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United States Department of Energy

Remedial Action Plan and Site Design for Stabilization of the Inactive Uranium Mill Tailings Site At Grand Junction, Colorado

NON-RECORD

Attachment 5: Summary of Field Investigations
Volume I: Cheney Disposal Area, Processing Site

Final

NON-RECORD

September 1991

Appendix B of the
Cooperative Agreement
No. DE-FC04-81AL16257

Uranium Mill Tailings Remedial Action Project

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ATTACHMENT 5

Summary of Field Investigations and Laboratory Data

Volume 1

Cheney Disposal Area
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Processing Site Area
- Test Pit Logs
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- Lysimeter Installation Boring Logs
- Lysimeter Completion Records

TERMS AND ABBREVIATIONS USED ON LOGS

TERMS

clasts - individual constituent or detrital sediment

conchoidal - smooth curved surfaces

scoria - volcanic slag

xyls,xls - crystals

ABBREVIATIONS

BX - broken
CLN - clean
D - decomposed
FLD - filled
Fr - fresh
HI,HIW - highly weathered
MW,MWD - moderately weathered
Rh,RGH - rough
SL,SLW - slightly weathered
SM,SMTH - smooth
STN - stained
T,TN - thin
VTN - very thin

CHENEY DISPOSAL AREA

Test Pit Logs

Jacobs Engineering Group, 1989.
Jacobs Engineering Group, 1984.
Lincoln-DeVore, Inc.
Western Engineers, Inc.

See Plate 3.1, Attachment 3 for locations of Borings and Test Pits in the Cheney Disposal Area.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/25/89

LOG OF TEST PIT NO. 13

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE Koerhing 666
LOCATION N11,969.0 E95,425.0
ELEVATION 5,277.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		SC		**TOPSOIL: CLAYEY SAND,** some with subrounded gravel and cobbles, fine sand, weakly lime cemented, low to medium plasticity, light red-brown.
			D		GP		**SANDY GRAVEL, COBBLES AND BOULDERS,** some silt, boulders less than 18 inches in diameter, predominantly coarse subround gravel and cobbles, fine to medium sand, weak to medium lime cemented, nonplastic, light grey brown.
5			D				
			D				
			D				
10			D				
			D		CL/ CH		**SANDY CLAY,** some with subrounded gravel and cobbles at base, fine to medium sand, moderately lime cemented, medium to high plasticity, mottled light yellow brown.
15			D		Sh		**MANCOS SHALE: CLAYSTONE,** high weathered, soft, thinly bedded, light yellow brown and grey. note: some gypsum and calcite.
20							Stopped backhoe at 16 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/25/89

LOG OF TEST PIT NO. 14

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,806.0 E95,265.0
ELEVATION 5,268.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					SC/ CL	Dry	**TOPSOIL: CLAYEY SAND AND SANDY CLAY,** trace of cobbles, some coarse rounded gravel, fine sand, some roots, weakly lime cemented, low to medium plasticity, light red brown.
					SC		note: increased clay with depth.
					GP	Dry	**CLAYEY SAND,** trace cobbles, some to considerable coarse rounded gravel, fine to medium sand, moderate to weakly lime cemented, low to medium plasticity, pale red brown.
5					GP	Dry	**SANDY GRAVEL,** trace cobbles, predominately coarse subrounded gravel, fine to medium sand, weak to moderately lime cemented, nonplastic, pale light grey brown.
10					CL/ CH	Dry	**SANDY GRAVEL, COBBLES AND BOULDERS,** boulders less than 3 feet in diameter, predominately coarse subrounded gravel and cobbles, fine to medium sand, weakly lime cemented, nonplastic, light yellow brown to light grey brown.
					Sh	Slightly moist	**CLAY,** moderately lime cemented, medium to high plasticity, light yellow brown and grey.
15							**MANCOS SHALE: CLAYSTONE,** highly weathered, soft to moderately soft, thinly bedded, light yellow brown and grey. Note: some gypsum and calcite.
20							Stopped backhoe at 12 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/24/89

LOG OF TEST PIT NO. 15

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,846.0 E95,310.0
ELEVATION 5,269.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SC	Dry	**TOPSOIL: CLAYEY SAND,** some course gravel, cobbles and boulders, fine sand, weakly lime cemented, roots, low plasticity, light red brown.
			D		SC	Dry	**CLAYEY SAND,** trace of some course subrounded gravel, cobbles and boulders, fine to medium sand, weak to moderately lime cemented, some roots, low to medium plasticity, pale red brown.
5			D		GP	Dry	**SANDY GRAVEL, COBBLES AND BOULDERS,** predominately course subrounded gravel and cobbles, boulders less than 18 inch diameter, fine to medium sand, moderately lime cemented, nonplastic, light grey brown. Note: strong to moderately lime cemented near top of unit.
10			D		GP	Moist	**SANDY GRAVEL AND COBBLES,** fine cobbles and gravel, some course sand, predominately fine to medium sand, weakly lime cemented, nonplastic, light grey brown.
15					CL/ CH	Very moist	**CLAY,** moderately lime cemented, some gypsum and calcite, medium to high plasticity, light yellow brown and grey mottled.
20			D		Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft to moderately soft, thinly bedded, light olive grey and light yellow brown. Note: some limonite on bedding, some calcite and gypsum filling.
25							Stopped backhoe at 18 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/24/89

LOG OF TEST PIT NO. 16

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,759.0 E95,172.0
ELEVATION 5,268.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		SC	Dry	**TOPSOIL: CLAYEY SAND,** trace to some coarse gravel and cobbles, fine sand, weakly lime cemented, roots, low to medium plasticity, light red brown.
			D		GM	Dry	**SILTY GRAVEL AND COBBLES,** fine to medium sand, course subrounded gravel and cobbles, moderately lime cemented, nonplastic, light grey brown. *Note: Considerable gypsum lenses, 6 inch thickness of gypsum crystals to approximately 2mm in size.*
5			D		GP	Dry	**SANDY GRAVEL AND COBBLES,** some boulders less than 15 inches in diameter, predominately coarse subrounded gravel and cobbles, fine to medium sand, weakly lime cemented, nonplastic, light grey brown.
10			D		GP	Dry	**SANDY GRAVEL, COBBLES AND BOULDERS,** boulders less than 2 feet in diameter, predominately coarse subrounded gravel and cobbles, fine to medium sand, moderately lime cemented, nonplastic, light grey brown.
15			D		CL/ CH	Slightly moist	**CLAY,** moderately lime cemented, some gypsum and calcite, medium to high plasticity, mottled light yellow brown and grey.
20			D		Sh		**MANCOS FORMATION: SHALE,** highly weathered, soft to moderately soft, thinly bedded, limonite on bedding surface, light yellow brown and gray.
25							Stopped backhoe at 20 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 17

JOB NO. GRJ-03 DATE 07/24/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,625.0 E95,081.0
ELEVATION 5,264.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some coarse subrounded and subangular gravel, fine sand, weakly lime cemented, some roots, blocky structure, some caliche development, medium plasticity, light red brown.
			D				
					GC/ SC	Slightly moist	**CLAYEY GRAVEL, COBBLES AND CLAYEY SAND,** some boulders less than 18 inches in diameter, predominately coarse subrounded gravel and cobbles, fine to medium sand, weakly lime cemented, low to medium plasticity, light red brown.
			D				
5							
					CL/ CH		**CLAY,** moderately lime cemented, medium to highly plasticity, mottled light yellow brown and grey. Note: some gypsum and calcite throughout.
			D		Sh		
10							**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft, thinly bedded, light grey and light yellow brown. Note: some gypsum and calcite filling.
15							Stopped backhoe at 8 feet, backfilled with spoils.
20							
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/24/89

LOG OF TEST PIT NO. 18

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,390.0 E95,056.0
ELEVATION 5,258.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content of Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some medium subangular to subrounded gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
					CL		
			D				
					GC/ SC	Slightly moist	**SANDY CLAY,** trace to some coarse gravel and cobbles, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D				
5							
			D				**CLAYEY GRAVEL, COBBLES AND CLAYEY SAND,** some small boulders, coarse subrounded gravel and cobbles, fine to medium sand, weakly lime cemented, light red brown.
					CL/ CH		
			D				
					Sh	Slightly moist	**CLAY,** moderately lime cemented, medium to highly plasticity, some gypsum and calcite, light yellow brown grey.
10							
							MANCOS FORMATION: CLAYSTONE, highly weathered, soft, thinly bedded, some calcite and gypsum filling, light yellow brown and grey.
15							Stopped backhoe at 9 feet, backfilled with spoils.
20							
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/24/89

LOG OF TEST PIT NO. 19

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,232.0 E95,023.0
ELEVATION 5,252.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0		X	D		SM	Dry	**TOPSOIL: SILTY SAND,** trace of fine to coarse rounded gravel, fine sand, noncemented, some roots, nonplastic, light brown.
		X			CL		
		X	D		CL	Slightly moist	**TOPSOIL: SANDY CLAY,** some fine to subrounded gravel, fine sand, medium plasticity, light red brown. Note: some roots, blocky structure, some caliche development.
		X	D		SC/ GC		
5		X					
		X	D			Slightly moist	**SANDY CLAY,** trace of fine to coarse subangular gravel, fine to medium sand, weakly lime cemented, medium plasticity, light red brown.
		X			CL/ CH		
						Slightly moist	**CLAYEY SAND AND GRAVEL,** trace small boulders, some considerable subrounded gravel and small cobbles, fine to medium sand, low to medium plasticity, weakly lime cemented, some gypsum and calcite, light reddish yellow brown.
10		X	D		Sh		
							CLAY, moderately lime cemented, some gypsum and calcite, some thin carbonate zones, medium to high plasticity, light yellow brown to olive brown.
15							**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft, thinly bedded, some gypsum and calcite, light yellow brown to olive brown.
20							Stopped backhoe at 10.5 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/24/89

LOG OF TEST PIT NO. 20

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,064.0 E94,954.0
ELEVATION 5,247.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					SM	Dry	**TOPSOIL: SILTY SAND,** some fine to coarse subrounded gravel, fine sand, weakly cemented, considerable roots, nonplastic, light brown.
					GM	Dry	**SILTY GRAVEL,** trace to some boulders 18 inches in diameter, predominately coarse subrounded gravel and cobbles, fine sand, moderately lime cemented, nonplastic, pale brown. Note: some roots.
5					GP		
					GP	Dry	**SANDY GRAVEL,** traces to some cobbles, predominately fine subrounded gravel, fine to medium sand, weak to moderately lime cemented, some roots, nonplastic, light grey brown. Note: unit is discoutinuous laterally
					CL/ CH		
10						Dry	**SANDY GRAVEL AND COBBLES,** some small boulders, predominately subrounded gravel and cobbles, weakly lime cemented, nonplastic, light grey brown
15						Slightly moist	**CLAY,** moderately lime cemented, medium to highly plastic, some gypsum and calcite, 3 inch carbonate layer at top of unit, mottled yellow brown and grey.
20							Stopped backhoe at 9.5 feet on top of Mancos Formation, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 21

JOB NO. GRJ-03 DATE 07/24/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,844.0 E94,868.0
ELEVATION 5,242.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					SM	Dry	**TOPSOIL: SILTY SAND,** some coarse rounded gravel, fine sand, weak to noncemented, some roots, nonplastic, light brown.
					GM		**SILTY GRAVEL,** predominately fine subrounded gravel, fine sand, moderately lime cemented, nonplastic, pale brown.
					GM		
5					GP	Dry	**SILTY GRAVEL,** trace cobbles, predominately course rounded gravel, fine to medium sand, weakly to moderately lime cemented, nonplastic, light grey brown.
					GP	Dry	**SANDY GRAVEL, COBBLES AND BOULDERS,** boulders less than 15 inches in diameter, predominately course rounded gravel and cobbles, fine to medium sand, weak to noncemented, nonplastic, light grey brown.
10					CL	Dry	**SANDY GRAVEL AND COBBLES,** trace to some small boulders, predominately course rounded gravel and cobbles, fine to medium sand, weakly to moderately lime cemented, nonplastic, light grey brown.
15					Sh	Moist	**CLAY,** moderately lime cemented, medium to high plasticity, some carbonate layers, mottled light yellow brown and grey.
						Dry	**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft, thinly bedded, some gypsum calcite, light yellow brown and grey.
20							Stopped backhoe at 15.5 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/24/89

LOG OF TEST PIT NO. 22

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,680.0 E94,759.0
ELEVATION 5,237.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0					SM	Dry	**TOPSOIL: SILTY SAND,** considerable coarse subangular gravel, fine sand, weak to noncemented, nonplastic, light brown.
					GM	Dry	**SILTY GRAVEL,** predominately coarse subrounded gravel and cobbles, fine to medium sand, moderately lime cemented, low plasticity, pale brown.
					GP		
5					GP	Dry	**SANDY GRAVEL,** trace cobbles and boulders, predominately fine to medium subrounded gravel, fine to medium sand, weak to moderately lime cemented, nonplastic, light grey brown.
					GM	Dry	**SANDY GRAVEL AND COBBLES,** some boulders less than 18 inches in diameter, predominately coarse subrounded gravel and cobbles, fine to medium sand, weakly lime cemented, nonplastic, light grey brown.
10					CL	Dry	**SILTY GRAVEL AND COBBLES,** trace to some boulders, predominately coarse subrounded gravel and cobbles, fine to medium sand, moderately lime cemented, nonplastic, light grey brown.
15							**CLAY,** moderately lime cemented, some limonite, gypsum and calcite, 2 to 3 inch carbonate zone at top of unit and scattered throughout, medium to highly plasticity, light yellow brown and grey.
20							Stopped backhoe at 14.5 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 7/24/89

LOG OF TEST PIT NO. 23

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666
LOCATION N12,051.0 E93,034.0
ELEVATION 5,235.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0					SM	Dry	**TOPSOIL,** silty sand, some coarse rounded gravels, fine sand, uncemented, nonplastic, light red brown. Note: considerable roots.
					GM		
5					GP	Dry	**SILTY GRAVEL,** predominantly coarse, subrounded and tabular gravels, some boulders less than 15 inch diameter, fine to medium sand, weak to moderately lime cemented, strong carbonate, nonplastic, white, light grey. Note: trace of roots.
					GP		**SANDY GRAVEL AND COBBLES,** fine to medium sand, cobbles less than 5 inch, rounded, weak to uncemented, nonplastic, light grey, brown. Note: contact with below variable and coarser eastward.
10					CL\ CH	Dry	**SANDY GRAVEL,** fine to medium sand, coarse, rounded and tabular, trace of cobbles, weak to uncemented, nonplastic, light grey, brown. Note: 2 inch carbonate layer at base.
					CST		
15						Slightly moist to moist	**CLAY,** moderately lime cemented, medium to high plasticity, mottled, light yellow, brown & grey. Note: some caliche discontinuous layers. Note: some very fine calcite and gypsum crystals, some brown dendrite on fractures, pinhole structures.
20							**MANCOS SHALE,** claystone, high weathered, soft, thinly bedded, mottled, light yellow, brown and grey. Note: some calcite and black dendrites, trace of gypsum 6 inch ammonite fossil, thin silty partings on bedding.
25							Stopped backhoe at 15 feet.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 24

JOB NO. GRJ-03 DATE 07/24/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,451 E94,487
ELEVATION 5,234
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					SM	Dry	**TOPSOIL: SILTY SAND,** some coarse subrounded gravel, fine sand, uncemented, considerable roots, nonplastic, light red brown.
					CL GM	Dry	**SANDY CLAY,** some coarse rounded gravel, fine to medium sand, weak to moderately lime cemented, medium plasticity, light grey to brown grey.
5					GP GM	Dry	**SILTY GRAVEL, COBBLES AND BOULDERS,** boulders less than 1 inch in diameter, coarse rounded gravel and cobbles, fine to medium sand, weak to moderately lime cemented, nonplastic, light grey brown. Note: some gypsum.
10					CL	Dry	**SANDY GRAVEL,** predominately fine rounded gravel, medium to coarse sand, weak to uncemented, nonplastic, light greyish brown.
					Sh	Dry	**SILTY GRAVEL AND COBBLES,** predominately coarse rounded gravel, cobbles less than 5 inches in diameter, fine to medium sand, uncemented, nonplastic, light grey brown. Note: 2 to 3 inch layer of white pale grey chalky bentonite and caliche base.
15						Slightly moist	**CLAY,** weak to moderately lime cemented, medium to high plasticity, mottled light yellow brown and grey. Note: some caliche and gypsum.
20							**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft thinly bedded, some scattered fine gypsum and caliche, light yellow brown and grey.
25							Stopped backhoe at 12.5 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/24/89

LOG OF TEST PIT NO. 25

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,364.0 E94,294.0
ELEVATION 5,231.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					SM	Dry	**TOPSOIL: SILTY SAND,** some coarse rounded gravel, fine sand, weak to noncemented, nonplastic, light red brown.
					CL		Note: considerable roots
5					GP	Dry	**SANDY CLAY,** some fine rounded gravel, trace of fine cobbles, fine sand, weak to moderately lime cemented, medium plasticity, light brown.
						Dry	**SANDY GRAVEL AND COBBLES,** traces of boulders <18 inches in diameter, predominately course round and tabular gravel and cobbles less than 5 inches in diameter, fine to medium sand, weakly lime cemented, nonplastic, light grey brown.
10					CL		Note: 6 to 8 inches thick discontinous seam, strongly lime cemented fine gravel at 6.5 feet.
							Note: 1 inch thick carbonate zone at base.
					Sh	Slightly moist	**CLAY,** weak to moderately lime cemented, medium to high plasticity, mottled light yellow brown and grey.
15							Note: trace of gypsum and calcite crystals.
							MANCOS FORMATION: CLAYSTONE, moderately to highly weathered, soft to medium soft, thinly bedded, light yellow brown and grey.
							Note: thin sandy silt partings on beddings.
20							Stopped backhoe at 13.5 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/24/89

LOG OF TEST PIT NO. 26

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,171 E93,984
ELEVATION 5,233
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content or Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					SM	Dry	**TOPSOIL: SILTY SAND**, considerable fine to coarse subrounded gravel, fine sand, uncemented, considerable roots, nonplastic, light brown.
					CL	Dry	**SANDY CLAY**, some fine subangular gravel, occasional fine cobbles, fine to medium sand, moderately lime cemented, medium plasticity, pale light brown.
5					GM	Dry	**SILTY GRAVEL**, traces of some fine cobbles, predominately coarse subrounded gravel, weak to moderately lime cemented, fine to medium sand, nonplastic, light greyish brown.
					GP	Dry	**SANDY GRAVEL AND COBBLES**, some boulders less than 18 inches in diameter, cobbles less than 8 inch diameter, predominately course subrounded gravel, medium to fine sand, weakly lime cemented, nonplastic, light greyish brown. Note: Considerable gypsum.
10					GP	Dry	**SANDY GRAVEL**, traces of cobbles, predominately fine subangular gravel, some subrounded gravel, fine to medium sand, weakly lime cemented, nonplastic, light greyish brown.
15					Sh	Slightly moist	**CLAY**, moderately lime cemented, medium to high plasticity, light yellow brown. Note: 2 to 5 inch carbonate zone at top, middle and base of unit.
20						Dry	**SANDY GRAVEL AND COBBLES**, some boulders less than 12 inches in diameter, cobbles less than 4 inches in diameter, predominately coarse rounded gravel, fine to medium sand, weak to uncemented, light greyish brown.
25						Dry	**MANCOS FORMATION: CLAYSTONE**, highly weathered, soft thinly bedded, light yellow brown.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 26

JOB NO. GRJ-03 DATE 07/24/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,171 E93,984
ELEVATION 5,233
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							Stopped backhoe at 17 feet, backfilled with spoils.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/24/89

LOG OF TEST PIT NO. 27

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,293.0 E94,096.0
ELEVATION 5,225.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0					SM	Dry	**TOPSOIL: SILTY SAND,** some coarse rounded gravel, fine sand, uncemented, nonplastic, light brown. Note: considerable roots.
					CL	Dry	**GRAVELLY CLAY,** considerable coarse rounded gravel, fine to medium sand, moderately lime cemented, medium plasticity, light grey brown.
5					GM		**SILTY GRAVEL,** traces of clay, fine to medium sand, predominately coarse rounded gravel, weak to moderately lime cemented, nonplastic, light greyish brown.
					GP	Dry	**SANDY GRAVEL,** medium to subrounded sand, fine subangular gravel, slightly uncemented, nonplastic, light greyish brown.
10					GP	Dry	**SANDY GRAVEL AND COBBLES,** some boulders less than 2 feet in diameter, cobbles less than 8 inches in diameter, coarse subrounded gravel, fine to medium sand, weak to uncemented, nonplastic, light greyish brown.
					Sh	Dry to slightly moist.	**MANCOS FORMATION: SHALE,** highly weathered, soft thinly bedded, trace of gypsum and calcite, light yellow brown and grey.
15							
20							Stopped backhoe at 12.5 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/25/89

LOG OF TEST PIT NO. 28

GROUNDWATER

DEPTH	HOUR	DATE
12.0	8:00	07/25/89
20.0	8:00	07/25/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,088.0 E95,543.0
ELEVATION 5,279.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL		**TOPSOIL: SANDY CLAY,** some coarse subrounded gravel, fine sand, weakly lime cemented, blocky, some roots, low to medium plasticity, light red brown.
5			D		GM	Dry	**SILTY GRAVEL AND COBBLES,** some boulders, predominately coarse subrounded gravel and cobbles, fine to medium sand, trace of clay, weak to moderately lime cemented, nonplastic, light greyish brown.
			D		GP	Dry	**SANDY GRAVEL,** predominately fine to medium subrounded gravel, fine to medium sand, strongly lime cemented, nonplastic, light greyish brown.
10			D		GP	Moist	**SANDY GRAVEL COBBLES AND BOULDERS,** boulders less than 5 inches in diameter at top-not continuous laterally, predominately coarse subrounded gravel and cobbles, fine to medium sand, weak to moderately lime cemented, nonplastic, light yellow brown to greyish brown.
15			D		GC	Saturated	**CLAYEY GRAVEL AND COBBLES,** some boulders, predominately coarse subrounded gravel and cobbles, some fine to medium sand, weakly lime cemented, limonitic, medium plasticity, light yellow brown.
					CL		**SANDY CLAY,** moderately lime cemented, medium to high plasticity, light yellow brown and grey.
20			D		Sh		**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft thinly bedded, some gypsum and calcite, light yellow brown and grey.
25							Stopped backhoe at 21.5 feet, backfilled with spoils. **Note:** two saturated zones.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/27/89

LOG OF TEST PIT NO. 29

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N13,079.0 E93,077.0
ELEVATION 5,243.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SM	Dry	**TOPSOIL: SILTY SAND,** traces of fine to coarse subangular gravel, fine sand, uncemented, nonplastic to low plasticity, some roots, light brown.
			D		CL	Moist	**SILTY CLAY,** weakly lime cemented, low to medium plasticity, light yellow brown.
5			D		CL	Moist	**SILTY CLAY,** traces of cobbles, some fine subangular gravel, some fine to medium sand, some caliche veining and gypsum, weakly lime cemented, light olive brown.
10			D, D, D		GM/ GC	Slightly moist	**SILTY GRAVEL, CLAYEY GRAVEL AND COBBLES,** traces of some boulders less than 2 inches in diameter, predominately subrounded gravel and cobbles, fine to medium sand, weak to moderately lime cemented, low plastic, light pale grey brown. Note: some gypsum Note: gravels slightly moist from 9 feet.
15			D, D, D		CH/ CL	Moist	**CLAY,** medium to high plasticity, moderately lime cemented, light to medium olive brown. Note: some gravel size limonitic concretions.
20					CL, GC	Slightly moist	**SANDY CLAY,** some to considerable fine to coarse subrounded gravel, considerable medium to coarse sand and pebbles, moderately lime cemented, low plasticity, light olive brown. Note: clay decreasing with depth.
			D, D, D		CL	Considerable moisture	**CLAYEY GRAVEL AND COBBLES,** traces to some less than 2 centimeter boulders, medium to coarse subrounded gravel, considerable rounded coarse sand, weakly to moderately lime cemented, low to medium plasticity, olive brown mottled orange.
25			D		Sh	Moist	**GRAVELLY SILTY CLAY,** considerable coarse subrounded gravel and cobbles, some boulders less

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 29

JOB NO. GRJ-03 DATE 07/27/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N13,079.0 E93,077.0
ELEVATION 5,243.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							than 3 feet, fine to medium sand, weakly lime cemented, limonitic, medium plasticity, medium olive brown to brown mottled with light maroon. Note: strongly lime cemented, nonplastic, fine to medium sand from 23 to 24 feet.
30							MANCOS FORMATION: CLAY SHALE, highly weathered, soft to moderately soft, thinly bedded, brown to olive brown.
35							Stopped backhoe at 27 feet, backfilled with spoils. Note: Piezometer installed in test pit as follows: 2 inch schedule 40 PVC blank installed from +2.8 feet to 16.6 feet. 2 inch schedule 40 PVC 0.05 slotted screen from 16.6 to 26.6 feet. 2 inch schedule 40 PVC blank installed form 26.6 to 27.2 feet. *Piezometer was backfilled with excavated soils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/28/89

LOG OF TEST PIT NO. 30

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N13,146 E92,843
ELEVATION 5,239
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SC	Slightly moist	**TOPSOIL: CLAYEY SAND,** some fine to coarse subrounded gravel, fine sand, weakly lime cemented, some roots, low plasticity, light orange brown.
			D		SC	Slightly moist	**CLAYEY SAND,** considerable to some subrounded gravel, some cobbles, fine sand, weakly lime cemented, low to medium plasticity, light orange brown.
5			D		GC	Slightly moist to moist	**CLAYEY GRAVEL AND COBBLES,** some angular boulders less than 1 foot, predominately coarse subrounded gravel and cobbles, fine to medium sand, weak to moderate lime cementation, low plasticity, light olive brown and grey brown. Note: some calcareous layers 3 inches thick in bands 1 to 2 feet wide, some gypsum.
10			D		GM	Slightly moist	**SILTY GRAVEL,** traces of clay, predominately coarse subrounded gravel and cobbles, weak to moderately lime cemented, fine to medium sand, nonplastic, light olive brown to grey brown. Note: cementation increasing below 10 feet, traces of boulders.
15			D		GP	Slightly moist	**SANDY GRAVEL,** predominately fine subrounded gravel with some subrounded gravel, fine to medium sand, very strongly lime cemented, nonplastic, light grey brown.
20			D		GW	moist	**SANDY GRAVEL AND COBBLES,** well graded, subrounded, some silt, very strongly lime cemented, nonplastic, light olive brown.
			D		Sh		**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft, thinly bedded, some black dendrite, light olive brown.
25							Stopped backhoe at 22 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/28/89

LOG OF TEST PIT NO. 31

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,686.0 E93,310.0
ELEVATION 5,247.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		SM	Dry	**TOPSOIL: SILTY SAND,** predominately fine sand, some clay, weakly lime cemented, some roots, low plasticity, pale to light brown.
			D		SM	Slightly moist	**SILTY SAND,** some traces of gravel, fine sand, weakly lime cemented, weak caliche development, low plasticity, pale brown.
5			D			Slightly moist	**SAND, GRAVEL AND COBBLES,** trace boulders less than 18 inch diameter, fine to coarse rounded to subrounded gravels, weak to moderately lime cemented, occasional strongly cemented 1 foot layers, nonplastic, light yellow brown to tan.
			D				
			D		GP		
10			D				
			D		Sh	Slightly moist	**MANCOS FORMATION: CLAYSTONE,** moderately to highly weathered, soft, thinly bedded, thin limonite on bedding, less than 1/4 inch gypsum coating on bedding planes, light grey.
15							Stopped backhoe at 15 feet, backfilled with spoils.
20							
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/28/89

LOG OF TEST PIT NO. 32

GROUNDWATER		
DEPTH	HOUR	DATE
	None	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,510.0 E93,403.0
ELEVATION 5,243.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry, blocky	**TOPSOIL: SANDY CLAY,** trace of fine gravel, fine sand, weakly lime cemented, some roots, spotted with caliche, medium plasticity, medium orange brown.
			D		CL	Dry	**SILTY CLAY,** some coarse rounded gravel, trace of cobbles, fine sand, weakly to moderately lime cemented, low to medium plasticity, pale brown.
5			D		CL	Dry	**SANDY CLAY,** trace of cobbles and gravel, fine to medium sand, moderately lime cemented, spotted with caliche, some gypsum, medium plasticity, light to medium olive brown.
			D		CL	Slightly moist	**CLAY,** trace of cobbles and gravel, some fine sand, moderately lime cemented, spotted with some calcareous material, considerable gypsum, medium plasticity, medium olive brown.
10			D				
					GM	Dry	**SILTY GRAVEL,** predominately fine rounded gravel, some course rounded gravel and some cobbles, fine to medium sand, trace to some clay, weakly to moderately lime cemented, nonplastic, light olive grey to brown.
15			D		Sh	Slightly moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft thinly bedded, light yellow brown to grey.
20							Stopped backhoe at 16.5 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 33

JOB NO. GRJ-03 DATE 07/28/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,871.0 E93,219.0
ELEVATION 5,247.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D				
					CL	Dry	**TOPSOIL: SANDY CLAY,** some course gravel, fine sand, weakly lime cemented, some roots, low to medium plasticity, light to pale brown.
			D				
			D		GM	Dry	**SILTY GRAVEL AND COBBLES,** predominately course subrounded gravel and subangular cobbles, fine to medium sand, weakly to moderately lime cemented, considerable gypsum, nonplastic, light olive grey.
5							
			D				**SANDY GRAVEL AND COBBLES,** trace boulders less than 12 inches in diameter, predominately course subrounded gravel and fine cobbles, fine to medium sand, weakly to uncemented, limonite increasing with depth to 16 feet, nonplastic, light yellow brown.
			D				
10			D				
					GP	Dry	
			D				Note: increased boulders from 14 to 16 feet.
15							
			D				Note: strongly cemented zone with fine subrounded gravel and cobbles from 16 to 21 feet.
			D				
20							
					Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** moderately to highly weathered, soft, thinly bedded, limonite on bedding, light grey and yellow brown.
							Stopped backhoe at 22 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/29/89

LOG OF TEST PIT NO. 34

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E

LOCATION N12,951.0 E93,063.0

ELEVATION 5,244.0

DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** trace to some coarse rounded gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light orange brown.
			D		SC	Slightly moist	**CLAYEY SAND,** fine, weakly lime cemented, low plasticity, light orange brown.
5			D		GM	moist	**SILTY GRAVEL,** coarse rounded gravel and cobbles, weakly lime cemented, fine sand, trace of some clay, low plasticity, medium orange brown.
10			D		GP	Slightly moist	**SAND, GRAVEL AND COBBLES,** some boulders less than 18 inch in diameter, some fine gravel pedominately subrounded and coarse, medium to course sand, some silt, weak to moderately lime cemented, nonplastic, light yellow grey. **Note:** boulder seams at 9 and 14 feet.
15			D				
20			D				**Note:** very strongly lime cemented fine angular gravels with some open work voids from 17 to 20 feet.
25							Backhoe refused at 20 feet on 07/28/89. **Note:** replaced brocken tooth, backhoe refused at 20 feet on 07/29/89.

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/29/89

LOG OF TEST PIT NO. 35

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,890.0 E92,875.0
ELEVATION 5,239.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SC	Dry	**TOPSOIL: CLAYEY SAND,** trace of gravel, fine sand, considerable silt, weakly lime cemented, roots, low to medium plasticity, light orange brown.
			D		SC/ SM	Dry	**CLAYEY AND SILTY SAND,** fine sand, considerable silt, weakly lime cemented, low plasticity, light orange brown.
			D				
5					CL	Dry	**SILTY CLAY,** trace of boulders, some course rounded gravel and cobbles, some to considerable fine to medium sand, trace of boulders, weakly to moderately lime cemented, spotted with white carbonates and some gypsum, low to medium plastictiy, light brown to light olive brown.
			D				
					GM	Dry	**SILTY GRAVEL AND COBBLES,** trace of some boulders, less than 18 inch, predominately coarse subrounded fine gravel and cobbles, fine to medium sand, weakly to moderately lime cemented, nonplastic, light greyish brown.
			D				
10			D		CL		
			D			Moist	**GRAVELLY CLAY,** some gravel and cobbles, considerable fine angular gravel, some coarse sand, weakly to moderately lime cemented, medium plasticity, medium brown.
			D				
15					GP	Dry	**SAND GRAVEL AND COBBLES,** some boulders less than 2 foot diameter, predominately subrounded gravel and cobbles, fine to medium sand, moderately to strongly lime cemented, nonplastic, light greyish brown. Note: some thin calcareous clay layers from 17 to 20 feet 3 to 5 feet thick.
			D				
20			D				Note: boulders from 20 to 22 feet.
			D		CL	Slightly moist	**SANDY CLAY,** some fine angular gravel and subangular sand, moderately lime cemented, numerous pinhole structures, medium plasticity, yellow brown mottled with grey.
25							Stopped backhoe at 25.5 feet due to reach limit and

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/29/89

LOG OF TEST PIT NO. 35

BACKHOE TYPE KOEHRING 666E
LOCATION N12,890.0 E92,875.0
ELEVATION 5,239.0
DATUM MSL

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							loss of one bucket tooth.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 36

JOB NO. GRJ-03 DATE 07/29/89

GROUNDWATER		
DEPTH	HOUR	DATE
23.0	11:40	07/29/89

BACKHOE TYPE KOEHRING 666E
LOCATION N13,301.0 E92,733.0
ELEVATION 5,237.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** trace of fine angular gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		CL/ SC	Moist	**CLAYEY SAND AND SANDY CLAY,** considerable silt, trace to some coarse rounded gravel, weakly lime cemented, medium plasticity, light orange brown.
5			D		CL	Moist	**SILTY CLAY,** considerable silt, some to considerable coarse blocky angular basalt gravel, weakly lime cemented, low to medium plasticity, light brown to pale yellow brown.
			D		SM		Note: silt balls pale yellow brown, calcareous, soft.
10			D		CL	Moist	**GRAVELLY CLAY,** predominately fine subrounded gravel, some fine sand, weakly lime cemented, some limonite and hematite and carbonate spotting, medium plasticity, light brown.
15			D			Moist	**SILTY SAND,** traces of cobbles, some coarse rounded gravel, considerable fine subrounded to subangular gravel, some clay, considerable silt, weakly lime cemented some carbonate spotting, low plasticity, pale yellow brown.
			D		CL	Moist	**GRAVELLY CLAY,** some cobbles and boulders less than 1 foot in diameter, considerable course and fine subrounded gravel, some course sand, moderate to weakly lime cemented, medium plasticity, medium brown.
20					GM		**CLAY,** trace of cobbles and gravel, moderately lime cemented, medium plasticity, blocky, light olive brown.
			D			Moist	**SILTY GRAVEL,** some subrounded cobbles, predominately medium subrounded gravel, fine to medium sand, weak to moderately lime cemented, nonplastic to low plasticity, light greyish brown to pale yellow brown.
25			D		SP		Note: clay increasing with depth.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/29/89

LOG OF TEST PIT NO. 36

GROUNDWATER

DEPTH	HOUR	DATE
23.0	11:40	07/29/89

BACKHOE TYPE KOEHRING 666E
LOCATION N13,301.0 E92,733.0
ELEVATION 5,237.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
			D			Slightly moist	**GRAVELLY SAND,** *some subrounded cobbles and* fine gravel, predominately coarse subangular sand, cemented, nonplastic, light greyish brown. Note: cobbles and sand increasing with depth.
30						Moist	**MANCOS FORMATION: CLAYSTONE,** soft, highly weathered, thinly bedded, some blocky dendrites, light grey to brown.
35							Stopped backhoe at 29 feet. Piezometer installed as follows: 2 inch schedule 40 PVC blank from +3.0 to 16.0 feet. 2 inch schedule 40 0.05 inch slotted PVC from 16.0 to 26.0 feet. 2 inch schedule 40 PVC blank from 26.0 to 29.0 feet. Backfilled with excavated material around PVC.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/31/89

LOG OF TEST PIT NO. 37

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,164.0 E93,023.0
ELEVATION 5,233.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some coarse subangular gravel and cobbles, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		CL	Dry	**SILTY CLAY,** traces of coarse gravel, some fine sand, moderately lime cemented, low to medium plasticity, light brown spotted with soft white carbonate.
5			D		GM	Dry	**SILTY SAND, GRAVEL AND COBBLES,** traces to some boulders, less than 12 inch diameter, predominately subrounded gravel and cobbles, fine to medium sand, weak to moderately lime cemented, nonplastic, light grey brown.
			D		GC	Slightly moist	**CLAYEY GRAVEL AND COBBLES,** traces of some boulders less than 12 inch diameter, medium to coarse subrounded gravel and cobbles, fine to medium sand, weak to moderately lime cemented, low to medium plasticity, light grey.
10			D		GP	Slightly moist	**SANDY GRAVEL,** some cobbles, predominately fine to medium subangular gravel, some coarse gravel, lime cemented, fine to medium sand, weak to moderately lime cemented, nonplastic, light olive brown. Note: becomes coarser and increases in cobbles while becomming more limonitic with depth.
15			D				
			D		CL	Slightly moist	**SILTY CLAY,** considerable cobbles and boulders, some coarse gravels, moderately to strongly lime cemented, medium plasticity, light olive brown.
20			D				
					Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft thinly bedded, medium yellow brown.
25							*Stopped backhoe at 23.5 feet, backfilled with spoils.*

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 7/31/89

LOG OF TEST PIT NO. 38

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE ICC KOEHRING 666E
LOCATION N11,834.0 E92,472.0
ELEVATION 5218.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** trace coarse gravel and cobbles, fine sand, weak lime cementation, some roots, medium plasticity, light reddish brown.
			D		CL	Dry	**SILTY CLAY,** cobbles and boulders less than 1 foot in diameter, some coarse gravel, fine sand, moderately lime cemented, low to medium plasticity, pale brown.
5			D		GP	Slightly moist	**SANDY GRAVEL & COBBLES,** trace boulders less than 1 foot in diameter, predominately clayey subrounded gravel & cobbles, medium to coarse sand, weakly to moderately lime cemented, some limonite and gypsum, nonplastic, light olive grey. Note: 1 foot layer of coarse sand 9 to 10 feet
10			D		CL/ CH	Moist	**CLAY,** trace to some fine gravel & sand, moderately lime cemented, medium to high plasticity, medium olive brown, moist. Note: some moist, spotted with white carbonate nodules throughout.
15			D		Sh	Slightly moist	**MANCOS FORMATION: SHALE,** highly weathered, thin to very thinly bedded, pale to light yellow brown.
20							Stopped backhoe at 20.0 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/03/89

LOG OF TEST PIT NO. 39

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,522.0 E92,952.0
ELEVATION 5,224.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some coarse gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		CL	Dry	**SILTY CLAY,** some coarse gravel and cobbles, fine sand, weak to moderately cemented, low to medium plasticity, pale brown.
			D		GP		
5					SC	Slightly moist	**SANDY GRAVEL AND COBBLES,** some subrounded gravel and cobbles, predominately medium rounded gravel, medium sand, weak to moderately lime cemented, some gypsum, nonplastic, light greyish brown.
			D		SM	Slightly moist	**CLAYEY SAND,** fine to medium sand, weakly lime cemented, considerable gypsum, low to medium plasticity, light yellow brown.
10			D		CL	Slightly moist	**SILTY SAND,** fine to medium sand, some medium to coarse sand layers, weak to moderately lime cemented, nonplastic, light yellow brown.
15					GP	Moist	**GRAVELLY CLAY,** predominately fine angular gravel, some subrounded gravel and cobbles, weakly to moderately lime cemented, medium plasticity, brown.
			D			Slightly moist	**SANDY GRAVEL AND COBBLES,** subrounded gravel and cobbles, some fine gravel, fine to medium sand, weak to moderately lime cemented, nonplastic, light olive brown.
20			D		CL/ CH	Moist	**CLAY,** moderately lime cemented, medium to high plasticity, light olive brown.
			D			Moist	**MANCOS FORMATION: CLAYSTONE,** soft highly weathered, thinly bedded, some Manganese oxide on bedding, medium yellow brown.
25							Stopped backhoe at 24 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/31/89

LOG OF TEST PIT NO. 40

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,160.0 E92,965.0
ELEVATION 5,218.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SC	Dry	**TOPSOIL: CLAYEY SAND,** some gravel and cobbles, fine sand, weakly lime cemented, some roots, low to medium plasticity, light red brown.
			D			Dry	**SILTY GRAVEL AND COBBLES AND SILTY SAND,** subrounded gravel and cobbles, fine sand, weakly lime cemented, considerable carbonate, nonplastic, pale brown.
					GM/ SM		
			D				
5							
			D				
						Slightly moist	**SILTY SAND,** fine to medium sand, weakly lime cemented, low plasticity, light olive brown.
			D		SM		
10			D			Moist	**SANDY CLAY,** fine to medium sand, weakly lime cemented, medium plasticity, light olive brown.
					CL		
15							
					GP	Dry	**SANDY GRAVEL AND COBBLES,** some boulders less than 2 foot diameter, considerable coarse rounded gravel and fine cobbles, predominately fine angular to subangular gravel, fine to medium sand, moderately lime cemented, some thin stongly cemented zones, nonplastic to low plasticity, light yellow brown.
			D				
			D				
20					Sh		**MANCOS FORMATION: CLAYSTONE,** soft highly weathered, thinly bedded, some limonite and Manganese oxide on bedding, medium yellow brown.
			D				
25							Stopped backhoe at 22 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/31/89

LOG OF TEST PIT NO. 41

GROUNDWATER

DEPTH	HOUR	DATE
30.0	15:10	07/31/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,603.0 E94,161.0
ELEVATION 5,260.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SILTY CLAY,** some coarse gravel and cobbles, fine sand, weakly lime cemented, some roots, low to medium plasticity, medium orange brown.
			D		SM	Slightly moist	**SILTY SAND,** trace angular cobbles, fine sand, considerable silt, weakly lime cemented, low plasticity, light orange brown.
5			D		GP	Slightly moist	**SANDY GRAVEL AND COBBLES,** predominately coarse subrounded gravel and cobbles, some fine rounded gravel, medium to coarse sand, weakly lime cemented, light grey brown, some limonite, considerable gypsum, nonplastic, light grey brown.
10			D		SM	Slightly moist	**SILTY SAND,** predominately fine to medium with some coarse sand, weak to moderately lime cemented, considerable gypsum, some limonite, nonplastic, medium to light olive brown.
			D		CL	Slightly moist	**SANDY CLAY,** fine to medium sand, moderately lime cemented, some gypsum, some white carbonate, low to medium plasticity, light olive grey.
15			D		ML	Slightly moist	**SANDY CLAYEY SILT,** fine sand, weakly to moderately lime cemented, considerable limonite, nonplastic to low plasticity, yellow orange. **Note:** becomes grey more clayey with less limonite below 16 feet.
20			D		CL	Slightly moist	**CLAY,** some cobbles and small boulders, moderately lime cemented, spotted with white carbonates, medium plasticity, light brown.
25			D D		ML/ SM	Moist	**SILTY SAND AND SANDY SILT,** traces to some clay, fine sand, moderately lime cemented low plasticity to nonplastic, mottled light grey and yellow brown. **Note:** dark brown buried soil horizon with roots at 24 feet.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/31/89

LOG OF TEST PIT NO. 41

GROUNDWATER

DEPTH	HOUR	DATE
30.0	15:10	07/31/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,603.0 E94,161.0
ELEVATION 5,260.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
			D			V.Moist	Note: increased clay and cobbles, moisture, limonite and grey below 24 feet.
					GC	Moist	SILTY CLAYEY GRAVEL AND COBBLES, some boulders less than 2 foot diameter, subrounded gravel and cobbles, fine to medium sand, weakly lime cemented, limonitic, low plasticity, medium grey green to orange brown.
30			D		Sh		MANCOS FORMATION, highly weathered, soft, thinly bedded, some roots in fractures and at top, calcite coated fractures, light grey and yellow brown.
35							Stopped backhoe at 30.5 feet. Installed Piezometer as follows: +3.0 to 20.5 feet, blank 2 inch I.D. schedule 40 PVC. 20.5 to 30.0 feet, 2 inch I.D. schedule 40, slotted PVC, 0.05 inch slots. 30.0 to 31.0 feet, blank 2 inch I.D. schedule 40 PVC, screen wrapped in filter fabric, backfilled with excavated materials.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/31/89

LOG OF TEST PIT NO. 42

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,628.0 E94,333.0
ELEVATION 5,263.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel and cobbles, fine sand, weakly lime cemented, medium plasticity, some roots, medium red brown.
			D		CL	Dry	**SILTY CLAY,** some gravel and cobbles, fine sand, low to medium plasticity, some roots, some calcareous, moderately to weakly lime cemented, pale brown.
5			D		GP	Dry	**SANDY GRAVEL AND COBBLES,** some small boulders, subrounded gravel and cobbles, medium to coarse sand, weak to moderately lime cemented, nonplastic, light grey brown.
10			D				Note: increased cobbles and boulders with depth.
			D		GM/ GC	Dry	**SILTY AND CLAY GRAVEL AND COBBLES,** some boulders less than 3 foot diameter, predominately coarse subrounded gravel and cobbles, some fine gravel, fine to medium sand, moderately lime cemented, low plasticity, light grey brown.
15			D				
			D				
20			D		SM/ SC	Slightly moist	**SILTY AND CLAYEY SAND,** some coarse subrounded gravel, stratified fine silty sand and medium to coarse clayey sand, moderately lime cemented, low plasticity, light yellow brown.
							Note: cobbles from 20 to 24 feet, 4 foot boulders at 24 feet.
25			D		Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft very thinly bedded, light yellow brown.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/31/89

LOG OF TEST PIT NO. 42

BACKHOE TYPE KOEHRING 666E
LOCATION N12,628.0 E94,333.0
ELEVATION 5,263.0
DATUM MSL

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							Stopped backhoe at 25.5 feet, backfilled with spoils.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 43

JOB NO. GRJ-03 DATE 08/01/89

GROUNDWATER		
DEPTH	HOUR	DATE
22.0		

BACKHOE TYPE KOEHRING 666E
LOCATION N12,493 E95,200
ELEVATION 5,282
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** traces to some fine angular gravel, fine sand, weakly lime cemented, some roots, medium plasticity, medium red brown.
			D		SC	Dry	**CLAYEY SAND,** traces of fine gravel, fine sand, weakly lime cemented, low plasticity, light orange brown.
5			D		GP	Dry	**SANDY GRAVEL AND COBBLES,** some boulders less than 18 inches in diameter, predominately subrounded gravel and cobbles, some fine gravel, fine to medium sand, moderately lime cemented, nonplastic, light brown.
10			D		CL	Slightly moist	**GRAVELLY CLAY,** predominately fine angular gravel, some coarse rounded gravel, fine to medium sand, moderately lime cemented, some limonite and carbonates, medium plasticity, light yellow brown. Note: cobbles increase with depth.
15			D		GM	Saturated	**CLAYEY SILTY GRAVEL,** medium to coarse rounded gravel and cobbles, considerable fine to medium sand, weakly lime cemented, low plasticity, medium brown. Note: increased fine gravel and increasing moisture below 18 feet, also increased cobbles and small boulders below 20 feet, saturated below 22 feet, +/-.
20			D		Sh	Saturated	**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft, thinly bedded, yellow brown with some grey.
25							Stopped backhoe at 25 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/01/89

LOG OF TEST PIT NO. 43

GROUNDWATER		
DEPTH	HOUR	DATE
22.0		

BACKHOE TYPE KOEHRING 666E

LOCATION N12,493 E95,200

ELEVATION 5,282

DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
30							note: Piezometer installed in Test Pit no. 43 as follows: 2 inch schedule 40 PVC blank from +2.2 to 13.8 feet. 2 inch shcedule 40 PVC 0.05 inch slotted screen from 13.8 feet to 23.3 feet. 2 inch schedule 40 PVC blank from 23.3 feet to 25.0 feet. * Wrapped screened section with filter fabric, backfilled with excaveted soils.
35							
40							
45							
50							

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/01/89

LOG OF TEST PIT NO. 44

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,369.0 E95,199.0
ELEVATION 5,279.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0					CL	Dry	**TOPSOIL: SANDY CLAY,** traces of gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
					SC	Slightly moist	**CLAYEY SAND,** considerable silt, traces gravel, fine sand, weakly lime cemented, low plasticity, light orange brown.
5					GM	Slightly moist	**SILTY GRAVEL,** predominately subrounded gravel and fine cobbles, traces of small boulders, some fine gravel, considerable fine to medium sand, moderately lime cemented, nonplastic, light yellow brown.
					GP	Slightly moist	**SANDY GRAVEL AND COBBLES,** predominately course rounded to subrounded gravel and cobbles, medium to coarse sand, moderately to strongly cemented, nonplastic, light yellow brown.
10					CL	Very moist	**GRAVELLY CLAY,** traces of cobbles, predominately fine angular gravel, fine to medium sand, weakly to moderately lime cemented, medium plasticity, medium brown. **Note:** increasing gravel and cobbles 12 to 18 feet, layers of small boulders at 13 feet.
15							
20					Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft, thinly bedded, light yellow brown and light grey.
25							Stopped backhoe at 22 feet, backfilled with spoils. **Note:** Piezometer installed in Test Pit no. 44 as follows: 2 inch schedule 40 PVC blank from +3.0 feet to 13.0 feet.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 44

JOB NO. GRJ-03 DATE 08/01/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,369.0 E95,199.0
ELEVATION 5,279.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							2 inch schedule 40 PVC 0.05 inch slotted screen form 13.0 to 22.5 feet.
							2 inch schedule 40 PVC blank form 22.5 to 25.0 feet. Wrapped screaned section with filter fabric, backfilled with excavated soils.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/02/89

LOG OF TEST PIT NO. 45

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,416.0 E94,175.0
ELEVATION 5,247.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** traces to some coarse gravel and cobbles, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		CL	Dry	**SILTY CLAY,** considerable fine sand, traces of gravel, weak to moderately lime cemented, low to medium plasticity, pale brown.
5			D		GM	Dry	**SILTY GRAVEL AND COBBLES,** some boulders less than 18 inches in diameter, predominately coarse subrounded gravel and cobbles, considerable fine to medium sand, weak to moderately lime cemented, nonplastic, pale yellow brown.
10			D		GP	Dry	**SANDY GRAVEL AND COBBLES,** some boulders less than 2 feet in diameter, predominately coarse subrounded gravel and cobbles, some fine gravel, fine to medium sand, weak to moderately lime cemented, considerable gypsum near top of unit, nonplastic, light greyish brown. Note: considerable boulders from 10 to 12 feet, increased cobbles from 12 to 16 feet.
15			D		SC/ SM	Slightly Moist	**SILTY SAND AND CLAYEY SAND,** stratified, weakly lime cemented, low to medium plasticity, light tan.
20			D		GP	Dry	**SANDY GRAVEL AND COBBLES,** some boulders less than 15 inch diameter, coarse subrounded gravel and cobbles, fine to medium sand, some silt, moderately lime cemented (with some strongly cemented zones), nonplastic, light grey brown.
			D		SM/ SC	Slightly Moist	**CLAYEY SAND AND SILTY SAND,** stratified some gravel and cobbles, fine sand, moderately lime cemented, low plasticity, light yellow brown. Note: hard, strong cemented zone at 22 to 23 feet.
25			D		CL	Moist	**SANDY CLAY,** trace to some fine to coarse

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/02/89

LOG OF TEST PIT NO. 45

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,416.0 E94,175.0
ELEVATION 5,247.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
			D				rounded gravel, moderately lime cemented, medium plasticity, mottled light yellow brown and grey.
					Sh	Moist	MANCOS FORMATION: CLAYSTONE, highly weathered, soft, thinly bedded, light yellow brown, some Mangenese oxide dendrites on bedding.
30							Stopped backhoe at 28 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/03/89

LOG OF TEST PIT NO. 46

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,200.0 E94,052.0
ELEVATION 5242.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D				
					CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel and cobbles, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		CL		
						Dry	**SILTY CLAY,** some cobbles and boulders less than 18 inch diameter, some fine sand, moderately lime cemented, medium plasticity, pale brown.
			D				
5							
			D				**SANDY GRAVEL AND COBBLES,** some boulders less than 18 inch diameter, predominately course and subrounded gravel and cobbles, some silt, weakly to moderately lime cemented, considerable gypsum, moderately cemented from 2.5 to 6 feet, nonplastic, light grey brown.
			D		GP	Dry	
							Note: decrease in silt and increase in course gravel and cobbles below 6 feet.
10			D				
			D				
15							
			D		GM	Dry	**SILTY GRAVEL,** some fine boulders, predominately coarse subrounded gravel and cobbles, considerable small sand, weakly lime cemented, nonplastic, light yellow brown.
							Note: some 0.5 to 1 foot thick fine gravel lenses.
					SP	Moist	**SAND,** fine sand, weakly lime cemented, with 1 to 2 inches thick clay laminations, medium plasticity, nonplastic, light tan.
20							
					GP	Slightly moist	**SANDY GRAVEL AND COBBLES,** some boulders, predominately course subrounded gravel and cobbles, fine to medium sand, moderately to strongly lime cemented, nonplastic, light yellow brown.
			D		Sh		Note: strongly cemented and hard from 19 to 21 feet.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/03/89

LOG OF TEST PIT NO. 46

BACKHOE TYPE KOEHRING 666E
LOCATION N11,200.0 E94,052.0
ELEVATION 5242.0
DATUM MSL

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
						Moist	**MANCOS FORMATION: CLAYSTONE**, highly weathered, soft very thinly bedded, light yellow brown.
							Stopped backhoe at 24 feet, backfilled with spoils.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/07/89

LOG OF TEST PIT NO. 47

GROUNDWATER

DEPTH	HOUR	DATE
23.5	14:40	08/07/89

BACKHOE TYPE KOEHRING 666E
LOCATION N11,119.0 E94,103.0
ELEVATION 5,241.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	TOPSOIL: SANDY CLAY, traces to some gravel and cobbles, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		CL	Dry	SANDY AND SILTY CLAY, traces to some medium subrounded gravel and cobbles, fine sand, weak to moderately lime cemented, medium plasticity, pale to light brown.
					SM		
5			D			Dry	SILTY SAND, fine to medium angular sand, traces of clay, moderately lime cemented, considerable gypsum, nonplastic, light yellow brown.
			D			Dry	SANDY GRAVEL AND COBBLES, predominately coarse rounded gravel and cobbles, fine to medium sand, some silt, some fine boulders, moderately lime cemented, nonplastic, light yellow brown to tan.
10					GP		Note: thin zones of fine to medium rounded gravel from 6 to 11 feet.
							Note: considerable gypsum from 4 to 6 feet.
15			D				Note: zone of 18 to 24 inch diameter boulders at 11 to 14 feet. Strongly lime cemented from 13 to 17.5 feet.
20			D			Moist to very moist	SANDY GRAVELS AND COBBLES, predominately medium to coarse subrounded gravel and fine cobbles, medium to coarse sand, weakly lime cemented to moderately lime cemented, nonplastic, medium greyish brown.
					GP		
25			D		Sh	Moist	MANCOS FORMATION: CLAYSTONE, highly weathered, soft, thinly bedded, light yellow brown and grey.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 47

JOB NO. GRJ-03 DATE 08/07/89

GROUNDWATER		
DEPTH	HOUR	DATE
23.5	14:40	08/07/89

BACKHOE TYPE KOEHRING 666E
LOCATION N11,119.0 E94,103.0
ELEVATION 5,241.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
30							Stopped backhoe at 26.5 feet, backfilled with spoils. Peizometer intalled as follows: +2.6 to 17.4 feet, blank 2 inch I.D. schedule 40 PVC, 17.4 to 26.4 feet, slotted 2 inch I.D. schedule 40 PVC, 0.05 inch slots. 26.4 to 27.4 feet, blank 2 inch I.D. schedule 40 PVC. Wrapped screened section with filter fabric, backfilled with excavated soils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/03/89

LOG OF TEST PIT NO. 48

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,667.0 E94,479.0
ELEVATION 5,266.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** considerable fine angular gravel, fine sand, weakly lime cemented, some roots, medium plasticity, medium red brown.
			D		CL	Slightly moist	**SILTY CLAY,** traces of some fine to medium subangular gravel, some fine sand, weakly lime cemented, medium plasticity, light orange brown.
5			D		SC/ CL	Slightly moist	**CLAYEY SAND AND SANDY CLAY,** some coarse rounded gravel and fine cobbles, fine sand, weak to moderately cemented, some gypsum and carbonates, low to medium plasticity, light orange brown.
10					GM	Slightly moist	**SILTY GRAVEL AND COBBLES,** some boulders less than 18 inches in diameter, predominately course rounded cobbles and gravel, some fine gravel, traces of clay, fine to medium sand, moderaterly lime cemented, nonplastic, pale yellow brown. Note: strongly lime cemented from 9 to 12 feet.
15			D		SM/ GM	Slightly moist	**GRAVELLY SILTY SAND AND SILTY GRAVEL,** traces of boulders, considerable fine to medium cobbles, predominately fine to medium subrounded gravel, fine to medium sand, moderately lime cemented, nonplastic, light yellow grey. Note: 6 foot long boulder at 15 feet, and 2 foot boulder at 18 feet, gravels and cobbles increasing below 19 feet, some limonite near base.
20			D				
			D		Sh	Slightly moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft, thinly bedded, grey and light yellow brown.
25							Stopped backhoe at 24 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/04/89

LOG OF TEST PIT NO. 49

GROUNDWATER	DEPTH	HOUR	DATE
▽		NONE	
▼			

BACKHOE TYPE KOEHRING 666E
LOCATION N12,821 E94,477
ELEVATION 5,268
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0					ML	Slightly moist	TOPSOIL: CLAYEY SILT, some fine sand, rootlets, blocky, weakly lime cemented, red brown.
						Dry	Note: calichified layer at 18 to 30 inch depth.
5					GP/ GM	Dry	SANDY AND SILTY GRAVELS AND COBBLES, some boulders less than 1.5 foot diameter, predominately small subrounded gravels, fine to very fine ground sand, weakly lime cemented, some gypsum, nonplastic to low plasticity, light brown to buff.
10					CL	Damp	CLAY, occasional fine gravels, traces of fine to very fine sand, blockly and firm, gypsum veinlets throughout, limonite staining near clasts, low plasticity, mottled light orange brown to brown.
15					GC	Slightly damp	CLAY AND CLAYEY GRAVEL AND COBBLES, occasional boulder to 2 feet, considerable fine to medium gravel, poorly graded, strongly lime cemented, very dense, low plasticity, light tan to light grey.
20					CL	Moist	CLAY, traces of fine to medium sand, dense, low to medium plasticity, mottled light grey to brown.
25					Sh		MANCOS FORMATION: CLAYSTONE, fissle and

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/04/89

LOG OF TEST PIT NO. 49

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,821 E94,477
ELEVATION 5,268
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							dense, mottled grey to brown.
					Sh	Slightly moist	
							Stopped backhoe at 27.5 feet, backfilled with spoils.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 50

JOB NO. GRJ-03 DATE 08/04/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,801.0 E94,677.0
ELEVATION 5,272.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Moist	**TOPSOIL: SANDY CLAY,** considerable medium subrounded gravel, fine sand, weakly lime cemented, some roots, low plasticity, light red brown.
					SC	Dry	**CLAYEY SAND,** trace to some gravels and cobbles, fine sand, weakly lime cemented, low to medium plasticity, light orange brown.
5					CL	Slightly moist	**SANDY CLAY,** some less than 1 foot thick zones of fine to medium subrounded gravel, fine to medium sand, moderately lime cemented, spotted clay, some gypsum, medium plasticity, light yellow brown.
					GP	Dry	**SANDY GRAVEL,** fine subangular gravel, medium to course sand, weakly lime cemented, nonplastic, light grey brown.
10							**SANDY GRAVEL, COBBLES AND BOULDERS,** boulders less than 3 feet in diameter, predominately coarse subrounded gravel and cobbles, fine to medium sand, moderately to strongly lime cemented, nonplastic, light grey brown.
15					GP	Slightly moist	Note: zones of medium gravel from 14 to 15 feet and 17 to 18 feet.
20							
25							Stopped backhoe at 21 feet on strongly cemented gravel and cobbles, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 51

JOB NO. GRJ-03 DATE 08/04/89

GROUNDWATER

DEPTH	HOUR	DATE
26.0	14:00	08/04/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,879.0 E94,691.0
ELEVATION 5,274.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Slightly damp	**TOPSOIL: SILTY CLAY**, cobbly, firm to blocky, some Calcium carbonate cementation, low to moderately plastic, light reddish brown.
5					GM	Dry	**SILTY GRAVEL AND COBBLES**, fine gravel, sand, predominately subangular to subrounded, loose to slightly calcium carbonate cemented, light buff.
10					GC	Slightly damp	**CLAYEY GRAVEL**, fine sand, slightly cemented, low plasticity, light buff to brown.
15					CL	Damp to moist	**CLAY**, occasional cobbles, traces of silt, fairly dense, some gypsum, low to moderately plastic, light brown to brown.
20					GC	Moist	**CLAYEY GRAVEL AND COBBLES**, subrounded, dense, matrix is highly plastic, dark brown.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/04/89

LOG OF TEST PIT NO. 51

GROUNDWATER

DEPTH	HOUR	DATE
26.0	14:00	08/04/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,879.0 E94,691.0
ELEVATION 5,274.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
					Sh	moist	MANCOS FORMATION: SHALE, clayey, highly weathered, fissle and dense, mottled grey to brown.
30							Stopped backhoe at 28.5 feet.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/07/89

LOG OF TEST PIT NO. 52

GROUNDWATER

DEPTH	HOUR	DATE
21.0	8:00	08/08/89

BACKHOE TYPE KOEHRING 666E
LOCATION N11,040.0 E94,154.0
ELEVATION 5,241.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some coarse rounded gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
					CL	Dry	**SILTY CLAY,** traces of coarse rounded gravel, some fine sand, weakly to moderately lime cemented, medium plasticity, pale brown.
			D		GP		
5			D		GM/ GC	Dry	**SANDY GRAVEL AND COBBLES,** predominately subrounded gravel and fine cobbles, fine to medium sand, moderately lime cemented, considerable gypsum, nonplastic, light greyish brown.
			D		GP	Dry	**SILTY AND CLAYEY GRAVEL AND COBBLES,** traces of some small boulders, fine to medium sand, moderately lime cemented, low plasticity, light greyish brown.
10							
			D		CL	Dry	**SANDY GRAVEL,** predominately coarse subangular to subrounded gravel, fine to medium sand, moderately lime cemented, nonplastic, light greyish brown.
			D			Slightly moist	**SILTY CLAY,** some gravel lenses, predominately fine to medium subrounded gravel, some fine sand, moderately lime cemented, medium plasticity, light brown.
15			D				
			D		GM	Moist	**SILTY GRAVEL AND COBBLES,** some small boulders, predominately fine to medium subrounded gravel, traces to some clay, fine to medium sand, weak to moderately cemented, nonplastic to low plasticity, light greyish brown.
20							
			D		Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered, soft, thinly bedded, some limonite on bedding, light yellow brown.
25							Stopped backhoe at 24 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/07/89

LOG OF TEST PIT NO. 52

BACKHOE TYPE KOEHRING 666E
LOCATION N11,040.0 E94,154.0
ELEVATION 5,241.0
DATUM MSL

GROUNDWATER

DEPTH	HOUR	DATE
21.0	8:00	08/08/89

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
30							note: Piezometer installed in Test Pit no. 52 as follows. 2 inch schedule 40 PVC blank to 14.0 feet. 2 inch schedule 40 PVC 0.05 inch slotted screen form 14.0 to 24.0 feet. Wrapped screened section with filter fabric, backfilled with excavated soils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/07/89

LOG OF TEST PIT NO. 53

GROUNDWATER		
DEPTH	HOUR	DATE
24.0	8:15	08/08/89

BACKHOE TYPE KOEHRING 666E
LOCATION N10,953.0 E94,203.0
ELEVATION 5,241.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content or Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** trace to some coarse rounded gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
					CL		
			D			Dry	**SILTY CLAY,** traces of coarse gravel, fine to medium sand, weak to moderately lime cemented, medium plasticity, pale brown.
5			D		GM	Dry	**SILTY GRAVEL, COBBLES AND BOULDERS,** some boulders less than 2 feet in diameter, predominately course subrounded gravels and cobbles, fine to medium sand, moderately to strongly lime cemented, considerable gypsum, nonplastic, light greyish brown.
			D				
			D				
10					SC/ CL	Slightly moist	**CLAYEY SAND AND SANDY CLAY,** some fine to course gravels and cobbles, fine to medium sand, considerable silt, weakly lime cemented, low to medium plasticity, light yellow brown. Note: not a continuous layer across trench.
			D				
15					GM	Slightly moist	**SILTY GRAVEL, COBBLES AND BOULDERS,** some boulders less 18 inch diameter, alternating fine to medium subrounded gravels with coarse gravels and cobbles, fine to medium sand, alternating moderately to strongly lime cemented layers less than 1 foot thick, nonplastic, light grey brown. Note: silt decreases with depth.
20			D				
			D				
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/07/89

LOG OF TEST PIT NO. 53

GROUNDWATER

DEPTH	HOUR	DATE
24.0	8:15	08/08/89

BACKHOE TYPE KOEHRING 666E
LOCATION N10,953.0 E94,203.0
ELEVATION 5,241.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
			D				
					Sh	Saturated	MANCOS FORMATION: CLAYSTONE, highly weathered, soft to moderately soft, thinly bedded, some limonite on bedding moist to wet, light grey and yellow brown.
30							Stopped backhoe at 28 feet.
35							**Note:** Piezometer installed in Test Pit no. 53 as follows: 2 inch schedule 40 PVC blank to 18.0 feet. 2 inch schedule 40 PVC 0.05 inch slotted screen from 18.0 to 28.0 feet. Wrapped screened section with filter fabric, backfilled with excavated soil.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/07/89

LOG OF TEST PIT NO. 54

GROUNDWATER

DEPTH	HOUR	DATE
30.0	17:40	08/07/89

BACKHOE TYPE KOEHRING 666E
LOCATION N10,874.0 E94,262.0
ELEVATION 5,242.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Dry	**TOPSOIL: SANDY CLAY,** some coarse rounded gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
					CL	Dry	**SILTY CLAY,** some coarse subrounded gravel and cobbles, some fine sand, moderately lime cemented, medium plasticity, pale brown.
					GM	Dry	**SILTY GRAVEL AND COBBLES,** predominately medium coarse subrounded gravel and fine cobbles, some fine to medium sand, trace to some clay, moderately lime cemented, considerable gypsum, nonplastic to low plasticity, light yellow brown.
5					SC	Dry	**CLAYEY SAND,** trace to some subrounded gravels at base, fine to medium sand, moderately lime cemented, low to medium plasticity, light yellow brown.
					GP	Dry	**SANDY GRAVEL,** some fine subrounded cobbles, predominately medium subrounded to tabular gravels, fine to medium sand, weakly lime cemented, nonplastic, light greyish brown.
10					SM	Dry	**SILTY SAND,** some fine gravel, fine sand, weakly lime cemented, low plasticity, light yellow brown. Note: layer non-continuous across pit.
15					GP	Slightly moist	**SANDY GRAVEL, COBBLES AND BOULDERS,** predominately course subrounded gravel, cobbles, and boulders less than 2 feet in diameter, fine to medium sand, some silt, alternating moderately lime cemented and strongly cemented less than 1 foot thick laminations, nonplastic, light greyish brown.
20							
25					GP		

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/07/89

LOG OF TEST PIT NO. 54

GROUNDWATER

DEPTH	HOUR	DATE
30.0	17:40	08/07/89

BACKHOE TYPE KOEHRING 666E
LOCATION N10,874.0 E94,262.0
ELEVATION 5,242.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
30					Sh	Moist	MANCOS FORMATION: CLAYSTONE, highly weathered, soft, thinly bedded, light yellow brown and grey.
35							Stopped backhoe at 30.5 feet. note: Piezometer installed in Test Pit no. 54 at follows: 2 inch schedule 40 PVC blank to 20.5 feet. 2 inch schedule 40 PVC 0.05 inch slotted screen from 20.5 feet to 30.5 feet. Wrapped screened section with filter fabric, backfilled with excavated soil.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/09/89

LOG OF TEST PIT NO. 55

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,328.0 E94,035.0
ELEVATION 5,255.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0					CL/ SC	Dry	**TOPSOIL: CLAYEY SAND AND SILTY CLAY,** some coarse gravel, fine sand, weakly lime cemented, some roots, low plasticity, light red brown.
5							**SILTY AND SANDY GRAVEL, COBBLES AND BOULDERS,** predominately medium to coarse subrounded to subangular gravel and cobbles, boulders less than 20 inches in diameter, fine to medium sand, weakly lime cemented, some gypsum, nonplastic, light greyish brown.
10					GM	Dry	Note: scattered 1/2 to 1 foot thick zones of fine sandy gravel, silt decreasing below 6 feet, some thin strongly cemented, fine gravel zones from 12 to 19 feet increasing in depth.
15							
20					Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** moderately to highly weathered, soft to moderately soft, thinly bedded, some fossil shells less than 8mm, light brownish grey.
25							Stopped backhoe at 22 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/09/89

LOG OF TEST PIT NO. 56

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,368.0 E93,995.0
ELEVATION 5,255.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL/ SC	Dry	**TOPSOIL: CLAYEY SAND AND SILTY CLAY,** some fine angular gravel, fine sand, weakly lime cemented, low plasticity, some roots, light red brown. Note: bottom 1 1/2 feet has considerable silt, strongly calcareous and pale brown.
5			D			Slightly moist	**SANDY GRAVEL, COBBLES, AND BOULDERS,** fine to medium sand, predominately coarse to medium subrounded gravel, some fine gravel, weakly to moderately lime cemented, nonplastic, light greyish brown. Note: moderately lime cemented 8 to 11.5 feet, some roots down to 5 feet. Note: considerable gypsum from 4 to 6 inches thick. Note: finer gravels and decreased cobbles and boulders from 7.5 to 11.5 feet.
10			D		GP		
15			D		CL	Slightly moist	**SANDY CLAY,** traces of gravel, fine sand, moderately lime cemented, medium plasticity, light brown. Note: spotted with lime, considerable pinhole structures.
20			D		GM	Slightly moist	**CLAYEY GRAVEL, COBBLES, AND BOULDERS,** boulders less than 18 inches in diameter, predominately medium to coarse angular to subrounded gravel, fine to medium sand, moderate to strongly lime cemented, low to medium plasticity, light yellow brown. Note: thin zones of strongly cemented fine angular gravel.
					Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered to moderately weathered, soft to moderately soft, thinly bedded, light brownish grey.
25							Stopped backhoe at 20 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/09/89

