Physical and Chemical Data from Eolian Sediment Collected along a Transect from the Mojave Desert to the Colorado Plateau

By Harland L. Goldstein, Richard L. Reynolds, Marith C. Reheis, James C. Yount, and Paul J. Lamothe

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Introduction

This report presents data and describes the methodology for magnetic, geochemical, and textural measurements of sediment and bedrock samples collected along a transect across the Southwestern United States (fig. 1).

The results presented here support a study that examines compositional variations of mineral dust deposited during the past few centuries in isolated natural traps spanning a region from the Mojave Desert of southern California to the central Colorado Plateau (Goldstein and others, in press; fig. 1). In particular, the study addresses the spatial and temporal variations in dust composition in the context of landscape geochemistry over a large area of the southwestern United States.

Methods

Site Selection and Sampling

The sampling sites were determined on the basis of spatial coverage along the transect and occurrences of mature eolian sandstone substrates. The sediments for this study were collected from natural depressions (potholes) that weathered into mostly eolian sandstones of Jurassic age (table 1). The sampled potholes are topographically isolated, so sediment in them can come from only two sources — airborne dust and detritus derived from the immediately surrounding catchment of the sandstone surface. The surface area of individual potholes and their catchments ranged from about 0.5 to 1.0 m^2 and 50 to 100 m^2, respectively.

Sediment in each pothole was sampled incrementally by depth. Three sediment samples from most potholes were collected with a trowel at depths of 0–1 cm, 1–2 cm, and 2–5 cm. Only

two sediment samples, 0–1 cm and 1–2 cm, were collected from site 05U–1. For each sample, about 50 grams of fine-grained material was obtained over an area of 0.5–1.0 m^2. A sample of the bedrock in which the pothole formed was also collected. Pothole elevations were determined from 30-meter digital elevation models (National Elevation Dataset, *http://seamless.usgs.gov*).

Laboratory Analysis

Samples were analyzed at the USGS Earth Surface Processes soils and magnetics laboratories (Denver, Colo.) for hygroscopic moisture factor, calcium carbonate percent, particle size, and magnetic properties (table 2). The soil analyses followed the protocols outlined in Singer and Janitzky (1986). Geochemical analysis was performed by the U.S. Geological Survey Geologic Discipline geochemistry laboratoy (Denver, Colo.).

Hygroscopic Moisture Factor

The hygroscopic moisture factor (table 2) is a measure of the moisture content of a sample at or near field conditions and is calculated by:

H = OD/AD, where
H = hygroscopic moisture factor
OD = oven-dry sample weight (105°C; 16 hours)
AD = air-dry sample weight

Calcium Carbonate Percent

Calcium carbonate percent (table 2) was measured using a Chittick apparatus (Dreimanis, 1962) as described by Machette (1986), whereby 6N HCl is applied to the sample and the gas evolved from the reaction displaces fluid within the Chittick apparatus. The volume of displaced liquid is used to calculate the percentage of calcium carbonate in the sample.

$CaCO_3$ % = (VCO_2 * C)/WS, where
$CaCO_3$ % = calcium carbonate percent
VCO_2 = The volume of liquid displaced during reaction in presence of HCl
C = Variable; (PB/TK)*0.16, where
PB = barometric pressure in Hg mm
TK = temperature in Kelvin
WS = oven-dry sample weight (105ºC; 16 hours)

Particle-Size Analysis

Particle-size analysis (PSA) was performed on the <2-mm-size fraction of the pothole sediment and on bulk bedrock by using a laser analyzer (tables 2 and 3). Bedrock samples were lightly disaggregated to obtain the PSA sample. Prior to analysis, all samples were prepared by digesting organic matter and $CaCO_3$ using 30 percent H_2O_2 and 15 percent HCl, respectively. Also prior to analysis, sodium hexametaphosphate was added to each sample to deflocculate clays.

Magnetic Properties

Magnetic properties were determined on both <2-mm- and <63-µm-size fractions of the pothole samples as well as on bulk bedrock samples (tables 2 and 4). Magnetic properties determined included low-frequency and high-frequency magnetic susceptibility (MS_{lf}, MS_{hf}), anhysteretic remanent magnetization (ARM), and isothermal remanent magnetization (IRM).

Magnetic Susceptibility

Magnetic susceptibility (MS) was measured by using a susceptometer with a sensitivity better than about 4×10^{-7} m^3/kg. Samples were measured in a 0.1-mT (millitesla) induction at a low frequency of 600 Hz (MS_{lf}) and high frequency of 6,000 Hz (MS_{hf}). For each sample, the MS value was determined as the mean of four measurements. Frequency-dependent susceptibility was calculated as:

$$FDMS = (MS_{lf} - MS_{hf}) / MS_{lf}.$$

Laboratory-Induced Magnetization

Measurements of anhysteretic remanent magnetization (ARM) and isothermal remanent magnetization (IRM) experiments were made by using a high-speed spinner magnetometer. Anhysteretic remanent magnetization was imparted in a decreasing alternating field from a peak induction of 100 mT and a DC bias of 0.1 mT. IRM magnetizations were generated at room temperature by using an impulse magnetizer. First, IRM was imparted in a 1.2-T induction ($IRM_{1.2T}$). The samples then were magnetized in the opposite direction by using an induction of 0.3 T ($IRM_{-0.3T}$). Hard isothermal remanent magnetization (HIRM) and the S-parameter were calculated as follows (King and Channel, 1991):

$$HIRM = (IRM_{1.2T} + IRM_{-0.3T})/2;$$

$S = IRM_{-0.3T} / IRM_{1.2T}$

Geochemical Analysis

Samples were analyzed for chemical properties by inductively coupled plasma–atomic emission spectrometry (ICP–AES), inductively coupled plasma–mass spectrometry (ICP–MS) and X-ray fluorescence (XRF) techniques (tables 2 and 5) (Lichte and others, 1987). Sediment and bedrock samples were analyzed on the <63-μm and bulk size fractions, respectively, and were finely ground using a shatterbox.

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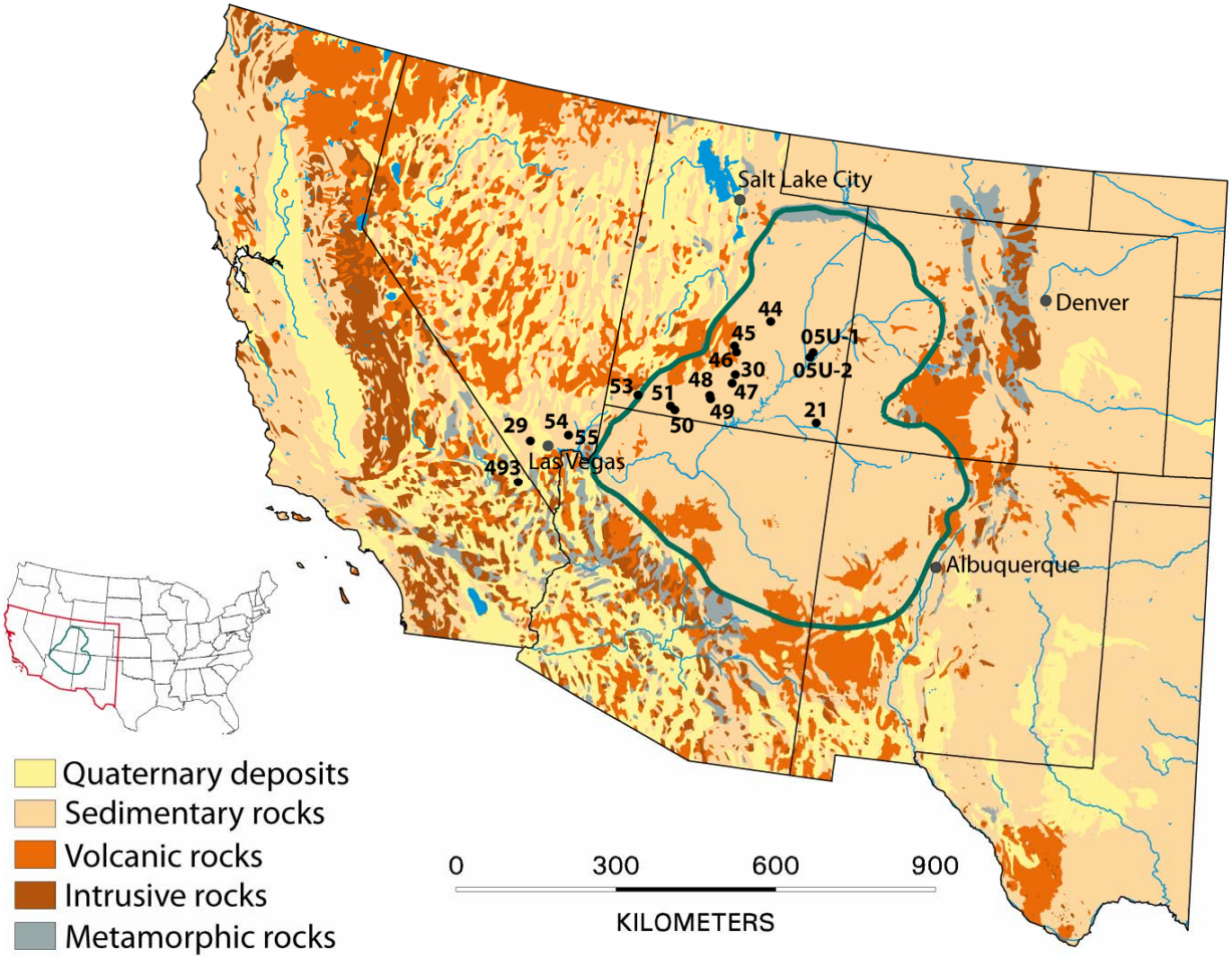

Figure 1. Generalized geologic map of the Southwestern United States showing the southwest-northeast transect of sampled pothole sites (small closed circles). The transect runs from the Mojave Desert to the central Colorado Plateau. Green outline denotes the boundary of the Colorado Plateau. Sites 54 and 55 are in close proximity and are displayed as one point.

Table 1. Pothole site location information.

Sampling site	Latitude[1]	Longitude[1]	Elevation[2] (meters)	Location	Bedrock type	Geologic map reference
44	38.8622	-110.8369	2188	San Rafael Swell, Utah	Navajo Sandstone	Williams and Hackman, 1983
45	38.3607	-111.5304	2510	Bicknell, Utah	Navajo Sandstone	Williams and Hackman, 1983
46	38.2601	-111.4597	2262	Teasdale,Utah	Navajo Sandstone	Williams and Hackman, 1983
47	37.7363	-111.4414	1818	Escalante, Utah	Navajo Sandstone	Hackman and Wyant, 1973
48	37.4726	-111.8749	2046	GSENM,Utah[3]	Entrada Sandstone	Hackman and Wyant, 1973
49	37.4199	-111.8497	1859	GSENM,Utah[3]	Navajo Sandstone	Hackman and Wyant, 1973
50	37.1322	-112.5633	1690	Kanab,Utah	Navajo Sandstone	Eppinger and others, 1990
51	37.1897	-112.6646	1801	Mt. Carmel Junction,Utah	Carmel Limestone	Eppinger and others, 1990
53	37.2704	-113.3988	1455	Leeds, Utah	Navajo Sandstone	Eppinger and others, 1990
54	36.3874	-114.6863	906	Buffington Pocket, Nevada	Aztec Sandstone (redbed)[4]	Bohannon, 1978
55	36.3867	-114.6870	885	Buffington Pocket, Nevada	Aztec Sandstone (redbed)[4]	Bohannon, 1978
29	36.1664	-115.4522	1345	Red Rocks, Nevada	Aztec Sandstone (redbed)[4]	Page and others, 2005
30	37.8904	-111.4067	1984	Boulder, Utah	Navajo Sandstone	Hackman and Wyant, 1973
05U-1	38.4501	-109.8169	1782	Island in the Sky, Utah	Navajo Sandstone	Williams, 1964
05U-2	38.3668	-109.8667	1879	Island in the Sky, Utah	Navajo Sandstone	Williams, 1964
21	37.2934	-109.5354	1421	Bluff, Utah	Bluff Sandstone	Haynes and others, 1972
493	35.4387	-115.5195	1615	Mescal Range, California	Aztec Sandstone (redbed)[4]	Jennings, 1961

[1] Latitude and longitude displayed in NAD83 datum.
[2] Elevation determined from 30-m DEM.
[3] GSENM = Grand Staircase Escalante National Monument.
[4] Redbeds contain fine-grained hematite as grain coatings.

Table 2. Summary data.

This table lists common soils laboratory data and magnetic and chemical properties completed.

[**Sample no.**, Unique sample number (for example, 44/0-1); presented as site designation (44), and depth in centimeters (0-1).

Hygroscopic moisture factor, A laboratory measure of soil moisture at or near field conditions (driest conditions when values are closest to 1).

$CaCO_3$ %, Calcium carbonate percent measured using a Chittick apparatus (Machette, 1986).

Sand, Silt, Clay %, Sand, silt and clay percentages determined using a laser particle-size analyzer. For detailed particle-size data, see table 3.

Magnetic properties completed, Samples for which magnetic properties were determined. One column lists the magnetic properties that were determined for the <2-mm-size fraction and the other column lists the magnetic properties that were determined for the <63-µm-size fraction. Refer to text for property designations and appropriate table for specific magnetic property data.

