

**CSS No Moss Gathers
Presents:**

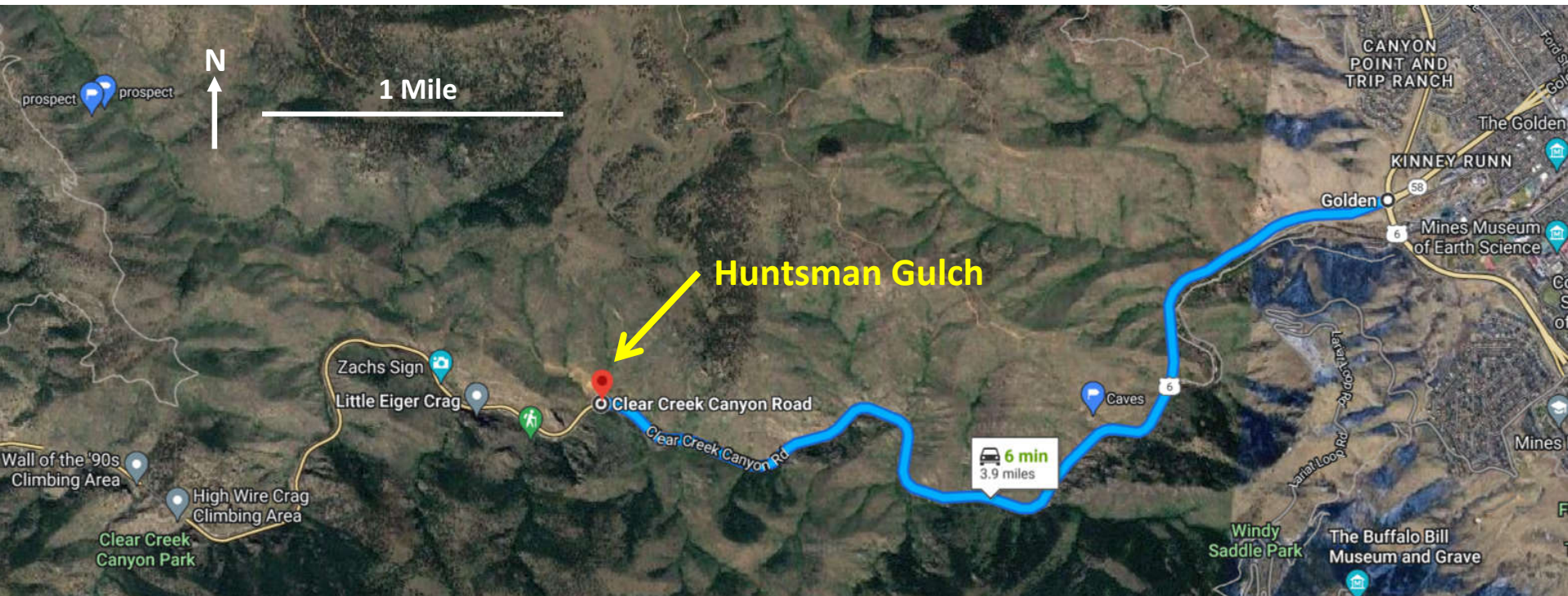
**HUNTSMAN GULCH
JEFFERSON COUNTY, CO**

**FEATURING LEW KLEINHANS
WITH
PETE MODRESKI, NED STERNE AND CAL RULEMAN**

**@ Huntsman Gulch
8 AM, November 6, 2022**

Location and Directions

Pull off is on the north side of Clear Creek Canyon Road,
~ 3.9 miles west of the Hwy. CO-93 / Hwy. CO-6 stop-lit intersection.