LOG OF TEST PIT NO. 57

GROUNDWATER

DEPTH	HOUR	DATE
28.5	13:00	08/09/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,447.0 E93,949.0
ELEVATION 5,255.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some fine gravel, fine sand, medium plasticity, weakly lime cemented, some roots, light red brown.
			D		SM/ SC	Dry	**SILTY CLAYEY SAND,** fine sand, considerable silt, weakly lime cemented, low plasticity, pale red brown.
5			D		GM	Slightly moist	**SILTY GRAVEL, COBBLES AND BOULDERS,** boulders less than 18 inches, predominately medium to course subangular to subrounded gravel, fine to medium sand, weakly to moderately lime cemented, some gypsum, nonplastic, light greyish brown.
10			D		GC	Moist	**CLAYEY GRAVELS AND COBBLES,** predominately medium to course subrounded gravel, considerable fine to medium sand, moderately lime cemented, some gypsum, some thin strongly cemented angular gravel zones, low to medium plasticity, light yellow brown. Note: clay decreasing with depth.
			D		SP	Slightly moist	**GRAVELLY SAND,** subangular to subrounded gravel medium sand, weakly lime cemented, nonplastic, tan.
15			D		GP	Moist	**SANDY GRAVEL, COBBLES, AND BOULDERS,** boulders less than 3 feet in diameter, predominately fine to medium subrounded to subangular gravel, fine to medium sand, moderately to strongly lime cemented, nonplastic, light yellow brown to greyish brown. Note: increased course gravel with some silt below 14 feet.
20			D		GM	Slightly moist-moist	**CLAYEY SILTY GRAVEL AND COBBLES,** some boulders less than 18", predominately fine to medium subrounded gravel, fine to medium sand, moderately lime cemented, low to moderate plasticity, light yellow brown. Note: boulders increasing with depth.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/09/89

LOG OF TEST PIT NO. 57

GROUNDWATER

DEPTH	HOUR	DATE
28.5	13:00	08/09/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,447.0 E93,949.0
ELEVATION 5,255.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
	TOP						
		X	D		SC	Moist-very moist	**CLAYEY SAND**, traces of cobbles, some fine to medium gravel, fine sand, weakly lime cemented, low plasticity, light yellow brown.
30					GC	Saturated	**CLAYEY GRAVEL, COBBLES, AND BOULDERS**, boulders less than 4 feet in diameter, predominately fine to medium subrounded gravel, considerable course gravel, fine sand, weakly lime cemented, low to medium plasticity, medium olive brown. Note: cobbles and boulders, clay decreasing below 29 feet, some thin zone of strongly cemented fine gravels from 30 to 32 feet.
		X	D		Sh		
35						Very moist	**MANCOS FORMATION: CLAYSTONE**, highly weathered, soft to moderately soft, thinly bedded, light grey to yellow brown.
40							Stopped backhoe at 33 feet. note: Piezometer installed in Test Pit no. 57 as follows: 2 inch schedule 40 PVC blank +2.2 to 23.0 feet. 2 inch schedule 40 PVC 0.05 inch slotted screen from 23 to 33 feet. Wrapped screened interval with filter fabric, backfilled with excavated soils.
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/09/89

LOG OF TEST PIT NO. 58

GROUNDWATER

DEPTH	HOUR	DATE
30.0	16:15	08/09/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,496.0 E93,923.0
ELEVATION 5,255.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some fine to medium subangular gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		CL	Dry	**SILTY CLAY,** some coarse gravel and cobbles, some fine sand, weakly lime cemented, low to medium plasticity, pale brown.
			D		GM	Slightly moist	**SILTY GRAVEL,** traces of fine cobbles, predominately fine to medium subangular gravel, fine to medium sand, traces to some clay, weakly to moderately lime cemented, non-plastic to low plasticity, light greyish brown.
5			D		SC/ CL		
			D			Moist	**CLAYEY SAND AND SANDY CLAY,** traces to some coarse gravel and cobbles, fine to medium sand, clay increasing with depth, weakly lime cemented, low to medium plasticity, medium olive brown.
10			D		GM/ GC		
						Moist	**SILTY AND CLAYEY GRAVEL, COBBLES AND BOULDERS,** predominately fine to medium subrounded gravel, fine to medium sand, moderately lime cemented, low plasticity, light olive brown.
15			D		GP	Moist	**SANDY GRAVEL, COBBLES AND BOULDERS,** boulders less than 3 feet in diameter, subrounded gravel, fine to medium sand, predominately coarse, moderately to strongly lime cemented, nonplastic, light olive brown. Note: considerable boulders from 16 to 20 feet.
			D				
20			D		GP	Slightly moist	**SANDY GRAVEL,** predominately fine subangular to subrounded gravel, fine to medium sand, moderately to strongly lime cemented, nonplastic, light olive brown.
			D				
					SC/ CL	Very moist	**SANDY CLAY AND CLAYEY SAND,** some coarse gravel and cobbles, considerable fine to medium subangular to subrounded gravel, fine to medium sand, considerable silt near top, weakly to moderately lime cemented, low to medium plasticity, light olive
25			D				

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/09/89

LOG OF TEST PIT NO. 58

GROUNDWATER

DEPTH	HOUR	DATE
30.0	16:15	08/09/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,496.0 E93,923.0
ELEVATION 5,255.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							brown.
					GC	Very moist to saturated	**CLAYEY GRAVEL, COBBLES, AND BOULDERS,** boulders less than 2 feet in diameter, predominately medium to course subrounded gravel, fine to medium sand, moderately lime cemented, medium plasticity, medium olive brown.
30			D		Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered, thinly bedded, soft, some small fossil shells, light grey and yellowish brown.
35							Stopped backhoe at 31 feet. **Note:** Piezometer installed in Test Pit no. 58 as follows: 2 inch schedule 40 PVC blank +2.3 to 20.3 feet. 2 inch schedule 40 PVC 0.05 inch slotted screen from 20.3 to 30.3 feet. Wrapped screen section in filter fabric, backfilled with excavated soils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/10/89

LOG OF TEST PIT NO. 59

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,540.0 E93,894.0
ELEVATION 5,254.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		SC	Dry	**TOPSOIL: CLAYEY SAND**, some gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D			Slightly moist	**CLAYEY SAND**, some coarse rounded gravel, fine to medium sand, weakly lime cemented, considerable gypsum, some to considerable gravel and cobbles from 3.5 to 5 feet, low plasticity, light brown.
5			D		SC		
			D		SC/ CL	Moist	**CLAYEY SAND AND SANDY CLAY**, considerable fine subangular gravel, fine to medium sand, weakly to moderately lime cemented, low to medium plasticity, medium olive brown.
			D				
10					GC	Slightly moist	**SILTY AND CLAY GRAVEL, COBBLES AND BOULDERS**, boulders less than 18 inches in diameter, predominately medium to course subrounded gravel, some fine sand, moderately lime cemented, low to moderate plasticity, light olive brown.
			D		GM	Slighlty moist	**SILTY GRAVEL AND COBBLES**, some boulders less than 15 inches in diameter, predominately fine to medium subrounded gravel, fine to medium sand, weak to moderately lime cemented, non-plastic, light brownish grey.
15					SM	Moist	**SILTY SAND**, traces of fine gravel, predominately fine sand, some thin zones of coarse open-work sand, weak to moderately lime cemented, non-plastic, tan.
			D				
20					GC	Moist to very moist	**CLAYEY GRAVEL, COBBLES AND BOULDERS**, predominately coarse subrounded gravel and cobbles, fine sand, weak to moderately lime cemented, low to medium plasticity, light yellow brown and olive.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/10/89

LOG OF TEST PIT NO. 59

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,540.0 E93,894.0
ELEVATION 5,254.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					Sh	Moist	MANCOS FORMATION: CLAYSTONE, highly weathered soft, thinly bedded, light yellow brown and grey.
30							Stopped backhoe at 28 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/10/89

LOG OF TEST PIT NO. 60

GROUNDWATER

DEPTH	HOUR	DATE
29.0	9:15	08/10/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,584.0 E93,863.0
ELEVATION 5,255.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** trace to some gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		ML	Dry	**CLAYEY SILT,** trace of gravel, some fine sand, weakly lime cemented, low plasticity, pale brown.
5			D		SC/ CL	Slightly moist	**CLAYEY SAND AND SANDY CLAY,** trace to some fine gravel, fine sand, weakly lime cemented, spotted with white carbonates, low to medium plasticity, medium orange brown.
			D		CL		
10			D			Slightly moist	**SANDY CLAY,** trace to some gravel and cobbles, fine sand, weakly lime cemented, low to medium plasticity, light olive brown. Note: 1 to 1.5 feet thick cobble zones at 5 feet and 10 feet, considerable gypsum with some coarse sandy zone from 6 to 8 feet.
			D		SM/ SC		
			D			Slightly moist	**SILTY AND CLAYEY SAND,** trace of gravel, fine to medium sand, weak to moderately lime cemented, low plasticity, light olive brown.
15			D			Slightly moist	**SANDY CLAY,** trace to some fine to medium gravel, fine to medium sand, weak to moderately lime cemented, some carbonate spotting, medium plasticity, light olive brown. note: 1 foot boulder zone at 18 feet.
					CL		
20							
			D		CL	Very moist	**SANDY CLAY,** trace of gravel, predominately fine sand, weakly to moderately lime cemented, medium plasticity, light to medium olive brown mottled with grey. Note: thin dark brown horizon with root hairs at 23 feet. Some coarse sand zones.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/10/89

LOG OF TEST PIT NO. 60

GROUNDWATER

DEPTH	HOUR	DATE
29.0	9:15	08/10/89

BACKHOE TYPE KOEHRING 666E
LOCATION N12,584.0 E93,863.0
ELEVATION 5,255.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content or Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					CL		
					GC/ CL	Very moist-saturated	**CLAYEY GRAVEL AND GRAVELLY CLAY,** some cobbles, trace of boulders, predominately fine to medium subrounded gravel, fine to medium sand, weakly to moderately lime cemented, low to medium plasticity, medium olive.
			D				
30					Sh	Very moist	**MANCOS FORMATION: CLAYSTONE,** highly to moderately weathered, soft to moderately soft, thinly bedded, light medium grey and light yellow brown.
35							Stopped backhoe at 30.5 feet.
							note: Piezometer installed in Test Pit no. 60 as follows: 2 inch schedule 40 PVC blank +2.4 to 21.2 feet. 2 inch schedule 40 PVC 0.05 inch slotted screen from 21.2 to 31.2 feet. Wrapped screened section in filter fabric, backfilled with excavated soils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 61

JOB NO. GRJ-03 DATE 08/10/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,640 E93837
ELEVATION 5,255
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** trace to some gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		ML	Dry	**CLAYEY SILT,** some fine sand and gravel, weakly lime cemented, low plasticity, pale brown.
			D		SC	Dry	**CLAYEY SAND AND SANDY CLAY,** some fine to medium gravel and cobbles, fine to medium sand, weakly lime cemented, considerable gypsum, low to medium plasticity, light olive brown.
5			D		SC/ CL		
						Slightly Moist	**CLAYEY SAND AND SANDY CLAY,** some fine to medium gravel and cobbles, fine to medium sand, weakly lime cemented, considerable gypsum, low to medium plasticity, light olive brown.
10					CL	Slightly Moist	**SANDY CLAY,** trace of boulders less than 15 inches in diameter, trace to some gravel and cobbles, fine to medium sand, weakly to moderately lime cemented, some white carbonate spotting, medium plasticity, brown.
			D				
					GC	Dry	**SILTY CLAYEY GRAVEL AND COBBLES,** some boulders less than 2 feet in diameter, predominately medium subrounded gravel, fine to medium sand, moderately to strongly lime cemented, low plasticity, pale yellow brown.
15							
20							Stopped backhoe at 16 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/10/89

LOG OF TEST PIT NO. 62

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,788 E94,383
ELEVATION 5,242
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content or Percent Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		CL/ SC	Dry	**CLAYEY SAND AND SANDY CLAY,** some to considerable fine to medium subangular gravel, fine sand, weakly to moderately lime cememented, some carbonate spotting, low to medium plasticity, light olive grey.
5			D		GM		
			D		SP	Slightly moist	**SILTY GRAVEL, COBBLES AND BOULDERS,** boulders less than 18 inches in diameter, predominately medium to coarse subrounded gravel and cobbles, fine to medium sand, silt decreasing below 5 feet, considerable gypsum from 3 to 4.5 feet, moderately lime cemented, light grey brown.
10			D			Slightly moist	**GRAVELLY SAND,** some small cobbles, predominately fine subrounded gravel, medium sand, weakly lime cemented, nonplastic, light gray brown.
					GP	Slightly moist	**SANDY GRAVEL AND COBBLES,** some boulders, predominately medium to coarse subrounded gravel, medium sand, weakly lime cemented, nonplastic, light greyish brown. Note: sandy interbeds 0.5 to 1 foot thick.
15			D				
					CL/ CH	Moist	**CLAY,** some fine sand, moderately lime cemented, medium to high plasticity, medium yellow brown.
			D		Sh	Moist	**MANCOS FORMATION: SHALE,** highly weathered, moderately soft to soft, thinly bedded, light yellow brown.
20							
25							Stopped backhoe at 19.5 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/10/89

LOG OF TEST PIT NO. 63

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,685.0 E94,511.0
ELEVATION 5,240.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SC/ CL	Dry	**TOPSOIL: CLAYEY SAND AND SANDY CLAY,** some gravel, fine sand, weakly lime cemented, some roots, low to medium plasticity, light red brown.
			D		GM	Dry	**SILTY GRAVEL,** some course gravel and cobbles, predominately fine to medium subangular gravel, fine to medium sand, some clay, moderately lime cemented, nonplastic to low plasticity, pale brown.
5			D		GP	Slightly moist	**SANDY GRAVEL,** predominately fine to medium subangular gravel, some gravel, some clay, fine to medium sand, weakly to moderately lime cemented, nonplastic, light greyish brown.
			D		SC	Slightly moist	**CLAYEY SAND,** trace to some gravel, fine to medium sand, weakly to moderately lime cemented, some gypsum, low to medium plasticity, tan.
10			D		GP	Slightly moist	**SANDY GRAVEL, COBBLES AND BOULDERS,** boulders less than 3 feet in diameter, predominately coarse subrounded gravel, well graded sand, weakly to moderately lime cemented, nonplastic, light greyish brown. Note: 1 foot thick layer of medium subrounded open-work gravel at 11 feet.
15			D		CH		
			D		Sh	Moist	**CLAY,** some sand, medium lime cemented, some gypsum, moderately to high plasticity, medium olive brown.
20						Moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered, moderately soft to soft, very thinly bedded, light yellow brown and grey.
25							Stopped backhoe at 17 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/11/89

LOG OF TEST PIT NO. 64

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,834.0 E93,257.0
ELEVATION 5,221.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		SC	Dry	**TOPSOIL: CLAYEY SAND,** some gravel and cobbles, fine sand, weakly lime cemented, low plasticity, some roots, light red brown.
			D		SM	Dry	**SILTY SAND,** some cobbles, some to considerable fine to medium angular gravel, fine sand, weakly lime cemented, nonplastic, tan to pale brown.
5			D		SM	Dry	**SILTY SAND,** some course subrounded gravel and cobbles, fine sand, considerable fine subangular gravel, weakly lime cemented, nonplastic, light brown.
			D		SC	Slightly moist	**SILTY CLAYEY SAND,** trace of some fine gravel and cobbles, fine to medium sand, weakly to moderately lime cemented, low plasticity, light olive to yellow brown.
10			D		SM	Slightly moist	**SILTY SAND,** medium sand, trace to some thin coarse sand layers, trace of clay, weakly lime cemented, nonplastic, light to medium yellow brown.
15			D		CL	Moist	**SANDY CLAY,** trace of gravel, fine to medium sand, weakly to moderately lime cemented, moderate plasticity, light to medium yellow brown to olive brown.
			D		CL/ CH	Moist	**GRAVELLY CLAY,** some fine cobbles, predominately course rounded gravel, moderately lime cemented, moderate to highly plasticity, light olive brown.
20			D		Sh	Moist	**MANCOS FORMATION: SHALE,** moderately weathered, moderately soft, thinly bedded, grey and brown.
25							Stopped backhoe at 21 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 8/11/89

LOG OF TEST PIT NO. 65

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,885.0 E92,627.0
ELEVATION 5,210.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SC	Dry	**TOPSOIL: CLAYEY SAND,** some gravel and cobbles, fine sand, weak lime cementation, roots, low plasticity, light red brown.
			D		SC	Dry	**CLAYEY SAND,** trace gravel, fine sand, weak to moderate lime cementation, low plasticity, light orange brown.
			D				
5					GC	Slightly moist	**CLAYEY GRAVEL, COBBLES & BOULDERS,** boulders less than 3 feet in diameter, predominately medium to coarse subangular to subrounded gravels and cobbles, medium to coarse angular sand, moderate lime cementation, some gypsum, low to medium plasticity, light brown.
			D				
					GP		
			D		SC	Dry	**SANDY GRAVEL, COBBLES & BOULDERS,** boulders less than 3 feet in diameter, predominately coarse subrounded gravel and cobbles, medium to coarse angular sand, weak to moderate lime cementation, nonplastic, pale grey brown. Note: contact below is approximately 2 feet higher on east side of pit
10							
			D				
					GP	Slightly moist	**CLAYEY SAND,** trace gravel, medium sand, stratified sandy clay and medium sand, weak lime cementation, some pinhole in matrix, low plasticity, light olive brown.
			D				
15							
			D		Sh	Slightly moist	**SANDY GRAVEL & COBBLES,** some boulders, predominately medium to coarse subrounded gravels, medium sand, weakly lime cemented, nonplastic, light grey brown Note: coarser gravel and cobbles below 14 feet. Note: heavy limonite at 16 feet.
20							
25						Slightly moist	**MANCOS FORMATION: CLAYEY SHALE,** moderately weathered, moderately soft to soft, very thinly bedded, pale olive gray. Note: numerous 6mm - 10mm hard white carbonate layers throughout.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 8/11/89

LOG OF TEST PIT NO. 65

BACKHOE TYPE KOEHRING 666E
LOCATION N10,885.0 E92,627.0
ELEVATION 5,210.0
DATUM MSL

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							Stopped drilling at 20.5 feet.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/14/89

LOG OF TEST PIT NO. 66

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,868 E92,231
ELEVATION 5,207
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content of Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		SC/ CL	Dry	**TOPSOIL: CLAYEY SAND AND SANDY CLAY,** trace to some gravel, fine sand, considerable silt, weakly lime cemented, some roots, low to medium plasticity, light red brown.
			D				
					GM	Dry	**SILTY GRAVEL AND COBBLES,** trace to subrounded boulders, fine sand, weakly of moderately lime cemented, some gypsum, nonplastic, pale brown.
			D				
5							
			D				**SANDY GRAVEL, COBBLES AND BOULDERS,** boulders less than 2 feet in diameter, predominately course and subrounded gravel and cobbles, fine to medium sand, weakly lime cemented, nonplastic, pale greyish brown. Note: 1.5 feet thick zone of course gravel at 7 feet, decreasing in cobbles and boulders from 11 to 17 feet.
10							
					GP	Dry	
			D				
15							
20							**CLAY,** traces of fine gravel, moderately lime cemented, stiff, medium to high plasticity, traces of gypsum, medium to light olive brown to tan.
					CL/ CH	Moist	
			D				
25							Note: decreasing gravel content and becomming grey at 27 feet.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/14/89

LOG OF TEST PIT NO. 66

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,868 E92,231
ELEVATION 5,207
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					CL\ CH		
					Sh		
30						Slightly Moist	MANCOS FORMATION: CLAYSTONE, moderately weathered, moderately soft, medium bedded, some black dendrites, light green to grey.
35							Stopped backhoe at 29 feet, backfilled with spoils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/14/89

LOG OF TEST PIT NO. 67

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,581.0 E92,200.0
ELEVATION 5,210.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SILTY AND SANDY CLAY,** some gravel and cobbles, fine sand, weakly lime cemented, some roots, low to moderate plasticity, light red brown.
			D		GM	Dry	**SILTY GRAVEL, COBBLES AND BOULDERS,** boulders less than 18 inches in diameter, predominately medium to course subangular to subrounded gravel and cobbles, fine to medium sand, weakly to moderately lime cemented, nonplastic, light greyish brown.
			D				
5					SC		
			D		CL	Slightly moist	**CLAYEY SAND,** traces of gravel, predominately fine to medium sand, some coarse sand, weakly lime cemented, considerable gypsum, low plasticity, mottled light yellow brown-tan and light orange brown.
10			D		CL	Slightly moist	**SANDY CLAY,** fine to medium sand, some coarse sand, moderately lime cemented, some to considerable small specks of gypsum, stiff, medium plasticity, medium brown grey to grey brown.
			D				
			D		CL	Moist	**SILTY CLAY,** moderately lime cemented, blocky and stiff, numerous pinhole structures, medium plasticity, light brown to greyish brown.
15							
			D			Slightly moist	**GRAVELLY CLAY,** considerable fine angular to subrounded gravel, some coarse gravel and cobbles, moderately lime cemented, stiff, moderate plasticity, light brown. **Note:** 1 to 1.5 feet thich zone of medium gravel at 17 feet.
20			D		CL	Moist	**CLAY,** some coarse sand, moderately lime cemented, very stiff, some limonite, some thin hard carbonate layers, some pinhole structures, medium to highly plasticity, light yellow grey brown.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/14/89

LOG OF TEST PIT NO. 67

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,581.0 E92,200.0
ELEVATION 5,210.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
		X	D				
		X			Sh	Slightly moist	MANCOS FORMATION: CLAYSTONE, moderately weathered, moderately soft, very thinly bedded, some dendrites, light green grey to brown grey.
30							Stopped backhoe at 27 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 8/15/89

LOG OF TEST PIT NO. 68

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,541.0 E92,640.0
ELEVATION 5,206.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SC	Dry	**TOPSOIL: CLAYEY SAND,** some gravel and cobbles, fine sand, weakly lime cemented, roots, low plasticity, light red brown.
5			D, D		GC	Dry	**CLAYEY GRAVEL, COBBLES & BOULDERS,** boulders less than 15 inches in diameter, predominately medium to coarse subrounded gravel and cobbles, fine to medium sand, some gypsum, moderately lime cemented, low to moderate plasticity light orange brown.
			D, D		SC/CL	Dry	**SANDY CLAY AND CLAYEY SAND,** trace to some fine gravel, fine to medium sand, moderately lime cemented, considerable gypsum, some carbonates, low plasticity, mottled light orange brown to light brownish grey.
10			D		GC	Moist	**CLAYEY GRAVEL,** trace to some cobbles, predominately fine subangular to subrounded gravel, fine to medium sand, moderately lime cemented, considerable carbonates, medium plasticity, light yellow brown.
15			D, D		CL	Moist	**CLAY,** moderately lime cemented, some pinhole structures, some to considerable fine gypsum, medium to high plasticity, light yellow brown to grey. Note: 6 inches to 1 foot thick zone of poorly graded medium sand, weakly cemented, nonplastic, tan, at 15 feet.
20			D		CL/CH	Moist	**CLAY,** moderately lime cemented, blocky, medium to high plasticity, medium grey.
			D		Sh	Slightly moist	**MANCOS FORMATION: CLAYEY SHALE,** moderately weathered, moderately soft, medium to thickly bedded, light grey.
25							Stopped backhoe at 22.5 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/15/89

LOG OF TEST PIT NO. 69

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,173.0 E92,231.0
ELEVATION 5,207.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL/ SC	Dry	**TOPSOIL: CLAYEY SAND AND SANDY CLAY,** some gravel, fine sand, considerable silt, weakly lime cemented, some roots, low to medium plasticity, light orange brown.
			D		ML	Dry	**CLAYEY SILT,** weakly lime cemented, low plasticity, pale brown to beige.
5			D		GM/ GC	Dry	**SILTY AND CLAYEY GRAVEL,** trace of boulders, some cobbles, fine to medium subangular to subrounded gravel, fine to medium sand, weakly to moderately lime cemented, low plasticity, light greyish brown. Note: boulders less than 2 feet in diameter and increasing below 7 feet. Note: clay decreasing with depth below 7 feet.
10			D		GM/ GC	Moist	**CLAYEY AND SILTY GRAVEL,** traces of some cobbles and boulders, predominately fine angular to subangular gravel, fine to medium sand, moderately lime cemented, low plasticity, light brown. Note: cobbles and boulders increasing with depth.
15			D		CL	Moist	**CLAY,** some fine angular gravel, moderately lime cemented, stiff and blocky, medium plasticity, light olive grey to brown. Note: gravels decreasing below 18 feet.
20			D		CL	Moist	**CLAY,** weakly lime cemented, stiff and blocky, traces of limonite, medium to high plasticity, light to medium grey.
25			D		Sh	Slightly moist	**MANCOS FORMATION: CLAYSTONE,** moderately

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/15/89

LOG OF TEST PIT NO. 69

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,173.0 E92,231.0
ELEVATION 5,207.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							weathered, moderately soft, medium to thickly bedded, some black dendrites, light brownish grey.
							Stopped backhoe at 25.5, backfilled with spoils.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/14/89

LOG OF TEST PIT NO. 70

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,477.0 E92,249.0
ELEVATION 5,212.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SM	Moist	**TOPSOIL: SILTY SAND,** some to considerable gravel and cobbles, fine sand, weakly lime cemented, trace of clay, nonplastic, light orange brown.
			D				
5					GM	Slightly moist	**SILTY GRAVEL, COBBLES AND BOULDERS,** boulders less than 2 feet in diameter, predominately medium to course subrounded gravel and cobbles, some caliche rinds on clasts, fine to medium sand, weakly to moderately lime cemented, some gypsum, nonplastic, light greyish brown. Note: decrease in silt and cementation below 4 feet and increase in sand.
			D				
10					SP/ GP	Slightly moist	**GRAVELLY SAND, SANDY GRAVEL AND COBBLES,** fine cobbles, predominately medium to course subrounded gravels, medium sand, weakly lime cemented, some limonite and gypsum, nonplastic, light yellow brown. Note: gravel and cobble layer from 9 to 12 feet, discontinuous, with a layer of fine gravel.
			D				
15					GP	Slightly moist	**SANDY GRAVEL AND COBBLES,** predominately medium to course subrounded gravel, medium sand, weakly lime cemented, considerable limonite, nonplastic, medium yellow orange.
			D				
20					GP	Slightly moist	**SANDY GRAVEL AND COBBLES,** predominately medium subrounded and tabular gravel, considerable fine subangular gravel, fine to medium sand, moderately to strongly lime cemented, limonitic, nonplastic, medium to dark yellow orange (ochre).
			D				
25					CL/ CH	Moist	**CLAY,** trace to some gravel and some limonite, stiff and blocky, medium to highly plastic, moderately lime cemented, light yellow grey to brown. Note: bottom 2 feet becomes greyer.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/14/89

LOG OF TEST PIT NO. 70

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,477.0 E92,249.0
ELEVATION 5,212.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
		X	D		Sh	Moist	MANCOS FORMATION: CLAYSTONE, moderately weathered, moderately soft, thinly bedded, some black dendrite, light olive grey.
30							Stopped backhoe at 28 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/15/89

LOG OF TEST PIT NO. 71

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,750.0 E92,249.0
ELEVATION 5,212.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SC/ SM	Moist	**TOPSOIL: SILTY AND CLAYEY SAND,** some gravel and cobbles, fine sand, weakly lime cemented, some roots, low plasticity, light orange brown.
			D				
					GM	Slightly moist	**SILTY GRAVEL, COBBLES AND BOULDERS,** boulders less than 2 feet in diameter, predominately medium to course angular to subrounded gravel and cobbles, trace to some clay, moderately lime cemented, caliche rinds on gravels, low plasticity, pale brown.
5							
			D		GC/ CL	Moist	**CLAYEY GRAVEL TO GRAVELLY CLAY,** predominately fine to medium subangular to surrounded gravel, considerable fine to medium sand in upper 2 feet, weakly to moderately lime cemented, low plasticity, light yellow brown to olive brown. Note: considerable caliche and limonitic nodules.
			D				
10					GP	Slightly moist	**SANDY GRAVEL AND COBBLES,** some boulders less than 15 inches, predominately fine to medium subrounded gravel, considerable course gravel, medium sand, weakly lime cemented, some limonite, nonplastic, light yellow brown.
			D				
					GW	Slightly moist	**SANDY GRAVEL, COBBLES AND BOULDERS,** boulders less than 18 inches in diameter, well graded, subrounded, fine to medium sand, moderately lime cemented with some strongly cemented zones, trace of clay, increased limonite, increased sand with depth, nonplastic, light to medium yellow brown.
15			D				
					CL		
			D		Sh	Moist	**CLAY,** trace to some very fine gravel, moderately lime cemented, blocky, some thin limonitic and calcareous layers, medium to highly plastic, light brownish grey, yellow orange and yellow brown.
20						Slightly moist	**MANCOS FORMATION: CLAYSTONE,** moderately weathered, moderately soft, medium bedded, light grey.
25							Stopped backhoe at 20 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/15/89

LOG OF TEST PIT NO. 72

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,053.0 E92,271.0
ELEVATION 5,216.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** trace to some gravel, fine sand, weakly lime cemented, some roots, low to medium plasticity, light red brown.
			D		CL	Dry	**SILTY CLAY,** traces of some fine gravel, considerable fine sand, weakly to moderately lime cemented, some caliche spotting, low to medium plasticity, pale brown.
5			D		SM	Slightly moist	**SILTY SAND,** trace of gravel, fine to medium sand, trace to some clay, weakly lime cemented, considerable gypsum, low plasticity to nonplastic, light tan.
			D		SM	Slightly moist	**SILTY SAND,** traces of boulders less than 15 inches in diam some to considerable subrounded gravel and cobbles, some clay nodules, fine to medium sand, weakly lime cemented, considerable gypsum, some limonite, low plasticity, light yellow brown.
10			D		GC		
			D		CL/CH	Moist	**CLAYEY GRAVEL AND COBBLES,** some boulders less than 13 inches in diameter, predominately fine to medium subrounded gravel, fine to medium sand, weakly to moderately lime cemented, low to medium plasticity, light yellow orange brown to brown.
15						Moist	**CLAY,** trace to some fine angular gravel, moderately lime cemented, stiff, medium to high plasticity, medium brown. Note: strongly lime cemented from 16.5 to 17.5 feet.
20							**CLAY,** considerably chalky, thin layers with depth, stiff, medium to high plasticity, medium brown with grey.
			D		CL/CH		
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/15/89

LOG OF TEST PIT NO. 72

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,053.0 E92,271.0
ELEVATION 5,216.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
			D				
					Sh	Moist	MANCOS FORMATION: CLAYSTONE, moderately weathered, moderately hard to moderately soft, thinly bedded, 2 inches in dameter of fossil shell, light grey.
30							
							Stopped backhoe at 28.5 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHERNEY RESERVOIR

JOB NO. GRJ-03 DATE 08/16/89

LOG OF TEST PIT NO. 73

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,376.0 E92,270.0
ELEVATION 5,223.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: CLAYEY SAND,** some gravel and cobbles, fine sand, weakly lime cemented, some roots, medium to low plasticity, light red brown.
			D		SM	Dry	**SILTY SAND,** some cobbles and boulders less than 15 inches, considerable medium to fine subangular gravel, fine to medium sand, traces of some clay, weakly to moderately lime cemented, low plasticity to nonplastic, pale brown.
5			D		CL	Moist	**SANDY CLAY,** traces of some gravel, fine to medium sand, moderately lime cemented, considerable gypsum, low to medium plasticity, medium olive brown.
			D				
10					GP	Slightly moist	**SANDY GRAVEL, COBBLES AND BOULDERS,** boulders less than 20 inches in diameter, considerable fine subangular gravel, some medium to coarse subrounded gravel, moderately to strongly cemented, some gypsum, nonplastic, light yellow brown. Note: 1 foot thick layer of fine tan silty sand at 11 feet. Note: cobbles and boulders increasing from 13 to 16 feet.
15							
			D		CL	Moist	**CLAY,** traces of some fine angular gravel, moderately lime cemented, stiff to very stiff, medium to highly plasticity, medium yellow brown.
20							
					CL/CH	Moist	**CLAY,** moderately to weakly lime cemented, very stiff, medium to highly plasticity, medium brown.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 73

JOB NO. GRJ-03 DATE 08/16/89

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,376.0 E92,270.0
ELEVATION 5,223.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
			D				
30					CL/ CH		CLAY, moderately to weakly lime cemented, very stiff, medium to highly plasticity, medium brown.
35			D		Sh	Moist	MANCOS FORMATION: CLAYSTONE, moderately weathered, moderately soft to moderately hard, medium bedded, light green grey-grey brown.
40							Stopped backhoe at 35 feet, backfilled with spoils.
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/16/89

LOG OF TEST PIT NO. 74

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,441.0 E93,426.0
ELEVATION 5,243.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content or Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		ML	Dry	**TOPSOIL: CLAYEY SILT,** considerable fine sand, trace to some gravel, weakly lime cemented, some roots, low plasticity, light orange brown.
			D		SC/ CL	Dry	**CLAYEY SAND AND SANDY CLAY,** some cobbles and boulders, considerable fine to medium subangular to subrounded gravel, weakly to moderately lime cemented, low to medium plasticity, pale brown to light orange brown.
5			D		GM	Slightly moist	**SILTY GRAVEL AND COBBLES,** some boulders less than 15 inches in diameter, considerable fine subangular gravel, some to considerable course subrounded gravel, considerable fine to medium sand, trace to some clay, some gypsum, weakly to moderately lime cemented, low plasticity to nonplastic, light tan to light grey brown.
10			D		CL	Slightly moist	**SANDY CLAY,** some gravel and cobbles, fine sand, moderately lime cemented, considerable to some gypsum, some carbonate spotting, medium to highly plastic, medium olive brown.
			D		CL	Moist	**CLAY,** trace of fine angular gravel, moderately lime cemented, stiff, some gypsum, medium to high plasticity, medium olive brown.
15			D		Sh	Slightly moist	**MANCOS FORMATION: CLAYSTONE,** moderately hard to moderately soft, thinly bedded, light yellow brown and greyish brown.
20							Stopped backhoe at 16.5 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/16/89

LOG OF TEST PIT NO. 75

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,357 E93,436
ELEVATION 5,241
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel and cobbles, fine sand, weakly lime cemented, some roots, medium plasticity, light red brown.
			D		ML	Dry	**CLAYEY SILT,** some gravel and cobbles, considerable fine sand, weakly to moderately lime cemented, low plasticity, pale brown.
5			D		GC	Slightly moist	**SILTY CLAYEY GRAVEL, COBBLES AND BOULDERS,** boulders less than 3 feet in diameter, considerable fine subangular gravel, predominately medium subrounded gravel, fine to medium sand, moderately lime cemented, some gypsum, low plasticity, light brownish grey.
			D				
10					GM	Moist	**SILTY GRAVEL, COBBLES AND BOULDERS,** boulders less than 18 inches, predominately fine to medium subrounded gravel and cobbles, some coarse gravel, fine sand, weakly to moderately lime cemented, nonplastic, pale yellow grey.
			D				
15					SC	Moist	**CLAYEY SAND AND SANDY CLAY,** fine sand, weakly lime cemented, considerable white carbonate layers, low to medium plastictiy, light yellow orange brown limonitic.
			D		Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered to decomposed, moderately soft to soft, thinly bedded, light to medium yellow brown and grey.
			D				
20							Stopped backhoe at 18.5 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/16/89

LOG OF TEST PIT NO. 76

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,284.0 E93,452.0
ELEVATION 5,241.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D				
					SC	Dry	**TOPSOIL: CLAYEY SAND,** some gravel and cobbles, fine sand, considerable silt, weakly lime cemented, some roots, low to medium plasticity, light orange brown.
			D				
					GM	Dry	**SILTY GRAVEL,** some cobbles, predominately fine to medium subangular gravel, some coarse subrounded gravel, fine sand, moderately to strongly lime cemented, low plasticity, white. Note: strongly calcified zone.
5			D				
					GM	Dry	**SILTY GRAVEL AND COBBLES,** some boulders less than 18 inch in diameter, predominately coarse subrounded gravel and cobbles, fine to medium sand, weakly lime cemented, nonplastic, light tan to pale grey.
			D				
					CL		
10			D			Moist	**SANDY CLAY,** trace of gravel, fine sand, weakly lime cemented, some gypsum, medium plasticity, light tan to light brown.
					CL	Moist	**SANDY CLAY,** fine sand, weakly lime cemented, medium plasticity, light grey tan. Note: interbedded clean poorly graded fine sand and medium brown clay.
15			D				
					SC	Slightly moist	**CLAYEY SAND,** some gravel and cobbles, fine to medium sand, moderately lime cemented, low plasticity, mottled light yellow orange brown and grey. Note: interbedded sand, clay and white carbonate layers, limonitic.
			D		Sh		
20						Moist	**MANCOS FORMATION: CLAYSTONE,** moderately to highly weathered, soft to moderately soft, thinly bedded, light to medium yellow brown and grey.
25							Stopped backhoe at 19 feet, backfilled with spoils.

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/16/89

LOG OF TEST PIT NO. 77

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,825.7 E94,007.1
ELEVATION 5,242.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		ML	Dry	**TOPSOIL: SANDY SILT,** some gravel and cobbles, fine sand, trace of clay, weakly lime cemented, some roots, nonplastic, light orange brown.
			D				
					ML	Dry	**SANDY SILT,** some cobbles, some to considerable fine angular gravel, fine sand, some clay, moderately lime cemented, low plasticity, pale brown to beige.
5			D				**SANDY GRAVEL,COBBLES AND BOULDERS,** considerable boulders less than 2 feet in diameter, predominately course subrounded to subangular gravel and cobbles, fine to medium sand, weakly to moderately lime cemented, nonplastic, light tan to light brown.
					GP	Slightly moist	
10			D				**CLAYEY SAND,** some fine angular gravel, fine sand, weakly to moderately lime cemented, some limonite, low plasticity, light yellow orange brown to tan.
					SC	Slightly moist	Note: interbedded grey thin clay with fine poorly graded sand, some thin coarse gravel zones.
15			D				**SAND, GRAVEL AND COBBLES,** predominately fine to medium subrounded gravel, some coarse gravel, well graded sand, some clay, moderately lime cemented, some strongly cemented zones, low plasticity, light yellow brown to tan.
					GP	Slightly moist	
20			D		Sh	Slightly moist	**MANCOS FORMATION: CLAYSTONE,** moderately to highly weathered, moderately soft, thinly bedded, some limonite and black dendrite, light to medium yellow brown and grey.
25							Stopped backhoe at 21.5 feet, backfilled with spoil.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/16/89

LOG OF TEST PIT NO. 78

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,142.0 E93,520.0
ELEVATION 5,243.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		ML	Slightly damp	**TOPSOIL: CLAYEY SILT,** some fine to medium sand, some rootlets, firm to blocky, weakly lime cemented, nonplastic, red brown.
			D		CL	Dry	**SILTY CLAY AND OCCASIONAL SMALL COBBLES,** some fine to very fine gravelly sand, caliche rinds on occasional subrounded gravels and cobbles, nonplastic, blocky white to buff.
5			D		GM	Slightly damp	**SILTY GRAVEL, COBBLES AND BOULDERS,** considerable fine to very fine gravelly sand and gypsum, clasts are subangular to subrounded, caliche rinds present on clasts, loose, weakly lime cemented, low plasticity, olive brown.
10			D		CL	Slightly damp	**SANDY CLAY,** firm sand, trace of silt, blocky, iron and manganese oxide stained surfaces, slight plasticity, dark brown.
15							
20			D		CL	Damp	**SANDY CLAY,** some cobbles and boulders, considerable lime cementation in fissures, wormholes present with iron oxidation, fine sand, blocky, slight plasticity, mottled grey to orange brown.
					Sh	Slightly damp	**MANCOS FORMATION,** moderately weathered fissle, thinly bedded, grey to brown.
25							Stopped backhoe at 23 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/17/89

LOG OF TEST PIT NO. 79

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,584.0 E93,563.0
ELEVATION 5,249.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		ML	Dry	**TOPSOIL: CLAYEY SILT,** small amounts of gravel, some fine sand, weakly lime cemented, considerable rootlets, nonplastic, red brown.
			D		GM	Dry	**SILTY CLAYEY GRAVEL,** occasional boulders to 18 inch in diameter, occasional cobbles, clasts subangular to subrounded, caliche rinds on clasts, weakly lime cemented, low plasticity, light tan to buff.
5			D		CL	Dry	**SILTY CLAY,** occasional subrounded gravel, traces of fine sand, low to medium plasticity, weakly lime cemented, red brown to brown.
			D		SM	Dry	**SILTY CLAYEY SAND,** fine to medium sand, moderately lime and gypsum cemented, considerable gypsum, traces of limonite, low plasticity, light olive brown.
10			D		CL	Slightly moist	**SILTY CLAY,** considerable cobbles and boulders to 16 inch in diameter, occasional thin stringers of fine sand, weakly to moderately lime and gypsum cemented, some gypsum nodules, low plasticity, olive gray to brown.
15			D		GM	Dry	**SILTY SAND AND GRAVEL,** some cobbles, small amounts of clay, clasts subangular to subrounded, weakly lime and gypsum cemented, occasional gypsum and limonite in nodules, nonplastic, light olive gray.
			D		Sh	Slightly moist	**MANCOS SHALE,** moderately weathered , soft, thinly bedded, light gray to yellow brown.
20							Stopped backhoe at 19 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/17/89

LOG OF TEST PIT NO. 80

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,617.0 E93,567.0
ELEVATION 5,250.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		ML	Dry	**TOPSOIL: CLAYEY SILT,** trace to some gravel, some fine sand, weakly lime cemented, nonplastic, considerable rootlets, red brown.
			D		CL	Dry	**SILTY CLAY,** occasional cobbles, some gravel and sand, clasts subangular with caliche rinds, moderately lime cemented, low to nonplastic, light tan.
5			D		GM	Dry	**SILTY SAND AND GRAVEL,** considerable cobbles and boulders to 16 inch in diameter, clasts subangular to subrounded with some caliche rinds, some clay, moderately lime and gypsum cemented, considerable gypsum, nonplastic, light tan to brown.
10			D		SM	Slightly moist	**SILTY SAND,** predominately fine to medium gravel, some clay, weakly lime cemented, some gypsum, low plasticity, light olive gray to brown.
			D		CL	Slightly moist	**SILTY CLAY,** some fine sand, weakly lime and gypsum cemented, low to medium plasticity, olive gray.
15			D		CL	Dry	**SILTY CLAY,** some to considerable gravel and cobbles to 10 inch in diameter, some fine sand, moderately lime and gypsum cemented, considerable gypsum in nodules, low plasticity, olive grey to brown.
20					Sh	Slightly moist	**MANCOS SHALE,** moderately weathered, soft, thinly bedded, light grey to yellow brown.
25							Stopped backhoe at 20 feet.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/17/89

LOG OF TEST PIT NO. 81

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	.

BACKHOE TYPE KOEHRING 666E
LOCATION N12,635.0 E93,591.0
ELEVATION 5,251.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					ML	Dry	TOPSOIL: CLAYEY SILT, small amounts of gravel, some fine sand, weakly lime cemented, considerable rootlets, nonplastic, red brown.
					CL	Dry	SILTY CLAY, traces of gravel, some fine sand, moderately lime cemented, low plasticity, light tan to white.
5					GM	Dry	SILTY SAND AND GRAVEL, considerable cobbles and boulders to 12 inch in diameter, clasts subrounded with partial caliche rind, moderately lime and gypsum cemented, considerable gypsum nodules, nonplastic, light tan to brown.
10					SM	Slightly moist	SILTY SAND, predominately fine grade, small amounts of clay, sand, weakly lime cemented, some gypsum, low to nonplastic, light olive gray.
					CL	Slightly moist	SILTY CLAY, some medium to fine sand, moderately lime and gypsum cemented, considerable gypsum, moderately plasticity, light olive gray.
15					GM/ GC	Dry	SILTY CLAYEY GRAVEL, considerable cobbles to 10 inch in diameter, some fine sand, moderately lime and gypsum cemented, considerable gypsum in nodules, low plasticity, olive grey to brown.
20					Sh	Slightly moist	MANCOS SHALE, moderately weathered, soft, thinly bedded, light grey to yellow brown.
25							Stopped backhoe at 20 feet.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/17/89

LOG OF TEST PIT NO. 82

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,488.0 E92,786.0
ELEVATION 5,232.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					ML		**CLAYEY SILT,** traces of medium gravel, some fine sand, weakly lime cemented, considerable rootlets to 10 to 12 inches, low to nonplastic, red brown.
5							
					SM		**SILTY SAND,** occasional cobbles to 8 to 10 inch in diameter, considerable gravel, clast subangular to subrounded, moderately lime and gypsum cemented, considerable gypsum, low to nonplastic, light tan.
10							
					GW		**SILTY SAND AND GRAVEL,** considerable cobbles to 8 inch in diameter, poorly graded, clasts subrounded to rounded, loose, nonplastic, brown. Note: single 30 inch boulder at 12 feet.
15					GP		**SANDS AND GRAVEL,** considerable cobbles and boulders to 16 inch in diamter, small amounts of silt, well graded, subrounded to rounded clasts, loose, nonplastic, orange brown.
20					CL		**SILTY CLAY,** small amounts of gravel to 1/2 inch in diameter, weakly lime and gypsum cemented, medium plasticity, light olive grey.
25					Sh		**MANCOS SHALE,** moderately weathered, soft, thinly bedded, light grey to greenish brown.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 82

JOB NO. GRJ-03 DATE 08/17/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,488.0 E92,786.0
ELEVATION 5,232.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							Stopped backhoe at 25.5 feet.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST PIT NO. 83

JOB NO. GRJ-03 DATE 08/17/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,032 E92,660
ELEVATION 5,224
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D			Dry	**SILTY CLAY,** some fine sand and gravel, weakly lime cemented, considerable calcite veinlets in top 8 to 10 inches, low plasticty, red brown.
			D		CL		
5							
			D			Slightly Moist	**SILTY SAND AND SILTY GRAVEL,** some cobbles 8 to 10 inches in diameter, subangular to subrounded, moderately lime cemented, considerable gypsum, nonplastic, light olive grey.
					GM/ SM		
10			D			Slightly moist	**SILTY CLAY,** weakly lime cemented, considerable gypsum nodules, low to medium plasticity, dark olive grey.
			D				
					CL		
15							
					Sh		**MANCOS FORMATION:** moderately weathered, bedded, light grey to greenish grey.
20							
							Stopped backhoe at 21.1 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/17/89

LOG OF TEST PIT NO. 84

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,499.0 E92,660.0
ELEVATION 5,219.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content of Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SILTY CLAY,** some fine sand, moderately lime cemented, considerable rootlets from 10 to 16 inches, low plasticity, red brown.
5			D		SC	Dry	**CLAYEY SAND,** cobbles to 6 inches, some gravel, clasts subangular with weak caliche rim, medium lime and gypsum cemented, low plasticity, light olive.
			D		GM	Dry	**SILTY SAND AND GRAVEL,** considerable cobbles and boulders to 14 inches, clasts subangular to subrounded, weakly lime and gypsum cemented, considerable gypsum, nonplastic, light olive.
10			D		SM	Slightly moist	**SILTY SAND,** some cobbles to 6 inches, weakly lime and gypsum cemented, considerable gypsum, nonplastic, olive grey.
15			D		SP	Dry	**SAND AND GRAVEL,** considerable cobbles and boulders to 16 inches, poorly graded, subrounded, nonplastic, brown to light tan.
20			D		CL	Slightly moist	**SILTY CLAY,** small amounts of fine gravel to 1/2 inch, weakly lime cemented, medium to high plasticity, dark olive grey. Note: may be very weathered mancos after 21 feet, no relict sedimentary structures remain.
25					Sh	Slightly moist	**MANCOS SHALE,** moderately weathered, soft, thinly bedded, light grey to greenish brown.
							Stopped backhoe at 25 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/17/89

LOG OF TEST PIT NO. 85

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,838.0 E94,309.0
ELEVATION 5,242.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SILTY CLAY,** traces to some fine sand, considerable rootlets, low plasticity, red brown.
			D				
					CL	Dry	**SILTY CLAY,** some fine sand, moderately lime cemented, trace to some rootlets and roots to 28 inch in length, low plasticity, brown.
			D				
					CL		
5			D			Dry	**SANDY CLAY,** occasional cobbles to 6 inches, trace to some gravels, clasts subrounded to subangular, slight caliche rinds, weakly lime and gypsum cemented, low plasticity, light olive.
			D			Dry	**SILTY SAND AND GRAVEL,** considerable cobbles and boulders to 18 inches, clasts subangular to subrounded, weakly lime gypsum cemented, considerable "free" gypsum, nonplastic, light olive to greenish brown. Note: gypsum decreases with depth.
10					GM		
15							
			D			Slightly moist	**SILTY SAND,** predominately fine, some clay, weakly lime and gypsum cemented, low to nonplastic, light olive.
					SM		
20							
			D		GM	Dry	**SILTY SAND AND GRAVEL,** considerable cobbles and boulders to 12 inches, poorly graded, subrounded, nonplastic, light tan.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/17/89

LOG OF TEST PIT NO. 85

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,838.0 E94,309.0
ELEVATION 5,242.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					GM	Dry	**SILTY SAND AND GRAVEL,** considerable cobbles and boulders to 12 inches, poorly graded, subrounded, nonplastic, light tan.
					Sh	Slightly moist	**MANCOS FORMATION: SHALE,** moderately weathered, soft, thinly bedded, some limonite coated fractures, light grey.
30							
							Stopped backhoe at 29.6 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/18/89

LOG OF TEST PIT NO. 86

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,720.0 E94,437.0
ELEVATION 5,241.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					ML	Dry	**TOPSOIL: CLAYEY SILT,** trace to some fine sand and gravel, considerable rootlets, low plasticity, red brown.
			D		CL	Dry	**SILTY CLAY,** some gravel, occasional cobbles, trace to some fine sand, medium lime cemented, low plasticity, light tan to buff.
5			D		GC	Dry	**CLAYEY SAND AND GRAVEL,** considerable cobbles to 6", clasts subangular with occasional caliche rinds, weakly lime cemented, low plasticity, tan.
10			D		GM	Dry	**SILTY SAND AND GRAVEL,** considerable cobbles to 8 inch in diameter, clasts subrounded, very weakly lime and gypsum cemented, some free gypsum, nonplastic, brown.
			D		GM	Dry	**SILTY SAND AND GRAVEL,** occasional boulders to 12 inch in diameter, considerable cobbles, clasts subrounded, very weakly lime gypsum cemented, nonplastic, light olive. **Note:** sample slightly moist due to overnight rains.
15			D		CL/ CH	Slightly moist	**SILTY CLAY,** trace to some fine gravel, weakly lime cemented, medium to highly plasticity, dark olive grey.
			D		Sh	Slightly moist	**MANCOS SHALE,** moderately weathered, soft, very thinly to thinly bedded, light gray to greenish brown.
20							Stopped backhoe at 19.5 feet.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/18/89

LOG OF TEST PIT NO. 87

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,685.0 E94,511.0
ELEVATION 5,238.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SILTY CLAY** trace to some fine sand, considerable rootlets, low plasticity, red brown.
			D		CL	Dry	**SILTY CLAY,** considerable gravel, occasional cobble, some fine sand, moderately lime cemented, low plasticity, light tan to buff.
5			D		GM/ GC	Dry	**SILTY SAND AND GRAVEL,** considerable cobbles to 6 inches, considerable clay, clasts subangular to subrounded with occasional caliche rims, weakly lime and gypsum cemented, some free gypsum, low plasticity, tan.
10			D		GM	Dry	**SILTY SAND AND GRAVEL,** occasional boulders to 12 inch in diameter, considerable cobbles, clasts subrounded to subangular, weakly lime and gypsum cemented, nonplastic, light olive.
15			D		CL/ CH	Slightly moist	**SILTY CLAY,** trace to some fine gravel, weakly lime cemented, medium to highly plasticity, dark olive.
					Sh	Slightly moist	**MANCOS SHALE,** moderately weathered, soft, thinly bedded, light grey to greenish brown.
20							Stopped backhoe at 19.6 feet.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/18/89

LOG OF TEST PIT NO. 88

GROUNDWATER

DEPTH	HOUR	DATE
26.1	8:30	08/17/89

BACKHOE TYPE KOEHRING 666E
LOCATION N11,021.0 E94,033.0
ELEVATION 5,239.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SILTY CLAY,** trace to some fine sand, trace to some rootlets, low plasticity, red brown.
			D		CL	Dry	**SILTY CLAY,** occasional cobbles to 8 inches, some fine to medium sand and gravel, moderately lime cemented, low plasticity, small amounts of rootlets, light tan to white.
			D		SM/ GM	Dry	**SILTY SAND AND GRAVEL,** occasional boulders to 12 inches, considerable clay, considerable cobbles, clasts subrounded to subangular, weakly lime and gypsum cemented, some free gypsum, low plasticity, light olive to brown.
5			D		SM	Dry	**SILTY SAND,** occasional cobbles to 6 inches, some medium gravel, predominately fine to medium gravel, weakly lime and gypsum cemented, nonplastic, light olive.
10			D		GM	Dry	**SILTY SAND, GRAVEL AND COBBLES,** considerable boulders to 24 inches, clasts subrounded, weakly lime and gypsum cemented, nonplastic, light olive gray.
			D			Dry	**SAND, GRAVEL AND COBBLES,** considerable boulders to 30 inches in diameter, clast subrounded, poorly graded, weakly lime cemented, nonplastic, light olive grey.
15			D		GP	Dry	
20			D		GM	Dry	**SILTY SAND, GRAVEL AND COBBLES,** occasional boulders to 16 inches, clast subangular, poorly graded, nonplastic, light olive grey.
25					SM	Dry	**SILTY SAND,** some gravel, occasional cobbles, predominately fine grade, nonplastic, dark olive grey.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 88

JOB NO. GRJ-03 DATE 08/18/89

GROUNDWATER

DEPTH	HOUR	DATE
26.1	8:30	08/17/89

BACKHOE TYPE KOEHRING 666E
LOCATION N11,021.0 E94,033.0
ELEVATION 5,239.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					SM	Dry	**SILTY SAND**, some gravel, occasional cobbles, predominately fine grade, nonplastic, dark olive grey.
30			D		Sh	Slightly moist	**MANCOS SHALE**, moderately weathered, soft thinly bedded, light grey to greenish brown.
35							Stopped drilling at 31.10 feet, backfilled with spoils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/18/89

LOG OF TEST PIT NO. 89

GROUNDWATER

DEPTH	HOUR	DATE
26.4	11:00	08/17/89

BACKHOE TYPE KOEHRING 666E
LOCATION N10,933.0 E94,080.0
ELEVATION 5,239.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Dry	**TOPSOIL: SILTY CLAY,** some fine sand, considerable rootlets, low plasticity, red brown.
			D				
					CL	Dry	**SITLY CLAY,** fine gravel to 2 inches, some fine sand, moderately lime cemented, low plasticity, light tan to white.
			D				
					GM		
5						Dry	**SILTY SAND AND SILTY GRAVEL,** considerable cobbles to 8 inches plus, clasts subangular, weakly lime cemented, nonplastic, grey to light tan.
			D				
					GM	Slightly moist	**SILTY SANDY GRAVEL,** occasional boulders to 14 inches, considerable cobbles, considerable clay, clasts subrounded to subangular, weakly lime cemented, some gypsum cement and free gypsum, low plasticity, light olive brown.
10			D				**SILYY SAND AND GRAVEL,** considerable cobbles to 8 inches, clasts subrounded, weakly lime and gypsum cemented, small amounts of free gypsum, nonplastic, light olive grey.
15			D				
					GM		
			D				
20							
			D				**SANDY GRAVEL,** occasional boulders to 14 inches, considerable cobbles, some silt, clasts subrounded, weakly lime and gypsum cemented, dark olive grey.
					GP	Slightly moist	
25					GC		**CLAYEY SAND AND GRAVEL,** considerable cobbles to 8 inches, occasional boulders, clasts

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/18/89

LOG OF TEST PIT NO. 89

GROUNDWATER

DEPTH	HOUR	DATE
26.4	11:00	08/17/89

BACKHOE TYPE KOEHRING 666E
LOCATION N10,933.0 E94,080.0
ELEVATION 5,239.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
			D				subrounded, dark olive grey.
					GC	Saturated	
30			D		Sh	Slightly moist	**MANCOS FORMATION: SHALE,** moderately weathered, soft, thinly bedded, light greenish brown.
35							Stopped backhoe at 31 feet, backfilled with spoils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 90

JOB NO. GRJ-03 DATE 08/17/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,860.0 E94,134.0
ELEVATION 5,239.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SILTY CLAY,** trace fine sand, considerable rootlets, low plasticity, red brown.
			D		CL	Dry	**SILTY CLAY,** small amounts of gravel and cobbles, some fine sand, moderately lime cemented, low plasticity, light tan to white.
5			D		GM/ SM	Dry	**SILTY SAND AND SILTY GRAVEL,** some boulders to 20 inches, considerable cobbles, clasts subrounded with thin caliche coatings, weakly lime cemented, nonplastic, brown.
10			D		GM	Dry	**SANDY SILTY GRAVEL,** considerable cobbles and boulders to 12 inches, clast subrounded, poorly graded, weakly lime and gypsum cemented, nonplastic, light olive.
15			D		GP	Dry	**SANDY GRAVEL,** considerable cobbles and boulders to 24 inches, clasts subrounded, poorly graded, moderately lime and gypsum cemented, nonplastic, light olive to brown.
20			D		GM	Dry	**SANDY SILTY GRAVEL,** some cobbles and boulders 12 inches, clast subangular to subrounded, poorly graded, moderately to strongly lime and gypsum cemented, nonplastic, buff to olive.
25			D		Sh	Dry	**MANCOS FORMATION: SHALE,** moderately weathered, soft, thinly bedded, light grey to greenish brown.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/17/89

LOG OF TEST PIT NO. 90

BACKHOE TYPE KOEHRING 666E
LOCATION N10,860.0 E94,134.0
ELEVATION 5,239.0
DATUM MSL

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							Stopped backhoe at 26 feet, backfilled with spoils.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/19/89

LOG OF TEST PIT NO. 91

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,827.5 E94,007.1
ELEVATION 5,237.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Dry	**TOPSOIL: SILTY CLAY,** trace to some fine sand, considerable rootlets, low plasticity, red brown.
					CL	Dry	**SILTY CLAY,** trace to some cobbles to 4 inches in diameter, some gravel, some medium to fine sand, moderately lime cemented, low plasticity, light tan to white.
5					GM	Dry	**SILTY SAND AND GRAVEL,** considerable cobbles to 6 inches in diameter, poorly graded, clasts subangular, weakly lime and gypsum cemented, low plasticity, gray to brown.
10					GP	Dry	**SAND, GRAVEL AND COBBLES,** some boulders to 18 inches in diameter, some silt, poorly graded, clasts subangular to subrounded, weakly lime and gypsum cemented, some free gypsum, low plasticity to nonplastic, light olive grey.
15					GM	Dry	**SILTY SAND, GRAVEL AND COBBLES,** some boulders to 18 inches in diameter, poorly graded, clasts subangular to subrounded, weakly lime and gypsum cemented, nonplastic, light olive.
20					GM	Slightly moist	**SILTY SAND AND GRAVEL,** occasional boulders to 16 inches in diameter, considerable cobbles, poorly graded, clasts subangular to subrounded, moderately lime cemented, occasional silica stringers well cemented, nonplastic, light olive.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 91

JOB NO. GRJ-03 DATE 08/19/89

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,827.5 E94,007.1
ELEVATION 5,237.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					Sh	Slightly moist	**MANCOS FORMATION: SHALE**, moderately weathered, thinly bedded, soft, light grey to greenish brown.
30							Stopped backhoe at 28.2 feet.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/19/89

LOG OF TEST PIT NO. 92

GROUNDWATER		
DEPTH	HOUR	DATE
26.6	14:30	08/19/89

BACKHOE TYPE KOEHRING 666E
LOCATION N10,442.0 E93,906.0
ELEVATION 5,236.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SILTY CLAY,** trace fine sand, considerable rootlets, low plasticity, red brown.
			D		CL	Dry	**SILTY CLAY,** occasional cobbles to 4 inches, some gravel, some medium sand, moderately lime cemented, low plasticity, light tan to white.
5			D		GM	Dry	**SILTY SAND AND GRAVEL,** occasional boulders to 12 inches, considerable cobbles, small amount of clay, poorly graded, clasts subangular with some caliche rims, weakly lime cemented, low plasticity to nonplastic, tan to light brown.
10			D		GP/ GM	Dry	**SAND AND GRAVEL,** occasional boulders, poorly graded to 14 inches, some silt, considerable cobbles, clasts subrounded, weakly lime and gypsum cemented, nonplastic, light olive to grey.
15			D		GM/ SM	Dry	**SILTY SAND AND SILTY GRAVEL,** occasional boulders to 18 inches, considerable cobbles, poorly graded, clasts subangular to subrounded, moderately lime cemented, occasional stringers, well silica cemented, nonplastic, light olive to grey.
20			D		ML	Slightly moist	**CLAYEY SILT,** trace fine sand, some caliche coated siliceous casts, weakly gypsum cemented, trace fine gypsum, low to nonplastic, dark olive. **Note:** thinly bedded shalely structure.
25			D		SM	Slightly moist to saturated	**SILTY SAND,** some gravel, occasional poorly graded medium cobbles, clasts subrounded, weakly lime cemented, nonplastic, dark olive.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/19/89

LOG OF TEST PIT NO. 92

GROUNDWATER

DEPTH	HOUR	DATE
26.6	14:30	08/19/89

BACKHOE TYPE KOEHRING 666E
LOCATION N10,442.0 E93,906.0
ELEVATION 5,236.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					SM	Slightly moist to saturated	**SILTY SAND,** some gravel, occasional poorly graded medium cobbles, clasts subrounded, weakly lime cemented, nonplastic, dark olive.
30		X	D		Sh	Slightly moist to saturated	**MANCOS FORMATION: SHALE,** moderately weathered, soft, thinly bedded, light grey to greenish brown.
35							Stopped backhoe at 30.0 feet, backfilled with spoils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/19/89

LOG OF TEST PIT NO. 93

GROUNDWATER

DEPTH	HOUR	DATE
34.5	11:40	08/22/89

BACKHOE TYPE KOEHRING 666E
LOCATION N11,038.0 E93,865.0
ELEVATION 5,235.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		ML	Dry	**TOPSOIL: CLAYEY SILT,** trace fine sand, considerable rootlets, low plasticity, dark brown.
			D		CL	Dry	**SILTY CLAY,** cobbles to 4 inches, some sand and gravel, moderately lime cemented, low plasticity, light tan to white
5			D		SM/GM	Dry	**SILTY SAND AND SILTY GRAVEL,** considerable poorly graded cobbles and boulders to 16 inch in diameter, clasts subrounded, occasional caliche rims, weakly lime and gypsum cemented, some gypsum, nonplastic, olive grey to brown.
10					SP	Dry	**SAND,** some silt, some gravel and cobbles to 4 inches, predominately medium sand, weakly lime cemented, nonplastic, light olive grey.
15					GP	Dry	**SANDY GRAVEL AND COBBLES,** trace to some boulders, predominately medium to coarse subrounded gravel, fine to medium sand, weakly lime cemented, nonplastic, light brown grey.
20			D		SP	Slightly moist	**SILTY SAND,** trace gravel, trace to some thin clayey sand layers, fine to medium sand, weakly to moderately lime cemented, nonplastic, light olive grey to tan.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/19/89

LOG OF TEST PIT NO. 93

GROUNDWATER

DEPTH	HOUR	DATE
34.5	11:40	08/22/89

BACKHOE TYPE KOEHRING 666E
LOCATION N11,038.0 E93,865.0
ELEVATION 5,235.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
30			D		GP	Moist	**SILTY SANDY GRAVEL AND COBBLES**, trace fine boulders, predominately medium to course subrounded gravel, fine to medium sand, weakly to moderately lime cemented, nonplastic, light to medium olive brown. **Note:** 1 to 1.5 feet strongly cemented zone at 27 feet. **Note:** one 3 feet in diameter boulder at 32 feet.
35			D		CL	Moist	**SILTY CLAY**, moderately lime cemented, stiff, medium to high plasticity, light olive brown. **Note:** some scattered gravel zones.
40							
45							Stopped backhoe at 42 feet, backfilled with spoils. **Note:** seepage from saturated zone approximately 27 to 32.5 feet.
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/22/89

LOG OF TEST PIT NO. 94

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,527.0 E93,665.0
ELEVATION 5,251.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** trace to some gravel and cobbles, fine sand, weakly lime cemented, some roots, low to medium plasticity, light orange brown.
					ML	Dry	**CLAYEY SILT,** trace boulders, some coarse gravel and cobbles, fine sand, weakly to moderately lime cemented, some gypsum, low plasticity, pale brown.
5			D		SM	Dry	**CLAYEY SAND,** some cobbles and small boulders, considerable fine to medium subrounded gravel, fine to medium sand, weakly lime cemented, low plasticity, light brown.
10			D		GM	Slightly moist	**SILTY GRAVEL AND COBBLES,** some boulders less than 15 inches in diameter, predominately fine to medium subrounded gravel, fine to medium sand, trace to some clay, weakly lime cemented, nonplastic to low plasticity, light grey brown.
			D		CL	Slightly moist	**SANDY CLAY,** trace to gravel, fine sand, weakly to moderately lime cemented, medium plasticity, light olive brown to tan.
15					CL/ SC	Slightly moist	**SANDY CLAY AND CLAYEY SAND,** some fine gravel, fine sand, moderately lime cemented, considerable white carbonate spots, some gypsum, low to medium plasticity, light olive grey.
			D		Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** moderately to highly weathered, moderately soft, thinly bedded, black dendrites on fractures, light grey to yellow.
20							Stopped backhoe at 18.5 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST PIT NO. 95

JOB NO. GRJ-03 DATE 08/23/89

GROUNDWATER	DEPTH	HOUR	DATE
		NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,375.0 E93,697.0
ELEVATION 5,248.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D			Dry	**TOPSOIL: SANDY CLAY,** some gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light to medium orange brown.
					CL		
					ML	Dry	**CLAYEY SILT,** trace to some gravel and cobbles, fine sand, moderately to weakly lime cemented, some roots, calichified, low plasticity, pale brown to beige.
5			D			Dry	**CLAYEY AND SILTY GRAVEL AND COBBLES,** trace to boulders, predominately fine to medium subangular to subrounded gravel, fine to medium sand, moderately lime cemented, low to medium plasticity, light brown to grey brown. **Note:** clay decreasing below 7 feet.
			D		GM/ GC		
10							
			D			Dry	**SANDY GRAVEL, COBBLES AND BOULDERS,** boulders less than 18 inches in diameter, predominately course subrounded gravel and cobbles, fine to medium sand, weakly lime cemented, nonplastic, light brown grey. **Note:** 1 to 1.5 feet thick, light brown sand layers scattered throughout.
15							
					GP		
20							
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/23/89

LOG OF TEST PIT NO. 95

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,375.0 E93,697.0
ELEVATION 5,248.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
			D				
					Sh	Slightly moist	MANCOS FORMATION: CLAYSTONE, highly weathered, moderately soft, thin bedded, some limonite on bedding, light grey and yellow brown.
30							Stopped backhoe at 28.5 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/23/89

LOG OF TEST PIT NO. 96

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,217.0 E93,716.0
ELEVATION 5,248.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: CLAYEY SAND AND SANDY CLAY,** some gravel and cobbles, fine sand, weakly lime cemented, some roots, low to medium plasticity, light orange brown.
			D				
5					GM	Dry	**SILTY GRAVEL, COBBLES AND BOULDERS,** boulders less than 20 inches in diameter, predominately course subrounded gravel and cobbles, fine to medium sand, weakly to moderately lime cemented, trace of clay, calichified, nonplastic, pale brown to pale grey.
			D				
					GM	Dry	**SILTY GRAVEL AND COBBLES,** predominately medium coarse subrounded gravel, fine to medium sand, weakly lime cemented, nonplastic, light brown grey.
10			D		CL	Slightly moist	**SANDY CLAY,** some fine subangular gravel, fine to medium sand, moderately lime cemented, medium plasticity, light olive brown.
					GM	Slightly moist	**SILTY GRAVEL AND COBBLES,** trace of small boulders, considerable fine subrounded gravel, predominately medium gravel, fine to medium sand, weakly to moderately lime cemented, trace of clay, traces of gypsum, nonplastic, light grey brown.
15			D				
			D		SM/ SC	Slightly moist	**SILTY AND CLAYEY SAND,** traces of some gravel, fine sand, weakly to moderately lime cemented, low plasticity, light tan.
20							
			D		CL	Moist	**SANDY CLAY,** fine sand, moderately lime cemented, stiff, spotted with white cabonates, medium plasticity, light olive brown.
25							**Note:** some 1 to 1.5 feet thick gravel and cobble zones.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/23/89

LOG OF TEST PIT NO. 96

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,217.0 E93,716.0
ELEVATION 5,248.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					CL	Moist	**SANDY CLAY,** fine sand, moderately lime cemented, stiff, spotted with white cabonates, medium plasticity, light olive brown.
30			D		GC	Slightly moist	**CLAYEY GRAVEL AND COBBLES,** some boulders, predominately medium to course subrounded gravel and cobbles, fine sand, moderately lime cemented, low to medium plasticity, light olive brown.
			D		Sh	Moist	**MANCOS FORMATION: SHALE,** moderately to highly weathered, moderately soft, thinly bedded, some limonite on bedding, light medium yellow brown.
35							
40							Stopped backhoe at 34 feet, backfilled with spoils.
45							
50							