Chemistry completed, Samples for which chemical analysis has been completed. Samples were analyzed by ICP-AES, ICP-MS and XRF techniques. Refer to appropriate table for specific chemistry data.

n.d., not determined; **mm**, millimeter]

Sample no.	Hygroscopic moisture factor	$CaCO_3$ (%)	Sand (%)	Silt (%)	Clay (%)	Magnetic properties (<2 mm) completed (see table 4)	Magnetic properties (<63 micrometers) completed (see table 4)	Chemistry completed (see table 5)
44/0-1	0.997	1.07	75.98	18.48	3.89	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
44/1-2	0.996	0.88	79.35	13.98	5.07	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
44/2-5	0.996	0.58	80.30	11.53	6.30	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
44/Bedrock	n.d.	n.d.	94.73	3.11	2.16	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
45/0-1	0.998	0.17	86.88	9.21	3.21	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
45/1-2	0.998	0.26	86.53	8.20	4.42	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
45/2-5	0.997	0.31	83.10	9.57	6.04	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
45/Bedrock	n.d.	n.d.	91.35	5.62	3.03	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
46/0-1	0.997	0.22	92.30	4.33	2.70	MS, ARM, IRM	MS, ARM, IRM	n.d.
46/1-2	0.997	0.27	88.37	6.10	4.53	MS, ARM, IRM	MS, ARM, IRM	n.d.
46/2-5	0.997	0.21	76.07	13.93	7.95	MS, ARM, IRM	MS, ARM, IRM	n.d.
46/Bedrock	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
47/0-1	0.997	0.24	37.00	44.07	13.01	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
47/1-2	0.997	0.23	29.80	46.36	17.77	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
47/2-5	0.998	0.28	23.95	43.48	24.01	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
47/Bedrock	n.d.	n.d.	96.50	2.54	0.96	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
48/0-1	0.997	4.65	71.53	16.14	9.17	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
48/1-2	0.997	4.97	76.13	11.72	8.95	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
48/2-5	0.997	5.51	74.02	11.93	9.57	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
48/Bedrock	n.d.	n.d.	88.80	7.13	4.08	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
49/0-1	0.998	0.37	80.93	14.14	3.47	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
49/1-2	0.998	0.36	84.67	10.17	3.58	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
49/2-5	0.997	0.31	83.97	10.30	4.47	MS, ARM, IRM	n.d.	n.d.
49/Bedrock	n.d.	n.d.	97.59	1.44	0.97	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS

Table 2. Summary data.—Continued

Sample no.	Hygroscopic moisture factor	$CaCO_3$ (%)	Sand (%)	Silt (%)	Clay (%)	Magnetic properties (<2 mm) completed (see table 4)	Magnetic properties (<63 micrometers) completed (see table 4)	Chemistry completed (see table 5)
50/0-1	0.997	0.76	90.38	7.69	1.40	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
50/1-2	0.997	0.93	83.88	13.08	2.19	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
50/2-5	0.998	1.04	80.64	15.71	2.41	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
50/Bedrock	n.d.	n.d.	100.00	0.00	0.00	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
51/0-1	0.998	0.20	77.06	17.08	4.18	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
51/1-2	0.996	0.22	81.38	12.59	4.37	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
51/2-5	0.998	0.38	82.42	10.27	5.15	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
51/Bedrock	n.d.	n.d.	n.d.	n.d.	n.d.	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
53/0-1	0.997	0.14	78.98	16.54	3.58	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
53/1-2	0.997	0.13	85.82	9.69	3.47	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
53/2-5	0.998	0.13	43.82	28.32	20.81	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
53/Bedrock	n.d.	n.d.	93.32	4.94	1.74	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
54/0-1	0.998	0.18	65.17	27.83	4.93	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
54/1-2	0.998	0.16	68.74	17.07	9.79	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
54/2-5	0.998	0.13	63.41	16.73	13.08	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
54/Bedrock	n.d.	n.d.	77.09	3.22	19.26	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
55/0-1	0.996	0.75	66.51	26.18	5.10	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
55/1-2	0.998	0.34	59.78	26.20	9.47	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
55/2-5	0.997	0.23	64.72	21.46	8.97	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
55/Bedrock	n.d.	n.d.	95.71	2.49	1.80	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
29/0-1	0.999	0.19	68.35	23.49	5.19	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
29/1-2	0.998	0.23	56.98	27.62	10.87	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
29/2-5	0.997	0.20	53.68	28.34	13.59	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
29/Bedrock	n.d.	n.d.	92.28	5.42	2.30	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
30/0-1	0.997	0.26	66.97	23.17	7.98	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
30/1-2	0.998	0.10	44.67	31.34	17.49	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
30/2-5	0.997	0.21	46.06	22.63	20.92	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
30/Bedrock	n.d.	n.d.	91.97	5.50	2.53	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
05U-1/0-1	0.994	1.02	80.61	13.13	5.04	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
05U-1/1-2	0.991	0.22	89.77	5.74	3.64	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
05U-1/Bedrock	n.d.	1.21	95.88	2.40	1.72	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
05U-2/0-1	0.996	0.36	74.65	17.82	6.10	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
05U-2/1-2	0.993	0.27	76.56	15.85	6.15	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
05U-2/2-5	0.950	0.24	82.96	10.96	4.78	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
05U-2/Bedrock	n.d.	0.19	96.27	2.01	1.73	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
21/0-1	0.990	2.25	94.11	3.56	1.93	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
21/1-2	0.960	1.71	92.95	4.34	2.24	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
21/2-5	0.942	1.68	92.83	4.57	2.07	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
21/Bedrock	n.d.	2.15	94.45	3.11	2.44	MS, ARM, IRM	n.d.	ICP-AES, ICP-MS, XRF
493/0-1	0.992	0.28	62.65	31.23	3.93	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
493/1-2	0.991	0.20	59.96	32.39	5.83	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
493/2-5	0.995	0.32	72.48	21.64	4.24	MS, ARM, IRM	MS, ARM, IRM	ICP-AES, ICP-MS, XRF
493/Bedrock	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	ICP-AES, ICP-MS, XRF

Table 3. Particle size data.

This table contains high-resolution particle-size data obtained using a laser particle-size analyzer. The particle size is displayed in accordance with the Wentworth scale (Wentworth, 1922). Values are reported as volume percent. Each value corresponds to the volume percent of the sample that has a grain size falling within that range.

[**microns**, micrometer; **n.d.**, not determined; **cm**, centimeter]

		Microns		493				29			
				0-1 cm	1-2 cm	2-5 cm	Bedrock	0-1 cm	1-2 cm	2-5 cm	Bedrock
Sand	Very Coarse	2,000	1,680	0.00	0.00	0.00	n.d.	0.00	0.00	0.00	0.00
		1,680	1,414	0.00	0.00	0.00	n.d.	0.00	0.00	0.00	0.00
		1,414	1,189	0.00	0.00	0.00	n.d.	0.00	0.00	0.00	0.00
		1,189	1,000	0.00	0.00	0.00	n.d.	0.00	0.00	0.00	0.00
	Coarse	1,000	841	0.00	0.00	0.00	n.d.	0.00	0.00	0.00	0.00
		841	707	0.00	0.00	0.00	n.d.	0.00	0.00	0.00	0.00
		707	595	0.00	0.00	0.00	n.d.	0.00	0.00	0.00	0.00
		595	500	0.00	0.00	0.00	n.d.	0.00	0.00	0.00	0.10
	Medium	500	420	0.12	0.00	0.00	n.d.	0.00	0.00	0.00	1.25
		420	354	1.22	0.34	1.38	n.d.	0.12	0.17	0.00	2.69
		354	297	2.75	1.89	3.66	n.d.	2.12	2.07	1.06	4.81
		297	250	4.12	3.45	5.69	n.d.	4.75	4.48	3.16	7.43
	Fine	250	210	5.56	5.08	7.68	n.d.	7.70	6.94	5.59	10.65
		210	177	6.61	6.37	8.88	n.d.	9.78	8.45	7.54	13.72
		177	149	7.48	7.49	9.68	n.d.	11.02	9.06	8.79	15.25
		149	125	8.06	8.28	9.47	n.d.	10.35	8.58	8.95	14.13
	Very Fine	125	105	7.69	7.92	8.37	n.d.	8.37	6.76	7.27	10.53
		105	88	7.23	7.38	7.28	n.d.	6.54	4.99	5.44	6.54
		88	74	6.45	6.48	5.91	n.d.	4.62	3.38	3.67	3.49
		74	63	5.35	5.27	4.47	n.d.	2.98	2.12	2.22	1.71
Silt	Coarse	63	53	5.04	4.85	3.86	n.d.	2.22	1.57	1.49	0.93
		53	44	4.63	4.37	3.29	n.d.	1.74	1.29	1.01	0.43
		44	37	3.64	3.39	2.45	n.d.	1.37	1.06	0.69	0.16
		37	31.2	3.02	2.83	1.99	n.d.	1.32	1.43	0.94	0.10
	Meduim	31.2	26.3	2.55	2.44	1.67	n.d.	1.88	1.64	1.14	0.15
		26.3	22.1	2.18	2.16	1.44	n.d.	1.99	1.81	1.34	0.25
		22.1	18.6	1.81	1.88	1.20	n.d.	1.92	1.87	1.52	0.33
		18.6	15.6	1.55	1.70	1.03	n.d.	1.80	1.94	1.73	0.38
	Fine	15.6	13.1	1.30	1.50	0.86	n.d.	1.60	1.92	1.88	0.38
		13.1	11	1.11	1.34	0.73	n.d.	1.40	1.91	2.05	0.36
		11	9.3	0.94	1.17	0.61	n.d.	1.20	1.83	2.14	0.33
		9.3	7.8	0.87	1.12	0.57	n.d.	1.15	1.93	2.41	0.33
	Very Fine	7.8	6.6	0.74	0.99	0.50	n.d.	1.02	1.84	2.41	0.32
		6.6	5.5	0.72	0.99	0.52	n.d.	1.06	2.00	2.70	0.35
		5.5	4.6	0.63	0.90	0.49	n.d.	0.98	1.91	2.61	0.34
		4.6	3.9	0.52	0.76	0.43	n.d.	0.84	1.67	2.29	0.30
Clay	Coarse	3.9	3.3	0.47	0.71	0.42	n.d.	0.77	1.57	2.14	0.28
		3.3	2.8	0.42	0.66	0.40	n.d.	0.68	1.41	1.89	0.25
		2.8	2.3	0.46	0.73	0.47	n.d.	0.71	1.49	1.97	0.26
		2.3	1.95	0.36	0.57	0.38	n.d.	0.51	1.09	1.40	0.19
	Medium	1.95	1.64	0.35	0.54	0.38	n.d.	0.46	0.99	1.25	0.17
		1.64	1.38	0.32	0.50	0.36	n.d.	0.39	0.85	1.05	0.15
		1.38	1.16	0.30	0.44	0.34	n.d.	0.33	0.74	0.88	0.13
		1.16	0.98	0.27	0.38	0.30	n.d.	0.28	0.62	0.72	0.10
	Fine	0.98	0.82	0.26	0.36	0.30	n.d.	0.26	0.58	0.66	0.10
		0.82	0.69	0.24	0.32	0.28	n.d.	0.22	0.51	0.55	0.10
		0.69	0.58	0.24	0.31	0.30	n.d.	0.29	0.51	0.54	0.11
		0.58	0.49	0.25	0.32	0.32	n.d.	0.31	0.53	0.54	0.13
	Very Fine		<0.49	2.20	1.83	1.65	n.d.	2.97	4.53	4.40	0.35

Table 3. Particle size data.—Continued

		Microns		55				54			
				0-1 cm	1-2 cm	2-5 cm	Bedrock	0-1 cm	1-2 cm	2-5 cm	Bedrock
Sand	Very Coarse	2,000	1,680	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.87
		1,680	1,414	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.22
		1,414	1,189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.28
		1,189	1,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25
	Coarse	1,000	841	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.56
		841	707	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.08
		707	595	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.63
		595	500	0.00	0.00	0.00	0.80	0.04	0.00	0.00	4.10
	Medium	500	420	0.00	0.00	0.00	3.89	2.08	0.71	0.06	4.34
		420	354	0.61	0.21	0.50	6.84	5.41	3.59	2.38	4.43
		354	297	2.66	2.22	2.97	10.16	9.12	7.32	7.33	4.82
		297	250	4.66	4.70	5.45	13.04	11.23	10.09	11.53	5.19
	Fine	250	210	6.75	7.16	7.75	14.72	11.37	11.43	13.34	5.78
		210	177	8.23	8.62	9.03	13.29	9.04	10.61	11.58	6.11
		177	149	9.25	9.24	9.61	11.48	6.32	8.65	8.18	6.11
		149	125	9.52	8.67	8.91	8.90	4.27	6.41	4.91	5.44
	Very Fine	125	105	8.32	6.99	7.35	5.98	2.63	4.36	2.51	4.04
		105	88	6.95	5.43	5.88	3.68	1.63	2.83	1.09	2.64
		88	74	5.47	3.91	4.32	1.99	1.07	1.72	0.38	1.48
		74	63	4.08	2.64	2.95	0.93	0.97	1.03	0.11	0.72
Silt	Coarse	63	53	3.56	2.10	2.34	0.44	1.52	0.83	0.16	0.35
		53	44	3.16	1.80	1.92	0.18	1.98	0.75	0.48	0.16
		44	37	2.56	1.47	1.52	0.11	2.26	0.96	0.62	0.11
		37	31.2	2.30	1.76	1.43	0.13	2.51	1.10	0.78	0.16
	Meduim	31.2	26.3	2.14	1.88	1.43	0.17	2.65	1.12	0.88	0.24
		26.3	22.1	2.01	1.93	1.46	0.20	2.66	1.13	0.94	0.31
		22.1	18.6	1.80	1.90	1.42	0.19	2.48	1.09	0.95	0.33
		18.6	15.6	1.61	1.86	1.38	0.17	2.29	1.08	1.00	0.32
	Fine	15.6	13.1	1.37	1.75	1.28	0.13	2.00	1.05	1.06	0.27
		13.1	11	1.16	1.64	1.19	0.10	1.73	1.06	1.16	0.22
		11	9.3	0.96	1.48	1.07	0.09	1.42	1.05	1.22	0.17
		9.3	7.8	0.87	1.47	1.07	0.09	1.25	1.15	1.40	0.14
	Very Fine	7.8	6.6	0.74	1.34	0.99	0.10	0.99	1.13	1.42	0.12
		6.6	5.5	0.73	1.39	1.05	0.12	0.88	1.25	1.61	0.12
		5.5	4.6	0.65	1.30	1.01	0.13	0.69	1.22	1.60	0.11
		4.6	3.9	0.56	1.14	0.90	0.13	0.52	1.11	1.45	0.09
Clay	Coarse	3.9	3.3	0.53	1.09	0.89	0.13	0.44	1.09	1.43	0.09
		3.3	2.8	0.49	1.02	0.85	0.13	0.39	1.03	1.36	0.08
		2.8	2.3	0.56	1.15	0.99	0.15	0.45	1.18	1.57	0.09
		2.3	1.95	0.44	0.90	0.81	0.12	0.38	0.94	1.25	0.07
	Medium	1.95	1.64	0.44	0.88	0.81	0.11	0.41	0.93	1.23	0.07
		1.64	1.38	0.42	0.81	0.76	0.10	0.42	0.85	1.13	0.06
		1.38	1.16	0.39	0.73	0.71	0.09	0.42	0.78	1.04	0.06
		1.16	0.98	0.35	0.64	0.64	0.08	0.39	0.68	0.91	0.05
	Fine	0.98	0.82	0.36	0.62	0.64	0.08	0.40	0.64	0.87	0.07
		0.82	0.69	0.35	0.54	0.59	0.07	0.39	0.56	0.77	0.01
		0.69	0.58	0.37	0.54	0.63	0.08	0.41	0.55	0.76	0.00
		0.58	0.49	0.41	0.56	0.67	0.09	0.44	0.56	0.77	0.00
	Very Fine		<0.49	2.22	4.55	4.85	0.58	2.07	4.40	6.77	0.00

