401471

VOLUME 2

APPENDIX

GROUND-WATER HYDROLOGY CHARACTERIZATION

FRENCH GULCH MINE POOL

BRECKENRIDGE, COLORADO

April 1995

Prepared for:

U.S. Environmental Protection Agency
Region VIII

Prepared by:

Arthur M. Morrissey
Consulting Geologist
721 S. Moline St.
Aurora, Colorado 80012

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APPENDIX
A

WELL COMPLETION DIAGRAMS AND LOGS

FRENCH GULCH MONITORING WELLS

#1
#8
#5
#4
#2
#6
#3
#7
#9
#11
#13
#14
#15
#16
#17
#18
MINE RELIEF WELL #3

APPENDIX

A WELL COMPLETION DIAGRAMS AND LOGS

B BASE MAP STUDY AREA

C GEOLOGIC CROSS SECTIONS

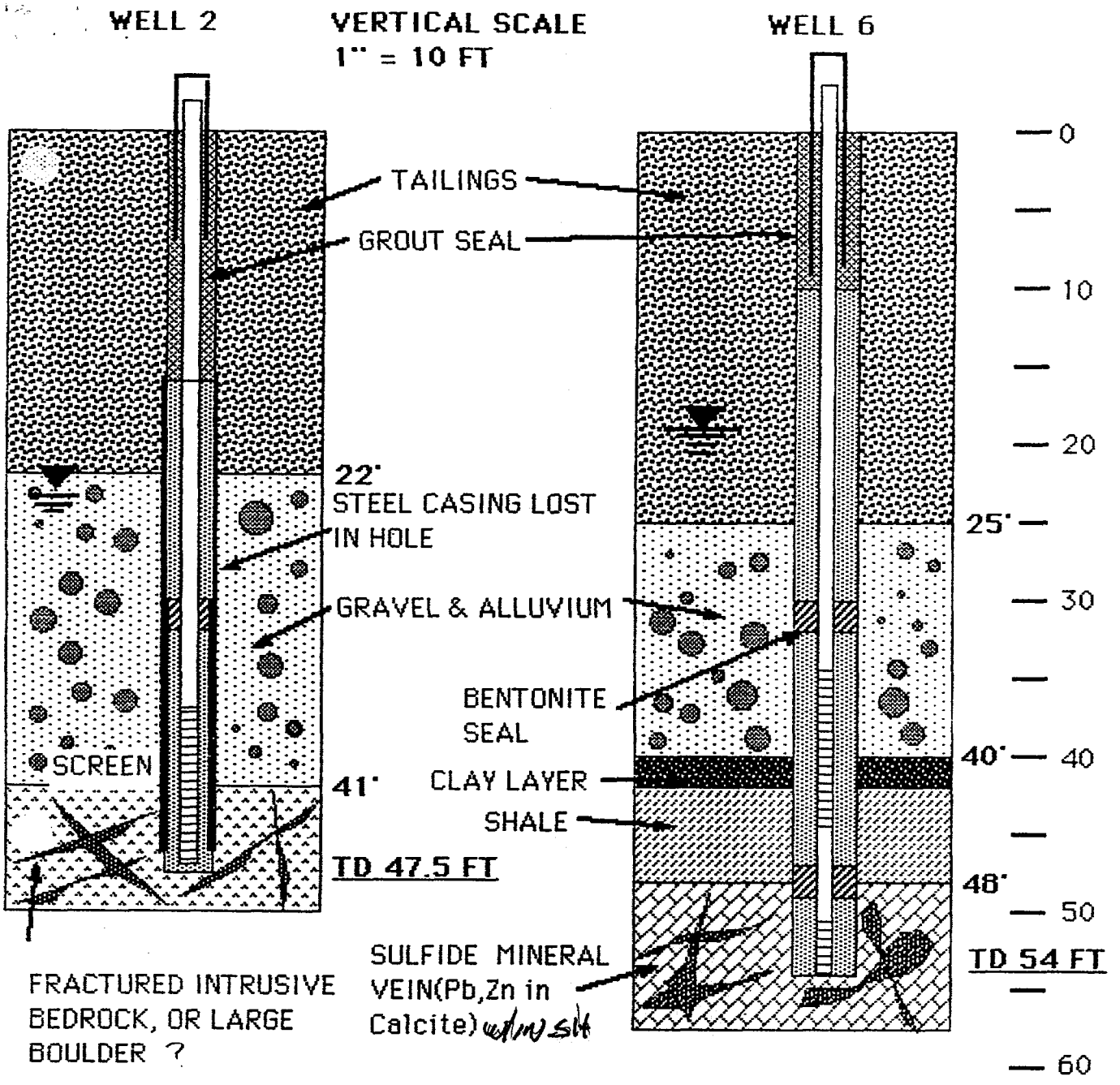
D GROUND-WATER CHEMISTRY

E AQTESOLV CURVE-MATCHING FOR SLUG TESTS

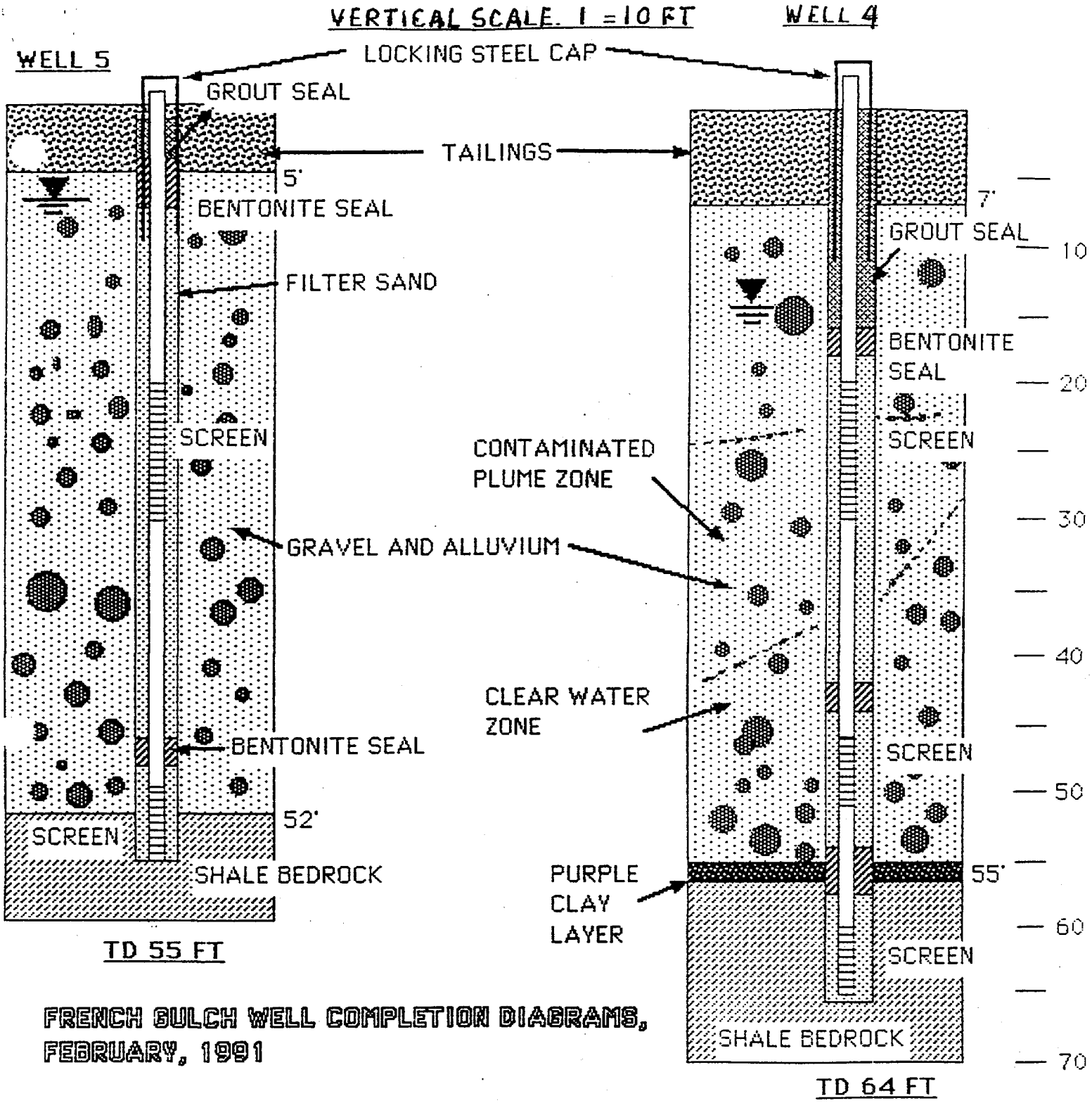
F CONSTANT DISCHARGE TEST DATA & PLOTS

G STATIC GROUND-WATER LEVELS VS TIME PLOTS

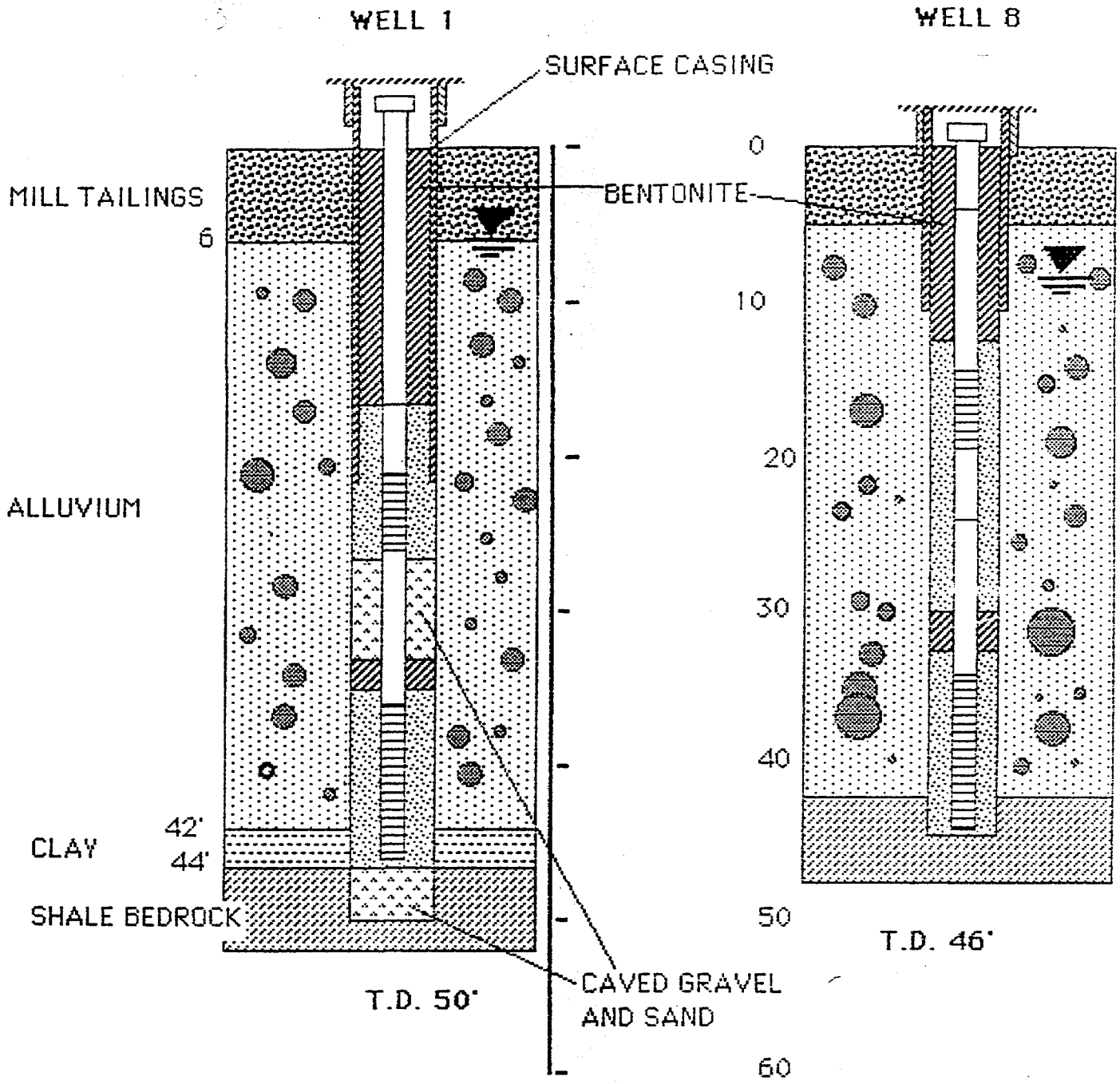
H POTENTIOMETRIC SURFACE MAPPING



FRENCH GULCH WELL COMPLETION DIAGRAMS,
FEBRUARY 1991



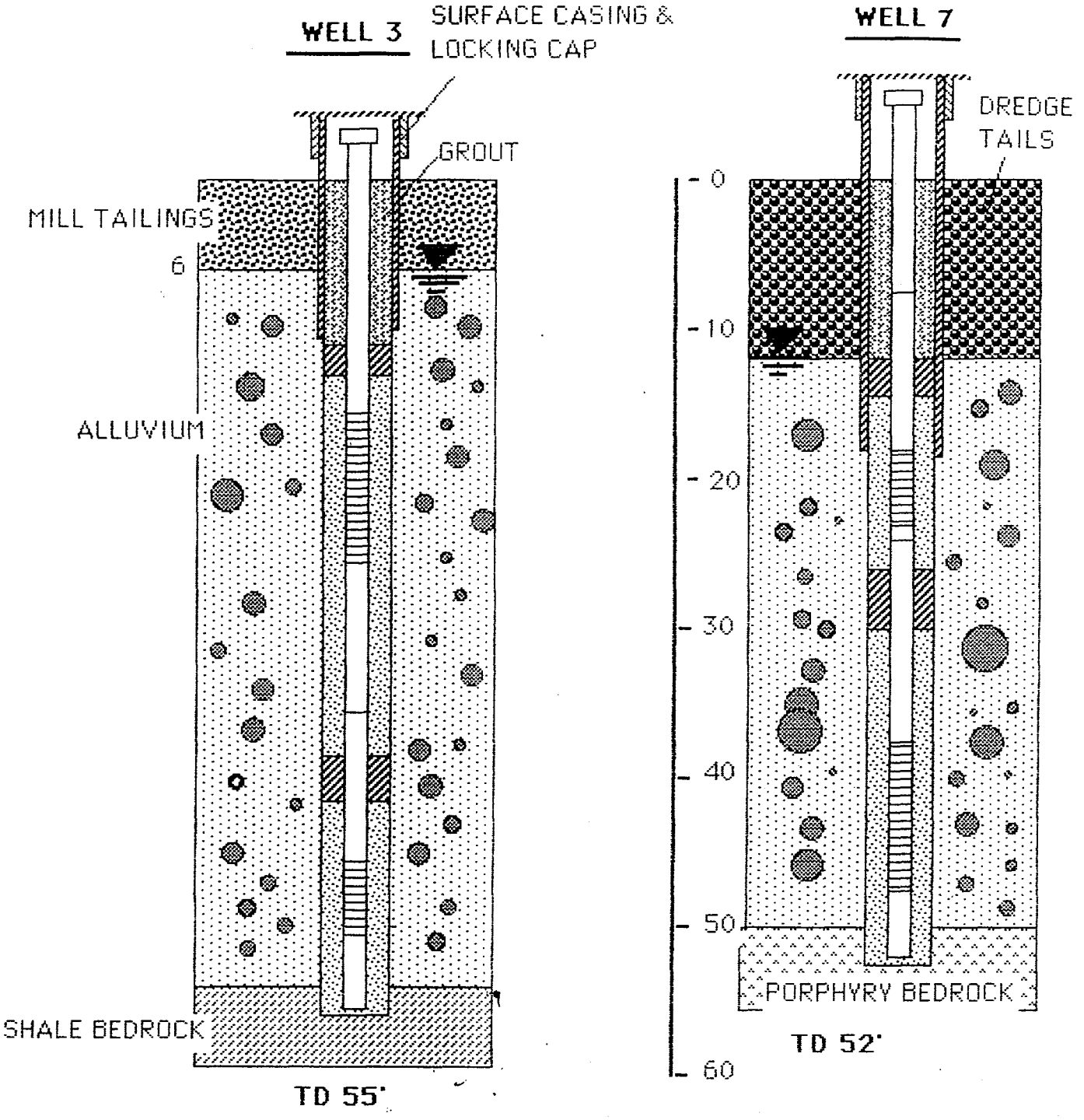
FRENCH GULCH WELL COMPLETION DIAGRAMS, FEBRUARY, 1991



FRENCH GULCH WELL COMPLETION DIAGRAMS, JUNE 1991

WATER LEVELS AS OF 6/12/91

VERTICAL SCALE: 1"=10FT

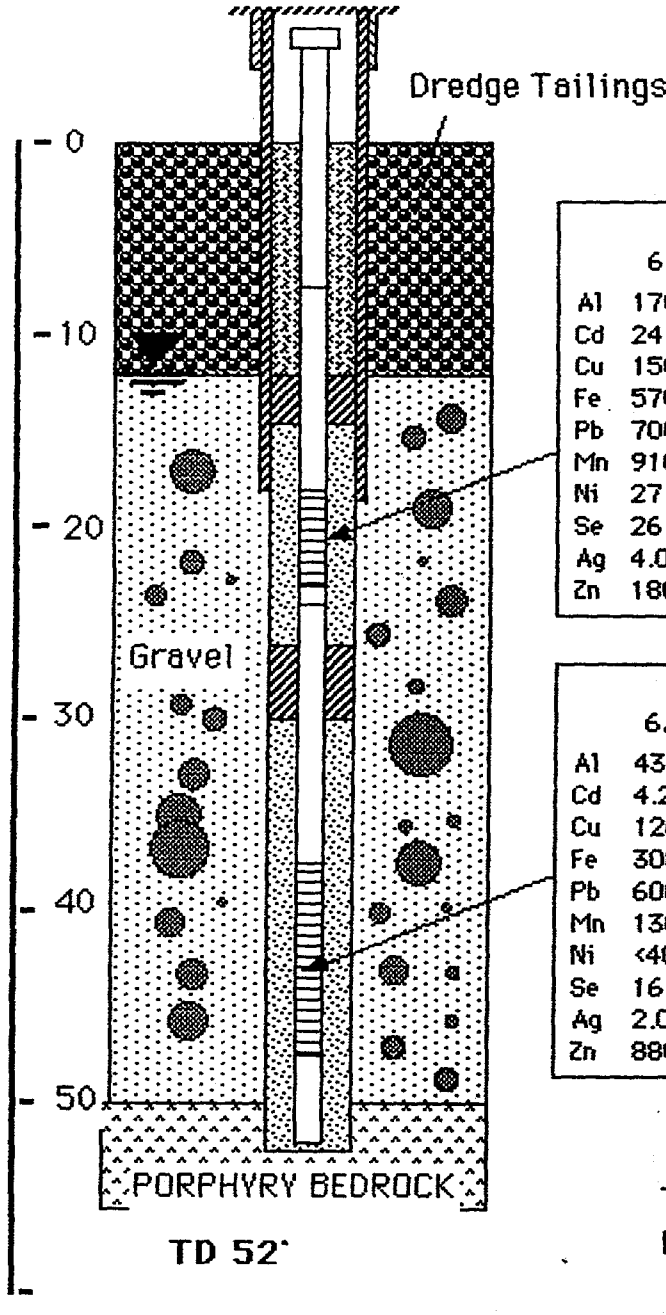


FRENCH GULCH WELL COMPLETION
DIAGRAMS, JUNE, 1991

WATER LEVELS AS
OF 6/12/91

WATER QUALITY DATA, 1991 SEASON

WELL 7



ug/l

	TM 6/12	FM 6/12	TM 8/1	FM* 8/1
Al	17000	110	---	---
Cd	24	0.7	---	41
Cu	150	<4	---	<8
Fe	57000	18000	---	25000
Pb	700	<5	---	<5
Mn	9100	7800	---	---
Ni	27	<20	---	---
Se	26	11	---	---
Ag	4.0	<0.2	---	---
Zn	18000	12000	---	10000

	TM 6/12	FM 6/12	TM 8/1	FM* 8/1
Al	4300	---	---	---
Cd	4.2	---	---	0.7
Cu	120	---	---	<8
Fe	30000	---	---	26000
Pb	600	---	---	<5
Mn	130000	---	---	---
Ni	<40	---	---	---
Se	16	---	---	---
Ag	2.0	---	---	---
Zn	8800	---	---	11000

TM = Total Metals
FM = Filtered Metals

* O-rings suspect, data not reliable

#640407

COLORADO GEOLOGICAL SURVEY
ROCK CORE LOG

Surface Elev. 9,900'	Hole Depth 54.5'	Boring No. 9	
Inclination from Horiz. 90°	Bearing N/A	Job No.	
Well Casing Used [2" PVC]	Core Size H (3½)	Sheet 1 of 1	
Drill 7/13 to 7-14	Rig ~~CANADIAN~~ BOYLES *	Rock Quality Parameters	
Geologist B. STOLER	Log Date 7/13		

Project: FRENCH GULCH/ORO
Location: WELLINGTON/ORO MINE
Drilling Co.: GOLDEN DRILLING
Driller: Wm. MATTHEWS

Surface Description: ON S. SIDE OF FR GULCH/ORO ACROSS FROM ~~MAIN DUMP~~ WELLINGTON MILL SITE.

