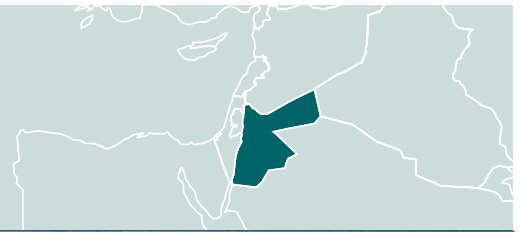


Arab Potash Company

Plant Optimization and Production Expansion - Phase 1



Jordan



Client

Arab Potash Company (APC)

Services Provided

- Feasibility study
- Market analysis

Dates

2003 - 2004

Project Data

- The project is carried out in 3 phases:
 1. development of the bankable feasibility study
 2. design development of the selected scenario
 3. supervision of construction during implementation
- Current APC potash (KCl) production capacity is 1.9 million t/y
- The refinery potash production capacity is to be increased to 2.45 million t/y in the first phase of the project and ultimately to reach 3 million t/y

- De-bottlenecking, optimization and expansion studies are based on actual measurements, production, and consumption data of the existing APC refinery, which have been collected in an earlier phase of the project
- Expansions of the APC product transport and storage facilities are evaluated, in addition to the plants and solar ponds optimization and expansion studies

Background

Conducting a technical and an economic feasibility study, as well as developing a model to determine the optimum ratio of the salt to carnallite pond areas are substantial; the model is used later to optimize the current configuration of the existing ponds system and expand it accordingly.

The expansion of the APC refinery and solar ponds system will be accompanied by the expansion of the storage warehouses at the Safi and Aqaba sites.

Main Features

- The APC runs a system of large solar ponds to produce potash from the Dead Sea water/brine
- The process starts at the Dead Sea where brine is pumped into a salt ponds system, afterwards solar evaporation increases the solids concentration of the brine and causes the precipitation of salt
- From the salt ponds, the remaining brine is pumped into carnallite ponds, where further solar evaporation provokes the carnallite precipitation. The precipitated carnallite, which is a mixture of magnesium chloride ($MgCl_2$), potassium chloride known as potash (KCl) and a small percentage of salt (NaCl), is harvested and pumped later to the refinery

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- The APC refinery employs a Hot Leach Plant (HLP) and a Cold Crystallization Plant (CCP) that process the harvested carnallite and extracts the potash (KCl) from it
 - The refinery potash current production is 1.9 million t/y, with the HLP currently producing an average of 1.4 million t/y, and the CCP an average of 0.5 million t/y
 - The plan is to optimize and to de-bottleneck the existing HLP and CCP plants and increase their total production capacity, in addition to installing a new cold crystallization plant with a production of 0.45 million t/y, in order to reach the 2.45-million t/y production capacity
 - In conjunction with the refinery optimization, de-bottlenecking, and expansion, the purpose is to optimize and expand the APC solar ponds system in order to supply the refinery with the carnallite quantities required to realize the ultimate capacity for phase one
 - The KCl produced is stored in a main warehouse at APC refinery site in Safi, which has 60,000-tons storage capacity
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- APC employs a fleet of 93 50-tons trucks dedicated for the transport of potash from Safi to their potash shipping site in Aqaba
 - The potash is loaded onto ships and subsequently shipped all over the world departing from APC shipping site in Aqaba. Currently APC employs two warehouses with a total storage capacity exceeding 180,000 tons