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/23/89

LOG OF TEST PIT NO. 97

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,056.0 E93,664.0
ELEVATION 5,245.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel, fine sand, weakly lime cemented, some roots, medium plasticity, light orange brown.
					ML	Dry	**CLAYEY SILT,** traces of some gravel, weakly to moderately lime cemented, calichified, low plasticity, pale brown beige.
5			D		GP	Slightly moist	**SANDY GRAVEL AND COBBLES,** predominately fine to medium rounded gravel and fine cobbles, fine to medium sand, weakly lime cemented, considerable gypsum, some limonite, nonplastic, light yellow orange brown.
			D		CL/ SC	Slightly moist	**CLAYEY SAND AND SANDY CLAY,** traces of gravel, fine sand, weakly to moderately lime cemented, low to medium plasticity, light yellow brown.
10			D		GC	Slightly moist	**SILTY AND CLAYEY GRAVEL,** trace of boulders, some cobbles, predominately fine to medium subangular to subrounded gravel, fine sand, traces of gypsum, weakly lime to moderately lime cemented, low plasticity, light yellow brown.
			D				
15					GM	Slightly moist	**SANDY GRAVEL AND COBBLES,** some small boulders, well graded angular sand, well graded subrounded gravel, weakly lime cemented, nonplastic, light grey brown.
20			D		CL	Moist	**SANDY CLAY,** trace to some fine angular gravel, moderately lime cemented, fine sand, some fine pinhole structures some carbonate spotting, medium plasticity, light olive grey mottled with grey. **Note:** bottem 2 feet massive.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 97

JOB NO. GRJ-03 DATE 08/23/89

GROUNDWATER	DEPTH	HOUR	DATE
▽		NONE	
▼			

BACKHOE TYPE KOEHRING 666E
LOCATION N12,056.0 E93,664.0
ELEVATION 5,245.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
		X	D		Sh	Moist	**MANCOS FORMATION: SHALE**, moderately to highly weathered, moderately soft, thinly bedded, some black dendrites, light grey and yellow brown.
30							Stopped backhoe 27.5 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/23/89

LOG OF TEST PIT NO. 98

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,780.0 E92840.0
ELEVATION 5,236.0
DATUM MSL

Depth in Feet	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0	D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel and cobbles, fine sand, weakly lime cemented, some roots, medium plasticity, light orange brown.
			CL	Dry	**SILTY CLAY,** some gravel and cobbles, weakly to moderately lime cemented, calichified, medium plasticity, beige to pale brown.
5	D		SC/ CL	Slightly moist	**CLAYEY SAND AND SANDY CLAY,** some gravel and cobbles, fine sand, weakly to moderately lime cemented, some white carbonate spotting, low to medium plasticity, light brown to tan.
	D		SC/ CL	Slightly moist to moist	**CLAYEY SAND AND SANDY CLAY,** some fine gravel, predominately fine to medium sand, some coarse sand, weakly to moderately lime cemented, low to medium plasticity, light to medium olive brown.
10	D		GM/ GP		
	D		CL	Dry	**SILTY AND SANDY GRAVEL AND COBBLES,** trace small boulders, predominately fine to medium subrounded gravel, fine to coarse sand, weakly lime cemented, nonplastic, light brownish grey.
15				Slightly moist	**SANDY CLAY,** some fine to medium gravel, moderately lime cemented, fine to medium sand, medium plasticity, light olive brown.
			GM/ GP	Slightly moist	**SILTY AND SANDY GRAVEL AND COBBLES,** some small boulders, predominately fine to medium subrounded gravel, fine to medium sand, moderately lime cemented, nonplastic, light grey brown.
20			Sh	Moist	**MANCOS FORMATION: CLAYSTONE,** moderate to highly weathered, moderately soft, thinly bedded, light yellow brown and medium brown.
25					Stopped backhoe at 21 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/24/89

LOG OF TEST PIT NO. 99

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,990.0 E92,863.0
ELEVATION 5,241.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel and cobbles, fine sand, weakly lime cemented, some roots, medium plasticity, light orange brown.
5			D		SC	Slightly moist	**SILTY CLAY,** some gravel and cobbles, weak to moderately lime cemented, fine to medium sand, considerable gypsum, low plasticity, light yellow brown
10			D		GP	Slightly moist	**SANDY GRAVEL,** some small cobbles, trace of boulders, predominately fine to medium subrounded gravel, fine to medium sand, weakly lime cemented, limonitic, nonplastic, light yellow orange brown.
15			D		GP	Dry	**SANDY GRAVEL,** predominately fine to medium subrounded gravel, fine to medium sand, strongly lime cemented, nonplastic, light brownish grey. **Note:** some open work filled with pale tan silt, some manganese oxide on gravels.
20							Stopped backhoe at 18 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/24/89

LOG OF TEST PIT NO. 100

GROUNDWATER		
DEPTH	HOUR	DATE
	None	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,965.0 E92,589.0
ELEVATION 5,236.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel, fine sand, weakly fine cemented, low to medium plasticity, light orange brown.
					ML		
			D		SM	Dry	**CLAYEY SILT,** some gravel and cobbles, weakly to moderately lime cemented, calichified, low plasticity, beige.
5			D		SC	Dry	**SILTY SAND,** trace gravel, fine sand, trace clay, weakly lime cemented, considerable fine gypsum, nonplastic, white pale brown.
			D		GC/ SC	Dry	**CLAYEY SAND,** trace to some gravel, fine to medium sand, weakly to moderately lime cemented, considerable fine gypsum, low plasticity, light yellow brown.
10			D		Sh	Slightly moist	**CLAYEY GRAVEL & COBBLES,** trace to some small boulders, predominately medium subrounded gravel, fine to medium sand, weakly to moderately lime cemented, some gypsum, low to medium plasticity, light pale yellow brown. **Note:** increased sand and decreasing gravel below 10 feet.
15			D			Moist	**MANCOS FORMATION: CLAYSTONE,** moderate to highly weathered, moderately soft, decomposed, thinly bedded, fissle, light yellow brown and medium brown.
20							Stopped backhoe at 14 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST PIT NO. 101

JOB NO. GRJ-03 DATE 08/24/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,820.0 E92,568.0
ELEVATION 5,232.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY**, some gravel, fine sand, weakly cemented, some roots, medium plasticity, light orange brown.
					CL	Dry	**SILTY CLAY**, some gravel, weak to moderately lime cemented, calcified, low to medium plasticity, beige.
			D		SM	Dry	**SILTY SAND**, trace of gravel, fine sand, weakly cemented, considerable fine gypsum, nonplastic, pale yellowish brown to tan.
5			D		SC/ CL	Slightly Moist	**CLAYEY SAND AND SANDY CLAY**, trace of gravel, fine to medium sand, some coarse sand, considerable coarse gypsum, weak to moderately cemented, low to medium plasticity, light to medium olive brown.
10			D		SC/ GC	Moist	**CLAYEY SAND AND CLAYEY GRAVEL WITH COBBLES**, trace of small boulders, predominately fine to medium subrounded gravel, fine sand, moderately lime cemented, alternating layers of sandy clay and clayey gravel, low plasticity, mottled light grey and yellowish brown.
15			D		GM	Dry	**SILTY GRAVEL AND COBBLES**, trace of boulders, predominately fine to medium subangular to subrounded gravel, trace to some fine sand, strongly lime cemented, nonplastic, light brown to grey.
20							Backhoe refusal at 15.5 feet on strongly cemented gravel, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/24/89

LOG OF TEST PIT NO. 102

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,678.0 E92,558.0
ELEVATION 5,228.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel and cobbles, fine sand, weakly lime cemented, roots, low to medium plasticity, light orange brown.
			D				
					CL	Dry	**SILTY CLAY,** some gravel, some fine sand, weak to moderately lime cemented, calcified, medium plasticity, beige to pale brown.
5							
			D		CL/ SC	Slightly moist	**SANDY CLAY AND CLAYEY SAND,** some to considerably fine subangular gravel, fine to medium sand, weak to moderately lime cemented, considerable coarse gypsum and white carbonate spotting, low to medium plasticity, medium brown to medium olive brown.
			D				
10			D				
					GM	Slightly moist	**SILTY GRAVEL,** some cobbles, predominantly very fine subrounded gravel and very coarse sand, weakly cemented, nonplastic, light yellowish brown to light brown.
					GM	Dry	**SILTY GRAVEL,** some cobbles and boulders, boulders less than 20 inches in diameter, predominantly coarse subrounded gravel and cobbles, fine to medium sand, weakly cemented, nonplastic, light yellowish brown to brownish grey.
15					GM		
			D			Dry	**SILTY GRAVEL,** predominantly fine to medium subrounded gravel, fine to medium sand, moderately lime cemented, nonplastic, light brownish grey.
					GM		
			D				
20					Sh	Dry	**SILTY GRAVEL,** trace to some cobbles, predominantly fine to medium subrounded to subangular gravel, fine to medium sand, strongly lime cemented, nonplastic, light brownish grey.
						Slightly moist	**MANCOS FORMATION: CLAYSTONE,** high to moderately weathered, moderately soft, thinly bedded, medium greyish brown.
25							Stopped Backhoe at 20 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/24/89

LOG OF TEST PIT NO. 103

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,819.0 E92,290.0
ELEVATION 5,227.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel, fine sand, weakly lime cemented, roots, low to medium plasticity, light orange brown.
					CL		
			D			Dry	**SILTY CLAY,** some gravel, weak to moderately lime cemented, calcified, low to medium plasticity, beige.
					SM		
5			D			Dry	**SILTY SAND,** trace to some gravel and cobbles, fine to medium angular sand, weak to moderately cemented, considerable gypsum, nonplastic, light pale grey.
					SC/ CL		
			D			Slightly Moist	**CLAYEY SAND AND SANDY CLAY,** some boulders, considerably fine to coarse subrounded gravel and cobbles, fine to medium sand, moderately lime cemented, considerable gypsum, some limonite, low to medium plasticity, light yellowish brown to brown.
					GW		
10			D		Sh		
						Dry	**SANDY GRAVEL AND COBBLES,** some boulders less than 13 inches, well graded subrounded gravel and cobbles, fine to medium sand, trace to some silt, weak to moderately lime cemented, limonite, nonplastic, light yellowish grey.
15						Moist	**MANCOS FORMATION: CLAYSTONE,** high to moderately weathered, moderately soft, thin bedded, light grey, yellowish brown and brown.
20							Stopped Backhoe at 11 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/24/89

LOG OF TEST PIT NO. 104

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,954.0 E92,301.0
ELEVATION 5,231.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content or Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel, fine sand, roots, weakly cemented, low to medium plasticity, light orange brown.
					ML		
			D		SM/ SC	Dry	**CLAYEY SILT,** some gravel, roots, calcified, weak to moderately lime cemented, low plasticity, beige.
5						Dry	**SILTY CLAYEY SAND,** fine to medium sand, weakly lime cemented, considerable gypsum, loose, low plasticity, pale tan.
			D		SC/ CL	Slightly Moist	**CLAYEY SAND AND SANDY CLAY,** some coarse gravel, fine to coarse angular sand, weak to moderately cemented, considerable gypsum and limonite, low to medium plasticity, mottled light grey, brown and orange.
			D		GP		
			D		GW		
10			D		GW	Dry	**SANDY GRAVEL,** some cobbles, predominantly fine to medium subrounded gravel, fine to medium sand, weak to moderately lime and limonite cemented, nonplastic, light brownish grey and orange.
			D		Sh		
15						Dry	**SANDY GRAVEL AND COBBLES,** some small boulders, fine to coarse subrounded gravel, fine to medium sand, trace to some silt, moderately lime cemented, nonplastic, pale yellowish grey. **Note:** coarse gravels and slightly more cemented 10 to 12 feet.
20						Moist	**MANCOS FORMATION: CLAYSTONE,** moderately weathered, moderately soft, thin bedded, considerable black dendrites, grey, black and brown.
25							Stopped Backhoe at 13.5 Feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/25/89

LOG OF TEST PIT NO. 105

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,804.0 E93,575.0
ELEVATION 5,228.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel and cobbles, fine sand, weakly lime cemented, medium plasticity, light orange brown.
			D		ML	Dry	**CLAYEY SILT,** some boulders, considerabe fine to coarse angular to subrounded gravel and cobbles, some fine sand, weak to moderately lime cemented, calcified, low plasticity, beige.
5			D		GP	Slightly moist	**SANDY GRAVEL AND COBBLES,** trace of boulders, predominantly medium to coarse subrounded gravel, fine to medium sand, some gypsum, weakly cemented, light olive grey. **Note:** decrease in gravel size from 8 to 10 feet.
10			D		SM/ SC	Slightly moist	**SILTY AND CLAYEY SAND,** interbedded with fine sand layers, weakly lime cemented, nonplastic to low plasticity, light tan. **Note:** thin layers of course angular to subrounded sand from 17 to 18 feet. **Note:** course subrounded gravel and cobbles from 19.5 to 20.5 feet.
15			D				
20			D				
			D		CL	Moist	**SANDY CLAY,** traces of gravel, fine to medium sand, moderately lime cemented, traces of limonite, some carbonate spotting, light olive brown to yellowish brown.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/25/89

LOG OF TEST PIT NO. 105

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,804.0 E93,575.0
ELEVATION 5,228.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
			D				
					SC/ SM	Slightly moist	**CLAYEY AND SILTY SAND,** fine sand, weak to moderately cemented, limonitic, low plasticity, light yellowish orange and grey mottled.
30							
			D		CL	Moist	**SANDY CLAY,** trace to some fine gravel, moderately cemented with some strongly cemented zones, medium plasticity, mottled light grey and orange brown. **Note:** numerous pinhole voids.
35							Stopped Backhoe at 32.5 feet, backfilled with spoils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/25/89

LOG OF TEST PIT NO. 106

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,353.0 E91,760.0
ELEVATION 5,184.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** trace of gravel, fine sand, weakly cemented, medium plasticity, roots, light orange brown.
					ML		
			D			Dry	**CLAYEY SILT,** some fine gravel, weak to moderately lime cemented, calcified, low plasticity, beige.
					SC		
5			D			Dry	**CLAYEY SAND,** fine sand, weak to moderately lime cemented, low to medium plasticity, pale orange brown.
					SC		
			D			Dry	**CLAYEY SAND,** trace to some gravel, weak to moderately gypsum cemented, low plasticity, light olive brown to tan.
					SM		
10			D			Dry	**SILTY SAND,** some cobbles and boulders less than 15 inches in diameter, considerable fine to coarse gravel, moderately gypsum cemented, some clay, considerable gypsum, low plasticity, tan to light olive grey.
					CL		
			D			Slightly moist	**SANDY CLAY,** considerable gravel and cobbles, fine sand, moderately lime cemented, pinhole voids in clay, low plasticity, brown.
					SM/ SC		
15			D			Dry	**SILTY AND CLAYEY SAND,** some thin fine gravel layers, weakly lime cemented, nonplastic, light tan.
					GM		
20						Dry	**SILTY GRAVEL,** some coarse gravel and fine cobbles, predominantly fine subrounded gravel, some fine sand, strongly lime cemented, pale grey.
25							Backhoe refused at 17 feet on strongly cemented gravel and cobbles, backfilled with spoils.

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/25/89

LOG OF TEST PIT NO. 107

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,718.0 E91,971.0
ELEVATION 5,202.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel and cobbles, fine sand, weakly lime cemented, roots, low to medium plasticity, light orange brown.
					GM/ GC	Dry	**SILTY AND CLAYEY GRAVEL AND COBBLES,** traces of boulders, medium to coarse subrounded gravel and cobbles, fine sand, weak to moderately lime cemented, calcified, nonplastic to low plasticity, beige to pale brown.
5			D				
10					GP	Dry	**SANDY GRAVEL AND COBBLES,** some boulders, predominantly medium to coarse subrounded gravel and cobbles, fine to medium sand, trace of gypsum, weakly lime cemented, nonplastic, light greyish brown to tan.
15			D		SM/ SC	Slightly moist	**SILTY AND CLAYEY SAND,** fine sand, stratified sandy clay layers, weak to moderately lime cemented, low plasticity, light olive brown to tan.
20			D		GC/ GM	Dry	**SILTY AND CLAYEY GRAVEL, COBBLES, AND BOULDERS,** boulders 2 to 3 feet in diameter, predominantly medium to coarse subrounded gravel and cobbles, fine sand, moderately lime cemented, low plasticity, light olive brown to tan.
			D		GM	Dry	**SILTY GRAVEL,** predominantly fine subrounded gravel, strongly lime cemented, some silt and clay infilling, limonite and magnesium oxide coating in voids, nonplastic, light grey.
			D				
25					CL/ CH	Moist	**CLAY,** trace to some fine gravel, some calcareous fragments, some pinhole structures, moderately lime

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/25/89

LOG OF TEST PIT NO. 107

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,718.0 E91,971.0
ELEVATION 5,202.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							cemented, very stiff, medium to high plasticity, light to medium brown to light brown with depth.
		X	D		Sh	Slightly moist	MANCOS FORMATION: CLAYSTONE, highly weathered, moderately soft to soft, very thinly bedded, fissile, pale yellow and greyish brown.
30							Stopped backhoe at 28 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/28/89

LOG OF TEST PIT NO. 108

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,034.0 E91,814.0
ELEVATION 5,201.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL/ SC	Dry	**TOPSOIL: SANDY CLAY AND CLAYEY SAND,** trace of gravel, fine sand, weakly lime cemented, roots, low to medium plasticity, light orange brown.
			D				
					CL	Dry	**SANDY CLAY,** some 2 foot diameter boulders, fine sand, weak to moderately lime cemented, roots, medium plasticity, light brown.
5			D		GP/ SP	Dry	**GRAVELLY SAND,** some coarse gravel and cobbles, considerably fine to medium subangular and subrounded gravel, fine sand, trace of clay, moderately gypsum cemented, considerable gypsum, nonplastic, light brown.
			D		GP	Dry	**SANDY GRAVEL AND COBBLES,** predominantly medium to coarse subrounded gravel, some fine gravel, fine to medium sand, weak to moderately cemented, some to considerable gypsum, nonplastic, light grey brown.
10			D		GP/ CL		**Note:** some coarse cobbles and boulders from 9 to 11 feet.
15			D			Dry	**SANDY GRAVEL AND CLAY,** stratified, some cobbles and boulders, predominantly sandy gravel with interbeds of medium plastic clay, fine to medium subrounded gravel with medium sand, moderately lime cemented with some strongly cemented local zones, nonplastic, light reddish orange.
			D		CL	Moist	**SANDY CLAY,** trace of gravel, fine sand, moderately lime cemented, stiff, medium plasticity, light grey brown.
20			D		Sh		**Note:** changes to olive grey below 16 feet.
						Slightly Moist	**MANCOS FORMATION: CLAYSTONE,** moderately weathered, moderately soft, thinly bedded, some limonite and black dendrites, medium plasticity, light to pale olive grey.
25							Stopped Backhoe at 20 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/28/89

LOG OF TEST PIT NO. 109

GROUNDWATER

DEPTH	HOUR	DATE
28.0		08/31/89

BACKHOE TYPE KOEHRING 666E
LOCATION N11,325.0 E91,990.0
ELEVATION 5,221.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0		X	D		SC	Dry	**TOPSOIL: CLAYEY SAND,** some subrounded gravels to 2 inches in diameter, fine sand, sulfates, roots, medium plasticity, reddish brown.
		X	D		SC	Dry	**SANDY CLAYS,** some gravel to 2 inch diameter, subrounded, fine sand, sulfate strings, some roots, medium plasticity, reddish brown.
5		X	D		CL		
		X	D		CL	Slightly moist	**CLAY,** occasional gravel less than 3/4 inch diameter, some sand, considerable gypsum, moderately stiff, medium plasticity, light brown to olive.
10		X	D				
15		X	D				**Note:** gravel content increasing 14 to 19 feet with some subrounded cobbles less than 18 inch diameter, stratified clay lenses with considerable gypsum.
20		X	D		CL	Slightly moist	**CLAY,** medium plasticity, some gypsum, grey.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/28/89

LOG OF TEST PIT NO. 109

GROUNDWATER

DEPTH	HOUR	DATE
28.0		08/31/89

BACKHOE TYPE KOEHRING 666E
LOCATION N11,325.0 E91,990.0
ELEVATION 5,221.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
			D			Moist	**MANCOS FORMATION: SHALE,** moderately weathered, some sulfates, very hard, medium plasticity good bedding structure, grey.
					Sh		
30							Stopped drilling at 28 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/29/89

LOG OF TEST PIT NO. 110

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,695.0 E91,827.0
ELEVATION 5,204.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0		X	D		SC/ CL	Moist	**TOPSOIL: SANDY CLAY,** some gravel to 3 inches, subrounded, fine sand, sulfates, some roots, medium plasticity, reddish orange.
		X	D		GP/ SM	Slightly moist	**GRAVEL,** poorly graded, subrounded, less then 8 inch diameter, silty sand filling, moderately dense, trace sulfates, low to medium plasticity, tan to brown.
5							
10		X	D		GP/ SC	Slightly moist	**SILTY GRAVEL,** boulders 18 to 36 inch diameter, moderately dense gravel,considerable clay, sulfates, some weak line cementation, white gypsum, medium plasticity, brownish grey.
15							
20		X	D		CL	Moist	**CLAY,** very stiff, some sulfates, medium plasticity, olive green.
25		X	D		Sh		

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/29/89

LOG OF TEST PIT NO. 110

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,695.0 E91,827.0
ELEVATION 5,204.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							MANCOS FORMATION: SHALE, highly weathered, medium plasticity, some sulfates, highly fractured, laminated light grey to yellowish brown.
30							Stopped Backhoe at 26 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 111

JOB NO. GRJ-03 DATE 08/29/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,932.0 E92,056.0
ELEVATION 5,211.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL/ SC	Moist	**TOPSOIL: SANDY CLAY,** some gravel about 6 inch diameter, fine sand, white gypsum fragments, some caliche, medium density, some roots, medium plasticity, reddish brown.
					GP/ SM		
			D			Moist	**GRAVEL,** poorly graded, occassional boulders to 24 inch diameter, subangular to subrounded gravels, some basalt gravels with secondary alteration present, silty sand to silty clay filling, some lime cementation, low plasticity to nonplastic, olive green. **Note:** smaller boulders and more clay at top of unit.
			D				
5							
			D				**CLAYEY GRAVEL,** occassional boulder to 18 inch diameter, subrounded, gypsum and sulfates in clay, considerable lime cementation, moderate to high plasticity, light brown to tan. **Note:** boulders at 14 and +/- 30 feet.
10					GC	Moist	
15							
			D				**CLAY,** some silt, some sulfates, very stiff, medium to high plasticity, olive.
					CL	Moist	
20							
25			D		Sh	Moist	**MANCOS FORMATION: SHALE,**

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/29/89

LOG OF TEST PIT NO. 111

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,932.0 E92,056.0
ELEVATION 5,211.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
					Sh		**MANCOS FORMATION: SHALE**, weathered, siltstone layering, moderately hard, some gypsum white, olive green.
30							Stopped backhoe at 27 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/29/89

LOG OF TEST PIT NO. 112

GROUNDWATER		
DEPTH	HOUR	DATE

BACKHOE TYPE KOEHRING 666E
LOCATION N12,218.0 E91,819.0
ELEVATION 5,210.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SC/ SM	Moist	**TOPSOIL: SANDY CLAY,** some subrounded gravels and cobbles to 6 inch diameter, some sulfate stainings, loose, some root zones, medium to low plasticity, reddish brown.
			D				
5					GM/ SM	Moist	**SILTY GRAVEL,** some boulders, poorly graded subrounded gravel and cobbles to 6 inch diameter, high sulfate content, fine grained sands intermixed with silts, medium to low plasticity, moderately dense, tan to olive green with white gypsum crystals.
10							
			D				
15					GC	Moist	**GRAVELLY CLAY,** some small subrounded boulders to 18 inch diameter, some cemention of the gravels, sulfate crystals, moderately dense, some white gypsum present, medium to highly plastic, tan to brown.
			D				
20					CL	Moist	**CLAY,** trace fine grained sands, some white gypsum, alteration, stiff, medium to high plasticity, brown.
			D		Sh	Moist	**MANCOS SHALE,** highly weathered, thinly bedded, considerable secondary alteration, medium to highly plasticity, tan to olive green.
25			D				Stopped backhoe at 26 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/30/89

LOG OF TEST PIT NO. 113

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,878.0 E91,861.0
ELEVATION 5,220.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		SM/ SC	Moist	**TOPSOIL: SILTY SAND,** some well rounded gravels, fine grain sands, some clay, white gypsum, deposits, sulfates, some roots, low to medium plasticity, reddish brown.
5			D		GP/ SM	Moist	**GRAVELS,** poorly graded to 8 inch diameter, considerable medium sand, subrounded, some silt, considerable gypsum and sulfate crystals, medium density, low plasticity, tan to olive green.
10			D		CL	Moist	**CLAY,** some sands, considerable gypsum crystals, some lime cemetation, very stiff, rootlets, medium to highly plastic, brown.
15			D		GP/ GM	Moist	**GRAVELS,** poorly graded, some small subrounded boulders to 18 inch diameter, silty sand and silt matrix, some gypsum crystals, low plasticity, tan to light brown. **Note:** clay and gypsum content increasing with depth.
20			D		Sh	Moist	**MANCOS SHALE,** highly weathered, soft to moderately hard, iron staining in fractures, some sulfates, medium plasticity, olive green.
25							Stopped backhoe at 23 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/31/89

LOG OF TEST PIT NO. 114

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,595.0 E92,097.0
ELEVATION 5,221.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content of Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SC/ SM	Dry	**TOPSOIL: SILTY SAND,** occassional medium subrounded gravels, predominantly fine sand, some clay, root zone, low to medium plasticity, reddish brown.
			D		CL		
						Dry	**CLAY,** trace cobbles to 1/2 inch diameter, some fine grain sand, lime and gypsum cementation, root zone, medium plasticity, buff.
5			D		SM/ SC		
			D			Moist	**SILTY CLAYEY SAND,** trace gravel, fine grained sand, some gypsum crystals, low plasticity, olive green.
			D				
					CL	Moist	**CLAY,** trace gravel, some fine grain sand, considerable gypsum crystals, medium plasticity, brown.
10							
			D		GC	Moist	**CLAYEY GRAVEL,** occasional boulder to 3 foot diameter, poorly graded subrounded gravel, clay matrix, very dense, slightly cemented, medium plasticity, gray to tan.
15							
					CL	Moist	**CLAY,** some subrounded gravel, trace sand, moderately firm, medium plasticity, light brown.
20			D		Sh	Moist	**MANCOS FORMATION: SHALE,** moderately to highly weathered, moderately hard to hard, bedded, some secondary alteration, olive green.
25							Stopped drilling at 22 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/31/89

LOG OF TEST PIT NO. 115

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N13,139.0 E92,130.0
ELEVATION 5,227.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0		X	D		CL	Moist	**TOPSOIL: SILTY CLAY,** some fine sand, medium plasticity, sulfates and gypsum, root zone, loose, reddish brown.
		X	D		GC	Moist	**CLAYEY GRAVEL,** poorly graded, subrounded gravel, some fine sand, medium plasticity, reddish orange.
5		X	D				**GRAVEL,** poorly graded subrounded gravels, occasional boulders to 30 inch diameter, some fine sand, some silt, low to medium plasticity, brown. **Note:** cementated layers 8 to 18 feet.
					GP	Moist	
10							
15							
		X	D		Sh	Moist	**MANCOS FORMATION: SHALE,** highly weathered, moderately soft, bedded, secondary altrerations in fractures, moderately plastic, black, grey to rust.
20							Stopped backhoe at 20 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 116

JOB NO. GRJ-03 DATE 09/01/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,775.0 E93,836.0
ELEVATION 5,210.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		SM/ SC	Moist	**TOPSOIL: SILTY TO CLAYEY SAND,** some subrounded gravels to 2 inches, fine grained sand, root zone, low to medium plasticity, medium to low density, reddish brown.
			D		SM/ SC		
5						Moist	**SILTY CLAYEY SANDS,** considerable subrounded gravel and cobbles less than 8 inch in diameter, some lime cementation, moderately plastic, tan to light brown.
			D		GM	Slightly moist	**SILTY GRAVEL,** occasional boulders to 16 inch diameter, subrounded to rounded, predominately well graded, some sand, some gypsiferous void filling, weakly lime cemented, very dense, low plasticity to nonplastic, brown.
10			D		SM	Slightly moist	**SILTY SAND,** some fine gravel, medium to fine grained sand, subangular to rounded, weakly lime cemented, firm, nonplastic, light brown to tan.
					GM/ GP		
15			D			Slightly moist	**SILTY GRAVEL,** cobbles and boulders to 20 inch in diameter, subrounded to rounded, considerable sand, predominately well graded, weak to moderate lime cementation, very dense, nonplastic, brown.
					GM/ GP	Slightly moist	**SANDY GRAVEL,** cobbles and boulders to 3 foot diameter, subrounded to rounded, gap graded with large boulders surrounded by matrix of coarse gravel and cobbles, some silt, strongly lime cemented, hard, nonplastic, brown to grey brown.
20			D				
					GC	Slightly moist	**CLAYEY GRAVEL,** cobbles and boulders to 18 inch in diameter, subrounded to rounded, some poorly graded fine sand, very dense, low plasticity, yellow brown.
25					GP		

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/01/89

LOG OF TEST PIT NO. 116

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,775.0 E93,836.0
ELEVATION 5,210.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
			D				
					GP	Moist to very moist	**SANDY GRAVEL,** some cobbles and boulders to 14 inch diameter, subrounded, some clay, low plasticity, very dense to dense, brown. **Note:** boulders increase below 25 feet.
30							
					Sh	Moist	**MANCOS SHALE: SILTY CLAYSTONE,** highly weathered, thinly bedded, soft to very soft, iron and manganese staining in fractures, brown to olive green.
35							
40							Stopped backhoe at 36 feet, backfilled with spoils.
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 117

JOB NO. GRJ-03 DATE 09/11/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,770.0 E93,950.0
ELEVATION 5,213.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 5 inches, some sand and gravel, medium dense to dense, slightly lime cemented below 1 foot, low plasticity, reddish brown.
5			D		GM		**SILTY GRAVEL,** some boulders to 28 inch diameter, considerable sand and cobbles, well graded, subrounded to rounded, very dense, slightly to moderately lime cemented, high gypsum content, low plasticity to nonplastic, yellow brown.
					GM/ GP		**SILTY GRAVEL,** boulders, cobbles and gravel to 30 inches, considerable sand, predominately well graded, subrounded to rounded, very dense, nonplastic, light brown.
10			D				**Note:** some gypsum crystals from 6 to 8 feet, becomming less sandy, boulder content and size decreasing below 12 feet.
15			D				**Note:** strong silica cemented zone 20 to 24 feet.
					GM	Slightly moist	
20			D				
25			D				
					Sh		

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/11/89

LOG OF TEST PIT NO. 117

BACKHOE TYPE KOEHRING 666E
LOCATION N10,770.0 E93,950.0
ELEVATION 5,213.0
DATUM MSL

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
						Slightly moist to moist	MANCOS FORMATION SHALE: SILTY CLAYSTONE, highly weathered, thinly laminated, closely fractured, very soft, olive grey.
30							Stopped backhoe at 26 feet, backfilled with spoils,
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/11/89

LOG OF TEST PIT NO. 118

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,771.0 E93,998.0
ELEVATION 5,236.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** gravel and cobbles, some sand, medium density to dense, slightly lime cemented below 1 foot, low plasticity, reddish brown to tan.
5					GM/ GC	Slightly moist	**SILTY TO CLAYEY GRAVEL,** some cobbles and boulders to 18 inch diameter, considerable sand, predominately well graded, subrounded to rounded, highly gypsiferous, low plasticity to nonplastic, yellow brown. **Note:** plasticity decreasing with depth.
					SC	Slightly moist	**CLAYEY SAND,** some fine gravel, subangular to subrounded, very dense, moderately lime cemented, low plasticity, tan. **Note:** some iron staining.
10					GM	Slightly moist	**SILTY GRAVEL,** some boulders to 24 inch diameter, considerable sand and cobbles, predominately well graded, subrounded to rounded, very dense, nonplastic, tan. **Note:** some thin sand lenses throughout.
15					GM	Slightly moist	**SILTY GRAVEL,** cobbles and boulders to 32 inch diameter, some sand, poorly graded, very dense, nonplastic, tan. **Note:** strong silica cemention below 21 feet.
20							
25							Stopped backhoe at 22 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/12/89

LOG OF TEST PIT NO. 119

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,743.0 E94,075.0
ELEVATION 5,237.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D				
					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** some sand, gravel and cobbles, medium dense to dense, slightly lime cemented below 1 foot, low plasticity, reddish brown to tan.
5			D		GM	Slightly moist	**SILTY GRAVEL,** some cobbles and boulders to 20 inch diameter, considerable sand, predominately well graded, subrounded to rounded, abundunt fibrous gypsum, nonplastic, very dense, yellow to orange brown.
10			D				**SILTY GRAVEL,** cobbles and boulders to 36 inch diameter, considerable sand, predominately well graded, subrounded to rounded, very dense, nonplastic, tan.
15					GM	Slightly moist	**Note:** thin sandy lenses below 15 feet.
20			D				**Note:** strong silica cemention below 21 feet.
25							Stopped backhoe at 22 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 120

JOB NO. GRJ-03 DATE 09/13/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,795.0 E94,103.0
ELEVATION 5,238.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 5 inch diameter, some sand and gravel, medium dense, slightly to moderately lime cemented, low plasticity, reddish brown.
5			D		GC	Slightly moist	**CLAYEY GRAVEL,** some cobbles and boulders to 16 inch diameter, some to considerable sand, predominately well graded, subrounded, slightly cemented, moderately to strongly gypsiferous, very dense, low plasticity, light brown. **Note:** plasticity decreases with depth.
10					GM	Slightly moist	**SILTY GRAVEL,** some to considerable cobbles and boulders to 24 inch diameter, some sand, poorly graded, very dense, nonplastic, tan.
					SC	Slightly moist	**SILTY CLAYEY SAND,** trace of fine gravel, predominately fine grained sand, medium dense, slightly cemented, low plasticity, tan to light yellow brown. **Note:** layer thining to about 1/2 foot at south end of pit.
15 20					GM	Slightly moist	**SILTY GRAVEL,** boulders and cobbles to 30 inch diameter, considerable sand, predominately well graded, subrounded, nonplastic, light orange brown. **Note:** strongly silica cemented below 21 feet.
25							Stopped backhoe at 22 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/12/89

LOG OF TEST PIT NO. 121

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,770.0 E94,180.0
ELEVATION 5,218.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D				
					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 5 inch diameter, some sand and gravel, medium dense, moderately lime cemented below 1 foot, low plasticity to nonplastic, reddish brown to tan.
					GM	Slightly moist	**SILTY GRAVEL,** some boulders and cobbles to 23 inch diameter, considerable sand, predominately well graded, subrounded, very dense, abundant gypsum deposits, low plasticity to nonplastic, orange brown. **Note:** large aggregates very brittle.
5							
			D		SM		
			D			Slightly moist	**SILTY SAND,** trace of fine gravel, fine to medium and subangular to subrounded, slightly lime cemented, yellow brown, irregular bedding layers of poorly graded gravel with occasional cobbles, boulders, some fine sand, rounded, dense to very dense, nonplastic, yellow brown.
10							
					GM		**SILTY GRAVEL,** some boulders and cobbles to 24 inch diameter, considerable sand, predominately well graded, rounded to subrounded, very dense, nonplastic, light brown. **Note:** some thin sand lenses throughout. **Note:** Strong silica cemention below 23 feet.
15							
20							
25					Sh		**MANCOS FORMATION: SILTY CLAYSTONE,**

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/12/89

LOG OF TEST PIT NO. 121

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,770.0 E94,180.0
ELEVATION 5,218.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
						Slightly moist	MANCOS FORMATION: SILTY CLAYSTONE, highly weathered, thinly laminated, closely fractured, some iron staining in interbeds, some fossil, very soft, olive grey.
30							Stopped backhoe at 26 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/07/89

LOG OF TEST PIT NO. 122

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,079.0 E93,317.0
ELEVATION 5,239.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 6 inch diameter, some sand and gravel, considerable silt, medium dense, low plasticity, reddish brown.
					GC		
5					GC	Slightly moist	**CLAYEY GRAVEL,** some boulders and cobbles to 14 inch diameter, some poorly graded sand, subangular to rounded, slightly lime cemented, dense to very dense, low plasticity, light reddish brown to light tan.
10					SC	Slightly moist	**CLAYEY GRAVEL,** boulders and cobbles to 20 inch diaimeter, some to considerable sand, predominantly well graded, subangular to subrounded, some interbedded gypsum crystals, slightly lime cemented, very dense, low plasticity, brown to grey.
						Slightly moist	**CLAYEY SAND,** trace of fine gravel, subangular to subrounded, fine to medium grained sand, slightly lime or gypsum cemented, medium dense, light greyish green.
15					GC	Slightly moist	**CLAYEY GRAVEL,** some boulders and cobbles to 30 inch diameter, considerable sand, predominantly well graded, subrounded, slightly lime cemented, very dense, low plasticity, tan.
20					CL	Slightly moist to moist	**SILTY CLAY,** some fine gravel, some sand, occasional gypsum crystals, very stiff, medium plasticity, olive grey. Note: residual claystone.
25					Sh	Slightly moist to moist	**MANCOS FORMATION: SILTY CLAYSTONE,** moderate to highly weathered, thinly laminated to thinly bedded, moderate to highly fractured, occasional gypsum crystals, occasional pelecypod fossils, very dense, greenish grey. Stopped Backhoe at 26 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/06/89

LOG OF TEST PIT NO. 123

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,064.0 E93,038.0
ELEVATION 5,232.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** some sand and gravel, some small roots, low to medium plasticity, moderately stiff, reddish brown.
			D		CL		
						Slightly moist	**SILTY CLAY,** some gravel, some sand, slightly lime cemented, moderately stiff to stiff, low to medium plasticity, light tan.
			D		GC		
5						Slightly moist	**CLAYEY GRAVEL,** poorly graded, some boulders to 14 inch diameter, subangular to subrounded, lime cement coats gravel, very dense, low plasticity, light tan.
			D				
10					GM	Slightly moist	**SILTY GRAVEL,** some cobbles and boulders to 30 inch diameter, predominantly well graded, subrounded, thin gypsiferous lenses and interspersed crystals, very dense, low plastic to nonplastic, light brown. **Note:** cobble and boulder content and size increasing from 10.5 to 14 feet.
15					GC	Slightly moist to moist	**CLAYEY GRAVEL,** occasional small boulders, some cobbles to 10 inch diameter, subrounded to rounded, some sand, poorly graded, very stiff to hard, medium plasticity, light olive grey. **Note:** cobble content decreasing with depth.
20							
					Sh		**MANCOS FORMATION: SILTY CLAYSTONE,** moderate to highly weathered, highly fractured, moderately soft to soft, light grey to olive grey.
25							Stopped Backhoe at 25 feet, backfilled with spoils.

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/06/89

LOG OF TEST PIT NO. 124

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,266.0 E92,777.0
ELEVATION 5,229.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** trace of gravel and cobbles, some sand, some small roots, stiff to very stiff, low to medium plasticity, reddish brown.
			D		CL	Slightly moist	**SILTY CLAY,** some sand and gravel, considerable lime, small uniformly dispersed gypsum crystals, stiff to very stiff, low plasticity, tan.
5					GM	Slightly moist	**SILTY GRAVEL,** some boulders and cobbles to 30 inch diameter, considerable sand, predominantly well graded, subrounded to rounded, some lime cemented lenses, abundant gypsum filled voids, very dense, nonplastic, light brown to light grey. **Note:** gypsum content decreases with depth **Note:** considerable boulders 9 to 12 feet.
10							
15					GC	Slightly moist	**CLAYEY GRAVEL,** some small boulders and cobbles to 16 inch diameter, some to considerable sand, predominantly well graded, subrounded, trace of gypsum, very dense, low plasticity, tan to yellow.
20					CL	Slightly moist to moist	**SILTY CLAY,** some sand and fine gravel, stratified layers, some lime concentrated along bedding planes, stiff, medium plasticity, light greenish brown. **Note:** residual claystone.
					Sh	Slightly moist to moist	**MANCOS FORMATION: SILTY CLAYSTONE,** highly weathered, highly fractured, thinly laminated, soft, small amount of ferrous oxide and magnesium oxide staining on bedding and fractures, greenish grey.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST PIT NO. 124

JOB NO. GRJ-03 DATE 09/06/89

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,266.0 E92,777.0
ELEVATION 5,229.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							Stopped Backhoe at 24.5 feet, backfilled with spoils.
30							
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/06/89

LOG OF TEST PIT NO. 125

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,209.0 E92,433.0
ELEVATION 5,223.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** trace fine gravel, some fine sand, hard, some small roots, low plasticity, reddish brown. **Note:** becomes progressively lime rich until pale pink color change at 3 feet.
			D		CL		
5			D		GC	Slightly moist	**SILTY CLAY,** some fine subrounded gravel, considerable lime cement, abundant small fibrous gypsum crystals uniformly distributed throughout, moderately stiff to stiff, low to medium plasticity, light yellowish brown to pink.
10						Slightly moist	**CLAYEY GRAVEL,** some cobbles to 6 inch diameter, some sand, subrounded, poorly graded, uniformly distributed sulfate crystals abundant, moderately lime cemented lenses, some iron oxide staining, dense to very dense, low plasticity, yellowish brown.
15					GC	Slightly moist	**CLAYEY GRAVEL,** some boulders to 30 inch diameter, some to considerable sand, subrounded, some gypsiferous void filling in upper part of strata, iron oxide stained, very dense, yellow to orange brown. **Note:** boulder size decreasing to 12 inch diameter below 12 feet, occasional boulders to 20 inch diameter below 16 feet.
20					CL	Moist	**SILTY CLAY,** some sand, lime present in irregular nodules, thin bedded structures in some layers, medium to high plasticity, brown. **Note:** residual claystone.
25					Sh		**MANCOS FORMATION: SILTY CLAYSTONE,** moderate to highly weathered, thinly laminated,

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/06/89

LOG OF TEST PIT NO. 125

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,209.0 E92,433.0
ELEVATION 5,223.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
						Damp	highly fractured, moderately soft to soft, some dendritic maganese oxide staining along fractures and bedding, greenish grey.
30							Stopped backhoe at 25.5 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/07/89

LOG OF TEST PIT NO. 126

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,866.0 E92,723.0
ELEVATION 5,223.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** some cobbles, gravel and sand, medium dense, low plasticity, reddish brown.
			D				
					GC	Slightly moist	**CLAYEY GRAVEL,** some boulders and cobbles to 14 inch diameter, some sand, poorly graded, rounded, slightly to moderately lime cemented, lime coated aggregates, very dense to dense, low plasticity, light orange to light tan.
5							
			D		GM	Slightly moist	**SILTY GRAVEL,** some to considerable boulders and cobbles to 20 inch diameter, some sand, predominantly well graded, subrounded to rounded, very dense, low to nonplastic, tan to grey.
10							
15							**CLAY,** some sand, hard, manganese oxide staining on fractures, medium to high plasticity, brown. Note: remnant bedding below 20 feet.
			D		CL/ CH	Slightly moist to moist	
20							
					Sh	Slightly moist to moist	**MANCOS FORMATION: SILTY CLAYSTONE,** highly weathered, highly fractured, thinly laminated, slightly manganese oxide stained, moderately soft, greenish grey.
25							Stopped backhoe at 22 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 127

JOB NO. GRJ-03 DATE 09/07/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,591.0 E92,455.0
ELEVATION 5,215.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** some sand and gravel, lime content increases with depth, slightly to moderately cemented below 3 feet, stiff to hard, low plasticity, reddish brown to light tan.
			D				
5							**CLAYEY GRAVEL,** some to considerable boulders and cobbles to 20 inch diameter, some sand, poorly graded, subrounded to rounded, very dense, moderately gypsiferous, low plasticity, yellowish brown.
			D		GC	Slightly moist	
10							**SILTY GRAVEL,** considerable boulders and cobbles to 24 inch diameter, some to considerable sand, predominantly well graded, subrounded to rounded, very dense, small amount of interspersed gypsum crystals, iron oxide stained, some strongly cemented layers, nonplastic, tan.
					GM	Slightly moist	
			D				
15							**SILTY CLAY,** some medium to coarse angular sand, hard, remnant bedding below 24 feet, medium to high plasticity, yellowish brown.
			D				
20					CL	Slightly moist to moist	
25							
			D		Sh		

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 127

JOB NO. GRJ-03 DATE 09/07/89

GROUNDWATER	DEPTH	HOUR	DATE
▽		NONE	
▼			

BACKHOE TYPE KOEHRING 666E
LOCATION N11,591.0 E92,455.0
ELEVATION 5,215.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					Sh	Slightly moist to moist	MANCOS FORMATION: SILTY CLAYSTONE, thinly laminated to thinly bedded, moderate to highly weathered, moderate to highly fractured, iron oxide stained, pyritized fossils, thin gypsum seams, moderately soft to soft, greenish grey.
30							Stopped Backhoe at 26 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/07/89

LOG OF TEST PIT NO. 128

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,291.0 E92,554.0
ELEVATION 5,214.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 6 inch diameter, some sand and gravel, medium stiff to hard, lime content increases with depth, moderately cemented below 1 foot, low to medium plasticity, reddish brown to light tan.
5			D		GM	Slightly moist	**SILTY GRAVEL,** boulders and cobbles to 3 foot diameter, considerable sand, poorly graded, rounded to subrounded, considerable gypsum in long fibers, slight to moderately cemented, very dense, low plastic to nonplastic, tan.
			D		CL	Slightly moist to moist	**SILTY CLAY,** some sand and gravel, moderately gypsum cemented, very stiff to hard, gypsum cementation increases below 8 feet, medium plasticity, light brown.
10			D		GP	Slightly moist	**SILTY SANDY GRAVEL,** poorly graded, some cobbles and boulders to 16 inch diameter, subrounded to rounded, some moderately cemented lenses in upper 2 feet of unit, very dense, nonplastic, yellowish brown.
15							
			D		CH	Moist	**CLAY,** some silt and sand, very stiff, high plasticity, brown.
20							
25					Sh		**MANCOS FORMATION: SILTY CLAYSTONE,**

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/07/89

LOG OF TEST PIT NO. 128

BACKHOE TYPE KOEHRING 666E
LOCATION N11,291.0 E92,554.0
ELEVATION 5,214.0
DATUM MSL

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
						Moist	MANCOS FORMATION: SILTY CLAYSTONE, moderately weathered, moderately fractured, thinly bedded, moderately soft, gypsum filled interbeds, manganese oxide stained, greenish grey.
30							Stopped backhoe at 26 feet, backfilled with spoils.
35							
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 129

JOB NO. GRJ-03 DATE 09/07/89

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,501.0 E93,150.0
ELEVATION 5,227.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		ML	Slightly moist	**TOPSOIL: CLAYEY SILT,** occasional cobbles to 6 inch diameter, some fine gravel, some fine sand, numerous fine roots, medium dense, low plasticity, reddish brown to tan.
			D		GM/ GC		
5			D		GC	Slightly moist	**SILTY AND CLAYEY GRAVEL,** some boulders and cobbles to 14 inch diameter, some sand, poorly graded, subangular to subrounded, dense to very dense, lime coated aggregates, some lenses strongly lime cemented, low plasticity, tan.
			D		CH	Slightly moist	**CLAYEY GRAVEL,** some boulders and cobbles to 16 inch diameter, considerable sand, predominantly well graded, rounded to subrounded, slight to moderately lime cemented, very dense, low to medium plasticity, light brown to reddish brown. Note: cementation decreasing and plasticity increasing with depth.
10			D		CL		
15						Slightly moist	**SILTY CLAY,** some fine gravel, some sand, moderately lime cemented with lime nodules to 1/2 inch in diameter, slightly gypsiferous, very stiff to hard, medium to high plasticity, reddish brown.
					GC	Slightly moist	**SILTY SANDY CLAY,** trace of fine gravel, considerably fine to medium sand, moderate to strongly gypsum cemented, hard, low to medium plasticity, yellowish brown.
			D				
20						Slightly moist	**CLAYEY GRAVEL,** some cobbles to 12 inches, poorly graded, rounded, some strongly lime or silica cemented layers, some iron oxide staining, very dense, low to medium plasticity, light orange brown.
			D				
					Sh	Slightly moist	**MANCOS FORMATION: SHALE,** moderate to highly weathered, highly fractured, thinly laminated, moderately soft.
25							Stopped Backhoe at 24.5 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/07/89

LOG OF TEST PIT NO. 130

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,395.0 E93,132.0
ELEVATION 5,224.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0		X	D		ML	Dry to slightly moist	**TOPSOIL: SILT,** some cobbles, trace fine gravel, trace fine sand, some clay, increased gravel content below 1 foot, numerous small roots, medium dense, moderately stiff, low plasticity, reddish brown.
5		X	D		GC	Slightly moist	**CLAYEY GRAVEL,** some cobbles to 10 inch diameter, some sand, poorly graded, subrounded to rounded, lime coated aggregates, some lime cementation, very dense, low plasticity, light tan to white.
10		X	D		ML/ CL	Slightly moist	**CLAYEY SILT AND SILTY CLAY,** occasional cobbles near top of unit, some sand and gravel, slightly lime cemented, lime concentrated in nodules and thin horizontal laminations, dense to stiff, low plasticity, brown.
		X	D		CL	Slightly moist	**SILTY CLAY,** some fine gravel, considerably fine to medium sand, stiff to very stiff, moderately lime or gypsum cemented, low plasticity, yellow brown to pale olive grey.
15		X	D		GM/ GP	Slightly moist	**SILTY GRAVEL,** boulders and cobbles to 16 inch diameter, some sand, poorly graded, subrounded to rounded, some layers strongly cemented, very dense, nonplastic.
20					Sh	Slightly moist to moist	**MANCOS FORMATION: SHALE,** moderately to highly weathered, thinly laminated, highly fractured, light iron oxide and manganese oxide staining, occasional gypsum void filling, moderately soft to soft, grey.
25							Stopped Backhoe at 20 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/08/89

LOG OF TEST PIT NO. 131

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,868.0 E93,421.0
ELEVATION 5,225.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL SILTY CLAY,** some gravel and sand, some roots, slight to moderate lime cementation increases with depth, medium density, low plasticity, reddish brown to tan.
5			D		CL	Slightly moist	**SILTY CLAY,** some fine rounded gravel, considerable fine sand, slight to moderate lime cementation in layers, stiff, low plasticity, pale orange brown. **Note:** Large lens of clayey gravel and cobbles runs along the north and west side of the pit. This lense begins about 4 feet below the ground surface. It is approximately 4 feet thick on north wall, decreasing to about 1 1/2 feet in the southwest corner of the pit.
10			D		SM/ ML	Slightly moist	**SILTY SAND AND SANDY SILT,** trace of fine gravel, medium dense to dense, low plasticity, yellowish brown.
15			D		GM	Slightly moist	**SILTY GRAVEL,** some boulders and cobbles to 16 inch diameter, considerable sand, predominantly well graded, subrounded to rounded, very dense, nonplastic, light brown.
20			D		CL/ ML	Slightly moist	**SILTY CLAY TO CLAYEY SILT,** considerable fine sand, dense to stiff, low plasticity, yellowish brown. **Note:** alternating layers of silts, clays, and fine sands.
25					GP		

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST PIT NO. 131

JOB NO. GRJ-03 DATE 09/08/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,868.0 E93,421.0
ELEVATION 5,225.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
30			D		GP	Slightly moist	**GRAVEL**, occasional boulders to 14 inch diameter, poorly graded, some cobbles, some to considerable sand, considerable silt, predominantly well graded, rounded to subrounded, very dense, nonplastic, light brown.
			D		Sh	Slightly moist to moist	**MANCOS FORMATION: SILTY CLAYSTONE**, highly weathered, highly fractured, thinly laminated, soft, iron oxide stained, pelecypod fossils common.
35							Stopped backhoe at 34 feet, backfilled with spoils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/08/89

LOG OF TEST PIT NO. 132

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,868.0 E93,011.0
ELEVATION 5,215.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** some sand and gravel, some small roots, moderately firm to firm, low plasticity, reddish brown. **Note:** lime content increases with depth, slightly to moderately lime cemented below 1.5 feet.
5					CL/ GC	Slightly moist	**SILTY CLAY AND CLAYEY GRAVEL,** some cobbles to 10 inch diameter, some sand, rounded, poorly graded, very dense, moderately lime cemented, lime coated aggregates, low plasticity, light brown.
10					CL	Moist	**SILTY CLAY,** some sand, moderately lime cemented, firm to very firm, low plasticity, light brown.
15					GP		**SANDY GRAVEL,** occasional boulders to 14 inch diameter, some cobbles, fine sand, subrounded to rounded, very dense, heavily iron oxide stained, nonplastic, orange brown.
20					Sh	Moist	**MANCOS FORMATION: SHALE,** highly weathered, thinly laminated to thinly bedded, highly fractured, soft to very soft, greenish grey.
25							Stopped backhoe at 20 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/08/89

LOG OF TEST PIT NO. 133

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N11,041.0 E92,818.0
ELEVATION 5,215.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		ML/CL	Slightly moist	**TOPSOIL: SILTY CLAY AND CLAYEY SILT,** some fine gravel, some fine sand, medium dense, low plasticity, reddish brown to tan.
			D		GM	Slightly moist	**SILTY GRAVEL,** some to considerable boulders and cobbles to 22 inch diameter, some sand, moderately lime cemented, very dense, tan.
5			D		GP	Slightly moist	**GRAVEL,** some poorly graded cobbles and boulders to 24 inch diameter, some silt, slightly lime cemented in lenses, very dense, nonplastic, light brown. **Note:** cobble and boulder content decreases 9 to 11 feet.
10			D		CL	Slightly moist to moist	**SILTY CLAY,** traces of fine rounded gravel, considerable fine sand, slightly to moderately lime cemented lenses, stiff, low plasticity, light brown. **Note:** some thin sandy lenses throughout.
15			D		GC		**CLAYEY GRAVEL,** occasional boulders to 16 inch diameter, some sand and cobbles, poorly graded, subangular to rounded, strongly cemented lime nodules, firm to very firm, medium plasticity, medium yellow brown.
20			D		Sh	Slightly moist to moist	**MANCOS FORMATION: SILTY CLAYSTONE,** moderately to highly weathered, highly fractured, thinly bedded, moderately soft to soft, greenish grey.
25							Stopped backhoe at 20 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/08/89

LOG OF TEST PIT NO. 134

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,554.0 E93,264.0
ELEVATION 5,219.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** trace fine gravel, some sand, medium dense to dense, small roots, slightly to moderately lime cemented increasing with depth, low to medium plasticity, reddish brown to tan.
			D		GC	Slightly moist	**CLAYEY GRAVEL,** some cobbles to 12 inch diameter, some to considerable sand, very dense, moderately lime cemented, low plasticity, tan to light brown.
5			D		GM/ GC	Slightly moist	**SILTY AND CLAYEY GRAVEL,** considerable cobbles to 6 inch diameter, considerable sand, very dense, iron oxide staining, moderately lime cemented, low plasticity, tan to light brown.
10							**SILTY CLAY,** some fine rounded gravel and fine sand, stiff to very stiff, low plasticity, brown to reddish brown.
15			D		CL	Slightly moist	**Note:** intebedded clay and clayey gravel between 12 and 13.5 feet, sand content decreases below 13.5 feet.
20			D		GM	Slightly moist	**SILTY GRAVEL,** occasional cobbles to 8 inch diameter, considerable poorly graded subangular sand, subrounded to rounded, very dense, nonplastic, tan to light brown. **Note:** top 6 to 12 inches strongly silica cemented, abundant manganese staining. **Note:** thin lenes less than 3 inches thick of silty clay interbeds.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/08/89

LOG OF TEST PIT NO. 134

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,554.0 E93,264.0
ELEVATION 5,219.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
30		D			CL	Slightly moist	**SILTY CLAY,** some fine gravel, moderately to strongly lime cemented, some sand, very stiff to hard, low to medium plasticity, interbedded with fine to medium grained silty sand, moderately to strongly lime cemented, iron oxide staining, nonplastic, light brown. **Note:** some thin strongly cemented fine gravel layers within.
35		D			Sh	Slightly moist	**MANCOS FORMATION: SILTY CLAYSTONE,** highly weathered, closely fractured, thinly laminated to thinly bedded, soft, iron oxode stained, greenish grey.
40							Stopped backhoe at 35 feet, backfilled with spoils.
45							
50							

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/08/89

LOG OF TEST PIT NO. 135

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,536.0 E92,989.0
ELEVATION 5,213.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** some gravel and fine sand, moderately lime cemented in lower portion, some small roots, moderately firm, medium plasticity, reddish brown.
5			D		GC	Slighlty moist	**CLAYEY GRAVEL,** some boulders and cobbles to 18 inch diameter, considerable sand, predominately well graded, subangular to rounded, very firm, low plasticity, yellow brown. **Note:** moderately lime cemented, highly gypsiferous from 3 to 6 feet.
10			D		GM	Slightly moist	**SILTY GRAVEL,** occasional boulders to 14 inch diameter, some cobbles, considerable sand, predominately well graded, rounded to subrounded, very firm, low plasticity to nonplastic, light orange brown. **Note:** strongly cemented below 12 feet.
15			D				**SILTY SAND,** some fine gravel, slight to moderately lime cemented, firm to very firm, low plasticity to nonplastic, moderately iron oxide staining, orange brown.
20			D		SM	Slightly moist	**Note:** silty clay layer below 20 feet. **Note:** interbedded with clayey gravel, fine grained, low plasticity from 21 to 23 feet.
25			D				

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/08/89

LOG OF TEST PIT NO. 135

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,536.0 E92,989.0
ELEVATION 5,213.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					SM		Note: interbedded with silty to sandy gravel, nonplastic from 25 to 26.5 feet and from 28 to 29 feet.
30					Sh	Slighlty moist	MANCOS FORMATION: SILTY CLAYSTONE, highly weathered, highly fractured, thinly bedded, soft, manganese and iron oxide staining grey.
35							Stopped backhoe at 30 feet, backfilled with spoils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/08/89

LOG OF TEST PIT NO. 136

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,756.0 E92,419.0
ELEVATION 5,205.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** some sand and gravel, medium density, some roots, low plasticity, red brown.
5					CL/ GC	Slightly moist	**SILTY CLAY AND CLAYEY GRAVEL,** some cobbles to 12 inch diameter, poorly graded, subrounded to rounded, dense, moderately to highly lime cemented, low plasticity, tan.
10					CL	Slightly moist	**SILTY CLAY,** some medium to coarse subangular sand, abundant fibrous to platy gypsum crystals, slightly lime cemented, medium plasticity, very stiff, tan. **Note:** clayey gravel lens from 9.5 to 10 feet.
15					CH	Slightly moist	**CLAY,** some fine gravel, some medium to coarse subangular sand, some interspersed gypsum, very stiff to hard, highly plastic, light brown. **Note:** large cobble, boulder lenses between 16 and 17 feet.
20					Sh	Slightly moist	**MANCOS FORMATION: SILTY CLAYSTONE,** highly weathered to decomposed, closely fractured, soft, thinly bedded, manganese oxide staining, greenish grey. **Note:** vertical, closed crack appears in test pit sidewall to a depth of approximately 15 feet. Fracture is stained by iron or manganese.
25							Stopped backhoe at 22 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/11/89

LOG OF TEST PIT NO. 137

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N12,766.0 E93,058.0
ELEVATION 5,231.00
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 8 inch diameter, some sand and gravel, some small roots, slightly lime cemented below 1 foot, medium dense to dense, low plasticity, reddish brown to tan.
5					GM	Slightly moist	**SILTY GRAVEL,** some boulders and cobbles to 14 inch diameter, considerable sand, poorly graded, subrounded to rounded, very firm, slightly to moderately lime cemented, highly gypsiferous, nonplastic to low plasticity, light brown.
10					GM	Slightly moist	**SILTY GRAVEL,** boulders and cobbles to 24 inch diameter, considerable sand, predominately well graded, subrounded to rounded, very firm, highly iron oxide staining, a few strongly cemented lenses, nonplastic, reddish brown to orange brown.
15					Sh		**MANCOS FORMATION: SILTY CLAYSTONE,** highly weathered, closely fractured, thinly bedded, highly fossiliferous, some iron oxide staining, olive grey.
20							Stopped backhoe at 17 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/11/89

LOG OF TEST PIT NO. 138

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N13,155.0 E92,653.0
ELEVATION 5,237.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 5 inch in diameter, some gravel and sand, moderately firm to firm, slightly to moderately lime cemented, low plasticity, reddish brown to light brown.
5			D			Slightly moist	**SILTY GRAVEL,** occasional boulders to 14 inch diameter, some cobbles, considerable sand, poorly graded, subrounded to rounded, slight to moderately cemented, considerable gypsum, very dense, nonplastic, yellow brown. **Note:** boulder size increasing to 2 foot diamter below 5 feet.
10					GM	Slightly moist	**Note:** numerous moderately to strongly cemented lenses, below 10 feet, strongly cemented 14 to 17 feet.
			D				
15							
			D		Sh	Slightly moist	**MANCOS FORMATION: SILTY CLAYSTONE,** decomposed to highly weathered, closely fractured, thinly laminated, iron oxide and manganese oxide staining, very soft, olive grey.
20							
25							Stopped backhoe at 20 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/11/89

LOG OF TEST PIT NO. 139

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N13,145.0 E92,505.0
ELEVATION 5,235.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D				
					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 5 inch diameter, some gravel and sand, moderately firm to firm, slightly to moderately lime cemented, low plasticity, red brown to tan.
					GM	Slightly moist	**SILTY GRAVEL,** some cobbles, predominately well graded, subrounded to rounded, very dense, slightly to moderately lime cemented, moderate to high gypsum content, nonplastic, yellow brown.
5			D				
10					GM	Slightly moist	**SILTY GRAVEL,** cobbles and boulders to 20 inch diameter, considerable sand, predominately well graded, subrounded to subangular, very firm, nonplastic, yellow to orange brown. Note: some iron oxide stained lenses. Note several strongly cemented lenses below 11 feet.
15							
					Sh	Slightly moist	**MANCOS FORMATION: SILTY CLAYSTONE,** decomposed to highly weathered, closely fractured, thinly laminated, iron and manganese stained, very soft, dark greyish green.
20							Stopped backhoe at 17.0 feet, backfilled with spoils.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/09/89

LOG OF TEST PIT NO. 140

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N13,139.0 E92,277.0
ELEVATION 5,231.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** trace gravel, some sand, moderately firm to firm, increasing lime content with depth, low plasticity, red brown to tan.
5			D		GM	Slightly moist	**SILTY GRAVEL,** some boulders to 18 inch diameter, considerable sand and cobbles, predominately well graded, subrounded to rounded, very firm, moderately lime cemented, highly gypsiferous, nonplastic, tan.
10			D				
15			D		GM	Slightly moist	**SILTY GRAVEL,** cobbles and boulders to 36 inch diameter, considerable sand, predominately well graded, rounded to subrounded, very firm, moderately to strongly lime cemented, nonplastic, light orange brown. **Note:** some iron oxide staining. **Note:** strongly cemented between 16 and 19 feet.
20							
			D		Sh	Slightly moist	**MANCOS FORMATION: SILTY CLAYSTONE,** highly weathered, thinly laminated to thinly bedded, closely fractured, iron oxide staining and filled fractures, very soft, greenish grey.
25							Stopped backhoe at 23 feet, backfilled with spoils.

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/09/89

LOG OF TEST PIT NO. 141

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N13,290.0 E92,290.0
ELEVATION 5,230.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content of Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 5 inch diameter, some gravel and sand, moderately firm, low to medium plasticity, reddish brown.
			D		CL	Slightly moist	**SILTY CLAY,** some sand, moderately firm, some interspersed gypsum, slightly lime cemented, some horizontal layers and nodules of lime, medium plasticity, light brown.
5							**SILTY GRAVEL,** some to considerable amounts of boulders and cobbles to 40 inch diameter, some sand, poorly graded, subrounded, some gypsum, some lime cemented lenses, very firm, nonplastic, light brown.
10					GM		
15							
20							
					Sh	Slightly moist	**MANCOS FORMATION: SILTY CLAYSTONE,** highly weathered, closely fractured, thinly laminated, very soft, iron oxide stained.
25							Stopped backhoe at 24 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST PIT NO. 142

JOB NO. GRJ-03 DATE 09/09/89

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N13,293.0 E92,462.0
ELEVATION 5,232.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D				
					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasionally cobbles to 6 inch diameter, some sand and gravel, moderately firm, slightly to moderately lime cementation, increasing with depth, low plastic, reddish brown to tan.
5							**SILTY TO CLAYEY GRAVEL,** some boulders and cobbles poorly graded, subrounded, to 20 inch diameter, considerable sand, predominately well graded, subrounded, moderately to strong cemented lenses, low plasticity, tan.
			D		GM	Slightly moist	
10							
			D				
					CL	Slightly moist	**CLAY,** trace gravel, some sand, stiff to very stiff, some gypsum, medium to highly plasticity, brown.
15							**CLAYEY GRAVEL,** boulders and cobbles to 30 inch diameter, considerable sand, predominately well graded, subrounded to rounded, very firm, low plasticity, tan. **Note:** strongly lime cemented lenses. **Note:** large boulders decrease below 16 feet.
					GC	Slightly moist	
20							
					Sh	Slightly moist to moist	**MANCOS FORMATION: CLAYSTONE,** highly weathered to decomposed, closely fractured, thinly laminated, very soft, olive grey. **Note:** gypsum filled and manganese dendrites with interbeds.
25							Stopped backhoe at 24 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/09/89

LOG OF TEST PIT NO. 143

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.0	16:20	09/09/89
▼	24.0	07:00	09/11/89

BACKHOE TYPE KOEHRING 666E
LOCATION N13,299.0 E92,600.0
ELEVATION 5,235.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0			D		CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 5 inch diameter, some sand and gravel, moderately firm, slightly to moderately lime cemented, moderately plastic, reddish brown.
5, 10			D		GM	Slightly moist	**SILTY GRAVEL,** boulders and cobbles to 30 inch diameter, considerable sand, poorly graded, subrounded to rounded, moderately lime cemented, very firm, low plasticity, tan. **Note:** abundant lime nodules 3 to 5 feet, some gypsum decreasing with depth.
15, 20			D		GM	Slightly moist	**SILTY GRAVEL,** boulders and cobbles to 20 inch diameter, poorly graded gravel, considerable sand, subrounded to rounded, very dense, some strongly cemented lenses, some iron oxide staining, nonplastic, orange brown.
▼ 25			D D		CL/GC	Very moist to saturated	**SILTY CLAY,** some gravel and cobbles, some sand, moderately stiff to stiff, medium plasticity, light brown.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/09/89

LOG OF TEST PIT NO. 143

GROUNDWATER

DEPTH	HOUR	DATE
28.0	16:20	09/09/89
24.0	07:00	09/11/89

BACKHOE TYPE KOEHRING 666E
LOCATION N13,299.0 E92,600.0
ELEVATION 5,235.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
30					CL/ GC		**Note:** interbedded with CLAYEY GRAVEL, some boulders to 15 inch diameter, some sand and cobbles, iron oxide staining, firm to very firm, moderately plastic, light brown.
					Sh	Saturated	MANCOS FORMATION: SILTY CLAYSTONE, highly weathered, varved, very soft, closely fractured, greyish black to brown.
35							Stopped backhoe at 34 feet, backfilled with spoils.
40							
45							
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/13/89

LOG OF TEST PIT NO. 144

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,713.0 E93,813.0
ELEVATION 5,232.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** occasional cobbles to 6 inch diameter, some sand and gravel, medium dense, low to medium lime content, low plasticity, reddish brown.
5					GM	Slightly moist	**SILTY GRAVEL,** boulders and cobbles to 36 inch diameter, considerable sand, predominately well graded, subrounded to rounded, very dense, nonplastic, light brown. **Note:** highly gypsiferous between 2 and 7 feet. **Note:** a few thin sand lenses throughout.
10							
15					SM/ ML		**SILTY SAND AND SANDY SILT,** some gravel, fine grained, dense, slight to moderately cemented, low plasticity, orange brown.
20					GM	Slightly moist to moist	**SILTY GRAVEL,** some cobbles and boulders to 16 inch diameter, considerable sand, poorly graded , subrounded to rounded, very dense, low plasticity, light brown. **Note:** some medium to stongly cemented layers. **Note:** boulders measure to 3 foot diameter below 22 feet.
25							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/13/89

LOG OF TEST PIT NO. 144

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,713.0 E93,813.0
ELEVATION 5,232.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
					GM		Note: strongly cemented layers between 30 and 31 feet.
30			D				
					GC	Moist to very moist	CLAYEY GRAVEL, boulders and cobbles to 36 inch diameter, some sand, dense to very dense, poorly graded, subounded to rounded, low to medium plasticity, red brown.
35			D				Note: grades to silty clay below 36 feet. Note: mottled colors below 36 feet.
40							
45							Stopped backhoe at 41 feet, backfilled with spoils.
50							

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/14/89

LOG OF TEST PIT NO. 145

GROUNDWATER		
DEPTH	HOUR	DATE
	NONE	

BACKHOE TYPE KOEHRING 666E
LOCATION N10,693.0 E93,861.0
ELEVATION 5,232.0
DATUM MSL

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Slightly moist	**TOPSOIL: SILTY CLAY,** some cobbles and gravel to 5 inch diameter, moderately firm, slightly to moderately lime cemented, low plasticity, reddish brown to tan.
5					GM	Slightly moist	**SILTY GRAVEL,** some boulders and cobbles to 24 inch diameter, some to considerable sand, predominately well graded, subrounded to rounded, very dense, low plasticity to nonplastic, tan. Note: some gypsum from 2 to 6 feet. Note: boulder size decreasing to 18 inch diameter below 8 feet.
10							Note: a few moderately lime cemented lenses. Note: a few thin silty sand lenses.
15					GM	Slightly moist	Note: strong silica cemention at 15 feet.
20							
25					Sh	Slightly moist	**MANCOS FORMATION: SILTY CLAYSTONE,** highly weathered, thinly laminated, closely fractured, olive grey.
							Stopped backhoe at 25 feet, backfilled with spoils.

