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UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY

Lithologic Descriptions, Core and Cutting Samples,
Mariano Lake-Lake Valley Drilling Project,
McKinley County, New Mexico, Hole Number 6

by

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This report is preliminary and has not been reviewed
for conformity with U.S. Geological Survey editorial
standards and stratigraphic nomenclature.

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INTRODUCTION

In the fall of 1980, the U.S. Geological Survey contracted with Longman Drilling Company of Albuquerque, New Mexico to rotary drill and core twelve holes along a north-south line from Mariano Lake to the vicinity of Lake Valley, New Mexico. This report contains the lithologic descriptions of core and cutting samples from drill hole no. 6.

The drilling project was funded under a reimbursable interagency agreement between the U.S. Bureau of Indian Affairs (BIA) and the U.S. Geological Survey (USGS). The program was designed by representatives of the BIA, USGS, and the Minerals Department of the Navajo Tribe.

PURPOSE

The principal objective of this project was to provide core samples and geophysical logs for petrologic, sedimentologic, geophysical, and geochemical studies of the Upper Jurassic Morrison Formation. Other objectives included the following: stratigraphic and coal studies of Upper Cretaceous rocks; hydrologic and water monitoring of well no. 2; control for a proposed seismic study of the same geographic area; and development of water wells by the Navajo Tribal Water and Sanitation Department.

GENERAL DRILLING PLAN

The locations of all twelve drill holes are shown on figure 1, which is a portion of the Gallup 1° x 2° Quadrangle. The general drilling plan called for most holes to be rotary drilled into the Upper Cretaceous Dakota Sandstone and then cored into or through the Recapture Member of the Morrison Formation. The interval to be cored in each hole was about 600 ft.

Exceptions to the general drilling plan were as follows: Hole no. 2, rotary drilled, surface to Jurassic Entrada Sandstone; Hole no. 4A, cored 21-218 ft, to test an observed near surface I.P. anomaly; Hole no. 6, deepened

after coring by rotary drilling into the Jurassic Entrada Sandstone; Hole no. 7A, cored only the Westwater Canyon Member of the Morrison Formation; Hole no. 8, abandoned in lower part of Westwater Canyon Member of the Morrison Formation; and Hole nos. 9 and 10, abandoned in Upper Cretaceous rocks.

Chip samples were collected at 10-ft or 20-ft intervals throughout each hole and sludge samples collected at 20-ft intervals throughout the cored interval.

The following suite of geophysical logs were included in the general drilling project: natural gamma, self potential, neutron-neutron porosity, resistance, resistivity, temperature, deviation, gamma-gamma density, caliper, magnetic susceptibility, gamma ray spectrometer (KUT), sonic, induced polarization, conductivity, and high-resolution 4-arm digital dipmeter.

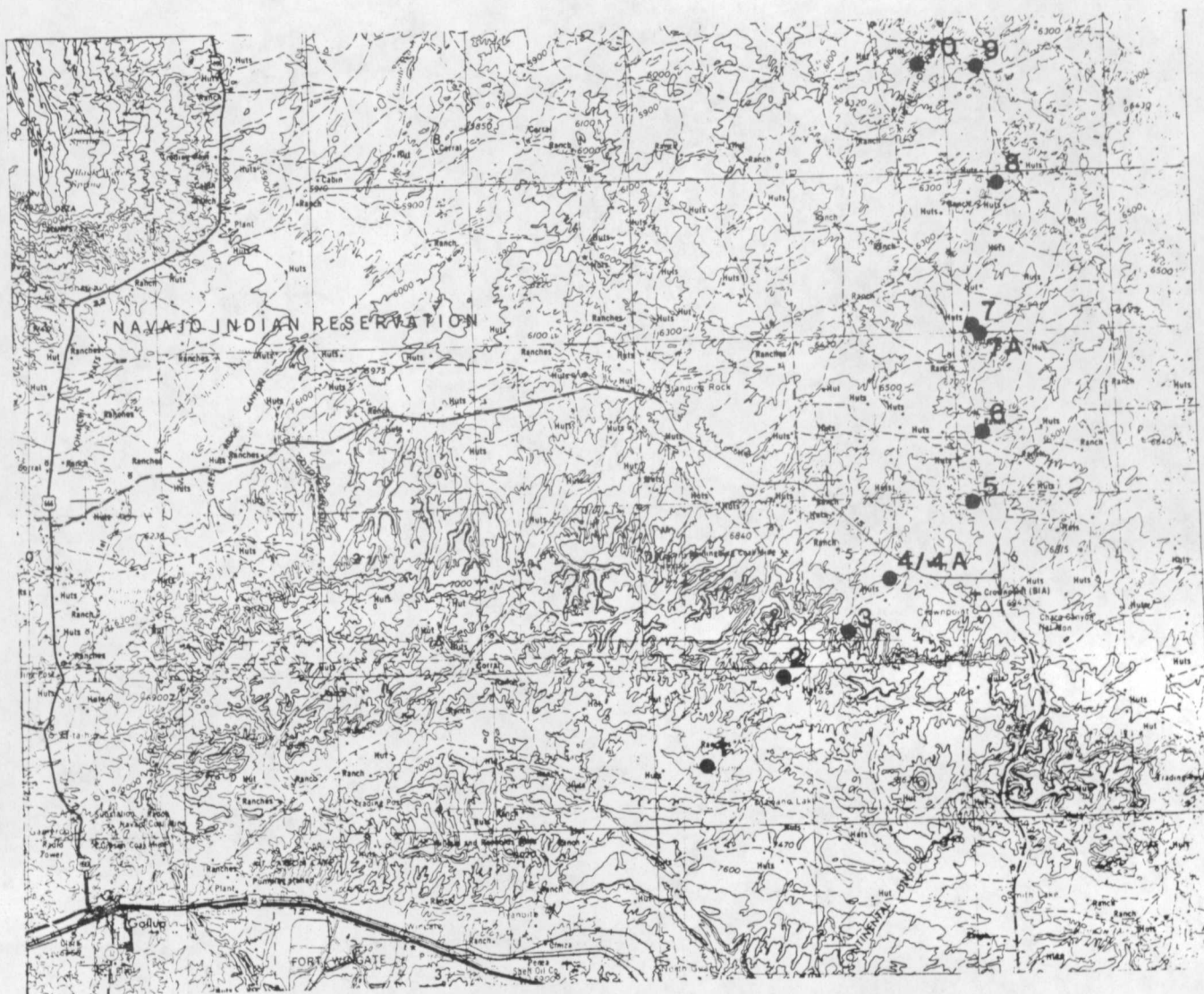


Figure 1. - Location of USGS Drill Holes, Gallup 1° x 2° Quadrangle.

DRILL HOLE NO. 6

The location of this well is shown on figure 2.

The vital statistics on this well include:

Spud date: November 1, 1980

Location: T. 18 N., R. 12 W., sec. 19

Lat. $35^{\circ}46'18''$, Long. $108^{\circ}08'54''$

Collar Elevation: 6565 ft (topo) Cleary Coal Member,
Menefee Fm. (Cretaceous)

Core Point Top: 2475 ft (depth) Brushy Basin Member,
Morrison Fm. (Jurassic)

Bottom Cored Interval: 3075 ft (depth) Recapture Shale
Mbr., Morrison Fm. (Jurassic)

Total Depth: 3470 ft (depth) Entrada Sandstone (Jurassic)

Core Recovery: 91 percent

Casing: Eleven feet of 7-in. surface casing

Status of well: Abandoned, December 22, 1980.

The following suite of geophysical logs were run on this hole and have been published by the U.S. Geological Survey (1981): natural gamma, self potential, resistance, neutron-neutron porosity, deviation, caliper, gamma-gamma density, KUT, induced polarization, resistivity, and sonic.

Cutting samples from rotary drilling were collected and described on ten (10) foot intervals to the core point at 2475 ft, and below the cored interval 3475-3075 ft (table 1). Cuttings were collected through the cored interval 2475-3075 ft but not described.

