STATE OF COLORADO

DIVISION OF RECLAMATION, MINING AND SAFETY
Department of Natural Resources

1313 Sherman St., Room 215
Denver, Colorado 80203
Phone: (303) 866-3567
FAX: (303) 832-8106

COLORADO DIVISION OF RECLAMATION MINING & SAFETY

December 23, 2008

Ms. Christina Progess
Superfund Project Manager
US EPA, Region VIII
1595 Wynkoop St. (EPR-SA)
Denver, Colorado 80202

RE: Standard Mine Drilling Report

Dear Ms. Progess:

Attached is a copy of the Standard Mine drilling report prepared by our contractor, Shannon and Wilson. The report summarizes the drilling activities conducted at the Standard Mine vicinity in the fall of 2008.

A number of groundwater monitoring wells were completed at the site, in order that water elevations can be measured in the future. A core hole was also completed at the site. This hole was sited in an attempt to intersect the mine void however, it was not encountered. Photos of the core return are included in the report. I understand that the physical core samples have been delivered to you already.

Once you review the report, please feel free to contact me if you have questions or comments.

Sincerely,

Steve Renner
Senior Project Manager / Geologist
Colorado Inactive Mines Reclamation Program
101 South 3rd Street Room 301
Grand Junction Colorado 81501
970-241-0336

cc: Jeff Graves, DRMS
Jim Lewis, CDPHE

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
PORTLAND
FAIRBANKS
ANCHORAGE
DENVER
SAINT LOUIS
SACRAMENTO
JACKSONVILLE

November 18, 2008

Colorado Division of Reclamation, Mining & Safety
101 South 3rd Street, Room 301
Grand Junction, Colorado 81501

Attn: Mr. Steve Renner

RE: STANDARD MINE DRILLING PROJECT, GUNNISON COUNTY, COLORADO

We are pleased to submit our geotechnical data report for the above-referenced project. The enclosed report summarizes drilling activities and monitoring well installations completed at the Standard Mine Superfund site, September 30 to October 7, 2008.

We appreciate the opportunity to be of service to you on this project. If you have any questions or require further information, please contact me at 303-825-3800.

Sincerely,

SHANNON & WILSON, INC.

Beth L. Widmann, P.G.
Senior Principal Geologist

BLW/blw

Enclosure: Geotechnical Data Report

1100 BANNOCK STREET, SUITE 200
DENVER, COLORADO 80204
PHONE 303-825-3800
FAX 303-825-3801
www.shannonwilson.com

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GEOTECHNICAL DATA REPORT
STANDARD MINE DRILLING PROGRAM
CO DIVISION OF RECLAMATION, MINING & SAFETY
GUNNISON COUNTY, COLORADO

1.0 INTRODUCTION

This report summarizes our drilling activities and installation of groundwater monitoring wells at the Standard Mine Superfund site near the town of Crested Butte in Gunnison County, Colorado. Our work was completed in accordance with our signed task order agreement with the Colorado Division of Reclamation, Mining & Safety, dated September 25, 2008. Our scope of work under this task order included rotary and core drilling and installation of monitoring wells, but did not include laboratory testing, geotechnical engineering analysis, or design recommendations.

2.0 PROJECT AND SITE DESCRIPTIONS

The U.S. Environmental Protection Agency (EPA) and the Colorado Department of Public Health and the Environment (CDPHE), through contract to the Colorado Division of Reclamation, Mining & Safety (DRMS), are interested in remediating poor quality water that is discharged from the Standard Mine site. The purpose of the Standard Mine Drilling Project was to install groundwater observation wells, report on observed geologic and groundwater conditions, and obtain core samples at the mine site to better understand how water migrates through the native rock and underground mine workings.

The Standard Mine is located approximately 4.5 miles west-northwest of Crested Butte in Gunnison County, Colorado (Figure 1). The mine produced lead, zinc, silver, and gold from the late 1800s through 1966 when the mine was abandoned. The Standard Mine workings generally follow the Micawber/Standard Fault, a northeast-southwest trending mineralized fault that dips approximately 55° to the southeast. The fault offsets the Ohio Creek Formation (primarily friable sandstone, lesser siltstone and shale) on the northwest from the Wasatch Formation (silicified conglomerate, sandstone, siltstone, and mudstone) on the southeast.

3.0 FIELD EXPLORATIONS

On September 4, 2008, Matt Thomas (Shannon & Wilson) and Steve Renner (DRMS) made a preliminary visit to the site to assess site conditions and determine drill rig accessibility. Upon determining adequate access and obtaining necessary permissions, a drilling program was initiated. Based on the remote location of the site and on detailed study of the site by DRMS and other partner agencies, DRMS indicated that there were no utilities in the immediate vicinity. Therefore, we did not initiate a utility locate for this project.

3.1 Borings

Shannon & Wilson evaluated subsurface geologic and groundwater conditions at the site by drilling eight borings, designated B-1 through B-8, over a nine-day period from September 30 through October 7, 2008. Boring locations were selected by DRMS and CDPHE staff and are shown on Figure 2. Latitude and longitude coordinates were obtained using a standard hand-held Global Positioning System (GPS) device accurate to within about 15 to 30 feet.

Drilling at the Standard Mine was completed by Precision Sampling, Inc., of Colorado Springs, Colorado, under subcontract to Shannon & Wilson. Seven of the eight borings (B-1 through B-7) were completed by rotary drilling, which was advanced using the ODEX air rotary method with a 5-inch-outside diameter (O.D.) downhole air hammer powered by a track-mounted CME-55 drill rig. Borings B-1 and B-5 were drilled to depths of approximately 60 feet. The remaining borings were drilled to depths ranging from approximately 13 to 20 feet.

An eighth boring (B-8) was completed by core drilling, which was accomplished with a Boart Longyear α10 diamond surface bit powered by the CME-55 rig. DRMS estimated that the ceiling of the mine workings might be breached from the surface by drilling to an approximate depth of 176 feet. The core hole was extended to a depth of 190 feet in anticipation of reaching the mine workings. However, no such voids were encountered. We understand that, if encountered, the bore hole would potentially have been used for lowering a camera into the mine void.

Matt Thomas (Shannon & Wilson) observed soil/rock cuttings and prepared a field log for each boring (Appendix A). The boring logs represent our interpretation of subsurface conditions based on observations made in the field. The cuttings generated by the rotary process were visually classified in accordance with the classification systems shown on Figures A-2 and A-3

for soil and rock, respectively. However, in most case, the rotary cuttings proved to be too fine for detailed visual classification, and therefore, classifications were supplemented with geologic information observed in nearby outcrops and/or provided to us by DRMS.

Elevations at each boring location, as shown on the individual boring logs, were estimated from topographic maps to the nearest contour, or 40 feet. These elevations are approximate and should be considered accurate to the degree implied by the method used.

Soil/rock samples were not collected from the rotary borings. Rock core collected from the cored boring was boxed and transported back to our Denver office for transfer to EPA personnel. Photos of each core box are provided in Appendix B. At the request of DRMS, and in accordance with our scope of work, no further analysis or testing was completed.

3.2 Groundwater Monitoring Wells

Following completion of the borings, the depth to groundwater, if present, was measured in each borehole. Monitoring wells were then installed in each of the seven rotary borings (B-1 through B-7) in general accordance with procedures outlined in our DRMS Task Order Letter (#002, C188836-102). Monitoring wells were constructed such that groundwater at the colluvial cover/weathered bedrock contact in each of the shallow wells (B-2, B-3, B-4, B-6 and B-7), and within the intact bedrock in the deep wells (B-1 and B-5), was isolated. Each monitoring well consisted of a 2-inch inside-diameter PVC riser pipe and machine-slotted pipe (0.010-inch spacing) of variable length (see Appendix A). The annular space surrounding the slotted pipe was backfilled with 10-20 filter sand. In the case of the 60-foot-deep wells, a bentonite seal was constructed at the top of the filter pack. A bentonite seal was constructed below the filter pack in the case of the shallow wells, with the remainder of the hole typically being backfilled with cuttings and/or bentonite. A locking cap was placed on the PVC riser pipe and stick-up monuments were placed on each monitoring well. Well completions are shown on the individual boring logs in Appendix A.

A monitoring well was not installed in the cored boring (B-8). Rather, this boring was completed with a stick-up monument, and the hole was left open per request by EPA personnel.

4.0 CLOSURE

This report was prepared for the exclusive use of DRMS and recognized partners of the Standard Mine water quality improvements project. We understand the EPA will be responsible for well monitoring and well abandonment. Laboratory testing of rock/soil samples was not completed as part of this project, and all rock core collected from boring B-8 was submitted directly to the EPA.

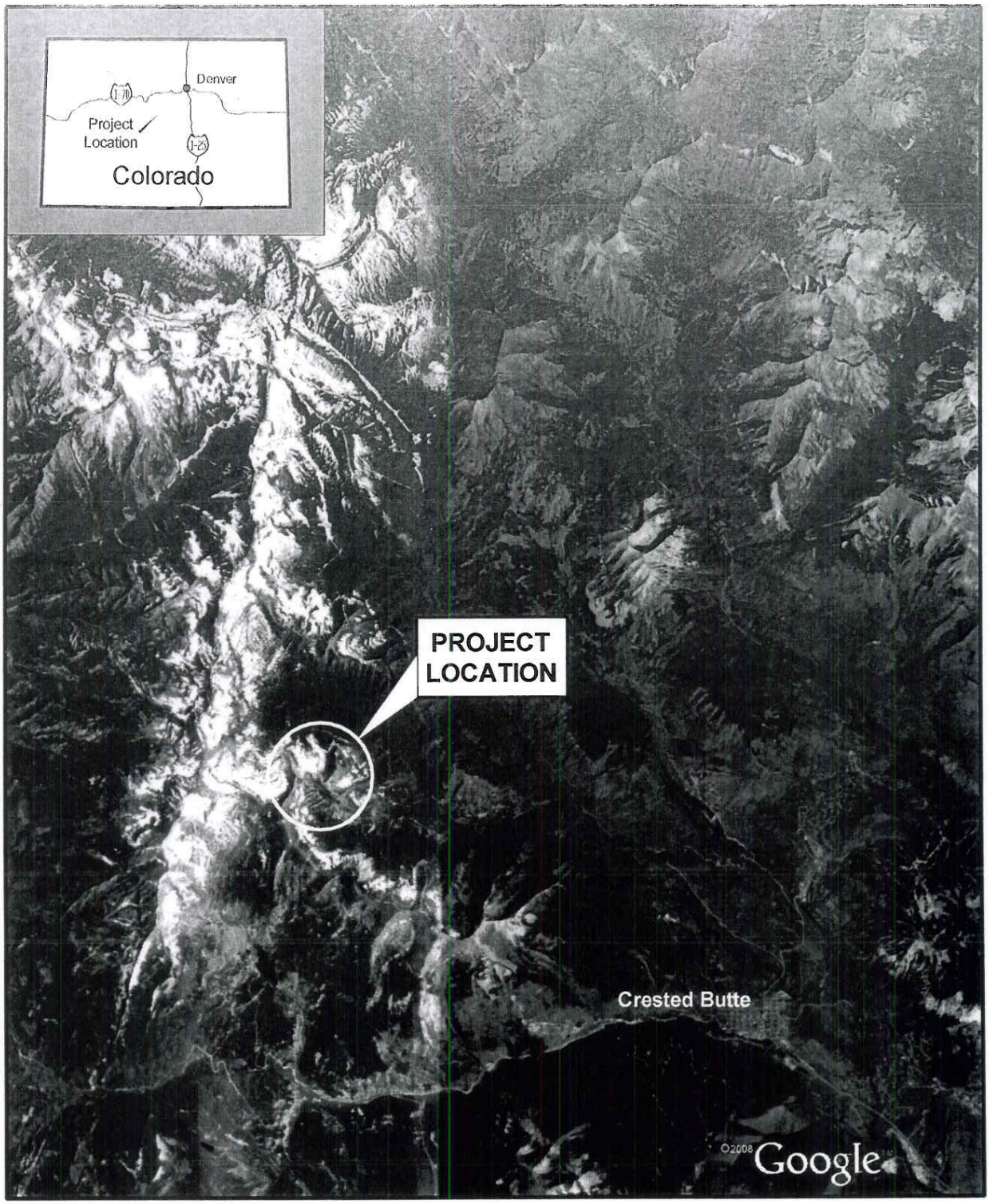
We appreciate the opportunity to be of service to DRMS. If you have any questions or comments regarding our findings, please contact me at 303-825-3800.

Sincerely,

SHANNON & WILSON, INC.

Beth L. Widmann, P.G.
Senior Principal Geologist

BLW:MET:GRF/blw



0 2 4

Approximate Scale in Miles

NOTE

Map adapted from aerial imagery provided by Google Earth Pro and Image © 2008 DigitalGlobe, reproduced by permission granted by Google Earth ™ Mapping Service.

