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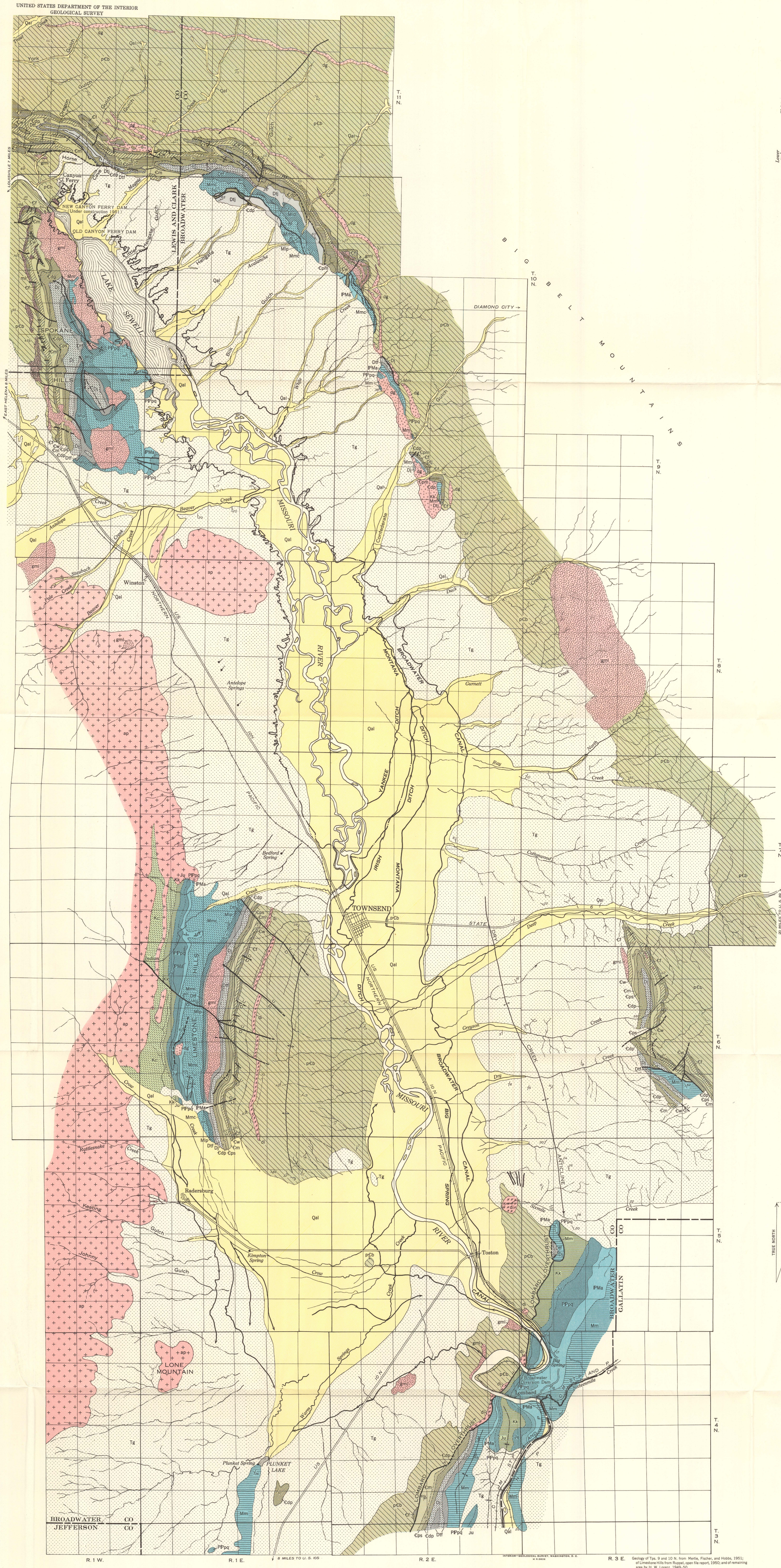
U. S. GEOLOGICAL SURVEY



EXPLANATION

SEDIMENTARY ROCKS

Pleistocene and Recent	Qal	Alluvium	QUATERNARY
	Tg	"Lake beds"	TERTIARY
Lower and Upper Cretaceous	Kc	Colorado shale	CRETACEOUS
Lower Cretaceous	Kk	Kootenai formation	
	Ju	Morrison(?) and Sawtooth formations, undifferentiated	JURASSIC
	PIPpq	Phosphoria and Quadrant formations, undifferentiated	PENNSYLVANIAN AND PERMIAN
	IPMa	Amsden formation	MISSISSIPPIAN AND PENNSYLVANIAN
Mm — Madison group, undifferentiated	Mmc	Mission Canyon limestone	MISSISSIPPIAN
	Mlp	Lodgepole limestone	
Dtj — Three Forks shale and Jefferson limestone, undifferentiated	Dtf	Three Forks shale	DEVONIAN
	Dj	Jefferson limestone	
	Ꞓdp	Dry Creek shale and Pilgrim limestone, undifferentiated	CAMBRIAN
Ꞓpm — Park shale and Meagher limestone, undifferentiated	Ꞓps	Park shale	
	Ꞓm	Meagher limestone	
	Ꞓw	Wolsey shale	
	Ꞓf	Flathead quartzite	
	p€b	Belt series *Includes Helena limestone, Empire, Spokane, and Greyson shales, and Newland limestone*	PRE-CAMBRIAN

IGNEOUS ROCKS

gml	Granite, granodiorite, monzonite, and latite	TERTIARY
ml	Monzonitic lamprophyres	
ap	Andesitic porphyry and breccia	
di	Diabase	PRE-TERTIARY
dg	Diorite and gabbro	

Contact, dashed where approximately located

Fault, dashed where approximately located; dotted where concealed

U D — High-angle fault; U, upthrown side; D, downthrown side

Overthrust fault

Trace of anticlinal axis, showing direction of plunge; dashed where approximately located

Trace of synclinal axis, dashed where approximately located

30 — Strike and dip of beds

90 — Strike and dip of vertical beds

58 — Strike and dip of overturned beds

Boundary of proposed reservoir

GEOLOGIC MAP OF THE TOWNSEND VALLEY, MONTANA

Scale 1:96,000

1 0 5 Miles

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.
M R-3606

Geology of Tps. 9 and 10 N. from Mertie, Fischer, and Hobbs, 1951; of Limestone Hills from Ruppel, open file report, 1950; and of remaining area by H. W. Lorenz, 1949-50