RENNER (MEADOWS) DAMSITE, PARK COUNTY

Location: Sec. 15, T. 32 N., R. 102 W.

Date Examined: October 3, 1957

Storage: A dam approximately 115 feet high will impound 16,000 acre-feet of water.

Geology

The damsite is located along Wood River, which flows between the toe of a relatively large landslide on the northwest side, and a steep hillside of the Willwood formation of Eocene age on the southeast side. On both sides of the river, the Willwood formation is unconformably overlain by drab brown volcanic sandstones and sandstone breccias of the Pitchfork (Aycross ?) formation, also of Eocene age.

The right abutment (southeast) adjoins the horizontal-lying Willwood formation which consists of red and gray interbedded shales, siltstones, and sandstones. This abutment is relatively impervious and geologically sound.

The left (northwest) abutment adjoins the toe of a landslide one mile long (northwest-southeast direction) and approximately one-third mile wide (northeast-southwest direction). The landslide is characterized by hummocky topography and is evidently fairly old geologically since it is covered by a thin soil mantle with grass, sage brush and small trees growing on it. The average slope near the toe of the slide is about 8 degrees.

At the time of examination the toe of the slide did not appear saturated, although several sag ponds were observed near the northwest end. Logs of holes drilled by the U. S. Bureau of Reclamation suggest considerable circulation difficulty encountered during drilling, and fluxuation of water level

in the holes. Since the slide is at the southeast end of a small cirque-like basin eroded in the Pitchfork formation, it is quite probable that considerable water circulates through it during periods of heavy precipitation.

Surficial exposures of the slide show a number of large blocks of volcanic sandstone and sandstone breccia that have slid from the Pitchfork formation lying to the northwest. These are imbedded in an upper weathered zone 0 - 40 feet thick; the matrix of which is composed of clay, sand, and gravel which have been derived from the decomposed volcanic sediments. Logs of several of the U. S. Bureau of Reclamation drill holes indicate that the above zone is underlain by 75 - 135 feet of silt, sand, volcanic sandstone and breccia blocks, and several lenses of blue to dark gray clay.

At the damsite the landslide debris overlies a thin unit composed of sand and gravel; evidently a former channel of Wood River. The slide as a whole lies on the Willwood formation (see enclosed geological cross section).

Evidence supporting the cause of sliding is lacking particularly since the sliding surface is obscured. Two factors, however, are important in producing slides in this area. (1) Rockslides and debris avalanches are not uncommon, and they usually occur during a period of exceptionally heavy precipitation. In this case the rock mass usually breaks away from an enlarged zone of weakness such as a joint and falls down hill. (2) During periods of heavy precipitation the shales in the Willwood formation become highly lubricated and lose much of their shear resistance. Since the logs

of the U. S. Bureau of Reclamation drill holes seem to indicate a gentle dip (old erosion surface ?) to the southeast at the contact of the Willwood formation and the slide, it seems reasonable to infer the following conclusion. During exceptionally heavy period of precipitation a rock slide occurred in the cirque-like basin to the northwest. This material came to rest on the lubricated Willwood surface with such rapidity and force that it slowly slid towards Wood River. The latter process may have occurred at the same time, or final movement may have been prolonged over several "wet" periods.

The depth to bedrock (Willwood formation) in the Wood River channel as indicated by U. S. Bureau of Reclamation drill holes varies from 20 to 30 feet.

The reservoir basin is entirely within the Willwood formation and is considered relatively impermeable.

Conclusion

Although the slide is presently considered geologically stable, surface exposures and circulation difficulties encountered during drilling indicate that there may be considerable seepage, particularly near the toe of the slide. Although further movement is unlikely, the toe of the slide has room for additional movement in case future conditions induce sliding again. Since a number of ranches exist downstream from the proposed site, the construction of a dam and reservoir would present a potential hazard to them, unless some action can be taken to prevent or minimize the dangers from the factors mentioned above.

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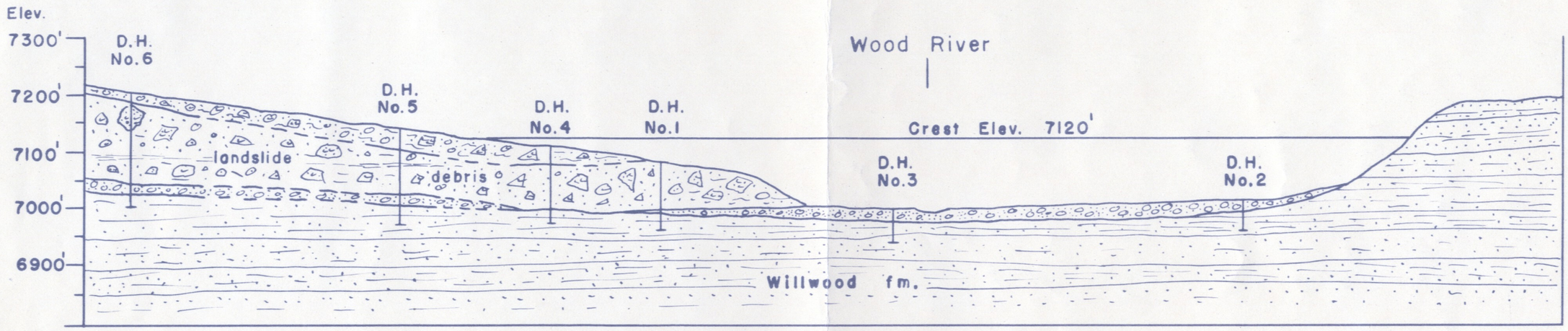
NW SE



Scale

250 0 250 500 ft.

NORTHWEST - SOUTHEAST GEOLOGICAL CROSS SECTION

(along axis of dam)

RENNER (Meadows) DAMSITE

Data compiled from field observations and U.S. Bureau of Reclamation drill hole logs.