GSA DR Item **2013139** accompanies Koning, D.J., Grauch, V.J.S., Connell, S.D., Ferguson, J., McIntosh, W., Slate, J.L., Wan, E., and Baldridge, W.S., 2013, Structure and tectonic evolution of the eastern Española Basin, Rio Grande rift, north-central New Mexico, *in* Hudson, M.R., and Grauch, V.J.S., eds., New Perspectives on Rio Grande Rift Basins: From Tectonics to Groundwater: Geological Society of America Special Paper 494, p. 185–219, https://doi.org/10.1130/2013.2494(08)

APPENDIX E. DESCRIPTIONS OF SELECT STRATIGRAPHIC SECTIONS IN THE CENTRAL ESPAÑOLA BASIN.

This appendix presents descriptions of nine stratigraphic sections of the Santa Fe Group in the central Española Basin. Colors of sediment are based on visual comparison of dry samples to the Munsell Soil Color Charts (Munsell Color, 1994). Grain sizes follow the Udden-Wentworth scale for clastic sediments (Udden, 1914; Wentworth, 1922) and are based on field estimates. Sand textures are abbreviated as follows: very fine-lower, vfL; very fine-upper, vfU; fine-lower, fL; fine-upper, fU; medium-lower, mL; medium-upper, mU; coarse-lower, cL; coarse-upper, cU; very coarse-lower, vcL; very coarse-upper, vcU; rounded, rnd; subrounded, subrnd; subangular, subang; angular, ang. (m) and (l) are used to abbreviated "mostly" and "lesser," respectively. Pebble sizes are subdivided as shown in Compton (1985). The term "clast(s)" refers to the grain size fraction greater than 2 mm in diameter. Clast percentages are based on counts of 100-150 clasts at a given locality, except where noted. Clast compositions may be abbreviated as follows: gr, granite; ss; sandstone; lm, limestone; Pz, Paleozoic; slst, siltstone; qtzite, quartzite. Quartzite may be further subdivided into: sil-qtzite, siliminite-bearing quartzite; cs-col or col-cs, colored coarse-grained quartzite; gray-smooth, gray-colored and smooth-textured quartzite; colored-smooth, colored and smooth-textured quartzite. Listed clast sizes are of the a and b axes (in that order). Descriptions of bedding thickness follow Ingram (1954). Soil horizon designations and descriptive terms follow those of the Soil Survey Staff (1994) and Birkeland (1999). Stages of pedogenic calcium carbonate morphology follow those of Gile et al. (1966) and Birkeland (1999). Each stratigraphic section was measured upsection from unit 1 using a Jacob staff and Abney level. Numerical unit designations were established up-section for measured section, but are listed in descending stratigraphic order. GPS localities for sites are in UTMs (NAD 27, zone 13), errors for the sites are 4-10 m.

Note that lithosome A of Cavazza (1986) is equivalent to the eastern alluvial slope lithofacies, lithosome B of Cavazza (1986) is equivalent to the basin floor lithofacies, and the Chama-El Rito Member is equivalent to the western alluvial slope lithofacies assemblages discussed in Appendix A.

West Chili section. This section consists of sand with subordinate mud and pebbles of the Chamita Formation (intercalated Vallito and Hernandez Members). Section is capped by the Lobato Basalt. Measured and described on the east slope of a basalt-capped ridge 4600-4700 ft south-southwest of the capilla at the town of Chili, Chili 7.5-minute quadrangle. Measured and described by Daniel Koning on December 5, 2006 using an abney level and Jacob staff. UTM coordinates of base: 3994420 N, 0396252 E (Zone 13, NAD 27). UTM coordinates of top: 3994500 N, 0396235 E (Zone 13, NAD 27).

Unit	Description	Thickness (m) (Unit)	(Total)
	Stake D-D is labeled on a boulder with a white calcium carbonate film on its south side. This is at 19.8 m in the section. UTM coordinates of 3991333 N, 0388249 E (Zone 13, NAD 27).	19.8	
22	**Basalt flow**	3.0	47.8
	Top of section at the south tip of the basalt knob (3994500 N		
21	**Greenish phreatomagmatic deposit**	0.2	44.8
	Vallito Member of the Chamita Formation	**2.7**	**44.6**
20	**Slightly silty sand:** vfL-vcL (mostly fU-mL), estimate 3-5% silt; pink (5-7.5YR 7/4); no internal sedimentary fabric and is probably bioturbated; sand is poorly sorted, subangular to subrounded, and composed of quartz, 15% orange-stained quartz and possible Kspar, 5-7% mafic grains, and 1-5% volcanic grains; no paleosols. Local moderate to strong calcium carbonate cementation observed near the top of the unit.	0.9	44.6
19	**Sand:** vfL-cU; reddish yellow (5-7.5YR 6/8) and internally massive; very thin bed of reddish brown (5YR 4-5/4) clay at base of unit. There are spheroidal zones in the sand (baseball to softball size) marked by 10-15% clay in the sand. This unit is disturbed and probably bioturbated; moderately consolidated.	0.3	43.7
18	**Sand:** fU-mU, very pale brown (10YR 8/2); vague, medium to thick, broadly lenticular(?) beds; sand is fU-mU, well sorted, subrounded to subangular, and	1.5	43.4

Unit	Description	Thickness (m) (Unit)	(Total)
	composed of quartz, 12-10% orange-stained quartz and possible Kspar, 5% mafic grains, and 2-5% volcanic grains. Moderately consolidated.		
	Vallito Member with Cejita Member input, Chamita Formation	**0.7**	**41.9**
17c	**Pebbly sand:** light brown to reddish yellow (7.5YR 6/4-6); estimate 1-3% clay; pebbles consist of intermediate to felsic volcanic rocks with 30-35% Paleozoic sandstone and limestone and 10% quartz; pebbles are subrounded, moderately sorted, and up to 12 mm-long; sand is fL-vcU, poorly sorted, subrounded, and composed of quartz, minor feldspar, 4-10% volcanic grains, 5-10% mafic grains, and 1-3% Paleozoic fragments and green quartz. Weakly to moderately cemented in lower 4 cm. 20-25 cm-thick.	0.2-0.3	41.9
17b	**Sand:** fL-fU; sand continues from below and grades upward into planar-laminated to very thinly bedded silt and vfL-fL sand (beds here are commonly disturbed); 20-25 cm-thick.	0.2-0.3	41.7
17a	**Sand with 1-2% vf-f pebbles:** fU-vcU and poorly sorted; very pale brown (10YR 7/4); sand is moderately sorted, subrounded, and composed of quartz, 15% Kspar and orange-stained quartz, 3-5% volcanic grains, 5% mafic grains, and 1% green quartz or sandstone bits; gradational upper contact; 20-25 cm-thick.	0.2-0.3	41.4
	Cejita Member of the Chamita Formation	**3.5**	**41.2**
16b	**Intercalated siltstone and very fine sandstone, with subordinate clay beds:** vfL-vfU sand; medium (mostly) to thick, tabular beds; light yellowish brown to very pale brown (10YR 6-7/4); clay is in thin to medium, tabular beds and is brown to reddish brown (5-7.5YR 5/3-4). Moderately consolidated; ~5% very thin to laminated plates of calcium carbonate.	3.2	41.2
16a	**Freshwater limestone(?) bed overlain by a sandstone bed:** basal bed consists of 7 cm of predominately calcium carbonate; the basal bed is overlain by a 20 cm-thick, fining-upward bed of sandstone (vfL-cU, light brown to pink (7.5YR 6-7/4), planar-laminated, subangular to subrounded, and moderately sorted – lower 10 cm of this bed is weakly to moderately cemented by calcium carbonate.	0.3	38.0
	Vallito Member of the Chamita Formation	**4.6**	**37.7**
15c	**Sandstone:** fL-cU (mostly fU-mU), fines slightly near the top of the unit; very pale brown (10YR 8/2); no sedimentary fabric (internally massive); sand is moderately sorted, subangular to subrounded, and composed of quartz, 10% orange-stained quartz and possible Kspar, 5% mafic grains, and 2-5% volcanic grains. Gradational upper contact.	1.0	37.7
15b	**Sandstone in a paleosol:** fl-cU, moderately sorted, subrounded to subangular, and approximately similar in composition to the sand in unit 5a; no sedimentary fabric. Paleosol is reddish yellow (5-7.5YR 6/6); has moderate, coarse, subangular blocky peds; peds have hard dry consistency; estimate 5-10% distributed clay (illuviated?) but no clay films, and clay content decreases downward.	0.4	36.7
15a	**Sandstone:** fU-cL; very pale brown (10YR 8/2); internally massive (no sedimentary fabric); 0.5% clay rip-ups 1-5 mm-long; sand is moderately sorted, subangular to subrounded,and composed of quartz, 12-15% orange-stained quartz and possible Kspar, 1-6% volcanic grains, and 5-8% mafic grains. Moderately consolidated. Basal part of unit consists of a 40 cm-thick channel-fill inset into unit 14 below (35 cm of scour relief); no clay rip-ups and fL-cL.	2.8	36.3
14	**Intercalated sandstone (75%) and siltstone (25%):** 9-12 cm-thick, tabular beds; silt is pink to very pale brown (7.5-10YR 7/3) and sand is pink to reddish yellow (7.5YR 7/4-6/6) and vfL-mL, well to moderately sorted, subrounded to subangular, and consists of quartz, 15% orange-stained quartz and possible Kspar, 7% mafic grains, and 3-7% volcanic grains. Well consolidated; sand may be weakly cemented.	0.4	33.5

Unit	Description	Thickness (m) (Unit)	(Total)
	Cejita Member of the Chamita Formation	**4.0**	**33.1**
13c	**Clay:** Brown (7.5YR 5/4); "gummy."	0.2	33.1
13b	**Silt:** Very pale brown (10YR 7/4); planar-laminated and well-consolidated; local very thin beds of strong calcium carbonate cementation.	2.7	32.9
13a	**Clay:** Brown to light brown (7.5YR 5-6/3); moderately consolidated and "gummy;" local very thin beds of strong calcium carbonate cementation.	1.1	30.2
	Vallito Member of the Chamita Formation	**4.4**	**29.1**
12	**Upper coarse white ash gradationally overlain by clayey sand**:	28.5	29.1
	@29.1 m: Unit is capped by a 3 cm-thick, strongly cemented, broadly lenticular bed of fL-mL, moderately sorted, subrounded to subangular sandstone of quartz, 12-15% orange-stained quartz and possible Kspar, 7-10% mafic grains, 3-5% volcanic grains, and trace to 1% green quartz grains.		
	@28.7-29.1 m: Light brown to reddish yellow (7.5YR 6/4-6), clayey vfL-fU sand mixed with 25% cL-vcU sand-size detritus of the upper coarse white ash at the base of this unit.		
	@28.5-28.7 m: 16 cm-thick bed of coarse white ash has 25-30% subequal biotite (altered to chlorite) compared to lithics (gray to pink but mostly gray volcanics); the biotite and lithic grains are mixed with consolidated white ash and plagioclase. Greenish white color. Gradational upper contact. Sampled this tephra at UTM coordinates of 3994475 N, 396243 E ± 7 m.		
11	**Intercalated siltstone and fine sandstone:** sand is vfL-fU; pale brown to light yellowish brown (10YR 6/3-4 and 2.5Y 6/3).	0.9	28.5
	@27.9-28.5 m: very pale brown (10YR 7/3-4) sand similar to that in unit 10 but locally pink to reddish yellow (7.5YR 7/4-6).		
10	**Silty sand:** fL-cU sand with 1-10% vfL-vfU sand and estimated 3-5% silt; ~1% subrounded, light gray dacite very coarse sand similar to "vc"-type lithology found in the Chama-El Rito Member of Tesuque Formation; very pale brown to pink (10-7.5YR 7/3); thin to thick, broadly lenticular beds. Sand is moderately sorted, subrounded to subangular, and composed of quartz, 12-18% orange-stained quartz and possible Kspar, 5-8% mafic grains, and 3-5% volcanic grains.	24.7	27.6
	@27.3-27.6 m: Channel-fill of fU-vcU sand that is subrounded, moderately sorted, and composed of quartz, 8-10% orange-stained quartz and possible Kspar, 10% pink to gray, intermediate to felsic volcanic grains, and 2% green quartz grains.		
	@26.1-26.4 m: This sand is mixed with abundant light gray to green, subrounded to subangular dacite in addition to abundant c-vc sand-size and vf- to m-pebble-size, white, biotite-bearing (~3% biotite) pumice lapilli. **This is a fluvially reworked, white, coarse white ash-lapilli bed.**		
	Cejita Member of the Chamita Formation	**6.2**	**24.7**
9f	**Siltstone:** Light brown to light yellowish brown (7.5-10YR 6/4).	1.5	24.7
9e	**Sandstone with local pebbles:** Lenticular, 20 cm-thick channel-fill of fL-mL sandstone; local very thin lenses of vf-f, subrounded pebbles and mU-vcU sand; pebbles and mU-vcU sand consist of Paleozoic sedimentary clasts (sandstone, limestone, and siltstone) together with light gray felsic-intermediate volcanic clasts; fL-mL sand is moderately sorted, subrounded, and composed of quartz, 12-15% orange-stained quartz and possible Kspar, 5% Paleozoic sedimentary grains and green	0.2	23.2

Unit	Description	Thickness (m) (Unit)	(Total)
	quartz grains, 1-3% volcanic grains, and 5-10% mafic grains.		
9d	**Silt:** Light yellowish brown (10YR 6/4); planar-laminated to ripple-marked laminated (<1 cm-thick foresets). In lower 15 cm of this unit are very thin, lenticular beds of sandstone (well-sorted, subrounded, and composed of quartz with 10% orange-stained quartz and Kspar, 3% Paleozoic(?) green quartz grains, 2% volcanic grains, and 2% mafic grains.	1.1	23.0
9c	**Clay and mud:** Pale brown to light yellowish brown (10YR 6/3-4) to yellowish brown (10YR 5/4).	0.6	21.9
9b	**Silty sand:** vfL-cU, estimate 5% silt; pink to pinkish white (7.5YR 7/3-8/2); no internal sedimentary fabric; sand is moderately sorted, subrounded to subangular, and consists of quartz, 15-20% orange-stained quartz and possible Kspar, and 15% lithic grains (mafics, volcanics, and colored quartz (most to least)); 5% c-vc sand-size and vf-m pebble-size chunks of coarse white ash and minor gray dacite pebbles. Well to moderately consolidated.	0.9	21.3
9a	**Claystone-mudstone:** Reddish brown (5YR 5/4).	1.9	20.4
	Vallito Member of the Chamita Formation	**15.8**	**18.5**
8	**Sand:** fL-cU; pink (7.5YR 7/4); internally massive (no sedimentary fabric); sand is moderately sorted, subrounded to subangular, and composed of quartz, 15% orange-stained quartz and possible Kspar, and 12% mafic and volcanic grains (volcanics are gray (mostly) to pink, intermediate to felsic volcanic grains with very minor black basalt(?)); estimate 5-10% vfL-vfU sand, 1-3% silt, and 1-5% vcU sand and very fine, volcanic pebbles. ~5% of sediment above the paleosol, and ~3% of sediment below the paleosol, consists of c-vc, sand-size to vf pebble-size pumice and/or consolidated white ash. Moderately consolidated and non-cemented. 16.9-17.7 m: Zone of rhizoliths; these are 2-10 mm-wide and up to 4 cm-long. @16.6-16.9 m: **paleosol:** contains 10-15% c-vc sand and vf pebble-size chinks of consolidated white ash and/or pumice; upper 10 cm is reddish brown to reddish yellow (5YR 5/4-6/6) and has strong, coarse, subangular blocky peds and has 5-10% estimated clay content; lower 20 cm is very pale brown (10YR 7/3) and has weak, very coarse, subangular blocky peds with hard dry consistence and 1-3% estimated clay;.	2.8	18.5
7	**Sand:** fL-cL; pinkish white to very pale brown (7.5-10YR 8/2); 0.5% scattered intermediate-volcanic very fine pebbles and cU-vcU sand; no sedimentary fabric; sand is moderately sorted, subrounded to subangular, and composed of quartz, 7-10% orange-stained quartz and Kspar, 7-10% volcanic and mafic grains; moderately consolidated. @15.4-15.7 m: 8-10% fU-cU black to dark gray, basalt-andesite sand grains mixed in with the typical sand of this unit, in addition to 2-5% c-vc sand and vf pebble-size consolidated white ash-pumice grains and clasts. @ 13.5-14.0 m: Cementation similar to that in 11.1-12.0 m.	2.8	15.7
6	**Basalt-rich sand in a paleosol:** vfL-vcU (mostly fU-mU); 10-20% black to dark gray sand grains of basalt or andesite; vf-f pebbles of consolidated white ash and plagioclase with minor biotite are found within 20-40 cm from the upper contact; sand is poorly sorted, subrounded to subangular, and composed of quartz, 10-12% orange-stained quartz and possible Kspar, and 10-20% black-gray basalt-andesite grains. Sampled. @12.6-12.9 cm: reddish yellow (5YR 6/6); 1-3% clay; moderate, coarse to very coarse, subangular blocky peds; hard dry consistence; no clay films, but distributed	0.6	12.9

Unit	Description	Thickness (m) (Unit)	(Total)
	clay within the peds may still be illuviated. Call this a Bw or Bt horizon. Photos. @12.3-12.5 cm: light brownish gray to very pale brown (10YR 6/2-7/3); coarse to very coarse, subangular blocky peds; hard dry consistence.		
5d	**Sand with trace scattered pebbles:** fL-vcU (mostly mU-cL); pink (7.5YR 7/3); internally massive (no sedimentary fabric); pebbles are vf-m and similar in composition to those in the white lapilli-coarse ash beds lower in the section (i.e., gray hornblende-dacite and brown hornblende-andesite(?); sand is poorly sorted, subrounded, and consists of quartz, 7-8% orange-stained quartz and possible Kspar, and 7-8% lithic grains (volcanic with minor mafics); moderately consolidated. @11.1-12.0 m: Golf- to softball-size, calcium carbonate-indurated, sandstone balls that are commonly fused or cemented together.	4.6	12.3
5c	**Sand with scattered lapilli:** Sand is similar to unit 5a, but mixed with vf-f pebble-size chunks of consolidated white ash and plagioclase (containing 5% unidentified mafic and biotite grains) together with vf-m pebbles of dacite, including a green plagioclase-porphyritic dacite that reminds me of the lapilli clasts in one of the coarse white ash beds in the Cuarteles section; I sampled the clasts; internally massive (no sedimentary fabric).	0.9	7.7
5b	**Sand:** fU-cU; very pale brown (10YR 8/2-7/3); internally massive (no sedimentary fabric); sand is similar to Ojo Caliente Sandstone (Tesuque Formation) and is poorly sorted, subrounded, and consists of quartz, 10% orange-stained quartz and Kspar, and 10% mafic grains and subordinate intermediate-felsic volcanic grains.	0.6	6.8
5a	**Sand with 0.5% pebbles:** fU-vcU; pinkish white to very pale brown (10-7.5YR 8/2); internally massive (no sedimentary fabric); pebbles are 2-10 mm in diameter and consist of light gray to pink, hornblende-dacite. Sand is poorly sorted, subrounded (mostly) to subangular, and consist of quartz, 12-15% orange-stained quartz and Kspar, and 8-10% intermediate volcanic and mafic grains with minor chert and colored quartz grains.	0.6	6.2
4	**Slightly silty sand with ~0.5% pebbles:** vfL-vcU (mostly fU-cL), estimate 1-2% silt; pink (7.5YR 7/4); planar-laminated to rippled-marked (south-facing and up to 1 cm-thick). Pebbles are up to 1.0 cm-long and scattered in the sediment; a minor component of the pebbles consists of consolidated crystalline, coarse and fine ash; rest is dark brownish gray andesite to basalt, and lesser pink and gray, hornblende dacite like those found in the lower coarse white ash zone in the area. Sand is poorly sorted, subrounded to subangular, and composed of quartz, 15% orange-stained quartz and Kspar, and 10% lithic grains (mafics and subordinate volcanics). Moderately consolidated and non-cemented. The upper 4 cm of unit consists of reddish brown to light reddish brown (5YR 5-6/4) clayey vfL-fL sand mixed with scattered, white coarse ash-fine lapilli fragments. @4-6 cm from top of unit is a 2 cm-thick lense of **white fine lapilli-coarse white ash**; this tephra contains 5% biotite and 3% volcanic lithic grains-clasts. @6-13 cm from top of unit: **Paleoso**l: Light brown to pink (7.5YR 6-7/4); moderate, very coarse, subangular blocky peds; very hard dry consistency; no clay films. 4.6-4.7 m: thin lense of **white fine lapilli-coarse ash** (3994432 N, 396251 E, ± 6); upper 3 cm is altered to a greenish gray color; tephra consists of consolidated, fresh-looking coarse white ash and plagioclase with 3% biotite and 7% pebble-size ltihic grains; tephra is located at 95-103 cm from the top of unit.	2.1	5.6
3	**White coarse ash-lapilli :** Lowermost 2 cm is strongly cemented and locally contains abundant (25-30% by volume) purple, pink, tan, and gray, vfL-c pebble-size, lithic fragments; these decrease in abundance up-section, while brown, detrital (?) clay increaseses upsection within this unit. Top is relatively planar, but base has 40 cm of	0.8	3.5

Unit	Description	Thickness (m) (Unit)	(Total)
	wavy relief that corresponds with 40 cm of paleotopographic relief.		
	Ojo Caliente Sandstone Member of the Tesuque Formation	**>2.7**	**2.7**
2	**Sand of a paleosol:** fL-cU (mostly mL-cL); pink (7.5YR 8/3-7/4); internally massive; sand is moderately to poorly sorted, subrounded, and composed of quartz with 12% orange-stained quartz and possible Kspar, 10-12% lithic grains (volcanics with subordinate mafics and colored quartz). Unit consists of a weak soil with weak, coarse, subangular blocky peds with no clay films; slightly hard and slight reddening.	0.9	2.7
1	**Sand:** mU-cU, very pale brown (10YR 8/2); laminated to very thin, planar to very low-angle cross-stratified beds (up to 2 cm-thick). Sand is well-moderately sorted, subrounded (mostly) to rounded, and consists of quartz, 10% orange-stained quartz and possible Kspar, 7% volcanic grains, and 8% chert and other colored quartz. Weakly consoliated and generally non-cemented (~1-3% local strong cementation). *Base of section is in the uppermost Ojo Caliente Sandstone of the Tesuque Formation. UTM coordinates of: 3994420 N, 0396252 E (Zone 13, NAD 27). From here, I proceed N20°W and use 0.5° down-dip.*	0	1.8

Upper Rio del Oso Section. This section consists of sand, silty sand, silt, and pebbly sand of the upper Chama-El Rito Member, Tesuque Fm. Measured and described on the west slope of a north-flowing tributary of Rio del Oso; approximately 2,000 ft east of the western boundary of the Chili 7.5-minute quadrangle and 18,500 ft north of the southern boundary of the Chili 7.5-minute quadrangle. Measured and described by Daniel Koning and Sean Connell on October 27-28, 2006. UTM coordinates of base: 3990141 N, 0388065 E (Zone 13, NAD 27), Chili 7.5-minute quadrangle, New Mexico. UTM coordinates at top is 3990150 N, 0387870 E (Zone 13, NAD 27).

Unit	Description	Thickness (m) (Unit)	(Total)
	Ojo Caliente Sandstone of the Tesuque Formation	Not measured	
	Sandstone: fU-mL (mostly mL); white (10YR 8/1); massive to tangential cross-laminated; sand is well sorted, subrounded (minor subangular), and composed of quartz, 17-20% orange-stained quartz and minor possible Kspar, and 10-12% mafic grains together with subordinate volcanic grains; weakly consolidated and non-cemented.		
	Chama-El Rito Member of the Tesuque Formation	**166.9**	**166.9**
26	**Sandstone:** fU-mL, very pale brown (10YR 7/3); medium to thick, vague beds that are tabular and internally planar-laminated to internally cross-planar-laminated (7 cm-thick foresets); sand is well sorted, subrounded to subangular, and composed of quartz, 12-15% orange-stained quartz and minor possible Kspar, 1-2% volcanic grains, and 7-10% mafic grains. Moderately to weakly consolidated and non-cemented. @165.0-166.9 m: Sand has a pinkish color. @164.9-165.0 m: Strongly cemented sandstone; 10-20 cm-thick. @160.7-161.9 m: two closely spaced, strongly cmented, medium-grained sandstone beds. ABOVE THESE BEDS MARKS THE GRADATIONAL INTERVAL BETWEEN THE CHAMA-EL RITO MEMBER AND OJO CALIENTE SANDSTONE. *@ ~ 160 m: Stake SEO-F placed at top of highest claystone in unit 25. Terrain too steep to continue upwards. Thickness of unit 26 is an estimate. UTM coordinates of 3990150 N, 0387870 E (Zone 13, NAD 27).*	6.2	166.9
25	**Sandstone with 10-20% claystone beds:** Sand is fL-mU, very pale brown (10YR 7/3), and in medium, tabular beds. Clay is brown (7.5YR 5/3-4), in laminations to very thin beds. Sand is well-sorted, subangular, and composed of quartz, 15% orange-stained quartz and minor possible Kspar, 1-3% volcanic grains, and 3% mafic grains; local claystone rip-ups; moderately consolidated.	1.5	160.7
24	**Intercalated vfL-fU sandstone and subordinate mudstone:** Sandstone is pink (7.5YR 7/4), in thin to medium, tabular beds, well sorted, subrounded to subangular, and consists of quartz, 15% orange-stained quartz and minor possible Kspar, 5-7% mafic minerals, and 1% possible volcanic grains. Mudstone is brown to strong brown (7.5YR 5/4-6); very thin to medium, tabular beds. Well consolidated.	0.6	159.2
23	**Sandstone with 10-20% claystone beds:** Sand is fL-mU, very pale brown (10YR 7/3), and in medium, tabular beds. Clay is brown (7.5YR 5/3-4), in laminations to very thin beds. Sand is well-sorted, subangular, and composed of quartz, 15% orange-stained quartz and minor possible Kspar, 1-3% volcanic grains, and 3% mafic grains; local claystone rip-ups; moderately consolidated. @ 155.9-156.1 m: Lenticular bed of sandstone with 30% monolithic grains of light gray dacite and tuff; mU-vcu; 22 cm-thick.	4.5	158.6
22	**Sandstone, with local claystone laminae**: fU-mL; very pale brown (10YR 7/3-4); thin to thick, tabular beds (minor broadly lenticular); internally planar-laminated to tangential cross-laminated (up to 7 cm-thick foresets); sand is well sorted, subrounded to subangular, and consists of quartz, 12-18% orange-stained quartz and minor	14.7	154.1

Unit	Description	Thickness (m) (Unit)	(Total)
	possible Kspar, 1-10% volcanic grains, and 1-10% mafic grains. Trace to 0.5% beds of mU-vcU sand within the thin to thick, tabular beds. Locally abundant claystone rip-ups and claystone laminae. Sand channel-fill trends 260°. Moderately consolidated and a cliff-former; non-cemented except for ~10% of beds. @153.7-154.1 m: 40 cm-thick zone of rhizoconcretions and bioturbations. **@150 m: Projection of thin bed of fine white ash from the north; possible correlation with TW ash in the Pojoaque type section.** @149.5-149.6: Strongly cemented bed of fU-mL sandstone; 10 cm-thick. @ 147.0-147.2 m: Mudstone; brown (7.5YR 5/4); 20 cm-thick.		
21c	**Sandstone and minor 1) silty sand and silt, and 2) pebbly sandstone channel-fills**: fU-mU, thick channel complexes (broadly lenticular to lenticular) that are internally planar-laminated to planar-very thinly bedded; subordinate, thin to medium, tabular beds of well consolidated, vfL-fU sandstone, silty sandstone, and siltstone (7.5YR 7/3), planar to wavy laminated. Pebbly sandstone channel-fills are medium to thick, and lenticular to broadly lenticular (mostly); internally laminated to very thin, planar to lenticular bedded; local (minor) transverse tangential cross-laminations up to 11 cm-thick; sand is fU to vcU (mostly fU), well to moderately sorted, and composed of quartz, ~15% orange-stained quartz and minor possible Kspar, and 15-18% volcanic and mafic lithics; mU-vcU sand is all volcanic; abundant pebble-size clay rip-ups; ~1% clast-supported sandy vf-f pebble conglomerate beds (minor medium pebbles) -- moderately to poorly sorted, subrounded, and composed of felsic to intermediate volcanic rocks, including 2-5% Amalia Tuff. 5-10% strong cementation, otherwise non-cemented and weakly consolidated. Paleocurrent indicators: 158° (inaccessible channel-margin); 103° (11-12 cm-tall channel margin), 246° (11 cm-deep channel-trend), east-west (8 cm-tall channel margin), 145° (10-40 cm-tall channel margin), 082° (7 cm-deep channel trend), 128° (trough cross-stratification (19 cm-thick), 157° (9 cm-deep channel trend). @138.4-139.4**: Channel-fill of pebbly sandstone:** Very thin, lenticular beds and planar-laminations. Similar to channel-fill at 146.0-146.2 m. @136.0-136.2 m: **Channel-fill of pebbly sandstone:** very thin to laminated, planar to lenticular beds; minor tangential cross-lamination 5 cm-thick. Pebbles are vf-c, poorly sorted, subrounded, and hetereolithic with rhyolite, dacite, andesite, tuff, and welded tuff (including Amalia Tuff); also see the greenish gray and reddish gray andesite observed in the Hernandez Member of the Chamita Formation. Sampled. @133.4-133.5 m: Strongly cemented, discontinuous lense of coarse-grained sandstone. @131.9-132.0 m: Strongly cemented, discontinuous lense medium-grained sandstone. @130.4-130.9 m: **Sandy pebbly conglomerate channel-fill.** @130.2-130.4 m: Strongly cemented, medium-grained sandstone.	15.4	139.4
21b	**Intercalated siltstone and vfL-fU sandstone:** Pinkish white to pink (7.5YR 8/2-7/3); very thin to thin, tabular beds.	3.1	124.0

