



## ***Supplemental road log 3: From intersection of NM-602 and Bread Springs road to Fort Wingate via Stinking Springs and McGaffey***

Orin J. Anderson, David W. Love, and Spencer G. Lucas  
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## SUPPLEMENTAL ROAD LOG 3, FROM INTERSECTION OF NM-602 AND BREAD SPRINGS ROAD TO FORT WINGATE VIA STINKING SPRINGS AND MCGAFFEY

ORIN J. ANDERSON, DAVID W. LOVE and SPENCER G. LUCAS

**Distance:** 26.1 mi. Segments of road not maintained, 4-wheel drive recommended.

**Estimated driving time:** 1 hr 15 min

### Mileage

- 0.0 Leave intersection of NM-602 and Bread Springs Road and proceed eastward on Bread Springs Road (mile 34.2 of third-day road log). **0.2**
- 0.2 Roadcuts on both sides expose the upper Bidahochi Fm, Mio-Pliocene, for next 0.5 mi. The Bidahochi is composed of pale reddish brown argillaceous sandstone, mudstone and white rhyolitic ash beds. **0.4**
- 0.6 At top of roadcut on right note the white rhyolitic ash bed; road continues on through cuts exposing Bidahochi Fm. **1.2**
- 1.8 Zuni Mountains form the skyline at 11:00 to 12:30; the crest and general upland surface are developed on Glorieta Ss and San Andres Ls. **1.4**
- 3.2 Leave Bread Springs Road and **bear right** onto the graveled, all-season Pinehaven Road. Roadcuts ahead expose more Bidahochi covered locally with thin patches of recent eolian sand. **2.0**
- 5.2 Old service station on left. **1.6**
- 6.8 Road descends into Upper Cretaceous rocks of Crevasse Canyon Fm. **0.3**
- 7.1 Pine Grove Road to left; continue straight ahead. **0.2**
- 7.3 Pine Garden Road to left; McKinley Co. has instituted a rural addressing system. **0.3**
- 7.6 Surface from this area eastward to the Zuni Mountain front is developed on Crevasse Canyon Fm. **0.5**
- 8.1 A massive fluvial channel sandstone in Crevasse Canyon Fm caps the mesa to left of road. **0.5**
- 8.6 Ranch on right. **0.2**
- 8.8 Cibola National Forest boundary; route now follows Forest Road 191 which is generally not maintained. **0.1**
- 8.9 Garcia Ranch road to right (Forest Road 419). **0.5**
- 9.9 Crevasse Canyon exposed in small hill to left of road. **0.5**
- 10.4 Approaching Nutria monocline. The monocline forms the southwestern margin of the Zuni uplift and consists of a drape fold over a reverse fault in the Precambrian and produces dips in the overlying strata of up to 88° locally; the eroded edges of the upturned beds form parallel hogbacks developed on the Gallup Ss and the Dakota Ss, with a strike valley in between on the lower Mancos Sh. Strike of the hogback along this segment is N32–34°W. **0.5**
- 10.9 Crossing water gap cut in the Gallup Ss at the "west wall" of the Nutria monocline. The Gallup (late Turonian) consists of, in descending order (W to E), the reddish-brown, coarse-grained, feldspathic, Torrivio Mbr; the mudstone-dominated, slope-forming Ramah Mbr, both of which are nonmarine; and the lower marine part that is represented in the hogback by two fine-grained, coarsening upward, yellowish-gray sandstones separated by a 40-ft-thick, slope-forming, sandy mudstone. The coal-bearing Ramah Mbr thins to the east and across the monocline as the overlying Torrivio Mbr cuts into it; this erosion surface has been designated a sequence boundary (Nummedal et al., 1988). **0.1**
- 11.0 At 2:30 note the slab or flatirons of lighter colored Two-wells Tongue of Dakota Ss dipping up to 80° to the southwest; immediately behind is the main body of the Dakota Ss which forms the prominent hogback through the area. The geometry of the fold indicates a simple monocline drape over a reverse basement fault. **0.1**
- 11.1 Cross **cattleguard** at water gap in Dakota Ss. Stinking Springs is in creek bottom on right. **0.2**
- 11.3 At 9:00 note the color-banded eolian Zuni Ss, which is the undivided equivalent of Entrada and Cow Spring Ss. The Zuni-Chinle contact is just ahead in narrow ridge on left side of road. A pebble conglomerate marks the base of the Zuni in this area. This probably is the equivalent of the basal, Iyanbito Mbr of the Entrada to the north (Green, 1974). **0.2**
- 11.5 Road now on Chinle and Chinle-derived alluvium as the grayish red to maroon colors indicate. The Chinle is locally as much as 1400 ft thick. At this point along the monocline there is no surface evidence of thrusting. However, 1.5 mi to the north along strike, a thrust cuts out nearly all of the Chinle; the thrust was recognized by Edmonds (1961), who referred to it as the Stinking Springs thrust, and who also mapped it southward through this area. Two mi south of this point at Grasshopper Springs another thrust is evident (see discussion at Stop 3, Day 3), as all but 400 ft of the Chinle has been cut out. Exposures are so poor here that the Chinle cannot be subdivided, although a medial sandstone, probably the Sonsela Ss Bed, is intermittently exposed.
- 11.7 Bear sharply left and stay on Forest Road 191; road to right leads to Grasshopper Springs. **0.1**
- 11.8 Note light gray sandstone of lower Chinle in roadcut on right. **0.2**
- 12.0 Grayish red and light gray mottled, thin bedded fluvial channel sandstone of Chinle exposed on right. **0.1**
- 12.1 Note in rapid succession on right for next 300 ft: (1) "mottled strata," a characteristic facies at the base of the Chinle, (2) the grayish red silty facies (possibly slumped) that is probably Moenkopi Fm, (3) slabs of San Andres Ls that also may have slumped a short distance and (4) more Moenkopi on the north side of San Andres Ls. **0.1**
- 12.2 Chinle dipping 35° to southwest at this point. **0.1**
- 12.3 Switchback in road exposes fossiliferous bed (recrys-

