

Field Logs of Borehole Drilled for Nested Piezometers,
Sierra Vista West Park Site

Prepared for
City of Albuquerque

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A borehole was drilled at Sierra Vista West Park (Fig. 1) for the purpose of installing nested piezometers. These piezometers will allow monitoring of shallow, intermediate and deep ground-water levels in the Santa Fe Group aquifer. The Sierra Vista well was drilled to a depth of 1650 feet during the month of June 1997; piezometers were installed in July 1997 (Table 1). This well also provides local characterization of the basin-fill aquifer in the central part of the Middle Rio Grande Basin. The Sierra Vista borehole log is submitted to the City of Albuquerque as partial fulfillment of an intergovernmental agreement between the City and the New Mexico Bureau of Mines and Mineral Resources, a division of New Mexico Tech.

Major textural units observed in the Sierra Vista well are graphically summarized in Figure 2. Interpretation of strata intercepted by the well bore is guided by geophysical logs shown in Figure 3. Major textural units have been classified with regard to hydrogeologic units using the system developed by Hawley and others (Hawley and Haase, 1992; Hawley and Whitworth, 1996). Lithologic intervals have been assigned to informal hydrostratigraphic units such as upper Santa Fe (USF) and middle Santa Fe (MSF); basin-fill lithofacies classes (I to X) have also been assigned to the textural units. Descriptions of major textural units are listed in Table 2. Lithofacies assigned to the Sierra Vista well are summarized in Table 3.

Descriptions of cuttings (Table 4) provide general lithologic data necessary to accurately interpret the geophysical logs. Descriptive categories include: 1) dominant texture (relative proportion of gravel, sand and silt/clay), 2) degree of sorting (well sorted = poorly graded), 3) clast angularity, 4) major clast lithologies (listed in order of decreasing abundance) and 5) color of dry sediment (Munsell Color Chart, 1975).

Electrical logs are the preferred method for defining the distribution of low resistivity silt/clay beds and high resistivity fresh-water-bearing sand/gravel beds in the Santa Fe Group aquifer. Unfortunately electrical logging was not performed for the Sierra Vista well. For this interpretation (Fig. 2), silt/clay beds are inferred to occur where moderate to strong gamma peaks are spatially coincident with neutron minima; and further evidence is provided by high percentages of silt/clay recovery in the

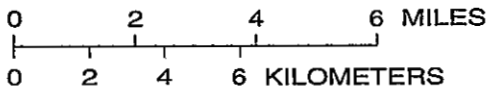
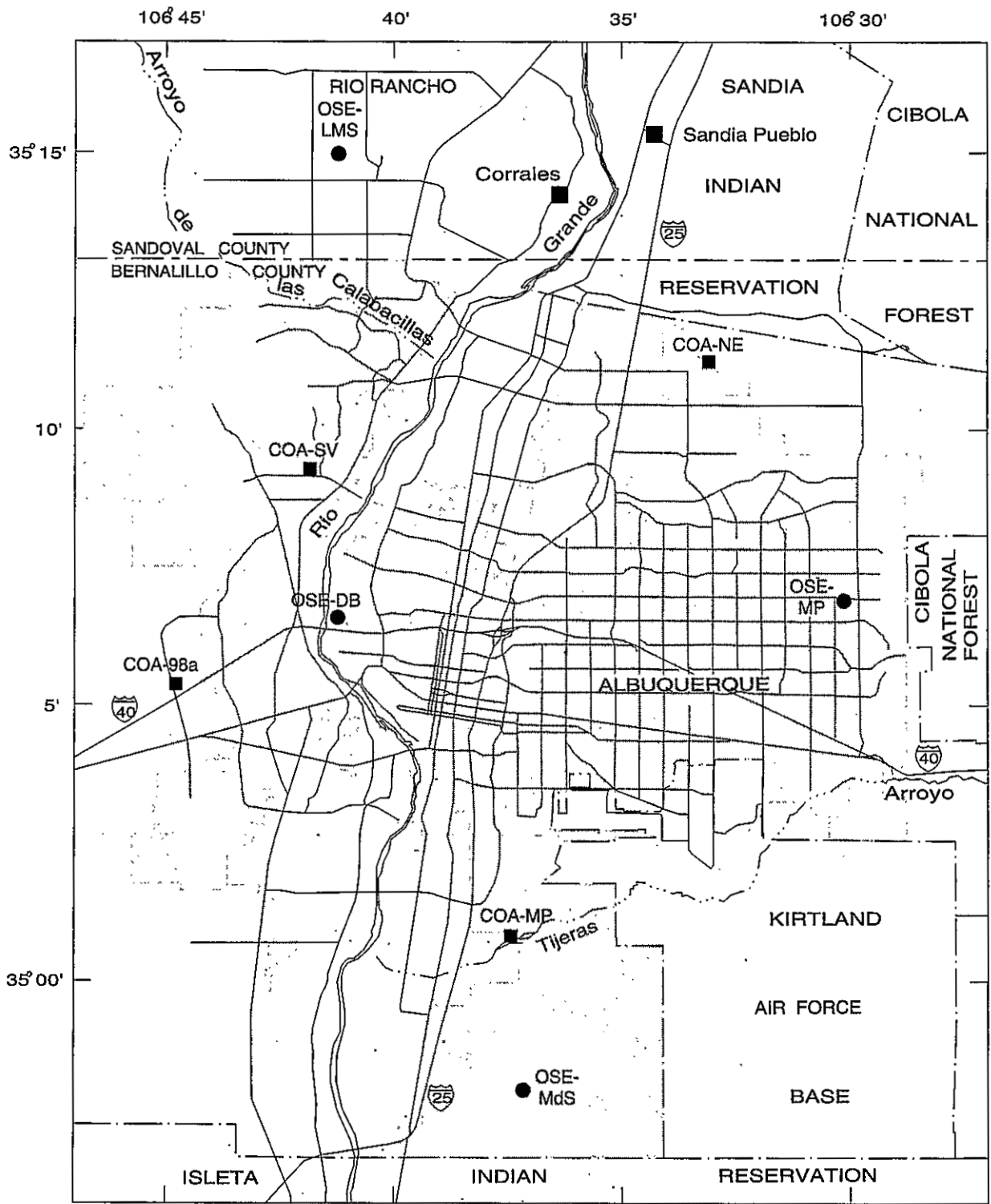
cuttings from this level. Sands and gravels are usually associated with low to moderate gamma counts and high neutron counts. Variations in borehole diameter (see caliper log, Fig. 3) may also influence the amplitude and intensity of the neutron log.