SAMPLE TYPE
B - Undistured Block Sample.
D - Disturbed Bulk Sample.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 09/19/89

LOG OF TEST PIT NO. 146

BACKHOE TYPE KOEHRING 666E

LOCATION

ELEVATION

DATUM MSL

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

Depth in Feet	Graphical Log	Sample	Sample Type	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0					CL	Dry	**TOPSOIL: SANDY CLAY,** some gravel and cobbles, fine sand, weak lime cemented, dry roots, light orange brown.
					CL/ ML	Dry	**SILTY CLAY AND CLAYEY SILT,** trace gravel, weak to moderate lime cement, low to medium plastic, calichified, pale brown.
					GM/ GP		**SILTY GRAVEL, COBBLES AND BOULDERS,** boulders to 2 inches in diameter, predomently subrounded gravel and cobbles, fine to medium sand, moderate lime cementing, light brown. note: some gypsum from 3 to 7 feet.
5							
10							
					GP	Dry	**SANDY GRAVEL,** some cobbles, fine to medium sand, predomenitly ? subrounded gravel, weak to moderately, lime cement, moderate plasticity, light brown to gray.
15							
20							
							MANCOS FORMATION: MUDSTONE, highly weathered, soft, very thin bedding, fissle, pale yellow brown and gray.
25							Stopped ~~drilling~~ Pit at 24 feet.

SAMPLE TYPE

B - Undistured Block Sample.
D - Disturbed Bulk Sample.

JACOBS ENGINEERING GROUP INC.
ADVANCED SYSTEMS DIVISION, ALBUQUERQUE OPERATIONS

TEST PIT LOG

Page ___ of ___

LOCATION MAP: A N

SITE ID: [illegible] LOCATION ID: [illegible]
APPROX. SITE COORDINATES (ft)
N _____ E _____
GROUND ELEV. (FT. MSL) _____
DATE EXCAVATED: [illegible]
BACKHOE TYPE: [illegible]
CONTRACTOR: [illegible]
FIELD REP: J [illegible]
REHAB. DATE: [illegible]

GROUNDWATER LEVELS			
DATE	TIME	DEPTH (ft)	EST. FLOW (GAL/MIN)
		NONE	

LOCATION DESCRIPTION _____
SITE CONDITION _____

DEPTH (ft.)	SAMPLE INT	SAMPLE TYPE	SAMPLE ID	UNIFIED SOIL CLASS	VISUAL CLASS.: DENSITY, COLOR, STRENGTH, PLASTICITY, CONDITION, ETC.
0				CL	SILTY CLAY TR. V FINE SAND WEAKLY CEMENTED MED. P.I. [illegible] NOTE: STRONGLY CEMENTED ZONE BELOW 1.5'
4.0'					
5				GM	NOTE: OCC. GRADES TO CLAYEY SILT MED P.I., TR. TO SOME V. FINE SAND NOTE: BASALT BOULDERS BELOW 3'
6.5					
10					SILTY SAND & GRAVEL TR. TO SOME CLAY MASSIV COBBLES SOME BOULDERS ANGULAR TO SUBROUNDED, OCC ROUNDED LOW P.I. (OCC MED. P.I.) LIGHT YELLOW BROWN 10YR 6/4 V. SL. MOIST HARD NOTE: SAND FRACTION IS WELL GRADED
					BACKHOE REFUSED AT 6' ON 2' DIA BOULDERS.
15					

COMMENTS: _____

SAMPLE TYPE
B - Undisturbed Block Sample
D - Disturbed Bulk Sample

JEG-AL-ENG-7 (3/84)

JACOBS ENGINEERING GROUP INC.
ADVANCED SYSTEMS DIVISION, ALBUQUERQUE OPERATIONS

TEST PIT LOG

Page 1 of 1

LOCATION MAP: (N)

SITE ID: [illegible] LOCATION ID: [illegible]
APPROX. SITE COORDINATES (ft)
N _____ E _____
GROUND ELEV. (FT. MSL) _____
DATE EXCAVATED: [illegible]
BACKHOLE TYPE: [illegible]
CONTRACTOR: [illegible]
FIELD REP: [illegible]
REHAB. DATE: [illegible]

GROUNDWATER LEVELS			
DATE	TIME	DEPTH (ft)	EST. FLOW (GAL/MIN)
		NONE	

LOCATION DESCRIPTION _____
SITE CONDITION _____

DEPTH (ft.)	SAMPLE INT	SAMPLE TYPE	SAMPLE ID	UNIFIED SOIL CLASS.	VISUAL CLASS.: DENSITY, COLOR, STRENGTH, PLASTICITY, CONDITION, ETC.
0		D	001	CL	SILTY CLAY TR V. FINE SAND MED P.I REDDISH BRN — SL. MOIST TO MOIST FIRM
		D	002		NOTE STRONGLY CEMENTED BROWN 1'. FALL BROWN — HARD BROWN 1'
3.5					NOTE TRACE TO SOME GRAVEL COBBLE & BOULDER 3.5' TO 3.5' — V. SL. MOIST
4.5				GM	SILTY SAND & GRAVEL TR TO SOME CLAY CONSID. COBBLES SOME TO CONSID. BOULDERS ANGULAR TO SUBROUNDED LOW P.I. TO NON MED P.I. LIGHT BROWN BROWN LOOSE
5					
10					BACKHOE REFUSED ON BOULDERS AT 4.5'
15					

COMMENTS:
0.5-1.5'. 2 samples CHS. - 1 RAE
2.5-3.5' - 1 CHEM (COBBLES & BOULDERS FROM UPPER STATION)

SAMPLE TYPE
B - Undisturbed Block Sample
D - Disturbed Bulk Sample

JEG-AL-ENG-7 (3/84)

JACOBS ENGINEERING GROUP INC.
ADVANCED SYSTEMS DIVISION, ALBUQUERQUE OPERATIONS

TEST PIT LOG

Page 1 of 1

LOCATION MAP: A N

SITE ID: GRI 03 LOCATION ID: 6 F
APPROX. SITE COORDINATES (ft)
N _____ E _____
GROUND ELEV. (FT. MSL) _____
DATE EXCAVATED: 12/5/83
BACKHOE TYPE: [illegible]
CONTRACTOR: [illegible]
FIELD REP: J. FINN
REHAB. DATE: 12/[illegible]/83

GROUNDWATER LEVELS			
DATE	TIME	DEPTH (ft)	EST. FLOW (GAL/MIN)
		NONE	

LOCATION DESCRIPTION _____
SITE CONDITION _____

DEPTH (ft.)	SAMPLE INT	SAMPLE TYPE	SAMPLE ID	UNIFIED SOIL CLASS.	VISUAL CLASS.: DENSITY, COLOR, STRENGTH, PLASTICITY, CONDITION, ETC.
0				CL	SILTY CLAY TR. FINE & MED SAND MED P.I. BROWNISH YELLOW - 1:[illegible] 6/6 NOTE: FINE SAND [illegible] NOTE: STR CEMENTED BELOW 1' TO ~ 3.5' TO TRACE NOTE BASAL COARSE FEATURE [illegible] ~ 15'
5		D	001	GM	HARD 1' V. SL MOIST
					SILTY SAND & GRAVEL TO CLAY SOME TO FINE ID. COFFEE [illegible] TR BOULDER ANGULAR TO SUBROUNDED LOW P.I. COLL MED. PT) LIGHT YELLOW BROWN HARD V. SL MOIST
		D	001	CL	
10					SILTY CLAY TR FINE SAND & MED SAND MED. P.I. MOD. TO STR. CEMENTED D BRN 10YR 3/3 TO NOTE. GYPSUM CRYSTALS [illegible] TO [illegible] BELOW 6.5') HARD V. SL MOIST NOTE. V. HARD DIGGING BELOW 6'.
15					BACKHOE REFUSED AT 8'6"

COMMENTS: 3.5'-5' 2 Samples - Coin
7'-8' 1 Sample - Coin (small bag)

SAMPLE TYPE
B - Undisturbed Block Sample
D - Disturbed Bulk Sample

JEG-AL-ENG-7 (3/84)

JACOBS ENGINEERING GROUP INC.
ADVANCED SYSTEMS DIVISION, ALBUQUERQUE OPERATIONS

TEST PIT LOG

Page ___ of ___

LOCATION MAP: N

SITE ID: [illegible] LOCATION ID: [illegible]
APPROX. SITE COORDINATES (ft)
N ___ E ___
GROUND ELEV. (FT. MSL) ___
DATE EXCAVATED: 12/5/84
BACKHOE TYPE: INTERNATIONAL [illegible]
CONTRACTOR: [illegible]
FIELD REP: J. [illegible]
REHAB. DATE: 12/5/84

GROUNDWATER LEVELS			
DATE	TIME	DEPTH (ft)	EST. FLOW (GAL/MIN)
		NONE	

LOCATION DESCRIPTION ___
SITE CONDITION ___

DEPTH (ft.)	SAMPLE INT	SAMPLE TYPE	SAMPLE ID	UNIFIED SOIL CLASS.	VISUAL CLASS.: DENSITY, COLOR, STRENGTH, PLASTICITY, CONDITION, ETC.
0				CL	SILTY CLAY TR. TO SOME FINE & MED SAND MED. P.I. LIGHT YELLOW BRN NOTE CONSD. BASALT COBBLES & BOULDERS FROM GROUND SURFACE BOULDERS UP TO 2.5' TO 3' DIA (AVE. SIZE 12" TO 18") NOTE WEAK TO MOD. CEMENTATION [illegible] 1-2'
2.5'				GM	
6.5'				GP	SILTY SAND & GRAVEL SOME CLAY [illegible] DECAYED [illegible] BOULDERS ANGULAR TO SUBROUNDED LOW TO MED. P.I. LT. YELLOW BROWN NOTE BOULDERS UP TO 2.5' DIA.
10					SANDY GRAVEL & COBBLES — HARD TR. SILT TO SOME SILT & SOME BOULDERS — TR. TO ANG. TO SUBROUNDED SOME TO CONSD COBBLES N.P. GRAYISH BROWN 2.5 Y 5/2 NOTE: SILT FRACTION INCREASES WITH DEPTH, LOW PI. NOTE: GRADES TO GM AT ~ 7.5 TO 8'
15					

COMMENTS: BACKHOE STOPPED AT 10' - V. HARD DIGGING

SAMPLE TYPE
B - Undisturbed Block Sample
D - Disturbed Bulk Sample

JEG-AL-ENG-7 (3/84)

Job No. LD 581-[illegible]

TEST HOLE No. Test Pit #617

ELEVATION ~ 5234'

Depth (Feet)	Description
	Lean Clay (CL) Reddish Brown Sandy
5	Qc Clayey Gravel (GC) Lean Clay Matrix Difficult Excavation Angular Boulders
10	Q_A Old Lean Clay Matrix Rounded Gravel & Cobbles Green to Brown
15	T.D. 14' No Free Water 2/21/86
20	
25	
30	
35	
40	

DRILLING LOGS

LINCOLN DeVORE ENGINEERS · GEOLOGISTS

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS

Job No. LD 881982

TEST HOLE No. Test Pit #618

ELEVATION ~ 5247'

Qc Lean Clay
Sandy Reddish Brown

Qc Clayey Sand
(SC)
Scattered Cobbles
& Large Boulders
Dry Silty Clay
Matrix

Q_A Old
Lean Clay Hard
(CL)
Dry High Sulfates
Sub-Rounded to
Rounded Cobbles

No Free Water
2/21/86

5 10 15 20 25 30 35 40

DRILLING LOGS

LINCOLN DeVORE ENGINEERS · GEOLOGISTS

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS

JOB NO. LD [illegible]

TEST HOLE NO. Test Pit #519

ELEVATION ~ 5244'

Qc Clayey Gravel (GC) Low Plastic Lean Clay Matrix (CL) Damp to Moist Scattered Large Cobbles & Angular To Sub-Angular Basaltic Boulders Difficult Excavation	
Q_A Lean Clay Green to Brown Mottled Low Plastic Calcareous/Sulfates	
T.D. 16'-6" No Free Water 2/21/86	

FEET

DRILLING LOGS

LINCOLN DeVORE ENGINEERS · GEOLOGISTS

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS

JOB NO. LD [illegible]

HOLE NO. Test Pit #21

ION ~5266'

Qc Red to Brown Lean Clay (CL) Sandy Soft to Firm	
Qc Clayey Gravel (GC) And Clayey Sand (SC) V. Stiff to Hard Green to Brown	
Residual (KM) Lean Clay (CL) Green Brown V. Stiff	
T.D. 16' No Free Water 2/21/86	

DEPTH IN FEET

DRILLING LOGS

LINCOLN DeVORE ENGINEERS.

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS

JOB NO. LD [illegible]

HOLE NO. Test Pit #[illegible]

ELEVATION ~ [illegible]'

Qc Clayey Gravel (GC) Lean Clay Matrix (CL)	
Poorly Graded Clayey Gravel (GP/GC) Dry to Damp Scattered Large Cobbles & Boulders To 3' Diameter Qc Lean Clay Matrix (CL)	
Residual (KM) Lean Clay (CL) V. Stiff Dry	
T.D. 17'-6" No Free Water 2/21/86	

5

10

15

20

25

30

35

40

DRILLING LOGS

LINCOLN DeVORE ENGINEERS

COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS

Job No. [illegible]

HOLE NO. Test Pit [illegible]

LOCATION ~ 5263'

Qc Reddish Brown Sandy Clay	
Qc Clayey Gravel (GC) Lean Clay Matrix V. Stiff Damp Calcereous High Sulfates Scattered Cobbles & Boulders in Clay Matrix Green to Brown	
Refusal on Large Boulders No Free Water 2/21/86	

FEET IN

DRILLING LOGS

LINCOLN DeVORE ENGINEERS · GEOLOGISTS

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS

JOB NO. LC [illegible]

HOLE NO. Test Pit #[illegible]

ELEVATION ~ 5283'

Qc Lean Clay
(CL)
Dry, Brown, Soft

Qc
Poorly Graded
Silty, Clayey
Gravel (GP/GM)
Low Moisture
Many Large
Basaltic
Cobbles & Boulders
Low Moisture
Less Rock

Residual (KM)
Lean Clay (CL)
V. Stiff Dry

T.D. 17'-6"
No Free Water
2/21/86

5
10
15
20
25
30
35
40

DRILLING LOGS

LINCOLN DeVORE
ENGINEERS · GEOLOGISTS

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS

HOLE NO. Test Pit #[illegible]

ELEVATION ~ 5048'

Qc Reddish Brown Sandy Clay	
Qc Poorly Graded Clayey Gravel (GP/GC) Light Red to Brown Many Large Boulders Difficult Excavating Low Moisture	
Refusal 11'-6" On Large Boulder No Free Water 2/21/86	

FEET IN

DRILLING LOGS

LINCOLN DeVORE ENGINEERS

COLORADO COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS

HOLE NO. [illegible]

LOCATION ~ [illegible]

Poor Clayey Topsoil

GC Clayey Gravel (GC)
Dry
Red to Brown
Lean Clay Matrix
Volcanic Cobbles & Boulders
Sub-Angular to Sub-Rounded
Green to Brown

Refusal On Large Boulder 10'6"
No Free Water
2/21/86

5
10
15
20
25
30
35
40

DRILLING LOGS

LINCOLN DeVORE ENGINEERS · GEOLOGISTS

COLORADO: COLORADO SPRINGS, GRAND JUNCTION, PUEBLO, GLENWOOD SPRINGS

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE Disposal Area PROJECT Cheney Reservoir Disposal Site STATE Colorado

HOLE NO. TP-1 COORD. N. 11,199.8 E. 93,740 GROUND ELEV. 5231.6 DEPTH TO GROUND WATER LEVEL Not Encountered

METHOD OF EXCAVATION J.D. 690B APPROXIMATE DIMENSIONS OF HOLE 21.5'D X 25'L X 11'W LOGGED BY L.F.V

CLASSIFICATION SYMBOL LETTER	CLASSIFICATION SYMBOL GRAPHIC	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART - "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +3-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 3-INCH	WEIGHT OF +3-INCH SAMPLED (LBS)	PERCENTAGE BY VOLUME OF +3-INCH
ML-CL		0.6'							
CL		1.7'	70 lbs	0-0.6': Silt, some gravel and cobbles of basalt, subangular to subround, silt is red brown, dry, some clay					
		3'							
		4'	200 lbs (6" minus)	0.6'-1.7': Silt, same as above, calcareous zones and patches, less rock.					
		8'		1.7'-4.0' Silt, clayey, a little basalt gravel, dry pale red brown.					
GM or SM		12'	200 lbs (6" minus)	4.0'-19.5': Sand, some silt and clay, gray to gray brown, ~30-40% gravel and cobbles mostly subround to sub angular basalt, a few with calcareous coatings, ~15% boulders 12" to 24" + below 8.5', gravel and cobble content increases to ~50% at 8', some tabular and elongated clasts, unit is dense, and dry.					
		17'							
CL		19.5'	50 lbs						
		21.5'	T.D.	19.5'-21.5': Clay, silty, a little very fine sand, slightly moist, gray and brown, some white calcareous spots, very dense.					

Notes: - Took ~2½ c.y. from piles for intervals 4' to 12' and 12' to 17' for partial large scale sieve sample No. 1.
- Test pit located at originally surveyed position.

PLATE

WESTERN ENGINEERS, INC.

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE Disposal Area PROJECT Cheney Reservoir Disposal Site STATE Colorado

HOLE NO. TP-2 COORD. N. ~~11,730~~ 11,729.8 E. 93,880 GROUND ELEV. 5241.5 DEPTH TO GROUND WATER LEVEL Not Reached

METHOD OF EXCAVATION LB. LS5P00 APPROXIMATE DIMENSIONS OF HOLE 23.5'D X 25'L X 6'W LOGGED BY LEV

CLASSIFICATION SYMBOL (LETTER)	CLASSIFICATION SYMBOL (GRAPHIC)	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART - "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +6-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 6-INCH	WEIGHT OF +3-INCH SAMPLED (LBS)	PERCENTAGE BY VOLUME OF +3-INCH
CL		3.5'	70 lbs.	0 - 3.5': Clay, silty, red-brown to 1.5', pale red-brown 1.5-3.5', slightly moist, calcareous below 1.5', some gravel and cobbles of subangular to subround basalt fragments, thin pozzolanic to hard calcareous coatings.					
SM			200 lbs. (8' Minus)	3.5'-16.0': Sand, clayey becoming silty with depth, some gravel, cobbles and boulders, ~5% 8" plus; thin, hard clayey sand strata above 13', more gravelly below, dry.					
CL		16'	70 lbs. 2 TUBES	16.0'-22.5': Clay, sandy, very stiff to hard, gray and brown, slightly moist, a little coarse sand and fine gravel, silty in places, hard calcareous specks and pods 17-17.5'.					
SM CL		22.5' 23' 23.5'	70 lbs. T.D	22.5'-23.0': Sand, silty, gray brown, slightly moist, soft to moderately dense, a little gravel. 23.0'-23.5': Clay, sandy, very stiff to hard, gray and brown, slightly moist, a little gravel and cobbles.					

Note: Test pit located at originally surveyed position.

PLATE

WESTERN ENGINEERS INC.

LOG OF TEST PIT OR AUGER HOLE
FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE: Disposal Area PROJECT: Cheney Reservoir Disposal site STATE: Colorado

HOLE NO. TP-3 COORD. N. 12,120 12,419.8 E. 93,856 93,855.8 GROUND ELEV. 5253.3 DEPTH TO GROUND WATER LEVEL: Not Reached

METHOD OF EXCAVATION: L.B. L55Bm APPROXIMATE DIMENSIONS OF HOLE: 21'D X 7'W X 26'L LOGGED BY: LEV

CLASSIFICATION SYMBOL (LETTER)	CLASSIFICATION SYMBOL (GRAPHIC)	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART - "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 8-INCH	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF +8-INCH
CL		4.5'	50 lbs	0 - 4.5': Clay, silty, red-brown, slightly-moist, calcareous and pale red-brown 1-2.5', occasional cobbles and boulders of basalt with calcareous coatings.					
GM		8.5'	70 lbs. (1 bucket); 80 lbs.	4.5'-8.5': Gravel, silty sand matrix, gray brown, slightly moist, cobbles and boulders to 48"x36"x30", ~ 5-10% 8" plus, soft calcareous coatings on some stones.					
SC		13'	70 lbs. (1 bag)	8.5'-13.0': Sand, clayey, gray-brown, slightly moist stiff, some fine gravel and coarse sand, hard calcareous spots.					
GM		15.5'							
CL		20'	70 lbs.; TUBE	13.0-15.5': Gravel, sand, silty to clayey, slightly moist, gray-brown, cobbles and boulders mostly subround to subangular basalt stones.					
CL		21'	T.D.	15.5'-20.0': Clay, sandy, gray and brown, very stiff to hard, some coarse sand and fine gravel, calcareous spots.					
				20.0'-21.0' Clay, same as above with boulders and cobbles, mostly of basalt.					

Notes: Loaded approximately 1.5 C.Y. from the intervals 4.5-8.5, ~1.5 C.Y. from 8.5-13.0 and 13.0-15.5'.

Test pit location uncertain, resurveyed position indicated.

PLATE

WESTERN ENGINEERS, INC.

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE Disposal Area PROJECT Chener Reservoir Disposal Site STATE Colorado

HOLE NO. TP-4 COORD. N. ~~10,710~~ 10,709.6 E. 94,230.3 GROUND ELEV. 5237.7 DEPTH TO GROUND WATER LEVEL Not Reached

METHOD OF EXCAVATION J.D 690B APPROXIMATE DIMENSIONS OF HOLE 19.5'D X 21'L X 6'W LOGGED BY LEV

CLASSIFICATION SYMBOL (LETTER)	CLASSIFICATION SYMBOL (GRAPHIC)	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART - "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +3-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 3-INCH	WEIGHT OF +3-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF +3-INCH
ML-CL		0.5'	70 lbs	0-0.5': Silt, clayey, red-brown, dry, some rock, mostly basalt.					
CL		1.5'							
CL		2.5'							
SM			70 lbs (3" minus)	0.5'-1.5': Silt, clayey, calcareous zone, irregular patches and zones of white carbonates, dry, ~5% gravel and ~5 to 15% cobbles and boulders, mostly basalt, calcareous coatings on the rock.					
		9'							
GM			70 lbs (3" minus)	1.5'-2.5': Silt, clayey, pale red-brown, same as above less calcareous.					
		14'		2.5'-9.0': Sand, some silt and clay, gray-brown, dry some fine gravel, cobbles and boulders, mostly subround to subangular basalt, minor other rock types, ~15 to 20% plus 3", ~10-15% fine gravel.		Material in these intervals is roughly stratified and includes 0.5' to 1' lenses of sand and pebbles w/crude lenses and pods of cobbles and boulders in a sandy, silty matrix			
			70 lbs (3" minus)						
		18.5'	25 lbs						
CL		20'	2 TUBES T.D	9.0'-18.5': Gravel, cobbles, boulders, mostly subround to subangular basalt, minor other rock types matrix is sand, some silt and clay, ~30-40% plus 3", and 10-15% gravel, a few boulders to 20"+, a few tabular clasts					
				18.5'-20': Clay, sandy, brown and yellow-brown, dry very stiff to hard, high dry strength.					

Note: loaded ~3.5-4 c.y. from the interval 2.5'-14' with material from TP-1 for first large scale sample, lost some fines in the wind when loading.

PLATE

WESTERN ENG. INC.

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE: Disposal Area. PROJECT: Cheney Reservoir Disposal Site STATE: Colorado

HOLE NO. TP-5 COORD. N. ~~11,420~~ 11,419.9 E. ~~94,260~~ 94,259.6 GROUND ELEV. 5249.3 DEPTH TO GROUND WATER LEVEL: Not Reached

METHOD OF EXCAVATION: J.D 690B APPROXIMATE DIMENSIONS OF HOLE: 40'L X 18.5'D X 5'W LOGGED BY: LEV

CLASSIFICATION SYMBOL LETTER	CLASSIFICATION SYMBOL GRAPHIC	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART - "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 8-INCH	WEIGHT OF +3-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF +3-INCH
CL		1.5'	70 lbs	0 - 1.5': Silt, clayey, red-brown, dry, below 0.5' calcareous and pale red-brown with irregular white patches and zones, ~5-10% cobbles and boulders, many with calcareous coatings.					
GM or SM			70 lbs (8" minus)	1.5' - 18.5': Gravel, sandy, some silt and clay, gray-brown, dry, rock is mostly subround to subangular basalt, minor other rock types, a few tabular clasts, below 7 feet the percentage of plus 12" rock increases to ~10-20%, boulders up to 30"+, one rock 36" x 30" x 30"					
			70 lbs (8" minus)						
		18.5'	70 lbs. (8" minus)						

Notes: - loaded ~3-4 C.Y. from the interval 1.5-15 feet to dump with material from TP-1 and TP-5, together comprising Sample No. 1.

- Very difficult digging below 15 feet, took ~2.5 hrs. to dig from 15 to 18.5 feet.

PLATE

WESTERN ENGINEERS INC.

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE: Disposal Area PROJECT: Cheney Reservoir Disposal Site STATE: Colorado

HOLE NO. TP-6 COORD. N. 13,006.5 E. 94,212 94,211.5 GROUND ELEV. 5267.3 DEPTH TO GROUND WATER LEVEL: Not Reached

METHOD OF EXCAVATION: L.B. LS5800 APPROXIMATE DIMENSIONS OF HOLE: 20.5'D X 6'W X 25'L LOGGED BY:

CLASSIFICATION SYMBOL (LETTER)	CLASSIFICATION SYMBOL (GRAPHIC)	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART – "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 8-INCH	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF +8-INCH
CL		3.0'	70 lbs	0 – 3.0': Clay, very silty, red-brown, slightly moist, occasional cobble and boulder, a little gravel.					
SM		6.0'	70 lbs (8" minus)	3.0'-6.0': Sand, silty, some clay, gravelly, a few cobbles and boulders to 12"+, intermittent and irregular masses and coatings of gypsum crystals on rocks between 3-6 Feet.					
GM		15.5'	70 lbs (8" minus) 70 lbs (8" minus)	6.0' – 15.5': Gravel, silty sand matrix, gray, dry to slightly moist, boulders to 30", ~10% plus 8" rock, mostly subround to subangular basalt, minor other rock types					
CL		20'	50 lbs TUBE	15.5'-20.0': Clay, gray and brown, slightly moist very stiff to hard, some coarse sand and fine gravel of decomposing sedimentary rock types, a little gypsum, hard calcareous nodules.					
CL		20.5	T.U. 5 lbs	20.0-20.5': Conglomerate, same as above cemented by carbonates.					

Notes: - Loaded ~4 C.Y. onto dump from the interval 3-15 feet.

(- Not certain test pit in original position, coo(ates above determined by re-survey.

PLATE

STERN ENGRS. INC.

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE Disposal Area PROJECT Cheney Reservoir Disposal Site STATE Colorado

HOLE NO. TP-7 COORD. N. 4,840 11,839.7 E. 94,600 94,599.6 GROUND ELEV. 5259.3 DEPTH TO GROUND WATER LEVEL Not Reached

METHOD OF EXCAVATION L.B LS580 APPROXIMATE DIMENSIONS OF HOLE 16.5'D X 20'L X 7'W LOGGED BY LEV

CLASSIFICATION SYMBOL LETTER	CLASSIFICATION SYMBOL GRAPHIC	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART - "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 8-INCH	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF +8-INCH
CL			70 lbs	0.-3.5': Clay, silty, red-brown, slightly moist, very little gravel, a few cobbles, calcareous spots between 1.5-3 feet, gypsum pods and accumulations at 3.5 feet.					
		3.5'							
SM			70 lbs	3.5'-8.0': Sand, silty to clayey, gray-brown, slightly moist, some gravel and cobbles, <1% plus 8" rock, dense, gypsum accumulations 3.5-5 feet.					
		8'							
GM			70 lbs (8" minus)	8.0'-13.0': Gravel, cobbles and boulders in silty sand matrix, gray-brown, dry to slightly moist, rock is mostly subround to subangular basalt, minor other rock types, ~10-15% plus 8" rock, one boulder 43"x30"x30", another 50"x36"x30".					
			140 lbs (8" minus)						
		13'							
CL			70 lbs						
		15'							
GM		16'							
		16.5'	5 lbs T.D						
GM				13.0'-15.0': Clay, sandy, gray and brown, very stiff to hard, silty with depth, a little coarse sand and fine gravel, hard calcareous nodules near top.					
				15.0'-16.0': Gravel, cobbles and boulders in silty sand matrix, gray brown, dense.					
				16.0'-16.5': Conglomerate, same as above cemented by carbonates, very hard to dig, not rippable, could only scratch grooves in the top of it.					

Notes: · Test pit at original surveyed position.

- Could not excavate below 16.5 feet because of well cemented conglomerate.

PLATE

WESTERN ENGINEERS, INC.

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE: Disposal Area — PROJECT: Cheney Reservoir Disposal Site — STATE: Colorado

HOLE NO.: TP-8 — COORD. N. 12,729 12,728.9 E. 94,316 — GROUND ELEV. 5266.2 — DEPTH TO GROUND WATER LEVEL: Not Reached

METHOD OF EXCAVATION: LB LS5800 — APPROXIMATE DIMENSIONS OF HOLE: 20.5'D X 7'W X 35'L — LOGGED BY: LEV

CLASSIFICATION SYMBOL (LETTER)	CLASSIFICATION SYMBOL (GRAPHIC)	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART - "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 8-INCH	WEIGHT OF +3-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF +8-INCH
SC		3'	70 lbs	0 - 3.0': Sand, clayey, red-brown, dry, calcareous and pale red-brown below 0.8 foot, some gravel and cobbles mostly basalt, soft calcareous coatings on the rocks.					
GM		13'	70 lbs (8" minus); 140 lbs (8" minus)	3.0'-13.0': Gravel, cobbles, some boulders, silty to clayey sand matrix, brown, dry, rock is mostly subround to subangular basalt, minor other rock types, gypsum crystal accumulations 3-3.5 feet, <5% plus 8" rock some boulders to 24" plus.					
CL		14.5'		13.0'-14.5': Clay, sandy, brown and gray, very stiff to hard, slightly moist, a little course sand and fine gravel.					
CL		20.5'	70 lbs (8" minus); T.D.	14.5'-20.5': Clay, sandy, gravel, cobbles and large boulders; no boulders or cobbles 17-18.5', dense.					

Notes: - Loaded ~3 C.Y. from the interval 3-13 ft., added to material from TP-3 & TP-6 for Sieve Sample No. 3
- Contacts between units are distinct but undulating, with 1-2 ft. of relief across test pit
- Moved location ~400 feet NWLY, resurvey po[illegible]ion indicated above
- [illegible]had to lengthen test pit to dig below 15 ft [illegible]ause of large boulders.

PLATE

[illegible]STERN [illegible] INC.

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE: Disposal Area — PROJECT: Cheney Reservoir Disposal Site — STATE: Colorado

HOLE NO. TP-9 — COORD. N. 12,300 — E. 94,430 94439.8 — GROUND ELEV. 5259.8 — DEPTH TO GROUND WATER LEVEL: Not Reached

METHOD OF EXCAVATION: L.B. LS5800 — APPROXIMATE DIMENSIONS OF HOLE: 7'W X 20'D X 25'L — LOGGED BY: LEV

CLASSIFICATION SYMBOL (LETTER)	CLASSIFICATION SYMBOL (GRAPHIC)	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART – "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +3-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 3-INCH	WEIGHT OF +3-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF +3-INCH
CL		2.5'	70 lbs	0 – 2.5': Clay, silty, red-brown, calcareous and pale red-brown below 0.6', dry, some gravel and cobbles, mostly basalt with calcareous coatings.					
GM		8.5'	200 lbs (3" minus)	2.5'-8.5': Gravel, sandy, silty to clayey, dry, dense, gray-brown, some cobbles, mostly basalt, no 12" plus rock.					
SM		13.5'	70 lbs	8.5'-13.5': Sand, silty to clayey, a little course sand and fine gravel, gray-brown, dry, dense.					
GM		18.5'	200 lbs (3" minus)	13.5'-18.5': Gravel, clayey sand and silt matrix, ~10-15% cobbles and boulders up to 18", mostly basalt.					
CL		20'	70 lbs T.D. TUBE	18.5'-20.0': Shale, in-situ, weathered, clayey, dense, yellow to gray and brown streaked, slightly moist, some gypsum, bedding planes evident.					

Notes: – Loaded ~2 C.Y. from 2.5'-8.5' and ~2 C.Y. from 13.5'-18.5' for sieve test.

– Test pit located at original surveyed position.

PLATE

WESTERN ENGINEERS, INC.

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE: Disposal Area PROJECT: Cherry Reservoir Disposal Site STATE: Colorado

HOLE NO.: TP-10 COORD. N.: 12,290 (12,289.7) E.: 94,980 (94,979.5) GROUND ELEV.: 5274.5 DEPTH TO GROUND WATER LEVEL: 18 Feet

METHOD OF EXCAVATION: L.B. LS 5800 APPROXIMATE DIMENSIONS OF HOLE: 23'D X 7'W X 27'L LOGGED BY: LEV

CLASSIFICATION SYMBOL (LETTER)	CLASSIFICATION SYMBOL (GRAPHIC)	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART - "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 8-INCH	WEIGHT OF +3-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF +3-INCH
CL		2.5'	70 lbs	0 - 2.5': Clay, silty, red-brown, top 0.5' moist, slightly moist below 0.5', slightly calcareous.					
SM		6.5'	70 lbs	2.5' - 6.5': Sand, gravelly, gray-brown, dry, dense, some cobbles and boulders, mostly subround to subangular basalt, < 5% plus 12" rock, rather heavy accumulation of crystallized gypsum between 2.5 and 3.5 ft.					
CL		10'	70 lbs						
SM		13.5'	200 lbs (8" minus)	6.5' - 10.0': Clay, gray and brown, slightly moist, very stiff to hard, a little coarse sand and fine gravel.					
CL		20.5'	70 lbs; wet seam seeping water	10.0' - 13.5': Sand, silty to clayey at top, gray-brown, dry, dense, cobbles and boulders, mostly subround to subangular basalt, some gravel, ~ 5% plus 12", ~ 10% 3" to 8", ~ 5% 8" to 12" rock, one rock 36".					
CL		23'	50 lbs r.d.	13.5' - 20.5': Clay, coarse sand and fine gravel of decomposing multi-colored sedimentary rocks and basalt, slightly moist, moisture increases at wet seam, < 5% plus 12", ~ 2-5% 3" to 8", and ~ 2% 8"-12" rock.					
				20.5' - 23.0': Shale, in-situ, weathered, clayey, moist, yellow brown and gray, bedding evident.					

Notes: - Loaded ~ 1.5 C.Y. from 2.5'-6.5', and ~ 1.5 C.Y. from 10'-13.5' with material from TP-9

(-Test pit located at original surveyed (ition

PLATE

WESTERN

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE: Disposal Area PROJECT: Cheney Reservoir Disposal Site STATE: Colorado

HOLE NO. TP-11 COORD. N. 12,869 E. 94,971 GROUND ELEV. 5279.5 DEPTH TO GROUND WATER LEVEL: Not Reached

METHOD OF EXCAVATION: L.B. LS5800 APPROXIMATE DIMENSIONS OF HOLE: 20'D X 7'W X 23'L LOGGED BY: LEV

CLASSIFICATION SYMBOL (LETTER)	CLASSIFICATION SYMBOL (GRAPHIC)	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART - "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 8-INCH	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF +8-INCH
CL		2.5'	70 lbs	0 – 2.5': Clay, silty, red-brown, slightly moist, calcareous and pale red-brown below 0.7 ft., some gravel and cobbles, a few boulders, calcareous coatings.					
SM		13'	70 lbs (8" minus)	2.5'-13.0': Sand, silty to clayey, gray-brown, dry to slightly moist, less silt and clay below 9 ft., gravel, cobbles and boulders to 30", ~10-15% plus 12", ~10% 8"+12", ~15-20% 8" minus rock.					
GM		18.5'	70 lbs (8" minus); 70 lbs (8" minus)	13.0'-18.5': Gravel, cobbles and boulders, sandy matrix, some silt, a little clay, dry to slightly moist, several boulders over 30", one 36"x30"x33", ~15-20% plus 8" rock, mostly subround to subangular basalt.					
CL		20'	70 lbs; TUBE	18.5'-20.0': Clay, very stiff to hard, some coarse sand and fine gravel, some decomposed sedimentary rock gravel.					

Notes:
- Loaded ~5 C.Y. from 2.5-15 feet, with material from TP-9 and TP-10 for large sieve sample No. 2.
- Test pit near original position, resurveyed position indicated above.

PLATE

WESTERN ENGINEERS, INC.

LOG OF TEST PIT OR AUGER HOLE

FOR BORROW AND FOUNDATION INVESTIGATIONS

FEATURE: Access Route - Cut Area PROJECT: Cheney Reservoir Disposal STATE: Colorado

HOLE NO.: TP-12 COORD. N. _____ E. _____ GROUND ELEV. _____ DEPTH TO GROUND WATER LEVEL: Not Reached

METHOD OF EXCAVATION: L.B. LS5800 APPROXIMATE DIMENSIONS OF HOLE: 25'D X 7'W X 28'L LOGGED BY: LEV

CLASSIFICATION SYMBOL (LETTER)	CLASSIFICATION SYMBOL (GRAPHIC)	DEPTH (FEET)	SIZE AND TYPE SAMPLE TAKEN	CLASSIFICATION AND DESCRIPTION OF MATERIAL (SEE CHART - "UNIFIED SOIL CLASSIFICATION"; GIVE GEOLOGIC AND IN-PLACE DESCRIPTION FOR FOUNDATION INVESTIGATIONS)	PERCENTAGE OF COBBLES AND BOULDERS: VOLUME OF HOLE SAMPLED (CUBIC FEET)	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF 3 TO 8-INCH	WEIGHT OF +8-INCH SAMPLED (LBS.)	PERCENTAGE BY VOLUME OF +8-INCH
CL		3'	No samples taken	0 - 3.0': Clay, red-brown, dry to slightly moist, calcareous at surface, spots to 1.5 ft., gypsum accumulations at 3 ft., some gravel and cobbles.					
GM		11'		3.0' - 11.0': Gravel, cobbles and boulders, clayey to silty sand matrix, brown, rock is mostly subround to subangular basalt.					
CL		25		11.0' - 25.0': Clay, sandy, very stiff to hard; slightly moist, hard digging, hard calcareous nodules at 15 and 20 ft., occasional rock between 15 & 17 ft., some coarse sand and fine gravel, more below 20 ft.					
SHALE		25.2'	T.D.	25.0' - 25.2': Shale, in-situ, weathered, yellow-brown, clayey, moist, rippable, thin bedding evident.					

Note: Test pit is located approximately 10 feet right of Station 65+10 of access route.

PLATE

WESTERN ENGINEERS, INC.

CHENEY DISPOSAL AREA

Boring Logs

(including soil and rock logs*)

Jacobs Engineering Group, 1989.

Lincoln-DeVore, Inc.

See Plate 3.1, Attachment 3 for locations of Borings and Test Pits in the Cheney Disposal Area.

* detailed rock logging of core can be found in Calculation GRJ-03-90-12-01-00 on file at the Department of Energy's Albuquerque Operations Office.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 501

JOB NO. GRJ-03 DATE 11/20/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N15,241.1 E95,359.8
SURFACE ELEV. 5,301.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				T						
						86	10.2	CL	Dry	TOPSOIL: SILTY CLAY, sandy, basalt cobbles on surface, brown.
				S	50/4.5"					
5										
				S	82					
10									Dry	SANDY SILT, some very fine basalt gravels and cobbles, brown.
								ML		
				S	50/2"					
15										
								ML	Dry	SANDY SILT AND CLAY, some shale fragements with root matter, calcareous, hard to very hard, light tan to grey.
				S	50/6"					
20										
				RX						
								Sh		MANCOS FORMATION: CLAYEY SHALE, very soft, highly weathered, platy, calcareous, light tan to grey.
25										Note: bedding is 80 degrees to

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 501

JOB NO. GRJ-03 DATE 11/20/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N15,241.1 E95,359.8
SURFACE ELEV. 5,301.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										core axis.
								SLT		MANCOS FORMATION: SILTSTONE, very soft and highly weathered iron stained calcareous.
30										
							10.3			
										MANCOS FORMATION: CLAYSTONE, very soft and highly weathered bedding is 85 to 90 degrees to core axis, brownish grey.
35										
								Sh		Note: color change to grey, some gypsum, with iron staining at 38.5 feet.
40										
45										
50										
										Stopped borehole at 49.9 feet, backfilled with spoils.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 502

JOB NO. GRJ-03 DATE 11/23/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N14,281.7 E94,162.6
SURFACE ELEV. 5,271.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				T				ML		TOPSOIL: SANDY SILT, some cobbles near surface, brown.
						98	14.5	ML		
				S	56					SANDY SILT, calcareous cement, buff to tan.
								ML		SANDY SILT, cobbles, hard to very hard, brownish grey to tan.
5										
				S	34		5.3			
10										
								GM		SANDY GRAVEL, few cobbles, coarse gravel, greyish tan to brown.
				S	50/3"					
15										
										CLAY, massive, medium dense, nonplastic to moderately plastic, greyish tan.
				T						
20				RX				CL		Note: becomming yellow brown clay.
										Note: basalt gravel fragments.
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 502

JOB NO. GRJ-03 DATE 11/23/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N14,281.7 E94,162.6
SURFACE ELEV. 5,271.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								SC		CLAY AND SAND, cobbles of basalt with gravel, tan.
30										
35								Sh		MANCOS FORMATION: CLAY SHALE, very soft, highly weathered, yellow brown, thinly laminated, fissle.
40								Sh		MANCOS FORMATION: CLAY SHALE, very soft, highly weathered bedding planes that are 80 to 85 degrees to the core axis, greyish tan to olive grey.
45										MANCOS FORMATION: SHALE, stringers of sandstone, soft slightly weathered, blue grey.
50										MANCOS FORMATION: SHALE, soft to medium dense, slightly weathered, light grey.
										Stopped drilling at 51 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 503

JOB NO. GRJ-03 DATE 11/07/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N13,348.9 E92,836.0
SURFACE ELEV. 5,238.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				T						TOPSOIL: SANDY SILT, basalt cobbles, very stiff, reddish brown.
								ML		
				S	24					
5										
				S	50/5"					SANDY SILT, basalt cobbles, very dense to hard, moderately fine cemented, moderate brown.
10										
								ML		
										Note: some fine gravel.
				S	50/6"					
15										
				S	50/5"					
20										
										Note: becoming very hard.
				S	50/2"					
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 503

JOB NO. GRJ-03 DATE 11/07/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N13,348.9 E92,836.0
SURFACE ELEV. 5,238.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				S	50/5"					
				RX				Sh		MANCOS FORMATION: CLAY SHALE, very soft, highly weathered, tan.
30										
										Note: bedding is 87 to 90 degrees to core axis, becoming olive grey.
35										Note: minor gypsum veins, soft, weathered, olive grey.
40										
45										
50										
										Stopped drilling at 50 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 504

JOB NO. GRJ-03 DATE 11/30/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N14,140.3 E96,238.6
SURFACE ELEV. 5,325.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				T				CL		TOPSOIL: SANDY SILTY CLAY, cobbles of basalt scattered on surface, brown.
						93	9.6			
				S	35			ML		SANDY SILT, cemented with carbonate, caliche zone, light grey to white.
5										SANDY SILT AND CLAY, basalt cobbles and gravel.
								CL/ ML		
10										
				S	50/2"					
							6.0			
								ML		SANDY SILT, very hard, cobbles generally 6 to 9 inches in diameter, boulders as large as 2 feet, brown to yellow brown.
15										
				S	50/5"					
20										SANDY SILT AND CLAY, with fine to coarse gravel, tan.
				S	50/1"					
								ML/ CL		
25										Note: 6 inch clay seam at 24.5 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 504

JOB NO. GRJ-03 DATE 11/30/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N14,140.3 E96,238.6
SURFACE ELEV. 5,325.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				S	50/6"					
								CL/ ML		SANDY SILT, some clay, hard to very hard, fine gravel. Note: 6 inch clay seams.
30										
35				S	50/3"					
								ML		SANDY SILT AND GRAVEL, hard to very hard, tan
				S	50/6"					
40								CL/ Sh		MANCOS FORMATION: SHALE, very soft, highly weathered, tan to grey.
				S	50/6"		10.4			
				RX						
45										Note: bedding at 85 degrees to core axis, little to no visible fractures.
										Note: core grades to slightly weathered to fresh shale at 49 feet.
50										Note: color changes to olive grey, healed fracture with clay at 48.5 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 504

JOB NO. GRJ-03 DATE 11/30/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N14,140.3 E96,238.6
SURFACE ELEV. 5,325.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
55										
60										Stopped drilling at 55.7 feet.
65										
70										
75										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
DX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 505

JOB NO. GRJ-03 DATE 12/06/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N13,132.9 E94,694.8
SURFACE ELEV. 5,279.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				T				ML		TOPSOIL: SANDY SILT, considerable cobble to gravel size, reddish brown.
				S	32/6"			ML		SANDY SILT, caliche cement below 18 inches, brown.
								ML		SANDY SILT, basalt cobbles, considerable carbonate cement.
5										
				S	37					SANDY SILT AND GRAVEL, carbonate cement, hard, tan to grey.
10										
				S	50/4"					SANDY SILT, fine gravel and cobbles of basalt, very hard, light (streaky) tan-grey-brown.
				S	78/10"			ML		
15										
				S	53					
20								ML		SANDY SILT, some fine gravel, very hard, dark brown.
				S	49					
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - OOEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 505

JOB NO. GRJ-03 DATE 12/06/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N13,132.9 E94,694.8
SURFACE ELEV. 5,279.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
			S	S	50/5"			ML/		SANDY SILT AND CLAY, fine gravel, increase in gravel percentage after 27 feet, becoming hard to very hard, brown.
			S	S	80/11"			CL		
30										
			S	S				Sh/		MANCOS FORMATION: SHALE, very soft, highly weathered, bedding is 85 to 90 degrees to core axis, tan and grey.
			RX	RX				CL		
35										
40										
								Sh		
45										
										Note: Gypsum present.
50										
										Stopped drilling at 50.5 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE
RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 506

JOB NO. GRJ-03 DATE 12/02/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N11,834.9 E93,198.0
SURFACE ELEV. 5,233.10'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								GP		TOPSOIL: GRAVEL, cobble size basalt.
				T		97	14.5			
				S	60					SANDY SILT, very hard with carbonate cement, brown to tan.
5								CL/ ML		
				S	50/6"					
10								ML/ SM		SANDY SILT AND SILTY SAND, becoming very hard, fine gravel to basalt cobbles, brown to tan.
				S	50/4"					
15										
				S	50/4"					
20										
				S	50/6"		5.0			
25								CL/ ML		SANDY SILT, very hard, some fine gravel, weathered shale

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 506

JOB NO. GRJ-03 DATE 12/02/82

RIG TYPE N.K.
BORING TYPE HSA/CORE N11,834.9 E93,198.0
SURFACE ELEV. 5,233.10'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										fragments, tan to brown.
				S RX	50/6"					MANCOS FORMATION: CLAY SHALE, very soft, highly weathered, very clayey with bedding at 85 to 90 degrees to core axis, grey.
30								Sh/ CL		Note: some gypsum filled fractures below 30.5 feet.
35										MANCOS FORMATION: SHALE, very soft, highly weathered, gypsum filled fractures, tan to olive grey.
40										
45										
50										Note: no gypsum below 47 feet.
										Stopped drilling at 50.5 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 507

JOB NO. GRJ-03 DATE 12/08/82

RIG TYPE N.K.
BORING TYPE HSA N11,902.9 E93,261.4
SURFACE ELEV. 5,235.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0										TOPSOIL: SAND and silt.
								SM		
5								GM		SILT, fine sand and gravel.
10										
15										
20										
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 507

JOB NO. GRJ-03 DATE 12/08/82

RIG TYPE N.K.
BORING TYPE HSA N11,902.9 E93,261.4
SURFACE ELEV. 5,235.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
30										
35										MANCOS FORMATION: SHALE Note: monitor well installed, 2 inch diameter PVC, sand pack interval 32 to 52 feet, bentonite seal 30 to 32 feet, grout to surface.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

2-3

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 507

JOB NO. GRJ-03 DATE 12/08/82

RIG TYPE N.K.
BORING TYPE HSA N11,902.9 E93,261.4
SURFACE ELEV. 5,235.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										Stopped drilling at 52 feet.
55										
60										
65										
70										
75										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 508

JOB NO. GRJ-03 DATE 12/09/82

RIG TYPE N.K.
BORING TYPE Rotary Air N14,169.1 E96,180.2
SURFACE ELEV. 5,324.06'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								GM/ GP		TOPSOIL: GRAVEL, sand, and silt.
								GM		SILTY GRAVEL, some cobbles to 24 inch diameter, considerable sand, low plasticity, tan to grey.
5										
10										
15										
20										
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 508

JOB NO. GRJ-03 DATE 12/09/82

RIG TYPE N.K.
BORING TYPE Rotary Air N14,169.1 E96,180.2
SURFACE ELEV. 5,324.06'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								GM		
30										
35										
								Sh		MANCOS FORMATON: SHALE Note: monitor well installed 2 inch diameter PVC, sand pack interval 29 to 50.7 feet, bentonite seal 27 to 29 feet, grout to surface.
40										
45										
50										
										Stopped drilling at 50.7 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 509

JOB NO. GRJ-03 DATE 12/10/82

RIG TYPE N.K.
BORING TYPE Rotary Air N14,336.4 E94,130.7
SURFACE ELEV. 5,271.57'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								SM		TOPSOIL: silty sand
5								SP		GRAVELLY SAND, predominately medium, some silt, nonplastic, greyish brown.
10										
15										
20										
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 509

JOB NO. GRJ-03 DATE 12/10/82

RIG TYPE N.K.
BORING TYPE Rotary Air N14,336.4 E94,130.7
SURFACE ELEV. 5,271.57'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								GP		SAND AND GRAVEL, medium to fine sand, some silt, low plasticity to nonplastic, brownish grey.
30										
35										
40										
				RX				Sh		MANCOS FORMATION: SHALE
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. _

JOB NO. GRJ-03 DATE 12/10/82

RIG TYPE N.K.
BORING TYPE Rotary Air N14,336.4 E94,1.
SURFACE ELEV. 5,271.57'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
								Sh		MANCOS FORMATION: SHALE
55										
60										
65										
70										
75										

GROUNDWATER

	HOUR	DATE
▽	NONE	
▼		

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.

GRAND JUNCTION
CHENEY RESERVOIR
GRJ-03 DATE 12/10/82

LOG OF TEST BORING NO. 509

RIG TYPE N.K.
BORING TYPE Rotary Air N14,336.4 E94,130.7
SURFACE ELEV. 5,271.57'
DATUM MSL

Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							Sh		MANCOS FORMATION: SHALE
80									
85									
90									
95									
100									

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03

DATE 12/10/82

LOG OF TEST BORING NO

RIG TYPE N.K.

BORING TYPE Rotary Air

SURFACE ELEV. 5,271.57'

DATUM MSL

N14,336.4 E

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
105								Sh		MANCOS FORMATION: SHALE
110										
115										
120										
125										

Stopped drilling at 105. feet. Note: monitor well installed 2 inch diameter PVC, cave-in 101 to 105 feet, sand pack interval 79 to 101 feet, bentonite seal 78 to 79 feet, grout to surface.

GROUNDWATER

DEPTH	HOUR	DATE
NE		

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

LOG OF TEST BORING NO. 701

GRAND JUNCTION
CHENEY RESERVOIR
RJ-03

DATE 03/14/83

RIG TYPE MOBILE B-57
BORING TYPE HSA
SURFACE ELEV. 5,293.10'
DATUM MSL

N14,463.1 E95,021.4

Penetration Resistance	Graphical Log	Sample Type	Sample/Foot, 30 Blows/foot, 140 lb. fall free-hammer drop	Dry Density lbs. per cubic foot	Moisture Content Percent Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
		S	30			SM		SILTY SAND, fine, nonplastic, light brown.
		S	64			CH		SILTY CLAY, high plasitcity, reddish brown.
		S	50/5 1/2"			CL		note: some gravel and cobble size basalt fragments.
		S	50/2"			SM		SILTY CLAY, considerable lime, some gravel, medium plasticity, white.
		S	62			SM		SILTY SAND, considerable gravel, occasional cobble, nonplastic, dark brown.
		S	72 11-1/-					SILTY SAND, some sand, small amounts of fine gravel, high plasticity, light tan.
		S	83					
		S	50/2 1/2"					
		S	50/5 1/2"			CL		SANDY CLAY, considerable fine gravel, medium plastic, light greenish-tan.
		S	50/3 1/2"					
		S	50/4"					

5 10 15 20 25

GROUNDWATER

	HOUR	DATE

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 701

B NO. GRJ-03 DATE 03/14/83

RIG TYPE MOBILE B-57
BORING TYPE HSA N14,463.1 E95,021.4
SURFACE ELEV. 5,293.10'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										note: occasional seams of silty clay, nonplastic, light tan.
				S	50/4"					
30				S	50/3 1/2"					
								Sh		MANCOS FORMATION: SHALE, very to moderately weathered, light tan.
				S	50/5"					
35										
										Stopped drilling at 38 feet.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 702

JOB NO. GRJ-03 DATE 03/14/83

RIG TYPE MOBILE B-57
BORING TYPE HSA N13,412.9 E93,568.3
SURFACE ELEV. 5,252.96'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	30					TOPSOIL: SILTY CLAY, some lime, medium to high plastictiy, light tan.
								CH		
				S	64					
5				S	50/5 1/2"					CLAYEY SAND AND GRAVEL, poorly graded, occasional cobbles, medium plastic, light tan.
								GC		
				S	50/2"					
10				S	62					
				S	72 11-1/-					
15				S	83					SANDY CLAY, considerable fine gravel, medium plastic, light tan to light reddish tan.
								CL		
				S	50/2 1/2"					
20				S	50/5 1/2"					SILTY CLAY, some sand, small amount of fine gravel, medium to high plasticity, light tan.
				S	50/3 1/2"			CL		
25				S	50/4"			SC		CLAYEY SAND, considerable fine gravel, low plasticity, tan.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 702

JOB NO. GRJ-03 DATE 03/14/83

RIG TYPE MOBILE B-57
BORING TYPE HSA N13,412.9 E93,568.3
SURFACE ELEV. 5,252.96'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot. 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										CLAYEY SAND AND GRAVEL COBBLES, poorly graded to .65 feet, subrounded, low plasticity, brown.
				S	50/4"					
								GC		
30				S	50/3 1/2"					
				S	50/5"					
								SH/ CL		MANCOS FORMATION: CLAY SHALE, highly weathered, light tan to grey.
35										
										Stopped drilling at 38 feet.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 805

JOB NO. GRJ-03 DATE 03/22/89

RIG TYPE MOBILE B-53
BORING TYPE HSA/ODEX N11,537.0 E94,389.0
SURFACE ELEV. 5,253.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			14.2			
							14.2	ML	Very moist	TOPSOIL: CLAYEY SILT, gravelly, trace fine sand, loose, red brown to brown.
							13.6			
							8.8			
							7.9	GM	Damp to moist	SILTY GRAVEL, sandy, cobbles and boulders at top, grades to subrounded/subangular, clasts with depth, loose, nonplastic, greyish brown.
5				U			4.8			
				OX			1.4			
							3.7			
							4.0			
							3.8			
10							4.1			
							8.0			Note: color change from grey to light brown at 11 feet.
							7.0			
							5.7			
							4.0			
15							5.6			
							6.1		Damp to moist	CLAYEY GRAVEL, some fine to very fine sand, medium dense, light brown.
							7.0	GC		
							8.0			
							6.4	CL	Slightly moist	GRAVELLY CLAY, traces of fine sand, slight plasticity, light brown.
20							7.3			
							5.0	GC	Slightly moist	CLAYEY GRAVEL, sandy, loose, fine to very fine sand, light brown.
							5.8			
							5.6	GP	Slightly moist	SANDY GRAVEL, some silt, light grey.
25							6.1			
							7.4			

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 805

JOB NO. GRJ-03 DATE 03/22/89

RIG TYPE MOBILE B-53
BORING TYPE HSA/ODEX N11,537.0 E94,389.0
SURFACE ELEV. 5,253.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							5.5	GM	Sligthly moist	SILTY GRAVEL, clayey, light grey to light brown.
							7.7			
				U			7.4			
							10.1	Sh	Very moist	MANCOS FORMATON: CLAY SHALE, fissle, slight plasticity, slightly to moderately weathered, light brown to grey.
30				OX			12.6			
							11.9			
							12.5			
							13.0			
35										
40										
										MANCOS FORMATION: SHALE, fresh, fissle and indurated, grey to black.
								Sh		
45							12.5			
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 805

JOB NO. GRJ-03 DATE 03/22/89

RIG TYPE MOBILE B-53
BORING TYPE HSA/ODEX N11,537.0 E94,389.0
SURFACE ELEV. 5,253.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
55										
60										
65										
70										Stopped drilling at 65 feet.
75										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 806

JOB NO. GRJ-03 DATE 03/06/89

RIG TYPE ~~KOEHRING 666E~~ Mobile B-57
BORING TYPE HSA/ODEX N13,610.2 E94,692.0
SURFACE ELEV. 5,281.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			18.9	CL	Moist	TOPSOIL: SILTY CLAY, moderate plasticity, dark brown.
							13.7	ML	Slightly damp	CLAYEY SILT, traces of fine sand, gypsum about 20%, nonplastic, light brown to white.
							11.8			
							9.9			
							9.1			
5				U			12.6	GM	Dry	GRAVELLY SILT, some clay, basalt clasts, nonplastic, light brown to grey.
				OX			12.8			
							8.3			
							3.5			
							1.5			
10							9.8			
							6.2			
							7.5	GC	Damp to moist	CLAYEY GRAVEL, some silt, slight plasticity, dark grey to black, strongly cemented from 11 to 15 feet, light brown to grey.
							8.0			
15							5.1			
							5.1			
							3.6			
							3.9			
							3.9			
20							6.0			
							8.1			
							3.0			
							3.8			
							5.2			
25							7.5			
							7.5			

GROUNDWATER

	DEPTH	HOUR	DATE
▽	37.0	N.K	03/05/89
▼	70.5	N.K.	03/06/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 806

JOB NO. GRJ-03 DATE 03/06/89

RIG TYPE ~~KOEHRING 666E~~ Mobile B-57
BORING TYPE HSA/ODEX N13,610.2 E94,692.0
SURFACE ELEV. 5,281.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot. 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							8.2	CL		CLAY, moderately weathered, moderate to highly plastic, tan.
							9.9			
				U			9.9			
							15.4	GC	Very moist	CLAYEY GRAVEL, cobbles to about 8 inches (basalt and occasional siltstone), traces of silt, light brown.
30				OX			14.4			
							11.4			
							11.2			
							11.6			
							8.3		Moist	MANCOS FORMATION: CLAY SHALE, moderately weathered, fissle, becomminig indurated with depth, light brown.
35							10.1	CL		
▽							8.9			
							8.6			
							9.1			
							8.8			
40							5.5			
									Sligthly moist	MANCOS FORMATION: SHALE, clayey, fairly fresh, fissle, becomes indurated with depth, light grey to black.
								Sh		
							5.7			
45										
							5.5			
							5.7			
							5.5			
							5.8			
							5.9			
50							6.1			
							5.9			

GROUNDWATER

	DEPTH	HOUR	DATE
▽	37.0	N.K.	03/05/89
▼	70.5	N.K.	03/06/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 806

JOB NO. GRJ-03 DATE 03/06/89

RIG TYPE ~~KOEHRING 666E~~ Mobile B-57
BORING TYPE HSA/ODEX N13,610.2 E94,692.0
SURFACE ELEV. 5,281.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							6.2			
							5.7			
							6.0			
55							5.1			
							5.5			
							6.4			
							6.6			
							6.5			
60							6.5	Sh	Slightly moist	**MANCOS FORMATION: SHALE,** fresh, fissle, indurated, grey to black.
							7.5			
							6.4			
							6.4			
							6.4			
65							6.8			
							6.7			
							6.8			
							6.6			
							6.5			
70 ▼							6.8			
							6.6			
							6.7			
							6.7			
							6.7			
75							5.7			
							5.3			
							5.5			

GROUNDWATER

	DEPTH	HOUR	DATE
▽	37.0	N.K	03/05/89
▼	70.5	N.K.	03/06/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 806

JOB NO. GRJ-03 DATE 03/06/89

RIG TYPE ~~KOEHRING 666E~~ Mobile B-57
BORING TYPE HSA/ODEX N13,610.2 E94,692.0
SURFACE ELEV. 5,281.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							5.8			
							6.2			
80										Stopped drilling at 80 feet.
85										
90										
95										
100										

GROUNDWATER

	DEPTH	HOUR	DATE
▽	37.0	N.K.	03/05/89
▼	70.5	N.K.	03/06/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 807

JOB NO. GRJ-03 DATE 03/14/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,598.6 E94,794.4
SURFACE ELEV. 5,270.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			10.4	SM	Very moist	**TOPSOIL: SANDY SILT,** occasional basalt cobbles, some clay, nonplastic, dark brown.
							10.0			
							10.7		Moist to very moist	**SANDY CLAYEY SILT,** very fine sand, slight plasticity, light brown.
							10.4	SM		
							10.0			
5				OX			6.7			
							7.3		Slightly moist	**CLAYEY GRAVEL AND COBBLES,** cobbles 7 to 8 inch diameter, some silt, light brown.
							4.8	GC		
							4.8			
							5.8			
10							5.8			
							4.6			
							2.9		Dry	**SILTY GRAVEL,** cobble to boulder gravel with some clay, light grey to light brown.
							2.3	GM		
							2.8			
							4.1		Dry to slightly damp	**CLAYEY GRAVEL,** trace of silt, slight plasticity, light yellowish brown.
15							5.0	GC		
							6.0			
							7.1			
							6.3			
							7.2		Moist to very moist	**CLAY,** trace of gravel at top contact, slightly to moderately plastic, light yellowish brown to olive brown.
20							8.1	CL		
							8.7			
							9.0			**Note:** gravel content increases with depth.
							8.3			
							8.5			
25							9.3			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 807

JOB NO. GRJ-03 DATE 03/14/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,598.6 E94,794.4
SURFACE ELEV. 5,270.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							9.6			
							10.5			
							10.4			
30							10.3			
							10.1			
							9.8			
							10.2			
							10.9			
							10.7	Sh	Moist to very moist	MANCOS FORMATION: CLAY SHALE, moderately weathered, fissle, light olive brown.
35							10.6			
							10.7			
							10.5			
							10.4			
40							10.2			
							8.9			
							8.6			
							7.8			
							6.6			
							5.5	Sh	Slightly moist	MANCOS FORMATION: SHALE, fissle and indurated, fresh, grey to black.
45							4.9			
							5.1			
							5.6			
							5.8			
50							5.5			
							5.9			
							5.9			

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 807

JOB NO. GRJ-03 DATE 03/14/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,598.6 E94,794.4
SURFACE ELEV. 5,270.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							6.2			
							5.7			
55							5.5			
							5.8			
							5.7			
							5.5			
							5.5			
60							5.3			
							5.4			
							5.4			
							6.2			
							7.0			
65							5.9			
										Stopped drilling at 65 feet.
70										
75										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 808

JOB NO. GRJ-03 DATE 03/20/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,947.7 E94,793.3
SURFACE ELEV. 5,263.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			14.9	ML	Very moist	**TOPSOIL: CLAYEY SILT,** some sand, slight plasticity, trace fine gravel, red brown.
							14.4			
							13.2		Very moist	**CLAYEY SILTY GRAVEL,** slightly plastic, red brown.
							13.7	GM		
							11.3			
5				OX			7.6		Slightly moist	**SILTY GRAVEL,** sandy, fine to very fine grained sand, light brown to grey.
							5.8	GM		
							5.9			
							5.2			
							6.0			
10							10.4	SM	Very moist	**SANDY SILT,** traces of clay, nonplastic, sand is very fine grained, occasional gravel, light brown.
							7.1			
							6.8		Slightly moist	**SILTY SANDY GRAVEL,** nonplastic, light grey.
							5.8	GP		
							4.5			
15							4.3			
							7.7		Slightly moist to moist	**SANDY GRAVEL,** poorly graded fine to medium sand, subrounded, weakly cemented, dark brown.
							5.9	GP		
							6.9			
							9.3			
20							7.7			
							8.5			
							7.7		Moist	**MANCOS FORMATION: CLAY SHALE,** moderate plasticity, slightly to moderately weathered, light brown, fissle.
							9.6	Sh		
25							9.6			
										Stopped drilling at 25 feet.

GROUNDWATER

DEPTH	HOUR	DATE
16.0		03/19/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 809

JOB NO. GRJ-03 DATE 03/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,843.4 E94,198.3
SURFACE ELEV. 5,266.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			14.1		Very moist	TOPSOIL: SILTY CLAY, gravelly, moderately to highly plastic, basalt clasts (nominal 4 inches), dark reddish brown.
							23.4	CL		
							21.8			
							18.2			
							7.7		Slightly moist to moist	SILTY SAND, some gravel, nonplastic, gypsum comprises approximately 23%, basalt clasts to 6 inches, light greyish brown.
5				OX			4.9	SM		
							9.3			
							9.0			
							7.3			
							6.7			
10							8.7	GM	Slightly moist	SILTY GRAVEL, some clay, medium dense, light brown.
							9.4		Moist to very moist	CLAY, some gravel and cobbles, (basalt clasts nominal 3 to 4 inches) moderately plastic, light brown.
							10.1	CL		
							10.0			
							7.8			
15							8.6			
							14.2			
							8.3			
							4.3		Slightly moist	SILTY GRAVEL, some clay, nonplastic, light grey to light brown.
							5.1	GM		
20							4.8			
							7.8	GC	Moist	CLAYEY GRAVEL, slight plasticity, light brown.
							10.8		Very moist	CLAY, traces of gravel, moderately plasticity, light brown.
							11.2	CL		
							8.2		Moist	CLAYEY GRAVEL, moderate
25							7.6	GC		

GROUNDWATER

DEPTH	HOUR	DATE

SAMPLE TYPE
RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 809

JOB NO. GRJ-03 DATE 03/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,843.4 E94,198.3
SURFACE ELEV. 5,266.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							6.9			plasticity, subangular to subrounded basalt and siltstone clasts, light brown.
							6.7			
							9.5			
							9.9			
30								Sh	Moist	MANCOS FORMATION: CLAY SHALE, slight plasticity, fissle, moderately weathered, slightly sandy at top, light brown to grey.
35										
										Stopped drilling at 36 feet.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 810

JOB NO. GRJ-03 DATE 03/21/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,180.9 E94,142.1
SURFACE ELEV. 5,252.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			11.0	ML	Moist	**TOPSOIL: CLAYEY SILT**, slight plasticity, occasional cobbles, rootlets, red brown.
							12.4			
							12.2		Damp	**CLAY**, traces of fine sand, moderate plasticity, about 5% gypsum (soft and striated), light brown.
							15.2	CL		
							14.8			
5				OX			11.8			
							11.8			
							10.4			**MANCOS FORMATION: CLAY SHALE**, fissle, moderate plasticity, gypsum about 5-10%, becomes indurated with depth, moderately weathered, oxidized bedding surfaces, light brown to grey.
							9.1	Sh		
10							9.6			
							9.2			
							9.7			
							10.0			
							9.9			
15							10.6			
							11.5			
							15.5			
							13.9			
							12.5			
20							12.4			
							12.8			
							11.8			
							11.7			
							10.9			
25							10.5			
							11.1			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 810

JOB NO. GRJ-03 DATE 03/21/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,180.9 E94,142.1
SURFACE ELEV. 5,252.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							11.2			
							11.6			
							12.0			
							11.7			
30							11.7	Sh	Damp	MANCOS FORMATION: CLAY SHALE, slightly weathered, fissle, light brown to grey.
							11.8			
							10.5			
							12.3			
35							10.6			
										Stopped drilling at 35 feet.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 811

JOB NO. GRJ-03 DATE 02/28/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,087.9 E95,470.1
SURFACE ELEV. 5,291.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			17.4	CL	Very moist	**TOPSOIL: SILTY CLAY,** moderate plasticity, dark brown.
							12.6		Moist to very moist	**SANDY SILT,** clayey, nonplastic, some gravel (basalt), light brown.
							14.2	SM		
							5.4			
5				OX			8.7			
							3.7			
							5.8			
							5.5	GM	Dry to slightly moist	**SILTY GRAVEL,** clayey, nonplastic, gravel is subrounded basalt, alternating light brown to brownish grey. **Note:** clay increasing with depth.
10							2.9			
							2.2			
								GC	Dry to slightly moist	**CLAYEY GRAVEL,** some silt, slight plasticity, poorly graded, light brown.
15							7.7		Moist	**CLAY,** some silt, highly weathered, firm to stiff, occasional basalt cobbles, isolated siltstone and iron pods, gypsum approximately 10%, light brown.
							8.5	CL		
							8.9			
							7.6			
20							6.6			
							7.6			
							7.4			
							5.3			
							7.2			
25							7.6			
							4.0			

GROUNDWATER

	DEPTH	HOUR	DATE
▽	56.0		03/01/89
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 811

JOB NO. GRJ-03 DATE 02/28/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,087.9 E95,470.1
SURFACE ELEV. 5,291.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							4.4			
							9.3			
							9.4			
							7.6			
30							5.2	GC	Moist	CLAYEY GRAVEL, some silt, slight plasticity, light brown to grey.
							6.9			
							9.0			
							9.6			
							7.3			MANCOS FORMATION: CLAY SHALE, some silt, moderately plastic, light brown to light grey.
35							6.9	CL		
							8.1			
							9.5	Sh	Slightly moist to moist	MANCOS FORMATION: SHALE, fresh, fissle, occasional, clay/siltstone seam, grey to black.
							8.9			
							8.6			
40							7.2			
							7.0			
							6.2			
							6.5			
							6.4			
45							5.8			
							6.6			
							6.0			
							5.8			
							5.6			
50				RX			5.4	Sh		Note: First core run from 50 to 55 feet.
							6.2			

GROUNDWATER

	DEPTH	HOUR	DATE
▽	56.0		03/01/89
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 02/28/89

LOG OF TEST BORING NO. 811

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,087.9 E95,470.1
SURFACE ELEV. 5,291.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							6.0			
							6.4			
55							5.7			Note: second run from 55 to 60 feet
60				OX				Sh		MANCOS FORMATION: SHALE, fissle and indurated, occasional clay siltstone seam, calcite and gypsum veinlets throughout.
65										
							5.2			
							5.1			
70							4.9			
							4.5			
							3.8			
							3.7			
							4.2			
75							4.0			
							4.5			
							4.8			
										Stopped drilling at 77.5 feet.