Core samples were collected in 20 ft core runs and are 3 in. in diameter. The core samples were described in the field (table 2), taped, boxed, and shipped to the USGS Core Library in Denver where they were frozen,

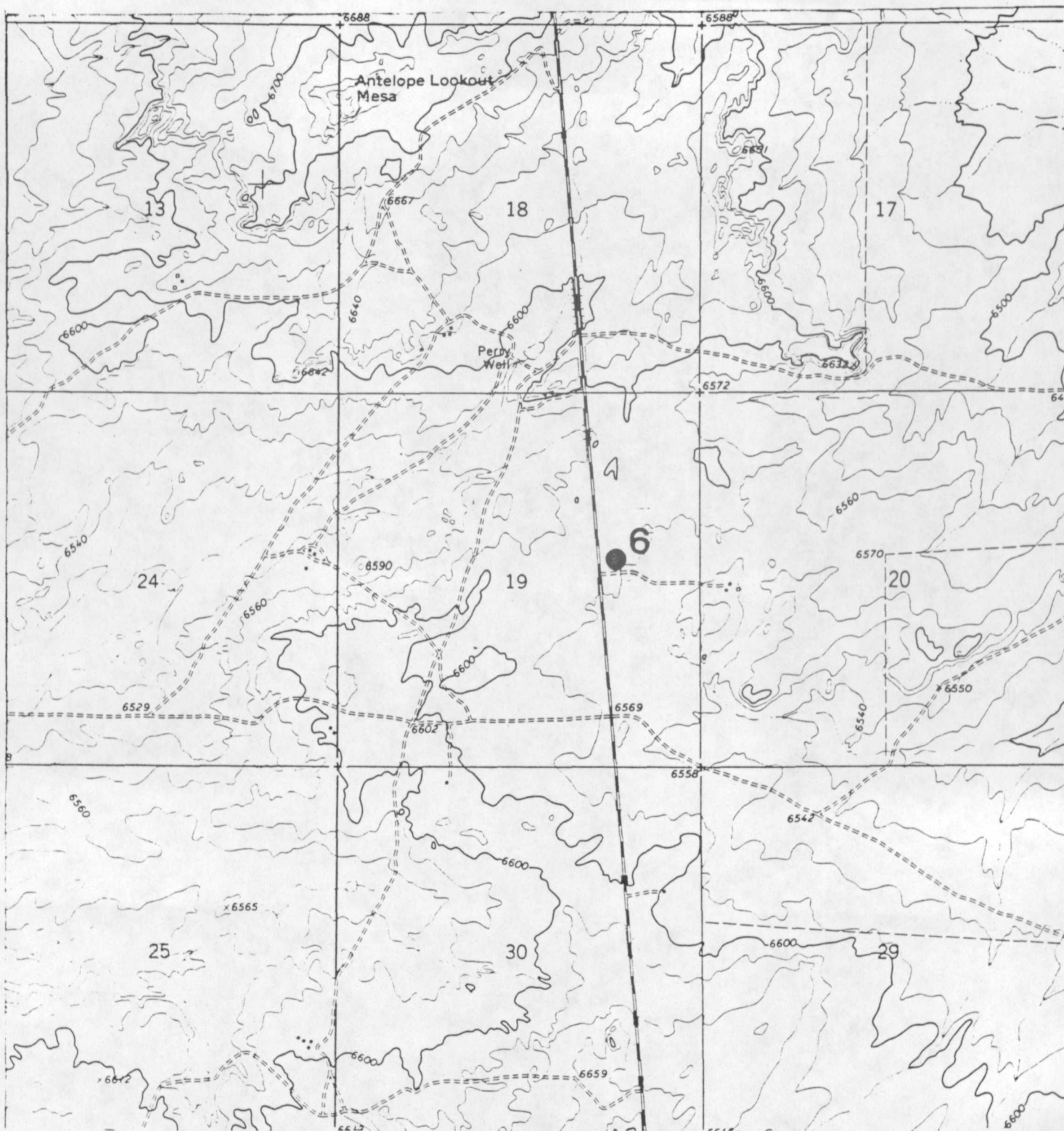


Figure 2.--Location of USGS Drill Hole No. 6, Antelope Lookout Mesa 7 1/2' Quadrangle, T17N, R12W.

split, photographed, and sampled (for petrography, geochemistry, heavy-mineral-suites, clay-mineralogy, and paleomagnetic studies). A split of the core has been archived for reference and future study.

Coal and carbonaceous shale intervals were encountered from the surface to 80 ft, at 560 ft, 1200 ft, and 2330 ft.

The following core and cutting sample descriptions were described in the field. The abbreviation and graphic symbols used in the core description are defined in Reynolds and others (1975).

REFERENCES CITED

- Reynolds, M. W., Ahlbrandt, T. S., Fox, J. E., and Lambert, P. W., 1975,
Description of selected drill cores from Paleozoic rocks, Lost Soldier Oil
Field, South Central Wyoming, Part 1: U.S. Geological Survey Open-File
Report 75-662, 34 p.
- USGS, 1981, Geophysical log suite from drill hole no. 6, Mariano Lake-Lake
Valley drilling project, McKinley County, New Mexico, USGS Open-File
Report 81-971, 4 p.

CHIP SAMPLE 106
FORM

Location: _____ Sec. 19 T. 12N R. 12W Quadrangle (9.5') Antelope Lookout Mesa
Hole No: S-6 State: N.M. Date: 11/2/80
Company: U.S.G.S. County: McKinley Geologist: Gundersen
Lat/Long: _____ Sheet 1 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Depth to Top of Sample Interval	Sample Number	Grain Size	Gravel	Coarse	Shale	Siltst	Sandst	Gravel	Grain Size	Sorting	Roundness	Feldspar	Carbonates	Rhyolite	Flintst.	Sandstone Color	Forming thin / thicker	COMMENTS
10	80-56-10	45/50			20	TR	50		5YR6/1 (limonite)	30							KmFc Cleary Coal Mbr Manganese Pyrite	50 Feet surficial material (sandy clayey)
20					25	10	35		N-4	30							KmFc	Silty shale (sandy, silty, surficial debris)
30					15	70	10		N-5	5			TR		Wk gr.		KmFc	Bentonite clay
40					TR	TR	98		dk. gy.	2					TR	N-5	KmFc	Orange stained grains
50					1	TR	100		N-5						Wk gr.	10YR4/2 - N-5	KmFc	"
60					TR	TR	100		N-5						Wk gr.	10YR4/2 - N-5	KmFc	Limonite stained quartz & Feldspar
70							40			60					Wk gr.		KmFc	Red stained quartz grains
80							30			70					Wk gr.		KmFc	Limonite stained quartz
90							100			TR					Wk gr.	5Y6/1	Kp Point Lookout Sandstone	Trace light green opaque grains
100	80-56-100						100			TR					Wk gr.	5Y6/1	Kp	"

CHIP SAMPLE 106
FORM

Location: _____ Sec. 19 T. 12N R. 12W Quadrangle (7.5') Antelope Lookout Mesa
Hole No: S-6 State: N.M. Date: 11/2/80 & 11/3/80
Company: U.S.G.S County: McKinley Geologist: Gundersen
Sheet 2 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Depth to top of sample interval	Sample Number	Grain Size	Longl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Lithology	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Pysile	Alters.	Sandstone Color	Formation / Member	Comments
110	80-56-110	45/45		100						UF (TR, M)	M	SR -SA	1%	TR		blk gr	5Y5/1	Kpt	Sand appears calc. Trace Lithic Fragments with limonite staining
120		"		100				TR		UF -M	M	SR -SA	TR			blk gr. LE gm. opt. 2-4%	5Y5/1	Kpt	11
130		40/45		40		60	10YR5/1 - 5Y5/1	TR		UF	M	SR	1%			blk gr	5Y6/1	Kpt	Olive grey shales stained with limonite, sandstone mostly loose; Gypsum chips (?)
140		"		98		2	10YR5/1 Lith. Frag. (?)	TR		LF	M	SR	TR			blk gr. TR gm.	5Y5/1	Kpt	Limonitic lithic fragments Sandstone mostly loose Gypsum chips
150		"		98		2	10YR5/1 Lith. Frag. (?)	TR		LF	MW	SR -R	TR			blk gr	5Y6/1	Kpt	Limonitic lithic fragments Sandstone in very small, round chips
160		"		99		1	10YR5/1 Lith. Frag. (?)	TR		LF	W	SR -R				blk gr	5Y6/1	Kpt	Limonitic lithic fragments Sandstone loose Trace of hard, dark fine rock Fragments - siderite (?)
170		"		100		TR		TR		LF	W	R -SR				blk gr. (?)	5Y6/1	Kpt	Limonitic lithic fragments Trace of hard, dark fine rock Fragments - siderite (?)
180		"		100		TR		TR		LF	W	R -SR				blk gr	5Y6/1	Kpt	Trace of hard, dark rock - siderite (?)
190		"		100		TR		TR		LF	W	SR -R	TR		TR	blk gr	5Y6/1	Kpt	Trace of limonitic lithic fragments Siderite chips (?)
200	80-56-200	"		100		TR		TR		LF	W	SR -SA		Y		blk gr	5Y6/1	Kpt	Trace of limonite and siderite fragments

CHIP SAMPLE 106
FAM

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout Mesa.
Hole No: S-6 State: N.M. Date: 11/3/80
Company: U.S.G.S. County: McKinley Geologist: Gundersen
Lat/Long: _____ Sheet 3 of 25.