Gamma and neutron curves both show a sharp step-like deflection at a depth of 232 feet (Fig. 3). The apparent sharp increase in gamma radiation downhole suggests an abrupt change in sediment composition. A significant increase in potassium-rich material (i.e. granite and/or rhyolite or U-Th bearing heavy minerals (e.g. zircon and monazite) could produce this gamma response. However, no significant change in the concentration of granitic or rhyolitic material was recognized at this level (232 ft, see Table 4). Neutron logs respond to variations in hydrogen nuclei content, a component unrelated to radioactive minerals. These relationships strongly imply that the apparent geophysical discontinuity at 232 feet most likely represents an unreported and undefined electronic scale change induced by the operator, or a malfunction in the instrumentation.

A second step-like increase in gamma intensity is apparent at a depth of 1395 feet (Fig. 3). The neutron log shows a downhole decrease in amplitude of variation but no significant shift at this level. The apparent increase in radioactivity occurs within a silty sand and silt/clay dominated section of the borehole; thus this response could mostly reflect a downhole increase in the proportion of potassic clays (illite) or fine-grained micas (biotite/muscovite). The clay/silt fraction of the cuttings changes in color from light brown to greenish gray at a depth of 1465 ft, about 70 ft below the gamma shift. These observations tentatively suggest, but do not require, a significant change in sediment composition at 1395 ft, to a more potassic (i.e., granitic?) facies of the Santa Fe Group. If true, this compositional change could reflect a different source area (provenance) for the more potassic sediments.

Representative subsamples of cuttings have been collected to test the above tentative conclusions. These subsamples are from nominal depths of 95, 165, 205, 245, 325, 1315, 1345, 1435, 1474, 1515 and 1595 feet (see Fig. 2). Sandy samples (above 325 ft) are being prepared for petrographic mineral analysis and chemical analysis (major element concentrations, plus U and Th). Clayey samples (below 1315 feet) are being prepared for x-ray analysis to determine the relative proportions (parts in 10) of clay minerals.

The results of these analyses will be provided in a future addendum to this report. Photographs of cuttings, assembled in trays, are provided in an appendix to this report.



Basemap modified from Bexfield, 1998 (Bexfield, L., 1998, Proposed expansion of the city of Albuquerque/U.S. Geological Survey groundwater-level monitoring network for the middle Rio Grande basin, New Mexico: U.S. Geological Survey Open-File Report 97-787, 21p, 2pl.)

Figure 1. Index Map showing location of Sierra West Park monitoring well (COA-SV).