Unit	Description	Thickness (m) (Unit)	(Total)
	@123.9-124.0: Strongly cemented, vfL-fU sandstone bed. @123.7-123.9 m: One medium bed of claystone that is brown (7.5YR 5/3). @122.5-122.7 m: Pebbly sandstone bed; pebbles are subrounded and consist of gray-brown felsic-intermediate volcanic clasts and trace chert. Clast imbrication (n=3): 150°.		
21a	**Pebbly sandstone:** cross-laminated and planar-laminated; foresets are tangential to planar, up to 8 cm-thick, and face south; pebbles are vf-m, subrounded, and rich in basalt; one brown, round chert pebble; sand is fU-vcU; ~1/2 of strata are strongly cemented. Scour relief of 20-30 cm. Took sand sample.	1.2	120.9
20d	**Sandstone:** vfU-fU; reddish yellow to pink (7.5YR 6/6-7/4); poor exposure, probably medium to thick beds; sand is well sorted, subangular to subrounded, and consists of quartz, 15-20% orange-stained quartz and minor possible Kspar, 5% mafics, and 1-2% volcanic grains; loose; 1% very thin to thin, tabular claystone beds (brown (7.5YR 5/3).	10.3	119.7
20c	**Sandstone:** fL-mL; planar-laminated; sand is well sorted, subrounded to subangular, and composed of quartz, 12-15% orange-stained quartz and possible Kspar, 5% mafics, and 1-2% volcanic grains.	0.4	109.4
20b	**Sandstone:** vfU-fU; reddish yellow to pink (7.5YR 6/6-7/4); poor exposure, probably medium to thick beds; sand is well sorted, subangular to subrounded, and consists of quartz, 15-20% orange-stained quartz and minor possible Kspar, 5% mafics, and 1-2% volcanic grains; loose; 1% very thin to thin, tabular claystone beds (brown (7.5YR 5/3).	0.7	109.0
20a	**Sandstone:** fL-mL; internally cross-bedded (very thin to medium, 7 cm-thick); strongly cemented.	0.3	108.3
19	**Siltstone and siltstone-vfL-fL sandstone:** Pink (7.5YR 7/3); very thin to thick, tabular beds; well consolidated; lower boundary is concealed.	3.0	108.0
18g	**Sandstone:** vfL-mL (mostly fU); very pale brown (10YR 7/3); medium to thick, tabular beds; internally planar-laminated and tangential cross-laminated (up to 20 cm-thick), minor very thin beds; sand is well sorted, subangular, and composed of quartz, 15% orange-stained quartz and minor possible Kspar, 5% mafic minerals, and 1-2% volcanic grains(?); local intraformational rip-ups of clay and cemented sand; weakly consolidated, with local strong cementation. More of ledge-former than unit 17. @93.9-94.2 m: Medium-grained sandstone bed 30 cm-thick.	13.5	105.0
18f	**Claystone:** brown (7.5YR 5/4).	0.5	91.5
18e	**Sandstone:** fU-mL; planar-laminated to cross-laminated (20 cm-thick foresets).	0.8	91.0
18d	**Coarse sandstone:** two stacked, medium beds; cross-stratified; cemented.	0.4	90.2
18c	**Sandstone:** fU-mU; cross-stratified (tangential cross-laminations 30 cm-thick).	0.5	89.8
18b	**Sandstone:** vfU-fU, with much rhizoliths.	0.4	89.3
18a	**Sandstone:** Intercalated beds of vfL-fU sand and fL-mL sand; very pale brown (10YR 7/3) to pink (7.5YR 7/4); medium to thick, tabular beds that are internally cross-stratified (tangential, up to 20 cm-thick foresets); sand is well sorted, subangular, and consist of quartz, 15% orange-stained quartz and minor possible Kspar, 5% mafic minerals, and 1-2% volcanic grains(?); local intraformational rip-ups of clay and cemented sand; weakly consolidated, with local strong cementation. More of ledge-former than unit 17. @84.2-85.0 m: Channel-fill fU-vcU sandstone; planar-laminated to cross-laminated (2 cm-thick foresets); sand is moderately sorted; sampled; locally strongly cemented; 70-80 cm-thick.	4.7	88.9
17d	**Sandstone:** fU-mL; very pale brown (10YR 7/3), thick to very thick beds; internally massive to planar-laminated to cross-laminated (7 cm-thick foresets); scattered, minor	8.2	84.2

Unit	Description	Thickness (m) (Unit)	(Total)
	grains of mU-vcU, subangular to subrounded volcanic grains. fU-mL sand is well sorted, subangular (mostly) to subrounded, and consisting of quartz, 15% orange-stained quartz and possible minor Kspar, 12-14% mafic grains, and 1-3% volcanic grains. Tracer, very thin, reddish brown claystone beds. 1% scattered, thin to medium lenses rich in mU-vcU volcanic sand (sampled)		
17c	**Sandstone:** (As below).	3.0	76.0
	Fault at 52.7 m to 64.0 m*: West-down with greater than 11 m of throw. Fault has a 1 cm-wide clay core and a 20 cm-thick, slight (weak) damage zone on either side of the fault (coherent beds are slightly dragged). Sediment is grossly similar on either side of the fault. We estimate 11-30 m of likely throw (avg of 20 m)*	9.0	73.0
17c	**Sandstone:** fU-mL; very pale brown (10YR 7/4); thick, tabular(?) beds; mostly internally massive, with minor planar-laminations; minor, scattered mU-vcU, subrounded to subangular, volcanic grains. fU-mL sand is subangular (mostly) to subrounded, well sorted, and composed of quartz, ~15% orange-stained quartz and possible minor Kspar, 7% mafics, and 1-2% volcanic grains. Weakly consolidated and non-cemented. *@52.7-64.0 m: proceed straight up steep, southern slope of arroyo on the footwall of the west-down fault described above.* @ 60 m: thin lense of very fine pebbles. @46.7-52.7 m: Maximum grain size of cU in the sand. @46.4-46.7 m: Clayey-silty, vfL-mL sand; 26 cm-thick. @44.7 mL Top of 11 cm-thick, lenticular, fU-vcU sandstone bed; mU-vcU sand is volcanic. @44 m: Sand deformation band fault, with ~30 cm of west-down throw. @41.0-42.5 m: Silty sand. At base is an 8 cm-thick bed of siltstone; pink (7.5YR 7/3); planar-laminated.	24.5	64.0
17b	**Sandstone:** As below but with less scattered mL-vcU volcanic sand grains. *@39.8 m: Top of exposure on fault footwall. I tied upper-middle part of this unit (39.5 m) to Stake RDO-G on the fault hangingwall. Stake RDO-F placed at 39.5 m on the fault footwall. If this correlation is wrong, I guess 1-10 m of missing section based on the physical characteristics of the fault (thin clay core and relatively minor damage zone). Also, in a gross sense the strata are similar on either side of the fault.*	0.7	39.5
17a	**Sandstone:** fU; very pale brown (10YR 7/3-4); as in unit 16 but with scattered mL-vcU volcanic grains and one thin lense of mL-vcU sand (sampled). One fine, subrounded pebble of pink welded tuff. *@ 36.8 m: Stake RDO-E. Top of offset unit on footwall of the fault at 30.3 m (UTM coordinates of 3990125 N, 387973 E).*	2.0	38.8
16b	**Sandstone:** fU-mL; very pale brown (10YR 7/3-4); relatively massive; consists of quatz, 15-18% orange-stained quartz and possible Kspar, 3-5% mafics, and 1-2% volcanic grains. @ 24.8-36.8 m: Two thick beds of mostly fU sandstone, minor mL; reddish yellow (7.5YR 6/6); composition and texture of sand as in 16b. *@30.3 m: Location of west-down fault.*	7.5	36.8

Unit	Description	Thickness (m) (Unit)	(Total)
16a	**Sandstone:** fU; very pale brown (10YR 7/4); medium, tabular beds that are internally planar-laminated to internally massive; also massive; sand is well sorted, subangular, and consists of quartz, 16-18% orange-stained quartz and Kspar, 10% mafics, and minor possible volcanics; weakly consolidated and non-cemented. Poorly exposed. *Sampled and described at 26-29.3 m.*	7.5	29.3
15	**Sandstone:** fU-mL; light brown to reddish yellow (7.5YR 6/4-6). Poor exposure. *@21.8 m: We transfer west to gully bottom using the top of a cemented fU sandstone bed. Sean does not document dips above this, but I assume he calibrated with apparent dips.* @20.0-20.3 m: fU sand channel-fill. @19.6-19.7 m: Cemented fU sandstone; 14 cm-thick. *Change dip to 5°down-dip; chnge trend to S50°W.* @ 18.8-19.6 m: Sand is very pale brown (10YR 7/3); planar-laminated to very thinly bedded. @ 18.8 m: 5 cm-thick siltstone bed; pink (7.5YR 7/4). @17.8-18.8 m: Very pale brown (10YR 7.3) fU-mL sandstone (sampled); sand is planar-laminated to cross-laminated (greater than ~30 cm-thick foresets); local (~1%) very thin, lenticular beds of cL-vcU sand (sampled). @ 16 m: Thin, reddish brown claystone bed.	7.5	21.8
14	**Intercalated vfL-fL sandstone and siltstone:** Pink to light brown (7.5YR 6-7/4); medium to thick, tabular beds. @14.2-14.3 m: Cemented fL-mL sandstone; 14 cm-thick. @12.4-12.6 m: Cemented fL-fU sandstone; 16 cm-thick.. @ 10.1-10.6 m: Cemented bed of fL-vcL sandstone; ~0.5 m thick.. @6.7-10.1 m: 25% scattered mL-vcU sand mixed with very fine- to fine-grained sand; these medium to very coarse grains are volcanic, and subrounded; sand is 10YR 7/3.	7.7	14.3
13	**Fine white ash:** Ash is silty-textured and has 3-5% very fine to fine sand-size mafics and 5-10% detrital sand. Altered. **This ash correlates to the ash in unit 6h.**	0.4	6.6
12	**Fining-upward sandstone to silty vfL-fL sandstone:** fU-mU; very pale brown (10YR 7/3-4); planar-laminated and cross-laminated (5-10 cm-thick); 1% planar-laminated siltstone. Sand grades upwards to a silty vfL-fL sand (upper 58 cm below unit 13). @3.5 m: A medium claystone bed with pebble-size claystone rip-ups; pink (7.5YR 7/3).	3.7	6.2
11	**Fine gray ash:** Planar-laminated to very thinly bedded; ash is light gray (2.5 Y 7/1), contains minor glass shards, and is mixed with very fine-grained sand. 40 cm-thick. **Sample OC-227-271006-FGA-djk. This ash chemically correlates to ash sample 091106c in the lower RDO section Janet Slate, personal communication, 2007).**	0.4	2.5
10	**Sandstone:** fL-mU (mostly fU-mL); Very pale brown (10YR 8/2-7/3); laminated to very thin, tabular beds. Upper 0.7 m is strongly cemented. Very sparse clay rip-ups. Weakly consolidated. *UTM coordinates of base: 3990150 N, 0387870 E (Zone 13, NAD 27). StakeRDO-D*	0	2.1

Unit	Description	Thickness (m) (Unit)	(Total)
	placed at base of exposure. From here, section trends N80W at 2° down-dip.		

Lower Rio del Oso section. This section consists of sand, silty sand, silt, and pebbly sand of the middle Chama-El Rito Member, Tesuque Fm. Measured and described on the east slope of a north-flowing tributary of Rio del Oso; approximately 3900 ft east of the western boundary of the Chili 7.5-minute quadrangle and 20,200 ft north of the southern boundary of the Chili 7.5-minute quadrangle. Measured and described by Daniel Koning and Sean Connell on October 27, 2006 and November 9, 2006. UTM coordinates of base: 3990739 N, 0388511 E (Zone 13, NAD 27), Chili 7.5-minute quadrangle, New Mexico. UTM coordinates at top is 3990619 N, 0388737 E (Zone 13, NAD 27).

Unit	Description	Thickness (m) (Unit)	(Total)
	Chama-El Rito Member of the Tesuque Formation	**108.6**	**108.6**
9	**Siltstone:** Pink (7.5YR 7/3).	2.0	108.6
8	**Fine white ash:** Ash is white, lacks mafics, is silty-textured, and contains abundant glass shards. 150-200 cm thick. **Sample OC-189-271006-djk**	1.6	106.6
7b	**Intercalated siltstone and vfL-mL sandstone:** Pink to pinkish white (7.5YR 7/3-8/2) siltstone interbedded with very pale brown (10YR 7/3) vfL-mL sandstone; medium to thick, tabular beds; sand is internally very thinly bedded to laminated, planar to cross-stratified up to 5 cm-thick; local rhizoliths; well to moderately consolidated.	3.0	105.0
7a	**Siltstone** **@101.9-102.0 m: Fine gray ash;** light gray to white (2.5Y 8/1-2), silty-textured ash with abundant glass shards and trace to 0.5% biotite; fresh-looking; ~10 cm-thick. **(sample 09110gh).**	1.1	102.0
6h	**Fine white ash:** Ash is white, chalky-textured, contains glass shards, and contains 3% biotite grains; ledge-former; 30 cm-thick. **Sample 091106a.**	0.3	100.9
6g	**Siltstone:** Thin to 40 cm-thick, tabular beds; pink (7.5YR 7/3); 15% rhizoliths (0.6 mm-wide and up to ~10 cm-tall); tubular; vertical orientation, with some diagonal and horizontal; well consolidated. @ 99.3 m: **Fine gray ash**: very thin and discontinuous; ash is light brownish gray (2.5Y 6/2) and contains minor glass shards; ash is mixed with very fine- to fine-grained sand; 1-3 cm-thick. (**sample 091106b**).	2.3	100.6
6f	**Sandstone:** vfL-fU; pale yellow (2.5-5Y 8/2); lower 30 cm has planar-laminations; upper part is internally massive (because of bioturbation?); sand is well-sorted, subangular, and composed of quartz, 10% orange-stained quartz and possible Kspar, trace volcanic grains, and 7% mafic minerals. Abundant rhizoliths 0.5 cm-wide and 9 cm-tall; these are tubular and generally vertical, with minor diagonal.	1.2	98.3
	Not exposed	0.5	97.1
6e	**Sandstone:** vfL-fU; very pale brown (10YR 8/2-7/3); thin to medium, tabular bds; sand is well sorted, subangular (mostly) to surrounded, and composed of quartz, 15% orange-stained quartz and possible Kspar, 2% volcanic grains, and 5% mafic grains. @ 96.5-96.6 m: **Fine gray ash** mixed with vfL-fL sand; 10 cm thick. **Sample 091106c. This ash chemically correlates to ash sample OC-227-271006-FGA-djk in the Upper RDO section (Janet Slate, personal communication, 2007).**	0.8	96.6
6d	**Intercalated siltstone and silty vfL-fL sandstone:** Medium to thick, vague, tabular beds; thinly bedded in upper 1 m; well consolidated. @94.6 m: **Thin bed of altered fine white ash.**	5.7	95.8
6c	**Sandstone:** Mostly fL-fU; very pale brown (10YR 7/3); thin to thick, tabular to broadly lenticular beds; sand is well sorted, subangular to subrounded, and consists of quartz, 12% orange-stained quartz and possible Kspar, 3-5% mafic grains, and 3-5% volcanic grains. Moderately to weakly consolidated and non-cemented. ~10% of beds (medium to thick) contain mL-vcL volcanic sand grains (**samples 091106d and 091106e**). These coarser sand beds have very thin, lenticular internal	7.7	90.1

Unit	Description	Thickness (m) (Unit)	(Total)
	beds and internal planar laminations; locally, there are minor rip-ups. ~5% medium, tabular siltstone beds that are well consolidated. @ 90.1 m: Thin bed of **fine gray ash**; not sampled. @89.9 m: Thin bed of **ashy vfL-fL sand** that may be altered. It is white to light gray (5Y 8/1-2), and ~10 cm-thick; .**sample 091106g.** @87.5 m: Thin bed of fine white ash altered to a clay.		
6b	**Intercalated siltstone, vfL-fL sandstone, and silty vfL-fL sandstone:** Pinkish white (7.5YR 8/2); very thin to thin, planar beds; internally planar-laminated and low angle, cross-laminated and ripple-marked (up to 1.5 cm-tall); well consolidated.	3.5	82.4
6a	**Sandstone:** White (2.5Y 8/1), fL-mU, cross-laminated to cross-planar-stratified to trough-bedded (planar, up to 0.5-1.0 m-thick); there is much very fine to medium pebble-size intra-formational siltstone and sandstone rip-ups clasts *@76.4 m: Above, we use a 2.5° up-dip along S80E trend (UTM coordinates of 3990636 N, 388642 E).*	2.5	78.9
5d	**Ash:** This is a light gray to white (N 7-8/) ash that is silty-textured, and fresh-looking. It contains abundant glass shards and trace biotite. 10-30 cm-thick. **Sample 091106f.**	0.3	76.4
5c	**Ledge-forming sandstone with 5% silt-silty vfL-fL sandstone:** vfL-fU; very pale brown (10YR 7/.3); sand is in medium to thick, broadly lenticular to lenticular beds; internally planar-laminated with minor trough cross-stratification (~20 cm-thick, laminated to very thin); sand is well-sorted, subangular (mostly) to subrounded, and consists of quartz, 12-15% orange-stained quartz and possible Kspar, and 5% mafic grains. ~10% of sand beds have mL-vcU sand dominated by intermediate(?) volcanic grains with trace vesicular brown andesite or basalt; this coarse sand was sampled. ~5% very thin to thin, planar to broadly lenticular beds of siltstone and silty vfL-fL sand; very pale brown (10YR 8/3). @73.4-74.9 m: White (5Y 8.1), fL-fU, planar- to slightly wavy-laminated sand with rhizoliths (9 cm long and up to 1 cm-wide). @71.4 m: A 15x12 cm cobble "floater" in sand; cobble is a purple basalt scoria. @68.1-68.4 m: Pale mudstone.	10.9	76.1
5b	**Ash**: 33 cm-thick, slightly greenish, soapy-textured fine-white ash that lacks mafic grains.	0.3	65.2
5a	**Ledge-forming sandstone with 10% silty vfL-fL sandstone interbeds:** Sand beds are thin to thick and tabular; internally planar-laminated to planar-very thin beds. Most sandstone is pink (7.5YR 7/4), vfL-fU, subangular (mostly) to subrounded, well sorted, and consists of quartz, 15% orange-stained quartz and possible Kspar, and 5% mafic grains (including very minor, possible volcanic grains). Silty sand is very pale brown (10YR 8/2), and includes minor sandy silt. Weakly to well consolidated, and non to weakly cemented. @63.1 m: Top of ledge-forming sandstone bed (~20 cm-thick). @58.9-59.4 m: Pale yellow to white mudstone. @ 57.8-58.5 m: 60 cm-thick, slightly greenish, fine white ash with a soapy feel. It is	8.5	64.9

Unit	Description	Thickness (m) (Unit)	(Total)
	obviously altered and was not sampled. The ash has no mafics. On the northwest side of the gully, this ash fills a paleo-channel inset into a coarse channel-fill. The coarse channel-fill consists of fU-cL sand that was sampled; it exhibits planar-laminations and very thin, lenticular to broadly lenticular beds; there is also trough cross-laminations 8 cm-thick. @56.4 m: *Change to 2° up-dip along N80°E trend (UTM coordinates of 3990636 N, 388642 E).*		
4	**Ledge-forming, intercalated siltstone, silty vfL-fL sandstone, and vfL-fU sandstone (25:25:50):** Siltstone and silty vfL-fL sandstone are pink (7.5YR 7/3-4) to pinkish white (7.5YR 8/2), and in very thin to medium, tabular beds; well consolidated and non-cemented. The vfL-fU sand is pink (7.5YR 7/4), and in very thin to thick, tabular to lenticular beds; internal planar-laminations to cross-laminations (mostly southward facing, and probably ripples, locally ripplemarks are found imposed on north facing, very thin cross-strata 10 cm-thick)); sand is well sorted, subangular, and consists of quartz, 15% orange-stained quartz and possible Kspar, 5-7% mafic grains, and 1% possible volcanic grains; weakly to moderately consolidated and non-cemented. Took sample about half-way up this unit. *@48.3 m: Change to 3° up-dip along N80°E trend (UTM coordinates of 3990637 N, 388628 E).*	8.1	56.4
3b	**Sandstone with subequal coarser-grained channel-fills:** fL-mL; pink (7.5YR 7/4); generally thick to very thick, tabular beds that may be internally planar, very thin-bedded to laminated; sand is subangular to subrounded, well sorted, and consists of quartz, 15% orange-stained quartz and possible Kspar, 5-7% mafic grains, and 5-7% volcanic grains. Channel-fills are up to 30 cm-thick, ribbon-like and in concave-up forms; sand is fL-vcU that includes 10-15% mU-vcU, subrounded, dark, intermediate(?) volcanic grains; the coarser channel-fills were sampled. Both kinds of strata are weakly to moderately consolidated and non-cemented. @ 44.4 m: Unit consists of vfL-fU sand.	4.7	48.3
3a	**Sandstone:** fU-mU; very pale brown (10YR 7/3); thick (0.5-1.5 m), tabular beds; internal planar-laminated to planar very thin beds as well as low angle, very thin cross-beds; local tangential cross-lamination up to 27 cm-thick. Sand is well sorted, subangular (mostly) to subrounded, and consists of quartz, with 15% orange-stained quartz and Kspar , and 10% subequal voclanics : mafics; locally, there are very minor cL-vcU sand grains; local pink siltstone and silty vf-f sandstone rip-ups (up to 21x18 cm) and local intraformational rip-ups of cemented sand. Sand is weakly consolidated and non-cemented. Sand sample at wpt 13. 1.5 m below the top of this unit is a petrified log 18 cm-wide. It is at the top of a 40 cm-thick, fL-vcU sandstone channel-fill (where cL-vcU sand consists of volcanic grains). @36.0-38.0 m: Pink siltstone and vfL-fU sandstone with rhizoliths. @35.5-36.0 m: ~0.5 m-thick bed of greenish siltstone with rhizoliths. One channel-fill trends S33°E ± 40° and is 110 cm deep (opposing margins of the channel-fill are S10°W and S75°E). @27.9-28.0 m: **Fine gray ash:** Ash is gray (5Y 6/1-2) and mixed with some very fine-grained detrital sandstone; glass shards are present; 3-10 cm-thick. **Sample OC-188-271006-djk.**	15.7	43.6
2	**Sandstone, with 25-30% siltstone and 5% claystone beds:** vfL-mL sand; very thin to thick, tabular beds; internally planar- laminated to very thin-bedded. Sand is well-sorted, subrounded to subangular, and consists of quartz, possible minor plagioclase, 15-17% orange-stained quartz and possible Kspar, 5% mafics, 1-3% possible volcanic	11.7	27.9

Unit	Description	Thickness (m) (Unit)	(Total)
	grains, and trace green quartz. 5% very thin, planar to lenticular claystone beds and 25-30% siltstone beds. Silt is 7.5YR 8/1-2; clay is 5YR 5/4; silt is in very thin to thick, tabular beds; silt is commonly mixed with vfL-vfU sand and is well consolidated and locally bioturbated. 0.5% channel-fills of very thin to medium, lenticular-bedded fL-vcU sand; sand is moderately sorted; mU-vcU sand consists of intermediate(?) volcanic grains; there is very minor very fine volcanic pebbles in these channel-fills. . Sediment is moderately consolidated and non-cemented. I sample the sand at wpt 3. @25-27.2 m: Local cross-stratification in the sand. @25 m: lenses of volcanic pebbles. Somewhere between 22.6 m and 26 m is a thick bed of rhizoliths up to 12 cm long and up to 1 cm-wide. @22.2-22.6 m: Pale sandstone nodules present, together with bioturbated sandstone (burrows). @ 20-22 m: Zone of rhizoconcretions 2-4 mm in diameter; subhorizontal to subvertical.		
1f	**No exposure.** *We measure from 12.0 to 26.7 m to the prominent, well-exposed gulley. After 18.5 m, we change to 4.5° down-dip along S15°E trend (UTM coordinates: 3990659N, 0388579E). At 26.7 m (16.2 m in the gully exposure), we change to 4.5° up-dip along a S85E trend. Upon reaching the gully, we start measuring from the bottom of exposure there, 10.5 m below 26.7 m (which correlates to about 16.2 m in the section). Stake RDO-B placed at 26.7 m (UTM coordinates: 3990628 N, 388588 E). Stratigraphic height calculated using trigonometric relations from map data gives 27.3 m between Stakes RDO-A and RDO-B.*	4.2	16.2
1e	**Sand:** Pink to reddish yellow (7.5YR 7/4-6/6); fU, well sorted, subrounded (minor subangular); composed of quartz, trace green quartz, 15% orange-stained quartz, 5% mafics grains, and trace chert. Uncemented, weakly consolidated, and poorly exposed.	2.5	12.0
1d	**Covered, but colluvium suggests sediment is like that in unit 1e.**	2.0	9.5
1c	**Sand:** Pink to very pale brown, fL-fU.	4.5	7.5
1b	**Covered: Total non-exposure**	2.5	3.0
1a	**Gray ash bed:** *UTM coordinates of base: 3990739 N, 0388511 E (Zone 13, NAD 27). StakeRDO-A placed at base of gray ash bed. From here, section trends S54E at 2° down-dip.*	0.5	0.5

Basal Rio del Oso section. This section consists of fine sand, silty sand, and silt of the middle Chama-El Rito Member, Tesuque Fm. Measured and described on the west slope of a north-flowing tributary of Rio del Oso; 2900 ft east of the western boundary of the Chili 7.5-minute quadrangle and 22,100 ft north of the southern boundary of the Chili 7.5-minute quadrangle. Measured and described by Daniel Koning on November 9, 2006. UTM coordinates of base: (3991178 N, 388339 E (Zone 13, NAD 27), Chili 7.5-minute quadrangle, New Mexico. UTM coordinates at top is 3991333 N, 0388249 E (Zone 13, NAD 27).

Unit	Description	Thickness (m) (Unit)	(Total)
	Stake D-D is labeled on a boulder with a white calcium carbonate film on its south side. This is at 19.8 m in the section. UTM coordinates of 3991333 N, 0388249 E (Zone 13, NAD 27).		
	Chama-El Rito Member of the Tesuque Formation	**19.8**	**19.8**
8	**Siltstone:** thin, tabular beds; abndant rhizoliths; well consolidated.	0.7	19.8
7	**Spring mound deposit consisting of two, subequeal types of sand and subordinate siltstone:** 1) thick to thin, tabular(?) beds of pinkish gray (7.5YR 7/2), fL-mL, subrounded (minor subangular), well sorted sand composed of quartz, 15-18% orange-stained quartz and Kspar, and 12% lithic grains (volcanic and mafic grains with very minor colored quartz); and 2) pink (7.5YR 7/3) vfL-fL sand and silty sand (similar to above in composition and well sorted). Estimate 15-25% siltstone in very thin to medium, tabular beds (pink, 7.5YR 7/3). No HCl effervescence, abundant rhizoliths, and lack of glassy ash shards. Upper 30-40 cm is mostly strongly cemented and forms a ledge; rest of unit is weakly cemented. This ledge consists of silty vfL-mL sandstone (5Y 8/1 and 2.5 7/2) that is subrounded to subangular and in thin to thick, planar beds with wavy laminations 5-10 cm tall; abundant rhizoliths throughout; one orangish basalt scoria clast. In one layer, the rhizoliths are abundant enough to form mats. The rhizoliths are cemented by silica cement, and are resistant to erosion as to stick out in the outcrop.	2.3	19.1
6	**Intercalated siltstone and vfL-fL sandy siltstone:** thin to thick, tabular beds; 5-10% rhizoliths; well consolidated.	2.0	16.8
5b	**Silty sandstone channel-fill:** vfL-fU; estimate 5-10% silt; pink (7.5YR 7/3); planar-laminated to cross-laminated (ripple-marks?; 1 cm-thick). Upper half is strongly cemented by silica and bioturbated with rhizoliths and possible burrows. Uppermost 12 cm is a pink (5YR 7/4) horizon that may possibly be a weakly developed paleosol.	0.8	14.8
5a	**Silty sandstone:** vfL-fL; estimate 10% silt;, pink (5YR 7/3-4); unit consists of one thick bed.	0.7	14.0
4a	**Sandstone:** fU-mL-mU (mostly fU-mL); light brown to pink (7.5YR 6-7/4); sand is well sorted, subrounded, and consist of quartz, 10-12% orange-stained quartz and Kspar, 7-10% volcanic grains, and 3% mafic grains. Weakly consolidated and not well-exposed. Lower 10 cm is strongly cemented (sampled). Upper 1 m is a well sorted, fL-fU sand	2.1	13.3
3c	**Silty sandstone:** vfL-fL, minor fU, unit fines slightly upward; estimate 15-20% silt; pink to reddish yellow (7.5YR 6/6-7/4); medium to thick beds; well consolidated.	1.1	11.2
3b	**Silty sandstone:** vfL-fU; estimate 3-10% silt; pink 7.5YR 7/4); bedding not exposed; moderately consolidated. @ 9 m: To east, local thick bed of relative pure white fine ash (sample OC-187-011004-djk) found 8 m below rhizolith-rich sandstone beds (unit 7). This ash would project to here.	5.0	10.1
3a	**Silty sandstone bed**: vfL-fL sand; well consolidated.	0.2	5.1
	No exposure	0.7	4.9
2b	**Sandstone and silty sandstone:** vfL-cU (mostly fL-fU); very pale brown to pink (10-7.5YR 8-7/3), silty sand is pink to reddish yellow (7.5YR 7/4-6); thin to medium, tabular beds; moderately consolidated.	0.8	4.2
2a	**Sandstone:** fL-mL (minor mL-cU volcanic sand); very pale brown to pink (10-7.5YR	1.2	3.4

Unit	Description	Thickness (m) (Unit)	(Total)
	8-7/3); planar cross-laminated at the base of this bed (10 cm-thick), planar-laminated above this basal 10 cm; sand is subrounded to subangular, moderately sorted, and composed of quartz, 15% orange-stained quartz and possible Kspar, 3-5% volcanic grains, and 5% mafic grains. Moderately to weakly consolidated.		
1a	**Sandstone:** fL-fU; pink (7.5YR 7/4); thin to thick, tabular beds; sand is well sorted, subrounded to subangular, and consists of quartz, 15% orange-stained quartz and possible Kspar, 3-5% volcanic grains, and 3% mafic grains; moderately consolidated.	0	2.2
	Fine gray marker ash: Ash is light gray (N7/), lacks mafic minerals, and has abundant glass shards. Ash appears similar to the gray ashes of the Skull Ridge Member to the east.	0	-0.3
	Stake CC placed on top of the fine gray marker ash (UTM coordinates: 3991243 N, 388321 E). From here, I proceed N40°W along-strike (0° dip). Stake BB placed at the base of the fine gray marker ash to the southeast (UTM coordinates: 3991181 N, 388334 E).		
	Intercalated silty vfL-fL sandstone and vfL-fL sandstone: Pinkish white to very pale brown (10-7.5YR 8/2); planar-laminated to low-angle cross-laminations (0.5 cm-thick). Sand is well sorted, subangular, and contains ~5% muscovite; locally, fU sand is present. Minor rhizoliths are present. Well consolidated.	-1.5	-1.8
	Intercalated siltstone with subequal vfL-fL sandstone compared to silty sandstone: Siltstone is pinkish white (7.5YR 8/2); planar to wavy laminated and also in very thin, planar beds. Sand is very pale brown (10YR 8/2), well sorted, and planar-laminated. Well consolidated *Stake A-A placed at the top of the fine whit ash marker bed (3991178 N, 388339 E, ±* 9 m.	-1.3	-3.1
	Fine white marker ash: Ash is planar-laminated to very thin-thinly bedded; ash is relatively hard and bright white in color. ~3% very fine-lower sands-size mafic minerals . Glass shards are common. Ash is weakly altered.	-0.9	-4.0

Cuarteles stratigraphic section. Reference section of Tesuque Formation that encompasses the Pojoaque, Cejita, and Martinez members. Measured and described in Arroyo Quarteles north of the Santa Cruz River and Highway 76. Described by D.J. Koning, S.D. Connell and D. Love on May 29, 30, 31, June 2, 2003. UTM coordinates of base: 3984357 N, 409170 E (Zone 13, NAD 27), Chimayo 7.5-minute quadrangle, New Mexico.