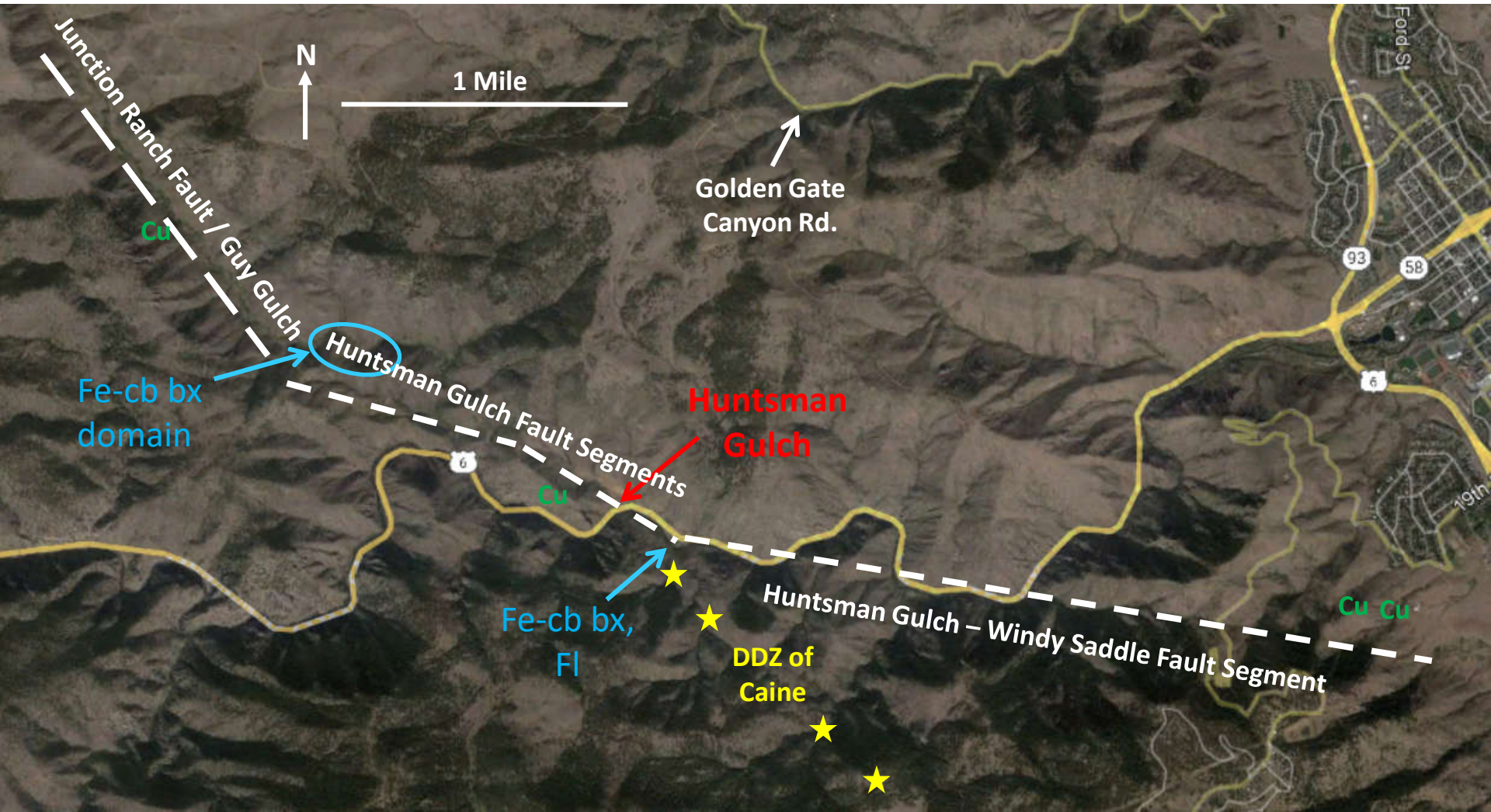


Field Trip Sequence of Observations (including proximal and distal)

- Regional context
- ~ 6,120 “trail” above and on south (and north?) sides of Clear Creek
- Multi-level perched gravels
- Iron carbonate breccia “reef” downstream from Huntsman Gulch on south side of Clear Creek... and elsewhere
- Parking area boulders from quarry operation (products of Huntsman Gulch faulting)
- Huntsman Gulch fault
- Crystal Cave
- Reed’s “gully fill deposits” (and other?) in drainage west of quarry
- Pegmatite and lower Guy Gulch overview at saddle top
- Barite-quartz-fluorite +/- base metals vein / prospect on ridge

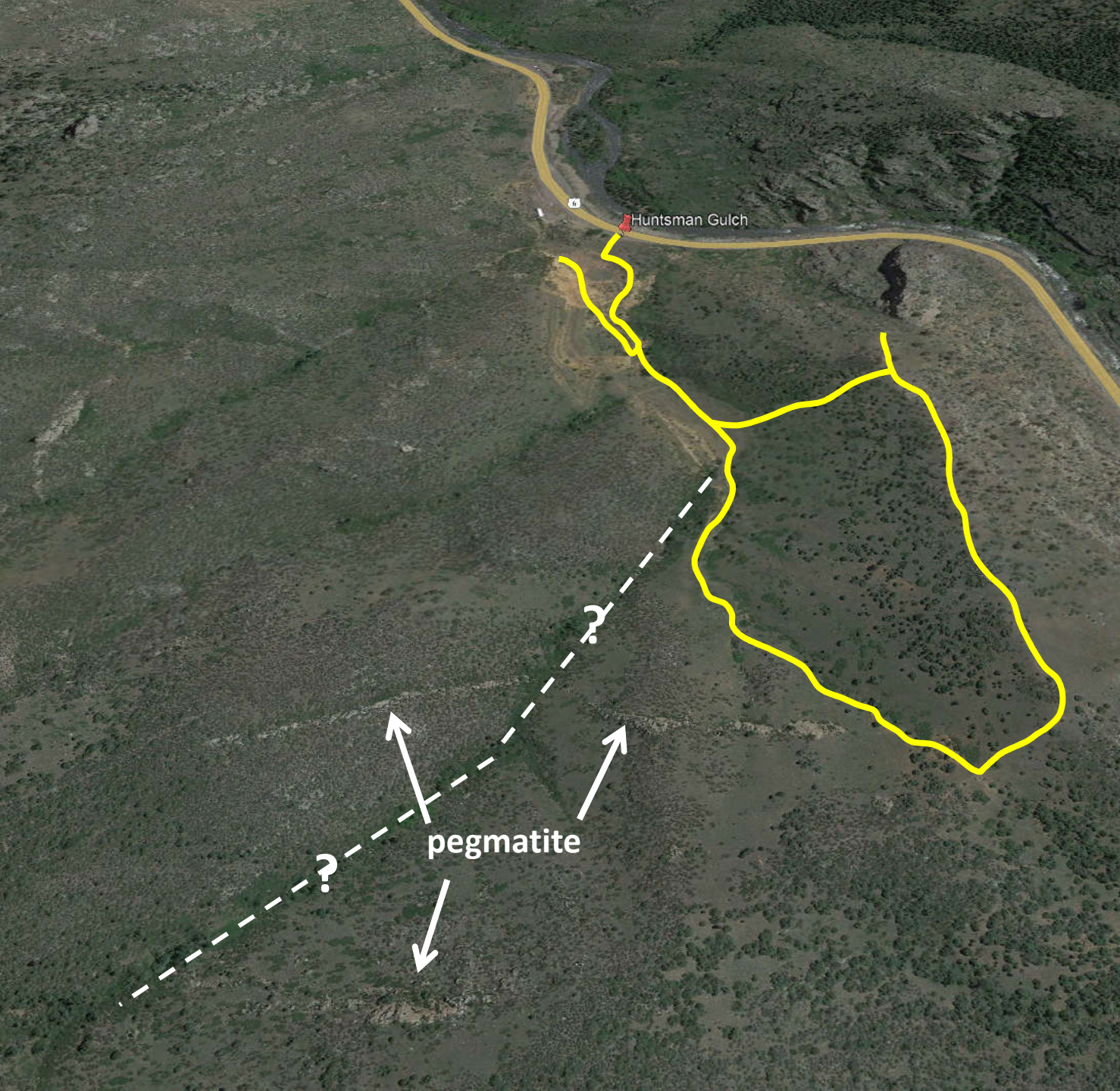
Note: Elevations superimposed on graphics were derived from the 1960 USGS 7.5 Minute Evergreen Quadrangle Topographic Map. An example of the significance of this is that Reed (USGS OFR 91-144) shows the elevation of Clear Creek at Huntsman Gulch to be ~ 6,110’, whereas the 1960 topographic sheet shows it to be ~ 6,080’, a difference of 30’.

