

## Metals/Minerals/Phosphates

### Phosphate Fertilizer Representative Experience Project List

Project Title	Area	Client	Location	Scope of Work	Capital Cost (USD)	Dates
Riverview DAP6 Micronutrient Hydrogel Enhanced MAP Granulation Plant Conversion	Granulation	Mosaic	USA	FEL2, 3	\$30M	2022-current
100,000 tpa Purified Phosphoric Acid Plant	Phosphoric Acid	Confidential	Confidential	FEL1, FEL2, FEL3	\$400M	2022-current
Phosphate Rock Calciner Replacement Project	Rock/Beneficiation	Nutrien	USA	FEL1, FEL2, FEL3	\$750M	2022-current
Phosphoric Acid Technology Development Project	Phosphoric Acid	Confidential	Confidential	Business/Technical Study, Laboratory	n/a	2022-current
Phosphoric Acid Pond Water Double Lime Treatment Project	Phosphoric Acid	Mosaic	USA	FEL2, FEL3, FEL4	\$10M	2022-current
Micronutrient Enhanced MAP Granulation Plant Conversion Options Study	Granulation	Mosaic	Brazil	FEL2	\$80M	2022
20K tpa Novaphos Phosphoric Acid Plant Project	Rock/Beneficiation/Phosphoric Acid	Novaphos	USA	FEL1	\$75M	2022-current
MAP2 Pipe Reactor Project	Granulation	Nutrien	USA	FEL2, FEL3	\$20M	2022-current
Phosphoric Acid Railcar Wash & Collection System	Phosphoric Acid	Nutrien	USA	FEL2, FEL3, FEL4	\$30M	2021-current
Supplemental Resources for Phosphate Opportunity Capital Projects	Beneficiation, Sulfuric Acid, Phosphoric Acid, and Granulation	Mosaic	USA	Business Case Development	n/a	2022-current
South Fort Meade Phosphate Mine Eastern Extension Project	Mining/Rock	Mosaic	USA	PMC, Construction Management	\$550M	2021-current
Phosphate Rock Impurity Technology Development Project	Phosphoric Acid	Confidential	USA	Technology Assessment, FEL1	\$300M	2021-current
Serra do Salitre Phosphate Complex Project	Beneficiation, Sulfuric Acid, Phosphoric Acid, and Granulation	Eurochem	Brazil	Business/Technical Study/Engineering Support	\$400M	2021-2022
Riverview DAP5 Micronutrient Enhanced MAP Granulation Plant Conversion	Granulation	Mosaic	USA	FEL2, FEL3, FEL4	\$50M	2021-current
Sulfuric Acid Capacity Evaluation & Single Super Phosphate Plant Design	Granulation	Zimplats	Zimbabwe	Business/Technical Study	n/a	2021-2022
Micronutrient Enhanced MAP Granulation Plant Conversion, 500k tpy plant conversion	Granulation	Mosaic	Brazil	FEL2	\$150M	2021-2022
Phosphate Mine and Beneficiation Plant, 1M tpa concentrate	Rock/Beneficiation	Hinda Phosphate	Congo	FEL3	\$400M	2020-2021
Impurity Removal Process for Phosphate Rock Concentrate Demo Plant	Rock	Eurochem	Russia	Process Study	n/a	2021-2022
Phosphate Beneficiation Plant Debottleneck Project	Beneficiation	Miski Mayo	Peru	FEL2	n/a	2021-2022