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico
Estimated % of Lithologies

Sample Number	Grain Size	Long.	Sandst.	Siltst.	Shale	Shale color	Coal	Limestone	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Rhyolite	Flint	Shale color	Comments
210	50-56-210	40/40	100		TR				LF	MW	SR -SA		TR (?)	TR		5Y6/1	Trace of limonitic lithic fragments Trace siderite
220			100		TR				uvf -LF	MW	SR -SA		TR (?)			5Y6/1	Sandstone disseminated in very muddy poor sample
230			70	10	20	5YR3/1			uvf -LF	M	SR -SA		TR (?)			5Y4/1	Trace of lithic fragments Very muddy sample; silty shale; Trace limonitic lithic fragments; sandstone dism. and in calcareous chips.
240			70	10	20	5Y4/1			uvf	M	SR -SA		TR			5Y4/1	11
250			70	5	25	5Y4/1			uvf -LF	M	SR -SA		TR dim			5Y4/1	Muddy sample (contaminated) with silty shale; sandstone disseminated; trace chips; yellow stained grains.
260			85	5	10	5Y4/1			uvf	M	SR -SA		TR dim			5Y5/1 - N-5	Muddy sample Silty shale Sandstone dism. in calc chips
270			75	5	20	5Y2/1			uvf	MW	SA		TR dim			N-5	Silty shale & silty sandstone; sandstone dism. in calc chips Muddy sample
280			70	10	20	5Y4/1			uvf -LvF	MW	SR -SA		TR dim			5Y4/1	11
290			70		30	5Y4/1			uvf	W	SR		TR (?)			5Y4/1	Silty shale Calcareous sandstone Amber, transparent; limonitic siltstone Montmorillonitic Very calc.
300	80-86-300	Y	80		20	5Y4/1			uvf	W	SR		TR			5Y6/1	Limonitic sandstone fragments

CHIP SAMPLE 106
FORM

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (9.5) Antelope Lookout Mesa
Hole No: S-6 State: N.M. Date: 11/3/80
Company: U.S.G.S. County: McKinley Geologist: Kirk, Gundersen
Lat/Long: _____ Sheet 4 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Depth to top of sample interval	Sample Number	Grain Size	Grain	Sorting	Rounded	Flake/frag	Carbon.	Pyrite	Fossils	Sandstone Color	Formation / member	COMMENTS
310	80-56-310	60	uvf	W	SR		TR		blk gr	5Y6/1	Kms	Montmorillonitic calc. sandstone chips
320		60	uvf						blk gr	5Y6/1	Kms	Montmorillonitic calc. Mudstone is carb.
330		40	uvf							5Y6/1	Kms	Very calc. Montmorillonitic
340		40	uvf			Micro TR			blk gr	5Y6/1	Kms	Mica Montmorillonitic ?
350		40	lvf						blk gr	5Y6/1	Kms	Lim. stained sandstone clods Montmorillonitic
360		60	uvf						blk gr	N-5	Kms	Inoceramus sp. (?) Slightly calc. Montmorillonitic
370		30	uvf			Micro TR				N-5	Kms	Slightly calc. Montmorillonitic
380		30	uvf						blk gr	N-5	Kms	Lim. stained sandstone clods
390		30	uvf-LF					TR	blk gr	N-5	Kms	Pyrite lump with carb
400	80-56-400	30	uvf						blk gr	N-5	Kms	Lim. stained sandstone clods Inoceramus sp. (?)

CHIP SAMPLE 106
FORM 5

Location: Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout Mo.
Hole No: S6 State: New Mexico Date: Nov 3-4
Company: USGS County: McKinlay Geologist: A. Klein / L. G. Anderson
Lat/Long: _____ Sheet 5 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Depth to top of sample interval	Sample Number	Coreb/Sec	Congl.	Sandst.	Siltst.	Shale	Shale Color	Bed	Lithology	Grain Size	Sorting	Rounded	Fid./par	Laminar.	Pyrite	Access.	Sandstone Color	Remarks / Notes	Comments
0117	80-56-410		30			07	SY 2 3/1		uvf- lf	W	sf/2			✓		Blk accs	N5	Satur Tongue Mudstone Shale	Clay class limonite ss dots very calc disseminated sand grains in shale
0120	80-56-420		40			60	SY 6/1		uvf- lf	W	sf/2			✓		Blk accs	SY 4/1	Kms	intergranular frags. MONT.
0130	80-56-430		30			70	SY 4/1		uvf- lf	W	sf/2					Blk accs	N6	Kms	MICACEOUS sl calc MONT.
0140	80-56-440	50/100	30			70	SY 4/1		uvf- lf	W	sf/2			✓		Blk accs	N6	Kms	MONT, MICACEOUS, intergranular, sl calc, limonite stained ss clumps, ss & sh
0150	80-56-450		30			70	SY 4/1		uvf- lf	W	sf/2			✓		Blk accs	SY 4 1/1	Kms	limonitic ss clumps, sl calc, MONT.
0160	80-56-460		40			60	SY 4/1		uvf- lf	W	sf/2		Tr	✓		Blk Hgn accs	N6	Kms	sl calc, MONT, clayey ss
0170	80-56-470		30			70	SY 4/1		uvf- lf	W	sf/2		Trace	✓		Blk	N6	Kms	sl calc clayey ss
0180	80-56-480		55		5	40	N2		uvf- lf	W	sf/2		Trace	✓		Blk dgn	N6	Kms	calc shales calc on lam in ss intergranular lam elst
0190	80-56-490		80			20	SY 2 1/1		uvf- lf	W	sf/2		Trace	✓		Blk Hgn	N6	Kms	very calc clayey
500	80-56-500		80			20			uvf- lf	W	sf/2			✓		Blk Hgn		Kp/H?	Is calc chips clayey sand V calc calc on lam in ss

CHIP SAMPLE 106
FORM 6

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Portage Lookout Area
Hole No: S6 State: New Mexico Date: 10/5/80
Company: U.S.G.S County: McKinley Geologist: ARK/LG
Lat/Long: _____ Sheet 6 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Sample Number	Core/Less	Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Lithology	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Pyrite	Fluores.	Sandstone Color	Remarks / Notes	Comments
510	80-56-710		45	55	5	N1			IF	F	Spl/xc	1	✓	✓	slk begin	5Y 8/2	Glauco. sandstone Cemented Keg	Clayey, calc ss green silt
520	80-56-520		40	50	10	N4			uvf	F	Spl/xc	Ta	✓		slk begin	5Y 8/2	Calc ss Keg	Calc ss Keg
530	80-56-530		70		30	N2			IF Tr, uf	MW	Spl/xc	N	✓		slk begin	N7	Calc Keg	Calc ss Keg
540	80-56-540		80		20	5Y 2/3/1			IF Tr, uf	MW	Spl/xc	Ta	✓		slk begin	N7	Calc Keg	Calc ss Keg
550	80-56-550		90		10	5Y 2/1	Tr		UF	MW	Spl/xc	1	✓		slk begin	N8	Calc Keg	Calc ss Keg
560	80-56-560		25		10	5Y 4/1			IF Tr, uf	M/F	Spl/xc	N	✓		slk begin	N8	Calc Keg	Calc ss Keg
570	80-56-570	45/10	15		10	5Y 2/1	Tr		LF	F/m	Spl/xc	N	✓		slk begin	N8	Calc Keg	Calc ss Keg
580	80-56-580	45/10	88		10	5Y 4/1			LF	M	Spl/xc	Ta	✓		slk begin	N8	Calc Keg	Calc ss Keg
590	80-56-590	50/40	80		15	5Y 2/1	Tr		LF	M	Spl/xc	Ta	✓		slk begin	N8	Calc Keg	Calc ss Keg
600	80-56-600				10	5Y 2/1	Tr		LF	F	Spl/xc	Ta	✓		slk begin	5Y 4/1	Calc Keg	Calc ss Keg

CHIP SAMPLE 106
FORM 7

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: 56 State: New Mexico Date: 10/5/80
Company: U.S.G.S. County: McKinley Geologist: ARK/KG
Lat/Long: _____ Sheet 2 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Depth to Interval Sample Number	Sample Number	Grain Size	Long.	Sand.	Silt.	Shale	Shale Color	Col.	Lithology	Drain	Sorting	Rounded	Feldspar	Carbonates	Rhyolite	Access.	Sandstone Color	Formation/Member	Comments
610	10-56-610	4 1/4	85			15	5Y2/1	Tr		UF	F/P	54/50	-	SS		nil	5Y4/1	Gibson Sand Member Kog Creek Formation	Intermediate ss clots 5% white ss chips - 1/4" 40% calc. siltst. LF matrix calc sandy clayey matrix
620	10-56-620	4 1/4	67			30	5Y4/1	Tr		LF	P	50/50	-	SS	✓	blk	5Y2 3/1	Dalton Sandstone Member Kog Creek Formation	10% wh. ss chips - 1/4" 40% calc. siltst. LF matrix calc sandy clayey matrix
630	10-56-630		70			20	5Y4/1	Tr		LF	F/P	50/50	1	✓	✓	nil	5Y2 3/1	Koda	5% wh. ss chips, 1/4" 40% calc. siltst. LF matrix calc sandy clayey matrix
640	10-56-640		60			35	5Y4/1			UF	F	54/50	Tr	✓	✓	blk	5Y2 3/1	Koda	5% wh. ss chips Intermediate sandstone on the matrix of matrix 2-3% of matrix
650	10-56-650		88			21	5Y4/1			LF	F	50/50	Tr	✓		dkgn	5Y4 3/1	Koda	20% wh. ss chips 5% calc
660	10-56-660	4 1/4	82			3	5Y4/1	Tr		LF	F	50/50	Tr	✓	✓	nil	5Y2 3/1	Koda	Matrix, massive sandstone 5% wh. ss chips, 1/4" 40% calc. siltst. LF matrix calc sandy clayey matrix
670	10-56-670		95			1	5Y4/1			UF	M	50/50	1	✓		nil	5Y4/1	Koda	Intermediate clay/clay 5% calc ss matrix
680	10-56-680		80			20	5Y4/1			UF	M	50/50	Tr	Tr		nil	5Y4/1	Koda	White clay chips 5% calc ss matrix
690	10-56-690	4 1/4	84			15	5Y4/1			LF	M	50/50	1	✓		nil	5Y4/1	Koda	3% wh. chips - ss 5% calc ss matrix
700	10-56-700	5 1/4	90			10	5Y4/1			LF	M	50/50	1	✓		nil	5Y4/1	Koda	2-3% wh. ss chips