GROUNDWATER

DEPTH	HOUR	DATE
56.0		03/01/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 812

JOB NO. GRJ-03 DATE 03/07/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,469.0 E95,562.0
SURFACE ELEV. 5,292.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			10.4	ML	Very moist	**TOPSOIL: CLAYEY SILT,** moderate plasticity, red brown.
							14.9			
							17.9	GP	Very moist	**SILTY GRAVELLY SAND,** fine to very fine, occasional basalt gravels and cobbles to 9 inches, nonplastic, light brown.
							17.9			
5				OX			17.9			
							13.2			
							12.2	ML	Very moist	**CLAYEY SILT,** some gravel, loose, slight plasticity, light brown.
							10.1			
							9.5	GM	Moist	**SILTY GRAVEL,** some clay, loose, nonplastic, light grey to light brown.
10							10.0			
				U			9.1	CL	Slightly moist to moist	**SILTY CLAY,** some gravel, slight plasticity, dark brown.
				OX			5.7			
							3.7	GM	Damp	**SILTY GRAVEL,** clayey, cobbles are subangular to subrounded basalt and siltstone, weakly lime cemented, light grey to grey.
15							3.3			
							3.3			
							9.3			
							11.3	CL		**CLAY,** some gravel to top contact, stiff to hard, very dense, moderately lime cemented, moderately plastic, dark brown.
							12.1			
20							12.5			
							5.3	GC	Moist to very moist	**CLAYEY GRAVEL,** some silt, weakly cemented, loose, nonplastic, light grey.
							8.1			
							13.2			
							12.8			
25							10.8		Very moist	**MANCOS FORMATION: CLAY SHALE,** some gravel at top,
							12.1	Sh		

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 812

JOB NO. GRJ-03 DATE 03/07/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,469.0 E95,562.0
SURFACE ELEV. 5,292.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							6.6			medium plasticity, light brown.
							13.6		Slightly to very moist	MANCOS FORMATION: SHALE, fissle, becomming indurated with depth, slightly moist zones from 33 to 40 feet, light grey to black.
							12.5	Sh		
							10.4			
30							12.3			
							11.5			
							10.4			
							10.7			
							10.3			
35							11.1			
							10.4			
							4.6			
							4.3			
							4.3			
40							4.2			
							4.3			
							4.2			
							4.6			
							4.7			
45							5.2			
							5.3			
							5.1			
							4.9			
							4.9			
50										
				RX			4.2	Sh		Note: first core run from 50.5 to 55.5 feet; 100% recovery, RQD=9, numerous horizontal fractures, fissle, indurated.
							3.9			

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 812

JOB NO. GRJ-03 DATE 03/07/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,469.0 E95,562.0
SURFACE ELEV. 5,292.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							5.3			
							5.4			
							5.2			
55							6.3			Note: second core run from 55.5 to 60.5 feet, 100% recovery, RQD=80, much more competent, fewer fractures.
							6.0			
							6.1			
							5.9			
							5.6			
60									Slightly moist	
				OX			5.3			MANCOS FORMATION: SHALE, fissle and indurated, light grey to black.
							5.0	Sh		
							5.1			
							5.0			
							4.3			
65										Stopped drilling at 65.0 feet.
70										
75										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 813

JOB NO. GRJ03 DATE 03/14/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,268.0 E95,089.0
SURFACE ELEV. 5,276.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			13.3			
							15.4	SM	Very moist	**TOPSOIL: SILTY SAND,** some subrounded gravel, dark brown.
							12.1	GP	Moist to very moist	**SILTY SANDY GRAVEL,** sand is fine to very fine grained, loose, weakly cemented, nonplastic, light brown.
							12.4			
							12.2			
5				OX			10.8			
							6.3			
							8.1			
							7.8			
							9.1			**Note:** clay seam from 8.5 feet to 9.0 feet.
10							11.1			
							12.1	CL	Very moist to wet	**GRAVELLY CLAY,** silty, dense, slight to moderate plasticity, light to dark brown.
							10.9			
							15.4			
15							10.4	GC	Very moist	**CLAYEY GRAVEL,** silty, medium plasticity, dark reddish brown.
							10.2			
							10.1			
							9.3	CL	Moist to very moist	**CLAY,** trace of gravel, gravels decreasing with depth, slight plasticity, light brown to yellowish brown.
							9.9			
20							7.6			
							10.5			
							10.4			
							10.1	Sh	Moist to very moist	**MANCOS FORMATION: CLAY SHALE,** moderately weathered, fissle, medium plasticity, light yellowish brown to brown.
							9.8			
25							10.2			
							9.4			

GROUNDWATER

	DEPTH	HOUR	DATE
▽	12.0	12:00	03/14/89
▼	13.0	13:00	03/13/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 813

JOB NO. GRJ-03 DATE 03/14/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,268.0 E95,089.0
SURFACE ELEV. 5,276.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot. 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							10.1			
							10.9			
							10.0			
							9.2			
30										
							8.3			
							7.4	Sh	Damp to moist	MANCOS FORMATION: SHALE, fissle, becomes indurated with depth, grey to black.
							7.0			
							6.7			
							6.6			
35										
							7.2			
							7.5			
							6.3			
							6.0			
							5.9			
40										
										Stopped drilling at 40.0 feet.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
12.0	12:00	03/14/89
13.0	13:00	03/13/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 814

JOB NO. GRJ-03 DATE 03/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,162.0 E94,715.0
SURFACE ELEV. 5,280.20'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30-free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			11.3	CL	Moist	**TOPSOIL: SILTY CLAY,** gravelly, trace of fine to very fine sand, dark reddish brown.
							16.2			
							17.2		Slightly damp	**SANDY SILT,** some gravel, clayey, nonplastic, light brown.
							12.0	SM		
							10.3			
5				OX			6.9			
							11.5		Dry	**SILTY SANDY GRAVEL,** gravel content increases with depth - cobble to boulder size, subangular to subrounded clasts, increasing clay at 14.0 feet, nonplastic, light brown to grey.
							12.1	GP		
							10.0			
							9.2			
10							5.5			
							3.4			
							3.8			
							2.5			
							3.0			
15							4.0			
							3.9			
							7.2			
							5.0	GM	Dry	**CLAYEY SILTY GRAVEL,** medium dense, slight to moderate plasticity, moderately lime cemented, light brown.
							4.7			
20							5.3			
							6.4			
							6.2			
							5.7			
							11.4			
25				U			10.8	CL	Moist	**CLAY,** occasional boulder and cobbles, trace fine sand, highly

GROUNDWATER

DEPTH	HOUR	DATE
30.5	15:56	03/17/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 814

JOB NO. GRJ-03 DATE 03/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,162.0 E94,715.0
SURFACE ELEV. 5,280.20'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							4.6			plastic, dark brown to buff/light brown.
							8.6			1st run: 25.5 to 27.0 feet, 22/39/56
				OX			5.6			2nd run: 27.0 to 28.5 feet, refused at 28.0 feet.
							6.6			
30										
							5.6			
							10.5	GC	Very moist	**CLAYEY GRAVEL**, subangular clasts, sandy, nonplastic, dark brown.
										Note: hit saturated zone at 30.5 feet.
							9.7			
							8.4			
35										
							9.4			
							10.1			
							8.6		Damp to moist	**MANCOS FORMATION: CLAY SHALE**, moderately weathered, fissle, moderate plasticity, light brown to grey.
							8.3	Sh		
							8.9			
40										
										Stopped drilling at 40.0 feet.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
30.5	15:56	03/17/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 815

JOB NO. GR-03 DATE 03/16/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,962.5 E95,193.4
SURFACE ELEV. 5,273.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			19.5	SM	Very moist	**TOPSOIL: SILTY SAND,** gravelly, gypsum accumulation less than 10%, slight plasticity, dark reddish brown.
							14.9			
							15.7			
							14.1		Dry	**SILTY GRAVEL,** sandy, fine to very fine sand, gypsum at top, nonplastic, grey.
							13.0	GM		
5				OX						
							5.6			
							5.7			
							6.4			
							6.8			
10							8.6		Moist	**SANDY SILT,** trace of fine subrounded gravel, very fine sand, nonplastic, light to dark brown.
							6.9	SM		
							7.5			
							6.2		Slightly moist	**SILTY GRAVEL,** sandy, nonplastic, light brown to light grey.
							5.5	GM		
15							7.8			
							5.4			
							6.0			
							4.5			
							6.7			
20							4.9			
▽							5.0	GC		
				U			14.1		Slightly moist	**CLAYEY GRAVEL,** moderate plasticity, light brown.
							11.8	Sh		
				OX						Note: Hit 6 inch GC seam just prior to first core run.
							12.6			
							12.2		Very moist	**MANCOS FORMATION: CLAY SHALE,** moderately weathered,
25										

GROUNDWATER

	DEPTH	HOUR	DATE
▽	21.0	15:40	03/15/89
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 815

JOB NO. GRJ-03 DATE 03/16/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,962.5 E95,193.4
SURFACE ELEV. 5,273.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										fissile, light brown to greyish brown.
										Stopped drilling at 25 feet.
30										
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
21.0	15:40	03/15/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 816

JOB NO. GRJ 03 DATE 03/17/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,650.5 E95,205.6
SURFACE ELEV. 5,281.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			15.3		Very moist	**TOPSOIL: SANDY SILT,** gravelly, trace of clay, nonplastic, dark reddish brown changing to light brown at 4 feet.
							14.0	SM		
							13.7			
							12.4			
							13.7			
5				OX			7.3			
							9.2			
							6.4		Slightly moist	**SILTY GRAVEL,** sandy, trace of clay, subangular to subrounded clasts, nonplastic, light brown.
							6.2	GM		
							9.5	GC		
10							6.0		Moist	**CLAYEY GRAVEL,** some silt, subrounded clasts, slight plasticity, light yellowish brown.
							10.9	GM		
							7.1		Slightly moist to moist	**SILTY GRAVEL,** some very fine to fine sand, light brown to grey.
							5.9			
							5.6			
15							11.2		Very moist	**CLAY,** some gravel, firm to dense, becoming sandy and shaley at 19.5 feet, high plasticity, dark brown.
							10.6	CL		
							10.2			
				U			14.1			
							14.4		Slightly moist to moist	**MANCOS FORMATION: CLAY SHALE,** sandy, moderately weathered, fissile, moderate plasticity, light brown to grey.
20				OX			7.8	Sh		
							6.5			
							6.7			
							7.0			
							6.4			
25										Stopped drilling at 25.0 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 817

JOB NO. GRJ-03 DATE 03/28/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,604.4 E94,981.9
SURFACE ELEV. 5,263.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			13.0	ML	Very moist	TOPSOIL: CLAYEY SILT, occasional gravel, some fine sand, slight plasticity, reddish brown.
							12.4			
							12.6			
							14.9	SM	Very moist	SANDY SILT, occasional gravel, gypsum crystalization less than 5%, clayey, moderate plasticity, light brown.
							13.3			
5				OX			5.8			
							4.0	GM	Slightly moist	SILTY GRAVEL, sandy, some gypsum, nonplastic, grey.
							6.6			
							11.9			
							10.9	GC	Very moist	CLAYEY GRAVEL, some gypsum, moderate plasticity, light brown.
10							11.7			
							11.8	Sh	Very moist	MANCOS FORMATION: CLAY SHALE, fissile, moderately weathered, slightly plastic, light brown.
							12.3			
							11.5			
							11.8			
15							12.8			
							12.8			
							12.7			
							13.2			
							13.4			
20										Stopped drilling at 20.0 feet.
25										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 818

JOB NO. GRJ-03 DATE 03/30/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,554.2 E93,561.2
SURFACE ELEV. 5,250.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			7.8	CL	Moist to very moist	**TOPSOIL: SILTY CLAY,** occasional gravel, rootlets, slight plasticity, red brown.
							10.3			
							10.1			
							8.6	CL	Moist to very moist	**SILTY CLAY,** some fine gravel, gypsum and calcite cement, slight plasticity, light red brown.
							8.3			
5				OX			6.7	SM	Slightly moist to moist	**SILTY SAND,** gravelly, fine gravels, fine to very fine sand, nonplastic, light olive brown to buff.
							7.6			
							7.8			
							6.3			
10							6.8			
							3.1			
							1.5	GM	Dry	**SILTY GRAVEL AND COBBLES,** sandy, traces of clay, basalt cobbles to 9 inches, nonplastic, grey to black.
							7.6			
							4.5	GC	Slightly moist	**CLAYEY GRAVEL,** traces of fine sand, moderate plasticity, light brown to buff.
15							3.9			
							4.1			
							4.0	GC	Damp	**SILTY CLAYEY GRAVEL,** traces of fine sand, becomes more cobbly at 14 feet, grey to greyish brown.
							3.3			
							5.4			
20							7.2	GC		**CLAYEY GRAVEL,** some silt, gravel content decreasing with depth, light brown.
							11.6			
							11.2			
				RX			11.4	Sh	Very moist	**MANCOS FORMATION: CLAY SHALE,** moderately weathered, occasional iron and manganese staining, fissle, moderate plasticity, light brown to grey.
							11.4			
25							10.1			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 818

JOB NO. GRJ-03 DATE 03/30/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,554.2 E93,561.2
SURFACE ELEV. 5,250.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
30										
35										Stopped drilling at 32 feet.
40										
45										
50										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 819

JOB NO. GRJ03 DATE 03/29/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,661.3 E93,714.8
SURFACE ELEV. 5,237.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content of Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			10.6			
							12.3	CL	Very moist	TOPSOIL: SILTY CLAY, occasional basalt cobbles, traces of fine sand, rootlets, nonplastic, red brown.
							11.2			
							8.8	GC	Dry to slightly moist	CLAYEY GRAVEL, basalt cobbles to 8 inch diameter, traces of gypsum and fine sand, fairly dense, subrounded clasts, light brown to grey buff.
							7.3			
5				OX			4.3			
							1.9			
							1.8			
							3.1			
							2.5			
10							3.2			
							3.2			
							2.8			
							2.2			
							2.7			
15							2.4			
							2.4			
							2.3	GP	Dry	SILTY SANDY GRAVEL, matrix comprises less than 20%, boulder size clasts, loose, grey to black.
							2.5			
20							2.2			
							3.3			
							3.9	GC/CL	Damp	CLAYEY GRAVEL AND GRAVELLY CLAY, sandy, fine to very fine, medium dense, light brown.
							4.3			
							4.8			
							4.3			
25							5.0	GP	Dry	SILTY SANDY GRAVEL, fine to

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 819

JOB NO. GRJ-03 DATE 03/29/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,661.3 E93,714.8
SURFACE ELEV. 5,237.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							4.3			medium sand, some clay, loose, weakly cemented, grey.
							4.5			
							4.6		Damp to slightly moist	**CLAYEY GRAVEL**, some silt and fine sand, subangular basalt clasts, light yellow brown.
							3.9	GC		
30							4.5			
							3.3			
							6.7			
							7.7			
							8.1		Slightly moist to very moist	**SAND**, traces of fine gravel, fines less than 5%, fine to very fine grained, light yellow brown.
35							6.7	SP		
							7.3			
							12.5			
							12.3	GC	Very moist	**CLAYEY GRAVEL**, some fine to very fine sand, light yellow brown.
							10.3		Moist	**MANCOS FORMATION: CLAY SHALE**, fissle, moderately weathered, moderately plastic, light to dark greyish brown.
40				RX			9.0			
							8.1	Sh		
							8.1			
							9.5			
							8.7			
45									Dry	**MANCOS FORMATION: SHALE**, fissle, fresh, indurated, grey to black.
								Sh		
50										
										Stopped drilling at 50.0 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GR-03 DATE 04/01/89

LOG OF TEST BORING NO. 820

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,141.7 E94,543.0
SURFACE ELEV. 5,249.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0				HSA			16.4	CL	Very moist	**TOPSOIL: SILTY CLAY,** gravelly, rootlets, slight plasticity, reddish brown.
							15.3			
							15.7		Very moist	**SILTY CLAYEY GRAVEL,** clasts of basalt, subrounded, slight plasticity, reddish brown.
							11.0	GC		
							10.6			
5				OX			12.0		Slightly moist to very moist	**SANDY GRAVEL,** medium to fine sand, less than 5% fines, poorly sorted, clean, greyish brown.
							5.9	GP		
							4.7			
							4.0		Damp to slightly moist	**SILTY GRAVEL,** sandy, trace of clay, loose, grey to light brown.
							4.0	GM		
10							5.2			
							3.6			
							5.4			
							9.6	GP	Moist	**SANDY GRAVEL,** silty, trace of clay, light brown to grey.
							7.8			
15							9.5	GC	Moist	**CLAYEY GRAVEL,** some fine to very fine sand, moderate plasticity, light brown.
							8.6			
							8.7		Slightly moist to moist	**SANDY GRAVEL,** gravel of basalt and claystone, poorly graded, less than 5% fines, clean, dark brown to greyish brown.
							9.4	GP		
20							7.0			
							4.8			
							6.7			
							6.8			
							13.0		Very moist	**MANCOS FORMATION: SHALE,** fissile, moderately weathered at 24.0 feet, becomes fresh with depth, light brown to grey.
							11.5	Sh		
25							10.8			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 820

JOB NO. GRJ-03 DATE 04/01/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,141.7 E94,543.0
SURFACE ELEV. 5,249.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							11.3			
							11.2			
							10.2			
							11.0			
30										Stopped drilling at 30.0 feet.
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 821

JOB NO. GRJ-03 DATE 04/26/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,204.9 E93,409.5
SURFACE ELEV. 5,228.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			7.7	CL	Slightly moist	TOPSOIL: SILTY CLAY, trace of gravel, loose, rootlets, slight plasticity, reddish brown.
							10.4			
							8.7	ML	Damp	CLAYEY SILT, occasional cobble, trace fine sand, nonplastic, buff.
							7.6			
							7.7			
5				OX			3.2	GP	Dry to slightly damp	SANDY GRAVEL, silty, subangular to angular, less than 10% gypsum, fine to medium sand, nonplastic, grey to dark reddish brown.
							2.5			
							4.7			
							2.1			
							2.7			
10							1.9			
							2.3			
							2.1			
							3.7	GM	Dry	SILTY GRAVEL, sandy, subrounded to subangular clasts, loose, nonplastic, grey.
							5.8			
15							6.9			
							7.6	GM	Slightly damp to damp	CLAYEY SILTY GRAVEL, some fine to very fine sand, medium dense, slight plasticity, light brown.
							5.8			
							4.2			
							4.3			
20							3.0			
							3.6			
							3.1	GP	Dry to slightly damp	SANDY GRAVEL, silty, fine to medium sand, trace of clay, nonplastic, dark reddish brown to light brown.
							4.1			
							3.0			
25							7.0			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 821

JOB NO. GRJ-03 DATE 04/26/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,204.9 E93,409.5
SURFACE ELEV. 5,228.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							6.8	GC	Slightly moist to moist	CLAYEY GRAVEL, clasts of basalt, matrix is clayey, dense, slight plasticity, light brown.
							9.3			
							5.9			
							6.9			
30							10.6			
							13.8		Very moist	MANCOS FORMATION: CLAY SHALE, fissile, moderately weathered, occasional iron oxides on bedding and parting surfaces, light brown.
							11.3	Sh		
							11.3			
							11.3			
35							10.7			
							8.4			
							7.4		Slightly moist	MANCOS FORMATION: SHALE, fissile, fresh, becoming indurated with depth, grey to black.
							2.6	Sh		
							12.0			
40							7.1			
							7.0			
							6.7			
							6.1			
							5.9			
45							6.0			
							5.7			
							5.4			
							5.5			
							7.5			
50				RX			6.0			Note: begin rotary coring at 50 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 821

JOB NO. GR-03 DATE 04/26/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,204.9 E93,409.5
SURFACE ELEV. 5,228.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
										1st run: recovered 100%, RQD = 33, fresh shale, occasional calcite filling in fractures.
55										2nd run: 55 to 60 feet, recovered 100%, shale, fossilferous, grey to black.
										3rd run: 60 to 65 feet, recoverey 100%, RQD = 100, same as above, shale, fissle and indurated, grey to black.
60										
65										
										Stopped Drilling at 65 feet.
70										
75										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 822

JOB NO. GRJ-03 DATE 04/05/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,759.4 E94,304.8
SURFACE ELEV. 5,240.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			6.2	ML	Moist	TOPSOIL: CLAYEY SILT, some fine sand, gravelly, slight plastic, redbrown.
							17.3			
							15.4			
							9.2			SANDY SILT, gravelly, some clay, clasts nominal 1 to 3 inch, gypsum, slight plastic, light brown to buff.
5				OX			9.8	SM	Moist to very moist	
							5.6			
							7.1			
							4.2			SANDY SILTY GRAVEL, trace clay, loose, clasts nominal 1 to 2 inch diameter, slight plastic, light brown to grey.
							3.6			
10							3.7			
							3.6			
							2.8			
							3.4			
							4.1			
15							3.6	GM	Dry to damp	
							3.2			
							2.9			
							2.5			Note: increase in gravel content, matrix less than 10 %.
							1.9			
20							2.4			
							3.1			
							4.8			
							4.9		Slightly damp	CLAYEY GRAVEL, trace fine to very fine sand, slightly plastic, light brown.
							5.4	GC		
25							6.3			
							9.6			

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 822

JOB NO. GRJ-03 DATE 04/05/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,759.4 E94,304.8
SURFACE ELEV. 5,240.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							9.3	Sh	Slightly moist to moist	MANCOS FORMATION: CLAY SHALE, fissle, nonindurated, slight to moderately plastic, light brown.
							8.6			
							8.9			
							9.1			
30										
35										Stopped drilling at 35.0 feet.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 823

JOB NO. GRJ-03 DATE 04/12/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,244.3 E93,957.0
SURFACE ELEV. 5,241.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			14.8	CL	Very moist	**TOPSOIL: SILTY CLAY**, some subrounded gravel, rootlets, slight plasticity, reddish brown.
							13.1			
							6.1			
							7.7	CL	Slightly moist to moist	**SANDY CLAY**, gravelly, some silt, gypsum less than 2%, calcareous, slight plasticity, buff.
							3.7			
5				OX			3.4			
							2.8	GM	Dry	**SANDY SILTY GRAVEL**, boulders, basalt clasts predominant with minor siltstone and trace of clay, matrix comprises less than 10%, grey to light greyish brown.
							2.8			
							2.3			
							2.2			
10							2.0			
							2.3			
							2.9			
							3.6			
							2.7			
15							2.4			
							2.1			
							2.7			
							1.4			Note: becomming clayey at 18 feet.
							1.6			
20							1.5	GC	Dry	**CLAYEY GRAVEL**, some fine to medium sand, trace silt, grey to light brown.
							1.6			
							2.1			
							1.0			
							2.0			
25							2.3			

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 823

JOB NO. GRJ-03 DATE 04/12/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,244.3 E93,957.9
SURFACE ELEV. 5,241.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							3.4			
							4.4	Sh		MANCOS FORMATION: CLAY SHALE, fissile, moderately weathered, slight to moderate plasticity, grey to light brown.
							11.0			
30				U						
								Sh		MANCOS FORMATION, clayey, fissile, light brown to grey.
				RX						Note: drive core from 30.0 - 31.5 feet, Rotary core from 31.5 - 35.0 = 3.5.
										1st run: 30 - 35 feet: Recovery 100%, cored with water.
35										2nd run: 35 - 40 feet : Recovery 100%, cored with water.
40										Note: shale, fresh with clayey interbeds alternating hard and soft, highly fractured, calcium carbonate on surfaces.
										3rd run: 40 - 45 feet recovery 100%, cored with water as drilling fluid mediam.
45							5.2			
							5.0	Sh	Slightly moist	MANCOS FORMATION: SHALE, fresh, broken, fissile, indurated, bedding plane partings, RQD = 0, grey to black.
							6.4			
							5.7			4th run: 45.0 - 47.7 feet : recovery 54% (air), cored with air.
50							5.4			Note: did not recover 47.0 - 50.0 feet
							5.2			
							5.6			Note: reamed out 3 1/2 inch corehole with ODEX to 60 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 823

JOB NO. GRJ-03 DATE 04/12/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,244.3 E93,957.9
SURFACE ELEV. 5,241.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot. 140 lb. 30 free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							5.2			
							5.2			
55							5.2			
							4.8			
							4.9			
							4.9			
							4.9			
60							4.5			
										Stopped drilling at 60 feet.
65										
70										
75										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 824

JOB NO. GRJ-03 DATE 04/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,884.4 E93,705.3
SURFACE ELEV. 5,231.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			8.6	CL	Moist to very moist	**TOPSOIL: SILTY CLAY,** some fine to very fine sand, reddish brown.
							11.0			
							11.5			
							10.5		Slightly moist to very moist	**SILTY CLAY,** some fine to medium gravel, slight plasticity, buff.
							8.9	CL		
5				OX			5.7			
							4.7		Damp to slightly moist	**SANDY GRAVEL,** fine sand, some silt, nonplastic, loose, light grey to brown.
							4.2	GP		
							3.4			
							4.9	GM	Damp	**SILTY GRAVEL,** sandy, nonplastic, fine sand, loose, weakly cemented, light grey.
10							4.0			
							3.5	GP		
							3.0		Damp	**SANDY GRAVEL,** very fine to fine sand, clean, nonplastic, loose to dense, light brown.
							2.3	GP/GM		
15							2.3		Dry	**SANDY GRAVEL AND SILTY GRAVEL,** fine to medium sand, matrix alternates from silt to sand on the foot, interbedded, nonplastic, medium dense, grey to greyish brown.
							3.5			
							2.6			
							2.2			
							2.3			
20							2.7			
							2.3			
							2.3			
							3.2			
							2.9		Dry to slightly moist	**CLAYEY GRAVEL,** some fine to very fine sand, slight plasticity, moderately lime cemented, light brown.
							4.6	GC		
25										
							7.9			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 824

JOB NO. GRJ-03 DATE 04/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,884.4 E93,70[illegible]
SURFACE ELEV. 5,231.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							10.8	SM	Damp to very moist	SILTY SAND, fine to very fine sand, nonplastic, loose, light orange brown.
							5.3			
							4.5			
							2.9		Slightly moist to moist	SANDY GRAVEL, subrounded to subangular clasts (nominal 3 to 4 inches), basalt siltstone and claystone, very fine to fine sand, some silt, light to dark brown.
30							7.3	GP		
							5.9			
							6.6			
							6.9			
							6.6			
35							21.0			
							6.3			
							6.1			
							6.1			
							6.4			
40							4.9			
							5.9			
							10.2		Very moist	CLAYEY SILTY GRAVEL, nonplastic, fairly dense, dark greyish brown.
							10.2	GM		
							6.5		Slightly moist to moist	SILTY CLAYEY GRAVEL, fresh, matrix is dark grey clay, nonplastic, grey to dark grey.
45							7.6	GC		
							5.8			
								Sh	Slightly damp	MANCOS FORMATION: SHALE, fresh, trace gypsum crystals (approximately 5%), slight to moderately indurated, fissile, light to dark grey.
50										
										Stopped drilling at 50 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 825

JOB NO. GRJ-03 DATE 04/14/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,179.2 E93,398.4
SURFACE ELEV. 5,239.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			8.4	CL	Moist	TOP SOIL: SILTY CLAY, rootlets, slight plasticity, reddish brown.
							11.7			
							12.1	ML	Slightly moist to moist	CLAYEY SILT, occasional cobbles and gravel, trace of fine to very fine sand, trace of gypsum crystals, buff.
							9.0			
							7.6			
5				OX			4.9			
							4.3			
							2.4			
							5.7	GM	Dry to slightly moist	SILTY GRAVEL, trace of clay, gypsum crystals locally, sandy, buff to grey.
							4.6			
10							3.4	GP	Damp	SANDY GRAVEL, some clay, basalt, siltstone and clasts, gypsum less than 1%, nonplastic, brown to greyish brown.
							3.4			
							6.6			
							6.4	GC	Slightly moist	CLAYEY GRAVEL, slightly plastic, light brown.
							4.9			
15							5.3			
							5.7	GP		SILTY SANDY GRAVEL, some clay, gypsum crystals less than 1%, nonplastic, grey.
							7.4			
							8.9	GC		CLAYEY GRAVEL, slight plasticity, light yellowish brown.
20							9.3			
							12.3			
							13.8	Sh		MANCOS FORMATION: CLAY SHALE, moderately weathered, fissile, slight to moderate plasticity, light brown to grey. Note: 100% recovered from 23.5 - 28.5 feet.
							10.3			
				RX						
25										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 825

JOB NO. GRJ-03 DATE 04/14/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,179.2 E93,398.4
SURFACE ELEV. 5,239.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								Sh		
										Note: 100% recovery 28.5 - 31.0 feet.
30										
										Note: fissile, gypsum, calcite fills, postings becoming more indurated at 33 feet.
										100% recovery 31.0 - 34.5.
35										Note: gypsum approximately 12%.
										100% recovered 34.5 - 38.0 feet.
										Note: clayey shale, fissile, moderately weathered, light brown to grey.
40										100% recovery from 38.0 - 41.0 feet.
										100% recovery 41.0 - 45.0 feet.
45										Note: 100% recovery 45.0 - 48.0 feet.
										MANCOS FORMATION: SHALE, fresh, indurated, grey to black.
50							7.9			100% recovery 48.0 - 50.5.
							5.6			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 825

JOB NO. GRJ-03 DATE 04/14/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,179.2 E93,398.4
SURFACE ELEV. 5,239.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							6.8	Sh		MANCOS FORMATION: SHALE, fresh, indurated, gray to black.
							7.3			
55							6.2			
							5.6			
							5.6			
							5.4			
							5.5			
60							4.8			
										Stopped drilling at 60 feet.
65										
70										
75										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 826

JOB NO. GRJ-03 DATE 04/29/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,291.4 E93,677.0
SURFACE ELEV. 5,234.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			9.5	CL	Slightly moist	**TOPSOIL: SILTY CLAY,** trace cobbles and gravel, slight plasticity, reddish brown.
							11.5			
							10.1			
							7.1			
							5.7			
5				OX			4.2			
							4.2	SW	Damp	**GRAVELLY SAND,** trace to some silt, minor gravel, fine to medium sand, well graded, trace of gypsum, grey.
							3.3			
							2.4	GM		
							2.6		Dry to damp	**SILTY SANDY GRAVEL,** fine to medium sand, dense, moderately lime cemented, grey to light brown.
10							2.2			
							2.5			
							3.2			
							2.8			
							3.6			
15							4.0			
							5.4	GC	Slightly moist	**CLAYEY GRAVEL,** silty, poorly graded, moderately lime cemented, light brown.
							8.7			
							8.5			
							8.4	CL	Moist to very moist	**CLAY,** trace of gravel, clay chips contain minor silt, massive, medium dense, slight plasticity, reddish brown.
20							9.7			
							8.8			
							11.6			
							9.9			
							8.5			
25							9.4			

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 826

JOB NO. GRJ-03 DATE 04/29/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,291.4 E93,677.0
SURFACE ELEV. 5,234.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							4.3			CLAYEY GRAVEL, some fine sand, medium dense, slightly cemented, light brown.
							2.7			
							5.8		Dry to slightly moist	CLAYEY AND SILTY GRAVEL, some to considerable fine sand, nonplastc to slightly plastic, loose to mdeium dense, occasional cobbles to boulder size material, loose to moserately cemented, light brown to grey.
							4.3			
30							3.4	GC/GM		
							2.7			
							3.6			
							4.4			
							4.4			
35										
							3.7			
							3.0			
40							8.4	CL	Moist	MANCOS FORMATION: CLAY SHALE, moderately weathered, fissile, thinly laminated, brown.
							11.4			
							8.2			
							7.5	Sh		MANCOS FORMATION: SHALE, fresh, indurated and fissile, black.
							6.9			
45										Stopped drilling at 45 feet.
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 827

JOB NO. GRJ-03 DATE 04/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,636.8 E93,037.2
SURFACE ELEV. 5,239.10'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			9.9	CL	Moist	TOPSOIL: SILTY CLAY, occasional gravel, trace of fine sand, slight plasticity, reddish brown.
							11.3			
							8.7	SM		
							5.1		Moist to very moist	SANDY SILT, some gravel, race of clay, nonplastic, light orange brown to buff.
							7.2			
5				OX			4.5	GP	Damp to moist	SILTY SANDY GRAVEL, some gypsum crystals less than 1%, fine to medium sand, clean, loose, nonplastic, buff.
							4.1			
							2.8			
							4.0			
							4.8	GP	Dry to sligthly moist	SANDY GRAVEL, medium sand, clean, loose, nonplastic, dark brown.
10							3.9			
							5.2			
							9.2	GC/CL	Moist	CLAYEY GRAVEL, GRAVELLY CLAY, dense, slight plasticity, (colluvium), light brown.
							10.9			
							10.9	Sh	Very moist	MANCOS FORMATION: CLAY SHALE, moderately weathered, fissile, moderate plasticity, light brown to light yellowish brown.
15							10.4			
										Stopped drilling at 16 feet.
20										
25										

GROUNDWATER

DEPTH	HOUR	DATE
10.0	11:34	04/19/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 828

JOB NO. GRJ-03 DATE 04/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,125.6 E93,286.7
SURFACE ELEV. 5,245.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0				HSA			14.0	ML	Very moist	**TOPSOIL: CLAYEY SILT,** occasional gravel, some fine to very fine sand, rootlets, nonplastic, reddish brown.
							14.7			
							21.1			
							9.7			
							8.5			
5				OX			8.3	SM	Moist to very moist	**SILTY SAND,** some gravel, gypsum less than 2%, trace of clay, nonplastic, light brown to buff.
							10.8			
							7.1			
							6.6			
10							5.9	GM	Slightly moist	**SILTY GRAVEL,** sandy, clasts are subrounded basalt, siltstone and claystone, fine to very fine sand, medium dense, nonplastic, light brown.
							6.0			
							4.3			
							5.4			
							5.2			
15							4.1			
							3.8			
							3.8	GP	Damp to slightly moist	**SANDY GRAVEL,** silty, subangular basalt and claystone clasts, fine sand, loose, nonplastic, light grey to brown.
							6.4			
							4.9			
20							3.3			
							4.6			
							5.4			
							6.8			
▽							9.0	GC	Moist	**CLAYEY GRAVEL,** some fine sand, moderate plasticity, light brown.
							13.2			
25							13.7	CL		

GROUNDWATER

	DEPTH	HOUR	DATE
▽	23.5	11:45	4/18/89
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 828

JOB NO. GRJ-03 DATE 04/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,125.6 E93,286.7
SURFACE ELEV. 5,245.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							11.9		Very moist	CLAY, some gravel, massive, medium dense, moderate plasticity, light grey to light brown.
							13.0			
							13.2	Sh	Very moist	MANCOS FORMATION: CLAY SHALE, fissile, moderate plasticity, light brown to grey.
30										
										Stopped drilling at 30 feet.
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
23.5	11:45	4/18/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 829

JOB NO. GRJ-03 DATE 04/16/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,016.5 E93,744.3
SURFACE ELEV. 5,258.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			13.1	ML	Very moist	**TOPSOIL: CLAYEY SILT,** occasional cobbles, some fine sand, rootlets, nonplastic, reddish brown.
							13.9			
							13.8		Very moist to moist	**SANDY SILT,** some clay, occasional gravel, fine to very fine sand, buff to yellowish brown.
							13.0	ML		
							9.7			
5				OX			7.3			
							8.8		Moist	**GRAVELLY SAND,** some silt, loose, gypsum less than 2%, dark brown.
							10.0	GP		
							8.4			
							6.6		Slightly moist	**SILTY SAND,** some clay, occasional cobbles, gypsum approximately 2%, loose, dark brown.
10							6.4	SM		
							6.8			
							6.2			
							5.6		Damp to slightly moist	**SILTY GRAVEL,** some fine to very fine sand, grey to brownish grey.
							4.4			
15							3.0	GM		
							4.5		Slightly moist to moist	**CLAYEY GRAVEL AND GRAVELLY CLAY,** some fine to medium sand, dense, slight to moderate plasticity, light brown to buff.
							6.6	GC/CL		
							6.9			
							9.5			
20							9.6			
							9.4			
							9.0			
				RX						
25										

GROUNDWATER

DEPTH	HOUR	DATE
30.0	15:00	04/15/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 829

JOB NO. GRJ-03 DATE 04/16/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,016.5 E93,744.3
SURFACE ELEV. 5,258.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
▽ 30				OX						
35				RX			4.0 9.4 9.1	Sh	Moist to very moist	MANCOS FORMATION: CLAY SHALE, moderately weathered, fissile, fairly soft, slight to moderate plasticity, light brown to grey.
40							9.9 13.0	Sh	Slightly moist	MANCOS FORMATION: SHALE, fresh, indurated, dark grey to black.
45										
				OX						
50										

GROUNDWATER

	DEPTH	HOUR	DATE
▽	30.0	15:00	04/15/89
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 829

JOB NO. GRJ-03 DATE 04/16/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,016.5 E93,744.3
SURFACE ELEV. 5,258.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							5.9			
							7.1			
55							6.6			
							6.3			
							6.8			
							6.5			
							6.6			
60										Stopped drilling at 60 feet.
65										
70										
75										

GROUNDWATER

DEPTH	HOUR	DATE
30.0	15:00	04/15/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 830

JOB NO. GRJ-03 DATE 03/31/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,457.7 E94,488.[illegible]
SURFACE ELEV. 5,264.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			12.6	ML	Very moist	**TOPSOIL: CLAYEY SILT,** gravelly, slight plasticity, reddish brown.
							11.1			
							11.7	GC	Very moist	**CLAYEY GRAVEL,** some fine sand, subrounded clasts to 4 inches, some silt, slight plasticity, reddish brown.
							11.6			
							14.4	GP		
5				OX			11.3		Very moist	**SANDY GRAVEL,** basalt cobble to boulder gravel, poorly graded, slightly plastic to nonplastic, grey.
							8.0			
							6.3			
							7.4		Slightly moist to moist	**SILTY SAND AND SILTY GRAVEL,** with some sand, fine to very fine sand, loose, light brown.
							8.3	SM/GM		
10							10.4			
							5.9			
							6.9			
							6.0			
				U	45		10.0		Moist to very moist	**SANDY CLAY,** gravelly, some wood debris, iron oxide stained surfaces, high plasticity, orange brown to grey.
15							12.4	CL		
				U	22		11.5			
				U	23					
				U	37					
20 ▽				U	11			GC	Wet (saturated)	**CLAYEY GRAVEL,** some sand, wood and carbonized debris, high plasticity, hit water at 20.5 feet.
				OX						
								Sh	Moist to wet	**MANCOS FORMATION: CLAY SHALE,** weathered, becomes fissile with depth, moderate to highly weathered, iron oxide on bedding surfaces, moderate to high plasticity, orange brown to grey.
25										

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.5	12:15	03/31/89
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 830

JOB NO. GRJ-03 DATE 03/31/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,457.7 E94,488.0
SURFACE ELEV. 5,264.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
30										Stopped drilling at 30.0 feet.
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
20.5	12:15	03/31/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 831

JOB NO. GRJ-03 DATE 03/28/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,731.7 E94,644.0
SURFACE ELEV. 5,239.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0				HSA			10.7	CL	Slightly moist	TOPSOIL: SILTY CLAY, medium gravel armors surface, some fine sand, rootlets, nonplastic, reddish brown.
							12.5			
							9.0	SM		
							7.3		Moist to very moist	SILTY SAND, clayey, some gypsum, nonplastic, light brown to buff.
							5.2			
5				OX			4.3	GC	Damp to slightly moist	CLAYEY GRAVEL, sandy, loose, light brown to grey.
							4.7			
							3.5			
							2.9	GM	Dry	SILTY SANDY GRAVEL, loose, nonplastic, grey.
							2.8			
10							3.0			
							4.1	GC	Damp to slightly moist	CLAYEY GRAVEL, trace of silt, slight plasticity, light yellowish brown.
							5.1			
							8.4		Moist to very moist	MANCOS FORMATION: CLAY SHALE, moderately weathered, gypsum approximately 5%, fissile, high plasticity, light to dark brown.
							10.2	Sh		
15							11.3			
							11.9			
							12.0			
							10.3			
							10.1			
20							10.8			
							9.7			
							10.4			
							9.7			
							9.4			
25										Stopped drilling at 30.0 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 832

JOB NO. GRJ-03 DATE 04/17/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,226.9 E94,234.7
SURFACE ELEV. 5,266.9'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			6.0	CL	Moist	**TOPSOIL: SILTY CLAY,** occasional cobbles, trace of fine to very fine sand, rootlets, slight plasticity, reddish brown.
							8.5			
							8.2			
							8.6			
5				OX			5.6	GM	Slightly moist	**SILTY GRAVEL,** sandy, gypsum approximately 1%, medium dense, nonplastic, light brown to grey.
							5.6			
							5.6			
							5.6			
							7.0	GP	Slightly moist to moist	**SANDY GRAVEL,** silty, fine to medium sand, nonplastic, light brown to grey.
							6.5			
10							5.5	GM	Slightly moist	**SILTY GRAVEL,** sandy, some clay, basalt clasts to 4 inches, medium dense, nonplastic, light brown to grey.
							6.7			
							5.9			
							7.1	GC	Slightly moist	**CLAYEY GRAVEL,** trace of very fine sand and silt, orange brown oxidized chips, slightly cemented at top contact, slight plasticity, light brown.
							4.9			
15							4.7			
							5.4			
							3.5			
							3.7			
							2.8	GM	Dry to damp	**CLAYEY SILTY GRAVEL,** some fine sand, nonplastic, light brown to grey.
20							3.8			
							3.3			
							5.3			
							8.1		Moist to very moist	**MANCOS FORMATION: CLAY SHALE,** weathered, fissile, slight to moderate plasticity, light brown.
							10.6	Sh		
25							10.5			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 832

JOB NO. GRJ-03 DATE 04/17/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N13,226.9 E94,234.7
SURFACE ELEV. 5,266.9'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							9.4			
							9.0			
										Stopped drilling at 28.5 feet.
30										
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 833

JOB NO. GRJ-03 DATE 04/29/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,804.3 E92,976.9
SURFACE ELEV. 5,228.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			7.0	CL	Moist	TOPSOIL: SILTY CLAY, trace of gravel, rootlets, slight plasticity, color change at 2.0 feet due to less moisture, from reddish brown to buff.
							11.3			
							8.7			
							8.8			
							7.0			
5				OX			3.5	SM	Damp	SILTY SAND, fine to coarse angular to subangular sand, loose, buff.
							3.3			
							3.5	GM	Dry	SILTY GRAVEL, some clay, considerable fine sand, medium dense, increase in clay at 13.0 feet with resulting color change from grey to buff.
							2.8			
							2.5			
10							2.0			
							1.8			
							3.0			
							2.7			
							2.0			
15							2.2			
							2.5			
							5.4		Slightly moist	CLAYEY GRAVEL, moderately cemented, dense, slightly plastic, greyish brown.
							4.0	GC		
							5.5			
20							11.2	Sh	Moist to very moist	MANCOS FORMATION: CLAY SHALE, fissile, moderately weathered, slight plasticity.
							10.1			
							10.2			
							10.7			
							9.7			
25							10.3			

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 833

JOB NO. GRJ-03 DATE 04/29/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,804.3 E92,976.9
SURFACE ELEV. 5,228.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							10.4			MANCOS FORMATION: CLAY SHALE, fissle, moderately weathered, slight plasticity.
							10.8			
							10.5			
							9.8			
30							10.0			
							9.0			
							9.2			
							9.2			
							8.8			
35							8.6			
							8.3			
							7.3			
							5.8	Sh	Slightly moist	MANCOS FORMATION: SHALE, slightly weathered, fissile, grey to light brown.
							6.6			
40							6.3			Note: gradational into fresh Mancos Shale.
							5.8	Sh		
							5.8		Slightly moist	MANCOS FORMATON: SHALE, fresh, indurated, thinly laminated, fissile, grey.
							6.1			
							5.6			
45							6.0			
							5.7			
							6.2			
							5.8			
							5.4			
50				RX			5.4		Slighlty moist	MANCOS FORMATION: SHALE, fresh, indurated, fissile, minor calcite, fossil shell found at 51.0
							5.9			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 833

JOB NO. GRJ-03 DATE 04/29/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,804.3 E92,976.9
SURFACE ELEV. 5,228.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							5.9			feet, grey to black.
							5.6			
55							5.5			
							5.6			
							5.6			
							5.6			
							5.5			
60							5.9			
							5.7			
							5.9			
							5.9			
							5.6			
65							5.7			
										Stopped drilling at 65.0 feet.
70										
75										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 834

JOB NO. GRJ-03 DATE 05/02/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,041.9 E94,414.2
SURFACE ELEV. 5,255.10'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			9.8	ML	Moist	**TOPSOIL: CLAYEY SILT,** occasional cobbles, rootlets, slight plasticity, reddish brown.
							10.8			
							10.5			
							12.5			
							11.8	GM	Very moist	**CLAYEY SILTY GRAVEL,** less than 1% gypsum, slight plasticity, reddish brown.
5				OX			5.1	GP	Sightly moist	**SANDY GRAVEL,** some fine sand and silt, nonplastic, grey.
							6.6			
							13.6			
							14.0	CL	Very moist	**CLAY,** sandy, trace of fine gravel, less than 1% gypsum, fine to very fine sand, medium dense, slight to moderate plasticity, light brown.
							12.6			
10							12.3	Sh	Very moist	**MANCOS FORMATION: CLAY SHALE,** fissile, moderately weathered, iron oxide on parting surfaces, slight plasticity, light orange brown to greyish brown.
							11.6			
							12.2			
							11.7			
				RX			11.3			
15							11.1			
							10.5			
							10.4			
							10.4			
							11.2			
20							11.0			
							11.0			
							11.1			
							10.6			
							10.6			
25							10.4			

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 834

JOB NO. GRJ-03 DATE 05/02/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,041.9 E94,414.2
SURFACE ELEV. 5,255.10'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							10.2			
							10.2			
							10.9			
							10.6			
30							8.2			
							5.6	Sh		MANCOS FORMATION: SHALE, fissile, indurated, thinly laninated, dense, grey to black.
							5.5			
							5.6			
							4.8			
35							4.4			
				OX						
									Slightly moist	
40							4.7			
							5.7			
							6.0			
							6.2			
45							5.6			
							6.2			
							6.4			
							6.4			
							6.2			
50							6.2			
							6.2			
							5.7			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 834

JOB NO. GRJ-03 DATE 05/02/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,041.9 E94,414.2
SURFACE ELEV. 5,255.10'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							6.1			MANCOS FORMATION: SHALE, fissle, indurated, thinely laminated, dense, gray to black.
							6.0			
55							5.9			
60										
65										
70										Stopped drilling at 65.0 feet.
75										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 835

JOB NO. GRJ-03 DATE 05/08/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,940.2 E94,790.5
SURFACE ELEV. 5,263.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			7.7	ML	Moist to very moist	TOPSOIL: CLAYEY SILT, trace of fine sand, rootlets, slight plasticity, reddish brown.
							12.0			
							11.9			
							11.7	GM	Moist	CLAYEY SILTY GRAVEL, boulders, cobbles, gravel consists of chewed up basalt, reddish brown.
							9.1			
5				OX			4.1			
							5.2	GM	Slightly moist	SILTY GRAVEL, some fine sand, grey.
							5.1			
							4.4			
							5.1			
10							8.3	SM	Moist	SANDY SILT, some gravel, sand fine to very fine, brown.
							5.4			
							6.6	GP	Slightly moist	SILTY SANDY GRAVEL, light brown to grey.
							4.3			
							4.3			
15							2.2	GM	Dry	SILTY GRAVEL, grey.
							2.9			
							3.4	GP	Dry to moist	SANDY GRAVEL, silty, poorly graded, light to dark grey.
							3.1			
							3.3			
20							6.0			
							7.1			
							6.0			
							14.0			
							8.1	CL	Moist to very moist	MANCOS FORMATION: CLAY SHALE, some gravel at top contact, moderately weathered, slightly fissile, moderate plasticity, light
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 835

JOB NO. GRJ-03 DATE 05/08/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,940.2 E94,790.
SURFACE ELEV. 5,263.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										brown.
										Stopped Drill at 25.0 feet.
30										
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 900

JOB NO. GRJ-03 DATE 06/27/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N11,208.9 E92,785.8
SURFACE ELEV. 5,216.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				OX			7.6	CL		TOPSOIL: SILTY CLAY, gravelly (cobbles to 8 inches), slightly plastic, light reddish brown.
							5.8			
							8.5			CLAYEY SILT, gravelly, slightly plastic, trace fine sand, gypsum approximately 10 to 15%, light red brown to buff.
							4.0	ML		
							3.1			
5				OX			3.3			
							3.0			
							5.6			CLAYEY SANDY GRAVEL, some silt, sand is fine to very fine grained, nonplastic, light brown to buff.
							9.7	GP		
							10.2			
10							8.7			CLAYEY SAND, gravelly, non plasticity, fine to very fine grained, gypsum approximately 30%, light brown to buff.
							6.9			
							5.4	SC		
							7.4			
15							7.0	CL/ GC		GRAVELLY CLAY AND CLAYEY GRAVEL, slight to moderate pasticity, moderate dense, some silt, and very fine grained sand, less then 30% gypsum.
							5.0			
							6.1			
							4.5			MANCOS FORMATION: CLAY SHALE, highly plastic, dense, firm to hard, moderately weathered, massive to moderate fissle, gypsum at top of contact, light brown to grayish brown.
							4.4			
20							3.9	SH/ CL		
							9.9			
							7.9			
							8.0			
							9.0			
							8.4			
25				RX						MANCOS FORMATION: SHALE,

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 900

JOB NO. GRJ-03 DATE 06/27/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N11,208.9 E92,785.8
SURFACE ELEV. 5,216.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										moderately weathered, highly plastic, gypsum fillings in core, light to dark brown grey.
				RX						
								Sh		
30										
35										Note: lost circulation at approximately 35 feet, becomming more indurated with depth color change to grey.
										MANCOS FORMATION: SHALE, slightly weathered to fresh, indurated, slight to moderately fissile, gypsum fills fracture planes (approximately 5-10%), occasional shaley partings with fresh unoxidized surfaces, grey to black.
40										
								Sh		
45										
										Note: 65 degree fracture at 46.5 feet is filled with 1/2 inch gypsum wafer.
50				RX						Note: Gypsum diminishing at approximately 50 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 900

JOB NO. GRJ-03 DATE 06/27/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N11,208.9 E92,785.8
SURFACE ELEV. 5,216.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										Note: begin using air at 52.5 feet.
55										MANCOS FORMATION: SHALE, some natural partings along bedding (all horizontal), occasional staining on bedding, indurated and moderate fissle, lacking in gypsum, grey to black.
60								Sh		
										Note: occasionally fossiliferous
65										Note: 90 degree centerline fractures - stress induced from coring at approximately 65 feet.
70										Note: radial partings - spinning of core induced helical clockwise fractures (changed film roll).
75								CST		MANCOS FORMATION: CLAYSTONE, becomming less fissle, more massive, dense, hard, black.
										Note: pyrite desiminated throughout core - horizontal

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 900

JOB NO. GRJ-03 DATE 06/27/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N11,208.9 E92,785.8
SURFACE ELEV. 5,216.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										fracture (less than 10%). Note: approximatly vertical fracture approcimately 85 degress, stained iron oxide surface.
80										
										MANCOS FORMATION: CLAYSTONE, dense and nonfissle, occasional shaley partings result in rubbilized zones during coring, gypsum and pyrite occasional throughout, gray to black.
85										
								CST	Dry	
90										
										Note: fracture at 91.5 approximately 45 degrees, dry, clean fresh surface.
95										
100										
								CST		MANCOS FORMATION: CLAYSTONE, dense, occasionally pyritic/fossiliferous, concoidal

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 900

JOB NO. GRJ-03 DATE 06/27/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N11,208.9 E92,785.8
SURFACE ELEV. 5,216.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
105								CST		fractures occured along bedding and planes of natural anisotropy, predominantly horizonal in orientation and lacking in fillings, gypsum, dark grey to black.
110										
115										Note: partings result in clayey rubbelized zone.
120										Note: becomming slightly fissle again.
125										MANCOS FORMATION: CLAYSTONE, very dense, occasional clayey partings, consoidal fracturing predominantly horizonal (0-5 degrees), occasional pyrite and fossil fragments, dark grey to black.
								CST		
130										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 900

JOB NO. GRJ-03 DATE 06/27/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N11,208.9 E92,785.8
SURFACE ELEV. 5,216.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
130										
135										
								CST		
140										
145										
150										
155										Stopped drilling at 152.5 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 901

JOB NO. GRJ-03 DATE 07/09/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N12,486.9 E92,593.5
SURFACE ELEV. 5,230.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0				HSA			2.9		Dry	**TOPSOIL: SANDY CLAY,** gravelly, slightly plastic, rootlets, sand is fine grained, gravel clasts, angular are basalt and occassionally chert, buff to light brown.
							5.8			
							6.4	CL		
							6.3			
							6.1			
5				OX			2.6		Dry	**SILTY GRAVEL,** trace fine to very fine sand, nonplastic, 5 to 10% gypsum, fairly loose, buff to gray.
							2.6	GM		
							2.6			
							2.7			
10							2.0		Slightly damp	**CLAYEY GRAVEL,** trace fine to very fine gravely sand, slightly to moderately plastic, moderately dense, light brown.
							4.8	GC		
							4.4			
							1.2			
							4.8			
15							2.2			
							1.4			
							0.8			
							2.2			Note: basalt boulder at 15 to 17 feet and color changed to gray.
							3.0			
20							3.9			Note: matrix becomming silty/sandy at 19.5 feet.
							1.9			
							2.3			
							5.3	CL	Slightly damp to damp	**GRAVELY CLAY,** trace silt/very fine sandy, moderately plastic, massive, dark brown.
							6.2			
25							4.8			**CLAYEY GRAVEL,** slightly to moderately plastic, trace fine sand, moderatly dense, light brown.
							5.0	GC		

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 901

JOB NO. GRJ-03 DATE 07/09/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N12,486.9 E92,593.5
SURFACE ELEV. 5,230.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							6.2			
							6.7			
							7.0	Sh	Slightly damp	MANCOS FORMATION: CLAY SHALE, slightly fissle, slightly plastic, slightly to moderately weathered, light brown to greyish brown.
30							6.7			
							6.1			
				RX						
								Sh	Dry to slightly damp	MANCOS FORMATION: CLAY SHALE, moderately fissle, moderately to highly weathered, clayey stained surfaces on natural partings, occasional calcite/gypsum fillings, light grey, to brown.
35										Note: No recovery from 34.05 to 37.85.
				RX						
40										Note: gypsum fillings (spacing at approximately 2 to 3).
				RX						
45										Note: began loosing some circulation at approximately 43.0 feet.
				RX						
50										Note: numerous gypsum filled fractures and bedding planes - spacing less than 2 inches, shale is fissle - not yet indurated, light brown grey.
										Note: becomming fresher, less fissle at 49.0 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 901

JOB NO. GRJ-03 DATE 07/09/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N12,486.9 E92,593.5
SURFACE ELEV. 5,230.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
				RX						Note: lost circlutation completely at 51.5 feet. Note: begin using air, non to slightly fissle, dense and indurated, concoidal fractures along planes of natural weakness, surfaces are fresh and only occasionally stained with iron oxides.
55								Sh		Note: occasionally pyrite and fossilferous, black.
60										
				RX						Note: end oriented data and downhole camera at 52.85 feet.
65										
70										
				RX						
75										Note: circulation returning at 78.0 feet.
										MANCOS FORMATION:

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 901

JOB NO. GRJ-03 DATE 07/09/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N12,486.9 E92,593.5
SURFACE ELEV. 5,230.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				RX						CLAYSTONE, dense, concoidal fractures along natural partings, all horizontal and devoid of fillings, (calcite and gypsum) etc...
80										
85										Note: pyrite diseminated throughout with occasional fossiliferous zones.
				RX				Cst		
90										
95										Note: clean horizontal fractures along plane of natural weakness every 4 to 5 inches.
				RX						
100									Dry	Note: indurated, dense, concoidal fractures all horizontal, occasionally fossiliferous/pyrite, gray to black, dry.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 901

JOB NO. GRJ-03 DATE 07/09/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N12,486.9 E92,593.5
SURFACE ELEV. 5,230.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				RX						
105								Cst		
				RX						Note: horizontal fractures every 4 to 5 inches (close), concoidal, devoid of fine wings, clean fresh, occasional pyritohedrons in dense black claystone.
110										
115										
				RX						
120										
125										
				RX					Dry	Note: dense and indurated, occassionally fossiliferous or pyrite, concoidal (horizontal) partings and fractures, black.
130										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 901

JOB NO. GRJ-03 DATE 07/09/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N12,486.9 E92,593.5
SURFACE ELEV. 5,230.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
130				RX						
135										Note: calcite filled vein at approximately 135 feet.
				RX						
140										
145										
				RX						
150									Dry	Note: dense, indurated and non-fissle, black.
155										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 901

JOB NO. GRJ-03 DATE 07/09/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N12,486.9 E92,593.5
SURFACE ELEV. 5,230.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										Stopped drilling at 157.85 feet.
160										
165										
170										
175										
180										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 902

JOB NO. GRJ-03 DATE 07/12/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N10,568.9 E93,562.9
SURFACE ELEV. 5,226.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			2.6	SM	Dry	TOPSOIL: SILTY SAND, some gravel, slight plasticity, rootlets, sands fine, clasts of basalt, angular, mostly 1/2 to 1 inch in diameter, red brown.
							5.5			
							9.6			
							6.9			SANDY SILT, slightly plastic, sands fine, clasts of basalt, trace gypsum, red brown.
							7.1	ML		
5				OX			4.3			
							3.4		Slightly damp	
							2.0			SANDY SILT AND GRAVEL, trace clay and gypsum, plasticity, loose, clasts of basalt, occasionally chert, light brown to grey.
							2.7	GM		
							5.7			
10							3.2			SILTY SANDY GRAVEL AND SANDY SILTY GRAVELS, interbedded, very fine to fine sands, trace gypsum, nonplastic, loose to slightly dense, grey to light brown. Note: Matrix alternated from mainly silt to mainly sand approximately every foot.
							2.6			
							3.6	GP/GM	Dry	
							2.1			
							5.6			
15							2.0			
							3.3			
							3.3			SANDY CLAYEY GRAVEL, very fine sands, slight plasticity, tan.
							3.7	GC		
							3.9			
20							3.9		Dry	SILTY SANDY GRAVEL, trace clay and fine sands, light brown to grey.
							6.7	GP		
							6.5			
							6.1			SANDY CLAY, gravelly, very fine to fine sand, plastic, light brown.
							4.0	CL		
25							5.4			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 902

JOB NO. GRJ-03 DATE 07/12/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N10,568.9 E93,562.9
SURFACE ELEV. 5,226.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							6.3			SILTY CLAY, trace very fine to fine sand and gravels, plastic, tan.
							8.7	CL		
							10.4			
							8.5			
30							3.5			SANDY GRAVEL, some silt, fine to medium sand, nonplastic, clasts of basalt and siltstone, light brown.
							7.7		Dry	
							4.8	GP		
							7.1			
							5.0			
35							7.4			
							10.0		Damp	
							8.0			Note: bedrock contact at 37.5 feet.
							6.9			
							7.3	Sh		MANCOS FORMATION: SHALE, fresh, fissile, tan to black. Note: no recovery 39.5 to 42.2 feet.
40				RX						
									Slightly damp	Note: plugged off at 42.2 feet, began water circulation at 43.2 feet.
				RX						
45										MANCOS FORMATION: SHALE, fissile, fractures 3/4 to 4 inches, filled with clays and gypsum, grey to black on fresh surfaces, moderately weathered. Note: fractures becomming more widely spaced up to 18 inches, slightly weathered and discolored 1/2 to 3/4 inch down core from fractures, mostly iron staining, some filled with gypsum and clay.
								Sh	Damp	
50										
									Damp	

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 902

JOB NO. GRJ-03 DATE 07/12/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N10,568.9 E93,562.9
SURFACE ELEV. 5,226.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				RX				Sh		Note: only 1 fracture very slightly weathered, discoloration only on fracture surface, fractures stained with some clay and iron oxide, shale is losing fissility, becomming more dense and indurated, occasional fossils, black.
55										
60									Dry to slightly damp	
				RX						Note: lost almost all circulation at 62 feet. Note: back to air circulation at 63.2 feet. Note: fractures occur along planes of weakness.
65										
70				RX						Note: fractures occur along planes of weakness.
75										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 902

JOB NO. GRJ-03 DATE 07/12/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N10,568.9 E93,562.9
SURFACE ELEV. 5,226.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
				RX						Note: some natural partings are rubblized, other concoidal, partings are along natural weaknesses.
80										
								Sh		
85										
				RX						Note: some natural partings are rubblized, others concoidal, partings are along natural weaknesses.
90										
				RX						Note: loose some air circulation at approximately 93.0 feet. Note: end run at 94.2 as plugged off, start with H2O. Note: 4 fractures all horizontal 8.0 / 9.0 foot run RQD = 93 black shale occasionally fossil.
95										
100										
				RX						

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 902

JOB NO. GRJ-03 DATE 07/12/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/CORE N10,568.9 E93,562.9
SURFACE ELEV. 5,226.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
105										Note: fissile black shale (Mancos Fm) partings along clayey zones, occasional fossils.
								Sh		
110										
				RX						
115										
120										Note: plugged off at 118.9 feet.
125										Stopped drilling at 122.7 feet.
130										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 903

JOB NO. GRJ-03 DATE 07/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,410.2 E93,972.3
SURFACE ELEV. 5,255.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				OX			8.5		Slightly damp	TOPSOIL: CLAYEY SILT, some cobbles, trace of sands and gravel, rootlets, moderately plastic, red brown.
							10.0	ML		
							10.0			
							10.4			
							8.8			
5				OX			3.5			
							3.0			
							2.6		Dry	SILTY SANDY GRAVEL, very fine to fine sands, nonplastic, clasts of basalt, traces of gypsum, grey to tan.
							2.4			
							2.3			
10							1.5	GP		
							2.1			
							2.1			
							1.6			
							1.6			
15							2.3			
								GM	Dry	SILTY GRAVEL, sandy, fine to medium sand, traces of clay, nonplastic, clasts of basalt, tan.
							2.5			
							1.8	GP		
							3.5		Dry	SANDY GRAVEL, some silt, very fine sand, traces of gypsum, nonplastic, clasts of basalt, grey.
20							4.6	GC		
							7.1		Dry	SILTY CLAYEY GRAVEL, some sand, poorly sorted sand, slightly plastic, tan.
							10.3			
							6.1			
							8.5	Sh	Slightly damp	MANCOS FORMATION: CLAY SHALE, highly weathered, fissle, tan.
25							7.9			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 903

JOB NO. GRJ-03 DATE 07/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,410.2 E93,972.3
SURFACE ELEV. 5,255.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							8.1			
							9.1			
							6.6			
							8.2			
30							7.5	Sh		MANCOS FORMATION: SHALE, becoming fresher, grey.
							7.9		Slightly damp	
							9.2			
							13.6			
35										Stopped boring at 34 feet.
40										
45										
50										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 904

JOB NO. GRJ-03 DATE 07/22/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,120.0 E93,935.8
SURFACE ELEV. 5,251'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				OX			4.5		Dry to slightly damp	**TOPSOIL: CLAYEY SILT,** gravelly, traces of fine sand, blocky, rootlets, red brown to buff.
							6.9	ML		
							7.2			
							3.5			
							1.6		Dry	**SILTY SANDY GRAVEL,** traces of clay, sand is fine to very fine, 5% gypsum, basalt clasts predominate, loose, light brownish grey.
5				OX			2.9	GP		
							2.0			
							1.3			
							1.2			
							1.7			
10							2.1			
							2.2			
							1.8			
							1.5		Dry	**SILTY GRAVEL,** some fine to very fine grained sand, loose, grey.
							1.0	GM		
15							1.5			
							1.3			
							1.7			
							1.5			
							1.2			
20							1.0			
							2.6		Slightly damp to damp	**CLAYEY GRAVEL,** sandy, moderately cemented, slight plasticity, medium dense, light brown.
							3.1	GC		
							1.4			
							3.9			**SANDY SILTY GRAVEL,** traces of clay, weakly cemented, nonplastic, loose, light brown to
25							3.8	GM		

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/22/89

LOG OF TEST BORING NO. 904

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,120.0 E93,935.8
SURFACE ELEV. 5,251'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							2.4		Dry to slightly damp	grey.
							1.9			
							2.3			
							1.2			
30							4.6		Damp to moist	**SANDY CLAYEY GRAVEL,** slightly to moderately plastic, medium dense, light yellowish brown.
							6.0	GC		
							8.8			
							5.1			
35							1.0			
							8.4			
							10.3			
							8.4			
							10.8		Damp	**MANCOS FORMATION: SHALE** moderately plastic, slightly fissle, some gypsum, medium dense, light yellowish brown to grey.
40							10.7	Sh		
										Stopped boring at 40 feet.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 905

JOB NO. GRJ-03 DATE 07/20/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,003.1 E93,735.0
SURFACE ELEV. 5,246.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			5.3		Damp	**TOPSOIL: SANDY SILT,** gravelly, sand predominately very fine to fine, moderate plasticity, gravel clasts of basalt, traces of clay, rootlets, red brown.
							8.8	ML		
							6.6			
							5.4			
							6.3			
5				OX			4.3			
							3.0		Dry	**SILTY SANDY GRAVEL,** traces of clay and gypsum, very fine to fine sand, slightly plastic, clasts of predominately basalt minor scoria and chert, tan.
							2.7	GP		
							2.6			
							3.2			
10							3.8			
							1.8			
							2.2			
							2.3		Slightly damp	**SILTY SAND,** gravelly, trace clay and gypsum, very fine to fine sand, slightly plastic, clasts of basalt, tan.
							1.8	SM		
15							20.0			
							1.5		Dry	**SILTY SANDY GRAVEL,** poorly sorted sands, clasts of basalt, weakly cemented, nonplastic, grey.
							1.3	GP		
							1.5			
							1.6			
20							2.4			
							2.0			
							2.2			
							3.2	GC	Slightly damp	**SILTY CLAYEY GRAVEL,** some sand, very fine to fine sand, moderately plastic, clasts of basalt and siltstone, tan.
							2.6			
25							3.4			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/20/89

LOG OF TEST BORING NO. 905

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,003.1 E93,735.0
SURFACE ELEV. 5,246.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							11.0	CL	Slightly damp	**SILTY CLAY,** some sand, traces of gravels, very fine to fine sand, clasts of basalt, moderately plastic, tan.
							1.0			
							0.0			
							6.5		Slightly damp	**SANDY SILTY GRAVEL,** traces of gypsum, poorly sorted sands, clasts of basalts and chert, slight plasticity, grey to tan.
30							5.9	GM		
							0.0			
							3.1		Damp	**SILTY CLAYEY GRAVEL,** some very fine to fine sand, clasts of basalt and siltstone predominate, traces of gypsum, moderate plasticity, tan.
							8.4	GC		
35										
							8.1		Damp	**MANCOS FORMATION: CLAY SHALE,** moderately weathered, fissile, tan.
							8.2			
							6.2	Sh		
							7.3			
							5.8			
40							4.9			
							6.0			
							4.9			
							5.1		Slightly damp	**MANCOS FORMATION: SHALE,** fresh laminated, fissile, grey.
							5.4	Sh		
45							4.9			
							5.2			
							4.0			
										Stopped drilling at 48 feet.
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/23/89

LOG OF TEST BORING NO. 906

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,423.2 E93,778.4
SURFACE ELEV. 5,238.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			2.8		Slightly damp	**TOPSOIL: CLAYEY SANDY SILT**, some gravel, very fine to fine sand, cliche rinds on gravel, clasts of basalt, roots, moderate plasticity, reddish brown.
							5.1	ML		
							4.8			
							6.2			
							5.6			
5				OX			4.6			
							1.7			
							3.7		Dry	**SILTY SANDY GRAVEL**, sand predominantly very fine to fine, gravels of basalt and scoria, trace of gypsum, nonplastic to slight plasticity, tan to grey.
							3.5	GP		
							4.3			
10							2.1			
							1.4			
							1.5			
							1.2			
							1.8			
15							2.0			
							2.4			
							2.0			
							1.6			
							2.9			
20							1.9			
							1.9			
							3.3		Slightly damp	**SILTY SAND**, gravelly, very fine to fine sands, clasts of basalt and siltstone, slight plasticity, tan.
							4.5	SM		
							6.5			
25							3.5			**CLAYEY SILT**, sandy, very fine

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 906

JOB NO. GRJ-03 DATE 07/23/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,423.2 E93,778.4
SURFACE ELEV. 5,238.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							4.6	ML	Slightly damp	to fine sands, gravel increases with depth, tan.
							4.1			
							4.5			
							5.0	GC	Damp	SILTY CLAYEY GRAVEL, some sand, very fine to fine sand, tan.
30							4.0			
							2.8			
							2.5			
							3.2			
							2.8			
35							2.4	GP		SILTY SANDY GRAVEL, trace to some clay and gypsum, slight to nonplastic, fine to very fine grained sand, poorly sorted, dark brown to greyish tan.
							3.8			
							5.1		Dry to slightly damp	
							4.2			
							4.3			
40							12.3	CL	Slightly damp	SILTY CLAY, trace of sand, sand very fine to medium, some gravel, tan.
							9.1			
							8.3			
							8.6	Sh		MANCOS FORMATION: SHALE, moderately weathered to fresh, fissile, tan to grey.
							7.8		Slightly damp	
45							8.6			
							7.0			
							6.8			
							7.0			
							5.8			
50							5.3			
							5.4			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 906

JOB NO. GRJ-03 DATE 07/23/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,423.2 E93,778.4
SURFACE ELEV. 5,238.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							5.8			MANCOS FORMATION: SHALE, moderately weathered to fresh, fissle, tan to gray.
							5.8	Sh		
							5.8			
55										Stopped Drilling at 55 feet.
60										
65										
70										
75										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 907