Sierra Vista West Park Monitoring Well

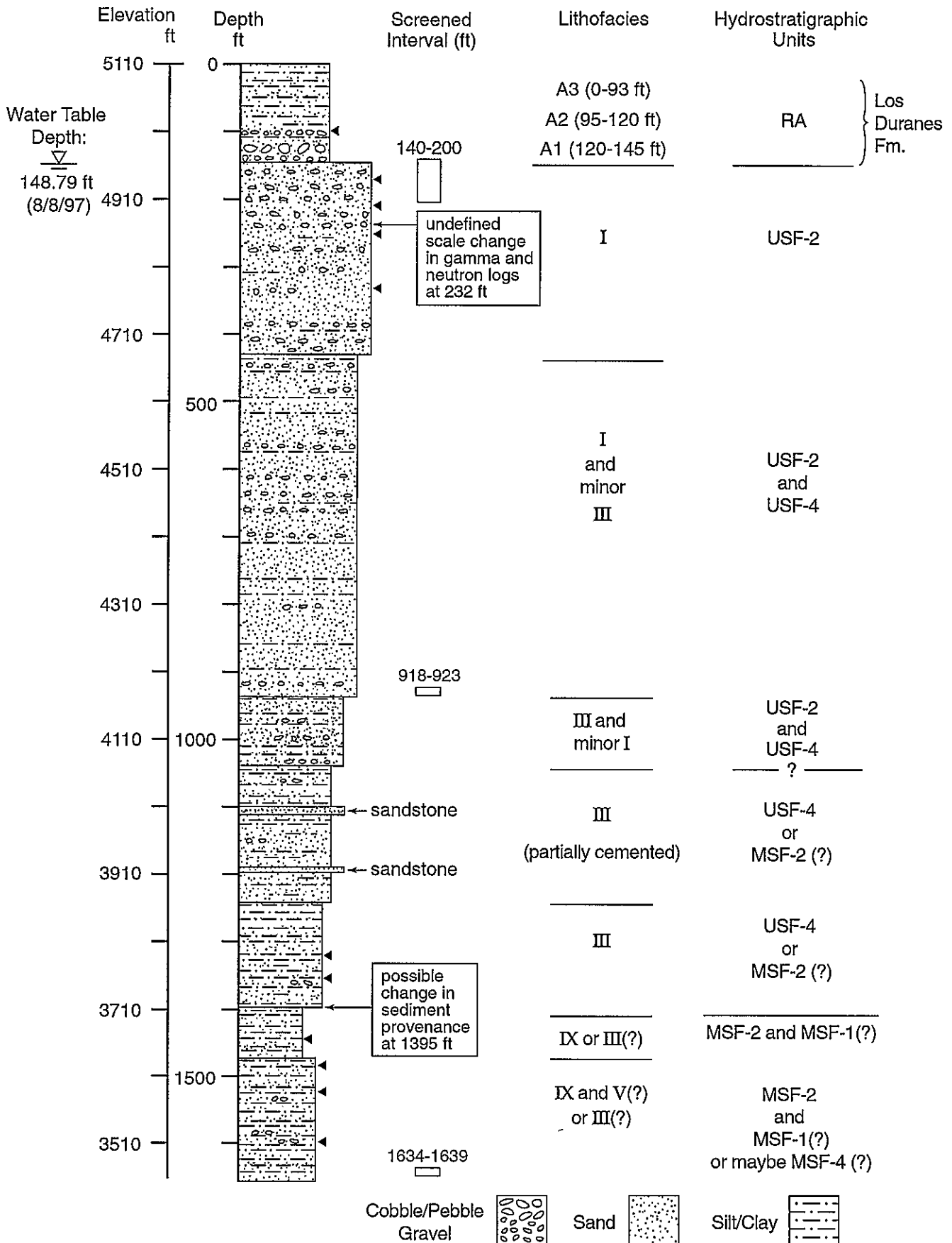
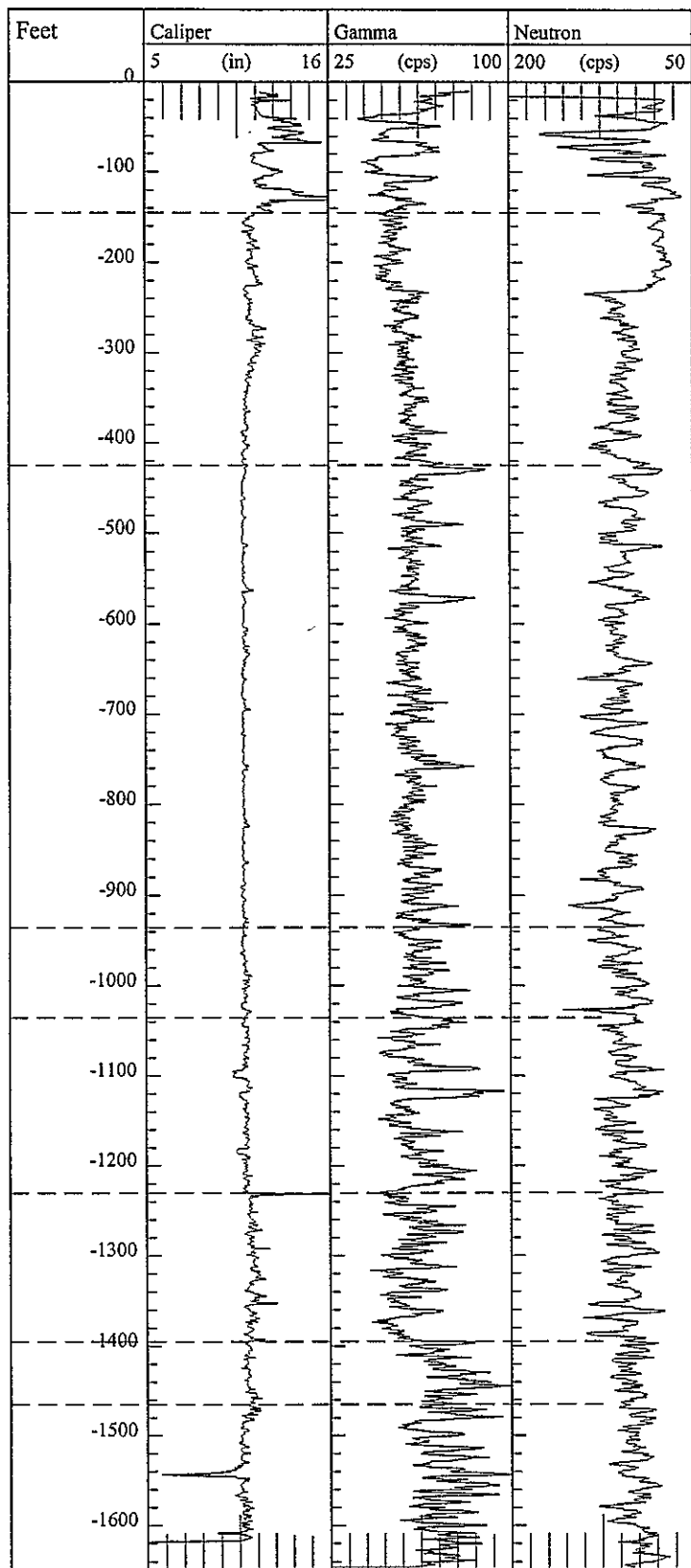


Figure 2. Summary of major textural units, lithofacies, and hydrostratigraphic units, Sierra Vista West Park monitoring well. Screened intervals of piezometers also shown. Small triangles show location of sediment samples collected for mineralogical or chemical analysis (in progress).