Unit	Description	Thickness (m) (Unit)	(Total)
	Cuarteles Member of the Tesuque Formation	**178.6**	**446.6**
	UPPER CUARTELES SECTION (DESCRIBED IN WESTERN CHIMAYO QUADRANGLE TO THE EAST)		
	Stake G placed on top of hill underlain by unit 9c. 3989840N, 410370E		
9c	**Similar to unit 9a.**	2.5	446.6
9b	**Pebbly sandstone to pebble-conglomerate channel complex sediment:** Channel complex is composed of pebbly sandstone and pebble-conglomerate (subequal proportions); beds are laminated to v thin-thin, tangential- and trough-cross-stratified and also lenticular. Channel-shaped beds also present that are up to 60 cm deep. In conglomerate beds, pebbles are clast-supported, subang (most of granite) to subrnd (quartzite) and modly to poorly sorted. Clast count: 77% granite, 18% qtzite (16% coarse-colored, 2% siliminite-bearing), 3% quartz, 2% biotite granitic gneiss. 13x6 cm, 10x9 cm, 13x10 cm, 18x13 cm. Channel sand is mostly mL-vcU, subang, poorly sorted, and an arkose in composition. Channels are generally moderately to well cemented. Clasts are vaguely imbricated as to indicate a NW-directed paleoflow. Paleoflow data: N62°W ± 11° (50-60 cm-thick cross-stratification); S88°W ± 4° (25 cm-deep channel trend); N70°W (35 cm-tall channel margin); N58°W ± 20° (15 cm-deep channel); N68°W (25 c-tall channel margin). N33°W (20 cm-tall channel margin). Maximum calst sizes are: 13x6, 10x9, 13x10, and 18x13 cm.	1.5	444.1
9a	**Sandy cobble-conglomerate channel complex:** Very thin to medium, lenticular beds whose gravel is comprised of 65-75% cobbes and 25-35% pebbles; 10-15% strong to moderate cementation, rest is weakly cemented. Max clast sizes: 32x16 cm, 35x19 cm, 23x18 cm, 19x18 cm, 47x19 cm.	3.5	442.6
8u	**Extra-channel sediment, with 35-40% coarse channel-fill sediment:** Light brown to reddish yellow (7.5YR 6/4-6), muddy (est 5% mud) vfL-vcU sandstone. Thin to thick, tabular beds. Sand is subang, poorly to moderately sorted and an arkose in composition. Moderately to well consolidated, and internally massive. 0.5-1% possible scattered reddish soil horizons. Channel complexes are thick, tabular, and composed of pebbly sandstone to sandy pebble-conglomerate; ~25% are strongly to moderately cemented, rest are weakly to non-cemented; conglomerate is clast-supported, moderately to poorly sorted, and composed of subang granite together with 1-2% vein quartz and 0-3% quartzite (cs-col); 0.5% of gravel are cobbles; channel sand is light brown (7.5YR 6/4), vfL-vcU but mostly cL-vcU, ang-subrnd but mostly subang, poorly sorted, and an arkose in composition.	13.3	439.1
8t	**Extra-channel sediment of Ttacu, with 25-35% coarse channel-fill sediment:** Light brown to reddish yellow (7.5YR 6/4-6 and 5/6) silty-clayey (est 3-40% fines) vfL-vcU sandstone. Medium to thick, tabular beds. Sand is subang, poorly sorted, and an arkose in composition. Moderately to well consolidated, and moderately cemented. Channels are in medium to thick, lenticular to tabular channel complexes with internal very thin to thin, lenticular beds, with minor planar and channel-shaped beds; well graded mixture of strong to poor cementation by CaCO3. Channels are composed of sandy pebble-conglomerate (most common) to pebbly sandstone (least common); conglomerate is clast-supported, subang-subrnd, moderately-poorly sorted, and granitic with ~1% quartzite. No cobbles. Channel sand is light brown (7.5YR 6/4), fL to vcU, subang (m) to subrnd(l), poorly sorted, and an arkose in composition. *From unit s, measured along ridge-top using 2 degree app dip, N10°E trend.*	7.2	425.8
8s	**Sandy pebble conglomerate channel complex:** Three stacked channels of strongly cemented, clast-supported sandy pebble conglomerate and subordinate pebbly sandstone. Ledge-former. Very thin to medium, lenticular to channel-shaped to planar	2.1	418.6

Unit	Description	Thickness (m) (Unit)	(Total)
	(most common to least common) beds. Clasts are moderately to poorly sorted and subrnd-subang. Clast cnt (n=107): 89% granite, 8% quartz, 3% coarse-colored quartzite). Max clast sizes: 9x7, 6x4, 6x5, 5x4, 5x4. Channel sand is fL-vcU but mostly mL-vcU, subang (mostly) to subrnd (minor), poorly sorted, and an arkose in composition. *Followed this unit to ridge-top, base of unit climbs 1.3 m in the process.*		
8r	**Extra-channel sediment, with 10-15% coarse channel-fills:** Light brown to light yellowish brown (7.5-10YR 6/4), silty-muddy vfL-vcU sandstone (mostly silt, mud, and vf-f sand). Internally massive to med-thick, tabular beds. Sand is subang (mostly) to subrnd (minor), poorly sorted, and an arkose in composition. Well-consolidated and no HCl effervescence. 10-15% channels (medium, lenticular to channel-shaped) are scattered in this unit.	3.0	416.5
8q	**Sandy conglomerate and pebbly sandstone channel complex:** Sandy conglomerate(m) to pebbly sandstone(l); very thin to thin, planar-lenticular beds. Clasts are all pebbles. Conglomerate is clast-supported, subang-subrnd, moderately sorted (within a bed), and granitic. Imbrication of ~5 clasts: N25-30°W. Sand is very pale brown (10YR 7/3), mL-vcU, subangular, poorly sorted, and an arkose in composition (one green ash grain). 2/3 weak-strong cementation, 1/3 moderate-strong cementation. @ 412.8 m: Channel complex has 25-30 cm-deep channels (25 cm scour depth); channel trend is N30°W±20°.	2.1	413.5
8p	**Extra-channel sediment:** Light brown (7.5YR 6/4) silty-muddy vfL-vcU ss (mostly silt, mud, and vf-f sand). Internally massive. Sand is subang (mostly) to subrnd (minor), poorly sorted, and an arkose in composition. Well-consolidated and moderately cemented by CaCO3. 10-20 cm-thick reddish soil(?) horiz on top of unit. Two tephra beds project into the section from 85 m to S32E. Lower and upper are 7 and 16-17 cm thick, respectively; upper is 80 cm below unit 8q; the two are separated by 37 cm of extra-channel sediment. The black ashes are composed of gray-black ashy sand; ~1/4 : 3/4 ratio of tephra : detrital sand. Black ash is cL-vcU sand-size and probably basaltic. Top 1-2 cm of upper bed is rich in white, consolidated ash clasts and grains 0.5 - 17 mm diam – this may perhaps correlate to the Orilla pumice (10.8 Ma; Manley 1979).	1.4	411.4
8o	**Strongly cemented, sandy pebble-conglomerate channel complex:** Very thin to medium, lenticular (mostly) to channel-shaped (lesser in porportion, up to 10-15 cm deep) internal bedding. Gravel are clast-supported, subrnd-subang, and poorly to moderately sorted. Clast count (n-108): 93% granite, 7% quartz. Channel sand is mostly mL-vcU, subang, poorly sorted, and an arkose in composition.	1.0	410.0
8n	**Channel complexes of pebbly sandstone and sandy pebble-conglomerate, interbedded with ~20% extra-channel sediment:** Generally medium to thick, tabular to broadly lenticular channel complexes of pebbly sandstone and sandy pebble-conglomerate. Internal very thin to medium, planar to lenticular beds. Conglomerate is clast-supported, poorly to moderately sorted, and subang to subrund. Only 1-3% of gravel are cobbles. Gravel is granitic with ~1% quartzite. Max clast sizes from channel at 401.7 m: 9x7, 9x7, 9x6, 8x7, 9x9, 7x7 cm. About subequal strong-moderate : weak cementation. Channel sand is very pale brown (10YR 7/3), fL-vcU but mostly mL-vcU, subang (m) to subrnd (l), poorly sorted, and an arkose in composition. Extra-channel sediment is in thick, tabular beds, moderately cemented, and composed of silty (est 3-5% silt) vfL-vcU sand [subang (m) to subrnd (l), poorly sorted, and an arkose in composition]. Top of extra-channel beds commonly have 10-20 cm-thick, reddish soil horizons. @406 m: 5.4 m below 1q base is a 30 cm-thick basalt-rich sand (15-35% basaltic sand grains that are fU-mU).	8.9	409.0
8m	**Ashy sandstone:** Light gray to light brownish gray (10YR 6-7/2), vfL-cU arkose sandstone with 20% very dark gray volcanic lithics and mafic grains. Sand is	0.2	400.1

Unit	Description	Thickness (m) (Unit)	(Total)
	moderately consolidated and mostly subang.		
8L	**Extra-channel sediment:** Very pale brown (10YR 7/3), slightly silty-muddy (est 1-3%) vfL-vcU sandstone; internally massive massive. Sand is subang(m) to subrnd(l), poorly sorted, and an arkose in composition. Well-consolidated and moderately cemented by CaCO3.	1.6	399.9
8k	**Pebbly sandstone-sandy pebbles channel-fill**: (channelized at base, planar, thin beds at top). Channel trends: S56°W±19°, S82°W±18°, N81°W±14°, N65°W±12°, S88°W±11°.	0.6	398.3
8j	**Upper bed of prominent black, coarse ash:** Light gray (10YR 7/2), basalt-rich arkosic arenite sand. 1/3 basalt or int vf-f sand and mafic grains. 3-15% white pumice 0.5-8.0 mm-long. Arkosic sand is vfL-vcU, and poorly sorted. ~5% Lith A pebbles. This tabular bed is scoured into up to 50 cm by overlying unit. *Stake E at 8K/8J contact; UTM coord: 3989499 N, 410257 E. 7 m to NW, stake F is at base of correlative unit 1J; UTM coord: 3989612 N, 410172 E.*	0.7	397.7
8i	**Fining-upward, coarse channel to finer extra-channel sediment:** Lower 2/3 is pebbly sandstone; pebbles are subang (mostly) to subrnd (minor) and granitic. Sand is light yellowish brown (10YR 6/4), fL-vcU, subang-subrnd, poorly sorted, and arkosic arenite (~7% dark gray volcanic lithics). Weakly consolid and weakly cemented. Upper 1/3 is a slightly silty (est. 3-5% silt) sand. Sand is vfL-vcU, subang (mostly) to subrnd (minor), poorly sorted, and arkosic arenite; well consolidated and well-cemented. Probable 10-15 cm thick, 7.5YR 5/6 soil on top (clay-rich but no clay films).	1.8	397.0
8h	**Middle bed of prominent black, coarse ash:** Light brownish gray to light gray (10YR 6-7/2), basalt-rich arkosic arenite sand. Basalt is dark gray to gray and fine- to medium- grained. Arkosic sand is fL-vcU, subang (mostly) to subrnd (minor), and poorly sorted.	0.9	395.2
8g	**Pebbly sandstone and sandy pebble-conglomerate channel complex:** Beds are very thin to thin, lenticular to cross-stratified. Upper channel like lower but no cross-stratification. Both fine-upward. Pebbles are clast-supported, subrnd-subang, moderately-poorly sorted, and granitic w/ <1% qtzite. Channel sand is fL-vcU, subang(m) to subrnd(l), poorly sorted, and an arkose in composition. Weak-strong cementation.	2.2	394.3
8f	**Lower bed of prominent black, coarse ash:** 25-35% black ash (f-m) mixed with 65-75% f-vc arkosic sandstone; internal v thin-thin bedding to massive. Light gray to light brownish gray (10YR 6-7/2); 10-20% 10-15 cm-thick lenticular beds of pebbly sand to sandy pebbles (also mixed in with the ash). Volcanic grains are dark gray and subrounded. Arkosic sand is subang and moderately to poorly sorted. Moderately consolidated and very weakly cemented. *Stake C placed at base of middle prominent black ash bed; UTM coord: 3989466 N, 410299 E. Followed this bed to west, where another section was measured between the lower and upper prominent black ash beds (the description in the text above is from the western section). Used N48°E\0 (along-strike); stake D placed at base of unit 8f (poor UTM coord: 3989495 N; 410251 E).*	1.4	392.1
8e	**Extra-channel sediment, with ~5% coarse channel-fills:** Light brown (7.5YR 6/4) slightly muddy (est ~3% mud) vfL-vcU sandstone; thick, tabular beds to massive; sand is subang (mostly) to subrnd (minor), poorly sorted, and an arkose in composition. ~5% 10-40 cm-thick channels of pebbly sandstone; pebbles are granitic; sand is light brown (7.5YR 6/4), subang (mostly) to subrnd (minor), poorly sorted, and arkosic; channels are moderately cemented by CaCO3. Well to moderately consolidated.	4.0	390.7
8e'	@ 386.8-387.3 and 389.2-38.4 m: **Basaltic(?) ashy sand:** 20-40 cm-thick bed of pink to very pale brown (7.5YR-10YR 7/3), slightly silty (est 1-3% silt) vfL-mL sandstone [subang (mostly) to subrnd (minor), modly sorted, and arkosic] with ~5% dark gray to gray volcanic (basalt?) lithic grains.		
8d	**Pebbly sandstone channel-fill:** Laminated to very thin to thin, lenticular to planar	0.9	386.7

Unit	Description	Thickness (m) (Unit)	(Total)
	internal beds; well-distributed weak to strong cementation. Lower 0.5-1 m is sandy pebble-conglomerate; ~1% cobbles (8x5 and 7x4 cm diam); pebbles are clast-sup (in pebble-congl), subang to subrnd, and granitic with 3-7% qtzite and very minor pink volcanic lithics; channel sand is 7.5YR 6/4, fL-vcU (mostly mL-vcU), subang (m) to subrnd (l), poorly sorted, and an arkose in composition. Basal channel margin (15 cm-tall): S54°W.		
8c	**Extra-channel sediment**: Light brown (7.5YR 6/4) slightly silty to muddy (est 1-3% fines), vfL - vcU sandstone with 3-5% pebbles; massive; sand is subang (mostly) to subrnd (minor), poorly sorted, an arkose in composition; well consolidated. ~2/3 up this unit are two med - thick, pebbly sandstone beds. Pebbles are poorly sorted and granitic; sand is f-vc, subang (m) to subrnd (l), poorly sorted, and arkosic; weakly cemented.	3.2	385.8
8b	**Sandy conglomerate channel-fill**: Internal bedding not well-exposed but appears to be thin to med and lenticular. Pebbles are clast-supported, subrnd to subang, and poorly sorted. Max clast sizes: 13x9, 8x7, 8x7, 8x6, 8x7, 7x5. Clast count (n=116): 6% quartzite (cs-col), 3% quartz, and 91% granite. Channel sand is 7.5YR 7/2-3, f-vc, subang(m) to subrnd(l), poorly sorted, and an arkose in composition. Weakly to strongly cemented by CaCO3 (more strongly cemented towards the base).	0.9	382.6
8a	**Extra-channel sediment, with ~3% coarse channel-fills**: Slightly silty to muddy (est 1-3% fines) vfL-vcU sandstone; massive; sand is subang, poorly sorted, and an arkose in composition; 3-5% scattered pebbles; well consolidated. Lower 2 m is light yellowish brown (10YR 6/4). Upper 1.5-2 m is light brown to reddish yellow (7.5YR 6/4-6); some of reddening may be due to two 20-30 cm reddish soil horizons (probly Bt); these are 5YR-7.5YR 6/6 and 5YR 5/6, and have hard, 3csbk ped structure and 3d-ppf clay films. Within the massive sediment are ~3% thin to med (up to 15 cm thick) channels of sandy pebble conglomerate; pebbles are clast-sup, subang (mostly) to subrnd (minor), poorly sorted, and granitic with 1-5% estimated quartzite; ~25% of channels are strongly cemented, rest are weakly to moderately cemented by CaCO3 (weak to moderate HCl effervescence). *@379.2 m: stake B (N 3989392 N, 410359 E); above, use N42°W\ 2°NW.*	3.2	381.7
	Covered: 370.5-378.5 m.	8.5	378.5
	***Shot along-strike from stake BB using an average attitude of N48E\3NW; add 4 m over this shot (error of +/- 1 m). Stake A placed at UTM coord: 3989307 N, 410432 E. Avg att in lower section is N48E\3NW, so used bearing of N42W\3NW.* Note that cumulative thicknesses continue from the Cuarteles section on the San Juan Pueblo quadrangle to the west.**		370.5
	LOWER AND MIDDLE CUARTELES SECTION ***@370.5 m: Stake BB placed on top of divide, still on hanging wall of fault (approx. UTM: 3988650N 409695E***	102.5	370.5
7ff	**Channel pebble-conglomerate to pebbly sandstone:** Subequal pebbly sandstone : pebble-conglomerate; very thin to medium, planar to lenticular beds. Conglomerate is clast-supported, poorly sorted, subrnd-rnd (qtzite) and subrnd-subang (gr). Clast count: 86% granite; 13% quartzite, 1% Pilar phyllite. Max clast sizes: 13x8, 13x8, 16x10, 13x13, 11x10 cm. Sand is 10YR 7/3, fL to vcU but mostly mL-vcU, subang-subrnd, poorly sorted, an arkose (trace felsic volc lithics). ~10% strong-moderate cementation, rest is weakly cemented to loose.	1.1	370.5
7ee	**Extra-channel sediment:** Reddish yellow to light brown (7.5YR 4-6/6) silty vfL-mU sand with minor cL-vcU sand; massive; est. 10% silt; sand is subang-subrnd, moderatelly sorted, and an arkose; moderately consolidated; poorly exposed. *@366.0 m: Stake AA placed on top of knoll. UTM coord: 3988540N, 409700E*	3.4	369.4
7dd	**Two channels of pebble-conglomerate to pebbly sandstone:** Lower channel fines upward from a 15 cm basal pebble-conglomerate to pebbly sandstone; weakly	2.5	366.0

Unit	Description	Thickness (m) (Unit)	(Total)
	cemented. Clasts are granitic with 10-20% quartzite (quartzite is subrnd to rnd, granite is subrnd to subang). No distinct beds aside from 15 cm basal layer. 0.5% felsic volcanic clasts. Sand is 7.5YR 7/3, fL-vcU, subang-subrnd, poorly sorted, and an arkose. Sharp lower contact. Intervening extra-channel sediment is silty vfL-vcU (est. 15-25% silt). Upper channel is mostly a clast-supported pebble-conglomerate; beds are very thin to medium, planar to lenticular to planar-cross-stratified (up to 25 cm tall). Mostly moderately to strongly cemented by CaCO3. Max clast size: 24x14, 11x10, 10x8, 11x11, 12x9 cm. Clast count gives 24% quartzite (subrnd-rnd) and 76% granite. (subrnd-subang). Clasts are poorly sorted and clast-supported. Sand is mL to vcU, subang, poorly sorted, and an arkose.		
7cc	**Extra-channel sediment of Ttacu:** Light brown to pink (7.5YR 6-7/4) silty vf to vc sand.; massive; I est 5-8% silt; sand is subang-subrnd, poorly sorted, and feld arenite with 2-3% felsic volc lithics and ash grains; moderately to well consolidated.	5.4	363.5
7cc''	@362.4-362.9 m: **Basaltic ash within unit 7cc:** Black basaltic ash mixed with minor detritus (~10% kspar).		
7cc'	@359.0-359.3 m: **Ashy sandstone of Ttacu:** Ash is whitish, m-vc (sand-size) and mixed with vfL-mU an arkosic sandstone.		
7bb	**Pebbly sandstone channel sediment:** Sand is mL-vcU; lower 40 cm is moderately to strongly cemented. Pebbles are scattered and consists of granite with 10-15% quartzite; no clear bedding; sand is subang-subrnd, poorly sorted, and an arkose. Sharp and scoured lower contact.	0.5	358.1
7aa	**Extra-channel sediment:** Reddish yellow to light brown (7.5YR 4-6/6) vfL-vcU sand with 3-5% silt-clay matrix; massive; sand has ~3% felsic volcanic grains; sand is subang-subrnd, an arkose, and poorly sorted. Moderately to well consolidated.	0.4	357.6
7z	**Coarse white ash:** White (10Y 7/1) altered glass and compacted white ash; 10% biotite and 3% felsic-int lithics. Somewhat greasy feel and greenish color indicates some alteration. Sharp lower contact; upper contact is gradational.	1.1	357.2
7y	**Extra-channel sediment overlain by sandstone channel:** Former is reddish yellow to light brown (7.5YR 4-6/6) and composed of silty vfL to fU sand (minor mL-vcU sand). Est 10-20% silt. Sand is subang to subrnd, modly sorted, and an arkose with 1% felsic volcanic grains; moderately to well consolidated. Channel fines-upward; lower 15 cm is strongly cemented and locally has granitic pebbles. Upper part of middle subunit is loose. Very thin to thin, planar to lenticular to cross-stratified (up to 8 cm) beds. Sand is fL-vcU, an arkose, subang-subrnd, and poorly to moderately sorted. Upper subunit is vfL-mL sand with 3-5% silt near the top; sand is moderately well sorted, subang, an arkose, and moderately consolidated. *@353.5 m: Stake Z placed on north side of arroyo, one shot up from stake Y. Continue upwards at* N5°*W trend and 2° dip.*	3.3	356.1
7x	**Coarse white ash:** 11 cm of loose 5Y 6/2 ash overlain by 70 cm of 10YR 7/1-2 modly consolidated, silty-clayey ash. Basal ash is mL-vcU (sand-size) and has 5-7% pink to gray lithics and 5-7% biotite; upper part is more altered (more clayey) and fL-mU gr (sand-size). *@352.0 m: Stake Y placed on top of ridge and top of 7v channel. From here, shot across arroyo using N5°W\3° NW trend. Continued upwards at N5W trend and 4 degr dip.*	0.8	352.8
7w	**Channel pebble-conglomerate to pebbly sandstone:** Beds are very thin to thin, planar to lenticular to tangential cross-stratified (latter up to 100 cm tall). 1/3:2/3 pble congl : pebbly ss; 25-35% of gravel are cobbles. Gravel is poorly sorted and clast-supported. Clast imbrication of N88W +/- 13. Max clast sizes: 24x19, 15x11, 26x4, 21x17, 19x17, 30x12. 3 clast counts give: 89-94% gr, 1% vein qtz, 6-7% colord, cs qtzite, 1% sil-qtzite. Weakly to strongly cemented. Sand is fL-vcU but mostly mL-vcU, subang-subrnd, poorly sorted, and an arkose. @345.1-345.2 m; Max clast sizes in cs channel: 6x3, 6x4, 6x3, 6x4, 3x2, 4x3, 5x5 cm	2.6	352.0
7v	**Extra-channel sediment with subordinate channel sediment:** Former is reddish	6.1	349.4

Unit	Description	Thickness (m) (Unit)	(Total)
	yellow to light brown (7.5YR 4-6/6) and composed of silty vfL to mU sand; massive; poorly to moderately sorted; subang-subrnd; arkosic arenite. (up to 7% felsic volcanic grains) modly-well consolid. Channels are pbly sand to pebble-conglomerate (pebbles are moderately-poorly sorted & granitic). *@343.3 m: Stake X placed on top of SCV-318 tephra. Continued upwards at N5W trend and 4 degr dip.*		
7u	**Extra-channel sediment:** Reddish yellow (7.5YR 6/6) vfL-fU sandstone; well sorted; an arkose. Vague, thin to thick, tabular beds, or else massive. 1-5% reddish, (7.5YR 5/6) clay-enriched (Bt) soil horizons.	5.8	343.3
7u'	@340.5-340.8 and 343.1-343.3: **Coarse white ashes:** Lower is vf to m arkosic sand containing 20-25% coarse ash to lapilli-size fragments of greenish dacite(?) and purplish gray volcanic lithics. Upper is a relatively pure, pumiceous, coarse ash with 3-5% biotite; hard. *Sample SCV-318 taken at upper ash.*		
7t	**Channel pebble-conglomerate to pebbly sandstone:** Beds are planar-laminated to planar-cross-laminated (up to 12 cm tall). Gravel are clast-supported, subang to subrnd, modly to poorly sorted, and composed of granite with trace quartzite. Sand is ml to vcU, subang, moderately sorted, and an arkose. Max depth of channels = 20 cm. Max clast sizes: 9x5, 4x4, 6x3, 3.5x3, 5x4, 7x7, 9x5 cm.	1.0	337.5
7s	**Extra-channel sediment**: Light brown to reddish yellow (7.5YR 6/4-6) vfL to cU sandstone (mostly vfL to fU), locally silty.	2.1	336.5
7r	**Channel pebble-conglomerate to pebbly sandstone:** Beds are laminated to v thin to thin, and planar-cross-stratified up to 10 cm tall; one trough-x-stratified channel ~10 cm deep (trend of N66W). Pebbles are clast-supported, poorly to moderately sorted, and granitic. Sand is light yellowish brown (10YR 6/4), fu to vcU, subang to subrnd, and an arkose. Well-cemented. Max clast sizes: 5.5x2.5, 4.5x4, 8x3, 3x3, 5x3, 4x3, 5x3.5 cm.	0.7	334.4
7q	**Extra-channel sediment:** Reddish yellow to pink (7.5YR 6/6 - 7/4) vfL to mL sandstone, with local minor mU to vcU sandstone. Massive. Sand is subang to subrnd, well to moderately sorted, and an arkose. Moderately consolidated.	5.3	333.7
7p	**Channel pebble conglomerate**: Clast-supported, granitic clasts; strongly cemented, v. thin to thin beds. Max clast sizes: 5x2.5, 3x1, 2.5x1, 2x1.5, 3x2, 2.5x1.5, 4x2.5 cm.	0.2	328.4
7o	**Extra-channel sediment:** Light brown to reddish yellow (7.5YR 6/4-6) very fine- to medium-grained sandstone (50-65%), silty very fine- to fine-grained sandstone (25-40%), and siltstone (10%). Weakly to modly consolidated.	6.1	328.2
7o'	@325.0-325.6: **Coarse white ash:** Lower 5 cm is relatively pure, above it is mixed with silt; 2-7% volcanic lithics and 1-2% biotite.		
7n	**Channel pebble conglomerate:** Clast-supported, subang to subrnd, poorly sorted, and composed of 98% granite, 1% quartzite, and 1% quartz; max clast sizes: 12x10, 8x6, 9x5, 7x7, 11x7, 6x4 cm (a : b axis) *@320.9 m: Stake V placed at base of unit 7N (UTM coord: 3988028 N, 409859 E).*	1.2	322.1
7m	**Extra-channel sediment:** Light brown to reddish yellow (7.5YR 6/4-6) very fine- to medium-grained sandstone and slightly silty (est. 1-3% silt) sandstone (mostly very fine- to fine-grained); 1% claystone in v thin beds.	3.0	320.9
7L	**Channel sandstone:** Strongly cemented medium- to very coarse-grained sandstone; sand is subangular, poorly sorted, and an arkose.	1.2	317.9
7k	**Coarse white ash:** Pale brown to light gray (10YR 6/3-7/2) silty fine ash that grades upward into siltstone. Basal 10-13 cm has tephra grains about 1 mm in diameter; these grains include 1-5% biotite, ~5% quartz, 3-5% gray lithics (angular to subangular), and 1-2% pyroxene(?). Sample coord: 3988016 N, 409853E.	0.2	316.9
7j	**Extra-channel sediment:** Light yellowish brown (10YR 6/4) slightly silty (est. trace-3% silt) very fine- to fine-grained sandstone; masive; sand is subangular to subrounded, moderately sorted, and an arkose; moderately consolidated.	8.4	316.7
7i	**Coarse white ash:** White (N8/) crystalline coarse ash to fine lapilli. Non-ash minerals include biotite, pyroxene(?), and quartz (in decreasing abundance). Biotite	0.2	308.3

