

Field boring log for Sandia Pueblo Well  
City of Albuquerque Piezometer Nest  
FY 1998

Prepared for Office of State Engineer

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New Mexico Bureau of Mines and Mineral Resources

Open-file 444-D

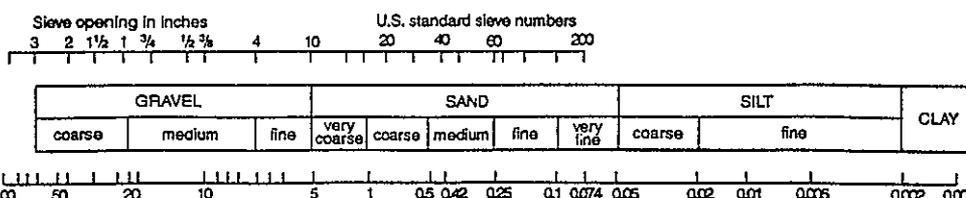
November 1998

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City of Albuquerque Piezometer Nest  
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The following borehole logs were completed for the piezometer nest located on the Sandia Indian Reservation, Sandoval County, New Mexico, in May-June 1998. The logs describe sample intervals, general lithologic characteristics and interpretations, supplemental drilling information, borehole geophysical logging information and limited interpretations, and hydrogeologic interpretations. The lithologic descriptions were made from mud-rotary cuttings taken from the well head. Drilling fluids prevent a complete evaluation of the fine-grained fraction; no sieve testing was conducted. The field lithologic descriptions include the following information:

1. Major textural class;
2. Estimated grain-size distribution by major textural class: silt/clay (<0.05 mm), sand (0.05-2 mm), and gravel (>2 mm);
3. Sorting and range of grain and clast size;
4. Shape of grains and clasts;
5. Clast composition;
6. Color (Munsell, 1992) for <2 mm matrix, unless otherwise noted;
7. Other characteristics and driller's comments.

Hydrogeologic interpretations classify materials according to a system of nomenclature developed for alluvial deposits of continental rift basins of New Mexico (Hawley and Haase, 1992; Hawley and Whitworth, 1996). This system describes major hydrostratigraphic units (RA, TA, VA, PA, USF, MSF, LSF) and component lithofacies (I to X). Deposits described in this borehole are provisionally assigned to Santa Fe Group nomenclature discussed in Connell and others (1998). It is important to note that the lithologic summary provides descriptions based on grain-size characteristics, supplemental information on driller's logs and geophysical logs, whereas, lithofacies and hydrogeologic interpretations are based on several integrated criteria including grain size, clast composition, geographic location within the basin and data from neighboring wells. A summary of lithologic descriptions, hydrostratigraphic interpretations and lithofacies are illustrated in the stratigraphic column (Fig. 1). A detailed log of the field descriptions by 10-foot sample interval is provided in Attachment A. Photographs of cuttings are provided in Attachment B. Borehole geophysical logs (three logs) are included as Attachment C.



## References

- Connell, S.D., Allen, B.D., and Hawley, J.W., 1998, Subsurface stratigraphy of the Santa Fe Group using borehole geophysics, Albuquerque area, central New Mexico: *New Mexico Geology*, v.20, n.1, p.2-7.
- Hawley, J.W., Hasse, C.S., and Lozinsky, R.P., 1995, An underground view of the Albuquerque basin, in *The water future of Albuquerque and middle Rio Grande basin*: New Mexico Water Resources Research Institute, 1994 conference, p.37-55.
- Hawley, J.W., and Whitworth, T.M., eds., 1996, Hydrogeology of potential recharge areas and hydrogeochemical modeling of proposed artificial-recharge methods in basin- and valley-fill aquifer systems, Albuquerque Basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources Open-File Report 402-D, 5 chapters, various appendices and pagination.
- Munsell, 1992, *Soil Color Chart*: New York, Munsell Company, Kollmorgen Instruments Corporation.

Name: Sandia Pueblo Well (SPW)

Location: Section 29, T12N, R04E. <sup>12</sup>(~~13~~N.4E.29.344)  
 Alameda 7.5-minute quadrangle.  
 Pueblo of Sandia Tribal Lands.  
 Latitude: 35° 13' 57" Longitude: 106° 32' 30" (NAD 27)

Elevation: 5435 ft (1657 m), estimated from topographic map

Drilling Method: Mud Rotary

Drillers: Steve Grant, assisted by Brian Bretz, USGS

Drilling Started: April 30, 1998

Drilling Completed: May 31, 1998

Sample Interval: 10 feet

Screened Intervals: 485 to 525 ft (Elev: 4950-4910 ft)  
 1015 to 1020 ft (Elev: 4420-4415 ft)  
 1305 to 1310 ft (Elev: 4130-4125 ft)

Total Depth: 1323 feet (403 m)  
 Bottom Hole Elevation: 4115 ft (1254 m)

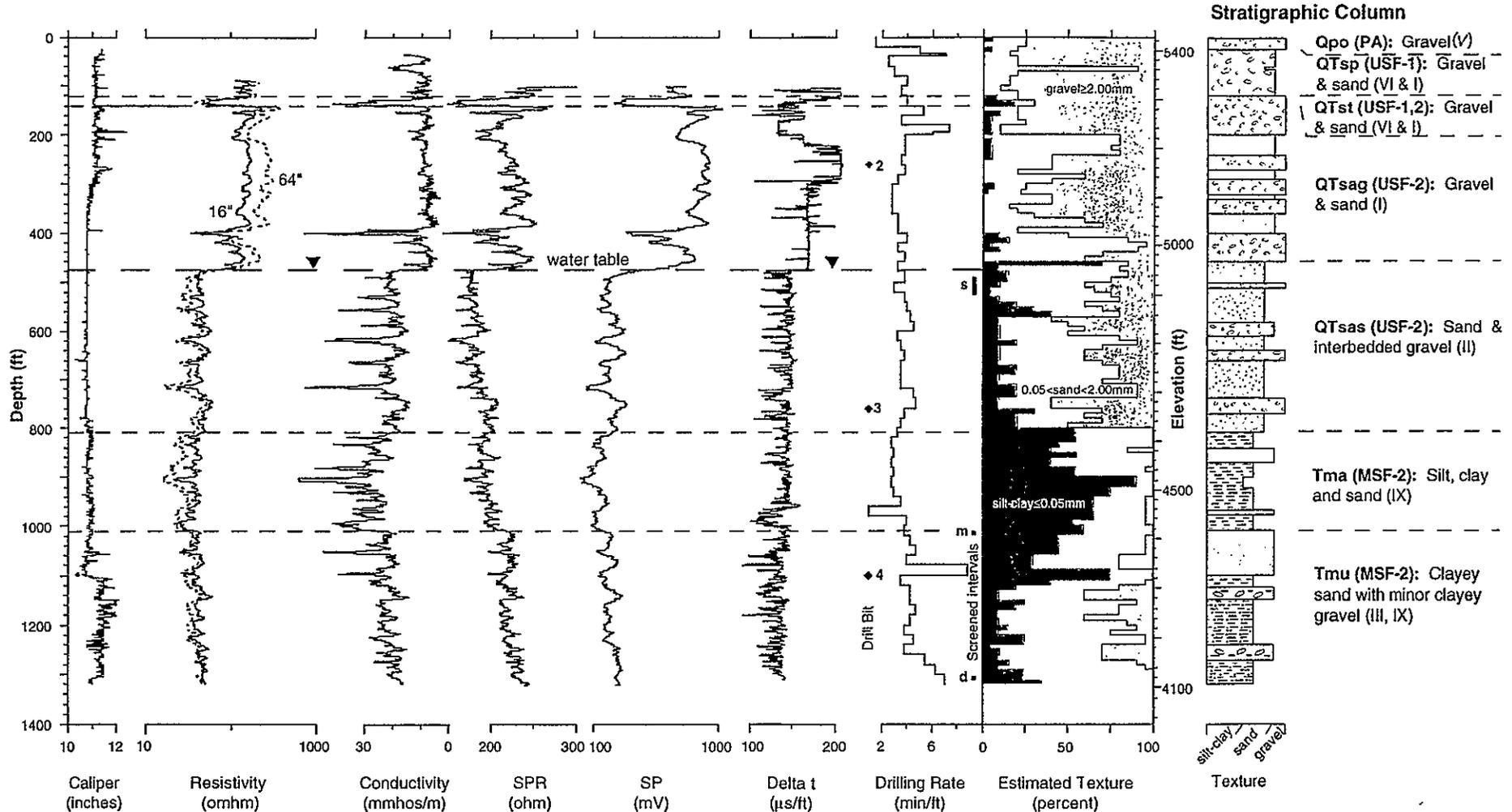
Water Table: 482 ft (Elevation: 4949 ft), based on abrupt increase in  $\Delta t$   
 on acoustic log

Sample Logging: M. Heynekamp & S.D. Connell

Geophysical Logging: U.S. Geological Survey-Water Resources Division (USGS),  
 Albuquerque, New Mexico  
 Southwest Geophysical Services, Inc. (SWGÍ), Farmington,  
 New Mexico

Geophysical Logs: USGS: Caliper, Induction Resistivity (below 400 ft), and  
 Natural Gamma Ray (below 400 ft)  
 SWGI: Spontaneous Potential (SP), Single-Point  
 Resistivity (SPR), Acoustic, Resistivity (16 and 64 inch coil  
 spacing) and Induction Conductivity