Well Name: Sierra Vista Park (COA-USGS)
 File Name: C:\VLWLOGS\SVP\SVP.HDR
 Location: Los Griegos 7.5' Quadrangle
 Elevation: 0 Reference: Ground Surface

Figure 3. Geophysical logs from the Sierra Vista West Park monitoring well. Horizontal lines indicate boundaries between textural units shown in Figure 2.

TABLE 1. Historical data for the Sierra Vista West Park monitoring well.

Location:	T11N, R4E, Section 26, 243 (Lat. 35°09'10"N, Long. 106°41'48"W)
Elevation:	5110 (±10) ft above mean sea level
Project Coordinator:	Conde Thorn (USGS)
Drilling Contractor:	U.S. Geological Survey
Driller:	Dan Sweeney
Date Started:	June 19, 1997
Date Completed:	June 29, 1997 (drilling completed), July 20, 1997 (piezometers installed)
Total Depth:	1650 ft (driller's log)
Water Level:	148.79 (shallow piezometer, 8/8/97)
Screened Intervals:	140–200 ft, 918–923 ft, 1634–1639 ft
Sample Intervals:	mostly 10 ft (some at 5–15 ft)
Geological Logging:	Patricial Jackson (NMBMMR) Michael Heynekamp (NMBMMR) Richard Chamberlin (NMBMMR) Sean Connell (NMBMMR)
Geophysical Logging:	Conde Thorn (USGS) caliper, natural gamma, and neutron
Digital Log Analysis:	Sean Connell (NMBMMR)
Log Synthesis:	Richard Chamberlin (NMBMMR) Sean Connell (NMBMMR)

TABLE 2. Description of major textural units, Sierra Vista West Park monitoring well (City of Albuquerque). Colors represent that of *dry* sediment.

<u>Depth (ft)</u>	<u>Description</u>
0–145	Silty clays (dominant from 0–95 ft), sand and silty clays with minor gravel (95–120 ft), and coarse sands with pebble to cobble gravels (120–145 ft). Brown silty clays (7.5YR-4/4–4/6) and yellowish brown sandy gravels (10YR5/6–4/6). Large amplitude variations in caliper, gamma, and neutron logs respectively reflect: 1) unconsolidated sands and gravels, 2) relatively quartz-rich sands(?) and potassium-rich silty clays (compared to underlying unit), and 3) large range of porosity combined with large borehole washouts. <i>Inset terrace deposit of Rio Grande: Los Duranes Formation (hydrostratigraphic unit RA).</i>
145–425	Pebbly gravel, sandy gravels and coarse- to fine-grained sand beds with rare silt/clay beds. Grayish brown gravels (10YR 5/2), yellowish brown to dark yellowish brown sands (10YR 5/6–4/6), and reddish yellow to strong brown clayey silts (7.5YR 5/6–6/6). <i>Top of upper Santa Fe Group (hydrostratigraphic unit USF-2), probably represents fluvial facies of ancestral Rio Puerco/Jemez River systems.</i> NOTE: Step-like shifts in gamma and neutron curves at 232 feet most likely represent an unreported (and undefined) electronic scale change in the instrumentation. There is no apparent change in sediment composition at this level.
425–935	Sand and granular to pebbly gravel beds (5–40 ft thick) with somewhat rhythmic interbeds of silty clay (1–10 ft thick). Dominantly yellowish brown sand and gravel (10YR 5/4) with light brown to light yellowish brown silty clays (7.5YR 6/4–10YR 6/4). <i>USF-2 and USF-4.</i>

- 935–1035 Fine to coarse sand and rhythmically interbedded silt-clays with minor gravels. Yellowish brown sands and gravels (10YR 5/4) and light brown to light yellowish brown silt/clays. *USF-2 and USF-4*. NOTE: Volcanic clasts become rare to absent below 965 ft.
- 1035–1230 Interbedded sands and silty clays with rare gravel lenses; caliper and drillers logs indicate moderately cemented (friable) sandstone beds at 1095–1102 ft and 1180–1183 ft. Yellowish brown sands (10YR 5/4) and light brown to yellowish brown silty clays (7.5YR 6/4–10YR 6/4). *USF-4 or MSF-2(?)*.
- 1230–1395 Silty clays and thin bedded sands with rare gravel lenses. Caliper log indicates *lesser* degree of cementation than immediately overlying unit; thin sand beds commonly washed out at margins of borehole. Light brown to yellowish brown silty clays (7.5YR 6/4 to 10YR 6/4) and yellowish brown sands (10YR 5/4). *USF-4 or MSF-2(?)*.
- 1395–1465 Silty clays and minor thin bedded sands. Gamma log shows an average increase of approximately 15 cps at top of unit. This suggests that these clays and sands are derived from a more potassium-rich provenance than the overlying unit. Light brown to yellowish brown silty clays (7.5YR 6/4 to 10YR 6/4) and yellowish brown sands (10YR 5/4). *MSF-2 and possibly MSF-1(?)*.
- 1465–1650 Clay and silty clay beds with minor fine to coarse sands and rare gravels. Greenish gray clays (5GY 5/1), light brown to light yellowish brown silty clays (7.5YR 6/4–10YR 6/4), and yellowish brown sands and gravels (10YR5/4). *MSF-2 and MSF-1(?) or MSF-4(?)*. NOTE: Driller reports that rotary bit became jammed (penetration rate near zero) with dense clay at 1480 ft.