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

VICINITY MAP

November 2008 23-1-01187-101

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FIG. 1

Filename: J:\23\101187-101\23-1-01187-101 Fig 1.dwg Date: 11-04-2008 Login: sac

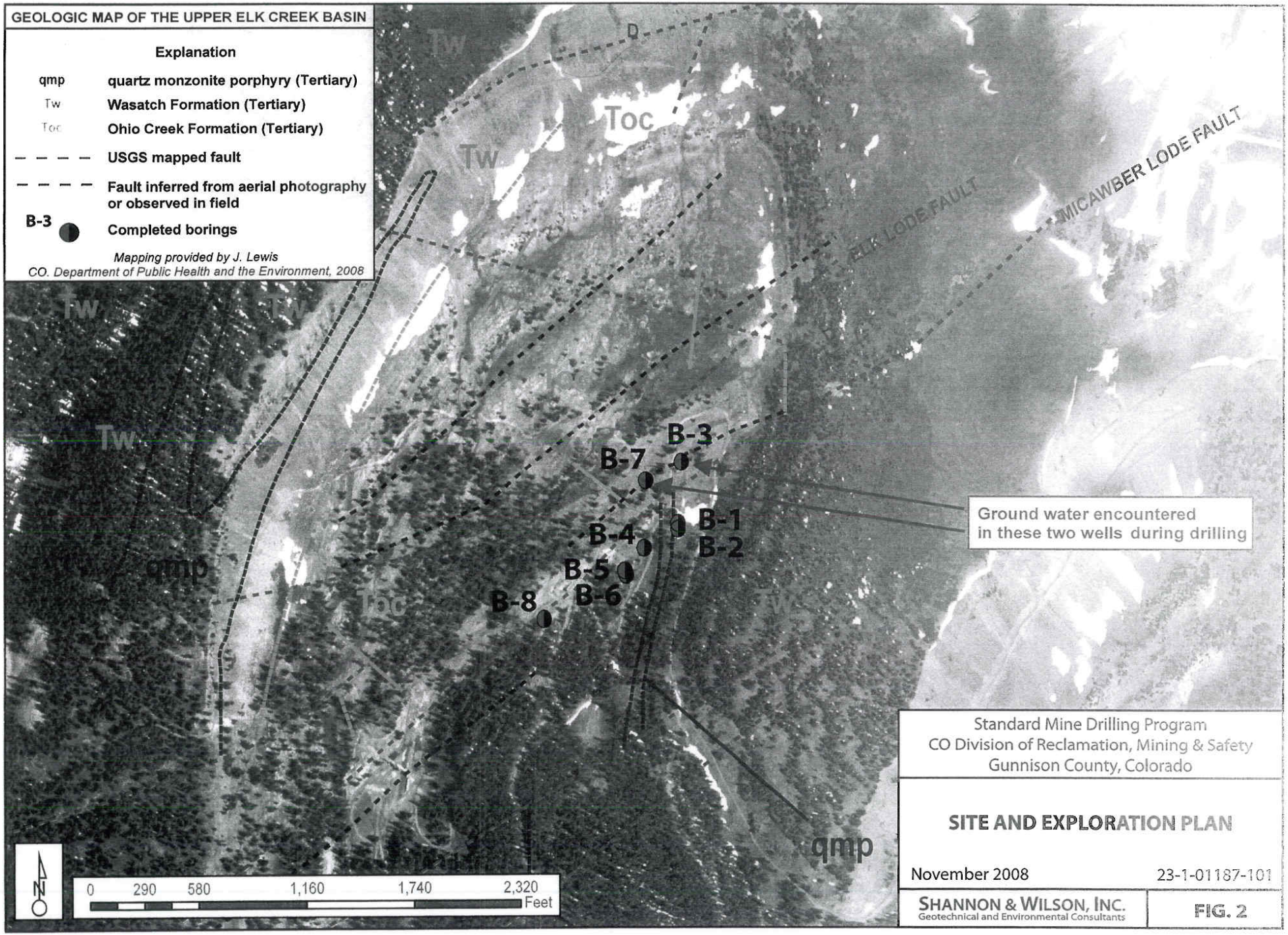
GEOLOGIC MAP OF THE UPPER ELK CREEK BASIN
Explanation
qmp quartz monzonite porphyry (Tertiary)
Tw Wasatch Formation (Tertiary)
Toc Ohio Creek Formation (Tertiary)
USGS mapped fault
Fault inferred from aerial photography or observed in field
B-3 Completed borings
Mapping provided by J. Lewis
CO. Department of Public Health and the Environment, 2008
ELK LODE FAULT
MICAWBER LODE FAULT
B-3
B-7
B-1
B-2
B-4
B-5
B-6
B-8
Ground water encountered in these two wells during drilling
0 290 580 1,160 1,740 2,320 Feet
N
Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado
SITE AND EXPLORATION PLAN
November 2008
23-1-01187-101
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FIG. 2

APPENDIX A

FIELD EXPLORATIONS

APPENDIX A

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LIST OF FIGURES

Figure No.

Shannon & Wilson, Inc. (S&W), uses a soil classification system modified from the Unified Soil Classification System (USCS). Elements of the USCS and other definitions are provided on this and the following page. Soil descriptions are based on visual-manual procedures (ASTM D 2488-93) unless otherwise noted.

S&W CLASSIFICATION OF SOIL CONSTITUENTS

- MAJOR constituents compose more than 50 percent, by weight, of the soil. Major constituents are capitalized (SAND).
- Minor constituents compose 12 to 50 percent of the soil and precede the major constituents (silty SAND). Minor constituents preceded by "slightly" compose 5 to 12 percent of the soil (slightly silty SAND).
- Trace constituents compose 0 to 5 percent of the soil (slightly silty SAND, trace of gravel).

MOISTURE CONTENT DEFINITIONS

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, from below water table

ABBREVIATIONS

ATD	At Time of Drilling
Elev.	Elevation
ft	feet
HSA	Hollow Stem Auger
ID	Inside Diameter
in	inches
lbs	pounds
Mon.	Monument cover
N	Blows for last two 6-inch increments
NA	Not Applicable or Not Available
OD	Outside Diameter
OVA	Organic Vapor Analyzer
PID	Photoionization Detector
ppm	parts per million
PVC	Polyvinyl Chloride
SS	Split Spoon sampler
SPT	Standard Penetration Test
USC	Unified Soil Classification
WLI	Water Level Indicator

GRAIN SIZE DEFINITIONS

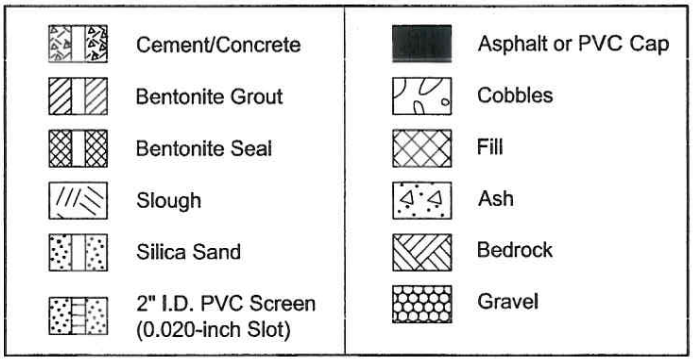
DESCRIPTION	SIEVE SIZE
FINES	< #200 (0.8 mm)
SAND*	
▪ Fine	#200 - #40 (0.4 mm)
▪ Medium	#40 - #10 (2 mm)
▪ Coarse	#10 - #4 (5 mm)
GRAVEL*	
▪ Fine	#4 - $\frac{3}{4}$ inch
▪ Coarse	$\frac{3}{4}$ - 3 inches
COBBLES	3 - 12 inches
BOULDERS	> 12 inches

* Unless otherwise noted, sand and gravel, when present, range from fine to coarse in grain size.

RELATIVE DENSITY / CONSISTENCY

COARSE-GRAINED SOILS		FINE-GRAINED/COHESIVE SOILS	
N, SPT, BLOWS/FT.	RELATIVE DENSITY	N, SPT, BLOWS/FT.	RELATIVE CONSISTENCY
0 - 4	Very loose	<2	Very soft
4 - 10	Loose	2 - 4	Soft
10 - 30	Medium dense	4 - 8	Medium stiff
30 - 50	Dense	8 - 15	Stiff
Over 50	Very dense	15 - 30	Very stiff
		Over 30	Hard

WELL AND OTHER SYMBOLS



Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

SOIL CLASSIFICATION AND LOG KEY

November 2008 23-1-01187-101

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-1
Sheet 1 of 2

UNIFIED SOIL CLASSIFICATION SYSTEM (From ASTM D 2488-93 & 2487-93)

MAJOR DIVISIONS			GROUP/GRAPHIC SYMBOL ②		TYPICAL DESCRIPTION
Coarse-Grained Soils *(more than 50% retained on No. 200 sieve)* *[use Dual Symbols for 5 - 12% Fines (i.e. GP-GM)]*①	Gravels *(more than 50% of coarse fraction retained on No. 4 sieve)*	Clean Gravels① *(less than 5% fines)*	GW		Well-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
			GP		Poorly Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		Gravels with Fines① *(more than 12% fines)*	GM		Silty Gravels, Gravel-Sand-Silt Mixtures
			GC		Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sands *(50% or more of coarse fraction passes the No. 4 sieve)*	Clean sands① *(less than 5% fines)*	SW		Well-Graded Sands, Gravelly Sands, Little or No Fines
			SP		Poorly Graded Sand, Gravelly Sands, Little or No Fines
		Sands with Fines① *(more than 12% fines)*	SM		Silty Sands, Sand-Silt Mixtures
			SC		Clayey Sands, Sand-Silt Mixtures
Fine-Grained Soils *(50% or more passes the No. 200 sieve)*	Silts and Clays *(liquid limit less than 50)*	Inorganic	ML		Inorganic Silts of Low to Medium Plasticity, Rock Flour, or Clayey Silts With Slight Plasticity
			CL		Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
		Organic	OL		Organic Silts and Organic Silty Clays of Low Plasticity
	Silts and Clays *(liquid limit 50 or more)*	Inorganic	CH		Inorganic Clays of Medium to High Plasticity, Sandy Fat Clay, Gravelly Fat Clay
			MH		Inorganic Silts, Micaceous or Diatomaceous Fine Sands or Silty Soils, Elastic Silt
		Organic	OH		Organic Clays of Medium to High Plasticity, Organic Silts
Highly Organic Soils	Primarily organic matter, dark in color, and organic odor		PT		Peat, Humus, Swamp Soils with High Organic Content (See D 4427-92)

NOTES

1. Dual Symbols (symbols separated by a hyphen, i.e., SP-SM, slightly silty fine SAND) are used for soils with between 5% and 12% fines or when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart.

2. Borderline symbols (symbols separated by a slash, i.e., CL/ML, silty CLAY/clayey SILT; GW/SW, sandy GRAVEL/gravelly SAND) indicate that the soil may fall into one of two possible basic groups.

Standard Mine Drilling Program
CO Division of Reclamation & Mining
Gunnison County, Colorado

SOIL CLASSIFICATION AND LOG KEY

November 2008 23-1-01187-101

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FIG. A-1
Sheet 2 of 2

ISRM CLASSIFICATION OF ROCK STRENGTH			
DESCRIPTION	FIELD IDENTIFICATION	APPROXIMATE UNCONFINED COMPRESSIVE STRENGTH (MPa)	APPROXIMATE UNCONFINED COMPRESSIVE STRENGTH (psi)
Very Low Strength	Crumbles under firm blows with point of geological hammer, can be peeled by a pocket knife	<5.0	
Low Strength	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer	5.0 - 25	700 - 4,000
			<700
Moderate Strength	Cannot be scraped or peeled by a pocket knife, specimen can be fractured with a single blow of geological hammer	25 - 50	4,000 - 7,000
Medium High Strength	Specimen requires more than one blow of geological hammer to fracture it	50 - 100	7,000 - 15,000
High Strength	Specimen requires many blows of geological hammer to fracture it	100 - 250	15,000 - 36,000
Very High Strength	Specimen can only be chipped with geological hammer	>250	

ISRM CLASSIFICATION OF WEATHERING >36,000	
TERM	DESCRIPTION
Fresh	No visible signs of rock material weathering: perphaps slight discoloration on major discontinuity surfaces.
Slightly Weathered	Slight penetration of discoloration away from fracture. Fractures may contain thin filling.
Moderately Weathered	Partial to complete discoloration away from fracture. Rock not friable except for poorly cemented rock. Fractures may contain thick filling.
Highly Weathered	All rock is discolored. Rock is friable except for poorly cemented rock. Corestones may be present.
Completely Weathered	All rock is decomposed and/or disintegrated to soil. The original mass is still largely intact.

ISRM CLASSIFICATION OF JOINT SPACING		
DESCRIPTION	SPACING (MM)	SPACING (FT)
Extremely Close Spacing	<20	<0.07
Very Close Spacing	20 - 60	0.07 - 0.20
Close Spacing	60 - 200	0.20 - 0.66
Medium Spacing	200 - 600	0.66 - 2.0
Wide Spacing	600 - 2,000	2.0 - 6.6
Very Wide Spacing	2,000 - 6,000	6.6 - 20

Reference: Brown, E.T., ed., 1981, Rock characterization testing and monitoring ISRM suggested methods: New York, International Society for Rock Mechanics

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

ROCK CLASSIFICATION AND LOG KEY

November 2008 23-1-01187-001

SHANNON & WILSON, INC.
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FIG. A-2

Total Depth: 60.5 ft.	Northing:	Drilling Method: Air Rotary	Hole Diam.: 5 in.
Top Elevation: ~ 11400 ft.	Easting:	Drilling Company: Precision Sampling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 55 Track Rig	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Silt, sand, gravel, and cobbles; (Colluvium).

4.0

SANDSTONE: (Inferred from cuttings) Medium to high strength, gray, fine-grained; (Wasatch Formation).

8.0

SILTSTONE or MUDSTONE: (Inferred from cuttings) Gray and brown, slightly weathered; (Wasatch Formation).

20.0

MUDSTONE: (Inferred from cuttings) Cuttings are fine, light grayish-brown and powdery (Wasatch Formation).

- Changes to dark gray, cuttings are coarse (coarse sand to fine gravel), thinly laminated.
- Cuttings are fine (powder to sand size), light brown.
- Cuttings are coarse, gray.
- Cuttings are coarse (coarse sand to gravel), gray, (Argillite).

CONTINUED NEXT SHEET

Depth, ft. | Symbol | Samples | Ground Water | Depth, ft.

None encountered during drilling

0 20 40 60

5 10 15 20 25 30 35 40 45

0 20 40 60

LEGEND

* Sample Not Recovered

Piezometer Screen and Sand Filter
Bentonite-Cement Grout
Bentonite Chips/Pellets
Bentonite Grout

Plastic Limit — Liquid Limit
Natural Water Content

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-1

November 2008 23-1-01187-101

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-3
Sheet 1 of 2

MASTER_LOG_E 23-1-01187-101 STANDARD MINE.GPJ 21-20617/GPJ/MH18/Rev: BLW Typ: LKD

Total Depth:	60.5 ft.	Northing:		Drilling Method:	Air Rotary	Hole Diam.:	5 in.
Top Elevation:	~ 11400 ft.	Easting:		Drilling Company:	Precision Sampling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 55 Track Rig	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.
MUDSTONE (Cont.): (Inferred from cuttings) Cuttings are fine, light grayish-brown and powdery (Wasatch Formation).					55
	60.5				60
BOTTOM OF BORING COMPLETED 9/30/2008					65
					70
					75
					80
					85
					90
					95

0 20 40 60

LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout

Plastic Limit ├──●──┤ Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-1

November 2008 23-1-01187-101

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-3
Sheet 2 of 2

Total Depth: 18.3 ft.	Northing:	Drilling Method: Air Rotary	Hole Diam.: 5 in.
Top Elevation: ~ 11400 ft.	Easting:	Drilling Company: Precision Sampling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 55 Track Rig	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.	
Silt, sand, gravel, and cobbles; (Colluvium).	
SANDSTONE: (Inferred from cuttings) cuttings are fine, brown; (Weathered Wasatch Formation).	5.0
ARGILLITE: (Inferred from cuttings) cuttings are fine, brown (Wasatch Formation).	8.5
BOTTOM OF BORING COMPLETED 10/1/2008	18.3

Symbol | Samples | Ground Water | Depth, ft.

