WATER FOR THE SYNTHETIC FUELS INDUSTRY

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SYNTHETIC LIQUID FUEL OPTIONS

- BIO-FUELS
  - Irrigation and process water demands are huge

- COAL TO LIQUIDS
  - Process water demands are huge

- OIL SHALE
  - Process water demands are moderate
  - Process produces connate water
  - Un-appropriated water available
  - Ground water available
NATIONAL WATER PROBLEM

• Fresh water distribution does not match growing demand

• National water policy always a compromise between arid West and Eastern interests

• Implementation of water policy bifurcated between Corps of Engineers and Bureau of Reclamation - then came TVA
FRESH WATER DISTRIBUTION BY RAINFALL
IMPLEMENTATION OF NATIONAL WATER POLICY

• TO UNDERSTAND THE FAILURE READ:
  – CADILLAC DESERT

• TO SEE THE WAY FORWARD READ:
  – U.S. WATER RESOURCES COUNCIL WATER ASSESSMENTS
  – USGS WATER FOR SYNTHETIC FUELS DEVELOPMENT Earth Science Considerations

• FUTURE MUST ACCOMDATE:
  – TETON DAM FAILURE
  – END OF BIG DAM ERA
  – ENVIRONMENTAL ETHIC
Historic Overview

• 1950s - A continent-wide water resource plan envisioned by Donald Baker, a planning engineer at Los Angeles Dept. of Water and Power

• 1960s - Ralph M. Parsons takes the initiative and spends part of personal fortune and more than 10 years to develop concept

• 1964 - NAWAPA presented to U.S. Special Congressional Subcommittee on Western Water Resources; received endorsement
1966 to 1977 – Parsons continues to refine conceptual report

1986 – Marc Reisner’s landmark book *Cadillac Desert* discusses NAWAPA in detail

1989 – San Jose State Univ. Economic Dept. conducts update of financial feasibility of NAWAPA; confirms program viability
NORTH AMERICAN WATER and POWER ALLIANCE (NAWAPA)

The Concept

• Divert water from a dozen wild rivers in North America to provide alternative water and electricity supplies to Canada, the United States and Northern Mexico; meets projected water and power needs for the next 100 years

• NAWAPA opens vast unused or underutilized areas for industrial and agricultural development and municipal use
NORTH AMERICAN WATER and POWER ALLIANCE (NAWAPA)
The Concept (cont.)

• Diverted water will be < 17% of high yield watersheds “wasting” to the sea
• Water is renewable, reliable and clean
• Water will be stored in an interconnected system of reservoirs across Canada and the United States
• Coast-to-coast navigable waterways, recreation, pollution control, water levels and flood control are additional benefits
NORTH AMERICAN WATER and POWER ALLIANCE (NAWAPA)

Some Statistics

- 110 million acre-feet of water west of Rocky Mts. would be diverted, collected, stored and delivered
- 48 million additional acre-feet east of the Rocky Mts. and Arctic Basins would be diverted into the Great Lakes
- The Rocky Mt. Trench (elev. 3000 ft.) would become a 500-mile long, 22-mile wide reservoir; 17 times capacity of Lake Mead
NORTH AMERICAN WATER and POWER ALLIANCE (NAWAPA)
Some Statistics (cont.)

- 100,000 megawatts of gross hydropower was to be produced; 20 times > Hoover Dam
- 70,000 megawatts available to be sold; 30 megawatts would meet pumping and operations’ needs of the program
- Traditional engineering and construction means and methods approach
- All government to all private financing options considered
NORTH AMERICAN WATER and POWER ALLIANCE (NAWAPA)
Some Statistics (cont.)

- Program costs (with all proposed elements) $100 billion in 1966 dollars
- NAWAPA would have been the largest civil works project in history
THE WISCONSIN RIVER MODEL
IMPLEMENTATION OF WISCONSIN RIVER MODEL ON A CONTINENTAL SCALE

• SERIES OF PRIVATE WATER VENTURES

• UTILIZE HIGHEST ELEVATIONS IN SEVERAL WATERSHEDS TO LOCATE HUNDREDS OF SMALL RESERVOIRS

• USE GATHERING AND PIPELINE SYSTEMS SIMILAR TO OIL AND GAS INDUSTRY TO BRING WATER TO MARKET
ENVIRONMENTAL ACCEPTABILITY OF SMALL RESEVOIRS

- Duplicates what 100 million beavers did for the environment before they became fur hats
- Can be remotely monitored and managed by satellites and computers
- Replenish aquifers
- Compatible with water laws and doctrine
SMALL RESERVOIRS AND WATER DOCTRINE

• SURFACE WATER SUBJECT TO:
  – Riparian Rights
  – Prior Appropriation
  – Hybrid Doctrine
  – Reserved Rights Doctrine

• GROUND WATER:
  – Owned by Surface Owner

• DIFFUSED WATER:
  – Owned by Surface Owner
FINANCIAL FEASIBILITY OF PRIVATE WATER VENTURES

IS THE SAN JOSE STATE ANALYSIS VALID?

CONSIDER THIS: The Maryland Convenience Store Prices for:
Gasoline: $3.20 per gallon
Bottled Water: $6.40 per gallon
OIL AND GAS COMPANIES

• THINK NEW
• THINK WATER VENTURES
• BECOME AN OIL, GAS AND WATER COMPANY
• SOLVE ONE MORE PROBLEM FOR OIL SHALE