PRELIMINARY REPORT ON THE POSSIBILITIES OF A WATER

SUPPLY FOR THE CITY OF CASPER FROM DEEP WELLS

The geology of the district in the vicinity of Casper is described in Professional Paper #32 and Bulletins #641 I and 626 of the United States Geological Survey. The Office of the State Geologist has not issued any publications relating to this immediate vicinity.

The surface rocks of Township 33 North, Range 79 West, in which the city of Casper is situated, belong to the Steele Shale, which has a thickness of approximately 2500 feet, formations underlying the Steele Shale being as follows:

Niobrara	400-1750 feet
Carlile	150-230
Frontier	800-1000
Mowry	250-300
Thermopolis Shale	150-300
Dakota Sandstone	0-60
Lower Cretaceous Shale	100-350
Lower Cretaceous Conglomerate	8-60
Morrison formation	250
Sundance	300
Chugwater formation, red sandstones and shales	900-1200
Embar	225
Tensleep	200-400
Amsden formation	350
Madison Limestone	100-700
Cambrian	400-637

The Cambrian is underlaid by the Pre-Cambrian granites and schists. A water has been encountered in oil well operations in various parts of the state in the sandstones of the Frontier formation, Dakota Sandstone, Lower Cretaceous Conglomerate, Embar Sandstone and Tensleep Sandstone. The water, however, is not always of sufficient purity for use for domestic purposes, and analyses are not

available at the present time to furnish definite information on this point. Where such wells have been found to be Artesian, flow has generally approximated 100 gallons per minute. The information furnished in connection with oil wells as to the flow of water is generally not definite as to the exact amount of flow, as the drillers in searching for oil seldom take the trouble to measure the flow of water. Wells drilled in the vicinity of Casper have not yet developed a flow of water which would be of any importance from the point of view of water supply. There therefore remains the study of the possibilities of other localities in the immediate vicinity.

The Cretaceous formations in the vicinity of Casper dip gently to the northeast, and any drilling in that direction from Casper would mean a greater distance down to the water sands. This condition exists to the east, north and northeast of Casper. Casper Mountain, part of the Laramie Range, lies about nine miles straight south of Casper. This is an uplift which brings to the surface along the north side of the Casper Range the Pre-Cambrian Granite and gneisses. Along the entire front of the Casper Range is situated the Casper Mountain Fault, one of the greatest faults in the state, with an uplift on the south side of not less than 6000 feet. This brings the lower part of the Steele Shale in juxtaposition to the Pre-Cambrian granites. No drilling has been done in this vicinity which would determine underground conditions, and it is impossible to state whether the trace of the fault is vertical or inclined. Formations as low as the Morrison and Sundance outcrop along the range line between Ranges 78 and 79, Township 32. At this point it is possible that water could enter the Lower Cretaceous Conglomerate and Dakota Sandstone along the front range of the mountain, north of the fault, and work its way along these formations. As these

outcrops are at an altitude of 6200 to 6700 feet, wells drilled in the southwest part of Township 33 Range 78, at an altitude of about one thousand feet lower, would have a possibility of developing a water supply in these sandstones. It could not be stated with any degree of certainty, however, that a commercial water supply would be obtained, although a field examination of that region would undoubtedly throw additional light on the subject and would be justified. Investigation should be made also of the potable possibilities of water in these formations.

Southwest of Casper at a distance of approximately twelve miles is the Emigrant Gap Anticline. At the southeastern end of the Emigrant Gap Anticline the water bearing formations are within reach of the drill at a distance of from 1500 to 2000 feet; none of the wells along this anticline are believed to have developed a sufficient flow of pure water to make them commercial possibilities for a city requiring a flow of 18,000,000 gallons per day. However, as previously mentioned, the well records are not as definite as they should be to make it possible to give any recommendations regarding the drilling of this structure for water.

In conclusion, it will be stated that where drilling has been done in oil and gas prospecting, no evidence of a large enough flow of good water has yet been obtained within a reasonable distance of Casper, and from present available information, drilling could hardly be recommended with much hope of success. The region southeast of Casper would justify geological examination as to the possibilities of an Artesian flow in the Dakota Sandstone, and Lower Cretaceous

Conglomerate.

Respectfully submitted,

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State Geologist.

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