Some Regional Context





Hike Route



**Oblique view
looking SE over
field trip loop
hike.**

**~ 6,120' "Trail" (game, human?)...
or
something else?
(e.g., ditch, RR Track, strandline?)**

Looking south across Clear Creek from Huntsman Gulch side



~ 6,120' "trail"

landslide
scarps

perched gravels
(~6,095')

dredge
tailings

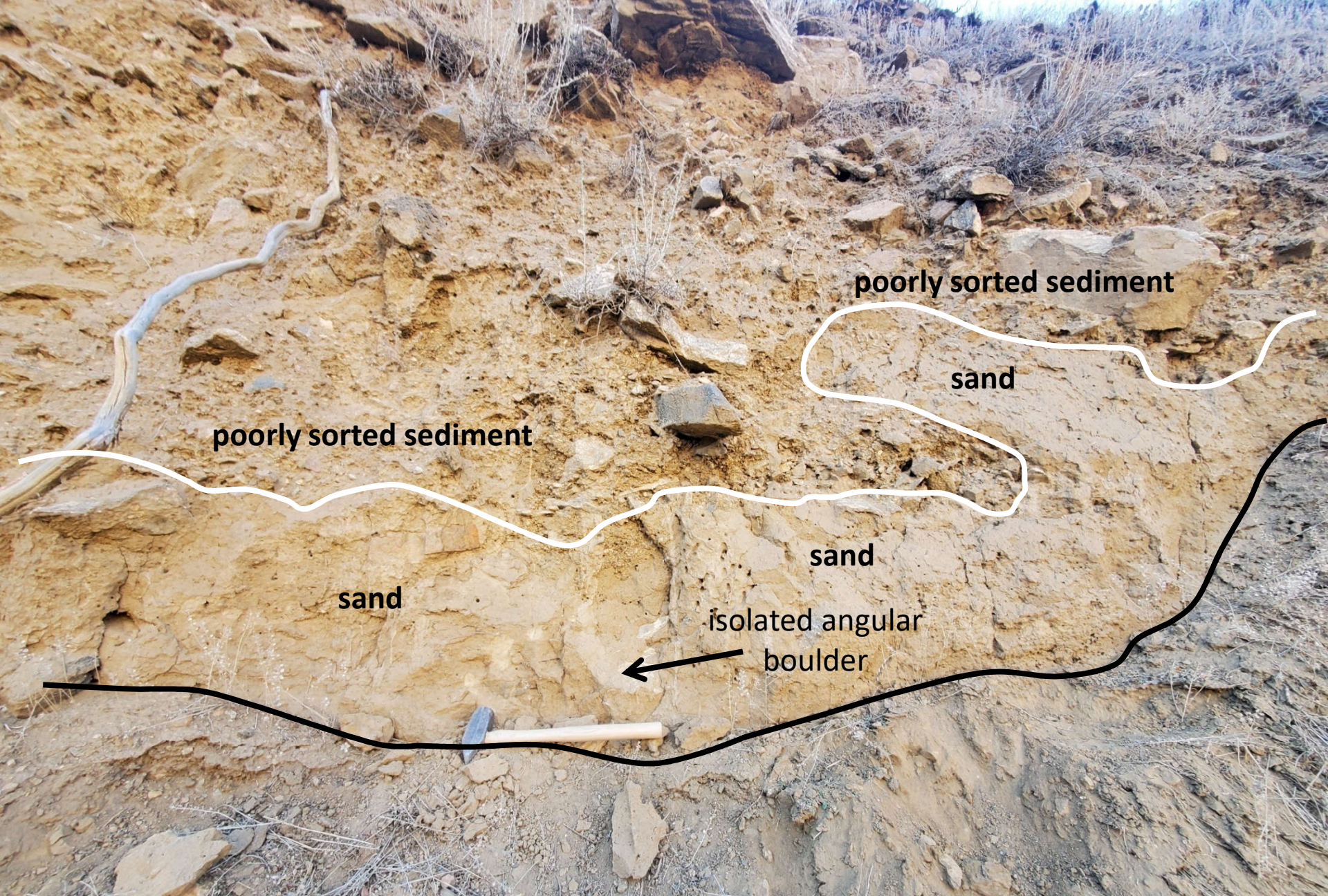




Upstream side of ~ 6,120' "trail"

~ 6,120' "trail"





poorly sorted sediment

sand

poorly sorted sediment

sand

sand

isolated angular
boulder

Largest of the landslide scarps, which exposes interfingering, poorly-sorted sediment (above) with sand having local angular pebble to boulder “erratics” (below).



Weathering metamorphic rocks make for an abundant source of immature sand.



Similar feature on north side of creek?