tallized productoid brachiopods) in San Andres Ls which here varies from 20 to 40 ft in thickness; may be totally missing in small patches due to development of karst surface prior to and during Moenkopi deposition. **0.1**

- 12.4 Approaching second switchback; above this switchback to crest of ridge road is on Glorieta Ss. **0.4**
- 12.8 Roadbed continues on highly siliceous Glorieta Ss; structural dips decrease as we approach the crest. **0.2**
- 13.0 Approaching crest of uplift (or anticlinal bend of monocline); Glorieta here is dipping 4–5° to southwest; road turns sharply left just ahead. **0.1**
- 13.1 **Cattleguard** at summit, elevation 8247 ft; continue on Forest Road 191 and begin gentle dip-slope descent on backside of the Zuni uplift. **0.3**
- 13.4 Dense gray limestone slabs on left of road indicate we are in the interbedded limestone and sandstone section that marks the top of the San Andres. **0.3**
- 13.7 Oso Ridge, another monoclinical flexure 4 mi in back of the Nutria monocline, is visible in distance at 12:00. Road is nearly at contact between Glorieta and San Andres for next 0.2 mi—look for scattered limestone slabs. **0.6**
- 14.3 Road to left leads to south end of Fort Wingate Military Reservation 2 mi from here—a restricted area; continue straight ahead on Forest Road 191 which now improves. **0.2**
- 14.5 Good San Andres outcrops along both sides of road. **1.0**
- 15.5 **Cattleguard**. **0.1**
- 15.6 Meadow is on Chinle Fm; elevation 7840 ft. **0.3**
- 15.9 **Cattleguard**; road continues through Chinle with thin alluvial cover. **0.4**
- 16.3 Intersection with SH-400; old logging town of McGaffy is 0.6 mi to right. Oso Ridge passes through downtown area, and McGaffy Lake is dammed in on the east, structurally high, side of the monocline. **Turn left** and proceed toward Fort Wingate. **0.5**
- 16.8 Milepost 1. **0.8**
- 17.6 Turkey Springs road to right; continue straight ahead. **0.7**
- 18.3 Quaking Aspen campground to left. **0.5**
- 18.8 Milepost 3; ridge to right at 1:00–2:00 exposes thick fluvial sandstones of Chinle, probably Sonsela Ss Bed of Petrified Forest Mbr. **0.5**
- 19.3 Good San Andres Ls outcrops on both sides of road; dips here are 2–3° to NE. San Andres is about 50 ft thick in this area. **0.5**
- 19.8 Milepost 4. Roadcut on right in the curve exposes the Glorieta–San Andres contact. **0.2**
- 20.0 Glorieta exposed along right side of highway. **0.3**
- 20.3 Chinle exposed on right side of highway in roadcuts. San Andres thins in this area and may be absent locally. **0.7**
- 21.0 Mottled strata exposed along both sides of highway indicate the basal part of Chinle Fm. **0.5**
- 21.5 Varicolored Petrified Forest Mbr of Chinle on both sides of road, but best exposures to left. **0.8**
- 22.3 One-quarter mi to right at this point, Ash (1978) described a lacustrine facies in what he termed the Monitor Butte Mbr of the Chinle and named it the Ciniza Lake Beds. Furthermore, Ash (1978) claimed that the lower Chinle strata exposed here contain evidence of Triassic

faulting and folding along which “Lake Ciniza” formed.