CHIP SAMPLE 106
FORM 8

Location: Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: 56 State: New Mexico Date: 10/5/80
Company: U.S.G.S. County: McKinley Geologist: LG/ARK
Lat/Long: _____ Sheet 8 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones

Sample Number	Core/Sec	Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Pyrite	Alters.	Sandstone Color	Remarks/Notes	Comments
014	80-56-710		86		2	5Y 4/1			UF, LF	med	SE	1	✓	dkn	dkn	5Y 7/1	(Keda?)	15% white ss chips (assure) white clay chip very calc
720	80-56-720		98		5 carb	5Y 4/1			LF	M	SE	Ta	✓		dkn		Keda	20% white ss chips calc
730	80-56-730		85		10	5Y 4/1			UF	M/L	SE/L	Ta	✓	✓	dkn	N 6.5	Keda	30% white ss chips calc limonitic clay chips
740	80-56-740		98		1 carb	5Y 4/1			L-UF	F	SE/L	Ta			dkn	N 6.3	Keda	20% white chips limonitic clay chips calc
750	80-56-750		94		6	5Y 4/1			LF	M	SE/L	Ta					Keda	20% white ss chips calc
760	80-56-760		80		Tr carb	5Y 4/1			UF	M	SE/L	Ta	✓	✓	dkn		Keda	5% white ss chips limonitic chips calc
770	80-56-770		87		5 carb	5Y 4/1			UF	M	SE	Ta	✓	✓	dkn	N 6.5	Keda	5% white ss chips limonitic clod calc
780	80-56-780		96		2 carb	5Y 4/1			UF	M	SE	Ta	✓	✓	dkn		Keda	10% white ss chips 1% limonitic stone calc
790	80-56-790		96		2 carb	5Y 4/1			UF	M	SE/L	Ta	✓	✓	dkn		Keda	8% white ss chips limonitic clods
800	80-56-800		98		1 carb	5Y 4/1			UF	M	SE/L	Ta	✓	✓	dkn		Keda	

CHIP SAMPLE 106
FORM 9

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: 56 State: New Mexico Date: 10/5/82
Company: U.S.G.S. County: McKinley Geologist: LG/ARIS
Lat/Long: _____ Sheet 9 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Sample Number	Core/Sec	Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Rounded	Foliation	Carbonates	Pyrite	Fluores.	Sandstone Color	Remarks/Notes	Comments
018	80-56-110	45/50	96		2	5Y4/1			LF	MW	Se	micro Tr	✓	✓	alk	DALTON		10% little white chips limonite cemented clay limonite clay chips calc
028	80-56-120	40/50	97		3	5Y4/1			LF	M	5Y4/1	-	-	-	alk	5Y4/1		5% little white chips V calc
038	80-56-130	40/40	92		4	carb	Te		uvr	M	5Y4/1	Te	✓	✓	alk	5Y4/1	Mudstone Tongue Mudstone Shale Kmin	3% little white chips 1% mudst 10% 7/4, calc very calc
048	80-56-140	40/40	96		2	5Y4/1			uvr	M	5Y4/1	Te	✓		alk	5Y4/1		4% little white ss chips Te mudst 10% 7/4 V calc
058	80-56-150	40/40	97		1	carb			uvr	M	5Y4/1	1	✓		alk	5Y4/1		3% little white chips Te mudst 10% 7/4 V calc
068	80-56-160	40/40	93		1	carb			uvr	M	5Y4/1	1	✓	✓	alk	5Y4/1		3% little white chips limonite ss clasts V calc
078	80-56-170	40/40	40		20	carb			uvr	M	5Y4/1	2	✓		alk	5Y4/1		5% little white chips Te mudst 10% 7/4 V calc
088	80-56-180	40/50	76		1	carb			LF	M	5Y4/1	2	✓	✓	alk	5Y4/1		4% little white chips V calc
098	80-56-190	40/50	57		10	10Y 8/2			LF	M	5Y4/1	Te	✓		alk	5Y4/1		10% 8/2 → waxy, spar E alk sandst, clay-sand V calc
000	80-56-200	40/50	57		5	5Y4/1			uvr	M	5Y4/1	2	✓		alk	5Y4/1		3% little white chips lots of limonite staining V calc

CHIP SAMPLE 106
FORM 10

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: 56 State: New Mexico Date: _____
Company: U.S.G.S. County: McKale Geologist: A Kirk
Lat/Long: _____ Sheet 10 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones

Depth to Top of Sample Interval	Sample Number	Estimated % of Lithologies								Formations / Members								Comments
		Coarse	Gravel	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Pyrite	Flint	Shale	Color	Subsac	Color	Flint	Pyrite	Carbonates	
01b	80-56-910	40/40			65						UVF	UVF	F	56/50	1	✓	✓	10% little white ss chips limonitic ss tab clods V calc
920	80-56-920	40/40			73						UVF	UVF	F	56/50	1	✓	✓	10% 7/4 - mudst 5% little white ss chips V calc
920	80-56-920	40/40			80						UVF	UVF	F	56/50	1	✓	✓	10% little white chips V. clayey ss. limonitic clay chips
940	80-56-940	40/40			97						LF	LF	M	56/50	1	✓	✓	1 grain as red chert calc ss
950	80-56-950	50/40			98						LF	LF	M	56/50	1	✓	✓	red chert grain hematitic stained chips
960	80-56-960	40/40			95						LF	LF	M	56/50	1	✓	✓	10% 7/4 - Te mudst V calc hematitic stained chips
960	80-56-960	40/40			97						LF	LF	M	56/50	1	✓	✓	hematitic stained chips oxidized pyrite on carb V. clayey mudst V. calc
980	80-56-980	40/40			97						LF	LF	M	56/50	1	✓	✓	hematitic stained chips oxidized pyrite on carb V. calc
990	80-56-990	40/40			98						LF	LF	M	56/50	1	✓	✓	hematitic stained chips Chips V. calc
1000	80-56-1000	40/40			93						UVF	UVF	F	56/50	1	✓	✓	Te hematitic stained chips, V. clayey, V. calc

CHIP SAMPLE 106
Form 11

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (9.5') Antelope Lookout
Hole No: 56 State: New Mexico Date: _____
Company: U.S.G.S County: McKinley Geologist: A. Kinn, L. Gundersen
Lat/Long: _____ Sheet 11 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Depth to Top of Sample Interval	Sample Number	Coreb/Sec	Congl.	Sandst.	Siltst.	Shale	Shale color	Coal	Limestone	Grain size	Sorting	Rounded	Feldspar	Carbonates	Rhyolite	Alters.	Sandstone Color	Remarks/Notes	Comments
	1010	40/40		91		1	cmv 10YR 7/4			LF	F	50/50	Tr	Aggl		slx	5Y 6/1		clayey sand Ta hemianne carb chips V calc, Tr. free calc.
	1020	40/40		95		5	cmv 10YR 7/4			uif	M	50	-				5Y 6/1		Tr. free calc Ta hemianne carb chips
	1030	40/40		94		5	cmv 10YR 7/4			uif some LF	F	50		Aggl			5Y 6/1		Tr. hemianne carb chips V calc.
	1040																		
	1050																		
	1060																		
	1070																		
	1080																		
	1090																		
	1100																		

CHIP SAMPLE 106
FORM

Location: _____ Sec. 19 T. 10N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: S-6 State: New Mexico Date: _____
Company: U.S.G.S. County: McKinley Geologist: _____
Lat/Long: _____ Sheet 12 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake - Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones																			
Depth to Top of Sample Interval	Sample Number	Grain Size	Estimated % of Lithologies										Fossils / Numbers	Comments					
			Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Rounded			Fieldpar.	Carbonac.	Pyrite	Fluorite	Sandstone Color
1110	8056-1110																	Kim	Samples too poor to describe - poor mud crystallization much mixing.
1120																		Kim	
1130																		Kim	
1140																		Kim	
1150																		Kim	
1160																		Kim	
1170																		Kim	
1180																		Kim	
1190																		Kim	
1200	8056-1200																	Kim	

Table 1. Descriptions of cuttings samples from Mariano Lake - Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (9.5') Antelope Lookout
Hole No: S-6 State: New Mexico Date: _____
Company: USGS County: McKinley Geologist: _____
Lat/Long: _____ Sheet 13 of 25.

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[illegible]

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: S-6 State: New Mexico Date: _____ MSK
Company: USGS County: Mekinley Geologist: _____
Lat/Long: _____ Sheet 14 of 25.

10

[illegible]

Table 1. Descriptions of cuttings samples from Mariano Lake - Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones
Estimated to 21.1 m, logics

[illegible]

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: S6 State: New Mexico Date: _____ Mesa
Company: U.S.G.S. County: McKinley Geologist: ARK/LC
Lat/Long: _____ Sheet 16 of 25.

