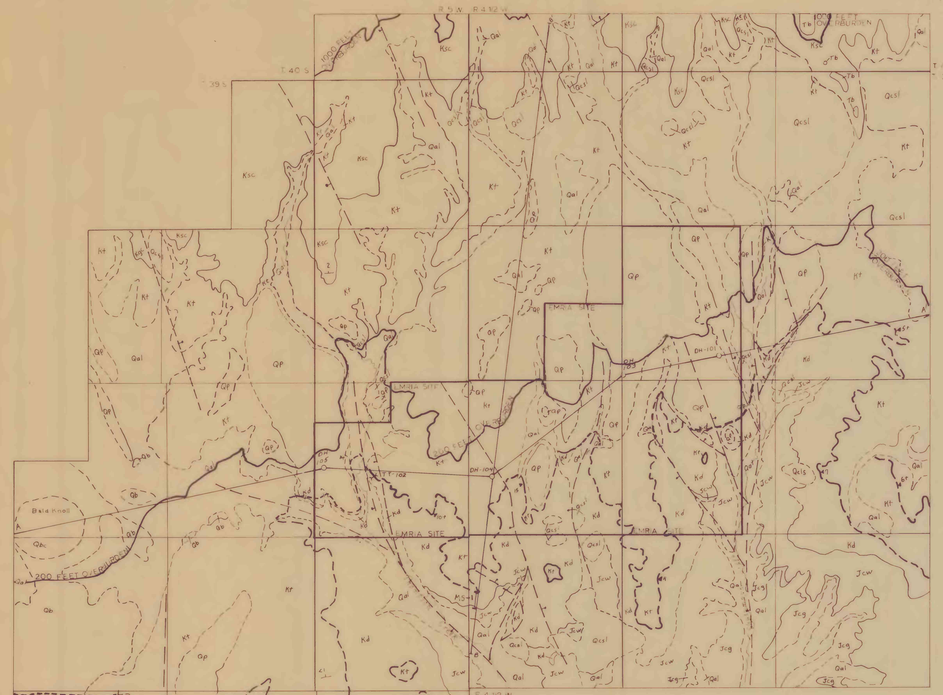
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
76-386
PART OF KANE COUNTY, UTAH



MAP EXPLANATION

Quaternary	Qal	Alluvium—mostly silt, sand and gravel.
	Qp	Sediment deposits—older stream channel. Fan and terrace deposits above present drainage composed mostly of silt, sand, and gravel, and includes a high percentage of subangular to subrounded pebble to boulder-size limestone fragments; locally includes cobbles and boulders of basalt. 0-100 feet thick.
	Qcls	Colluvium, slopewash, and landslide deposits; undifferentiated—material varies with source and includes areas of soil and deeply weathered bedrock.
	Qbc	Volcanic cinder cone (Qbc) of Bald Knoll and related flows of olivine basalt (Qb).
Tertiary Flows	Tb	Alkaline olivine basalt—part of an older basalt flow covering a high ridge in the southeastern part of the area.
Unconformity		
Cretaceous	Ktc	Straight Cliffs Formation—mostly tan to buff, fine- to medium-grained, cliff-forming sandstone with interbeds of mudstone, siltstone, and minor coal. More than 600 feet thick.
	Kt	Tropic Shale—mostly dark gray, marine, claystone or shale with some tan very fine grained sandy beds in upper and lower part; includes thin beds of bentonite and limestone concretions in lower part. About 700 feet thick. In some areas mapped at Kt, bedrock is obscured by soil or slopewash.
	Kd	Dakota Formation—tan to gray, fine- to medium-grained sandstone, mudstone, carbonaceous mudstone and coal. A major coal zone, the Smirl coal, as much as 20 feet thick, occurs at or near the top of the formation. Minor coal beds occur below the main coal, the most important of which is the lower or Bald Knoll coal zone, as much as 5 feet thick with partings, which is 20 to 30 feet above the base. The formation locally includes a basal conglomerate and is unconformable on underlying Jurassic rocks. About 200 to 240 feet thick.
Unconformity		
Jurassic	Jcw	Winsor Member of Carmel Formation—thick beds of friable brown, white or yellow fine-grained sandstone with minor interbeds of red or green siltstone and mudstone. Thins westward, truncated by the pre-Dakota unconformity. May include thin remnants of overlying Entrada sandstone locally at top. Ranges from 200 to more than 600 feet thick.
	Jcg	Gypsiferous Member of Carmel Formation—Red medium-grained, friable sandstone with minor green or red siltstone, mudstone, and white sandstone interbeds; includes a thick gypsum bed at the base. About 150-200 feet thick.

Fault, bar, and ball on downthrown side. Dashed where approximately located, short dashed where covered or inferred.

Contact, dashed where approximately located.