Sulfur Melter Plant Project, 500k tpy greenfield plant design	Sulfur	Mosaic	USA	FEL2	\$70M	2021
Calcium Nitrate Fertilizer Production Plant	Other	Yara	USA	FEL4, Process Study	n/a	2002
Phosphoric Acid Sludge Consumption Project	Phosphoric Acid/Granulation	Mosaic	USA	FEL2, FEL3, FEL4	\$10M	2020-2022
Phosphoric Acid Plant, FSA Recovery System Design	Phosphoric Acid	Itafos	USA	FEL3, FEL4	\$15M	2020-2022
Granulation Plant DAP Product Quality Study	Granulation	Ma'aden (MPC)	Saudi Arabia	Process Study	n/a	2020
Phosphoric Acid Hemihydrate Conversion Project	Phosphoric Acid	Nutrien	USA	FEL1	\$25M	2021
Phosphoric Acid Purification A2G Membrane Filtration Plant	Phosphoric Acid	Nutrien	USA	FEL3	\$20M	2021-2022
Micronutrient Enhanced MAP Granulation Plant, 1M tpy greenfield plant design	Granulation	Confidential	Confidential	FEL2	\$240M	2020
Phosphate Rock Processing, Pilot Plant Technical Support	Rock	Novaphos	USA	Phosphate & Pyro Technical Support	n/a	2017-2022
Phosphogypsum Decomposition Study	Phosphoric Acid	Mosaic	USA	FEL1	\$250M	2019-2020
Rare Earth Element Extraction from Phosphogypsum	Phosphoric Acid	Mosaic	USA	FEL1	\$200M	2019-2020
Magnesium Ammonium Phosphate Granulation Plant Conversion	Granulation	Ostara	USA	FEL3, FEL4	\$50M	2018
Salitre Phosphate Beneficiation Recovery Project	Beneficiation	Yara	Brazil	FEL3	\$100M	2019-2021
Phosphoric Acid Plant Pocatello Alternate Cooling Project	Phosphoric Acid	JR Simplot	USA	FEL2, FEL3, FEL4	\$30M	2019-current
Phosphoric Acid Plant Rock Springs Beville Project	Phosphoric Acid	JR Simplot	USA	FEL2, FEL3	\$30M	2020-current
Phosphoric Acid Plant Evaporators (#1 & #2 Evaporators) Replacement Project	Phosphoric Acid	Mosaic	USA	FEL3, FEL4	\$5M	2020-2022
Phosphoric Acid Membrane Filtration Purification Demonstration Plant	Phosphoric Acid	Nutrien	USA	FEL1, FEL3, FEL4, CM	\$12M	2019-2022
Sulfur Enhanced MAP Granulation Plant Conversion, Y-Train Plant	Granulation	Nutrien	USA	FEL2	\$12M	2020
Sulfur Enhanced MAP Granulation Plant Conversion, MAP3 Plant	Granulation	Nutrien	USA	FEL2	\$15M	2020
Phosphoric Acid Alternate Process Water Cooling Project	Phosphoric Acid	Mosaic	USA	FEL4, CM, Commissioning	\$50M	2018-2021
Amine Phosphate Tailings Recycle	Beneficiation	Mosaic	USA	FEL3	\$3M	2019
Sulfur Melter Plant Improvement Project	Sulfur/Sulfuric Acid	Mosaic	USA	FEL1, FEL2	\$20M	2019-2020
Process Water Spray Evaporation Systems	Process Ponds	Mosaic	USA	FEL3, FEL4	\$7M	2019-2020
Phosphate Mine Expansion Project Field Sled and 69KV Power Lines	Rock	Mosaic	USA	FEL4	\$12M	2019-2021
Phosphate Chemical Complex Plant Water Balance Study & Improvement Project	Other	Mosaic	Brazil	Process Study	n/a	2019-2020
Monocalcium Phosphate Animal Feed Granulation Plant, 500k tpy greenfield plant design	Granulation	Nutrien	USA	FEL1	\$100M	2019

Sulfur Enhanced Potash Granulation Plant Conversion	Granulation	Nutrien	USA	FEL1	\$15M	2019
Sulfur Enhanced MAP Granulation Plant Conversion, Z-Train Plant	Granulation	Nutrien	USA	FEL1, FEL2, FEL3, FEL4, Commissioning	\$10M	2017-2019
Phosphate Rock Testing, Process Support	Rock	Rotem	Israel	Process Support	n/a	2018
Phosphogypsum Stack Decant Water Pumping Systems	Phosphoric Acid	Nutrien	USA	FEL3	\$1M	2018
Phosphate Mine Clay Transport and Distribution	Beneficiation	Nutrien	USA	FEL1	\$37M	2018
P2O5 Recovery Double Filtration & Phosphogypsum Stacking Improvement Study	Phosphoric Acid	Ma'aden (MPC)	Saudi Arabia	FEL1, FEL2	\$120M	2018-2020
Ammonium Sulfate Plant Evaluation & Due Diligence Study	Other	TRP	USA	Technical Due Diligence	N/A	2018
Phosphoric Acid Oxidation Reactor Scrubber Projects	Phosphoric Acid	Itafos	USA	FEL3, FEL4	\$500k	2018
Phosphate Rock Processing, Plant Design	Rock	Novaphos	USA	FEL1	\$10M	2018-2019
Phosphoric Acid Process Water Neutralization Project	Phosphoric Acid	Nutrien	USA	FEL1, FEL2, FEL3, FEL4	\$10M	2017-2019
Process Water Neutralization Project	Process Ponds	Nutrien	Canada	FEL1	\$30M	2018
Phosphoric Acid Cooling Pond Improvement Study	Phosphoric Acid	Mosaic	USA	FEL2	\$45M	2017
Phosphoric Acid Process Water Neutralization System	Phosphoric Acid	Nutrien	USA	FEL2	\$20M	2018
Phosphoric Acid Plant Resource Conservation Recovery Act Wash Project, White Springs Facility	Phosphoric Acid	Nutrien	USA	FEL1, FEL2	\$20M	2016-2017
Phosphate Rock Concentrate Port Expansion for Vessel Unloading Study	Rock	Confidential	USA	FEL1	\$100M	2017
Phosphate Chemical Complex Evaluation	Phosphoric Acid	IFDC	South Africa	Technical Due Diligence	n/a	2018
Granulation Plant Resource Conservation Recovery Act Wash Project, Riverview Facility	Granulation	Mosaic	USA	FEL2, FEL3, FEL4, CM, Commissioning	\$15M	2017-2021
Granulation Plant Resource Conservation Recovery Act Wash Project, New Wales Facility	Granulation	Mosaic	USA	FEL2, FEL3, FEL4, CM, Commissioning	\$29M	2017-2021
Phosphoric Acid Process Pond Water Heat Input System Project, Plant City	Phosphoric Acid	Mosaic	USA	FEL2, FEL3, FEL4	\$22M	2015-2017
Phosphoric Acid Plant Resource Conservation Recovery Act Project, Uncle Sam Tank Farm Scrubber	Phosphoric Acid	Mosaic	USA	FEL2, FEL3, FEL4, Commissioning	\$10M	2018-2021
Granulation Plant Tailgas Scrubber Replacement, Uncle Sam C-Train	Granulation	Mosaic	USA	FEL2, FEL3, FEL4	\$ 8M	2015-2017
Granulation Plant Granulator Upgrade Project, Uncle Sam C-Train	Granulation	Mosaic	USA	FEL2, FEL3, FEL4	\$4M	2015-2017
Micronutrient Enhanced MAP Twin Train Granulation Plant Conversions, New Wales	Granulation	Mosaic	USA	FEL2, FEL3, FEL4, CM, Commissioning	\$200M	2014-2017
Phosphoric Acid Plant Process Water Neutralization System	Phosphoric Acid	Nutrien	USA	FEL3, FEL4	\$8M	2015-2016
Phosphoric Acid Plant Process Water Blend Tank and Gypsum Pumping Systems Project	Phosphoric Acid	JR Simplot	USA	FEL1, FEL2, FEL3, FEL4	\$20M	2014-2016
Phosphate Chemical Complex Water and Fluoride Balance	Phosphoric Acid/Granulation	JR Simplot	USA	FEL1, FEL2	n/a	2015