Unit	Description	Thickness (m) (Unit)	(Total)
	xtals are up to 2 mm long, but mostly 1 mm or less, and have a green or brown alteration rind. 2-5% mafic minerals. 5-10% lapilli-size clay and zeolites(?). Sample coord: 3987986 N, 409851E.		
7h	**Extra-channel sediment:** Light yellowish brown (10YR 6/4) very fine- to medium-grained sandstone and minor silty sandstone; massive; sand is very fine- to medium-grained, sungangular to subrounded,and moderately sorted. Moderately consolidated. Lower part of unit is light brown to reddish yellow (7.5YR 6/4-6).	10.0	308.1
7g	**Channel sandy conglomerate:** Thick, tabular bed of cobble- to pebble-conglomerate; gravel is clast-supported and composed of granite with about 15-25% quartzite (est.). Clasts are subrounded to rounded and poorly sorted. Max clast sizes: 16x12 cm, 22x19 cm, 19x17 cm, 22x15 cm, 15x15 cm, 15x13 cm. 10-20% moderately to strongly cemented, rest is weakly cemented to loose.	2.3	298.1
7f	**Extra-channel sediment**: Pink to very pale brown (7.5-10YR 7/3-4) very fine- to fine-grained sandstone, with minor medium to coarse sand; sand is subangular to subrounded, well sorted, and feldspathic arenite. Moderately consolidated.	17.0	295.8
7f'	@ 294.5-294.7: **Coarse white ash:** White (5Y 8/1); ash size is about 0.25-0.75 mm. Contains 3-5% biotite, 3-5% pinkish to grayish volcanic rock lithics, 3-5% quartz, rest is compacted white ash. Biotite not as altered as in unit 7i. Sample coord: 3987943 N, 409897 E.		
7f''	@280.5-280.7 m: **Coarse white ash:** Ash size is 0.2-2.0 mm. Contains 3-5% biotite (commonly corroded), 3-5% pinkish volcanic rock lithics, trace hornblende, rest is compacted, hard white ash. Projected in from 30-50 m to north.		
7e	**Channel pebbly sandstone of Ttacu:** Includes minor pebble-conglomerate. Internal bedding is laminated to very thin to thin, planar beds. Sand is fine- to very coarse-grained, subangular to subrounded, moderately sorted, and an arkose. 10-20% moderate to strong cementation by calcium carbonate. Gravel is poorly sorted, subang-subrnd (gr) to subrnd-rnd (qtzite), and granitic with 10-15% qtzite; ~1% of gravel are cobbles. Max clast sizes: 3.5x3, 5x3, 9x5, 12x4.5, 5x3, 5x4, 9x8 cm.	0.3	278.8
7d	**Extra-channel sediment:** Light yellowish brown (10YR 6/4) very fine- to fine-grained sandstone; subrounded to subangular, well to moderately sorted, and an arkose. No exposure of bedding; moderately consolidated.	4.2	278.5
7c	**Pebbly sandstone channel:** Fining-upward channel deposit of pebble-conglomerate (base) to pebbly sandstone. Beds are thin to thick (mostly thin to medium), lenticular to tangential cross-stratified up to 25 cm-thick. Conglomerate is clast-supported, moderately to poorly sorted, and subrnd (gr) to subrnd-rnd (qtzite). Max clast sizes: 9x9, 9x8, 7x6, 8x6, 10x5, 9x9, 9x5 cm. Clast count (n=122): 85% granite, 8% quartzite, 5% yellowish Paleozoic limestone, 2% vein quartz. Sand is very pale brown (10YR 7/3), subrnd (minor subang), moderately to poorly sorted, arnd an arkose. ~35% of channel is moderately cemented by CaCO3, rest is weakly to non-cemented.	0.3	274.3
7b	**Extra-channel sediment:** Pink (7.5YR 7/4) silty very fine- to fine-grained ss; sand is subrnd, well sorted, and an arkose; ~5% thin lenses of granitic vf-c pebbles and m-vc sand. Beds not exposed; moderately consolidated.	4.5	274.0
7a	**Sandy pebble conglomerate channel of Ttacu:** Very thin, planar internal bedding. Pebbles are clast-supported and moderately to poorly sorted. Max clast size by stake u: 6x6, 10x8, 8x7, 7x7, 6x4, 8x4, 8x6, 7x5 cm; max clast size by stake t is 12x6, 10x8, 8x4, 9x5, 6x4, 10x7, 12x7 cm (axb axis). Clast count (n=146): 85% granite, 15% quartzite. Sand is very pale brown to pink (7.5-10YR 7/3-4), fL-vcU but mostly cL-vcU, subang-subrnd, poorly sorted, and an arkose. *@320.9 m: Stake T placed at base of unit 7a to west of Arroyo Quarteles; UTM coord: 3987276 N, 409710 E.@268 m: Stake U placed at base of unit 7a to east in Arroyo Quarteles: UTM coord: 3987780 N, 409969 E; above, used N30°W\5°NW*	1.5	269.5
	Cejita Member of the Tesuque Formation	**70.5**	**268.0**

Unit	Description	Thickness (m) (Unit)	(Total)
6k	**Floodplain sediment:** Silty very fine- to fine-grained sand. Beds are tabular and very thin to thick; well consolidated; unit represents a transition from light brown to pale brown (7.5YR-10YR 6/3) sediment of the Cejita Member (with ratio of 25-35%: 75-65% NE lithics : Kspar) upwards to light brown to light yellowish brown (7.5-10YR 6/4) sediment of the Cuarteles member (with ratio of 2/3-3/4:1/3-1/4 kspar : NE lithics.) *@260.5 m: Stake S placed at top of unit 6i to the east. UTM coord: 3987258 N, 409720 E. Stake R placed at top of unit 6i to the west. UTM coord: 3986986 N, 409598 E.*	3.0	268.0
6j	**Medium-grained sand of lithosome B provenance.**	4.5	265.0
6i	**Interbedded sandstone and conglomerate channels**: Channels have thin to thick, planar to irregular internal beds; minor low cross-stratification. Gravel is mostly subrnd pebbles with 10-20% cobbles and is dominated by Paleozoic clasts; max clast sizes: 30x18, 16x12, 18x14, 14x9, 20x10, 50x23, 20x22, 30x15 cm. Sand is pale brown (10YR 6/3), subrounded, well sorted, and composed of 65-80% : 35-20% Paleozoic-rich lithics : potassium feldspar. @ 2-2.5 m below Stake R on top of ridge: channel deposit with good clast imbrication directed S63°W (4), S65°W (1), S60°W (1), S68°W (1), S52°W(1), S34°W(3). Clast count gives: 49% Paleozoic limestone, 25% Paleozoic sandstone and siltstone, 15% quartzite, 4% granite, 1%chert, 4% quartz, 1% felsic volcanic rock. Gravel are clast supported, subrnd to rnd, poorly to moderately sorted, and consists of pebbles with 20-25% cobbles, 3-5% boulders by volume. The channel overlies sand that is moderately sorted, subrnd to subang, has 1/3 to 1/2 Kspar : 2/3 to 1/2 Paleozoic-rich lithics (~10% of lithics are volcanic grains). Color of sand is light yellowish brown to light gray (2.5Y 6/3 to 7/2). @ 1 m below stake S, max clast sizes: 12x11, 12x6, 9x5, 9x5, 10x10, 13x6, 9x9, 12x17, 14x13, 17x12, 15x12 cm.	2.5	260.5
6h	**Sandstone channels:** Laminated to very thin to thin, planar beds of of fine- to medium-grained sandstone; sand is subrnd, well sorted, and rich in lithic grains. 15-25% of channel is moderately to strongly cemented.	2.5	258.0
6g	**Channel pebble-conglomerate and pebbly sandstone**: Internal bedding is very thin to thin, and cross-stratified up to 100-110 cm-tall; there are also planar beds and channels up to 150 cm deep. Gravel is clast-supported, subrnd, poorly sorted, and dominated by Paleozoic clasts. Clast count gives: 37% Paleozoic limestone, 24% Paleozoic sandstone and siltstone, 26% quartzite, 5% quartz, 4% granite, 2% mylonite, 1% hypabyssal intrusives, 2% calcium carbonate cement. Sand is pale brown (10YR 6/3), fine- to very coarse-grained, subrnd, well to moderately sorted, and rich in lithics; sand may be laminated. 25-35% of channels are moderately to strongly cemented. Channel trend of 150 cm-deep channel: S43°W. *@254 m: Stake Q placed within unit 6g; above, use bearing of N35°W\2°NW. UTM coord: 3986918 N, 409666 E.*	5.5	255.5
6f	**Sandstone channels of mixed provenance, and minor floodplain deposits: Upper 6f channels**: Sand grain sizes: fU to vcU mostly mL to cU. Sand is moderate to poorly sorted, subrnd to subang, and composed of subqueal Paleozoic-rich lithics and potassium feldspar +/- 10%. 10-20% moderate to strongly cemented channel cementation, the rest is weakly to moderately cemented. **Flood plain deposits**: low angle x-lamination. Sand is pale brown (10YR 6/3), vfL-mL, subrnd (minor rnd), and moderately sorted. ~7/10 : 3/10 Paleozoic-rich lithics : Kspar (+/- 5%). ~5% moderate to strong cementation. Cemented beds are thin to medium and lenticular to planar. It grades upward to a light yellowish brown (10YR 6/4), fU sand to silt that is well sorted. No obvious bedding, but there is trace clay (2.5YR 5/4) planar laminations. Weak HCL effervescence. **Lower 6f channels** consist of channel conglomerate, pebbly sandstone and sandstone of mixed provenance; about subequal clasts associated with provenance for lithosomes A and B. Lower 6f conglomerate has	15.5	250.0

Unit	Description	Thickness (m) (Unit)	(Total)
	1/4-1/5 : 3/4-4/5 cobbles : pebbles and is clast-supported. Grains are poorly sorted and subrnd-rnd. Internal beds are medium to thick, and lenticular to channel shaped. Channel sand is light gray to light yellowish brown (2.5Y 7/2-6/3), fu-vcu, poorly sorted, ang-subrnd, and has subequal Kspar : Paleozoic-rich lithics. 10-20% of channel is moderately to strongly cemented by CaCO3, rest are weakly to non-cemented. Max clast sizes are 21x15, 16x10, 14x14, 20x9, 13x11, 14x12, 11x11, 25x12. Uppermost channel complex is 465-475 m long and correlates to uppermost channel in Llano sections.		
6e	**Floodplain sediment:** Light yellowish brown (2.5Y 6/3) very fine- to fine-grained sandstone; sand is subrnd, well sorted, and has a ratio of 75-90%:10-25% Paleozoic-rich lithics : potassium feldspar. Moderately consolildated. Locally vertebrate fossil fragments are present.	1.2	234.5
6d	**Channel pebbly sandstone and subordinate sandy pebble-conglomerate of mixed provenance:** Channel bedding is very thin to thick and lenticular; sand may be laminated and planar. Gravel includes 1-3% cobbles. Clasts are poorly sorted, clast-supported, and subrnd to rnd; about 10-20% clasts are associated with lithosome B, otherwise gravel is granitic. Sand is pale brown (10YR 6/3), fine- to very coarse-grained, subrnd to subang, poorly sorted, and has subequal potassium feldspar : Paleozoic-rich lithic grains. ~20% of channels are strongly to moderately cemented. Max. clast sizes: 12x7, 10x9, 9x9, 9x8, 13x8 cm (axb axis). 12x8, 15x9, 9x8. @ 231.4-233.3: Clast count gives: 45% granite, 24% pz lm, 13% pz ss slst, 15% cs-col qtzite, 1% sil qtzite, 3% clr-gray qtzite. Max clast sizes: 12x7, 10x7, 11x8, 10x6, 10x6, 10x10, 9x7 cm. *@225.8 m: Stake O placed at top of unit 6c to the west UTM coord: 3986882 N, 409632 E.* *@225.8 m: Stake P placed at top of unit 6c to the east. UTM coord: 3986846 N, 409727 E.*	7.5	233.3
6c	**Floodplain sediment:** Pale brown (10YR 6/3) siltstone in thin to thick, tabular beds. Moderately to well consolidated. Vertebrate fossils are present.	14.3	225.8
6b	**Interbedded channel sandstone of lithosome B provenance and channel conglomerate of lithosome A provenance:** Pebble-conglomerate of mixed provenance interbedded with lithosome B sandstone. Pebbles are poorly sorted, subang to subrnd, and contain 1-5% cobbles up to 15 cm diameter. Internal bedding of granitic channels is thin to thick, planar to lenticular. Lithosome B sand is pale brown (10YR 6/3), fine- to very coarse-grained, subrnd, and moderately sorted. @ 209-210m: S69°W trend from 27cm-tall channel margin of a pebble conglomerate with ratio of 20%:80% Paleozoic : granite clasts. This is projected in from 30 m to south. Cross stratification height is 40cm. @ 207.5, max clast sizes are 13x8, 11x9, 10x8, 10x6, 8x7, 10x7, 10x8. @206.5 m: 1.5-2 m thick pebble conglomerate with 10-20% cobble, clasts are all granitic, 16x13, 10x7, 10x8, 13x6, 9x6, 9x6, 10x7, 11x9.	7.0	211.5
6a	**Channel pebble- to cobble-conglomerate of mixed provenance:** Clast-supported and moderately to well cemented. Unit is composed of 10-40% sandstone, 60-90% conglomerate. Matrix is poorly sorted medium- to very coarse-grained sand to very fine pebbles. Basal contact is scoured as much as 2 m into unit Ttau. Unit consists of a series of stacked channels, each 0.5-2.0 m thick. Clasts are mostly associated with lithosome B, with 30-50% granitic clasts mixed in. By stake M, base of unit is mostly composed of sandstone and pebbly sandstone. Pebbly sandstone and pebble-conglomerate compose about 10-50% of the unit; gravelly beds are thin to medium and lenticular, with some cross-stratification; sand is mosly massive, with some cross-bedding. Max clast sizes are: 12x10, 9x7, 14x5, 10x6, cm (axb axis). Clast count gives: 56% Paleozoic limestone, sandstone, and siltstone, 32% granite, 12% quartzite,. About 10-15% of the channels are moderately to strongly cemented by calcium carbonate. Moderately consolidated. From 30-35 meters south of stake N, max clast	7.0	204.5

Unit	Description	Thickness (m) (Unit)	(Total)
	sizes are: 13x6, 10x7, 10x7, 11x8, 12x7, 11x10, 17x10 . @201.1 m: 56% granite, 17% Paleozoic limestone, 12% quartzite, 12% Paleozoic sandstone and siltstone, 4% quartz. *@197.5 m: Stake N placed at base of unit 6a near floor of Arroyo Quarteles. UTM coord: 3986635 N, 409787 E; above, used bearing of N30W,\2NW* *@197.5 m: Stake M placed at base of unit 6a west of Arroyo de Quarteles. UTM coord: 3986210 N, 409441 E.*		
	Upper Lithosome A unit of the Pojoaque Member, informal salmon-colored unit, Tesuque Formation	**28.0**	**197.5**
5d	**Extra-channel sediment: Upper part of unit:** light brown to reddish yellow (7.5YR 6/4-6) very fine- to fine-grained sandstone and silty very fine- to fine-grained sandstone (50-60%), siltstone (30-40%), and mudstone (5%). Beds are thin to thick and tabular; well to moderately consolidated. Sand is subrnd to subang, moderately to well sorted, and an arkose. 2-4% thin to thick, lenticular to tabular channels of pebbly sandstone and sandstone; pebbles are subang to subrnd, poorly sorted, and granitic; channel sand is medium- to very coarse-grained, subangular to subrounded, and poorly sorted. **Lower part of unit:** Reddish yellow (7.5YR 6/6) silty very fine- to coarse-grained sand and very fine- to coarse-grained sand; massive; sand is moderately to well sorted and an arkose. Light yellowish brown near base of unit. Moderately consolidated.	18.3	197.5
5c	**Channel pebbly sandstone to pebble-conglomerate:** Pebbles are clast-supported (in conglomerate), subrnd to subang, poorly sorted, and composed of granite with 1-3% est quartzite. Sand is pink (7.5YR 7/4), mL to vcU, subang (m) to subrnd, and an arkose arenite. Basal 15 cm strongly cemented, otherwise loose. Trend of 15 cm-tall channel margin: N21°W. Max clast sizes: 10x6, 9x6, 6x5, 6x5, 6x4, 8x4, 9x4, 7x6, 8x7, 8x5, 10x9, 8x7 cm.	3.7	179.2
5b	**Extra-channel sediment**: Very pale brown (10YR 7/3-4) in upper part, light brown to pink (7.5YR 6-7/4) and reddish yellow (7.5YR 6/6) in lower part, silty vf - f sandstone; medium to thick, tabular beds. Sand is subang to subrnd, moderately to well sorted, and an arkose. Moderately to well consolidated. @171-171.1 m: Basaltic(?) coarse ash seen in section at Arroyo del Llano: 10 cm-thick, strongly cemented bed of 0.25-2.0 mm-diam basaltic(?) lithic grains; green to gray to black, subrnd, and moderately sorted.	5.5	175.5
5a	**Upper Pojoaque white ash bed**: Light gray (10YR 7/2) altered ash with 2-7% f-m-sand-size biotite. Mostly altered to clay by contains platy to shiny, m-c-sand-size flakes of mica or zeolite. UTM coord: 3985954 N, 409532 E. *@187.5 m: Stake K placed on top of ridge by fence post, 3.1 m above the top of the salmon unit (shot past the Salmon unit in this location, and Salmon unit description not given here). UTM coord: 3986065 N, 408313 E. Followed base of salmon unit to the east.* *@169.5 m: Stake L placed at base of unit 5a west of Arroyo de Quarteles (i.e., contact between units Ttbuf and Ttau). UTM coord: 3986004 N, 409572 E. Above this, used bearing and dip of 320°W\1°NW. Salmon unit description from this area is given above.*	0.5	170.0
	Upper lithosome B unit of the Pojoaque Member, Tesuque Formation	**28.7**	**169.5**
4b	**Overbank sediment:** Light brown mudstone and siltstone with subordinate light brown vf - f sandstone. Medium to thick, tabular beds. Sand is subrnd, moderately well sorted, and has a ratio of 50-60% : 40-50% potassium feldspar : Paleozoic-rich lithic grains. Moderately consolidated.	26.7	169.5

Unit	Description	Thickness (m) (Unit)	(Total)
	~ 500 m to northeast of section line: a channel near the middle of the unit is approximately 0.5-1.0 m thick and consists of a sandy gavel; loose; about subequal pebbles:cobbles; max clast sizes: 40x16, 27x20, 28x19, 22x12, 21x10 cm. Clasts count gives: 38% Paleozoic limestone, 38% Paleozoic sandstone and siltstone, 16% Proterozoic quartzite, 5% vein quartz, 1% muscovite-schist, and trace to 1% porphyritic silicic rockthat has biotite phenocrysts. *From 134.0-155.0 m: contacts and descriptions are projected in from exposures ~20-40 m to the west*		
4a	*@ 140.8-142.8 m:* **10-30 cm-thick channel of m - c sandstone:** Sand is subrnd to subang, moderately sorted, and has a ratio of 65-70% : 30-35% Paleozoic-rich lithics : potassium feldspar; very minor black grains that may be basaltic. Strongly cemented by calcium carbonate.	2.0	142.8
	Upper, mixed or interfingering lithosomes A and B of the Pojoaque Member, Tesuque Formation	**72.8**	**140.8**
3L	**Overbank sediment:** Light gray (5Y 7/2) siltstone and mudstone and light yellowish brown (2.5Y 6/3), very fine-grained, well sorted sandstone and siltstone.	6.8	140.8
3k	**Covered by Qay from 124.8-134 m**: Based on exposures 1.6 km along-strike to southwest, sediment probably consists of thin to thick, tabular beds of v. p. brown, very fine- to fine grained sandstone; sand is subrnd, well sorted, and has an est ratio of 50-60% kspar : 40-50% Paleozoic-rich lithics; subordinate silty vfL-fU sand and minor siltstone. 10-15% strongly-modly cemented beds. Two thick (90-100 cm), white ashy vfL-mL sandstone-siltstone to silty ash beds very likely correlate to upper part of covered interval; ashes are altered and feel soapy. *@124.8 m: Between stakes I and J, followed to north a contact located between a brown mudstone (at base) and a 10YR 8/2-7/3 fine-grained sandstone [subrnd, well sorted, arkosic) on top. UTM coord. of stake J: 3985272 N, 408860 E; UTM coord. of stake I: 3985205 N, 408822 E. Above stake J, use bearing and dip of N37°W\4°NW.*	9.2	134.0
3j	**Eolian, extra-channel, and overbank sediment:** ~40% 7.5YR 7/4 silty very fine- to fine-grained sandstone that is subrnd, well sorted, and arkosic arenite. ~25% vfL-mL sandstone; no obvious bedding; sand is subrnd, well-sorted, and arkosic (with an est ratio of 20%:80% Paleozoic-rich lithics : kspar). ~35% very thin to thick, tabular beds of mudstone. The first two deposits are either eolian or extra-channel, the third represents overbank deposit. 3-5% very thin to medium, tabular channel deposits of very fine- to fine-grained sandstone that are commonly strongly cemented by CaCO3; sand is subrounded, well sorted, has about subequal Kspar : Paleozoic-rich lithics in widely varying proportions. Moderately to weakly consolidated. *@110.1: Stake H placed on top of Pleistocene terrace deposit on east rim of northern mesa.UTM coord: 3985096 N, 408924 E.*	14.7	124.8
3i	**Pebbly fine- to very coarse-grained sandstone channel complex (lithosome B):** Planar-laminated to cross-laminated (up to 10 cm-tall and tangential); channel fines upward into a silty very fine- to fine-grained overbank(?) sand. Channel sand is pale brown (10YR 6/3), has an est ratio of 50-60% : 40-60% Paleozoic-rich lithics : Kspar, subrnd to subang, and moderately sorted. Very fine to medium, subrounded pebbles of lithosome B provenance (generally greenish Paleozoic limestone, siltstone, and sandstone, with an est 15-20% granite and ~10% quartzite); pebbles are subrnd and poorly sorted. Basal 30 cm has minor very coarse pebbles and trace cobbles (max clast size of 8x8 cm). Max clast sizes: 5X4, 5x3, 3x3, 5x4, 5x3, 5x4, 5x5 cm. About 10% of channel is strongly cemented by CaCO3. 200-300 m southwest of section line, this channel lies just above a white ash bed.	3.5	110.1
3h	**Extra-channel and overbank sediment**: Very pale brown to light yellowish brown (10YR 6-7/4), very fine- to fine-grained sandstone and subordinate siltstone; thin to thick, tabular beds; sand is subrnd, well-sorted, and has an est ratio of 50-60% Kspar :	15.7	106.6

Unit	Description	Thickness (m) (Unit)	(Total)
	40-50% Paleozoic-rich lithics. Minor light brown (7.5YR 6/4) mudstone and silty very fine- to fine-grained sandstone. If channels are present, they are sufficiently broad as to be tabular in shape; there are 3-5% very thin to thin (up to 20 cm thick) broadly lenticular channels. Moderately consolidated. Sediment may be partly eolian. @ 96.5-96.8 m: fL to cL sandstone channel of lithosome A; subrounded to subangular; est ratio of 75%:25% kspar : Paleozoic-rich lithic grains. @ 94.9-95.2 m: Fine- to very fine-grained sandstone channel of lithosome A, subrnd, well sorted, and arkosic.		
3g	**Extra-channel and overbank sediment**: Similar to that in unit 3h but @ 88.9-90.0 m there are 20 to 30 cm-thick channels of fine-grained sandstone that is subrnd, well sorted, strongly cemented, and has an est ratio of 60-65% : 35-40% Kspar : Paleozoic-rich lithics.	2.8	90.9
3f	**Overbank sediment**: 5YR-7.5YR 5/3 mudstone.	1.0	88.1
3e	**Extra-channel and overbank sediment**: Very fine- to fine-grained sandstone (2/3 of volume and 7.5YR 6/4-6 in color) plus 30-35% siltstone and mudstone (7.5YR 6/3 for mdst and sltst, some siltst is 10YR 5-6/3); thin to thick, tabular beds; sand is subrnd, well sorted, arkosic arenite, and has an est ratio of 60-65 : 35-40% Kspar : Paleozoic-rich lithics. Weakly to well consolidated.	10.5	87.1
3d	**Channel sediment**: fL to mL sandstone; very thin to medium, planar-bedded; sand is subrnd, well sorted, and has subequal Paleozoic-rich lithics : Kspar. Strongly cemented.	0.5	76.6
3c	**Overbank sediment**: 7.5YR 6/4 siltstone and very fine-grained sandstone.	1.6	76.1
3b	**Pebbly sandstone channel sediment (lithosome B):** Very thin to medium, planar to lenticular beds, with minor planar-cross-stratification up to 15 cm tall; sand is 10YR 6/3, fine- to very coarse-grained, subrounded, moderately to poorly sorted, and has an est. ratio of 70-75% : 25-30% NE-derived ltihics : Kspar. Pebbles are mostly calcium carbonate-indurated rip-ups of unit 2-like siltstone and very fine-grained sanstone. About half of sediment is strongly to moderately cemented by CaCO3., rest is weakly to non-cem. Max Pz clast sizes: 2x2, 3x2, 5x3, 4x2, 4x2, 3x2, 3x2 cm. @ 73 m: Projection of a thick bed of fine white ash. At SCV-215, there is 30-35 cm of relatively pure ash overlain by 60-95 cm of ash reworked with ~50% detrital sand. Lower, pure part is planar- to wavy-laminated and altered (soapy feel; 1% possible glass shards; no mafic minerals. Upper, reworked part is planar- or cross-laminated (up to 20 cm tall).	4.5	74.5
3a	**Overbank sediment:** Very pale brown (10YR 7/3) siltstone and very pale brown to light yellowish brown (10YR 6/4 - 7/3) vfL-fU sandstone and silty vfL-fU sandstone. Very thin to thin, laminated and planar beds. Sand is subrnd, well sorted, est ratio of 60-65% : 35-40% Paleozoic-rich lithics : Kspar. Weakly to moderately consolidated; 1-3% strong to moderate cementation. @68 m: Stakes Fand G placed on unit 3a/2c contact (northward step between the two along the contact. *UTM coord of stake g: 3984979 N, 409084 E; UTM coord of stake f: 3984825 N, 409138 E. Above, used bearing and dip of N45°W\5°NW.*	2.0	70.0
	Lower, mixed lithosomes A and B of the Pojoaque Member, Tesuque Formation	**33.0**	**68.0**
2c	**Extra-channel, overbank, and eolian(?) sediment:** Medium to thick, tabular beds of vfL to fU sandstone and silty sandstone; sand similar to that in unit 2b; ledge-former; no mudstone; well consolidated. May be eolian sand sheets. Lower contact is gradational over 51.5-54.0 m. *@64 m: StakesD and E placed on top of prominent, tabular, strongly cemented fine ss bed. Used this bed to step to the north. UTM coord of stake E: 3984821 N, 409158 E; UTM coord of stake D: 3984604 N, 409040 E. Above, used N60°W\4°NW.*	15.5	68.0
2b	**Extra-channel and overbank sediment:** Medium to thick, tabular beds of siltstone,	11.3	52.5

Unit	Description	Thickness (m) (Unit)	(Total)
	vfL to fU sandstone, silty sandstone, minor silt-rich mudstone. Sand is subrnd, well-sorted, and has an est ratio of 60-70% : 30-40% Kspar : Paleozoic-rich lithics. Well consolidated and a ledge-former. May be eolian sand sheets, in part. *@41.5 m: Stakes B and Cplaced on top of prominent ledge-forming, tabular, strongly cemented very fine sandstone bed. Used this bed to step to the north. UTM coord of stake c: 3984588 N, 409076 E; UTM coord of stake b: 3984458 N, 409403 E. Above this, used bearing and dip of N60°W\4°NW.*		
2a	**Extra-channel, overbank, and eolian(?) sediment:** Medium to thick, tabular beds of siltstone, vfL to fU sandstone, and silty sandstone. Sand is subrounded, well-sorted, and has an est ratio of 70% : 30% Kspar : Paleozoic-rich ltihics. Well consolidated and a ledge-former. May possibly be eolian sand sheets.	6.2	41.2
	Lower lithosome B deposits, Pojoaque Member, Tesuque	**35.0**	**35.0**
1g	**Overbank floodplain sediment:** Pale brown (10YR 6/3) siltstone and very fine- to fine-grained sandstone; very thin to thick, tabular beds, also laminated; moderately consolidated. Lower 4-5 m of unit is composed of light gray (10YR 7/2) siltstone; laminated-planar to very thinly bedded-planar; wealy to moderately consolidated.	7.5	35.0
1f	**Channel sediment:** Fining-upward channel deposit. ~1 m of pebbly sandstone at base: pebble clasts are subrnd to rnd, moderately sorted, and of lithosome B provenance; channel sand is pale brown to light yellowish brown (10YR 6/3-4), fL-vcU, subrnd, moderately sorted, and has an est ratio of 65% : 35% Paleozoic-rich lithics : Kspar; loose; exposure does not permit observation of bedding. Overlying channel sediment is generally sand with 1-2% thin, lenticular beds of pebble-conglomerate; pebbles are very fine to medium in size and of lithosome B provenance; sand is pale brown (10YR 6/3), fL - vcL, subrnd, moderately sorted, and has an est ratio of 65% : 35% Paleozoic-rich lithics : Kspar; sand is in very thin to thin to laminated, planar beds. Generally weakly consolidated.	2.5	27.5
1e	**Overbank floodplain sediment:** light brown to pale brown (7.5-10YR 6/3) siltstone (~35%) and very fine- to fine-grained sandstone (~25%), interbedded with ~40% brown to pale brown to light brown (7.5YR 5-6/3 and 7.5YR 6/4) mudstone. Sand is subrnd, well sorted has an est ratio of subequal Kspar : Paleozoic-rich lithic grains. Moderately to well consolidated.	13.2	25.0
1d	**Channel sandstone and pebbly sandstone:** Very thin to thin to laminated, planar beds of sandstone and pebbly sandstone. Sand is fine- to very coarse-grained, subrnd, moderately to well sorted, and has an est ratio of 65-70% Paleozoic-rich lithics : 30-35% Kspar. Pebbles are vf-m in size. Generally strongly cemented by CaCO3.	1.6	11.8
1c	**Overbank floodplain sediment**: Light brown to light yellowish brown (10-7.5YR 6/4), very fine- to fine-grained sandstone, siltstone, and minor mudstone. Moderately consolidated.	3.2	10.2
1b	**Overbank floodplain sediment of Ttbm:** Brown (7.5YR 5/4) mudstone and siltstone; moderately consolidated.	3.3	7.0
1a	**Pebbly sandstone, sandy pebble-conglomerate, and sandstone channel sediment:** Very thin to thin, planar to lenticular beds plus low (~20 cm tall) planar-cross-stratification; sand may be laminated; possible epsillon cross-bedding. Gravel has about 3-5% cobbles, and is clast-supported, subrnd, and poorly sorted. Clast count gives: 49% greenish Pz ss and siltstone, 15% green-gray Pz limestone, 6% brownish Paleozoic sandstone-siltstone, 19% felsic-int volcanic rocks (of which 8% are tuff), 8% quartzite, 2% quartz, 1% granite, 1% chert; max clast sizes: 7x4, 5x4, 6x3, 6x4, 11x7, 6x4, 5x5, 7x3, 7x6, 5x5, 7x3, 7x6, 5x5, 10x7 cm. Weak clast imbrication directions: S30°W, S12°W, S5°W, S0°W, S7°E, and S5°W. Channel sand is pale brown to very pale brown (10YR 6-7/3); mostly mL-vcU, subrnd to subang, moderately to poorly sorted, and has an est ratio of 55-60% : 45-40% Paleozoic-rich lithics : Kspar. Generally weakly consolidated, with weak cementation by CaCO3 (weak to moderate HCl eff); 10-20% of sediment is moderately to strongly cemented	3.7	3.7

Unit	Description	Thickness (m) (Unit)	(Total)
	by $CaCO_3$. **Stake A at base**: *UTM coord of 3984357 N, 409170; above this, used bearing and dip of N60°W, 4°NW*		

Martinez stratigraphic section. Measured in upper Arroyo del los Martinez and Arroyo Chinguague. Described by Daniel Koning and Chi Le on July 9, 10, Oct. 1, 2002; D.J. Koning on October 1, 2002 and August 25, 2003; D.J. Koning, S.D. Connell and D. Love on August 18, 2003. UTM coordinates of base: 3984357 N, 409170 E (Zone 13, NAD 27), Chimayo 7.5-minute quadrangle, New Mexico. Stake localities are preceeded by "MS-" on the geologic map.

