

## Video Transcript

### Phosphate Mining Video

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- Speaker 1: Of all the many elements drawn from nature, there is one who may not know much about: phosphorous. And while phosphorous isn't a word you hear very often, it's something plants, animals, and people need every day.
- Speaker 1: Look at it this way: What do all these things have in common? Phosphorous. Phosphorous moves energy around the plant and makes photosynthesis possible. What's the most important role of phosphorous? Feeding the world. Phosphorous works with other nutrients to grow healthy plants. These nutrients are found naturally in the soil but are often not plentiful enough. As farmers well know, a lack of phosphorous can be bad news.
- Speaker 1: Phosphorous is the backbone of DNA, the genetic blueprint contained in every living cell, and it plays a vital role in the way living matter provides energy in cells. When phosphate is lacking in soil, food crops simply can't grow as they should.
- Speaker 1: That's when farmers turn to fertilizers, made from one of our nation's largest natural resources. These fertilizers increase the yield and quality of our nation's and the world's crops. In fact, fertilizers have increased our food supply by 50%.
- Speaker 1: But where does phosphate fertilizer come from? The largest phosphate deposits in North America lie in the Bone Valley region of central Florida. In fact, Florida's phosphate mining accounts for about two-thirds of the phosphate used in the United States, as well as about 15% of the phosphate used around the world. But significant phosphate deposits can also be found in Georgia, Idaho, North Carolina, Montana, Tennessee, Wyoming, South Carolina, and Utah.
- Speaker 1: So, how did these phosphate deposits get there? That's another story, a very old one. Scientists believe that these large phosphate deposits formed from the skeletons and decomposition from sea creatures living in the seas during the Miocene Period more than 20 million years ago. At that time, large portions of the United States were covered by the ocean, but as the seas retreated, this prehistoric muck transformed over time to become phosphate rock. In effect, much of the food that we eat today comes to our dinner tables courtesy of animals that lived millions of years ago. Thanks, guys.
- Speaker 1: Of course, these prehistoric sea creatures didn't exactly make it easy for us to make use of their ancient gift. From mine to manufacturing to farm and ultimately your dinner table, the process of creating usable phosphate fertilizer is complex. It begins at the mine, where getting phosphate rock out of the ground comes in a very big way.
- Speaker 1: Take a look at this amazing machine. It weighs seven million pounds and can carve out over 75,000 tons of material a day. But before the job can begin, workers first have to get it into position. This gigantic machine is equipped with two giant mechanical feet that allow it to move. Once it's in place, it's time to begin.
- Speaker 1: The enormous bucket does the heavy lifting. It's big enough to hold a car, weighs 110,000 pounds, and is secured by 10 four-inch-thick steel chains. With a touch of the

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controls, this bucket can dig up over 140,000 pounds of a mixture called matrix, which consists of sand, clay, and phosphate. Then workers behind joystick controllers hydroblast it in a sort of high-tech video game that comes to life. This creates a milkshake-like consistency of materials that can be pumped to a processing plant.

Speaker 1: At the plant, the matrix is separated through another high-tech process. The phosphate rock is transported from here to a fertilizer manufacturing complex. The sand and clay are pumped back to the mine site for use in an ongoing land reclamation process.

Speaker 1: In fact, once the mining is finished, this land is carefully restored and reclaimed back into beautiful and high-quality ecosystems. Reclaimed lands may be used for commercial or agricultural uses or even for development. Land reclamation displays the magic of science and Mother Nature as plants, birds, and other wildlife reestablish a thriving presence.

Speaker 1: Meanwhile, back at the fertilizer plant, phosphate rock is ground and mixed with water and pumped to an area where it reacts with sulfuric acid to form phosphoric acid, the basis for all phosphate fertilizers. Next, the phosphoric acid is combined with anhydrous ammonia to produce the fertilizer. The fertilizer then makes its way to distributors, serving farms across the United States and the world, where the essential element of phosphorous helps each little plant grow. Energy within the plant cell is created and crops thrive because of phosphorous.

Speaker 1: It's an amazing story that begins with sea creatures millions of years old and takes us from the mine to the farm and then to your dinner table. Working in unison with other nutrients, this incredible element is crucial to feeding the world's population of over seven billion people. Phosphorous: a word you don't hear very often, but an essential nutrient to feeding the world.