Multi-level Perched Gravels



**Higher-level gravel on
slopes north of Huntsman**



**Higher-level gravel
on slope north of Huntsman**



**Rimmed porphyry clast from higher-level gravel
on slopes north of Huntsman**



**Intermediate-level gravel
above road on NW side of
Clear Creek
(i.e., Reed's gravels on nose
east of Crystal Cave)**



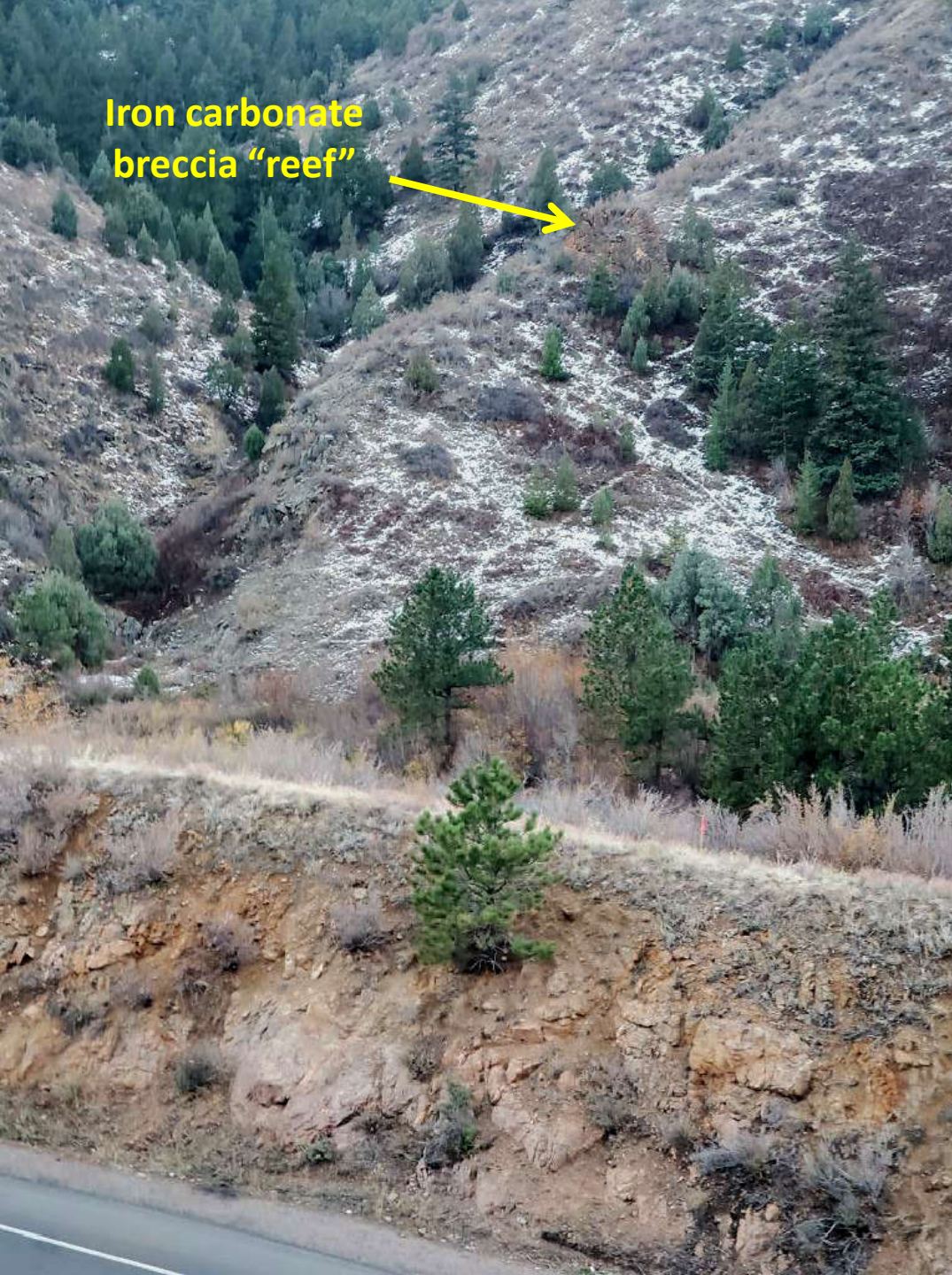
Possible excavation site in intermediate level gravel on nose east of Crystal Cave



**Lower-level gravel
below largest scarp
on south side of creek;
possible dredge source**

Iron-Carbonate Fault Breccia “Reefs”

**Iron carbonate
breccia "reef"**



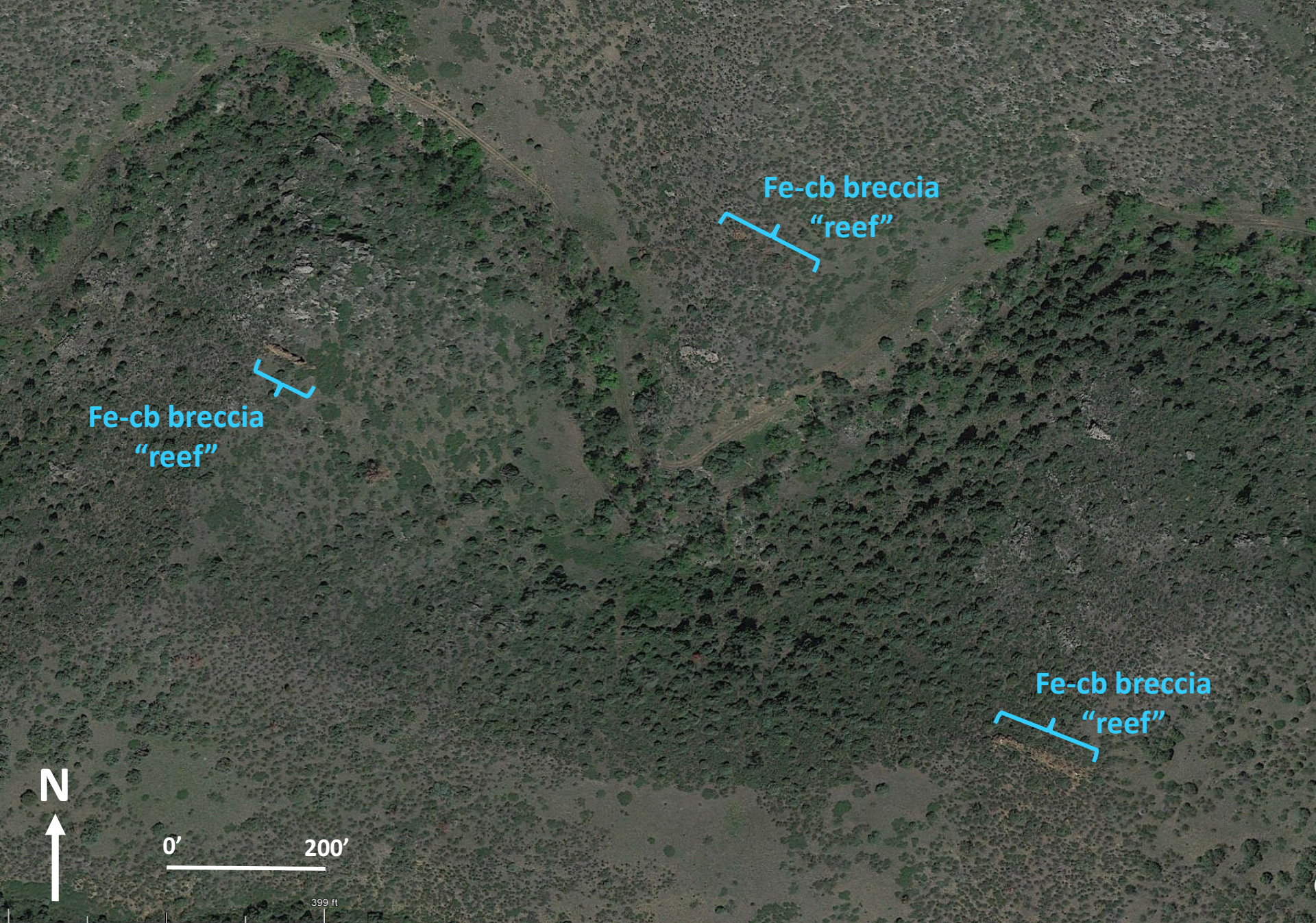
**Iron carbonate breccia "reef"
just downstream from Huntsman, on
south side of and above Clear Creek**