JOB NO. GRJ-03 DATE 07/23/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,773.8 E94,146
SURFACE ELEV. 5,247.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			8.0		Slightly damp	**TOPSOIL: SILTY CLAY,** some fine to very fine sand, gravelly, basalt clasts with minor siltstone and chert, rootlets, red brown to buff.
							10.9	CL		
							8.1			
							8.2			
							6.5			
5				OX			8.2			
							3.6	GP	Dry to slightly damp	**CLAYEY SANDY GRAVELY,** slightly plastic, fine to very fine gravel, approximately 3% gypsum, light brown.
							3.5			
							4.9	SC	Damp	**CLAYEY SAND,** gravelly, slightly plastic, fine to very fine gravel, light brown, trace gypsum.
10							7.3			
							9.9	CL	Dry to slightly damp	**CLAY,** sandy, some gravel, slight to moderate plastic, medium dense, light brown.
							12.4			
							12.1			
							9.2			
15							4.0		Dry	**SANDY SILTY GRAVEL,** nonplastic, loose, fine grain sand, light greyish brown.
							3.5	GM		
							3.2			
							3.4			
							4.8			
20							6.9			Note: bedrock contact at 21.0 feet.
				RX					Damp	**MANCOS FORMATION: SHALE,** slightly to moderately plastic, slightly fissle; light gray to light brown.
								Sh		
				RX						
25										Note: Weathered Mancos

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 907

JOB NO. GRJ-03 DATE 07/23/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,773.8 E94,146.6
SURFACE ELEV. 5,247.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				RX						MANCOS FORMATION: CLAY SHALE, moderately weathered, slightly fissle, clayey partings approxamitely 2 to 3 inches, gypsum filled, some staining, moderately plastic, mottled light brown to grey.
30								Sh		
				RX						Note: gypsum filled surfaces.
35										Note: begin loosing some circulation at contact - 35.0 feet.
				RX						
40										MANCOS FORMATION: SHALE, slightly weathered, becomming more indurated with depth, slightly to moderately fissle, occasional clayey partings, grey.
				RX				Sh		Note: circulation good at approximately 85%.
45										Note: fresh Mancos Shale.
				RX						
50				RX						Note: oily black hydrocarbon film present in fluid.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 907

JOB NO. GRJ-03 DATE 07/23/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,773.8 E94,146.6
SURFACE ELEV. 5,247.80'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
55										
60				RX				Sh		MANCOS FORMATION: SHALE, fresh, indurated, slightly fissle, occasionally fossiliferous, calcite present in partings, dense black.
65										
70										Stopped drilling at 68.0 feet.
75										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 908

JOB NO. GRJ-03 DATE 07/24/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,830.4 E93,778.3
SURFACE ELEV. 5,238.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classiri-cation	REMARKS	VISUAL CLASSIFICATION
0				HSA			5.8		Slightly damp	**TOPSOIL: SILTY CLAY,** some sand, very fine to fine sand, moderate plasticity, trace gravel, roots, reddish brown.
							8.5	CL		
							9.2			
							9.2			
							8.2	CL	Slightly damp	**SILTY CLAY,** sandy, very fine to fine sand, trace of gravel, basalt gravel with caliche rinds, moderate plasticity, reddish brown.
5				OX			4.1			
							5.4			
							2.9	GP	Dry	**SANDY GRAVEL,** trace to some silt, trace of gypsum and clay, very fine to medium sand, clasts of basalt, slight plasticity, loose, grey.
							2.3			
							3.1			
10							5.4	ML	Slightly damp	**SANDY SILT,** gravelly, very fine to fine sands, moderate plasticity, tan.
							1.3			
							2.1			
							2.8			Note: interbedded with some silt, very fine to medium sand, nonplastic, grey.
							5.2			
15							3.0		Dry to Damp with depth	**SANDY SILTY GRAVEL,** very fine to fine sand, trace of clay, slight plasticity, tan.
							2.1	GM/ GP		
							1.6			
							2.2			
20							2.3			
							2.5			
							3.0			
							8.9			
							5.5			
25							5.4	CL		

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 908

JOB NO. GRJ-03 DATE 07/24/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,830.4 E93,778.3
SURFACE ELEV. 5,238.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							10.6		Damp to slightly moist	CLAY, sandy, some gravel, very fine to fine sand, very dense, slightly plastic, yellowish brown to tan.
							8.8			
							4.5			
30							4.2			
							3.4			
							4.5			
							5.0			
							5.7			
35							9.1		Slightly damp to damp	SANDY GRAVEL, some silt, very fine to fine sand, clasts of basalt and silts, loose, nonplastic, tan.
							4.4	GP		
							2.7			
							3.5			
							1.3			
40							3.8			
							6.7			
							8.9			MANCOS FORMATION: SHALE, fissle, moderately weathered, light brown to grey.
							1.3	Sh		
							7.3			
45										Stopped Drilling at 44 feet.
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 909

JOB NO. GRJ-03 DATE 07/25/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,607.8 E94,006.8
SURFACE ELEV. 5,245.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			5.8	ML	Dry	**TOPSOIL: SILTY SAND,** clayey, very fine to fine sands, some gravel, clasts of basalt with caliche rinds, roots, moderate plasticity, reddish brown.
							4.9			
							6.3			
							7.7	CL	Slightly damp	**SILTY CLAY,** sandy, trace of gravel, very fine to fine sand, clasts of basalt, roots, moderate plasticity, light reddish brown.
							6.0			
5				OX			3.6	GM		
							3.6		Dry	**SANDY SILTY GRAVEL,** very fine to fine sands, clasts of basalt and scoria, trace of gypsum, nonplastic, tan.
							3.4	GC		
							2.2			
							2.2		Slightly damp	**SANDY CLAYEY GRAVEL,** some silt, very fine to fine sands, clasts of basalt, trace of gypsum, dense, slight plasticity, tan.
10							1.8			
							1.7	GP		
							1.5		Dry	**SANDY GRAVEL,** some silt, very fine to medium sand, trace of gypsum, clasts of basalt and scoria, nonplastic, loose, grey.
							1.4			
							2.1			
15							2.6		Slightly damp to damp	**SANDY SILTY GRAVEL,** trace of clay and gypsum, very fine to fine sand, clasts of basalt, slight plasticity, yellowish tan.
							2.4	GM		
							2.6			
							1.2			
							2.2			
20							2.0			
							2.3			
							3.7			
							2.6			
							2.7			
25							3.9			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 909

JOB NO. GRJ-03 DATE 07/25/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,607.8 E94,006.8
SURFACE ELEV. 5,245.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							3.6			
							2.5			
							5.3	GP	Damp	**SANDY CLAYEY GRAVEL,** some silt, very fine to fine sand, clasts of basalt, silts, and chert, moderate plasticity, yellowish brown.
30							4.2			
							5.8			
							4.8			
							2.8			
							5.1	GM	Slightly damp	**SANDY SILTY GRAVEL,** trace of clay, very fine to fine sand, moderate plasticity, tan.
35							4.6			
							5.5			
							1.9			Note: bedrock contact at 40.5 feet.
							1.5			
							1.4			
40							2.7			
							1.8			
							3.1	Sh	Slightly damp to damp	**MANCOS FORMATION: SHALE,** fresh to weathered, fissile, tan and grey.
							3.3			
							8.7			
45							7.0			
										Stopped drilling at 45 feet.
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/27/89

LOG OF TEST BORING NO. 910

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11332.1 E93869.4
SURFACE ELEV. 5,239.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			5.6	CL	Slightly damp	**TOPSOIL: SANDY CLAY,** fine to medium sand, some gravel, slight plasticity, rootlets, reddish brown.
							8.1			
							6.8		Slightly damp	**SILTY CLAY,** some fine to medium sand, gravelly, subrounded basalt clasts, buff to light reddish brown.
							6.6	CL		
							5.5			
5				OX						
							4.0		Dry	**SILTY SANDY GRAVEL,** fine to medium sand, basalt clasts predominant with minor scoria and chert, nonplastic, loose, light grey.
							3.2	GP		
							3.4			
							2.8			
10							2.6			
							3.3			
							2.4			
							2.6			
							2.6			
15							3.0			
							3.4			
							2.3	GP	Dry to slightly damp	**SANDY GRAVEL,** some clay, fine to very fine sand, nonplastic, slightly dense, light brown.
							4.7			
							6.4	SC	Slightly damp	**CLAYEY SAND,** very fine to fine sand, gravelly, slight plasticity, medium density, light brown.
20							4.6			
							5.6		Dry	**SILTY SAND AND GRAVEL,** very fine to medium sand, some gravel, approximately 5 to 10% gypsum, slight plasticity, moderate density, light brownish grey.
							4.1			
							6.5	SM		
							4.8			
25							3.2			
							2.4			

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 910

JOB NO. GRJ-03 DATE 07/27/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11332.1 E93869.4
SURFACE ELEV. 5,239.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							2.4		Damp	**SILTY SAND AND GRAVEL,** very fine to medium sand, some gravel, approximately 5 to 10% gypsum, slight plasticity, moderate density, light brownish grey.
							2.8			
							2.7			
							2.8			
30							6.6		Moist	**SILTY CLAYEY GRAVEL,** some very fine to fine sand, clayey, clasts of basalt, boulders from 35 to 37 feet, moderate plasticity, brownish tan.
							19.4	GC		
							5.0			
							4.7			
							2.9			
35							2.2			
							1.0			
							4.7			
							4.3			
							4.4			
40							5.6		Slightly damp	**SANDY CLAY,** very fine to fine sand, trace of gravel, moderate plasticity, tan.
							3.6	SC		Note: bedrock at 42 feet.
							3.1			
							8.0			
45							10.2		Damp	**MANCOS FORMATION: SHALE,** fresh to weathered, fissile, tan and black.
							8.1	Sh		
50										Stopped Drilling at 46 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 07/26/89

LOG OF TEST BORING NO. 911

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,536.2 E93,751.1
SURFACE ELEV. 5,238.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			3.6		Slightly damp	**TOPSOIL: SILTY CLAY,** trace of very fine to fine sand, gravelly, slight plasticity, rootlets, light brown to buff.
							6.5	CL		
							7.3			
							8.2			
5							8.4			
							3.9			
				OX			4.0		Dry	**SILTY SANDY GRAVEL,** medium to fine sand, approximately 8 to 10% gypsum, nonplastic, loose, greyish brown.
							3.5	GP		
							3.5			
10							4.0			
							2.0			
							0.7			
							1.5			
							2.9			
15							2.3			
							3.3			
							2.6		Dry to slightly damp	**SILTY SANDY GRAVEL,** basalt clasts with minor scoria and chert, trace of gypsum, nonplastic, loose, light grey.
							2.7	GP		
							3.5		Slightly damp	**SILTY CLAYEY GRAVEL,** sandy, fine to very fine sand, slight plasticity, medium dense, light brown.
20							3.2	GC		
							3.8			
							2.0		Dry	**SILTY SANDY GRAVEL,** fine sand, medium dense, light greyish brown.
							2.9	GP		
							4.1	SP		**GRAVELLY SAND,** some silt, fine to very fine sand, medium dense, light yellowish brown.
25							4.1			
							4.2	ML		

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 911

JOB NO. GRJ-03 DATE 07/26/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,536.2 E93,751.1
SURFACE ELEV. 5,238.40'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							1.8		Damp	CLAYEY SILT, trace of fine to very fine sand, gravelly, slight plasticity, medium dense, light brown.
							1.5			
							4.2			
							4.2	ML		
30							4.4			
							4.0			
							5.2		Damp	SANDY SILTY GRAVEL, some clay, very fine to fine sands, moderate plasticity, tan.
							3.9			
							1.5	GM		
35							4.7			
							4.5			
							2.7			
							2.5			
							2.8			
40							4.6	GC	Slightly damp to damp	CLAYEY GRAVEL, sandy, very fine to fine sand, moderate plasticity, tan. Note: bedrock contact at 41 feet.
							8.0			
							8.8			
							5.8	Sh	Damp	MANCOS FORMATION: SHALE, fissile, tan.
							8.6			
45										Stopped drilling at 45 feet.
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 912

JOB NO. GRJ-03 DATE 08/01/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,762.6 E93,659.0
SURFACE ELEV. 5,239.70'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			4.6		Slightly damp	**TOPSOIL: SILTY CLAY,** some fine to medium sand, gravelly, slight to medium plasticity, rootlets, light brown to buff.
							0.8	CL		
							0.9			
							4.8			
							4.5			
5				OX						
							1.9		Dry	**SILTY SANDY GRAVEL,** fine to medium sand, approximately 7 to 10% gypsum, basalt clasts predominantly, minor chert and baked claystone, nonplastic, loose, light grey.
							2.2	GP		
							2.8			
							2.0			
							2.0			
10							2.0		Slightly damp	**SILTY CLAYEY GRAVEL,** some fine sand, medium dense, light brown.
								GC		
							3.0			
							3.1		Slightly damp	**CLAYEY SILTY GRAVEL,** dense, light grey.
							3.1	GM		
15										
							1.7		Damp	**CLAYEY GRAVEL AND GRAVELLY CLAY,** trace of fine to medium sand, slight to moderate plasticity, medium dense, light grey to light brown.
							2.3	GC/CL		
							5.2			
							6.0			
							5.5			
20							7.1			
							5.2			
							2.3			
							2.8			
							2.6			
25							9.0			**SANDY GRAVEL,** some clay,

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 912

JOB NO. GRJ-03 DATE 08/01/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,762.6 E93,659.0
SURFACE ELEV. 5,239.70'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							2.7		Dry to slightly damp	fine to medium sand, nonplastic, loose to medium dense, light brown to grey.
							2.0	GP		
							2.3			
							3.7			
30							1.9			
							2.0		Slightly damp	**CLAYEY GRAVEL,** some very fine to fine sand, slight plasticity, medium dense, light brown. Note: Bedrock Contact at 34.5 feet.
							2.4	GC		
							5.3			
35							8.5		Dry	**MANCOS FORMATION: SHALE,** slight to moderately weathered, moderately fissile, light brown to greyish brown.
							8.9			
							8.8	Sh		
							8.5			
40										Stopped drilling at 38 Feet.
45										
50										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 913

JOB NO. GRJ-03 DATE 08/01/89

RIG TYPE MOBILE B-57
BORING TYPE ODEX/HSA N11,853.0 E93,611.0
SURFACE ELEV. 5,241.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			3.5	ML	Dry	**TOPSOIL: SANDY SILT,** some gravel and clay, very fine to fine sand, moderately plastic, gravels of basalt with caliche rinds, medium brown.
							19.6	CL		
							10.4			
							5.8		Damp	**SILTY CLAY,** gravelly, trace very fine to fine sand, slightly plastic, gravels of basalt, roots, light red brown.
5				OX			6.9			
							3.9			
							2.9	GP	Dry	**SILTY SANDY GRAVEL,** trace clay and gypsum, poorly sorted sand, slightly plastic, grey brown.
							3.4			
							3.1			
10							2.2			
							2.4		Slightly damp	**CLAYEY SILTY SAND,** some gravel, very fine to fine sand, clasts of basalt, slightly plastic, tan.
							5.2	SM		
							3.3			
							1.8		Dry	**SANDY GRAVEL,** silty, very fine to fine sands, clasts of basalt, nonplastic, trace gypsum, grey brown.
15							1.7	GP		
							2.1			
							3.5			
							6.2	CL	Damp	**SILTY CLAY,** some sand, trace gravels, very fine to fine sand, clasts of basalt, slightly plastic, tan.
							3.6			
20							4.7			
							6.1			
							4.8			
							1.3			
							0.7			
25							0.7			

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 913

JOB NO. GRJ-03 DATE 08/01/89

RIG TYPE MOBILE B-57
BORING TYPE ODEX/HSA N11,853.0 E93,611.0
SURFACE ELEV. 5,241.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							1.5		Damp	**SILTY CLAY,** some sand, trace gravels, very fine to fine sand, clasts of basalt, slightly plastic, tan.
							1.2			
							1.5			
							5.9			
30							0.3			
							0.3	GC	Slightly damp	**CLAYEY GRAVEL,** some silt, trace very fine to medium sand, moderate plasticity, clasts of basalt, tan.
							1.3			
							0.7			
							2.7	GP	Slightly damp	**SILTY SANDY GRAVEL,** trace clay, very fine to fine sand, nonplastic, grey brown.
35							1.7			
							6.4		Slightly damp	**MANCOS FORMATION: CLAY SHALE,** moderately weathered, bedrock contact at 36 feet, fissle, tan.
							5.1	Sh		
							4.1			
							5.3			
40										Stopped drilling at 40 feet.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 914

JOB NO. GRJ-03 DATE 08/02/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,713.7 E93,685.1
SURFACE ELEV. 5,239.20'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			4.2		Slightly damp	**TOPSOIL: CLAYEY SILT,** gravelly, some fine sand, rootlets, slight plasticity, light red brown.
							9.5	ML		
							7.4			
							8.3			
							8.5			
5				OX			8.2			
							6.0		Dry	**SILTY SAND,** basalt boulders to 12 inch diameter, some gravel, very fine to fine, nonplastic, light brown to greyish brown.
							4.7	SM		
							3.4			
							2.3		Slightly damp	**SILTY SANDY GRAVEL,** loose, fine to medium grade sand, nonplastic, light brownish grey.
10							3.4	GP		
							5.2			**SANDY CLAYEY GRAVEL,** fine to medium sand, slightly to moderately plastic, greyish brown.
							5.6	GC		
							6.8			
							9.3			
15							10.4			
							7.0		Slightly damp to damp	**SANDY CLAY,** gravelly, dense, limonite staining on some clasts, slight to moderate plasticity, light brown to yellowish brown.
							5.7	CL		
							6.1			
							6.1			
20							5.0			
							6.5			
							5.5			
							5.2			
							5.6			
25							4.8	GM		**SILTY GRAVEL,** some fine to

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 914

JOB NO. GRJ-03 DATE 08/02/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,713.7 E93,685.1
SURFACE ELEV. 5,239.20'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							2.7		Slightly moist	medium sand, loose, light brown to grey.
							3.5	GM		
							4.0			
							4.4		Damp	**SILTY CLAYEY GRAVEL,** some fine to very fine sand, slightly plasticity, light yellow brown.
30							4.0	GC		
							3.8			
							4.6			
							4.9			
							4.3			
35							4.3			
							6.7			
							8.5		Dry to slightly damp	**MANCOS FORMATION: SHALE,** slightly weathered, fissle, slightly plasticity, light olive brown to grey.
							8.7	Sh		
40							5.0			
										Stopped drilling at 40 feet.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/02/89

LOG OF TEST BORING NO. 915

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,874.2 E93,617.0
SURFACE ELEV. 5,229.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			6.1	SM	Slightly moist	TOPSOIL: SILTY SAND, trace of gravel, gravel has caliche rind, some clay, very fine to fine sand, rootlets, moderate plasticity, dark reddish brown.
							8.4			
							9.0			
							8.2	ML		
							7.3		Moist	SANDY CLAYEY SILT, trace of gravel with depth, very fine to fine sand, moderate plasticity, light reddish brown.
5				OX			5.0			
							5.7			
							4.5	GP	Slightly moist	SILTY SANDY GRAVEL, trace of clay, poorly sorted sand, clasts of basalt and scoria, trace of gypsum, nonplastic, greyish brown.
							4.1			
							4.2			
10							3.5	SM	Slightly moist	SILTY SAND, trace of gravel, trace of clay, very fine to fine sand, nonplastic, greyish brown.
							3.3			
							2.5			
							3.0			
15							2.8	GP	Dry	SILTY SANDY GRAVEL, trace of clay, sand predominantly very fine to fine, trace of gypsum, clasts of basalt and scoria, nonplastic, loose, greyish brown.
							3.1			
							2.6			
							2.4			
							2.4			
20							2.0	GM	Dry	SANDY SILTY GRAVEL, trace of clay, sand predominantly very fine to medium, clasts of basalt, nonplastic, grey.
							4.4			
							3.2		Slightly moist	CLAYEY GRAVEL, sandy, very fine sand, clasts of basalt, moderate plasticity, tan.
							3.1	GC		
							4.1			
25							3.1	GP	Slightly moist	SILTY SANDY GRAVEL, some clay, poorly graded sand, nonplastic, greyish brown.
							3.2			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 915

JOB NO. GRJ-03 DATE 08/02/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,874.2 E93,617.0
SURFACE ELEV. 5,229.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							5.1	GC	Slightly moist	SANDY CLAYEY GRAVEL, silty, very fine to fine sand, moderate plasticity, tan.
							5.2			
							3.9			
30							2.8	GP	Slightly moist	SANDY GRAVEL, some silt and clay, very fine to fine sand, nonplastic, tan.
							3.4			
							2.8			
							2.4	GM	Dry	SANDY SILTY GRAVEL, some clay, very fine to fine sand, slight plasticity, tan.
							2.7			
							5.2	GC		
35							5.9	GP	Slightly moist	SANDY CLAYEY GRAVEL, very fine to fine sand, clasts of basalt, quartz, and scoria, moderate plasticity, yellowish tan.
							5.5			
							5.7	GC		
							5.0			
							4.9	GP	Slightly moist	SILTY SANDY GRAVEL, trace of clay, very fine to fine sand, nonplastic, tan.
40							5.0	GC		
							4.4			
							6.8	Sh	Slightly moist	CLAYEY GRAVEL, sandy, very fine sand, moderate plasticity, tan.
45									Slightly moist	SANDY GRAVEL, silty, very fine to medium sand, clasts are rounded, fine gravel, nonplastic, tan.
50									Slightly moist	CLAYEY GRAVEL, some sand, poorly sorted, moderate plasticity, tan.
									Slightly moist	MANCOS FORMATION: CLAY SHALE, fissile, grey.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 915

JOB NO. GRJ-03 DATE 08/02/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,874.2 E93,617.0
SURFACE ELEV. 5,229.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										Note: Bedrock Contact at 41 feet.
55										Stopped drilling at 43 feet.
60										
65										
70										
75										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 916

JOB NO. GRJ-03 DATE 08/03/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,576.9 E93,735.3
SURFACE ELEV. 5,237.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			4.2		Slightly moist	TOPSOIL: CLAYEY SANDY SILT, very fine to fine sand, some gravel, clasts of basalt, becoming gravelly with depth, slightly plastic, roots, dark reddish brown and lightening with depth to a light pink.
							6.6	ML		
							8.5			
							7.2			
							6.2			
5				OX			3.2			
							2.3		Dry	SILTY SANDY GRAVEL, predominantly very fine to medium sand, clasts of basalt, nonplastic, grey to brown.
							2.4	GP		
							2.7			
							3.2	GC	Dry	CLAYEY GRAVEL, silty, very fine to fine sand, matrix moderately plastic, tan.
10							2.8			
							2.8	GP	Dry	SANDY GRAVEL, silty, poorly sorted sand, nonplastic, greyish brown.
							2.7			
							5.0			
							6.1	GM		
15							6.4		Slightly moist	SANDY SILTY GRAVEL, very fine to fine sand, slight plasticity, greyish brown.
							4.6			
							6.0	CL	Slightly moist	SILTY CLAY, some sand, very fine to fine sand, some gravel, clasts of basalt, plastic, tan.
							6.1			
							3.0			
20							4.2		Slightly moist	SILTY SAND/SANDY SILT, trace of gravel, very fine to fine sand, slight to nonplastic, tan.
							5.5			
							5.5	SM/ ML		
							5.7			
							4.7			
25							3.7			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 916

JOB NO. GRJ-03 DATE 08/03/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,576.9 E93,735.3
SURFACE ELEV. 5,237.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							2.8		Dry	**SILTY SANDY GRAVEL**, some clay, poorly sorted sand, slight plasticity, greyish tan.
							2.2	GP		
							2.8			
30							2.5		Dry to moist	**SANDY SILTY GRAVEL**, boulders from 32 to 33 feet, some clay, very fine to medium sand, slight plasticity, tan.
							4.5			
							3.0	GM		
							1.6			
							3.6		Slightly moist	**CLAYEY SILTY GRAVEL**, sandy, very fine to fine sand, nonplastic, tan
35							3.4	GM		
							5.9			
							4.4		Slightly moist	**SILTY SANDY GRAVEL**, some clay, poorly sorted sand, slight plasticity, greyish tan.
							3.7	GP		
							6.7		Slightly moist	**MANCOS FORMATION: CLAY SHALE**, highly weathered, fissile, tan.
							5.7	Sh		
40										
45										Stopped drilling at 40 feet.
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 917

JOB NO. GRJ-03 DATE 08/04/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,883.8 E93,658.6
SURFACE ELEV. 5,230.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			8.3		Slightly damp	TOPSOIL: CLAYEY SILT, trace of gravel, sandy, very fine to fine sand, roots, moderate plasticity, light reddish brown.
							10.1			
							9.9			
							9.0	ML		
							8.2			
5				OX			4.3			
							3.9		Dry	SILTY SANDY GRAVEL, trace of clay, predominantly very fine to fine sand, clasts of basalt, trace of gypsum, nonplastic, greyish brown.
							4.0			
							4.3			
							3.9	GP		
10							3.1			
							3.2			
							3.1		Slightly damp	SILTY GRAVELLY SAND, trace of clay, poorly sorted sand, nonplastic, light brown.
							4.2	GP		
							2.7		Dry	SILTY SANDY GRAVEL, trace of clay, predominantly very fine to fine sand, clasts of basalt, scoria, and siltstone, nonplastic, loose, greyish brown.
15							2.3			
							2.4			
							2.4	GP		
							2.3			
							2.1			
20							1.9			
							2.3		Slightly damp	CLAYEY GRAVEL, some sand, very fine to medium sand, clasts of basalt and scoria, moderate plasticity, medium dense, tan.
							2.7	GC		
							4.4			
							3.2		Damp	SANDY SILT, clayey, very fine to fine sands, trace of gravel, clasts
25							4.6	ML		

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 917

JOB NO. GRJ-03 DATE 08/04/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,883.8 E93,658.6
SURFACE ELEV. 5,230.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							4.7			of basalt, moderate plasticity, medium dense, tan.
							2.8	GP		
							4.5		Slightly damp	SILTY SANDY GRAVEL, poorly sorted sand, clasts of basalt, nonplastic, greyish brown.
							4.0	GC		
30							3.1			
							2.8		Damp	SANDY CLAYEY GRAVEL, silty, very fine to fine sand, moderate plasticity, tan.
							3.2			
							2.2			
							4.4	GP	Dry	SANDY GRAVEL, some silt, poorly sorted sand, clasts of basalt and scoria, nonplastic, loose, greyish brown.
35							4.0			
							3.5			
							3.6			
							3.4	GC	Damp	SILTY CLAYEY GRAVEL, sandy, very fine to fine sand, plastic matrix, medium dense, tan.
							3.5	GP		
40							3.7	GC		
							4.5	Sh	Slightly damp	SANDY GRAVEL, silty, very fine to medium sand, clasts of basalt, nonplastic, greyish brown.
45									Damp	SANDY CLAYEY GRAVEL, poorly sorted sand, moderate plasticity, some fissile clay chips, tan.
									Slightly damp	MANCOS FORMATION: SHALE, fresh, fissile, dark grey.
50										Note: Bedrock Contact at 42 feet. Stopped drilling at 42 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 917

JOB NO. GRJ-03 DATE 08/04/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,883.8 E93,658.6
SURFACE ELEV. 5,230.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			8.3		Slightly damp	TOPSOIL: CLAYEY SILT, trace of gravel, sandy, very fine to fine sand, roots, moderate plasticity, light reddish brown.
							10.1			
							9.9			
							9.0	ML		
							8.2			
5				OX			4.3			
							3.9		Dry	SILTY SANDY GRAVEL, trace of clay, predominantly very fine to fine sand, clasts of basalt, trace of gypsum, nonplastic, greyish brown.
							4.0			
							4.3			
10							3.9	GP		
							3.1			
							3.2			
							3.1		Slightly damp	SILTY GRAVELLY SAND, trace of clay, poorly sorted sand, nonplastic, light brown.
							4.2	GP		
15							2.7		Dry	SILTY SANDY GRAVEL, trace of clay, predominantly very fine to fine sand, clasts of basalt, scoria, and siltstone, nonplastic, loose, greyish brown.
							2.3			
							2.4			
							2.4	GP		
							2.3			
20							2.1			
							1.9			
							2.3		Slightly damp	CLAYEY GRAVEL, some sand, very fine to medium sand, clasts of basalt and scoria, moderate plasticity, medium dense, tan.
							2.7	GC		
							4.4			
							3.2		Damp	SANDY SILT, clayey, very fine to fine sands, trace of gravel, clasts
25							4.6	ML		

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 918

JOB NO. GRJ-03 DATE 08/04/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,480.4 E93,765.0
SURFACE ELEV. 5,237.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							4.3			Note: clay increases and gravel decreases with depth.
							5.2			
							6.6			
30							4.5			
							4.6			
							4.3			
							4.8			
							4.6			
35							5.0			
							6.7			
							6.0			MANCOS FORMATION: CLAY SHALE, relatively soft, moderately weathered, laminated, low to nonplastic, light brown to yellowish brown.
							3.6			
							4.0	Sh		
40							9.2			
										Stopped drilling at 40 feet.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 918

JOB NO. GRJ-03 DATE 08/04/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,480.4 E93,765.0
SURFACE ELEV. 5,237.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			5.0			TOPSOIL: SILT, occasional cobbles, trace to some fine sand, low plasticity, light brown.
							7.0	ML	Sligthly damp	
							7.8			
							6.4			SANDY SILTY GRAVEL, gravel and cobbles, occasional boulder to 3 feet, boulders are vesicular basalt, dark to medium brown.
							5.0			
5				OX			3.4			
							2.4			
							1.5			
							1.4			
							2.0			
10							1.9	GM	Dry	
							1.7			
							1.2			
							1.5			
							1.0			
15							6.0			
							1.6			
							4.1			SANDY GRAVEL, cobbles and boulders, considerable silt, light brown.
							3.0			
							3.0			
20							4.3	GP	Dry	
							4.3			
							3.5			
							3.6			
							2.7		Slightly damp	SANDY CLAYEY GRAVEL, cobbles and boulders, light brown to yellowish brown.
25							4.2	GC		

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 919

JOB NO. GRJ-03 DATE 08/05/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,382.1 E93,826.8
SURFACE ELEV. 5,239.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
							1.0			light brown.
							4.7		Slightly moist	CLAYEY SILT, trace of fine to medium gravel, some fine to very fine sand, slight plasticity, light brown.
							5.8			
							4.8			
30							7.2	ML		
							5.5			
							4.2			
							5.1			
							2.7		Dry	SILTY GRAVEL, some clay, nonplastic, loose to medium dense, grey.
35							3.0			
							2.9	GM		
							2.8			
							5.8		Moist	CLAYEY GRAVEL, some fine to very fine sand, clasts of basalt, siltstone and chert predominant, slight plasticity, dense, light to dark brown.
							3.0			
40							7.4	GC		
							7.8		Moist	CLAY, trace of fine to medium gravel, massive, moderate plasticity, dense, dark brown.
							5.6	CL		
							4.2		Moist	SILTY CLAY, occasionally fine gravel, fine to very fine sand, slight plasticity, dense, light yellowish brown.
45							8.0	CL		
							9.9			
							9.0			
							8.3		Moist	MANCOS FORMATION: SHALE, fresh, indurated, fissile, grey to black.
							7.6			
50							7.0	Sh		
							5.8			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 919

JOB NO. GRJ-03 DATE 08/05/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,382.1 E93,826.8
SURFACE ELEV. 5,239.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			6.9			TOPSOIL: SANDY SILTY CLAY, occasional cobbles, fine to medium sand, caliche comprises approximately 40%, rootlets, slight plasticity, buff to reddish brown.
							7.4			
							7.1	CL	Damp	
							6.8			
							6.2			SANDY GRAVEL, some silt, fine to medium sand, clasts are predominantly vesicular basalt and pink scoria, trace of gypsum throughout, nonplastic, loose, light grey to brown.
5				OX			5.3			
							3.8			
							2.7			
							2.3			
							2.1			
10							3.7	GP	Dry	
							2.6			
							2.7			
							2.4			
							2.5			
15							2.2			
							2.2			
							4.2			SILTY GRAVEL, some clay, fine to very fine sand, nonplastic, light brown to grey.
							3.5			
							2.6			
20							2.6	GM	Damp	
							3.1			
							4.2			
							3.1			
							3.6			SANDY SILT, gravelly, trace of clay, fine to very fine sand, fine gravel, nonplastic, medium dense,
25							2.9	SM	Slightly damp	

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 920

JOB NO. GRJ-03 DATE 08/05/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,856.7 E93,533.3
SURFACE ELEV. 5,227.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content of Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			7.9		Slightly damp	TOPSOIL: SANDY SILT, trace of clay, very fine to fine sand, some gravel (with caliche rind), moderate plasticity, roots, light reddish brown.
							9.6			
							9.3			
							7.8	ML		
							7.5			
5				OX			3.2			
							5.5			
							3.5		Dry	SANDY SILTY GRAVEL, poorly sorted sand, clasts of basalt and scoria, trace of clay and gypsum, nonplastic, loose, greyish brown.
							3.2	GP		
							3.9			
10							2.8	GP	Slightly damp to damp	SANDY GRAVEL, very fine to fine sand, clasts of basalt, nonplastic, loose, dark brown.
							2.7			
							3.5			
							4.1	GP	Slightly damp	SANDY SILTY GRAVEL, very fine to medium sand, clasts of basalt and scoria, nonplastic, dark greyish brown.
							3.2			
15							4.3			
							1.8		Slightly damp to damp	SILTY SANDY GRAVEL, trace clay, very fine to fine sand, slight plasticity, tan (pink from 16 to 17 feet).
							2.9	GP		
							3.2			
							2.4			
20							6.2		Damp	SANDY SILTY GRAVEL, trace of clay, very fine to medium sand predominant, gravel of basalt with some chert, slight plasticity, tan.
							6.1	GM		
							4.1			
							7.3	SM	Damp	SILTY SAND, very fine to medium sand, trace of gravel, slight plasticity, tan.
							5.1			
25							4.4			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 919

JOB NO. GRJ-03 DATE 08/05/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,382.1 E93,826.8
SURFACE ELEV. 5,239.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							5.7			
							5.7			
							5.2			
55										Stopped drilling at 55 feet.
60										
65										
70										
75										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 921

JOB NO. GRJ-03 DATE 08/06/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,857.5 E93,741.3
SURFACE ELEV. 5,232.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0				HSA			7.1		Dry to slightly damp	**TOPSOIL: SANDY SILT,** occasional gravel, some clay, very fine to fine sand, roots, moderate plasticity, dark reddish brown.
							10.1	ML		
							9.6			
							4.0		Slightly damp	**SANDY SILT,** some clay, poorly sorted sand, gravelly, moderate plasticity, greyish brown.
5				OX			4.0	ML		
							3.1			
							2.0		Dry	**SILTY SANDY GRAVEL,** trace of clay and gypsum, gypsum in large crystals (some 1 cm. long), poorly sorted sands, clasts of basalt and scoria, nonplastic, greyish tan.
							3.4			
							2.8			
							2.7			
10							2.2	GP		
							1.7			
							2.2			
							2.2			
							2.3	GM	Dry	**SANDY SILTY GRAVEL,** trace of clay and gypsum, predominantly very fine to fine sands, clasts of basalt, slight plasticity, tan.
15							2.5			
							2.0			
							1.4		Dry	**SANDY GRAVEL,** some silt, trace of clay and gypsum, poorly sorted sands, clasts of basalt and scoria, slight plasticity, greyish tan.
							1.4	GP		
							1.4			
20							1.9			
							1.4			
							2.8	GC	Slightly damp	**SANDY CLAYEY GRAVEL,** silty, predominantly very fine to fine sand, clasts of basalt, slight plasticity, tan.
							2.3	SM		
							4.7			
25							4.9			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/05/89

LOG OF TEST BORING NO. 920

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,856.7 E93,533.3
SURFACE ELEV. 5,227.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							3.7	GM	Slightly damp	SANDY SILTY GRAVEL, trace of clay, poorly sorted sand, clasts of basalt, slight plasticity, greyish tan.
							5.8			
							6.2	ML		
							6.1			
30							5.2		Damp	SANDY SILT, some gravel, trace of clay, very fine to fine sand, moderate plasticity, tan.
							6.6	SM		
							5.2	ML		
							4.7	GP	Damp	SILTY SAND, very fine to fine sand, nonplastic, tan.
							4.5			
35							3.4	ML	Damp	SANDY SILT, very fine to fine sand, moderate plasticity, tan.
							4.6			
							5.7	GP	Damp	SILTY SANDY GRAVEL, predominantly very fine to medium sand, nonplastic, tan.
							8.6			
							8.3			
40							8.2		Slightly damp	SANDY SILT, some clay, predominantly very fine to fine sand, poorly graded, moderate plasticity, tan.
							7.6			
							8.3			
							7.2	Sh		
45							6.2			SILTY SANDY GRAVEL, some clay, poorly sorted sand, moderate plasticity, dark brown.
							7.2			
							4.3			
							3.1			MANCOS FORMATION: CLAY SHALE, moderate to highly weathered, fissile, dark brownish grey.
50										Note: Bedrock Contact at 38.5 feet.
										Stopped drilling at 48 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 922

JOB NO. GRJ-03 DATE 08/07/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,343.1 E93,646.9
SURFACE ELEV. 5,224.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			7.7	CL	Damp	TOPSOIL: SANDY CLAY, some fine gravel, trace of lime cementation, rootlets, reddish brown.
							8.2			
							9.5			
							7.4	ML	Moist	CLAYEY SILT, gravelly, clasts fine to medium, trace of white caliche cementation, slight plasticity, reddish brown to buff.
							5.0			
5				OX			3.8			
							3.4			
							3.1		Dry	SILTY SANDY GRAVEL, fine to medium sand, clasts predominantly of basalt with minor scoria, chert and siltstone, nonplastic, loose, grey.
							2.3			
							2.1			
10							2.2	GP		
							2.6			
							3.7			
							3.4			
							2.5			
15							2.0			
							2.6			
							4.0			
							3.9			
							4.2	GM	Dry to slightly damp	CLAYEY SILTY GRAVEL, some fine to very fine sand, nonplastic, medium dense, light brown.
20							4.9			
							5.6			
							5.3	CL	Slightly damp	SILTY CLAY, some fine gravel, slight to nonplastic, medium dense, light yellowish brown.
							5.1			
							4.2			
25							4.4			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 921

JOB NO. GRJ-03 DATE 08/06/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,857.5 E93,741.3
SURFACE ELEV. 5,232.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							5.7	ML	Dry	SILTY SAND, very fine to fine sand, some gravel, nonplastic, very light grey.
							4.0			
							5.1			
30							4.5	GM	Damp	SANDY CLAYEY SILT, very fine to fine sand, nonplastic, tan.
							1.9			
							3.2		Damp	SANDY SILTY GRAVEL, boulders at 30.5 to 31 feet, trace of clay, poorly sorted sand, slight plasticity, tan.
							3.8			
							3.4			
							4.0			
35							3.3	GP	Slightly damp	SANDY GRAVEL, some silt, poorly sorted sand, clasts of basalt, nonplastic, greyish tan.
							2.9			
							2.0			
							4.1			
							5.0			
40							7.4			
							5.1	GC	Damp	SANDY CLAYEY GRAVEL, very fine to fine sand, moderate plasticity, tan.
							7.6			
							9.2			
45							7.4	Sh	Damp	MANCOS FORMATION: SHALE, fresh, fissile, dark greyish brown. Note: Bedrock Contact at 43.5 feet.
										Stopped drilling at 45 feet.
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 923

JOB NO. GRJ-03 DATE 08/07/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,215.8 E93,718.8
SURFACE ELEV. 5,221.9'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			4.0		Slightly moist	**TOPSOIL: SANDY CLAY,** occasional gravel and cobbles, some silt, very fine to medium sand, trace of caliche in top 3 feet, slight to nonplastic, buff.
							7.8	CL		
							7.4			
							6.6			
							5.7		Dry	**SANDY GRAVEL,** fine to medium sand, basalt clasts predominant minor scoria and chert, nonplastic, grey.
5				OX			2.7			
							2.7			
							2.5			
							2.5	GP		
							2.6			
10							3.1			
							2.3			
							2.3			
							2.8			
							2.7		Dry	**SILTY GRAVEL,** some clay, very fine to fine sand, nonplastic, light brown.
15							1.8	GM		
							2.2			
							6.1	GC	Moist	**CLAYEY GRAVEL,** some fine sand, some organic debris in matrix, slight plasticity, light brown.
							7.6			
								Sh		
20									Moist	**MANCOS FROMATION: SHALE,** slightly weathered, fissile, slight plasticity, light brown to grey.
										Stopped Drilling at 20 feet.
25										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 922

JOB NO. GRJ-03 DATE 08/07/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,343.1 E93,646.9
SURFACE ELEV. 5,224.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							4.0		Damp	CLAYEY GRAVEL, some fine to very fine sand, slight to moderate plasticity, dense, light yellowish brown.
							4.2			
							6.6	GC		
							3.8			
30							3.3			
							4.7		Slightly damp to damp	CLAYEY SILTY GRAVEL, trace of fine to medium sand, nonplastic, dense, light greyish brown.
							6.4	GM		
							6.6		Slightly damp	CLAYEY GRAVEL, some silt, some fine to very fine sand, slight plasticity, dense, light yellowish brown to dark brown.
35							6.6			
							4.8			
				RX			8.6			
										MANCOS FORMATION: SHALE slightly weathered, fissile, grey to brown.
								Sh		
40										Note: Bedrock Contact at 36 feet.
										MANCOS FORMATION: SHALE, fresh, fissle, grey to black.
								Sh		
45										
										Stopped drilling at 47 feet.
50										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 924

JOB NO. GRJ-03 DATE 08/08/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,727.3 E93,641.3
SURFACE ELEV. 5,230.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
30								CL	Damp	**CLAY,** trace of fine gravel, slight plasticity, light brown.
35								GC	Slightly moist	**CLAYEY GRAVEL,** fine to medium angular gravel, some fine sand, slight plasticity, dense, dark brown.
40								GM	Dry to slightly damp	**SANDY SILTY GRAVEL,** very fine to medium sand, approximately 3% gypsum, nonplastic, grey.
45								GP	Slightly damp	**SANDY GRAVEL,** some silt, fine sand, nonplastic, dense to loose, brownish grey.
								GC	Slightly damp	**CLAYEY GRAVEL,** sandy, very fine to fine sand, dense, dark brown to grey.
								Sh	Damp	**MANCOS FORMATON SHALE,** fresh, fissile and indurated, grey to black. **Note:** bedrock Contact at 45.5 feet.
50										Stopped drilling at 46 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 924

JOB NO. GRJ-03 DATE 08/08/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,727.3 E93,641.3
SURFACE ELEV. 5,230.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA						
								SC	Damp	**TOPSOIL: CLAYEY SAND**, some fine to medium gravel and cobbles, fine to medium sand, weakly lime cemented, rootlets, nonplastic, reddish brown.
5				OX						
								GP	Dry	**SANDY GRAVEL**, some silt, fine to medium sand, basalt clasts, scoria, approximately 10% gypsum, nonplastic, loose, grey.
10										
15								GM	Dry	**SILTY GRAVEL**, some fine to medium sand, trace gypsum, nonplastic, loose, grey.
								SM	Dry to slightly damp	**SILTY GRAVELLY SAND**, fine to medium sand, nonplastic, medium dense, light brown.
20								GC	Damp	**SILTY CLAYEY GRAVEL**, some fine to very fine sand, slight to nonplastic, dense, light yellowish brown.
25										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 925

JOB NO. GRJ-03 DATE 08/09/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,825.0 E93,933.9
SURFACE ELEV. 5,235.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										MANCOS FORMATION: CLAY SHALE, slight to moderately weathered, fissile, dense, becoming indurated with depth, light brown to greyish brown.
30										
								Sh	Damp	
35										
40										
										Stopped drilling at 40 feet.
45										
50										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 925

JOB NO. GRJ-03 DATE 08/09/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,825.0 E93,933.9
SURFACE ELEV. 5,235.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA						
								CL	Damp	**TOPSOIL: SILTY CLAY,** occasional fine to medium gravel, some fine sand, some lime cementation, rootlets, buff to reddish brown.
5				OX						
								GP	Dry	**SANDY GRAVEL,** some silt, fine to medium sand, gypsum approximately 7%, predominantly basalt, loose, grey to light brown.
10										
15										
								GP	Slightly damp	**SILTY SANDY GRAVEL,** fine to very fine sand, nonplastic, medium dense, light brown.
20										
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 926

JOB NO. GRJ-03 DATE 08/10/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,831.2 E94,071.9
SURFACE ELEV. 5,237.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							8.6	Sh	Moist	MANCOS FORMATION: CLAY SHALE, moderately weathered, fissle, tan.
30										Stopped drilling at 27 feet.
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 926

JOB NO. GRJ-03 DATE 08/10/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,831.2 E94,071.9
SURFACE ELEV. 5,237.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			3.7		Slightly moist	TOPSOIL: SANDY SILT, large boulders at 2 to 3 feet, occassional gravels of basalt, very fine to fine sand, considerable clay, roots, moderately plastic, red brown.
							7.5			
							7.0	ML		
							6.9			
							5.8	GM	Slightly moist	CLAY SILTY GRAVEL, gravels of basalt, very fine sand, matrix is slightly plastic, red brown.
5				OX			4.9			
							4.2			
							2.9		Damp	SANDY GRAVEL, gravels of basalt, silty, predominately very fine to fine sand, traces of gypsum up to 5%, nonplastic, grey to tan.
							2.4			
							2.0	GP		
10							2.2			
							1.8			
							3.0			
							3.8			
							3.5			
15							3.8	SM	Damp	GRAVELLY SILTY SAND, very fine to fine, moderately plastic, gravels of basalt and scoria, tan.
							3.4			
							2.2		Dry	SANDY GRAVEL, gravels of basalt, silty, poorly sorted sands, scoria and siltstone, fairly dense, nonplastic, grey to tan,
							1.6			
20							1.2	GP		
							1.4			
							1.9			
							2.5			
							3.2	GC	Damp	CLAY GRAVEL, some sand, very fine to fine sand, matrix plasticity, clasts of basalt, tan.
25							7.7			
							9.4			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 927

JOB NO. GRJ-03 DATE 08/16/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,015.1 E93,552.9
SURFACE ELEV. 5,229.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								GP	Moist	**SILTY SANDY GRAVEL**, dense, nonplastic, orange brown.
30								GM	Dry	**SILTY GRAVEL**, trace of clay, medium dense, light grey.
35								GC	Dry to damp	**CLAYEY GRAVEL AND SAND**, fine to medium sand, dense, slight to nonplastic, brown.
								Sh	Damp to slightly moist	**MANCOS FORMATION: SHALE**, fresh, fissile and indurated, grey to black. Note: Bedrock Contact at 38 feet.
40										Stopped drilling at 40 feet.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 927

JOB NO. GRJ-03 DATE 08/16/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,015.1 E93,552.9
SURFACE ELEV. 5,229.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				CL	Damp	**TOPSOIL: SANDY CLAY,** some silt, rootlets, buff.
5				OX				GM	Dry	**SILTY GRAVEL,** sandy, basalt, scoria, gypsum approximately 5%, fine to medium sand, loose, brown to grey.
10								SM	Damp	**SILTY SAND,** gravelly, fine to very fine sand, nonplastic, orange brown.
15								GP	Dry	**SANDY GRAVEL,** fine to medium sand, trace of silt, loose, nonplastic, grey.
20								CL	Damp	**CLAY,** trace of fine to very fine gravel and sand, dense, slight plasticity, light brown.
25										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 928

JOB NO. GRJ-03 DATE 08/17/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,110.6 E93,479.8
SURFACE ELEV. 5,228.9'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							2.3			
							5.1			
							3.6			
							4.4			
30							4.0			
							6.9		Slightly moist	**CLAYEY GRAVEL,** trace of silt, angular to subangular gravel, slightly plastic, reddish brown.
							8.5			
							5.3	GC		
35							3.7			
							4.3		Slightly moist to moist	**MANCOS FORMATION: CLAY SHALE,** *moderately weathered,* fissile, moderate plasticity, indurated, reddish brown.
							5.6	Sh		
							10.0			
40										Stopped drilling at 38 feet.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 928

JOB NO. GRJ-03 DATE 08/17/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,110.6 E93,479.8
SURFACE ELEV. 5,228.9'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			6.9		Moist	TOPSOIL: CLAYEY SILT, trace of fine sand, rootlets, slight plasticity, reddish brown.
							9.6	ML		
							8.2			
							7.0			
							6.0		Dry to damp	SILTY GRAVEL, angular to subangular gravel and cobbles, trace of clay and fine sand, color change at 14 feet due to increase in clay content in matrix from greyish brown to light brown.
5				OX			4.3			
							2.9			
							3.1			
							2.8			
10							3.9			
							2.5			
							2.7	GM		
							2.4			
							3.4			
15							4.1			
							3.6			
							3.5			
							3.1			
							3.1			
20							2.1	GP	Dry	SANDY GRAVEL, trace to some silt, poorly graded angular to subangular, grey.
							4.9			
							3.9			
							3.6		Damp	SILTY GRAVEL, angular gravel, interbedded units of sandy and clayey gravel, some sand, greyish brown to light brown.
							6.1	GM		
25							2.7			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 929

JOB NO. GRJ-03 DATE 08/15/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,941.1 E93,582.4
SURFACE ELEV. 5,242.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										plasticity, grey to tan.
								Sh		
									Damp	SANDY CLAYEY GRAVEL, poorly sorted sand, slightly plastic, tan. Note: Bedrock Contact at 25 feet.
30									Damp	MANCOS FORMATION: CLAY SHALE, slight to moderately weathered, fissile, tan.
35										Stopped drilling at 29 feet.
40										
45										
50										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 929

JOB NO. GRJ-03 DATE 08/15/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,941.1 E93,582.4
SURFACE ELEV. 5,242.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				ML	Damp	**TOPSOIL: SANDY SILT**, trace of basalt gravel, very fine to fine sand, some clay, roots, moderate plasticity, reddish brown.
								CL	Damp	**SILTY CLAY**, gravelly, clasts of basalt, some very fine to fine sand, roots, plastic, light reddish brown.
5				OX				SM	Slightly damp	**SILTY SAND**, some clay and gravel, clasts of basalt and scoria, very fine to fine sand, trace of gypsum, slight to moderate plasticity, tan.
								GM		
10								GP	Damp	**SANDY SILTY GRAVEL**, predominantly fine to very fine sand, clasts of basalt, scoria and siltstone, trace of gypsum, slight plasticity, tan.
15								SP	Dry	**SANDY GRAVEL**, gravel of basalt and scoria, trace of gypsum, poorly sorted sand, some silt, nonplastic, grey to tan.
20								CL	Dry	**SAND**, gravelly, poorly sorted sand, trace of silt, clasts of basalt and scoria, trace of gypsum, nonplastic, grey.
								GP	Damp	**SILTY CLAY**, trace of gravel and very fine to fine sand, slightly plastic, tan.
25								GC	Slightly damp	**SILTY SANDY GRAVEL**, poorly sorted sand, trace of clay, slight

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 931

JOB NO. GRJ-03 DATE 08/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,144.6 E93,700.0
SURFACE ELEV. 5,234.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				ML	Slightly moist	**TOPSOIL: CLAYEY SILT,** traces of sand, rootlets, slight plasticity, red brown.
5				OX				GP		**SANDY GRAVEL,** angular sands and gravels, trace of silt, poorly graded, grey.
10								GC	Slightly moist	**CLAYEY GRAVEL,** angular gravel, some sand, moderate plasticity, red brown.
15								CL	Slightly moist	**SILTY CLAY,** some gravel, medium plasticity, calcite cemented.
								GC		**CLAYEY GRAVEL,** some gravel, calcite cemented, medium plasticity, red brown.
20								CL	Slightly moist	**SILTY CLAY,** traces of gravel at 21 feet, calcite cemented, medium plasticity.
25								GC	Slightly moist	**SILTY CLAYEY GRAVEL,** angular gravels, slightly plasticity, light brown.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 930

JOB NO. GRJ-03 DATE 08/16/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,041.5 E93,545.9
SURFACE ELEV. 5,252.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			6.7			
							8.4	ML	Slightly moist to moist	TOPSOIL: SANDY SILT, occasional cobbles, very fine to fine sand, some clay, roots, slightly plastic, reddish brown.
							8.8			
							8.8	ML	Moist	SANDY SILT, gravelly, very fine to fine sand, some clay, roots, nonplastic, reddish brown.
							7.9			
5				OX			4.5			
							4.5			SILTY SAND, some gravel, very fine to fine sand, some clay, slight plasticity, tan.
							4.5			
							4.5			
							3.2	SM	Damp	
10							3.3			
							4.5			
							4.4			
							4.7			
							3.4			
15							3.0			SILTY SANDY GRAVEL, clasts of basalt, scoria and siltstone, poorly sorted sand, some clay, nonplastic, grey to tan.
							2.6	GP	Dry to damp	
							2.0			
							2.4			
							3.4			
20							5.9	GC	Damp	SANDY CLAYEY GRAVEL, clasts of basalt, poorly sorted sand, plastic, tan.
							4.6			
							11.3			
							12.3	Sh	Moist	MANCOS FORMATION: CLAY SHALE, moderately weathered, fissile, tan.
							12.3			Note: Bedrock Contact at 22 feet.
25										Stopped drilling at 25 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 932

JOB NO. GRJ-03 DATE 08/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,300.2 E93,915.2
SURFACE ELEV. 5,240.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				ML	Slightly moist	**TOPSOIL: GRAVELLY SILT,** gravels are predominately subangular basalt, low plasticity, light red.
								GM	Dry	**SILTY GRAVEL,** gravels subangular, traces of sand, low plasticity, light tan.
5				OX						
										SANDY GRAVEL, angular gravels, traces of silt, fine to course sands, grey.
10								GP	Dry	
15								GM	Slightly moist	**SILTY GRAVEL,** sandy, subangular gravels, traces of clay, light brown to grey.
								GC	Slightly moist	**CLAYEY GRAVEL,** predominately medium gravel, some silt, low plasticity, light brown.
20								GM	Slightly moist	**SILTY GRAVEL,** some clay, medium angular sand and gravel, low plasticity, grey.
25										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

LOG OF TEST BORING NO. -

N
/OIR
ATE 08/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX
SURFACE ELEV. 5,234.7'
DATUM MSL

N11,144.6 E93,700.0

Blows/ft. 140 lb. Trip Free Hammer	Dry Density lbs. per cubic foot	Moisture Content Percent Weight	Dry Unit Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				GL	Slightly moist	SILTY CLAY, medium plasticity, light brown.
				GC		CLAYEY GRAVEL, some silt, angular gravel, light brown.
				GP		SANDY GRAVEL, angular gravel, poorly graded, brown grey.
				GC	Slightly moist	SILTY CLAYEY GRAVEL, angular gravels, slight plasticity, light brown.
				GM	Slightly moist	CLAYEY SILTY GRAVEL, angular gravels, silt and clay matrix, light brown.
				GC	Slightly moist	CLAYEY GRAVELS, angular to subangular gravels, medium plasticity, light brown.
				CL	Slightly moist	CLAY, traces of coarse sand, subangular, silty, medium dense, slight plasticity.
				GC	Slightly moist	CLAYEY GRAVELS, angular clasts, trace of silt, tan to brown.
				Sh	Slightly moist	MANCOS FORMATION: SHALE, fresh, fissle and indurated, medium plasticity, grey to black.
						Stopped drilling at 48.0 feet.

45

50

GROUNDWATER

HOUR	DATE

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
- ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 933

JOB NO. GRJ-03 DATE 08/16/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,670.5 E92,841.9
SURFACE ELEV. 5,235.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			4.4		Slightly moist	TOPSOIL: SANDY SILT, traces of gravel, very fine to fine sands, gravels of basalt, some clay, roots, traces of gypsum, increases with depth to 5%, clay content increases with depth, moderately plastic, red brown.
							5.9	ML		
							7.1			
							10.4			
5				OX			11.4		Moist	SILTY CLAY, some gravels, traces of very fine to fine sand and gypsum, slight plasticity, tan.
							9.9			
							10.0			
							10.5			
							9.2			
							8.3			
10							7.2	CL		
							6.3			
							7.4			
							5.0			
15							3.4	GC	Damp	CLAYEY GRAVEL, some silt and very fine to fine sand, gravels of basalt, medium dense, slight plasticity, tan.
							4.6			
							2.8		Dry to damp	SANDY SILTY GRAVEL, some clay, poorly sorted sands, clasts of basalt, scoria and siltstone, medium dense, slight plasticity, tan.
							4.1	GM		
							2.6			
20							1.5		Dry	SILTY SANDY GRAVEL, traces of clay, predominately very fine to fine sands, clasts of basalt, scoria and siltstone, medium dense, nonplastic, grey tan. Note: Boulders from 21 to 22 feet.
							2.0			
							1.6			
							2.5	GP		
							4.1			
25							6.9	Sh	Moist	MANCOS FORMATION: CLAY SHALE, moderately weathered,
							8.3			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 932

JOB NO. GRJ-03 DATE 08/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,300.2 E93,915.2
SURFACE ELEV. 5,240.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								GC	Slightly moist	**CLAYEY GRAVEL**, subangular gravel, silt, grey to brown.
								CL	Slightly moist	**SILTY CLAY**, traces of sand and gravel, medium plasticity, tan.
30										
								GC	Slightly moist	**CLAYEY GRAVEL**, angular gravels, some course sand and silt, brown to grey.
35								GM	Slightly moist	**SILTY GRAVEL**, sandy subangular gravel and fine to course sand, traces of clay, low plasticity, light brown.
								SC	Slightly moist	**CLAYEY SAND**, traces of gravel, medium to course sand, medium plasticity, tan.
40								CL	Slightly moist	**SILTY CLAY**, traces of angular gravel, medium plasticity, red brown.
								GC	Slightly moist	**CLAYEY GRAVEL**, silty subangular gravel, traces of medium sand.
45								Sh	Slightly moist	**MANCOS FORMATION: SHALE**, fresh, fissile, indurated, grey black.
50										Stopped drilling at 48 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 934

JOB NO. GRJ-03 DATE 08/17/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,625.1 E92,557.4
SURFACE ELEV. 5,227.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA						TOPSOIL: SANDY SILT, traces of gravels, some clay, very fine to fine sands, some roots, moderate plasticity, red brown.
								ML	Slightly damp	
5				OX						SANDY SILT, very fine to fine sand, some clay, traces of gypsum, moderate plasticity, tan.
								ML	Slightly damp	
10										
								GP	Dry	SILTY SANDY GRAVEL, poorly sorted sands, clasts of basalt and scoria, medium dense, nonplastic, grey.
15										
								GM	Slightly damp	SANDY SILTY GRAVEL, poorly sorted sand, some clay, clasts of basalt, scoria and siltstone, medium dense, slightly plastic, tan.
								GC	Damp	SILTY CLAY GRAVEL, some poorly sorted sand, clasts of basalt, medium dense, moderate plasticity, tan.
20										
								Sh	Damp	MANCOS FORMATION: CLAY SHALE, moderately weathered, fissile, tan.
25										
										Stopped drilling at 25 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/16/89

LOG OF TEST BORING NO. 933

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,670.5 E92,841.9
SURFACE ELEV. 5,235.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							7.6			fissile, tan.
							7.2			
							7.4			
							7.4			
30										Stopped drilling at 30 feet.
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 936

JOB NO. GRJ-03 DATE 05/03/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,776.5 E94,390.3
SURFACE ELEV. 5,254.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
30								Sh	Slightly moist	MANCOS FORMATION: SHALE, fresh to slightly weathered, slight plasticity, brownish grey.
										Stopped drilling at 30.0 feet.
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 936

JOB NO. GRJ-03 DATE 05/03/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,776.5 E94,390.3
SURFACE ELEV. 5,254.1'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				CL	Slightly moist	**TOPSOIL: SILTY CLAY**, trace of gravel, rootlets, reddish brown.
5				OX				GM	Slightly moist	**SILTY SANDY GRAVEL**, gravel fraction consists of chewed up boulders, reddish brown.
10								GM	Slightly damp	**SILTY GRAVEL**, trace of sand, gravel subangular, slightly damp at 10 feet, color change at 5.0 - 6.0 ft from reddish brown to grey.
15								GC	Moist	**CLAYEY GRAVEL**, trace of sand, clay chips in cuttings increasing with depth, trace of silt, moisture increases with depth, color change at 19.0 feet from grey to light brown.
20								Sh	Damp	**MANCOS FORMATION: CLAY SHALE**, moderately to highly weathered, fissile, becomming fresher and more indurated with depth, light brown to grey.
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 937

JOB NO. GRJ-03 DATE 05/03/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,927.6 E93,969.7
SURFACE ELEV. 5,261.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								GC	Slightly moist	CLAYEY GRAVEL, reddish brown.
								CL	Moist	CLAY, trace of gravel, slight plasticity, reddish brown.
30								Sh	Slightly moist	MANCOS FORMATION: CLAY SHALE, moderately weathered, slightly fissile, indurated, discontinuous calcite veins throughout, tan to light yellowish brown.
35										Stopped drilling at 33.0 feet.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 05/03/89

LOG OF TEST BORING NO. 937

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,927.6 E93,969.7
SURFACE ELEV. 5,261.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				CL	Slightly moist	TOPSOIL: SILTY CLAY, rootlets, reddish brown.
								GC	Slightly moist	CLAYEY GRAVEL, silty gravel consists of ground up boulders and cobbles, reddish brown.
5				OX				GM	Slightly moist to moist	SILTY GRAVEL, gravel angular to subangular, trace of sand, brown.
10								GC	Slightly moist	CLAYEY GRAVEL, silty, subangular to subrounded basalt clasts, medium dense, nonplastic to slightly plastic, light brown to grey.
15								GM	Dry	SILTY GRAVEL, gravel consists of chewed up basalt boulders, subrounded to angular, dark grey.
20								GC	Slightly moist	CLAYEY GRAVEL, silty, medium dense, nonplastic, light brown.
								CL/ ML	Slightly damp	SILTY CLAY AND CLAYEY SILT, trace of gravel, slight plasticity, reddish brown.
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 939

JOB NO. GRJ-03 DATE 05/03/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,302.3 E94,782.4
SURFACE ELEV. 5,270.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA						
								GC	Slightly moist	TOPSOIL: CLAYEY GRAVEL, trace of silt, slight plasticity, reddish brown.
								GM	Dry	SILTY GRAVEL, some sand, grey.
5				OX						
								GC	Slightly moist	CLAYEY GRAVEL, silty, predominately basalt clasts, brown.
								GM	Slightly moist	SILTY GRAVEL, sandy, grey.
								GM	Moist	SILTY GRAVEL, sandy, some clay, slight plasticity, brown.
10								GC	Moist	CLAYEY GRAVEL, silty, medium dense, brown.
								GM	Slightly damp	SILTY GRAVEL, some sand, grey to light brown.
15								GC	Moist	CLAYEY GRAVEL, silty, silt decreaseing with depth, brown.
20								Sh	Moist	MANCOS FORMATION: CALY SHALE, moderately weathered, fissile, slight plasticity, brown.
25										Stopped drilling at 22 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 04/30/89

LOG OF TEST BORING NO. 938

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,683.2 E92,960.1
SURFACE ELEV. 5,213.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA						
								CL	Damp	**TOPSOIL: SILTY CLAY,** occasional cobble, some fine sand, rootlets, slight plasticity, reddish brown.
5				OX				GC	Slightly moist	**CLAYEY GRAVEL,** some silt, subrounded to rounded clasts (nominal 1/2 to 2 inches), slight plasticity, light reddish brown.
								GM	Dry	**SILTY GRAVEL,** fine to medium sand, nonplastic, light grey.
10								GP	Dry	**SANDY GRAVEL,** fine to medium sand, some silt, approximately 1% gypsum, light greyish brown.
								GC	Dry	**CLAYEY GRAVEL,** some fine to very fine sand, medium dense, nonplastic, light brown.
15								CL	Slightly damp	**CLAY,** trace of gravel, less than 1% gypsum, non fissile clay chips, slight plasticity, light brown.
20								Sh	Slightly damp	**MANCOS FORMATION: CLAY SHALE,** moderately to highly weathered, fissile, light brown.
25										Note: becomming fresher (slightly weathered) at 24.0 feet.
										Stopped drilling at 25.0 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 941

JOB NO. GRJ-03 DATE 08/17/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,729.1 E92,205.7
SURFACE ELEV. 5,224.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			5.0			
							9.0	ML	Moist	**TOPSOIL: SANDY SILT,** very fine to fine sand, some clay, roots, moderate plasticity, reddish brown.
							9.3			
							12.7			
							13.5	ML	Moist	**SANDY SILT,** some gravel, very fine to fine sand, some clay, moderate plasticity, reddish brown.
5				OX						
							7.0			
							4.2			
							5.2	GP	Damp	**SILTY SANDY GRAVEL,** clasts of basalt and siltstone, poorly sorted sand, some clay, slight plasticity, grey to tan.
							3.3			
							3.2			
10							3.2	GM	Damp	**SANDY SILTY GRAVEL,** clasts of basalt, poorly sorted sand, trace of clay, slight plasticity, tan.
							4.4			
							7.5			
							8.7	Sh	Moist	**MANCOS FORMATION: CLAY SHALE,** moderately weathered, fissile, tan.
							8.3			
15										Note: Bedrock Contact at 11.5 feet.
										Stopped drilling at 15 feet.
20										
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 940

JOB NO. GRJ-03 DATE 08/17/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N12,595.1 E92,200.5
SURFACE ELEV. 5,221.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA						
								ML	Slightly damp	**TOPSOIL: SANDY SILT,** some basalt gravel, caliche rind on clasts, occasional nodules of caliche, very fine to fine sand, trace of clay, moderate plasticity, reddish brown to very light pinkish brown.
5				OX						
								ML	Slightly damp	**CLAYEY SILT,** sandy, trace of gypsum, very fine to fine sand, increasing clay content with depth, moderate plasticity, caliche layer stops at 11.5 feet and color changes from white to tan.
10										
								GM	Slightly damp	**SANDY SILTY GRAVEL,** poorly sorted sand, trace of clay, clasts of basalt and scoria, slight plasticity, greyish tan.
15										
								CL	Damp	**CLAY,** slightly plastic, massive, tan.
20										
								Sh	Slightly damp	**MANCOS FORMATION: CLAY SHALE,** moderately weathered, fissile, tan. **Note:** Bedrock Contact at 20 feet.
25										Stopped drilling at 23 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation..