None encountered during drilling

0 20 40 60

5 10 15 20 25 30 35 40 45

0 20 40 60

LEGEND

* Sample Not Recovered

Piezometer Screen and Sand Filter
Bentonite-Cement Grout
Bentonite Chips/Pellets
Bentonite Grout

Plastic Limit — Liquid Limit
Natural Water Content

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-2

November 2008 23-1-01187-101

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-4

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

MASTER_LOG_E 23-1-01187-101 STANDARD MINE.GPJ 21-20617.GPJ 11/18/08 Rev: BLW Typ: LKD

Total Depth: 13.5 ft.	Northing:	Drilling Method: Air Rotary	Hole Diam.: 5 in.
Top Elevation: ~ 11420 ft.	Easting:	Drilling Company: Precision Sampling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 55 Track Rig	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

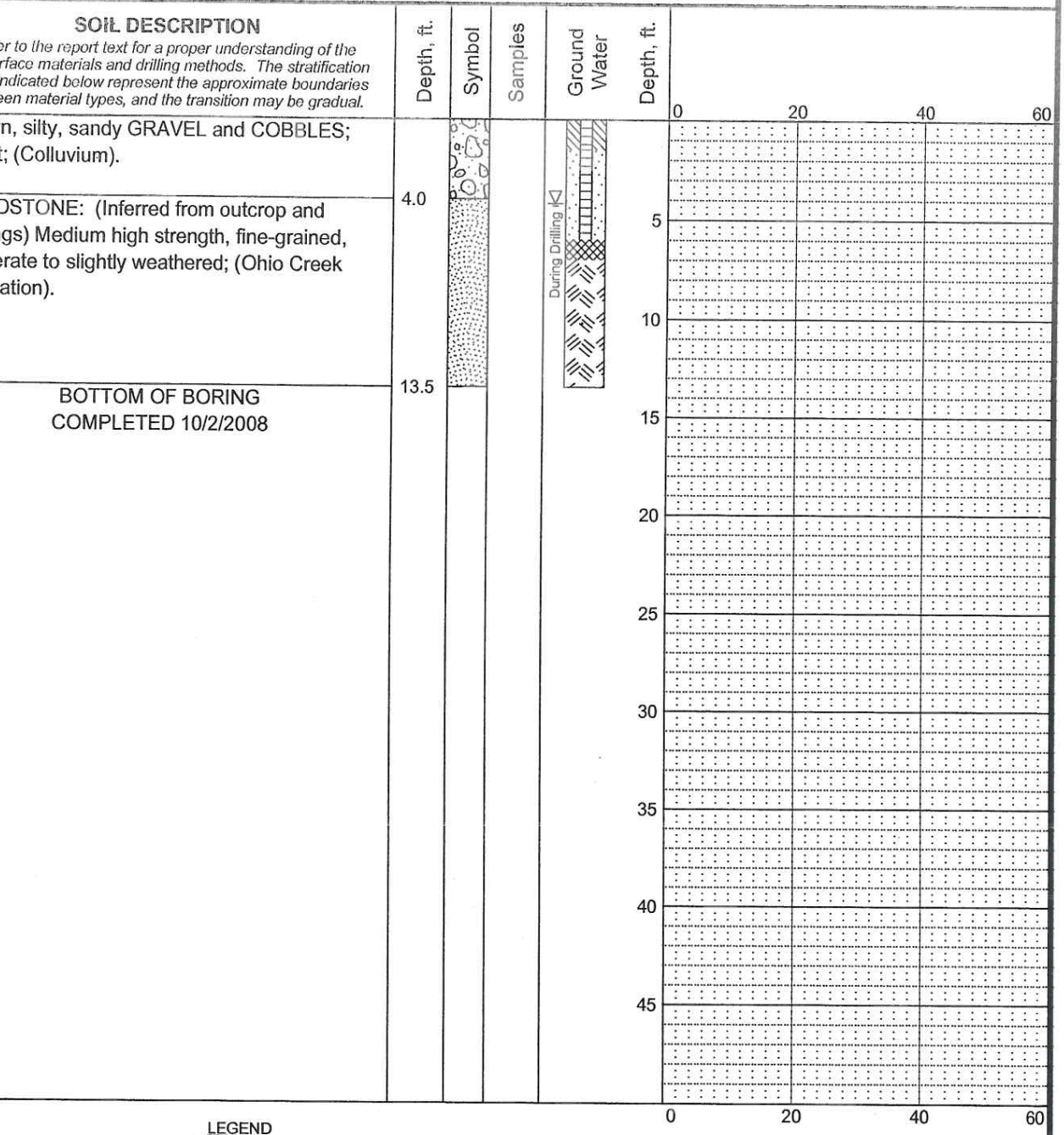
Brown, silty, sandy GRAVEL and COBBLES; moist; (Colluvium).

4.0

SANDSTONE: (Inferred from outcrop and cuttings) Medium high strength, fine-grained, moderate to slightly weathered; (Ohio Creek Formation).

13.5

BOTTOM OF BORING
COMPLETED 10/2/2008



LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level ATD

Plastic Limit — Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-3

November 2008 23-1-01187-101

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-5

MASTER_LOG_E 23-1-01187-101 STANDARD MINE.GPJ 21-20617/GPJ/MET 18/08 Rev: BLW Typ: LKD

Total Depth: 20 ft.	Northing:	Drilling Method: Air Rotary	Hole Diam.: 5 in.
Top Elevation: ~ 11360 ft.	Easting:	Drilling Company: Precision Sampling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 55 Track Rig	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Brown, silty, sandy GRAVEL and COBBLES; moist; angular clasts; (Colluvium).

15.0

SANDSTONE: (Inferred from cuttings and outcrops); light gray to gray, fine-grained, siliceous, fresh to slightly weathered (Wasatch Formation).

20.0

BOTTOM OF BORING
COMPLETED 10/1/2008

Depth, ft. | Symbol | Samples | Ground Water | Depth, ft.

None encountered during drilling

0 20 40 60

5 10 15 20 25 30 35 40 45

0 20 40 60

LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout

Plastic Limit — Liquid Limit
Natural Water Content

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-4

November 2008 23-1-01187-101

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-6

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

MASTER LOG E 23-1-01187-101 STANDARD MINE.GPJ 21-20617/gpj/MET18/Rev: BLW Typ: LKD

Total Depth: 60.5 ft.	Northing:	Drilling Method: Air Rotary	Hole Diam.: 5 in.
Top Elevation: ~ 11320 ft.	Easting:	Drilling Company: Precision Sampling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 55 Track Rig	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.	
Brown, silty, sandy GRAVEL and COBBLES; moist; (Colluvium).	
SANDSTONE: (Inferred from outcrops and cuttings) Moderate to medium high strength; gray, fine-grained, moderately to slightly weathered; (Wasatch Formation).	3.0
- Cuttings become lighter (yellowish to light brown), finer than above.	
CLAYSTONE: (Inferred from cuttings), brown, fine grained, (Wasatch Formation).	33.0
- Light brown cuttings, lighter percussion.	
SANDSTONE: (Inferred from cuttings and drill action) becomes gray to light gray, much harder drilling (Wasatch Formation).	40.0
CONTINUED NEXT SHEET	

Symbol | Samples | Ground Water | Depth, ft.

None encountered during drilling

0 20 40 60

5 10 15 20 25 30 35 40 45

0 20 40 60

LEGEND

* Sample Not Recovered

Piezometer Screen and Sand Filter
Bentonite-Cement Grout
Bentonite Chips/Pellets
Bentonite Grout

Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-5

November 2008 23-1-01187-101

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FIG. A-7
Sheet 1 of 2

MASTER_LOG_E 23-1-01187-101 STANDARD MINE.GPJ 21-20617(GPJ MET 18/Rev: BLW Typ: LKD

Total Depth:	60.5 ft.	Northing:		Drilling Method:	Air Rotary	Hole Diam.:	5 in.
Top Elevation:	~ 11320 ft.	Easting:		Drilling Company:	Precision Sampling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 55 Track Rig	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.					0 20 40 60
SANDSTONE (Cont.): (Inferred from cuttings and drill action) becomes gray to light gray, much harder drilling (Wasatch Formation).					55 60 65 70 75 80 85 90 95
BOTTOM OF BORING COMPLETED 10/2/2008	60.5				

LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout

Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-5

November 2008 23-1-01187-101

SHANNON & WILSON, INC.
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FIG. A-7
Sheet 2 of 2

MASTER LOG E 23-1-01187-101 STANDARD MINE.GPJ 21-20617(GPJ MET 18/Rev: BLW Typ: LKD

Total Depth:	14 ft.	Northing:		Drilling Method:	Air Rotary	Hole Diam.:	5 in.
Top Elevation:	~ 11320 ft.	Easting:		Drilling Company:	Precision Sampling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 55 Track Rig	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL DESCRIPTION	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.	
Brown, silty, sandy GRAVEL and COBBLES; moist; (Colluvium).	
SANDSTONE: (Inferred from cuttings) gray to light gray, fine-grained; (Wasatch Formation).	3.0
BOTTOM OF BORING COMPLETED 10/1/2008	14.0

Symbol | Samples | Ground Water: None encountered during drilling | Depth, ft.: 0 5 10 15 20 25 30 35 40 45

0 20 40 60

LEGEND

* Sample Not Recovered

Piezometer Screen and Sand Filter
Bentonite-Cement Grout
Bentonite Chips/Pellets
Bentonite Grout

Plastic Limit — Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-6

November 2008 23-1-01187-101

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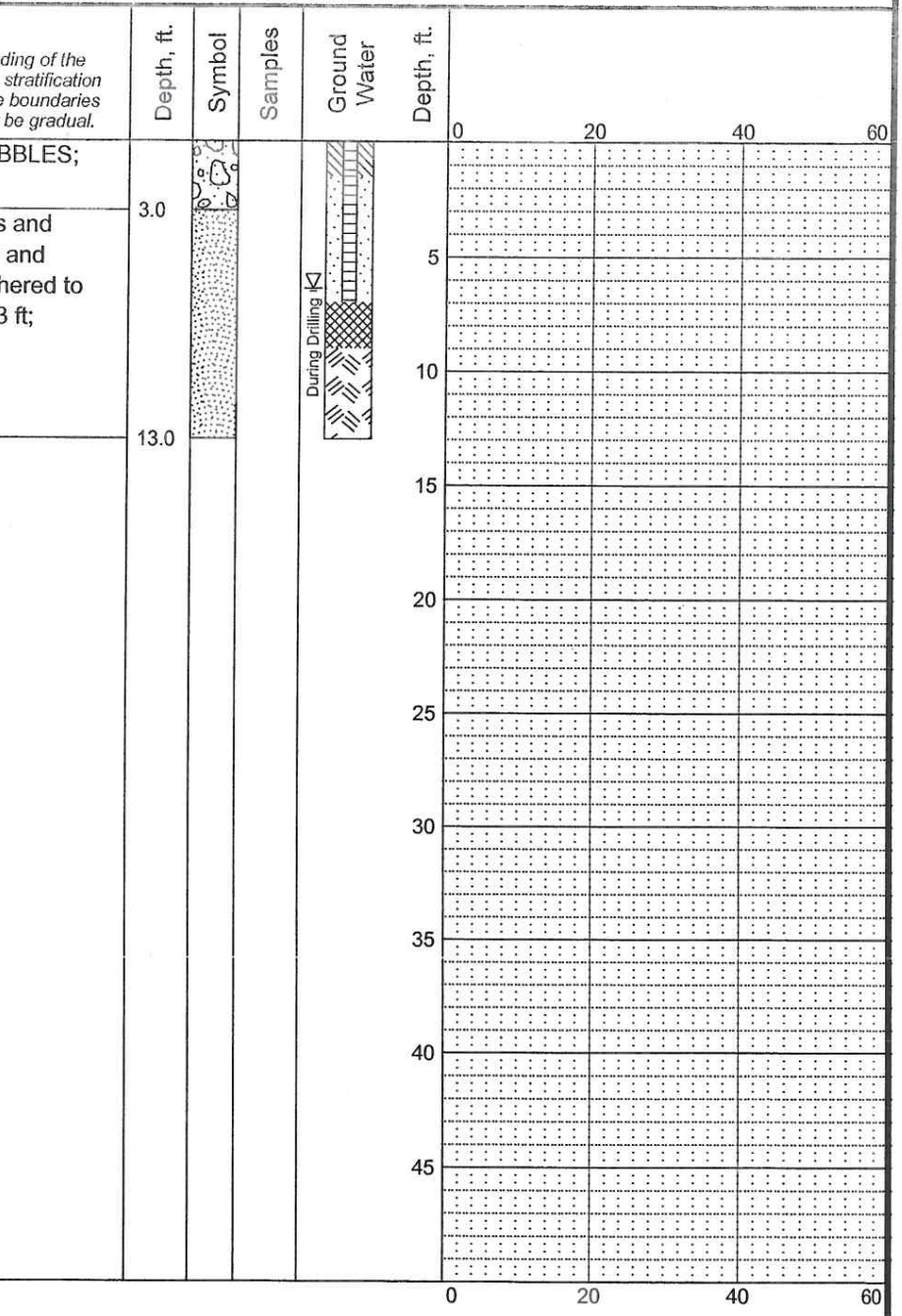
FIG. A-8

MASTER_LOG_E 23-1-01187-101 STANDARD MINE.GPJ 21-20617(GPJ MET 18/Rev: BLW Typ: LKD

Total Depth: 13 ft.	Northing:	Drilling Method: Air Rotary	Hole Diam.: 5 in.
Top Elevation: ~ 11380 ft.	Easting:	Drilling Company: Precision Sampling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 55 Track Rig	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL DESCRIPTION	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.	
Brown, silty, sandy GRAVEL and COBBLES; moist; (Colluvium).	
SANDSTONE: (Inferred from cuttings and outcrops) medium high strength, gray and brown, fine-grained; moderately weathered to near 6 ft, then slightly weathered to 13 ft; (Wasatch Formation).	3.0
BOTTOM OF BORING COMPLETED 10/3/2008	13.0



LEGEND

* Sample Not Recovered

- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level ATD

Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-7

November 2008 23-1-01187-101

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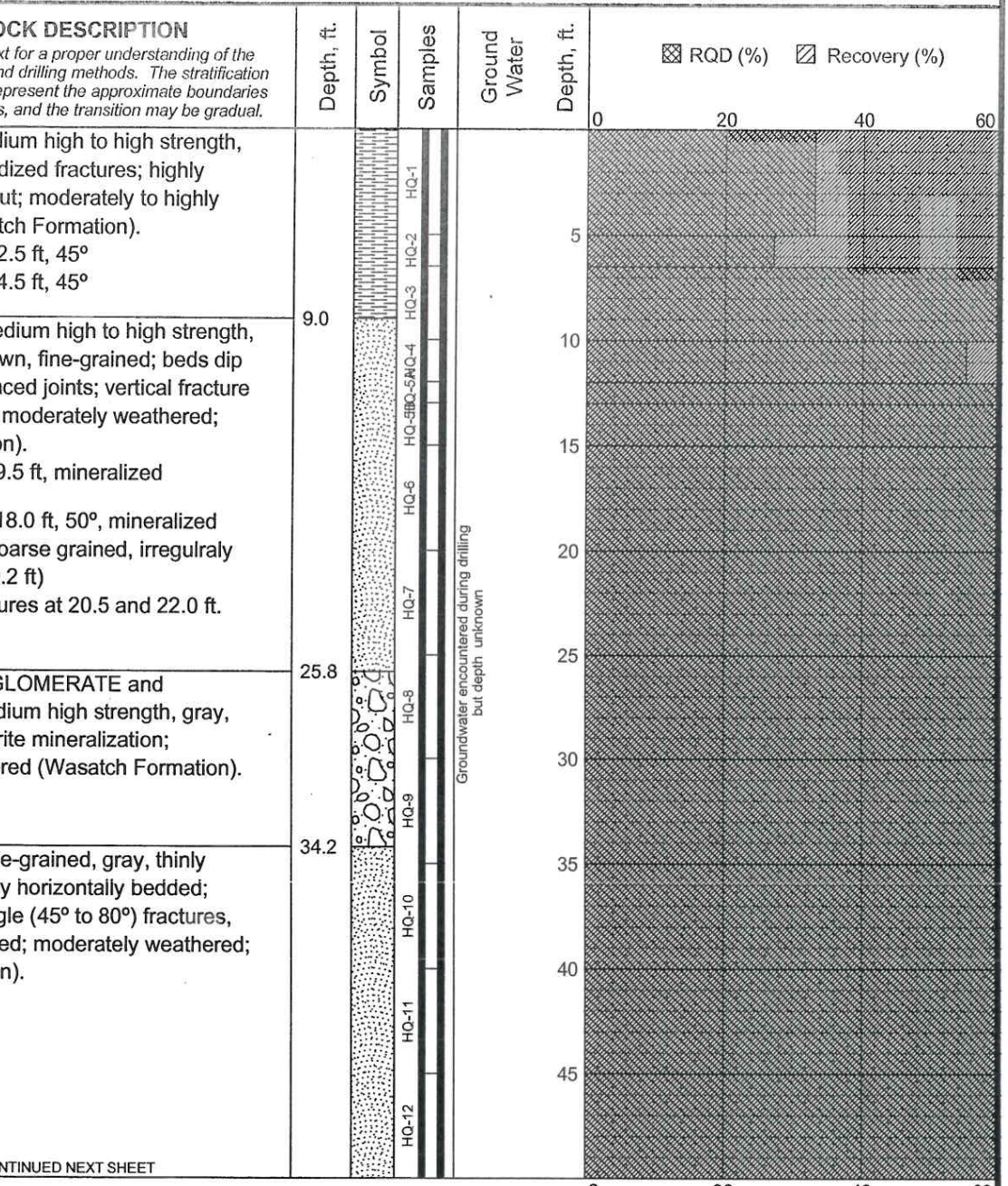
FIG. A-9