# Sandia Pueblo Well (T13N, R4E, Section 29, 344) Alameda 7.5-minute Quadrangle



**Lithologic Summary and Borehole Geophysical Interpretations  
Sandia Pueblo Well Site  
Lithologic Description**

| <b>Depth (ft)</b> | <b>Description (all colors are moist)</b>  |
|-------------------|--|
| <b>0-25</b>       | <u>Quaternary piedmont-slope deposits (Opo)</u><br>GRAVEL (75% gravel, 20% sand, <5% silty-clay): Brown (7.5YR 5/4) to reddish-yellow (7.5YR 6/6), angular to subangular, poorly sorted gravel containing granite, schist, white quartz (aplite) and rare limestone. Clasts are broken and less than 20 mm in diameter.  |
| <b>25-120</b>     | <u>Sierra Ladrones Formation-eastern margin (piedmont) facies (OTsp)</u><br>25-60 GRAVEL (80% gravel, 15-20% sand, 0-5% silt-clay): Brown (7.5YR 5/4 to 4/4) to reddish-yellow (7.5YR 6/6), angular to subangular, moderately to well sorted, fine-grained gravel containing granite, schist, white quartz (aplite) and rare limestone. Clasts are less than 4 mm in diameter.<br>60-70 SAND (10% gravel, 90% sand): Brown (7.5YR 7/4), subangular to subrounded, well sorted, fine-to coarse-grained sand.<br>70-120 GRAVEL (80-90% gravel, 10-20% sand): Brown (7.5YR 5/4 to 4/4), subangular to subrounded, moderately sorted gravel containing granite, schist, white quartz (aplite) and rare limestone. Sand is medium to very coarse grained. Clasts are less than 4 mm in diameter.  |
| <b>120-140</b>    | <u>Sierra Ladrones Formation-transitional fluvial-piedmont facies (OTst)</u><br>GRAVEL (70-80% gravel, 10-20% sand, 0-20% silt-clay): Brown (7.5YR 5/4 to 4/4) to yellowish-brown (10YR 5/4 to 3/4), subangular to rounded gravel containing dominantly quartzite, granite and schist with subordinate silicic volcanic clasts. Missing sample interval: 140-150 ft.   |
| <b>140-800</b>    | <u>Sierra Ladrones Formation-axial-fluvial facies, upper gravel member (OTSag)</u><br>SAND and GRAVEL with minor, thin SILTY to CLAYEY SAND interbeds associated with the ancestral Rio Grande fluvial system. Coarsens upward from the top of the Atrisco member contact. Clasts are dominantly quartzite and silicic to intermediate porphyritic volcanic rocks and basalt with subordinate granite.<br>140-200 GRAVEL and coarse-grained SAND (75-90% gravel, 5-20% sand, 5-10% silt-clay): Brown (7.5YR 4/4) to yellowish-brown (10YR 5/4 to 4/4), subangular to subrounded gravel with interbedded sandy gravel beds. Clasts are broken and contain dominantly quartzite with subordinate red-brown to brown volcanic tuff and basalt. Clasts are up to 20 mm in diameter.<br>200-240 GRAVELLY SAND (20-25% gravel, 75-80% sand, 0-5% silt-clay): Brown to dark yellowish-brown (10YR 4/3 to 4/4) and brown to yellowish-brown (7.5YR 5/4 and 10YR 5/4), fine-to coarse-grained gravelly sand. Clasts are up to 10 mm in diameter. Many clasts are less than 4 mm in diameter.<br>240-270 GRAVEL (60% gravel, 40% sand): Dark yellowish-brown to yellowish-brown (10YR 4/4 to 5/4) rounded to subrounded gravel. Missing sample interval: 250-260 ft. |

- 270-290 SAND and GRAVEL (40-80% gravel, 20-60% sand): Brown to yellowish-brown (10YR 4/4 to 4/3) sandy gravel to gravelly sand.
- 290-320 GRAVEL and coarse-grained SAND (60-75% gravel, 40-25% sand) Brown (7.5YR 5/4 and 10YR 5/3) to yellowish-brown (10YR 4/4) rounded to subrounded quartzite-bearing gravel. Clasts are dominantly quartzite and reddish-brown, brown and greenish-gray volcanic rock with minor granite, chert and sandstone.
- 320-340 GRAVEL (60% gravel, 40% sand): Fine-grained gravel (<5 mm maximum diameter)
- 340-360 GRAVEL and SAND (80-85% gravel, 15-20% sand): Medium-grained gravel (<25 mm maximum diameter).
- 360-410 SAND and GRAVEL (30-80% gravel, 20-70% sand): Light yellowish-brown to dark yellowish-brown (10YR 4/4, 5/3, and 6/4).
- 410-460 SANDY GRAVEL (5-40% gravel, 60-90% sand, 0-15% silt-clay): Brown to yellowish-brown (10YR 5/4, 5/3) sandy gravel.  
Lower sandy member (QTsas)
- 460-500 GRAVELLY to SILTY SAND (15-25% gravel, 15-70% sand, 15-70% silt-clay): Yellowish-brown to dark yellowish-brown (10YR 5/4, 4/3).
- 500-510 GRAVEL (40% gravel, 50% sand, 10% silt-clay): Brown (10YR 5/3, 7.5YR 5/4), subangular to subrounded, fine-grained gravel. Clasts are less than 5 mm maximum diameter.
- 510-580 SILTY to SANDY GRAVEL (20-60% gravel, 30-70% sand, 5-40% silt-clay): Brownish-yellow to dark yellowish-brown (10YR 6/6, 4/4, & 5YR 5/4), subangular to subrounded sand and gravel. Clasts are less than 5 mm maximum diameter.
- 580-610 GRAVEL and SAND (40-50% gravel, 40-50% sand, 10% silt-clay): Grayish-brown to light brown (10YR 5/2, 7.5YR 6/4) gravel and sand. Clasts are less than 5 mm maximum diameter.  
585-590: SILTY SAND TO SANDY SILT BED.
- 610-640 SAND (10-30% gravel, 60-70% sand, 10-20% silt-clay): Light yellowish-brown to grayish-brown (10YR 6/4, 5/2), subangular to subrounded, moderately sorted sand.  
615-645: SILTY SAND to SANDY SILT BED.
- 640-645 GRAVEL (40% gravel, 50% sand, 10% silt-clay): Brown to light-brown (10YR 5/3, 7.5YR 6/4), subangular to subrounded, poorly sorted, fine-grained gravel. Clasts are less than 5 mm maximum diameter.
- 645-740 SAND (10-40% gravel, 60-70% sand, 10-20% silt-clay): Gray-brown to light reddish-brown (10YR 5/3, 5/4, 5YR 5/4, 6/4), subangular to subrounded very-fine to coarse-grained sand.  
660-670: SILTY SAND or SANDY SILT BED.  
710-720: SILTY SAND or SANDY SILT BED.
- 740-765 GRAVEL, small pebble (30-70% gravel, 30-40% sand, 20% silt-clay): Light brown to yellowish brown (10YR 5/3, 5/4, 7.5YR 6/4), subangular to subrounded, fine-grained gravel containing quartzite, granite and chert. Clasts are less than 10 mm maximum diameter.
- 770-800 GRAVELLY SAND (30-50% gravel, 30-50% sand, 20% silt-clay): Light brown to yellowish-brown (10YR 5/3, 5/4, 7.5YR 6/4), subangular to subrounded sand and gravel.
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| <b>800-1010</b> | <u>Atrisco member of middle red formation (Tma)</u><br>SILT and CLAY with minor SAND. Provisionally assigned to the Atrisco member of Connell and others (1998).  |
| 800-840         | SANDY CLAY to CLAYEY SAND (45% sand, 55% silt-clay): Pale brown (10YR 6/3), subangular to subrounded, very fine- to coarse-grained sand.  |
| 840-870         | SILTY CLAY to CLAYEY SAND (45-60% sand, 40-55% silt-clay): Pale brown (10YR 6/3), subangular to subrounded, moderately sorted, fine-grained gravel.   |
| 870-900         | SILTY CLAY to SANDY CLAY (0-5% gravel, 40-45% sand, 55% silt-clay): Pale brown (10YR 6/3), sticky clay to clayey sand with light greenish-gray (5GY 7/1) and gray (10YR 5/1) discontinuous mottles  |
| 900-920         | CLAY (10% sand, 90% silt-clay): Dark gray to brown (7.5YR 4/1, 10YR 5/4, 5/3) very sticky clay. Fine-grained sequence is composed of three prominent clay intervals at 880-885, 890-895, and 900-910 ft. These are recognized by prominent low resistivity (15 to 25 ohmm) and moderately high natural gamma ray (160 to 200 GAPI) log responses. |
| 920-970         | SANDY CLAY (0-5% gravel, 30-35% sand, 65% silt-clay): Gray to yellowish-brown (10YR 5/1, 5/4) sticky, sandy clay.   |
| 980-1010        | SANDY CLAY to CLAYEY SAND (0-5% gravel, 40-45% sand, 55-60% silt-clay): Pale-brown to yellowish-brown (10YR 6/3, 6/4, 5/6) silty to clayey sand.  |