Table 3. Particle size data.—Continued

		Microns		53				51			
				0-1 cm	1-2 cm	2-5 cm	Bedrock	0-1 cm	1-2 cm	2-5 cm	Bedrock
Sand	Very Coarse	2,000	1,680	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		1,680	1,414	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		1,414	1,189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		1,189	1,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
	Coarse	1,000	841	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		841	707	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		707	595	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		595	500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
	Medium	500	420	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		420	354	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		354	297	0.04	0.07	0.53	1.70	0.02	0.07	0.02	n.d.
		297	250	2.64	4.01	2.31	5.45	1.47	3.32	1.70	n.d.
	Fine	250	210	6.37	8.56	4.40	9.94	4.74	6.71	5.28	n.d.
		210	177	10.08	13.98	6.10	14.11	7.73	10.09	9.17	n.d.
		177	149	13.79	18.17	7.22	17.34	10.97	13.18	13.19	n.d.
		149	125	15.47	17.28	7.37	16.37	13.80	14.91	16.04	n.d.
	Very Fine	125	105	12.51	11.62	6.26	12.45	13.23	12.89	14.36	n.d.
		105	88	8.73	6.80	4.67	8.56	11.18	9.72	11.06	n.d.
		88	74	5.68	3.53	3.11	4.96	8.33	6.50	7.33	n.d.
		74	63	3.67	1.81	1.86	2.45	5.61	4.01	4.28	n.d.
Silt	Coarse	63	53	2.87	1.11	1.24	1.23	4.25	2.83	2.73	n.d.
		53	44	2.28	0.66	0.85	0.48	3.09	1.93	1.58	n.d.
		44	37	1.66	0.35	0.59	0.13	1.92	1.14	0.75	n.d.
		37	31.2	1.40	0.63	0.81	0.05	1.32	0.79	0.39	n.d.
	Meduim	31.2	26.3	1.27	0.84	0.98	0.14	0.99	0.66	0.25	n.d.
		26.3	22.1	1.17	0.95	1.16	0.23	0.82	0.65	0.24	n.d.
		22.1	18.6	1.00	0.91	1.31	0.31	0.71	0.63	0.46	n.d.
		18.6	15.6	0.85	0.78	1.50	0.35	0.65	0.61	0.47	n.d.
	Fine	15.6	13.1	0.69	0.61	1.66	0.34	0.57	0.54	0.47	n.d.
		13.1	11	0.57	0.48	1.87	0.30	0.49	0.48	0.45	n.d.
		11	9.3	0.48	0.38	2.05	0.25	0.42	0.41	0.41	n.d.
		9.3	7.8	0.47	0.37	2.43	0.23	0.40	0.39	0.41	n.d.
	Very Fine	7.8	6.6	0.44	0.36	2.58	0.21	0.36	0.36	0.38	n.d.
		6.6	5.5	0.49	0.43	3.09	0.23	0.38	0.40	0.43	n.d.
		5.5	4.6	0.49	0.44	3.20	0.24	0.37	0.40	0.44	n.d.
		4.6	3.9	0.44	0.41	3.01	0.23	0.34	0.37	0.42	n.d.
Clay	Coarse	3.9	3.3	0.42	0.41	3.00	0.23	0.35	0.38	0.43	n.d.
		3.3	2.8	0.39	0.38	2.82	0.22	0.35	0.38	0.44	n.d.
		2.8	2.3	0.44	0.43	3.09	0.25	0.42	0.45	0.54	n.d.
		2.3	1.95	0.33	0.32	2.29	0.19	0.35	0.37	0.44	n.d
	Medium	1.95	1.64	0.30	0.29	2.06	0.18	0.36	0.37	0.45	n.d.
		1.64	1.38	0.29	0.26	1.72	0.17	0.35	0.37	0.43	n.d.
		1.38	1.16	0.25	0.22	1.42	0.16	0.33	0.33	0.40	n.d.
		1.16	0.98	0.20	0.18	1.13	0.14	0.29	0.29	0.35	n.d.
	Fine	0.98	0.82	0.20	0.20	0.99	0.17	0.30	0.30	0.37	n.d.
		0.82	0.69	0.22	0.23	0.79	0.04	0.32	0.32	0.38	n.d.
		0.69	0.58	0.25	0.26	0.75	0.00	0.36	0.38	0.43	n.d.
		0.58	0.49	0.30	0.29	0.76	0.00	0.41	0.44	0.49	n.d.
	Very Fine		<0.49	0.90	1.02	7.05	0.00	1.68	1.66	2.16	n.d.

Table 3. Particle size data.—Continued

		Microns		50				49			
				0-1 cm	1-2 cm	2-5 cm	Bedrock	0-1 cm	1-2 cm	2-5 cm	Bedrock
Sand	Very Coarse	2,000	1,680	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,680	1,414	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,414	1,189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,189	1,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Coarse	1,000	841	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.48
		841	707	0.00	0.00	0.00	3.10	0.00	0.00	0.00	3.46
		707	595	0.00	0.00	0.00	9.29	0.00	0.25	0.00	7.17
		595	500	0.78	0.00	0.29	15.33	0.26	1.91	0.68	10.82
	Medium	500	420	3.19	0.52	2.04	19.97	2.05	3.83	3.20	13.81
		420	354	5.19	2.39	3.98	18.85	4.13	5.61	5.55	15.05
		354	297	7.52	4.48	6.08	14.27	6.36	7.66	8.21	13.78
		297	250	9.20	6.38	7.56	8.99	8.05	9.02	9.93	11.18
	Fine	250	210	10.52	8.21	8.67	5.26	9.38	10.05	10.98	8.55
		210	177	10.61	9.39	8.97	2.73	9.78	9.83	10.48	5.77
		177	149	10.23	10.50	8.92	1.33	9.53	9.08	9.40	3.65
		149	125	9.76	10.74	8.60	0.57	8.79	8.27	8.30	2.10
	Very Fine	125	105	8.46	9.99	7.91	0.19	7.64	6.92	6.64	1.03
		105	88	6.84	8.94	7.12	0.01	6.42	5.54	5.01	0.44
		88	74	4.91	7.18	5.95	0.00	4.97	4.03	3.43	0.18
		74	63	3.18	5.16	4.57	0.00	3.55	2.66	2.15	0.11
Silt	Coarse	63	53	2.27	4.06	3.93	0.00	2.87	1.95	1.53	0.14
		53	44	1.53	2.95	3.22	0.00	2.25	1.36	1.07	0.18
		44	37	0.87	1.75	2.21	0.00	1.54	0.83	0.69	0.17
		37	31.2	0.55	1.08	1.58	0.00	1.16	0.60	0.54	0.14
	Meduim	31.2	26.3	0.39	0.67	1.13	0.00	0.92	0.50	0.49	0.10
		26.3	22.1	0.32	0.44	0.81	0.00	0.77	0.46	0.49	0.06
		22.1	18.6	0.29	0.31	0.56	0.00	0.64	0.44	0.48	0.03
		18.6	15.6	0.27	0.26	0.41	0.00	0.55	0.44	0.49	0.03
	Fine	15.6	13.1	0.24	0.23	0.31	0.00	0.48	0.42	0.48	0.03
		13.1	11	0.20	0.21	0.25	0.00	0.44	0.42	0.49	0.05
		11	9.3	0.16	0.20	0.21	0.00	0.41	0.41	0.50	0.07
		9.3	7.8	0.14	0.20	0.22	0.00	0.42	0.44	0.56	0.09
	Very Fine	7.8	6.6	0.12	0.18	0.21	0.00	0.41	0.44	0.57	0.09
		6.6	5.5	0.12	0.19	0.23	0.00	0.45	0.50	0.66	0.10
		5.5	4.6	0.11	0.19	0.23	0.00	0.44	0.50	0.66	0.09
		4.6	3.9	0.10	0.17	0.21	0.00	0.40	0.46	0.60	0.08
Clay	Coarse	3.9	3.3	0.10	0.17	0.21	0.00	0.39	0.45	0.59	0.07
		3.3	2.8	0.10	0.18	0.20	0.00	0.37	0.42	0.54	0.07
		2.8	2.3	0.13	0.22	0.25	0.00	0.41	0.46	0.60	0.07
		2.3	1.95	0.11	0.19	0.21	0.00	0.32	0.35	0.44	0.06
	Medium	1.95	1.64	0.12	0.20	0.21	0.00	0.31	0.33	0.41	0.06
		1.64	1.38	0.12	0.20	0.21	0.00	0.28	0.29	0.36	0.06
		1.38	1.16	0.12	0.19	0.20	0.00	0.26	0.26	0.31	0.05
		1.16	0.98	0.11	0.17	0.19	0.00	0.23	0.23	0.26	0.05
	Fine	0.98	0.82	0.12	0.17	0.19	0.00	0.23	0.22	0.25	0.05
		0.82	0.69	0.11	0.17	0.18	0.00	0.22	0.19	0.23	0.04
		0.69	0.58	0.12	0.17	0.18	0.00	0.22	0.19	0.24	0.04
		0.58	0.49	0.12	0.18	0.19	0.00	0.24	0.20	0.25	0.05
	Very Fine		<0.49	0.54	0.85	1.24	0.00	1.46	1.58	1.27	0.32

Table 3. Particle size data.—Continued

		Microns		48				47			
				0-1 cm	1-2 cm	2-5 cm	Bedrock	0-1 cm	1-2 cm	2-5 cm	Bedrock
Sand	Very Coarse	2,000	1,680	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,680	1,414	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,414	1,189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,189	1,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Coarse	1,000	841	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		841	707	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
		707	595	0.00	0.00	0.00	1.35	0.00	0.00	0.00	0.52
		595	500	0.00	0.00	0.00	4.19	0.00	0.00	0.00	3.64
	Medium	500	420	0.00	0.00	0.00	6.82	0.00	0.00	0.00	7.31
		420	354	0.00	0.00	0.00	9.32	0.00	0.43	0.00	11.54
		354	297	0.03	0.03	0.00	11.54	2.08	2.32	1.48	15.76
		297	250	1.70	1.78	0.44	11.92	3.68	4.13	2.74	16.94
	Fine	250	210	3.93	4.41	2.60	10.73	5.25	5.22	3.97	14.42
		210	177	6.21	7.25	5.42	9.08	5.63	5.14	4.26	10.99
		177	149	9.00	10.39	8.99	7.45	5.35	4.39	3.95	7.49
		149	125	11.75	13.58	12.90	5.84	4.52	3.17	3.13	4.43
	Very Fine	125	105	12.99	13.49	15.20	4.21	3.58	2.14	1.99	2.17
		105	88	11.47	11.64	13.26	2.98	2.85	1.38	1.30	0.91
		88	74	8.69	8.42	9.52	2.01	2.24	0.85	0.74	0.31
		74	63	5.76	5.13	5.67	1.34	1.83	0.63	0.40	0.08
Silt	Coarse	63	53	4.13	3.27	3.43	1.08	1.94	0.77	0.34	0.02
		53	44	2.71	1.84	1.72	0.91	2.27	1.17	0.48	0.05
		44	37	1.46	0.80	0.63	0.69	2.39	1.51	0.70	0.11
		37	31.2	0.82	0.34	0.21	0.57	2.62	1.89	0.99	0.15
	Meduim	31.2	26.3	0.50	0.16	0.07	0.47	2.84	2.25	1.32	0.18
		26.3	22.1	0.40	0.12	0.05	0.40	3.02	2.59	1.70	0.19
		22.1	18.6	0.43	0.28	0.27	0.33	3.05	2.83	2.06	0.17
		18.6	15.6	0.51	0.36	0.39	0.29	3.12	3.13	2.52	0.15
	Fine	15.6	13.1	0.56	0.43	0.50	0.27	3.08	3.36	2.98	0.14
		13.1	11	0.59	0.48	0.57	0.27	3.07	3.62	3.49	0.15
		11	9.3	0.58	0.48	0.58	0.27	2.93	3.70	3.83	0.16
		9.3	7.8	0.62	0.53	0.64	0.30	3.04	4.07	4.45	0.20
	Very Fine	7.8	6.6	0.61	0.55	0.63	0.30	2.83	3.94	4.52	0.22
		6.6	5.5	0.72	0.66	0.73	0.34	2.95	4.25	5.05	0.25
		5.5	4.6	0.76	0.71	0.77	0.33	2.68	3.95	4.84	0.23
		4.6	3.9	0.75	0.72	0.75	0.30	2.24	3.34	4.20	0.19
Clay	Coarse	3.9	3.3	0.80	0.78	0.81	0.29	2.01	3.01	3.87	0.16
		3.3	2.8	0.82	0.80	0.83	0.28	1.73	2.57	3.38	0.13
		2.8	2.3	1.00	0.98	1.01	0.31	1.76	2.59	3.46	0.13
		2.3	1.95	0.82	0.81	0.84	0.25	1.25	1.79	2.43	0.09
	Medium	1.95	1.64	0.81	0.80	0.85	0.24	1.11	1.55	2.14	0.09
		1.64	1.38	0.77	0.76	0.80	0.22	0.95	1.28	1.78	0.08
		1.38	1.16	0.70	0.69	0.75	0.20	0.83	1.08	1.50	0.08
		1.16	0.98	0.62	0.62	0.69	0.18	0.71	0.89	1.25	0.08
	Fine	0.98	0.82	0.65	0.64	0.71	0.17	0.69	0.83	1.16	0.10
		0.82	0.69	0.66	0.64	0.70	0.16	0.63	0.72	1.01	0.02
		0.69	0.58	0.73	0.69	0.76	0.18	0.65	0.72	1.01	0.00
		0.58	0.49	0.80	0.74	0.82	0.20	0.69	0.75	1.04	0.00
	Very Fine		<0.49	3.16	3.20	4.49	1.41	5.93	6.06	8.56	0.00