TABLE 3. Summary of lithofacies (modified from Hawley and Whitworth, 1996) assigned to major textural units in the Sierra Vista West Park monitoring well.

<u>Lithofacies</u>	<u>Dominant Textural classes</u>	<u>Dominant depositional setting</u>
A	sand, gravel, silt and clay	river-valley fluvial (terrace)
A1	pebble to cobble gravel and sand	basal channel
A2	sand and pebbly sand	braid-plain channel
A3	silty clay, clay and sand	overbank meander-belt oxbow
I	sand and pebble gravel, lenses of silty clay	basin-floor fluvial; braid plain
III	interbedded sand and silty clay; lenses of pebbly sand	basin-floor fluvial deltaic and playa lake (or floodplain), locally eolian
V(?)	gravel, sand, silt and clay; common loamy (sand-silt-clay) mixtures	distal to medial piedmont-slope, alluvial-fan
IX	silty clay interbedded with sand, silty sand and clay	basin-floor playa lake and alluvial flat, distal piedmont alluvial

Table 4: Descriptions of cuttings from the Sierra Vista West Park monitoring well (T11N, R3E Section 26.243).

Note: Colors indicated are for dry sediment. Most, but not all, granitic clasts contain pink alkali feldspar.

Sample No.	Depth Interval (ft)	Description
SVW 1	0-10	Silt (95% silt, 2.5% sand, 2.5% gravel), well sorted. Brown (7.5YR 4/4-4/6).
SVW 2	10-20	Silty clay (95% silt/clay, 2.5% sand, 2.5% gravel), well sorted. Brown (7.5YR 4/4-4/6).
SVW 3	20-35	Silty clay (95% silt/clay, 2.5% sand, 2.5% gravel), well sorted. Brown (7.5YR 4/4-4/6).
SVW 4	35-45	Silty clay (95% silt/clay, 2.5% sand, 2.5% gravel), well sorted. Brown (7.5YR 4/4-4/6).
SVW 5	45-55	Silty clay (95% silt/clay, 2.5% sand, 2.5% gravel), well sorted. Brown (7.5YR 4/4-4/6).
SVW 6	55-65	Silty clay (95% silt/clay, 2.5% sand, 2.5% gravel), well sorted. Brown (7.5YR 4/4-4/6).
SVW 7	65-75	Silty clay (95% silt/clay, 2.5% sand, 2.5% gravel), well sorted. Brown (7.5YR 4/4-4/6).
SVW 8	75-85	Silty clay (95% silt/clay, 2.5% sand, 2.5% gravel), well sorted. Brown (7.5YR 4/4-4/6).
SVW 9	85-95	Silty clay (95% silt/clay, 2.5% sand, 2.5% gravel), well sorted. Brown (7.5YR 4/4-4/6).
SVW 10	95-105	Silty sand (60% sand, 30% silt, 10% gravel), moderately to well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), strong brown sand and gravel (7.5YR 5/6). Quartzite, chert, sandstone, 5% intermediate volcanics, and 5% granite.
SVW 11-12	105-120	Silty clay (90% silt/clay, 5% sand, 5% gravel), well sorted. Brown (7.5YR 4/4-4/6).
SVW 12-13	120-135	Pebbly to coarse gravel (85% gravel, 10% sand, 5% silt), well sorted, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), yellowish brown to dark yellowish brown gravel (10YR 5/6-4/6). 50% Quartzite, 20% chert, 20% sandstone, 5% intermediate volcanics, 5% granite, and trace amounts of rhyolitic volcanics and basalt. Intermediate volcanics are predominantly plagioclase-pyroxene andesite and plagioclase-hornblende-biotite dacite.
SVW 14	135-145	Pebbly to coarse gravel (85% gravel, 10% sand, 5% silt), well sorted, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), yellowish brown to dark yellowish brown gravel (10YR 5/6-4/6). Quartzite, chert, sandstone, intermediate volcanics, granite, and trace amounts of rhyolitic volcanics and basalt.
SVW 15	145-155	Fine sand and gravel (40% gravel, 40% sand, 10% silt), well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics, granite, trace amounts of rhyolitic volcanics.
SVW 16	155-165	Fine sand and gravel (40% gravel, 40% sand, 10% silt), well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics, granite, trace amounts of rhyolitic volcanics.
SVW 17	165-175	Fine sand and gravel (40% gravel, 40% sand, 10% silt), well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics, granite, trace amounts of rhyolitic volcanics.