**Iron-carbonate breccia “reef”
across and just downstream from Huntsman Gulch, on south side of Clear Creek**



Iron carbonate breccia just downstream from Huntsman, on south side of Clear Creek



Fe-cb breccia
"reef"

Fe-cb breccia
"reef"

Fe-cb breccia
"reef"



0' 200'

399 ft

Guy Gulch Fe-cb breccia "reef" domain



Guy Gulch Fe-cb breccia "reef"



**Guy Gulch Fe-cb breccia “reef” with young, associated calcite;
latter dated at 240,800 +/- 7,200 yrs. (Adam Hudson, USGS, pers. comm., Dec. '21)**



Guy Gulch Fe-cb breccial with alignment fabric



Guy Gulch Fe-cb breccia with pseudo-cross-bedding(?)



Guy Gulch fractured Fe-cb breccia “reef”

**True Precambrian “Dirty” Marble
(NOT here but included for comparison)**



**Precambrian “dirty” marble and calc-silicate along Grapevine Road,
near confluence of Mt. Vernon Canyon and Shingle Creeks**

Huntsman Gulch Fault







0 1 2 3 4 5 6 7

CENTIMETRES



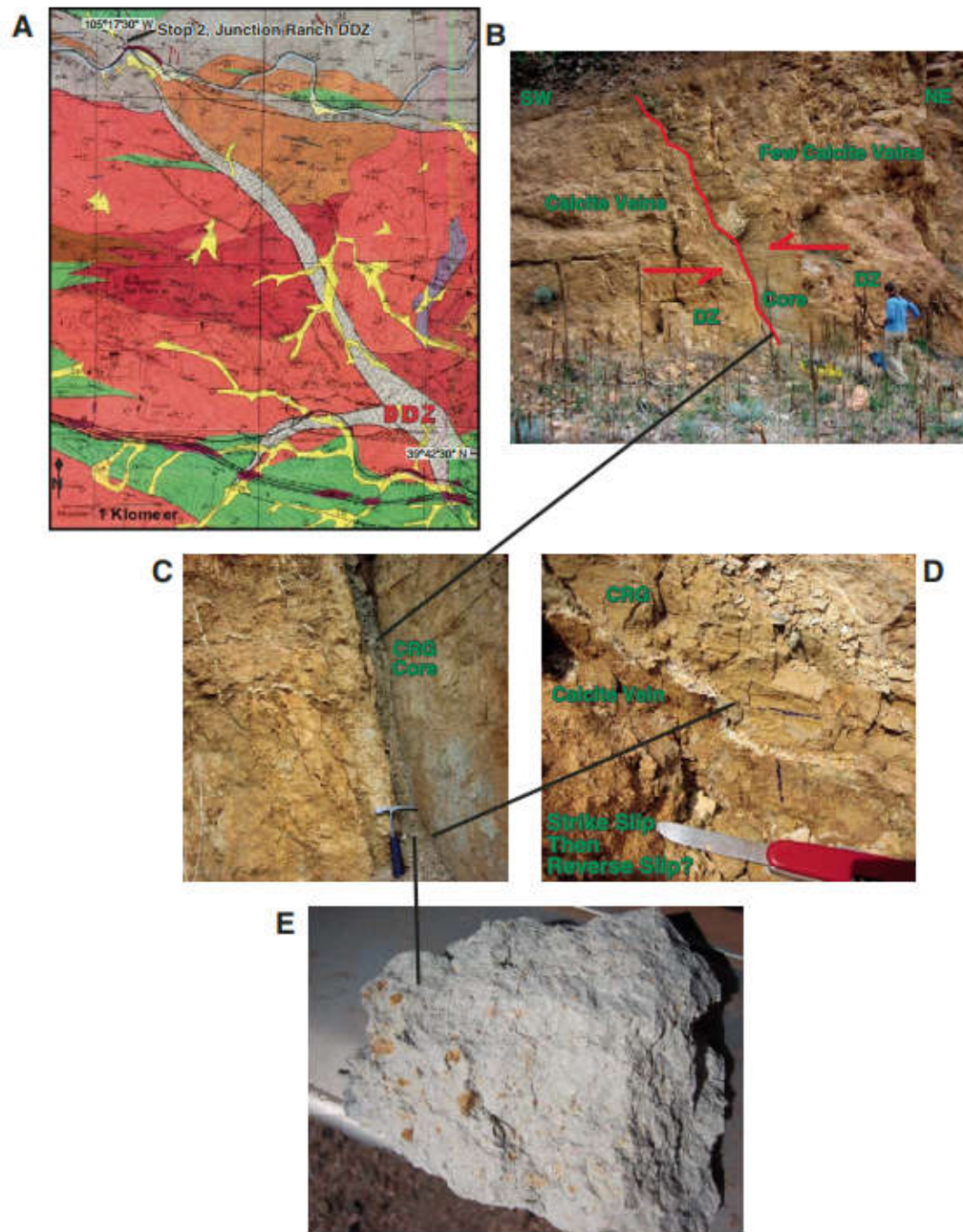


Figure 5. (A) 1:24,000 scale geologic map, Evergreen quadrangle, Colorado, showing the location of the Junction Ranch fault zone locality (modified from Sheridan et al., 1972; Geologic features and units include: af (artificial fill); Qp, Qpp, Qt (Upper Holocene alluvial and colluvial deposits); Proterozoic p (pegmatite) and la (lamprophyre) dikes. Early Proterozoic (X) gneisses are ggr (gneissic granites), f (feldspar), h (hornblende amphibolite), fh (feldspar-hornblende), bg (garnet, sillimanite, biotite), and mb (migmatic biotite). Note the unusual width of the fault zone shown as a cross hatched pattern, mapped as a zone of “shattered rock” relative to the few hundred meters of sinistral separation of the Proterozoic map units. (B) Outcrop photograph of the fault zone showing