

UNITED STATES
DEPARTMENT of the INTERIOR

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BUREAU OF RECLAMATION

Palmer - Interior 4662

For Release NOVEMBER 27, 1961

PAPER MILL BYPRODUCT HELPS STRENGTHEN GIANT GLEN CANYON DAM IN ARIZONA

A byproduct of the pulp and paper industry is being used to strengthen a mighty concrete dam under construction by the Bureau of Reclamation on the Colorado River in northern Arizona, the Department of the Interior reported today.

The ingredient is lignin (in the form of a calcium salt of lignosulfonic acid) and the dam is Glen Canyon, massive key structure of the five-State Colorado River Storage Project.

Lignin, used as an additive to the concrete mix for the dam, serves as a lubricant. Reclamation engineers have found that this increases the plasticity of the mix and reduces the water needed, which in turn increases the compressive strength of the mass concrete about ten percent.

Just as valuable, according to engineers, is the ability of lignin to keep the fresh concrete plastic longer. This lets motor-driven vibrators knit together upper and lower layers of concrete, allowing uniform texture and placement which are vitally important in any concrete structure.

Lignin is generally available from paper mills and large chemical companies throughout the United States. It is received at Glen Canyon as a solution in tank cars. About one pound, by dry measure, is used per cubic yard of concrete.

The Bureau was among the early investigators and used lignin in concrete mixes for the Tecolote diversion tunnel in the Cachuma Project of California and also in the Glen Canyon diversion tunnel.

As part of its continuing research program, Reclamation has been studying water-reducing agents--of which lignin is one--in the mixing of concrete for the past nine years.

The second millionth cubic yard of concrete was placed in Glen Canyon Dam this month. Upon completion of the 710-foot-high structure in 1964, nearly five million cubic yards of concrete will have been placed. The dam will be the second highest in the western hemisphere.

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