MASTER_LOG_E 23-1-01187-101 STANDARD MINE.GPJ 21-20617/GPJ/MT18/Rev: BLW Typ: LKD

Total Depth: 190 ft.	Northing:	Drilling Method: Rock Core	Hole Diam.: 5 in.
Top Elevation: ~ 11080 ft.	Easting:	Drilling Company: Precision Sampling	Rod Diam.:
Vert. Datum:	Station:	Drill Rig Equipment: CME 55 Track Rig	Hammer Type:
Horiz. Datum:	Offset:	Other Comments:	

SOIL/ROCK DESCRIPTION	Depth, ft.
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.	
SILTSTONE: Medium high to high strength, gray and olive; oxidized fractures; highly fractured throughout; moderately to highly weathered; (Wasatch Formation). Note: Fracture at 2.5 ft, 45° Note: Fracture at 4.5 ft, 45°	
SANDSTONE: Medium high to high strength, gray and olive, brown, fine-grained; beds dip 10-20°; closely spaced joints; vertical fracture from 6.5 to 7.75 ft; moderately weathered; (Wasatch Formation). Note: Fracture at 9.5 ft, mineralized Note: Fracture at 18.0 ft, 50°, mineralized - Conglomerate, coarse grained, irregulraly bedded (18.9 to 19.2 ft) - Mineralized fractures at 20.5 and 22.0 ft.	9.0
Interbedded CONGLOMERATE and SANDSTONE: medium high strength, gray, coarse grained; pyrite mineralization; moderately weathered (Wasatch Formation).	25.8
SANDSTONE: Fine-grained, gray, thinly laminated, generally horizontally bedded; medium to high angle (45° to 80°) fractures, surfaces are oxidized; moderately weathered; (Wasatch Formation).	34.2
CONTINUED NEXT SHEET	



LEGEND

* Sample Not Recovered

Rock Core

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-8

November 2008 23-1-01187-101

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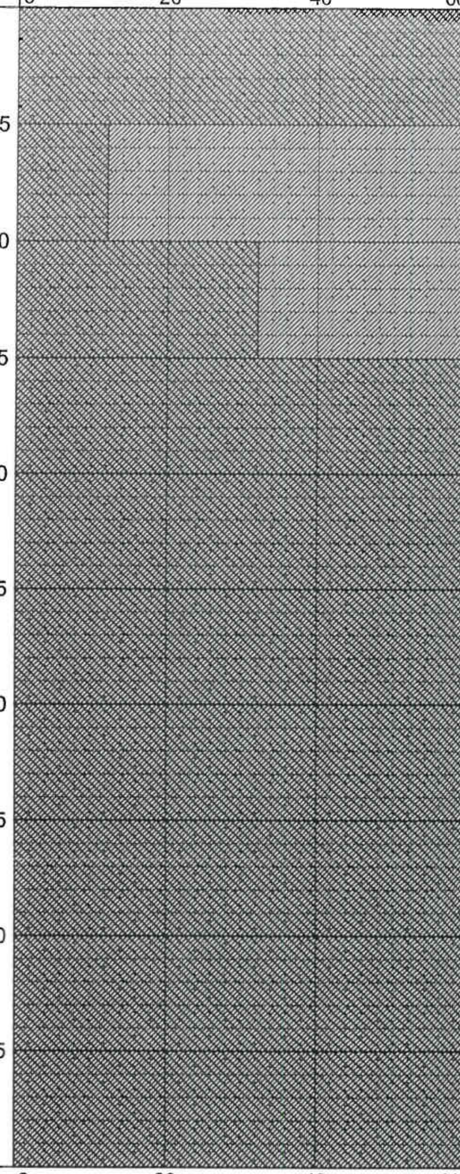
FIG. A-10
Sheet 1 of 4

MASTER_LOG_E 23-1-01187-101 STANDARD MINE.GPJ 21-20617/gpjMET18/Rev: BLW Typ: LKD

Total Depth:	*190 ft.*	Northing:		Drilling Method:	*Rock Core*
Top Elevation:	*~ 11080 ft.*	Easting:		Drilling Company:	*Precision Sampling*
Vert. Datum:		Station:		Drill Rig Equipment:	*CME 55 Track Rig*
Horiz. Datum:		Offset:		Other Comments:	

Hole Diam.: *5 in.*
Rod Diam.:
Hammer Type:

SOIL/ROCK DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Samples
		HQ-13
		HQ-14
- Clay gouge at 63.0 ft.		HQ-15
- Quartz/pyrite seam at 65.0 ft.		
ARGILLITE/SILTSTONE: Medium high strength to high strength, dark gray, thinly laminated at 10-20° dip angle; slightly weathered (Wasatch Formation).	67.0	HQ-16
SANDSTONE: High strength, light gray, fine-grained, thinly laminated; slightly weathered to fresh, beds dip 10 to 20°; close to medium spaced joints (Wasatch Formation).	73.2	HQ-17, HQ-18
- Fracture at 82.0 ft, 40-50° - Fracture at 83.5 ft, pyrite		HQ-19
-Fracture at 86.5 ft, 30-40°		HQ-20
- Fracture at 92.4 ft, pyrite		HQ-21
ARGILLITE/SILTSTONE: Dark gray, medium high strength, thinly laminated, irregularly bedded; slightly weathered to fresh.	95.0 95.6	HQ-22
CONTINUED NEXT SHEET	99.1	



LEGEND

* Sample Not Recovered
Rock Core

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-8

November 2008 23-1-01187-101

SHANNON & WILSON, INC.
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FIG. A-10
Sheet 2 of 4

Total Depth:	190 ft.	Northing:		Drilling Method:	Rock Core	Hole Diam.:	5 in.
Top Elevation:	~ 11080 ft.	Easting:		Drilling Company:	Precision Sampling	Rod Diam.:	
Vert. Datum:		Station:		Drill Rig Equipment:	CME 55 Track Rig	Hammer Type:	
Horiz. Datum:		Offset:		Other Comments:			

SOIL/ROCK DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

SANDSTONE: High strength, light gray, fine-grained, thinly laminated; slightly weathered to fresh, beds dip 10 to 20°; close to medium spaced joints (Wasatch Formation).

ARGILLITE/SILTSTONE: Dark gray, medium high strength, thinly laminated, irregularly bedded; slightly weathered to fresh.
- Pyrite infilling in joints (1/2 inch thick) at 102.8, 103.5, 104.8, 105.0 ft.
- Pyrite & galena mineralization from 104.4 to 105.2 ft.
- Joint is clay-filled at 105.8 ft.

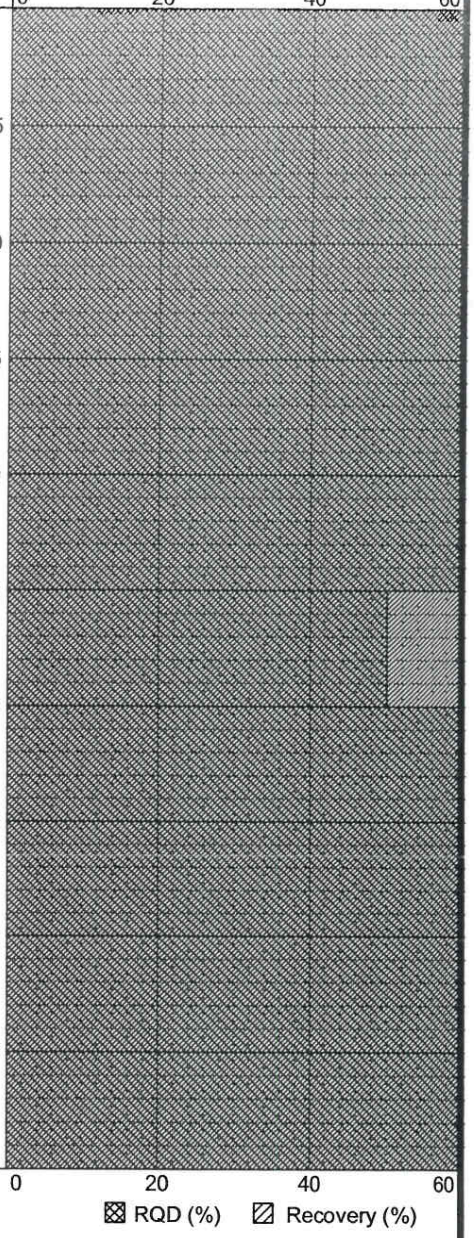
106.4

SANDSTONE: High strength, light gray, fine-grained, thinly laminated; slightly weathered to fresh, beds dip 10 to 20°; close to medium spaced joints (Wasatch Formation).
Note: Lost circulation below 109 ft for remainder of boring. Coring action choppy from 109 to 115 ft.
- Mineralized joints from 112.2 to 114.1 ft. Joint surfaces are oxidized.
- Quartz seam (1/2 inch thick) at 117.0 ft.
Note: Sandstone below 120 ft becomes moderate strength and moderately weathered.
- Mineralization in vugs from 123.0 to 123.2 ft; pyrite, galena.
Note: Driller notes coring becomes soft, and down pressure decreases from 127 to 128 ft.
Note: Sandstone becomes medium- to coarse-grained from 135.9 to 139.1 ft.
- Clay infilling/gouge at 136.1 ft.
- Occasional SILTSTONE/ARGILLITE interbeds below 139 ft.

- Fractured from 149.0 to 149.5 ft.

CONTINUED NEXT SHEET

Depth, ft. | Symbol | Samples: HQ-23, HQ-24, HQ-25, HQ-26, HQ-27, HQ-28, HQ-29, HQ-30, HQ-31, HQ-32 | Ground Water Depth, ft.



LEGEND

* Sample Not Recovered

Rock Core

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

Standard Mine Drilling Program
CO Division of Reclamation, Mining & Safety
Gunnison County, Colorado

LOG OF BORING B-8

November 2008 | 23-1-01187-101

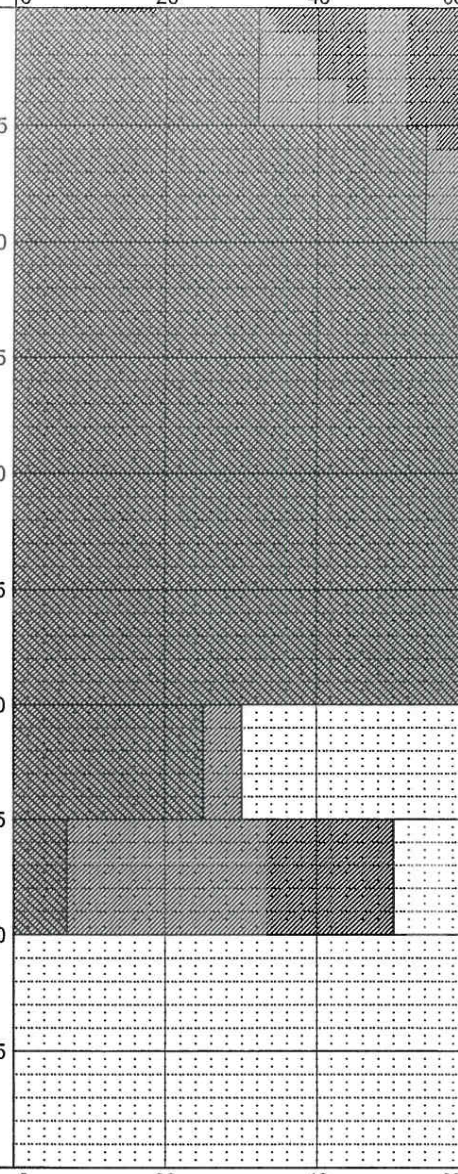
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-10
Sheet 3 of 4

MASTER_LOG_E 23-1-01187-101 STANDARD MINE.GPJ 21-20617(GPJ).MET 7/18/08 Rev: BLW Typ: LKD

Total Depth: 190 ft.	Northing:	Drilling Method:	Rock Core	Hole Diam.:	5 in.
Top Elevation: ~ 11080 ft.	Easting:	Drilling Company:	Precision Sampling	Rod Diam.:	
Vert. Datum:	Station:	Drill Rig Equipment:	CME 55 Track Rig	Hammer Type:	
Horiz. Datum:	Offset:	Other Comments:			

SOIL/ROCK DESCRIPTION *Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.*	Depth, ft.	Symbol	Samples	Ground Water	Depth, ft.
- Highly weathered, brown mud, rubble and clay from 150 to 154 ft. Note: Drill steel dropped about 1 foot from 152 to 153 ft with no down pressure.			HQ-33		155
			HQ-34		160
			HQ-35		165
- Clayey, soft, gray 167.4 to 168.3 ft.			HQ-36		170
- High angle joint >50° near 172.5 ft. - Clayey, gray, soft from 173.8 to 174.1 ft.			HQ-37		175
			HQ-38		180
Note: Choppy drill action near 179 ft. - Mineralized joints/fractures from 179 to 181.5 ft. Note: Choppy drill action from 182 to 185 ft.	185.0		HQ-39		185
QUARTZITE: High strength, gray, fine grains are faintly evident; slight mineralization; slightly weathered.	190.0		HQ-40		190
BOTTOM OF BORING COMPLETED 10/8/2008					195



LEGEND

* Sample Not Recovered

Rock Core

Standard Mine Drilling Program

CO Division of Reclamation, Mining & Safety

Gunnison County, Colorado

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
4. The hole location was measured using a cloth tape from existing site features and should be considered approximate.