Table 3. Particle size data.—Continued

		Microns		30				46			
				0-1 cm	1-2 cm	2-5 cm	Bedrock	0-1 cm	1-2 cm	2-5 cm	Bedrock
Sand	Very Coarse	2,000	1,680	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		1,680	1,414	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		1,414	1,189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		1,189	1,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
	Coarse	1,000	841	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		841	707	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		707	595	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
		595	500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.d.
	Medium	500	420	0.00	0.00	0.00	1.47	0.00	0.00	0.00	n.d.
		420	354	0.16	0.00	0.32	4.85	1.92	2.41	0.00	n.d.
		354	297	2.46	1.72	2.61	8.27	5.18	6.72	2.19	n.d.
		297	250	5.46	3.99	5.34	11.27	9.01	10.66	5.67	n.d.
	Fine	250	210	8.85	6.46	7.54	13.69	13.11	14.64	9.67	n.d.
		210	177	11.18	7.68	8.18	13.59	16.32	16.79	12.71	n.d.
		177	149	12.16	7.75	7.66	11.90	16.97	15.78	14.33	n.d.
		149	125	10.46	6.66	6.03	9.96	13.98	11.27	12.59	n.d.
	Very Fine	125	105	7.30	4.76	4.06	7.33	8.51	6.05	8.81	n.d.
		105	88	4.71	3.09	2.50	4.99	4.42	2.64	5.56	n.d.
		88	74	2.75	1.73	1.29	3.02	2.00	1.02	3.06	n.d.
		74	63	1.50	0.83	0.54	1.64	0.88	0.38	1.50	n.d.
Silt	Coarse	63	53	0.97	0.44	0.23	0.96	0.45	0.15	0.77	n.d.
		53	44	0.66	0.26	0.08	0.53	0.19	0.06	0.34	n.d.
		44	37	0.79	0.40	0.11	0.30	0.07	0.04	0.13	n.d.
		37	31.2	1.00	0.62	0.20	0.26	0.08	0.08	0.22	n.d.
	Meduim	31.2	26.3	1.19	0.86	0.31	0.29	0.14	0.15	0.34	n.d.
		26.3	22.1	1.40	1.15	0.45	0.31	0.22	0.23	0.49	n.d.
		22.1	18.6	1.52	1.42	0.61	0.31	0.26	0.28	0.61	n.d.
		18.6	15.6	1.62	1.75	0.85	0.30	0.28	0.33	0.74	n.d.
	Fine	15.6	13.1	1.66	2.07	1.15	0.27	0.27	0.35	0.84	n.d.
		13.1	11	1.70	2.44	1.54	0.26	0.26	0.39	0.97	n.d.
		11	9.3	1.70	2.71	1.91	0.25	0.26	0.45	1.09	n.d.
		9.3	7.8	1.85	3.20	2.47	0.28	0.31	0.58	1.32	n.d.
	Very Fine	7.8	6.6	1.80	3.31	2.75	0.28	0.34	0.66	1.40	n.d.
		6.6	5.5	1.97	3.77	3.34	0.32	0.41	0.81	1.64	n.d.
		5.5	4.6	1.82	3.68	3.45	0.32	0.42	0.82	1.62	n.d.
		4.6	3.9	1.52	3.24	3.19	0.28	0.37	0.73	1.43	n.d.
Clay	Coarse	3.9	3.3	1.36	3.01	3.09	0.26	0.34	0.68	1.32	n.d.
		3.3	2.8	1.15	2.62	2.82	0.23	0.31	0.61	1.15	n.d.
		2.8	2.3	1.14	2.66	3.00	0.24	0.34	0.63	1.17	n.d.
		2.3	1.95	0.77	1.83	2.16	0.18	0.25	0.44	0.80	n.d.
	Medium	1.95	1.64	0.65	1.56	1.93	0.16	0.22	0.38	0.68	n.d.
		1.64	1.38	0.54	1.25	1.60	0.15	0.20	0.32	0.55	n.d.
		1.38	1.16	0.45	1.01	1.34	0.13	0.17	0.26	0.44	n.d.
		1.16	0.98	0.37	0.81	1.10	0.12	0.14	0.21	0.36	n.d.
	Fine	0.98	0.82	0.36	0.74	1.03	0.11	0.14	0.21	0.35	n.d.
		0.82	0.69	0.36	0.64	0.90	0.11	0.16	0.23	0.33	n.d.
		0.69	0.58	0.39	0.66	0.94	0.11	0.20	0.26	0.37	n.d.
		0.58	0.49	0.44	0.71	1.01	0.11	0.24	0.31	0.42	n.d.
	Very Fine		<0.49	1.88	6.51	10.39	0.62	0.68	1.01	2.06	n.d.

Table 3. Particle size data.—Continued

		Microns		45				44			
				0-1 cm	1-2 cm	2-5 cm	Bedrock	0-1 cm	1-2 cm	2-5 cm	Bedrock
Sand	Very Coarse	2,000	1,680	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,680	1,414	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,414	1,189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,189	1,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Coarse	1,000	841	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		841	707	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		707	595	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		595	500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Medium	500	420	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		420	354	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67
		354	297	0.05	0.01	0.03	0.06	0.94	1.57	2.80	6.30
		297	250	2.41	1.56	2.00	3.74	3.42	4.41	5.90	11.59
	Fine	250	210	5.27	6.29	5.82	8.50	5.99	7.39	9.31	17.64
		210	177	9.17	10.94	9.99	14.43	8.30	9.95	11.58	19.94
		177	149	13.56	16.61	14.20	20.27	10.37	12.04	12.79	16.90
		149	125	17.01	17.98	16.75	19.88	11.75	12.25	11.91	11.00
	Very Fine	125	105	15.52	14.60	14.29	13.27	11.07	10.84	9.66	5.78
		105	88	11.87	10.00	10.32	6.88	9.89	9.16	7.55	2.53
		88	74	7.68	5.68	6.33	3.03	8.16	6.97	5.36	1.02
		74	63	4.34	2.87	3.36	1.28	6.09	4.77	3.45	0.37
Silt	Coarse	63	53	2.67	1.59	1.88	0.58	4.98	3.59	2.45	0.14
		53	44	1.50	0.78	0.90	0.22	3.80	2.50	1.62	0.04
		44	37	0.67	0.29	0.32	0.06	2.41	1.47	0.93	0.06
		37	31.2	0.29	0.12	0.11	0.03	1.62	0.93	0.61	0.11
	Meduim	31.2	26.3	0.15	0.09	0.06	0.13	1.13	0.65	0.47	0.17
		26.3	22.1	0.17	0.26	0.16	0.22	0.83	0.50	0.41	0.22
		22.1	18.6	0.24	0.33	0.23	0.31	0.63	0.43	0.38	0.23
		18.6	15.6	0.32	0.39	0.30	0.37	0.53	0.40	0.37	0.22
	Fine	15.6	13.1	0.35	0.40	0.36	0.39	0.44	0.38	0.36	0.18
		13.1	11	0.36	0.40	0.42	0.39	0.39	0.38	0.38	0.16
		11	9.3	0.34	0.41	0.48	0.38	0.33	0.37	0.41	0.15
		9.3	7.8	0.37	0.48	0.62	0.43	0.31	0.41	0.49	0.19
	Very Fine	7.8	6.6	0.38	0.53	0.73	0.46	0.27	0.42	0.54	0.23
		6.6	5.5	0.46	0.69	0.96	0.57	0.28	0.51	0.68	0.32
		5.5	4.6	0.49	0.74	1.05	0.58	0.28	0.54	0.73	0.35
		4.6	3.9	0.46	0.70	1.01	0.52	0.26	0.52	0.71	0.34
Clay	Coarse	3.9	3.3	0.44	0.67	0.98	0.47	0.28	0.54	0.73	0.33
		3.3	2.8	0.40	0.60	0.88	0.40	0.29	0.53	0.72	0.31
		2.8	2.3	0.42	0.61	0.89	0.39	0.38	0.62	0.82	0.34
		2.3	1.95	0.29	0.42	0.60	0.25	0.33	0.49	0.63	0.26
	Medium	1.95	1.64	0.25	0.36	0.50	0.20	0.35	0.47	0.60	0.23
		1.64	1.38	0.23	0.31	0.41	0.17	0.35	0.43	0.53	0.22
		1.38	1.16	0.20	0.26	0.33	0.14	0.33	0.38	0.46	0.19
		1.16	0.98	0.17	0.22	0.28	0.12	0.30	0.32	0.38	0.20
	Fine	0.98	0.82	0.18	0.22	0.28	0.12	0.30	0.32	0.37	0.08
		0.82	0.69	0.19	0.23	0.28	0.12	0.30	0.31	0.34	0.00
		0.69	0.58	0.21	0.25	0.30	0.13	0.33	0.33	0.35	0.00
		0.58	0.49	0.24	0.27	0.33	0.14	0.36	0.35	0.37	0.00
	Very Fine		<0.49	0.69	0.85	1.29	0.37	1.66	1.59	1.87	0.00

Table 3. Particle size data.—Continued

		Microns		05U-1 0-1 cm	05U-1 1-2 cm	05U-1 Bedrock	05U-2 0-1 cm	05U-2 1-2 cm	05U-2 2-5 cm	05U-2 Bedrock
Sand	Very Coarse	2,000	1,680	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,680	1,414	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,414	1,189	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		1,189	1,000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Coarse	1,000	841	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		841	707	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		707	595	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		595	500	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Medium	500	420	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		420	354	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		354	297	1.90	2.63	1.69	0.05	0.05	0.07	0.04
		297	250	4.66	6.13	4.63	2.61	2.56	3.39	2.12
	Fine	250	210	8.73	11.01	9.45	5.40	5.43	6.98	5.05
		210	177	12.72	16.62	15.21	9.33	9.62	11.40	10.63
		177	149	15.61	18.41	20.61	13.51	14.23	16.47	18.13
		149	125	14.31	15.33	19.45	15.60	16.51	16.83	25.45
	Very Fine	125	105	10.07	9.68	12.76	12.26	12.70	12.65	19.78
		105	88	6.48	5.56	7.05	8.06	8.03	8.08	9.85
		88	74	3.87	2.92	3.44	4.89	4.69	4.58	3.79
		74	63	2.26	1.49	1.60	2.93	2.73	2.51	1.44
Silt	Coarse	63	53	1.52	0.85	0.83	2.12	1.92	1.60	0.64
		53	44	1.00	0.42	0.36	1.55	1.35	0.94	0.29
		44	37	0.65	0.17	0.11	1.08	0.88	0.46	0.09
		37	31.2	0.64	0.14	0.05	0.99	0.79	0.36	0.04
	Meduim	31.2	26.3	0.78	0.22	0.06	1.10	0.90	0.47	0.04
		26.3	22.1	0.94	0.32	0.09	1.24	1.07	0.66	0.07
		22.1	18.6	0.98	0.37	0.12	1.27	1.12	0.77	0.10
		18.6	15.6	0.97	0.38	0.13	1.24	1.10	0.79	0.12
	Fine	15.6	13.1	0.88	0.36	0.12	1.12	1.00	0.74	0.12
		13.1	11	0.79	0.34	0.10	1.02	0.91	0.68	0.11
		11	9.3	0.70	0.31	0.07	0.90	0.82	0.60	0.09
		9.3	7.8	0.69	0.34	0.05	0.90	0.83	0.60	0.07
	Very Fine	7.8	6.6	0.64	0.34	0.05	0.83	0.78	0.56	0.04
		6.6	5.5	0.69	0.40	0.07	0.89	0.85	0.61	0.05
		5.5	4.6	0.67	0.41	0.10	0.84	0.82	0.60	0.07
		4.6	3.9	0.59	0.38	0.10	0.74	0.73	0.54	0.09
Clay	Coarse	3.9	3.3	0.57	0.37	0.11	0.71	0.69	0.52	0.10
		3.3	2.8	0.52	0.35	0.10	0.65	0.64	0.48	0.09
		2.8	2.3	0.57	0.38	0.10	0.70	0.70	0.52	0.10
		2.3	1.95	0.44	0.30	0.08	0.53	0.53	0.40	0.08
	Medium	1.95	1.64	0.43	0.30	0.09	0.51	0.51	0.40	0.09
		1.64	1.38	0.43	0.32	0.11	0.51	0.52	0.40	0.12
		1.38	1.16	0.39	0.30	0.11	0.46	0.47	0.37	0.13
		1.16	0.98	0.33	0.25	0.11	0.37	0.38	0.31	0.11
	Fine	0.98	0.82	0.32	0.24	0.11	0.37	0.37	0.31	0.11
		0.82	0.69	0.33	0.26	0.12	0.39	0.40	0.33	0.12
		0.69	0.58	0.35	0.28	0.13	0.42	0.44	0.36	0.13
		0.58	0.49	0.38	0.30	0.14	0.48	0.50	0.40	0.15
	Very Fine		<0.49	1.22	0.85	0.43	1.44	1.44	1.30	0.40