the hydrothermally altered damage zone on either side of the well-developed fault core. Note the greater abundance of calcite veins in the southwest block as compared with the northeast block. (C) Photograph of well-developed clay-rich fault gouge (CRG) bounded within the planar slip surfaces of the contact between the hanging wall and footwall damage zones. Note the mutually crosscutting subhorizontal and subvertical calcite veins primarily found in the southwest footwall block. (D) Close-up photograph of the CRG in the fault core showing multiple layers of CRG and subhorizontal slickenlines (shown with blue lines) in the interior of the core with a calcite vein cutting the core and restricted to the southwest footwall side of the core. The clay gouge on this vein show subvertical slickenlines. (E) Photograph showing details of a fist-sized sample of one layer of the CRG from the fault core. Note the rounded clasts of iron oxide stained wall rocks in this clay matrix supported breccia.

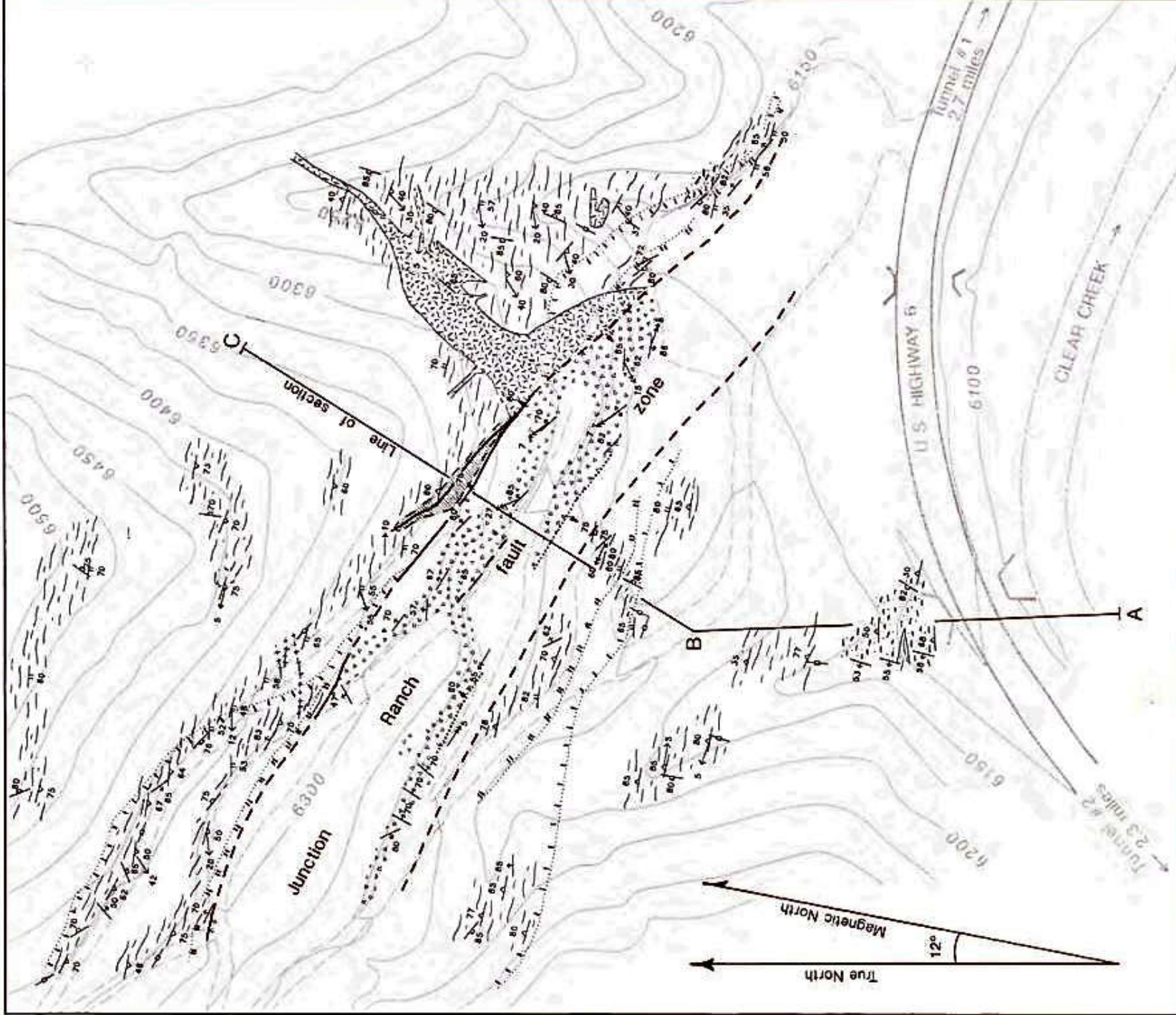
**From Caine, Ridley and Wessel
(2010); GSA Field Guide 18**



Crystal Cave



**Padlocked entrance
to Crystal Cave,
Huntsman Gulch**



Topography of excavation by planetable methods, April 1989.
 Other topography from Jefferson County Mapping Department

Geology mapped
 May 1989-January 1990

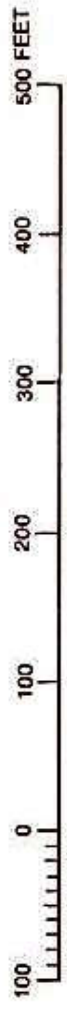


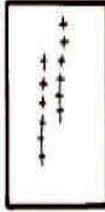
Plate 1 Map
From Reed USGS OFR 91-144

CONTOUR INTERVAL 25 FEET

EXPLANATION



Breccia and microbreccia (dotted line shows zone of flinty crush rock)



Lamprophyre dikes



Pegmatite



Granitic gneiss



Biotite gneiss, schist, and migmatite with minor amphibolite



Fault or shear zone (dashed where approximately located)