LOG OF BORING B-8

November 2008 23-1-01187-101

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FIG. A-10

Sheet 4 of 4

MASTER_LOG_E 23-1-01187-101 STANDARD MINE.GPJ 21-20617LOG.JME 11/18/08 Rev: BLW Typ: LKD

APPENDIX B

ROCK CORE PHOTOS

APPENDIX B

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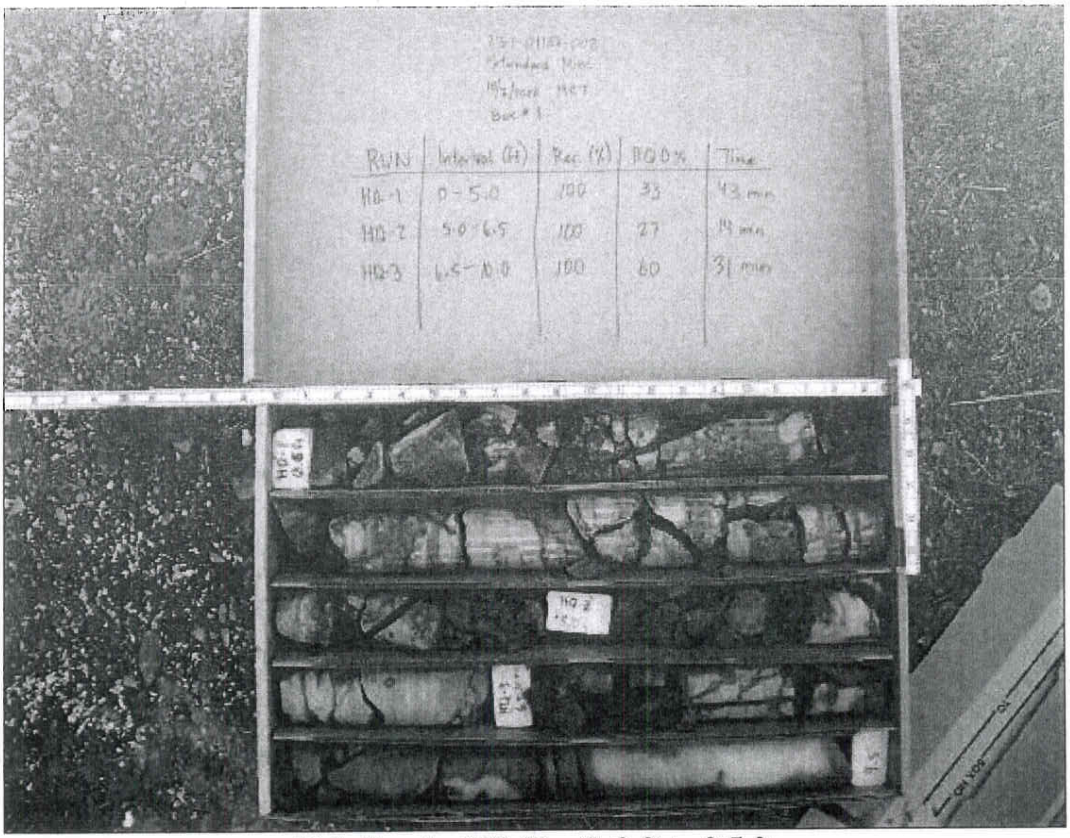
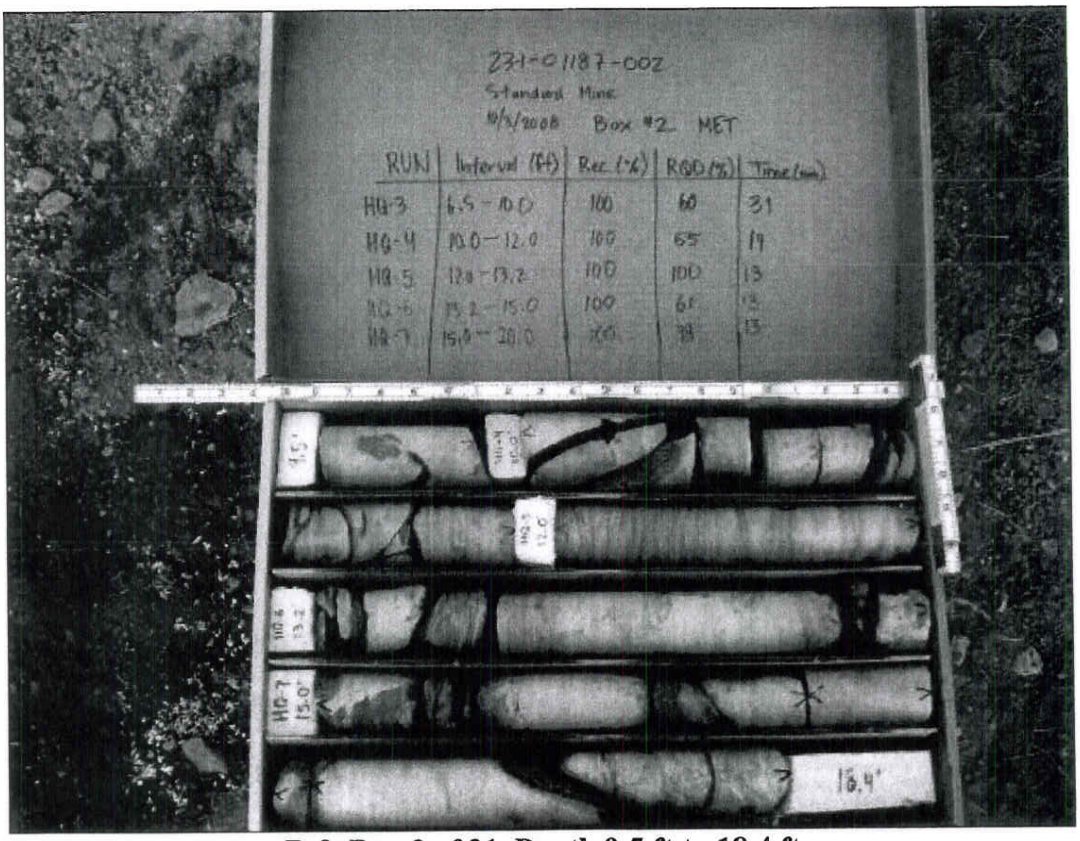
LIST OF FIGURES

Figure No.

