

# STATE OF COLORADO

## DEPARTMENT OF TRANSPORTATION

4201 East Arkansas Avenue  
Denver, Colorado 80222  
(303) 757-9632  
FAX (303) 757-9445



**DATE:** March 12, 2009

**TO:** Judy DeHaven

**FROM:** Steven M. Wallace

**SUBJECT:** Paleontological assessment for project HPP 0251-331, Dillon Drive Bridge Over I-25

On February 2, 2009, Colorado Department of Transportation staff paleontologist Steven M. Wallace conducted on-the-ground reconnaissance for paleontological resources for project HPP 0251-331, Dillon Drive Bridge Over I-25. This project, for construction of (1) a new bridge over Interstate Highway 25 at Dillon Drive, with an associated southbound I-25 on-ramp, northbound I-25 off-ramp, and a southbound connection with the existing I-25 Eden interchange to the north, and (2) improvements to existing Dillon Drive between southbound I-25 and Elizabeth Street, in Pueblo, is located on and along (1) the existing I-25 alignment between points in the SW<sup>1</sup>/<sub>4</sub> SE<sup>1</sup>/<sub>4</sub> SE<sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub> and NE<sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub> NE<sup>1</sup>/<sub>4</sub> NW<sup>1</sup>/<sub>4</sub> of section 1, T20S, R65W, Pueblo County, and (2) the existing and future Dillon Road alignment between a point at or very near the midpoint of the boundary of the NE<sup>1</sup>/<sub>4</sub> and NW<sup>1</sup>/<sub>4</sub> of the NW<sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub> of section 1, T20S, R65W, and a point in the NW<sup>1</sup>/<sub>4</sub> NE<sup>1</sup>/<sub>4</sub> NE <sup>1</sup>/<sub>4</sub> SW<sup>1</sup>/<sub>4</sub> of section 1, T20S, R65W, Pueblo County.

The geologic units mapped (Scott 1969) within the proposed project limits are the Holocene Piney Creek Alluvium, the Late Cretaceous Apache Creek Sandstone Member of the Pierre Shale, and the immediately stratigraphically underlying Late Cretaceous transition member of the Pierre Shale. I did not systematically examine Piney Creek Alluvium exposures in the field. The Piney Creek Alluvium can produce prehistoric bone, shell, and/or plant material, but because the sediments are less than 10,000 radiocarbon years old, any material found could be in an archaeological context and should be evaluated by a qualified archaeologist. I saw no transition member of the Pierre Shale exposure that merited on-the-ground reconnaissance for paleontological resources within the proposed project limits.

Most of the proposed project area is mapped (*ibid*) as Apache Creek Sandstone Member of the Pierre Shale bedrock. For the most part, this geologic unit lies very close to or at the existing ground surface within the proposed project limits, but bedrock is usually strongly weathered to a thin surface layer of semi-vegetated, loose sand and clay, with fossils not likely to be preserved at the existing ground surface. I examined one area within the environmental survey area limits, but just outside the proposed project limits, where the surface weathering products have been scraped off relatively recently and there I found moderately abundant invertebrate fossils, including inoceramid clams and baculites (extinct squid relatives), in rounded calcareous sandstone concretions and, more commonly, small tabular calcareous sandstone slabs.

Specimens I collected are moderately well preserved and probably identifiable to the species level. Species level identification, however, awaits study by an invertebrate fossil specialist.

I know of no previously recorded fossil localities within the proposed project limits, but Pierre Shale fossil localities are well-documented in the Pueblo area (Scott and Cobban 1986). Well preserved fossils are “uncommon” in the Apache Creek Sandstone Member of the Pierre Shale (Scott 1969:72), but Scott and Cobban (1986) mapped four fossil localities in the Apache Creek Sandstone Member within two miles of the proposed northern project limit. One of those localities is a vertebrate fossil locality. That locality produced a partial mosasaur (extinct giant marine lizard) skeleton, identified by G. Edward Lewis, formerly of the U. S. Geological Survey (USGS) in Lakewood, Colorado, as *Platecarpus* cf. *P. crassartus* (Scott 1969:72). That species has been reassigned to the genus *Prognathodon* (Russell 1967:164)

At this time, the need for mitigation of construction impacts to the Apache Creek Sandstone Member of the Pierre Shale through paleontological monitoring during construction is arguable. None of the collected invertebrate fossils appear to me to be scientifically important, but the results of further study by a Late Cretaceous invertebrate specialist could suggest otherwise. I am also concerned about the discovery of a partial mosasaur skeleton within two miles of the north end of the proposed project limits. The occurrence of scientifically important vertebrate fossils in the Apache Creek Sandstone Member of the Pierre Shale is almost impossible to predict, but the likelihood that fossil preservation conditions were similar at the partial mosasaur skeleton site and the proposed project area leads me to think that it would be best to err on the side of caution.

As a result, I am recommending paleontological clearance for project HPP 0251-331 with the stipulation that once project design plans are finalized, I will examine them in order to determine the location(s) and scope of construction monitoring work, if any, required. If final design plans indicate the likelihood of significant construction impacts to Apache Creek Sandstone Member of the Pierre Shale outcrop, I will write a revision of Subsection 107.23 of the Standard Specifications (Archaeological and Paleontological Discoveries) for attachment to the construction project specifications. If paleontological resources are uncovered during project construction in areas not being actively monitored, I should be notified immediately.

## References

Russell, D. A.

1967 Systematics and Morphology of American Mosasaurs (Reptilia, Sauria). Bulletin of the Peabody Museum of Natural History, Yale University, no. 23, 241 pp.

Scott, G. R.

1969 General and Engineering Geology of the Northern Part of Pueblo, Colorado. U. S. Geological Survey Bulletin 1262, 131p., geologic map at the 1:24,000 scale.

Scott, G. R., and W. A. Cobban

1986 Geologic and Biostratigraphic Map of the Pierre Shale in the Colorado Springs – Pueblo Area, Colorado. U. S. Geological Survey Miscellaneous Investigations Series Map I-1627. 1:100,000 scale.

SMW:smw

cc: CF, Wallace