

KANSAS GEOLOGICAL SURVEY
Environmental Geology Section

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September 27, 1979

Mr. Harold LeFevre
U.S. Nuclear Regulatory Commission
Geosciences Branch
Div. of Systems Safety
Washington, D.C. 20555

Dear Mr. LeFevre:

On September 26, I visited the excavation site of the service spillway at the main dam of the Wolf Creek Nuclear Power Station near Burlington, Kansas with engineers of the Water Resources Division of the State Board of Agriculture. Their principal responsibility is to inspect various phases of dam construction to assure that it is being carried out according to the plans and specifications of the permit issued by their department. I advise them on the engineering geology aspects of the site.

Dave Fenster and Charles Bandoian of Dames and Moore Engineering Company - the geotechnical consulting firm for the project - had also requested that I view some minor shear zones and other structures which had been uncovered in the walls of the excavation.

The formation involved is called the Ireland Member of the Lawrence Formation by the project geologists but which is an unnamed shale above the Ireland sandstone according to KGS nomenclature. It is a gray, laminated, silty to sandy shale containing an impure coal about 8 inches thick. About 15 to 16 minor structures were exposed in an interval from the base of the coal to about 10 feet into the shale above it. These were of two types: 45° shear zones with minor displacement, and vertical discontinuities in the coal bed a few inches wide where either overlying or underlying shale appeared to have been "injected" through the coal. Only one of these discontinuities was associated with a shear zone. Neither the shear zones nor the discontinuities appeared to have extended across the width of the excavation which is perhaps 50 feet. It was interesting to note that at one place a 45° shear zone had an apparent dip to the north (approx., my orientation may have been off) and another about 10 feet away had an apparent dip to the south. The two nearly intersected at the top.

In all instances, both the shear zones and the coal discontinuities died out within a few inches of their ends and strata above and below are undisturbed, demonstrating that they were developed shortly after deposition and are not now active.

My tentative opinion and the opinions of the site geologists are that the structures are related to post-burial compaction of the sediments while they were in a semi-indurated state and that they are not caused by tectonic activity.

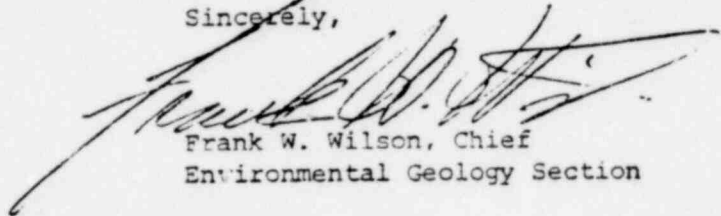
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This observation, however, should not be taken to mean that tectonic features may not eventually be uncovered at the site. I noted, for example, a miniature "pop-up" relief structure in the shale on the bottom of the excavation which had occurred very recently. It had an amplitude and width of 2-3 inches and an estimated length of 15-20 feet. The orientation (abbreviated to north half of compass) was N50°W. It is not certain whether this structure is related to local stress, air slaking of the uncovered shale, or to actual regional ambient stress but I think the latter should at least be considered.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Frank W. Wilson', is written over the typed name and title.

Frank W. Wilson, Chief
Environmental Geology Section

FWW:elp

cc: Ray Seiple
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