Phosphogypsum Or Teaching Pigs to Fly Update

- An independent state research agency
- Governed by a Board of Directors appointed by the Governor
- Funded by the severance tax on phosphate rock

FIPR's Mission

- Environment and public health research
- Technology research
- Education and public information

New Wales Gypstack

Phosphogypsum Problem

- ~800 Million to 1 billion tons in stacks in Florida
- ~40 Million tons being added each year

Gypsum Production, 2003

	Production (Mt/yr)	Relative Amount
PG in Florida	40	1
Mined Gypsum in US	16 (est.)	0.40
Mined Gypsum in World	102 (est.)	2.55

Potential Uses for Phosphogypsum

- Road building
- Agriculture
- Landfills
- Oyster culch
- Roofing tile

Radioactivity of Phosphogypsum

Phosphogypsum	pCi/g
Northern Florida	5 to 10
West Central Florida	20 to 35

Relative Risks

Activity	Relative Risk
Living Near the Road	1
Building the Road	2
Driving on the Road (Radioactivity)	72
Airplane Crash	652
^{40}K Decay in Your Body	1304
Dying in a Fire	1957
Drowning	4565

Barriers to Phosphogypsum Use

- Regulatory agencies
- Public fear of the word radioactivity

Status of Permitting Efforts for Uses

- USEPA
- FDEP
- Congressional Hearing

The Pond Water Problem

- Each stack has billions of gallons of process water
- The water is acidic and contains significant concentrations of metals, fluoride, and ammonia
- Dilute mixture of
  - Phosphoric, sulfuric, fluorsilicic acids
  - Saturated with calcium sulfate
  - Contains numerous other ions and ammonia

An Example of Pond Water Quality at an Operating Plant

Parameter	Untreated Process Water
pH	2.1
Conductivity (umhos/cm)	22,100
Calcium mg/l	538
Magnesium (mg/l)	223
Sodium (mg/l)	2260
Potassium (mg/l)	210
Fluoride (mg/l)	4120
Sulfate (mg/l)	6200
Total Phosphorus (mg/l)	6600
Ammonia Nitrogen (mg/l)	1240

The Process Water Problem (Cont.)

- There can be accidental releases of pond water
- Prior to discharge, process water must be treated by an expensive process
- Closure of stacks requires discharge of water
- The State may require substantially financial responsibility assurances

Piney Point Problem

- Approximately 1 billion gallons of low pH, high conductivity water
- Water near the top of the stack threatened to spill into Bishop's Harbor

Piney Point Water Inventory Reduction

- Trucking
- Lime treatment and removal
- Reverse osmosis with no pretreatment (US Filter)
- Ocean Dumping
- Pretreatment/reverse osmosis project (IMC/FIPR)

IMC/FIPR RO Demonstration

Possible Solutions

- Reduce the accumulation of phosphogypsum
- Reduce the amount of water on the stacks
- Improve the quality of the water on the stacks

When Will Use of PG Be Allowed By EPA and DEP?

When Will Use of PG Be Allowed By EPA and DEP?