Dep th to top
of interval

Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones										Estimated % of Lithologies										Descriptions of cuttings samples from hole and take									
Sample Number	Core/Sec	Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Roundness	Feldspar	Carbonates	Pyrite	Foliation	Sandstone Color	Remarks/Notes	COMMENTS											
Bottom of Section	1510	80-56-1510	55/45	84		10	5	01	10/42/4	5Y 4.5/4	carb	uvf	F/p	50/50	TL	✓	✓	5Y 6/1	km	Calc V clayey ss									
	1520	80-56-1520	45/45	73		10	15	05	10/42/4	10/42/4	carb	LF	F/p	50/50	TL	✓	✓	5Y 6/1	km	both 10/42's are midst seen as burrow on 10/42 midst V clayey ss Limestone stained ss									
	1530	80-56-1530	45/45	100		10	10	05	10/42/4	10/42/4	carb	uvf	mm	50/50	TL	✓	✓	5Y 6/1	km	10/42 6/2 midst chip Calc									
	1540	80-56-1540	45/45	90		10	10	05	10/42/4	10/42/4	carb	uvf	F	50/50	TL	✓	✓	5Y 6/1	km	Calc									
	1551	80-56-1550	50/45	10		10	10	05	10/42/4	10/42/4	carb	uvf	M	50/50	TL	✓	✓	5Y 6/1	km	hematitic stained Calc									
	1560	80-56-1560	50/45	90		10	10	05	10/42/4	10/42/4	carb	uvf	M	50/50	TL	✓	✓	5Y 6/1	km	V Calc									
	1570	80-56-1570	45/45	70		10	10	05	10/42/4	10/42/4	carb	uvf	F	50/50	TL	✓	✓	5Y 6/1	km	hematitic stained Calc									
	1580	80-56-1580	45/45	60		10	10	05	10/42/4	10/42/4	carb	uvf	M	50/50	TL	✓	✓	5Y 6/1	km	V Calc									
	1590	80-56-1590	45/45	70		10	10	05	10/42/4	10/42/4	carb	uvf	F	50/50	TL	✓	✓	5Y 6/1	km	V clayey ss hematitic stained chips									
	1600	80-56-1600	45/45	60		10	10	05	10/42/4	10/42/4	carb	uvf	F	50/50	TL	✓	✓	5Y 6/1	km	hematitic stained chips V Calc 10 12 4/2 midst									

CHIP SAMPLE 106
FROM

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (9.5') Antelope Lookout mesa
Hole No: S-6 State: New Mexico Date: _____
Company: U.S.G.S County: McKinley Geologist: ARK/LC
Lat/Long: _____ Sheet 17 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Depth to top of bottom interval	Sample Number	Grain Size	Sort.	Silt	Sand	Shale	Stale	Color	Coal	Limestone	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Pyrite	Fluores.	Sandstone Color	Formation/Member	Comments
0161	80-56-160	45/54	40		50	50	10	olive black			LF (T _u)	F	Se/50	Ta	✓ mud		red		Km	1 white kaolinitic ss chip very calc
1620	80-56-1620	45/54	70	Tr	30	30	54/21	10/54			LF (T _u)	P/c	Se/50	N	✓ s	✓ carb		54/51	Km	aggreg spherical masses on pyrite with cubes on outside
1630	80-56-1630	45/54	40		55	55	54/21	1/54			LF (T _u)	P	Se/50	Ta	✓	✓ carb			Km	homotinic stained carbonaceous matrix
1640	80-56-1640	45/54	30	1	64	64	54/21	1/54			LF (T _u)	F	Se/50	N	✓	✓		54/51	Km	calc yellow disperse zillaceous
1650	80-56-1650	54/55	40	Te	5	5	54/21	carb			LF (T _u)	P	Se/50	N	✓	✓			Km	Ta homotinic chips very calc muddy sand matrix
1660	80-56-1660	54/55	40	Tr	58	58	54/21	carb			UW	P	Se/50	N	✓				Km	very calc
1670	80-56-1670	54/55	30	Tr	65	65	54/21	carb			UW	P	Se/50	Ta	✓			54/51	Km	very calc
1680	80-56-1680	54/55	20	Tr	72	72	54/21	carb			UW	P	Se/50	Ta	✓	✓	red		Km	very calc
1690	80-56-1690	54/55	60	Ta	40	40	54/21	carb			UW	m	Se/50	Ta	✓				Km	clay with mud homotinic stained carb material
1700	80-56-1700	54/55	15	1	81	81	54/21	carb			UW	P	Se/50	Ta	✓	✓			Km	very calc limonitic clots

CHIP SAMPLE 106
FORM

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: 56 State: New Mexico Date: _____
Company: U.S.G.S County: McKinley Geologist: ARK/LK
Lat/Long: _____ Sheet 18 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Table 1. Descriptions of cuttings samples from Maricao Lake - Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones																				
Depth to Top of Sample Interval	Sample Number	Grain Size	Lithology								Limestone	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Pyrite	Fossils	Sandstone Color	Comments
			Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal												
1710	1710	80-56-1710																		Km
1720	1720	80-56-1720																		Km
1730	1730	80-56-1730																		Juanita type mbr. Manaos Shale Km
1740	1740																			Km
1750	1750																			Km
1760	1760																			Km
1770	1770																			Km
1780	1780																			Km
1790	1790																			34 Km
1800	1800																			Km

NOT MUCH MIXING
SAMPLER 1710-1900
poor mud return.

LIMESTONE CHIPS IN THIS INTERVAL MAY
BE MANAOS SHALE.
JUANITA LOPEZ MBR.

NOT MUCH MIXING WITH
SANDS 1710-1900
Poor mud return.

LIMESTONE CHIPS IN THIS
INTERVAL MAY
JUANITA Lopea mbr.
MANDOS Shale?

CHIP SAMPLE 106
FORM

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: S6 State: New Mexico Date: Nov 7 MEX
Company: U.S.G.S. County: McKinley Geologist: A. KIRK / L. Lundgren
Lat/Long: _____ Sheet 19 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Depth to Top of Interval	Sample Number	Grain Size	Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Pyrite	Fluores.	Sandst. Color	Form thin / medium	COMMENTS
1910	1910	45/54				100	N5											K ml	Silty shale system. v calc.
1920	1920	45/54				100	N5											K ml	v. silty shale - some LVF sandstone hydrous, v calc Tr of sand
1930	1930	54/54				100	N5											K ml	Silty shale Tr of sandstone v calc.
1940	1940	45/54				100	N5											K ml	Silty shale Tr of sandstone v calc.
1950	1950	45/54				100	N5											K ml	Silty shale pyrite in more carb layers Tr of ssr. v. calc.
1960	1960	45/54				100	N3											K ml	Silty shale Tr of ssr hematitic stained chips v calc.
1970	1970	45/54		20		80	N3			LVF								K ml	Silty shale hydrous hematitic chips v calc.
1980	1980	55/54		10		90	N3			LVF								K ml	Silty shale hematitic chips
1990	1990	45/54		10		90	N3			LVF								K ml	Silty shale
2000	2000	45/45		15		85	N3			LVF							N7	K ml	Tr of 10YR 7/4 ss hematitic chips

CHIP SAMPLE 106
FORM

Location: _____ Sec. 17 T. 18N R. 12W Quadrangle (9.5') Antelope Valley
Hole No: 96 State: New Mexico Date: _____
Company: U.S.G.S. County: McKinley Geologist: A. KIRK / L. GUNAWAN
Lat/Long: _____ Sheet 20 of 25.

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones

Sample Number	Sample Interval	Grain Size	Congl.	Sandst.	Siltst.	Shale	Shale Color	Col	Limestone	Grain Size	Sorting	Rounded	Feldspar	Carbonates	Pyrite	Recess.	Sandstone Color	Remarks	Formation / Member	Comments
2010	20-56-2010	55/55		2		98	N3			Lvs				✓	✓		N7		Kml	V Silty shale
2020	20-56-2020	45/55		2		98	N3			Lvs				✓	✓		N7		Kml	V Silty shale Tr. 10% 7/4 ss
2030	20-56-2030	45/55		5		95	N3			Lvs				✓	✓		N7		Kml	Silty shale hematitic chips pyrite (?)
2040	20-56-2040	45/55		20		80	N3			Lvs				✓	✓		N7		Cranham ls Mar Manitou Shale Kmg	Silty shale
2050	20-56-2050	55/55		5		95	N3			Lvs				✓	✓		N7		Kmg	hematitic chips silty shale
2060	20-56-2060	55/55		2		98	N3			Lvs				✓	✓		N7		Km	Silty shale hematitic chips
2070	20-56-2070	50/55		2		98	N3			Lvs				✓	✓		N7		Km	V. Silty shale Tr. 10% 7/4 ss probably hydrous too
2080	20-56-2080	50/55				99	N3			Lvs				✓	✓				Thomville Tampa Ocala Sandstone Kdt	1% Tr. 10% 7/4 ss (lv) little crystals on coarse silty shale hematitic chips
2090	20-56-2090	55/55		5		95	N3			Lvs				✓	✓		N7		Kdt	Silty shale 5% in Tr. 10% 7/4 ss (lv) hematitic chips
2100	20-56-2100	55/55		30		70	N3			Lvs		SK TL		✓	✓		N7		Kdt	Silty shale

CHIP SAMPLE 106
FORM

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: S6 State: New Mexico Date: _____
Company: U.S.G.S. County: McKinley Geologist: ARK/LL
Lat/Long: _____ Sheet 21 of 25.