Unit	Description	Thickness (m) (Unit)	(Total)
	Stake II placed on top of hill, marking top of upper Martinez section; UTM coord: 3990091 N, 411547 E.		
	Sandy gravel Plio-Pleistocene(?) terrace deposit: Gravel has ~65% cobbles, 30% pebbles, and 5% boulders; clast-supported, poorly sorted, and loose. Scoured, sharp basal contact with 20 cm of relief.	2.5	
	Cuarteles Member of the Tesuque Formation	**219.5**	**558.9**
63d	**Pebbly sand to sandy pebbles channel complex sediment**: Similar to that in unit 63.	0.6	558.9
63c	**Basalt(?)-rich sand; probably lower basaltic bed of Alcalde tuffaceous zone:** Fining-upward channel of sandy pebbles (lower 20 cm) overlain by silty sand extra-channel sediment; both contain ssubordinate (3-40%) black grains (probably basalt) that are fL-vcL in size. Overall, a thick, tabular bed that is internally massive. Basal sandy pebbles are clast-supported and like those in unit 63b; max channel depth of 35 cm. Extra-channel sediment is of vfL-vcU (mostly vfL-mU) sand with an estimated 5-8% silt; sand is moderately to poorly sorted, subrnd (basalt) to subang-subrnd (arkosic sand); some intervals have as much as 70% black ash grains; extra-channel sediment is generally light brownish gray to light gray (10YR 6-7/2), but top is pale brown to very pale brown (10YR 6-7/3) and light yellowish brown (10YR 6/4); well to modly consolidated; not cemented except for minor (1-3%) strongly cemented CaCO3 nodules 3-7 cm in size.	1.9	558.3
63b	**Pebbly sand to sandy pebbles channel complex sediment**: Not cemented and weakly consolidated. About 2/3 pebbly sand and 1/3 sandy pebbles. Very thin to medium, lenticular (subord channel-shaped and planar) beds. Conglomerate beds are clast-supported; ~5% of gravel are cobbles; one boulder seen. Gravel are poorly sorted; granite are subrnd-subang, qtzite are surnd-rnd. Max clast sizes: 25x17, 13x7, 10x8, 10x8, 7x5, 9x5, 8x6 cm. Clast count (n=126): 85% granite, 15% quartzite (13% cs-col, 2% sil). Sand is very pale brown to light yellowish brown (10YR 7/3-6/4(and subequal reddish yellow (7.5YR 6/6), fL-vcU (mostly mL-vcU), ang-subrnd (mostly subang), poorly sorted, and an arkose in composition (trace felsic volc grains). *@550.8 m: Stake HH placed; UTM coord: 3990076 N, 411558E; from here we measure down-dip using att of N70°E\2°NW (bearing of N20°W\2°NW).*	6.1	556.4
63a	**Pebbly sand to sandy pebbles channel complex sediment:** As in unit 63b, but 3-5% of channels are strongly cemented. Unit has 5-10% extra-channel deposits of light brown to reddish yellow (7.5YR 6/4-6; some 10YR 7/3) slightly silty (est 3% silt) vfL-vcU sand (mostly vfL-mU); sand is ang-subrnd (mostly subang), v poorly sorted (some moderate to poor sorting), and an arkose in composition; internally massive and moderately consolidated. Uppermost cemented channel trends N80°W ± 10° (by 3-D shape) and is 40 cm thick -- trend is consistent with weak clast imbric of N40°W (from 3 clasts).	5.5	550.3
62	**Extra-channel sediment**: Light yellowish brown to very pale brown (10YR 6-7/3, 10YR 7/4), silty (est 3-5% silt) vfL-fU sand (minor mL-vcU sand and 3±2% scattered pebbles). Internally massive. Sand is subang, modly sorted, and an arkose in composition. Modly consolidated and weakly cemented (weak HCl eff).	3.7	544.8
61	**Extra-channel sediment**: Strong brown to reddish yellow (7.5YR 5-6/6) clayey (est 3-5% clay) vfL-vcU sand (slightly more vf-f than m-vc sand); internally massive; sand is ang-subrnd (mostly subang), v poorly sorted, and an arkose in composition. Well consolidated and weakly cemented (weak-mod HCl eff).	0.9	541.1
60	**Sandy pebble-conglomerate channel complex**: ~1/3 pebbly sandstone. Channel	2.3	540.2

Unit	Description	Thickness (m) (Unit)	(Total)
	complex extends at least 150 m in west (downstream) direction. Mostly strongly cemented, and is a prominent ledge-former; cement is not sparry. Internal beds are v thin to med, and lenticular, tabular, and channel-shaped; v minor cross-strat (up to 20 cm-tall). Conglomerate beds are clast-supported; gravel are vc-vc pebbles (1% cobbles) that are poorly to modly sorted, and rnd-subrnd (qtzite) to subang-surnd (gr). Max clast sizes: 13x10, 8x5, 5x4, 4x3, 5x3, 8x6, 3x3 cm. Clast count (n=107): 24% quartzite (1% sil, 20% cs-col, 3% clr-gray), 71% granite, 4% vein qtz, 2% amphibolite. Channel sand is v pale brown (10YR 7/3), mostly mL-vcU, ang-subrnd (mostly subang), poorly sorted, and an arkose in composition. 30 cm-tall channel margin trends N27°W. Sharp lower contact.		
59	**Extra-channel sediment, with subordinate channels:** Light brown to reddish yellow (7.5-10YR 6/4-6), vfL-vcU sand (est 0.5% silt), mostly vfL-mU sand. Internally massive. Sand is subang, modly-poorly sorted, and an arkose in composition. Generally poor exposure; interbeds of pebbly sand-sandy pebbles (similar to those in unit 57) may possibly comprise up to half of exposure. Modly-weakly consolid and not cemented.	2.3	537.9
58b	**Sandy conglomerate channel:** Similar to 58a but poorly exposed. ~10% strongly cemented beds.	3.6	535.6
58a	**Sandy conglomerate channel:** Gravel are poorly sorted and include granite (subang-subrnd) and subordinate quartzite (rnd-subrnd); subequal cobles and pebbles. Max clast sizes: 13x9, 14x8, 12x9, 14x12, 13x8, 10x7, 8x7 cm. Clast count (n=101): 42% quartzite (9% sil, 29% cs-col, 4% clr-gray), 57% granite, 1% Pz yellowish limestone. Channel sand is mL-vcU, ang-subrnd (mostly subang), poorly to modly sorted, and an arkose in composition. Beds are not well exposed. Strongly cemented. This gravelly zone appears to correlate with unit 8w gravels at top of upper Cuarteles section (i.e., seems like one can follow it westward to that locality).	0.9	532.0
57	**Pebbly sand channel complexes, with subordinate extra-channel sediment:** Similar to unit 55, but extra-channel sediment may be lt yellowish brown (10YR 6/4) or reddish yellow (7.5YR 6/6), and has subordinate cL-vcU sand. Channels are in v thin to thin (minor med), lentic to planar beds. Channel pebbles are granitic with ~25% quartzite in uppermost part; in middle and lower parts pebbles are granitic with about 5% quartzite. Quartzite clasts are subrnd-rnd and granite clasts are ang-subrnd (mostly ang-subang); gravel is poorly to modly sorted. Weakly to modly consolid; non- to weakly cemented.	10.3	531.1
56	**Covered by Holocene valley fill. Probably like unit 55.** *@511.8 m: Stake GG placed near bottom of arroyo; UTm coord: 3989968 N, 411387 E; continue shooting across arroyo at N62°E.* *@510.3 m: Stake FF placed on top of ridge; UTm coord: 3989877 N, 411209 E; shoot across arroyo at N62E to Stake GG. Bedding exposure parallel to section line confirms 0.5° dip.*	10.5	520.8
55	**Pebbly sand channel complexes, with 25-35% extra-channel sediment:** Sparsely exposed channel beds are v thin and lenticular. Sand has trace silt, 1-3% vfL-vfU sand, and rest is fL-vcU sand (mostly mL-vcU); sand is pink (7.5YR 7/3-4 and 5YR 7/4), ang-subrnd but mostly subang, poorly sorted, and an arkose in composition; 3-20% gravel in channels; gravel are pebbles with ~5% cobbles, poorly sorted, and composed of granite (subang) with 10-20% quartzite (subrnd-rnd); weakly cemented (mod-strong HCl eff);. Est 25-35% extra-channel sediment of modly consolidated, light brown to reddish yellow (7.5YR 6/4-6), slightly muddy (est 1% fines), vfL-mU sand with minor cL-vcU sand and vf-f pebbles; medium, tabular beds; sand is subang, modly to poorly sorted, and an arkose in composition. Gradational lower contact.	1.3	510.3
54	**Gravelly sand to sandy gravel channel complex:** Approx 65% : 35% ratio of cobbles : pebbles. Sharp and scoured (10 cm of relief) lower contact. Basal 10 cm is strongly cemented, overlying sediment is loose to weakly cemented (except for 1-3% v thin CaCO3-ind lenses or zones). Bedding at base is v thin to thin and lentic; beds not exposed elsewhere. Gravel are clast-supported and poorly to v poorly sorted. Max	3.4	509.0

Unit	Description	Thickness (m) (Unit)	(Total)
	clast sizes: 22x13, 22x12, 18x11, 19x12, 22x14, 20x17 cm. Clast count (n-101): 33% quartzite (31 cs-col, 2 clr-gray), 67% granite. Channel sand is light yellowish brown (10YR 6/4), fL-vcU but mostly mL-vcU, subang, poorly to modly sorted, and an arkose in composition. Unit may correlate with unit 9a of upper Cuarteles section (based on texture, composition, and attitude data).		
53	**Extra-channel sediment, with 20-25% pebbly to sandy channels:** Reddish yellow (7.5-5YR 6/6) vfL-vcU (but mostly fL-vcU) sandstone with ~1% estimated clay; thick, tabular beds that are internally massive; sand is subang, v. poorly sorted, and an arkose in composition; modly consolidated, with weak-mod HCl eff. 20-25% channel deposits (medium to thick but can't tell bed shape) of pebbly sandstone to sandy pebble-conglomerate. No cobbles. Pebbles are modly-poorly sorted, ang-subrnd (mostly subang), and granitic with 1-3% quartzite; channel sand is lt brown to reddish yellow (7.5YR 6/4-6), fL-vcU but mostly mL-vcU, ang-subrnd but mostly subang, poorly sorted, and an arkose in composition; ~20% of channels are modly to strongly cemented by CaCO3, rest are weakly to non-cemented. Soil at top of unit consists of 15 cm of 5-7.5YR 5/6 Bt with 2csbk, hard peds and 2f-dpf clay films; below Bt is a Bk hor with stage I+ to II carbonate morphology.	7.0	505.6
52	**Pebbly sandstone channel complex:** Contains ~25% clast-supported sandy pebble-conglomerate. Laminated to v thin to thin, lentic beds; v minor planar-cross-stratication up to 20 cm thick; minor planar lamination; pebbly beds are v thin to thin. ~5% of gravel are cobbles. Max clast sizes: 12x9, 12x9, 8x5, 7x6, 7x5, 6x6, 6x5 cm. Pebbles are subang-subrnd, and modly to poorly sorted. Clast count (n=102): 1% biot-gneiss, 1% quartzite (cs-col), and 98% granite. Weak clast imbric: N65°W(2), N65°W(2), N80°W(2). Channel sand locally has a muddy vf to f sand matrix. Sand generally ranges from fU-vcU, but mostly is mL-vcU; sand is v pale brown (10YR 7/3), ang-subrnd but mostly subang, poorly sorted, and an arkose in composition. ~75% of channels are strongly-modly cemented by CaCO3, rest are weakly cemented (weak-mod HCl eff).	2.3	498.6
51	**Extra-channel sediment, with subordinate pebbly to sandy channels:** V. Poor exposure. Extra-channel sediment is internally massive, and larger-scale bedding is not exposed; composed of clayey-silty (est 3-8% fines) sandstone; sand is vfL-vcU, lt brown to reddish yellow (7.5YR 6/4-6) and lt yellowish brown (10YR 6/4), subang(m), to subrnd(l), poorly to v poorly sorted, and arkosic with ~5% basaltic lithics; modly consolidated and weakly cemented (mod to str HCL eff). Channel sediment is strong brown to reddish yellow (7.5YR 6/5-6), vfL-vcU (mostly mL to vcU), poorly to v. poorly sorted, subrnd-ang (mostly subang), and arkosic; weakly to non-cemented. Pebbly channel beds are composed of poorly sorted, subang-subrnd granite with 1% quartzite; ~3 (±2)% of gravel are cobbles. *@495.8 m: contact from stake DD may project to here using N33°W\2° NW; 8-16 m of inferred error in this shot (asssuming 2.5 and 3 degree dips, respectively).*	10.0	496.3
	Stake EE placed at base of upper Martinez section: *UTM coor: 3989838 N, 411129 E. Red flagging tied to nearby tree. Section measure almost along-strike at N62°E\0.5° NE.*	1.5	486.3
	@488.4 m: stake DD placed on top of hill (2.7 m strat above fence post); UTM coord is 3989126 N, 0411612 E. *From here, I shoot across Arroyo de Chinguague using a bearing of N33°W\2°NW, gaining 1.5 m; this brings us to base of uppermost Martinez section, with an error of +/- 5 m (not including error assoc with accuracy of attitudes use to determine bearing and dip).*		
50	**Channel complex of sandy conglomerate with subordinate extra-channel sediment:** Poorly exposed; about 60-65% : 35-40% ratio of channel : extra-channel deposits. Channel sediment consists of pebbly sandstone to sandy pebble-conglomerate; channel bedding is thin to medium, lenticular to broadly lenticular; pebbles are subang, some are subrnd, and composed of granite with trace quartzite;	12.6	484.8

Unit	Description	Thickness (m) (Unit)	(Total)
	pebble-conglomerate beds are clast- supported; max clast sizes are 8x5, 6x4, 8x5, 6x4, 6x4, 5x4 cm. Channel sand is fL to vcU, mostly mL to vcU, ang to subrnd (most subang), poorly sorted, and an arkose in composition. 3-5% of channels are strongly to moderately cemented by CaCO3. Extra-channel sediment is lt brown to reddish yellow (7.5YR 6/4-6) to lt yellowish brown (10YR 6/4). Sand is vfU to vcU, mostly mL to mU; 1-3% mud; 3% gray to black volcanic lithics, otherwise arkosic (subrounded to angular but mostly subangular; low moderately sorted to high poorly sorted). Modly consolidated, weak to mod HCL eff. @ 475.9-476.4: an ashy sand bed is lt brownish gray (10YR 6/2); est 3-7% black basaltic(?) ash, fL to fU in size, mixed with arkosic sand, vfL to vcL in size.		
49	**Ashy sandstone of Espanola tephra zone:** Color is lt brownish gray (10YR 6/2); fU to vcU, mostly mL to mU. Sand is subrnd to subang, modly to poorly sorted (mostly modly sorted), and arkosic arenite with 10% grayish volcanic lithics that are mostly fU to mU in size; trace pink felsic volcanic grains and 5-15% grayish basalt(?) grains. Bedding is not exposed. Weakly to moderately consolidated sand.	1.3	472.2
48	**Channel complex of pebbly sandstone with ~20% sandy pebble conglomerate:** Internal bedding is lenticular to channel shaped to planar; v thin to medium; minor tangential cross stratification up to 25cm tall; max scour depth of channel is 20-25 cm; conglomerate is clast-supported; clasts are angular to subrounded (but mostly subangular), moderate to poorly sorted; max clast sizes are 7x4, 5x5, 10x5, 8x4, 8x4, 5x3, 4x3; clast count yields: 87% granite, 12% quartz, 1% quartzite. (cs-col). Sand is fU to vcU (mostly mU to vcU), and is ang to subang, poorly sorted, and arkosic in composition. Strongly cemented.	1.8	470.9
47	**Extra-channel sediment with 25-35% channel complexes:** Extra-channel sediment is lt yellowish brown (10YR 6/4) and composed of slightly silty (est ~1% silt) very fine to very coarse sand (mostly fU to mU). Beds are massive to thick and tabular but generally not exposed. Sand is subrnd to subang (mostly subang), modly to poorly sorted, and an arkose in composition. Some thick beds contain basalt grains that are fL and fU and comprise 5-10% of given bed. Both this and underlying unit has 3-5% medium-thick reddish horizons that may be soils. Channels are composed of pebbly sandstone to sandy pebble conglomerate, and up to ~15 m in width. Pebbles are clast supported (in conglomerate), subang, and composed of all granite; no cobbles present; channel sand is fL to vcU (mostly mL to vcU), subang (m) to ang(l), poorly sorted, and an arkose in composition. Weakly consolidated. @461.2-461.9 m: Upper black ash is 70 cm thick and composed of 40-50% fine-sand-size ash (probly basaltic) with 50-60% vf-c feld arenite sandstone. @459.1-459.7 m: Middle black ash is 60 cm thick and appears to fill a channel; tephra are 0.1-1.0 in size, probably basaltic, and are mixed w/ subequal f-vc arkosic sandstone.	12.4	469.1
46	**Pebbly sandstone to sandy pebble-congl channel complexes, with 25-35% extra-channel sediment:** Channels are in v thin to medium, lenticular internal beds; <10% cobbles; gravely beds are clast-supported, modly-poorly sorted, and composed of granite (subang, some subrnd) with ~5% quartzite (subrnd-rnd; cs-col). Sand is lt reddish brown to reddish yellow (5YR 6/4-6), fU-vcU, subang (minor subrnd), poorly sorted, an arkose in composition, and has sparse clay in the matrix. ~25% of channels are modly-strongly cemented, rest are weakly to non-cemented. Extra-channel sed as in unit 45.	1.8	456.7
45	**Extra-channel sediment:** Slightly clayey (est 3% clay) vfL-vcU (mostly vfL-mU) sandstone. Internally massive and well consolidated. Sand is subang, poorly sorted, and an arkose in composition. Top 25 cm of unit is probly a soil (10-20% clay + coatings on clasts), 5YR 5/4-6, 2-3cabk peds). @453.6-453.9 m: 28 cm-thick black ash; cinders are black and basaltic(?), and mL-vcU sand-size but mostly cL-cU (some clasts up to 7 mm diam); lower 4-5 cm is 5Y	4.1	454.9

Unit	Description	Thickness (m) (Unit)	(Total)
	8/8, upper 4 cm is composed of reddish to black cinders in reddish yellow (5YR 6/6) clayey sand .		
44	**Pebbly sandstone channel sediment**: Pebbles are subrnd, poorly sorted, and granitic with ~25% qtzite. Gravel are not in beds but rather are scattered. Sand is planar-laminated, mL-vcU, subang, poorly sorted, and an arkose in composition. Strongly cemented by CaCO3.	1.1	450.8
43	**Pebbly sandstone channel sediment, with 25% extra-channel sediment:** Coarse channels are in thin to thick, lenticular to channel-shaped internal beds; max channel depth of 40 cm; one 40 cm-thick channel is at least 20 m wide in direction tranverse to flow; pebbles are composed of granite with ~3% quartzite (cs-col); 1-2% cobbles; pebbles are poorly sorted; sand is generally mL-vcU, ang-subrnd (mostly subang), poorly sorted, and an arkose in composition. ~35% of channels are strongly cemented. Extra-channel sediment is slightly muddy (est 3%) vfL-vcU sandstone (mostly vfL-mU); internally massive; sand is subang-subrnd, poorly sorted, and an arkose in composition. Well consolidated.	1.8	449.7
42	**Pebbly sandstone channel complex sediment:** 1/3 sandy pebbles. Very thin to medium, lenticular beds. Gravely beds are clast-supported. Pebbles are subang-subrnd (gr) to subrnd-rnd (qtzite), and poorly to modly sorted. Clast cnt (n=104): 71% gr, 23% qtzite (19% cs-col, 4% sil), 4% qtz, 1% biot gn, 1% amphib. Max clast sizes: 10x7, 7x5, 4x4, 4x4, 6x3, 5x3, 6x4, 6x5 cm. Sand is pink (5YR 7/4), vf-vc, subang, poorly sorted, and an arkose in composition. Loose. *Stake BB placed at base of unit to southwest (UTM coord: 3988787 N, 411705 E). Follow base of unit to NE (1-2 m poss error in this). Stake CC placed at base of unit to NE (UTM corrd: 3988990 N, 411,720 E) -- start measuring 5 m due north of the stake cc.*	1.5	447.9
41b	**Extra-channel sediment of Ttacu:** Light brown (7.5YR 6/4) clayey sandstone with 1-3% very fine to medium, subangular, granitic pebbles. Internally massive. Sand is vfL-vcU (mostly vfL-fU), subangular, very poorly sorted, and an arkose in composition. Well consolidated and weakly cemented. In this and subjacent units, coarse channel intervals and extra-channel sediment intervals are of comparable lateral extent.	1.0	446.4
41a	**Coarse channel complex sediment:** Subequal pebbly sandstone to sandy pebble conglomerate in a tabular bed. Internal bedding is very thin to medium, lenticular to broadly lenticular. Pebbles are very fine to coarse, clast-supported (in conglomerate), subangular (granite) to subrounded (quartzite), and moderately sorted. Clast count (n=119) gives: 80% granite, 16% quartzite, and 4% vein quartz. Sand is pink (7.5YR 7/3), subangular, moderately to poorly sorted, and of quartz, 23-30% Kspar, and 4-5% biotite and mafic minerals. 10-15% mod-strong cementation, rest is weakly to non-cemented.	2.0	445.4
40b	**Extra-channel sediment:** Pink (5YR 7/4) clayey-muddy (est 5-8%) sandstone. Unit is probably tabular. Sand is mostly fU (vcL-vcU range), subangular, poorly sorted, and arkosic with ~1% reworked ash. Weakly consolidated. @ 442.4 m (below stake cc), there is a 20 cm-thick, white (2/5Y 8/1), mL-vcU sand-size, fluvially reworked coarse white ash. Tephra consists of consolidated white ash, plagioclase(?), and gray volcanic lithic grains mixed with fU-vcU arkosic sand with subordinate pebbles. Ash abundance is greater than clastic detritus only in basal 1 cm.	1.0	443.4
40a	**Pebbly sandstone channel complex sediment**: 20-25% pebble-conglomerate beds that are v thin to medium and lenticular. Pebbly sandstone is in very thin to thin, broadly lenticular beds. Gravel are subrnd-rnd (quartzite) to subrnd (gr), poorly sorted, clast-supported (in congl), and composed of gr with estimated 30% quartzite. Max clast sizes: 13x9, 11x7, 10x7, 7x6 cm. Sand is generally planar-lamin, pink (7.5YR 7/4), mostly mL-cL, ang-subang, poorly sorted, and an arkose in composition. ~5% mod cementation, rest is weakly to non-cemented.	2.0	442.4
39	**Extra-channel sediment:** Pink (7.5YR 7/4) clayey (est 5-10% clay) sand. Internally	1.6	440.4

Unit	Description	Thickness (m) (Unit)	(Total)
	massive and well-consolidated. Non- to weakly cemented. Sand is vfU-cL, ang-subang, poorly sorted, and arkosic with ~3% reworked ash. Top 10 cm is mostly cL-mL sand that is reddish yellow (5YR 6/6) and poorly sorted .		
38	**Coarse channel complex sediment:** Subequal sandy pebbles to pebbly sandstone. Loose and bedding poorly exposed over much of unit; basal 20 cm is strongly cemented, and bedding there is med (up to 40 cm tall) and lenticular, w/ minor tangential cross-strat 4 cm thick. Gravel are 70-80% pebbles : 20-30% cobbles, clast-supported in conglomerate beds, and subrnd-subang (gr) to subrnd to rnd (qtzite). Clast cnt (n=119): 62% gr, 31% qtzite (28% cs-col, 3% sil), 4% granitic gn, 2% pilar phyl, 1% qtz. Max clast sizes: 33x20, 22x18, 25x11, 22x13, 22x14, 21x10, 16x14. Sand is light brown (7.5YR 6/3), vfL-vcU, subang(m) - subrnd (l), poorly sorted, and an arkose in composition. *@434.7 m: Stake AA placed at base of unit 38. UTM coord: 3988729 N, 411755 E; from here, used bearing of N60°W\4°NW (from app att)*	4.1	438.8
37	**Extra-channel sediment, with 15-20% coarse channel-fills**: Lt brown to reddish yellow (7.5YR 6/4-6) silty to slightly silty vfL-vcU sand (mostly silt to vfL to cL). Tabular, thick beds that are generally internally massive. Sand is mostly subang, poorly sorted, and an arkose in composition. Weakly to modly consolid. Moderately to weakly cemented. 15-20% tabular to broadly lenticular channel complexes up to 70 cm thick; these are composed of lithosome A pebbly sandstone to sandy pebble-conglomerate; the conglomerate is clast-supported; clasts are very fine to very coarse, poorly sorted, granitic w/ 2-7% quartzite (granite is subang-subrnd, quartzite is subrnd-rnd). @429.0-429.3 m: **Coarse White Ash:** 10Y 8/1 altered tephra; generally consolidated white ash and plagioclase that is m-vc sand-size; volcanic lithics compose 3-5% of tephra and are mostly m sand-size; 7% mL-vcU sand-size biotite. Modly cemented by Ca CO3. @428.0-429.0 m: **Channel of pebbly sandstone:** Subordinate sandy pebble-conglomerate. Generally modly-strongly cemented. V thin to as much as 15 cm, planar to lenticular internal beds together with planar-laminations and minor planar cross-laminations. Pebbles are modly sorted, clast-supported (in pbly beds), composed of gr w/ 5-10% est qtzite, and subang-subrnd (gr) to subrnd (qtzite). Channel sand is fL-vUc, subang (v minor subrnd), poorly sorted, and an arkose in composition.	11.0	434.7
36	**Channel complex sediment, with 10-20% extra-channel sediment:** Generally a series of stacked channel complexes of pebble-conglomerate with subordinate pebbly sandstone. Channels complexes have very thin to med, channel-shaped to lenticular to planar beds. 5-10% cobbles. Conglomerate is clast-supported, and gravel are poorly sorted and composed of 87% granite (subang-subrnd), 7% qtzite (subrnd-rnd), and 6% qtz. (n=129). Max clast sizes: 24x15, 27x14, 18x11, 21x13 cm, 14x8 cm. Channel sand is lt yellowish brown to v pale brown (10YR 6-7/4), fL-vcU, subang, poorly sorted, and an arkose in composition. ~20% of unit is modly to strongly cemented, particularly within 3 m of base; rest is weakly to non-cemented. Extra-channel sediment is lt brown to reddish yellow (7.5YR 6/4-6), slightly muddy (est 1% mud), vfL-mU sand with ~3% cL-vcU sand; weakly to moderately consolidated. Channel margins: N36°W (50 cm-deep), S31°W (20 cm deep). Uppermost channel complex is 1.7 m thick and tabular.	18.9	423.7
35	**Extra-channel sediment, with 25-35% coarse channel-fill complexes:** Lt brown to reddish yellow (7.5YR 6/4-6), silty vfL-vcU sandstone (mostly silt to vfL-fU sand) with 1-10% scattered cL-vcU sand; massive or in vague, very thick and tabular beds. Sand is an arkose in composition, subangular (minor subrounded), and moderately sorted. Well consolidated. Estimate 2-5% silt. No paleosols seen. Coarse channel-fill complexes are composed of pebbly sandstone to sandy pebbles of Lithosome A provenance. Coarse channel-fills consist of pebbly sandstone and sandy pebble-conglomerate. Sand is subangular, mL-vcU, poorly sorted, and of quartz, ~25% Kspar,	24.8	404.8