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|                  |   |
|------------------|---|
| <b>1010-1320</b> | <u>Middle red formation: undivided fluvial facies (Tmu)</u><br>SILTY to CLAYEY SAND with minor very small pebble to granule GRAVEL. Clasts are predominantly quartzite, reddish-brown and brown silicic tuff, granite and minor non-vesiculated basalt.   |
| 1010-1100        | CLAYEY SAND TO GRAVELLY CLAY (0-5% gravel, 40-55% sand, 40-60% silt-clay). Yellowish-brown (10YR 5/4 to 5/6) clayey sand to gravelly clay. Clasts are less than 5 mm maximum diameter and composed of quartzite, silicic volcanic rocks, granite and rare basalt. Contains 2 to 5-ft thick clayey sand interbeds. |
| 1100-1120        | SANDY CLAY (0-5% gravel, 55-65% sand, 40-65% silt-clay): Yellowish-brown (10YR 5/4) subangular to subrounded sand. Clasts are <4 mm maximum diameter and include quartzite and volcanic lithologies.  |
| 1120-1150        | SILTY SAND to GRAVELLY SAND (20-40% gravel, 50-60% sand, 10-20% silt/clay): Grayish-brown (10YR 5/2) to brown (10YR 5/3) moderately to well sorted, subangular to subrounded silty sand and muddy gravel. Clasts include quartzite and volcanic lithologies.  |
| 1150-1200        | SILTY SAND to GRAVELLY SAND (10-40% gravel, 50-75% sand, 10-20% silt-clay): Pale-brown (10YR 6/3), moderately to well sorted, subangular to subrounded. Clasts include quartzite, volcanic and granitic lithologies.  |
| 1200-1320        | SILTY to CLAYEY SAND and GRAVEL (0-30% gravel, 60-85% sand, 0-25% silt-clay): Brown (10-7.5YR 5/3), subangular to subrounded, very fine- to medium-grained sand. Clasts contain quartzite, reddish-brown, brown and gray volcanic tuff and basalt, granite and sandstone.   |

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**Hydrogeologic Interpretation  
Sandia Pueblo Well Site**

| Depth (ft) | Hydrostratigraphic Units   | Lithofacies |
|------------|--|-------------|
| 0-25       | Piedmont-slope Alluvium (PA)   | V           |
| 25-120     | Ancestral Sandia Mountains piedmont-slope alluvium<br>(USF-1)  | V, VI       |
| 120-140    | Ancestral river valley and piedmont-slope alluvium:<br>(USF1&2)  | VI,I        |
| 140-460    | Ancestral river valley and basin-floor deposits, gravel<br>dominated: (USF-2)  | I           |
| 460-800    | Ancestral river valley and basin-floor deposits, sand<br>dominated: (USF-2)  | II          |
| 800-1010   | Ancestral basin-floor deposits, dominantly silt-clay with<br>interbedded sand: (MSF-2)   | IX          |
| 1010-1320  | Ancestral basin-floor and river valley deposits,<br>dominantly silty to clayey sand with interbedded granule<br>gravel and sand interbeds. (MSF-2) | III, IX     |

Note: The identification of lithofacies units is interpretive and based on several criteria, including texture, composition (provenance), and geographic location of the described sample within the basin. The interpretation of lithofacies is tentative and preliminary due to the limitations of the data and the fact that correlation to adjacent wells has not been fully established; accordingly, these lithofacies interpretations are subject to revision.

**Attachment A**  
**Field Lithologic Descriptions**  
**Sandia Pueblo Well (T13N, R4E, Section 29.344)**

| Sample No. | Depth Interval (ft) | Description   |
|------------|---------------------|---|
| SPW-1      | 0-10                | Gravel (75% gravel, 20% sand, <5% silt/clay); moderately to poorly sorted, angular. Granite, schist, and aplite clasts. Reddish yellow (7.5YR 6/6) silt/clay; brown (7.5YR 5/4) sand. Driller's log: 0-5 ft: cobble sand; 5-10 ft: sand, gravel.  |
| SPW-2      | 10-20               | Gravel (75% gravel, 25% sand); moderately sorted, subangular sand, and angular gravel. Granite, schist, and aplite clasts. Strong brown (7.5YR 5/6). Driller's log: sand, small gravel.   |
| SPW-3      | 20-30               | Gravel (80% gravel, 15% sand <5% silt/clay); moderately to well sorted, angular to subangular. Granite, schist, and aplite clasts. Reddish-yellow (7.5YR 6/6) silt/clay; brown (7.5YR 4/4) sand. Driller's log: 20-25 ft: sand, small gravel; 25-30 ft: sand, sandy clay.   |
| SPW-4      | 30-40               | Gravel (85% gravel, 15% sand); moderately to well sorted, angular to subangular. Granite, schist, and aplite clasts. Brown (7.5YR 5/4). Light gray concrete chips from grout used to set surface casing. Driller's log: 30-35 ft: sand, coarse sand, gravel.  |
| SPW-5      | 40-50               | Gravel (80% gravel, 20% sand); well sorted, angular to subangular. Granite, aplite, and schist clasts. Brown (7.5YR 5/4). Driller's log: sand, gravel, coarse sand.   |
| SPW-6      | 50-60               | Same as above. Driller's log: sand, gravel, coarse sand.  |
| SPW-7      | 60-70               | Sand (90% sand, 10% gravel); well sorted, angular to subangular. Granite, aplite, schist, and limestone clasts. Brown (7.5YR 5/4). Silt- or clay-rich bed at 62 ft. Driller's log: sand, coarse sand.   |
| SPW-8      | 70-80               | Gravel (80% gravel, 20% sand); angular to subangular. Granite, aplite, schist, and limestone clasts. Brown (7.5YR 5/5). Driller's log: sand, coarse sand, gravel.   |
| SPW-9      | 80-90               | Gravel (85% gravel, 15% sand); well sorted, angular to subangular. Granite, schist, and aplite clasts. Brown (7.5YR 5/4). Driller's log: sand, coarse sand, gravel.   |
| SPW-10     | 90-100              | Same as above. Driller's log: sand, coarse sand, gravel.  |
| SPW-11     | 100-110             | Gravel (90% gravel, 10% sand); moderately to well sorted, angular to subangular. Granite and schist clasts. Brown (7.5YR 5/2). Driller's log: sand, coarse sand, gravel.  |
| SPW-12     | 110-120             | Gravel (80% gravel, 20% sand); moderately to well sorted, angular to subangular. Granite and schist clasts. Brown (7.5YR 4/2). Driller's log: sand, coarse sand, gravel.  |
| SPW-13     | 120-130             | Gravel (80% gravel, 10% sand, 10% silt/clay); moderately sorted, angular to subangular (sand), subangular to rounded (gravel). Granite, schist, and quartzite clasts. Yellowish-brown (10YR 5/4) silt/clay; brown (7.5YR 5/4) sand. Rounded quartzite clasts mark top of ancestral Rio Grande fluvial facies. Driller's log: 120-125 ft: coarse sand, gravel; 125-130 ft: sand, silty clay. |

| Sample No. | Depth Interval (ft) | Description  |
|------------|---------------------|--|
| SPW-14     | 130-140             | (70% gravel, 20% silt/clay, 10% sand); moderately to well sorted, subangular. Granite, schist, quartzite, and chert clasts. Dark yellowish-brown (10YR 3/4) silt/clay; brown (7.5YR 4/4) sand. Driller's log: 130-135 ft: sand, silty; 135-140 ft: silty clay, gravel, small cobble.   |
| SPW-15     | 140-150             | No sample. Driller's log: 140-145 ft: coarse sand, gravel; 145-150 ft: gravel, small cobble.   |
| SPW-16     | 150-160             | Gravel (80% gravel, 10% sand, 10% silt/clay); well sorted, subangular to subrounded (sand), subangular (gravel). Granite, basalt, sandstone, quartzite, and schist clasts. Yellowish-brown (10YR 5/4) silt/clay; brown (7.5YR 4/4) sand. Driller's log: 150-155 ft: gravel, coarse sand, silty clay; 145-150 ft: gravel, coarse sand, small cobble.            |
| SPW-17     | 160-170             | Gravel (80% gravel, 15% sand, 5% silt/clay); well sorted, angular to subangular. Quartzite, schist, granite, and basalt clasts. Yellowish-brown (10YR 5/4) silt/clay; brown (7.5YR 4/4) sand. Driller's log: 160-165 ft: cobble, coarse sand; 165-170 ft: coarse sand, sand, sandy clay.   |
| SPW-18     | 170-180             | Sandy gravel (75% gravel, 20% sand, 5% silt/clay); well sorted, angular to subangular (sand), subrounded to rounded (gravel). Quartzite, schist, granite, and basalt clasts. Yellowish-brown (10YR 5/4) silt/clay; brown (7.5YR 4/4) sand. Driller's log: 170-175 ft: coarse sand, sand, sandy clay; 175-180 ft: gravel, coarse sand.                          |
| SPW-19     | 180-190             | Gravel (90% gravel, 5% sand, 5% silt/clay); well sorted, angular to subangular (sand), subrounded to rounded (gravel). Quartzite, schist, granite, silicic (reddish-brown)-volcanic, and basalt clasts. Yellowish-brown (10YR 5/6) silt/clay; brown (7.5YR 4/4) sand. Driller's log: 180-185 ft: coarse sand, gravel; 185-190 ft: gravel, cobble, coarse sand. |
| SPW-20     | 190-200             | Gravel (90% gravel, 5% sand, 5% silt/clay); well sorted, angular to subangular sand, and subrounded to rounded gravel. Schist, quartzite, granite, and silicic (reddish-brown)-volcanic clasts. Yellowish-brown (10YR 5/6) silt/clay; brown (7.5YR 4/4) sand. Driller's log: gravel, cobble, coarse sand.  |
| SPW-21     | 200-210             | Sandy gravel (80% sand, 20% gravel); well sorted, angular to subangular sand, and subangular to subrounded gravel. Volcanic (andesite), quartzite, and granite clasts. Brown (10YR 4/3). Driller's log: 200-205 ft: gravel, coarse sand; 205-210 ft: sand, silty clay.   |
| SPW-22     | 210-220             | Sandy gravel (75% sand, 20% gravel, 5% silt/clay); well sorted, angular to subangular sand, and subrounded gravel. Quartzite, granite, and schist clasts. Brown (7.5YR 5/4 and 10YR 4/3). Driller's log: sand, silty clay.   |
| SPW-23     | 220-230             | Sandy gravel (70% sand, 25% gravel, 5% silt/clay); well sorted, angular to subangular sand, and subrounded gravel. Quartzite, granite, and schist clasts. Yellowish-brown (10YR 5/4) silt/clay; brown (10YR 4/3) sand. Driller's log: 220-225 ft: coarse sand, silty clay; 225-230 ft: small gravel, silty clay.   |
| SPW-24     | 230-240             | Sandy gravel (75% sand, 20% gravel, <5% silt/clay); well sorted, angular to subangular sand, and subangular to subrounded gravel. Quartzite, andesite, granite, and schist clasts. Yellowish-brown (10YR 5/4) silt/clay; dark yellowish-brown (10YR 4/4) sand. Driller's log: 230-235 ft: sand, coarse sand; 235-240 ft: coarse sand, silty clay, gravel.      |

