

**Appendix 4. Descriptions for the upper Sandlin unit south of Highway 285.
(locations listed in UTM coordinates using the NAD83 datum)**

Northern Petrofacies in paleovalley by U.S. Highway 285

GTM-780, waypoint 8 (419701 m E, 4022081 m N)

Massive to thick-bedded pebbly sand and sandy gravel with very thin and lenticular bedding. Estimate 15% very fine to very coarse pebbles (mostly very fine to fine) that are scattered, subrounded to subangular, and composed of rhyolite, welded tuffs, various intrusives (ranging from granite to diorite), and quartzite (clast types listed from most to least abundant). Sand is light yellowish brown to very pale brown (10YR 6-7/4) or pink (7.5YR 7/4), very fine- to very coarse-grained, has 1-5% silt, and is poorly sorted.

GTM-780, waypoint 9 (419695 m E, 4021988 m N)

Gravel float consists of very fine to very coarse pebbles with 3% cobbles. 5-7% basalt in gravel, including fine cobbles of vesicular basalt. Pebbles are subrounded and composed mostly of felsic-dominated volcanic rocks (rhyolite, welded tuff that includes Amalia Tuff, and lesser dacite). Other lithologic types include minor granite, ~5% quartzite + vein quartz, and trace gabbro-diorite. No Paleozoic sedimentary clasts.

GTM-781 waypoint 10 (419377 m E, 4022041 m N)

A bed that is 1-1.5 m thick at the base of the upper Sandlin unit. It is comprised of sandy pebbles and cobbles; the cobbles are fine to coarse. In this cobbly bed are 30-40% Paleozoic sandstone clasts, 40-50% granite and mylonitized intermediate intrusives (granodiorite, quartz diorite?), ~20% quartzite, and 1% basalt. Basaltic cobbles and boulders become more abundant to the north. Pebbles contain appreciably more felsic to

intermediate volcanic clasts. Overlying the cobble-rich bed, the abundance of Paleozoic sandstone and siltstone clasts are mostly 1-3%.

GTM-781 waypoint 15 (419276 m E, 4022221 m N)

In the basal gravel of the upper Sandlin unit (2 m thick) there is 1-3% Paleozoic sandstone-siltstone, 1% gabbro-quartz diorite (commonly ductily sheared), and trace Amalia Tuff. In this vicinity are coarse cobbles and boulders of basalt that are concentrated at the base of the upper Sandlin unit.

GTM-783 (419635 m E, 4021857 m N)

Pebbly sand to sandy pebbles. Pebbly sand exhibits variable bedding: 1) horizontal-planar laminated to thinly bedded, 2) very thin to thin, lenticular bedded, 3) cross-stratified with planar or tangential foresets that are laminated to very thin. Sandy pebbles are in lenticular beds or else cross-stratified. Pebbles are subrounded and composed of rhyolite and dacite (including gray, aphinitic, flow-banded rhyolite), 3-5% greenish white quartz-porphry marker clast, trace greenish intermediate intrusives (probably granodiorite or quartz diorite), trace amphibolite or gabbro. The sand is very fine- to very coarse-grained but mostly medium- to very coarse-grained, light brown to reddish yellow (7.5YR 6/4-6), and subrounded. Moderately consolidated and generally non-cemented. 1% medium, tabular beds of silty (est. ~5% silt) very fine- to very coarse-grained sand (mostly very fine- to fine-grained); light yellowish brown to very pale brown (10YR 6/4-7/3).

Maximum clast sizes: 14x10 cm (tuff), 8x7 cm (rhyolite or dacite), 10x5 cm, granitic

gneiss, 12x7 cm (dacite), 8x6 cm (rhyolite). Twenty clast imbrication measurements indicate paleoflow directions ranging from northwest to southwest.

GTM-784, waypoint 29 (419381, 4021744 m N)

Channel fill inset into a 2 m-thick bed of internally massive pebbly sand. The latter has ~3% silt and is mostly comprised of very fine-lower to medium-lower sand that has 1% grains of volcanic tuff. Sand is light yellowish brown to very pale brown (10YR 6/4-7/3).

Northern Petrofacies south of U.S. Highway 285 paleovalley

GTM-785, waypoint 34 (419289 m E, 4021669 m N)

Base of gravelly sediment overlying Vallito Member sand. This is much higher than base of gravelly sediment to the north and lies on a paleotopographic high. The paleovalley butress is to the immediate north.

GTM-785, waypoint 35 (419341 m E, 4021540 m N)

>5% Paleozoic sedimentary clasts in lower 2 m, but not observed in higher strata.

GTM-785, waypoint 36 (419354 m E, 4021555 m N)

A cobbly bed ~10 ft above the base of the upper Sandlin unit. Cobbles consist of rhyolite, (including the white subunit of the Petaca rhyolite), and basalt. Provenance of this bed is from the eastern Tusas Mountains.

GTM-786, waypoint 42 (419630 m E, 4021105 m N)

Base of the upper Sandlin unit. One 2 m-long boulder of basalt observed.

GTM-786, waypoint 49 (420097 m E, 4020943 m N)

Pebbly sand. Pebbles are subrounded, very fine to coarse, and composed of rhyolite, felsic tuff (including welded tuff), 10% intermediate volcanics, and trace amphibolite.

GTM-5 (420093 m E, 4020944 m N)

A thick sandy pebbly bed exposed in a gully. It is clast-supported. Pebbles are very fine to very coarse (mostly very fine to medium), subrounded, poorly sorted, and composed of felsic volcanic clasts (rhyolite and tuffs) and 1-5% quartzite. One basalt pebble observed. This sandy pebble bed is overlain by reddish yellow to strong brown pebbly sand that is massive (bioturbated?). This pebbly sand has 10-15% very fine to medium pebbles similar to the underlying sandy pebble bed, and the sand fraction is very fine- to medium-grained, subrounded, and moderately sorted. Well consolidated and non-cemented.

Southern Petrofacies south of Highway 285 paleovalley

GTM-789, waypoint 55 (419701 m E, 4020028 m N)

Poorly exposed gravel and sand. Gravel is comprised of very fine to very coarse pebbles and fine cobbles. Clasts are subrounded; visual clast estimation: 50-60% granite (white to red), 25% greenish Paleozoic sandstone-siltstone, 2% amphibolite, trace gabbro or intermediate (diorite?) intrusives, 3-5% greenish quartz-porphyry marker clast, and 10% quartzite. No Pilar Slate. These clasts closely resemble those found in Mesa Vibora.

GTM-791, waypoint 67 (419936 m E, 4019462 m N)

Pebbly sand. Pebbles are very fine to very coarse and subrounded. Mixed gravel assemblage but Paleozoic sedimentary clasts still present. To west, the southern petrofacies is ~2 m thick and overlain by the northern petrofacies.