Phosphoric Acid Plant Double Filtration Study	Phosphoric Acid	Nutrien	USA	FEL1	\$26M	2015
Granulation Plant Tailgas Scrubber Replacement Project, Riverview	Granulation	Mosaic	USA	FEL2, FEL3, FEL4	\$2M	2013-2015
Granulation Plant Dust Control Project	Granulation	Mosaic	USA	FEL2	n/a	2015
Phosphoric Acid Plant Expansion Project	Phosphoric Acid	Nutrien	USA	FEL1	\$40M	2015
Phosphoric Acid Plant Gypsum Pumping System Improvement Project	Phosphoric Acid	Nutrien	USA	FEL1	n/a	2015
Phosphoric Acid Plant Evaporator Condensate Collection and Reuse System Upgrade Project	Phosphoric Acid	Nutrien	USA	FEL3, FEL4	\$3M	2014-2015
Phosphoric Acid Plant Process Cooling Water Transfer Study	Phosphoric Acid	Nutrien	USA	FEL2	\$4M	2015
Fertilizer Dock Modification and Refurbishment Project, Louisiana	Material Handling	Mosaic	USA	FEL1, 2, FEL3, FEL4	\$19M	2013-2015
Uranium Recovery Study	Other	Urtek	USA	FEL2	\$113M	2014
Phosphoric Acid Plant Process Water Fluoride Emission Reduction Studies	Phosphoric Acid	JR Simplot	USA	FEL1	\$30-\$50M	2014
Phosphoric Acid Plant Process Water Cooling Pond Systems Study	Phosphoric Acid	Nutrien	USA	FEL1	n/a	2014
Phosphate Rock Transportation Study	Rock/Material Handling	Mosaic	USA	FEL1	\$200M	2014
Granulation Plant Structural Integrity Analysis	Granulation	Mosaic	USA	FEL2	\$3M	2014
Granulation Plant Cooler Optimization Study	Granulation	Mosaic	USA	FEL2	n/a	2014
Phosphoric Acid Plant Expansion Project, Rock Spring, WY	Phosphoric Acid	JR Simplot	USA	FEL1, FEL2, FEL3, FEL4, CM, Commissioning	\$134M	2012-2015
Phosphoric Acid Plant Reactor Modifications	Phosphoric Acid	JR Simplot	USA	FEL4	\$1M	2014
Sulfur Rail Improvement Project	Sulfur	JR Simplot	USA	FEL4	\$5M	2014
Phosphoric Acid Plant Controls Systems Migration	Phosphoric Acid	JR Simplot	USA	FEL4	\$2M	2014
Granulation Plant Rotary Cooler and Ammonia Vaporizer Project	Granulation	Mosaic	USA	FEL3, FEL4	\$11M	2012-2013
Phosphate Chemical Plant Drainage Control and Improvement Project	Other	JR Simplot	USA	FEL4	\$2M	2013
Phosphoric Acid Plant Hemihydrate to Dihydrate Conversion Project	Phosphoric Acid	Confidential	USA	FEL1	\$100M	2013
Fertilizer Truck Loadout Optimization Project	Material Handling	JR Simplot	USA	FEL2	\$5M	2013
Phosphate Fertilizer Dock Improvement Study, Mississippi River	Material Handling	Mosaic	USA	FEL2, FEL3	\$17M	2013
Phosphate Mine Optimization Study	Rock	Nutrien	USA	FEL1	n/a	2013
Granulation Plant Acid and Water Scrubber Circuit Improvement Study	Granulation	Mosaic	USA	FEL1	\$3M	2013
Fluorine By-products Study	Other	Ma'aden (MPC)	Saudi Arabia	FEL1	\$200M	2013