Table 1. Descriptions of cuttings samples from Mariano Lake - Late Valley Drilling Project Hole No. 6, New Mexico Sandstones																	
Sample Number Depth to top of Sample Interval	Core/lot	Estimated % of Lithologies								Facies							
		Congl.	Sandst.	Siltst.	Shale	Shale color	Coal	Limestone	Crin. Sbc	Sorting	Rounded	Fidelpar	Carbon.	Pyrite	Flacc.	Subbase Color	
2110	80-56-2110	45/45	5		95	N3		Te white	LVP				✓	✓		N7	hematitic stained chips Unconformity Homo Tertiary Monoc. shale Known
2120	80-56-2120	50/45	10		88	N3		2 white	LVP				✓	✓		N7	limestone is very finely crystalline Known
2130	80-56-2130	55/45	4		92	N3		4 white	LVP				✓	15 sh		N7	limestone is very finely crystalline Known
2140	80-56-2140	45/45	2		96	N3		2 white					✓	✓		N7	limestone, silty shale limonitic stained chips Known
2150	80-56-2150	50/45	8		82	N3	Te						✓	✓		N7	silty shale hematitic chips Known TTL 10 YR 7/4 SLR
2160	80-56-2160	45/54	7		93	N3		Te white	UVP	W	SL		✓	blk		N7	1X 10YR 7/4 SLR organic material along ss bands silty shale, gypsum (brown) ss, calc. chert Known
2170	80-56-2170	55/45	15		85	N3	Ta		UVP	mw	SL		✓	slk		N7	2X 10YR 7/4 SLR organic material along ss bands, hematitic chert, silty shale Known
2180	80-56-2180	45/45	Tr		100	N3	Ta						✓			N7	hematitic stained chips gypsum silty shale Known
2190	80-56-2190	45/45	20		80	N3	Ta		UVP	mw	SL		✓			N7	silty shale hematitic Known
2200	80-56-2200	45/54	1		99	N3								✓			silty carb shale Known

CHIP SAMPLE 106
FORM

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (9.5') Antelope Lookout Mesa
Hole No: 56 State: New Mexico Date: _____
Company: U.S.G.S. County: McKinley Geologist: ARK/LG
Lat/Long: _____ Sheet 22 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project Hole No. 6, New Mexico Sandstones
Estimated % of Lithologies

Depth to top of Sample Interval	Sample Number	Core/Sec	Gravel	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Rounded	Fiducial	Carbonate	Pyrite	Notes	Sandstone Color	Formation/Member	Comments
2210	80-56-2210	45/45		8.5	#	91.5	N3	Ta		UVF	mm	SL		✓	✓		N7	Dakota Sandstone K1	Silty shale
2220	80-56-2220	55/45		22		748	N3			UVF	mm	SL		✓	✓		N7	P1	10 yr 6/6 mdst (Ta) hematitic stained chips silty shale
2230	80-56-2230	45/45		5		95	N3			UVF	mm	SL		✓	✓		N7	P1	Ta 10 yr 7/4 ss silty shale
2240	80-56-2240	45/45		10		97	N3			UVF	mm	SL		✓	✓		N7	P1	Ta 10 yr 7/4 ss silty shale carbonate
2250	80-56-2250	45/45		12		95	N3	Ta		UVF	mm	SL		✓	✓		N7	P1	Silty carb shale Ta hematitic stained chips SHELL FRAGMENTS
2260	80-56-2260	45/45		40		85	N3	Ta		UVF	mm	SL	Ta	✓	✓		N7	P1	10 yr 6/6 mdst (Ta) hematitic stained chips silty shale
2270	80-56-2270	45/45		10		95	N3			UVF	mm	SL	Ta	✓	✓		N7	P1	Silty shale w/ carbonate
2280	80-56-2280	45/45		10		95	N3			UVF	mm	SL		✓	✓		N7	P1	Ta 10 yr 7/4 ss silty shale hematitic chips
2290	80-56-2290	45/45		5		95	N3			UVF	mm	SL	Ta		✓		N7	P1	hematitic chips
2300	80-56-2300	45/45																	NO SAMPLE

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: 56 State: New Mexico Date: _____
Company: U.S.G.S County: McKinley Geologist: ARK/LG
Lat/Long: _____ Sheet 23 of 25.

Table 1. Descriptions of cuttings samples from Mariano Lake - Lake Valley Drilling Project Hole No. 6, New Mexico Sandstones

[illegible]

CHIP SAMPLE 106
FORM

Location: _____ Sec. 19 T. 18N R. 12W Quadrangle (7.5') Antelope Lookout
Hole No: 5-6 State: New Mexico Date: _____
Company: U.S.G.S. Country: McKinley Geologist: ARK/LG
Lat/Long: _____ Sheet 24 of 25

Table 1. Descriptions of cuttings samples from Mariano Lake -
Lake Valley Drilling Project, Hole No. 6, New Mexico Sandstones

Sample Number	Grain Size	Congl.	Sandst.	Siltst.	Shale	Shale Color	Coal	Limestone	Grain Size	Sorting	Roundness	Feldspar	Carbonates	Pyrite	Fluorite	Trace	Sandstone Color	Remarks/Notes	Comments
2410	80-56-2410		8		92	N4			LF (fine)	F/M	SC/SA	N	SS ✓ sh	✓			3 N8 5/ N7	FX	clean grs rich ss, SA, fine med, silty shale, graywacke (SS), d. sil calc, calc ss. N7
2420																		KL	Samples not described
2430																		KL	
2440																		Bushy Basin Mbr Mariano Fm Jmb	
2450																		Jmb	
2460																		Jmb	
2470																		Jmb	
2480	80-56-2480																	Jmb	
2490																			Core part 2485
2500																			

Location: _____ Sec. 17 T. 18N R. 1 Quadrangle (9.5') Antelope Lookout
Hole No: SL State: New Mexico Date: 12/21/81
Company: U.S.G.S County: Mckinley Geologist: ARK/ACH
Lat/Long: _____ Sheet 25 of 25

Depth to Top of
Sandy Interval

[illegible]

LOCATION S-6 Sec. 19 T. 13N R. 12W QUADRANGLE (7.5') Lookout Mesa
STATE New Mexico COUNTY McKinley DATE Nov 13/Nov. 18
LAT.-LONG. 35° 46' 18" N 108° 08' 54" W GEOL. AK, LG, PS