Approximate outer limit of conspicuous limonite stain on joints and fractures





Approximate outer limit of carbonate coating on joints and fractures




Approximate outline of cave (vertical projection of cave floor to surface)


 Strike and dip of foliation

 Strike and dip of layering

 Inclined Strike and dip of joints

 Inclined Strike and dip of shear zone

 Direction and plunge of lineation

 Direction and plunge of striae

 Direction and plunge of fold axis



Edge of access road or quarry bench

Legend for Plate 1 Map
From Reed USGS OFR 91-144

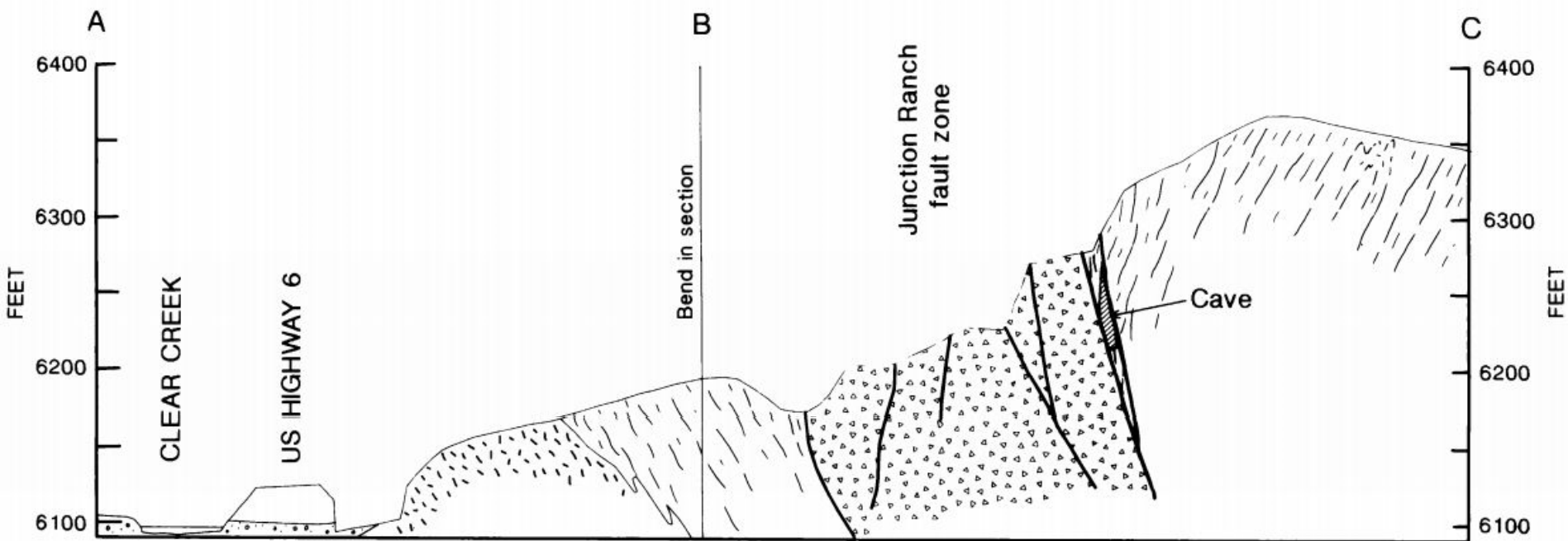


Figure 2.--Geologic cross section of the excavation

From Reed USGS OFR 91-144

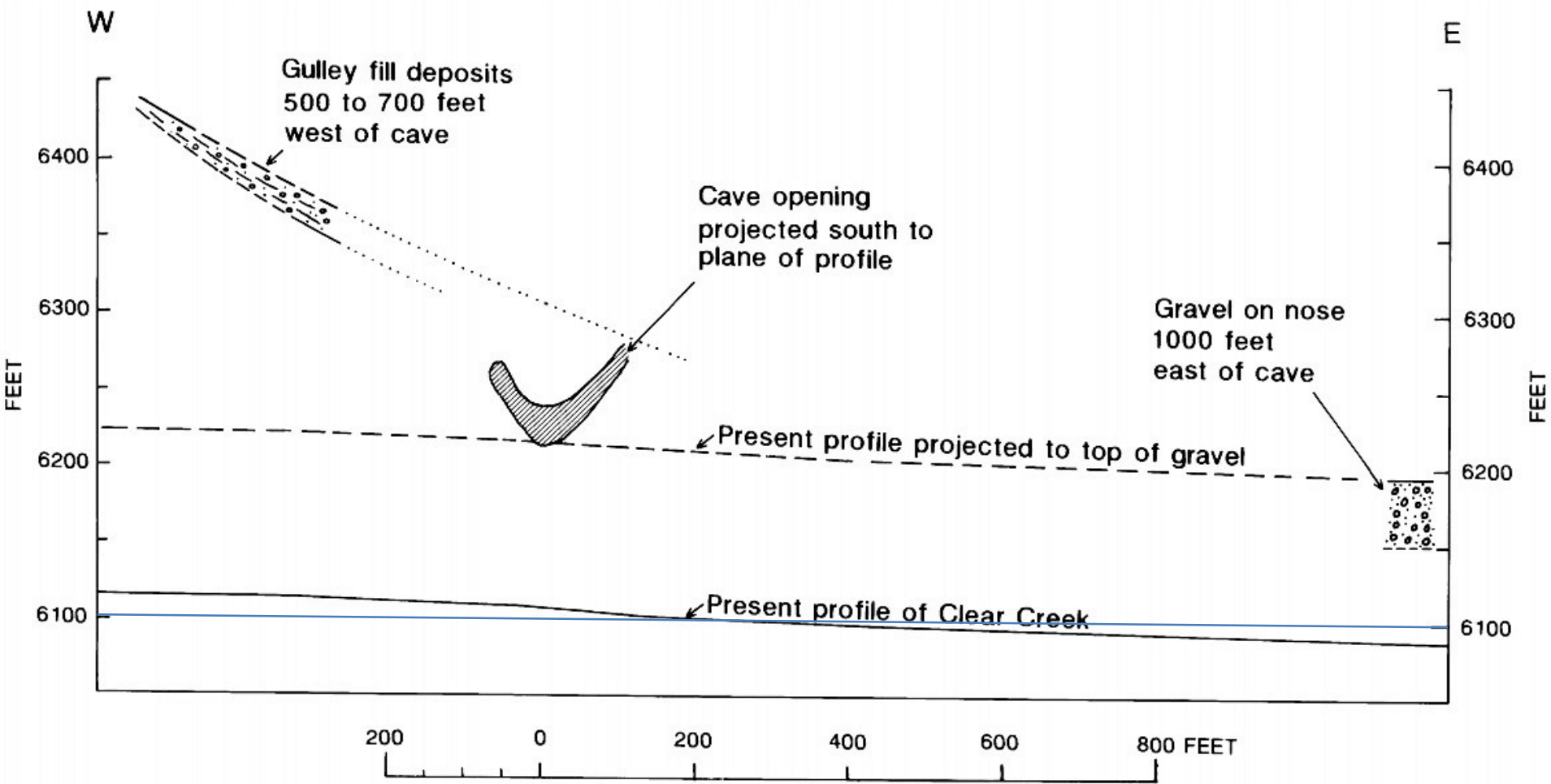


Figure 3.--Diagram showing relations of the cave to terrace gravel along Clear Creek and gulley fill deposits

From Reed USGS OFR 91-144

Reed's "Gully Fill Deposits" (?) and (?) Other Adjacent Deposits

Contrast the level(s) of organization within these sedimentary packages.