SVW 18	175-185	Fine sand and gravel (40% gravel, 40% sand, 10% silt), well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics with trace amounts of rhyolitic volcanics, and granite.
SVW 19	185-195	Fine sand and gravel (40% gravel, 40% sand, 10% silt), well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics with trace amounts of rhyolitic volcanics, and granite. NOTE: Below 195 feet there is a break in gravel size. Gravel clasts become smaller in size, 2 mm-4 mm.
SVW 20	195-205	Sandy gravel (65% gravel, 30% sand, 5% silt), moderately to well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics, and 5% granite.
SVW 21	205-215	Sandy gravel (65% gravel, 30% sand, 5% silt), moderately to well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics, and granite.
SVW 22	215-225	Sandy gravel (65% gravel, 30% sand, 5% silt), moderately to well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics, and granite.
SVW 23	225-235	Fine sand and gravel (60% sand, 40% gravel), moderately to well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), yellowish brown to dark yellowish brown sand (10YR 5/6-4/6), and grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics, and 5% granite.
SVW 24	235-245	Sandy gravel (60% gravel, 35% sand, 5% silt), moderately to well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), yellowish brown to dark yellowish brown sand (10YR 5/6-4/6), and grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics, and 5% granite.
SVW 25	245-255	Sandy gravel (60% gravel, 35% sand, 5% silt), moderately to well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Brown silt (7.5YR 4/4-4/6), yellowish brown to dark yellowish brown sand (10YR 5/6-4/6), and grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics, and 5% granite.
SVW 26	255-265	Silt (90% silt, 5% sand, 5% gravel), well sorted. Reddish yellow to strong brown (7.5YR 5/6-6/6).
SVW 27-28	265-280	Silt, gravel and sand mixture (50% silt, 30% gravel, 20% sand), moderately sorted, subangular to subrounded gravel, subangular to rounded sand grains. Reddish yellow to strong brown (7.5YR 5/6-6/6), yellowish brown to dark yellowish brown sand (10YR 5/6-4/6), and grayish brown gravel (10YR 5/2). Quartzite, chert, sandstone, intermediate volcanics, and granite.
SVW 28-29	280-295	Silt (90% silt, 10% sand), well sorted. Brown (7.5YR 5/4).
SVW 30	295-305	Silt (90% silt, 10% sand), well sorted. Brown (7.5YR 5/4).
SVW 31	305-315	Sand (90% sand, 5% silt, 5% gravel), moderately sorted, subrounded to rounded sand grains. Brown silts (7.5YR 5/4) and yellowish brown sand (10YR 5/4).
SVW 32	315-325	Silt (90% silt, 10% sand), well sorted. Brown (7.5YR 5/4).
SVW 33	325-335	Consolidated fine sand (95% sand, 5% silt), well sorted, subrounded to rounded sand grains. Yellowish brown sand (10YR 5/4).

SVW 34	335-345	Consolidated fine sand (95% sand, 5% silt), well sorted, subrounded to rounded sand grains. Yellowish brown sand (10YR 5/4).
SVW 35	345-355	Consolidated fine sand (95% sand, 5% silt), well sorted, subrounded to rounded sand grains. Yellowish brown sand (10YR 5/4).
SVW 36	355-365	Consolidated fine sand (95% sand, 5% silt), well sorted, subrounded to rounded sand grains. Yellowish brown sand (10YR 5/4).
SVW 37	365-375	Consolidated fine sand (95% sand, 5% silt), well sorted, subrounded to rounded sand grains. Yellowish brown sand (10YR 5/4).
SVW 38	375-385	Consolidated fine sand (95% sand, 5% silt), well sorted, subrounded to rounded sand grains. Yellowish brown sand (10YR 5/4).
SVW 39	385-395	Coarse sand (85% sand, 15% gravel) moderately sorted, subangular to subrounded sand and gravel grains. Brownish yellow to yellowish brown (10YR 6/6-5/6). Quartzite, chert, sandstone, granite, intermediate volcanics.
SVW 40	395-405	Coarse sand (85% sand, 15% gravel) moderately sorted, subangular to subrounded sand and gravel grains. Brownish yellow to yellowish brown (10YR 6/6-5/6). Quartzite, chert, sandstone, granite, intermediate volcanics.
SVW 41	405-415	Coarse sand (85% sand, 15% gravel) moderately sorted, subangular to subrounded sand and gravel grains. Brownish yellow to yellowish brown (10YR 6/6-5/6). Quartzite, chert, sandstone, granite, intermediate volcanics.
SVW 42	415-425	Coarse sand (85% sand, 15% gravel) moderately sorted, subangular to subrounded sand and gravel grains. Brownish yellow to yellowish brown (10YR 6/6-5/6). Quartzite, chert, sandstone, granite, intermediate volcanics.
SVW 43-44	425-440	Silty clay (95% clay/silt, 5% gravel), moderately to well sorted. Light brown to light yellowish brown (7.5YR 6/4-10YR 6/4). Quartzite, chert, sandstone, granite, intermediate volcanics.
SVW 44-45	440-450	Gravel, coarse sand and clay (40% gravel, 40% sand, 20% clay), moderately sorted, subangular to subrounded. Light brown to light yellowish brown clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, and trace amounts of basalt and intermediate volcanics.
SVW 45-46	450-465	Sandy clay/silt (75% clay/silt, 20% sand, 5% gravel), moderately sorted, subangular sand grains. Light brown to light yellowish brown clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4).
SVW 47	465-475	Medium to coarse sand (65% sand, 20% gravel, 15% silt), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, and trace basalt.
SVW 48	475-485	Medium to coarse sand (65% sand, 20% gravel, 15% silt), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, and trace basalt.
SVW 49	485-495	Sandy clay/silt mixture (75% clay/silt, 20% sand, 5% gravel), moderately sorted, subangular to subrounded sand and gravel grains. Light brown to light yellowish brown clay/silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 50	495-505	Sandy clay/silt mixture (75% clay/silt, 20% sand, 5% gravel), moderately sorted, subangular to subrounded sand and gravel grains. Light brown to light yellowish brown clay/silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.