Table 3. Particle size data.—Continued

		Microns		21 0-1 cm	21 1-2 cm	21 2-5 cm	21 Bedrock
Sand	Very Coarse	2,000	1,680	0.00	0.00	0.00	0.00
		1,680	1,414	0.00	0.00	0.00	0.00
		1,414	1,189	0.00	0.00	0.00	0.00
		1,189	1,000	0.00	0.00	0.00	0.00
	Coarse	1,000	841	0.00	0.00	0.00	0.00
		841	707	0.00	0.00	0.00	0.00
		707	595	0.00	0.00	0.00	0.00
		595	500	0.00	0.00	0.00	0.00
	Medium	500	420	0.95	0.98	1.26	0.00
		420	354	4.23	3.40	3.81	1.38
		354	297	7.89	6.88	7.06	4.24
		297	250	11.79	11.02	10.56	8.21
	Fine	250	210	15.15	14.89	13.81	12.87
		210	177	15.19	15.45	14.34	16.32
		177	149	12.96	13.42	12.86	17.00
		149	125	10.27	10.67	10.82	14.52
	Very Fine	125	105	7.03	7.26	7.86	10.07
		105	88	4.50	4.63	5.30	5.76
		88	74	2.67	2.78	3.27	2.81
		74	63	1.49	1.59	1.88	1.28
Silt	Coarse	63	53	0.90	1.00	1.19	0.64
		53	44	0.47	0.55	0.69	0.27
		44	37	0.22	0.28	0.35	0.09
		37	31.2	0.16	0.22	0.24	0.05
	Meduim	31.2	26.3	0.17	0.23	0.22	0.07
		26.3	22.1	0.18	0.24	0.22	0.11
		22.1	18.6	0.17	0.22	0.21	0.14
		18.6	15.6	0.15	0.19	0.19	0.15
	Fine	15.6	13.1	0.13	0.16	0.16	0.15
		13.1	11	0.11	0.14	0.14	0.14
		11	9.3	0.10	0.13	0.12	0.13
		9.3	7.8	0.12	0.15	0.14	0.16
	Very Fine	7.8	6.6	0.13	0.17	0.15	0.19
		6.6	5.5	0.17	0.21	0.18	0.26
		5.5	4.6	0.19	0.23	0.20	0.29
		4.6	3.9	0.18	0.22	0.19	0.28
Clay	Coarse	3.9	3.3	0.18	0.22	0.19	0.27
		3.3	2.8	0.17	0.21	0.19	0.24
		2.8	2.3	0.20	0.23	0.21	0.25
		2.3	1.95	0.16	0.18	0.17	0.18
	Medium	1.95	1.64	0.16	0.19	0.17	0.17
		1.64	1.38	0.16	0.19	0.18	0.16
		1.38	1.16	0.15	0.18	0.17	0.14
		1.16	0.98	0.13	0.15	0.15	0.12
	Fine	0.98	0.82	0.14	0.16	0.15	0.12
		0.82	0.69	0.15	0.17	0.16	0.13
		0.69	0.58	0.16	0.18	0.16	0.14
		0.58	0.49	0.16	0.19	0.17	0.15
	Very Fine		<0.49	0.41	0.47	0.53	0.38

Table 4. Magnetic properties.

[**Sample no.**, Unique sample number (for example, 44/0-1); presented as site designation (44), and depth in centimeters (0-1).

MSlf and MShf, Low frequency (lf) and high frequency (hf) magnetic susceptibility in m^3/kg.

FDMS, Frequency-dependent magnetic susceptibility. Expressed in percent and m^3/kg.

ARM, Anhysteretic remanent magnetization in Am^2/kg.

IRM 1.2, Isothermal remanent magnetization from a 1.2 tesla induction. Expressed in Am^2/kg.

IRM -0.3, Isothermal remanent magnetization from a -0.3 tesla induction. Expressed in Am^2/kg.

HIRM, Hard isothermal remanent magnetization: HIRM is calculated as: (IRM1.2T + IRM-0.3T)/2.

S, (S parameter) calculated as IRM-0.3T/IRM1.2T.

n.d., not determined; **Am^2/kg**, Ampere meter squared per kilogram; **m^3/kg**, cubic meter per kilogram; **mm**, millimeter; **T**, tesla; **μm**, micrometer; **%**, percent]

Magnetic properties for <2-mm-size fraction and bulk bedrock.

Sample no.	MSlf (m^3/kg)	MShf (m^3/kg)	FDMS (%)	FDMS (m^3/kg)	ARM (Am^2/kg)	IRM1.2 (Am^2/kg)	IRM -0.3 (Am^2/kg)	HIRM (Am^2/kg)	S
493/0-1	4.87E-07	4.81E-07	1.31	6.39E-09	1.37E-04	6.91E-03	5.83E-03	5.44E-04	0.84
493/1-2	4.98E-07	4.91E-07	1.51	7.54E-09	1.59E-04	7.23E-03	6.12E-03	5.55E-04	0.85
493/2-5	4.30E-07	4.42E-07	-2.85	-1.22E-08	1.61E-04	6.44E-03	5.49E-03	4.79E-04	0.85
493/Bedrock	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
29/0-1	2.54E-07	2.50E-07	1.87	4.75E-09	7.14E-05	3.51E-03	3.05E-03	2.27E-04	0.87
29/1-2	2.31E-07	2.27E-07	1.79	4.14E-09	7.55E-05	3.45E-03	3.03E-03	2.11E-04	0.88
29/2-5	1.36E-07	1.34E-07	1.46	1.98E-09	5.45E-05	2.10E-03	2.07E-03	1.15E-05	0.99
29/Bedrock	5.76E-09	9.68E-09	-67.99	-3.92E-09	5.31E-06	1.42E-04	7.63E-05	3.29E-05	0.54
55/0-1	3.89E-07	3.82E-07	1.88	7.31E-09	8.51E-05	5.02E-03	4.54E-03	2.38E-04	0.91
55/1-2	3.82E-07	3.76E-07	1.45	5.52E-09	8.92E-05	4.70E-03	4.17E-03	2.68E-04	0.89
55/2-5	2.82E-07	2.77E-07	1.79	5.04E-09	7.37E-05	3.43E-03	3.03E-03	2.02E-04	0.88
55/Bedrock	7.27E-09	1.09E-08	-50.03	-3.64E-09	2.18E-06	1.11E-04	1.55E-05	4.77E-05	0.14
54/0-1	2.43E-07	2.36E-07	2.76	6.69E-09	6.34E-05	3.56E-03	3.07E-03	2.45E-04	0.86
54/1-2	1.90E-07	1.84E-07	3.17	6.03E-09	7.00E-05	3.01E-03	2.02E-03	4.94E-04	0.67
54/2-5	8.62E-08	8.63E-08	-0.18	-1.55E-10	3.98E-05	1.34E-03	7.70E-04	2.84E-04	0.58
54/Bedrock	2.36E-08	2.67E-08	-13.13	-3.10E-09	2.97E-06	3.76E-04	2.07E-05	1.78E-04	0.06
53/0-1	1.61E-07	1.60E-07	1.01	1.63E-09	4.31E-05	2.26E-03	1.94E-03	1.58E-04	0.86
53/1-2	1.25E-07	1.22E-07	3.11	3.90E-09	5.21E-05	1.82E-03	1.58E-03	1.19E-04	0.87
53/2-5	1.92E-07	1.86E-07	2.90	5.56E-09	5.83E-05	3.33E-03	2.83E-03	2.46E-04	0.85
53/Bedrock	2.92E-09	5.78E-09	-98.30	-2.87E-09	4.29E-06	1.19E-04	1.00E-04	9.19E-06	0.85
51/0-1	2.15E-07	2.07E-07	3.95	8.50E-09	8.87E-05	2.35E-03	1.96E-03	1.98E-04	0.83
51/1-2	1.67E-07	1.61E-07	3.63	6.07E-09	8.60E-05	2.09E-03	1.75E-03	1.66E-04	0.84
51/2-5	1.69E-07	1.61E-07	4.41	7.45E-09	8.37E-05	1.85E-03	1.70E-03	7.65E-05	0.92
51/Bedrock	5.46E-09	8.96E-09	-64.29	-3.51E-09	2.19E-06	8.37E-05	7.68E-05	3.44E-06	0.92
50/0-1	6.91E-08	6.78E-08	1.95	1.35E-09	3.15E-05	1.06E-03	7.97E-04	1.31E-04	0.75
50/1-2	5.18E-08	5.28E-08	-1.79	-9.27E-10	2.79E-05	8.52E-04	5.87E-04	1.32E-04	0.69
50/2-5	5.17E-08	5.19E-08	-0.33	-1.68E-10	2.13E-05	4.15E-04	3.00E-04	5.73E-05	0.72
50/Bedrock	2.94E-09	6.76E-09	-129.50	-3.81E-09	2.40E-06	1.12E-04	5.85E-05	2.66E-05	0.52
49/0-1	8.78E-08	8.66E-08	1.37	1.20E-09	3.13E-05	9.80E-04	8.83E-04	4.85E-05	0.90
49/1-2	6.83E-08	7.07E-08	-3.53	-2.41E-09	2.45E-05	6.97E-04	5.53E-04	7.20E-05	0.79
49/2-5	6.03E-08	6.20E-08	-2.85	-1.72E-09	1.05E-05	6.57E-04	5.39E-04	5.87E-05	0.82
49/Bedrock	2.26E-09	5.00E-09	-121.09	-2.74E-09	3.69E-06	1.85E-04	1.66E-04	9.30E-06	0.90

Table 4. Magnetic properties.—Continued

Magnetic properties for <2-mm-size fraction and bulk bedrock—Continued.

Sample no.	MSlf (m^3/kg)	MShf (m^3/kg)	FDMS (%)	FDMS (m^3/kg)	ARM (Am^2/kg)	IRM1.2 (Am^2/kg)	IRM -0.3 (Am^2/kg)	HIRM (Am^2/kg)	S
48/0-1	9.86E-08	1.01E-07	-2.39	-2.36E-09	1.47E-05	9.33E-04	9.24E-04	4.63E-06	0.99
48/1-2	6.68E-08	6.60E-08	1.15	7.70E-10	1.12E-05	6.57E-04	5.76E-04	4.02E-05	0.88
48/2-5	7.22E-08	7.68E-08	-6.39	-4.62E-09	2.53E-05	6.47E-04	5.66E-04	4.02E-05	0.88
48/Bedrock	5.00E-08	5.27E-08	-5.21	-2.61E-09	3.22E-06	1.31E-04	2.25E-05	5.44E-05	0.17
47/0-1	2.03E-07	1.99E-07	1.94	3.93E-09	6.90E-05	2.93E-03	2.37E-03	2.77E-04	0.81
47/1-2	1.77E-07	1.72E-07	3.23	5.73E-09	5.52E-05	2.63E-03	2.21E-03	2.10E-04	0.84
47/2-5	1.17E-07	1.18E-07	-1.11	-1.30E-09	2.93E-05	1.60E-03	1.22E-03	1.89E-04	0.76
47/Bedrock	4.06E-08	4.40E-08	-8.44	-3.43E-09	7.04E-06	2.09E-04	1.66E-04	2.13E-05	0.80
30/0-1	1.70E-07	1.65E-07	2.72	4.61E-09	4.83E-05	3.49E-03	3.06E-03	2.17E-04	0.88
30/1-2	1.46E-07	1.45E-07	0.29	4.28E-10	4.46E-05	2.06E-03	1.84E-03	1.12E-04	0.89
30/2-5	4.44E-08	4.98E-08	-12.26	-5.44E-09	2.57E-05	6.41E-04	5.37E-04	5.20E-05	0.84
30/Bedrock	4.20E-09	8.01E-09	-90.88	-3.81E-09	2.94E-06	6.83E-05	5.67E-05	5.79E-06	0.83
46/0-1	3.34E-08	3.59E-08	-7.40	-2.47E-09	2.24E-05	3.81E-04	3.43E-04	1.92E-05	0.90
46/1-2	2.71E-08	2.68E-08	1.06	2.88E-10	2.01E-05	3.38E-04	3.68E-04	-1.50E-05	1.09
46/2-5	4.21E-08	4.50E-08	-6.81	-2.87E-09	1.79E-05	5.66E-04	5.18E-04	2.45E-05	0.91
46/Bedrock	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
45/0-1	7.25E-08	7.38E-08	-1.78	-1.29E-09	1.96E-05	8.39E-04	7.88E-04	2.59E-05	0.94
45/1-2	6.58E-08	6.84E-08	-4.03	-2.65E-09	2.45E-05	6.10E-04	5.40E-04	3.51E-05	0.89
45/2-5	4.84E-08	4.67E-08	3.44	1.66E-09	2.14E-05	5.17E-04	4.70E-04	2.31E-05	0.91
45/Bedrock	3.47E-09	8.68E-09	-149.70	-5.20E-09	3.51E-06	8.95E-05	7.62E-05	6.65E-06	0.85
44/0-1	9.30E-08	9.60E-08	-3.29	-3.06E-09	3.17E-05	1.03E-03	8.08E-04	1.11E-04	0.78
44/1-2	6.63E-08	6.87E-08	-3.59	-2.38E-09	1.61E-05	7.89E-04	6.64E-04	6.26E-05	0.84
44/2-5	5.18E-08	5.52E-08	-6.72	-3.48E-09	1.33E-05	6.45E-04	5.21E-04	6.19E-05	0.81
44/Bedrock	3.21E-09	7.26E-09	-126.29	-4.05E-09	3.38E-06	5.96E-05	5.14E-05	4.07E-06	0.86
05U-1/0-1	1.02E-07	1.02E-07	-0.26	-2.69E-10	4.36E-05	1.77E-03	1.32E-03	2.26E-04	0.75
05U-1/1-2	3.60E-08	3.77E-08	-4.76	-1.71E-09	2.59E-05	6.36E-04	4.39E-04	9.85E-05	0.69
05U-1/Bedrock	4.34E-09	6.68E-09	-53.80	-2.34E-09	5.80E-06	1.59E-04	6.27E-05	4.82E-05	0.39
05U-2/0-1	1.13E-07	1.12E-07	0.94	1.06E-09	6.21E-05	1.95E-03	1.42E-03	2.68E-04	0.73
05U-2/1-2	9.65E-08	9.62E-08	0.26	2.55E-10	5.59E-05	1.70E-03	1.22E-03	2.41E-04	0.72
05U-2/2-5	4.51E-08	4.74E-08	-5.16	-2.33E-09	2.47E-05	8.40E-04	5.29E-04	1.55E-04	0.63
05U-2/Bedrock	4.36E-09	7.35E-09	-68.69	-2.99E-09	6.45E-06	1.54E-04	6.94E-05	4.22E-05	0.45
21/0-1	8.91E-08	8.94E-08	-0.36	-3.23E-10	3.01E-05	1.47E-03	1.01E-03	2.27E-04	0.69
21/1-2	6.21E-08	6.09E-08	1.88	1.17E-09	2.71E-05	1.05E-03	7.09E-04	1.72E-04	0.67
21/2-5	5.97E-08	6.34E-08	-6.19	-3.70E-09	2.46E-05	9.52E-04	6.26E-04	1.63E-04	0.66
21/Bedrock	1.44E-08	1.69E-08	-16.79	-2.42E-09	8.04E-06	5.79E-04	2.04E-04	1.87E-04	0.35

Table 4. Magnetic properties.—Continued

Magnetic properties for <63-µm-size fraction.

