

DRIVING INSTRUCTIONS

Geology 1 Field Trip – San Gabriel Mountains, Soledad Basin, San Andreas Fault

What to bring:

- Weather appropriate clothing
- Closed-toe walking shoes
- Sun glasses, sun screen, hat
- Water bottle
- Hand lens
- Clip-board or notebook, pencil
- Printout of Field Exercise and these Driving Instructions
- Gas money
- Sack lunch or money

ROAD LOG

START: Gather at PCC parking lot 7 on the east side of the campus. Enter at the kiosk on Bonnie Ave. (near the Burger King). Form carpool groups. Please volunteer to drive only if you have insurance and your car is in good condition and can comfortably carry passengers. The trip is about 110 miles total.

! Each individual pool groups will arrange splitting the cost of gas.

🚗 Directions: Enter the 210 Fwy westbound at Hill. Stay in the right-hand lanes. Where the 210 and 134 split bear right, staying on the 210. Drive 16 mi and exit at Sunland Blvd. Proceed straight through the intersection at the bottom of the ramp (Fenwick) and go 0.17mi to Foothill Blvd. Turn left on Foothill. Drive 0.9 mile. Park on Foothill just before crossing the Big Tujunga bridge. The Angeles National Golf Club is on your right. (Total = 19 mi)

STOP 1: Big Tujunga River

This is a major tributary of the Tujunga watershed which drains a 225 mi² area of the southwestern San Gabriel Mtns. While average annual rainfall is low, 15in/yr, it can be twice this in the higher elevations. Every few years episodes of intense rain fall, up to a record 26 inches in 24 hours, can cause "flash floods" which transport huge volumes of sediment. In 1934 heavy rains caused flooding and debris flows that killed 40 people and left 8ft boulder in the streets. Floods also occurred in 1938, 1941, 1969 and 1978. The highway was washed out just a few miles up stream in January 2005.

The low average rainfall means that the typical stream flow cannot transport the sediment present in the channel resulting in its braided character. Note other stream features like meander scarps, gravel bars, and terraces.

🚗 Directions: Continue N on Foothill 1.3mi to Wheatland, turn left then right onto the 210 Fwy west-bound. We will be driving through the area heavily shaken by the 1971 and 1994 earthquakes. After about 9mi you will make the transition to the I-5 northbound (Sacramento). Stay right and after 1 mi transition to the CA-14 toward Palmdale. Continue on CA-14 for 8.4 mi. Exit a Sand Canyon. (Total = 21 mi). Stop at In-N-Out.

LUNCH STOP: In-N-Out or sack lunch

🚗 Directions: Exit In-N-Out, drive North on Sand Canyon and turn right on Soledad Canyon immediately after crossing the freeway. Proceed about 2.5mi. After crossing under the freeway, park on the shoulder just past Lang Station Rd. (Total = 2.6 mi)

STOP 2: Soledad Canyon Freeway Cut

Climb the hill by the freeway onramp.

- a) View North: road cut exposes an angular unconformity between sandstone and conglomerates of the Mint Canyon Fm overlain by Pleistocene gravels. The right (east) end of the cut is a buttress unconformity indicating the upper layers were deposited in a channel or basin. Note that the beds exposed in the cuts for the railroad to the south match the orientation of the lower beds here.
- b) View WSW: sand and gravel works, Santa Clara River valley and 850ft suspended pipeline.
- c) View SE: Cemex Inc. - Soledad Canyon quarry. The company estimates gravel and stone production from the quarry at 56.1 million tons over the next 20 years. Sand and gravel ranks 4th in value of natural resources in California; after oil, gas, and cement (from limestone). Note the significant grading that is necessary to keep the artificial slopes stable.

🚗 Directions: Proceed E on Soledad Canyon Rd 1.9 miles to pullout. (Total = 1.9 mi)

STOP 3: Road Cut – Exercise in Stratigraphic Crosscutting Relationships

🚗 Directions: Proceed E on Soledad Canyon Rd 1.4 mi to junction of Agua Dulce Rd. Turn left (north) on Agua Dulce Rd passing under CA-14. About 4 mi. north the road makes a 90 degree right turn and becomes Escondido Rd. Continue 0.25 mi. past the turn to the stop sign. Go straight. At 0.65 mi. past the stop sign look for the sign for Vasquez Rocks County Park on the right. Turn right into the park and follow signs down the dirt road to the main parking area. (Total = 6.3 mi.)

STOP 4: Vasquez Rocks County Park.

These coarsely clastic sedimentary rocks belong to the Miocene (12 –15 Ma) *Vasquez and Mint Canyon Formations* which comprises more than 20,000 m of coarse-grained conglomerate sandstone, shale, and basalt, that can be found from here to Santa Barbara. The sediments were derived from sources as far away as present-day Mexico that have since been moved even farther away by movement along the plate boundary. The sediments were deposited on-shore in a river flood plain environment. The reddish hue is caused by the oxidation of iron. These *hogbacks* are folded and tilted up to 50 degrees over 8 to 15 Ma by deformation along the Elkhorn fault, an offshoot of the San Andreas Fault. They rise up to 50 m high and were sculpted by erosion by both water and wind.

🚗 Directions: Exit Vasquez Rocks County Park. Turn left (west) and return to CA-14. Turn right onto CA-14 (toward L.A.). Return to Pasadena the way we came.