THICKNESS	SAMPLE NO.	UNIT NO.	FM/MBR.	RADIOACT.	CPS	VISUAL POROSITY	CORE ESTIMATE	ROCK TYPE	FOOTNOTES	COLOR	GRAIN SIZE	BEDDING	SEDIMENTARY STRUCTURES	BIOLOGY/ORGANICS	SORTING/ROUNDNESS	CEMENT	PERCENT	ACCESSORY MINERALS OR FRAGMENTS	NOTES: (ALTERATION, ATTITUDE, CLASTS, MINERALIZATION, & MISC. INFO.)	INFERRED DEPOSITION ENVIRONMENT	TRANSPORT DIRECTION	(NO. OF MEASUREMENTS)
2475				50		Exc	1			50/50	Med				W/SA	sl. calc clay		bl. pyrite pyrite bl. pyrite pyrite pyrite bl. pyrite	tr. qtz. sand 2% clino, abnt carb in top foot of interval net-like dessication also at top very mottled, color diff. due to higher % (9) of clino ripples? 4% clino at bottom decreasing to 4% at top, tr. anal. cime. Calcite filled fracture in top foot of interval			
2485				50		Exc	1			50/50	Med				W/SA	sl. calc clay		pyrite pyrite pyrite pyrite pyrite bl. pyrite	small amt. anal. cime. 0-5% clino dk. gn irreg. blebs, tr. of clino mottled, ripples?, 8% clino net-like pattern, sometimes filled w/ clino (classification?) 1% clino. lg. bl. clasts up to 3 mm (carb?) near top of unit is lg. gn mottling (churns?) 8" silty mudstone, tr. qtz. sand 4-10% clino, dr. ripple lan? mudstone, calc. cime. silica cime. fractures, tr. clino calc. little sand, silty calc. cime. coating w/ pyrite. irreg. rounded calc. blebs throughout. Tr. clino in lower part of column abnt near calc. elongate, irreg. boulder blades, blk mat'l. rounded irreg. blebs of buff calcite cime. same mat'l, gn. dom. mottled at base, red @ top calcite filled fractures, blk mat'l as below.			
2495				40		Exc	2			50/50	Med				W/SA	sl. calc clay		pyrite pyrite pyrite pyrite pyrite bl. pyrite	small amt. anal. cime. 0-5% clino dk. gn irreg. blebs, tr. of clino mottled, ripples?, 8% clino net-like pattern, sometimes filled w/ clino (classification?) 1% clino. lg. bl. clasts up to 3 mm (carb?) near top of unit is lg. gn mottling (churns?) 8" silty mudstone, tr. qtz. sand 4-10% clino, dr. ripple lan? mudstone, calc. cime. silica cime. fractures, tr. clino calc. little sand, silty calc. cime. coating w/ pyrite. irreg. rounded calc. blebs throughout. Tr. clino in lower part of column abnt near calc. elongate, irreg. boulder blades, blk mat'l. rounded irreg. blebs of buff calcite cime. same mat'l, gn. dom. mottled at base, red @ top calcite filled fractures, blk mat'l as below.			
2505				45		Exc	2			50/50	Med				W/SA	sl. calc clay		pyrite pyrite pyrite pyrite pyrite bl. pyrite	small amt. anal. cime. 0-5% clino dk. gn irreg. blebs, tr. of clino mottled, ripples?, 8% clino net-like pattern, sometimes filled w/ clino (classification?) 1% clino. lg. bl. clasts up to 3 mm (carb?) near top of unit is lg. gn mottling (churns?) 8" silty mudstone, tr. qtz. sand 4-10% clino, dr. ripple lan? mudstone, calc. cime. silica cime. fractures, tr. clino calc. little sand, silty calc. cime. coating w/ pyrite. irreg. rounded calc. blebs throughout. Tr. clino in lower part of column abnt near calc. elongate, irreg. boulder blades, blk mat'l. rounded irreg. blebs of buff calcite cime. same mat'l, gn. dom. mottled at base, red @ top calcite filled fractures, blk mat'l as below.			
Jmb				55		Exc	3			50/50	Med				W/SA	sl. calc clay		pyrite pyrite pyrite pyrite pyrite bl. pyrite	small amt. anal. cime. 0-5% clino dk. gn irreg. blebs, tr. of clino mottled, ripples?, 8% clino net-like pattern, sometimes filled w/ clino (classification?) 1% clino. lg. bl. clasts up to 3 mm (carb?) near top of unit is lg. gn mottling (churns?) 8" silty mudstone, tr. qtz. sand 4-10% clino, dr. ripple lan? mudstone, calc. cime. silica cime. fractures, tr. clino calc. little sand, silty calc. cime. coating w/ pyrite. irreg. rounded calc. blebs throughout. Tr. clino in lower part of column abnt near calc. elongate, irreg. boulder blades, blk mat'l. rounded irreg. blebs of buff calcite cime. same mat'l, gn. dom. mottled at base, red @ top calcite filled fractures, blk mat'l as below.			
Jmw				40		Exc	3			50/50	Med				W/SA	sl. calc clay		pyrite pyrite pyrite pyrite pyrite bl. pyrite	small amt. anal. cime. 0-5% clino dk. gn irreg. blebs, tr. of clino mottled, ripples?, 8% clino net-like pattern, sometimes filled w/ clino (classification?) 1% clino. lg. bl. clasts up to 3 mm (carb?) near top of unit is lg. gn mottling (churns?) 8" silty mudstone, tr. qtz. sand 4-10% clino, dr. ripple lan? mudstone, calc. cime. silica cime. fractures, tr. clino calc. little sand, silty calc. cime. coating w/ pyrite. irreg. rounded calc. blebs throughout. Tr. clino in lower part of column abnt near calc. elongate, irreg. boulder blades, blk mat'l. rounded irreg. blebs of buff calcite cime. same mat'l, gn. dom. mottled at base, red @ top calcite filled fractures, blk mat'l as below.			
2515				40		Exc	3			50/50	Med				W/SA	sl. calc clay		pyrite pyrite pyrite pyrite pyrite bl. pyrite	small amt. anal. cime. 0-5% clino dk. gn irreg. blebs, tr. of clino mottled, ripples?, 8% clino net-like pattern, sometimes filled w/ clino (classification?) 1% clino. lg. bl. clasts up to 3 mm (carb?) near top of unit is lg. gn mottling (churns?) 8" silty mudstone, tr. qtz. sand 4-10% clino, dr. ripple lan? mudstone, calc. cime. silica cime. fractures, tr. clino calc. little sand, silty calc. cime. coating w/ pyrite. irreg. rounded calc. blebs throughout. Tr. clino in lower part of column abnt near calc. elongate, irreg. boulder blades, blk mat'l. rounded irreg. blebs of buff calcite cime. same mat'l, gn. dom. mottled at base, red @ top calcite filled fractures, blk mat'l as below.			
2525				40		Exc	4			50/50	Med				W/SA	sl. calc clay		pyrite pyrite pyrite pyrite pyrite bl. pyrite	small amt. anal. cime. 0-5% clino dk. gn irreg. blebs, tr. of clino mottled, ripples?, 8% clino net-like pattern, sometimes filled w/ clino (classification?) 1% clino. lg. bl. clasts up to 3 mm (carb?) near top of unit is lg. gn mottling (churns?) 8" silty mudstone, tr. qtz. sand 4-10% clino, dr. ripple lan? mudstone, calc. cime. silica cime. fractures, tr. clino calc. little sand, silty calc. cime. coating w/ pyrite. irreg. rounded calc. blebs throughout. Tr. clino in lower part of column abnt near calc. elongate, irreg. boulder blades, blk mat'l. rounded irreg. blebs of buff calcite cime. same mat'l, gn. dom. mottled at base, red @ top calcite filled fractures, blk mat'l as below.			
2535				40		Exc	4			50/50	Med				W/SA	sl. calc clay		pyrite pyrite pyrite pyrite pyrite bl. pyrite	small amt. anal. cime. 0-5% clino dk. gn irreg. blebs, tr. of clino mottled, ripples?, 8% clino net-like pattern, sometimes filled w/ clino (classification?) 1% clino. lg. bl. clasts up to 3 mm (carb?) near top of unit is lg. gn mottling (churns?) 8" silty mudstone, tr. qtz. sand 4-10% clino, dr. ripple lan? mudstone, calc. cime. silica cime. fractures, tr. clino calc. little sand, silty calc. cime. coating w/ pyrite. irreg. rounded calc. blebs throughout. Tr. clino in lower part of column abnt near calc. elongate, irreg. boulder blades, blk mat'l. rounded irreg. blebs of buff calcite cime. same mat'l, gn. dom. mottled at base, red @ top calcite filled fractures, blk mat'l as below.			
2545				40		Exc	5			50/50	Med				W/SA	sl. calc clay		pyrite pyrite pyrite pyrite pyrite bl. pyrite	small amt. anal. cime. 0-5% clino dk. gn irreg. blebs, tr. of clino mottled, ripples?, 8% clino net-like pattern, sometimes filled w/ clino (classification?) 1% clino. lg. bl. clasts up to 3 mm (carb?) near top of unit is lg. gn mottling (churns?) 8" silty mudstone, tr. qtz. sand 4-10% clino, dr. ripple lan? mudstone, calc. cime. silica cime. fractures, tr. clino calc. little sand, silty calc. cime. coating w/ pyrite. irreg. rounded calc. blebs throughout. Tr. clino in lower part of column abnt near calc. elongate, irreg. boulder blades, blk mat'l. rounded irreg. blebs of buff calcite cime. same mat'l, gn. dom. mottled at base, red @ top calcite filled fractures, blk mat'l as below.			

Table 2 Descriptions of core from Mariano Lake - Lake Valley
Drilling Project Hole No. 6, New Mexico

Drilling Project Hole No. 6, New Mexico

LOCATION 56 Sec. 17 T. 18N R. 12W
 STATE New Mexico COUNTY McKinley
 U.S.G.S. CORE LIBRARY NUMBER _____ API WELL NUMBER _____

Depth (ft)	Lithology	Core Description	Notes
2545	dk stained blebs w/ pyrite, tr. red chert 80-56-2549 P19	12-15	
2550	dk stained pyrite blebs, apple gn, magn, clay clasts	12-15	
2555	magn. along lams, clay seams, wht. chert	12-15	
2560	granules, graded lams, gn. clay chips	12-15	
2565	6 cm dk gn. clay clast, granitic pebbles, rusty bn. gneiss pebbles	12-15	
2570	10 cm dk gn. clay clast, coarse sand and granules	12-15	
2575	10 cm dk gn. clay clast, coarse sand and granules	12-15	
2580	10 cm dk gn. clay clast, coarse sand and granules	12-15	
2585	10 cm dk gn. clay clast, coarse sand and granules	12-15	
2590	10 cm dk gn. clay clast, coarse sand and granules	12-15	
2595	10 cm dk gn. clay clast, coarse sand and granules	12-15	
2600	10 cm dk gn. clay clast, coarse sand and granules	12-15	
2605	10 cm dk gn. clay clast, coarse sand and granules	12-15	
2610	10 cm dk gn. clay clast, coarse sand and granules	12-15	
2615	10 cm dk gn. clay clast, coarse sand and granules	12-15	

Table 2 Descriptions of core from Mariano Lake - Lake Valley
Drilling Project Hole No. 6, New Mexico

LOCATION S-6 Sec. 19 T. 18N R. 12W
STATE New Mexico COUNTY McKinley
U.S.G.S. CORE LIBRARY NUMBER _____ API WELL NUMBER _____

Depth (ft)	Core Description	Grain Size	Color	Texture	Notes
2625
2635
2645
2655
2665
2675
2685
2695
2705
2715
2725
2735
2745
2755
2765
2775
2785
2795
2805
2815
2825
2835
2845
2855
2865
2875
2885
2895
2905
2915
2925
2935
2945
2955
2965
2975
2985
2995
3005
3015
3025
3035
3045
3055
3065
3075
3085
3095
3105
3115
3125
3135
3145
3155
3165
3175
3185
3195
3205
3215
3225
3235
3245
3255
3265
3275
3285
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564					