Sample no.	MSlf (m^3/kg)	MShf (m^3/kg)	FDMS (%)	FDMS (m^3/kg)	ARM (Am^2/kg)	IRM1.2 (Am^2/kg)	IRM -0.3 (Am^2/kg)	HIRM (Am^2/kg)	S
493/0-1	1.37E-06	1.36E-06	1.37	1.88E-08	2.93E-04	1.92E-02	1.70E-02	1.11E-03	0.88
493/1-2	1.35E-06	1.33E-06	1.79	2.42E-08	3.35E-04	1.96E-02	1.71E-02	1.22E-03	0.88
493/2-5	1.04E-06	1.02E-06	1.86	1.93E-08	2.59E-04	1.49E-02	1.30E-02	9.34E-04	0.87
29/0-1	1.10E-06	1.08E-06	1.78	1.95E-08	2.81E-04	1.56E-02	1.41E-02	7.69E-04	0.90
29/1-2	1.03E-06	1.01E-06	2.29	2.36E-08	2.45E-04	1.46E-02	1.30E-02	8.19E-04	0.89
29/2-5	5.87E-07	5.73E-07	2.39	1.41E-08	1.56E-04	8.85E-03	7.69E-03	5.84E-04	0.87
55/0-1	1.40E-06	1.37E-06	2.00	2.79E-08	2.58E-04	1.82E-02	1.62E-02	9.62E-04	0.89
55/1-2	1.25E-06	1.23E-06	1.88	2.36E-08	2.94E-04	1.67E-02	1.48E-02	9.49E-04	0.89
55/2-5	1.18E-06	1.16E-06	2.34	2.76E-08	2.27E-04	1.55E-02	1.38E-02	8.35E-04	0.89
54/0-1	1.01E-06	9.89E-07	2.38	2.41E-08	2.36E-04	1.43E-02	1.23E-02	9.97E-04	0.86
54/1-2	6.65E-07	6.45E-07	3.12	2.07E-08	2.13E-04	1.01E-02	7.46E-03	1.33E-03	0.74
54/2-5	4.74E-07	4.59E-07	3.07	1.46E-08	1.51E-04	7.30E-03	5.05E-03	1.13E-03	0.69
53/0-1	9.01E-07	8.79E-07	2.39	2.15E-08	1.85E-04	1.38E-02	1.19E-02	9.07E-04	0.87
53/1-2	8.51E-07	8.29E-07	2.57	2.18E-08	1.81E-04	1.31E-02	1.14E-02	8.37E-04	0.87
53/2-5	6.25E-07	6.06E-07	2.93	1.83E-08	1.93E-04	1.05E-02	8.88E-03	7.90E-04	0.85
51/0-1	8.87E-07	8.49E-07	4.22	3.74E-08	2.54E-04	1.24E-02	1.07E-02	8.21E-04	0.87
51/1-2	9.08E-07	8.76E-07	3.49	3.17E-08	2.66E-04	1.22E-02	1.06E-02	8.03E-04	0.87
51/2-5	7.78E-07	7.41E-07	4.74	3.69E-08	2.22E-04	1.08E-02	9.26E-03	7.51E-04	0.86
50/0-1	6.16E-07	5.93E-07	3.79	2.34E-08	1.43E-04	9.65E-03	7.88E-03	8.80E-04	0.82
50/1-2	6.15E-07	5.93E-07	3.52	2.16E-08	1.45E-04	9.80E-03	7.81E-03	9.99E-04	0.80
50/2-5	6.68E-07	6.45E-07	3.45	2.31E-08	1.52E-04	1.07E-02	8.65E-03	1.04E-03	0.81
49/0-1	6.82E-07	6.64E-07	2.73	1.86E-08	1.03E-04	7.63E-03	6.51E-03	5.58E-04	0.85
49/1-2	6.36E-07	6.27E-07	1.43	9.09E-09	9.76E-05	6.90E-03	5.90E-03	5.00E-04	0.86
49/2-5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
48/0-1	4.72E-07	4.64E-07	1.85	8.74E-09	7.15E-05	4.62E-03	4.09E-03	2.64E-04	0.89
48/1-2	4.18E-07	4.17E-07	0.23	9.61E-10	5.92E-05	3.83E-03	3.39E-03	2.17E-04	0.89
48/2-5	3.42E-07	3.32E-07	2.98	1.02E-08	4.62E-05	3.15E-03	2.78E-03	1.83E-04	0.88
47/0-1	6.02E-07	5.85E-07	2.71	1.63E-08	1.82E-04	8.44E-03	7.14E-03	6.51E-04	0.85
47/1-2	5.48E-07	5.37E-07	2.12	1.16E-08	1.43E-04	7.66E-03	6.44E-03	6.09E-04	0.84
47/2-5	3.61E-07	3.56E-07	1.35	4.89E-09	8.39E-05	4.88E-03	3.82E-03	5.31E-04	0.78
30/0-1	6.02E-07	5.93E-07	1.55	9.33E-09	1.33E-04	8.40E-03	7.71E-03	3.45E-04	0.92
30/1-2	4.63E-07	4.48E-07	3.30	1.53E-08	1.16E-04	6.78E-03	6.06E-03	3.58E-04	0.89
30/2-5	1.59E-07	1.59E-07	0.08	1.20E-10	5.13E-05	2.17E-03	1.85E-03	1.62E-04	0.85
46/0-1	5.64E-07	5.52E-07	2.00	1.13E-08	1.37E-04	7.47E-03	6.78E-03	3.45E-04	0.91
46/1-2	6.25E-07	6.15E-07	1.65	1.03E-08	1.29E-04	8.01E-03	7.38E-03	3.15E-04	0.92
46/2-5	4.75E-07	4.68E-07	1.52	7.22E-09	1.09E-04	6.22E-03	5.68E-03	2.66E-04	0.91
45/0-1	7.66E-07	7.52E-07	1.78	1.36E-08	1.27E-04	9.97E-03	9.13E-03	4.20E-04	0.92
45/1-2	7.26E-07	7.10E-07	2.15	1.56E-08	1.16E-04	9.23E-03	8.37E-03	4.28E-04	0.91
45/2-5	6.62E-07	6.48E-07	2.06	1.37E-08	1.13E-04	8.53E-03	7.77E-03	3.81E-04	0.91
44/0-1	3.92E-07	3.82E-07	2.42	9.49E-09	7.83E-05	5.14E-03	4.21E-03	4.64E-04	0.82
44/1-2	3.46E-07	3.38E-07	2.14	7.40E-09	7.18E-05	4.48E-03	3.65E-03	4.11E-04	0.82
44/2-5	3.15E-07	3.08E-07	2.13	6.69E-09	6.50E-05	3.99E-03	3.31E-03	3.38E-04	0.83
05U-1/0-1	4.53E-07	4.46E-07	1.68	7.62E-09	1.26E-04	7.37E-03	5.63E-03	8.67E-04	0.76
05U-1/1-2	2.84E-07	2.81E-07	1.26	3.58E-09	9.34E-05	4.78E-03	3.47E-03	6.58E-04	0.72
05U-2/0-1	3.77E-07	3.70E-07	1.82	6.85E-09	1.37E-04	6.08E-03	4.59E-03	7.47E-04	0.75
05U-2/1-2	3.52E-07	3.43E-07	2.73	9.60E-09	1.26E-04	5.72E-03	4.25E-03	7.33E-04	0.74
05U-2/2-5	2.24E-07	2.23E-07	0.67	1.50E-09	6.85E-05	3.72E-03	2.47E-03	6.23E-04	0.67
21/0-1	3.81E-07	3.78E-07	0.97	3.69E-09	7.53E-05	5.50E-03	3.84E-03	8.29E-04	0.70
21/1-2	3.32E-07	3.28E-07	1.32	4.40E-09	7.02E-05	4.97E-03	3.32E-03	8.25E-04	0.67
21/2-5	3.11E-07	3.06E-07	1.32	4.11E-09	6.48E-05	4.66E-03	3.09E-03	7.85E-04	0.66

Table 5. Geochemical data.

This table contains geochemical data obtained by ICP–AES (inductively coupled plasma–atomic emission spectrometry), ICP–MS (inductively coupled plasma–mass spectrometry), and XRF (X-ray fluorescence) techniques (Litche and others, 1987). All analyses were performed at the USGS Geologic Division geochemistry laboratory in Denver, Colorado, and are reported in parts per million (ppm) or percent (%).

[**Sample no.**, Unique sample number (for example, 44/0-1); presented as site designation (44), and depth in centimeters (0-1).

n.d., not determined; *, Zr (ppm) and Ti (%) obtained by XRF]

ICP–AES and XRF data

Sample no.	Al %	Ca %	Fe %	K %	Mg %	Na %	P %	Mn ppm	Nd ppm	*Zr ppm	*Ti%
493/0-1	5.98	1.46	2.91	2.00	0.975	1.21	0.0952	550	50.3	581	0.84
493/1-2	6.44	1.41	3.16	2.11	1.05	1.17	0.0982	572	43.6	562	0.84
493/2-5	6.64	1.35	3.26	2.16	1.04	1.07	0.0930	549	36.0	457	0.75
493/Bedrock	6.12	4.82	2.04	2.30	1.83	1.46	0.0686	304	22.5	77	0.24
29/0-1	7.14	1.05	2.56	3.14	0.862	0.919	0.0661	394	29.3	485	0.72
29/1-2	7.39	0.933	2.46	3.11	0.778	0.867	0.0642	357	29.8	419	0.74
29/2-5	7.34	0.542	2.13	3.19	0.635	0.580	0.0366	273	26.5	284	0.63
29/Bedrock	1.73	0.0356	0.509	0.879	0.0861	0.0281	0.00782	61.3	< 4	59	0.09
55/0-1	5.11	1.83	2.68	2.24	1.35	0.878	0.0848	515	34.8	764	0.71
55/1-2	5.71	1.24	2.94	2.48	1.17	0.768	0.0893	411	32.0	638	0.80
55/2-5	5.47	1.04	2.76	2.38	0.985	0.743	0.0782	348	29.1	631	0.75
55/Bedrock	1.40	0.0672	1.08	1.47	0.0686	0.0352	0.0327	24.6	< 4	38	0.06
54/0-1	5.24	1.06	2.67	2.39	1.02	0.776	0.0839	461	30.3	399	0.63
54/1-2	6.06	0.697	3.15	2.71	0.977	0.524	0.104	345	29.4	233	0.66
54/2-5	5.60	0.573	2.79	2.62	0.837	0.426	0.0914	290	25.5	189	0.55
54/Bedrock	2.17	0.280	0.779	1.48	0.0690	0.0353	0.0571	135	5.46	52	0.06
53/0-1	5.61	0.692	2.01	3.08	0.498	0.843	0.0577	338	21.5	917	0.64
53/1-2	5.58	0.602	1.97	3.07	0.478	0.781	0.0515	329	20.8	869	0.68
53/2-5	7.95	0.435	2.09	2.83	0.467	0.620	0.0371	293	23.0	475	0.88
53/Bedrock	1.35	0.0716	0.473	0.620	0.0547	0.0248	0.0135	133	< 4	52	0.10
51/0-1	5.40	0.854	2.66	2.49	0.674	0.642	0.0648	693	28.5	1,273	0.80
51/1-2	5.52	0.931	2.77	2.51	0.697	0.630	0.0654	748	27.4	1,260	0.78
51/2-5	5.40	1.27	2.64	2.43	0.694	0.552	0.0544	714	26.3	1,107	0.75
51/Bedrock	0.350	41.5	0.183	0.251	0.451	0.0302	0.0105	348	< 4	10	0.02
50/0-1	4.20	1.13	2.05	2.53	0.569	0.528	0.0794	826	22.8	1,214	0.72
50/1-2	4.00	1.03	2.00	2.47	0.526	0.496	0.0733	846	22.9	1,531	0.80
50/2-5	4.14	1.10	2.12	2.51	0.551	0.520	0.0760	875	24.4	1,409	0.77
50/Bedrock	0.597	7.74	0.412	0.599	0.0467	0.0172	0.00826	392	< 4	27	0.03
49/0-1	4.28	0.975	1.56	2.42	0.688	0.464	0.0722	355	28.4	1,772	0.71
49/1-2	4.48	0.938	1.50	2.44	0.671	0.442	0.0684	334	24.5	1,543	0.60
49/2-5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
49/Bedrock	0.683	0.0744	0.315	0.421	0.0287	0.0172	0.00994	30.5	< 4	52	0.06
48/0-1	4.91	4.93	1.58	1.51	0.626	0.555	0.0768	426	24.0	1,229	0.67
48/1-2	4.51	5.31	1.41	1.51	0.546	0.561	0.0715	402	23.2	1,210	0.63
48/2-5	4.61	6.95	1.39	1.46	0.510	0.534	0.0674	386	25.6	1,147	0.65
48/Bedrock	1.72	1.02	7.37	0.109	0.0554	0.0504	0.0179	46.4	11.7	226	0.27
47/0-1	7.24	0.549	2.03	2.38	0.560	0.695	0.0441	288	23.6	592	0.73
47/1-2	7.49	0.519	2.03	2.38	0.555	0.668	0.0431	279	22.6	578	0.72
47/2-5	8.11	0.426	1.80	2.33	0.472	0.633	0.0256	221	21.9	410	0.73
47/Bedrock	1.53	0.0418	4.60	0.802	0.0855	0.0376	0.0491	245	6.33	49	0.07

Table 5. Geochemical data.—Continued

ICP–AES and XRF data—continued.

