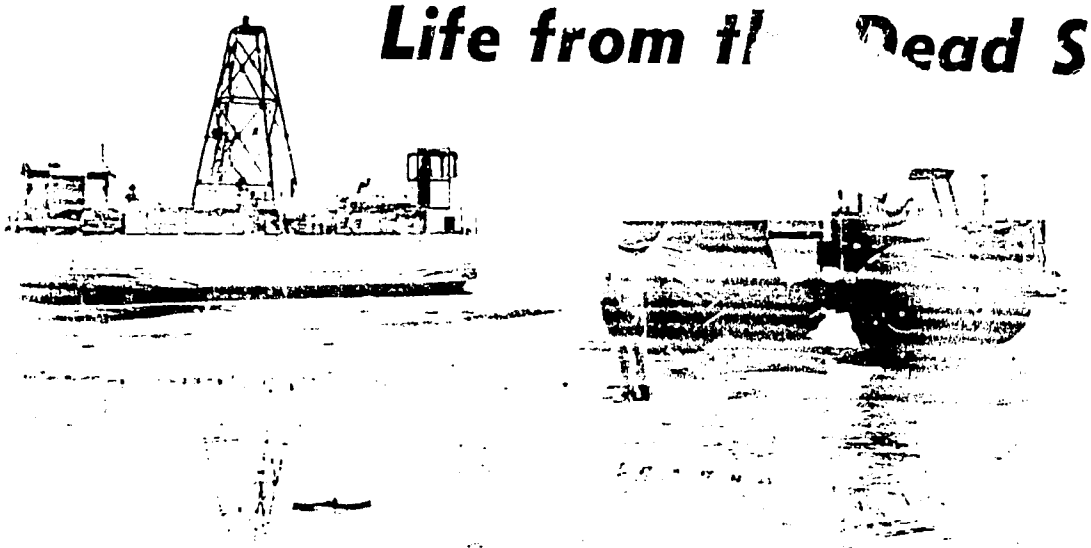
Life from the Dead Sea



SPACE-AGE TECHNOLOGY HELPS U.S. ENGINEERS MINE POTASH BY THE DEAD SEA IN JORDAN

AID finances potash project in Jordan

Story and photos by Kay Chernush

Under the searing desert sun a drilling rig on an outsize platform moves over primeval land—a foot and a half above the surface.

The walls of an earthen dike, starting nowhere and seemingly going nowhere, slope up from layers of salt crust.

Not far from the mountains of Moab and the place where Sodom and Gomorrah once stood loom several rows of neat, prefabricated bungalows.

It's no mirage or setting for a science fiction tale on a distant planet. Rather, it's part of a multimillion dollar pilot project to extract life-giving potash from waters of the Dead Sea in Jordan.

The desolate stillness is broken by the crackle of a walkie-talkie. A relaxed Texas drawl suddenly makes the scene very real.

This is no conventional mining process. What distinguishes it from the usual mining sights and sounds is the use of solar evaporation to achieve the final product—potash, a crucial mineral for fertilizer.

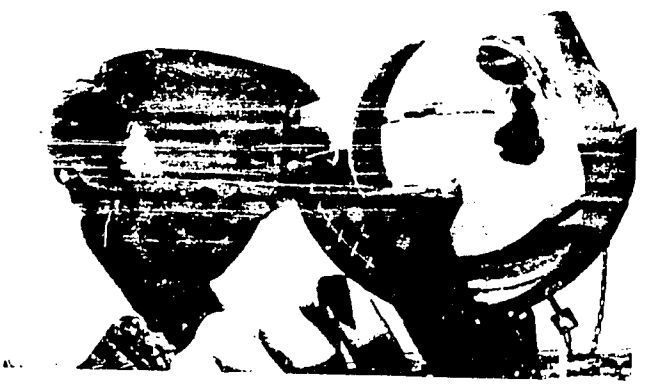
Financed in part by AID, the project holds the promise of a new export industry for the desert kingdom. Jordan has nearly three million people, hardly any natural resources and a need for foreign exchange earnings.

Nolan "Al" B. Allison, who oversees things for the Houston-based contractor, Brown & Root, says the project is one of the most challenging he has ever worked on. After putting up a well-equipped air-conditioned village "in the middle of nowhere" for more than 100 workers, Allison has built several trial dikes on terrain that is either brittle salt crust or mud impossible to walk on without sinking.

"We're working at the lowest spot on Earth's surface—1,300 feet below sea level. It's a difficult environment," remarks the soft-spoken Texan, gazing out over the barren landscape.

That is something of an understatement. He also has to contend with flash floods, sand storms, blistering temperatures of up to 130 degrees and land mines left over from past fighting in the area. But neither the hardships nor the dangers have fazed the men charged with determining the best way to set up a commercially viable potash operation.

Because of the unusual terrain, project engineers have turned to space-age technology and unusual equipment. To take core samples, Allison explains, their drilling rig is fastened to a "hover pontoon." This is a platform that lifts itself up on a cushion of air and is pulled over the mud flats from site to site by a vehicle with enormous balloon-like tires.



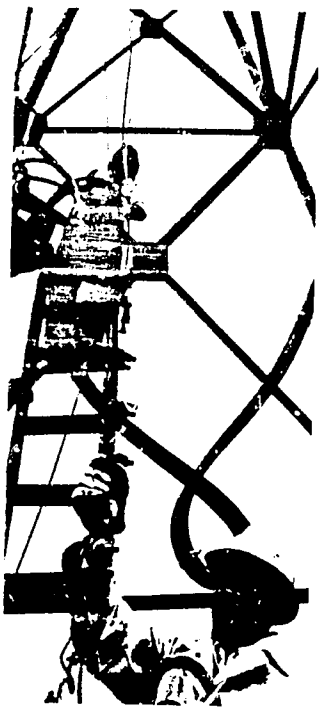
While Nature posed nothing but headaches for the civil engineers and builders, the chemical engineers are making Nature work for them. "The high temperatures and more or less constant wind down here make this southern area of the Dead Sea very adaptable to solar evaporation," says Donal O'Callaghan of Jacobs International, a California firm responsible for establishing the chemical procedures.

O'Callaghan has set up an experimental station next to Trial Dike 2, where he is meticulously monitoring meteorological conditions and testing concentrations of brine. In just a few short months he has "manufactured," in small-scale evaporation pans, a ton and a half of carnallite, which has been sent to the States for further testing and refining into potash.

Ultimately a number of dikes will crisscross a 70-square-kilometer area, forming evaporation ponds many kilometers wide to hold the briny waters.

"Basically it's a three-stage process," O'Callaghan explains. "As the water evaporates the salt precipitates and carnallite crystals form. When we're a full-scale operation the carnallite will be scraped off the bottom of the pans by harvester machines and piped to the refinery, which extracts the potash."

Using solar evaporation, he quickly adds, "is what makes the whole thing economically feasible. The sun is one thing Jordan has plenty of!"



U.S. engineer Donal O'Callaghan (above, left) oversees the AID-financed experimental potash station. Americans (above) are working by the Dead Sea to extract potash, via solar evaporation, from salt brine. Hovercraft (below) help the U.S. engineers get about the extremely soft mud terrain of the site.