Unit	Description	Thickness (m) (Unit)	(Total)
	and 5-7% mafics. Pebbles are very fine to very coarse, subangular (minor subrounded), very poorly sorted, and of granite with <1% quartzite; moderately to well consolidated and commonly indurated by CaCO3; channel internal bedding is laminated to v thick-bedded, planar to lenticular. Within 402.8 to 404.2 m is a **coarse white ash bed**. This ash has 0.25-10 mm-long consolidated ash together with 10-15% pink-gray volcanic lithics and 3-5% biotite. @~402 m locally is a Bt soil horizon; it is 20 cm-thick, light reddish brown (5YR 6/4), and has 25-50% clay bridges and 5-10% distinct clay films on ped face. @ approximately 400 m is a 30 cm-thick **coarse white ash**. This ash is 30 cm-thick and consists of fU-mU sand-size consolidated ash mixed with arkosic sand; this tephra contains 5% volcanic lithics and 5-7% biotite that may be up to cL sand-size. *@ approximately 386-391 m is a northwest-down normal fault, having an approximate length of 200-350 m, whose throw is not well-constrained; best estimate is 4 +/-2 m. This will act to cut out section, so 4 m is added to stratigrapic section above.* *@ 385.5 m:* Channel complex that probably correlates to unit 34 (which has climbed up 5.5 m between stake z and locality 10/1f.) Deepest channel is 30 cm. Trends from channels at arroyo bottom: N60°W ± 10°, N73°W ± 10°, N53°W ± 16°. *Stake Z placed on top of ridge. Keep shooting along trend of N36°W and dip of 5°NW.*		
34	**Coarse channel complexes:** Like unit 32, with sharp, scoured base with ~40 cm of relief. Channel margins: N75°W (20 cm-deep), S71°W (35 cm-deep).	3.5	380.0
33	**Extra-channel sediment with minor coarse channel-fills:** Lt brown to reddish yellow (7.5YR 6/4-6) silty vfL-vcU sandstone (mostly silt to vfL-fU sand). Sand has trace scattered pebles and 1-5% cL-vcU sand. Some intervals have a slight amount of clay. Sand is subangular (very minor subrounded), moderately to poorly sorted, and an arkose in composition. Vague, thick, tabular beds. Moderately to well consolidated. Estimate 3-6% silt and clay. Top of one yellowish red (5YR 5/6), 20 cm-thick Bw paleosol soil horizon found 130 cm above top of underlying coarse white ash; soil has modly hard peds, 2-3csbk ped structure, and has an est 1-5% clay. About 1 m above the ash, unit contains 10-20% v thin to medium, lenticular coarse channel beds. These coarse channels consist of pebbly fL-vcU sand that is subangular (minor subrounded), poorly sorted, and composed of quartz, ~25% Kspar, and 5-7% mafic minerals. Pebbles are very fine to very coarse, subrounded to subangular, poorly sorted, and dominated by granite. Near top of unit are beds of clast-supported, sandy pebble conglomerate whose clasts are composed of granite with an estimated 10-20% quartzite. @372.8-373.2 m: **Coarse white ash:** 30-40 cm-thick. White (5Y 8/1) coarse ash composed of consolidated ash of mL-vcU sand-size. 3-5% medium-sand-size volcanic lithics and 3-5% biotite. Upper 15 cm is generally medium-sand-size. Weakly consolidated. *Attitude from ash: N54°E\5°NW.*	6.5	376.5
32	**Pebbly sandstone and sandy conglomerate channel complex:** Channel internal bedding is v thin to medium, planar to lentic to cross-stratified (foresets are up to 90 cm +/-10 cm tall). Conglomerate is clast-supported, poorly sorted, and composed of 83% granite (subang(m) to subrnd(l)), 9% qtzite (cs-col and sil; subrnd-rnd), 2% biot gneiss, and 4% vein qtz (n=109). About 20% of clasts are cobbles, rest are pebbles. Very coarse granitic pebbles and cobbles tend to be subrounded. Max clast sizes: 20x15, 16x11, 14x9, 10x7, 28x20 cm. Channel sand is pink to v. pale brown (7.5-10YR 7/4), fL-vcU, subangular, poorly sorted, and an arkose in composition. About 50% of channel complex is strongly to modly cemented, rest is weakly to non-cemented. Trend of channels: N89W° ± 8° (25 cm deep), S78°W ± 11°; S51°W ± 6° (20 cm deep),	2.8	370.0

Unit	Description	Thickness (m) (Unit)	(Total)
	S80°W ± 3° (60-80 cm deep), S80°W (8 cm tall channel margin), S85°W (8 cm tall channel marg), N76°W (13 cm-tall channel marg). Sharp scoured base with ~ 50 cm of scour relief; grades upward into unit 33.		
31	**Extra-channel sediment, with ~5% coarse channel-fills:** Pink (7.5YR 7/4) silty vfL-cU sandstone (mostly vfL-fU sand). Thin to thick, tabular beds. Sand is moderately sorted (some poor sorting), subangular (minor subrounded), and an arkose in composition. ~5% very thin to thick, lenticular (mostly) to planar channel lenses of sandy pebbles and pebbly sandstone (lithosome A provenance); pebbles in these coarse channel-fills are very fine- to very coarse-grained, poorly sorted, subangular (mostly) to subrounded, and composed of granite with an estimated 3% subrouned quartzite Sand is fL to vcU, angular to subangular (mostly) to subrounded, very poorly sorted, and an arkose in composition. 5 paleosols observed that are 5-20 cm thick; these are marked by a reddish yellow 7.5YR 6/6 Bw (possibly Bt) horizon (sharp top and gradational base over 1-2 cm) that has 2csbk ped structures and is slightly more clay-rich than parent material. Three of soils have a Bk horizons 3-5 cm thick, 7.5YR 7/3 color, stage I-II morphology, and bases are sharp or gradational over 1 cm. Possibly more soils are buried under slough.	4.8	367.2
30	**Sandy conglomerate to pebbly sandstone channel complex:** Internal bedding is very thin to thin, planar to lenticular. Sharp, scoured lower contact with about 50 cm of relief. Gravel is clast-supported, poorly sorted, and composed of granite (subangular to subrounded) with ~3% estimated quartzite (subrounded-rounded). Sand is pink (7.5YR 7/4), fU-vcU, subangular (mostly) to subrounded, poorly sorted, and conoposed of quartz, ~25% Kspar, and ~5% lithics of biotite, quartzite, and trace volcanic grains. Strongly cemented in lowermost 30 cm. Top 120 cm has several stacked paleosols that each generally consist of a 10-20 cm-thick, 5YR 6/6 Bw horizon over a 4-5 cm-thick Bk horizon (stage I carbonate morphology); top of Bw horizon is sharp, top and lower Bk hor is gradational over 1-2 cm. Channel trend: S3°W ± 10° and N33°W ± 18°. Channel margin of N47°W (43 cm-tall). *Stake X placed on top of ridge; shot across canyon to north from stake x to stake y.* *Stake X coordinates: 3988311 N, 412071 E.* *Stake Y coordinates: 3988448 N, 411963 E.*	1.2	362.4
29	**Extra-channel sediment:** Reddish yellow (7.5YR 6/6; some 7.5-10YR 6/4) silty to clayey (estimate 10-20% fines) vfL-cU sand. Beds are thin to thick, tabular, and vague. Sand is mostly vfL-fU w/ 1% scattered cL-vcU grains, moderately sorted, subangular with very minor subrounded, and an arkose in composition. Weakly to well consolidated. Conformable and gradational base.	6.9	361.2
28	**Coarse channel complex**: Composed of subequal pebbly sandstone to sandy pebble-conglomerate. Internal bedding is v thin to med, lenticular to channel-shaped to planar. Gravel are clast-supported, poorly sorted, and composed of granite (subang(m)-subrnd(l)) with 3-7% qtzite (subrnd). 2/3 : 1/3 ratio of pebbles : cobbles. Channel sand is pink to v pale brown (7.5-10YR 7/4), generally mL-vcU, subang-subrnd, poorly sorted, and an arkose in composition. Sharp and scoured base. Well-graded, weak to strong cementation by CaCO3. Channel trends: S15°E ± 9° (35 cm deep); S3°W ± 20° (55-60 cm deep). Channel margins: S0°W (60 cm-tall); S13°W (30 cm tall), S17°W (20 cm tall).	3.0	354.3
27	**Extra-channel sediment, with 10-30% coarse channel-fill deposits:** Lt brown (7.5YR 6/4, some 10YR 7/3) silty vfL-vcU sand (mostly vfL-fU sand). V thin to thick, tabular, vague beds or else massive. Most of the v thin to thin beds are composed of silt (1-5% of extra-channel sed). Sand is mostly subang, poorly sorted(m) to modly-well sorted(l), and an arkose in composition; 1-3% muscovite in the sand; extra-channel sed has 3% scattered pebbles and cobbles (max size is 12x10 cm, 10x8 cm, 8x6 cm). Channel complexes are up to 130 cm thick, and are tabular to broadly lenticular in shape; v thin to med, planar to lenticular internal bedding. Channel sediment generally consists of sandy pebble-conglomerate with subordinate pebbly sandstone. Gravel in	11.9	351.3

Unit	Description	Thickness (m) (Unit)	(Total)
	conglomerate beds is clast-supported, modly to poorly sorted, and consists of 93% granite (subang(m) to subrnd(l)) with 5% qtzite (subrnd-rnd, cs-col), 2% qtz, 1% biot gn (n=133). Max clast sizes: 21x21, 11x7, 15x11, 24x15, 10x7, 7x6, 6x5 cm. Three paleosols are exposed in upper 2 m of the unit. The top paleosol is marked by a reddish Bw horizon and its top is 41-56 cm below the upper unit contact; this paleosol has a 14-15 cm-thick gradational base. The top of the middle soil is 130 cm below the upper unit contact; it has a 7.5YR 6/6 Bw horizon (20 cm thick) over a Stage I Bk horizon (5-10 cm thick); the lower soil is immediately below the middle soil, is 20-30 cm thick, and has one Bw horizon that is 7.5YR 6/6. The Bw horizons of the soils tend to have a sharp upper contact and a gradational (over 10 cm) lower contact; their ped structure is 2csbk, they have no visible clay films, and they are slightly more muddy than the parent material. Unit has sharp and scoured lower contact. @ 347.4 m (3.9 m below upper contact of unit) is a 0.6 m-thick bed of slightly ashy sand. Sediment has a light gray (10YR 6-7/2) color, 3-7% biotite, and 3-7% muscovite, is moderately sorted, subangular, fL-cL (mostly fL-fU-mL). I estimate 5-15% white fL-fU-mL grains of ash, which generally has been altered to clay. No sign of colored volcanic lithic grains. Surrounding extra-channel sediment has 2-5% biotite and 2-5% muscovite. *@339.4 m: Stake W placed at base of the coarse upper unit. UTM coordinates of: 3988283 N, 412096 E* ± 25 ft .		
	Cejita Member of the Tesuque Formation	**34.5**	**339.4**
26b	**Floodplain claystone:** Reddish yellow to brown (7.5YR 6/6 to 7.5YR 5/4); poorly bedded but appears medium-bedded and tabular. Lower contact is gradational.	2.2	339.4
26a	**Channel-fill of medium-grained sandstone with 1-3% very fine to coarse pebbles:** Pebbles are largely granitic with subordinate Lithosome B clasts. Pebbles are scattered throughout the channel. Sand is well-sorted, subangular, and a feldspathic arenite with about 1/4-1/3 : 3/4-2/3 possible NE lithics to Kspar. Lower 60 cm is indurated by calcium carbonate, upper 90 cm is loose. Scoured lower contact. *Stake V placed at top of unit 25f. We correlate along top of Ttbu floodplian deposits to the NE, where stake w is placed at top of thick sandy mudstone floodplain deposit. UTM coordinates of Stake V: 3988129 N, 411635 E* ± 16 ft.	1.5	337.2
25f	**Floodplain siltstone:** Pale brown (10YR 6/3); massive. Weakly consolidated with gradational, planar contact with subunit 25e. 5% of sediment has intervals of calcium carbonate-indurated laminae. About 1% of unit is composed of channel bodies that are lenticular, up to 15 cm thick, and composed of fine- to medium-grained sand. Unit grades upward into light brown to light yellowish brown (7.5-10YR 6/4) claystone in vague, medium, tabular beds.	9.2	335.7
25e	**Fine- to medium-grained sandstone with minor, coarse, channel-fill sandstone:** Light yellowish brown (25Y 6/3) overbank sand with about 10% channel sandstone up to 20-30 cm-thick. Unit is poorly exposed. Overbank sand is fine- to medium-grained, well sorted, subrounded to subangular, and contains subequal kspar to NE lithics. Channel sand is medium- to coarse-grained and commonly indurated by calcium carbonate; channels are very thinly- to thinly-bedded and cross-stratified. 4.8 m thick (includes basal channel). @321.7-322.7 m: Pebble conglomerate; gravel are clast-supported and granitic with 10-15% Lithosome B gravel.	4.8	326.5
25d	**Floodplain very fine- to fine-grained sand.** Pale brown to very pale brown (10YR 6-7/3). Lower contact is semiplanar and sharp. Massive and weakly consolidated.	5.0	321.7
25c	**Sandstone channel complex:** Light gray to pale brown (10YR 7/2-6/2). Medium to very coarse-grained sand; sand is moderately to poorly sorted, lithic arkose to litharenite (subequal NE lithics : Kspar), subangular, and loose. A sample of this sand is taken and labeled 120702-djk-a. Subunit fines upward to a medium- to very fine-grained sand. There are minor pebbles in this unit similar in composition to those of	2.4	316.7

Unit	Description	Thickness (m) (Unit)	(Total)
	subunit 25b. Lower contact is wavy and abrupt. .		
25b	**Pebble- to cobble-conglomerate channel complex:** Pale brown to light yellowish brown (10YR 6/3-4). Gravel are clast-supported and comprised of 55%:45% pebbles: cobbles; clasts are poorly sorted and subrounded (very fine to coarse granitic clasts may be subangular).; clasts are significantly larger than those of unit 25a; average max. clast size of 16.8x11.8 cm. (13x8, 16x12, 17x15, 15x10, 16x10, 20x12, 13x13, 26x14, 16x13, 18x14, 11.5x7, 12x10, 13x10, 21x12, 20x14, 18x14, 20x12; more clast imbrication than unit 25a but still uncommon, measurements include S50°W, S45°W, S30°W, S50°W, S10°W; most confident cluster gives a reading of due south. Bedding is thin to medium lenticular to planar; minor very thin bedding. Some beds are composed soley of sand. Subordinate cross-stratification. 10% of unit 25a is indurated by CaCO3. Lower contact is scoured with about 30 cm of relief. Clast count (n=139) gives 40% granite, 22% quartzite, 13% quartz, 15% Paleozoic limestone, 9% Paleozoic siltstone and sandstone, and 1% mylonite.	5.4	314.3
25a	**Pebble- to cobble-conglomerate channel complex:** Light gray (10YR 7/1). Gravel are clast-supported and comprised of 3/4 : 1/4 pebbles: cobbles; clasts are poorly sorted and subrounded(very fine to coarse granitic clasts may be subangular). Generally planar, very thin to thin beds or else cross-stratified very thin to thin beds up to about 50 cm tall. Cobble-size mudstone rip-up clasts are common near the base. Clast count (n=91) gives 52% granite, 22% quartzite, 15% Paleozoic limestone, 7% Paleozoic siltstone and sandstone, and 4% quartz. Degree of cementation varies from moderate to strong. Scoured lower contact that may represent a disconformity.	4.0	308.9
24-25 contact	At Stake T: Base of unit 25 is underlain by sediment similar to upper unit 24 near stake s. (i.e., light brown to pink, silty very fine- to fine-grained sandstone, massive or poorly-bedded thick tabular beds, with 3-5% granitic/arkosic channels (no Lithosome B gravel); upper part of unit 24 is moderately consolidated but there is no HCl eff. The lower 4 m of unit 25 is a light gray (10YR 7/1-2) pebble-conglomerate dominated by granitic clasts with 1-3% Lithosome B clasts. The sediment is generally planar, very thinly-bedded, with minor tangential cross-stratification up to 20 cm tall. Well consolidated with only weak HCl eff. Large siltstone rip-ups of upper unit 24 are present near the base and are up to 140 cm long and 36 cm tall. The planar bedding is probably upper flow regime. Basal contact is scoured with up to 60 cm of relief. The large siltstone rip-up clasts indicate a large river that tapped mostly Provenance A and some Provenance B (B becomes more important a few m up-section). Maximum gravel size is 13x10 cm. Clast imbrication is not obvious. Channel margin trend at base of unit is S71°W. *Stake S placed at top of unit 24q. From there, we shoot northwest into Arroyo de los Martinez and place stake S'. Moved west from stake S' along lower unit 25 contact to Stake T. From Stake T to Stake U, we use an adjacent attitude of N55°E\4°NW. UTM coordinates of Stake S: 3987736 N, 412129 E; UTM coordinates of Stake T: 3987951 N, 411745 E. UTM coordinates of Stake U: 3987984 N, 411761 E* ± 8 m.		
	Lithosome A, finer upper unit, Tesuque Formation	**111.5**	**304.9**
24q	**Extra-channel silty very fine- to medium-grained sandstone, with 3-5% coarse channel-fills:** Light yellowish brown (10YR 6/4); massive; weakly consolidated with no HCl effervescence; sand is subangular, moderately sorted, and an an arkose in composition. Gradational lower contact with the ash of unit 24p. Unit is estimated to have 3-5% channels, two of which were traversed by this section. @298.4 m, near Stake T, is the top of a Btk paleosol soil horizone that is 10 cm thick. ~3 m above this soil is another reddish soil horizon. 30 cm below is a 6 cm-thick Bt soil horizon over a ~10cm-thick Bk soil horizon having stage II to stage III carbonate morphology. @296.4-297.4 m: Lenticular channel deposit 1.0 m thick. Composed of gravelly sand.	17.3	304.9

Unit	Description	Thickness (m) (Unit)	(Total)
	Scoured lower contact, gradational upper contact. Fines upward from coarse-very coarse sand to very fine-medium sand. Sand is an arkose, subangular, and moderately to poorly sorted. Basal 10 cm is indurated by CaCO3, above this the deposit is loose. Clast count (n=146) gives 95% granitic clasts and 5% quartzite clasts. @290.6-291.4 m: Lenticular channel deposit 0.8 m thick. Composed of medium- to coarse-grained sand; sand is an arkose, subangular, and moderately sorted. Contains minor granitic gravel (mostly pebbles, minor cobbles). 3% muscovite grains. No sedimentary structures. Mostly loose, only locally indurated by calcium carbonate.		
24p	**White ash of upper Pojoaque white ash zone:** 15-70 cm thick, continuous, slightly altered but still has glass shards, and contains 3% corroded biotite or MnO(?) dendrites,. Sharp lower contact and grades upwards into silty very fine- to fine-grained sandstone. Ash is well consolidated near base and moderately consolidated in its upper portions. *Place stake R'; move along ash bed 200-300 ft to northeast to stake r. UTM coordinates of Stake R': 3987771 N, 412007 E. UTM coordinates of Stake R: 3987697N, 412160E.*	0.7	287.6
24o	**Extra-channel silty very fine- to fine-grained sandstone, with 1-2% coarse channel-fills:** Light yellowish brown (10YR 6/4); thick, tabular beds but poorly bedded. Weakly consolidated; weak HCl effervescence and weakly cemented. There is more silt in this unit than there was in unit 24m. Unit has 1-2% lenticular, 10-30 cm-thick channel sandstone indurated by CaCO3 and composed of very fine- to fine-grained sand; sand is a well sorted and an arkose. ~10% of this unit hs 1-2 m-thick intervals of light brown to reddish yellow (7.5YR 6/4-6) silty, very fine- to fine-grained sandstone (which have more silt than the surrounding sediment). Near middle of unit: thin, discontinuous ash bed not sufficiently extensive to be mapped. *Change dip to 4° degrees, trend N40°W.*	23.2	286.9
24n	**White ash of upper Pojoaque white ash zone:** White (2.5YR 8/1), altered (feels soapy), 10 cm-thick ash with 2-3% biotite and MnO(?) dendrites (the latter may be corroded biotite). Very sparse glass shards. Ash is massive and moderately hard. Sharp lower contact.	0.1	263.7
24m	**Extra-channel silty very fine- to fine-grained sandstone:** Light brown to light yellowish brown (7.5-10YR 6/4); poorly bedded; vfL to mL sand; weakly consolidated, no HCl effervescence, and weakly to non-cemented. *Change dip to 4° degrees, trend N45°W.*	3.4	263.6
24L	**Gravelly sandstone channel complex:** Light yellowish brown (10YR 6/4); bedding not exposed; fines-upward from very coarse sand to fine sand; generally loose with 1-2% zones of strong cementation; sand is an arkose, subangular, and moderately sorted. Gravel is found near the base of the deposit and are similar in composition to those of the next described lower channel. Gravel is poorly sorted, clast-supported, and subrounded (very fine to coarse granitic pebbles may be subangular). Average max. clast size (n=17) gives 11.8 cm x 8.3 cm (15x9, 10x9, 10x7, 9x8, 14x7, 13x7, 10x8, 12x9, 11x9, 9x9, 10x9, 13x7, 14x8, 13x5.5, 10x7, 14x12, 14x10 cm (axb axes).	1.6	260.2
24k	**Extra-channel siltstone and very fine- to fine-grained sandstone:** Light brown to light yellowish brown (7.5YR 6-7/4) and pink (7.5YR 7/4); bedding not exposed; sand is well sorted and an arkose in composition; weakly consolidated with moderate HCl effervescence (indicating weak cementation).	6.9	258.6
24j	**Gravelly sand channel complex:** Light yellowish brown (10YR 6/4), gravelly sand channel complex that is very loose except that 5-10% of the coarser zones are strongly cemented by calcium carbonate. Sand is mostly fine- to very coarse-grained, subangular, moderately sorted with some poor sorting, has 3-5% muscovite flakes, and	1.7	251.7

Unit	Description	Thickness (m) (Unit)	(Total)
	is an arkose. Gravel is mostly found near the base of the channel complex and forms very thin to thin lenticular beds. Minor cross-stratification is 5-10 cm tall. Gravel is clast-supported, subrounded (except that granitic very fine to coarse pebbles may be subangular) and poorly sorted. Clast count of gravel (n= 150) gives 53% granite, 37% quartzite, and 10% quartz (probably associated with the granite).		
24i	**Extra-channel silty very fine- to medium-grained sandstone:** Reddish yellow (7.5YR 6/6) to light yellowish brown (10YR 6/4) (subequal colors). Weakly consolidated. Sand is an arkose, moderately sorted, and subangular. Unit has about 1% thin to medium, lenticular channel sandstone beds. Sand in these beds is generally medium-grained, an arkose, and has 1-2% muscovite flakes. Subordinate intervals of light yellowish brown (10YR 6/4) very fine- to coarse-grained sand with 3% muscovite.	23.8	250.0
24h	Covered by Qay or not exposed, probably like overlying sediment	13.5	226.2
24g	**Extra-channel silty very fine- to fine-grained sandstone:** Reddish yellow (7.5YR 6/6). Sand is subangular, moderately sorted, an arkose in composition, and loose.	1.2	212.7
24f	**Gravelly sand channel complex:** Light yellowish brown (10YR 6/4); sand is very fine- to very coarse-grained but mostly medium-grained; sand is moderately sorted, subangular, and an arkose; sand is massive or else planar- very thinly bedded or planar-laminated. Channel-fill sand is mostly weakly cemented and weakly consolidated; minor zones of strong cementation. Gravel includes 60% : 40% pebbles:cobbles; gravel are mostly subrounded, clast-supported, and poorly sorted. Average max. clast size (n=11): 11.7x7.7 cm (8x5, 9x7.5, 12x8, 9x5.5, 12x7.5, 11x5, 17.5x10, 10x10, 10x6.5, 14x10, 16x10 cm); clast count (n=191) gives 57% granite and 34% quartzite, 1% mylonite, and 8% quartz (probably associated with the granite). Gravel is found mostly near the base and middle of the channel complex in lenticular beds up to 40 cm thick.	5.8	211.5
24e	**Extra-channel silty very fine- to medium-grained sandstone and subordinate siltstone, with ~5% coarse channel-fills:** Light yellowish brown to reddish yellow (10YR 6/4 to 7.5YR 6/6); 1% muscovite grains; sand is an arkose, moderately sorted, and subangular; weakly consolidated (weak HCl effervescence). Finer sediment appears poorly bedded but this may be due to poor exposure. About 5% thin to thick, lenticular, channel bodies composed of fine- to coarse-grained sand; these channels are commonly indurated by calcium carbonate (whereas extra-channel finer sand deposits are not cedmented) and form the only ledges in the Salmon-colored unit (in contrast to the underlyin Ttasr2 unit, where extra-channel deposits may be cemented and form ledges); channel sand is an arkose, subangular, well to moderately sorted, and contains 0.5% granitic to quartzite pebbles. One channel 50 cm above mudstone is a 15 cm-thick pebble- to cobble-conglomerate; gravel are subrounded, clast-supported, and poorly sorted; clast count (n=120) gives 73% granite and 27% quartzite. Lower contact is sharp, planar, and appears conformable. *Stake P is established at top of uppermost brown mud bed of unit 23c . From there, we move northeast along-strike to stake Q, and then proceed up-section. Local attitude: N45E\6 NW. We will use this attitude until the next ridge. UTM coordinates of Stake P: 3987034 N, 412310 E. UTM coordinates of Stake Q: 3987254 N, 412460E.*	9.0	205.7
23c	**Extra-channel silty very fine- to fine-grained sandstone and minor mudstone, with ~5% coarse channel fills:** Light brown to reddish yellow (7.5YR 6/4-6). 5±3% of sediment is composed of thin to medium, lenticular beds of channel-fill sandstone; channel sand is very fine- to fine-grained and indurated by calcium carbonate; weakly consolidated and in thin to thick, tabular, poorly-bedded beds. Lower contact is gradational with underlying unit. @196.3-196.7 m: At top of unit is a single brown (7.5YR 5/4) mudstone bed. *Above base of unit, we use a bearing and trend of N45°W and 6° NW.*	3.3	196.7
	Lower lithosome B unit of the Pojoaque Member, subordinate	**44.1**	**193.4**

Unit	Description	Thickness (m) (Unit)	(Total)
	lithosome A interbeds		
22b	**Floodplain siltstone and mudstone (lithosome B):** Light brown to reddish yellow (7.5YR 6/4-6) and brown (5-7.5YR 5/4). Thick, tabular beds but poorly bedded. Siltstone may have subordinate very fine-grained sandstone. Lower contact not exposed.	2.9	193.4
22a	**Channel sandy pebble-conglomerate of lithosome B:** Planar-very thinly bedded and planar-cross-stratified (foresets up to 4-5 cm thick). Strongly cemented by CaCO3. Max. clast sizes average 11.2 x 7.8 cm (10x7.5, 9x6, 8x5, 9.5x6, 7x5, 8x7.5, 16x12, 13x7.5, 16x13, 11x7, 9.5x4, 9x9, 18x14, 12x8, 8x7.5, 12x7, 14x7, 11x8 cm). Clast count (n=171) gives 33% Paleozoic limestone, 26% Paleozoic greenish to grayish sandstone and siltstone, 8% quartz, 7% intermediate to felsic volcanic clasts, 7% quartzite, 4% granite, 4% coarse-grained metasandstone, 4% reddish sandstone and siltstone, 2% reworked, cemented arkosic sandstone, 1% intermediate to felsic hypabyssal intrusives, 1% unidentified mafic-rich rock, 1% chert, and 1% foliated quartzite. Scoured lower contact.	1.6	190.5
21d	**Floodplain deposits of subequal silty very fine- to medium-grained sandstone and siltstone (lithosome B):** Silty sandstone is light yellowish brown (10YR 6/4); thick, tabular beds but poorly bedded; sand is an arkose to lithic arkose (approximately 20% : 80% northeast-derived lithics : Kspar), moderately sorted, subrounded to subangular. Siltstone is light brown to reddish yellow (7.5YR 6/4-6). Sharp lower contact and weakly consolidated. *Stake O' is established on bed of silicai-indurated fine-grained sandstone. From here, I follow this Si-indurated sandstone along strike to station O. UTM coordinates of Stake O': 3986914 N, 412393 E. UTM coordinates of Stake O: 3986992 N, 412337 E.*	7.4	188.9
21c	**Overbank siltstone and very fine- to fine-grained sandstone (lithosome A):** Light brown (7.5YR 6/4) siltstone and reddish yellow (7.5YR 6/6) very fine- to fine-grained arkosic arenite sandstone; weakly consolidated. No sedimentary structures and local, nodular cementation suggest bioturbation. Overlain by thin to thick, tabular, silica-indurated, fine-grained sandstone marker bed. *Stake N is established on a thin CaCO3 marker bed (see SCV-60); I follow this bed about 100 ft along-strike and place stake N'. UTM coordinates of Stake N: 3986859 N, 412293 E. UTM coordinates of Stake N': 3986907 N, 412339 E.*	4.6	181.5
21b	**Channel-fill sandstone (lithosome A):** Pink (7.5YR 7/4); generally medium-grained but ranging from very fine- to very coarse-grained sand; no sedimentary structures observed; sand is moderately sorted, subangular, and an arkose; weakly to moderately consolidated and not cemented; channel sand sharply overlies underlying siltstone over a scoured contact with 10 cm of relief; within the channel sand is 0.5% scattered pebbles and cobbles that are poorly sorted, subrounded to subangular, and granitic with minor quartzite. One medium, lenticular bed of pebble-cobble conglomerate observed.	3.0	176.9
21a	**Overbank siltstone and very fine- to medium-grained sandstone (lithosome A):** Light brown to light yellowish brown (7.5-10YR 6/4); thick, tabular beds that are internally massive.	3.3	173.9
20f	**Floodplain siltstone and very fine-grained sandstone (lithosome B):** Light brown (7.5YR 6/4) and subordinate light yellowish brown (10YR 6/4); moderately consolidated; very thin to thick, tabular beds.	4.8	170.6
20e	**Floodplain silty very fine- to fine-grained sandstone (lithosome B):** 33 cm of pale brown (10YR 6/3) silty sandstone with no internal sedimentary structures, (well consolidated, sharply overlies the channel sand of unit 20d), overlain by 15 cm of light yellowish brown (10YR 6/4), well sorted, fine-grained sand (moderately consolidated).	0.6	165.8
20d	**Lithosome B channel-fill sand with minor gravel:** Pale brown (10YR 6/3) to minor light yellowish brown (10YR 6/4) and minor brown (10YR 5/3). No sedimentary structures seen and the channel sand is not vertically graded. Sand is generally fU to vcU and contains about 5% pebbles and cobbles. Maximum clast sizes are: 7.5x4, 6.5x4.5, 6x5.5, 9x6, 8x4, 6x6, 5x5 cm. The sand is moderately sorted, subrounded to	1.2	165.2