| Sample No. | Depth Interval (ft) | Description   |
|------------|---------------------|---|
| SPW-25     | 240-250             | Sandy gravel (60% gravel, 40% sand, 5% silt/clay); moderately to well sorted, angular to subangular sand, and subrounded to rounded gravel. Quartzite, granite, schist, and chert clasts. Yellowish-brown (10YR 5/4) silt/clay; dark yellowish-brown (10YR 4/4) sand. Driller's log: coarse sand, sandy clay. |
| SPW-26     | 250-260             | No sample. Driller's log: 250-255 ft: coarse sand, sandy clay; 255-260: gravel, coarse sand.  |
| SPW-27     | 260-270             | Sandy gravel (60% gravel, 40% sand); well sorted, angular sand, and subrounded to rounded gravel. Quartzite, basalt, and granite clasts. Dark yellowish-brown (10YR 4/4). Driller's log: 260-265 ft: sand, coarse sand; 265-270 ft: gravel.   |
| SPW-28     | 270-280             | Gravel (80% gravel, 20% sand); well sorted, angular sand, and subangular to subrounded gravel. Quartzite, schist, and granite clasts. Dark yellowish-brown (10YR 4/4). Driller's log: 270-275 ft: gravel, coarse sand; 275-280 ft: sand, sandy clay, coarse sand.   |
| SPW-29     | 280-290             | Sandy gravel (60% sand, 40% gravel); moderately to well sorted, subangular sand, and subangular to subrounded gravel. Quartzite, andesite, and schist clasts. Brown (10YR 4/3). Driller's log: coarse sand, sand.   |
| SPW-30     | 290-300             | Sandy gravel (60% gravel, 40% sand); moderately to well sorted, subangular sand, and subrounded to rounded gravel. Granite, andesite, basalt, volcanic, and quartzite clasts. Brown (10YR 4/3). Abundant volcanic clasts. Driller's log: 290-295 ft: coarse sand, gravel; 295-300 ft: gravel, coarse sand.    |
| SPW-31     | 300-310             | Gravel (75% gravel, 20% sand, 5% silt/clay); well sorted, angular, subrounded to rounded. Quartzite and granite clasts. Brown (7.5YR 5/4) silt/clay; dark yellowish-brown (10YR 4/4) sand. Driller's log: 300-305 ft: sand, coarse sand; 305-310: sand, coarse sand with sandy clay.                          |
| SPW-32     | 310-320             | Gravel (75% gravel, 20% sand, 5% silt/clay); moderately to well sorted, subangular sand, and subrounded gravel. Granite, quartzite, and schist clasts. Yellowish-brown (10YR 5/4) silt/clay; brown (10YR 5/3) sand. Driller's log: sand, small gravel.  |
| SPW-33     | 320-330             | Sandy gravel (60% gravel, 40% sand); well sorted, subangular sand, and subrounded to rounded gravel. Granite, quartzite, and schist clasts. Brown (10YR 5/3). Driller's log: sand, gravel.  |
| SPW-34     | 330-340             | Sandy gravel (60% gravel, 40% sand); well sorted, angular to subangular sand, and subrounded to rounded gravel. Quartzite, granite, schist, and basalt clasts. Brown (10YR 5/3). Driller's log: 330-335 ft: sand, gravel; 335-340 ft: sand, gravel, cobble.   |
| SPW-35     | 340-350             | Gravel (85% gravel, 15% sand); well sorted, angular to subangular sand, and rounded gravel. Quartzite and granite clasts. Dark yellowish-brown (10YR 4/4). Driller's log: 340-345 ft: gravel, coarse sand; 345-350 ft: gravel, coarse sand, silty clay.   |
| SPW-36     | 350-360             | Gravel (80% gravel, 20% sand); well sorted, angular sand, and subrounded gravel. Quartzite, granite, and chert clasts. Brown (10YR 4/3). Driller's log: coarse sand, sandy clay.  |
| SPW-37     | 360-370             | Gravel (70% gravel, 30% sand); well sorted, angular sand, and subrounded to rounded gravel. Quartzite, granite, and chert. Dark yellowish-brown (10YR 4/4). Driller's log: 360-365 ft: sand, coarse sand; 365-370 ft: gravel coarse sand.   |

| Sample No. | Depth Interval (ft) | Description  |
|------------|---------------------|--|
| SPW-38     | 370-380             | Sandy gravel (60% sand, 40% gravel); well sorted, angular sand, and subrounded to rounded gravel. Granite, quartzite, and chert clasts. Dark yellowish-brown (10YR 4/4). Driller's log: coarse sand, sandy clay, sand.   |
| SPW-39     | 380-390             | Gravel (70% sand, 30% gravel); well sorted, angular sand, and subangular to subrounded gravel. Granite, quartzite, and chert clasts. Dark yellowish-brown (10YR 4/4). Driller's log: coarse sand, sandy clay.  |
| SPW-40     | 390-400             | Gravel (80% gravel, 20% sand); well sorted, angular sand, and subangular to subrounded gravel. Silicic (reddish-brown)-volcanic, andesite, quartzite, and granite clasts. Dark yellowish-brown (10YR 4/4). Driller's log: 390-395: coarse sand, sandy clay; 395-400 ft: coarse sand, sandy clay, gravel.   |
| SPW-41     | 400-410             | Sandy gravel (50% gravel, 40% sand, 10% silt/clay); well sorted, angular sand, and subangular to subrounded gravel. Quartzite, chert, silicic-volcanic, granite, and andesite clasts. Light yellowish-brown (10YR 6/4) silt/clay; brown (10YR 5/3) sand. Driller's log: 400-405 ft: sand, silty clay; 405-410 ft: sand, sandy clay               |
| SPW-42     | 410-420             | Sand (70% sand, 15% gravel, 15% silt/clay); well to moderately sorted, angular sand, and subangular to subrounded gravel. Quartzite and granite clasts. Yellowish-brown (10YR 5/4) silt/clay; brown (10YR 5/3) sand. Driller's log: sand, sandy clay.  |
| SPW-43     | 420-430             | Gravel (90% sand, 5% gravel, 5% silt/clay); moderately sorted, angular sand, and subrounded gravel. Quartzite and granite clasts. Light yellowish-brown (10YR 6/4) silt/clay; dark yellowish-brown (10YR 4/4) sand. Driller's log: sand, sandy clay.   |
| SPW-44     | 430-440             | Sand (80% sand, 10% gravel, 10% silt/clay); moderately to well sorted, angular sand, and subangular to subrounded gravel. Quartzite and granite clasts. Yellowish-brown (10YR 5/4) silt/clay; brown (10YR 5/3) sand. Driller's log: sand, sandy clay.  |
| SPW-45     | 440-450             | Gravelly sand (70% sand, 30% gravel); well to moderately sorted, angular sand, and well sorted, subangular to subrounded gravel. Granite, quartzite, and chert clasts. Brown (10YR 5/3). Possible clasts of volcanic ash. Driller's log: sand, sandy clay, coarse sand.  |
| SPW-46     | 450-460             | Gravelly sand (60% sand, 40% gravel); well sorted, angular to subangular sand, and well sorted, subrounded to rounded (gravel). Quartzite, granite, and chert clasts. Brown (10YR 5/3). Driller's log: 450-455 ft: sand, sandy clay; 455-460 ft: sand, sandy clay, gravel.   |
| SPW-47     | 460-470             | Sandy to gravelly silt and clay (70% silt/clay, 15% sand, 15% gravel); well sorted, angular to subangular sand, and subrounded to rounded gravel. Quartzite, granite, and chert. Yellowish-brown (10YR 5/4) silt/clay; dark yellowish-brown (10YR 4/4) sand. Driller's log: 460-465 ft: sand, gravel, sandy clay; 465-470 ft: sand, coarse sand. |
| SPW-48     | 470-480             | Gravelly sand (70% sand, 20% gravel, 10% silt/clay); well to moderately sorted, angular to subangular sand, and subangular to subrounded gravel. Quartzite, granite, and chert clasts. Brown (7.5YR 5/4) silt/clay; brown (10YR 4/3) sand. Driller's log: 470-475 ft: sand, coarse sand; 475-480 ft: sand, coarse sand with sandy clay.          |