What processes can be called upon to account for the deposition and preservation of these sediments?

How are these sedimentary packages different and what are their relationships to one another and the fault?

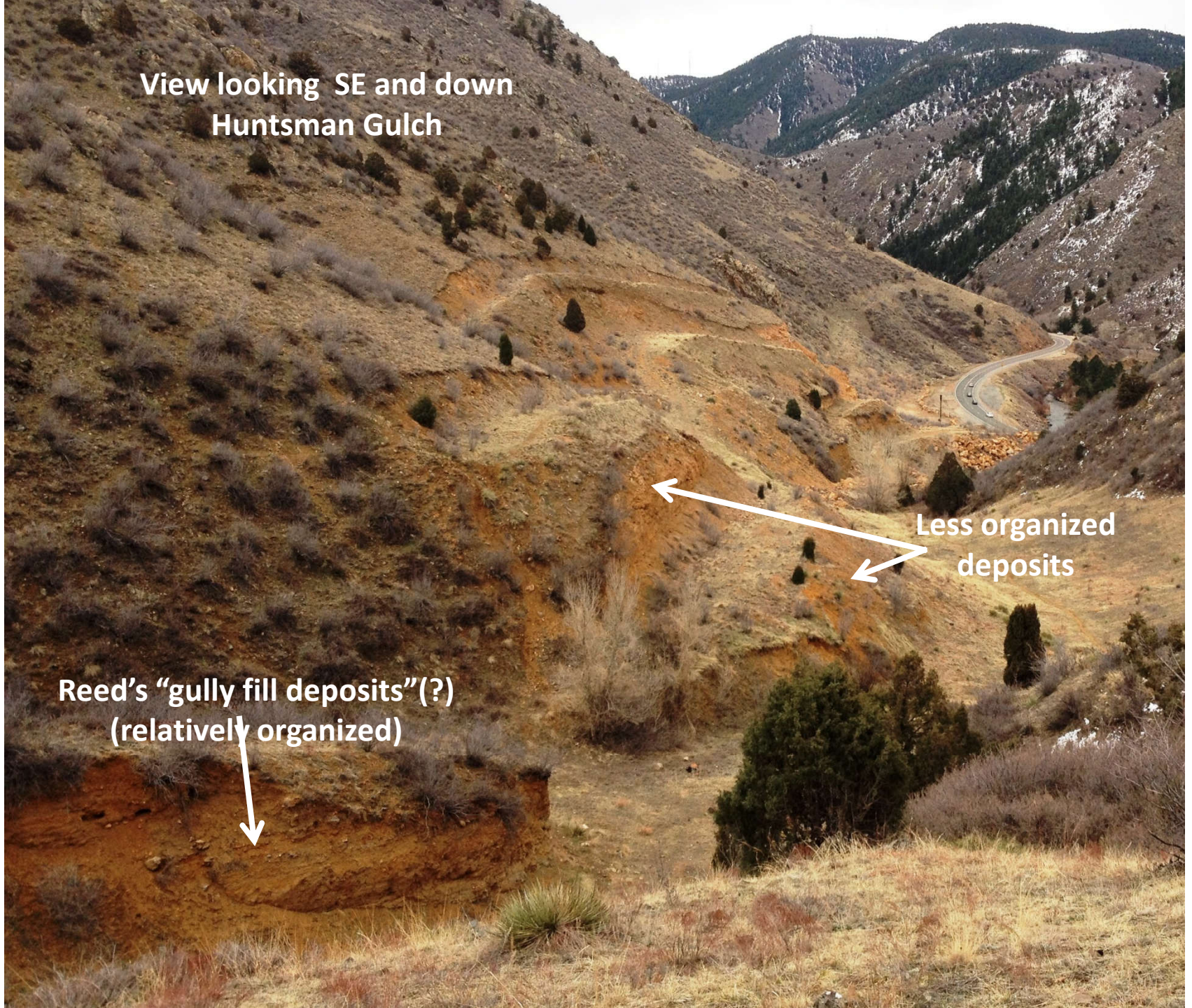


View looking NW and up Huntsman Gulch.

View looking SE and down
Huntsman Gulch

Less organized
deposits

Reed's "gully fill deposits" (?)
(relatively organized)





Relatively disorganized deposits below Reed's "gully fill deposits".



Reed's "gully fill deposits"



Reed's "gully fill deposits"



Reed's "gully fill deposits"



Reed's "gully fill deposits"

Saddle and Near Saddle Perspectives



Iron oxide stained, truncated(?) southwest end of pegmatite close to saddle and projection of Huntsman Fault segment. Note similar dips and apparent lateral continuity of pegmatite segments as viewed along strike towards the NE.

Barite-Quartz-Fluorite +/- Base Metal Vein

What have we here?

100' on ground