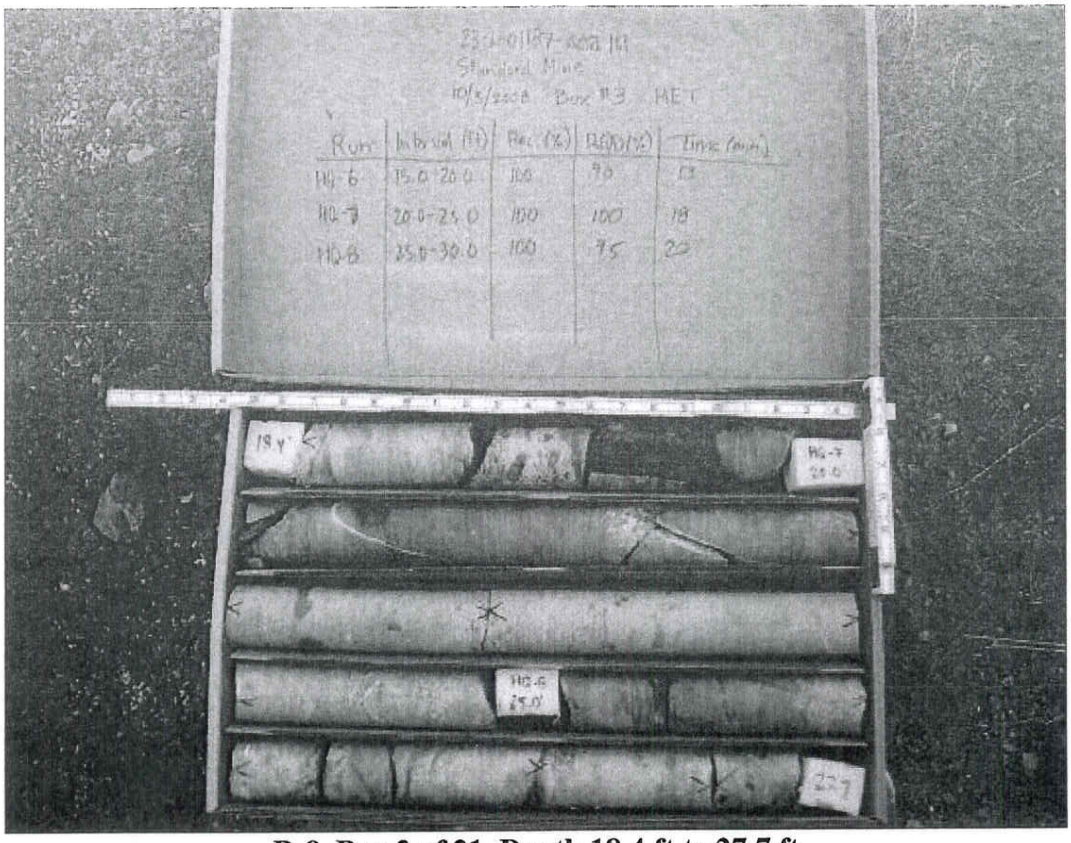


B-8, Box 1 of 21, Depth 0 ft to 9.5 ft

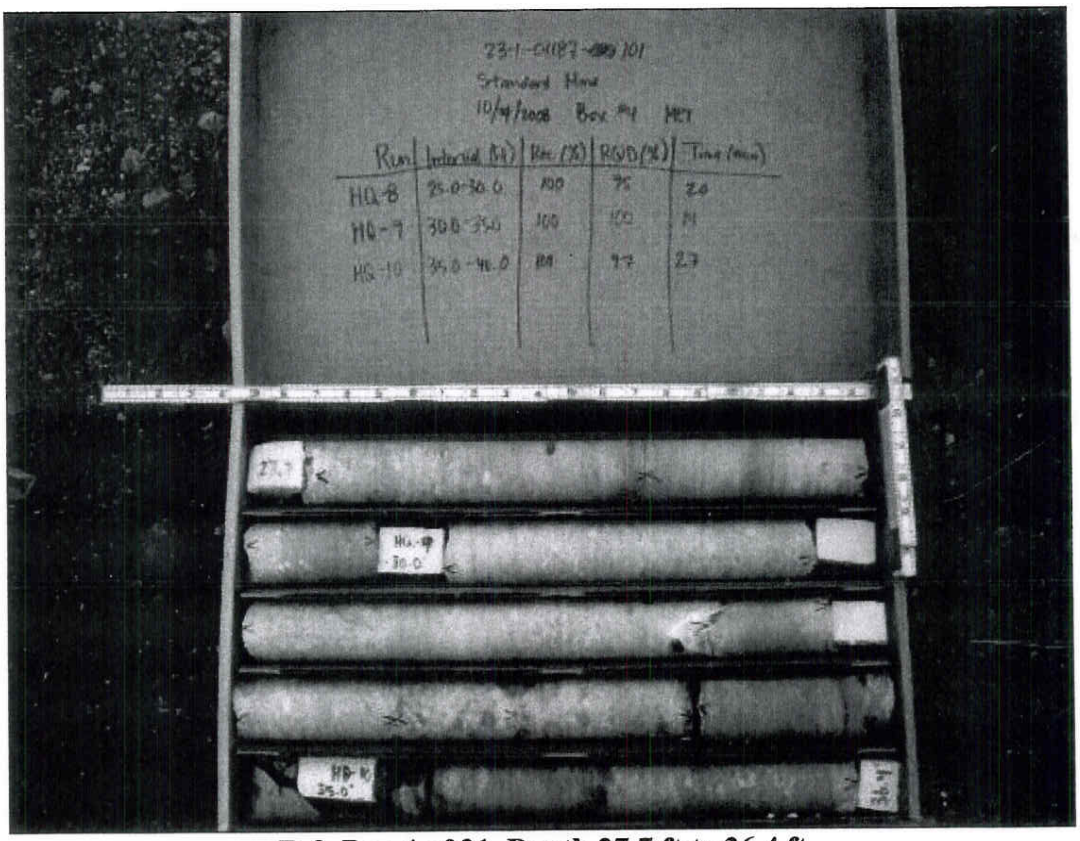


B-8, Box 2 of 21, Depth 9.5 ft to 18.4 ft

Figure B-1
(Sheet 1 of 11)
23-1-01187-101

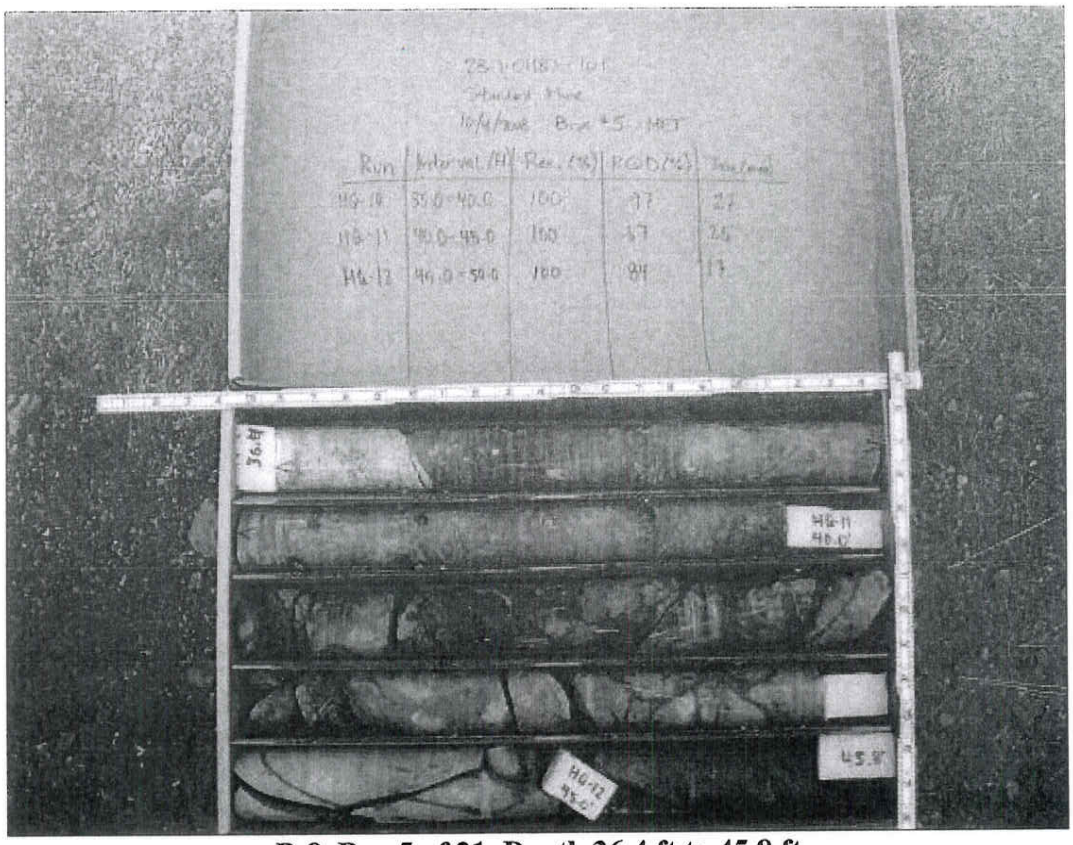


B-8, Box 3 of 21, Depth 18.4 ft to 27.7 ft

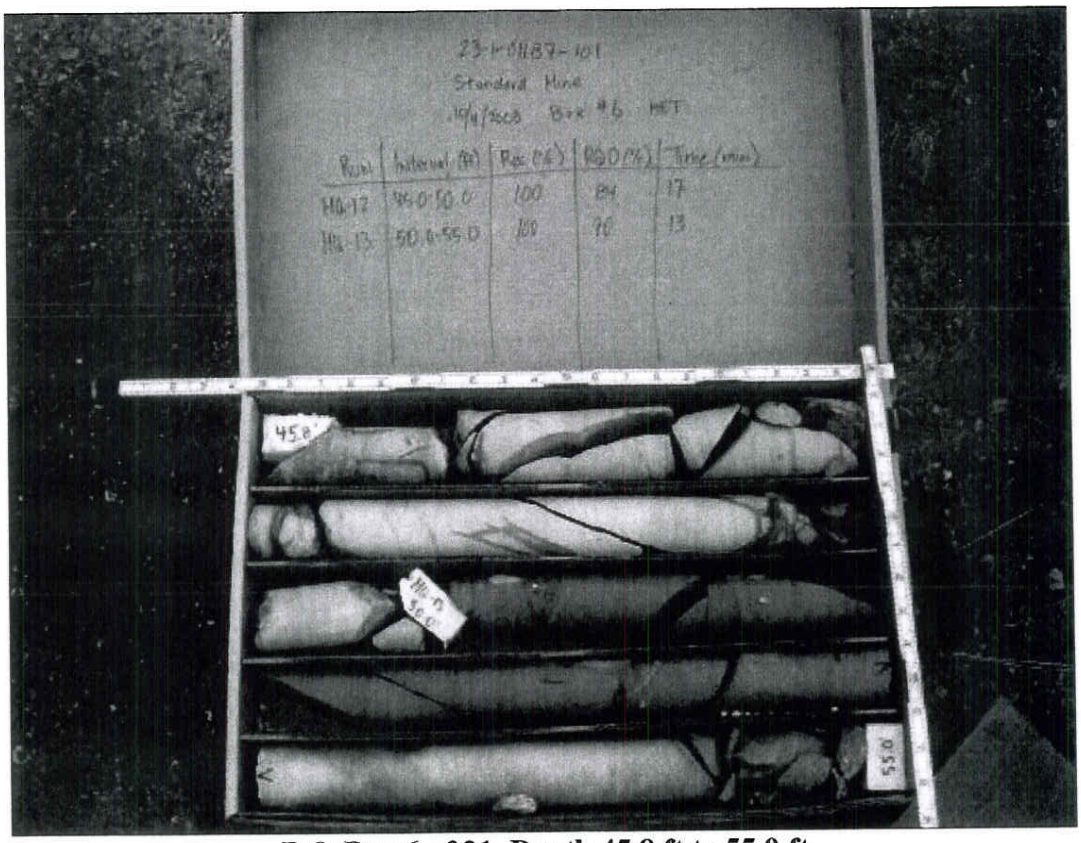


B-8, Box 4 of 21, Depth 27.7 ft to 36.4 ft

Figure B-1
(Sheet 2 of 11)
23-1-01187-101

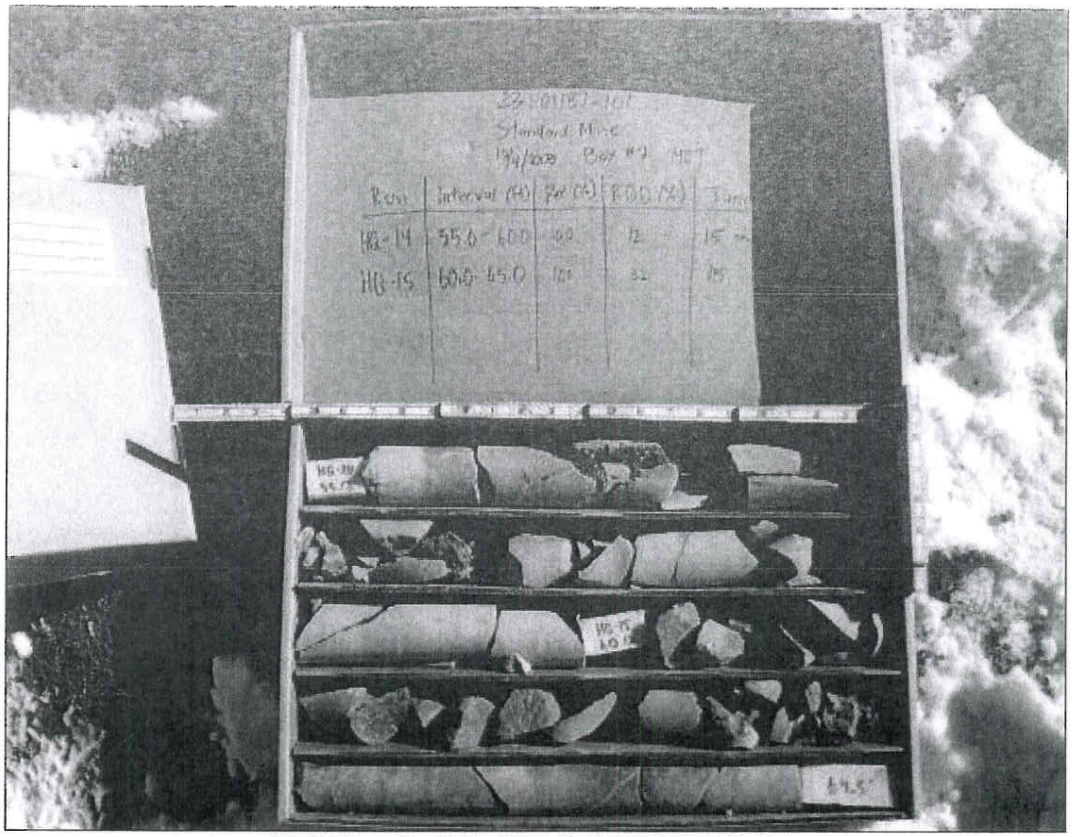


B-8, Box 5 of 21, Depth 36.4 ft to 45.8 ft

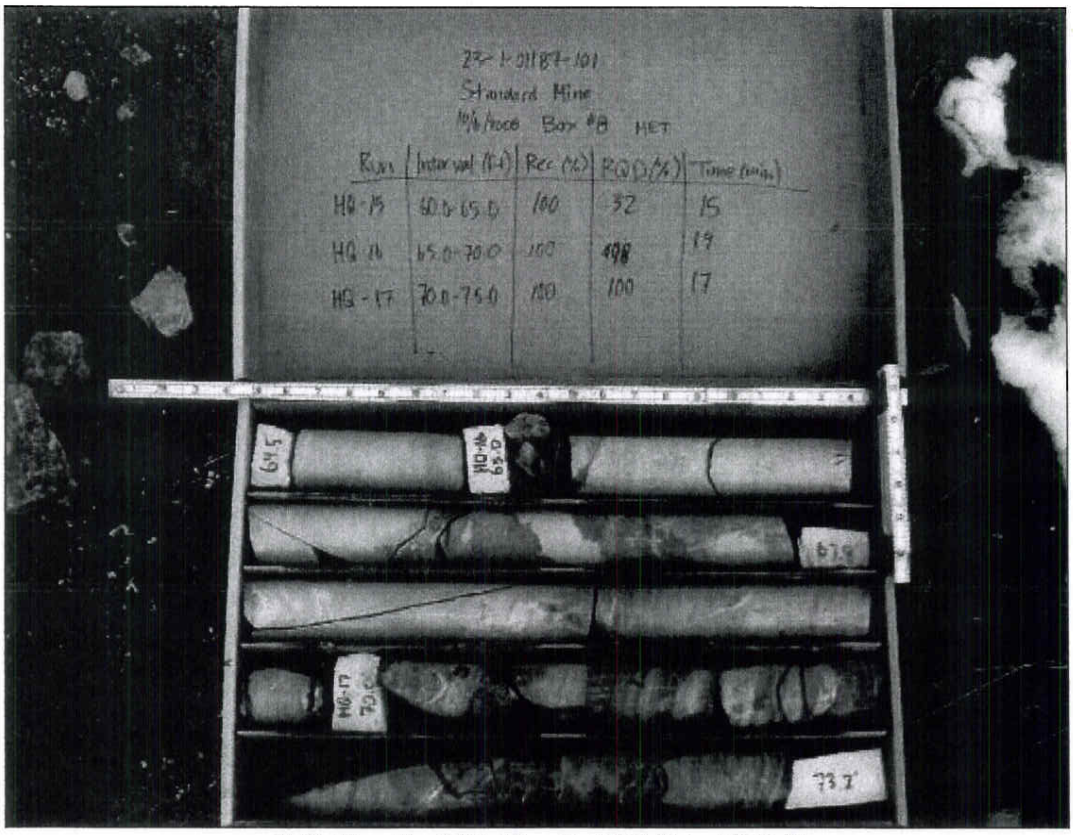


B-8, Box 6 of 21, Depth 45.8 ft to 55.0 ft

Figure B-1
(Sheet 3 of 11)
23-1-01187-101