Unit	Description	Thickness (m) (Unit)	(Total)
	subangular, and a litharenite with greenish quartz grains and reddish volcanic grains. The gravel are subrounded, mostly pebbles with minor cobbles, poorly sorted, and are distributed throughout the channel. A clast count (n=103) gives 11% Paleozoic limestone, 60% Paleozoic siltstone and meta-sandstone, 1% granite, 1% mylonite, 9% quartzite (no laminations), 9% quartz, 6% intermediate to felsic volcanic clasts, 3% intermediate to felsic hyperbyssal intrusives, and 2% unidentified mafic-rich rocks. Sand is loose and not cemented.		
20c	**Floodplain claystone (lithosome B):** Light brown to pink (7.5YR 6-7/4); planar-laminated.	1.4	164.0
20b	**Floodplain silty very fine- to fine-grained sandstone (lithosome B):** Tabular and internally massive; color of light yellowish brown (10YR 6/4). Sand is well sorted and belongs to Lithosome B (estimated 2/3 : 1/3 ratio of NE lithics : kspar).	1.9	162.6
20a	**Floodplain mudstone and siltstone (lithosome B):** Brown to strong brown (7.5YR 5/3-6); siltstone may be yellowish brown to light yellowish brown (10YR 5-6/4) and contain 0.5% muscovite flakes.	11.4	160.7
	UPPER LITHOSOME A UNIT OF SKULL RIDGE MEMBER, INCLUDING SUBORDINATE MIXED LITHOSOME A-B SEDIMENT AND POSSIBLE EOLIAN SEDIMENT (Ttasr2):	**~52**	**149.3**
19c	**Overbank siltstone and very fine-grained sandstone:** Light yellowish brown (10YR 6/4). Upper contact of unit 19 is approximate and not exposed.	3.4	149.3
19b	**Overbank mudstone:** Brown (7.5YR 5/4). A 25 cm-thick, calcium carbonate-indurated very fine-grained sandstone bed lies on top of the mudstone.	2.6	145.9
19a	**Eolian(?) very fine- to fine-grained sandstone**: Light yellowish brown to yellowish brown (10YR 5-6/4) and light brown (7.5YR 6/4); loose and poorly exposed; sand is well sorted, subrounded, and an arkose. Much of unit may be eolian. Base of unit has a thick, tabular bed of pink (7.5YR 7/3) siltstone and very fine-grained sandstone (internally massive and well consolidated). The lower contact of unit 19 is sharp (over 2 cm) and planar. @ 138.8 m is a medium bed of calcium carbonate-indurated very fine to fine-grained sandstone. Sand is well sorted, subrounded, and an arkose. This bed seems to fill a channel that is at least 50 m long in a southwestward direction. From here, we use a bearing and dip of N48°W and 7° NW.	7.5	143.3
18	**Overbank mudstone, siltstone, and very fine-grained sandstone** Upper 3 m: Reddish brown to light reddish brown (5YR 5-6/3) mudstone, pinkish gray to light brown (7.5YR 7/2 to 6/3) siltstone, and light brown to light yellowish brown (10-7.5YR 6/4) siltstone and very fine-grained sandstone. Beds are thick (minor medium beds) and tabular; one bed is 55-60 cm thick. Very fine-grained sandstone is internally massive. No rhizoliths, and only minor evidence for bioturbation. Moderately to well consolidated. This sediment may reflect basin floor deposition. Bottom 3-4 m: light brown to brown (7.5YR 5-6/4) and light yellowish brown (10YR 6/4) mudstone; weakly consolidated and massive. This sediment may reflect basin floor deposition. *Stake L is at 131.9 m (top of upper CaCO3 bed). From Stake L, we move northeast along-strike following the CaCO3 bed to Stake M. From Stake M, we continue measuring up-section. UTM coordinates of Stake L: 3986563 N, 412488 E. UTM coordinates of Stake M: 3986645 N, 412493 E.*	7.5	135.8
17	**Interbedded fine, eolian sandstone with fluvial fine sandstone, claystone, and siltstone:** Sandstone is reddish yellow (7.5YR 6/6), clean, well sorted, subrounded, very fine to fine-grained, loose to weakly consolidated, and has an approximate ratio of:	4.8	128.3

Unit	Description	Thickness (m) (Unit)	(Total)
	10-20% : 80-90% northeast-derived lithics to Kspar (probably eolian sand); this sand grades upward to a light yellowish brown (10YR 6/4) siltstone and very fine-grained sandstone. Claystone is thinner than the sandstone and light brown to brown (7.5YR 5-6/4) and pale brown (7.5YR 6/3); thick, tabular beds. @ 125.3 m is a 80 cm-thick bed of whitish, muddy ash that is altered. Near top of the unit are two 25-30 cm-thick, whitish, tabular calcium carbonate beds. At base of unit is a sheet-like channel-fill deposit 15-20 cm-thick composed of very fine- to fine-grained sand; sand is well sorted and an arkose; channel sand is oxidized to a reddish yellow color (7.5YR 6/6) and may reflect fluvial reworking of eolian sand; slightly scoured lower contact. *Stake J is at 125.9 m; from here we shift along-strike to Stake K and go up 1.5 m. UTM coordinates of Stake J: 3986540 N, 412480 E. UTM coordinates of Stake K: 3986560 N, 412498 E.*		
16c	**Overbank mudstone:** Light brown (7.5YR 6/3-4) and massive. Abundant, pebble-size calcium carbonate nodules are present on the surface of the mud. Channel bodies are not observed.	11.7	123.5
16b	**Extra-channel deposits of siltstone and subordinate very fine- to fine-grained sandstone:** Light brown to light yellowish brown (7.5-10YR 6/4). Sand and silt is generally massive, but may be in thick, tabular beds. 0.5% muscovite flakes in the sediment. 0.5-1% of sediment is composed of channel-fill deposits 20-50 cm thick and lenticular in shape. Channel sand is well sorted, fine- to medium-grained, mostly subangular, minor subrounded, and an arkose. Channels are locally cemented by calcium carbonate and contain 1% pebble-size nodules of strongly cemented siltstone and/or calcium carbonate rip-ups. Generally, channel-fill and overbank deposits are weakly to moderately consolidated. Edge of a cemented channel: S82°W; trend of a calcium carbonate-indurated channel is N65°W.	4.5	111.8
16a	Covered by Qay	9.9	107.3
	Mixed and interbedded lithosomes A and B of the Skull Ridge Member, Tesuque Formation	**~97**	**~97**
15c	Covered by Qay	8.2	97?
15b	**Extra-channel deposits of very fine- and fine-grained sandstone with subordinate siltstone (mix of lithosomes A and B):** Light brown to pink (7.5YR 6-7/4). Sand is well-sorted, subangular, and arkosic arenite with minor northeast-derived grains. No sedimentary structures observed, probably because of bioturbation. Poorly exposed. At top is a 70 cm-thick, tabular bed of siltstone and very fine- to fine-grained sandstone. Not well-exposed and weakly consolidated. Lower contact not well-exposed.	5.4	89.2
15a	**Overbank, silty very fine- to fine-grained sand: (lithosome B):** Massive and well-sorted; perhaps eolian; not well-exposed. Overlian by 30 cm-thick, fining-upward channel bed that lacks sedimentary structures; this channel-fill is composed of fU-vcL sand, with minor very fine to medium pebbles near the base. Sand has 6/10 : 4/10 Kspar: northeast-derived lithic grains (latter is marked by reddish volcanic grains and greenish quartz grains), sand is subrounded to subangular, and moderately to poorly sorted. Pebbles are mostly of lithosome B composition and are subrounded; poorly to moderately sorted. Relatively sharp lower contact with Ash Alpha. *On 7/9/02, we ended on Ash Alpha. On 7/10/02, we followed the Ash Alpha bed across arroyo to north, where we establish Station I. UTM coordinates of Stake I: 3986329 N, 412760 E. Above, we use a trend and dip of N52°W and 7° NW.*	2.0	83.8
14c	**Ash Alpha:** White (N8\ ), somewhat shard-rich, silty-textured ash mixed with about 5% detrital very fine-grained sand. 55 cm thick. Minor, very thin beds or laminations of fine- to coarse-grained, micaceous, arkosic arenite sand (Lithosome A) are interbedded with the ash. Locally, the ash is altered. Ash is capped by 10-15 cm of calcium carbonate, which may represent strongly cemented ash. Sharp lower contact.	0.6	81.8

Unit	Description	Thickness (m) (Unit)	(Total)
	Weakly consolidated.		
14b	**Extra-channel and overbank deposits of siltstone and very fine- to fine-grained sandstone (mixed lithosome A and lithosome B):** Light brown to brown (7.5YR 6/3-4 and 7.5YR 5/4) and pink (7.5YR 7/3). The very fine- to fine-grained sand is subrounded to subangular, well sorted, and an arkosic arenite. About 1-5% channel-fill deposits; channel deposits attain a maximum 40 cm thickness and are composed of fine-grained sand with minor pebbly sandstone. The sand in the latter is surrounded, poorly sorted, and has an approximate ratio of 1/3 Kspar : 2/3 northeast-derived grains. Unit is poorly bedded and weakly to moderately consolidated. Gradational lower contact with WA #4. Sharp upper contact with Ash Alpha ash. @ 75-76 m: One thick bed of light yellowish brown (10YR 6/4) sand. The sand is fU-mU, subangular to subrounded, well sorted, and has about subequal northeast-derived lithic grains compared to Kspar grains.	7.7	81.2
14a	**No. 4 white ash of the Skull Ridge Member:** White (5Y 8/1), non- to slightly altered, and glass shards present. Ash is mixed with minor detrital silt, and has 1% detrital(?) very fine-grained sand-size biotite. Ash is very thinly bedded to planar-laminated. Lower contact is sharp. Upper contact grades to a light brown (7.5YR 6/4) very fine-grained sandstone. Upper about 30 cm of ash is more altered. 1.3 m total thickness. Loose to weakly consolidated. A lithosome B channel that has eroded this ash to west trends S26°W and has a minimum depth of 1.3 m.	1.3	73.5
13	**Extra-channel and overbank deposits of siltstone and very fine- to fine-grained sandstone, with 3-5% coarse channel-fills and minor claystone (lithosome B and lithosome A):** Medium to thick, tabular, ledge-forming beds of siltstone and very fine- to fine-grained sandstone; these are pink (7.5YR 7/3-4, subangular to subrounded, well-sorted, and arkosic – probably lithosome A. 3-5% medium-bedded, relatively tabular, coarse channel-fill deposits of lithosome B. The channel deposits are composed of fine to coarse sand (moderately to poorly sorted, subrounded to subangular, and has an approximate ratio of 50-65% northeast-derived grains : 35-50% Kspar grains). The contact between units 12 and 13 is relatively sharp with 10-20 cm of relief. @75.2 m: Freshwater limestone bed of medium thickness. Between this bed and the White Ash #4 is brown to light brown (7.5YR 5-6/4) claystone and mudstone. @ basal 0.9 m of unit is a fU-mL lithosome B litharenite. Sand is pale brown (10YR 6/3), well sorted, and surbrounded to subangular. Locally, there is another bed like this in the middle of the unit.	4.9	72.2
12i	**10-30 cm-thick marker bed of calcium carbonate:** Calcium carbonate is internally very thinly to thinly planar-bedded (described by Stake G). Probably formed by high evaporation of shallow groundwater along a piedmont/playa interface. Sharp lower contact. *Location of Stake G. UTM coordinates of Stake G are: 3985872 N, 412461 E. We use this marker bed to move northeast 115 m at a bearing of N65°E, and from that point back-track down-section to describe units 12e, 12f, 12g, and 12h. Where units 12e through 12h were described, Stake Hwest was placed on top of unit 12e, 7.5 m below the marker bed of unit 12i. We then use top of the lithosome A to move northeast to Stake H, where Stake Heast was placed 7.5 m above top of unit 12e. Note that 7.5 m corresponds to the thickness of units 12f, 12g, and 12h near Stake Hwest, and so Stake Heast is at the equivalent stratigraphic level as Stake G . UTM coordinates of Stake H is: 3986100 N, 412716 E. We then measure from Stake Heast to Ash Alpha using N70°W bearing and 5° NW dip.*	0.2	67.3
12h	**Floodplain mudstone and siltstone (lithosome B):** Light brown (7.5YR 6/3-4). Weakly to moderately consolidated. Very thin to thick, tabular beds or else massive.	2.9	67.1

Unit	Description	Thickness (m) (Unit)	(Total)
	@66.7 m: Light greenish gray (N8/1) silty ash to ashy silt and very fine-grained sand.		
12g	**Channel-fill of pebbly sandstone (lithosome B):** Sand is pale brown to light yellowish brown (10YR 6/3-4), moderately (mostly) to poorly sorted, subrounded to subangular, medium- to very coarse-grained, and a litharenite in composition. Gravel generally are scattered in the sand, and are mostly pebbles with minor cobbles; clasts are subrounded and poorly sorted. Loose, and bedding not generally exposed. Slightly scoured lower contact; probably gradational upper contact. Maximum clast sizes: 9x8, 8x5, 6x5, 8x6, 20x12, 15x12, 8x7 cm. Clast count of 106 clasts gives: 42% greenish Pz sltst and ss, 3% grayish to reddish volcanic rocks (intermediate to felsic), 5% quartzite (no Rinconada qtzite), 4% granite, 39% Pz limestone, 3% quartz, 2% calcium carbonate nodules (perhaps associated with the Pz limestone), and 3% reddish fine-grained sandstone. Channel disappears between stations Hwest and Heast (see SCV-184).	1.5	64.2
12f	**Floodplain mudstone to siltstone (lithosome B):** Light brown (7.5YR 6/3-4) to brown (7.5YR 5-6/4). Weakly to moderately consolidated. Very thin to thick, tabular beds or else massive near Stake Heast. Massive or very poorly bedded near Stake Hwest.	3.0	62.7
	Where units 12f to 12h were described, Stake Hwest was placed on top of unit 12e, 7.5 m below the marker bed of unit 12i. We then use top of unit 12e to step to northeast, where Stake H was placed on top of unit 12e. UTM coordinates of Stake H is: 3986100 N, 412716 E. Above Stake H, Stake Heast was placed 7.5 m above the of unit 12e. Note that 7.5 m corresponds to the thickness of units 12f, 12g, and 12h near Stake Hwest, and so Stake Heast is at the same stratigraphic level as Stake G. We then measure from Stake Heast to Ash Alpha using N70°W bearing and 5° NW dip.		
12e	**Channel-fill sandstone (mixed lithosome A-B). Just northeast of Stake Hwest:** Pale brown to light yellowish brown (10YR 6/3-4). Sand has about 1% scattered pebbles, and is massive except for minor very thin to medium, lenticular beds; about 3% of these beds are of strongly cemented pebbly sandstone and sandy pebble-conglomerate. Pebbles consist of calcium carbonate nodules, quartzite, and granite; pebbles are fine to coarse, subrounded, and moderately sorted. Sand is subrounded to subangular, moderately to well sorted, very fine- to very coarse-grained but mostly fine- to medium-grained, has ~5% muscovite grains, and has an approximate ratio of 60% Kspar : 40% northeast-derived lithics. Weakly consolidated; slightly scoured lower contact; probably gradational upper contact. **At Stake H:** Unit is 2 m-thick; sand is very fine- to fine-grained, pale brown to very pale brown (10YR 6-7/3), generally massive, and grains are well sorted and arkosic arenite (1/3 : 2/3 probable northeast-derived lithics : Kspar). Sand has 5% muscovite grains.	3.0	59.7
12d	**Floodplain mudstone and siltstone (lithosome B):** Light brown to brown (7.5YR 5-6/4). Not well-exposed. There are ~5% float of scattered, broken laminae of calcium carbonate or pebble-size calcium carbonate nodules. Weakly to moderately consolidated; gradational and conformable lower contact.	2.0	56.7
12c	**Floodplain siltstone and very fine-grained sandstone (lithosome B):** Pale brown to light yellowish brown (10YR 6/3-4). The sediment is massive except for about 10% (estimate by volume) scattered laminae of calcium carbonate. One thin bed of calcium carbonate observed (interpreted to be associated with high evaporation of shallow groundwater on a basin floor); scattered calcium carbonate laminae are also interpreted to be due from the same process.	5.0	54.7
	Above unit 12b, we use bearing and dip of N50°W, 8° NW.		
12b	**Floodplain siltstone (lithosome B):** Brown to pale brown (10YR 5-6/3) with minor grains of very fine- to fine-grained sand. Very thin to medium, tabular bedded or else massive. Weakly to moderately consolidated. Estimate 3% channel deposits; channels are up to 25 cm thick and are composed of fL to mL sand (well sorted, generally	10.0	49.7

Unit	Description	Thickness (m) (Unit)	(Total)
	subrounded, litharenite with 1/3: 2/3 estimated ratio of Kspar to northeast-derived lithics). Sampled the sand (sample # 090702-djk-a). The channel sandstones are indurated by calcium carbonate. Gradational, conformable lower contact.		
12a	**Pebbly sandstone channel complex (lithosome B):** An extensive, tabular channel deposit that is about 1 m thick; planar-laminated. Sediment fines upwards from medium- to very coarse-grained sand near the base to fine- and very fine-grained sand near the top. Pebbles and lesser amounts of cobbles are located near the base. Overall, channel is composed of pebbly sand. Loose. Sand is subrounded to subangular, moderately to well sorted, and a lithic arenite with an estimate ratio of 35-45% Kspar : 55-65% northeat-derived lithic grains. Gravel is subrounded, poorly sorted, and has a composition consistent with lithosome B. *At base of unit, change bearing to N50°W; dip is still 9° NW.*	1.0	39.7
11	**Overbank siltstone, very- fine-grained sandstone, and mudstone (lithosome B):** Thick, tabular beds that are pink to very pale brown (7.5YR 7/3-4; 10YR 7/3). *@ 34.2 m: Stake F placed. UTM coordinates: 3985774 N, 412565 E..*	4.5	38.7
10	**Generally covered by Holocene sediment:** Unit probably similar to unit 9, with approximately 3-5% coarse channel deposits. @34 m, 30-120 m northeast of section line: At least three discrete channel-fills of coarse lithosome A that are up to 30-60 cm in depth, which is probably indicating much avulsion. These are about 15 m wide. @32.5-33.2 m: **Lithosome A pebbly sandstone channel-fill**. This channel-fill has a scoured lower base with 10-25 cm of relief and is 50-80 cm-deep. The channel-fill is weakly consolidated and weakly cemented. It is composed of fine to very coarse-grained sand (moderately sorted, subangular to subrounded, and an arkose) with minor gravel. Maximum clast sizes of: 8x7, 7x4, 13x9, 7x5, 8x8, 7x6, 7x5 cm. Gravel is poorly sorted, surbrounded, and composed of granite with subordinate quartzite. Clast count of 111 clasts give: 76% granite and 24% quartzite. Gravel is underlain by light yellowish brown to very pale brown (10YR 6-7/4) siltstone and very fine-grained sandstone that are well-consolidated. Channel-fill is greater than 60 m in width. @29.1-29.7 m: **Lithosome A coarse channel-fill**. This channel complex is 60 cm thick, planar laminated to very thinly bedded to thinly bedded, and strongly cemented by calcium carbonate. It is composed of medium to very coarse-grained sand and trace to granitic pebbles. Pebbles are less than 1 cm in diameter. Sand is moderately sorted, an arkose, subrounded to subangular, and is totally of Lithosome A. *Shoot along strike from station d to station e and f, gaining 3 m in the process. Stake E UTM coordinates: 3985688 N, 412474 E. Stake D UTM coordinates: 3985655 N, 412432E.* *4.5 m of Qao gravel to Stake C; used bearing and trend of N48°W and 9° NW. Shoot down-slope from station c to station d and go up 1.5 m. UTM coordinates of Stake C: 3985550 N, 412600 E.*	4.8	34.2
9b	**Unit 9 covered by Qao gravel.** *3.2 m in unit 9 to top of hill Stake A); traverse northeast along-strike to station b (no elevation change). Stake B is within Qao gravel. Stake A UTM coordinates: 3985395 N, 412514 E. Stake B UTM coordinates: 3985546 N, 412540 E.*	4.5	29.4
9a	**Extra-channel and overbank deposits of interbedded siltstone and fine sandstone, with 1-5% sandstone channels (lithosome A):** Channels are composed of fine-grained to medium-grained sand that is an arkose, well-sorted, subangular, has 0.5% muscovite, and has 5% biotite grains. Channels are strongly cemented by calcium carbonate.	3.2	24.9
8	**No. 3 white ash of the Skull Ridge Member:** 20-25 cm-thick white ash mixed with 5-	0.4	21.7

Unit	Description	Thickness (m) (Unit)	(Total)
	8%, very fine-grained sand. Ash is massive, slightly altered, and moderately to strongly cemented by calcium carbaonte. Has a sharp lower contact and sharp, but conformable, upper contact with unit 9a.		
7	**Overbank deposits of interbedded siltstone and fine sandstone (lithosome A):** Interbedded (a) Pale brown to pink (10YR 6-7/3) very fine- to fine-grained sandstone and siltstone. Sand is well sorted and arkosic arenite. 3% muscovite grains. Forms medium to thick, tabular beds. Well consolidated. Moderate to strongly cemented. (b): Light brown to pink (7.5 YR 6-7/4) siltstone; medium to thick, tabular beds that are greater than 14 m in length. Weakly to moderately consolidated and poorly cemented.	5.7	21.3
6	**White Ash 2a,b, or c:** White, silty-textured, shard-rich, and non-altered.	0.3	15.6
5	**Overbank siltstone (lithosome A?):** Pink to light brown (7.5YR 6-7/4). Massive but near top unit is medium to thick, tabular-bedded. Moderately consolidated. Sharp, conformable contact with unit 6. On west side of ridge, 3-5% burrows are present in this unit (1-2 cm in diameter) and there are minor rhizoliths.	3.2	15.3
4	**Overbank siltstone and very fine- to fine-grained sandstone (lithosome B?):** Light brown (7.5YR 6/3-4) and pale brown (10YR 6/3); thick, tabular, ledge-forming beds; sand is well-sorted and lithic arkose to litharenite in composition. Lithic grains are probably of lithosome B provenance because of greenish quartz grains. Sediment is well consolidated with moderate to strong calcium carbonate cementation. Upper contact is sharp but conformable. 80-90 cm down from top is a 15 cm-thick white, altered ash that is planar-laminated. Sand becomes significantly more arkosic towareds top of unit; here, sand is subangular, well sorted, and its color is pale brown to pink (10YR 6-7/3).	3.5	12.1
3	**Floodplain mudstone to siltstone (lithosome B):** Light brown (7.5YR 6/4). Massive. Upper contact is gradational over 50 cm. Moderately consolidated. This is considered as lithosome B because 360-370 m to the north-northeast White Ash #2 has locally been obliterated by a 4.5 m-thick channel complex of medium to coarse-grained sandstone; this sand is subangular to subrounded, moderately sorted, has 5% muscovite grains, and has approximate ratio of 35-50% northeast-derived lithics : 50-65% Kspar.	3.2	8.6
2	**No. 2 white ash of the Skull Ridge Member:** Ash is white (7.5YR 8/1), soapy-textured because of alteration to bentonite(?), and has 1-3% fL-fU sand-size crystals of biotite. Interval includes silty and very fine-grained sandy ash near top which has a light greenish gray (N8/1) color. Ash has a sharp lower contact and a gradational, conformable upper contact over 10-20 cm. Weakly consolidated	1.6	5.4
1	**Floodplain mudstone (lithosome B?):** Reddish brown (2.5YR 4/3 and 5YR 4-5/4). No bedding observed. Weakly to moderately consolidated. Between 30 and 80 cm from base is a calcium carbonate bed: crudely planar-laminated to very thinly bedded; probably a freshwater limestone or evaporative calcium carbonate.	3.8	3.8
	Base of section at unmarked stake near gully bottom. UTM coordinates of: 3985445 N, 412555 E. We use bearing and dip of N53°W and 9° NW.		0.0

West Arroyo Seco hanging wall section. This section consists of sand, siltstone, silty sand, and minor pebble and minor clay beds of the Skull Ridge Member of the Tesuque Formation. Measured and described 0.5-1.0 km south of Arroyo Seco near the western border of the Cundiyo 7.5-minute quadrangle. This corresponds to a location 1700-4200 ft east of the western boundary of the Cundiyo7.5-minute quadrangle. Measured and described by Daniel Koning on July 3, 2007 using a Jacob staff, abney level, and hand-held GPS. UTM coordinates of base: 3978214 N, 0411081 E (Zone 13, NAD 27). UTM coordinates of top: 3978907 N, 410329 E; +/- 5 m zone 13; NAD 27).