Sample no.	Al %	Ca %	Fe %	K %	Mg %	Na %	P %	Mn ppm	Nd ppm	*Zr ppm	*Ti%
30/0-1	8.01	0.293	1.95	2.05	0.368	0.330	0.0576	169	21.8	662	0.74
30/1-2	9.62	0.271	2.04	2.00	0.376	0.301	0.0624	146	25.0	486	0.75
30/2-5	10.9	0.182	1.90	1.91	0.336	0.167	0.0676	99.4	22.0	256	0.58
30/Bedrock	1.58	0.0351	0.583	0.869	0.0542	0.0319	0.0138	33.8	6.44	95	0.12
46/0-1	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/1-2	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/2-5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/Bedrock	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
45/0-1	4.60	0.420	1.42	3.17	0.320	0.337	0.0457	246	18.9	2,569	0.71
45/1-2	4.38	0.384	1.42	3.11	0.294	0.313	0.0443	245	18.6	2,159	0.59
45/2-5	5.12	0.403	1.34	3.26	0.307	0.305	0.0415	226	19.4	2,387	0.71
45/Bedrock	1.86	0.0424	0.335	1.20	0.0900	0.0433	0.00759	26.8	< 4	63	0.10
44/0-1	4.28	1.75	1.59	2.18	1.03	0.596	0.0754	325	30.4	1,514	0.61
44/1-2	4.23	1.74	1.49	2.20	0.994	0.598	0.0715	306	28.0	1,513	0.67
44/2-5	4.19	1.70	1.46	2.21	0.945	0.587	0.0692	296	29.1	1,554	0.71
44/Bedrock	2.02	0.350	0.232	1.14	0.0893	0.0344	0.00956	11.1	4.81	289	0.22
05U-1/0-1	5.77	0.597	2.06	3.06	0.718	0.483	0.078	346	28.1	991	0.98
05U-1/1-2	5.34	0.448	1.65	3.26	0.56	0.369	0.062	270	23.4	779	0.83
05U-1/Bedrock	1.51	0.375	0.302	1.5	0.0746	0.0456	0.00698	130	<4	142	0.12
05U-2/0-1	5.55	0.536	2.03	2.84	0.67	0.541	0.07	363	26.9	715	0.77
05U-2/1-2	5.7	0.503	1.99	2.95	0.64	0.552	0.0664	357	24.8	628	0.75
05U-2/2-5	5.31	0.366	1.72	2.97	0.555	0.487	0.0319	287	21.7	634	0.68
05U-2/Bedrock	1.65	0.0335	0.212	1.75	0.0604	0.0555	0.00557	35.2	<4	62	0.09
21/0-1	4	3.2	1.7	1.9	0.83	0.67	0.055	380	23	903	0.65
21/1-2	3.3	2.4	1.4	1.8	0.64	0.55	0.04	300	17	822	0.60
21/2-5	3.8	2.5	1.5	2	0.69	0.67	0.047	340	19	899	0.63
21/Bedrock	1.7	0.64	0.32	1.3	0.17	0.086	0.013	62	<8	174	0.12

Table 5. Geochemical data.—Continued

ICP–MS data

Sample no.	Ag (ppm)	Al (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Ca (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs (ppm)
493/0-1	<2	69,600	8.9	903	2	0.3	17,100	0.3	204	9.8	56.8	6.8
493/1-2	<2	77,000	11	882	2.2	0.31	16,900	0.32	163	10.7	62.8	8.3
493/2-5	<2	66,500	10.1	691	2	0.21	13,000	0.24	88	9.2	54.4	8.4
493/Bedrock	<2	35,600	8.8	413	0.98	< 0.06	21,500	0.06	29	4	37	3.3
29/0-1	<2	89,600	11.4	954	1.8	0.27	11,300	0.28	79.2	7.8	54	5.3
29/1-2	<2	95,800	12.1	985	1.9	0.26	10,200	0.24	80.2	7.6	49	5.5
29/2-5	<2	98,300	13.6	956	1.8	0.15	5,760	0.11	65.3	6.5	42	5.8
29/Bedrock	<2	18,900	2.4	225	0.46	< 0.06	314	0.01	10.1	0.94	12.8	1.1
55/0-1	<2	56,600	13.8	652	1.5	0.31	17,700	0.28	96.4	7	55.6	4.6
55/1-2	<2	67,800	18.3	640	2	0.26	12,100	0.26	73.7	7.5	60.6	6.1
55/2-5	<2	65,200	17.1	617	1.9	0.17	9,870	0.18	68.4	6.8	56.8	6.1
55/Bedrock	<2	15,200	3.4	337	0.22	< 0.06	530	0.008	6.5	0.33	18.8	1
54/0-1	<2	58,000	19.8	592	1.6	0.33	10,500	0.3	78.5	7	44.2	4.9
54/1-2	<2	75,200	43	648	2.3	0.35	7,280	0.3	66.4	7.6	55.2	7.2
54/2-5	<2	66,100	39	560	2	0.26	5,770	0.23	58.6	6.7	47.8	6.5
54/Bedrock	<2	24,600	29.5	393	0.7	< 0.06	3,120	0.08	11.6	1.6	41.7	0.93
53/0-1	<2	65,500	6.4	942	1.3	0.31	6,340	0.23	48.8	5.8	47	4.9
53/1-2	<2	70,900	6.9	1000	1.3	0.3	6,260	0.26	54.2	5.9	44.6	5.1
53/2-5	<2	95,600	10.2	887	1.5	0.21	4,880	0.15	66.2	6.6	49.4	5.7
53/Bedrock	<2	14,700	2.7	174	0.27	< 0.06	764	0.04	12	2.7	37.6	1.1
51/0-1	<2	56,800	9.8	583	1.6	0.25	8,020	0.29	61.6	8.6	53	5.5
51/1-2	<2	56,900	9.2	593	1.6	0.25	8,070	0.29	61.4	8.6	54	5.5
51/2-5	<2	58,600	10.3	582	1.8	0.24	12,200	0.31	65.2	9.2	51.4	5.9
51/Bedrock	<2	3,200	1	19.5	0.18	< 0.06	454,000	0.16	3	0.18	4	0.33
50/0-1	<2	38,900	5.6	492	1.1	0.27	9,620	0.28	52.3	4.6	58.3	2.9
50/1-2	<2	36,600	5	477	1	0.26	8,280	0.26	59.6	4.4	48	2.6
50/2-5	<2	36,800	5.2	473	1	0.31	8,680	0.34	51.4	4.5	54.1	2.7
50/Bedrock	<2	5,920	1.6	106	0.17	< 0.06	81,700	0.05	4.4	0.68	40.4	0.38
49/0-1	<2	46,000	6.1	692	1	0.26	9,520	0.24	59.4	4.3	37.4	3.1
49/1-2	<2	42,700	4.9	664	0.87	0.22	7,460	0.21	48.3	3.6	40.8	2.9
49/2-5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
49/Bedrock	<2	7,510	<1	100	0.15	< 0.06	363	0.01	7.2	0.38	19.3	0.41
48/0-1	<2	48,800	6.7	390	1.3	0.23	46,700	0.18	48.6	3.8	32.8	2.8
48/1-2	<2	45,200	5.8	381	1.2	0.2	50,300	0.15	47.9	3.4	33.4	2.6
48/2-5	<2	45,900	6.5	352	1.2	0.2	64,100	0.14	53.8	3.4	29.6	2.5
48/Bedrock	<2	16,900	80.2	166	1.2	0.37	9,660	0.12	20.9	0.82	14.8	0.22
47/0-1	<2	83,100	18.8	602	1.8	0.38	5,380	0.31	54.5	5.9	44.3	5.1
47/1-2	<2	85,200	19.1	608	1.9	0.42	5,100	0.32	54.5	5.8	48.8	5.3
47/2-5	<2	102,000	20.6	575	2	0.27	4,470	0.17	52.4	5.2	45.3	5
47/Bedrock	<2	14,500	273	217	1.6	< 0.06	461	0.32	8.6	2	14.9	1.2
30/0-1	<2	107,000	233	671	1.5	0.24	3,260	0.26	62.7	5	41.3	5.4
30/1-2	<2	115,000	294	540	1.6	0.27	2,930	0.22	63.4	5.1	38	5.5
30/2-5	<2	129,000	303	544	1.7	0.19	2,250	0.14	53.5	4.2	33.8	5.8
30/Bedrock	<2	15,900	59.2	341	0.34	0.07	409	0.03	14.9	0.58	33	1.3
46/0-1	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/1-2	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/2-5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/Bedrock	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
45/0-1	<2	42,000	19.6	675	0.82	0.12	2,820	0.1	29.2	2.9	43.4	4.4
45/1-2	<2	33,300	14.2	616	0.59	0.07	1,540	0.06	17.8	2	25.9	3.6
45/2-5	<2	48,500	20.7	723	0.82	0.11	2,770	0.09	29.2	2.7	41.4	4.7
45/Bedrock	<2	20,600	4.6	293	0.41	< 0.06	263	0.01	8.1	0.85	17.7	2
44/0-1	<2	44,600	8.8	550	1.3	0.14	14,300	0.14	47.5	3.8	41.2	3.7
44/1-2	<2	48,400	9.4	558	1.5	0.15	17,400	0.14	58.7	4.2	41.8	4
44/2-5	<2	46,600	9.8	532	1.5	0.13	17,000	0.11	56.9	4.1	41.3	3.7
44/Bedrock	<2	20,600	2.2	233	0.77	< 0.06	3,120	<0.007	11.8	0.62	21.2	1.8
05U-1/0-1	<2	60,300	19.6	518	1.6	0.44	6,080	0.42	81.7	6.6	45	4.8
05U-1/1-2	<2	57,000	15.6	494	1.4	0.4	4,670	0.47	53.8	5.4	33.5	4.3
05U-1/Bedrock	<2	14,700	1.6	296	0.29	< 0.06	3,690	0.03	7.1	1	17.6	1.1
05U-2/0-1	<2	56,600	19.1	504	1.4	0.62	5,460	0.62	58.4	6.5	41.7	4.7
05U-2/1-2	<2	55,400	19.1	501	1.4	0.67	4,900	0.61	50.9	6.5	44	4.6
05U-2/2-5	<2	55,300	18	498	1.4	0.67	3,950	0.48	47.6	5.6	41.9	4.4
05U-2/Bedrock	<2	18,400	4.7	347	0.36	< 0.06	390	0.009	7.2	0.65	10.5	1.2
21/0-1	<2	38,600	3.3	579	1.1	0.21	25,200	0.33	45	4.2	35.1	2.2
21/1-2	<2	39,100	3.1	601	1	0.2	23,500	0.19	44.9	4	32.6	2.2
21/2-5	<2	38,400	3.5	591	1.1	0.21	21,200	0.16	39.1	3.8	33.2	2.1
21/Bedrock	<2	15,900	<1	267	0.35	< 0.06	7,680	0.01	9.4	0.81	14.2	0.81

Table 5. Geochemical data.—Continued

ICP–MS data—continued.