Table 2 Descriptions of core from Mariano Lake - Lake Valley
Drilling Project Hole No. 6, New Mexico

Core No.	Depth (ft)	Core Description	Grain Size	Color	Texture	Notes
2705	32	Scour base - dk gray clay chips, clayey matrix	10% calc	10% calc	10% calc	lens are defined by conc. of blk chit & mag?
2715	32	Scour base - pebbles up to 2cm, brn gtz, granitic frags, clay clasts, large feldspars	10% calc	10% calc	10% calc	80-56-2711 & 9
2725	32	Interbed. siltst. & mottled	10% calc	10% calc	10% calc	80-56-2725 P, G
2735	32	Few scattered granules - tan chit, blue gtz, brn gtz & granule	10% calc	10% calc	10% calc	80-56-2735 P, G
2745	32	1" fine grained sand, mud	10% calc	10% calc	10% calc	80-56-2745 P, G
2755	32	blk stoned bleb w/ pyrite (thin) blue gtz, scour base, feld. pebble	10% calc	10% calc	10% calc	80-56-2755 P, G
2765	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2765 P, G
2775	32	Scour base	10% calc	10% calc	10% calc	80-56-2775 P, G
2785	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2785 P, G
2795	32	Scour base	10% calc	10% calc	10% calc	80-56-2795 P, G
2805	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2805 P, G
2815	32	Scour base	10% calc	10% calc	10% calc	80-56-2815 P, G
2825	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2825 P, G
2835	32	Scour base	10% calc	10% calc	10% calc	80-56-2835 P, G
2845	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2845 P, G
2855	32	Scour base	10% calc	10% calc	10% calc	80-56-2855 P, G
2865	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2865 P, G
2875	32	Scour base	10% calc	10% calc	10% calc	80-56-2875 P, G
2885	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2885 P, G
2895	32	Scour base	10% calc	10% calc	10% calc	80-56-2895 P, G
2905	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2905 P, G
2915	32	Scour base	10% calc	10% calc	10% calc	80-56-2915 P, G
2925	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2925 P, G
2935	32	Scour base	10% calc	10% calc	10% calc	80-56-2935 P, G
2945	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2945 P, G
2955	32	Scour base	10% calc	10% calc	10% calc	80-56-2955 P, G
2965	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2965 P, G
2975	32	Scour base	10% calc	10% calc	10% calc	80-56-2975 P, G
2985	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-2985 P, G
2995	32	Scour base	10% calc	10% calc	10% calc	80-56-2995 P, G
3005	32	pyrite, clay chips, 8-10 mm blk st. blebs w/ pyrite, 10 mm blk clay clasts	10% calc	10% calc	10% calc	80-56-3005 P, G

4
AKK-WMA
DTH

LOCATION S-6 Sec. 19 T. 18N R. 12W
STATE New Mexico COUNTY McKinley
U.S.G.S. CORE LIBRARY NUMBER _____ API WELL NUMBER _____

Table 2 Descriptions of core from Mariano Lake - Lake Valley
Drilling Project Hole No. 6, New Mexico

ARK-DJH
LMA

LOCATION S-6 Sec. 19 T. 15N R. 12W
STATE New Mexico COUNTY McKinley
U.S.G.S. CORE LIBRARY NUMBER _____ API WELL NUMBER _____

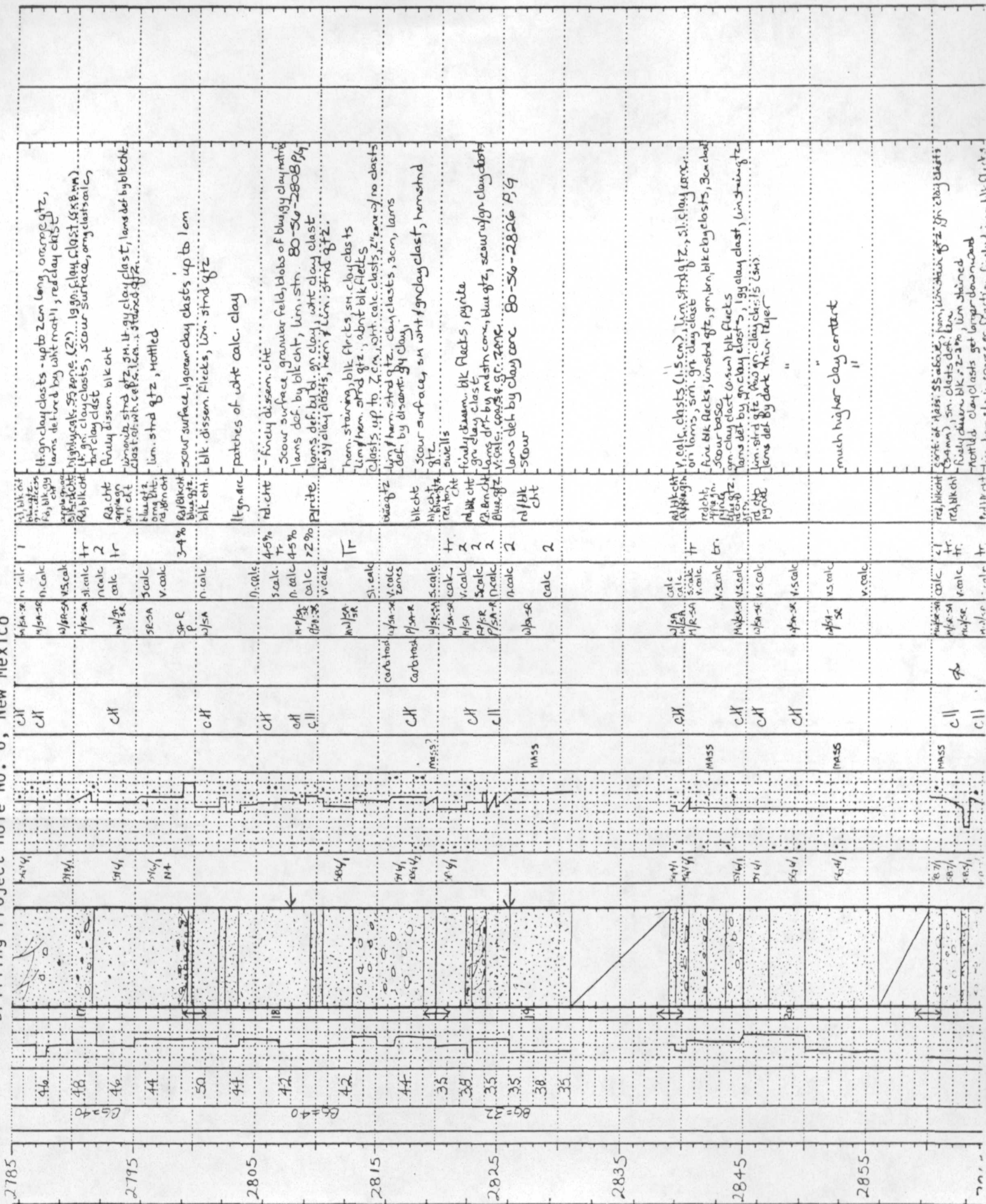


Table 2 Descriptions of core from Mariano Lake - Lake Valley

Drilling Project Hole No. 6, New Mexico

6
ARK-DH-DH

LOCATION S-6 Sec. 19 T. 13N R. 12W
 STATE New Mexico COUNTY McKinley
 U.S.G.S. CORE LIBRARY NUMBER _____ API WELL NUMBER _____

Depth (ft)	Core Description	Grain Size	Texture	Color	Notes
2865	Pyritic blks of gn. access grains (poor in clay chips) finely dissem. Blk flecks, 80-90% pyrite-bk flecks. Hem. str. qtz.	mlse	thin	ell	
2875	Scour base, med. cl. red clay clast w/ gn. clasts at bottom. Pyrite, 80-90% pyrite-bk flecks. Hem. str. qtz.	mlse	mass	ell	
2885	Pyrite, 80-90% pyrite-bk flecks. Hem. str. qtz.	mlse	mass	ell	
2895	Pyrite, 80-90% pyrite-bk flecks. Hem. str. qtz.	mlse	mass	ell	
2905	Pyrite, 80-90% pyrite-bk flecks. Hem. str. qtz.	mlse	mass	ell	
2915	Pyrite, 80-90% pyrite-bk flecks. Hem. str. qtz.	mlse	mass	ell	
2925	Pyrite, 80-90% pyrite-bk flecks. Hem. str. qtz.	mlse	mass	ell	
2935	Pyrite, 80-90% pyrite-bk flecks. Hem. str. qtz.	mlse	mass	ell	

Table 2 Descriptions of core from Mariano Lake - Lake Valley
Drilling Project Hole No. 6, New Mexico

ARK-

7

LOCATION S-6 Sec. 19 T. 13N R. 12W
STATE New Mexico COUNTY McKinley
U.S.G.S. CORE LIBRARY NUMBER API WELL NUMBER

Depth (ft)	Core Description	Grain Size	Color	Texture	Notes
2945
2955
2965
2975
2985
2995
3005
3015

810245
LPRK

LOCATION.....S-6

Sec. 19

T. 18N

R. 12w

STATE New Mexico

COUNTY McKinley

U.S.G.S. CORE LIBRARY NUMBER

API WELL NUMBER

40