Unit	Description	Thickness (m) (Unit)	(Total)
32	**No. 4 white ash of the Skull Ridge Member.** *Stake placed at base (UTM coordinates 3978907 N, 410329 E; +/- 5 m zone 13; NAD 27).*		
	Basin floor sediment (lithosome B) of the Skull Ridge Member, Tesuque Formation	**43.2**	**124.1**
31	**Intercalated fine sandstone, siltstone, and silty fine sandstone:** Thin to medium, tabular beds. Sand is pale brown to light yellowish brown (10YR 6/3-4), subrounded to subangular, well sorted, and consists of quartz and minor plagioclase, 10-12% potassium feldspar, and 10-12% green quartz, volcanic, and mafic grains. Silt and silty vfL-fL sand is pink to very pale brown (7.5-10YR 7/3) and internally planar to wavy laminated within thin to medium, tabular beds. ~10% strong to moderate cementation.	18.9	124.1
30	**Siltstone:** Very pale brown; poor exposure, but at least locally planar-laminated. Well consolidated. @103.1-103.2 m: Cemented siltstone. @ 102.5-103.1 m: Very thin to medium, tabular beds with locally abundant rhizoliths. @100.6 m: Base of fine white ash (A ash).	6.5	105.2
29b	**Strongly cemented fine sand and silty sand:** Planar laminated.	0.1	98.7
29a	**Fine sand and silty sand:** Very pale brown to light yellowish brown (10YR 7/3-6/4). Poor exposure does not permit observation of bedding. Sand is vfL-fU, subrounded to subangular, and of lithosome B composition. Towards top of unit, sand becomes arkose, subangular to subrounded, and pink (7.5YR 7/4). *@94.1 m: Stake K placed at top of yellowish gray fine ash. It has UTM coordinates of 3978691 N and 410439 E (+/- 5 m; zone 13: NAD 27). From there, I use the white ash to offset to the northwest to Stake L (3978883 N, 410452 E) (+/-4-5 m; zone 13, NAD 27). Attitude by Stake L is N6E\7.5 degrees west. Continue using 280-280.5-1.05 trend and 8 degrees west dip.* At stake L, 5.0 m of strata lies between the base of unit 28a and the base of unit 26. Below unit 28c lies 0.6 m of 7.5YR 7/3 siltstone, then 0.3 m of fine white ash, and then 4.5 m to base of gray ash of unit 26..	4.5	98.6
28c	**Yellowish gray fine ash:** Shard-rich; silt- to very fine sand-size grains. Locally 1.0 m-thick. At stake L, this ash complex consists of an upper gray fine ash and a lower 30 cm-thick white fine ash (separated by 0.9 m of pink (7.5YR 7/3) siltstone. B ash complex.	0.5	94.1
28b	**Siltstone and fine sandstone:** Sand is very pale brown (10YR 7/3-4), vfL-fL, and lithosome B. *@ 92.3 m: Stake J placed on top of fine white ash. It has UTM coordinates of 3978658 N and 410486 E (+/- 5 m; zone 13: NAD 27).*	1.3	93.6
28a	**Fine white ash:** Shard-rich and silt- to very fine sand-size grains. Not seen at Stake	0.3	92.3

Unit	Description	Thickness (m) (Unit)	(Total)
	L. Part of B ash complex.		
27c	**Silty fine sandstone:** Pink to very pale brown (7.5-10YR 7/3); wavy- to planar-laminated. Sand is vfL-fU, subangular, and well sorted. More silty than unit 27a.	1.6	92.0
27b	**Cemented ledge of very fine-fine sandstone**	0.2	90.4
27a	**Silty fine sandstone:** Pink to very pale brown (7.5-10YR 7/3); internally massive with much paleo-burrows. Sand is vfL-fU, subangular, and well sorted.	1.4	90.2
26	**Light gray ash:** Shard-rich and silt- to very fine-sand-size; 15 cm-thck.	0.2	88.8
25	**Siltstone and very fine sandstone:** Light brown to pink (7.5YR 6-7/4); moderately consolidated. Not exposed.	1.5	88.6
	@88.6 m: Step along strike to ash bed to the north.		
	@ 87.1 m: Use 285 degrees trend and 8 degrees dip based on local bedding attitudes.		
24	**Fine to medium sandstone of lithosome B with much lithosome A input:** Light yellowish brown to very pale brown (10YR 6/4-7/3); bedding not exposed. Sand is vfL-mL sand and silty sand that is subrounded and well-sorted.	6.0	87.1
	@84.9 m: Base of a medium to thick, tabular bed of fL-mL sandstone with cigar-shaped cementation within the bed. Sand is composed of quartz, 17-20% orange stained quartz and potassium feldspar, 7% mafics, and 3% green quartz grains.		
23	**Lithosome B sandstone:** Sand is fL-fU, subrounded (mostly subrounded) to subangular, well sorted, and consists of quartz and plagioclase, 10% potassium feldspar, and 10% volcanic and mafic grains.	0.2	81.1
	Distal alluvial slope sediment (lithosome A) of the Skull Ridge Member, Tesuque Formation	**13.4**	**80.9**
22i	**Intercalated siltstone and silty fine sandstone:** Pink to very pale brown (7.5-10YR 7/3). Very thin to medium, tabular beds. Sand is vfL-fL, well-sorted, and an arkose. Well consolidated and a ledge-former.	1.3	80.9
22h	**Greenish, shard-rich fine gray ash – *observed to north by stake L.*** It is within lithosome B, vfL-fL sand and siltstone; pink to pinkish white (7.5YR 7/3-8/2).	0.25	79.6
22g	**Siltstone:** Pink (7.5YR 7/3) -- ***observed to north by stake L.***	1.3	79.0
22f	**White ashy(?) fine sandstone:** Sand is cemented and vfL-fL. -- ***observed to north by stake L.***	0.3	77.7
22e	**Intercalated siltstone and silty fine sandstone:** Pink to very pale brown (7.5-10YR 7/3). Very thin to medium, tabular beds. Sand is vfL-fL, well-sorted, and an arkose. Well consolidated and a ledge-former.	0.2	77.4
22d	**Pebbly sandstone channel-fill:** Laminated to very thin, planar-cross-stratified within a lenticular channel-fill body that fines-upward. Pebbles are vf-c, subangular to subrounded, poorly sorted, and composed of granite. Sand is fU-vcU, subangular to angular, poorly sorted, and an arkose.	0.8	77.2
22c	**Intercalated siltstone and silty fine sandstone:** Pink to very pale brown (7.5-10YR 7/3). Very thin to medium, tabular beds. Sand is vfL-fL, well-sorted, and an arkose. Well consolidated and a ledge-former.	1.1	76.4
22b	**Sandstone channel-fill:** Trough cross-stratified and laminated to very thinly bedded. Sand is vfL-vcU (mostly vf-f sand), subangular, poorly sorted, and an arkose. Local vf-m granitic pebbles at base.	0.4	75.3
22a	**Siltstone and very fine sandstone:** Very pale brown (10YR 7/3) and in thin to thick, tabular beds. Minor possible paleo-burrows. Well consolidated and a ledge-former.	7.4	74.9
	@74.9-75.3 m: Discrete channel-fill of sand. *@ 68.6 m: Stake G placed. UTM coordinates of 3978485 N, 410636 E. Still use 7 degrees WNW dip.*		

Unit	Description	Thickness (m) (Unit)	(Total)
	Basin floor sediment (lithosome B) of the Skull Ridge Member, Tesuque Formation	**15.5**	**67.5**
	Sandstone: Cemented ledge of vfL-fU, lithosome B sandstone that is subrounded to subangular. Composition of sand similar to that in unit 19.	0.4	67.5
	Intercalated siltstone and fine sandstone: Pink (7.5YR 7/3); medium to thick, tabular beds. Local rhyzoliths	6.6	67.1
	Above 61.5 m is much strong cementation of the sandstone.		
21	**Intercalated sandstone and siltstone:** White (10YR 8/1); beds are very thin to thin and planar. Much vertebrate scrap fossils. Sand is vfL-cL by mostly vfL-mL. Silt is planar-laminated. Weakly consolidated.	6.7	60.5
20	**Siltstone:** Light gray to pale brown (10YR 7/2-6/3); planar-laminated, with some slightly wavy laminated.	0.7	53.8
19	**Coarse channel-fill of lithosome B sand:** Light gray to pale brown (10YR 7/2-6/3) and planar-laminated. Sand is fU-cL, moderately sorted, subangular to subrounded, and consists of quartz with 12-14% mafic + volcanic + green quartz grains and 12-14% potassium feldspar. Trace cU-vcU sand and very fine pebbles. Local clay rip-ups.	1.1	53.1
	Distal alluvial slope sediment (lithosome A) of the Skull Ridge Member, Tesuque Formation	**52.0**	**52.0**
18	**Coarse channel-fill of lithosome A pebbly sand:** Very pale brown to light yellowish brown (10YR 6/4-7/3), fL-vcU sand that is subangular, poorly sorted, and an arkose. Subordinate vf to vc pebbles and 5% cobbles of granite.	1.0	52.0
17	**Siltstone:** Very pale brown to light gray (10YR 7-8/2). *Stake D placed on top of F ash. It has the following UTM coordinates: 3978247 N, 410900 E (+/- 5 m, zone 13, NAD 27). From here, we shift north along ash to Stake E (UTM coordinates of 3978404 N, 410910 E) and then shift northwest along ash to Stake F (UTM coordinates 3978442N, 410797 E. Attitude of ash is N15E\7E. Use bearing and dip of 285 degrees and 7 degrees.*	0.9	51.0
16	**F Ash:** Ash is light gray, fresh, and shard-rich. Sampled middle 10 cm	0.3	50.1
15	**Sandstone:** Reddish yellow (7.5YR 6/6) with no internal bedding. Sand is fL-mL (minor vfL-vfU and silt), subangular (mostly) to subrounded, and well-sorted. Possible eolian unit.	0.7	49.8
14	**Intercalated siltstone and fine sandstone:** Very pale brown (10YR 7/3) and in medium to thick, tabular beds. Sand is vfL-fU and an arkose; 5% muscovite flakes, gradually decreasing to 0% at top of the unit. Gradually becomes mostly silt and very fine sand towards top of the unit. 10% strong cementation.	8.2	49.1
13	**Sandstone:** Very pale brown (10YR 7/3) sand channel-fill that is fL-vcU, moderately to poorly sorted, subangular (mostly) to angular, and an arkose; trace very fine granitic pebbles.	1.0	40.9
12	**White, ashy vfL-fU sand**	0.2	39.9
11	**Intercalated siltstone and fine sandstone:** Sediment is light brown to pink (7.5YR 6-7/4) and consists of siltstone and intercalated vfL-fU sand; sand is subangular, well sorted, and an arkose. Weakly consolidated. *Stake C placed on top of E ash. It has the following UTM coordinates: 3978210 N, 410983 E (+/- 4 m; zone 13; NAD 27). From here, use a bearing and dip of 290 degrees and 7 degrees west.*	1.6	39.7
10	**E Ash ?:** Fine white ash. *@28.5 m: Stake B placed at following UTM coordinates: 3978209 N, 411050 E (+/- 6 m; zone 13; NAD 27).*	0.4	38.1
9	**Sandstone and silty sandstone:** Very pale brown (10YR 7/3); vfL-fU sand and silty	10.5	37.7

Unit	Description	Thickness (m) (Unit)	(Total)
	sand; sand is subangular to angular, well-sorted, and an arkose. 5-10% muscovite flakes. Weakly to moderately consoslidated. @33.6-36 m: Sediment grades upward to pink (7.5YR 7/4) silt and very fine to fine sand at the top.		
8	**Pebbly sandstone:** Light gray to very pale brown (10YR 7/2-3). Sand is subangular to angular, poorly sorted, and an arkose. Pebbles are subangular, granitic, and very fine to very coarse.	0.8	27.2
7	**Ashy(?) siltstone and very fine sandstone:** White (10Y 8/1); 1% muscovite.	0.8	26.4
6	**Pebbly sandstone:** Light gray to very pale brown (10YR 7/2-3). Sand is subangular to angular, poorly sorted, and an arkose. Pebbles are subangular, granitic, and very fine to very coarse.	1.2	25.6
5	**Siltstone and fine sandstone:** Pink (7.5YR 7/4) silt and vfL to fU sand. Fines-upward.	0.4	24.4
4	**No. 3 white ash of the Skull Ridge Member (to south) and sandy pebble-cobble conglomerate channel-fill (to north):** The scoured base of the coarse channel-fill is at 19.8 m. The channel-fill fines upwards and is ~1/3 strongly cemented. It is planar-laminated to very thinly bedded (and also has minor planar cross-stratification about 10 cm-thick). Pebbles are vf-vc, consist of granite, and are poorly sorted and subangular. Cobbles are subrounded. Sand is very pale brown (10YR 8/2-7/3), fL-vcU, subangular (mostly) to angular, poorly sorted, and an arkose. The No. 3 white ash is in a tabular, thick bed 1.0 m-thick; it is internally massive and has a gradational top. **Base is at 20.4 m (about the same level as conglomerate channel-fill to the north).**	3.8	24.0
3b	**Intercalated siltstone, fine sandstone, and silty sandstone:** Silt, vfL-fU sand, and silty vfL-fU sand in thin to thick, tabular beds. 3-5% mL-vcU arkose sand with vf-f granitic pebbles in thin, lenticular beds. Fine sand has 7% muscovite. Minor rhizoliths.	3.2	20.2
3a	**Intercalated fine sandstone and siltstone:** Very pale brown (10YR 7/3) silt and vfL-fL sand; thin to thick, tabular beds; local internal planar laminations.	3.3	17.0
2e	**Fine sandstone:** Thin to thick, planar beds of fL-fU sandstone; internal planar, very thin to laminated beds; also internally massive. Sand is fL-fU, an arkose, angular to subangular, and well-sorted. Well to moderately consolidated with 5% strong cementation and 7-10% muscovite. @9-13.6 m: Mostly vfL to fL sand in thick, tabular beds. @10.2-10.3 m: Fine white ash bed.	7.1	13.7
2d	**Dark greenish gray ash:** Not shard-rich.	0.1	6.6
2c	**Fine sandstone:** Thin to thick, planar beds of fL-fU sandstone; internal planar, very thin to laminated beds; also internally massive. Sand is fL-fU, an arkose, angular to subangular, and well-sorted. Well to moderately consolidated with 5% strong cementation and 7-10% muscovite.	0.8	6.5
2b	**Gray fine ash:** Very fine sand-size to silt-size and shard-rich.	0.15	5.7
2a	**Fine sandstone:** Thin to thick, planar beds of fL-fU sandstone; internal planar, very thin to laminated beds; also internally massive. Sand is fL-fU, an arkose, angular to subangular, and well-sorted. Well to moderately consolidated with 5% strong cementation and 7-10% muscovite.	3.6	5.5
1	**No. 2 white ash of the Skull Ridge Member:** White, ashy vfL to fL sand. *Base of section is in the lower Skull Ridge Member of the Tesuque Formation (stake A). UTM coordinates of: 3978214 N, 0411081 E (+/- 19 m; zone 13, NAD 27). From here, I proceed N70°W and use 6° down-dip.* **Brown siltstone and sandstone:** Ledge-forming, tabular, very thin to thick (mostly thin to medium) beds of siltstone and vfL-fL sandstone. Beds are internally massive	1.9	1.9

Unit	Description	Thickness (m) (Unit)	(Total)
	and have 1-5% pebble-size, CaCO3-cemented, sediment nodules.		

West Arroyo Seco footwall extension section (also called the La Puebla strat section). Measured about 1.5 kilometers northeast of Arroyo Seco, between the youth recreational building and the gun club, along a WNW trend. Described by D.J. Koning in early September, 2007. UTM coordinate of base: 409095 m E, 3980827 m N; UTM coordinate of top: 408633 m E, 3981120 m N (Zone 13, NAD 27, Espanola 7.5-minute quadrangle, New Mexico).

Unit	Description	Thickness (m) (Unit)	Total)
	Distalmost alluvial slope sediment (lithosome A) of the Skull Ridge Member, Tesuque Formation	**4.6**	**59.4**
	Interbedded siltstone and very fine sandstone: Very thin to thick (mostly medium to thick), tabular beds that is well consolidated and locally indurated. Took a sample just below the upper contact.	3.5	59.4
	@58.4 m: Nose of ridge. UTM coordinate of 408604 m E, 3981097 m N. I correlate along bedding to northeast.		
	Top of section @59.4 m. UTM coordinate of 408633 m E, 3981120 m N.		
	Interbedded fine sandstone and silty sandstone: Minor siltstone is present. Pink (7.5YR 7/4); sand is vfL-fU, subrounded to subangular (mostly subangular), well-sorted, and arkosic (composition of quartz with an estimated 15% Kspar or orange-stained quartz, 5% mafic grains, and trace volcanic grains). Moderately consolidated and non-cemented. Locally 10% muscovite grains. 5% strongly cemented beds. Took a sand sample at 49.3 m.	1.1	55.9
14	**Quaternary terrace gravel and colluvium**	**19.8**	**54.8**
	@54.8 m: Base of last slope.		
	Cairn built 21.0 m stratigraphic height above Ash Z. UTM coord: 408828 m E, 3980924 m N. From here, I make a long short using 306 degrees trend and 3.5 degrees dip.	6.0	53.3
	Cairn built 15.0 m stratigraphic height above Ash Z. UTM coord: 408879 m E, 3980868 m N. Above here, use a trend of 306 degrees and a dip of 4.5 degrees.	1.5	47.3
	Cairn built 13.5 m stratigraphic height above Ash Z. UTM coord: 408834 m E, 3980808 m N,	11.7	45.8
	Distalmost alluvial slope sediment (lithosome A) of the Skull Ridge Member, Tesuque Formation	**35.0**	**35.0**
13	**Fine sandstone:** Pink to very pale brown (7.5-10YR 7/4); very thick-bedded to massive; sand is fL-fU, subangular to subrounded, well-sorted, and arkosic with 5% mafic grains. Moderately consolidated.	3.2	35.0
12	**Ash Z:** Ash is light gray, sparkly, and has a fine texture. Ash is reworked and consolidated. Name given by Daniel Koning and does not follow the ash nomenclature of Galusha and Blick (1971). Ash interpreted to correlate to the Road Ash of Izett and Obradovich (2001).	0.9	33.2
	Stake E placed at base of Ash Z. UTM coordinates of 408792 m E, 3980765 m N. Above here, I use trend of 035 degrees (along-strike) and use a dip of 0.		
11	**Interbedded siltstone and fine sandstone:** Pink (7.5YR 7/3); thin to thick (mostly medium to thick), tabular beds that are internally massive; mostly a silt and vfL-fL sand mix; sand is vfL-fU, subangular, well-sorted, and arkosic. Well consolidated, with 5% strongly cemented vfL-fU sandstone beds. 5-10% pebble-size, CaCO3 nodules are present.	6.4	32.3
10	**Gray ash:** Light gray (weathering to buff) ash with a fine-sand texture. Ash is cemented, reworked, and consolidated. ~2-3 cm thick total.	0.1	25.9
9	**Interbedded siltstone and fine sandstone:** Pink (7.5YR 7/3); thin to thick (mostly medium to thick), tabular beds that are internally massive; mostly a silt and vfL-fL sand mix; sand is vfL-fU, subangular, well-sorted, and arkosic. Well consolidated, with 5% strongly cemented vfL-fU sandstone beds. Burrows and pebble-size, CaCO3 nodules are present.	2.6	25.8
8	**Ash X:** Ash is light gray, sparkly, and has a fine texture. Basal 5 cm appears to have rip-up clasts. Ash is reworked and locally fills paleochannels; consolidated, but goes to powder on excavation. Name is given by Daniel Koning and does not follow the ash	0.7	23.1

Unit	Description	Thickness (m) (Unit)	Total)
	nomenclature of Galusha and Blick (1971). *Ash X is followed between Stake C (UTM coordinate of 408941 m E, 3980768 m N) and Stake D (UTM coordinate of 408847 m E, 3980727 m N). Along way, Ash X is found at UTM coordinate 408930 m E, 3980754 m N. Note that Stake C is 2.8 m above Ash X.*		
7	**Very fine- to fine-grained sandstone and clayey-silty fine sandstone**: Pink (7.5YR 7/3-4), vfL-fU sandstone in medium to thick, tabular beds. Sand is subangular to subrounded, well-sorted, and arkosic with 5-7% mafic grains. Trace to 1% possible greenish quartz and volcanic grains. Beds are internally planar-laminated. Also present is 10-15% very pale brown (10YR 8/2-7/3) siltstone and vfL-vfU sandstone. Also present is 5% clayey-silty, pink to reddish yellow (7.5YR 7/4-6/6), vfL-fU sandstone. Well-consolidated and a ledge-former, with 1-5% strong cementation. *@19 m, change to 225 degrees trend and 2 degrees dip (based on apparent attitude of nearby ledges).* *At 16.0 m, Stake B placed at UTM coordinates of 408954 m E, 3980780 m N. I change trend to 220 degrees and dip to 0 (along-strike based on nearby exposures).*	6.4	22.4
6	**No exposure**	6.8	16.0
5	**Lenticular bed of grayish white ash:** Ash contains very fine to fine sand grains and is 0.5 m-thick. *Above this bed, I use a trend of 310 degrees and a dip of 4.5 degrees.*	0.3	9.2
4	**No exposure**	4.9	8.9
3	**Interbedded siltstone and fine sandstone:** Thin to medium, tabular(?) beds of pink (7.5YR 7/4) siltstone, vfL-vfU sandstone, and vfL-fU arkosic sandstone that is subangular and has 10% muscovite grains. At base of unit is a 16 cm-thick sandstone bed that is very pale brown (10YR 7/3), fL-mL, subangular, well-sorted, and has 12% biotite + maffic grains. *Stake A placed at base of the very pale brown, fine- to medium-grained sandstone bed. It has the following UTM coordinates: 40903 m E, 3980825 m N (+/- 6 m; zone 13; NAD 27). From here, use bearing and dip of 253 degrees and 4 degrees (based on an apparent attitude from ledge exposure to north).*	3.0	4.0
2	**Siltstone:** Very pale brown (10YR 7/3) and micaceous. Not well-exposed. Weakly to moderately consolidated and non-cemented.	0.6	1.0
1	**Sandstone:** Light yellowish brown to very pale brown (10YR 6-7/4); sand is fU-mU, subangular, well-sorted, arkosic, and has 10% biotite grains. Weakly consolidated. *Stake A' placed at top of light gray mudstone. It has the following UTM coordinates: 409095 m E, 3980827 m N. Exposure is ~1 m tall and shows exposure of pinker sediment of lithosome A overlying grayer sediment of lithosome B.*	0.4	0.4
	Lithosome B mudstone and very fine- to fine-grained sandstone: Light gray (2.5Y 7/2); sand is vfL-fL.	-0.5	0.0

West Arroyo Seco footwall section. This section consists of sand, siltstone, silty sand, and minor pebble-cobble and minor clay beds of the Skull Ridge Member of the Tesuque Formation. Measured and described 0.7-1.0 km south of Arroyo Seco across the boundary between the Espanola and Cundiyo 7.5-minute quadrangles. This corresponds to a location 4500-9700 ft east-southeast of the town of Arroyo Seco, located southeast of Espanola. Measured and described by Daniel Koning on July 6, 2007 using a Jacob staff, abney level, and hand-held GPS. UTM coordinates of base: 3978214 N, 0411081 E (Zone 13, NAD 27). UTM coordinates of top: 3978907 N, 410329 E; (+/- 5 m zone 13; NAD 27).

Unit	Description	Thickness (m) (Unit)	(Total)
	Distalmost alluvial slope sediment (lithosome A) of the Skull Ridge Member, Tesuque Formation		
20	Fine lithosome A sediment		
	Basin floor sediment (lithosome B) of the Skull Ridge Member, Tesuque Formation	**101.5**	**128.0**
19	Intercalated claystone-siltstone and fine-medium sandstone: Pinkish gray to pinkish white (7.5YR 7-8/2); medium to thick, tabular beds of silt, clay, and vfL-fL sand. Also light yellowish brown to light gray (2.5Y 6/3-7/2) fU-mU, ltihosome B sand with 18% Paleozoic lithics + mafic grains and 12% Kspar.	4.5	128.0
18	**No. 4 white ash of the Skull Ridge Member**	2.3	123.5
17	**Stacked channel-fill sandstones of lithosome B:** As in unit 15, but with local pebbly-cobbly sandstone channel-fills. @ 102.1 m: Use a bearing and dip of 280 degrees and 4 degrees west based on local apparent and mapped attitudes. *Stake J placed at the following UTM coordinates: 3979908 N, 408754 E (+/- 4 m, zone 13, NAD 27).* @ 100.6 m: Change to 2 degrees westward dip. *Stake I placed at the following UTM coordinates: 3979898 N, 408825 E (+/- 5 m, zone 13, NAD 27).*	29.2	121.2
16	**B ash complex**, described from top to bottom: Upper ash is light gray, fine, and 40-50 cm-thick; it is separated from the middle ash by 1.5 m of sediment. Middle ash is 30-40 cm-thick and yellowish gray to light gray to white (mostly white), with a thin medium-gray ash bed at its top; it is planar-laminated to very thinly bedded; ash is mostly altered, but it's shard-rich where sampled. 0.8 m of sediment [pink (7.5YR 7/3) siltstone and vfL-fL sandstone] separates the middle and lower ashes. The lower ash is a fine white ash and is 6 cm-thick near Stake G and 20 cm thick to the north; some glass shards and slightly altered. *Stake G placed at 90.1 m within the B ash complex (at top of middle bed). It has UTM coordinates of: 3979443 N, 409469 E (zone 13, NAD 27). From Stake G, I follow the B ash complex westward to Stake H (3979874 N, 409183 E; +/- 4 m, zone 13, NAD 27). From Stake H, I proceed 275 degrees with a dip of 4 degrees west.*	5.4	92.0
15	**Stacked channel-fill sandstones of lithosome B:** Very thin to thick and planar-bedded. Internal bedding of planar-laminations and minor tangential to cross-trough-lamination. Sand is pale brown to light gray, mostly mL-cU, subrounded, moderately sorted, and consists of quartz, minor possible plagioclase, 15% Paleozoic and mafic grains, and 7% orangish Kspar grains. 15% medium to thick, pink to light brown claystone beds. ~0.5% of beds are pebbly m-vc sand. Pebbles are vf-c, subrounded,	40.5	88.6

Unit	Description	Thickness (m) (Unit)	(Total)
	and consist mostly of Paleozoic sandstone with subordinate quartzite, P-type dacite, and lesser Paleozoic limestone and chert. @74.0-74.3 m: Top of a 25 cm-thick, cemented, ashy vfL-fL sandstone. @73.3-73.4 m: 10 cm-thick, white, cemented ashy vfL-fL sandstone. *@ 49.4 m: Stake E placed on top of ash, which has UTM coordinates of: 3979387 N, 409676 E; zone 13, NAD 27. Follow ash west to Stake F, which is also on top of the ash (3979415 N, 409577 E; zone 13 and NAD 27).*		
14	**Ash F:** Whitish gray. *@ 37.4 m: Stake D placed on ridge before a long shot. Still use 6 degrees west dip. UTM coordinates of: 3979249 N and 409920 E (zone 13, NAD 27).*	0.5	49.4
13	**Intercalated siltstone and very fine sandstone:** Pink (7.5YR 7-8/4); thin to thick, tabular beds; sand is vfL-vfU; 10% medium beds of grayish vfL to fU lithosome B sand. @41.0 to 41.1 m: 9 cm-thick, **light gray ash** that is internally massive. Sample unit13-ash-ArroyoSeco-FW.	19.2	48.9
12	**Coarse lithosome B channel-fill:** Sand plus pebbles and cobbles. Gravel are subrounded, poorly sorted, and consists of greenish Paleozoic limestone, sandstone, and siltstone with 15% estimated quartzite and 5% est. volcanic rocks (andesite? to dacite). One dacite cobble. Sampled the gravel. *@27.5 m: Stake C placed at base of coarse lithosome B channel-fill. UTM coordinates of: 3979164 N, 410102 E (zone 13; NAD 27). From here, I proceed 295 degrees west with a dip of 6 degrees west (using average of local attitudes on the Espanola quadrangle).*	2.2	29.7
11c	**Intercalated siltstone and very fine sandstone:** Very pale brown (10YR 8/2); sand is vfL-vfU.	0.6	27.5
11b	**Fine gray ash**: Medium-gray and shard-rich. Laminated and planar- to low-angle cross-stratified (ripple-marks).	0.2	26.9
11a	**Intercalated siltstone and very fine sandstone:** Very pale brown (10YR 8/2); sand is vfL-vfU.	0.2	26.7
	Basin floor sediment (lithosome B) with much lithosome A input, Skull Ridge Member, Tesuque Formation	**7.7**	**26.5**
10	**Channel-fill sandstone of mixed lithosomes A and B:** Sand is very pale brown to light yellowish brown (10YR 6-7/4), fU-vcU, subangular to subrounded, poorly moderately sorted, and consists of quartz and minor plagioclase with 12-15% Kspar and 6% greenish quartz + mafic + volcanic grains.	1.0	26.5
9	**Greenish to pinkish gray siltstone**	0.3	25.5
8	**Intercalated siltstone and fine sandstone:** Very pale brown (10YR 7/3); very thin to medium, tabular beds.	1.4	25.2
7	**Channel-fill sandstone of mixed lithosomes A and B, 1% pebbles:** Very pale brown (10YR 7/4), fU-vcL sand that is subangular to subrounded, moderately sorted, and consists of quartz and minor plagioclase, 15% orangish Kspar, and 6% mafics + volcanic + greenish quartz grains. Weakly consolidated. 1% subangular, vf-c granitic pebbles. Fines-upward in upper part of deposit.	1.5	23.8
6	**Fine to medium sandstone:** One thin bed of fU-mL sand mixed with gray fine ash. Mixed lithosome A-B composition. Cemented.	0.1	22.3
5	**Siltstone**: Pink (7.5YR 7/3-4).	1.0	22.2
4	**Sandstone channel-fill:** Sand is vfL-vcU, subangular to subrounded, and composed of quartz and minor possible plagioclase, 10% Kspar, 5-7% green quartz + possible Paleozoic grains + mafic minerals. Locally very micaceous and locally cemented. Lithosome B with much lithosome A input. Deposit fines-upward.	2.4	21.2

Unit	Description	Thickness (m) (Unit)	(Total)
	Distal alluvial slope deposits (lithosome A) of the Skull Ridge Member, Tesuque Formation	**18.8**	**18.8**
3	**No. 3 white ash of the Skull Ridge Member: Ash is fresh, shard-rich, and white.**	0.6	18.8
2e	**Intercalated siltstone, silty fine sandstone, and fine sandstone:** Very pale brown (10YR 8/2); thick tabular beds. Sand is vfL-fL and an arkose with 5% muscovite. Well-consolidated. *@ 16.3 m: Place stake B (UTM coordinates of 3979061 N, 410051 E, zone 13, NAD 27). Proceed along-strike at a bearing of 018 degrees and use 0 degree dip, based on a local attitude of N18E\6 degree W.* @14.2 m: Base of 30 cm-thick, medium-gray, shard-rich ash that is internally massive. Upper 3 cm is strongly cemented. Called this 2z-upper ash. @13.4 m: ~10 cm-thick, lenticular strongly cemented bed of ashy(?) vfL-fL sand. To west, this becomes a light gray, shard-rich ash in a channel-fill 0.8 m-deep. Called this the 2z-lower ash bed. @ 13 m: 3 cm-thick bed of sandy (vfL-fL) ash with internal planar-laminations. *@ 12 m: Change dip to 7 degrees west. Bearing is still 290 degrees.*	9.4	18.2
2d	**Fine gray ash over a fine white ash:** Dark gray and shard-rich ash 20 cm-thick; 10 cm below is a 5 cm-thick bed of altered fine white ash. Called it the 2y ash.	0.2	8.8
2c	**Intercalated siltstone, fine sandstone, and silty sandstone:** As in unit 2a.	3.8	8.6
2b	**Fine gray ash:** Medium-gray and shard-rich. Called it the 2x ash.	0.2	4.8
2a	**Intercalated siltstone, fine sandstone, and silty sandstone:** Very pale brown (10YR 8/2-7/3); thin to thick (mostly medium), tabular beds; vague, internal planar-laminations or else internally massive. Sand is vfL-fL, subangular, well sorted, and an arkose. Well consolidated	3.4	4.6
1b	**Gradational zone between ash and overlying sediment**	0.3	1.2
1a	**No. 2 white ash of the Skull Ridge Member:** Altered, fine white ash. *Stake A placed at base of White Ash #2. It has the following UTM coordinates: 3979037 N, 410106 E (+/- 5 m; zone 13; NAD 27). From here, use bearing and dip of 290 degrees and 8 degrees west (from an attitude of N20E\8 degrees W.* **Siltstone:** Light brown (7.5YR 6/4); thin to medium, tabular beds or else massive. Well consolidated.	0.9	0.9

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