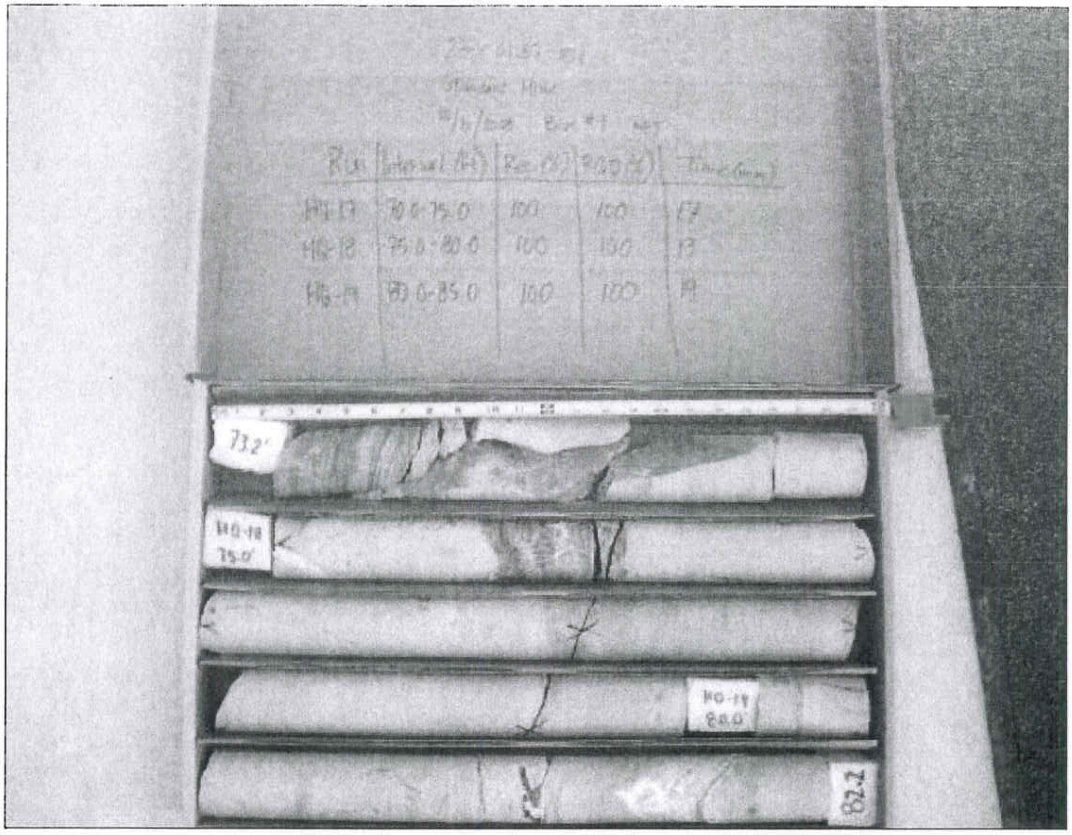


B-8, Box 7 of 21, Depth 55.0 ft to 64.8 ft

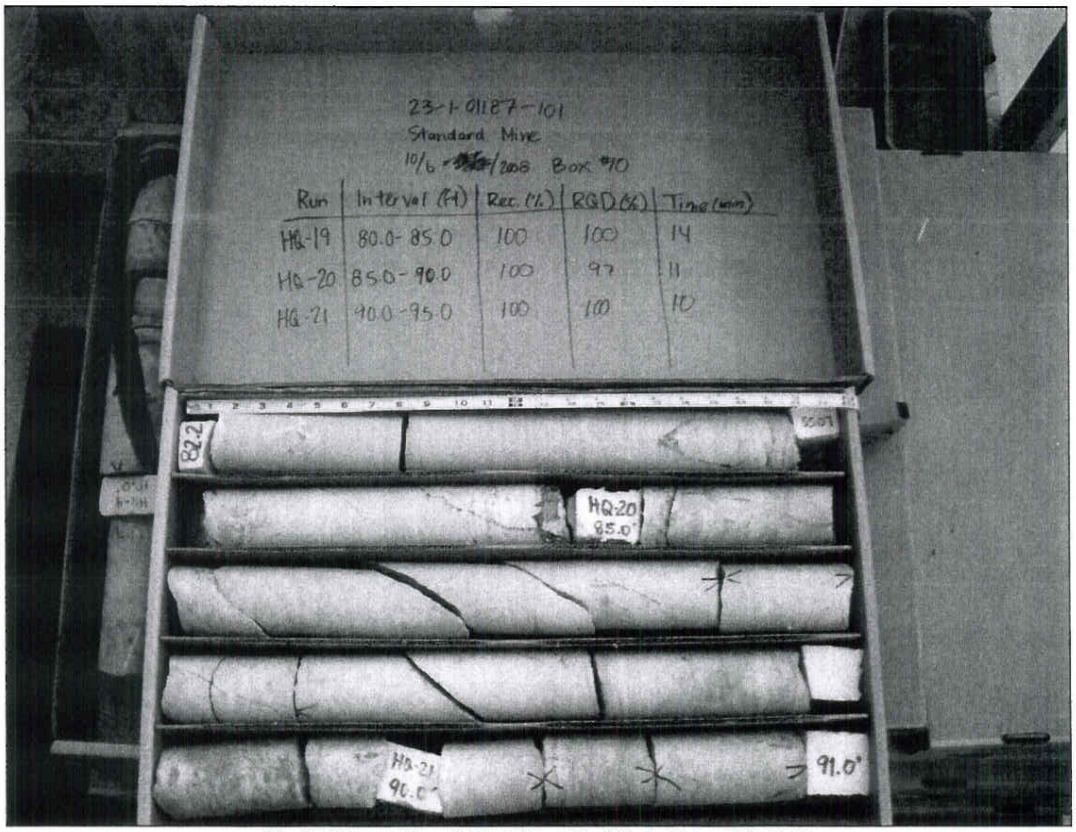


B-8, Box 8 of 21, Depth 64.8 ft to 73.2 ft

Figure B-1
(Sheet 4 of 11)
23-1-01187-101

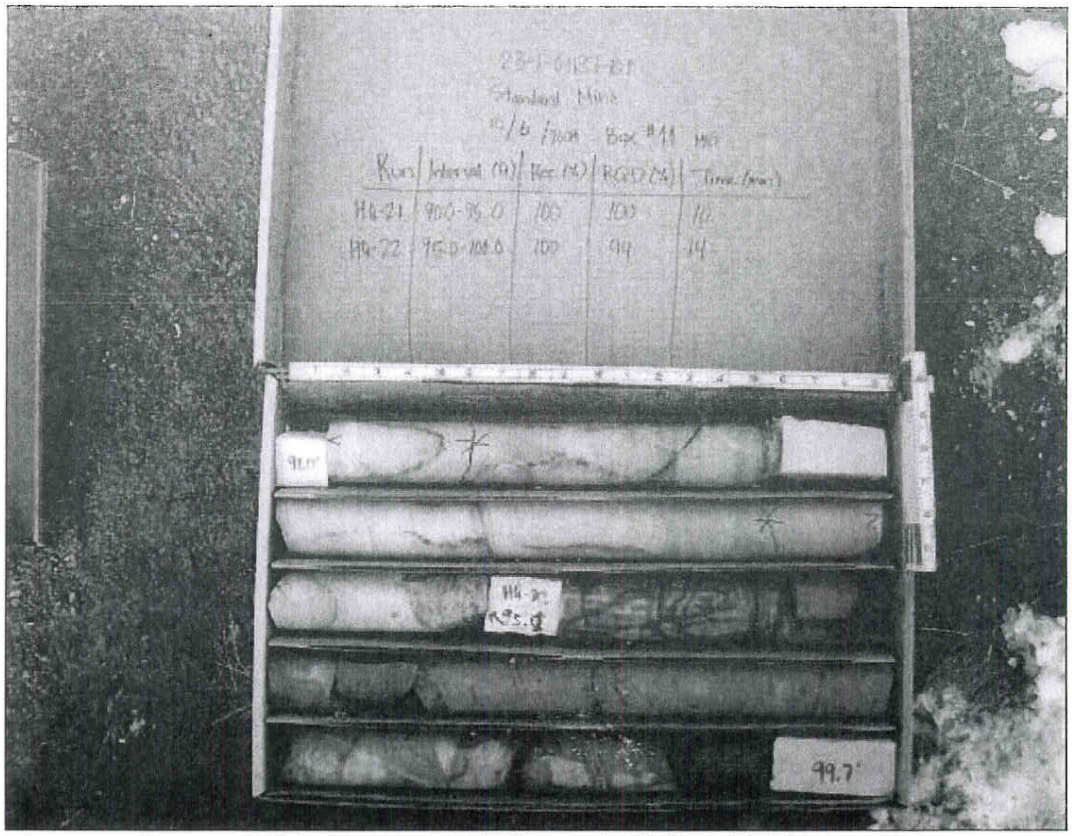


B-8, Box 9 of 21, Depth 73.2 ft to 82.2 ft

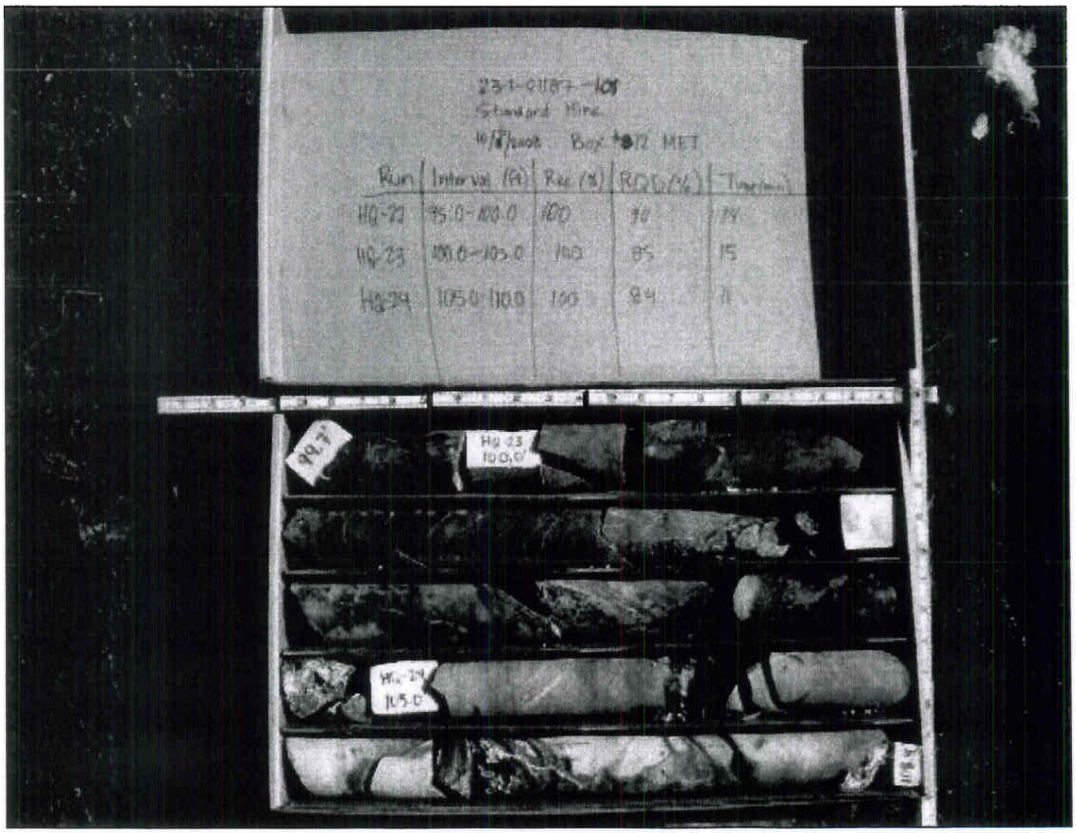


B-8, Box 10 of 21, Depth 82.2 ft to 91.0 ft

Figure B-1
(Sheet 5 of 11)
23-1-01187-101



B-8, Box 11 of 21, Depth 91.0 ft to 99.7 ft



B-8, Box 12 of 21, Depth 99.7 ft to 108.4 ft

Figure B-1
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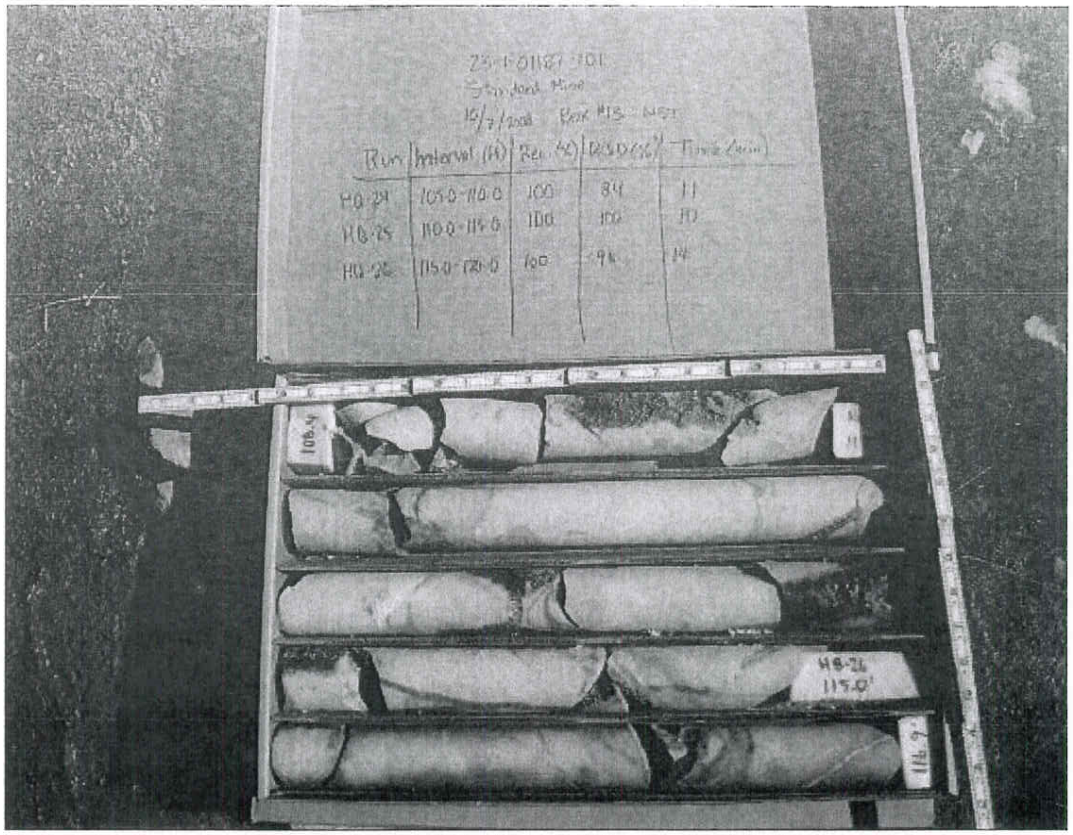
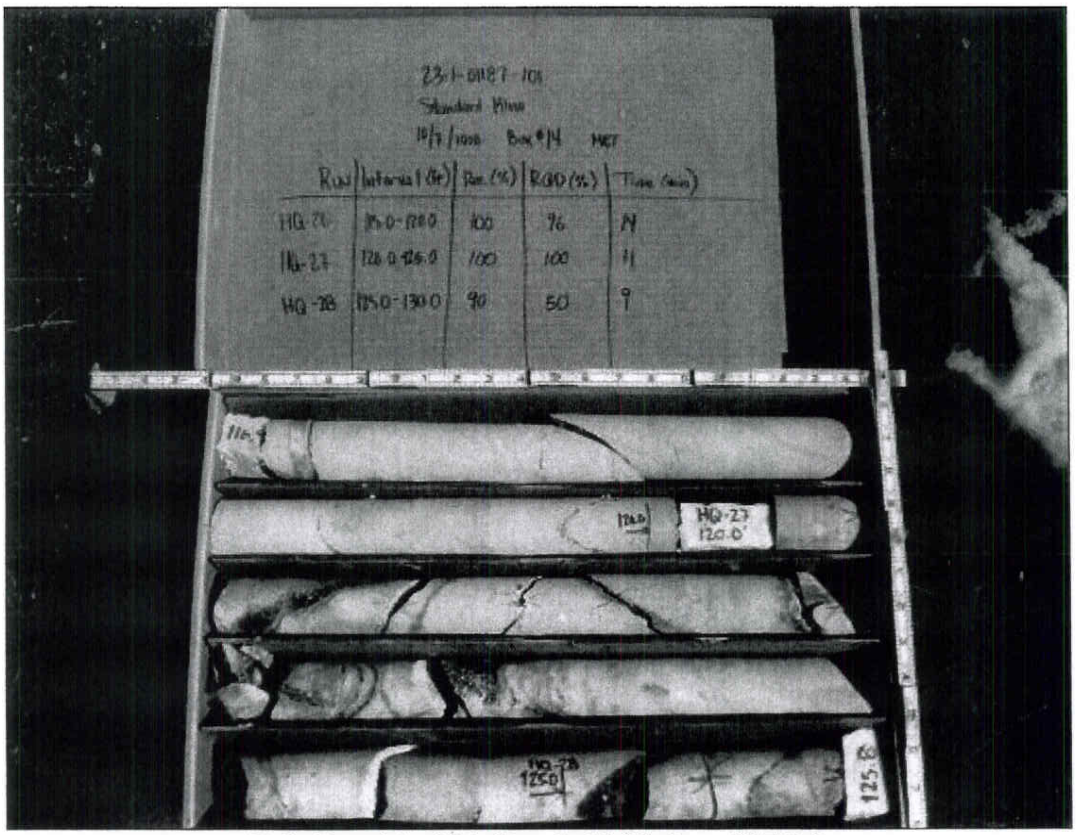


