed.

Rosemont hopes to be able to start digging by the end of this year.

Ms. Hartmann says she hopes the government will stop the project cold.

“The copper will go to China, the profits will go to the investors, and we’ll get left with a massive hole in the ground,” she said. “And, very likely, toxics in our groundwater.”