We, however, take issue with three aspects of Ash’s (1978) study (also see Lucas and Hayden, this guidebook):

1. Ash’s use of the term Monitor Butte Mbr of the Chinle Fm is not justified. We believe the term Monitor Butte should only be used in those areas to the northwest where the Moss Back Mbr of the Chinle Fm is present (cf. Stewart et al., 1972). Thus, we term this interval of the lower Chinle in west-central New Mexico the Bluewater Creek Mbr.

2. The formal stratigraphic term Ciniza Lake Beds proposed by Ash (1978) seems unnecessary. At most, Lake Ciniza covered about 45 acres, and the strata that represent it are no more than 7 ft thick. Bed-level designation of so areally restricted and so thin a unit strikes us as of little value stratigraphically.

3. Field examination of Ash’s (1978) putative angular unconformity within the Chinle Fm at Fort Wingate does not support his conclusions (Fig. S3-22.3). There are steeply dipping strata of the Chinle Fm exposed here, but nowhere can we demonstrate that flat-lying Chinle strata are above these inclined beds. Instead, the steeply dipping Chinle strata at Fort Wingate appear to be Quaternary slump blocks or Laramide fault blocks. Thus, we see no evidence for local structural deformation during the Late Triassic near Fort Wingate.

At 12:00 in the distance the northerly dipping strata forming the cuesta are Petrified Forest Mbr of Chinle. **0.5**

22.8 Milepost 7; note limestone-pebble conglomerate bed in lower part of Chinle in roadcut on right. **0.4**

23.2 Cross bridge. **0.1**

23.3 To right is historic Fort Wingate, established in 1860 as Fort Fauntleroy. The garrison was withdrawn in 1861 because of the invasion of New Mexico by Confederate forces, and only a mail station was maintained throughout the Civil War. When the post was reoccupied in

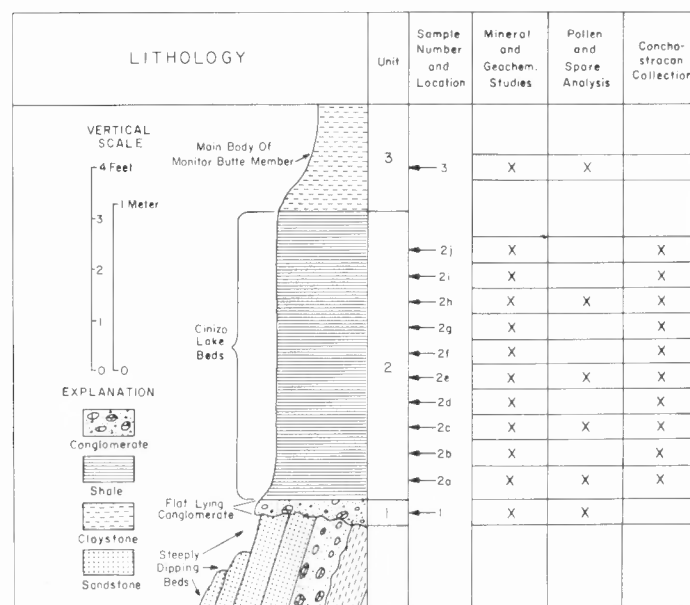


FIGURE S3-22.3. Stratigraphic section of Upper Triassic “Ciniza Lake Beds” (from Ash, 1978).

- 1868 it was designated Fort Wingate for Captain Benjamin Wingate, who died of wounds received in the Battle of Valverde south of Socorro in 1862. **0.1**
- 23.4 Entering business district of modern Fort Wingate. **0.4**
- 23.8 Fort Wingate High School on left. **0.4**
- 24.2 On left of 9:00–12:00 note cuesta with good exposures of lower Petrified Forest Mbr capped by Sonsela Ss Bed on Chinle. **0.6**
- 24.8 Milepost 9. **0.4**
- 25.2 Fort Wingate cliffs ahead along the north side of I-40

- expose in ascending order, the red Entrada Ss, the very thin, white band of Todilto Ls, the Beclabito Mbr of the Wanakah, the light-colored Cow Springs Ss and the Morrison Fm. A thin, generally cliff-forming Dakota Ss caps the section. **0.4**
- 25.6 Gravel pit on left; road on alluvial plain of south fork of Puerco River. **0.5**
- 26.1 Eastbound I-40 on-ramp to right; Albuquerque to right; Gallup to left just ahead.

