

FY97-XXVII-75

DEVELOPMENT OF CONCRETE ADMIXTURES FROM DGC'S CATECHOLS

CONTRACTOR: Dakota Gasification Company

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PARTICIPANTS

<u>Sponsor</u>	<u>Cost Share</u>
Dakota Gasification Company	\$74,000
ND Industrial Commission	<u>70,000</u>
Total Project Cost	\$144,000

Project Schedule – Ten Months

Contract Date – 5/21/97
Start Date – 1/15/97
Completion Date – 11/15/97

Project Deliverables

Final Phase I Report - 8/31/97 ✓
Interim Phase 2 Report - 1/31/98
Final Report - 3/15/98 ✓

OBJECTIVE / STATEMENT OF WORK

The objective of this project is to evaluate the use of catechols derived from DGC's crude phenol stream as a concrete admixture. Concrete admixtures including superplasticizers are added to concrete to reduce water requirement, increase strength, and maintain flow characteristics of the uncured concrete. The project involves the three following phases:

Phase One: The Evaluation Phase - Five admixture compositions will be prepared and characterized.

Phase Two: Detailed Study - The most promising admixture compositions (one or two) will be further tested. Phase Two will commence after completion of Phase One and approval from the Industrial Commission.

Phase Three: Demonstration - This phase is not a part of the proposed project funding request but is a follow-up project involving commercial demonstration and market development.

STATUS

The phase one evaluation study revealed a number of conclusions, which indicate appropriate directions for future testing. **The following conclusions were reached:**

Iron and sodium silicate are an undesirable added component of a polymer product.

Both 3-methylcatechol and 4-methylcatechol are good admixture candidates. The ratio of 3-methyl to 4-methyl does not have much effect on product performance.

A concrete admixture can be manufactured from DGC's catechol materials, which imparts to concrete excellent slump, strength, and durability characteristics. It was determined that conducting a Phase II pilot plant test effort was not productive based on observations that companies using the product would prefer to do their own research. The unused NDIC funds were returned to the state.