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Surficial-Geologic Map of the Muddy Creek Landslide Complex Gunnison County, Colorado, April 15, 1986

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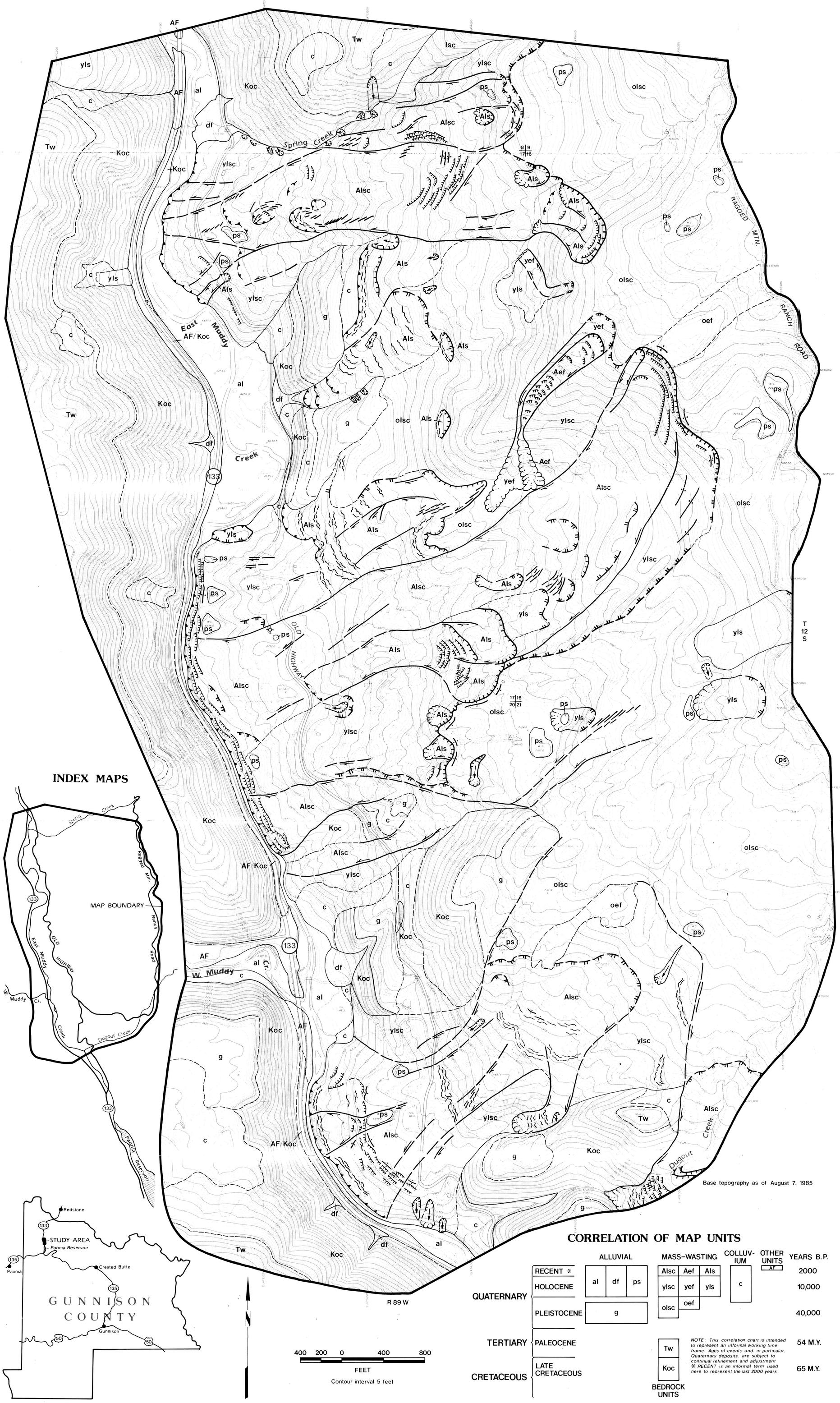

