

FERTILIZERS

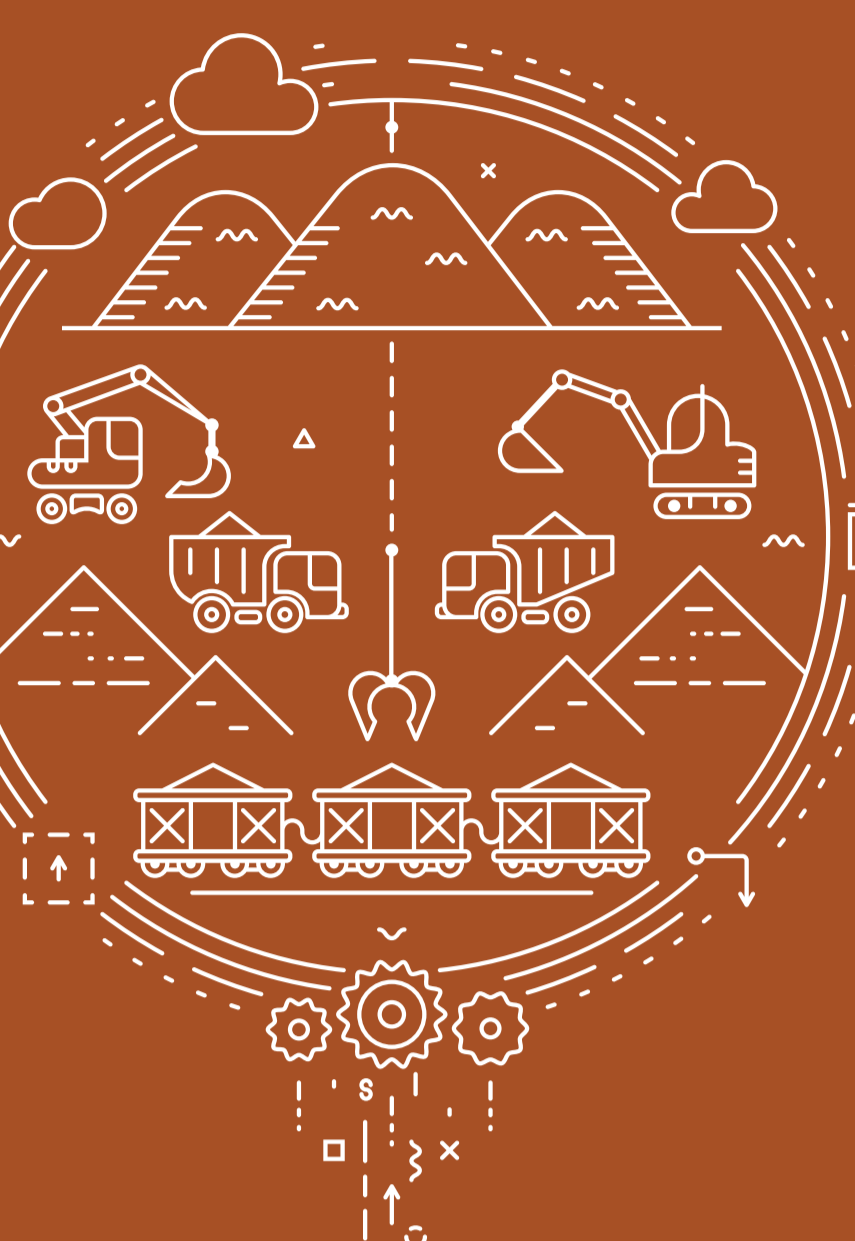
How Mining Drives a Growing Industry

More than 200 million tons of nitrogen, phosphate, and potash/potassium fertilizers are produced each year to fuel the world's food supply. From locating specific minerals to reusing mined land to ensuring fertile farmland for growers, analytical testing solutions ensure quality fertilizers and agrochemical blends.

THE AGROCHEMICALS MARKET WILL GROW TO \$328 BILLION BY 2026*

THE FERTILIZER MARKET WILL REACH \$225 BILLION BY 2026*

*Research Dive Press Release, "Global Agrochemicals Market to Reach \$328 Billion by 2026"



PREFERRED TECHNOLOGIES

- | | | | |
|------------------|----------|----------------|---------------|
| 1 AAS or ICP-OES | 4 IR | 7 MQ-ICP-MS*** | 10 HPLC/UV |
| 2 UV/Vis | 5 GC/FID | 8 ICP-MS | 11 GC/FID/ECD |
| 3 GC/MS | 6 LPC** | 9 LC/MS/MS | 12 GC/FPD |

**Liquid particle counter
***World's first multi-quadrupole ICP-MS (four quadrupoles)

EXPLORATION

Researchers seek out high-quality Ores of phosphate and potash.



- 1 2 3 4 5 6
7 8 9 10 11 12

MINING

Minerals are brought to the surface using solution process or conventional mining and processed to separate potassium or phosphate into a unique product for fertilizer.



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MANUFACTURING

Phosphate and potash minerals are refined, processed, and blended for crop nutrition and for sale into advanced manufacturing processes.



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TRANSPORTATION

Raw materials, phosphate, potash and finished fertilizers are transported by train, truck, barge, and ship. Heavy transport machinery and vehicles require in-service lubricants analysis.



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ADVANCED MANUFACTURING

A wide range of applications are incorporated into advanced manufacturing, from R&D, production, and formulation testing to environmental management to employee health monitoring.



- 1 2

RECLAMATION AND RUNOFF

Environmental assessment and testing for contaminants that come about as result of mining operation. Transform mining zoning site to other uses.

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FARMING AND SOIL TESTING

Farmers must choose the right fertilizer, so they use contract and government labs for agronomy, fertility, and soil science; hydro-agriculture and organic soil-amendment management; and water quality assessments related to agricultural runoff.



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