| Sample No. | Depth Interval (ft) | Description   |
|------------|---------------------|---|
| SPW-49     | 480-490             | Silty to gravelly sand (70% sand, 15% gravel, 15% silt/clay); well to moderately sorted, angular sand, and subangular to subrounded gravel. Quartzite, granite, and chert. Brown (10YR 5/3). Water table at 482 ft. Driller's log: 480-485 ft: sand, sandy clay; 485-490 ft: sand, sandy clay, gravel.  |
| SPW-50     | 490-500             | Gravelly to silty sand (60% sand, 25% gravel, 15% silt/clay); well to moderately sorted, angular sand, and subangular to subrounded gravel. Quartzite, granite, and chert clasts. Brown (7.5YR 5/4) silt/clay; brown (10YR 5/3) sand. Driller's log: sand, sandy clay, gravel.  |
| SPW-51     | 500-510             | Gravelly sand (50% sand, 40% gravel, 10% silt/clay); moderately sorted, angular sand, and subangular to subrounded gravel. Quartzite, granite, and chert clasts. Brown (7.5YR 5/4 and 10YR 5/3). Driller's log: 500-505 ft: sand, coarse sand, sandy clay; 505-510 ft: sand, coarse sand.   |
| SPW-52     | 510-520             | Gravelly sand (60% sand, 35% gravel, 5% silt/clay); well to moderately sorted, angular sand, and subrounded to rounded gravel. Quartzite, granite, and chert clasts. Brown (7.5YR 5/4 and 10YR 5/3). Driller's log: 510-515 ft: sand, coarse sand; 515-520 ft: sand, coarse sand, gravel.   |
| SPW-53     | 520-530             | Gravelly sand (70% sand, 25% gravel, 5% silt/clay); moderately sorted, angular sand, and subrounded gravel. Quartzite, granite, and chert clasts. Brown (7.5YR 5/4) silt/clay; dark yellowish-brown (10YR 4/4) sand. Driller's log: 520-525 ft: sand, coarse sand; 525-530 ft: sand, coarse sand, silty clay.   |
| SPW-54     | 530-540             | Gravelly sand (70% sand, 20% gravel, 10% silt/clay); moderately to well sorted, angular sand, and subangular to subrounded gravel. Granite, quartzite, and chert clasts. Brownish-yellow (10YR 6/6) silt/clay; dark yellowish-brown (10YR 4/4) sand. Driller's log: 530-535 ft: sand, coarse sand, silty clay; 535-540 ft: sand, coarse sand with sandy clay. |
| SPW-55     | 540-550             | Silty sand and gravel (40% gravel, 40% sand, 20% silt/clay); moderately to well sorted, angular sand, and subangular to rounded gravel. Quartzite, granite, and chert clasts. Brown (7.5YR 5/4) silt/clay; yellowish-brown (10YR 5/4) sand. Driller's log: coarse sand, sandy clay.   |
| SPW-56     | 550-560             | Gravelly to silty sand (40% sand, 30% gravel, 30% silt/clay); moderately sorted, subangular sand, and subrounded to rounded gravel. Quartzite, granite, schist, and chert. Light reddish-brown (5YR 6/4) silt/clay; yellowish-brown (10YR 5/4) sand. Driller's log: 550-555 ft: coarse sand, sandy clay, silty clay; 555-560 ft: sand, coarse sand.           |
| SPW-57     | 560-570             | Gravelly sand and silt/clay (40% sand, 40% silt/clay, 20% gravel); moderately sorted, angular sand, and subrounded to rounded gravel. Quartzite, granite, chert, and schist. Light reddish-brown (5YR 6/4) silt/clay; brown (10YR 5/3) sand. Driller's log: 560-565 ft: sand, coarse sand, silty clay; 565-570 ft: small gravel, coarse sand.                 |
| SPW-58     | 570-580             | Sandy gravel (60% gravel, 30% sand, 10% silt/clay); moderately to well sorted, angular sand, and subangular to subrounded gravel. Quartzite, granite, and schist. light-brown (7.5YR 6/4) silt/clay; brown (10YR 5/3) sand. Driller's log: small gravel, coarse sand, sandy clay.   |

| Sample No. | Depth Interval (ft) | Description   |
|------------|---------------------|---|
| SPW-59     | 580-590             | Sandy gravel (50% gravel, 40% sand, 10% silt/clay); moderately sorted, angular sand, and subangular to subrounded gravel. Quartzite, granite, and schist clasts. Light-brown (7.5YR 6/4) silt/clay; brown (10YR 5/4) sand. Driller's log: 580-585 ft: coarse sand, sand; 585-590 ft: coarse sand, sand, sandy clay.               |
| SPW-60     | 590-600             | Sandy gravel (50% gravel, 40% sand, 10% silt/clay); moderately sorted, angular sand, and subangular to subrounded gravel. Quartzite, granite, and schist clasts. Light-brown (7.5YR 6/4) silt/clay; grayish-brown (10YR 5/2) sand. Driller's log: 590-595 ft: coarse sand, sand, sandy clay; 595-600 ft: coarse sand, sand.       |
| SPW-61     | 600-610             | Sandy gravel (50% gravel, 40% sand, 10% silt/clay); well to moderately sorted, angular sand, and subangular to subrounded gravel. Quartzite, granite, schist, and chert clasts. Light-brown (7.5YR 6/4) silt/clay; brown (10YR 5/3) sand. Driller's log: sand, coarse sand, silty clay.   |
| SPW-62     | 610-620             | Gravelly sand (70% sand, 20% gravel, 10% silt/clay); moderately to well sorted, angular sand, and subrounded to rounded gravel. Quartzite, granite, and schist clasts. Light reddish-brown (5YR 6/4) silt/clay; brown (10YR 5/3) sand. Driller's log: 610-615 ft: sand, silty clay; 615-620 ft: sand, coarse sand, sandy clay.    |
| SPW-63     | 620-630             | Gravelly sand (70% sand, 20% gravel, 10% silt/clay); moderately to well sorted, angular sand, and subrounded to rounded gravel. Quartzite, granite, and schist clasts. Light reddish-brown (5YR 6/4) silt/clay; brown (10YR 5/3) sand. Driller's log: 620-625 ft: sand, coarse sand, clay; 625-630 ft: sand, silty clay.          |
| SPW-64     | 630-640             | Gravelly sand (60% sand, 30% gravel, 10% silt/clay); moderately sorted, angular to subangular sand, and subangular to subrounded gravel. Quartzite, granite, and schist clasts. Light yellowish-brown (10YR 6/4) silt/clay; grayish-brown (10YR 5/2) sand. Driller's log: 630-640 ft: sand, coarse sand, sandy clay.              |
| SPW-65     | 640-650             | Gravelly sand (50% sand, 40% gravel, 10% silt/clay); well to moderately sorted, angular to subangular sand, and subangular to subrounded gravel. Quartzite, granite, and schist clasts. Light-brown (7.5YR 6/4) silt/clay; brown (10YR 5/3) sand. Driller's log: 640-645 ft: sand, coarse sand; 645-650 ft: same with sandy clay. |
| SPW-66     | 650-660             | Gravelly sand (50% sand, 40% gravel, 10% silt/clay); moderately to well sorted, angular sand, and subrounded to rounded gravel. Quartzite, granite, chert, and schist clasts. Light reddish-brown (5YR 6/4) silt/clay; brown (10YR 5/3) sand. Driller's log: 650-660 ft: sand, coarse sand with sandy clay.                       |
| SPW-67     | 660-670             | Gravelly sand (60% sand, 30% gravel, 10% silt/clay); well sorted, angular sand, and subrounded to rounded gravel. Quartzite, granite, chert, and schist clasts. Reddish-brown (5YR 5/4) silt/clay; brown (10YR 5/3) sand. Driller's log: 660-665 ft: sand, coarse sand; 665-670 ft: sand, silty clay                              |
| SPW-68     | 670-680             | Gravelly sand (60% sand, 20% gravel, 20% silt/clay); well sorted, angular sand, and subangular to subrounded gravel. Quartzite and granite clasts. Reddish-brown (5YR 5/4) silt/clay; yellowish-brown (10YR 5/4) sand. Driller's log: 670-680 ft: sand, silty clay.   |