Sample no.	Cu (ppm)	Fe (ppm)	Ga (ppm)	K (ppm)	La (ppm)	Li (ppm)	Mg (ppm)	Mn (ppm)	Mo (ppm)	Na (ppm)	Nb (ppm)	Ni (ppm)
493/0-1	38.3	31,100	17.5	24,500	124	31.2	11,100	605	1.1	15,000	19	19.3
493/1-2	32.8	33,600	18.7	26,800	98.4	35.6	12,100	625	1.2	14,900	18	21.7
493/2-5	29.4	29,300	16.2	24,200	50.1	33.6	10,100	523	1	11,400	15	19.4
493/Bedrock	11.1	11,000	7.5	16,000	16.7	28	9,020	150	0.46	6,520	4.9	10.8
29/0-1	35.3	26,000	16.5	37,300	43.7	42.2	10,800	417	1.2	10,900	18	18.3
29/1-2	32.9	26,000	17.1	37,900	43.7	46	9,990	386	1	10,700	18	18.4
29/2-5	24.1	21,400	16.7	37,600	36.4	52.4	8,010	285	0.86	6,820	16	16.5
29/Bedrock	3.2	2,550	3.2	9,660	5.3	12.5	863	33.2	0.1	306	1.4	3
55/0-1	40.6	24,400	12.1	24,300	47.2	27	14,400	499	1.3	8,980	13	16
55/1-2	39.4	29,200	14.8	28,700	39.8	34.4	13,400	399	1.4	8,210	14	18.4
55/2-5	32.1	27,200	14.3	28,000	37.5	32.5	11,200	333	1.2	7,710	14	17.5
55/Bedrock	8	4,050	2.6	16,300	3.5	4.2	669	11.1	0.22	394	1	1.9
54/0-1	45.3	24,300	12.9	25,800	41.3	28.6	11,100	451	1.7	7,990	13	15.8
54/1-2	44.2	32,500	17.5	33,200	34.8	38.8	11,500	343	2.4	5,480	18	19.6
54/2-5	55.3	27,300	15.2	29,700	30.4	35	9,520	280	2.1	4,240	13	16.6
54/Bedrock	10.4	7,280	2.8	17,100	6.6	6.6	721	131	2.9	394	1.1	4.9
53/0-1	32.1	17,600	12.9	36,500	25.6	30.4	5,660	332	1	8,460	12	12.7
53/1-2	21.2	18,300	13.5	39,500	28	29.1	5,550	327	1.1	9,130	13	12.6
53/2-5	35.9	20,500	17.5	33,500	36.4	47.6	5,610	304	1.1	7,480	18	14.7
53/Bedrock	6.7	4,010	3.3	6,800	5	12.8	556	113	0.4	265	1.4	4.3
51/0-1	36.6	23,700	12.3	28,600	31.4	30.6	6,810	636	1.7	6,380	13	17.1
51/1-2	32.3	23,300	12.3	28,600	30.8	30.9	6,670	648	1.7	6,020	13	16.9
51/2-5	32.4	24,400	12.8	29,000	33.1	32.3	7,220	675	1.7	5,920	13	18.5
51/Bedrock	2.1	1,290	0.7	2,140	2	4.8	5,020	312	0.22	230	0.44	4.2
50/0-1	30.6	16,900	8	26,200	26.8	15.7	4,970	725	1	4,330	7.1	11.7
50/1-2	22.1	17,000	7.3	25,000	28.6	14.7	4,510	719	0.85	4,140	6.2	11.1
50/2-5	24	17,000	7.4	24,800	26.4	15.3	4,560	721	0.99	4,140	6	11.8
50/Bedrock	6.2	3,560	1	5,940	2.8	4.8	431	363	0.4	168	0.3	3.9
49/0-1	30.1	13,600	9	27,300	29.9	21.5	7,020	346	0.64	4,860	8	9.2
49/1-2	24.6	11,600	8.2	25,400	24.7	19.4	5,740	285	0.63	3,780	7.1	8.4
49/2-5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
49/Bedrock	5.2	1,520	1.4	4,330	3.5	8.3	237	17.9	0.2	146	0.56	1.7
48/0-1	21.2	13,000	10.5	16,500	26.2	25	5,680	386	1	5,970	7.9	8
48/1-2	18.6	11,800	9.7	16,500	26.1	23.2	5,080	366	0.98	5,970	6.5	7.4
48/2-5	18.9	11,800	10.1	15,600	29.2	24.1	4,900	345	1	5,420	7.8	7.2
48/Bedrock	16.8	62,600	8.9	1,070	12.7	11.1	488	41.5	4.5	458	6.5	2
47/0-1	30.1	20,100	14.4	29,200	30.3	44.2	6,420	318	0.88	7,510	14	14.5
47/1-2	30.2	20,300	14.5	28,900	31.8	45.9	6,330	310	0.86	7,240	15	14.9
47/2-5	40.3	19,200	15.8	28,700	29.4	53.2	5,790	242	0.75	7,280	16	15
47/Bedrock	35.4	38,800	3.5	8,240	4.4	12.7	777	218	0.72	363	1.2	6.8
30/0-1	28.1	18,800	16.2	23,800	32.6	45.8	4,610	171	0.81	4,020	13	13.2
30/1-2	37.9	19,600	18.6	23,200	33.7	54.6	4,230	141	0.87	3,140	14	14.1
30/2-5	37.2	17,000	19.8	21,500	28.7	59.2	3,730	88	0.73	1,960	12	13.1
30/Bedrock	5.2	4,890	3.4	9,180	7.9	9.5	509	31.1	0.37	328	1.6	2.9
46/0-1	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/1-2	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/2-5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/Bedrock	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
45/0-1	25.1	10,200	7.6	32,100	15.4	16	2,490	192	0.51	2,570	7.2	7.8
45/1-2	12.4	6,900	6	27,800	9.6	12.7	1,680	142	0.32	1,600	4.1	5.7
45/2-5	34.6	9,590	8.1	34,600	15.4	17.1	2,430	169	0.48	2,340	7.9	7.9
45/Bedrock	4.3	2,210	3.4	13,800	4.7	11.4	927	21.1	0.2	460	1.6	3.3
44/0-1	20.7	11,800	8.6	25,400	25.4	27.2	9,070	266	0.56	5,550	6.8	9.4
44/1-2	18.6	13,400	9.4	26,000	31.6	28.3	10,500	298	0.57	6,340	7.9	9.8
44/2-5	23.1	13,100	9	25,400	30.6	27.6	9,970	281	0.59	6,260	9.9	9.7
44/Bedrock	8	1,910	3.2	12,400	6.4	22.5	830	9.4	0.1	341	2.3	2.7
05U-1/0-1	32.6	21,700	12.4	32,900	41	27.7	7,870	369	1	5,610	19	16.6
05U-1/1-2	31.4	17,200	10.8	36,800	29	23.6	6,200	290	0.72	4,340	11	14
05U-1/Bedrock	4.2	2,600	2.6	15,400	4	4.5	688	119	0.2	454	1.4	2.8
05U-2/0-1	33.2	20,000	11.3	30,300	29.7	29.7	6,930	367	0.89	5,950	12	15.7
05U-2/1-2	30.5	20,000	11.1	30,500	27.3	28.1	6,690	367	0.93	6,020	14	15.8
05U-2/2-5	24.4	18,000	10.5	32,400	24.6	26.7	6,120	310	0.75	5,580	10	14.1
05U-2/Bedrock	3.4	1,970	2.9	19,600	4.1	6	650	34.2	0.09	547	1.1	2.2
21/0-1	18.7	14,800	7.7	19,300	23.6	21.1	7,210	345	0.51	6,630	5.2	8.4
21/1-2	16.8	14,000	7.8	19,800	22.9	20.5	6,820	327	0.44	6,690	5.3	7.9
21/2-5	20.1	13,700	7.4	20,100	20	20.3	6,200	309	0.43	6,720	5.7	7.7
21/Bedrock	3.9	3,380	3	11,300	5.3	9.7	1,560	49.4	0.2	750	1.8	2

Table 5. Geochemical data.—Continued

ICP–MS data—continued.

Sample no.	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sr (ppm)	Th (ppm)	Ti (ppm)	Tl (ppm)	U (ppm)	V (ppm)	Y (ppm)	Zn (ppm)
493/0-1	1,000	45.6	104	1.9	11.1	371	14.7	4,880	0.68	2.62	83.6	26.5	96.7
493/1-2	998	43.2	113	2	12	384	15.5	4,970	0.74	2.79	90.7	28	102
493/2-5	771	29.7	103	1.9	10.3	316	12.7	3,840	0.7	2.2	80	23.5	84.6
493/Bedrock	405	12.4	58.1	1.1	3.7	409	3.8	1,270	0.44	0.89	30.6	7.9	30
29/0-1	718	46.3	141	1.3	8.8	253	12.1	3,890	0.87	2.36	65.1	21.9	71.2
29/1-2	692	37.3	146	1.2	8.9	255	12.9	3,920	0.88	2.56	65	22.4	65.5
29/2-5	368	28.3	157	0.93	7.5	207	10.1	3,320	0.94	2.15	54.6	17.7	45.9
29/Bedrock	64	6.42	35.6	0.2	1	30.5	1.3	309	0.23	0.24	4.8	2.9	3.7
55/0-1	824	46.5	89.8	1.1	8	236	12.8	3,520	0.5	2.51	58.7	22.5	65.9
55/1-2	911	30	109	1.1	9.5	245	12.8	3,980	0.56	2.55	66.5	24.2	67.2
55/2-5	758	21.2	107	0.99	9.1	231	12.9	3,600	0.53	2.38	61.7	23.5	58
55/Bedrock	148	6.46	45.8	0.2	0.8	43.8	0.87	190	0.24	0.19	3.1	2	< 3
54/0-1	839	45.2	91.6	1.4	7.8	342	10.2	3,150	0.53	2.07	57.8	20.1	67.5
54/1-2	1,170	36.2	120	1.6	10.5	716	12	3,580	0.63	2.46	73.5	24.9	69.5
54/2-5	967	28.5	107	1.3	8.9	649	10.4	2,680	0.57	2.51	61.4	21.7	57.9
54/Bedrock	566	8.22	37.4	0.28	2.2	351	1.23	214	0.21	0.55	17.4	3.9	10.3
53/0-1	559	46.4	137	1.1	5.6	222	8.47	2,730	0.86	1.86	45.1	15	69
53/1-2	526	43	143	1.1	6.1	230	9.1	2,890	0.9	2.02	47.6	16	62.5
53/2-5	382	33.8	130	1.3	7.4	243	11.8	4,200	0.86	2.5	61.8	18.4	58.9
53/Bedrock	128	9.58	25.4	0.54	1	66	1.76	393	0.18	0.26	7.7	3.1	12
51/0-1	577	34.5	98.5	1.1	8.2	130	11.2	3,530	0.74	2.58	58.2	22.4	74.5
51/1-2	549	32.2	97.8	1.1	8	124	10.5	3,360	0.76	2.48	56.4	21.2	75.9
51/2-5	520	31.9	100	1.1	8.5	129	12.6	3,360	0.79	2.63	59.7	23	75.3
51/Bedrock	108	1.14	5.3	0.08	0.6	217	0.42	126	<0.08	0.44	5.5	2	6.5
50/0-1	658	35	75.1	0.58	4.9	94.8	7.38	3,110	0.42	1.96	39.3	19.4	49.6
50/1-2	570	37	70.4	0.49	4.7	87.4	8.98	3,270	0.4	2.26	38.7	20.5	43.8
50/2-5	569	39.1	70.4	0.53	4.9	86.3	8.09	3,320	0.41	2.12	39.5	20.4	46.9
50/Bedrock	76	3.05	15.8	0.1	0.5	24.4	0.76	111	0.08	0.19	2.6	3.2	4.1
49/0-1	642	31.6	88.6	0.66	5.2	125	11	3,040	0.62	3.32	49.3	22.6	45.5
49/1-2	506	27.9	81.8	0.6	4.6	107	8.75	2,510	0.56	2.71	43.2	19.3	39
49/2-5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
49/Bedrock	58	4.38	13.1	0.2	0.4	21.4	1.09	210	0.09	0.47	13	1.9	4.2
48/0-1	601	20.6	56.6	0.66	5.9	113	10.4	2,930	0.56	2.45	43.8	20	34.9
48/1-2	573	18.3	54.3	0.62	5.5	115	9.92	2,710	0.52	2.27	39.7	19.4	30.2
48/2-5	552	17.8	50.4	0.74	5.6	133	12	2,940	0.52	2.48	40.7	21	29
48/Bedrock	146	19.5	2.8	3.2	2	63	8.87	1,430	1.67	1.78	116	6.2	13.5
47/0-1	457	32.1	93.2	0.81	7	151	10.4	3,540	0.62	2.7	70.2	19.4	54.6
47/1-2	453	34.5	91.9	0.85	7.2	150	10.2	3,580	0.63	2.62	71.8	19.4	55.2
47/2-5	265	24.3	90.4	0.75	7.2	152	10	3,800	0.6	2.53	77.4	17.7	45.5
47/Bedrock	392	15.9	28.7	0.96	2.2	38	4.35	284	0.21	1.58	240	10	21.3
30/0-1	592	29.3	80.9	0.88	6.1	251	9.01	3,130	0.66	3.4	52.7	17.9	49.9
30/1-2	606	29.5	76.9	0.84	6.8	301	8.98	3,020	0.68	3.94	56.9	17	57.2
30/2-5	599	24.7	73.2	0.67	6.2	378	6.4	2,440	0.71	3.96	53.8	14.5	43.3
30/Bedrock	115	11	31.8	0.21	1	98.2	1.54	410	0.23	0.53	6.8	3	5.5
46/0-1	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/1-2	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/2-5	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
46/Bedrock	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
45/0-1	326	26.3	97.3	0.77	4.3	110	5.31	2,700	0.58	1.82	40.1	18	28.2
45/1-2	207	20.3	84.8	0.57	3	83.3	3.04	1,910	0.5	1.16	28.5	11.9	18.8
45/2-5	293	24.9	103	0.81	4.5	111	5.22	2,840	0.6	1.81	40.7	19.3	27.8
45/Bedrock	64	7.52	43.8	0.2	1.2	36.3	1.15	389	0.26	0.26	8.9	2.9	7
44/0-1	574	18.8	77.1	0.43	4.7	134	8.67	2,230	0.47	2.11	31.7	18.4	35.6
44/1-2	690	17.7	79.2	0.48	5.1	148	10.5	2,660	0.47	2.4	36.1	21.3	38.5
44/2-5	659	16.6	74.7	0.47	4.9	143	10.3	2,700	0.46	2.46	35.3	20.6	36.8
44/Bedrock	87	4.82	35.4	0.1	0.8	68.2	2.04	758	0.2	0.31	7	3.5	7.1
05U-1/0-1	794	34.3	94	0.99	7.7	169	13.9	4,230	0.64	3.24	58.5	25.1	75.1
05U-1/1-2	646	30.4	92.4	0.84	6.2	140	9.54	2,780	0.62	2.33	47	17.6	71.3
05U-1/Bedrock	64	6.58	43.7	0.26	1.5	34.5	0.92	368	0.28	0.22	6.5	2.5	13
05U-2/0-1	698	45.6	91	0.87	7.4	171	9.58	3,370	0.6	2.67	55.4	20.2	73.7
05U-2/1-2	656	47	89.7	0.87	7	169	8.91	3,050	0.62	2.42	52.1	18.5	72.1
05U-2/2-5	308	46.4	92.5	0.72	6.5	154	8	2,630	0.64	2.13	47.8	15.7	53.8
05U-2/Bedrock	53	8.18	52.1	0.2	0.9	54.6	0.88	276	0.34	0.23	5.3	1.8	5.6
21/0-1	449	19.4	65.2	0.41	4.3	131	7.73	2,350	0.42	2.16	37.1	16.9	43.8
21/1-2	414	17.9	66.1	0.42	4	122	7.41	2,290	0.42	2.01	34.7	16.5	33
21/2-5	393	16.1	67.2	0.41	3.8	115	6.26	2,340	0.41	1.87	33.4	15.7	33.7
21/Bedrock	122	5.6	35.4	0.2	0.9	35.4	1.42	484	0.22	0.55	7.4	3.6	7.2