Phosphate Rock Transport Alternatives Study	Material Handling	Mosaic	USA	FEL1	\$300M	2013
Phosphate Rock Rail Transport Logistics Modeling Study	Material Handling	Mosaic	USA	FEL1	n/a	2013
Granulation Plant HMI Programming Project	Granulation	Mosaic	USA	FEL4	\$50k	2013
Phosphoric Acid Plant Process Fluids Collection and Recycle Study	Phosphoric Acid	Mosaic	USA	FEL1	\$20M	2013
Phosphoric Acid Plant Process Water Cooling Alternatives Study	Phosphoric Acid	JR Simplot	USA	FEL1	\$50M	2013
Phosphoric Acid Plant, FSA Recovery Study	Phosphoric Acid	JR Simplot	USA	FEL1	\$25M	2013
Sulfuric Acid Plant Water Treatment Study	Sulfuric Acid	Mosaic	USA	FEL1	\$20M	2013
Phosphoric Acid Plant Cooling Tower Elimination Project	Phosphoric Acid	JR Simplot	USA	FEL1, FEL2, FEL3, FEL4, CM, Commissioning	\$23M	2011-2013
Phosphoric Acid Plant Fluorine Balance and Fluorine Recovery Study	Phosphoric Acid	JR Simplot	USA	FEL1	\$27M	2013
Phosphoric Acid Demonstration Plant	Phosphoric Acid	Nutrien	USA	FEL2	\$1M	2013
Uranium Recovery from Phosphoric Acid Study	Phosphoric Acid	Confidential	USA	FEL1	\$200M	2013
Phosphoric Acid Plant Hemihydrate Expansion Project	Phosphoric Acid	Nutrien	USA	FEL2	\$9M	2012
Phosphate Chemical Complex Due Diligence and CAPEX Estimate	Phosphoric Acid/Granulation	Confidential	USA	Process Study	n/a	2012
Hemihydrate Phosphoric Acid Plant Production Study	Phosphoric Acid	Confidential	USA	FEL2	\$400k	2012
Ras Al Khair (RAK) Phosphate Chemical Complex Technical Assessment	Phosphoric Acid/Granulation	Ma'aden (MPC)	Saudi Arabia	Process Study	n/a	2012
Micronutrient Enhanced MAP Granulation Plant Conversion, Faustina	Granulation	Mosaic	USA	FEL2, FEL3, FEL4, Commissioning	\$80M	2011-2013
Granulation Plant Debottlenecking, 40% production increase	Granulation	Mosaic	USA	FEL2, FEL3, FEL4	\$9M	2010-2012
Granulation Plant Classification Circuit Upgrade Project	Granulation	Mosaic	USA	FEL2, FEL3, FEL4, Commissioning	\$7M	2011-2012
Phosphate Rock Unloading, Storage, Blending, and Load-out Project	Rock	Mosaic	USA	FEL2	N/A	2011-2012
Granulation Plant Debottlenecking, 40% production increase	Granulation	Mosaic	USA	FEL4	\$100k	2010-2011
Granulation Plant Debottlenecking and Expansion Study, Riverview	Granulation	Mosaic	USA	FEL1	\$100M	2011
Phosphoric Acid Plant Resource Conservation Recovery Act Scoping Study	Phosphoric Acid	Mosaic	USA	Process Study	\$100M	2011
Granulation Plant Resource Conservation Recovery Act Scoping Study	Granulation	Mosaic	USA	Process Study	\$100M	2011
Phosphoric Acid Plant Environmental Sustainability Study	Phosphoric Acid	Mosaic	USA	Process Study	N/A	2011
Phosphorus and Fluorine Process Water Discharge Study	Phosphoric Acid	Mosaic	USA	Process Study	N/A	2011
Phosphoric Acid Plant Due Diligence Study	Phosphoric Acid	Confidential client	USA	Process Study	N/A	2010