| Sample No. | Depth Interval (ft) | Description   |
|------------|---------------------|---|
| SPW-69     | 680-690             | Gravelly to silty sand (60% sand, 20% gravel, 20% silt/clay); moderately to well sorted, angular to subangular sand, and well sorted, subrounded to rounded gravel. Quartzite and granite clasts. Reddish-brown (5YR 5/4) silt/clay; grayish-brown (10YR 5/2) sand. Driller's log: 680-690 ft: sand, silty clay.  |
| SPW-70     | 690-700             | Gravelly sand (70% sand, 30% gravel, 10% silt/clay); moderately sorted, angular sand, and subangular to subrounded gravel. Quartzite, granite, and schist clasts. Reddish-brown (5YR 5/4) silt/clay; brown (10YR 5/3) sand. Driller's log: 690-695 ft: sand, silty clay; 695-700 ft: sand, sandy clay.  |
| SPW-71     | 700-710             | Gravelly sand (60% sand, 30% gravel, 10% silt/clay); moderately to well sorted, angular to subangular sand, and subrounded to rounded gravel. Quartzite, chert, and granite clasts. Brown (7.5YR 5/4) silt/clay; brown (10YR 5/3) sand. Driller's log: 700-710 ft: sand, sandy clay.  |
| SPW-72     | 710-720             | Silty sand to gravelly sand (70% sand, 20% silt/clay, 10% gravel); moderately to well sorted, angular sand, and well sorted, subrounded to rounded gravel. Quartzite and granite clasts. Light-brown (7.5YR 6/4) silt/clay; brown (10YR 5/4) sand. Driller's log: 710-720 ft: sand, sandy clay.   |
| SPW-73     | 720-730             | Silty sand to gravelly sand (70% sand, 20% silt/clay, 10% gravel); well sorted, angular sand, and subrounded to rounded gravel. Quartzite and granite clasts. Light-brown (7.5YR 6/4) silt/clay; grayish-brown (10YR 5/2) sand. Driller's log: 720-725 ft: sand, sandy clay; 725-730 ft: small gravel, sand.  |
| SPW-74     | 730-740             | Silty sand to gravelly sand (70% sand, 20% silt/clay, 10% gravel); moderately to well sorted, angular sand, and subrounded to rounded gravel. Quartzite, granite, and schist clasts. Brown (7.5YR 5/4 & 10YR 5/3). Driller's log: 730-740 ft: small gravel, sand.   |
| SPW-75     | 740-750             | Sandy gravel (60% gravel, 30% sand, 10% silt/clay); moderately sorted, angular sand, and moderately to well sorted, subangular to subrounded gravel. Quartzite, granite, and schist clasts. Light-brown (7.5YR 6/4) silt/clay; yellowish-brown (10YR 5/4) sand. Driller's log: 740-745 ft: sand, coarse sand; 745-750 ft: sand, coarse sand with small gravel.          |
| SPW-76     | 750-760             | Sandy gravel (60% gravel, 30% sand, 10% silt/clay); moderately sorted, angular to subangular sand, and subangular to subrounded gravel. Granite, quartzite, and chert clasts. Light-brown (7.5YR 6/4) silt/clay; Brown (10YR 5/3) sand. Driller's log: 750-755 ft: sand, coarse sand with small gravel; 755-760 ft: sand, coarse sand with small gravel and sandy clay. |
| SPW-77     | 760-770             | Gravelly to silty sand (40% sand, 30% gravel, 30% silt/clay); moderately sorted, angular sand, and well sorted, subangular gravel. Quartzite, granite, and chert clasts. Light-brown (7.5YR 6/4) silt/clay; Brown (10YR 5/3) sand. Driller's log: 760-765 ft: sand, sandy clay; 765-770 ft: sand, coarse sand.  |
| SPW-78     | 770-780             | Silty sand and gravel (40% gravel, 40% sand, 20% silt/clay); moderately sorted, angular sand, and subangular to subrounded gravel. Quartzite, granite, and schist clasts. 7.5YR 6/4, silt/clay; 10YR 5/3, sand. Driller's log: 770-780 ft: sand, sandy clay.  |

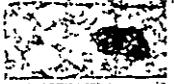
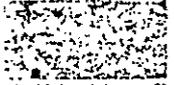
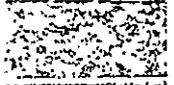
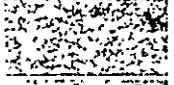
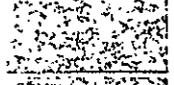
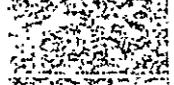
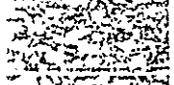
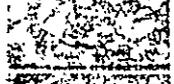
| Sample No. | Depth Interval (ft) | Description   |
|------------|---------------------|---|
| SPW-79     | 780-790             | Gravelly to silty sand (50% sand, 30% gravel, 20% silt/clay); moderately sorted, angular (sand), subangular to subrounded (gravel). Granite, quartzite, schist. Light-brown (7.5YR 6/4) silt/clay; Brown (10YR 5/3) sand. Driller's log: 780-790 ft: sand, coarse sand.   |
| SPW-80     | 790-800             | Gravelly to silty sand (50% gravel, 30% sand, 20% silt/clay); moderately sorted, angular sand, and subangular to subrounded gravel. Granite, quartzite, andesite, and schist clasts. Light-brown (7.5YR 6/4) silt/clay; Brown (10YR 5/3) sand. Driller's log: 790-800 ft: sand, coarse sand.                      |
| SPW-81     | 800-810             | Silty to sandy clay (55% silt/clay, 45% sand (m-vc)); moderately to well sorted, angular to subrounded sand and clay. Pale-brown (10YR 6/3). Very sticky. Driller's log: 800-805 ft: sand, sandy clay; 805-810 ft: coarse sand, small gravel.   |
| SPW-82     | 810-820             | Silty to sandy clay (55% silt/clay, 45% sand (f-c)); well to moderately sorted, subangular to subrounded sand, and clay. Pale-brown (10YR 6/3). Very sticky. Driller's log: 810-815 ft: coarse sand, small gravel; 815-820 ft: coarse sand, sand.   |
| SPW-83     | 820-830             | Same as above. Driller's log: 820-830 ft: sand, coarse sand, sandy clay.  |
| SPW-84     | 830-840             | Clayey sand (55% sand (f-vc), 45% silt/clay); well to moderately sorted, angular to subrounded sand. Pale-brown (10YR 6/3). Very sticky. Driller's log: 830-840 ft: sand, coarse sand, sandy clay.  |
| SPW-85     | 840-850             | Clayey sand (55% sand, 40% silt/clay, <5% gravel); moderately sorted, angular to subrounded sand, and angular gravel. Granite, quartzite, rounded basalt and volcanic clasts. Pale-brown (10YR 6/3). Driller's log: 840-845 ft: coarse sand, small gravel; 845-850 ft: coarse sand, small gravel with sandy clay. |
| SPW-86     | 850-860             | Silty clay to clayey sand (55% silt/clay, 45% sand); moderately sorted, angular to subrounded sand. Pale-brown (10YR 6/3). Sticky. Driller's log: 850-855 ft: coarse sand, small gravel, with sandy clay; 855-860: gravel, coarse sand.   |
| SPW-87     | 860-870             | Clayey sand (60% sand, 40% silt/clay); moderately sorted, angular to subrounded. Pale-brown (10YR 6/3). Driller's log: 860-865 ft: sand, coarse sand; 865-870 ft: sand, coarse sand with sandy clay.  |
| SPW-88     | 870-880             | Same as above. Driller's log: 870-875 ft: sand, coarse sand with sandy clay; 875-880 ft: coarse sand, gravel.   |
| SPW-89     | 880-890             | Silty clay to clayey sand (55% silt/clay, 40% sand (vf-vc), <5% gravel); moderately sorted. Quartzite and volcanic (rhyolite, basalt) clasts. Pale-brown (10YR 6/3) with light greenish-gray (5GY 7/1) discontinuous mottles. Driller's log: 880-885 ft: sand, coarse sand; 885-890 ft: sand, silty clay.         |
| SPW-90     | 890-900             | Silty clay to clayey sand (55% silt/clay, 45% sand); angular to subrounded. Pale-brown (10YR 6/3) and gray 10YR 5/1). Driller's log: 890-895 ft: coarse sand, sand; 895-900 ft: sand, silty clay.   |
| SPW-91     | 900-910             | Clay (90% silt/clay, <10% sand). Dark-gray (7.5YR 4/1). Very sticky. Driller's log: 900-905 ft: sand, sandy clay; 905-910 ft: sand, coarse sand.  |
| SPW-92     | 910-920             | Clay (90% silt/clay, <10% sand). Yellowish-brown (10YR 5/4) and very dark-gray (10YR 3/1) with light greenish-gray (5GY 7/1) discontinuous mottles. Very sticky. Driller's log: 910-915 ft: sand, coarse sand; 915-920 ft: silty clay, sand.  |
| SPW-93     | 920-930             | Sandy clay (75% silt/clay, 25% sand (vf-c)). Gray (10YR 5/1) and yellowish-brown (10YR 5/4). Sticky. Driller's log: 920-925 ft: sand clay; 925-930 ft: silty clay, sand.  |