SVW 51	505-515	Silty medium to coarse-grained sand (70% sand, 25% silt, 5% gravel), moderately sorted, subangular to rounded grains. (Note: the more rounded grains are the smaller, recycled quartzite grains.) Light brown to light yellowish brown clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, lithic volcanics, and granite.
SVW 52-53	515-530	Clay (80% clay, 10% medium to coarse sand, 10% fine gravel), moderately sorted, subangular to subrounded sand and gravel. Light brown to light yellowish brown clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4).
SVW 53-54	530-545	Silt (85% silt, 10% fine to medium grained sand, 5% gravel), moderately to well sorted, subangular sand grains. Light brown to light yellowish brown (7.5YR 6/4-10YR 6/4).
SVW 55	545-555	Silt (85% silt, 10% fine to medium grained sand, 5% gravel), moderately to well sorted, subangular sand grains. Light brown to light yellowish brown (7.5YR 6/4-10YR 6/4).
SVW 56-57	555-570	Medium to very coarse pebbly sand (65% sand, 20% gravel, 15% silt), moderately sorted, subangular sand and gravel grains. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, intermediate volcanics.
SVW 57-58	570-585	Silt (90% silt with trace clay nodules, 5% coarse sand, 5% gravel), well sorted, subangular to subrounded sand and gravel grains. Light brown to light yellowish brown (7.5YR 6/4-10YR 6/4). Quartzite, chert, granite, intermediate volcanics.
SVW 59	585-595	Silt (90% silt with trace clay nodules, 5% coarse sand, 5% gravel), well sorted, subangular to subrounded sand and gravel grains. Light brown to light yellowish brown (7.5YR 6/4-10YR 6/4). Quartzite, chert, granite, intermediate volcanics.
SVW 60	595-605	Silty coarse to very coarse grained sand and gravel (55% sand, 25% silt, 20% gravel), moderately sorted, subangular to subrounded sand and gravel grains. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite.
SVW 61	605-615	Silty coarse to very coarse grained sand and gravel (55% sand, 25% silt, 20% gravel), moderately sorted, subangular to subrounded sand and gravel grains. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite.
SVW 62	615-625	Silt (75% silt, 15% sand, 10% gravel), moderately sorted, subangular to subrounded sand and gravel. Light brown to light yellowish brown clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4).
SVW 63	625-635	Silty coarse grained sand and gravel (55% sand, 25% silt, 20% gravel), moderately sorted, subangular to subrounded sand and gravel grains. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite.
SVW 64	635-645	Silty fine sand (70% sand, 25% silt, 5% gravel), moderately to well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, lithic volcanics, granite.
SVW 65	645-655	Silty fine sand (70% sand, 25% silt, 5% gravel), moderately to well sorted, subrounded to rounded sand grains, subangular to subrounded gravel clasts. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, intermediate volcanics.
SVW 66-67	655-670	Silt and coarse-grained mixture (60% silt, 30% sand, 10% gravel), moderately sorted, subangular to subrounded sand grains. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, lithic volcanics, granite.
SVW 67-68	670-685	Silty coarse, pebbly sand (55% sand, 25% silt, 20% pebbly gravel), moderately sorted, subangular to rounded sand and gravel. (Note: more rounded grains and clasts are quartzite.) Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite.

SVW 69	685-695	Silty, pebbly sand (55% medium to very coarse sand, 25% silt, 20% pebbly gravel), moderately sorted, subangular to rounded sand grains, subangular to subrounded gravel clasts. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert.
SVW 70	695-705	Silty/clayey coarse sand (65% sand, 25% silt/clay, 10% gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, intermediate volcanics, trace basalt.
SVW 71	705-715	Clayey /silty coarse sand (65% sand, 25% silt/clay, 10% gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, intermediate volcanics, trace basalt.
SVW 72	715-725	Clayey /silty coarse sand (65% sand, 25% silt/clay, 10% gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, intermediate volcanics, trace basalt.
SVW 73	725-735	Silt (80% silt, 15% sand, 5% gravel), moderately sorted, subangular to subrounded sand and gravel. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 74	735-745	Silt (80% silt, 15% sand, 5% gravel), moderately sorted, subangular to subrounded sand and gravel. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 75	745-755	Silt (80% silt, 15% sand, 5% gravel), moderately sorted, subangular to subrounded sand and gravel. Light brown to light yellowish brown silt (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 76-77	755-770	Silty clay (80% clay/silt, 10% sand, 10% gravel), moderately sorted, subangular to subrounded sand and gravel. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 77-78	770-785	Silty/clayey coarse sand (65% sand, 25% silt/clay, <10% gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 79	785-795	Coarse sand & gravel with clay lenses (50% sand, 35% clay, 15 % gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 80	795-805	Coarse sand & gravel with clay lenses (50% sand, 35% clay, 15 % gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 81	805-815	Coarse sand & gravel with clay lenses (50% sand, 35% clay, 15 % gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.