Logging Conditions: CLEAR, SUNNY, NICE DAY/ (WIRELINE CORE *)

Formation	Graphic Log	% Water Loss	Bedding ∡	Rock Color	Depth Scale	Geologic Description	Remarks (trace min., samp., stab. water lev., casing, etc.)	Joints ∡	Well	R.Q.D. %	Core Recov. %	Decomposition	Strength	Fracturing
DREDGE TAILINGS		100			5, 10	4" SOIL: GRAVEL, COBBLES, [DREDGE TAILS]. DREDGE ROCK 0-17'	MIXED LITHOLOGY GRAVELS AND COBBLES. 0-17 FT.		10		10% 10%			
FINE GRAVEL ALLUVIUM				17' ▼	15, 20	17-33' ALLUVIUM; SAND, SILTS CLAY, SAND GRAVELS, NOT DISTURBED BY DREDGING, BEDDED ALLUVIUM, ONLY AN OCCASIONAL LARGE COBBLE.	UNDISTURBED 17- ALLUVIUM		10		25%			
BOULDERY ALLUVIUM					25, 30, 35, 40	33'-41' BOULDERS, MIXED LITHOLOGY, Tqm, Kquartzite ~2' THICK. SOME Fe & Mn STAINING	STARTING TO PICK UP SHALE FRAGS. @ 30'. CLAY FILLED FRACTURE @ 34' PYROLUSITE DENDRITES & Fe STAINS ON JOINTS IN BOULDERS @ 40'		10, 10		75%			
CLAY					45, 50	41-52 NO RECOVERY - [POSSIBLY FINE SILT, SANDS, CLAYS WASHED AWAY (?)] NOT PROBABLE GRAVELS/BOULDERS; NO RECOVERY - CORE BARREL NOT LATCHED. 51-52 - HEAVY CLAY - ROCK FLOUR (?)	CORE BARREL NOT LATCHING - CORE RIDING UP INTO CASING.	WELL SCREEN	1, 10		0%			
Kp	TD 54.5'				55	52-54 SHALE BEDROCK, BLACK, WELL INDURATED, PYRITIC. TD 54.5 ft.	DRILLED OUT 18" OF CORE NOT PICKED UP IN BARREL w/ SMALL ROD & ROLLER BIT. 56½' PVC 10' SCREEN		56½ ft OF PVC					

GOLDEN DRILLING, INC.

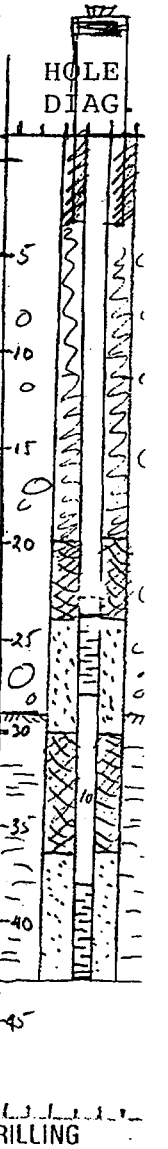
Wm E. Matthews (719) 539-6832

P. O. BOX 387 • SALIDA, COLORADO 81201

HOLE NO 11 LOCATION WELLINGTON MINE, FRENCH GL DATE 10/11/93
OWNER DIV. OF MINS. & GEOLOGY COUNTY SUMMIT STATE CO
DRILLER WM. MATTHEWS METHOD AIR HAMMER ADDITIVES
LOGGER B. STOVER WATER ENCOUNTERED T.D. 43'
DEVELOPED ✓ YES NO METHOD HAND BAILED
CASING SIZE 2" PLAIN PVC SLOTTED SIZE 0.010 SCREEN
GRAVEL/SAND/NONE INTERVAL SIZE
bENTONITE SEAL/S
CEMENT INTERVAL
SURFACE PROTECTION SIZE
OTHER

LITH COL.	SAMPLED BL/IN	WATER LEVEL	NOTES
0–45	TOP OF SHALE @ 29' (WEDIN TUB 1 FT)		0-10 FT COLLUVIUM, SLOPEWASH, MINE WASTE. ADMIXED SHALE AND INTRUSIVE PORPHYRY GRAVELS, AND FINES 10-29' ALLUVIUM - GRAVEL, BOULDERS, AND COBBLY ALLUVIUM [GLACIAL OUTWASH], ZONES OF CLAYEY SANDS AND PEBBLE GRAVEL [BLOR 13-15½ CLAYEY GRAVEL 18-28 Cobbles-28-29 29'→ SOFT, BLK MARINE SHALE BEDROCK; PYRITIC, SOFT, FRACTURED, WET [WATER TABLE ON TOP OF SHALE BEDROCK] DRILLED TO 43' TO ALLOW DUAL-COMPLETION WELL. 43-38 SCREEN 43-36½ SAND 36½-30 BENT. 30-24 SND 24-20 BENT 20-4 CUTTINGS

HOLE DIAG.



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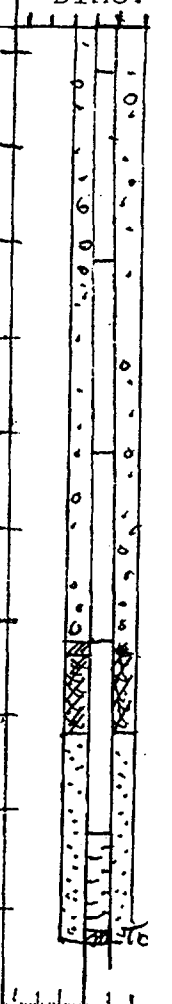
PG 1 OF 1

HOLE NO FG-12 LOCATION Wallington Mine site, French Gulch DATE 10/12/93
OWNER Div. Mins & Geology COUNTY Summit STATE Co
DRILLER Wm Matthews METHOD STRATEX ADDITIVES
LOGGER B. Stover WATER ENCOUNTERED T.D.
DEVELOPED ✓YES NO METHOD Hand Bailer
CASING PVC SIZE 2" PLAIN PVC SLOTTED PVC SIZE 0.010
GRAVEL/SAND/NONE INTERVAL SIZE
bENTONITE SEAL/S
CEMENT INTERVAL
SURFACE PROTECTION SIZE
OTHER
ORD SHAFT WATER LEVEL @ 85' TODAY

LITH COL.	SAMPLED BL/IN	WATER LEVEL	NOTES
0–10			0-10 Ft. Colluvium & slopewash – Road base made from above. Cobbly gravels, sands, and fines
10–46			10–46 Qtz Monzonite Porphyry – Volc. Intrusive; Hard, dense, highly fractured; Gray to dark gray. 16'– soft, Fe oxide stained fractured, crumbly zone to 19' (fault?); sparse pyrite. Very hard zones 38-39 - moisture on down. ~ 1/2 gal/min production TD 46' in Tqm 5' screen on bottom.
TD 46'			

HOLE DIAG.



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HOLE NO F6-13 LOCATION WELLINGTON MINE, FRENCH GULCH DATE 10-13; 10-14-93
OWNER DIVISION of MINERALS & GEOLOGY COUNTY SUMMIT STATE COLO
DRILLER Wm. MATTHEWS METHOD STRATEX ADDITIVES
LOGGER J. NELSON WATER ENCOUNTERED T.D. 47'
DEVELOPED X YES NO METHOD
CASING P.V.C. SIZE 2" PLAIN SLOTTED SIZE
GRAVEL/SAND/NONE INTERVAL SIZE
bENTONITE SEAL/S
CEMENT INTERVAL
SURFACE PROTECTION SIZE
OTHER

LITH COL.	SAMPLED BL/IN	WATER LEVEL	NOTES	HOLE DIAG.
0			0	0
			0-4½' MINE DUMP	
5			4½-5' WOOD; MINE TIMBERS ?? OR CRIBBING	
			MINE DUMP + WOOD MIXED ±70% WOOD (5'-8')	
10			CLAY + GRAVEL (W) PYRITE (8'-10')	
			YELLOW DAMP WOOD 10-11½ (IRON OXIDES)	
			GRAVEL	
15			13½-17 BROWN CLAY (W) SOME GRAVEL	
			WATER IN HOLE (AM 10-14-93)	
20			20-21½ BLK CLAY (W) GRAVEL	
			21½'-25' DARK BRN to BLACK	
25			BRN CLAY or SHALE (W) FINE GRAVEL >1½"	
			DARK BRN CLAYEY GRAVEL (SOME WATER)	
30			BLK, CARBONACEOUS SHALE (BEDROCK) 30-32½ BENTONITE PLUG	
			32½-35½ BENTONITE PLUG	
35			SMALL FAULT @ 35'-36'	
			SAND 35½ to 47'	
40			BLK SHALE (BELDEN?)	
			HOLE MAKING ± 2 GPM	
45				
T.D. 47'			T.D. @ 47' IN BELDEN Sh 1' CUTTINGS @ BOTTOM	
50				

FAULT HOLE

GOLDEN DRILLING, INC.

Wm E. Matthews

(719) 539-6832

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HOLE NO FG-14 LOCATION FRENCH GULCH [I-10 FAULT HOLE] DATE 10/20 TO 10/29
OWNER COLO. DIV. MINS & GEOLOGY COUNTY SUMMIT STATE CO
DRILLER WM. MATTHEWS METHOD STRATEX ADDITIVES FOAM & POLYMER
LOGGER B. STOVER WATER ENCOUNTERED 22' T.D. 277
DEVELOPED __YES NO___ METHOD
CASING SIZE___ PLAIN___ SLOTTED___ SIZE
GRAVEL/SAND/NONE INTERVAL SIZE
bENTONITE SEAL/S
CEMENT INTERVAL
SURFACE PROTECTION STEEL WELLHEAD CASING, 80 FT. SIZE 4"
OTHER

	LITH COL.	SAMPLED BL/IN	WATER LEVEL	START 3:30pm 10/20 NOTES	HOLE DIAG.
0				0 - 2½ FT - MINE DUMP	0
5					
10					
15				VALLEY FILL GRAVEL, COBBLES & BOULDERS of LIMESTONE, QUARTZITE, MINOR GRANITE + VOLCANICS?	
20					22' H2O LEVEL
25				[AIRDRILLED TO ~40' WHERE TOO MUCH WATER - GO TO WATER CIRCULATION.	
30					
35				BLK SHALE @ 38' - DRY! AT CONTACT (?)	
40				GAINING WATER FROM 40' ON DOWN TO 65'	
45				BLK - SHALE - DISEMENATED PYRITE THROUGHOUT. -Kp MARINE SHALE 14~18 GPM FROM 40 TO 65'	
50					

HOLE NUMBER FG-14 CONTINUED 10/25 PAGE NUMBER 2 of 5

DEPTH	ROCK TYPE	RQD %	BLOW COUNT 12"	BOX NO.	% RCV'Y	GEOLOGY/SOIL DESCRIPTION	SAMPLE TYPE
55		STRATEX DOWNHOLE HAMMER				BLK. SHALE - ORO FAULT BLOCK Kp PIERRE SHALE - EXTREMELY PYRITIC	
60						61' @ 5:00 PM 10-21-93	
65						WATER RISES TO 20' IN HOLE	
70						CASING TO 70½; AIR HAMMER TO 77~78' -	
75						GRAY - BLACK PYRITIC SHALE, CALCAREOUS, w/ STRINGERS OF WHITE, PYRITIC CALCITE - NUMEROUS "HEALED" FRACTURES w/ CALCITE. FEW GOUGY FRACTURE	
80		CORE	1ST RUN		~80%	ZONES. ABUNDANT PYRITE THROUGHOUT.	
85			2ND RUN				
90			3RD	88°		MAKING MORE WATER FROM 90 FT ON (FRACTURED)	
95			4th	91.3 93.0	~80%	CALCAREOUS PYRITIC BLK SHALE/GRAY-BLACK TO 101 FT	
100			5th	98.3			
105			6TH	100.6	100%	101 FT → 119; TERTIARY INTRUSIVE QTZ MONZONITE PORPHYRY - LIGHT GRAY, PUNKY, ALTERED ABRUPT KNIFE EDGED CONTACT. ALMOST GOUGY, ALTERED TO CLAYS @ 114' FINELY DISSEMINATED PYRITE AND GALENA. FELDSPARS HIGHLY ALTERED ALONG FRACTURES.	
110				HQ2	QUIT 10/25		
115	GOUGY		7TH 8TH	115.0	~98%	119 FT. TO 131 FT; CARB. BLK SHALE, NO CALCITE STRINGERS PYRITE LENSES, SOFT, CARBONACEOUS	
120							

REMARKS

WILL CASE DOWN TO 70', THEN BEGIN CORING ABOVE FAULT ZONE. HQ DOWN TO 78'

(N) ON DOWN TO

HOLE NUMBER FG-14 CONTINUED 10/26 PAGE NUMBER 3 OF 5

DEPTH	ROCK TYPE	RQD %	BLOW COUNT 12"	BOX NO.	% RCV'Y	GEOLOGY / SOIL DESCRIPTION	SAMPLE TYPE
120							
125		127.7			80%	CARBONACEOUS BLK. PYRITIC SHALE, SOME FRACTURES, ALMOST SOLID PYRITE SEAMS EVERY SO OFTEN. 101' → 131'	
		PYRITE				1/4" THICK PYRITE VEIN @ 128'	
130					80%		
135		131' CALCITE 133.7			70%	CALCAREOUS SHALE 131 TO 240 [1/4" THICK CALCITE VEIN AT 132 1/2 FT, PYRITIC] GRAY TO BLACK, CALCITE VEINLETS MORE WATER LOSS AT 135' - NO CIRCULATION AT SURFACE - COMES BACK. VUGS @ 132'. 2" GOUGY FRACTURE @ 139'. HARD. ABUNT. PYRITE THROUGHOUT.	▼@22'
		2" FAULT					
140							
145		143.7				1/8" Qtz VEIN @ 147 FT - VUGGY - GOOD XTALS. [Qtz on CALCITE] Qtz, CALCITE	
		Qtz VEIN				1" GOUGE AT 149'	
150		1" GOUGE 150.2					
155						CALC. SHALE w/ CALCITE VEINLETS, PYRITE	
160		160.3					
165		166.5					
170							
175		176.0	QUIT 10/26			1/4" Qtz & CALCITE FILLED FRAC/VUG	
180		Qtz VUG					
185		186.2					
						Qtz FILLED VUGS @ 189 CALCITE SWIRLS	
190							

REMARKS

HOLE NUMBER FG-14 CONTINUED 10/27 PAGE NUMBER 4 of 5

DEPTH	ROCK TYPE	RQD %	BLOW COUNT 12"	BOX NO.	% RCV'Y	GEOLOGY/SOIL DESCRIPTION	SAMPLE TYPE
~~190~~ 195		193.1			100%	CALCAREOUS GRAY—BLACK SHALE; HARD, CALCITE STRINGERS/VEINLETS, PYRITIC; THIN RIP-UP MUD/CALCITE BEDS @ 199 ft. FULL RECOVERY. SOLID-ALMOST NO FRACTURES	WELL COMPLETION DIAGRAM
200	CALCITE LAMS.						
205		202.2			100%		
210							
215		212.9			100%		
220	FAULT						
225		222.2 225.5				2½" CRUSHED, BOUGY ZONE, SLICKS, MYMT INDICATIONS @ 218½' TO 221 FT FRACTURED, BROKEN, POORER RECOVERY 222-225, 225-227.	
230		229.2					
235		236.3	QUIT 10/27		100%	GOOD RECOVERY AGAIN @ 228	
240	ALTERED					ALTERED LIMEY SHALE, BRITTLE, BEDDING LOST, NO CALCITE VIENLETS	
245	VOLC. INTRUSIVE	246.2	100% VOLC. 100%		100%	240—243½ FINE GRAINED VOLC. INTRUSIVE; PYRITE & CHALCOPYRITE VEINLETS; RIP-UP BASAL CONTACT w/ SHALE FRAGS, WAVEY, ABRUPT LOWER CONTACT. PYRITIC THROUGHOUT. 243—246.3 CALCAREOUS GRAY TO BLACK SHALE w/ CALCITE VEINLETS 246.3-246.5—2" VOLC INTRUSIVE VEIN	
250		250				246.5 → CALC. BLK SHALE, HEALED FRACTURE/CRUSHED ZONE @ 249, w THIN GOUGE VEIN, QTZ ON CALCITE VUG. HARDER, NO BEDDING @ 253' SHALE TURS CARBONACEOUS AT 256 SMALL CRUSHED FAULT ZONE-HEALED @ 255—255.5	PVC
255		255	HEALED FAULT				
260	CARB SHALE FAULT ZONE					FAULT 258.6 TO	

REMARKS

SLICKS/STRESS CUTANS THROUGH CARB SHALE ABOVE FAULT @ 258.6

BENTONITE SEAL

SAND FILTERPACK TO 250'

HOLE NUMBER FG-14 CONTINUED 10/28 PAGE NUMBER 5 OF 5

DEPTH	ROCK TYPE	RQD %	BLOW COUNT 12"	BOX NO.	% RCV'Y	GEOLOGY/SOIL DESCRIPTION	SAMPLE TYPE
~~260~~							
265		262.5 FAULT	11-10 ZONE		~50%	FAULT, 258.6 TO CRUSHED, GOUGY, SOFT, MUDDY, BROKEN CARB. SHALE, SLICKS ON FRAGS, HEAVILY PYRITIZED, WHITE GOUGE SEAM 269 TO 271	
270		268.2 WHITE GOUGE	SEAM				
275		271.5 275' ~~272.2~~ TD	QUIT 10/28		~10%	FRACTURED, BROKEN SHALE, GOUGE SEAMS @ 275-277 TD 277.2 FT IN FAULT ZONE	10' SCREEN
280							
285							

REMARKS WELL COMPLETION NOTES:

SCREEN ~~278 TO 268'~~ 276 TO 266 (PLASTIC MOVED UP 2 FT WHILE PULLING CASING)

SAND FILTER PACK TO 250'

BENTONITE SEAL 250 TO 230' (20')

Division of Minerals & Geology Drilling Log

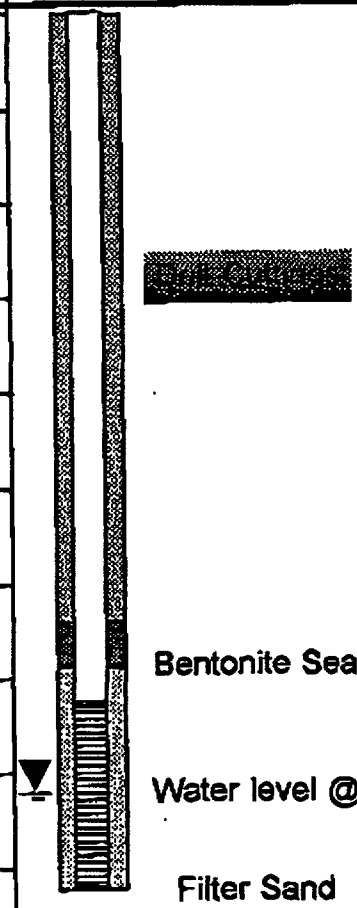
HOLE No. 15
Collar Elev. 9789
Total Depth 46

PROJECT: French Gulch/FATCAT
LOCATION: Sec 32T6S.R77W
COUNTY: Summit
DRILLING CO. Golden Drilling Inc.

DRILLER Wm. Matthews
RIG TYPE Track Drill #1
METHOD dwnhole hammer
HOLE SIZE 4in.

Date Started 10/17/94
Date Compl. 10/19/94
Logged By B.Stover

DEPTH	Rock Type	Geologic Description	Samples, Drilling Notes Well Completion Diag.
0		0 - 3' Topsoil	
		3 - 12' Sand, gravel, cobbles, alluvium, lt. yellow	
10		12 - 15' Clayey gravel & sand, black to dark gray, damp.	
20		15 - 26' Black shale bedrock, dry,(Pierre Shale)	
30		26 - 43' Light gray intrusive volcanic qtz. monzon-ite porphyry, dry	Bentonite Seal
40			Water level @ 41'
		43 - 46 Black shale, picking up water from 41' on.	Filter Sand
	TD 46		
50			
60			



Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 6

To ART MORISSEY	From B. STOVER
Co. SNYDER OIL Co	Co. COLO. DMG
Dept.	Phone # 866-3567
Fax # 592-8602	Fax # 832-8106

Remarks

Division of Minerals & Geology Drilling Log

PAGE 1 OF 2

HOLE No. 16
Collar Elev. 9881.65
Total Depth 91

PROJECT: FRENCH GULCH/FATCAT
Location: Sec 32 T. 6S R. 77W
County: SUMMIT
Drilling Co. GOLDEN DRILLING

Rig Type TRACK DRILL
Method DOWN HOLE/STRETCH.
Hole Size 4"

Date Started 10/12
Date Compl. 10/17
Logged By B. STOVER

DEPTH	Rock Type	Geologic Description	Samples, Drilling Notes Well Completion Diag.
0		0-8 MINE & MILL TAILINGS, 2" MINUS ORANGE/YELLOW/BRN.	
10		8-46$^{\underline{5}}$ ALLUVIUM & GLACIAL OUTWASH; UNDISTURBED (NOT DREDGED) SAND, GRAVEL COBBLES, BOULDERS. H_2O @ 13'. PROGRESSIVLY WETTER	2" PVC MONITOR WELL
20			
30			
40			
50		46$^{\underline{5}}$ — 54$^{\underline{5}}$ QTZ. MONZ. PORPHYRY INTRUSIVE, DECOMPOSED, HIGHLY FRACTURED, HVY FE STAINING ON HAMMER & CUTTINGS, LT. YELLOW COLOR WATER	
60		54$^{\underline{5}}$-70 PORPHYRY, FIRM, LESS FE STAIN ON CUTTINGS, 12-15 GPM WATER	4" CASING SET TO 59' DURING DRILLING
70			

Remarks

Division of Minerals & Geology Drilling Log

HOLE No. 16
Collar Elev. 9881.65
Total Depth 91

PROJECT: FRENCH GULCH / FAT CAT

Location: Sec 32 T. 6S R. 77W
County: SUMMIT
Drilling Co. GOLDEN DRILLING

Rig Type TRACK
Method STRATITECH.
Hole Size 4"

Date Started 10/12
Date Compl. 10/17
Logged By BKS

DEPTH	Rock Type	Geologic Description	Samples, Drilling Notes Well Completion Diag.
70		70-72 BLACK SHALE (K_P) ~ 30 GPM WATER PRODUCTION	4" STEEL CASING SET TO 59'
80		72-91 BLACK SHALE AND INTERLAYERED PORPHYRY INTRUSIVE; 2 SEAMS OF WHITE GOUGE(?) @ 76' & @ 83 (6" THICK SEAMS)	BENTONITE SEAL
90	T.D. 91		10 FT SCREEN 15' FILTER SAND 91'
100			

Remarks

Division of Minerals & Geology Drilling Log

PG 1 OF 2

HOLE No. 17
Collar Elev. 9882.13
Total Depth 93

PROJECT: FRENCH GULCH/FAT CAT

Location: Sec 32 T. 6S R. 77W
County: SUMMIT
Drilling Co. GOLDEN/TWIN PEAKS

Rig Type CHI. PNUE. 1650W
Method ROTARY/CASING HAMMER
Hole Size 6"

Date Started 10/18
Date Compl. 10/27
Logged By BKS

DEPTH	Rock Type	Geologic Description	Samples, Drilling Notes Well Completion Diag.
		0-9 MINE/MILL TAILINGS	
10			
		9-46 GLACIAL OUTWASH/ALLUVIUM - BOULDER/HARD ZONE @ 35' OR SO	
20			
30			
40			
50		46-54 WEATHERED, SOFT, CRUMBLY, HIGHLY FRACTURED, DECOMPOSED - HOLE WON'T STAND OPEN	
60		55-70 PORPHYRY INTRUSIVE, FIRM, HOLE STANDING OPEN	
70			

Remarks

Division of Minerals & Geology Drilling Log

PG 2 OF 2

HOLE No. 17
Collar Elev. 9882.13
Total Depth 93

PROJECT: FRENCH GULCH / FAT CAT

Location: Sec ____ T. ____ R. ____
County: ____
Drilling Co. ____

Rig Type ____
Method ____
Hole Size ____

Date Started 10/18
Date Compl. 10/27
Logged By BCS

DEPTH	Rock Type	Geologic Description	Samples, Drilling Notes Well Completion Diag.
80		70 - 82 CRUMBLY, FRACTURED, BLACK SHALE (CONTACT METAMORPH) - HOLE UNSTABLE, WILL NOT STAND OPEN	73
90		82 - FIRMING UP, BUT STILL OCC. CAVEY ZONES. 5" STEEL TAKEN ALL THE WAY TO 93 FT, THEN WITHDRAWN AROUND 4" PVC WELL PIPE.	20 10' SCREEN
	TD.93'		TO 93
100			4" PVC WELL

Remarks

EXTREMELY DIFFICULT TO DRILL W/ LARGE SIZED HOLE.
BEDROCK WILL NOT STAND OPEN IN MANY PLACES.

Division of Minerals & Geology Drilling Log

PG 1 OF 1

HOLE No. 18
Collar Elev. 9882.98
Total Depth ____

PROJECT: FRENCH GULCH / FAT CAT
Location: Sec 32 T. 6S R. 77W
County: SUMMIT
Drilling Co. GOLDEN DRILLING

Rig Type CHICAGO PNUEMATIC 1650W
Method ROTARY W/ CASING DRIVER
Hole Size 6"

Date Started ____
Date Compl. ____
Logged By ____

DEPTH	Rock Type	Geologic Description	Samples, Drilling Notes Well Completion Diag.
		0-7' MINE/MILL TAILINGS, 2" MINUS YELLOW/BRN, FINE GND.	4" PVC
10		7-39 ALLUVIUM, GLACIAL OUTWASH; SND, GRVL, COBBLES, (UNDISTURBED) 30+ GPM WATER PRODUCTION NEAR BEDROCK	CUTTINGS/CAVED HOLE
20			BENTONITE 19-39
30			FILTER PACK 20 & 10' SCREEN
40		39-43 BLK SHALE BEDROCK	TD
	TD 43'		
50			

Remarks

4" PVC PUMP TEST WELL

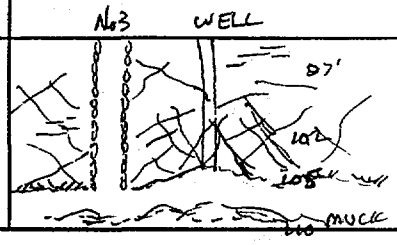
PROJECT	FRENCH GULCH/OAD	LOC. STR	32-6S-77W	DRILLER	WM. MATTHEWS
HOLE NO.	"RELIEF WELL"	COUNTY	SUMMIT	RIG TYPE	ROTARY SCHRAMM ROTO-DRILL
DATE STARTED	1/13/92	LAND OWNER	USFS/B&B MINES	HOLE SIZE	7 7/8"
DATE COMPLETED	1/16/92	COLLAR EL.	9885.7	GWT DEPTH	10'
TOTAL DEPTH	110 ft	LOGGED BY	BKS		ROTARY w/ AIR CIRC.

DEPTH	ROCK TYPE	RQD %	BLOW COUNT 12"	BOX NO.	% RCV'Y	GEOLOGY/SOIL DESCRIPTION	~~SAMPLE TYPE~~ WELL
						0 - 45 ft GLACIAL OUTWASH ALLUVIUM; sndy gravel, cobbles, bldrs, WATER	
10		▼				TABLE @ 10 ft.	
20						8" STEEL SURFACE CASING TO 46' 6" PVC TO 55' BOOT PACKER @ 43'	
30							
40						45' — BLACK SHALE BEDROCK, MINERALIZED w/ PYRITE, GALENA, CALCITE, HARD BRITTLE	
50						(Kp) METAMORPHOSED PIERRE SHALE, PYRITIZED, OCCASSIONAL 2mm PYRITE CUBES, WEATHERED AT TOP 6" PVC TO 55'	
60							

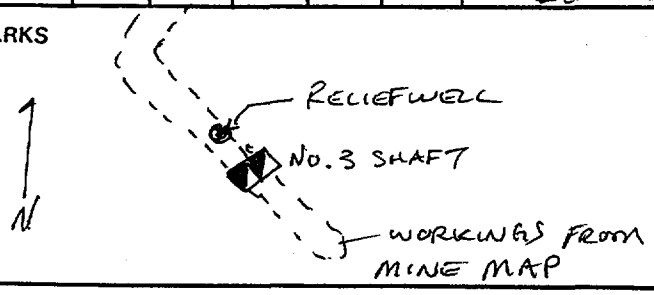
REMARKS RELIEF WELL PVC COULD NOT BE SET TO MINE LEVEL DUE TO UNSTABLE HOLE. BEDROCK/ALLUVIUM CONTACT SEALED; MINE CAN DRAIN THROUGH WASHED ROCK COLUMN SET TO MINE ROOF FROM 68' TO 105'. ROCK ABOVE MINE IS CAVEY, UNSTABLE/SUBSIDED, AND IS SATURATED BY MINE POOL.

4" PVC TO 68'
BOOT PACKER @ 48'
BENTONITE SEAL 48-43'

HOLE NUMBER "RELIEF WELL CONTINUED 1-15-92 PAGE NUMBER _____

DEPTH	ROCK TYPE	RQD %	BLOW COUNT 12"	BOX NO.	% RCV'Y	GEOLOGY/SOIL DESCRIPTION	SAMPLE TYPE
65						FRACTURED, MINERALIZED SHALE BEDROCK, 4"PVC TO 68' →	
70							
75						WASHED 3/4" ROCK 68' → 110'	
80							
85						MINERALIZED CALCITE VEIN 92	
90							
95		FRACTURES @ 97' - LOST AIR CIRCULATION....				LOST AIR CIRCULATION @ 97' - AIR LIFTING WATER OUT OPEN NO. 3 SHAFT - WATER IS ORANGE FLOWING OUT SHAFT. NO VOIDS - CIRC. LOSS PROB THROUGH	
100		LOTS OF CIRCULATION				FRACTURES TO SHAFT. HOLE MAKING ORANGE WATER @ 102' - (MINE POOL ??) TOP OF MINE ROOF @ 105' - SOFT RUBBLE TO 107-110 FT. - HIT STEEL @ 110'....	
105	3' void	MUCK STEEL RAILS (?)					MUCK
110	TD.					TWISTED OFF 7 7/8 BIT AND 5' SUB ON STEEL RAILS (?) ON MINE FLOOR, DESTROYED 20' JOINT. TD 110' MINE POOL @ 102'	MINE FLOOR
						 BEDROCK HEAVILY FRACTURED BELOW 97' - STEPPING (?) OR CAVED/SUBSIDED INTO MINE (?)	

REMARKS



NOTE: WELL IS CAVED, UNSTABLE BELOW 90'. RELIEF FOR MINE TO DRAIN STABILIZED W/ 3/4" WASHED ROCK FROM 105 TO 68'. BEDROCK/ALLUVIUM SEALED OFF 43-48' INSIDE 6" PVC.

APPENDIX
B

BASE MAP STUDY AREA

EPA REGION VIII
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DOC ID # 401471
PAGE #

IMAGERY COVER SHEET
UNSCANNABLE ITEM(S)

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SITE NAME: French Gulch

REPORT OR DOCUMENT TITLE: Volume II Appendix Ground-Water Hydrology Characterization French Gulch Mine Pol. Breckenridge, Colorado

DATE OF DOCUMENT: 01-APR-95

DESCRIPTION OF IMAGERY: Oversized Map

APPENDIX
C

GEOLOGIC CROSS SECTIONS

C-1 A-A' ORO SHAFT & FRENCH GULCH

C-2 B-B' NO.3 SHAFT & FRENCH GULCH

C-3 C-C' FRENCH GULCH & WELLINGTON MILL SITE

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SITE NAME: French Gulch

REPORT OR DOCUMENT TITLE: Volume II Appendix Ground-Water Hydrology Characterization French Gulch Mine Pool Breckenridge, Colorado

DATE OF DOCUMENT: 01-APR-95

DESCRIPTION OF IMAGERY: Oversized Maps (3)

APPENDIX
D

GROUND-WATER CHEMISTRY

D-1 IRON CONCENTRATION MAP 11/93
D-2 ZINC CONCENTRATION MAP 11/93
D-3 TEMPERATURE MAP 11/93
D-4 CONDUCTIVITY MAP 11/93
D-5 pH MAP 11/93
D-6 SULFATE CONCENTRATION MAP 11/93
D-7 Fe+Mn+Zn CONCENTRATION MAP 11/93
D-8 IRON CONCENTRATION MAP LOWER ALLUVIUM 6/91
D-9 IRON CONCENTRATION MAP LOWER ALLUVIUM 3/92
D-10 IRON CONCENTRATION MAP LOWER ALLUVIUM 9/92
D-11 ZINC CONCENTRATION MAP LOWER ALLUVIUM 6/91
D-12 ZINC CONCENTRATION MAP LOWER ALLUVIUM 3/92
D-13 ZINC CONCENTRATION MAP LOWER ALLUVIUM 9/92
D-14 IRON CONCENTRATION MAP UPPER ALLUVIUM 6/91
D-15 IRON CONCENTRATION MAP UPPER ALLUVIUM 3/92
D-16 IRON CONCENTRATION MAP UPPER ALLUVIUM 9/92
D-17 ZINC CONCENTRATION MAP UPPER ALLUVIUM 6/91
D-18 ZINC CONCENTRATION MAP UPPER ALLUVIUM 3/92
D-19 ZINC CONCENTRATION MAP UPPER ALLUVIUM 9/92
D-20 CATION/ANION RATIOS 11/93
(WELLS NOS. 1,2,3,4,5,6,7,8,9,11,12,13,14 & MINE WATER)
D-21 STIFF PATTERNS 11/93
(WELLS NOS. 2,3,4,5,6,8,9,11,12,14 & MINE WATER)
D-22 METAL CONCENTRATIONS (Zn,Fe,Cd) VERSUS TIME
(WELLS NOS. 2,3,4,5,6,& 8)

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SITE NAME: French Gulch

REPORT OR DOCUMENT TITLE: Volume II Appendix Ground-Water Hydrology Characterization French Gulch Mine Pol. Breckenridge, Colorado

DATE OF DOCUMENT: 01-APR-95

DESCRIPTION OF IMAGERY: Oversized Maps (19)

FRENCH GULCH D-20

Chemical analysis	Well #1 ALL. only mg/l	meq/l	Date 11/17/93 meq(%)
cations			
Na	14.04	0.61	
K	2.90	0.07	
Mg	119.40	9.55	
Ca	388.00	19.40	
Fe	108.84	3.90	
Mn	34.36	1.25	
Zn	131.90	4.03	
Totals		38.82	
anions			
HCO3	78.00	1.28	
Cl	2.45	0.07	
SO4	1750.00	36.19	
F	3.10	0.12	
Totals		37.66	
cation/anion ratio=	1.03		

Chemical analysis	Well #3 ALL. only mg/l	meq/l	Date 11/17/93 meq(%)
cations			
Na	10.36	0.45	
K	2.20	0.06	
Mg	97.64	7.81	
Ca	311.00	15.55	
Fe	243.40	8.72	
Mn	42.60	1.55	
Zn	140.48	4.30	
Totals		38.43	
anions			
HCO3	21.00	0.34	
Cl	2.40	0.07	
SO4	1750.00	36.19	
F	1.92	0.08	
Totals		36.68	
cation/anion ratio=	1.05		

Chemical analysis	Well #2 ALL + ? mg/l	meq/l	Date 11/17/93 meq(%)
cations			
Na	11.86	0.52	
K	3.00	0.08	
Mg	97.28	7.78	
Ca	448.00	22.40	
Fe	174.38	6.25	
Mn	30.24	1.10	
Zn	76.60	2.34	
Totals		40.46	
anions			
HCO3	82.00	1.35	
Cl	2.58	0.07	
SO4	1710.00	35.36	
F	3.03	0.12	
Totals		36.90	
cation/anion ratio=	1.10		

Chemical analysis	Well #4 ALL. + SH mg/l	meq/l	Date 11/17/93 meq(%)
cations			
Na	14.16	0.62	
K	3.30	0.08	
Mg	113.40	9.07	
Ca	381.00	19.05	
Fe	82.54	2.96	
Mn	31.90	1.16	
Zn	123.72	3.78	
Totals		36.72	
anions			
HCO3	82.00	1.35	
Cl	2.54	0.07	
SO4	1640.00	33.91	
F	2.96	0.12	
Totals		35.45	
cation/anion ratio=	1.04		

FRENCH GULCH CHEMICAL DATA D-20

Chemical analysis	Well #5 ALL + SH mg/l	meq/l	Date 11/17/93 meq(%)
cations			
Na	14.72	0.64	
K	3.40	0.09	
Mg	118.30	9.46	
Ca	401.00	20.05	
Fe	97.38	3.49	
Mn	34.00	1.24	
Zn	123.26	3.77	
Totals		38.74	
anions			
HCO3	102.00	1.68	
Cl	2.34	0.07	
SO4	1870.00	38.67	
F	3.02	0.12	
Totals		40.53	
cation/anion ratio=	0.96		

Chemical analysis	Well #7 ALL only mg/l	meq/l	Date 11/17/93 meq(%)
cations			
Na	3.93	0.17	
K	1.50	0.04	
Mg	31.66	2.53	
Ca	134.00	6.70	
Fe	50.62	1.81	
Mn	15.36	0.56	
Zn	21.68	0.66	
Totals		12.48	
anions			
HCO3	43.00	0.71	
Cl	1.69	0.05	
SO4	460.00	9.51	
F	0.96	0.04	
Totals		10.30	
cation/anion ratio=	1.21		

Chemical analysis	Well #6 ALL + SH/LS? mg/l	meq/l	Date 11/17/93 meq(%)
cations			
Na	13.93	0.61	
K	3.70	0.10	
Mg	110.00	8.80	
Ca	434.00	21.70	
Fe	62.46	2.24	
Mn	21.48	0.78	
Zn	48.24	1.48	
Totals		35.70	
anions			
HCO3	114.00	1.87	
Cl	2.41	0.07	
SO4	1580.00	32.67	
F	2.86	0.11	
Totals		34.73	
cation/anion ratio=	1.03		

Chemical analysis	Well #8L SH + ALL mg/l	meq/l	Date 11/17/93 meq(%)
cations			
Na	13.20	0.57	
K	2.80	0.07	
Mg	123.60	9.89	
Ca	378.00	18.90	
Fe	104.00	3.72	
Mn	43.62	1.59	
Zn	186.48	5.70	
Totals		40.45	
anions			
HCO3	76.00	1.25	
Cl	2.49	0.07	
SO4	1850.00	38.25	
F	3.06	0.12	
Totals		39.70	
cation/anion ratio=	1.02		

FRENCH GULCH CHEMICAL DATA D-20

Chemical analysis	Well #9 ALL. only mg/l	meq/l	Date 11/16/93 meq(%)
cations			
Na	1.31	0.06	
K	1.00	0.03	
Mg	1.96	0.16	
Ca	24.63	1.23	
Fe	5.00	0.18	
Mn	8.00	0.29	
Zn	0.12	0.00	
Totals		1.94	
anions			
HCO3	51.00	0.84	
Cl	0.50	0.01	
SO4	20.60	0.43	
F	0.20	0.01	
Totals		1.29	
cation/anion ratio=	1.51		

Chemical analysis	Well #11 ALL. F&H mg/l	meq/l	Date 11/16/93 meq(%)
cations			
Na	2.06	0.09	
K	1.10	0.03	
Mg	3.65	0.29	
Ca	29.43	1.47	
Fe	5.00	0.18	
Mn	0.06	0.00	
Zn	2.93	0.09	
Totals		2.15	
anions			
HCO3	45.00	0.74	
Cl	1.55	0.04	
SO4	45.70	0.94	
F	0.20	0.01	
Totals		1.74	
cation/anion ratio=	1.24		

Chemical analysis	Well #8U ALL. mg/l	meq/l	Date 11/17/93 meq(%)
cations			
Na	13.02	0.57	
K	2.30	0.06	
Mg	135.10	10.81	
Ca	378.00	18.90	
Fe	429.00	15.37	
Mn	50.42	1.84	
Zn	25.20	0.77	
Totals		48.30	
anions			
HCO3	0.00	0.00	
Cl	3.67	0.10	
SO4	2610.00	53.97	
F	4.30	0.17	
Totals		54.25	
cation/anion ratio=	0.89		

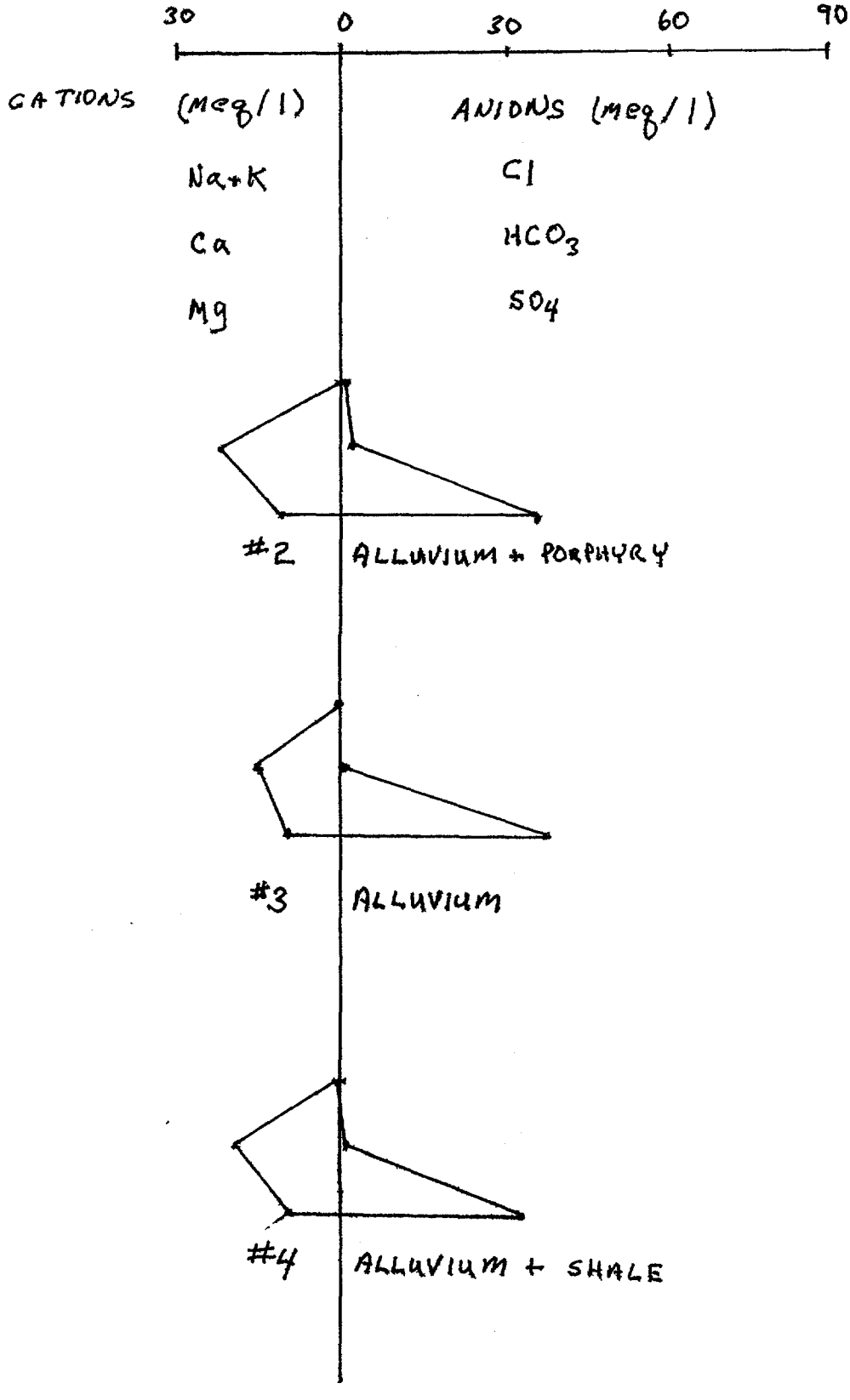
Chemical analysis	Well #12 Portal only mg/l	meq/l	Date 11/16/93 meq(%)
cations			
Na	5.19	0.23	
K	5.10	0.13	
Mg	5.65	0.45	
Ca	38.38	1.92	
Fe	5.00	0.18	
Mn	0.11	0.00	
Zn	0.11	0.00	
Totals		2.91	
anions			
HCO3	82.00	1.35	
Cl	3.29	0.09	
SO4	54.80	1.13	
F	0.20	0.01	
Totals		2.58	
cation/anion ratio=	1.13		

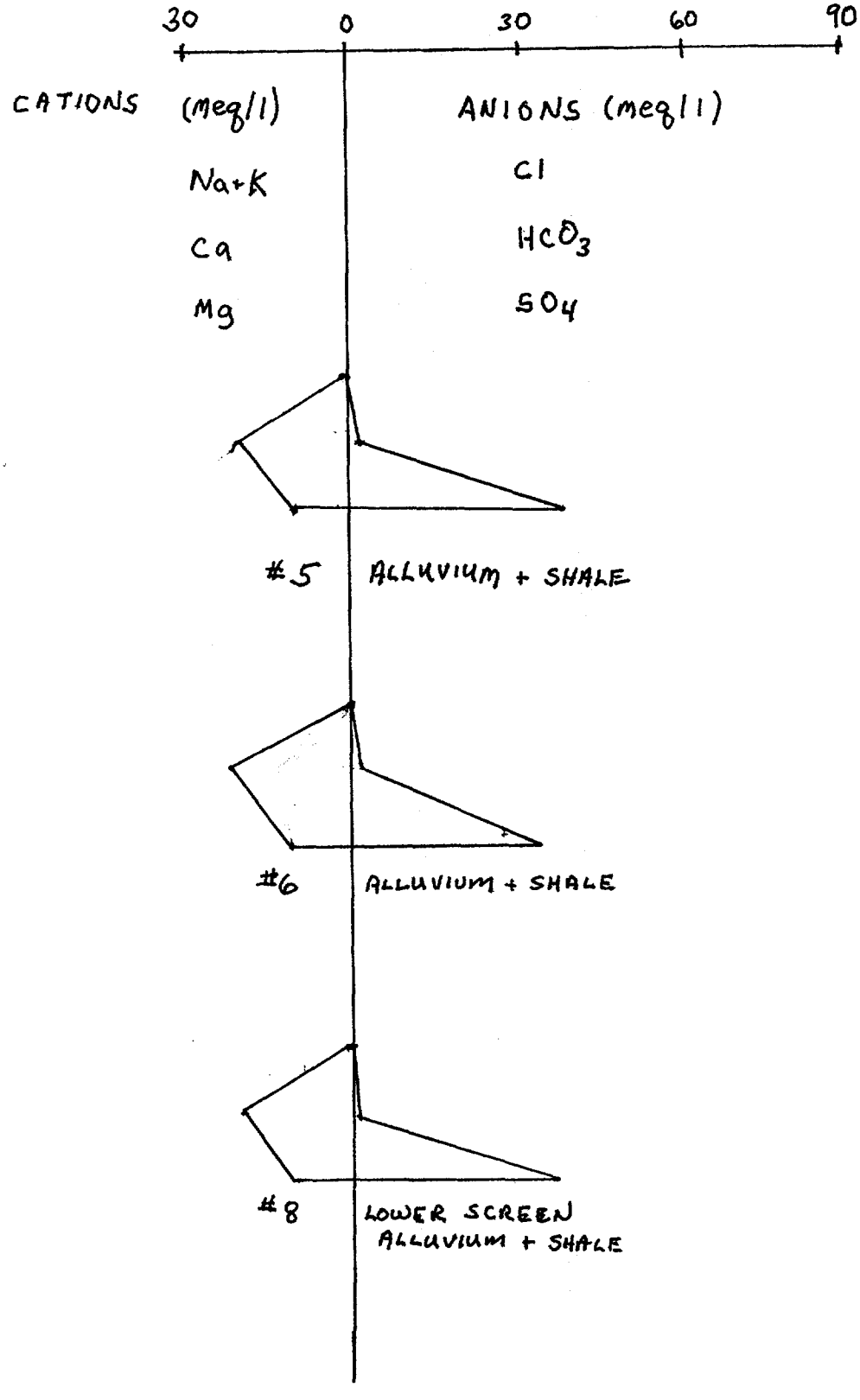
D-20

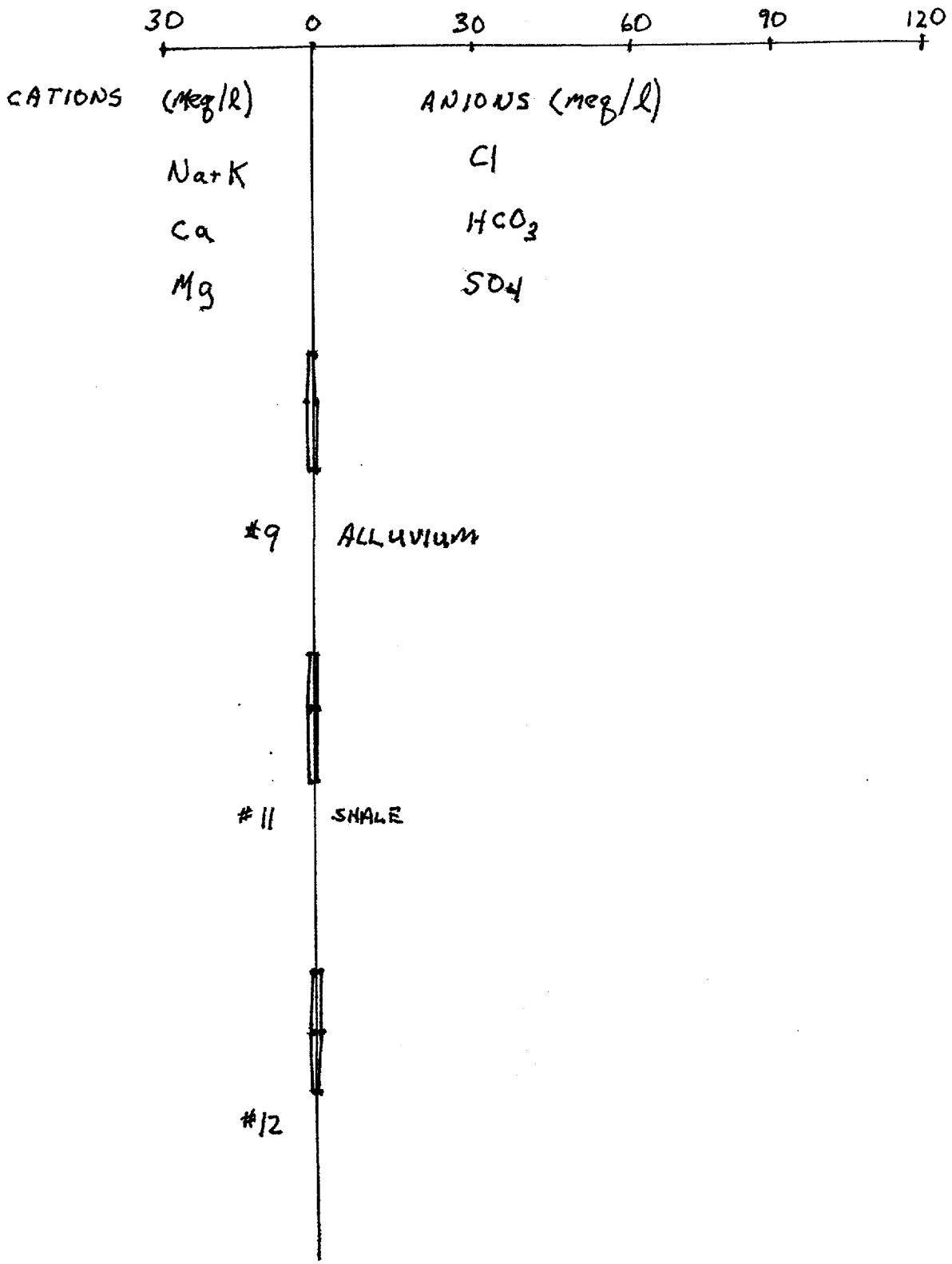
Chemical analysis	Well #13 SHALLOW mg/l	meq/l	Date 11/16/93 meq(%)
cations			
Na	23.97	1.04	
K	10.80	0.28	
Mg	228.10	18.25	
Ca	393.80	19.69	
Fe	20.47	0.73	
Mn	130.06	4.73	
Zn	1495.00	45.73	
Totals		90.46	
anions			
HCO3	23.00	0.38	
Cl	7.49	0.21	
SO4	4190.00	86.64	
F	5.95	0.24	
Totals		87.47	
cation/anion ratio=	1.03		

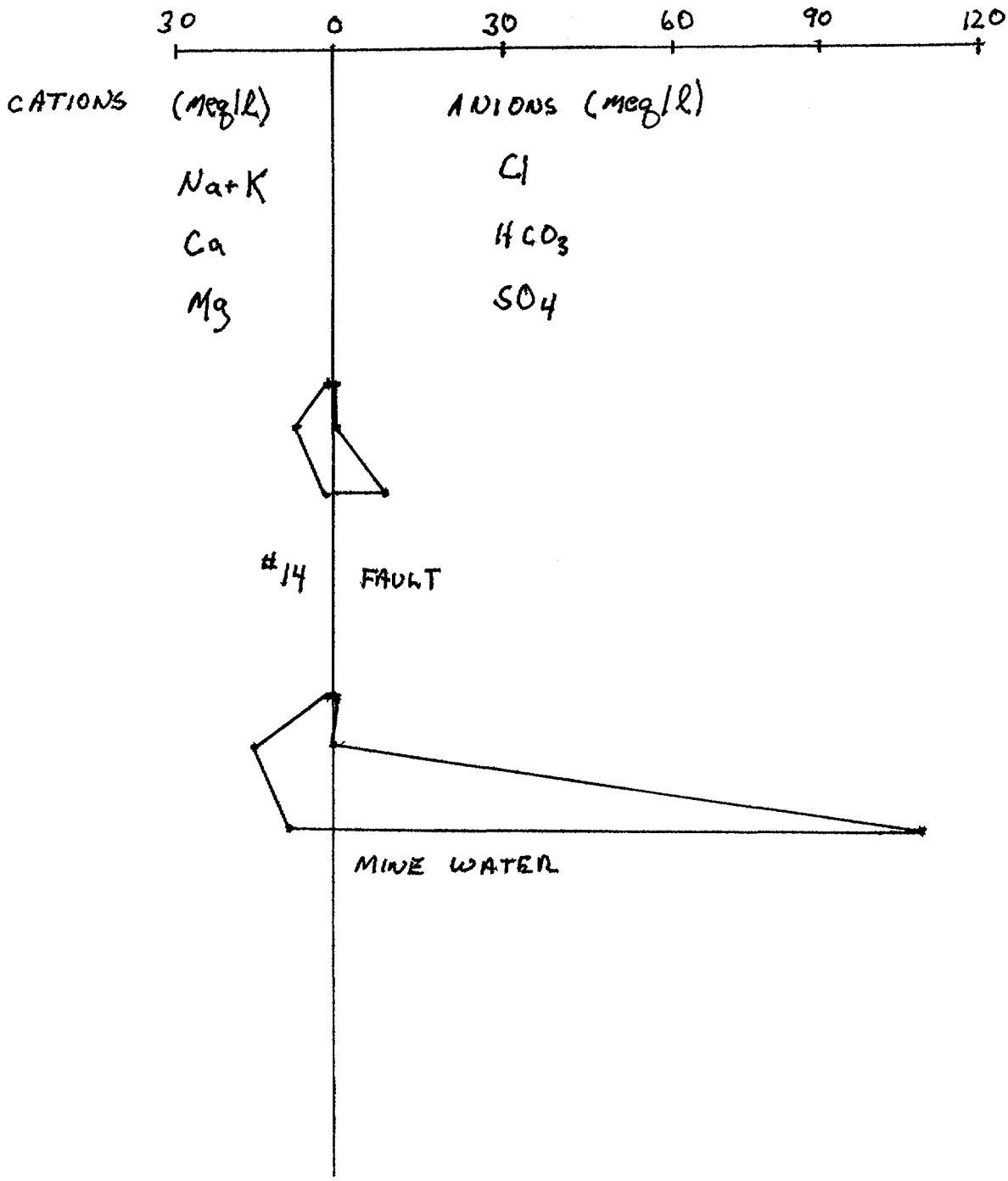
Chemical analysis	Well #14 mg/l	meq/l	Date 11/16/93 meq(%)
cations			
Na	22.25	0.97	
K	3.10	0.08	
Mg	34.02	2.72	
Ca	215.20	10.76	
Fe	0.12	0.00	
Mn	0.49	0.02	
Zn	0.07	0.00	
Totals		14.55	
anions			
HCO3	108.00	1.77	
Cl	15.30	0.43	
SO4	560.00	11.58	
F	0.99	0.04	
Totals		13.83	
cation/anion ratio=	1.05		

Chemical analysis	Mine Water mg/l	meq/l	Date 3/9/93
cations			
Na	20.5	0.89	
K	5.2	0.14	
Mg	185	14.80	
Ca	365	18.25	
Fe	2040	73.10	
Mn	310	11.28	
Zn	158	4.83	
Totals		123.29	
anions			
HCO3	0	0	
Cl	45	1.26	
SO4	5348	110.58	
F	0	0	
Totals		111.84	
cation/anion ratio=	1.10		


30
0
30
60
90
CATIONS (meq/l)
ANIONS (meq/l)
Na+K
Ca
Mg
Cl
HCO3
SO4
#2
ALLUVIUM + PORPHYRY
#3
ALLUVIUM
#4
ALLUVIUM + SHALE

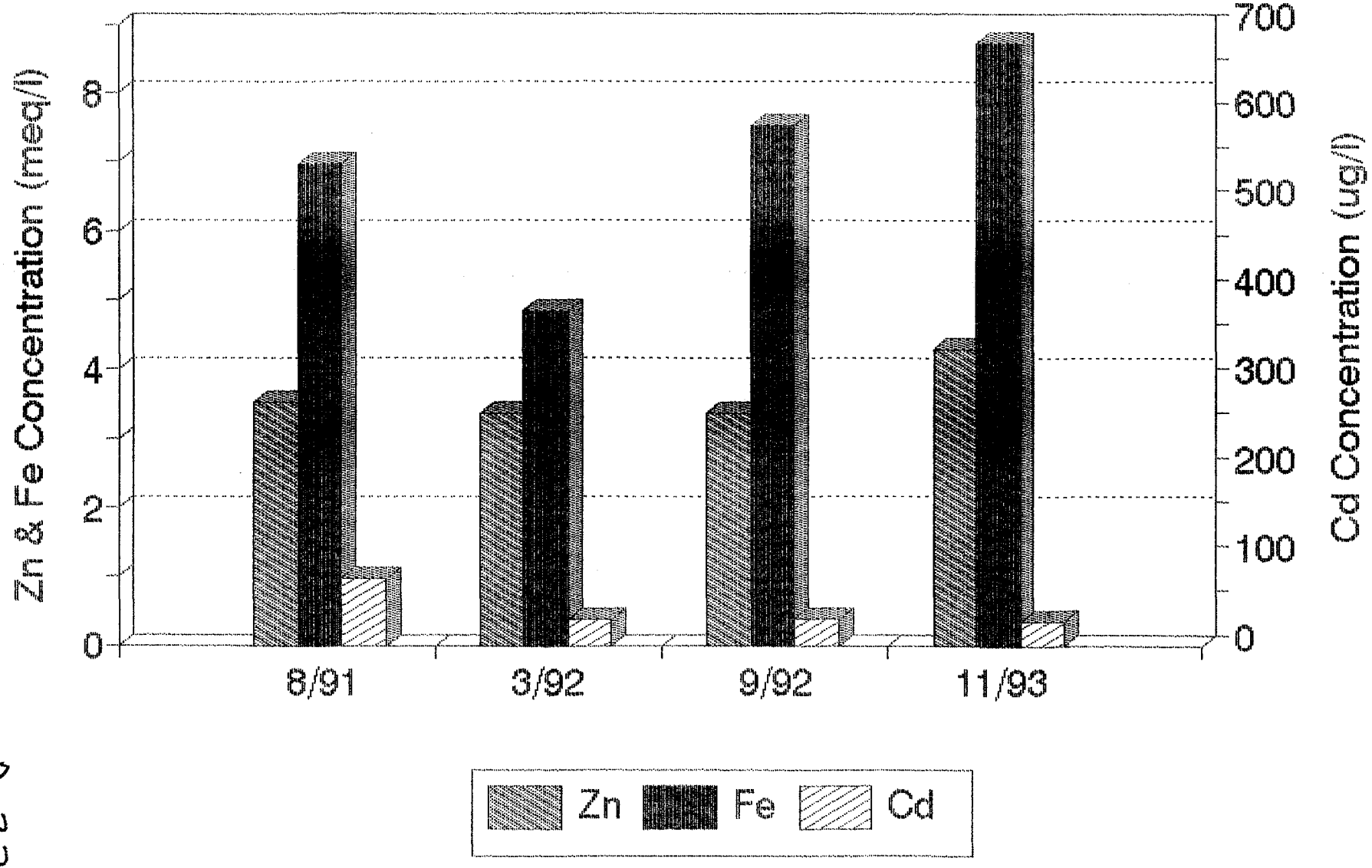

30
0
30
60
90
CATIONS (meq/l)
ANIONS (meq/l)
Na+K
Ca
Mg
Cl
HCO3
SO4
#5 ALLUVIUM + SHALE
#6 ALLUVIUM + SHALE
#8 LOWER SCREEN
ALLUVIUM + SHALE


30
0
30
60
90
120
CATIONS (Meq/l)
ANIONS (meq/l)
Na+K
Ca
Mg
Cl
HCO3
SO4
#9
ALLUVIUM
#11
SHALE
#12


30
0
30
60
90
120
CATIONS (meq/l)
ANIONS (meq/l)
Na+K
Ca
Mg
Cl
HCO3
SO4
#14 FAULT
MINE WATER

French Gulch Well 3

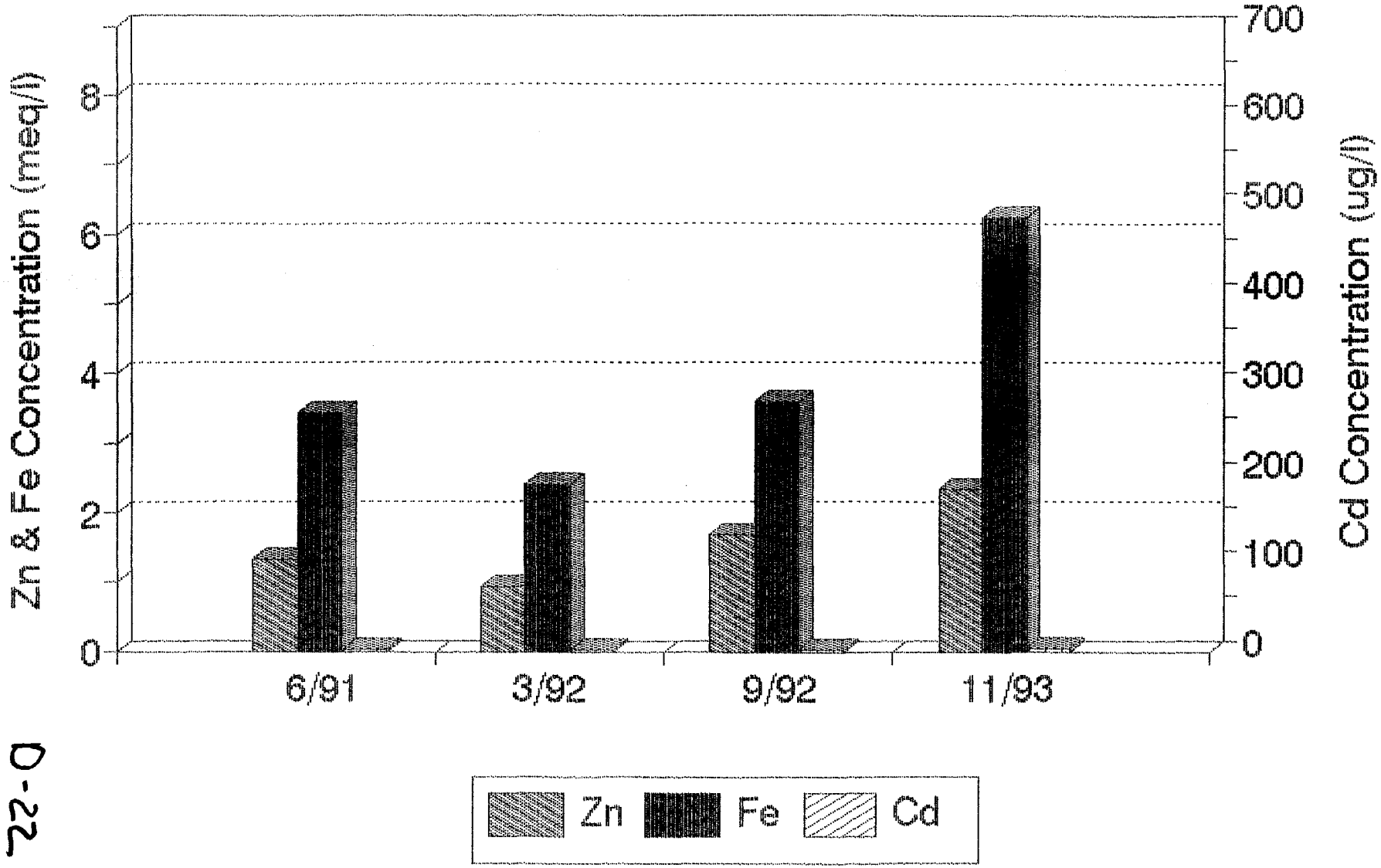
Well Water Chemistry



D-22

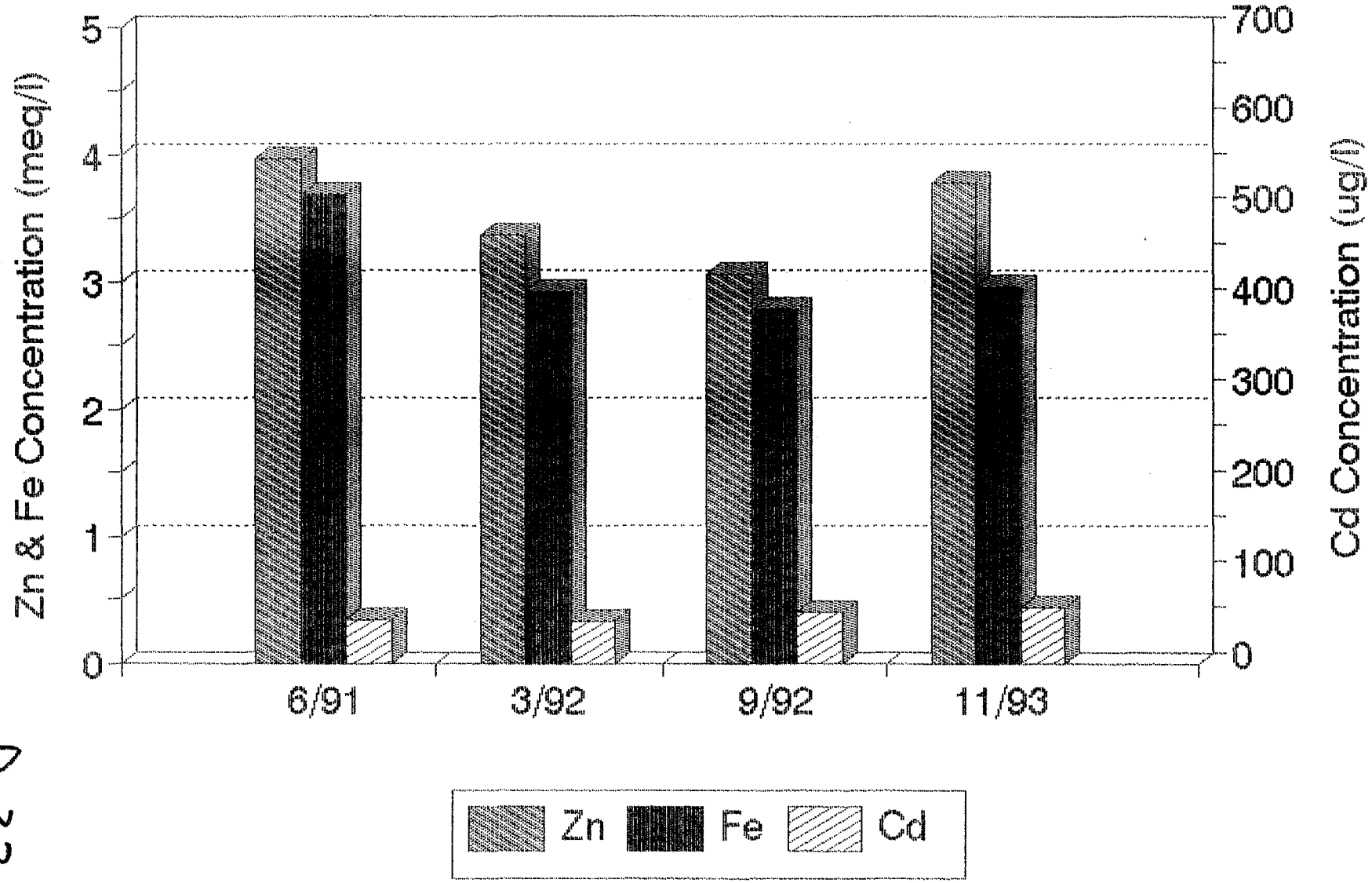
French Gulch Well 2

Well Water Chemistry



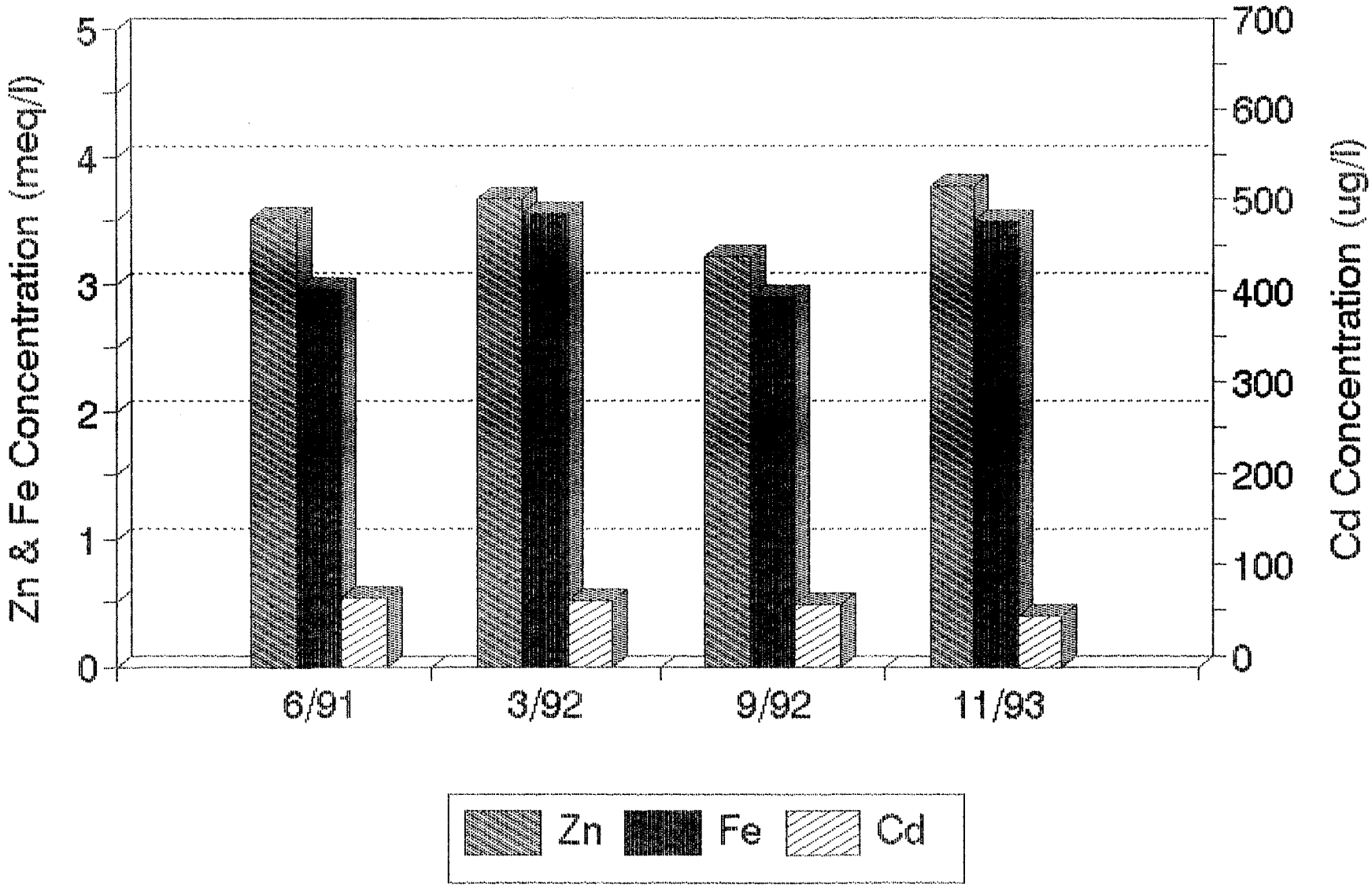
French Gulch Well 4

Well Water Chemistry



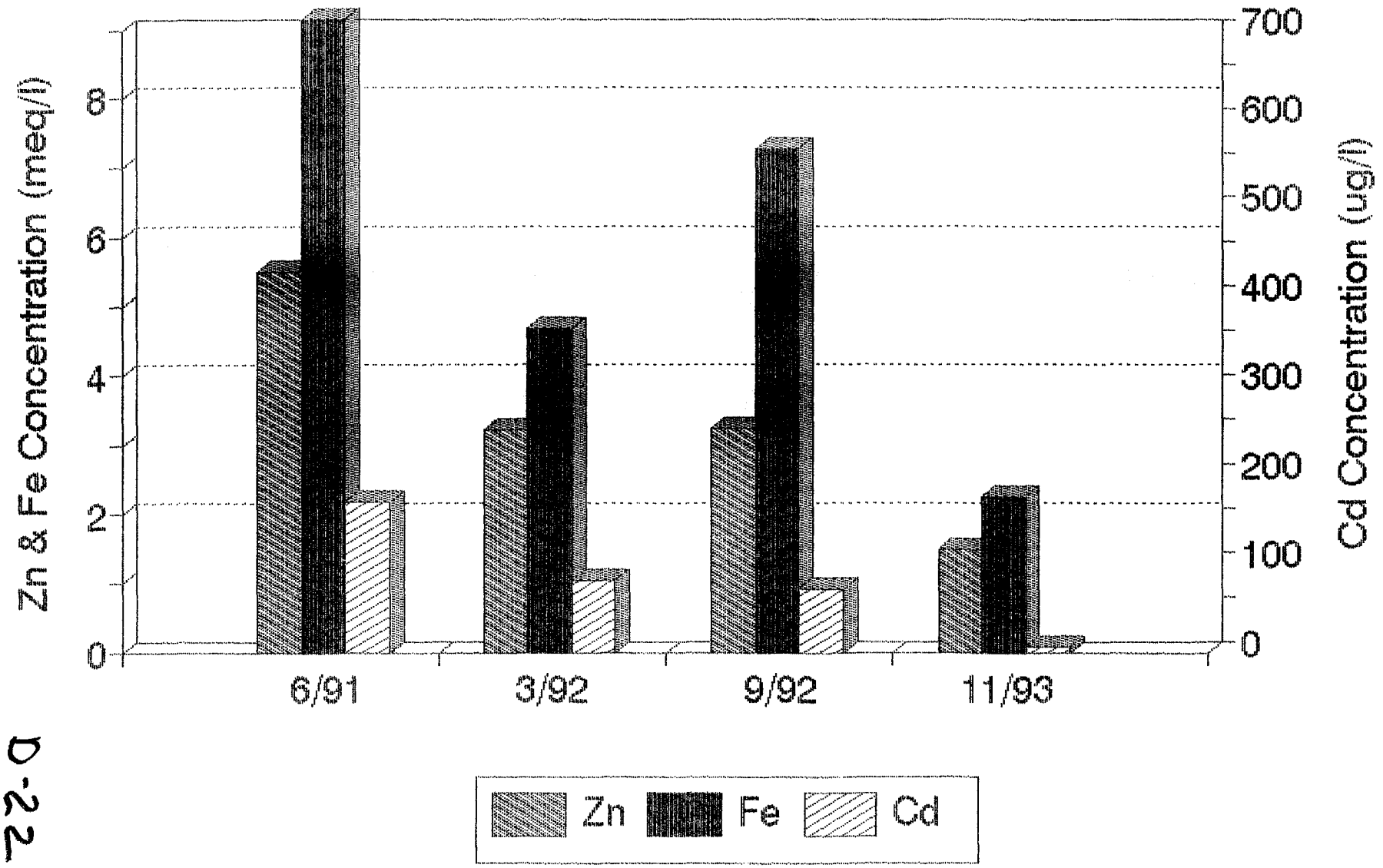
French Gulch Well 5

Well Water Chemistry



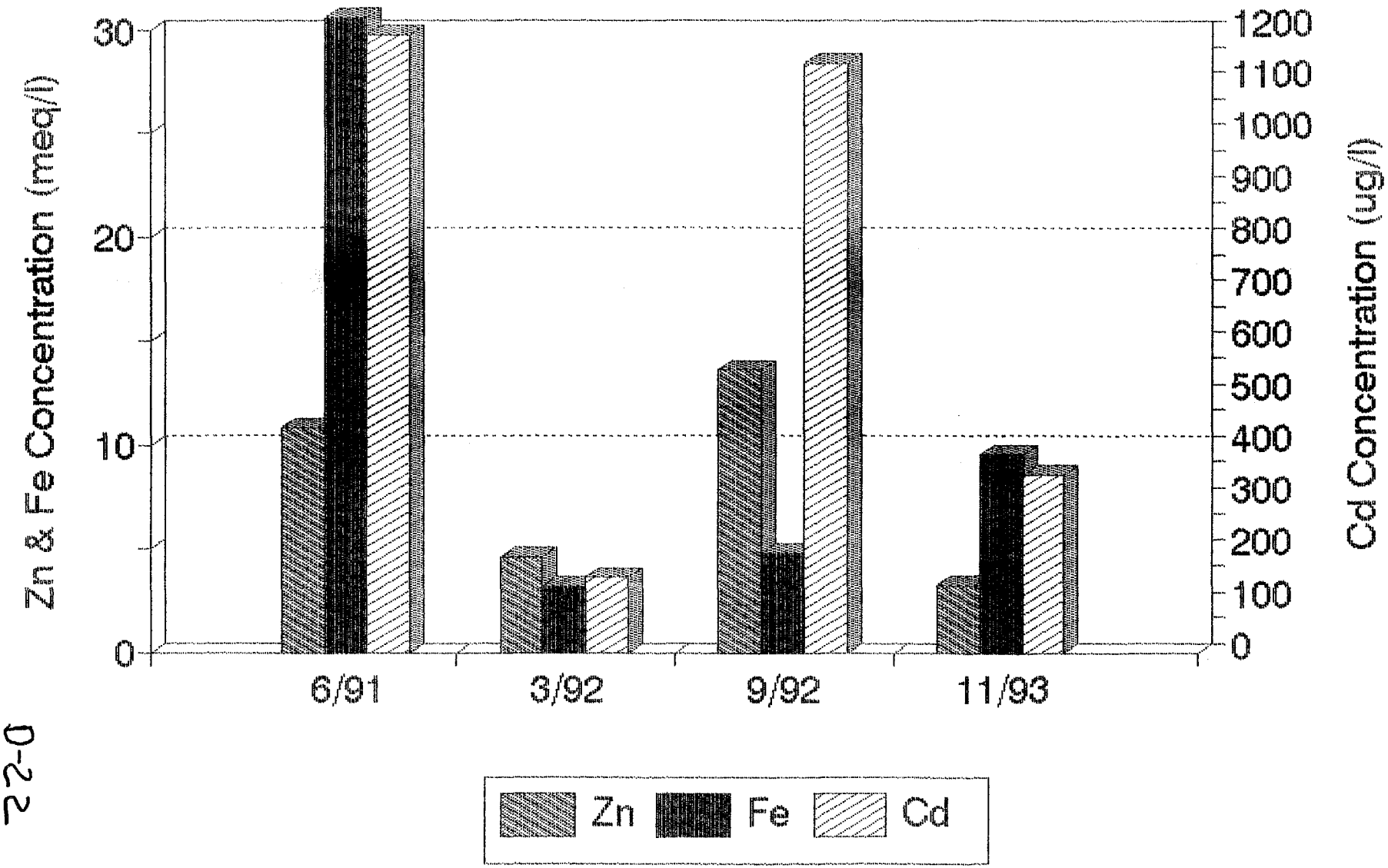
French Gulch Well 6

Well Water Chemistry



French Gulch Well 8

Well Water Chemistry



D-22

APPENDIX
E

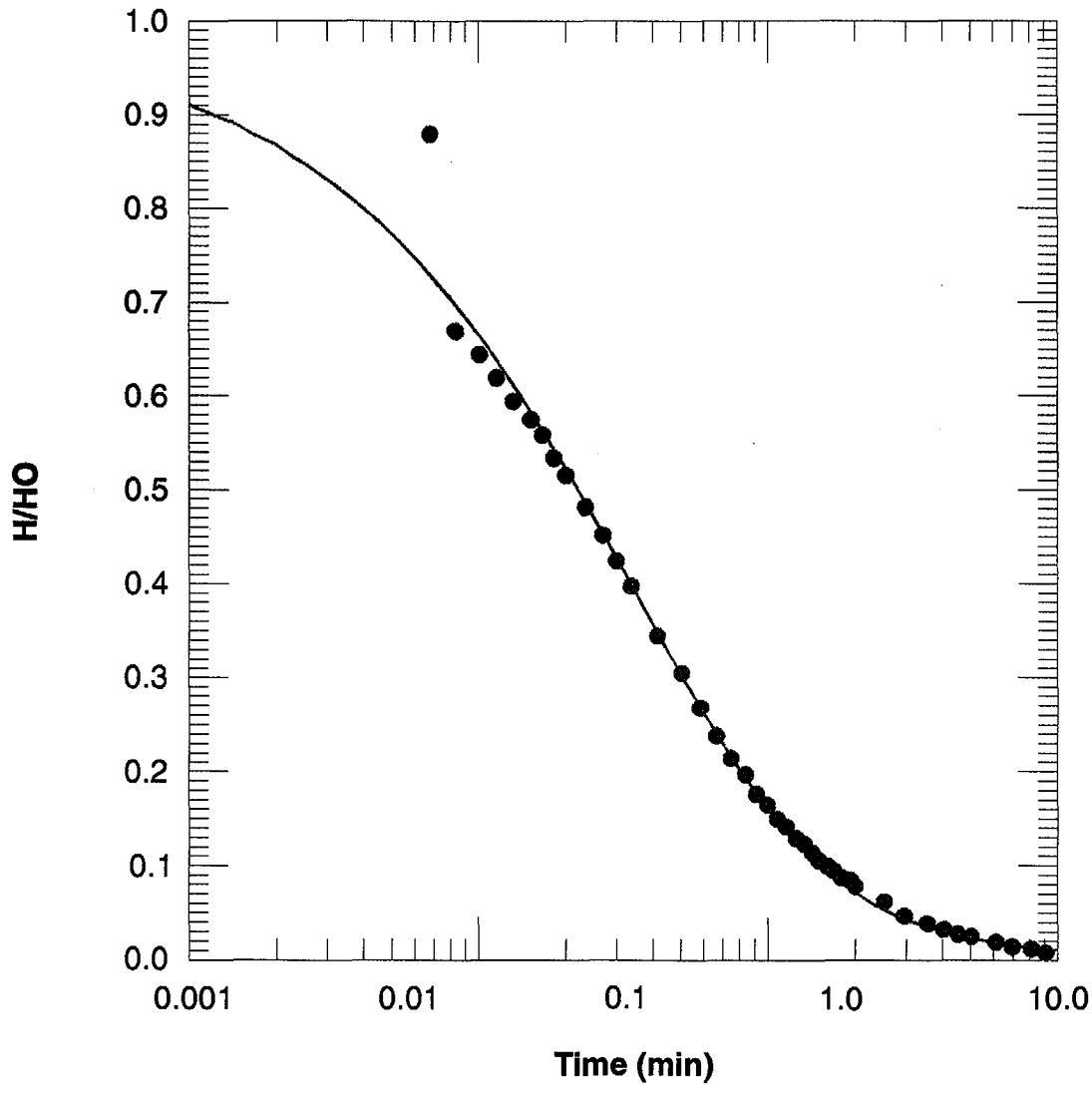
AQTESOLV CURVE-MATCHING FOR RISING HEAD (RH) AND FALLING HEAD (FH) SLUG TESTS

FRENCH GULCH MONITORING WELLS

#11
#1
#2
#3
#7
#8

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 11RH



DATA SET
wm11rhst.dat
10/14/94

AQUIFER TYPE
Confined

SOLUTION METHOD
Cooper et. al.

TEST DATA
10/12/94

TEST WELL
11

OBS. WELL
11

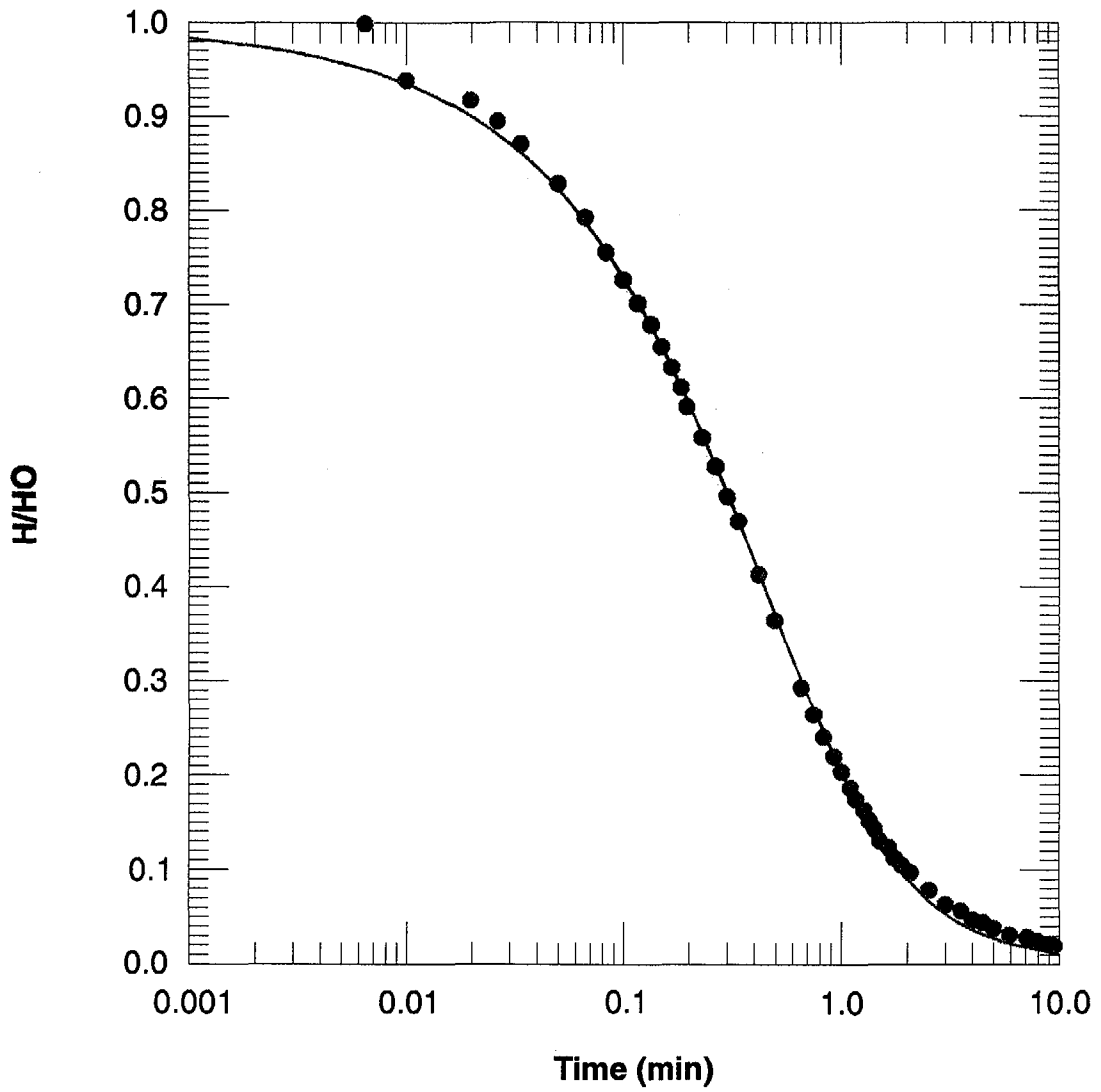
ESTIMATED PARAMETERS
T = 0.01902 ft^2/min
S = 0.009129

TEST DATA
HO = 4.92 ft
rc = 0.08333 ft
rw = 0.1667 ft

11RH.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 11FH



DATA SET
wm11fhst.dat
10/14/94

AQUIFER TYPE
Confined

SOLUTION METHOD
Cooper et. al.

TEST DATA
10/12/94

TEST WELL
11

OBS. WELL
11

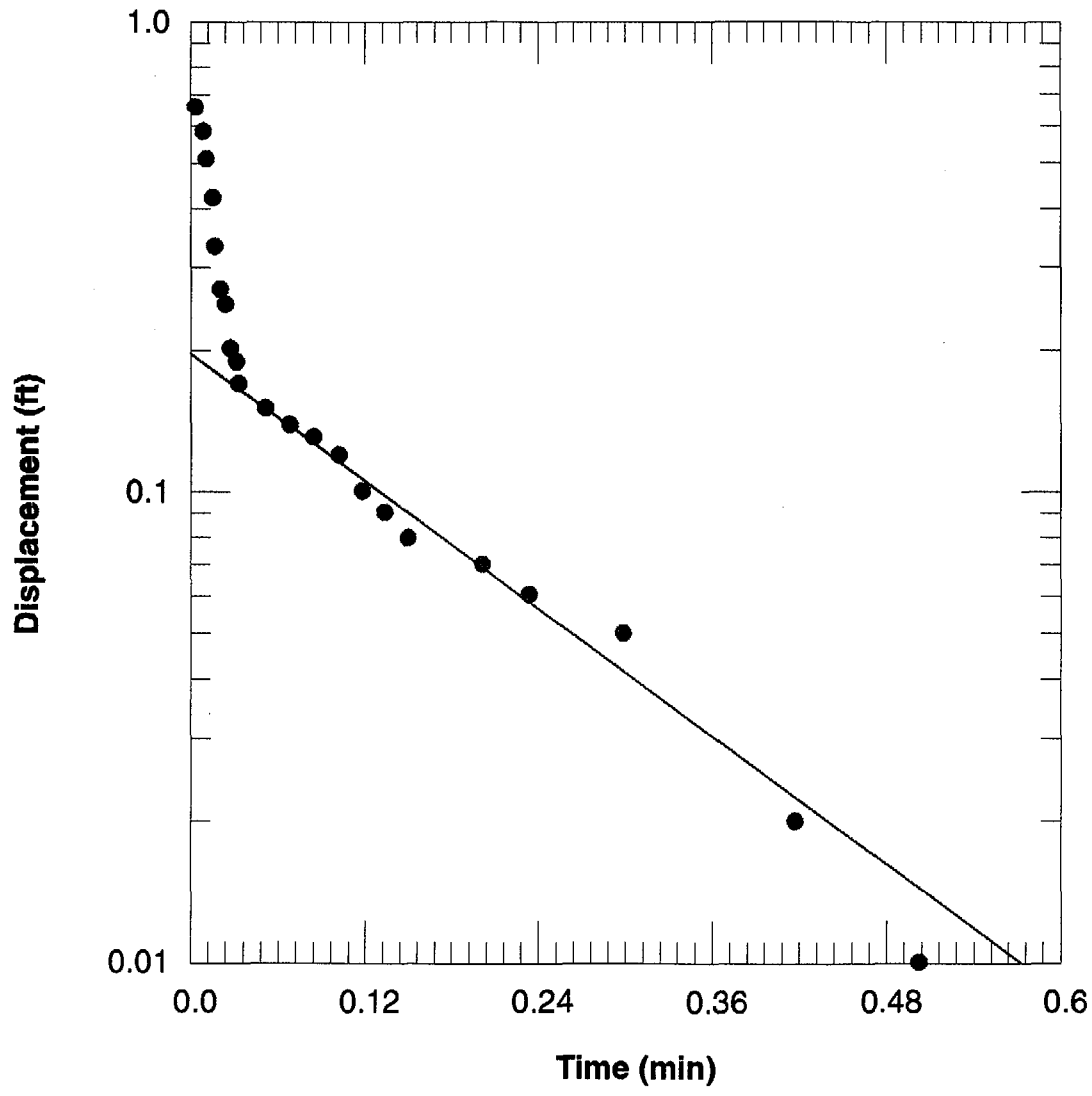
ESTIMATED PARAMETERS
T = 0.0173 ft^2/min
S = 0.004355

TEST DATA
HO = 4.3 ft
rc = 0.08333 ft
rw = 0.1667 ft

11FH.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 01RH



DATA SET
wm01rhst.dat
10/14/94

AQUIFER TYPE
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATA
10/12/94

TEST WELL
01

OBS. WELL
01

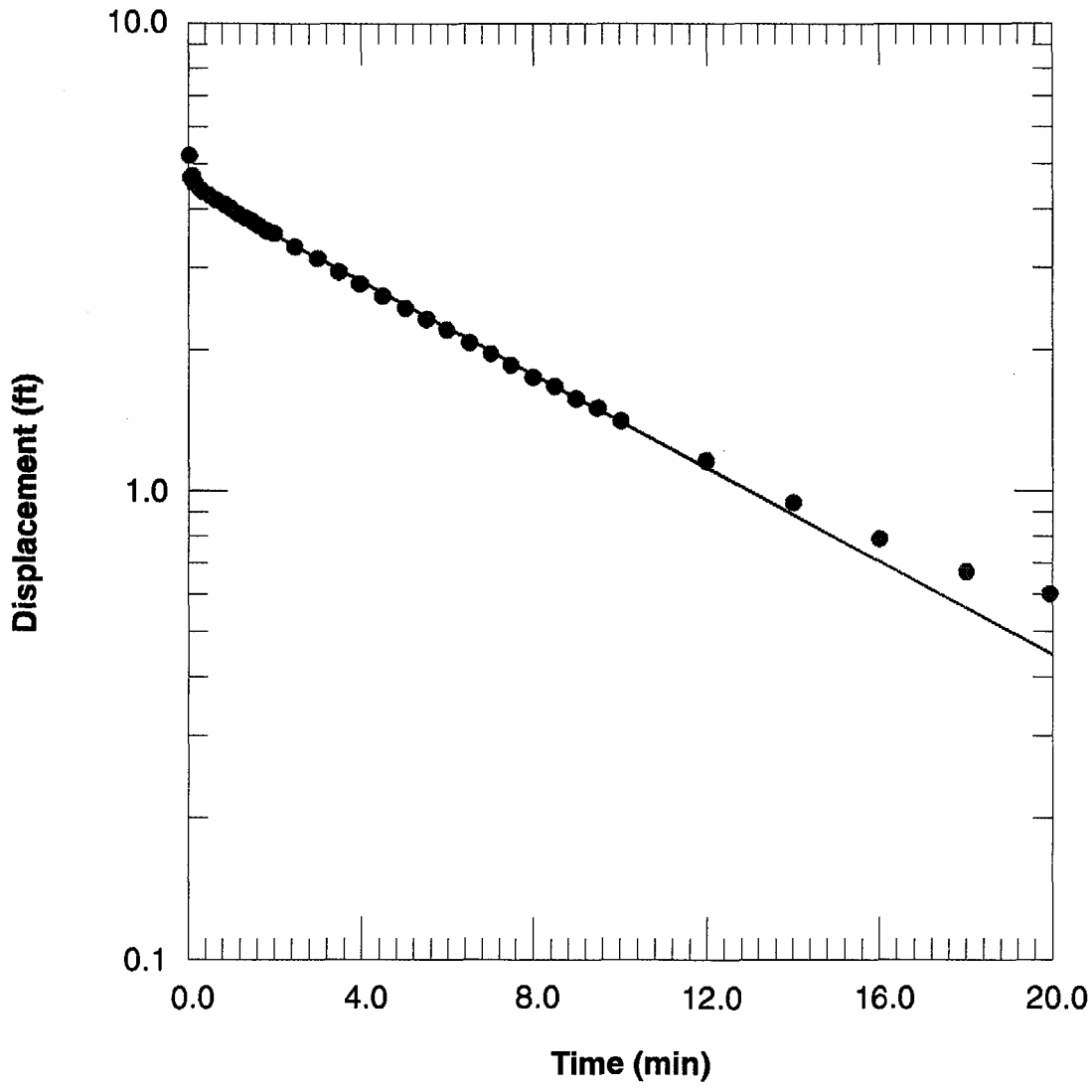
ESTIMATED PARAMETERS
K = 0.005343 ft/min
y0 = 0.1966 ft.

TEST DATA
HO = 4 ft
rc = 0.833 ft
rw = 0.1667 ft
L = 13 ft
b = 29 ft
H = 29 ft

01RH2.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 02RH



DATA SET
wm02rhst.dat
10/17/94

AQUIFER TYPE
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATA
10/12/94

TEST WELL
02

OBS. WELL
02

ESTIMATED PARAMETERS
K = 0.0001537 ft/min
y0 = 4.433 ft.

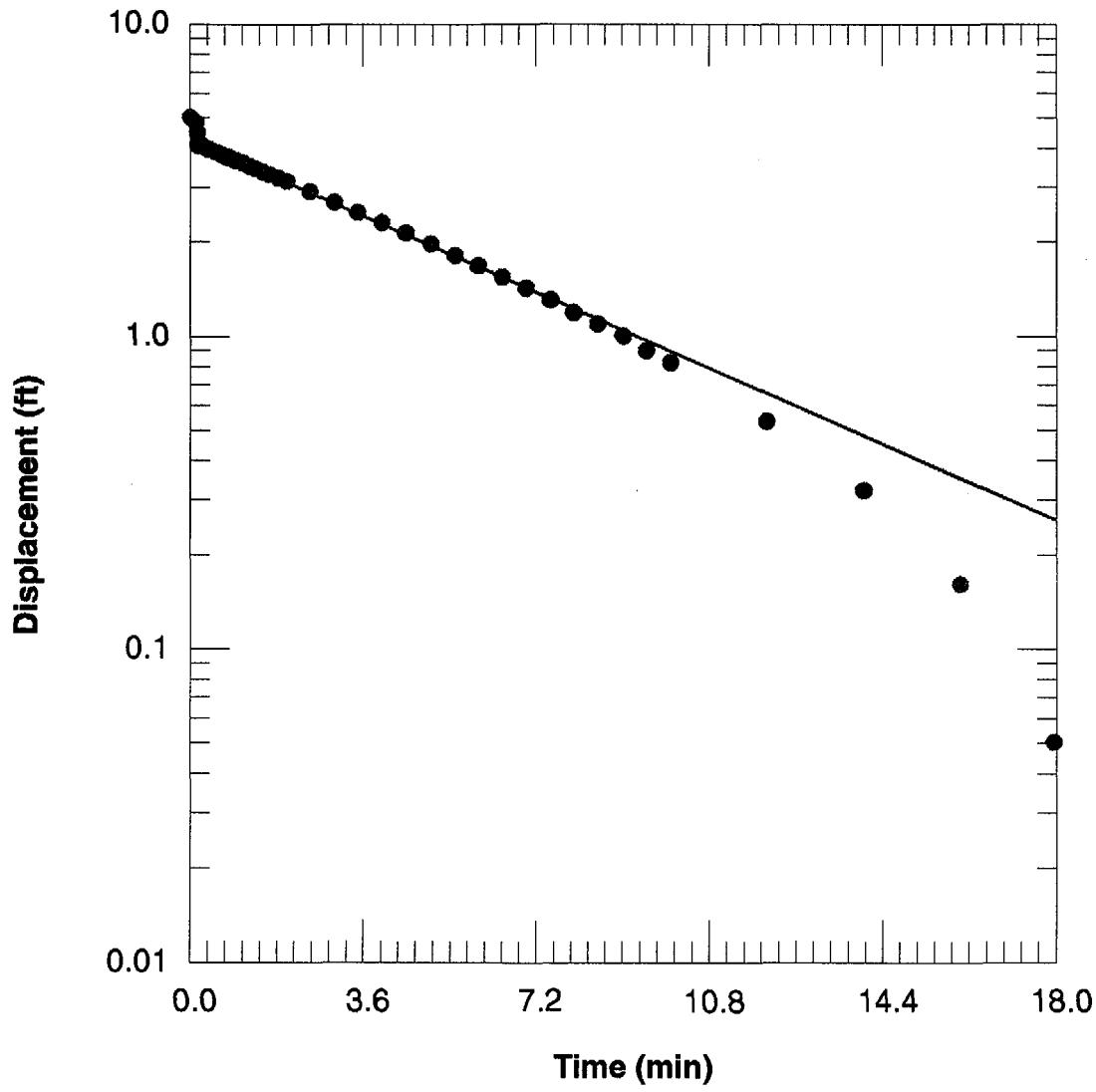
TEST DATA
HO = 5.2 ft
rc = 0.0833 ft
rw = 0.1667 ft
L = 10 ft
b = 25 ft
H = 32 ft

E

02RH1.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 02FH



DATA SET
wm02fhst.dat
10/17/94

AQUIFER TYPE
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATA
10/12/94

TEST WELL
02

OBS. WELL
02

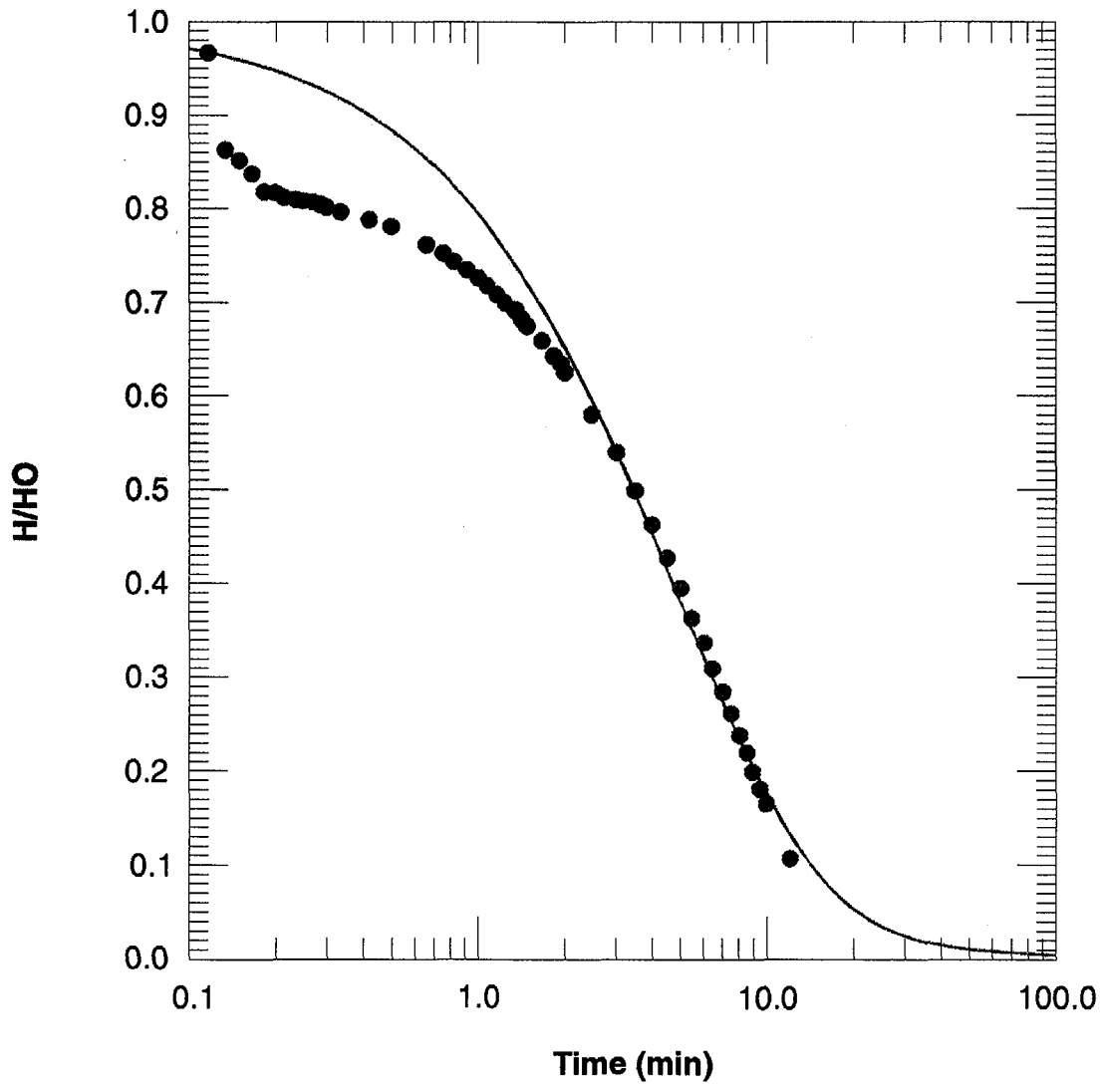
ESTIMATED PARAMETERS
K = 0.0002082 ft/min
y0 = 4.238 ft.

TEST DATA
HO = 5 ft
rc = 0.0833 ft
rw = 0.1667 ft
L = 10 ft
b = 25 ft
H = 32 ft

02FH1.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 02FH



DATA SET
wm02fhst.dat
10/17/94

AQUIFER TYPE
Confined

SOLUTION METHOD
Cooper et. al.

TEST DATA
10/12/94

TEST WELL
02

OBS. WELL
02

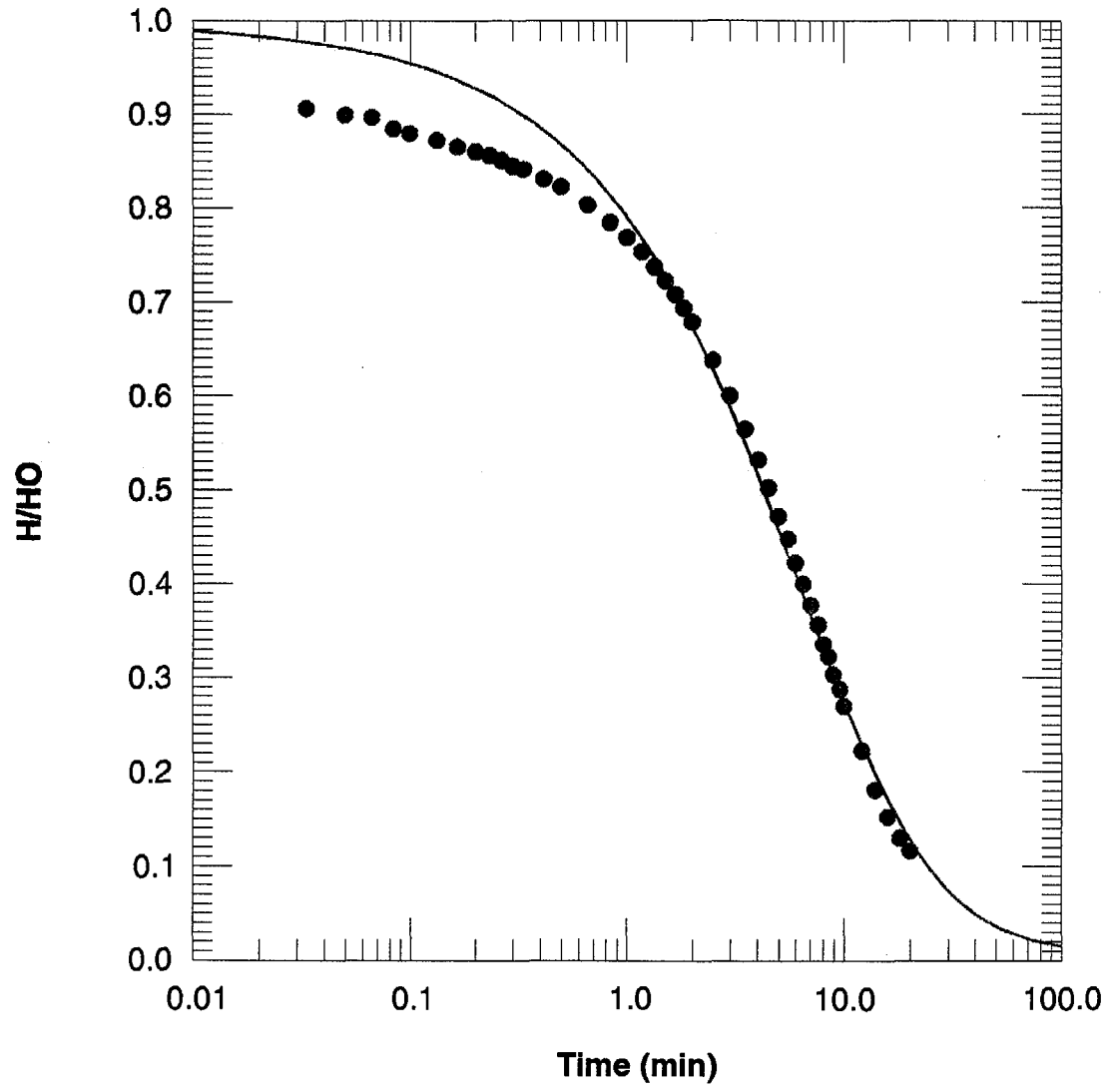
ESTIMATED PARAMETERS
T = 0.0044 ft^2/min
S = 2.5168E-06

TEST DATA
HO = 5 ft
rc = 0.08333 ft
rw = 0.1667 ft

W02FH.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 02RH



DATA SET
wm02rhst.dat
10/17/94

AQUIFER TYPE
Confined

SOLUTION METHOD
Cooper et. al.