| Sample No. | Depth Interval (ft) | Description   |
|------------|---------------------|---|
| SPW-94     | 930-940             | Same as above. Driller's log: 930-940 ft: coarse sand, sand.  |
| SPW-95     | 940-950             | Sandy clay (65% silt/clay, 30% sand, 5% gravel); angular to subrounded. Pale-brown (10YR 6/3). Very sticky. Driller's log: 940-950 ft: sand, silty clay.  |
| SPW-96     | 950-960             | Same as above. Driller's log: 950-960 ft: sand, coarse sand.  |
| SPW-97     | 960-970             | Same as above. Sand and silt clay. Driller's log: 960-970 ft: coarse sand, sand.  |
| SPW-98     | 970-980             | Sandy clay (65% silt/clay, 30% sand, <5% gravel); angular to subrounded. Pale-brown (10YR 6/3) to light yellowish-brown (10YR 6/4). Sand grades coarser downhole. Driller's log: 970-980 ft: coarse sand, sand.   |
| SPW-99     | 980-990             | Sandy clay (65% silt/clay, 30% sand, <5% gravel); angular to subrounded. Pale-brown (10YR 6/3) to light yellowish-brown (10YR 6/4). Driller's log: 980-990 ft: sand, coarse sand.   |
| SPW-100    | 990-1000            | Sandy clay (55% silt/clay, 40% sand, 5% gravel); well to moderately sorted, subangular to subrounded. Quartzite, volcanic, and granite clasts. Yellowish brown (10YR 5/6). Driller's log: 990-1000 ft: sandy clay, sand.  |
| SPW-101    | 1000-1010           | Clayey sand (60% silt/clay, 40% sand); well to moderately sorted, subangular to subrounded. Granite, quartzite, and volcanic clasts. Yellowish-brown (10YR 5/4-5/6). Driller's log: 1000-1005 ft: sand; 1005-1010 ft: sand, coarse sand.  |
| SPW-102    | 1010-1020           | Same as above. Driller's log: 1010-1015 ft: coarse sand; 1015-1020 ft: sand, coarse sand.   |
| SPW-103    | 1020-1030           | Clayey sand to sandy clay (50% sand, 45% silt/clay, 5% gravel); well sorted. Subrounded pebbles. Yellowish-brown (10YR 5/4). Driller's log: 1020-1025 ft: sand, coarse sand; 1025-1030 ft: coarse sand, gravel.   |
| SPW-104    | 1030-1040           | Clayey sand (55% sand, 40% silt/clay, 5% gravel); moderately to well sorted. Granite, quartzite, and volcanic (basalt?) clasts. Yellowish-brown (10YR 5/4). Driller's log: 1030-1035 ft: coarse sand, gravel; 1035-1040 ft: coarse sand, gravel, with sandy clay.                         |
| SPW-105    | 1040-1050           | Same as above. Driller's log: 1040-1050 ft: sand, coarse sand.  |
| SPW-106    | 1050-1060           | Same as above. Driller's log: 1050-1055 ft: sand, coarse sand; 1055-1060 ft: sand, coarse sand, sandy clay.   |
| SPW-107    | 1060-1070           | Silty sand and gravelly silty sand (50% sand, 30% silt/clay, 20% gravel); moderately to well sorted, subangular to subrounded. Quartzite, granite, and volcanic (reddish-brown rhyolite, and dark gray basalt?) clasts. Brown (10YR 5/3). Driller's log: 1060-1070 ft: coarse sand, sand. |
| SPW-108    | 1070-1080           | Same as above. Driller's log: 1070-1080 ft: coarse sand, sand.  |
| SPW-109    | 1080-1090           | Same as above. Driller's log: 1080-1085 ft: sand, silty clay; 1085-1090 ft: silty clay.   |
| SPW-110    | 1090-1100           | Sandy clay (65% silty/clay, 35% sand(vf-m)); subangular to subrounded sand. Brown (10YR 5/3). Sticky. Driller's log: 1090-1100 ft: silty clay, sand.  |
| SPW-111    | 1100-1110           | Same as above. Driller's log: 1100-1110 ft: sandy clay, sand.   |
| SPW-112    | 1110-1120           | Sandy silt and clay (55% sand, 40% silt/clay, 5% gravel); subangular to subrounded sand. Yellowish-brown (10YR 5/4). Driller's log: 1110-1115 ft: sandy clay, sand; 1115-1120 ft: coarse sand, sand.  |

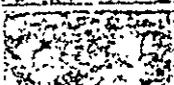
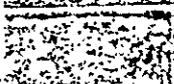
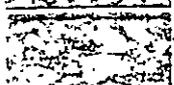
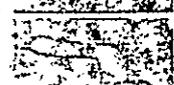
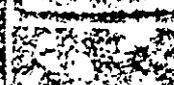
| Sample No. | Depth Interval (ft) | Description   |
|------------|---------------------|---|
| SPW-113    | 1120-1130           | Silty sand (60% sand, 20% silt/clay, 20% gravel); moderately to well sorted, subangular to subrounded sand, and subangular gravel. Quartzite and volcanic (reddish-brown rhyolite) clasts. Grayish-brown (10YR 5/2) to brown (10YR 5/3). Driller's log: 1120-1130 ft: sand, coarse sand.                  |
| SPW-114    | 1130-1140           | Gravelly sand (50% sand, 40% gravel, <10% silt/clay); well to moderately sorted, subangular to rounded sand and gravel. Grayish-brown (10YR 5/2) to brown (10YR 5/3). Vesicular basalt not recognized. Driller's log: 1130-1135 ft: sand, coarse sand; 1135-1140 ft: sand, coarse sand with gravel.       |
| SPW-115    | 1140-1150           | Same as above. Driller's log: 1140-1150 ft: small gravel, sand, coarse sand.  |
| SPW-116    | 1150-1160           | Silty sand (65% sand, 25% silt/clay, 10% gravel); subangular to subrounded sand and gravel. 10YR 5/2-5/3, fines; grayish brown green, coarse. Driller's log: 1150-1155 ft: small gravel, sand, coarse sand; 1155-1160 ft: coarse sand, sand.  |
| SPW-117    | 1160-1170           | Silty sand and gravel (60% sand, 20% silt/clay, 20% gravel). Quartzite, volcanic (rhyolite, minor basalt), and granite clasts. Pale-brown (10YR 6/3). No vesicular basalt. Driller's log: 1160-1170 ft: sand, sandy clay.   |
| SPW-118    | 1170-1180           | Gravelly sand (70% sand, 20% gravel, 10% silt/clay); angular to subrounded sand and gravel. Quartz, quartzite, volcanic (rhyolite, basalt, brown porphyritic), granite, and sandstone clasts. Yellowish-brown (10YR 5/4) to strong-brown (5YR 5/8). Driller's log: 1170-1180 ft: coarse sand, sandy clay. |
| SPW-119    | 1180-1190           | Gravelly sand (50% sand, 40% gravel, 10% silt/clay); well to moderately sorted, angular to subrounded sand and gravel. Quartz, quartzite, and volcanic clasts. No basalt. Pale-brown (10YR 6/3). Driller's log: 1180-1190 ft: sand, coarse sand.  |
| SPW-120    | 1190-1200           | Gravelly sand (75% sand, 15% gravel, 10% silt/clay); well to moderately sorted, subangular to subrounded sand and gravel. Quartzite, granite, volcanic, and sandstone clasts. Pale-brown (10YR 6/3). Driller's log: 1190-1195 ft: sand, coarse sand; 1195-1200 ft: sand, coarse sand with sandy clay.     |
| SPW-121    | 1200-1210           | Silty sand (75% sand, 15% silt/clay, 10% gravel); moderately sorted, subangular to subrounded sand and gravel. Brown (10YR 5/3). Driller's log: 1200-1205 ft: coarse sand; 1205-1210 ft: sand, sandy clay.  |
| SPW-122    | 1210-1220           | Gravelly sand (65% sand, 25% gravel, 10% silt/clay); well sorted, subangular to rounded sand and gravel. Quartzite, volcanic, and granite clasts. Pale-brown (10YR 6/3). Driller's log: 1210-1215 ft: sand, sandy clay; 1215-1220 ft: sand, coarse sand.  |
| SPW-123    | 1220-1230           | Silty sand (70% sand, 25% silt/clay, 5% gravel); moderately to well sorted, subangular to subrounded sand and gravel. Brown (7.5-10YR 5/3). Driller's log: 1220-1225 ft: coarse sand, sand; 1225-1230 ft: sand, sandy clay.   |
| SPW-124    | 1230-1240           | Same as above. Driller's log: 1230-1235 ft: sand, sandy clay; 1235-1240 ft: sand, coarse sand.  |
| SPW-125    | 1240-1250           | Gravelly sand (65% sand, 30% gravel, <5% silt/clay); well to moderately sorted, subangular to subrounded sand and gravel. Quartzite, volcanic, granite. Brown (7.5-10YR 5/3). Driller's log: 1240-1245 ft: coarse sand, sand; 1245-1250 ft: sand, sandy clay.   |

| Sample No. | Depth Interval (ft) | Description   |
|------------|---------------------|---|
| SPW-126    | 1250-1260           | Gravelly silty sand (60% sand, 30% gravel, 10% silt/clay); well to moderately sorted, subangular to rounded sand and gravel. Quartzite and granite. Brown (7.5-10YR 5/3). Driller's log: 1250-1255 ft: sand, sandy clay; 1255-1260 ft: coarse sand, sand. |
| SPW-127    | 1260-1270           | Same as above. Driller's log: 1260-1270 ft: sand, coarse sand, sandy clay.  |
| SPW-128    | 1270-1280           | Silty sand (75% sand, 15% silt/clay, 10% gravel); well to moderately sorted, subangular to subrounded sand and gravel. Quartzite, volcanic, granite, and sandstone clasts. Brown (7.5-10YR 5/3). Driller's log: 1270-1280 ft: sandy clay, sand.           |
| SPW-129    | 1280-1290           | Sand (85% sand, 10% silt/clay, 5% gravel); well to moderately sorted, subangular to subrounded sand and gravel. Quartzite, volcanic, granite, and sandstone clasts. Brown (10YR 5/3). Driller's log: 1280-1290 ft: coarse sand, sand.                     |
| SPW-130    | 1290-1300           | Silty sand (75% sand, 25% silt/clay). well to moderately sorted, subangular to subrounded sand. Brown (7.5-10YR 5/3). Driller's log: 1290-1295 ft: coarse sand, sand; 1295-1300 ft: sand, silty clay.   |
| SPW-131    | 1300-1310           | Same as above. Driller's log: 1300-1310 ft: sand, silty clay.   |
| SPW-132    | 1310-1320           | Silty sand (65% sand (vf-m), 35% silt/clay); well to moderately sorted, subangular to subrounded sand. Brown (10YR 6/3). Driller's log: 1310-1320 ft: sand, silty clay.   |