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 942

JOB NO. GRJ-03 DATE 08/18/89

RIG TYPE Mobiel B-57
BORING TYPE HSA/ODEX N10,189.6 E93,272.7
SURFACE ELEV. 5,217.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								SM	Damp	**SILTY SAND**, some gravel, clasts of basalt, very fine to fine sand, some clay, moderate plasticity, tan to yellow.
30								GC	Damp	**CLAYEY GRAVEL**, some poorly sorted sand, clasts of basalt, moderately plastic, tan.
								Sh	Damp	**MANCOS FORMATION: CLAY SHALE**, fissile, dark brown to grey. **Note:** Bedrock Contact at 32 feet.
35										Stopped drilling at 34 feet.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 942

JOB NO. GRJ-03 DATE 08/18/89

RIG TYPE Mobiel B-57
BORING TYPE HSA/ODEX N10,189.6 E93,272.7
SURFACE ELEV. 5,217.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				ML	Slightly damp	TOPSOIL: SANDY SILT, very fine to fine sand, some clay, roots, moderate plasticity, reddish brown.
								GM	Slightly damp	SANDY SILTY GRAVEL, clasts of basalt, very fine to fine sand, some clay, roots, moderate plasticity, reddish brown.
5				OX				GP		
								SM/ ML	Dry	SANDY GRAVEL, some silt, clasts of basalt, trace of gypsum, poorly sorted sand, nonplastic, grey to tan.
10									Slightly damp	SILTY SAND/SANDY SILT, gravelly, clasts of basalt and siltstone, trace of gypsum, very fine to fine sand, moderate plasticity, tan.
15								GP	Dry	SILTY SANDY GRAVEL, clasts of basalt, scoria and siltstone, poorly sorted sand, nonplastic, grey to tan.
20								GC	Damp	CLAYEY GRAVEL, some silt and sand, clasts of basalt, very fine to medium sand, moderate plasticity, tan.
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 943

JOB NO. GRJ-03 DATE 08/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,236.7 E92,904.8
SURFACE ELEV. 5,209.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
									Slightly damp	**SILTY SANDY GRAVEL,** clasts of basalt, poorly sorted sand, nonplastic, grey to tan.
30								Sh	Damp	**MANCOS FORMATION: CLAY SHALE,** moderately weathered, fissile, tan. Note: Bedrock Contact at 26.5 feet.
35										Stopped drilling at 34 feet.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 943

JOB NO. GRJ-03 DATE 08/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,236.7 E92,904.8
SURFACE ELEV. 5,209.3'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				ML	Slightly damp	**TOPSOIL: SANDY SILTY,** trace of gravel, very fine to fine sand, trace of clay, roots, moderate plasticity, dark reddish brown.
5				OX				ML	Slightly damp	**SANDY SILT,** gravelly, very fine to fine sand, moderate plasticity, reddish brown.
								SM	Slightly damp	**SILTY SAND,** trace of gravel, gypsum approximately 5%, very fine to fine sand, slight plasticity, buff.
10								ML	Slightly damp	**SANDY SILT,** very fine sand, some clay, slightly plastic, buff.
								CL	Damp	**SILTY CLAY,** trace of very fine sand, slightly plastic, tan.
								GM	Slightly damp	**SANDY SILTY GRAVEL,** very fine to fine sand, clayey, moderate plasticity, tan.
15								SM	Slightly damp	**SILTY SAND,** gravelly, very fine to fine sand, well sorted, slight plasticity, tan.
20								GP	Slightly damp	**SILTY SANDY GRAVEL,** clasts of basalt, predominantly very fine to fine sand, trace of clay, nonplastic, tan.
								GM		
25								GP	Damp	**CLAYEY SILTY GRAVEL,** clasts of basalt, some predominantly very fine to fine sand, moderate plasticity, yellow to tan.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 944

JOB NO. GRJ-03 DATE 08/20/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,612.0 E93,849.8
SURFACE ELEV. 5,240.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							6.2		Moist	CLAYEY SILT, sandy, low plasticity, tan.
							6.3			
							6.8		Slightly moist	CLAYEY GRAVEL, silty, angular gravel, medium to coarse sand, medium plasticity, tannish brown.
30							9.1			
							5.7	GC		
							5.9			
							6.7			
							6.7			
35							5.3			
							5.5			
							4.2	GM	Damp	SILTY GRAVEL, clayey and sandy, angular gravel, medium to coarse sand, low plasticity, grey.
							6.5	GC		
							8.3		Slightly moist	CLAYEY GRAVEL, silty, angular gravel, grey.
							3.8	CL		
40										
							6.8		Damp to slightly moist	SILTY CLAY, gravelly, low plasticity, tan.
							7.9	Sh		
							7.9	Sh		
45									Moist	MANCOS FORMATION: CLAY SHALE, moderate to highly weathered, slightly fissle, moderate to high plasticity, tan.
									Moist	MANCOS FORMATION: SHALE, fresh, fissile, highly indurated, grey to black.
50										
										Stopped drilling at 43 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 944

JOB NO. GRJ-03 DATE 08/20/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,612.0 E93,849.8
SURFACE ELEV. 5,240.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			7.6			
							6.7	ML	Moist	**TOPSOIL: GRAVELLY SILT,** angular gravel, rootlets, low plasticity, reddish brown.
							7.2			
							7.0			
							5.3			
5				OX					Dry to slightly moist	**SILTY GRAVEL,** sandy, angular gravel, medium to fine sand, low plasticity, grey.
							3.7			
							3.3	GM		
							3.0			
10							2.1			
							2.2			
							3.9		Damp	**GRAVELLY SILT,** angular gravel, trace medium to coarse sand low plasticity, reddish brown.
							3.1	ML		
							1.6			
							2.5	GP	Dry	**SANDY GRAVEL,** angular gravel, fine to medium sand, slight silt, grey.
15							3.8			
							4.8			
							4.4	ML	Slightly moist	**CLAYEY SILT,** gravelly, angular gravel, low plasticity, light tan.
							5.9			
							5.3			
20							3.4		Damp	**SILTY GRAVEL,** sandy, angular gravel, medium sand, grey to light brown.
							3.3	GM		
							6.1			
							5.7	GM	Slightly moist	**SILTY GRAVEL,** clayey, medium to coarse sand, medium plasticity, tan.
							6.2			
25							7.4	ML		

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/20/89

LOG OF TEST BORING NO. 945

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,855.3 E93,903.1
SURFACE ELEV. 5,243.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
							5.8			clayey, clasts of basalt, very fine to fine sand, moderate plasticity, tan.
							5.0			
							2.8			SILTY SANDY GRAVEL, clasts of basalt, poorly sorted sand, nonplastic, grey to tan.
30							3.9	GP	Damp	
							4.2			
							6.1			SANDY SILTY GRAVEL, clasts of basalt, scoria and siltstone, poorly sorted fine sand, nonplastic, tan.
							4.2			
							4.5	GM	Damp	Note: Boulder at 34 to 35 feet.
							2.6			
35							6.8	GC	Slightly moist	SANDY CLAYEY GRAVEL, silty, poorly sorted sand, slight plasticity, tan.
							12.3			
							10.5			
							10.8	Sh	Moist	MANCOS FORMATION: CLAY SHALE, weathered, soft, fissile, tan.
							10.0			
40										
										Stopped drilling at 40 feet.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/20/89

LOG OF TEST BORING NO. 945

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,855.3 E93,903.1
SURFACE ELEV. 5,243.0'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA			9.5		Moist	TOPSOIL: SANDY SILT, some gravel, clasts of basalt, very fine to fine sand, moderate plasticity, reddish brown.
							11.4			
							10.7			
							9.8	ML		
							8.6			
5				OX			3.6			
							3.5		Dry to damp	SANDY SILTY GRAVEL, clasts of basalt, very fine to fine sand, medium dense, slight plasticity, buff.
							3.2			
							2.6	GM		
							2.8			
10							1.5		Dry	SANDY GRAVEL, clasts of basalt, scoria and siltstone, very fine to fine sand, some silt, loose, nonplastic, grey to tan. Note: Boulder at 11 to 12 feet.
							1.3	GP		
							2.6			
							1.7			
							2.0		Dry	SANDY GRAVEL, clasts of basalt, scoria and siltstone, medium dense, poorly sorted sand, some silt, nonplastic, grey.
15							1.9	GP		
							2.8			
							3.6		Damp	SANDY SILT, trace of gravel, very fine to fine sand, clayey, nonplastic to moderate plasticity, tan.
							4.7	ML		
							5.5			
20							3.5		Damp	SILTY SAND, trace of gravel, clasts of basalt, very fine to fine sand, clayey, slight plasticity, tan.
							3.6	SM		
							5.6			
							5.3			
							4.4			
25							6.5	ML	Slightly moist	SANDY SILT, some gravel,

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 08/22/89

LOG OF TEST BORING NO. 949

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,976.1 E93,825.4
SURFACE ELEV. 5,233.10'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
									Damp	MANCOS FORMATION: SHALE, CLAYEY, fissile, tan.
								Sh		
30										Stopped drilling at 30 feet.
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 949

JOB NO. GRJ-03 DATE 08/22/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,976.1 E93,825.4
SURFACE ELEV. 5,233.10'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								ML	Slightly damp	**SANDY SILT,** some clay, very fine to fine sands, moderately plastic, roots, becomes more gravelly with depth and lighter in color, red brown.
								GM	Slightly damp	**SANDY SILTY GRAVEL,** some clay, very fine to fine sands, moderate plasticity, buff.
5								GP	Damp	**SILTY SANDY GRAVEL,** poorly sorted sands, nonplastic, clasts of basalt and scoria, traces of gypsum about 5%, loose, grey to tan.
10										
15								SM	Slightly damp	**SILTY SAND,** predominately very fine to fine sands, gravelly, nonplastic, clasts of basalt and scoria, tan.
20								GP	Damp	**SILTY SANDY GRAVEL,** poorly sorted sands, nonplastic, clasts of basalt, scoria and siltstone, loose, grey to tan.
25								GM	Slightly damp	**SANDY SILTY GRAVEL,** some clay, poorly sorted sands, slightly plastic, clasts of basalt, scoria, siltstone, chert, loose, tan.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 956

JOB NO. GRJ-03 DATE 09/10/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,680.2 E93,796.5
SURFACE ELEV. 5,231.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				ML	Slightly damp	TOPSOIL: SANDY SILT, trace gravel, very fine to fine sands, medium plasticity, roots, red brown.
								GM	Slightly damp	SANDY SILTY GRAVEL, trace clay, very fine to fine sands, moderately plastic, clasts of basalt, red brown.
5				OX				GP	Slightly damp	SANDY GRAVEL, trace silt, nonplastic, poorly sorted sands, clasts of basalt, loose, trace of gypsum, grey to tan.
10								SM	Slightly damp	SILTY SAND, slightly plastic, very fine to fine sands, occasional gravels, tan.
15								GP	Dry	SANDY GRAVEL, silty, nonplastic, poorly sorted sands, clasts of basalt and scoria, gray to tan.
20								GC	Slightly damp to damp	SILTY CLAYEY GRAVEL, trace very fine to fine sand, increasing with depth, clasts of basalt and scoria, slightly plastic, tan.
								GP	Dry	SANDY GRAVEL, silty, poorly sorted sands, nonplastic, clasts of basalt, scoria and siltstone, gray to tan.
								GC		
25									Slightly damp	CLAY AND GRAVEL, trace sand, poorly sorted sands, plastic, clasts of basalt and scoria and

GROUNDWATER

DEPTH	HOUR	DATE
29.0	8:10	09/10/89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 950

JOB NO. GRJ-03 DATE 08/22/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,763.9 E93,885.7
SURFACE ELEV. 5,234.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				CL		SILTY CLAY, traces of very fine to fine sand, nonplastic to slight plasticity, rootlets, occassional pods of white caliche, red brown.
5				OX				CL		CLAY, some silt, gravelly, caliche comprizes about 40%, traces of very fine gravel sand, slight plasticity, red brown to buff.
10										
15								GM		SILTY AND SANDY GRAVELS, nonplastic, loose, sand is fine to very fine, poorly sorted, clasts of basalt, scoria and siltstone, gypsum observed occasionally, tan to grey.
20										
25								GC		CLAYEY GRAVEL, traces of very fine gravel sand, slightly to moderately plastic, dense, yellow tan.
								Sh		
30										MANCOS FORMATION: SHALE, slightly plastic, slightly fissle, moderately weathered, light yellow brown to light greyish brown.
35										
40										Stopped drilling at 27 feet.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 957

JOB NO. GRJ-03 DATE 09/21/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,992.6 E92,341.9
SURFACE ELEV. 5,209.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0				HSA				ML	Slightly damp	**TOPSOIL: SANDY SHALE,** some gravel, moderately plastic, very fine to fine sands, clasts of basalt and scoria with caliche rinds, increassing clay with depth, red brown, becomming buff in color with depth.
5				OX				GP	Dry	**SANDY GRAVEL,** some silt, trace gypsum, nonplastic, poorly sorted sand, clasts of basalt, grey.
10										
								GC	Damp	**SILTY CLAY GRAVEL,** sandy, moderately plastic, poorly sorted sand, clasts of basalt, scoira and siltstone, tan.
15										
								CL	Damp	**CLAY,** trace snad and gravel, trace gypsum, plastic, tan.
20										**Note:** bedrock contact at 21.0 feet.
								Sh		**MANCOS FORMATION: SHALE,** clayey, weathered, moderately fissile, tan.
25				NX				Sh		Very thinly bedded, moderately

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 956

JOB NO. GRJ-03 DATE 09/10/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,680.2 E93,796.5
SURFACE ELEV. 5,231.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										siltstone, tan.
								GP	Slightly damp	**CLAYEY SANDY GRAVEL,** nonplastic, poorly sorted sand, clasts of basalt and scoria, tan.
▽										note: color change from 27 to 29 feet to red buff.
30								GP	Wet	**SILTY SANDY GRAVEL,** slightly plastic, poorly sorted sands, tan.
								SC/CL	Damp	**CLAYEY SAND AND SANDY CLAY,** slightly plastic, very fine to fine sands, yellow.
35									Slightly damp to dry	**SANDY GRAVEL,** some silt, poorly sorted sands, nonplastic, brown.
40								GC	Damp	**CLAYEY GRAVEL,** trace sands, poorly sorted sands, plastic, clasts of basalt, tan.
								Sh		note: bedrock contact at 41 feet.
45									Damp	**MANCOS FORMATION: SHALE,** fresh, fissile, dark grey.
										Stopped drilling at 45.0 feet.
50										

GROUNDWATER

	DEPTH	HOUR	DATE
▽	29.0	8:10	09/10/89
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 957

JOB NO. GRJ-03 DATE 09/21/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,992.6 E92,341.9
SURFACE ELEV. 5,209.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				NX						
										Iron and magnesium staining on gypsum in high angle fracture.
55										
										Gypsum filled fractures 1/8 inch thick shell fossils.
										Breakage along shaley partings.
60										
										Iron and magnesum stained fractures, some smooth, some stepped or concoidal with trace gypsum.
65										
										Iron and magnesum stained fractures, mostly rough with trace gypsum, some fractures are smooth.
70										
										Fractures still held together, clean, smooth surfaces.
										Shell fossils
75										
								Sh		Iron and magnesium fracture, rough and concoidal, filled fracture (clay) is rough.
										Clean fracture is smooth with minor

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 957

JOB NO. GRJ-03 DATE 09/21/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,992.6 E92,341.9
SURFACE ELEV. 5,209.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				NX						weathered, very soft to soft shale, iron and magenisum staining along bedding, broken from drilling.
									Damp	
30										Fractues filled with gypsum, some partially (honey combed), iron and magnesium staining on low angle fractures, some only lightly stained, highly weathered along 90 degree gypsum filled fracture.
35									Wet	Fractures filled with gypsum 1/8 to 1/2 inches thick. High angle fractures with light iron and magnesium staining.
40										Fractures filled with gypsum 3/8 to 1/2 inch thick honey combed, rough. Stained iron magnesium and clean fractures, smooth surfaces.
45										Fractures filled with gypsum 1/8 to 1/4 inches thick. Shale is dark grey, massive, concoidal on breakages.
50								Sh		Fracture filled with gypsum 1/4 inch thick, high angle fracture only partially filled, 1 foot long.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 957

JOB NO. GRJ-03 DATE 09/21/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,992.6 E92,341.9
SURFACE ELEV. 5,209.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				NX						
105										Large fossil (bivalve)
110										Large fossils (ammonite and bivalve)
115										Glebs of microcrystalline pryite
120										
125								Sh		MANCOS FORMATION: SHALE, massive, hard, shell fossils, dark grey.
130										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 957

JOB NO. GRJ-03 DATE 09/21/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,992.6 E92,341.9
SURFACE ELEV. 5,209.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				NX						clay.
80										Zones of broken rock along shaley partings 1/2 to 1 1/2 inches thick, drilling induced.
85										Shell fossils Shale breaks concoidally but generally along shaley partings.
90										
95										
100								Sh		Shale breaks irregular but generally along shaley partings. Shell fossils (bivalve)

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 959

JOB NO. GRJ-03 DATE 09/20/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,326.0 E91,951.1
SURFACE ELEV. 5,204.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				ML	Slightly damp	**TOPSOIL: SANDY CLAYEY SILT**, plastic, very fine to fine sands, red brown.
								GP		
5				OX					Dry	**SILTY SANDY GRAVEL**, trace gypsum, nonplastic, poorly sorted sands, clasts of basalt, red brown to greyish tan.
10								GM	Slightly damp	**SANDY SILTY GRAVEL**, trace clay, slightly plastic, predominately very fine to fine sands, clast of basalt and scoria, tan.
15										
20								GC	Slightly damp	**SANDY CLAY GRAVEL**, medium plastic, poorly sorted sands, clasts of basalt, tan. Note: boulder 19 to 20 feet.
								CL		**CLAY**, trace silt and sands, plastic, massive, tan. Note: bedrock contact at 24.0.
25								Sh		**MANCOS FORMATION: SHALE**, moderately weathered, very thinly bedded shale, fractures with iron

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 957

JOB NO. GRJ-03 DATE 09/21/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N10,992.6 E92,341.9
SURFACE ELEV. 5,209.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
130										Stopped drilling at 130.0 feet.
135										
140										
145										
150										
155										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 959

JOB NO. GRJ-03 DATE 09/20/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,326.0 E91,951.1
SURFACE ELEV. 5,204.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										weathered fractures.
								Sh		
55				NX						Note: occasional fossil shells.
60										Note: fracture partially filled with gypsum and stained, shale becoming hard.
65										Note: occasional globs of gypsum and pyrite.
70										Note: high angle fracture, smooth, very lightly iron stained, occasional fossils.
75										Note: massive, hard and dark grey.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 959

JOB NO. GRJ-03 DATE 09/20/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,326.0 E91,951.1
SURFACE ELEV. 5,204.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
									Damp	and magnesium staining, some fractures with roots, core is broken from drilling, very soft to soft.
										Note: fractures filled with 1/8 inch thick gypsum, gypsum seams contains some holes, occasional shaley partings with iron and magnesium staining.
30				NX						
									Damp	Note: fractures filled with 1/8 to 1/4 inch thick qypsum, seams slightly undulating, some seams only partially filled.
35										
40										
45										Note: high angle partially filled with gypsum fractures.
50										Note: fractures partially filled with gypsum, shale becoming massive and greyer, moderately

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 959

JOB NO. GRJ-03 DATE 09/20/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,326.0 E91,951.1
SURFACE ELEV. 5,204.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
105				NX				Sh		Note: core broken because missing core from above in core barrel.
110										
115										Note: core breaks along horizontal partings.
120										Note: high angle fracture breaks in steps.
125								Sh	Damp	MANCOS FORMATION: SHALE, massive, hard, occasional fossils, grey.
130										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 959

JOB NO. GRJ-03 DATE 09/20/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,326.0 E91,951.1
SURFACE ELEV. 5,204.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
80				NX						Note: breaks along shaly partings but concoidal bivalve fossils.
85										
90										
95										
100									Damp	MANCOS FORMATION: SHALE, fresh, massive, hard, occasional bivalve fossils, dark grey.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 960

JOB NO. GRJ-03 DATE 10/06/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,063.4 E93,260.6
SURFACE ELEV. 5,223.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				ML	Slightly damp	**TOPSOIL: SANDY CLAYEY SILT,** nonplastic, very fine to medium sands, trace coarse sand, tan. NOTE: ORIENTED HOLE DIP - 55° STRIKE - N 65° E
5				OX				SM	Slightly damp	**SILTY SAND,** some gravels, trace gypsum, slight plastic, predominately fine to very fine sands, clasts of basalt, dark brown to red.
								SM		
								SM		
10									Slightly damp	**SILTY SAND,** trace gravels and gypsum, slight plasticity, predominately very fine to fine sands, clasts of basalt, dark brown to red.
								ML		**SANDY CLAY SILT,** plastic, very fine sands, trace gypsum, tan.
								GM	Slightly damp	**SILTY GRAVEL,** clayey and sandy, plastic, fine sands, clast of basalt, buff.
15								GP	Damp	**SANDY GRAVEL,** silty, trace gypsum, nonplastic, poorly sorted sands, clasts of basalt, grey to tan.
								GM	Damp	
20								GC	Slight damp	**CLAY GRAVEL,** sandy, plastic, very fine sands, clasts of basalt, tan.
				RX				Sh	Dry	**MANCOS FORMATION: SHALE,** weathered, fissile, tan.
25										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 959

JOB NO. GRJ-03 DATE 09/20/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,326.0 E91,951.1
SURFACE ELEV. 5,204.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
130										Stopped drilling at 130 feet.
135										
140										
145										
150										
155										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 960

JOB NO. GRJ-03 DATE 10/06/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,063.4 E93,260.6
SURFACE ELEV. 5,223.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										Shale is hard and grey.
										Fracture strained with iron and magnesium.
55										MANCOS FORMATION: SILTSTONE AND GYPSUM, layer with fine sand grains, 2 inches thick.
										Fossiliferous and coarse grained layer 40 degree contact approximately 1 inch thick.
60								Mst		
										Fracture clean, rough, lightly filled with gypsum, others smooth and clean.
65										Some pyrite
70										
75										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 960

JOB NO. GRJ-03 DATE 10/06/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,063.4 E93,260.6
SURFACE ELEV. 5,223.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
									Damp	
30									Damp	
35										Very thinly bedded shale with all stone layers, most fractures stained, thin layers of gypsum < 1/8 inches thick, smooth. Core mostly breaks along bedding planes. Shale is tan, soft to modreately soft.
40										
45										Fractures filled with gypsum and iron stained, smooth and rough, gypsum 1/8 to 1/4 inches thick, mostly honey combed (porous). Bivalve fossil Shale is a little greyer and harder
50										Fractures filled with gypsum, irregular fractures, 1/8 to 1/4 inches thick, gypsum holds core together. Bivalve fossils

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 960

JOB NO. GRJ-03 DATE 10/06/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,063.4 E93,260.6
SURFACE ELEV. 5,223.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				RX						
105										
110										
										Fracture smooth and clean along bedding.
								Mst		
115										
120										
										Fracture clean and smooth.
125										
130										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 960

JOB NO. GRJ-03 DATE 10/06/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,063.4 E93,260.6
SURFACE ELEV. 5,223.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
80										
										Catcher may have broken up core.
85										
90										
95										Fracture smooth with thin sparse gypsum. Shale hard and grey. Machine breaks concoidal, oblique to bedding planes.
100								Sh		

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 961

JOB NO. GRJ-03 DATE 08/28/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,658.7 E92,828.1
SURFACE ELEV. 5,228.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				CL	Dry	TOPSOIL: SANDY CLAY, trace of gravel, fine sand, weakly lime cemented, low to medium plasticity, light orange brown.
								CL		
5				OX					Dry	SILTY CLAY, some cobbles and gravel, weakly lime cemented, low to medium plasticity, calcified, beige.
10										
								GP	Dry	SANDY GRAVEL AND COBBLES, some boulders, fine to medium sand, weak to moderately cemented, grey.
15										
20									Moist	SANDY CLAY, some cobbles and gravel, fine sand, moderately lime cemented, medium plasticity, pale yellow brown.
								CL		
25								CL		CLAY, moderately lime cemented, medium plasticity, light brownish grey.
								Sh		
30									Slightly moist	MANCOS FORMATION: CLAYSTONE, highly weathered, moderately soft, thin bedded, yellowish brown to light brownish grey.
35										Stopped Drill at 29 feet.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 960

JOB NO. GRJ-03 DATE 10/06/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N11,063.4 E93,260.6
SURFACE ELEV. 5,223.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
130										
135										
140										Fracture smooth and clean, along bedding.
145										Stopped drilling at 143.0 feet.
150										
155										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
55								CLS		becomming grayish, note: fragements end at 34 feet bls.
60										SILTY CLAYSTONE, no gravel, low plasticity, dark brown. (weathered mancos?) note: Stopped odex drilling at 40 feet and set up for Rock Coring.
65, 70, 75, 80, 85										MANCOS FORMATION: MUDSTONE, moderately to highly weathered, thinly bedded, moderate soft, dark greyish brown. Slight limonite on bedding planes, considerable gypsum on discontinuities at: 40.2 feet, 20 degrees, 1mm, 40.3 feet, 0 degrees, 2mm, 40.4 feet, 0 degrees, 3mm, 40.5 feet, 5 degrees, 4mm, 40.7 feet, 0 degrees, 3mm, 40.9 feet, 0 degrees, 2mm, 41.3 feet, 10 degrees, 2mm, rusty. 41.9 feet, 5 degrees, 4mm, honey. 42.0 feet, 0 degrees, 0mm, rusty. note: color changes to dark grey with depth.
90, 95, 100										MANCOS FORMATION: SILTY CLAYSTONE, moderately weathered, massive, moderately soft to moderately hard, carbonaceous, calcareous, few gypsum coated joints, dark grey. note: 61.1 feet, 3mm gypsum, 0 degrees, 64.2 feet, 2mm calc., 0 degrees, 64.9 feet, 2mm calc., 0 degrees 65.0 feet, 2mm calc., 0 degrees, note: numerous thin (less than 2mm gypsum and calciche) bands from 68.8 to 70.8 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
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T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				HSA				ML/CL		TOPSOIL: CLAYEY SILT AND SILTY CLAY, some fine sand, some to considerable gravel and subrounded, cobbles, weak to medium lime cemented (calichified), low plasticity, beige to pale brown.
5				OX				CL		
								GM		
10								SM/SC		SILTY CLAY, weak to moderately cemented, medium plasticity, light olive grey.
15								GM		SILTY GRAVEL AND COBBLES, some to considerable gravel, weak to medium cemented, nonplastic, light grey.
20								GP		SILTY AND CLAYEY SAND, some to considerable gravel, weak to moderately cemented, fine sand, low plasticity, light yellowish brown to tan.
25								CL		
30								CL		SILTY GRAVEL AND COBBLES, fine to medium sand, weak to moderately cemented, nonplastic, light grey. note: sandy clay from 20.0 to 21.0 feet.
35										
40				RX						SANDY GRAVEL AND COBBLES, some boulders, weak to moderately cemented, fine to medium sand, nonplastic, some silt, light grey.
45										SILTY CLAY, some gravel, moderately cemented, low to medium plasticity, pale yellowish brown.
50										SILTY CLAY, some gravel (basalt fragments), pale yellowish brown,

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
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T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										note: interbedded soft shaley layers from 154.4 to 160 feet.
160										
165										MANCOS FORMATION: SHALE AND SITLY CLAYSTONE, fresh, massive, moderately hard, carbonaceous, trace fine pyrite, smooth concoidal bedding plane breaks, black.
170										note: unusual shaded relief pattern on bedding plane break at 465.7 feet.
175										note: pyrite not evident below 85 feet.
180										
185										
190										
195										note: some thin sandy zones from 196 to 197 feet.
200										note: pelecypods at 194.2 feet, 200.4 and 200.9 feet.
205										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,730.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
105										note: some sandy thin partings and thin (< 22mm) calc. bands 0 degrees from 73.0 to 81 feet, fossils (pelecypods).
110										note: 81.2 to 82.2 feet soft to moderately soft and thin bedded.
115										Note: calcarous seams and fossils (pelecypods) less than 2mm to 91 feet.
120										MANCOS FORMATION: SILTY CLAYSTONE, slightly weathered, massive, moderately hard to moderately soft, carbonaceous, calcareous, trace of pelecypods, 2 calcite bands (less than 2mm), dark grey to black.
125										note: sandy from 121.5 to 125 feet.
130				RX						note: moderately hard from 125 to 154.4 feet, trace calcareous bands and pelecypods.
135										note: generally nondescript
140										
145										
150										
155										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
260										
265										note: some pelecypods with gypsum from 264.5 to 271.5 feet, some fine pyrite.
270										
275										
280										
285										
290										note: massive nondescript.
295										
300										
305										
310			RX							

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
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T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
210										
215										
220				RX						
225										
230										
235										
240										note: gypsum veinlets 0 degrees at: 239.0 feet, 3mm; 240.9 feet, 1 to 3 mm, discontinous; 241.1 feet, 4mm lens; 241.3 feet, 5 degrees, 241.5 feet, 1 to 2 mm (shell replacement)
245										
250										note: some fine pyrite from 245 to 250 feet, some pelecypods with gypsum from 252 to 253 feet.
255										
260										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
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PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
365										note: some concoidal pelecypods form 363 to 389 feet shaley 366.3 to 366.8 feet, moderately soft 373.3 to 376.7 feet.
370										
375										
380										
385										note: 35 degrees fracture with dip slip slickinsides at 383.4 feet.
390										note: thin shaley zones from 389.0 to 391.0 feet.
395										
400				RX						
405										
410										
415										note: considerable fossils from

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

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U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,730.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
315										
320										
325										
330										
335										
340										note: shaley soft zones at: 345.2 - 345.3 346.2 - 342.7 349.5 - 349.6 356.7 - 356.8 trace pyrite at 358.0 feet
345										
350										
355										
360										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
470										calcareous sandy zone 456.9 to 456.8 feet. Hard calcareous zone from 458 to 458.8 feet, shows irregular calcite veining less than 10 mm. Dip approximately 45 degrees. Thin dark layers, less than 3 mm show brittle brecciation.
475										
480										MANCOS FORMATION: SILTY CLAYSTONE, unweathered, fresh, moderately hard, massive to medium bedding, calcareous, carbonaceous, some fossils and thin calcareous bands, dark grey to black.
485										
490			RX							note: 486.8 to 487.0 feet white fine calcareous sandy zone with fine pyrite along bedding, base is scoured hard. 482.3 to 483.0 feet, thin layers of irregular cross bedded hard calcareous sand.
495										note: 495.5 to 498.0 feet increased white calcareous bands 2 mm to 30 mm thick, 495.7 to 496.2 feet numerous small fossil shells in a turbid calcareous matrix.
500										
505										note: increased white calcareous bands from 503.1 to 513.0 feet, 2 to 30 mm thick.
510										
515										note: white sandy calcareous bands with shale laminations from 514 to 520 feet sandy zones are 2 to 50 mm thick, 515.8 feet 40 degrees slickenside with dip slip slicks, 416.5 to 517.3 feet, healed
520										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
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T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										413 to 435 feet.
420										note: intraformational breccia with calcite and siderite from 419.1 to 419.6 feet.
425										note: layer (10 mm) of fine pyrite at 424.5 feet.
430										
435										note: soft shaley and fissle from 433.3 to 434 feet. note: 25 mm ellipse of fine pyrite at 435.4 feet.
440										
445										
450										
455										MANCOS FORMATION: SILTY CLAYSTONE, slightly weathered, moderately hard to hard, thin to medium bedded, considerable calcareous and calcite laminations 1 to 10 mm thick, shale is occasionally carbonaceous, some fossils, black, dark grey with white banded laminatious.
460										
465										note: fine cross bedding in white calcareous sandy zone, 10 to 15 degrees from 455 to 455.2 feet. Hard

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
575										
580				RX						
585										
590										note: 589.8 to 591.2 feet increased sand and calcareous layers. note: increased sand from 593 to 603 feet.
595										
600										
605										
610										note: 608.5 feet, 20mm, calcareous sandy zone. 609.8 feet, 20mm, calcareous sandy zone. 609.3 feet, 15mm, calcareous sandy zone.
615										
620										note: 620.4 feet, 45 degrees, 1mm, calcareous veinlet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
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T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

LOG OF TEST BORING NO. 962

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
		brecciated calcite and siderite veining, hard 517.3 to 517.8 feet zone with lenses of calcareous sand and shells, 531.7 to 532.0 feet hard calcareous sandy layers with light brown augen 16 by 50 mm.
		note: 537.0 to 537.3 feet white to light grey sandy, hard siltstone, 538.3 feet calcareous sandy layer 30 mm thick, 542.3 feet healed 45 degrees slickenside, 540.6 to 540.8 calcareous sandy layer.
		MANCOS FORMATION: SANDY SILTSTONE, hard to very hard, massive, fine grained, noncalcareous, rare amount of fossils, medium grey. note: color changes to dark grey to black with decreased sand with depth.
		MANCOS FORMATION: CLAYSTONE, unweathered, hard to very hard, massive, noncalcareous, some fine pyrite, carbonaceous, dark grey to black.

MPLE TYPE
g - NX or HX
8" I.D. tube sample.
2" I.D. tube sample.
n-walled Shelby tube.
hole reverse circulation.

OG OF TEST BORING NO. 962

MOBILE B-57
HSA/ODEX N12,082.4 E93,739.0
5,247.00'
MSL

S	VISUAL CLASSIFICATION
	note: slickensides, 45 degrees, at 647.3 and 647.7 feet.
	note: slickenside, 30 degrees, at 653.5 feet. note: thin white calcareous and noncalcareous laminations frim 654.6 to 662.5 feet. note: white sandy zone from 660.7 to 661.2 feet.
	note: 671.6 to 673.2 feet, sandy siltstone, calcareous, bentonitic, white to light grey. 672.4 feet, 2 white bentonitic and calcified veinlets 2 to 3 mm thick,

ion.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										undulating, 40 to 45 degrees dip. 672.5 to 673.0 some pelecypods.
680										
685										
690										note: some fine pyrite at 689.5 feet, some hackly 85 degree fracture, from 689 to 893 feet.
695										note: slickensides at: 696.1 feet, 25 degrees. 696.4 feet, 60 degrees. 701.0 feet, 35 degrees. 703.0 feet, 30 degrees. 711.5 feet, 15 degrees. 712.2 feet, 10 degrees. 711.5 to 712.1 feet fine grained, hard, calcareous sandstone, pale grey.
700										
705										
710										MANCOS FORMATION: CLAYEY SILTSTONE, unweathered, moderately hard to hard, massive, dark grey to black.
715										
720										note: 718.5 to 718.8 hard, calcareous sandstone, light grey.
725										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
730										note: some fossils at 731.8 feet.
735										note: 735.8 to 735.9 feet, white, noncalcareous and bentonitic veinlets, 3 to 6 mm, some pyrite rock bleached light to medium grey from 738.7 to 739.2. note: 739.3 to 740.8 feet, white to pale grey bentonitic zone.
740										
745										
750										
755										note: ammonite fragment at 752.8 feet, some thin calcareous bands to 3 mm thick from 751.5 to 753.0 feet. note: slickensides at 755.7 feet, 40 degrees, 756.2 feet, 40 degrees. note: 757.8 to 757.9 feet, hard, white to light grey, medium grained, calcareous sand. 757.9 to 759.8 feet, layered with white calcareous sand layers. 760.2 feet, 4mm, 30 degrees, white calcareous veinlet. 752.0 feet, 2 white irregular calcareous veinlets 2 to 3 mm, 10 degrees. note: 767.5 to 771.7 feet considerable 1 to 30 mm white to light grey calcareous and noncalcareous fine sand layers.
760				RX						
765										
770										
775										note: white sandy calcareous bands increasing with depth from 773 to 776.8 feet. note: 777.7 to 779.1 feet, hard, white calcareous fine sandstone with lithic fragments of shale.
780										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
780										note: 779.1 to 781 feet, white sandy calcareous bands.
785										DAKOTA SANDSTONE, unweathered, hard to very hard, medium bedded, fine grained, quartz rich, noncalcareous, numerous thin black shale zones, white to light grey.
790										note: shaley zones vary in thickness from 2 to 40 mm. 793.0 to 794.3 feet slightly calcareous, wavy bedding with black lithic fragments and layering.
795										DAKOTA SANDSTONE: SANDSTONE, unweathered, hard, medium grained, light grey, sligthly calcareous, quartzose sand. note: 15 degrees, slickenslide at 794.6 feet, coal seams with some fine pyrite at: 796.8 feet, 2mm, 10 degrees; 799.8 feet, 6 mm, 10 degrees; 797.5 feet, 10mm, 5 degrees; 800.7 feet, 2 mm, 10 degrees; 797.8 feet, 6mm, 0 degrees; 801.1 feet, 2 mm, 15 degrees; 798.0 feet, 20mm, 0 degrees; 801.3 feet, 19mm, 5 degrees; 799.9 feet, 10mm, 10 degrees.
800										
805										
810										
815										SHALE, slightly weathered, clayey, moderately soft, thin bedded, medium grey.
820										SHALE AND COAL, carbonaceous, coal seam 6 inch thick, some pyrite, bright luster, black.
825										SANDY LIMESTONE, hard, fine sand, numerous thin carbonaceous coal seams less than 2 mm thick, some pyrite, white to pale grey .
830										SANDSTONE, carbonaceous, fine, hard, considerable 3 to 10 mm bands carbonaceous shale, white to light grey. SANDY CLAY SHALE,

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

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PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										moderately hard, thin to medium bedded, dark grey.
835										SANDY SHALE, carbonaceous, moderately soft to moderately hard, fine sand, thin bedded, considerable carbonized interbeds, some fossils and plant fragments. note: 315.4 to 317.0 feet, shaley sandstone, fine to medium, moderately hard, noncalcareous, considerable fossil plant fragments, medium grey. 818.1 to 819.3, 819.9 to 821.0, 815.7, 0 degree slickenslides. 821 to 825.5 feet moderately soft to soft, fissle.
840										
845										
850				RX						SHALEY SANDSTONE, moderately hard, fine sand, some to considerable thin carbonaceous layers, medium grey, some fossil plants.
855										SANDSTONE, hard, fine to medium grained, considerable fi coal seams less then 3 mm thick light grey to white.
860										SANDSTONE, hard to very hard, massive, medium grained quartzose sand, some to considerable fine coal lenses less than 1 mm.
865										SANDY CLAY SHALE, moderately hard, carbonaceous, coalified, some fossil plants, black.
870										SILTY SANDSTONE, hard, slightly carbonaceous, some plant fossils, fine to medium sand, light to medium grey.
875										BENTONITIC CLAY SHALE, soft to very soft, fissle, interbedded with carbonaceous shale, light to medium grey.
880										SILTY SANDSTONE, considerable fine carbonaceous lenses, considerable plant fossils, hard,

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
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PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
885										fine sand, some fine pyrite along plant fragments, turbid conditions near bottom, light to medium grey.,
890										SANDSTONE, unweathered, hard, white to light grey, medium grained, considerable carbon shale and coal seams less than 40 mm thick.
895										SANDY SILTSTONE, carbonaceous, moderately hard, unweathered, pronounced 85 degree rough joint, considerable carbonaceous fragments, turbid conditions, turbid grey sandstone clasts, black.
900										SANDSTONE, hard, medium grained, some grey lithic fragments, quartose, light grey to white.
905										SANDSTONE, hard to moderately hard, silty, fine to medium, light to medium grey.
910										CLAY SHALE, moderately soft to moderately hard, carbonacous, black.
915										SILTY SANDSTONE, hard, quartose, fine, light to moderately grey, some black to grey lithic fragments.
920										SHALE, carbonaceous, thinnly bedded, moderately soft to moderately hard, black.
925										CLAY SHALE, carbonaceous, soft to moderately soft, coalified, black.
930										SANDY SILTSTONE, carbonaceous, moderately hard, black, some fine pyrite, massive.
935										SANDSTONE, hard to very hard, fine to medium, white to moderatley grey, some to consitedable grey bands.
										CLAY SHALE, carbonaceous, moderately hard, medium bedded,

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
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PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 962

JOB NO. GRJ-03 DATE 08/30/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N12,082.4 E93,739.0
SURFACE ELEV. 5,247.00'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										black. note: 863.1 to 863.3 feet fissle shaly pale grey bintonitic clay.
940										SILTY SANDSTONE, hard to very hard, fine to medium grained, medium to light grey, considerable black plant fragments.
945										SANDSTONE, hard to very hard, grey and white banded, some to considerable fine carbonaceous plant fragments, becomes turbid with depth.
950										BURRO CANYON FORMATION: SANDY SILTSTONE, moderately hard, massive, unweathered, fine sand, ligth green grey to grey green.
955										SILTY SHALE, moderately soft to moderately hard, thinnly bedded, considerable fine sand, light grey green.
960										SILTY SANDSTONE, hard, unweathered, fine, massive, pale grey green.
965										Stopped boring at 884 feet
970										
975										
980										
985										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

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S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/4/89

LOG OF TEST BORING NO. 963

RIG TYPE Mobile B-57
LOCATION N11,699.3 E93317.9
ELEVATION 5234.00 TD=138'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
	0										ML	Note: hole oriented 60 degrees from horizontal N 65 degrees E.
	5										GP	**SANDY SILT**, clayey, plastic, predominantly very fine to medium sand, trace of gypsum, reddish brown, slightly damp.
	10										ML/CL	**SILTY SANDY GRAVEL**, nonplastic, poorly sorted sand, clasts of basalt and, trace of gypsum, loose, grayish tan, slightly damp.
	15										GP	**CLAYEY SILT - SILTY CLAY**, sandy, some gravels, plastic, predominantly very fine sand, clasts of basalt, tan, damp.
	20										CL	Note: becoming sandier with depth.
											GC	
	25											**SANDY GRAVEL**, some silt, trace of gypsum, nonplastic, poorly sorted sand, clasts of basalt, grayish tan, slightly damp.
NC	30		NC	5	100	0				MW	Sh	Note: boulder at 17 to 18 feet.
	35			5	100	0					Sh	**CLAY**, trace of sand and gravel, plastic, tan, damp.
	40											**CLAY GRAVEL**, plastic, clasts of basalt, tan, damp.
									FLD			Note: Bedrock contact at 24 feet.
	45			60	100	5					Sh	**CLAY SHALE TO WEATHERED MANCOS**, fissile, tan, damp.
				40	100	5			STN			**CLAY SHALE**, thinly bedded, minor thin silt layers, soft to moderately soft, tan, damp.
	50										Sh	Note: core broken from drilling.

GROUNDWATER

DEPTH	HOUR	DATE
90.0	NK	NK

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/4/89

LOG OF TEST BORING NO. 963

RIG TYPE Mobile B-57
LOCATION N11,699.3 E93317.9
ELEVATION 5234.00 TD=138'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC			NC	60	100	30			STN	SLW		Fractures filled with gypsum 1/8 to 3/8 inch thick, honeycomb (porous) fillings.
									FLD		Sh	Minor Fe/Mn staining.
	55									Fr		
												One fracture filled with gypsum and clay, 1/2 inch thick.
									FLD			
				90	90	100					Sh	
	60								STN			Breaks along shaley partings (30 degree).
				85	100	80						Fractures filled with gypsum 1/16 to 1/8 inch thick, porous fillings, some fractures filled with gypsum and Fe/Mn stained.
											Sh	
	65											
				100	100	100						Fractures along bedding, filled with gypsum 1/8 to 1/4 inch thick, with Fe/Mn staining and clay. Shale becoming hard.
											Sh	
	70											
									CLN			
									FLD			
				95	100	95			CLN			Shale with gray, occasional siltstone layers, fractures smooth, occasional fossils.
	75										Sh	
												Fractures smooth Fe/Mn. Stained, occasional bivalve fossils.
									FLD			
	80								CLN			Stained fractures rough and smooth, Core breaks along shaley partings.
									STN			
				95	100	85						Breaks becoming more concoidal, but generally along shaley partings.
									CLN		Sh	
	85					0						
						100						Fracture clean, smooth, fine sandy grains on surface of fracture.
									FLD			
▽	90											Filled fracture with clay and fine xyls of gypsum.
										SLW		
				60	100	35						Core breaks along coarser grained layers, generally along shaley partings.
	95							X	CLN		Sh	
										Fr		Shale is hard.
									BX			Minor filling of clay with fine xyls of gypsum.
	100							X				
												Loot air at 85 feet, H2S gas. Hit water at 90 feet.
												Ammonite fossil and Beleminite fossil

GROUNDWATER

	DEPTH	HOUR	DATE
▽	90.0	NK	NK
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/4/89

LOG OF TEST BORING NO. 963

RIG TYPE Mobile B-57
LOCATION N11,699.3 E93317.9
ELEVATION 5234.00 TD=138'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing wide - close 1 2 3 4 5	orientation horiz. - vert. H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC	105		NC	70	100	60		X	CLN	Fr	Sh	Very fine xyls of pyrite in fractures.
									FLD			Core breaks at fossils.
									CLN			Fractures filled with minor amounts of clay and very fine xyls of gypsum.
				95	100	85						Core is softer 91 to 93 feet.
	110										Sh	
									FLD			Core broken very close, natural?, gypsum seams, abundant 91 to 93 feet.
	115											Irregular gypsum seams generally along bedding planes. Clay filled fractures 3/4 inch thick (or clay layer).
								X				
				90	100	90			CLN			2 inch thick layer with clasts of shale in siltstone,
	120										Sh	
									FLD			Fractures with highly broken shale at 95 feet.
									STN			
									CLN			Breaks in shale are concoidal, shale is hard.
									FLD			
									CLN			
	125											Core highly broken at 98 to 99 feet.
				90	100	90			FLD			Shale is softer and broken up along fracture.
									CLN		Sh	Clean fractures are smooth.
	130											Fractures at bottom of run is welded, and not completely broken.
												High angle fracture filled with broken shale.
	135											Fracture filled with soft wet shale.
												Fracture filled with thin layer of clay, smooth.
	140											Shale hard and not fractured.
												Total Depth 138 feet.
	145											
	150											
	155											

GROUNDWATER

DEPTH	HOUR	DATE
90.0	NK	NK

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/4/89

LOG OF TEST BORING NO. 964

RIG TYPE MOBILE B-57
LOCATION N12,362.3 E93,121.7
ELEVATION 5236.00 TD=123'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
HSA											GC	NOTE: oriented hole, dip - 60 degrees, strike - N 60 E
OX	5		OX									CLAYEY GRAVEL, occasional cobble & boulder, some poorly graded sand, some silt, weakly lime cemented, medium plasticity, light brown to gray.
	10											
	15											
											CL	CLAY, gravelly, some sand, strongly lime cemented, medium plasticity, brown.
	20									HI	SH	
	25											MANCOS FORMATION: SHALE, moderately soft, brown to greyish brown.
										MW		Note: becoming dark greyish brown, medium hard at 27 feet.
	30											
NC	35		NC	25	na	0						Note: began NC coring with air at 35 feet.
									FLD	MW		Note: thinly bedded, moderately hard, brown and light brown.
	40						BROKEN	X		SLW		Note: packer test interval 37.5 to 43 feet, k = 10e-3 cm/sec
			NC	75	na	50						Note: numerous random sandy bedding partings and random gypsum filled partings bedding dips 50 degrees to core axis.
	45							X		SLW		
	50		NC	80	na	30				FR		Note: moisture sampling 45 to 54.5 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/4/89

LOG OF TEST BORING NO. 964

RIG TYPE MOBILE B-57
LOCATION N12,362.3 E93,121.7
ELEVATION 5236.00 TD=123'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC			NC	60	na	20			FLD	FR	SH	MANCOS FORMATION:
	55											Note: packer test interval 52.5 to 58 feet, k = 10e-5 cm/sec.
									CLN			Note: moisture sample at 55 to 55.5 feet.
	60											
			NC	65	na	40						
	65											Note: packer test interval 62.5 to 75 feet, k = 10e-7 cm/sec.
	70											Note: moisture sample 72.0 to 72.5 feet.
			NC	95	na	70			BX CLN			
	75											Note: packer test interval 75 to 88 feet, k = 10e-7 cm/sec.
	80											
			NC	100	na	90						Note: moisture sample at 81.5 to 82.0 feet. Note: slickensides at 84 feet.
	85											
	90											Note: moisture sample at 88.5 to 88.9 feet.
			NC	100	na	85						
	95											Note: moisture sample at 93.7 to 99.3 feet.
	100											
			NC	55	na	15						

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/4/89

LOG OF TEST BORING NO. 964

RIG TYPE MOBILE B-57
LOCATION N12,362.3 E93,121.7
ELEVATION 5236.00 TD=123'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC	105									FR	SH	MANCOS FORMATION:
												Note: packer test interval 97.5 to 103 feet, k = 10e-6 cm/sec. Note: moisture sample at 106.0 to 106.3 feet.
	110											
			NC	65	na	50						
	115											
	120											
	125											Stopped NC coring at 123.0 feet. Ran packer tests on 10-3-89 and 10-4-89. Grouted hole from bottom on 10-04-89 used 12 bags of cement, type I-II.
	130											
	135											
	140											
	145											
	150											
	155											

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 967

JOB NO. GRJ-03 DATE 10/25/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N13,100.0 E91,200.0
SURFACE ELEV. 5,208.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				A				CL		**SILTY CLAY**, some gravel and cobble, weak lime cementation, medium plasticity, light orange brown moist.
								CL		
								GC		**SILTY CLAY**, considerable fine to medium subangular gravel, weak lime cementation, low to medium plasticity, light orange brown, moist.
5				OX				GP		
										CLAYEY GRAVEL, fine sand, considerable silt, fine to medium subangular to subrounded gravel, weak cementation, low to medium plasticity, light brown, moist.
10								GP/GM		**SANDY GRAVEL AND COBBLES**, fine to medium sand, to coarse gravel and cobbles, weak cementation, light gray to brown gray, some gypsum. Note: increase in silt from 7 to 9 feet, dry.
								CL		
15				GB						**SILTY AND SANDY GRAVEL**, some cobble, fine to medium sand, weak cementation, nonplastic, light brown, moist to slightly moist.
								GM		
								CL		**SANDY CLAY**, fine to medium sand, some fine gravel, weak to moderate cementation, moist, medium plasticity, light yellowish brown, some gypsum. Note: increase sand and gravel with depth to 15 feet.
20								GM/GC		
								CL		
25								GM/GC		**SILTY GRAVEL**, fine sand, fine to medium gravel, very moist, medium plasticity, light yellowish brown.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 967

JOB NO. GRJ-03 DATE 10/25/89

RIG TYPE MOBILE B-57
BORING TYPE HSA/ODEX N13,100.0 E91,200.0
SURFACE ELEV. 5,208.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										SANDY CLAY, some gravel, fine sand, low to medium plasticity, moist, light yellowish brown.
								SH		**SILTY AND CLAYEY GRAVEL**, fine sand, fine to medium gravel, low plasticity, slightly moist, tan to light brown. Note: becoming sandy at 22 feet.
30										**SILTY CLAYEY GRAVEL**, fine sand, fine to medium gravel, low to medium plasticity, light brownish gray to brown, moist to very moist. Note: boulder from 26 to 27.5 feet.
35										**MANCOS SHALE**, highly weathered-decomposed, soft to moderately soft, moist, light yellowish brown. Note: becoming slightly weathered at 29 feet.
40										**MANCOS SHALE**, slightly weathered, moderately soft, moist, medium gray.
45										Stopped rotary drilling at 30 feet at 9:30 am on 10-26-89. Installed 2 inch monitor well with screen 19.4 to 29.4 feet on 10-26-89.
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 968

JOB NO. GRJ-03 DATE 10/31/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,748.1 E94,015.1
SURFACE ELEV. 5236.'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				A				ML/CL		**CLAYEY SILT TO SILTY CLAY,** trace of some gravel, weak lime cementation, low to medium plasticity, moist to slightly moist, pale brown. Note: increased gravel and cobbles content 3 to 4 feet, increased sand from 4 to 5 feet.
5				OX				SM/SC		**SILTY TO SANDY CLAY,** some gravel and cobbles, weak cementation, fine to medium sand, low plasticity, tan, slightly moist, clay increasing with depth.
10								GM/GP		**SILTY GRAVEL AND COBBLES,** fine sand, medium to coarse subangular gravel, weak cementation, nonplastic, medium gray, dry. Note: increased fine gravel 11 to 12 feet. Note: considerable cobbles and boulders from 15 to 17 feet.
15								SM/SC		**SILTY TO CLAYEY SAND,** some considerable gravel, fine sand, low plasticity, tan, slightly moist.
20								GM		**SILTY GRAVEL AND COBBLES,** fine sand, medium to coarse gravel, nonplastic, light greyish brown, slightly moist.
25										**CLAYEY GRAVEL AND**

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 968

JOB NO. GRJ-03 DATE 10/31/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,748.1 E94,015.1
SURFACE ELEV. 5236.'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classiri-cation	REMARKS	VISUAL CLASSIFICATION
				OX				GC/ CL		**GRAVELLY CLAY,** low to medium plasticity, slightly moist, light yellowish brown.
								SH		**MANCOS SHALE MUDSTONE,** highly weathered-decomposed, soft to moderately soft, slightly moist, light yellowish brown.
30										Note: highly weathered below 30 feet.
35										Stopped Odex drilling at 35 feet on 11-1-89.
										Abandoned hole, grouted hole, 11-1-89, 10:20am - 11:00am
										Used 10 C.F. of Type I-II cement and 0.5 C.F. of Bentonite Powder.
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 969

JOB NO. GRJ-03 DATE 11/1/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,180.4 E93.575.1
SURFACE ELEV. 5,220.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				A				CL		**SILTY CLAY,** some gravel and cobbles, weak lime cementation, low to medium plasticity, pale brown, moist to slightly moist.
								GC		**CLAYEY GRAVEL AND COBBLES,** fine to medium subangular gravel, weak cementation, low to medium plasticity, slightly moist, light, pale brown.
5				OX				GM		**SILTY GRAVEL AND COBBLES,** fine to medium sand, some gypsum, nonplastic, tan to medium gray, dry. Note: silt and sand decreasing with depth down to 11 feet. Increased sand from 11 to 13 feet and 14 to 15 feet. Note: hard drilling from 15 to 16.5 feet.
10										
15										
20								GM/GC		**SILTY TO CLAYEY GRAVEL AND COBBLES,** fine to medium sand, fine to medium gravel, low plasticity, dry, light tan to medium gray.
25										**CLAYEY GRAVEL TO GRAVELLY CLAY,** low to medium plasticity, moist, light yellowish brown.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 969

JOB NO. GRJ-03 DATE 11/1/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,180.4 E93.575.1
SURFACE ELEV. 5,220.90'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX						MANCOS SHALE; MUDSTONE, highly weathered, soft to medium soft, moist, light olive gray.
								MST		Note: color changes to pale yellowish brown below 28 feet.
30										Installed monitor well with 2 inch PVC and screen from 19.3 to 29.3 feet.
										Stopped Odex at 30 feet on 11-1-89.
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 970

JOB NO. GRJ-03 DATE 11/2/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N9,840.1 E93,292.4
SURFACE ELEV. 5,211.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				A				ML		**SILT**, topsoil, trace of gravel, plasticity, slightly moist, rootlets, reddish brown.
								GM/ GC		**SILTY GRAVEL**, clayey, some sand, trace of gypsum, angular to subangular gravel, slightly moist, reddish brown.
5				OX				SM		**SILTY SAND**, gravelly, trace of gypsum, slight plasticity, slight moist, tan.
								GM		**SILTY GRAVEL**, sandy, trace of gypsum, low plasticity, slightly moist, light brown to tan.
10								SM		**SILTY GRAVEL SAND**, slightly clayey, angular gravel, low plasticity to medium plasticity, slightly moist, tan.
15								GM		**SILTY GRAVEL**, sandy, low plasticity, slightly moist, tan.
								GP		**SANDY GRAVEL**, slightly silty, angular gravel, fine to medium sand, dry, gray.
20								GM		**SILTY CLAYEY GRAVEL**, some sand, angular gravel, silt in a clay matrix and are commonly iron stained (red), slight to medium plasticity, slightly moist to tan. Gravel decreases with depth.
25										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 970

JOB NO. GRJ-03 DATE 11/2/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N9,840.1 E93,292.4
SURFACE ELEV. 5,211.7'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX				GM		
30								SH		**CLAY SHALE,** weathered mancos, slightly silty, fissile, medium to high plasticity, slightly moist, light brown to gray.
										Total Depth 30 feet.
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	Lithology	Rock Type & Remarks
	0			na	na	na						
BH											CL	**Silty Clay,** some sand, trace gravel, cobble to 12 inches, poorly graded, weak lime cement, medium plasticity, brown.
	5											
											GP	**Sandy Gravel,** some clay, trace cobble and boulder to 16 inches, weak lime cement, some gypsum, medium plasticity, poorly graded, subrounded, brown.
	10											
											SC	**Clayey Sand,** trace gravel and cobble, poorly graded, subrounded, nonplastic to low plasticity, brown.
	15											
											GP	**Sandy Gravel,** some clay and cobble, trace boulder to 5 feet, poorly graded, subrounded, low plasticity, brown.
	20											
	25										SH	MANCOS SHALE: moderate to highly weathered, moderately soft to moderately hard, thinly bedded, brown to gray.
	30											
GB			GB	na	100	na						Note: Soil samples and Mancos Shale above obtained with backhoe. At 32 feet boring operation switched to air rotary gear bit.
	35											
	40											Note: At 38 feet Mancos Shale changed color from brown/gray to dark/gray. This is unweathered.
	45										SH	MANCOS FORMATION: fissle, slightly silty, indurated, calcareous, moderately hard.
	50		GB									

GROUNDWATER

	DEPTH	HOUR	DATE
▽	797.5	NK	NK
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
GB											SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	55			na	100	na						
	60											
	65											
	70											
	75											
	80											
	85											
	90											
	95											
	100		GB									

GROUNDWATER

DEPTH	HOUR	DATE
797.5	NK	NK

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
GB	105		GB	na	100	na					SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	110											
	115											
	120											
	125											
	130											
	135											
	140											
	145											
	150		GB									
	155											

GROUNDWATER

DEPTH	HOUR	DATE
797.5	NK	NK

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
GB			GB	na	100	na					SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	160											
	165											
	170											
	175		GB									
	180			na	100	na						
	185											
	190											
	195											
	200		GB									
	205			na	100	na						

GROUNDWATER

	DEPTH	HOUR	DATE
▽	797.5	NK	NK
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
GB	210			na	100	na					SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	215											
	220											
	225		GB									
	230			na	100	na						
	235											
	240											
	245											
	250		GB									
	255			na	100	na						
	260											

GROUNDWATER

DEPTH	HOUR	DATE
797.5	NK	NK

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
GB	260			na	100	na					SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	265											
	270											
	275		GB									
	280			na	100	na						
	285											
	290											
	295											
	300		GB	na	100	na						
	305											
	310											

GROUNDWATER

	DEPTH	HOUR	DATE
▽	797.5	NK	NK
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
GB				na	100	na						
	315										SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	320											
	325		GB									
	330			na	100	na						
	335											
	340											
	345											
	350		GB									
	355			na	100	na						
	360											

GROUNDWATER

DEPTH	HOUR	DATE
797.5	NK	NK

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
GB	365			na	100	na					SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	370											
	375		GB									
	380			na	100	na						
	385											
	390											
	395											
	400		GB									
	405			na	100	na						
	410											
	415											

GROUNDWATER

	DEPTH	HOUR	DATE
▽	797.5	NK	NK
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
GB				na	100	na						
											SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	420											
	425		GB									
	430			na	100	na						
	435											
	440											
	445											
	450		GB									
	455			na	100	na						
	460											
	465											

GROUNDWATER

DEPTH	HOUR	DATE
797.5	NK	NK

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing wide - close 1 2 3 4 5	DISCONTINUITIES orientation horiz. - vert. H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
	470										SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	475											
	480			na	100	na						
	485											
	490											
	495											Note: Changed bit from 10 3/4" to 10". Bearings in 10 3/4" were shot.
GB	500											
	505			na	100	na						
	510											
	515											
	520											

GROUNDWATER

	DEPTH	HOUR	DATE
▽	797.5	NK	NK
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
	520										SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	525											
	530			na	100	na						
	535											
	540											
	545											
GB	550											
	555			na	100	na						
	560											
	565											
	570											

GROUNDWATER

DEPTH	HOUR	DATE
797.5	NK	NK

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
											SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	575											
	580			na	100	na						
	585											
	590											
	595											
GB	600											
	605			na	100	na						
	610											
	615											
	620											

GROUNDWATER

DEPTH	HOUR	DATE
797.5	NK	NK

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
	625										SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	630			na	100	na						
	635											
	640											
	645											
GB	650											
	655			na	100	na						
	660											
	665											
	670											Note: At 670 feet cuttings contain Bentonite chips. White, high plasticity.
	675											

GROUNDWATER

DEPTH	HOUR	DATE
797.5	NK	NK

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
											SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	680			na	100	na						
	685											
	690											
	695											
GB	700											
	705			na	100	na						
	710											
	715											
	720											
	725											

GROUNDWATER

DEPTH	HOUR	DATE
797.5	NK	NK

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
	730			na	100	na					SH	MANCOS FORMATION: shale, fissle, slightly silty, indurated, calcareous, moderately hard, dark gray.
	735											
	740											Note: Bentonite chips constitute approximately 30% of cuttings from 740 feet to 750 feet.
	745											
GB	750									TN		Note: Total Depth with Shramm Rig was 752.5 feet. Began coring at this depth on 11-6-89.
NC			NC	95	100	61						
	755											Note: 752.5 feet to 757 feet, claystone/shale, unweathered mancos, silty; numerous bentonite clay layers < 3mm in thickness.
			NC	100	100	98						
	760		NC	100	100	88			FLD			DAKOTA FORMATION:, sandstone.
								X		M	SH/SS	761.1 feet: 30 degree joint with striated surface filled with calcite.
	765		NC	100	100	73				TN/M		761.5 feet: Calcareous sandstone.
								X	FLD			761.9 feet: Calcareous sandstone 0.35 feet thick; hard.
												762.2 feet: Wavey bedding.
												763 - 765 feet: Lenticular bedding.
	770		NC	100	100	68						764 feet: Glassy brown carbonaceous layer along bedding plane.
												765 feet: Iron stain along bedding plane.
	775		NC	97	100	32						766 - 766.3 feet: 30 degree joints opposite to each other filled with calcite.
											SS/SH	770 - 775 feet: Thin to medium interbedded carbonaceius sandstone and shale. Iron staining throughout.
	780							X	RB			

GROUNDWATER

DEPTH	HOUR	DATE
797.5	NK	NK

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN
LOCATION N12,142.3 E93,784.7
ELEVATION 5235.82 TD=897
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
	780		NC	32	100	0						Sandstone medium to fine, highly indurated, very hard. Burrows at 774 feet.
				no/ rec								
	785		NC	100	100	20						779.5 feet: 40 degree fracture with striated surface.
			NC	100	100	57						
	790		NC	88	100	31		x		M		789 - 799 feet: Sandstones in this interval illustrate low angle crossbedding 5 - 10 degrees.
								xx				
				no/ rec								
	795		NC	94	100	52						Note: Water encountered at 797.7 feet.
▽												
NC	800		NC	54	100	52				M	SH/ SS	Note: At 799 feet a massive quartzite sandstone was encountered, highly indurated and very hard. Carbonaceous shale at 799.9 feet, very black.
GB				na	100	na				NA		
	805											Note: Coring stopped at 802 feet.
	810											
	815											Note: On 11-20-89 drilled through the Dakota Formation, NC core hole and undrilled formation, to the Burrow Canyon Formation at a total depth of 897 feet. No cuttings or samples were retained.
	820											
	825											
	830											

GROUNDWATER

	DEPTH	HOUR	DATE
▽	797.5	NK	NK
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN

LOCATION N12,142.3 E93,784.7

ELEVATION 5235.82 TD=897

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
											SH/SS	DAKOTA FORMATION
	835			na	100	na						
	840											
	845											
GB	850											
	855											
	860											
	865											
	870											
	875											
	880											

GROUNDWATER

	DEPTH	HOUR	DATE
▽	797.5	NK	NK
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 11/20/89

LOG OF TEST BORING NO. 971

RIG TYPE SCHRANN

LOCATION N12,142.3 E93,784.7

ELEVATION 5235.82 TD=897

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	bedding and/or fabric	lithology	Rock Type & Remarks
	885			na	100	na					SH/SS	DAKOTA FORMATION
	890											Approximate Top of Burrow Canyon Formation, green siltstone and shale, at 895 feet.
	895										MST/SH	
	900											Total Depth 897 feet.
	905											
	910											
	915											
	920											
	925											
	930											
	935											

GROUNDWATER

DEPTH	HOUR	DATE
	NK	NK

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/12/89

LOG OF TEST BORING NO. 972

RIG TYPE Mobile B-57
LOCATION N11,685.2 E93,295.7
ELEVATION 5233.70 TD=144'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
	0		GB								ML	SANDY SILT, clayey, plastic, predominantly very fine to fine sand, roots, reddish brown, slightly damp, occasional gravel at depth.
	5										SM	SILTY SAND, gravelly, moderately plastic, predominantly very fine to fine sand, clasts of basalt, reddish brown, slightly damp.
	10										GP	
											GP	SANDY GRAVEL, some silt, nonplastic, poorly sorted sand, clasts of basalt and scoria, gray to tan, dry.
	15										SM	
											GP	
	20										GC	SILTY SANDY GRAVEL, slightly plastic, very fine to fine sand, clasts of basalt and scoria, tan, slightly damp.
GB	25										Sh	SILTY SAND, gravelly, nonplastic, very fine to fine sand, clasts of basalt, tan, slightly damp.
	30											SANDY GRAVEL, some silt, nonplastic, poorly sorted sand, clasts of basalt, gray, dry.
	35											SILTY CLAY GRAVEL, some silt, sand, plastic, very fine to fine sand, clasts of basalt, tan, slightly damp.
	40											Bedrock contact at 20 feet.
	45											CLAY SHALE - WEATHERED MANCOS, fissile, tan, damp.
												Cuttings sampled for moisture content every 1 feet.
	50											Cuttings becoming grey at 46 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/12/89

LOG OF TEST BORING NO. 972

RIG TYPE Mobile B-57
LOCATION N11,685.2 E93,295.7
ELEVATION 5233.70 TD=144
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing wide - close 1 2 3 4 5	DISCONTINUITIES orientation horiz. - vert. H 45 V	condition	weathering	lithology	Rock Type & Remarks
GB											Sh	
	55											
	60											
	65											
	70											
	75											
	80											
	85											
	90											
	95											
NC			NC	50	100	30				Fr	Sh	Shale is dark grey, hard, almost massive. Fractures are very rough and filled with clay and fragmented shale 1 to 1 1/2 inch thick.
	100							XX	FLD			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/12/89

LOG OF TEST BORING NO. 972

RIG TYPE Mobile B-57
LOCATION N11,685.2 E93,295.7
ELEVATION 5233.70 TD=144
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC	105		NC	25	100	20			CLN FLD	Fr	Sh	Fractures are smooth and clean. Filled Fracture is wet and filled with damp clay and fragmented shale 1/4 inch thick.
	110											Shale contains occasional fossils (bivalve).
									STN			
	115		NC	90	100	90					Sh	Core breaks concordally but generally along shaley partings bedding planes, some fossils.
	120								FLD			Fracture is rough and partly covered with microxyline pyrite and gypsum(?). Covering has a micaceous look. Possibly altered fossil shells.
	125		NC	90	100	90					Sh	Microxyline pyrite.
	130											Fracture like above, partly covered with microxyline gypsum and pyrite(?), has a micaceous look. Fracture sides are moderately smooth. Possibly altered fossil shells.
	135		NC	30	100	30					Sh	Bottom of core broken from drilling. Bit plugged, lost most of core.
	140											
	145											Total Depth 144 feet.
	150											
	155											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/17/89

LOG OF TEST BORING NO. 973

RIG TYPE Mobile B-57
LOCATION N11,707.2 E93,388.5
ELEVATION 5235.80 TD=104'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
HSA											CL	**TOPSOIL: SILTY CLAY,** some fine sand and cobbles, clasts are subrounded to subangular, nonplastic, weakly cemented, reddish brown, slightly moist.
	5		OX								GM	
OX												**SILTY GRAVEL AND COBBLES,** some to considerable clay, nonplastic, considerable gypsum, weakly cemented, loose, subangular to subrounded, light brown, dry.
	10											
	15										GP	**SANDY GRAVEL AND COBBLES,** fine to medium subangular sand, some silt and gypsum, nonplastic, occasional boulders, brown to olive brown, slightly moist.
	20											
												Bedrock contact at 23 feet.
GB	25		HX	30	-	0			FLD		SH	**MANCOS FORMATION:** Clay Shale, moderately to highly weathered, fissile, laminated grey to light yellowish brown, slightly moist.
HX	30		HX	33	100	0		X X		Mw		
	35		HX	28	-	0		X	FLD STN	Hiw		**MANCOS FORMATION:** Shale, moderately to highly weathered, thinly laminated, considerable calcite and gypsum filling in discontinuities, soft, fissile and platey, light brown to greyish brown.
	40		HX	50	100	15		X X	STN	Slw		Note: Weathered Mancos Shale to 42 feet.
			HX	100	100	50		X X	CLN FLD	Fr Slw /Fr		Saturated at 42 feet (fractured).
	45							X	CLN	Fr		**MANCOS FORMATION:** Claystone and Shale, massive to thinly bedded, slightly to unweathered, dense partings along bedding planes are clayey.
			HX	100	100	41		X			CST	
	50											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/17/89

LOG OF TEST BORING NO. 973

RIG TYPE Mobile B-57
LOCATION N11,707.2 E93,388.5
ELEVATION 5235.80 TD=104'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
HX			HX	100	100	21		X	CLN	Fr	CST	
	55											MANCOS FORMATION: Claystone, fresh, dense, hard, occasional clayey partings - staining (iron and manganese) on surfaces, pelecypod fossils occur throughout, core is damp, dark grey to black.
			HX	80	100	12		X	STN			
	60							X	CLN			
			HX	100	100	54		X				
	65											MANCOS FORMATION: Claystone and Shale, dense, black, moist.
			HX	100	100	0					SH	
	70											Becoming more fragmented - numerous partings (horizontal), filled with clay, H2S smell.
			HX	100	100	7		X			SH	
	75											Hit moist to wet zone at approximately 74 feet, moisture present along parting throughout core run to 78 feet.
			HX	80	100	15		X			CST	
	80											
			HX	66	100	0						Highly fragmented, fracture from 85.5 to 86.5 feet. Surfaces are rough to smooth and clean - no staining.
	85							X				Calcite nodules at 85 feet.
				100	20	85		X X X				
	90							X				
				100	90	100		X				Lost circulation at 90 feet, occasional fossils - pelecypods.
	95							X				
				100	90	100		X				
	100											Lost circulation and stopped boring at 104 feet.
				100	100	100		X				

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 10/17/89

LOG OF TEST BORING NO. 973

RIG TYPE Mobile B-57

LOCATION N11,707.2 E93,388.5

ELEVATION 5235.80 TD=104'

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
	105											Total Depth boring at 104 feet.
	110											
	115											
	120											
	125											
	130											
	135											
	140											
	145											
	150											
	155											

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/17/89

LOG OF TEST BORING NO. 974

RIG TYPE Mobile B-57
LOCATION N11,782.9 E93,368.7
ELEVATION 5236.10 TD=139'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
HSA	0										CL	SILTY CLAY, some poorly graded sand, trace of gravel and cobble, occasional boulder, weak lime cementation, medium plasticity, brown.
											CL-SC	
OX	5										GP	SANDY CLAY - CLAYEY SAND, poorly graded subrounded sand, some gravel and cobble, trace of boulders, weak lime cementation, medium plasticity, brown.
	10											
	15											SANDY GRAVEL, small amounts of silt and clay, some boulder and cobble, poorly graded, weak lime cementation, low plasticity, brown and dark gray.
	20											
	25											MANCOS SHALE, moderately soft to moderately hard calcareous, dark gray and brown.
NC			NC	10	100	0						
									Stn	Mdw	SH	MANCOS SHALE: CLAY SHALE, fine grained, moderately soft to moderately hard dark gray, and dark brown, calcareous.
	30											
			NC	10	100	0			Stn	Mdw	SH	Note: occasional fossil, limonite stain.
	35											Note: fragmented 25 to 42 feet.
			NC	<5	100	0		X	Stn	Mdw	SH	Note: occasional manganese stain.
	40											
			NC	40	100	0			Stn	Mdw	SH	
	45						X	X		Slw		Note: becoming "massive" at 45 feet.
			NC	40	100	10		X	Stn		SH	
	50											
			NC	100	100	45			Cln	Slw	SH	

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/17/89

LOG OF TEST BORING NO. 974

RIG TYPE Mobile B-57
LOCATION N11,782.9 E93,368.7
ELEVATION 5236.10 TD=139'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC								X	Rgh	to Fr		MANCOS SHALE: CLAY SHALE, fine grained, calcareous, moderately soft to moderately hard, dark gray, with occasional limonite and manganese stain.
	55							X				
			NC	80	100	40		X	Rgh	Fr	SH	Note: occasional fine sandy partings
	60											
			NC	100	100	75		X	Rgh	Fr	SH	
	65										SH	
			NC	90	100	65		X	Rgh	Fr		
	70											
			NC	100	100	55		X	Rgh	Fr	SH	
	75								Cln			
			NC	90	100	45		X	Rgh	Fr	SH	MANCOS SHALE: CLAY SHALE, fine grained, calcareous, moderately soft to moderately hard, dark gray with occasional limonite and manganese stain.
	80											
			NC	<5	100	0		X	Cln Rgh	Fr	SH	Note: occasional gypsum
	85											
			NC	50	100	0		X	Cln Rgh	Fr	SH	
	90											
			NC	95	100	95		X	Cln	Fr	SH	
	95											
			NC	95	100	90		X	Cln Rgh	Fr	SH	
	100											
			NC	100	100	100		X	Cln Rgh	Fr	SH	

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/17/89

LOG OF TEST BORING NO. 974

RIG TYPE Mobile B-57
LOCATION N11,782.9 E93,368.7
ELEVATION 5236.10 TD=139'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC	105											MANCOS SHALE: CLAY SHALE
			NC	100	100	95		X	Cln Rgh	Fr	SH	
	110											
			NC	100	100	95		X	Cln Rgh	Fr	SH	
	115											
			NC	100	100	95		X	Cln Rgh	Fr	SH	
	120											
			NC	40	100	30		X	Cln Rgh	Fr	SH	
	125											
			NC	100	100	55		X	Cln Rgh	Fr	SH	
	130										SH	
			NC	40	100	0		X	Cln Rgh	Fr		
	135											
			NC	80	100	40		X	Cln Rgh	Fr	SH	
	140											Total Depth 139 feet.
	145											
	150											
	155											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 975

JOB NO. GRJ-03 DATE 10/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,708.1 E93,400.7
SURFACE ELEV. 5,235.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				A				CL		**SILTY CLAY,** some poorly graded sand, trace of gravel, weak lime cementation, medium plasticity, brown to light brown.
								GP/ GC		**SANDY GRAVEL - CLAYEY GRAVEL,** some considerable clay, poorly graded sand and gravel, subrounded to subangular, weak lime cementation, medium plasticity, light brown.
5				OX						
10								GP		**SANDY GRAVEL,** considerable gypsum, some clay, poorly graded and subrounded to subangular gravel and sand, slight gypsum cementation, medium plasticity, light brown changing to gray with depth. Note: clay from 8.5 to 10 feet. Basalt boulders from 13 to 15 feet and 17 to 20 feet. Large amounts of gypsum from 5 to 10 feet.
15										
20								SH		**MANCOS SHALE: CLAY SHALE,** highly weathered, moderately soft, brown, slightly moist, considerable gypsum.
25										

GROUNDWATER

DEPTH	HOUR	DATE

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 975

JOB NO. GRJ-03 DATE 10/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,708.1 E93,400.7
SURFACE ELEV. 5,235.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX				SH		MANCOS SHALE; CLAY SHALE, highly weathered, moderately soft, brown, slightly moist, considerable gypsum.
30										
35										
								SH		MANCOS SHALE; CLAY SHALE, slightly to moderately weathered, gray.
40										
								SH		MANCOS SHALE; CLAY SHALE, unweathered, moderately soft to moderately hard, gray to dark gray
45										
50										

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 975

JOB NO. GRJ-03 DATE 10/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,708.1 E93,400.7
SURFACE ELEV. 5,235.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX				SH		**MANCOS SHALE; CLAY SHALE,** unweathered, moderately soft to moderately hard, gray to dark gray.
55										
60										
65										
70										
75										

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
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PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 975

JOB NO. GRJ-03 DATE 10/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,708.1 E93,400.7
SURFACE ELEV. 5,235.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX				SH		**MANCOS SHALE; CLAY SHALE,** unweathered, moderately soft to moderately hard, gray to dark gray.
80										
85										
90										Note: slightly moist, but noticed a slight increase in moisture ("wet clay balls") below approximately 85 feet.
95										
100										

GROUNDWATER

DEPTH	HOUR	DATE

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 975

JOB NO. GRJ-03 DATE 10/18/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,708.1 E93,400.7
SURFACE ELEV. 5,235.5'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
105										Total Depth 105 feet on 10-18-89.
										Monitor well installation completed on 10-19-89
										Installed 2 inch schedule 40 PVC with screen at 73 to 103 feet.
110										
115										
120										
125										
130										

GROUNDWATER

DEPTH	HOUR	DATE

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/20/89

LOG OF TEST BORING NO. 976

RIG TYPE Mobile B-57
LOCATION N11,659.0 E93,418.4
ELEVATION 5234.30 TD=129
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
HSA	0										CL, CL-, ML, GM-, GC	SILTY CLAY (TOPSOIL), some fine sand, weak lime cementation, low to medium plasticity, light brown, moist.
OX	5										GP	SILTY CLAY - CLAYEY SILT, some fine gravel, weak to moderately lime cemented, low to medium plasticity, pale brown, calichified, slightly moist.
	10										SC-, CL	
											GC, SP	SILTY GRAVEL - CLAYEY GRAVEL AND COBBLES, fine sand, trace of some boulders, weak to moderately lime cementation, low to medium plasticity, light grayish brown.
	15										GP	
	20										SH	SANDY GRAVEL AND COBBLES, fine to medium sand, coarse subrounded to subangular gravel and cobbles, weak cementation, nonplastic, some gypsum, light brownish gray, dry.
NC	25		NC	0	100	0			0	Hiw	SH	
	30		NC	0	100	0				Hiw	SH	CLAYEY SAND, considerable fine subangular gravel, some gypsum, fine to medium sand, weak to moderately cemented, low to medium plasticity, tan to light gray. Note: gravel becomes coarser with depth below 11 feet with increased clay, also light brown.
	35		NC	0	100	0	BROKEN			Hiw	SH	
	40		NC	20	100	0		X X	Rgh Stn	Hiw	SH	CLAYEY GRAVEL, fine sand, fine to coarse gravel, weak cementation, low to medium plasticity, light grayish brown.
	45		NC	85	100	0		X	Rgh Stn	Mdw Slw	SH	SAND, fine, aeolian, trace of gravel, weak cementation.
	50		NC	60	100	5		X	Rgh	Slw	SH	SANDY GRAVEL AND

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/20/89

LOG OF TEST BORING NO. 976

RIG TYPE Mobile B-57
LOCATION N11,659.0 E93,418.4
ELEVATION 5234.30 TD=129
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing wide - close 1 2 3 4 5	orientation horiz. - vert. H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC												COBBLES, fine to medium sand, medium to coarse subangular gravel, weak cementation, nonplastic, light brownish gray, dry.
	55		NC	60		5		X	Rgh	Slw	SH	
	60		NC	30	100	0		X	Rgh	Slw to Fr	SH	MANCOS FORMATION: SHALE, highly weathered-decomposed, soft to moderately soft, clay shale, light yellowish brown, slightly moist to moist, some gypsum.
	65		NC	65	100	15		X	Rgh	Fr	SH	Note: Stopped Odex drilling at 25 feet on 10-14-89 and started NC Coring.
	70		NC	65	100	0		X	Rgh	Fr	SH	MANCOS FORMATION, clayey shale, soft calcareous, brown to light brown. Note: limonite and manganese stain on jointing and random.
	75		NC	90	100	5		X	Rgh	Fr	SH	Note: rubblized 39 to 44 feet. Note: occasional gypsum and fossil
	80		NC	100	100	45		X	Rgh	Fr	SH	Note: color changes to dark gray at 40 feet. Note: moderately soft to moderately hard before 45 feet
	85		NC	95	100	65		X	Rgh	Fr	SH	Note: becoming massive at 65 feet. Note: light gray band at 85.2 to 85.3 feet with fine sand at base of light gray.
	90		NC	100	100	50		X	Rgh	Fr	SH	
	95		NC	95	100	55		X	Rgh	Fr	SH	
	100		NC	100	100	75		X	Rgh	Fr	SH	

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/20/89

LOG OF TEST BORING NO. 976

RIG TYPE Mobile B-57
LOCATION N11,659.0 E93,418.4
ELEVATION 5234.30 TD=129'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing wide - close 1 2 3 4 5	orientation horiz. - vert. H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC	105		NC	90	100	55		X	Rgh	Fr	SH	MANCOS FORMATION, clay shale.
	110		NC	95	100	95		X	Rgh	Fr	SH	
	115		NC	100	100	100		X	Rgh	Fr	SH	
	120		NC	25	100	10		X	Rgh	Fr	SH	
	125		NC	25	100	10		X	Rgh	Fr	SH	
	130											Total Depth 129 feet.
												No noticable moisture in shale.
	135											Set 132 feet of 2 inch I.D. schedule 40 PVC Blank - 0 to 77 feet Screen - 77 to 127 feet Sump - 127 to 129 feet bent.- 50 to 64 feet sand - 64 to 129 feet
	140											
	145											
	150											
	155											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				OX					OX	Silty Clay, some poorly graded sand, trace gravel and cobble to 10 inches, weak to moderately lime cement, medium plasticity, light brown to tan, slightly moist.
5										Sandy Gravel, Cobbly, some clay and silt, boulders to 24 inches, poorly graded, subrounded to round, weak lime cement, low plasticity, brown to gray.
10										
15										
20										Clayey Sand, some cobble and gravel, predominantly fine to medium grained, subrounded to subangular, weak lime cement, low plasticity, brown with occassional limonite stain to light gray.
25										
30				GB					GB	Note: Above soil samples obtained with a backhoe. At 30 feet boring operation switched to air rotary gear bit. Note: 30 to 50 feet, weathered Mancos, clay shale, fissile, medium plasticity, slightly moist and tan.
35				GB						
40										
45										
50				GB					GB	

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										Note: At 50 feet, unweathered Mancos encountered, shale, fissile, slightly silty, indurated, calcareous, moderately hard, dark gray.
55										
60				GB						
65										
70										
75										
80										
85				GB						
90										
95										
100				GB					GB	MANCOS FORMATION

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▽			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
DX - DDEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR
JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

LOG OF TEST BORING NO. 977

RIG TYPE SCHRANN
BORING TYPE
SURFACE ELEV. TD=857' N11,431.8 E93,572.5
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
105										
110										
115										
120										
125										
130										
135			GB							
140										
145										
150			GB					GB		MANCOS FORMATION
155										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE
RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
DX - DDEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot. 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
160				GB						
165										
170										
175										
180										
185				GB						
190										
195										
200									GB	MANCOS FORMATION
205										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
DX - DDEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
210				GB						
215										
220										
225										
230										
235				GB						
240										
245										
250				GB					GB	MANCOS FORMATION
255										
260										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▽			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
260				GB						
265										
270										
275										
280										
285				GB						
290										
295										
300				GB					GB	MANCOS FORMATION
305										
310				GB						

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
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PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
315										
320										
325										
330										
335				GB						
340										
345										
350				GB					GB	MANCOS FORMATION
355										
360				GB						

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN

BORING TYPE N11,431.8 E93,572.5

SURFACE ELEV. TD=857'

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
365										
370										
375										
380										
385				GB						
390										
395										
400				GB					GB	MANCOS FORMATION
405										
410				GB						
415										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
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PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
420										
425										
430										
435				GB						
440										
445										
450				GB					GB	MANCOS FORMATION
455										
460				GB						
465										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
CX - CODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
470										
475										
480										
485				GB						
490										
495										
500				GB					GB	MANCOS FORMATION
505										
510				GB						
515										
520										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
CX - CDEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
520										
525										
530										
535				GB						
540										
545										
550				GB					GB	MANCOS FORMATION
555										
560				GB						
565										
570										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
DX - DDEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
575										
580										
585				GB						Note: 585 to 590 feet bentonite chips present in cuttings.
590										
595										
600				GB					GB	MANCOS FORMATION
605										
610				GB						
615										
620										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
625										
630										
635				GB						Note: Bentonite chips present from 635 to 640 feet.
640										
645										
650				GB					GB	MANCOS FORMATION
655										
660				GB						
665										
670										
675										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▽			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
DX - DDEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30-free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
680										
685				GB						
690										
695										Note: From 655 to 695 feet bentonite chips increase to approximately 590 feet of cuttings.
700				GB					GB	MANCOS FORMATION
705										
710				GB						
715										Note: Approximate top of Dakota Formation, sandstone and carbonaceous shale. Sandstone is unweathered and hard to very hard.
720										
725										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▽			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
DX - DDEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
730				GB						
735				NC					NC	Note: Total depth before switching to NC coring is 736 feet.
740										Note: 736 to 741 feet, thin to medium cross bedded sandstone and carbonaceous shell, core damp at 741 feet.
745				GB					GB	Note: 741 to 745.2 feet, run consists of 80 percent low angle to horizontally bedded sandstone, burrows present from 741.5 to 742.0 feet.
750				GB					GB	Note: Water encountered at 741 feet. Total Depth of coring is 745.7. Gear bit tricon rotary drilling wit' mud begun on 1/5/90. Drilled through Dakota to 20 to 30 feet i the Burrow Canyon Formation, a depth of 857 feet.
755										
760										
765										
770										Note: Dakota Formation consists of sandstone and carbonaceous shale.
775										
780										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▽			

SAMPLE TYPE

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OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
780										
785										
790										
795										
800				GB					GB	MANCOS FORMATION
805										
810										
815										
820										
825										
830										Approximate top of Burrow Canyon Formation, green siltstone

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
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CX - CDEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 977

JOB NO. GRJ-03 DATE N11,431.8 E93,572.5

RIG TYPE SCHRANN
BORING TYPE N11,431.8 E93,572.5
SURFACE ELEV. TD=857'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot. 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
										and shale.
835										
840										
845										
850				GB					GB	Burrow Canyon Formation
855										
										Total Depth equals 857 feet.
860										
865										
870										
875										
880										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
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T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0									BH	Silty Clay, trace poorly graded sand, occassional gravel and cobble, subrounded, weak lime cement, medium plasticity, light brown.
5										Sand, Gravel and Cobble, small amounts of clay and silt, occassional boulders to 36 inches, round and subangular, strong lime cement in places, nonplastic, brown and gray with limonite stain.
10										
15										Note: Occasional gypsum stringers.
20										Silty Clay, weak lime cement, medium plasticity, brown to gray-brown.
25				GB					GB	WEATHERED MANCOS SHALE: clayshale, moderate to highly weathered, fissile, moderately soft, slightly moist, brown and gray-brown with limonite staining.
30										
35										Note: Stop backhoe at 35.5 feet. Air Rotary gear bit used to 792 feet.
40										Note: Unweathered Mancos Shale at 38 feet; indurated, fissile, slightly silty, calcareous, dry, gray/black.
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

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OX - ODEX, downhole reverse circulation.

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot, 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
									GB	MANCOS FORMATION
55										
60										
65										
70										
75										
80										
85										
90										
95										
100										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▽			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
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PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
105									GB	MANCOS FORMATION
110										
115										
120										
125										
130										
135										
140										
145										
150										
155										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
CX - CDEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot. 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
									GB	MANCOS FORMATION
160										
165										
170										
175										
180										
185										
190										
195										
200										
205										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
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PROJECT CHENEY RESERVOIR

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

LOG OF TEST BORING NO. 978

RIG TYPE

BORING TYPE

SURFACE ELEV. TD=932'

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
210									GB	MANCOS FORMATION
215										
220										
225										
230										
235										
240										
245										
250										
255										
260										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
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JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
260									GB	MANCOS FORMATION
265										
270										
275										
280										
285										
290										
295										
300										
305										
310										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
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PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				GB					GB	MANCOS FORMATION
315										
320										
325										
330										
335										
				GB						
340										
345										
350										
355										
360										
				GB						

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
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CHENEY RESERVOIR

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
365									GB	MANCOS FORMATION
370										
375										
380										
385				GB						
390										
395										
400										
405										
410										
				GB						
415										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

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T - 3" O.D. thin-walled Shelby tube.
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PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
									GB	MANCOS FORMATION
420										
425										
430										
435										
				GB						
440										
445										
450										
455										
460										
				GB						
465										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

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JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				GB					GB	MANCOS FORMATION
470										
475										
480										
485				GB						
490										
495										
500										
505										
510					GB					Note: 512 to 517 feet encountered hard sandstone bed; extremely time consuming to drill through; sandstone chips showed up in the cuttings, white and highly indurated.
515										
520										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

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PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot. 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
520									GB	MANCOS FORMATION
525										
530										
535										
				GB						
540										
545										
550										
555										
560										
				GB						
565										
570										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▽			

SAMPLE TYPE

RX - Rock Coring - NX or HX
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U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
CX - CODEX, downhole reverse circulation.

CHENEY RESERVOIR

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE

BORING TYPE

SURFACE ELEV. TD=932'

DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/Foot. 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
									GB	MANCOS FORMATION
575										
580										
585										
				GB						
590										
595										
				GB						Note: 597 to 602 feet drilling rate slowed considerably; cuttings contained highly indurated sands chips.
600										
										Note: At 602 feet drilling rate speeds up; cutting shows bit is back in softer shale.
605										
610										
				GB						
615										
620										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
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T - 3" O.D. thin-walled Shelby tube.
CX - CODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
625									GB	MANCOS FORMATION
630										
635										
				GB						
640										
645										
650										
655										
660										
				GB						
665										
670										
675										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
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PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				GB					GB	MANCOS FORMATION
680										
685										
				GB						
690										
695										
700										
				GB						Note: 702 to 707 feet numerous bentonite chips encountered in cuttings.
705										
710										
				GB						
715										
720										
725										

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▽			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
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PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
									GB	MANCOS FORMATION
730										
735										
				GB						
740										
745										
				GB						Note: At 747 feet sandstone chips found in cuttings.
750										
755										
760										
										Note: At 762 feet no quartz in cuttings.
765										
										Note: From 767 to 787 feet bentonite chips, 2-3-90, present in cuttings.
770										
775										
780										

GROUNDWATER

	DEPTH	HOUR	DATE
		NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
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PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
780				GB					GB	
785										
790										
				NC				RH	NC	Note: At 962 drill rods started to bounce and sandstone chips started to show up in the cuttings stopped drilling here for NC coring. Dakota Transition encountered here. Coring will begin on 10-6-90.
795				NC				FLD		Note: 792 to 795 feet wavey and lenticular bedded sandstone and 40 percent silty shale; 60 degree striated joint at 792.6 feet. Note: 794.5 to 795 feet webbed fracture zone filled with calcite; fractures approximately 60 degree.
800										796 to 801 feet mottled and burrowed sandstone and silty sh?
805				NC				CLN		801 to 806 feet Lenticular and wavey bedded sandstone. Burrowing at 802 feet.
810										808 feet 60 degree striated fracture, clean. 809 to 810 feet Conglomerate present containing shale, sandstone, and volcanic clasts.
815				NC						810.5 to 811 feet Thin lignite bed. 811 to 812 feet Bentonite clay layer.
820				NC						823 feet 2 inch bentonite clay layer.
825				NC						828 to 829 feet Bentonite clay layer.
830				NC						831 to 832 feet High anle cross

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▽			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 978

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				NC					NC	bedded sanstone (30 degrees).
835				NC						836 to 839 feet: Sandy shale, mottled and burrowed throughout.
840				NC						840 to 841 feet: Carbonaceous shale. 840 to 843 feet: Carbonaceous, black material along sandstone bedding planes.
845				NC						845 to 849 feet: Fine to medium grained horizontally bedded sandstone interbedded with thin carbonaceous shale.
850										
855				GB						Note: Water encountered at 851.3 feet. Coring stopped at 854.8 feet. 1/19/90.
860										Note: 7 7/8 inches gear bit rotary began on 1/19/90 at 792 feet.
865										DAKOTA FORMATION: sandstone and carbonaceous shale with minor coal. Sandstone chips white, quartzitic and highly indurated. Shale gray to black and highly organic.
870										
875										
880										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

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S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
CX - CODEX, downhole reverse circulation.

PROJECT CHENEY RESERVOIR LOG OF TEST BORING NO. 976

JOB NO. GRJ-03 DATE N12,299.55 E94,471.89

RIG TYPE
BORING TYPE
SURFACE ELEV. TD=932'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
885				NC					NC	DAKOTA FORMATION
890										
895										
900										
905										
910										Note: 912 feet, approximate top of Burrow Canyon Formation; green siltstone and shale.
915										
920										
925										
930										
935										Total Depth is 932 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▽			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 979

JOB NO. GRJ-03 DATE 10/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,718.9 E93,390.2
SURFACE ELEV. 5,235.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				A				SC/SM		**TOPSOIL: CLAYEY SILTY SAND,** fine sand, weak lime cementation, low plasticity, brown, moist.
								CL/ML		**SILTY CLAY - CLAYEY SILT,** silt, some coarse subrounded gravel, weak lime cementation, calichified, low to medium plasticity, pale brown, slightly moist.
5				OX						
								GP		**SANDY GRAVEL AND COBBLES,** fine to medium sand, some considerable gypsum, predominantly fine to medium subangular gravel, weak to moderately cemented, light gray brown, dry, trace of gypsum.
10								SP/SC		**CLAYEY SAND,** trace of some fine gravel, weak cementation, fine sand, low plasticity, light tan, dry, aeolian. Note: some gypsum.
								GM/GP		
15								GP		**SILTY GRAVEL AND COBBLES,** fine to medium sand, trace of clay, coarse to medium subangular gravel, weak cementation, nonplastic to low plasticity, light red brown gray, dry.
20								SH		**SANDY GRAVEL AND COBBLES,** fine to medium sand, some boulders, coarse gravel and cobbles, weak cementation, nonplastic, dry, medium to light gray.
25										**MANCOS SHALE, CLAY SHALE,** high weathered, decomposed, soft to moderately soft, some gypsum, slightly moist to

GROUNDWATER

	DEPTH	HOUR	DATE
▽	96.0	7:30pm	10-19-89
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 979

JOB NO. GRJ-03 DATE 10/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,718.9 E93,390.2
SURFACE ELEV. 5,235.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX				SH		moist, light yellow brown.
										MANCOS SHALE, CLAY SHALE, high weathered, moderately soft, slightly moist to moist, light yellow brown to brown.
30										
35										
40										
										MANCOS SHALE: CLAY SHALE, moderately to slightly weathered, moderately soft, dry, light to medium brown gray.
45										**MANCOS SHALE: CLAY SHALE,** slightly weathered to unweathered, moderately soft, dry, medium to dark gray.
50										

GROUNDWATER

	DEPTH	HOUR	DATE
▽	96.0	7:30pm	10-19-89
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 979

JOB NO. GRJ-03 DATE 10/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,718.9 E93,390.2
SURFACE ELEV. 5,235.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
				OX				SH		MANCOS SHALE: CLAY SHALE, slightly weathered to unweathered, moderately soft, dry, medium to dark gray.
55										
60										
65										
70										
75										

GROUNDWATER

DEPTH	HOUR	DATE
96.0	7:30pm	10-19-89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 979

JOB NO. GRJ-03 DATE 10/19/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,718.9 E93,390.2
SURFACE ELEV. 5,235.6'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX				SH		MANCOS SHALE: CLAY SHALE, slightly weathered to unweathered, moderately soft, dry, medium to dark gray.
80										
85										
90										
95										
100										
										Stopped Odex at 100 feet. Set monitor well with screen from 74.5 to 99.5 feet.

GROUNDWATER

DEPTH	HOUR	DATE
96.0	7:30pm	10-19-89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 980

JOB NO. GRJ-03 DATE 10/21/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,720.2 E93,400.0
SURFACE ELEV. 5,235.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classifi-cation	REMARKS	VISUAL CLASSIFICATION
0				A				ML-CL		**CLAYEY SILT - SILTY CLAY,** some gravel and cobbles, fine sand, weak lime cementation, low to medium plasticity, slightly moist, light brown.
5				OX				GM		**SILTY GRAVEL AND COBBLES,** fine to medium sand, coarse to medium subangular gravel and cobbles, weak cementation, trace of clay, nonplastic, dry, light gray brown.
10								GP-GM		**SANDY GRAVEL AND COBBLES,** fine to medium sand, coarse to medium gravel, weak cementation, nonplastic, dry, medium to light gray. Note: increased tan fine silty sand with some gypsum from 11 to 19.5 feet.
15										
20								SH		**MANCOS SHALE: CLAY SHALE,** high weathered, decomposed, soft to medium soft, moist to slightly moist, light yellow brown.
25										

GROUNDWATER

DEPTH	HOUR	DATE
80.0	7:55am	10-23-89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 980

JOB NO. GRJ-03 DATE 10/21/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,720.2 E93,400.0
SURFACE ELEV. 5,235.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX				SH		**MANCOS SHALE: CLAY SHALE,** same as above.
30										
								SH		**MANCOS SHALE,** high to moderately weathered, moderately soft, slightly moist, light yellow brown with some gray, some gypsum.
35										
40										
								SH		**MANCOS SHALE,** slightly to moderately weathered, moderately soft, dry, light brown gray to gray.
45										
								SH		**MANCOS SHALE,** slightly to unweathered, moderately soft, dry, some fine pyrite, dark to medium gray.
50										

GROUNDWATER

DEPTH	HOUR	DATE
80.0	7:55am	10-23-89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 980

JOB NO. GRJ-03 DATE 10/21/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,720.2 E93,400.0
SURFACE ELEV. 5,235.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX				SH		**MANCOS SHALE**, slightly to unweathered, moderately soft, dry, some fine pyrite, dark to medium gray.
55										
60										
65										Note: considerable pyrite and sulfurous odor from 67 to 80 feet.
70										
75										Note: no detectable H20 with gieger tube from 75 to 80 feet.

GROUNDWATER

DEPTH	HOUR	DATE
80.0	7:55am	10-23-89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 980

JOB NO. GRJ-03 DATE 10/21/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,720.2 E93,400.0
SURFACE ELEV. 5,235.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX				SH		**MANCOS SHALE**, slightly to unweathered, moderately soft, dry, some fine pyrite, dark to medium gray.
∇ 80										
85										
90										
95										
100										

GROUNDWATER

	DEPTH	HOUR	DATE
∇	80.0	7:55am	10-23-89
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 980

JOB NO. GRJ-03 DATE 10/21/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,720.2 E93,400.0
SURFACE ELEV. 5,235.2'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX				SH		**MANCOS SHALE,** slightly to unweathered, moderately soft, dry, some fine pyrite, dark to medium gray.
105										
110										Stopped Odex drilling at 110 feet at 3:13 PM on 10/23/89. Completed 2 inch monitor well with screen at 78 to 108 feet on 10/24/89.
115										
120										
125										
130										

GROUNDWATER

DEPTH	HOUR	DATE
80.0	7:55am	10-23-89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 10/21/89

LOG OF TEST BORING NO. 981

RIG TYPE Mobile B-57

LOCATION N11,732.3 E93,441.2

ELEVATION 5236.20 TD=124'

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
HSA	0										CL	**TOPSOIL, SILTY CLAY,** fine sand, some gravel and cobbles, weak cementation, low to medium plasticity, light brown, moist.
											GC/ CL	
OX	5											
											GP-GM	**CLAYEY GRAVEL AND COBBLES - GRAVELLY CLAY,** considerable silt, some boulders, fine sand, weak to moderately lime cementation, calichified, low to medium plasticity, pale brown, slightly moist.
	10											
	15											
											SP	**SANDY AND SILTY GRAVEL AND COBBLES,** trace of gypsum, medium to coarse subangular gravel, fine to medium sand, weak cementation, nonplastic, grayish brown, slightly moist.
	20										SH	
												Note: oily sample from 8 to 14 feet due to compressor oiler.
NC	25		NC	25	100	0		X	Rgh	Hiw to Mdw	SH	Note: considerable fine gravel from 8 to 10 feet.
	30		NC	5	100	0		X			SH	Note: increased sand and decreased silt from 14 to 18 feet.
	35		NC	40	100	0		X X	Rgh	Mdw to Slw	SH	**GRAVELLY SAND,** some fine subangular gravel, fine sand, weak cementation, nonplastic, tan, dry.
	40		NC	40	100	0		X	Rgh	Mdw to Slw	SH	**MANCOS FORMATION: CLAY SHALE,** highly weathered-decomposed, soft to moderately soft, trace of some gypsum, light yellowish brown, slightly moist to moist.
	45		NC	80	100	0		X	Rgh	Slw	SH	Stopped Odex drilling at 25 feet on 10-20-89, set up for NC coring.
	50		NC	60	100	0		X	Rgh	Slw to Fr	SH	**MANCOS FORMATION,** clay shale, moderately soft to moderately hard, calcareous, occasional gypsum and fossil, brown.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/21/89

LOG OF TEST BORING NO. 981

RIG TYPE Mobile B-57
LOCATION N11,732.3 E93,441.2
ELEVATION 5236.20 TD=124'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC												
	55		NC	80	100	0		X	Rgh	Fr	SH	MANCOS FORMATION: CLAY SHALE
												Note: rubblized 25 to 45 feet
	60		NC	60	100	50		X	Rgh	Fr	SH	Note: color changes to gray at 44 feet.
	65		NC	90	100	50		X XX X XX X	Rgh	Fr	SH	Note: 5 ppm H2S at 65 feet. Note: bedding dips 10 degrees.
	70		NC	40	100	0		X	Rgh	Fr	SH	Note: brownish gray at 65 to 69 feet.
	75		NC	55	100	0		X	Rgh	Fr	SH	Note: lost circulation at 77 to 80 feet.
	80		NC	50	90	5		X X	Rgh	Fr	SH	Note: blew out water at start of 79 to 84 feet run.
	85		NC	100	100	95		X	Rgh	Fr	SH	Note: pyritization of fossils at 80 feet.
	90		NC	95	100	55		X	Rgh	Fr	SH	Note: occasional sandy partings.
	95		NC	95	100	95		X	Rgh	Fr	SH	
	100		NC	70	90	70		X	Rgh	Fr	SH	Some water at 99 feet at start of run #16.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 10/21/89

LOG OF TEST BORING NO. 981

RIG TYPE Mobile B-57

LOCATION N11,732.3 E93,441.2

ELEVATION 5236.20 TD=124'

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing wide - close 1 2 3 4 5	orientation horiz. - vert. H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC	105		NC	100	95	75		?X	Rgh	Fr	SH	Note: 90 degree breaks, are probably driller related.
								X				
								X				
	110		NC	100	95	75		X	Rgh	Fr	SH	
								X				
	115		NC	90	95	90			Rgh	Fr	SH	
								X				
								X				
	120		NC	100	95	75			Rgh	Fr	SH	Note: blew out small amount of water at 119 feet.
								X				
								X				
	125											Total Depth 124 feet, no indication of moisture in last core run.
	130											
	135											
	140											
	145											
	150											
	155											

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 982

JOB NO. GRJ-03 DATE 10/22/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,711.9 E93,389.1
SURFACE ELEV. 5,235.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				OX						**SILTY CLAY - CLAYEY SILT,** some coarse subrounded gravel, weakly lime cemented (calichified), low to medium plasticity, pale brown, slightly moist.
								CL/ ML		
5										
								GP		**SANDY GRAVEL AND COBBLES,** fine to medium sand predominantly fine to medium gravel, nonplastic, weak to moderate cementation, light gray brown, dry, some considerable gypsum.
10								SP/ SC		**CLAYEY SAND,** trace of some fine gravel, fine sand (aeolian ?) weak cementation, low plasticity, tan, dry, some gypsum.
								GM/ GP		**SILTY - SANDY GRAVEL AND COBBLES,** fine to medium sand, trace of clay, coarse to medium subangular gravel, nonplastic, weak cementation, light red brown to light gray. Note: decreased silt and increased sand and boulders below 15 feet.
15										
20								SH		**MANCOS FORMATION: Clay Shale,** highly weathered-decomposed, soft to moderately soft, some gypsum, light yellow brown, slightly moist to moist. Note: Stopped 8 5/8 inch diameter Odex at 25 feet on 10/22/89 and set up for drilling with 7 3/8 inch Tricone.
25				GB						

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 10/22/89

LOG OF TEST BORING NO. 982

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX
SURFACE ELEV. 5,235.8' N11,711.9 E93,389.1
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								SH		MANCOS FORMATION: Clay Shale, moderately soft, slightly moist, calcareous, highly weathered, light brown, trace of gypsum.
30										
35										
40										
45										
50										Note: color change to dark gray, to moderately soft to moderately hard, becoming unweathered and fresh at 50 feet.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE
RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 982

JOB NO. GRJ-03 DATE 10/22/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,711.9 E93,389.1
SURFACE ELEV. 5,235.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								SH		MANCOS FORMATION: Clay Shale, moderately soft to moderately hard, calcareous, dark gray, slightly moist.
55										
60										
65										
70										Note: H2S odor at 72 feet.
75										Note: possible water at 77 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 982

JOB NO. GRJ-03 DATE 10/22/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,711.9 E93,389.1
SURFACE ELEV. 5,235.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
								SH		MANCOS FORMATION: Clay Shale, moderately soft to moderately hard, calcareous, dark gray, slightly moist.
80										
85										
90										
95										
100										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 982

JOB NO. GRJ-03 DATE 10/22/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N11,711.9 E93,389.1
SURFACE ELEV. 5,235.8'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
105								SH		MANCOS FORMATION: Clay Shale, moderately soft to moderately hard, calcareous, dark gray, slightly moist. Note: temporarily lost circulation at 105 feet. Note: can hear air bubbling in No. 963 when air is being pumped in No. 982.
110										Total Depth 110 feet.
115										
120										
125										
130										

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR

LOG OF TEST BORING NO. 983

JOB NO. GRJ-03 DATE 10/31/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,727.7 E94,102.0
SURFACE ELEV. 5,238.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				A				ML-CL		**CLAYEY SILT - SILTY CLAY,** trace of some gravel, weak lime cementation, low plasticity, pale brown, slightly moist.
5				OX				GM-GC		**CLAYEY AND SILTY GRAVEL AND COBBLES,** predominantly fine to medium subangular gravel and cobbles, weak cementation, low plasticity, pale brown, slightly moist.
10								GM		**SILTY GRAVEL AND COBBLES,** fine sand, medium to coarse gravel, weak cementation, nonplastic, light gray brown, dry.
15								GM-GP		**SANDY GRAVEL AND COBBLES,** medium to coarse gravel and cobbles, fine to medium sand, weak cementation, nonplastic, medium gray to dark gray, dry. Note: considerable sand from 14 to 16 feet.
20								GP		**SANDY GRAVEL,** fine to medium sand, fine to medium gravel, nonplastic, tan, moist.
25								GC-SC		**CLAYEY GRAVEL - CLAYEY SAND,** fine sand, fine to medium gravel, low to medium plasticity, light to medium yellow brown, moist.

GROUNDWATER

DEPTH	HOUR	DATE
22.0	11:10am	10-31-89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION
CHENEY RESERVOIR

LOG OF TEST BORING NO. 983

JOB NO. GRJ-03 DATE 10/31/89

RIG TYPE Mobile B-57
BORING TYPE HSA/ODEX N10,727.7 E94,102.0
SURFACE ELEV. 5,238.4'
DATUM MSL

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows/foot 140 lb. 30" free-fall drop hammer	Dry Density lbs. per cubic foot	Moisture Content Percent of Dry Weight	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
				OX						**MANCOS SHALE: CLAYSTONE,** highly weathered-decomposed, soft to moderately soft, moist, light yellow brown. Note: odor of natural gas from 27 to 28 feet.
30										Stopped Odex drilling at 30 feet. Installed 2 inch PVC with screen from 19.4 to 29.4 feet below top PVC Riser
35										
40										
45										
50										

GROUNDWATER

DEPTH	HOUR	DATE
22.0	11:10am	10-31-89

SAMPLE TYPE

RX - Rock Coring - NX or HX
S - 2" O.D. 1.38" I.D. tube sample.
U - 3" O.D. 2.42" I.D. tube sample.
T - 3" O.D. thin-walled Shelby tube.
OX - ODEX, downhole reverse circulation.

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57
LOCATION N11,644.6 E93,307.9
ELEVATION 5239.40 TD=802'
DATUM MSL
HOLE ORIENTED 45° FROM HORIZONTAL N45°E

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
OX	0		OX	na	na	na					ML	Clayey Silt, small sand, fine grained, rootlets, topsoil, slightly moist, red/brown.
	5		OX								GM	Silty Gravel, Clayey, angular gravels, dry, red/brown.
			OX								SM	Silty Sand, trace gravel, fine to medium sand, low plasticity, dry, tan.
	10										ML	Clayey Silt, trace gravel, angular, low plasticity, dry, tan.
	15										SM	Silty Sand, clayey, coarse to medium sand, subangular, low plasticity, tan.
											ML	Clayey Silt, trace sand, fine, medium plasticity, slightly moist, red/tan, sand fraction decreases with depth.
	20											
	25										GM	Silty Sandy Gravel, trace clay, angular gravel, medium plasticity, slightly moist, tan.
	30										SC	
											GC	Clayey Sand, Silty, medium subangular sand, medium plasticity, slightly moist, tan.
NC	35		NC	12	100	0			FLD	Hiw/Mdw		
											SH	Clayey Gravel, angular gravel, high plasticity, slightly moist, tan.
NC	40		NC	28	100	0			FLD FLD			MANCOS FORMATION: Clayey Shale, weathered Mancos, high plasticity, fissile, slightly moist, tan. Note: Total depth odex at 35 feet. Note: Unweathered Mancos encountered at 39 feet. Note: Gypsum filled bedding plan fractures 41 to 43 feet. Note: 45 degree fracture, clean, 51.5 to 52 feet.
	45											
	50											

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57

LOCATION N11,644.6 E93,307.9

ELEVATION 5239.40 TD=802'

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC			NC	25	100	0			CLN/FLD	Mdw	SH	MANCOS FORMATION:
	55											
	60							X	CLN			Note: Near vertical fracture, clean, 61 to 62 feet.
				nk	100	nk				Mdw/Slw		
	65							X	FLD			Note: Bedding plane fractures filled with gypsum from 66 to 70 feet, spaced 3 to 6 inches apart.
	70								STN/FLD			
NC			NC	53	100	41				Slw		
	75											
	80								CLN	Slw/Fr		
NC			NC	100	100	83		X				
	85											
	90							X	CLN			Note: 89 to 89.5 feet, 45 degree fracture, clean surface.
NC			NC	90	100	83						Note: Carbonaceous films on bedding plan partings from 91 to 102 feet.
	95											
	100											Note: Shell fragments on bedding plan partings at 102.5, 102.6, 103.8, and 106.2 feet.
NC			NC	100	100	88						

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57
LOCATION N11,644.6 E93,307.9
ELEVATION 5239.40 TD=802'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
	105								CLN	Fr	SH	MANCOS FORMATION:
	110											
NC			NC	83	100	70			FLD			Note: From 112 to 122 feet, bedding plan fractures filled with gypsum, fairly widely spaced.
	115											
	120											
NC			NC	100	100	100		X	FLD	SLW Fr		
	125											
	130						BROKEN	X	CLN			Note: 130.4 to 132 feet, composite 45 degree fractures produced water.
NC			NC	65	100	55						
	135											
	140											
NC			NC	78	100	65			CLN			Note: 65 degree fracture from 144 to 148 feet, clean.
	145							X	CLN			
	150											Note: Out of fractured Mancos from 150 feet on. Shale is massive, hard, thin bedded, slightly silty, calcareous, dark gray to black, and unweathered. Bedding plan parting are smooth to concoidal.
NC			NC	20	100	0		X				
	155											

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57
LOCATION N11,644.6 E93,307.9
ELEVATION 5239.40 TD=802'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
									CLN	Fr	SH	MANCOS FORMATION:
	160											
NC			NC	100	100	100						
	165											
	170											
NC			NC	90	100	92						
	175											
	180							X				Note: At 180.5 feet pyrite scattered on bedding plane parting.
NC			NC	100	100	95						
	185											
	190							X				
								X				
NC			NC	74	100	74						
	195											
NC			NC	21	100	0						
NC	200		NC	57	100	0						
	205											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57
LOCATION N11,644.6 E93,307.9
ELEVATION 5239.40 TD=802'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC			NC	100	100	100			CLN	Fr	SH	MANCOS FORMATION:
	210											
								X				
	215											
	220											
NC			NC	nk	nk	nk						
	225											
									STN			
	230								CLN/ STN			
NC			NC	70	100	nk						
	235											Note: At 237.5 feet carbonaceous material on bedding plan parting.
								X	FLD CLN			
	240											
NC			NC	80	100	nk		X				
	245											
	250											
NC			NC	80	100	nk						
	255											
	260											

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57
LOCATION N11,644.6 E93,307.9
ELEVATION 5239.40 TD=802'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
	260								CLW	Fr	SH	MANCOS FORMATION:
NC			NC	96	100	nk						
	265											
	270											
				nk	nk	nk						
	275											
	280											
	285											
NC			NC	100	100	82						
	290								FLD CLW			Note: At 291 feet bedding plane parting filled with gypsum.
	295											
												Note: Core lost to circulation from 297 to 302 feet.
	300											
NC			NC	100	100	87						
	305											Note: Shell fragments parallel to bedding at 308.1, 310.1, and 310.45 feet.
	310											Note: Clay clast present at 309.14.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57
LOCATION N11,644.6 E93,307.9
ELEVATION 5239.40 TD=802'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC			NC	100	100	99			CLN	FT	SH	MANCOS FORMATION:
	315											Note: Shell fragments along bedding at 313.1, 314, 315.9, and 320.15 feet.
	320											
NC			NC	100	100	88		X				
	325											Note: Pyrite replacement of shell fragment at 326.6 feet.
	330											Note: Shell fragments numerous along bedding planes from 327 to 350 feet.
NC			NC	100	100	82		X				
	335											
	340											
NC			NC	100	100	97		X				
	345											
	350											
NC			NC	99	100	95		X				
	355											
	360											
NC			NC	90	100	85						

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57

LOCATION N11,644.6 E93,307.9

ELEVATION 5239.40 TD=802'

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition CLN	weathering Fr	lithology SH	Rock Type & Remarks
	365											MANCOS FORMATION:
	370											
NC			NC	90	95	98						Note: 371.2 to 373.0 feet intermittent gypsum veins 1 to 2 mm wide. Approximately 2 percent pyrite in fine grained dark gray matrix.
	375											
	380											
NC			NC	90	95	98						
	385							X				
	390							X				
NC			NC	100	100	100						
	395							X				
	400											
NC			NC	100	100	98						
	405							X				
								X				
	410							X				
NC			NC	100	81	100						Note: 11/29/89, 200 gallons of drilling mud lost to formation.
	415							X				

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57

LOCATION N11,644.6 E93,307.9

ELEVATION 5239.40 TD=802'

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (1 2 3 4 5 wide - close)	DISCONTINUITIES orientation (H 45 V horiz. - vert.)	condition (CLN)	weathering (FR)	lithology (SH)	Rock Type & Remarks
												MANCOS FORMATION:
	420											
NC			NC	100	78	98						
	425											
	430											Note: 429.1 to 432.0 feet pyrite vein approximately 3 mm wide and 1.5 inches long following bedding.
NC			NC	88	83	100						
	435											
	440											
NC			NC	94	98	100						
	445											
	450											
NC			NC	95	100	40						Note: From 450.2 to 460 feet core highly broken up.
	455											
	460											
NC			NC	100	100	100						
	465											Note: 1/2 inch wide light gray clay layer, moderately hard.

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57
LOCATION N11,644.6 E93,307.9
ELEVATION 5239.40 TD=802'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
								X	CLN	Fr	SH	MANCOS FORMATION:
NC	470		NC	100	100	98						
	475							X X				
NC	480		NC	100	90	95						Note: 481 to 491 feet, sparse shell fragments, < 1 mm wide and < 3/4 inches long present along bedding.
	485							X X				Note: From 481 to 491 feet, 75 gallons of drilling fluid lost to formation.
NC	490		NC	100	96	100						
	495											
NC	500		NC	100	98	100		X				
	505											
NC	510		NC	60	100	0						
	515											
	520											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57
LOCATION N11,644.6 E93,307.9
ELEVATION 5239.40 TD=802'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
	520								CLN	Fr.	SH	
NC			NC	94	100	100		X				MANCOS FORMATION:
	525											
	530							X				
NC			NC	100	100	100						Note: At 530 feet softer shale encountered. 530 to 540 feet shell fragments occur along bedding planes.
	535											
	540							X				
NC			NC	100	100	100						
	545											
	550											
NC			NC	100	90	100						
	555											
	560							X				
NC			NC	99	100	98		X				
	565											
	570											Note: At 571 feet, a 2 inch section of core contains material resembling fault gouge.
NC			NC	100	100	96						

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57
LOCATION N11,644.6 E93,307.9
ELEVATION 5239.40 TD=802'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition CLN	weathering Fr	lithology SH	Rock Type & Remarks
												MANCOS FORMATION:
	575											Note: At 576.9 feet calcareous sands were encountered interbedded with shale. Sands range in thickness from 1 mm to 4 inches.
	580											
NC			NC	100	100	100						
	585											
	590											
NC			NC	100	96	100						
	595											
								X				
	600											
NC			NC	100	94	100						
	605											
								X				
	610											
NC			NC	100	98	95						Note: 612 to 620 feet, scattered shell fragments parallel to bedding.
	615											
	620											
NC			NC	100	100	99						

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57

LOCATION N11,644.6 E93,307.9

ELEVATION 5239.40 TD=802'

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
	625								CLN	FT	SH/SS	MANCOS FORMATION:
	630											
NC			NC	100	100	100						
	635											
	640											Note: At 640 feet very distinct 2 inch wide sand layer, calcareous and fine grained.
NC			NC	100	100	100		X				
	645											
	650							X				
NC			NC	100	100	100						Note: At 651 feet no shell fragments present along bedding. Intermittent sand layers still encountered.
	655											
	660											
NC			NC	100	100	100						
	665											
	670											
NC			NC	99	100	98						
	675							X				

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57
LOCATION N11,644.6 E93,307.9
ELEVATION 5239.40 TD=802'
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
									CLN	Fr	SH/SS	MANCOS FORMATION:
	680											
NC			NC	100	100	92						
	685							X				
	690											
NC			NC	100	100	94						Note: At 692 to 702 feet calcareous sands illustrate crossbedding and penecontemporaneous deformation.
	695											
	700							XX				
NC			NC	97	100	98		X X				
	705											Approximate interface with DAKOTA FORMATION: at 710 feet.
	710											
NC			NC	94	100	90						Note: 712 to 722.7 feet, interbedded sandstone and shale, undulating bedding, sandstone beds 1 to 5 mm thick, light brown, fine grained, shell fragments along bedding.
	715											
	720											
NC			NC	94	100	85						Note: 722 to 732 feet, interbedded sandstone and shale sandstone fine to medium grained, 3 to 7 mm thick, white, lenticular and wavey bedding present.
	725											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57

LOCATION N11,644.6 E93,307.9

ELEVATION 5239.40 TD=802'

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close: 1 2 3 4 5)	DISCONTINUITIES orientation (horiz. - vert.: H 45 V)	condition	weathering	lithology	Rock Type & Remarks
									CLN	Fr	SH/SS	DAKOTA FORMATION:
	730											
NC			NC	100	100	83						Note: Shell fragments along bedding at 726.6 feet. Ammonite fossil encountered at 727.6 feet.
	735											Note: Unusually large shell fragments at 735.76 feet.
	740											Note: At 736 and 736.6 feet unusual fossils with plantlike structures along bedding.
NC			NC	100	100	88						Note: Fossile fragments decrease in frequency of occurrence from 742 feet on.
	745											
	750											
NC			NC	100	98	100						
	755											
	760											
NC			NC	100	100	100						
	765											Note: Prominent 4 inch thick sand layer at 768.5 feet.
	770											Note: Fine grained very thin sand layers from 771.5 to 793.1 feet; sandy shale present to total depth.
NC			NC	100	100	100						
	775											
	780											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE 11/4/89

LOG OF TEST BORING NO. 984

RIG TYPE Mobile B-57

LOCATION N11,644.6 E93,307.9

ELEVATION 5239.40 TD=802'

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close: 1 2 3 4 5)	DISCONTINUITIES orientation (horiz. - vert.: H 45 V)	condition	weathering	lithology	Rock Type & Remarks
	780								CLN	Fr	SH/SS	DAKOTA FORMATION:
NC			NC	100	100	100						
	785											
	790											
NC			NC	100	100	100						Note: Sandy shale is fissiliferous from 793 feet to total depth at 802 feet.
	795											
	800											
	805											Total depth is 802 feet.
	810											
	815											
	820											
	825											
	830											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57

LOCATION N11,706.8 E93,348.9

ELEVATION 5235.00 TD=710.5

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
HSA	0			na	na	na			NA		SM	Silty Sand, trace gravel, fine grained sand fraction, nonplastic, dry.
OX	5		OX	na	100	na					SM/GP	Silty Sand, Gravelly, fine grained sand fraction, gravel consists of basalt clasts 1-4 mm in diameter, nonplastic, dry.
	10											
											GM	Silty Gravel, nonplastic, dry.
	15			99	100	98						
	20										GC	Clayey Gravel, clay fraction displays medium plasticity, slightly moist, tan.
	25											
											CL	MANCOS FORMATION: Clay Shale, highly plastic, fissile, slightly moist, tan.
NC 0.71	30		NC	38	100	0			CLN FLD			
											SH	Shale, slightly silty, slightly weathered, fissile, calcareous, light brown to gray.
	35								NA			Note: 30 to 35 feet, fractures oriented zero to 5 degrees, 2 to 7 mm thick, filled with gypsum.
	40		NC	68	100	30						Note: 40 to 50 feet, limonite staining occurs along bedding planes. 2 mm fracture filled with gypsum, parallel to bedding at 46 feet.
	45								FLD NA			
	50											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57
LOCATION N11,706.8 E93,348.9
ELEVATION 5235.00 TD=710.5
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing wide - close 1 2 3 4 5	orientation horiz. - vert. H 45 V	condition	weathering	lithology	Rock Type & Remarks
NC 0.77			NC	100	100	87			NA		SH	MANCOS FORMATION:
	55											
NC 0.83	60		NC	85	100	70						Note: 60 to 70 feet, fossil shells, fragments and whole, occur along bedding planes. Pyrite sporadic along bedding.
	65											
NC 0.91	70		NC	100	100	85			FLD			Note: First 0.2 feet of 70 to 80 foot corerun is wet. Rest of corerun dry. Fractures parallel to bedding filled with gypsum throughout run. 1/2 inch thick sand bed at 79 feet. Mancos shale unweathered from 75 feet on.
	75											
NC 0.83	80		NC	98	100	88			NA		SS SH	
	85											
NC 0.77	90		NC	68	100	37						Note: 90 to 100 foot core run wet.
	95											
NC 0.77	100		NC	1	25	0						Note: Virtually no core recovered from 100 to 110 foot run. This is due to the presence of water in the hole. Air circulation is reduced and NC bit

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
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GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57
LOCATION N11,706.8 E93,348.9
ELEVATION 5235.00 TD=710.5
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
	105								NA		SH	MANCOS FORMATION:
												tears up formation. At this point will rotary with 7 1/4 inch bit to 135 feet and case and grout off water bearing zones in shallow Mancos.
GB	110		GB	na	100	na						
	115											
	120											
												Note: 4 inch casing installed and grouted to 135 feet in 7 1/4 inch open borehole by end of day, 1/2/90 after four day break.
	125											
	130											
NC 0.77	135		NC	100	100	90		X	NA	Fr	SH	Note: 1/2/90 begin coring, 135 feet.
												Note: shale, slightly silty, calcareous, fissile, shell fragments parallel to bedding, moderately hard, dark gray.
NC 0.71	140		NC	100	100	78		X				
	145								FLD NA			Note: 2 mm gypsum vein at 147 feet.
NC 0.71	150		NC	91	100	61		X	FLD NA			Note: Calcite vein parallel to bedding at 151.5 feet.
	155										SH	

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57
LOCATION N11,706.8 E93,348.9
ELEVATION 5235.00 TD=710.5
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
									NA	Fr		MANCOS FORMATION:
NC 0.77	160		NC	100	100	79		X				Note: 160 to 170 feet, shale, massive, moderately hard, dark gray to black; no shell fragments present at this depth.
	165											
NC 0.77	170		NC	100	100	85		X				
	175								FLD NA			Note: Calcite vein parallel to bedding at 177 feet.
NC 0.71	180		NC	97	100	74		X				
	185											
NC 0.67	190		NC	100	100	90		X				
	195											
NC 0.71	200		NC	98	100	92		X				
	205											

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57
LOCATION N11,706.8 E93,348.9
ELEVATION 5235.00 TD=710.5
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
									NA	Fr	SH	
NC 0.5	210		NC	20	100	0		X				MANCOS FORMATION:
NC 0.71			NC	100	100	65						Note: Lost air circulation at 212 to 213 feet. Removed core barrel and recovered 0.5 feet of core. Circulation regained after removing core barrel.
	215											
	220		NC	21	100	11		X				Note: Pyrite present along bedding from 212 to 220 feet.
	225											
NC 0.67			NC	45	100	0						
NC 0.71	230		NC	94	100	27		X				
	235											
NC 0.67	240		NC	92	100	64		X				
	245											
NC 0.71	250		NC	90	100	78		X				
	255											
	260											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57
LOCATION N11,706.8 E93,348.9
ELEVATION 5235.00 TD=710.5
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1	2	3	4	5	orientation (horiz. - vert.) H	45		V	condition	weathering	lithology	Rock Type & Remarks
NC 0.77	260		NC	100	100	70						X				NA		SH	MANCOS FORMATION:
	265																		
NC 0.71	270		NC	94	100	55						X							Note: Last 5.1 feet of 270 to 280 corerun were wet. Will need to blow hole dry before next run.
	275																		
	280		NC	76	100	21						X							
	285																		
	290		NC	98	100	90						X							
	295																		
NC 0.77	300		NC	95	100	76						X							
	305																		
NC 0.71	310		NC	98	100	63						X							

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57
LOCATION N11,706.8 E93,348.9
ELEVATION 5235.00 TD=710.5
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
									NA	Fr	SH	MANCOS FORMATION:
	315											
	320								NA			320 to 322 feet: Missing footage.
NC 0.76			NC	87	100	71		X	NA			Note: From 322 to 332 feet pyrite disseminated along bedding.
	325											
	330											Water encountered at 331 feet. Water zone was grouted off and coring continued with smaller NX bit on 1/19/90.
NX 0.67			NX	92	100	71		X				
NX 0.59	335		NX	30	60	62		X				
NX 0.56			NX	84	100	0		X				
0.53			NX	6	100	0						Note: From 339 to 340 feet shell fragments present parallel to bedding. Also, calcite crystals present, across bedding planes, in this interval.
0.34	340		NX	90	100	40		X				
NX 0.43			NX	96	100	77		X				
	345											Note: Fault gouge from 339 to 339.6 feet.
	350											
NX 0.38			NX	93	100	61		X				Note: From 351 to 361 feet shell fragments parallel to bedding.
	355											Trace pyrite in shell matrix.
	360											
NX 0.36			NX	85	100	34		X				Note: From 361 to 371 feet shell fragments parallel to bedding.

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
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NX,HX - Conventional Rock Coring
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PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57
LOCATION N11,706.8 E93,348.9
ELEVATION 5235.00 TD=710.5
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
	365								NA	Fr	SH	MANCOS FORMATION:
	370											
NX 0.48			NX	80	100	37		X				
	375											
											SH/ SS	
	380											Note: From 379 to 401 feet calcareous sands 1 to 4 mm thick are present; shell fragments parallel to bedding.
NX 0.56			NX	100	100	66		X				
	385											
	390							X				
NX 0.53			NX	93	100	20						
	395											
	400											
NX 0.48			NX	87	100	70		X				Note: From 401 to 421 feet frequency and thickness of calcareous sand layers decreases. Shell fragments still occur parallel to bedding.
	405											
	410							X				
NX 0.48			NX	96	100	28						
	415											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION
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GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57

LOCATION N11,706.8 E93,348.9

ELEVATION 5235.00 TD=710.5

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
									NA	Fr	SH/SS	MANCOS FORMATION:
	420											
NX 0.46			NX	94	100	49		X				Note: From 421 to 451 feet calcareous sand layers increase in frequency and thickness. Sand layers range from 1 to 3 1/2 inches thick.
	425											
	430											
NX 0.40			NX	89	100	24		X				
	435											
	440											
			NX	84	100	35		X				Note: Shale fraction of 441 to 451 foot corerun darker than previous runs. The shale is carbonaceous.
	445											
	450											
NX 0.34			NX	36	100	0		X			SH	Note: Only 36 percent core recovery from 451 to 461 foot core run. Core recovered was a clayey shale, very soft, fissile and slightly moist. Circulation reduced by 50 percent at 461 feet.
	455											
	460											
NX 0.30			NX	93	50	76		X				Note: 461 to 464 foot core run consists of moderately hard massive Mancos shale.
NX 3.7	465		NX	100	100	52						

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
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GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57
LOCATION N11,706.8 E93,348.9
ELEVATION 5235.00 TD=710.5
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
									NA		SH/	
	470									Fr	SS	MANCOS FORMATION:
								x			SH/	
			NX	75	100	23					SS	Note: Light gray fine sandy zone from 471 to 471.2 feet.
NX 2.3	475		NX	52	100	20						Note: 475.2 to 477 feet numerous light gray fine sand beds 10 to 50 mm thick.
	480											
NX 5.0			NX	86	100	18		x				
NX 5.6	485		NX	68	100	20					SH	Note: 485.2 to 486.5 feet fissile and shaley.
											SH/ SS	
	490											Note: Buck in sandy shale at 487 feet.
	495		NX	25	100	0						Note: Perched water encountered at 492 feet.
NX 4.0	500		NX	82	100	58		x x				
	505											
	510		NX	97	100	94		x				
	515											
	520											

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION
HSA - 6.5" Hollow Stem Auger
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PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57

LOCATION N11,706.8 E93,348.9

ELEVATION 5235.00 TD=710.5

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
NX 1.0	518		NX	100	100	100		X	NA		SH/ SS	MANCOS FORMATION:
										Fr		
	525											
	530		NX	93	100	91		X				
	535											
NX 1.0	540		NX	100	100	95		X				Note: Carbonaceous shale encountered from 540 to 540.5 feet.
	545											
	550							X				
	555							X	NA CLN NA			Note: Joint encountered at 555.7 feet. Inclined 60 degrees from the horizontal. No gouge or striations present on surface. Surface is smooth and clean.
	560										SH	Note: Out of sandy zone and back into shale at 560 feet.
	565											
	570		NX	100	100	86						

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR
JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57
LOCATION N11,706.8 E93,348.9
ELEVATION 5235.00 TD=710.5
DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	DISCONTINUITIES orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
									NA	Fr	SH/SS	MANCOS FORMATION:
	575							X	NA RH NA			Note: At 576 feet small fault encountered, inclined 40 degrees from the horizontal. Striations present on surface.
NX 0.90	580		NX	95	100	76						
	585											
NX 1.0			NX	92	100	100						Note: Core tube blocked off at 586 feet.
	590		NX	99	100	98						
	595											
	600		NX	100	100	90		X				
	605								RH NA			Note: At 603.5 feet striations were encountered on 30 degree inclined cone shaped surfaces. Fracture zone is approximately 0.3 feet long.
	610		NX	100	100	71						
	615											
	620		NX	94	100	66						

GROUNDWATER

	DEPTH	HOUR	DATE
▽		NONE	
▼			

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57

LOCATION N11,706.8 E93,348.9

ELEVATION 5235.00 TD=710.5

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close 1 2 3 4 5)	orientation (horiz. - vert. H 45 V)	condition	weathering	lithology	Rock Type & Remarks
	625								NA	Fr	SH	MANCOS FORMATION:
									NA			
NX 1.0	630		NX	100	100	80		X	SM			Note: From 630 to 631.5 feet a highly fractured zone was encountered. No striations were found but several surfaces were highly polished. Surfaces are inclined approximately 25 degrees from the horizontal.
									NA			
	635											
	640		NX	94	100	93						
	645											
	650		NX	100	100	89						
								X	NA			Note: At 653.6 feet a striated surface inclined 30 degrees from the horizontal was encountered.
									RH			
									NA			
	655											
NX 0.91	660		NX	97	100	87						
								X	NA			Note: At 664 feet a striated surface inclined 30 degrees from the horizontal was encountered.
									RH			
	665								NA			
NX 1.0	670		NX	100	100	90						
									NA			Note: At 674.8 feet a surface inclined 50 degrees from the horizontal was encountered.
								X	SM			
	675								NA			

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

PROJECT GRAND JUNCTION CHENEY RESERVOIR

JOB NO. GRJ-03 DATE

LOG OF TEST BORING NO. 986

RIG TYPE Mobile B-57

LOCATION N11,706.8 E93,348.9

ELEVATION 5235.00 TD=710.5

DATUM MSL

Boring Operation and Drill Rate (min/ft)	Depth in Feet	Sample	Sample Type	% core recovery	% drilling fluid recovery	rock quality designation	DISCONTINUITIES spacing (wide - close) 1 2 3 4 5	orientation (horiz. - vert.) H 45 V	condition	weathering	lithology	Rock Type & Remarks
									CUN	Fr	SH	MANCOS FORMATION:
NX 1.0	680		NX	100	100	100						
	685											
	690		NX	100	100	86						Note: At 692.5 to 693 feet a highly fractured zone was encountered. At 693 feet the rock changed color to a chalky white. This one foot zone had a calcite crystalline matrix.
	695											Note: At 694 feet a 3 inch layer of bentonite was encountered.
NX 0.67	700		NX	95	100	89						Note: From 695 feet to a total depth of 710.5 feet, typical Mancos shale, fissile, calcareous, slightly silty, moderately hard, dark gray.
	705											
	710											Total Depth equals 710.5 feet.
	715											
	720											
	725											

GROUNDWATER

DEPTH	HOUR	DATE
	NONE	

BORING OPERATION

HSA - 6.5" Hollow Stem Auger
C - 4.5" Continuous Flight Auger
GB - Tricone (Gear Bit)
NX,HX - Conventional Rock Coring
NQ,HQ - Wireline Rock Coring

SOIL BORING LOG

Boring No. E15-03-6
Page 6 of

Job No.
Name
Location
Client

Date 2-21-96 Rig
Crew
Logger
Weather
Site Conds.

Dia Elev
Location
Total Depth
Depth to H_2O
Stabilized H_2O
Date

Visual Description and Drilling Notes	Graph	Sample Info	% -200	% +4	Max Size	Plas	Dens Cons	Mois
0 ≈ 1'; upper clayey soil								
cobbles from 1' on								
SC matrix; sandy,			35-45	15	small bulders	L		D
clayey, low plastic, mostly								
fine, red brn, brn, clay		sample from	~	41				
larger cobbles to bulders (volcanic, sandstone)								
with depth;		drilling						
(35-40% +4 from 5')								
Picking up a green brown								
CL matrix from ~9.0'								
Refusal at 10.5'								
large bulder in bottom								

SOIL BORING LOG

Boring No. CRS-03-627
Page 5 of
Dia Elev
Location

Job No.
Name
Location
Client

Date 2-21-92 Rig
Crew
Logger KEM
Weather
Site Conds.

Total Depth
Depth to H_2O
Stabilized H_2O
Date

Visual Description and Drilling Notes	Graph	Sample Info	% -200	% +4	Max Size	Plas	Dens Cons	Mois
0 - 20'								
Reddish brown sandy clay fill								
20' — 115'								
SC; sandy, poorly graded, mainly fine, light red brown to red brown, clay		Sample ~4'	45+					
cobbly (10%)								
higher % of cobble (3"-6") from 5' (20-25%)								
boulders from 5.0'								
large boulders (3'-4' dia)								
predominantly small to large boulders on this pit								
from 5'.0 Difficult excavation		(60% + of material is cobble to boulder size)						
Refusal at 11.5'								
large boulders								

No H2O

SOIL BORING LOG

Test Pit

Boring No. 65-03-626
Page ____ of ____
Dia ____ Elev ____
Location ____

Total Depth ____
Depth to H_2O ____
Stabilized H_2O ____
Date ____

Job No. ____
Name ____
Location ____
Client ____

Date 2-21-86 Rig Backhoe
Crew ____
Logger RJM
Weather ____
Site Conds. ____

Visual Description and Drilling Notes	Graph	Sample Info	% -200	% +4	Max Size	Plas	Dens Cons	Mois
0 - 3.0'								
Qc; CL, clay, low plastic, sandy, brown, silt, dry hard brown			75	-	c.s	L	S	
3' — 16.0'								
Qc; SC, sand, pg., lg. gr br, clayey, low plastic, dry & damp			35					
picking up coarse volcanic cobbles & boulders from 3' - 6' 3' dia. boulders from ~ 6'		Material is heterogeneous SC & CL; sandy		+ 25+	Sample from ~8'			
Material is roughly 20-25% cobbles & boulders		Test 1 bucket gravel sample from each pit; sample approx 3'-4' Run Gradation in field, discard						
smoothed out at 16.0' CL; clay, residual soil,								
16.0' - 17.5' Residual Soil. CL clay low plastic, light gr br, lg. v. stiff, dry								

T.D 17.5 No H_2O

SOIL BORING LOG

Boring No. [illegible]
Page 4 of
Dia Elev
Location

Job No.
Name
Location
Client

Date [illegible] Rig
Crew
Logger
Weather
Site Conds.

Total Depth
Depth to H_2O
Stabilized H_2O
Date

Visual Description and Drilling Notes	Graph	Sample Info	% -200	% +4	Max Size	Plas	Dens Cons	Mois
0 — 2.0'								
upper bilbal brown sandy clay soil			65					
2.0' — 15.0'								
CL; clay, low plasticity, gr'ln, v.stiff, damp, sandy, scattered cobbles			85			Lm	v.stiff	dp
10% cobbles, larger boulders at 10'								
mainly fine grained clay and highly calcareous and/or sulfates								
large boulders at 11.0' (3' dia.)								
higher pct. of boulders from [illegible]								
large boulder at 15.0'								
Refusal								
T.D. 15.0' No H_2O								

SOIL BORING LOG

Boring No. 65J-03-623
Page ____ of ____
Dia ____ Elev ____
Location ____

Job No. ____
Name ____
Location ____
Client ____

Date 7-21-86 Rig ____
Crew ____
Logger RJM
Weather ____
Site Conds. ____

Total Depth ____
Depth to H_2O ____
Stabilized H_2O ____
Date ____

Visual Description and Drilling Notes	Graph	Sample Info	% -200	% +4	Max Size	Plas	Dens Cons	Mois
0 ≈ ¢'			65	5	small boulder	L	S	D
Qc ; CL, clay, low plastic, sandy, red br, soft, dry scattered large boulders from surface			Sample	from	~	2'-3'		
¢' – 16.5'								
Qc ; CL, sandy to SC, clayey sand to sandy clay, gr br, firm to stiff, dry to damp, larger % of cobble to boulder sized material from ~6'			45-75	20	small boulders	L	firm to stiff	dry to dp
			Sample	from	~	7'-8'		
Coarser cobbles and boulders with depth (35% of sample) 3' diameter max. (5-10% of coarse fraction 6"-9")								
16.5' – 17.5'								
Residual Soil (R) ; CL, clay low to med plastic, gr br, hard, dry								

SOIL BORING LOG

Boring No. CCT-03-001

Page ____ of ____

No. ____ Date 2-2-96 Rig ____ Dia ____ Elev ____

Name ____ Crew ____ Location ____

Logger ____

Location ____ Weather ____ Total Depth ____

Depth to H_2O ____

Client ____ Site Conds. ____ Stabilized H_2O ____

Date ____

Visual Description and Drilling Notes	Graph	Sample Info	% -200	% +4	Max Size	Plas	Dens Cons	Mois
0 – 4'								
Qc; CL, clay, low plastic, silty, sandy, red brown, soft to firm, damp								
4' – 13.0'								
Qc; CL, clay, low plastic, sandy, green brown, v. stiff, to hard, cobbly 10-15% cobbles, much less than 623 or 626		45-65 Sample ~8.0'						
13.0' – 16.0'								
Rock Qs; CL, clay, low to med plastic, green br, v. stiff to hard, dp to moist		Sample	13.0'	–	16.0'			
T.D. 16.0'								

no H_2O

SOIL BORING LOG

Boring No. GT-03 - 619
Page ____ of ____
Dia ____ Elev ____
Location ____
Total Depth ____
Depth to H_2O ____
Stabilized H_2O ____
Date ____

Job No. ____
Name ____
Location ____
Client ____

Date 2-21-86 Rig ____
Crew ____
Logger RM
Weather ____
Site Conds. ____

Visual Description and Drilling Notes	Graph	Sample Info	% -200	% +4	Max Size	Plas	Dens Cons	Mois
0 — 13.0'								
Qa CL; clay, low plastic, sandy, soft to, dry to moist, scattered large cobbles (5%)		Sample 13.' -16'						
coarser scattered boulders (angular to subangular) from 6' in a green brown CL matrix								
Large subang-subrnd boulders (basaltic) at 10½'; difficult excavation								
13.0' — 14.0'								
Rock other than CL; clay, low plastic, gritty, some mottling, highly calcareous, carbonate, hard, damp								

Boring No. 65-03-6A
Page ____ of ____
Dia ____ Elev ____
Location ____

Job No. ____
Name ____
Location ____
Client ____

Date 2-21-81 Rig ____
Crew ____
Logger GTM
Weather ____
Site Conds. ____

Total Depth ____
Depth to H_2O ____
Stabilized H_2O ____
Date ____

Visual Description and Drilling Notes	Graph	Sample Info	% -200	% +4	Max Size	Plas	Dens Cons	Mois
0 — 2.0'								
QC; cc, clay, L.R., sandy, mottled, stiff, damp, subrounded cobbles to 6" but;		two buckets taken at 5.0'	65	5	s. with	L	stiff	dp
larger subrounded boulders from 4.0' to 2.0'								
in a very fine dry silt to sandy clay matrix			65					
change at 12.0' to 12' —								
olive gray stiff CC; clay, L.R., mottled, hard, dry, high sulfate and/or Calcite = subangular, large gravels to to rounded, cobbles								

Boring No. 6R-03-617
Page ____ of ____
Dia ____ Elev ____
Location ____
Total Depth ____
Depth to H_2O ____
Stabilized H_2O ____
Date ____

Job No. ____
Name ____
Location ____
Client ____

Date 2-21-01 Rig ____
Crew ____
Logger ____
Weather ____
Site Conds. ____

Visual Description and Drilling Notes	Graph	Sample Info	% -200	% +4	Max Size	Plas	Dens Cons	Mois
0 – 1.5'								
CL; lt br, sandy, sandy topsoil								
1.5' – 9.0'								
SC; sand, pl, lg, low plasticity, clayey picking up fine to coarse angular boulders from 2'; difficult excavation (40% +) +4 ≈ +3'			35 to plastic	40+				
clayey matrix (CL) from 9'0; ~~old Qa~~ older Alluvium from 9.0'								
9.0' – 14.0'								
older Alluvium; CL, clay matrix large rounded gravels to cobbles, gr br, low plastic, sandy,	(2'-6")	TS-80 in ablin Sample	20 (14)	~10'				
TD 14.0'								

No H2O