

**Title: IMC-AGRICO COMPANY, NEW WALES PLANT  
GYPSUM STACK EXPANSION - PROJECT RECAP  
[Slide presentation]**

**By: J. E. Cameron, Project Superintendent**

### **BACKGROUND**

New Wales is the largest fertilizer manufacturing facility in the world, with capacity to produce 3.5 million tons of fertilizer products per year, principally diammonium phosphate. By-product "phosphogypsum" is also produced at a rate of 8.5 million tons per year.

The phosphogypsum is stored in a "gypsum stack," and requires storage space of approximately 5,200 acre-feet per year. The original 400 acre gypsum stack at New Wales was projected to be at its design height of 200 feet in 1992, requiring a new storage facility to be in place by that time to continue operations.

### **PROJECT OBJECTIVE**

The project goal was to provide for 20 years of gypsum storage capacity, to be constructed in two phases of approximately 400 acres each.

Planning and conceptual design began in 1986, with the intent to submit permit applications and supporting documents in 1988. It was assumed at the time that one year would be sufficient for permit approvals, and 2.5 years for design and construction. It was anticipated that the first phase would be completed in 1991, allowing about 6 months of float in the schedule. Construction of the second phase would follow about 10 years later.

Permit applications were submitted on schedule in 1988. However, they were re-submitted in 1989 with major design changes to essentially address environmental concerns with groundwater protection, and did not receive final approval until August 1990, 2 years after original submittal. This delay required "fast-track" design and construction to recover lost time, with construction actually starting in September 1990. The project was completed on schedule in 1992.

### **PERMITS**

Principal permits included the following:

- o Due to the project's size, it was determined to be a "Development of Regional Impact," requiring a "Development Order" by the Polk County Board of County Commissioners, approved by the Central Florida Regional Planning Council and the Florida Department of Community Affairs.

- o Construction and Operating Permits by the Florida Department of Environmental Protection [FDEP]
- o Conceptual reclamation approval by FDEP's Bureau of Mine Reclamation
- o Other various permits by:

Polk County  
 Southwest Florida Water Management District  
 U.S. Environmental Protection Agency

All permits were for the first phase only, except the Development Order which was granted for both phases.

**PROJECT SCOPE**

The project scope included the following:

- o 400 acres of 60 mil high density polyethylene liner were installed beneath the proposed gypsum stack, about 20 feet below natural grade in mined out lands
- o 46,000 feet of "stack drains" were installed above the liner to improve the structural stability of the gypsum stack at its perimeter
- o 2,000,000 cubic yards of soft clays were removed from the site to prevent differential settlement beneath the liner
- o 5,000,000 cubic yards of earth were moved in a balanced cut and fill to achieve a uniform liner subgrade
- o 1,000,000 cubic yards of gypsum were hauled from the existing stack and placed in the new expansion for initial starter dikes, liner cover and drain construction
- o 2 miles of soil-bentonite vertical cut-off walls were installed at the perimeter of the existing gypsum stack/cooling pond and fertilizer plant
- o 16,000 feet of pipeline were installed to pump the gypsum slurry to the new gypsum stack
- o Extensive quality control and quality assurance was provided to comply with various permitting conditions
- o Over 50 separate engineering and construction contracts were required to accomplish the project on the "fast-track" schedule. Most of the construction contracts were "hard dollar." Notable exceptions were clay removal and earthwork, which were performed "time and material."
- o Overall project cost exceeded \$70,000,000