B-8, Box 13 of 21, Depth 108.4 ft to 116.9 ft



B-8, Box 14 of 21, Depth 116.9 ft to 125.8 ft

Figure B-1
(Sheet 7 of 11)
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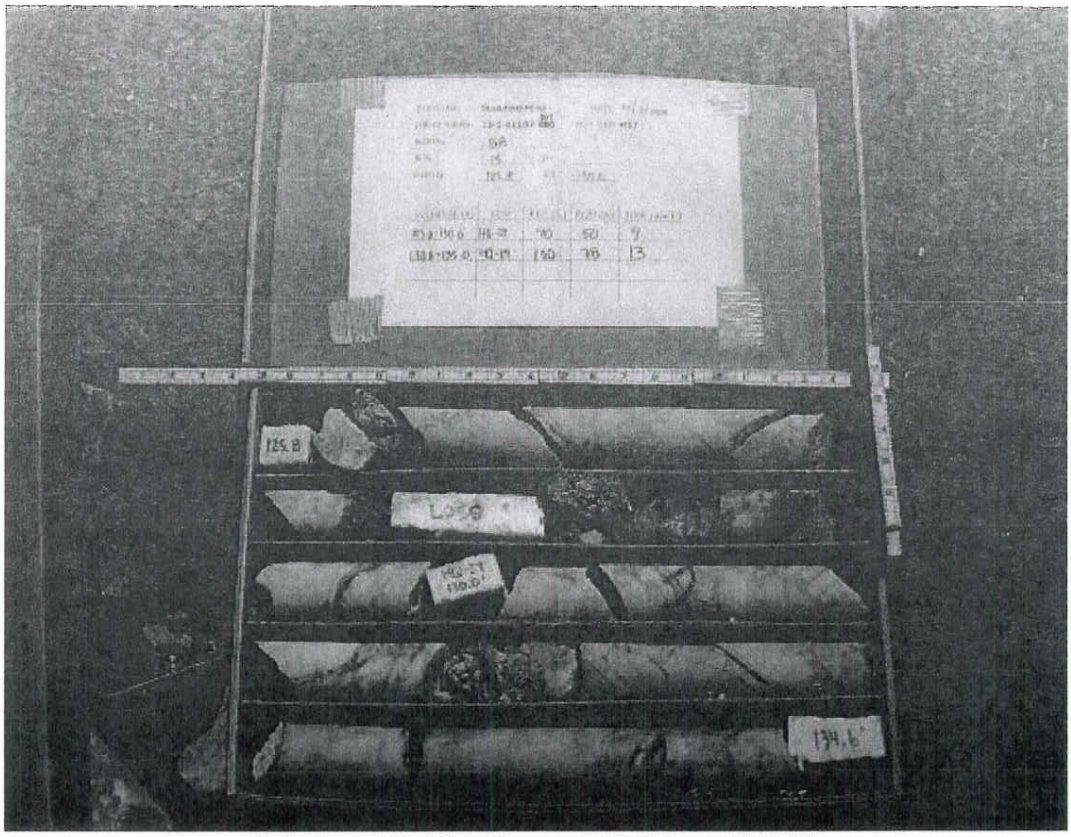
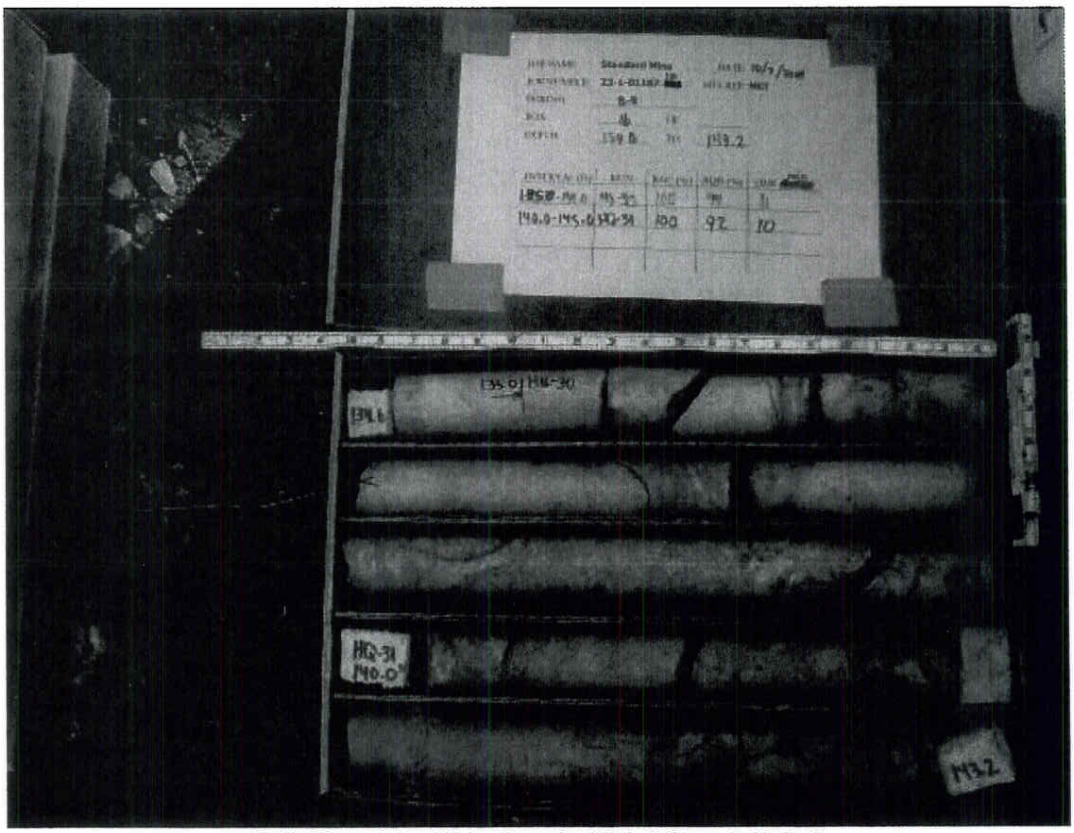
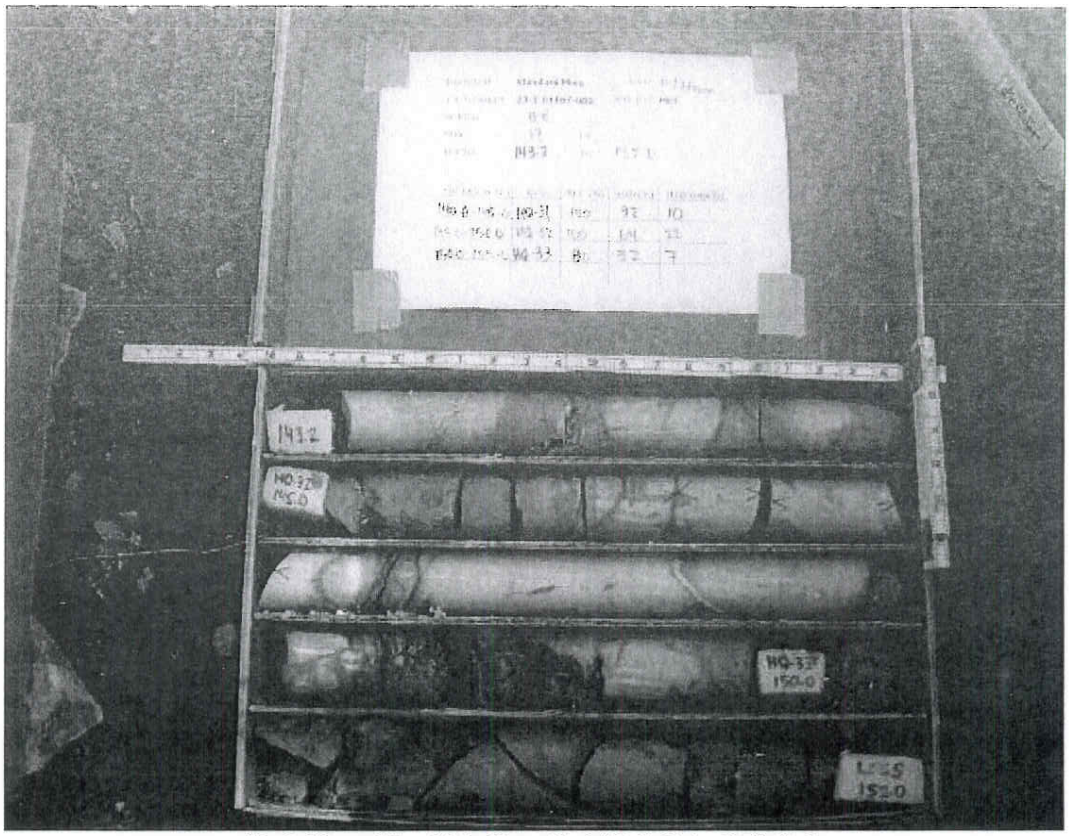


B-8, Box 15 of 21, Depth 125.8 ft to 134.6 ft



B-8, Box 16 of 21, Depth 134.6 ft to 143.2 ft

Figure B-1
(Sheet 8 of 11)
23-1-01187-101



B-8, Box 17 of 21, Depth 143.2 ft to 152.0 ft

B-8, Box 18 of 21, Depth 152.0 ft to 161.6 ft

Figure B-1
(Sheet 9 of 11)
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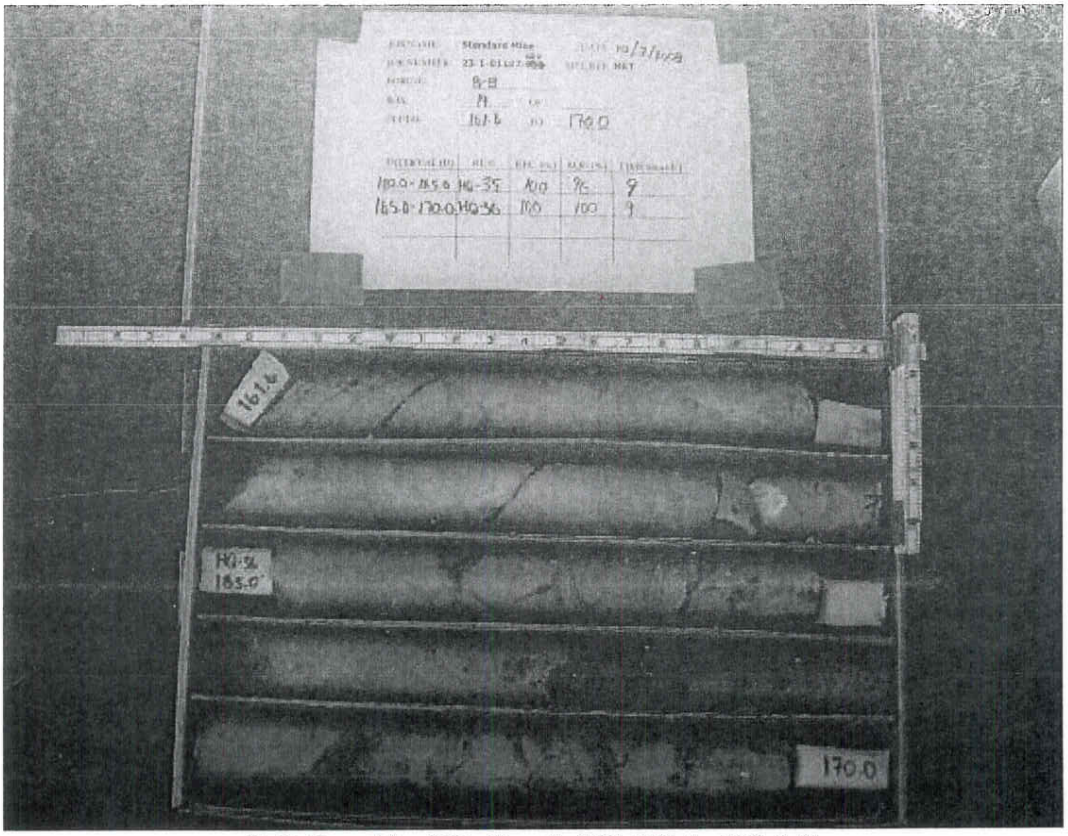
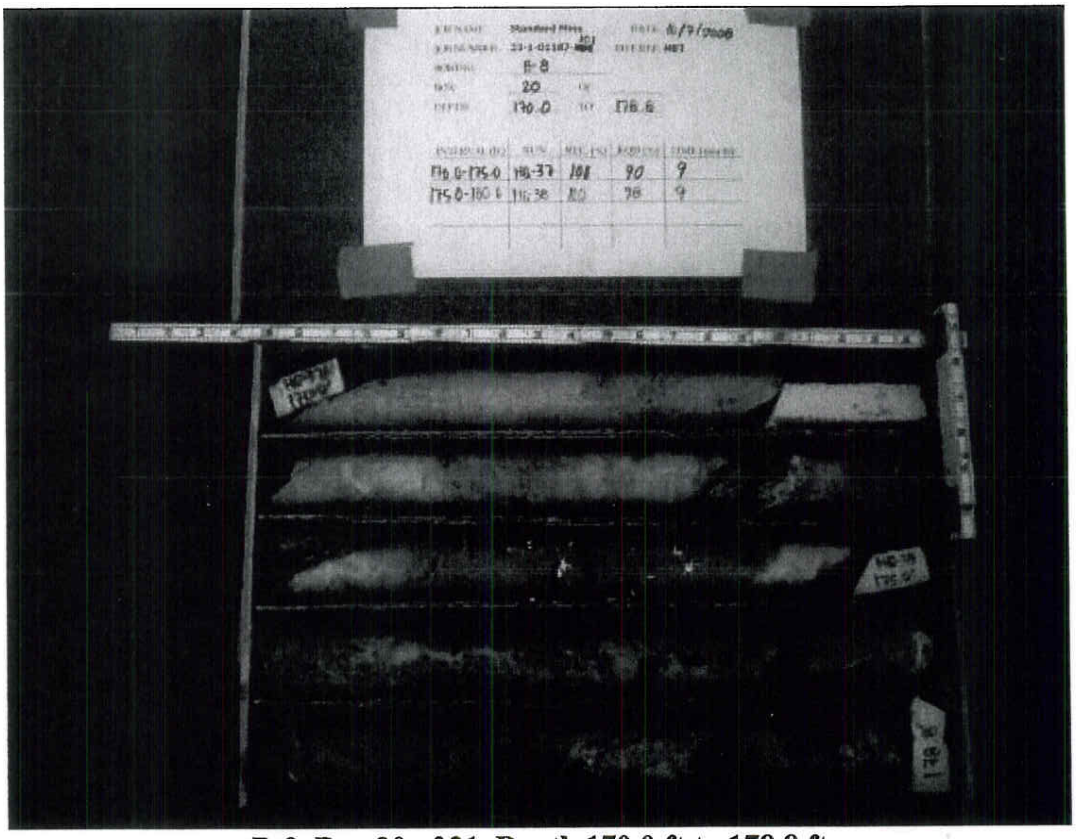


B-8, Box 19 of 21, Depth 161.6 ft to 170.0 ft



B-8, Box 20 of 21, Depth 170.0 ft to 178.8 ft

Figure B-1
(Sheet 10 of 11)
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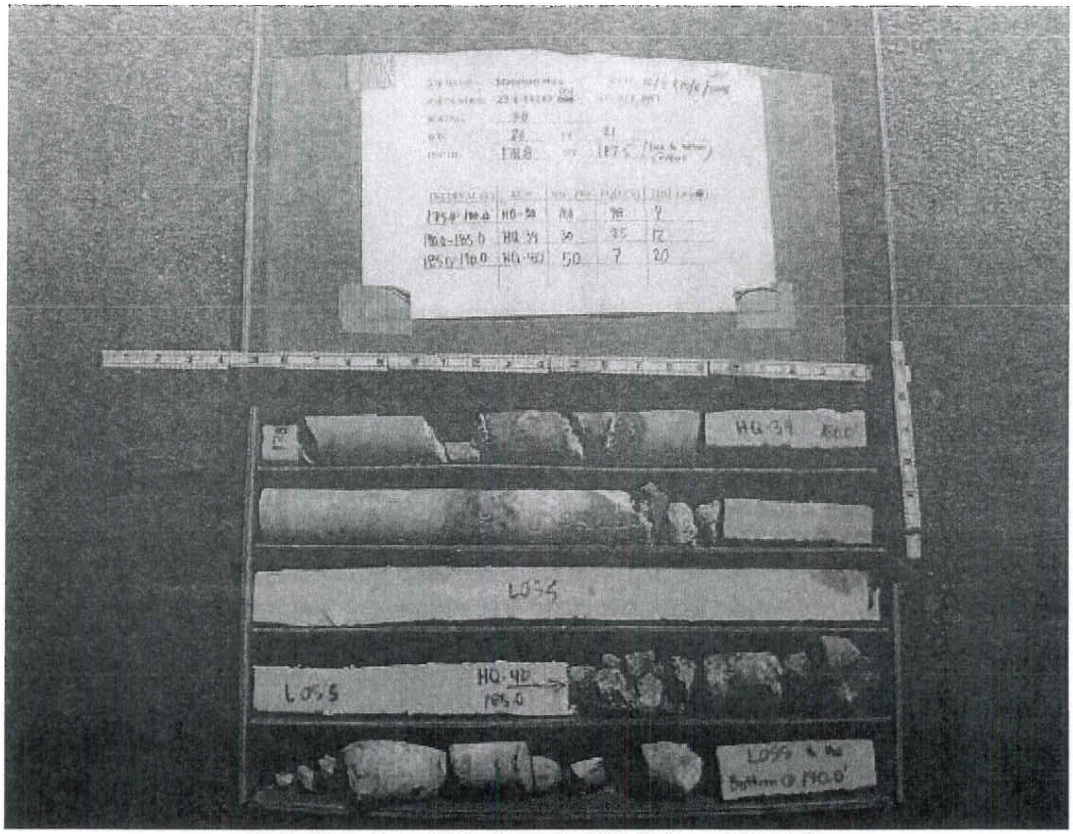

B-8, Box 21 of 21, Depth 178.8 ft to 190.0 ft

Figure B-1
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APPENDIX C

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL REPORT

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland