A-A'

Geraghty & Miller, Inc.

WELL LOG

Well No.: H-42

Project: Stauffer Chemical Company

Date Completed: 2/22/80

Location: Henderson, Nevada

Description	Depth Below Land Surface (feet)
Sand, silty to clayey, grayish-brown very fine to very coarse (poorly sorted) and gravel, pebbles, cobbles and boulders rounded to subangular; also with layers of caliche and caliche-cemented sand and gravel. Note: caliche layer 42.5-44; organic odor in mud at 41'	0 - 44
Clay, silty, to silt, clayey, light brown with traces of sand and gravel in matrix also with occasional thin layers of sand reworked caliche, and caliche (Muddy Creek Formation).	44 - 55

Geraghty & Miller, Inc.

WELL LOG

Well No.: H-42

Date Completed: 2-22-80

Project: Stauffer Chemical Company

Location: Henderson, Nevada

Split Spoon Samples

Description	Depth Below Land Surface (feet)
30-31-32 blows/6" light brown clayey silt; organic odor	44.0 - 45.1
light brown clayey silt, with occasional caliche gravel; slight organic odor 55.0-56.1; no organic odor 56.1-56.5	55.0 - 56.5

Geraghty & Miller, Inc.

WELL LOG

Well No.: H-46

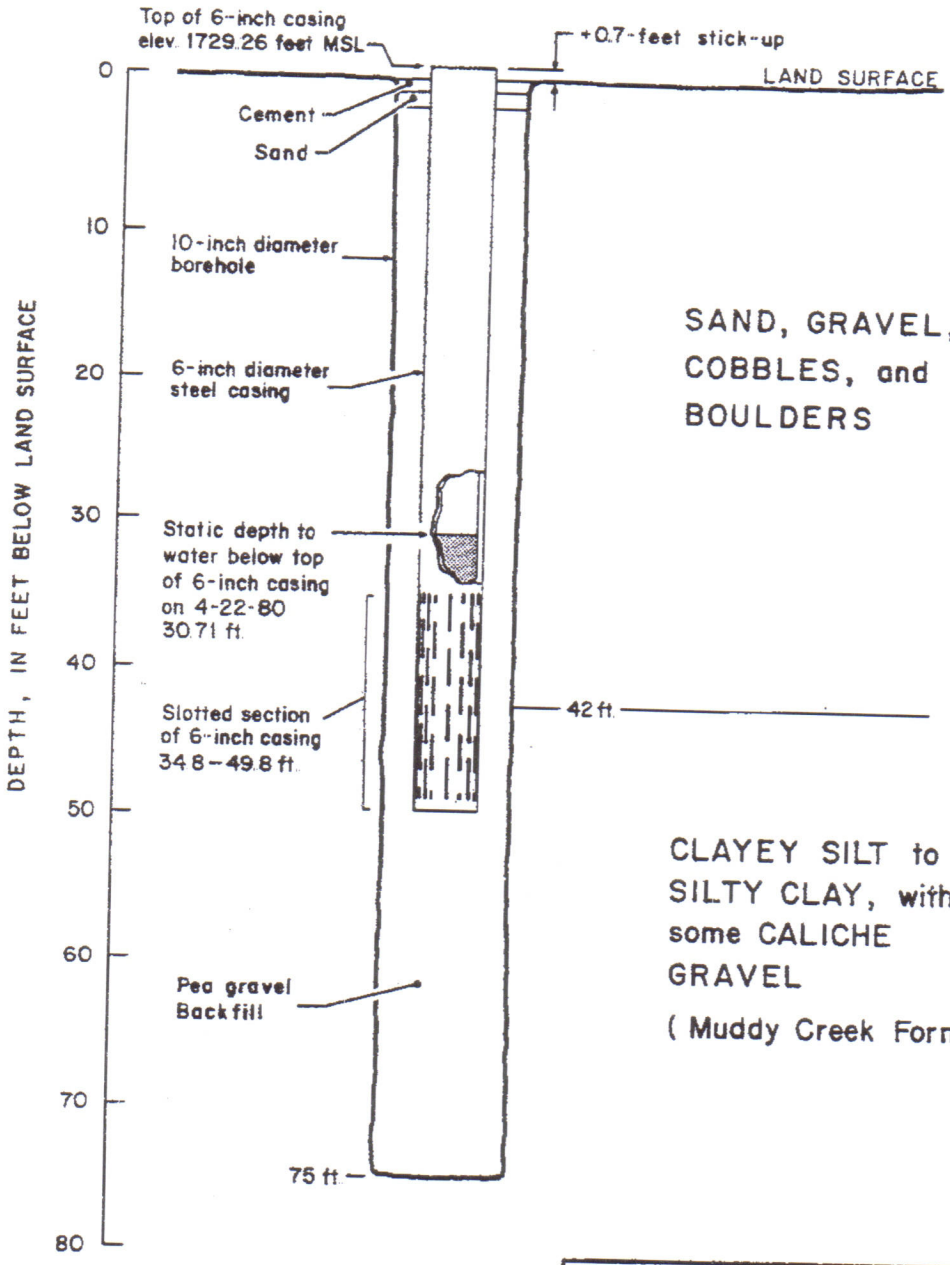
Date Completed: 3/29/80

Project: Stauffer Chemical Company

Location: Henderson, Nevada

Description	Depth Below Land Surface (feet)
Sand, silty to clayey, grayish-brown very fine to very coarse (poorly sorted and gravel, pebbles, cobbles and boulders rounded to subangular; also with layers of caliche and caliche-cemented sand and gravel. Note: organic odor in cuttings at 41'	0 - 42
Clay, silty, to silt, clayey, light brown with traces of sand and gravel in matrix also with occasional thin layers of sand reworked caliche, and caliche (Muddy Creek Formation)	42 - 51

WELL H-19



TITLE

CONSTRUCTION DETAILS AND STRATIGRAPHY OF MONITOR WELL H-19

PREPARED FOR STAUFFER CHEMICAL COMPANY
Henderson Nevada

Geraghty & Miller, Inc.

COMPILED BY	M. WARFEL	SCALE	FIGURE No.
PREPARED BY		SHOWN	
PROJECT MGR.	JOHN ISBISTER	DATE	
		JULY 1980	

453-369

Geraghty & Miller, Inc. WELL LOG

Well No.: H-43

Project: Stauffer Chemical Company

Date Completed: 2/27/80

Location: Henderson, Nevada

Description	Depth Below Land Surface (feet)
Sand, silty to clayey, grayish-brown very fine to very coarse (poorly sorted and gravel, pebbles, cobbles and boulders rounded to subangular; also with layers of caliche and caliche-cemented sand and gravel Note: caliche layer 43'-45'; organic odor in mud at 45'	0 - 45.5
Clay, silty, to silt, clayey, light brown with traces of sand and gravel in matrix also with occasional thin layers of sand reworked caliche, and caliche (Muddy Creek Formation)	45.5 - 55

Geraghty & Miller, Inc.

WELL LOG

Well No.: H-43

Date Completed: 2/27/80

Project: Stauffer Chemical Company

Location: Henderson, Nevada

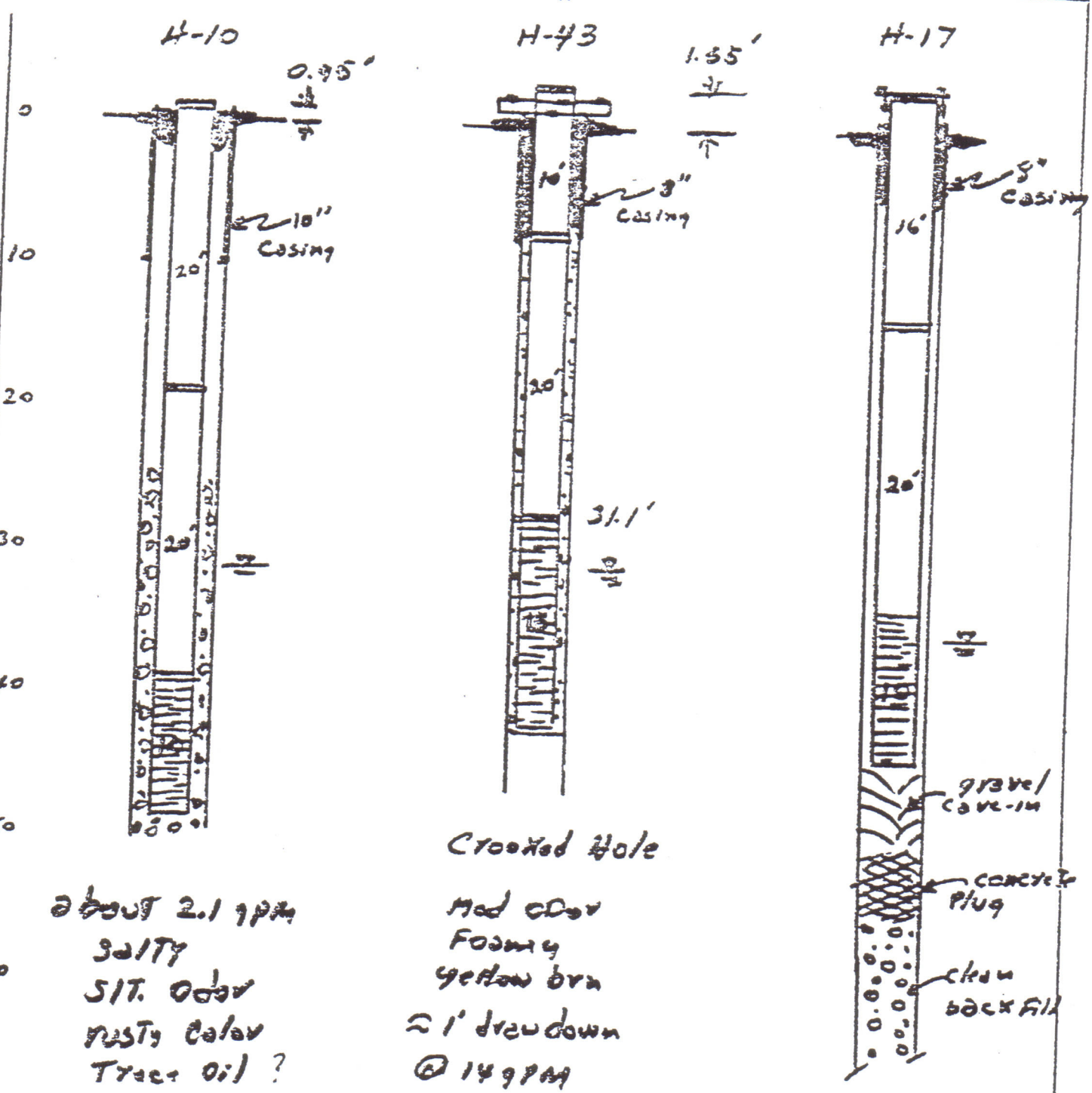
Solit Spoon Samples

Description	Depth Below Land Surface (feet)
10-10-12 blows/6" light brown silty clay, with occasional caliche fragments; organic odor	46.0 - 47.3
7-8-9 blows/6" light brown silty clay to clayey silt, with occasional caliche fragments; thin layer of reworked caliche at 55.0'; no organic odor	55.0 - 56.6

BY _____ DATE _____ CLIENT H-43 SHEET NO. _____ OF _____

CHKD. BY _____ DATE _____ PROJECT NO. _____

PROJECT _____



about 2.1 gpm
salty
slt. odor
rusty color
Trace oil ?

Crooked Hole

Mod odor
Foamy
yellow brn
≈ 1' drawdown
@ 1½ gpm

Crooked Hole

bottom at 42.2'
on clay
< 1 gpm

ConverseWardDavisDixon

SIGNED _____ SHEET NO.

Log of Boring No. BW-5B

BMI Landfill CAMU Investigation

Henderson, Nevada

Drilling Method: Rotary Sonic
Drilling Equipment: GEFCO
Drilling Contractor: Water Development Corporation
Driller: Mike Wilkerson

Sample Type: N/A
Sample Interval Continuous

Logged By: A. Norris
Date Started: 03/9/05
Date Completed: 03/11/05

Northing: 26721183.830
Easting: 825065.410
TOC Elevation (ft. msl): 1729.209
Borehole Total Depth: 200 ft bgs
Borehole Diameter: 7 5/8" O.D. Casing / 7 7/8" O.D. Bit
Well ID: GW-AA-BW-05A
Depth to Water (ft. bgs): 40 ft bgs ▽

Basic Remediation COMPANY

Monitoring Well Construction

Type of Surface Seal:	Bentonite-Grout	**Screen Slot Size:**	0.010 in
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	34 ft bgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	64 ft bgs
Transition Sand Type:	N/A	**Type of Sand Pack:**	#2/12

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
0					0.0		SM: Silty sand, dark yellowish brown (10YR4/4), dry to moist, subangular to subrounded sand, nonplastic to very low plasticity silt, locally partly indurated trace fine to coarse volcanic gravel (up to 1" long). Approximately trace gravel, trace coarse, 15% medium sand, 65% fine sand and 20% silt.	Locking monument well box with concrete apron and ballards
					0.0		Silty sand, yellowish brown (10YR5/4), dry to moist, subangular to subrounded sand, nonplastic silt, fine to coarse subangular to subrounded volcanic gravel (up to 1.5" long), locally partly indurated to weakly cemented. Approximately 10% gravel, 5% coarse sand, 15% medium sand, 55% fine sand and15% silt.	Cement Bentonite Grout
-10					0.0		Silty sand, dark yellowish brown (10YR4/4), dry, subangular to subrounded sand, nonplastic silt, fine to coarse subangular to subrounded volcanic gravel (up to 1" long), some local volcanic cobbles up to 4" long. Approximately 5% gravel, 5% coarse sand, 15% medium sand, 60% fine sand and 15% silt.	4" Blank PVC Riser Pipe
					0.0		Silty sand with gravel, yellowish brown (10YR5/4), dry, subangular to subrounded sand, nonplastic silt, fine to coarse subangular to subrounded volcanic gravel (up to 3" long), trace local volcanic cobbles (up to 4" long). Approximately 15% gravel, 10% coarse sand, 15% medium sand, 45% fine sand and 15% silt.	
-20					0.0		Silty sand, yellowish brown (10YR5/4), dry, subangular to subrounded sand, nonplastic silt, fine to coarse subangular to subrounded volcanic gravel (up to 2" long). Approximately 10% gravel, 5% coarse sand, 15% medium sand, 55% fine sand and 15% silt.	
					0.0		Silty sand with gravel, brown (7.5YR5/4), dry, subangular to subrounded sand, nonplastic silt, fine to coarse angular to subrounded volcanic gravel (up to 1" long). Approximately 25% gravel, 10% coarse sand, 10% medium sand, 40% fine sand and 15% silt.	

BMI Landfill CAMU Investigation

Henderson, Nevada

Basic Remediation COMPANY

Log of Boring No. BW-5B

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-30					0.0		Silty sand with gravel, light yellowish brown (10YR6/4), dry, subangular to subrounded sand, nonplastic silt, fine to coarse angular to subrounded volcanic gravel (up to 3" long), locally partly indurated, trace local volcanic cobbles (up to 4" long). Approximately 20% gravel, 10% coarse sand, 10% medium sand, 45% fine sand and 15% silt.	Bentonite seal
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			
					0.0			#2/12 Sand Pack
					0.0			
					0.0		Silty sand with gravel, pale brown (10YR6/3), dry, subangular to subrounded sand, nonplastic silt, fine to coarse subangular to subrounded fine to coarse volcanic gravel (up to 1.5" long), locally partly indurated to weakly cemented. Approximately 20% gravel, 10% coarse sand, 15% medium sand, 40% fine sand and 15% silt.	
					0.0			
					0.0			
					0.0			4" 0.010 Slot PVC screen
					0.0			
					0.0			
					0.0			
					3.2		ML: Sandy silt, gray (10YR5/1), moist, nonplastic to very low plasticity silt, subangular to subrounded sand, locally partly indurated to moderately cemented. Approximately trace coarse sand, 5% medium sand, 35% fine sand and 60% silt.	
-40					7.6			
					12.5		SP-SM: Poorly graded sand with silt, brown (10YR5/3), wet, angular to subrounded sand, nonplastic silt. Approximately 10% coarse sand, 40% medium sand, 40%fine sand and 10% silt.	
					22.7			
					18.2			
					20.0			
					14.2		Poorly graded sand with silt, dark grayish brown (10YR4/2), wet, subangular to subrounded sand, nonplastic silt, trace local cementation. Approximately 10% coarse sand, 50% medium sand, 30% fine sand and 10% silt.	
					46.5			
					42.5			
					29.5			
					5.7			
-50					3.7		SM: Silty sand, light gray (10YR7/2), dry, cemented from 49' to 51' bgs, subangular to subrounded sand. Approximately 5% medium sand, 55% fine sand and 40% silt.	
					20.1			
					8.9			#2/12 Sand Pack
					74.9			
					61.4			
					12.0		Silty sand, grayish brown (10YR5/2), wet, subangular to subrounded sand, nonplastic silt, partly indurated. Approximately 5% medium sand, 60% fine sand and 35% silt.	
					6.2			
					4.3			
					7.5			
					27.1		ML: Clayey silt, yellowish brown (10YR5/4), moist, low plasticity silt, subangular to subrounded sand. Approximately 70% silt and 30% clay.	
-60							SM: Silty sand with clay, yellowish brown (10YR5/4), wet, subangular to subrounded sand, low plasticity fines. Approximately 5% coarse sand, 20% medium sand, 45% fine sand, 20% silt and 10% clay.	#2/12 Sand Pack
								4" 0.010 Slot PVC screen

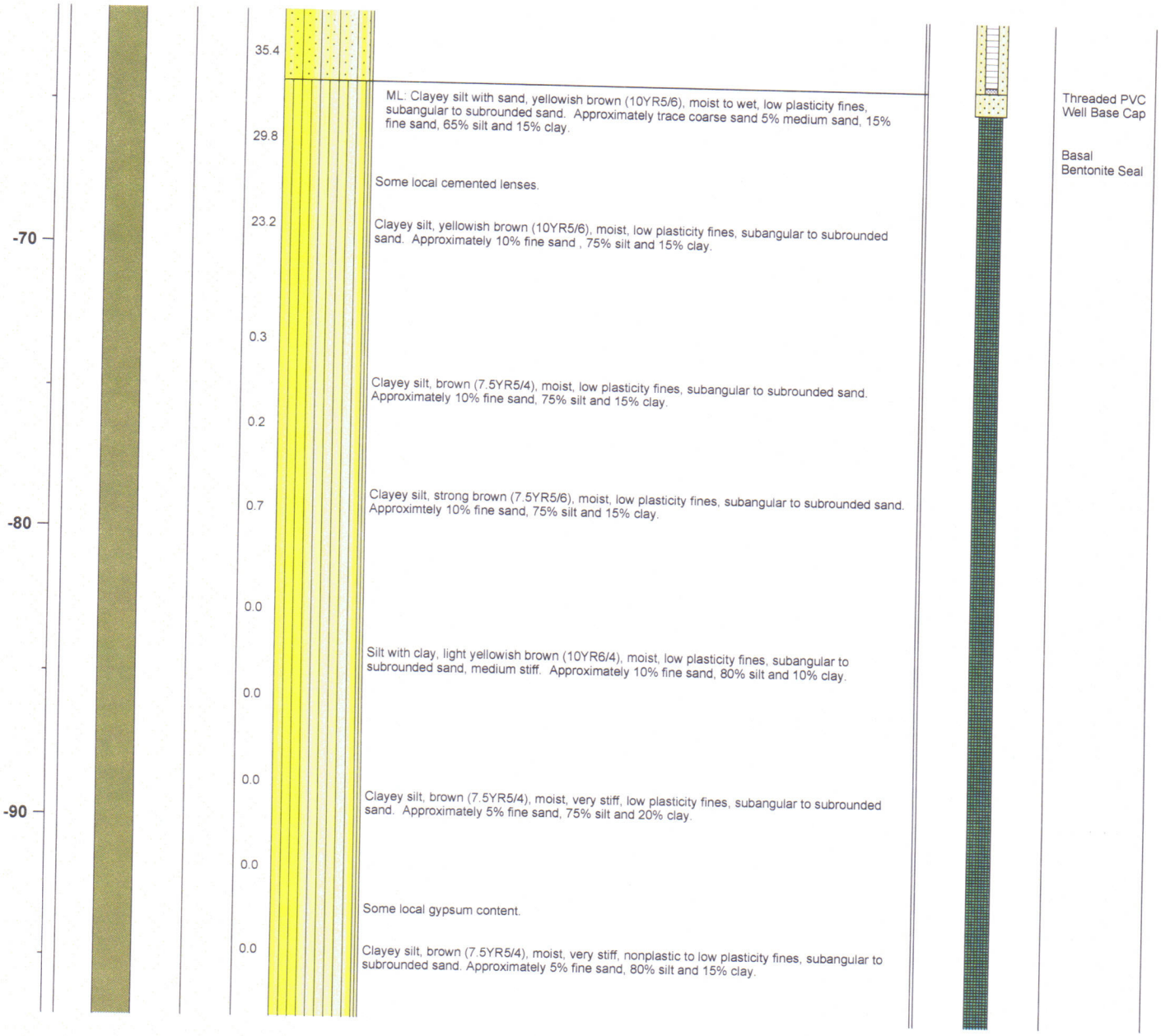
BMI Landfill CAMU Investigation

Henderson, Nevada

Basic Remediation COMPANY

Log of Boring No. BW-5B

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-70					35.4		ML: Clayey silt with sand, yellowish brown (10YR5/6), moist to wet, low plasticity fines, subangular to subrounded sand. Approximately trace coarse sand 5% medium sand, 15% fine sand, 65% silt and 15% clay.	Threaded PVC Well Base Cap
					29.8		Some local cemented lenses.	Basal Bentonite Seal
					23.2		Clayey silt, yellowish brown (10YR5/6), moist, low plasticity fines, subangular to subrounded sand. Approximately 10% fine sand , 75% silt and 15% clay.	
					0.3		Clayey silt, brown (7.5YR5/4), moist, low plasticity fines, subangular to subrounded sand. Approximately 10% fine sand, 75% silt and 15% clay.	
-80					0.2		Clayey silt, strong brown (7.5YR5/6), moist, low plasticity fines, subangular to subrounded sand. Approximtely 10% fine sand, 75% silt and 15% clay.	
					0.7		Silt with clay, light yellowish brown (10YR6/4), moist, low plasticity fines, subangular to subrounded sand, medium stiff. Approximately 10% fine sand, 80% silt and 10% clay.	
					0.0		Clayey silt, brown (7.5YR5/4), moist, very stiff, low plasticity fines, subangular to subrounded sand. Approximately 5% fine sand, 75% silt and 20% clay.	
-90					0.0		Some local gypsum content.	
					0.0		Clayey silt, brown (7.5YR5/4), moist, very stiff, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 5% fine sand, 80% silt and 15% clay.	
					0.0			



Basic Remediation COMPANY

Log of Boring No. BW-5B

Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-100					0.0		Trace local gypsum content.	
					0.0		Clayey silt, yellowish brown (10YR5/4), moist, stiff, low plasticity fines, subangular to subrounded sand, becomes wet @ ~100.5' bgs. Appeoximately 5% fine sand, 80% silt and 15% clay.	
					0.0		Sandy silt, strong brown (7.5YR5/6), wet, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 5% medium sand, 35% fine sand, 55% silt and 5% clay.	Basal Bentonite Seal
							(Sample BRC-BW-05B-102 collected).	
					0.0		Clayey silt, brown (7.5YR5/4), moist, medium stiff, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 5% fine sand, 80% silt and 15% clay.	
-110					0.0		Silt with clay, light yellowish brown (2.5YR6/3), moist, stiff, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 5% fine sand, 85% silt and 10% clay.	
					0.0		Clayey silt, light yellowish brown (2.5Y6/3), moist, stiff to very stiff, subangular to subrounded sand. Approximately 5% fine sand, 85% silt and 10% clay.	
					0.0		Clayey silt, yellowish brown (10YR5/4), moist, very stiff, low plasticity fines. Approximately 80% silt and 20%.	
-120					0.0		Silt with clay, pale brown (10YR6/3), moist, very stiff, nonplastic to low plasticity fines. Approximately trace fine sand, 90% silt and 10% clay.	
					0.0		Clayey silt, light yellowish brown (10YR6/4), moist, very stiff, low plasticity fines, subangular to subrounded sand. Approximately 5% fine sand, 80% silt and 15% clay.	
					0.0		Some local gypsum content.	
					0.0		Clayey silt, yellowish brown (10YR5/4), moist, stiff to very stiff, low plasticity fines. Approximately trace fine sand, 75% silt and 25% clay.	
-130					0.0		Silt with clay, pale brown (10YR6/3), moist, very stiff, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 5% fine sand, 85% silt and 10% clay.	Basal Bentonite Seal

BMI Landfill CAMU Investigation

Henderson, Nevada

Basic Remediation COMPANY

Log of Boring No. BW-5B

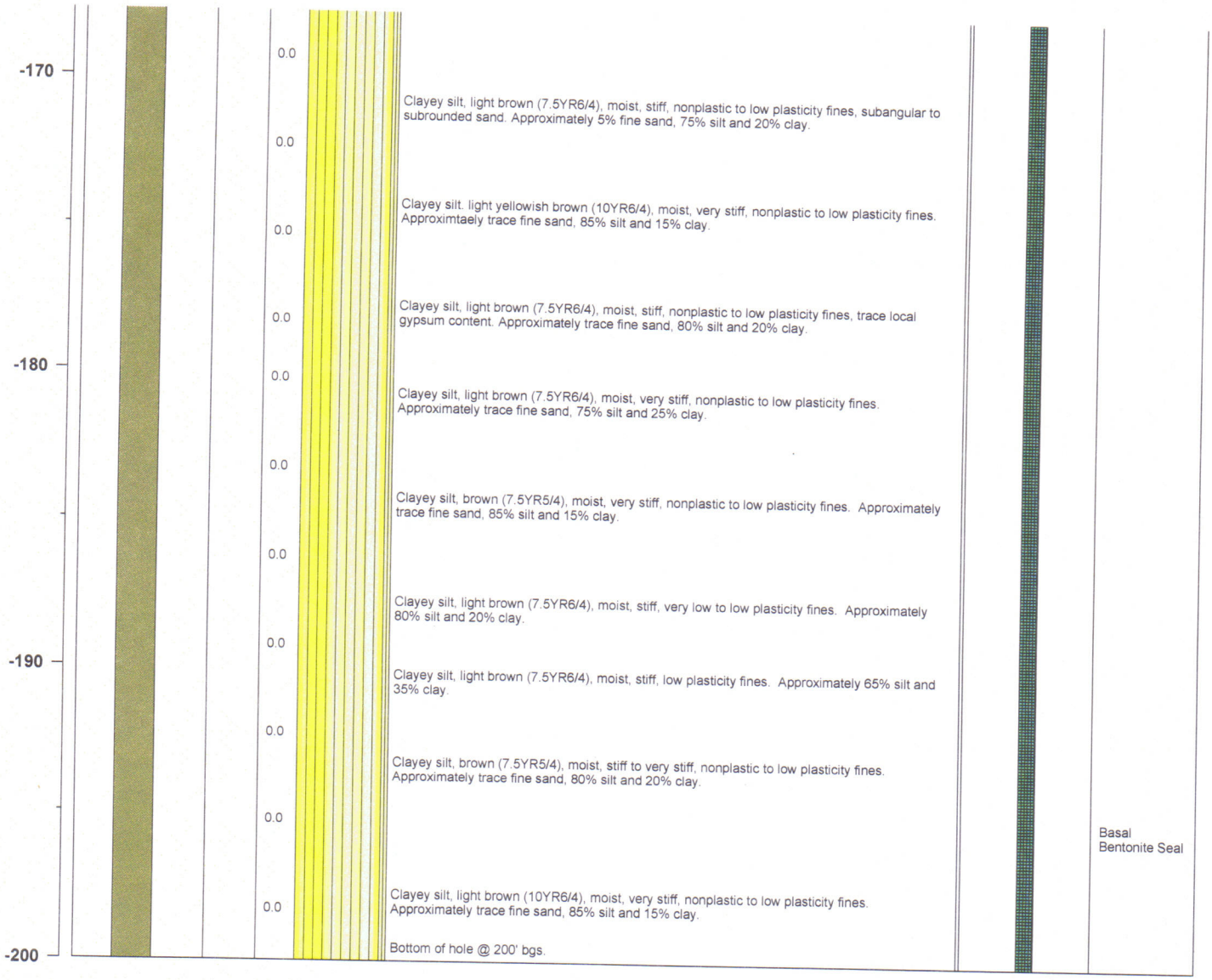
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
-140					0.0		Silt with clay, light yellowish brown (10YR6/4), moist, very stiff, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 5% fine, 85% silt and 10% clay.	
					0.0		Clayey silt, yellowish brown (10YR5/4), moist, stiff to very stiff, low plasticity fines, trace local gypsum content. Approximately 85% silt and 15% clay.	
					0.0		Clayey silt, light yellowish brown (10YR6/4), moist, medium stiff, low plasticity fines, subangular to subrounded sand. Approximately 5% fine sand, 75% silt and 20% clay.	
					0.0		Clayey silt, yellowish brown (10YR5/4), moist, medium stiff, nonplastic to low plasticity fines, subangular to subrounded sand. Approximately 5% fine sand, 80% silt and 15% clay.	
-150					0.0		Clayey silt, brown (7.5YR5/4), moist, stiff, nonplastic to low plasticity fines. Approximately trace fine sand, 85% silt and 15% clay.	
					0.0		Clayey silt, brown (7.5YR5/4), moist, very stiff, nonplastic to low plasticity fines. Approximately trace fine sand, 80% silt and 20% clay.	
					0.0		Clayey silt, light yellowish brown (10YR6/4), moist, very stiff, nonplastic to low plasticity fines. Approximately trace fine sand, 85% silt and 15% clay.	
					0.0		Clayey silt, brown (7.5YR5/4), moist, very stiff, nonplastic to low plasticity fines. Approximately trace fine sand, 85% silt and 15% clay.	
-160					0.0		Clayey silt, light brown (7.5YR6/4), moist, stiff, low plasticity fines. Approximately trace fine sand, 65% silt and 35% clay.	Basal Bentonite Seal
					0.0		Clayey silt, light brown (7.5YR6/4), moist, stiff, low plasticity fines. Approximtely trace fine sand, 65% silt and 35% clay.	
					0.0		Clayey silt, light brown (7.5YR6/4), moist, stiff, nonplastic to low plasticity fines. Approximately trace fine sand, 80% silt and 20% clay.	

BMI Landfill CAMU Investigation

Henderson, Nevada

Basic Remediation COMPANY

Log of Boring No. BW-5B



Fernandina, NV

BEGUN 6/3/82 FINISHED 6/8/82 LOGGED BY CAD DRILLED BY Converse, Weld, Davis, Dixon DRILL HOLE MC-1

ELEV. 1730.68 TOTAL DEPTH 40' LOCATION along Stauffer-Kerr Mt. fence, ~~more~~ between wells 21 & 22

Drilled w/ Mayhew 1000 - attempted to ~~40~~ w/ air, then redrilled w/ bentonite mud

FOOTAGE FROM	FOOTAGE TO	THICKNESS	RECOVERY	LITHOLOGY	REMARKS
0	20			sand & gravel - fine sand to silt, ½" to 1½" gravel, becomes more moist @ 7' thin noncemented caliche @ 17½'	
20	35			sand & gravel - brown to tan sand, less silty, more moist partially cemented caliche @ 25-30' also contains uncoated gravel	odor @ 21'
35				Muddy Creek Fm: clay - tan in top 1' reddish brown below	
				water level 6/8/82 : 30.3'	
				Water Level 7/8/82 30.2	

Geraghty & Miller, Inc. WELL LOG

Well No.: H-23 Date Completed: 1/31/80

Project: Stauffer Chemical Company Location: Henderson, Nevada

Description	Depth Below Land Surface (feet)
Sand, silty to clayey, grayish-brown very fine to very coarse (poorly sorted), and gravel, pebbles, cobbles and boulders, rounded to subangular; also with layers of caliche and caliche-cemented sand and gravel Notes: layers of cemented sand and gravel 27'-29', 31'-34', 40'-41'; organic odor in mud at 37'	0 - 42½
Clay, silty, to silt, clayey, light brown with traces of sand and gravel in matrix; also, with occasional thin layers of sand, reworked caliche, and caliche (Muddy Creek Formation) Notes: thin layers of white silt and clay (reworked caliche) at 54'-55', 87', 96'.	42½ - 101

Log of Boring No. BW-4A

BMI Landfill CAMU Investigation

Henderson, Nevada

Drilling Method: Rotary Sonic
Drilling Equipment: GEFCO
Drilling Contractor: Water Development Corporation
Driller: Mike Wilkerson

Sample Type: 2" Split Spoon
Sample Interval Continuous

Logged By: A. Norris
Date Started: 03/22/05
Date Completed: 03/22/05

Northing: 26721142.810
Easting: 825492.254
TOC Elevation (ft. msl): 1729.467
Borehole Total Depth: 60 ft bgs
Borehole Diameter: 7 5/8" O.D. Casing / 7 7/8" O.D. Bit
Well ID: GW-AA-BW-04A
Depth to Water (ft. bgs): 43' bgs ⧖

Basic Remediation COMPANY

Monitoring Well Construction

Type of Surface Seal:	Bentonite-Grout	**Screen Slot Size:**	0.010 in
Blank Casing Type/Size:	4" Sch 80 PVC	**Top of Screen (ft. bgs):**	32 ft bgs
Screen Type/Size:	4" Sch 80 PVC	**Bottom of Screen (ft. bgs):**	52 ft bgs
Transition Sand Type:	N/A	**Type of Sand Pack:**	#2/12

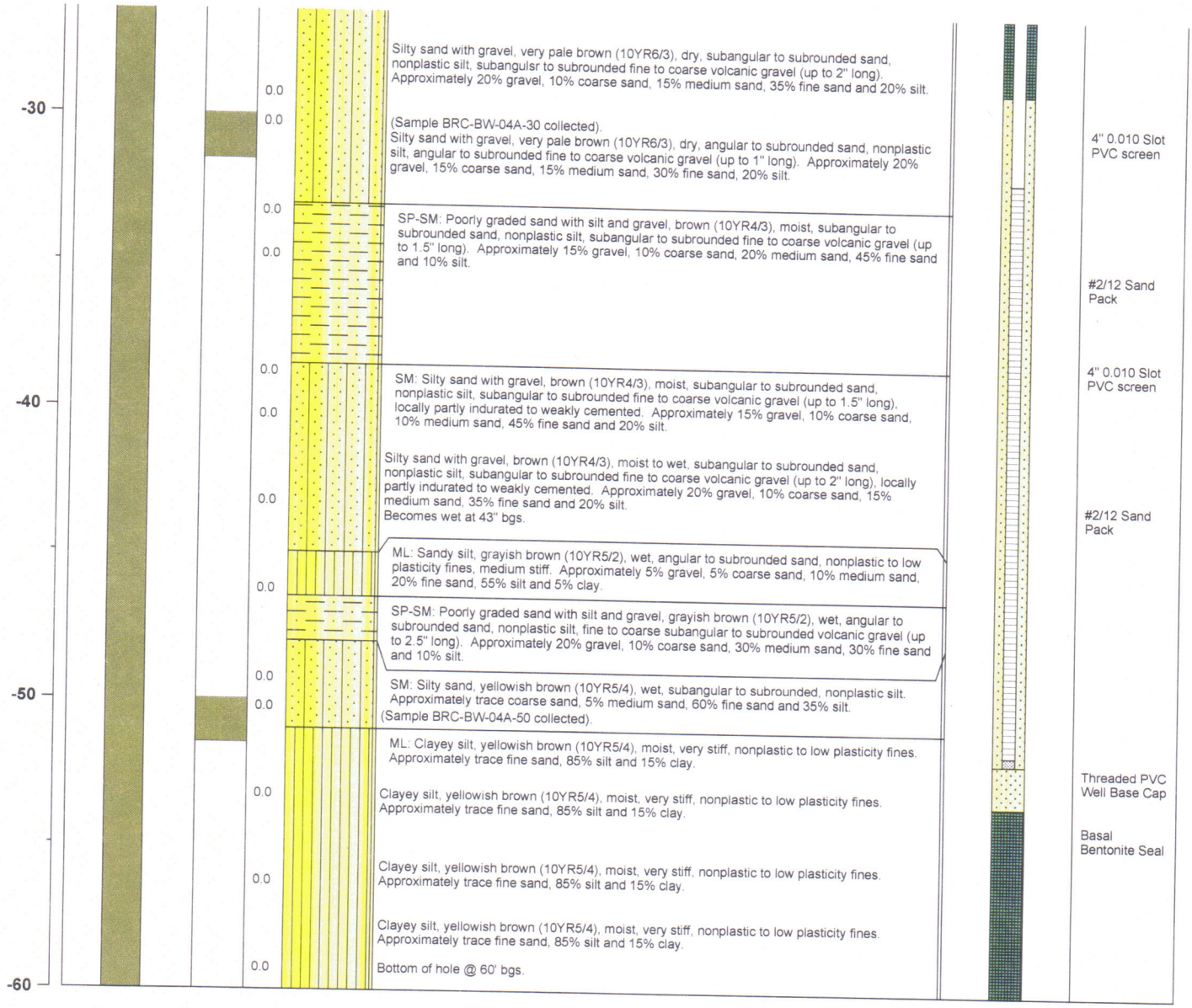
Depth Elevation (MSLD)	Sample Type	Sample Interval	Sample Recovery (feet)	Sample Retained for Analysis	PID	Lithology	Soil Description	Well Construction
0					0.0		SM: Silty sand with gravel, yellowish brown (10YR5/4), moist, subangular to subrounded sand, nonplastic to low plasticity fines, subangular to subrounded fine to coarse volcanic gravel (up to 2" long). Approximately 20% gravel, 10% coarse sand, 20% medium sand, 20% fine sand, 25% silt and 5% clay. (Sample BRC-BW-04A-0 collected).	Locking monument well box with concrete apron and ballards
					0.0		Silty sand with gravel, yellowish brown (10YR5/4), moist, subangular to subrounded sand, nonplastic to low plasticity fines, subangular to subrounded fine to coarse volcanic gravel (up to 1.5" long). Approximately 20% gravel, 10% coarse sand, 15% medium sand, 25% fine sand, 25% silt and 5% clay.	Cement Bentonite Grout
					0.0		Silty sand with gravel, yellowish brown (10YR5/4), moist to dry, subangular to subrounded sand, nonplastic silt, subrounded to subrounded fine course volcanic gravel (up to 3" long), trace local volcanic cobbles (up to 4" long). Approximately 15% gravel, 10% coarse sand, 15% medium sand, 40% fine sand and 20% silt.	
-10					0.0		Silty sand with gravel, very pale brown (10YR7/3), dry, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volcanic gravel (up to 2" long). Approximately 20% gravel, 10% coarse sand, 15% medium sand, 30% fine sand and 25% silt.	4" Blank PVC Riser Pipe
					0.0		Silty sand with gravel, very pale brown (10YR6/3), dry, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volcanic gravel (up to 2" long). Approximately 20% gravel, 15% coarse sand, 10% medium sand, 30% fine sand and 25% silt.	
							(Sample BRC-BW-04A-18 collected).	
-20					0.0		Silty sand with gravel, very pale brown (10YR6/3), dry, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volcanic gravel (up to 2" long). Approximately 20% gravel, 10% coarse sand, 15% medium sand, 35% fine sand and 20% silt.	
					0.0		Silty sand with gravel, very pale brown (10YR6/3) dry, subangular to subrounded sand, nonplastic silt, subangular to subrounded fine to coarse volcanic gravel (up to 2" long). Approximately 20% gravel, 10% coarse sand, 15% medium sand, 35% fine sand and 20% silt.	Bentonite seal

BMI Landfill CAMU Investigation

Henderson, Nevada

Basic Remediation COMPANY

Log of Boring No. BW-4A



WELL CONSTRUCTION DETAILS

WELL H-28

Depth: 51 feet

Borehole Diameter: 10 inches

Casing Diameter and Type: 6" steel I.D.

Casing Length: 51.7 feet

Top of Casing Eelvation: 1730.33

Screened Interval: 37.4 to 50.5 feet, 6" factory slotted steel well screen

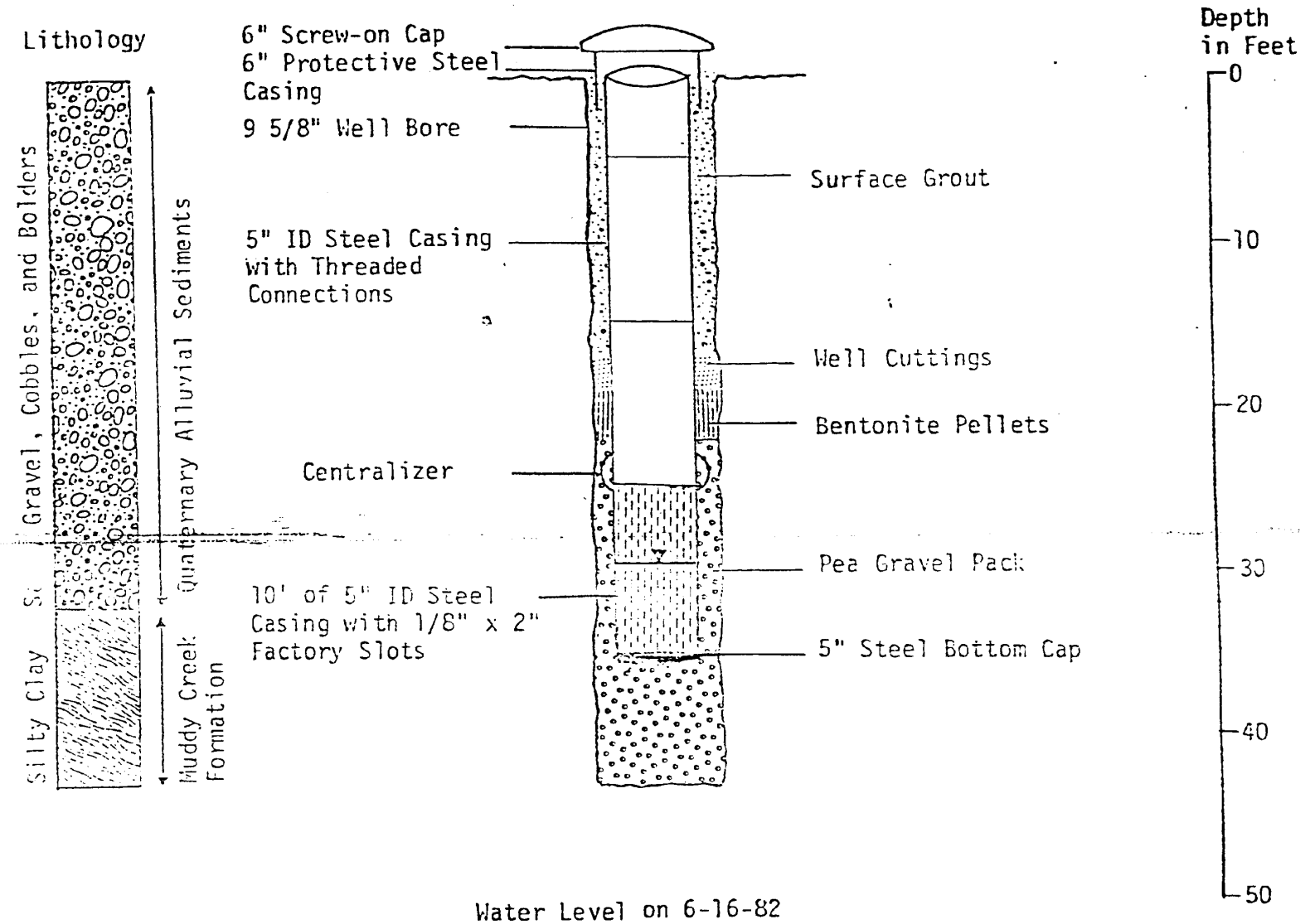
Gravel Pack Interval: 28 to 51.7 feet

Seal Interval: 0-28 feet: cement

Date Completed: 12-18-80

Data from Geraghty and Miller, Inc., 1980.

K-M Chemical Corporation
Henderson, Nevada Facility
Well No. M-6



Water Level on 6-16-82

31' 4"

Measured from Top of Protective Casing

KERR-McGEE CHEMICAL CORPORATION

Henderson Facility

RCRA Monitor Well No. M-6
Well Construction and Completion Table

Date Started	June 2, 1982
Date Completed	June 3, 1982 (except for surface grout)
Location	NW corner of landfill
Elevation from Top of Well Cover	1729.17'
Drilling Method	Rotary rig
Drilling Fluid	Revert
Depth to Muddy Creek	32'
Total Depth of Well	43'
Borehole Diameter	9 5/8"
Well Casing Diameter/Type	5" ID/threaded steel pipe
Well Casing Interval	34' to surface
Perforated Interval	35' - 25'
Perforation Type/ Size /Open Area	Factory slot/ 1/8" x 2" / 4 in^2 per 10'
Casing Above Ground (Well Cover)	Approx. 15"
Gravel Pack Interval	43' -22'
Type of Gravel	1/8" - 3/8" pea gravel
Surface Seal Interval	15' to surface
Completion:	0 -15.0' grout 15.0'-18.0' well cuttings 18.0'-22.0' bentonite pellets 22.0'-43.0' gravel pack
Comments: Open hole with gravel from 43.0' to 35.0'. Steel well cover with cap cemented in place on 6-16-82.	

Lithology Log
for Henderson
Well No. M-6

Depth in Feet	Lithology Description
0-29.0	GM Silty gravel and sand; slightly cemented from 12' - 13'
29.0-32.0	SM Silty sand and gravel with gypsum
32.0-32.5	CL Brown silty clay
32.5-34.0	SM Silty sand and gravel
34.0-38.0	CL Brown silty clay
38.0-43.0	CL Brown clay with sand and gravel

Top of Muddy Creek at 32 feet

/ = INCLUDED IN CAMU X-SECTIONS

TABLE 3.3

Well Completion and Water Level Information for Wells Installed at the BMI and Henderson Areas

A-A'

WELL	TOTAL DEPTH	SCREENED OR OPEN HOLE INTERVAL	DEPTH TO WATER AND YEAR MEASURED				DEPTH OF MUDDY CREEK FORMATION
			1971	1980	1982	1983	
H-1	91		46.3	Abd.			47
H-2	96	56-96		52.9			50
H-3	100	20-100	50.8	Abd.			55
H-4	77	20-77	45.9	Abd.			55
H-5	200		47.9				50
H-6	135	127-133		41.3			50
H-7	100	20-100		51.75			49
H-8	110	20-110	51.7				55
H-9	105	20-105	50.8				55
H-10	55 old	10-55		32			40
	50 new	39-49			31.3		
H-11	116 old	10-116		89			102
	105 new	95-105			88.5		
H-12	55	10-55		21	22.8		22
H-13	88	10-88		54			38
H-14	55	10-55		23			24
H-15	101	34-101		44			55
H-16	55	10-55		26			28
H-17	101 old	20-101		37			46
	50 new	39-49			37		
H-18	61	41-61		36	36.8		50
H-19	75 old	47-75		33			42
	50 new	35-50			34		
H-20	101	29-101		38	39		41
H-21	101 old	32-101		30			45.5
	55 new	40-55			31.2		
H-22	231	20-231					44
H-23	101 old	32-101		32			42.5
	50 new	30-50			35.6		
H-24	228	221-228		0 -Flowing- 0			38
H-25	102 old	25-102		22			24
	39 new	29-39			22.5		
H-26	25	19-25					
H-27	231	19-231					45
H-28	51	38-51		30	31.7		44.5
H-29	102	26-102		26	28		16
H-30	102	37-102		42	40		37
H-31	Not Drilled	-	-	-	-	-	-

* All depths are in feet below ground surface

A-A'

Table 1

Tabulation of Data
from Monitoring and Exploration Wells
at Henderson, Nevada

Well Number	Casing Elev.	Surface Elev.	Depth to Muddy Creek Fm.	Elev. of p of Muddy Creek Fm.	Water Level Elev. Dec. 1982	Water Level Distance from Top of Muddy Creek Fm.
H-1		1794				
H-2	1802.11	1801	50	1751		
H-3		1786	55	1731		
H-4		1790	55	1735		
H-5		1792	49	1743		
H-6		1793	50	1743		
H-7	1788.91	1789?	49	1740	1737.61	-2
H-8	1789.39	1789	55	1734		
H-9	1786.79	1786	55	1731		
H-10*	1704.01	1703.1	40	1663	1672.53	10
H-11*	1866.47	1865.1	102	1763	1778.35	15
H-12	1710.00	1709.2	22	1687	1688.87	2
H-13	1819.47	1818.8	38	1781	1766.24	-15
H-14	1711.94	1711.0	24	1687	1688.82	2
H-15	1772.20	1771.1	55	1716	1725.73	10
H-16	1713.88	1713.3	28	1685	1689.18	4
H-17*	1707.35	1704.6	46	1656	1670.33	14
H-18	1729.80	1728.6	51	1678	1692.53	14
H-19	1729.26	1728.6	42	1687	1695.46	8
H-20	1732.17	1731.9	41	1691	1693.35	2
H-21	1729.45	1728.4	45.5	1683	1697.57	15
H-22#			44			
H-23	1730.6	1729.5	42.5	1687	1695.02	8
H-24*+	1706.63		38		Flowing	
H-25*	1711.08	1710	24	1686	1688.36	
H-26	Not drilled					
H-27#	1729.8	1729?	45	1684?		
H-28	1730.33	1729.1	44.5	1685	1698.18	13
H-29	1717.33	1717.3	23	1694	1689.79	-4
H-30	1740.42	1739.6	37	1703	1698.88	-4
H-31	Not drilled					
H-32	1736.48	1735.9	38	1698	1696.66	-1
H-33	1733.91	1732.6	37	1696	1695.52	0
H-34	1728.49	1727.0	44	1683		
H-35+	1706.65	1705.2	35	1670		

Corehole without well completion
+ Second zone monitor
* Reworked configuration of well

from the original well. This may have contributed to the low yield of the original well H-17. Well yields will be discussed further in another section.

In September 1981, subsequent to the well upgrading, it was discovered that wells H-10 and 17 had been vandalized by filling the casings with wood, rocks, cable, and metal scraps. This resulted in the redrilling of wells H-10 and 17 with new screened 5" wells as described earlier. Table 1 presents the new well configurations.

In summary, eight new permanent 5" screened wells were installed; three were upgraded by the installation of screens and casings, and two temporary 2" PVC wells were installed during the 1981 drilling program. Additionally, wells outside of the plant area have been securely capped in order to prevent vandalism.

Table 1. Characteristics of New and Upgraded Wells

Well No.	Depth, ft.	Casing Diameter, in.	Casing Depth, ft.	Screened Interval, ft.
10	49	5	39	39-49
11	105	8	11	-
		5	95	95-105
17	49	5	39	39-49
25	39	8	26	-
		5	29	29-39
36	39	5	29	29-39
H-43	44	8	9	-
		5	29	29-44
48	43	5	33	33-43
49	38	5	28	28-38
50	43	5	33	33-43
51	42	5	32	32-42
52	28	5	18	18-28

Geraghty & Miller, Inc.

Monitoring Well Construction Data

Stauffer Chemical Company/Henderson, Nevada

Well No.	Date Started	Date Completed	Hole Diam.	Total Depth	Casing Diam.	Casing Length	Completion	TOC above GS	TOC Elevation	Contractor/ rig
H-10	10-10-79	10-15-79	10"	55'	10" (c)	11.0'	open hole, 10' - 55'	0.8'	1705.75'	M/CT
H-11	10-15-79	10-18-79	8"	116'	10" (c)	11.3'	open hole, 10' - 116'	1.2'	1866.25'	M/CT
H-12	10-17-79	10-20-79	10"	55'	10" (c)	10.6'	open hole, 10' - 55'	0.8'	1710.00'	M/CT
H-13	10-22-79	10-26-79	8"	88'	10" (c)	10.5'	open hole, 10' - 55'	0.7'	1819.47'	M/CT
H-14	10-24-79	10-25-79	10"	55'	10" (c)	10.5'	open hole, 10' - 55'	0.9'	1711.94'	M/CT
H-15	10-30-79	11- 6-79	8"	44'	10" (c)	10.5'	abandoned & backfilled	-	-	M/CT
H-15	12- 5-79	12- 6-79	9"	65'	10" (c) 8" (c)	10.0' 34.2'	pilot hole	-	-	A/AR
H-15	2- 4-80	2- 4-80	8"	101'	as above		open hole, 34' - 101'	1.1'	1772.20'	G/MR
H-16	10-31-79	11- 3-79	10"	55'	10" (c)	10.5'	open hole, 10' - 55'	0.6'	1713.88'	M/CT
H-17	11- 5-79	11- 9-79	10"	35'	10" (c)	10.5'	abandoned	-	-	M/CT
H-17	11-16-79	11-16-79	9"	35'	8" (c)	30.7'	pilot hole	-	-	A/AR
H-17	2- 7-80	2- 7-80	8"	101'	as above		open hole, 30' - 101'	0.9'	1709.43'	G/MR
H-18	11-13-79	11-13-79	12"	45'	10" (h)	13.5'	pilot hole	-	-	A/AR
H-18	11-14-79	11-16-79	8"	55'	as above		abandoned & backfilled	-	-	M/CT
H-18	2-18-80	2-26-80	10"	61'	6"	61.3'	torch slots, 41' - 61'; gravel backfill from 0' - 61'; cement cap	1.2'	1729.80	G/MR
H-19	11-13-79	11-13-79	12"	45'	10" (h)	29.6'	pilot hole	-	-	A/AR
H-19	11-26-79	11-30-79	10"	75'	10"	47.9'	drive casing behind hole	-	-	A/CT

Monitoring Well Construction Data

Stauffer Chemical Company/Henderson, Nevada

Well No.	Date Started	Date Completed	Hole Diam.	Total Depth	Casing Diam.	Casing Length	Completion	TOC above GS	TOC Elevation	Contractor rig
H-19	2-19-80	2-20-80	-	-	6"	50.5'	gravel backfill 49.8'-75'; 10" pulled; torch slots 34.8' - 49.8'; gravel to surface; cement cap	0.7'	1729.26	A/CT
H-20	11-14-79	11-14-79	12"	45'	10" (h)	29.3'	pilot hole	-	-	A/AR
H-20	1-24-80	1-25-80	8"	101'	as	above	open hole, 29'-101'; cement plug at surface	0.3'	1732.17	G/MR
H-21	11-15-79	11-15-79	9"	40'	8" (h)	32.6'	pilot hole	-	-	A/AR
H-21	1-28-80	1-30-80	8"	101'	as	above	open hole, 32'-101'	-	-	G/MR
H-21	2-20-80	2-21-80	-	-	6"	56.0'	gravel backfill, 55'-101'; 8" not pulled; torch slots 40'-50'; sand & gravel cave-in to 38'; open annulus; cement plug at surface	1.1'	1729.45'	A/CT
H-22	11-15-79	11-15-79	12"	25'	10" (h)	21.1'	pilot hole	-	-	A/AR
H-22	2-29-80	3- 6-80	5"	231'	as	above	test hole with core samples; open hole 20'-231'; cement plug at surface	-	-	G/MR
H-23	11-16-79	11-16-79	9"	25'	8" (h)	24.2'	pilot hole	-	-	A/AR
H-23	1-30-80	1-31-80	8"	101'	as	above	open hole, 23' - 101'	-	-	G/MR

