REPORT ON NATURAL STREAM INVESTIGATIONS
DENVER BASIN

Colorado Division of Water Resources

October 24, 1985

Technical Appendix D

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The map entitled "Saturated Alluvium of the Denver Basin" referred to as Figure 5 and Staff Exhibit 20 was constructed at a scale of 1:100,000 for an area slightly larger than the extent of the Base of the Laramie-Foxhills as shown on Figure 4B. The principal source of data used to construct the map was existing published reports which included maps showing the real extent of saturated alluvium. Geologic maps showing alluvial deposits were used where published reports were not available. Field investigations by Division of Water Resource geologists were made to supplement the geologic maps and to obtain data in areas where neither published reports nor geologic maps were available.

Field investigations were concentrated in the area from Denver to Colorado Springs, and from the Front Range eastward to Kiowa Creek or Upper Black Squirrel Creek. The far eastern and southeastern extremities of the Denver Basin were also mapped with data collected from field investigations.

The field investigation procedure included the use of a two man team, a driver and a geologist, who traveled selected roads throughout the area under investigation. The odometer readings from the car or distance obtained by pacing stream widths were used to determine the location of streams and the width (horizontal distance) of the alluvium. Those data were recorded as field notes and plotted on U.S. Geological Survey topographic maps having a scale of 1:24,000. Considering the change in slope of the land surface as shown on the topographic maps and incorporating the field data, lines were then constructed on the topographic maps indicating the extent of the alluvium adjacent to each stream. The field investigation also collected information on where the streams were flowing, where ground water was observed and describing the existence of vegetation such as cottonwood trees. These data support the existence of saturated alluvium. The width of the alluvial deposits as plotted in the topographic maps were then transferred to the final saturated alluvium map, Staff Exhibit No. 20.

During the field investigations the geologist did note the existence of some geologic outcrops, especially in eastern El Paso County. The purpose of this specific field investigation was not to locate the geologic outcrops.

Historical ground water level hydrograph data available in the State Engineer's office shows some seasonal and year to year variation in the ground water levels in the alluvium of the South Platte and its tributaries but there is not long term decline except in the Kiowa and Bijou drainages. Data collected by the Ground Water Commission staff of the water table fluctuations in the Kiowa Creek, Bijou Creek and Upper Black Squirrel Creek drainages do show declines in the water table elevations in the alluvium at some locations in those drainages. Data do not show that significant portions of the alluvium in those areas has gone dry. Thus, the saturated alluvium maps contained in the Kiowa-Bijou and Upper Black Squirrel Designated Basin reports are considered to be valid for locating where saturated alluvium exists.

Where published reports contained maps showing the extent of saturated alluvium, those maps were transferred to the final saturated alluvium map, Staff Exhibit No. 20.

Data from the Saturated Alluvium Map were used in the ground water model to define areas where the stream and its adjacent saturated alluvium was in contact with the underlying bedrock aquifers. The model computed the impact of pumping water from the bedrock aquifer wells upon these alluvial valleys. A more thorough description of the use of the data in the model and modeling procedures and assumptions can be found in Technical Appendix C, also attached to this Statement of Basis and Purpose.

The following reference list identifies those published reports and geologic maps which were used in the preparation of Figure 5. In some instances the reports may cover overlapping areas. In those instances, preference in the transfer of the data to the map was given to the most recent and most detailed report.

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