Sandia Pueblo Well (T13N, R04E, S29.344)

|   |      |     |
|---|------|-----|
|    | 0-   | 10  |
|    | 10-  | 20  |
|    | 20-  | 30  |
|    | 30-  | 40  |
|    | 40-  | 50  |
|    | 50-  | 60  |
|    | 60-  | 70  |
|    | 70-  | 80  |
|    | 80-  | 90  |
|    | 90-  | 100 |
|   | 100- | 110 |
|  | 110- | 120 |
|  | 120- | 130 |
|  | 130- | 140 |
|  | 140- | 150 |
|  | 150- | 160 |
|  | 160- | 170 |
|  | 170- | 180 |
|  | 180- | 190 |
|  | 190- | 200 |

Sandia Pueblo Well (T13N, R04E, S29.344)

|   |      |     |
|---|------|-----|
|    | 200- | 210 |
|    | 210- | 220 |
|    | 220- | 230 |
|    | 230- | 240 |
|    | 240- | 250 |
|    | 250- | 260 |
|    | 260- | 270 |
|    | 270- | 280 |
|    | 280- | 290 |
|    | 290- | 300 |
|   | 300- | 310 |
|  | 310- | 320 |
|  | 320- | 330 |
|  | 330- | 340 |
|  | 340- | 350 |
|  | 350- | 360 |
|  | 360- | 370 |
|  | 370- | 380 |
|  | 380- | 390 |
|  | 390- | 400 |

Sandia Pueblo Well (T13N, R04E, S29.344)

|  |      |
|--|------|
|  | 800- |
|  | 810  |
|  | 810- |
|  | 820  |
|  | 820- |
|  | 830  |
|  | 830- |
|  | 840  |
|  | 840- |
|  | 850  |
|  | 850- |
|  | 860  |
|  | 860- |
|  | 870  |
|  | 870- |
|  | 880  |
|  | 880- |
|  | 890  |
|  | 890- |
|  | 900  |
|  | 900- |
|  | 910  |
|  | 910- |
|  | 920  |
|  | 920- |
|  | 930  |
|  | 930- |
|  | 940  |
|  | 940- |
|  | 950  |
|  | 950- |
|  | 960  |
|  | 960- |
|  | 970  |
|  | 970- |
|  | 980  |
|  | 980- |
|  | 990  |
|  | 990- |
|  | 1000 |

Sandia Pueblo Well (T13N, R04E, S29.344)

|  |       |
|--|-------|
|  | 1000- |
|  | 1010  |
|  | 1010- |
|  | 1020  |
|  | 1020- |
|  | 1030  |
|  | 1030- |
|  | 1040  |
|  | 1040- |
|  | 1050  |
|  | 1050- |
|  | 1060  |
|  | 1060- |
|  | 1070  |
|  | 1070- |
|  | 1080  |
|  | 1080- |
|  | 1090  |
|  | 1090- |
|  | 1100  |
|  | 1100- |
|  | 1110  |
|  | 1110- |
|  | 1120  |
|  | 1120- |
|  | 1130  |
|  | 1130- |
|  | 1140  |
|  | 1140- |
|  | 1150  |
|  | 1150- |
|  | 1160  |
|  | 1160- |
|  | 1170  |
|  | 1170- |
|  | 1180  |
|  | 1180- |
|  | 1190  |
|  | 1190- |
|  | 1200  |

Sandia Pueblo Well (T13N, R04E, S29.344)

|  |      |
|--|------|
|  | 400- |
|  | 410  |
|  | 410- |
|  | 420  |
|  | 420- |
|  | 430  |
|  | 430- |
|  | 440  |
|  | 440- |
|  | 450  |
|  | 450- |
|  | 460  |
|  | 460- |
|  | 470  |
|  | 470- |
|  | 480  |
|  | 480- |
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|  | 570  |
|  | 570- |
|  | 580  |
|  | 580- |
|  | 590  |
|  | 590- |
|  | 600  |

Sandia Pueblo Well (T13N, R04E, S29.344)

|  |      |
|--|------|
|  | 600- |
|  | 610  |
|  | 610- |
|  | 620  |
|  | 620- |
|  | 630  |
|  | 630- |
|  | 640  |
|  | 640- |
|  | 650  |
|  | 650- |
|  | 660  |
|  | 660- |
|  | 670  |
|  | 670- |
|  | 680  |
|  | 680- |
|  | 690  |
|  | 690- |
|  | 700  |
|  | 700- |
|  | 710  |
|  | 710- |
|  | 720  |
|  | 720- |
|  | 730  |
|  | 730- |
|  | 740  |
|  | 740- |
|  | 750  |
|  | 750- |
|  | 760  |
|  | 760- |
|  | 770  |
|  | 770- |
|  | 780  |
|  | 780- |
|  | 790  |
|  | 790- |
|  | 800  |

Sandia Pueblo Well (T13N, R04E, S29.344)

1200-  
1210

1210-  
1220

1220-  
1230

1230-  
1240

1240-  
1250

1250-  
1260

1260-  
1270

1270-  
1280

1280-  
1290

1290-  
1300

1300-  
1310

1310-  
1320

Sandia Pueblo Well (T13N, R04E, S29.344)

|  |      |     |
|--|------|-----|
|  | 0-   | 10  |
|  | 10-  | 20  |
|  | 20-  | 30  |
|  | 30-  | 40  |
|  | 40-  | 50  |
|  | 50-  | 60  |
|  | 60-  | 70  |
|  | 70-  | 80  |
|  | 80-  | 90  |
|  | 90-  | 100 |
|  | 100- | 110 |
|  | 110- | 120 |
|  | 120- | 130 |
|  | 130- | 140 |
|  | 140- | 150 |
|  | 150- | 160 |
|  | 160- | 170 |
|  | 170- | 180 |
|  | 180- | 190 |
|  | 190- | 200 |

Sandia Pueblo Well (T13N, R04E, S29.344)

|  |      |     |
|--|------|-----|
|  | 200- | 210 |
|  | 210- | 220 |
|  | 220- | 230 |
|  | 230- | 240 |
|  | 240- | 250 |
|  | 250- | 260 |
|  | 260- | 270 |
|  | 270- | 280 |
|  | 280- | 290 |
|  | 290- | 300 |
|  | 300- | 310 |
|  | 310- | 320 |
|  | 320- | 330 |
|  | 330- | 340 |
|  | 340- | 350 |
|  | 350- | 360 |
|  | 360- | 370 |
|  | 370- | 380 |
|  | 380- | 390 |
|  | 390- | 400 |

Sandia Pueblo Well (T13N, R04E, S29.344)

|  |          |
|--|----------|
|  | 800-810  |
|  | 810-820  |
|  | 820-830  |
|  | 830-840  |
|  | 840-850  |
|  | 850-860  |
|  | 860-870  |
|  | 870-880  |
|  | 880-890  |
|  | 890-900  |
|  | 900-910  |
|  | 910-920  |
|  | 920-930  |
|  | 930-940  |
|  | 940-950  |
|  | 950-960  |
|  | 960-970  |
|  | 970-980  |
|  | 980-990  |
|  | 990-1000 |

Sandia Pueblo Well (T13N, R04E, S29.344)

|  |           |
|--|-----------|
|  | 1000-1010 |
|  | 1010-1020 |
|  | 1020-1030 |
|  | 1030-1040 |
|  | 1040-1050 |
|  | 1050-1060 |
|  | 1060-1070 |
|  | 1070-1080 |
|  | 1080-1090 |
|  | 1090-1100 |
|  | 1100-1110 |
|  | 1110-1120 |
|  | 1120-1130 |
|  | 1130-1140 |
|  | 1140-1150 |
|  | 1150-1160 |
|  | 1160-1170 |
|  | 1170-1180 |
|  | 1180-1190 |
|  | 1190-1200 |

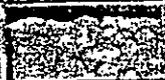
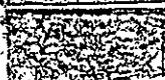
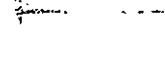
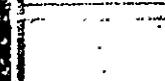
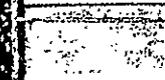
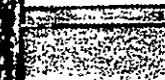
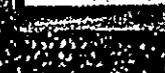
Sandia Pueblo Well (T13N, R04E, S29.344)

400-  
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Sandia Pueblo Well (T13N, R04E, S29.344)

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770-  
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790-  
800

Sandia Pueblo Well (T13N, R04E, S29.344)

|   |               |
|---|---------------|
|    | 1200-<br>1210 |
|    | 1210-<br>1220 |
|    | 1220-<br>1230 |
|    | 1230-<br>1240 |
|    | 1240-<br>1250 |
|    | 1250-<br>1260 |
|    | 1260-<br>1270 |
|    | 1270-<br>1280 |
|    | 1280-<br>1290 |
|    | 1290-<br>1300 |
|   | 1300-<br>1310 |
|  | 1310-<br>1320 |
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