**End of Supplemental Road Log 3.**

## SUPPLEMENTAL ROAD LOG 4, FROM INTERSECTION OF NM-53 AND FOREST ROAD 50 (NEAR BANDERA CRATER) TO GRANTS VIA FOREST ROADS 50 AND 49

ROBERT M. COLPITTS, JR., PAUL BAUER and CLAY T. SMITH

### SUMMARY

This trip crosses 20 mi of forested land in the southeastern part of the Zuni Mountains. Along this route are exposures of rock that range in age from early Proterozoic to Quaternary. These rocks include granitic gneisses and aplites in the core of the range and Wolfcampian(?) Abo Formation, Leonardian Yeso, Glorieta and San Andres formations and Quaternary basalt flows from several volcanic vents in the core and along the flanks of the range. Several stops have been set up so that important stratigraphic features can be examined. If you wish to stop along the road at other places than those listed, be careful of the land ownership status. Private lands exist within and around the national forest.

### Mileage

- 0.0 **Turn north on Forest Road 50** from State Highway 53 (turn off is at milepost 59; mile 112.3 of third-day road log). Road is on San Andres Formation, part of the dip slope of the south flank of the Zuni Mountains. **0.2**
- 0.2 Road crosses from limestones of San Andres Formation to sandstones in Glorieta Formation. **0.1**
- 0.3 Cross **cattleguard** onto private land. Road still on Glorieta Formation. **0.2**
- 0.5 San Andres Formation in hillside at 9:00. **0.4**
- 0.9 Road is back on San Andres Formation. **0.2**
- 1.1 Road now on Glorieta Formation. **0.4**
- 1.5 **Junction** with road to Oso Ridge Lookout (Forest Road 187). **Stay right** on Forest Road 50. Ridges at 12:00 are made up of Early Proterozoic granitic gneiss. Mount Taylor is at 2:00. **0.2**
- 1.7 Approaching switchback in road. Road crosses Glorieta-Yeso contact which is concealed beneath slope debris on hillside to the left of the road. At 12:00 note cinders from volcanic vent on Oso Ridge. Cinders rest on upper part of Yeso Formation. **0.3**
- 2.0 At 9:00, base of basalt flow from Oso Ridge rests on

- cinder deposit. Flow continues out into valley ahead (11:30–12:00). **0.2**
- 2.2 Note basalt flow from Oso Ridge at 9:00. **0.1**
- 2.3 Basalt flow at 10:00. Oak trees growing on outcrop. **0.1**
- 2.4 Ranch house at 9:00. **0.1**
- 2.5 Entrance to "No Easy Life" ranch on left. **0.1**
- 2.6 Low ridge at 2:00 is composed of Meseta Blanca Member of Yeso Formation. **0.1**
- 2.7 Oso Ridge basalt flow continues on left. **0.4**
- 3.1 Outcrop of Meseta Blanca Member lies below basalt flow on left. The Meseta Blanca Member consists of pale orange-gray to pale yellow-gray, very fine-grained, very well-sorted, subangular, friable, quartz sand. This unit typically displays low- to medium-angle crossbed sets. Up section, the beds are more tabular and locally contain halite casts. See Colpitts (this guidebook) for detailed discussion. **0.2**
- 3.3 Meseta Blanca exposed in bank of arroyo; beds dip south. This outcrop contains abundant fossil burrows. These types of burrows are also common in the upper part of the Abo Formation at Gallo Peak. **0.1**
- 3.4 Side road to left, **continue straight** ahead. **0.1**
- 3.5 Road crosses basalt flow from Oso Ridge vent. Flow conceals Abo-Yeso contact. **0.1**
- 3.6 Road to right leads to Paxton Springs; **continue straight** ahead. **0.1**
- 3.7 **Cattleguard**; entering Cibola National Forest. Basalt flow at 9:00. **0.1**
- 3.8 Basalt on Abo Formation. Abo exposed in roadcut ahead. **0.2**
- 4.0 Roadcut in Abo Formation. **0.1**
- 4.1 At 2:30, cinder cone with associated basalt flows. Goddard (1966) suggested that this cone is the source for the Zuni Canyon basalt flows that we will see later in the trip. **0.1**
- 4.2 **Cattleguard**. **0.1**