Monitoring Well Construction Data

Stauffer Chemical Company/Henderson, Nevada

Well No.	Date Started	Date Completed	Hole Diam.	Total Depth	Casing Diam.	Casing Length	Completion	TOC above GS	TOC Elevation	Contractor rig
H-23	2-22-80	2-26-80	6"	80'(drill out dog leg)	6"	51.4'	gravel backfill 50'-80'; 8" not pulled; torch slots 30.3'-50.3'; gravel to 25'; sand to 22'; cement to surface.	1.1	1730.60'	A/CT
H-24	11-17-79	11-17-79	12"	35'	10" (h)	25.2'	pilot hole	-	-	A/AR
H-24	11-19-79	12- 6-79	10"	225'	6"	221.3'	sand backfill 220'-225'; pressure cemented 0'-75'; plug fails; cement inside 6"	-	-	M/CT
H-24	1- 3-80	1- 4-80	5"	228'	as	above	drill out cement; open hole 220'-228'	1.4	1706.63	G/MR
H-25	11-17-79	11-17-79	9"	25'	8" (h)	25.7'	pilot hole	-	-	A/AR
H-25	1-10-80	1-12-80	8"	102'	as	above	open hole, 25'-102'; cement plug at surface	0.9'	1710.77	G/MR
H-26	11-19-79	11-19-79	12"	25'	10" (h)	19.0'	pilot hole;adjacent to Well H-25; abandoned	-	-	A/AR
H-27	11-19-79	11-19-79	12"	25'	10" (h)	19.0'	pilot hole	-	-	A/AR
H-27	3-11-80	3-13-80	5"	231'	as	above	test hole with core samples; open hole 19'-231'; cement plug at surface	-	-	G/MR
H-28	11-19-79	11-19-79	9"	25'	8" (h)	25.7'	pilot hole	-	-	A/AR
H-28	12- 3-79	12-12-79	8"	60'	8"	65.0'	drive casing behind hole	-	-	A/CT

TABLE 3.3 (Cont'd)

WELL	TOTAL DEPTH	SCREENED OR OPEN HOLE INTERVAL	DEPTH TO WATER AND YEAR MEASURED				DEPTH OF MUDDY CREEK FORMATION
			1971	1980	1982	1983	
H-32	101	37-101		39	40		38
H-33	101	36-101		38	38.4		37
H-34	44	41-44					44
H-35	94	91-94					35
H-36	44 old	41-44		26			38
	39 new	29-39			28.4		
H-37	50.5	25-50					25
H-38	55	16-55		34	34.5		25
H-39	75	15-75		45	46.1		43
H-40	75	55-75		49	51		40.5
H-41	75	65-75		46	50		54
H-42	55	8-555		33	36		44
H-43	55 old	9-55		30			45.5
	44 new	29-44			32.9		
H-44	231	6-231					49
H-45	Not Drilled	-	-	-	-	-	-
H-46	51	36-51					42
H-47	152	142-152			41.7		52
H-48	43	33-43			32		59
H-49	38	28-38			32		48
H-50	43	33-431			35		40
H-51	42	32-42			34		57.5
H-52	28	18-28			18		18
H-53					26		42
H-54					31		51
H-55					44		43
H-56					30.8		
LG-9	91	85-90		5.5			
LG-10	42			8.6			
LG-11	39	0-39		18.4			
LG-13	250	241-243		38.9			
LG-15	25	23-25		3			
LG-16	47	43-40		3			
LG-17	90	80-82		15.2			
LG-19	70			0-Flowing			
LG-20	20			5.6			
LG-21	40	37-39		29.1			
LG-25	24			11.4			
LG-26	100	87-90		11.7			
LG-27	62	57-62		14			
LG-30	30	27-29		6			
LG-32	155	147-155	35	49.7			54
				Nov 79			
LG-32R	90	80-90		50			52

Table 1 - continued

Well Number	Casing Elev.	Surface Elev.	Depth to Muddy Creek Fm.	Elev. of Top of Muddy Creek Fm.	Water Level Elev. Dec. 1982	Water Level Distance from Top of Muddy Creek Fm.
H-36*	1716.20	1715.4	38	1677	1687.86	11
H-37	1712.32	1710.7	25	1685		
H-38	1772.69	1771.7	25	1746	1738.25	-8
H-39*	1770.32	1770.7	43	1728	1724.20	-4
H-40	1770.31	1769.0	40.5	1729	1719.30	-10
H-41	1774.92	1773.7	54	1720	1724.12	4
H-42	1729.09	1728.2	55	1684	1693.82	10
H-43*	1729.82	1728.2	45.5	1683	1696.89	14
H-44#			49.5			
H-45	Not drilled					
H-46	1730.03	1728.8	42	1687		
H-47+	1770.54		54		1729.47	
H-48	1682.79	1680.3	59	1621	1650.88	30
H-49	1685.38	1684.1	48	1636	1653.77	18
H-50	1700.48	1699.1	40	1659	1665.96	7
H-51	1699.00	1698.1	57.5	1641	1664.92	24
H-52	1727.71	1726.3	18	1708	1709.68	2
H-53	1713.87	1712.9	42	1672	1688.06	16
H-54	1722.30	1719.8	51	1671	1690.53	20
H-55	1749.05	1748.0	43	1706	1705.43	-1

Corehole without well completion
+ Second zone monitor
* Reworked configuration of well

Monitoring Well Construction Data

Stauffer Chemical Company/Henderson, Nevada

Well No.	Date Started	Date Completed	Hole Diam.	Total Depth	Casing Diam.	Casing Length	Completion	TOC above GS	TOC Elevation	Contractor/ rig
H-41	4- 3-80	4-16-80	6"	75'	6"	57.0'	drive casing; bottom 10.0' torch slotted	1.2'	1774.92'	A/CT
H-42	2-22-80	2-22-80	10"	55'	8" (h)	8.5'	open hole, 7.5' - 55';	0.9'	1729.09'	G/MR
H-43	2-27-80	2-28-80	10"	55'	8"	9.4'	open hole, 8.5' - 55'; cement plug at surface	0.8'	1728.95'	G/MR
H-44	3-17-80	3-19-80	5"	231'	-	-	test hole with core samples; open hole	-	-	G/MR
H-45	3-19-80	-	5"	40;45'	-	-	abandoned after 2 attempts due to lost circulation	-	-	G/MR
H-46	3-25-80	3-29-80	5"	51'	1¼" PVC	52.2'	drill-perforated pipe 36'-51'l gravel to 30'; cuttings to l; cement to surface	1.2'	1730.03'	G/MR
H-47	5-13-80	5-13-80	12"	39'	10" (c)	40.0'	pilot hole	-	-	A/FA
H-47	5-15-80	6-18-80	8"	120'	6" (c)	120.0'	annulus pressure cemented - by Halliburton			
			6"	152'	4" (h)	152.4'	bottom 10.0' torch/	1.75		A/CT
LG032R	2-22-80	2-22-80	12"	15'	10" (c)	16.0'	pilot hole slotted	-	-	A/FA
LG032R	4-17-80	5- 6-80	10"	70'	6" (c)	72.5'	annulus cemented from bottom	1.5'	-	A/CT
			6"	90'	4" (h)	92.5'	torch slot bottom 10.0'	1.9'	1770.75'	
LG033	5- 8-80	5- 9-80	6"	35'-60'	6"		existing 6" casing	0.8'	-	A/CT
	(existing well deepened)		-	-	4" (h)	63.4'	torch slot bottom 10.0'	2.6	1770.06	

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