TEST DATA
10/12/94

TEST WELL
02

OBS. WELL
02

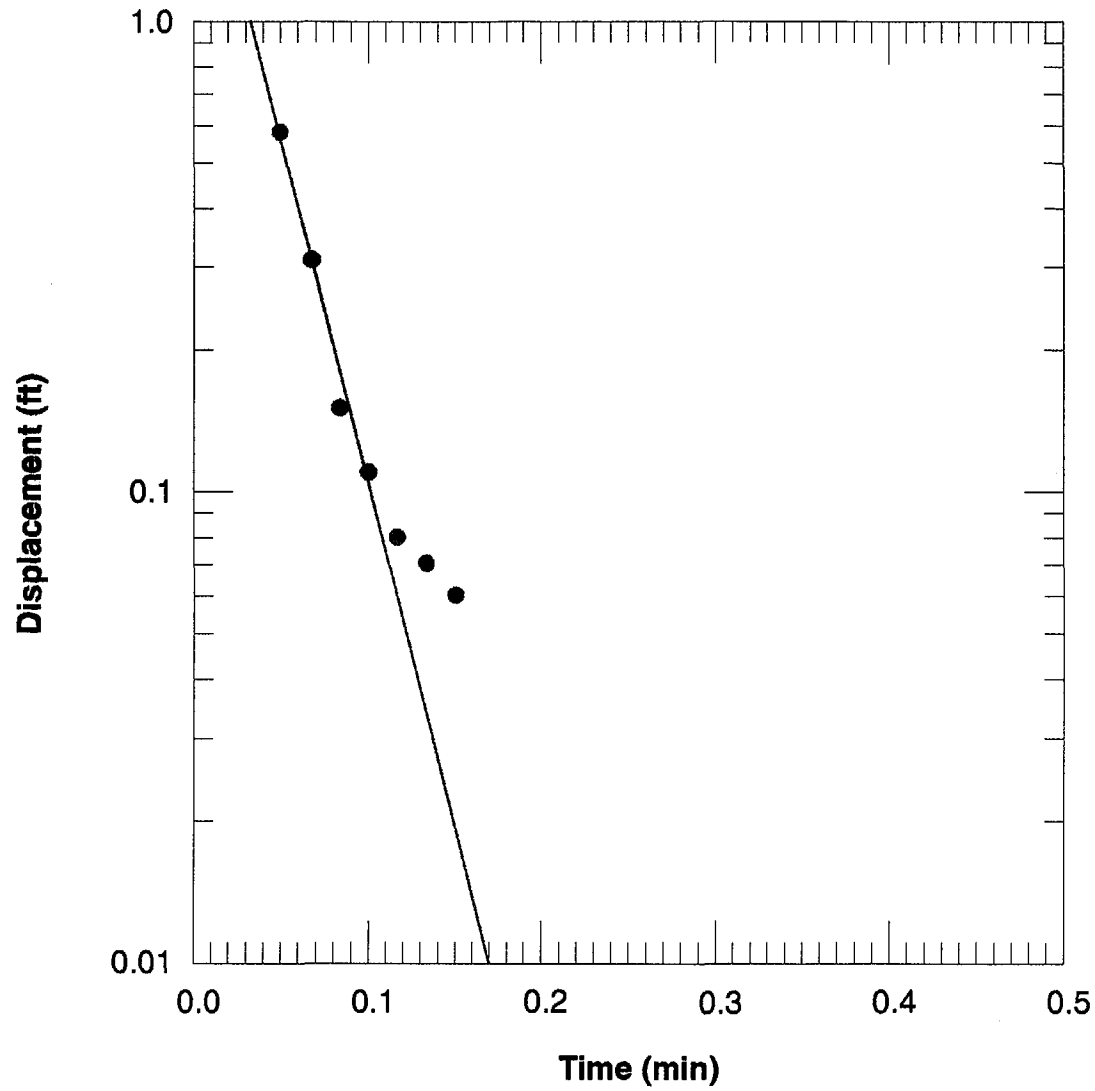
ESTIMATED PARAMETERS
T = 0.001442 ft^2/min
S = 0.002102

TEST DATA
HO = 5.2 ft
rc = 0.08333 ft
rw = 0.1667 ft

W02RH.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 03FH



DATA SET
wm03fhst.dat
10/17/94

AQUIFER TYPE
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATA
10/12/94

TEST WELL
03

OBS. WELL
03

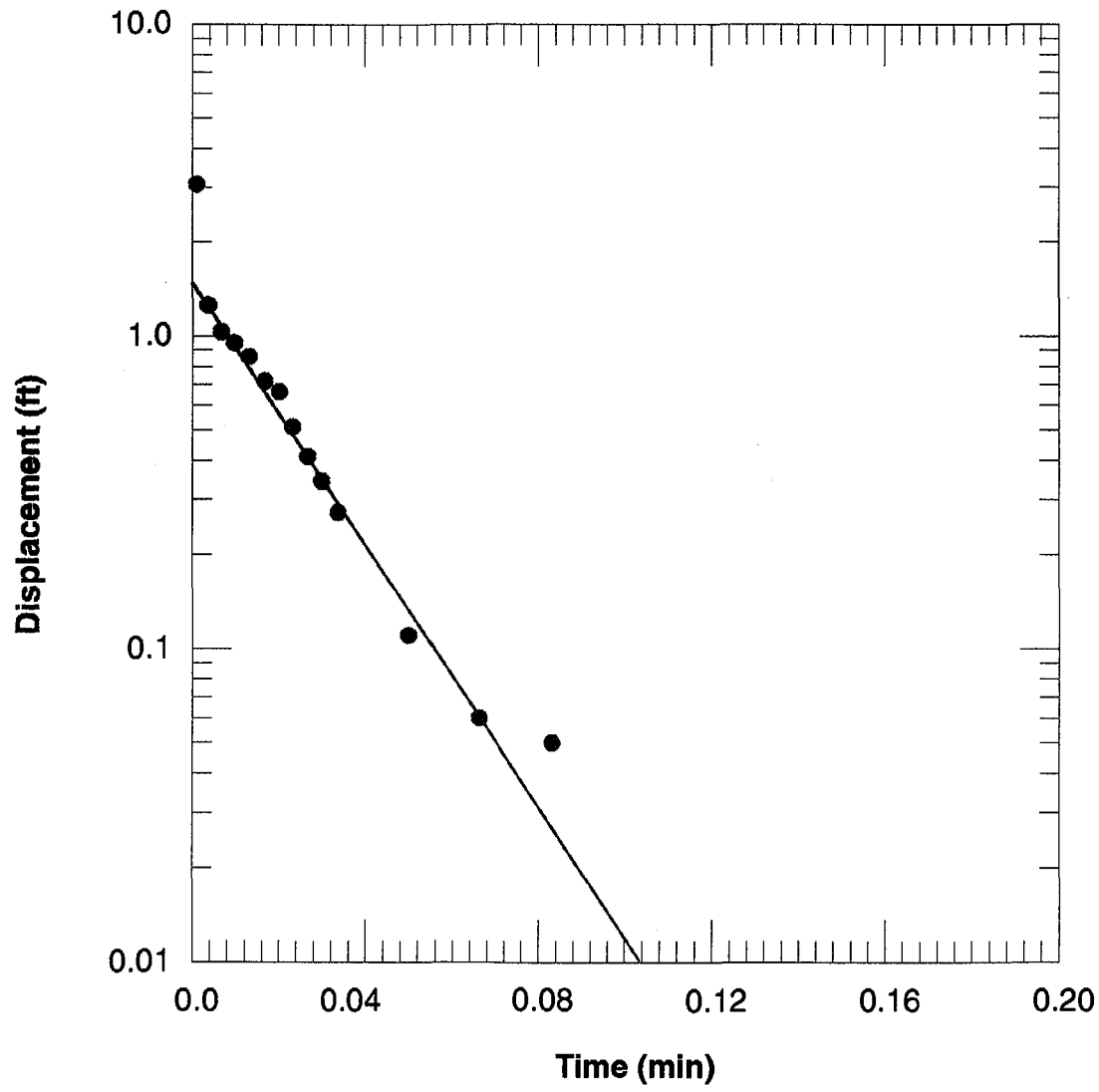
ESTIMATED PARAMETERS
K = 0.03159 ft/min
y0 = 3.067 ft.

TEST DATA
HO = 3 ft
rc = 0.08333 ft
rw = 0.1667 ft
L = 15 ft
b = 38 ft
H = 38 ft

W03FH.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 03RH



DATA SET
wm03rhst.dat
10/17/94

AQUIFER TYPE
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATA
10/12/94

TEST WELL
03

OBS. WELL
03

ESTIMATED PARAMETERS
K = 0.04513 ft/min
y0 = 1.483 ft.

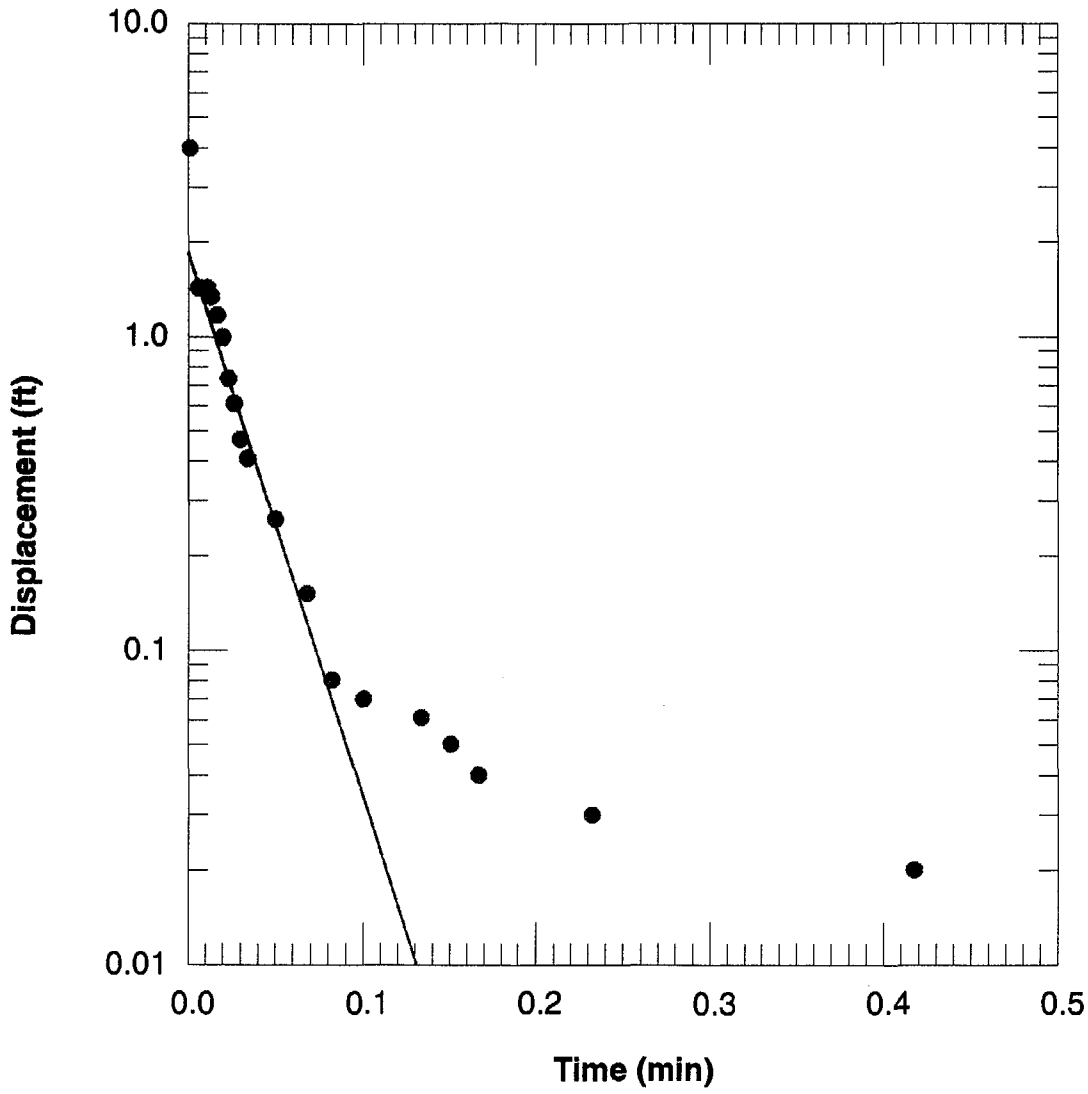
TEST DATA
HO = 3 ft
rc = 0.0833 ft
rw = 0.1667 ft
L = 15 ft
b = 38 ft
H = 38 ft

W03RH.CDR

III

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 07RH



DATA SET
wm07rhst.dat
10/14/94

AQUIFER TYPE
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATA
10/12/94

TEST WELL
07

OBS. WELL
07

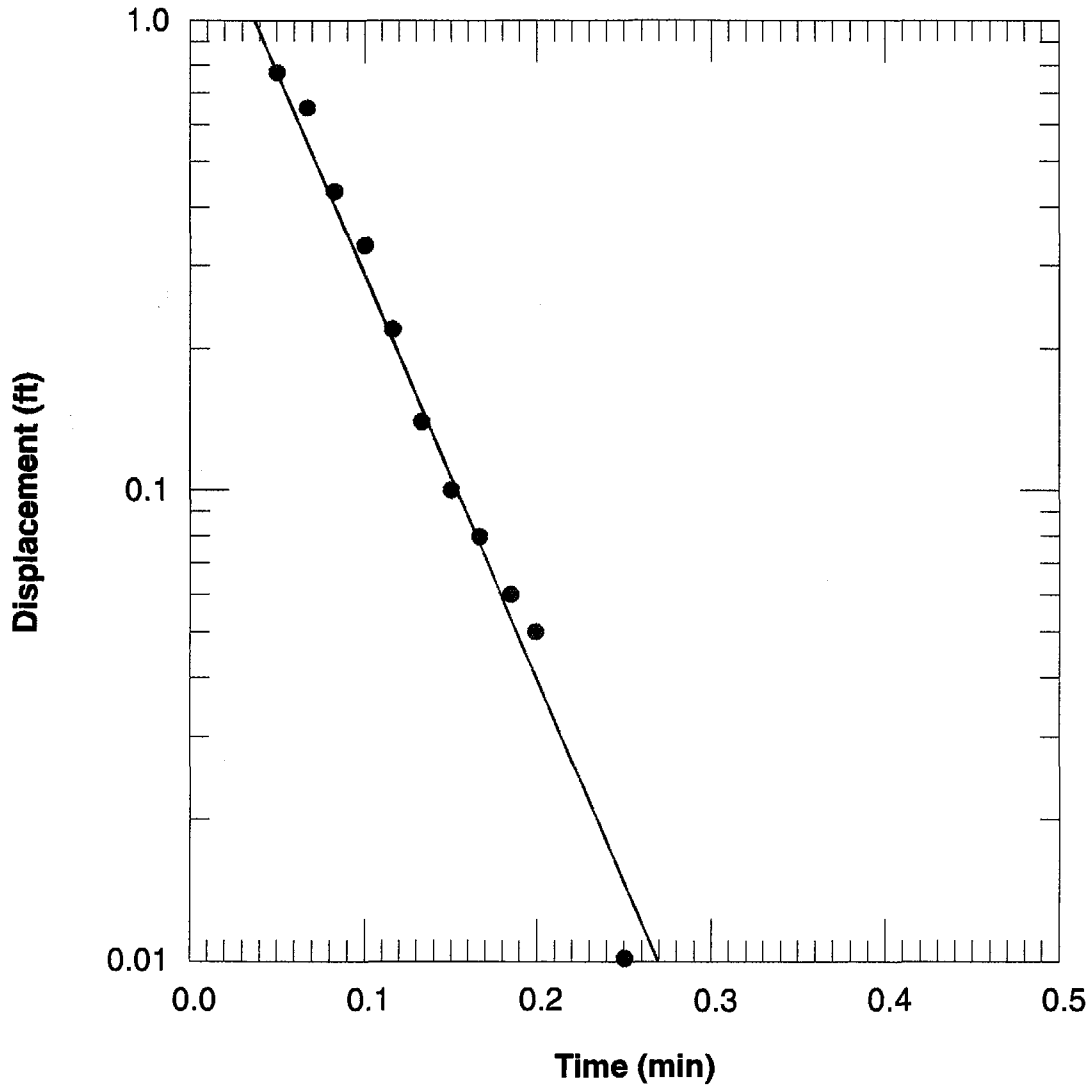
ESTIMATED PARAMETERS
K = 0.03678 ft/min
y0 = 1.847 ft.

TEST DATA
HO = 4 ft
rc = 0.0833 ft
rw = 0.1667 ft
L = 15 ft
b = 35 ft
H = 35 ft

07RH.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 07FH



DATA SET
wm07fhst.dat
10/14/94

AQUIFER TYPE
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATA
10/12/94

TEST WELL
07

OBS. WELL
07

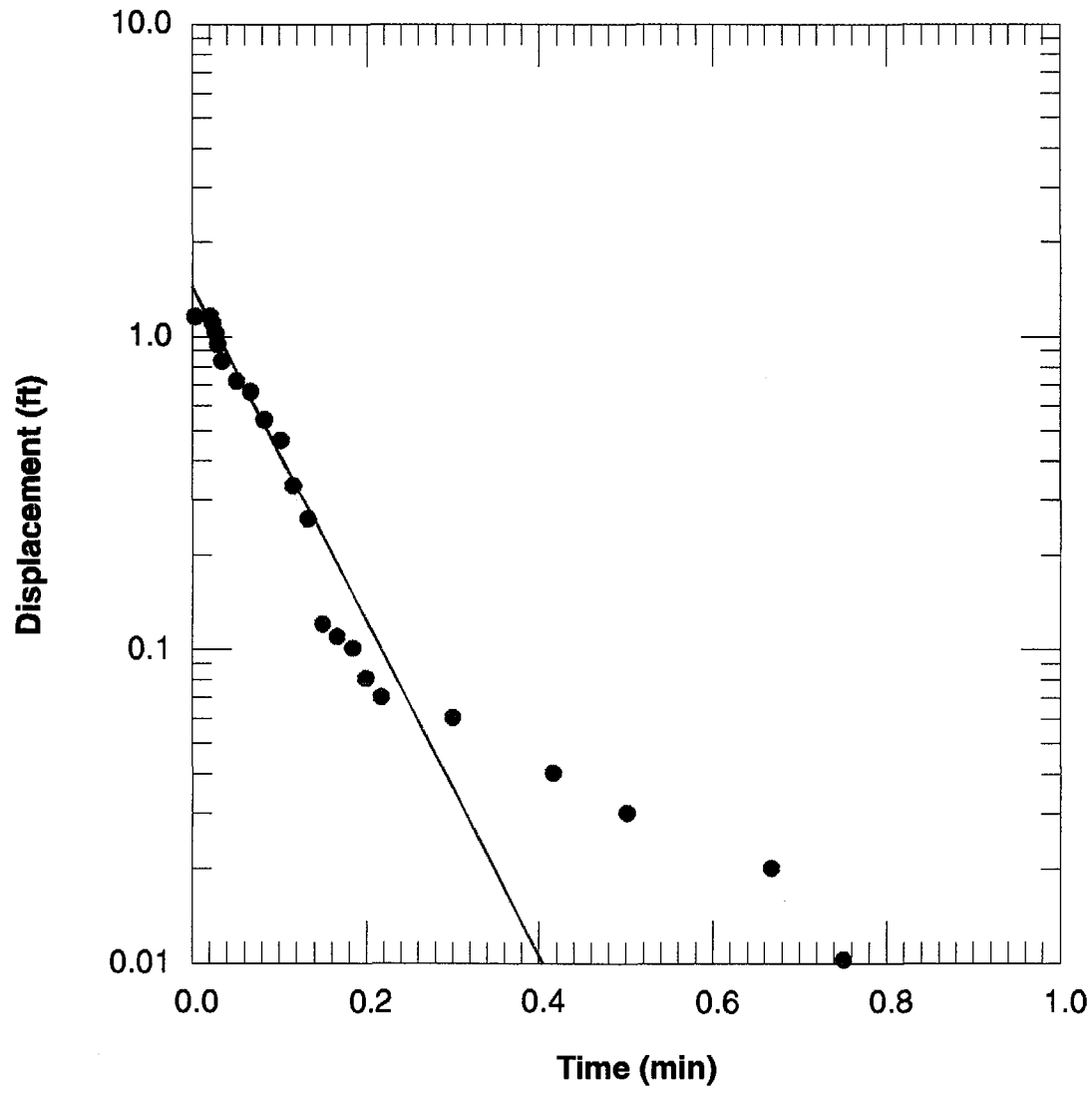
ESTIMATED PARAMETERS
K = 0.01833 ft/min
y0 = 2.103 ft.

TEST DATA
HO = 4 ft
rc = 0.0833 ft
rw = 0.1667 ft
L = 15 ft
b = 35 ft
H = 35 ft

07FH.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 08RH



DATA SET
wm08rhsy.dat
10/14/94

AQUIFER TYPE
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATA
10/12/94

TEST WELL
08

OBS. WELL
08

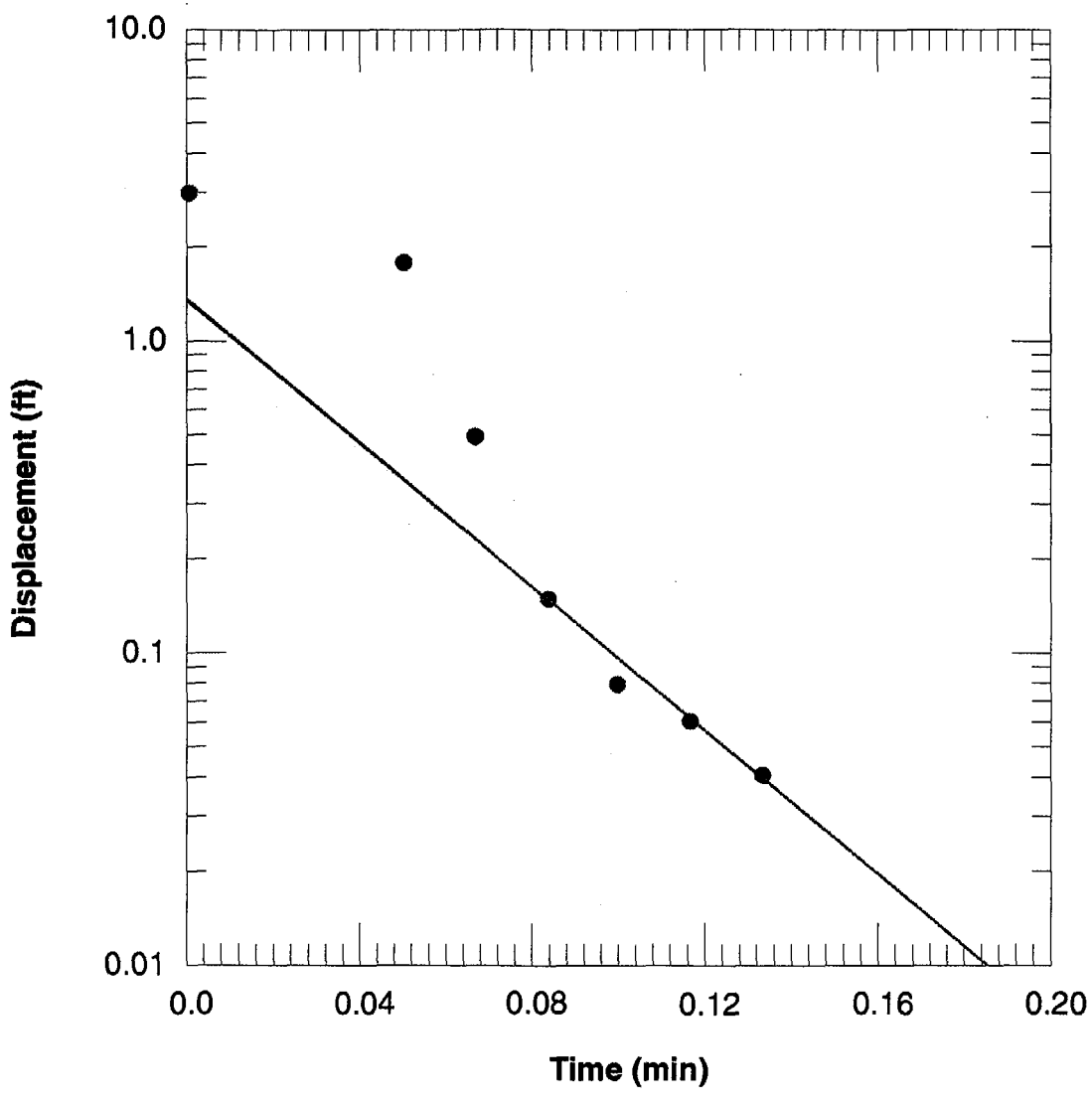
ESTIMATED PARAMETERS
K = 0.01289 ft/min
y0 = 1.442 ft.