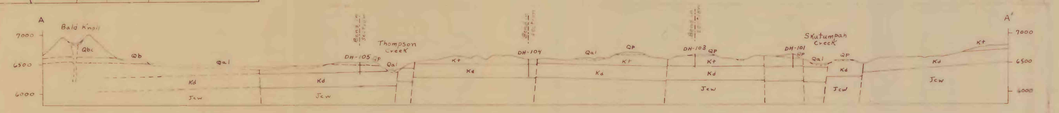
Coal bed—main coal horizon, Smirl zone, at top of Dakota Formation showing thickness in feet observed at outcrop. Burned outcrops marked by red clinker zones and poor exposures are typical of the study area.

TT-102 Bureau of Reclamation test trench.

DH-104 Bureau of Reclamation drill hole.

Strike and dip of beds.

MS-1 Measured section.

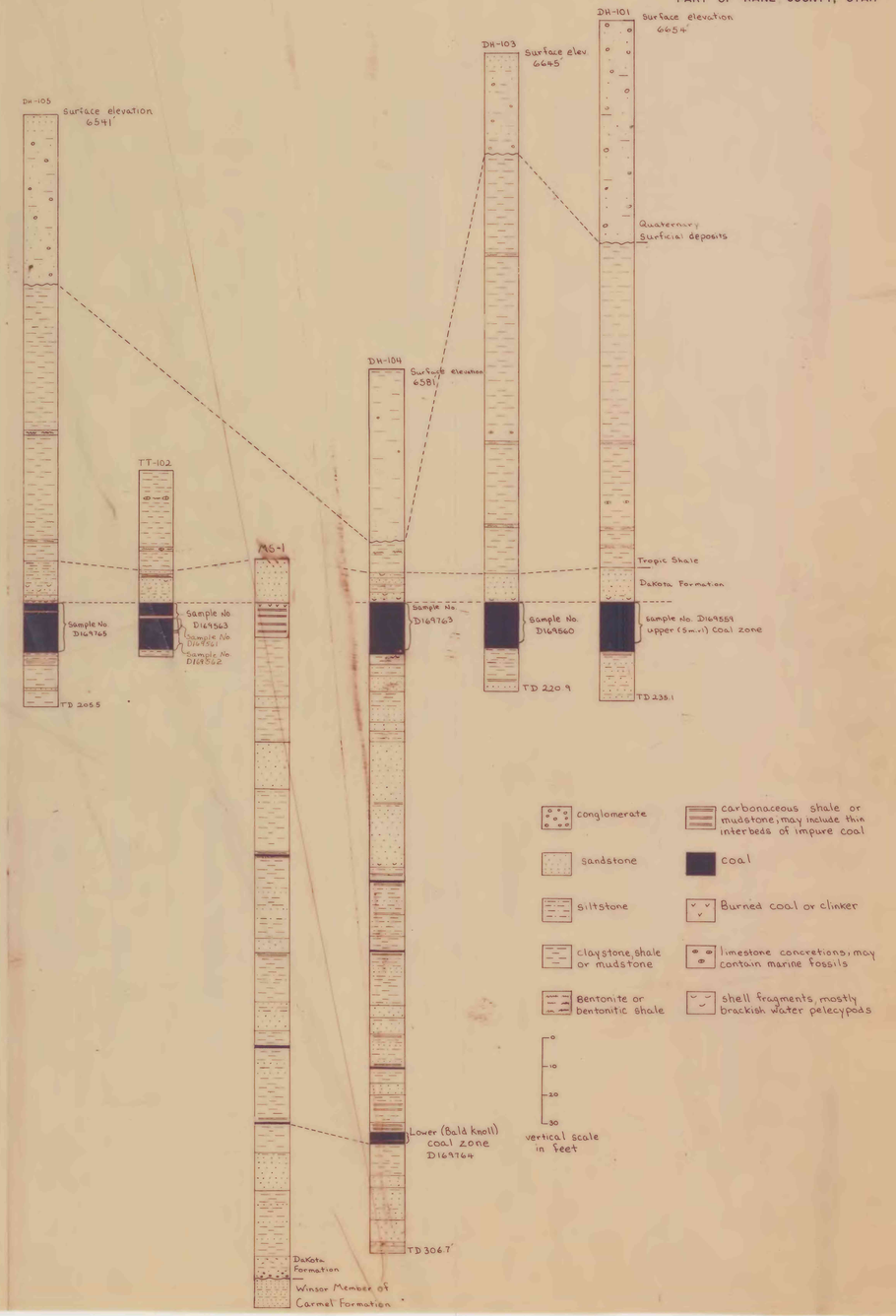


Geology modified after Goode (1973) and mapping by Utah International, Inc., 1963-1969. Base maps - Bald Knoll and Skutumpah Creek USGS topographic maps.

Scale 1:24,000

1 MILE

1 KILOMETER



U.S. Geological Survey
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This map is preliminary and has not been edited or reviewed for conformity with Geological Survey standards or nomenclature.

PLATE I. GEOLOGIC MAP, STRUCTURE SECTIONS, AND LITHOLOGIC LOGS OF DRILL HOLES OF THE ALTON EMRIA SITE, KANE COUNTY, UTAH

By
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1976