INDEX MAPS

400 200 0 400 800
FEET
Contour interval 5 feet

CORRELATION OF MAP UNITS

		ALLUVIAL			MASS-WASTING			COLLUVIUM	OTHER UNITS	YEARS B.P.
	RECENT *	al	df	ps	Alsc	Aef	Als	c	AF	2000
QUATERNARY	HOLOCENE				ylsc	yef	yls			10,000
	PLEISTOCENE	g			olsc	oef				40,000
TERTIARY	PALEOCENE									54 M.Y.
CRETACEOUS	LATE CRETACEOUS				Tw / Koc (BEDROCK UNITS)					65 M.Y.

NOTE: This correlation chart is intended to represent an informal working time frame. Ages of events and, in particular, Quaternary deposits, are subject to continual refinement and adjustment.
** RECENT is an informal term used here to represent the last 2000 years.*

Explanation

Description of Map Units

LANDSLIDE AND SLOPE-FAILURE DEPOSITS

Alsc ACTIVE LANDSLIDE COMPLEX - Large-scale, reactivated elements of Holocene and Pleistocene complex slope-failure deposits, moving in continuous creep mode. Moving areas are bounded by combinations of fresh, open longitudinal shear fractures, en-echelon tension fractures, overriding or bulging toes, and active or incipient head scarps. Topography within the moving elements is extremely hummocky, and includes sharp-crested flank ridges, longitudinal shear fractures, and numerous open cracks and fractures. Compositionally similar to Holocene and Pleistocene mass-wasting deposits.

Aef ACTIVE EARTHFLOW - Small-scale, reactivated earthflows within Holocene and Pleistocene complex slope-failure deposits. Active flows are mapped separately on the basis of fresh headscarps and side shears, and actively forming lobate, overriding toes. Compositionally similar to deposits in which they have formed.

Als LOCALIZED ACTIVE LANDSLIDES - Individual active rotational slumps and slides occurring within complex, large-scale, reactivated landslide elements, or Holocene and Pleistocene mass-wasting deposits. Individual active slides are distinguished by fresh headscarps, flanks, and bulging lobate toes which define a local zone of failure within large-scale complex landslide deposits. Compositionally similar to deposits in which they have formed.

ylsc YOUNG LANDSLIDE COMPLEX (HOLOCENE) - Large-scale, complex landslide deposits which form much of the lower valley slopes on the east side of Muddy Creek. The deposits formed as landslide-earthflow complexes derived from previously failed Pleistocene mass-wasting deposits. Large elements within these deposits have begun to move, and are mapped separately as "Alsc" areas. Topographic expression and comparative soil development suggests these landslide complexes entered the valley axis of Muddy Creek between 4,000 and 7,000 years b.p. Compositionally similar to Pleistocene landslide deposits.

yef YOUNG EARTHFLOW DEPOSITS (HOLOCENE) - Small-scale, individual earthflow scars and deposits which can be mapped separately within large-scale slope-failure complexes on the basis of fresh topographic expression. Although presently inactive, these deposits possess sharply defined headscarps, flank ridges, and lobate toes.

yls LOCALIZED YOUNG LANDSLIDES (HOLOCENE) - Rotational slumps and landslides which can be mapped separately within large-scale slope-failure complexes on the basis of fresh diagnostic topography. Although presently inactive, these deposits possess well defined headscarps, flanks, and lobate toes. They are compositionally similar to the deposits in which they occur.

olsc COMPLEX OLD LANDSLIDE DEPOSITS (PLEISTOCENE) - Large-scale, complex slope-failure deposits consisting predominantly of remolded, purple and reddish-brown clay derived from the Wasatch Formation, admixed with angular to moderately rounded pebbles, cobbles, and boulders of quartz-monzonite porphyry from the Ragged Mountain Laccolith three miles to the east. Locally these deposits contain admixed masses of brownish-orange, deeply weathered, grussified, periglacial outwash gravels and cobbles composed almost entirely of quartz-monzonite-porphyry clasts. This deposit forms an extensive, hummocky terrain from the east edges of the map area to the base of Ragged Mountain. Active and Holocene mass wastage units have been derived from renewed failures of these deposits, and are compositionally similar.

oef OLD EARTHFLOW SCARS AND DEPOSITS (PLEISTOCENE) - Individual earthflow scars and deposits which can be mapped separately within complex old landslide deposits, (olsc), on the basis of preserved diagnostic topography of flank ridges, head scarp areas, and U-shaped zones of depletion.