SVW 82	815-825	Coarse sand & gravel with clay lenses (50% sand, 35% clay, 15 % gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 83	825-835	Coarse sand & gravel with clay lenses (50% sand, 35% clay, 15 % gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 84	835-845	Coarse sand & gravel with clay lenses (50% sand, 35% clay, 15 % gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 85	845-855	Coarse sand & gravel with clay lenses (50% sand, 35% clay, 15 % gravel), moderately sorted, subangular to subrounded grains. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 86	855-865	Silty medium to coarse-grained sand (50% silt, 40% sand, 10% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 87	865-875	Silty medium to coarse-grained sand (50% silt, 40% sand, 10% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 88	875-885	Silty medium to coarse-grained sand (50% silt, 40% sand, 10% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 89	885-895	Silty coarse sand and gravel (50% sand, 30% gravel, 20% silt), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 90	895-905	Silty coarse sand and gravel (50% sand, 30% gravel, 20% silt), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 91	905-915	Silty coarse sand and gravel (50% sand, 30% gravel, 20% silt), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 92	915-925	Silty coarse sand and gravel (50% sand, 30% gravel, 20% silt), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 93	925-935	Silty coarse sand and gravel (50% sand, 30% gravel, 20% silt), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.

SVW 94	935-945	Silt with coarse sand (75% silt, 20% sand, 5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 95	945-955	Silt with coarse sand (75% silt, 20% sand, 5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 96	955-965	Medium grained sand (85% sand, 10% silt, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, granite, trace intermediate volcanics.
SVW 97	965-975	Silty fine to medium grained sand (75% sand, 20% silt, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite. Volcanic clasts become very rare to non-existent below 965 feet.
SVW 98	975-985	Sandy clay with some gravel (70% clay, 20% fine sand, 10% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 99	985-995	Sandy clay with some gravel (70% clay, 20% fine sand, 10% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 100	995-1005	Sandy clay with some gravel (70% clay, 20% fine sand, 10% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 101	1005-1015	Sandy clay with some gravel (70% clay, 20% fine sand, 10% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 102	1015-1025	Sandy clay with some gravel (70% clay, 20% fine sand, 10% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 103	1025-1035	Cemented sandy clay and silt (75% clay/silt, 25% fine to medium grained sand), subangular to subrounded grains, moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).
SVW 104	1035-1045	Silty sand and clay (75% silt/clay, 20% sand, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 105	1045-1055	Silty sand and clay (75% silt/clay, 20% sand, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.

SVW 130	1295-1305	Silty sand and clay (75% silt/clay, 20% sand, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 131	1305-1315	Silty sand and clay (75% silt/clay, 20% sand, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 132	1315-1325	Silty sand and clay (75% silt/clay, 20% sand, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 133	1325-1335	Silty sand and clay (75% silt/clay, 20% sand, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 134	1335-1345	Silty sand and clay (75% silt/clay, 20% sand, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 135	1345-1355	Silty sand and clay (75% silt/clay, 20% sand, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 136	1355-1365	Silty sand and clay (75% silt/clay, 20% sand, <5% gravel), subangular to subrounded grains, moderately sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 137	1365-1375	Sandy clay (80% clay, 20% sand), moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).
SVW 138	1375-1385	Sandy clay (80% clay, 20% sand), moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).
SVW 139	1385-1395	Sandy clay (80% clay, 20% sand), moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).
SVW 140	1395-1405	Sandy clay (80% clay, 20% sand), moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).
SVW 141	1405-1415	Sandy clay (80% clay, 20% sand), moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).
SVW 142	1415-1425	Sandy clay (80% clay, 20% sand), moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).
SVW 143	1425-1435	Sandy clay (80% clay, 20% sand), moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).
SVW 144	1435-1445	Sandy clay (80% clay, 20% sand), moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).
SVW 145	1445-1455	Sandy clay (80% clay, 20% sand), moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).

SVW 146	1455-1465	Sandy clay (80% clay, 20% sand), moderately to well sorted. Light brown to light yellowish brown silt/clay (7.5YR 6/4-10YR 6/4) and yellowish brown sand (10YR 5/4).
SVW 147	1465-1475	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 148	1475-1485	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite. NOTE: Driller's log indicates that rotary bit got jammed (penetration rate dropped to 0), dense clay was hit at 1480 feet.
SVW 149	1485-1495	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 150	1495-1505	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 151	1505-1515	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 152	1515-1525	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 153	1525-1535	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 154	1535-1545	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 155	1545-1555	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 156	1555-1565	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 157	1565-1575	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.

SVW 158	1575-1585	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 159	1585-1595	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 160	1595-1610	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 161	1610-1620	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 162	1620-1630	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 163	1630-1640	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.
SVW 164	1640-1650	Green/gray clay with some coarse sand (65% clay, 30% fine to coarse sand, 5% gravel), subangular to angular grains, moderately to well sorted. Light grayish brown to light olive brown silt/clay (2.5YR 5/2-5/3) and yellowish brown sand and gravel (10YR 5/4). Quartzite, chert, and granite.

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- Hawley, J. W., and Haase, C. S., 1992, Hydrogeologic framework of the northern Albuquerque Basin: New Mexico Bureau of Mines and Mineral Resources, Open-file Report 387.
- Hawley, J. W., and Whitworth, T. M., 1996, Hydrogeology of potential recharge areas for the basin- and valley-fill aquifer systems, and hydrogeochemical modeling of proposed artificial recharge of the upper Santa Fe aquifer, northern Albuquerque Basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Open-file Report 402-D, 70 p. and appendices.
- Munsell Soil Color Charts, 1975, Macbeth Division of Kollmorgen Corp., Baltimore, Maryland.

Attachment A

Photologs of dilling samples: Sierra Vista West site (T11N, R3E, S 26.234)

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