ALLUVIAL DEPOSITS

al STREAM ALLUVIUM - Stream-deposited clay, silt, sand, pebbles, cobbles, and boulders in the modern physiographic flood plain. Includes fine-grained overbank clays and silt in low terraces within a few feet of stream level.

df DEBRIS AND ALLUVIAL-FAN DEPOSITS - Intermixed masses of clay, silt, sand, gravel, cobbles, and boulders forming cone or fan-shaped deposits at the confluence of steep streams or ravines where they discharge upon floodplains or terraces. Mapped Deposits are all undergoing active deposition by flash-flooding and local mud/debris-flow activity.

ps POND SEDIMENTS - Local accumulations of black, organic mud and peat deposits associated with sag ponds and closed depressions common to the hummocky surfaces of slope-failure deposits. Only larger areas are shown.

g ALLUVIAL TERRACES, VALLEY FILL, AND FAN GRAVEL (PLEISTOCENE) Clay, silt, sand, gravel, cobbles, and boulders resting on bedrock surfaces 175 ft to 300 ft above the modern flood plain. The gravels contain abundant well-to-moderately-well-rounded boulders and cobbles of basalt and quartz monzonite porphyry in a silty to coarse sandy matrix. Many of the granitic clasts are grussified. Thickness ranges from 75 ft to approximately 150 ft.

COLLUVIUM

c COLLUVIUM AND SLOPE WASH - Deposits of clay, silt, sand, and rock fragments derived from downslope transport and sheet wash of materials from adjacent side slopes. Also includes some areas of wind-blown silt and sand. Mapped only in footslope areas where accumulations are thick enough to form diagnostic landforms.

BEDROCK

Tw WASATCH FORMATION - Varicolored purple and reddish-brown mudstone, siltstone, and white-to-gray, fine-to-coarse-grained, lenticular, feldspathic and arkosic sandstone, conglomeratic sandstone, and conglomerate. Slope-failure complexes are predominantly derived from mudstone units in the Wasatch.

Koc OHIO CREEK FORMATION - Light-gray, medium-to-coarse-grained, friable, feldspathic conglomeratic sandstone, cross-bedded sandstone, and interbedded gray-to-black shale and mudstone.

OTHER UNITS

AF ARTIFICIAL FILL - Areas of man-made roadfill and embankments associated with construction of Highway 133. Substrate unknown.

AF/Koc ARTIFICIAL FILL ON BEDROCK BENCHES - Areas of man-made roadfill placed on prepared bedrock cuts and benches.

Symbols

- CONTACT; dashed where approximately located
- SCARP; dashed where inactive, (Holocene and Pleistocene units), or where beginning to form, (Active elements). Scarps act as contacts between some map units.
- LONGITUDINAL SHEAR FRACTURE; dashed where beginning to form at surface. Arrows on moving block show relative sense of movement. Shears act as contacts between some map units.
- SHEAR ZONE; en-echelon tension cracks, (denotes distributed shear).
- TENSION CRACKS
- SCARPLET SWARM; generalized distribution of minor scarps in slumping and moving ground.
- OVERRIDING TOE OR THRUST; dashed where beginning to form at surface.
- BULGING SURFACE AND SOIL RIPPLES; Act as contacts between some map units.
- LOCALIZED SMALL SOIL-SLIPS AND SLIDE AREAS
- LOBATE TOE OF EARTHFLOW OR LANDSLIDE; Act as contacts between some map units.
- CRACKS AND FRACTURES
- DRY HOLE; Delhi-Taylor Oil Co. McLaughlin 1. T.D. 3550 ft. in Mancos Shale

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