TEST DATA
HO = 1.15 ft
rc = 0.0833 ft
rw = 0.1667 ft
L = 13 ft
b = 33 ft
H = 33 ft

08RH.CDR

Research Project	Client: EPA/CDH/CMG
Project No: Wellington Mine	Location: Breckenridge, CO

French Gulch Mine Hydrology - Well 08FH



DATA SET
wm08fhst.dat
10/14/94

AQUIFER TYPE
Unconfined

SOLUTION METHOD
Bouwer-Rice

TEST DATA
10/12/94

TEST WELL
08

OBS. WELL
08

ESTIMATED PARAMETERS
K = 0.02781 ft/min
y0 = 1.354 ft.

TEST DATA
HO = 3 ft
rc = 0.0833 ft
rw = 0.1667 ft
L = 13 ft
b = 33 ft
H = 33 ft

08FH.CDR

APPENDIX
F

CONSTANT DISCHARGE TEST DATA & PLOTS

F-1 SURVEY NOTES FOR OBSERVATION WELLS

F-2 STATIC WATER LEVELS ALLUVIAL PUMP TEST

F-3 STATIC WATER LEVELS SHALE PUMP TEST

F-4 DRAWDOWN DATA ALLUVIAL PUMP TEST (WELLS NOS. 1,5,18,16,17,4,8,13,& 3 MINE RELIEF)

F-5 DRAWDOWN DATA SHALE PUMP TEST (WELLS NOS. 16,17,1,5,8,13,18, & 3 MINE RELIEF)

F-6 RECOVERY DATA ALLUVIAL PUMP TEST (WELLS NOS. 5,1,4,8,13,16,17,18,& 3 MINE RELIEF)

F-7 RECOVERY DATA SHALE PUMP TEST (WELLS NOS. 1,4,5,8,13,17,18,& 3 MINE RELIEF)

SURVEY NOTES FOR PUMP TEST

STA	FS	BRNG	DIST
#18	RELIEFWELL	256°	32 ft.
#18	#1	203°	25'
#18	#17	200°	35.5'
#18	#16	190°	51'
#18	#5	227°	ND
#18	#4	191°	ND
#18	#8	140°	ND
#18	#13	60°	ND
#17	RELIEFWELL	332°	31.5'
#17	#1	355°	14'
#17	#18	20°	35.5
#17	#16	190°	16.5
#17	#5	230°	
#17	#4	182°	72'
#17	#8		
#17	#13		

40
40 80 20 MW

F-1

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

WELL FLUID LEVEL DATA FORM

Project Name: FRENCH GULCH
Project Number:

Date: NOV. 1, 1994
Recorded By: Water Depth from surface
Unit of Measurement: FEET

Well No.	Time	Water Depth from casing	Water Depth from surface	Product Depth from casing	Measuring Instrument	Notes
#18	0834	*14.21	14.10	11.66		-2.55 to GS
#17	0810	12.76	12.53	11.41		-1.35' to GS
#16	0812	12.05	12.12	11.2		-0.85' to GS
#3 MINE SHAFT	0808	11.96	12.06	10.96		-1.0' to ground surface
#1	0805	11.51	11.62	10.66		-0.85' to ground surface
#4	0829	11.63	11.63			-1.20 to GS
#5	0817	6.48	6.53	6.08		-0.4 to GS
#13	0824	32.22	32.22			-2.0 to GS
#8	0820	13.60'	13.59			-1.8 to GS

Additional Comments:
* #18 Pom used is +2.50" above Top of casing due to well head assembly. -2.55 ft from Top of casing to GS

14.875
13.955
.920

14.21
2.55
11.66

14.2
.02
13.96

1.350
.25
1.10

F-2

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

START PUMP @ 12 GPM @ 10:00

WELL FLUID LEVEL DATA FORM

Project Name: FRENCH GULCH

Project Number:

Date: NOV. 3, 1994

Recorded By:

Unit of Measurement: FEET

Well No.	Time	Water Depth from casing	Water Depth from surface	Product Depth from casing	Measuring Instrument	Notes
#18		14.21	(14.21)			
#17		12.94				
#16		12.23				
#3 MINESHAFT		12.16				
#1		11.72				
* #4	9:47	13'7 inches				
#5	9:49	6.70				
#13	9:42	32.35				
#8	9:44	13.85				

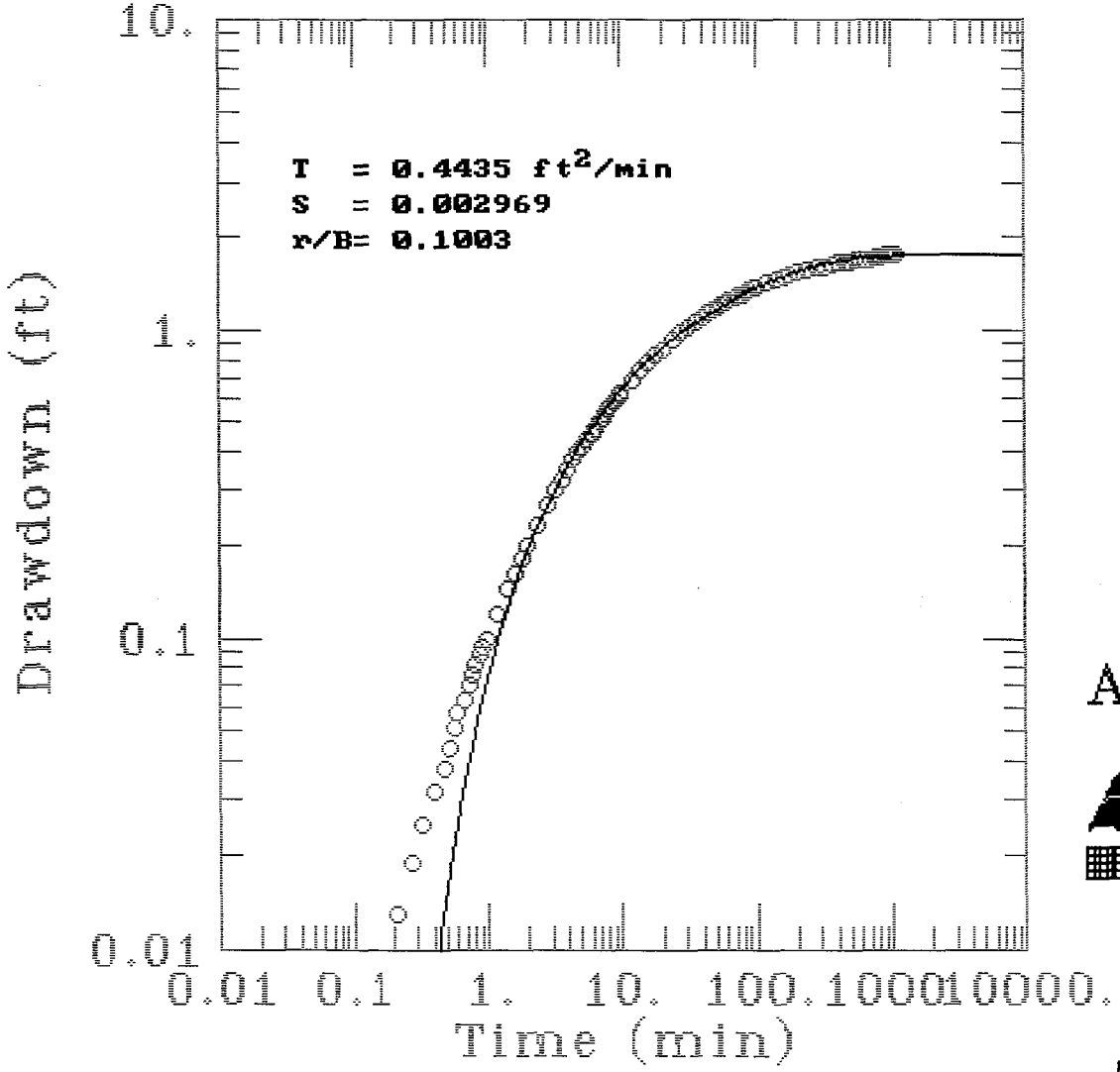
Additional Comments:

* NOTE +1 FOR PROBE STICK-UP CASING.
CORRECTED = 12'7"

PUMP TEST START @ 10:00:24 AM 11/3/94

F-3

French Gulch Hydrology – QAL Pt, 1QalDD



1aloda.dat

1QHautwo.pgl

AQTESOLV

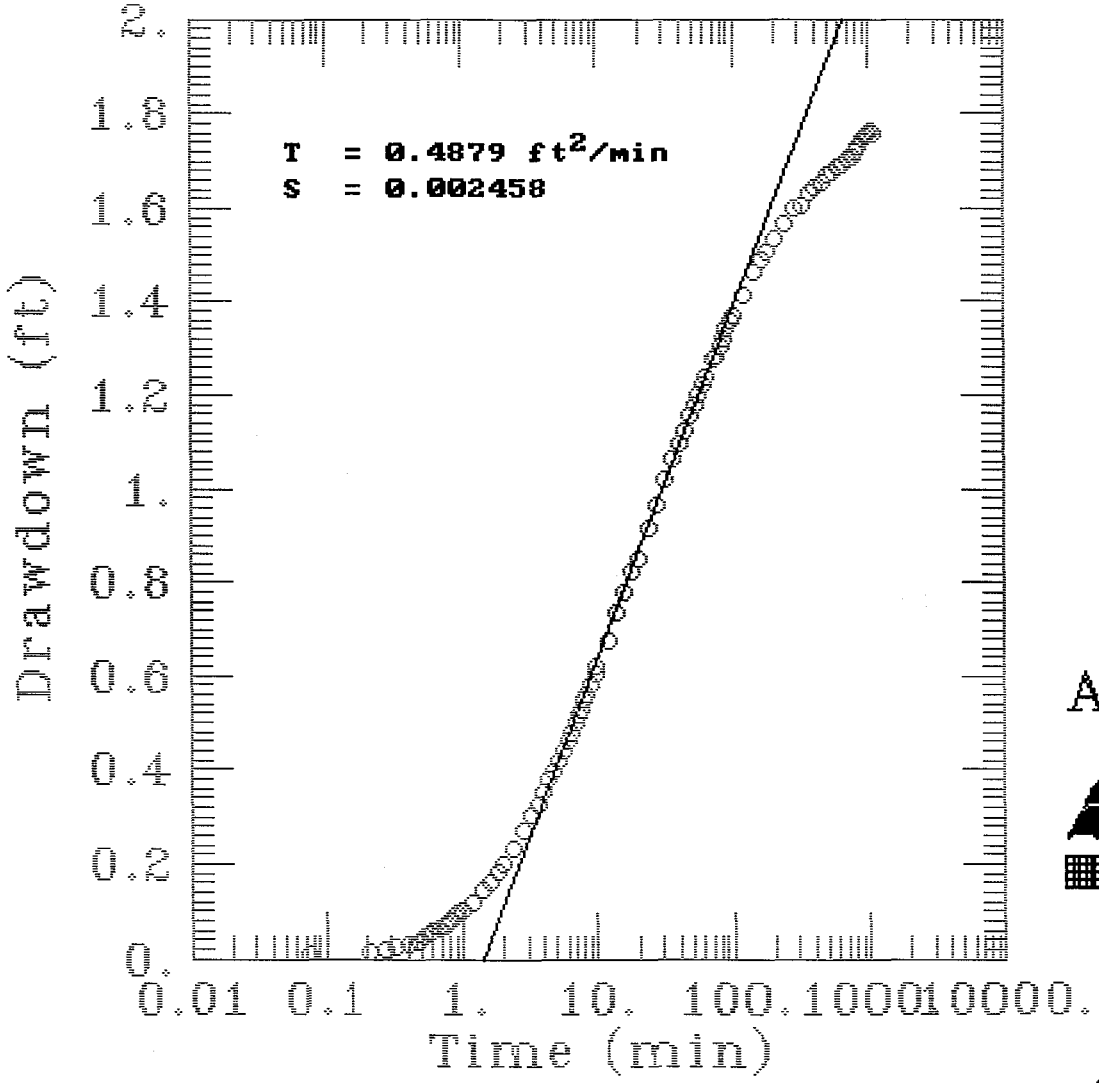
GERAGHTY & MILLER, INC.

Modeling Group

Hantush + Jacob

NO storage Aquitard

French Gulch Hydrology – QAL Pt, 1QalDD



AQTESOLV

GERAGHTY & MILLER, INC.

Modeling Group

Cooper + Jacob

Well1d.dat Alluvium

Alluv Obs 1 - DD

SE2000
Environmental Logger
11/08 09:52

Unit# 530 Test 0

INPUT 2: Level (F) TOC

Reference	0.000
PSI at Ref.	15.129
SG	1.000
Linearity	0.000
Scale factor	20.037
Offset	0.039
Delay mSEC	50.000

Step 0 11/01 16:03:20

Elapsed Time	INPUT 2
0.0000	-0.088
0.0083	-0.088
0.0166	-0.088
0.0250	-0.088
0.0333	-0.088
0.0416	-0.088
0.0500	-0.088
0.0583	-0.088
0.0666	-0.088
0.0750	-0.082
0.0833	-0.088
0.0916	-0.088
0.1000	-0.082
0.1083	-0.082
0.1166	-0.082
0.1250	-0.082
0.1333	-0.088
0.1416	-0.082
0.1500	-0.082
0.1583	-0.082
0.1666	-0.082
0.1750	-0.082
0.1833	-0.082
0.1916	-0.082
0.2000	-0.082
0.2083	-0.075
0.2166	-0.075
0.2250	-0.075
0.2333	-0.075
0.2416	-0.075
0.2500	-0.075
0.2583	-0.075
0.2666	-0.075
0.2750	-0.069
0.2833	-0.069
0.2916	-0.069
0.3000	-0.069
0.3083	-0.069
0.3166	-0.069

0.3250	-0.063
0.3333	-0.069
0.3500	-0.063
0.3666	-0.063
0.3833	-0.063
0.4000	-0.056
0.4166	-0.056
0.4333	-0.056
0.4500	-0.056
0.4666	-0.056
0.4833	-0.050
0.5000	-0.050
0.5166	-0.044
0.5333	-0.044
0.5500	-0.044
0.5666	-0.037
0.5833	-0.037
0.6000	-0.031
0.6166	-0.031
0.6333	-0.031
0.6500	-0.031
0.6666	-0.031
0.6833	-0.025
0.7000	-0.025
0.7166	-0.025
0.7333	-0.018
0.7500	-0.018
0.7666	-0.012
0.7833	-0.012
0.8000	-0.012
0.8166	-0.006
0.8333	-0.006
0.8500	-0.006
0.8666	-0.006
0.8833	0.000
0.9000	0.000
0.9166	0.006
0.9333	0.006
0.9500	0.006
0.9666	0.006
0.9833	0.012
1.0000	0.012
1.2000	0.031
1.4000	0.056
1.6000	0.075
1.8000	0.094
2.0000	0.113
2.2000	0.132
2.4000	0.145
2.6000	0.164
2.8000	0.183
3.0000	0.196
3.2000	0.215
3.4000	0.227
3.6000	0.240
3.8000	0.253
4.0000	0.265
4.2000	0.278
4.4000	0.291
4.6000	0.303

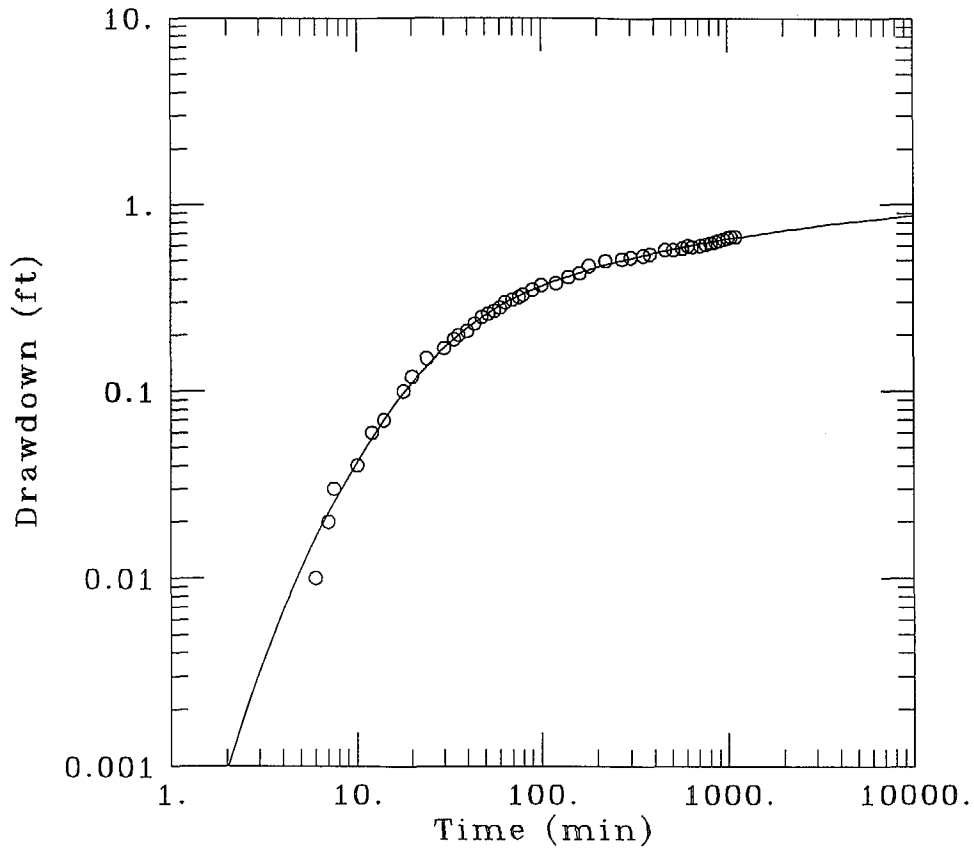
4.8000	0.310
5.0000	0.322
5.2000	0.329
5.4000	0.341
5.6000	0.354
5.8000	0.360
6.0000	0.373
6.2000	0.379
6.4000	0.392
6.6000	0.398
6.8000	0.411
7.0000	0.417
7.2000	0.430
7.4000	0.436
7.6000	0.442
7.8000	0.455
8.0000	0.461
8.2000	0.468
8.4000	0.474
8.6000	0.480
8.8000	0.493
9.0000	0.493
9.2000	0.506
9.4000	0.506
9.6000	0.518
9.8000	0.525
10.0000	0.531
12.0000	0.588
14.0000	0.645
16.0000	0.689
18.0000	0.733
20.0000	0.765
22.0000	0.797
24.0000	0.828
26.0000	0.860
28.0000	0.879
30.0000	0.904
32.0000	0.930
34.0000	0.955
36.0000	0.974
38.0000	0.993
40.0000	1.006
42.0000	1.025
44.0000	1.037
46.0000	1.056
48.0000	1.069
50.0000	1.088
52.0000	1.088
54.0000	1.107
56.0000	1.113
58.0000	1.126
60.0000	1.132
62.0000	1.151
64.0000	1.151
66.0000	1.164
68.0000	1.176
70.0000	1.189
72.0000	1.195
74.0000	1.195
76.0000	1.208

78.0000	1.214
80.0000	1.214
82.0000	1.227
84.0000	1.233
86.0000	1.240
88.0000	1.246
90.0000	1.252
92.0000	1.259
94.0000	1.265
96.0000	1.271
98.0000	1.278
100.000	1.284
110.000	1.309
120.000	1.328
130.000	1.354
140.000	1.373
150.000	1.385
160.000	1.404
170.000	1.410
180.000	1.417
190.000	1.436
200.000	1.448
210.000	1.455
220.000	1.461
230.000	1.474
240.000	1.480
250.000	1.486
260.000	1.493
270.000	1.505
280.000	1.512
290.000	1.505
300.000	1.518
310.000	1.518
320.000	1.518
330.000	1.524
340.000	1.531
350.000	1.537
360.000	1.543
370.000	1.550
380.000	1.556
390.000	1.556
400.000	1.556
410.000	1.556
420.000	1.556
430.000	1.562
440.000	1.569
450.000	1.569
460.000	1.569
470.000	1.575
480.000	1.569
490.000	1.569
500.000	1.581
510.000	1.575
520.000	1.581
530.000	1.581
540.000	1.581
550.000	1.588
560.000	1.588
570.000	1.594
580.000	1.594

590.000	1.600
600.000	1.600
610.000	1.607
620.000	1.607
630.000	1.607
640.000	1.600
650.000	1.607
660.000	1.607
670.000	1.607
680.000	1.613
690.000	1.613
700.000	1.613
710.000	1.613
720.000	1.613
730.000	1.619
740.000	1.619
750.000	1.619
760.000	1.626
770.000	1.626
780.000	1.626
790.000	1.626
800.000	1.632
810.000	1.632
820.000	1.632
830.000	1.638
840.000	1.638
850.000	1.645
860.000	1.645
870.000	1.645
880.000	1.651
890.000	1.651
900.000	1.657
910.000	1.657
920.000	1.670
930.000	1.664
940.000	1.657
950.000	1.664
960.000	1.657
970.000	1.664
980.000	1.670
990.000	1.670
1000.00	1.670
1010.00	1.676
1020.00	1.676
1030.00	1.676
1040.00	1.676
1050.00	1.676
1060.00	1.670
1070.00	1.676
1080.00	1.670
1090.00	1.676
1100.00	1.670
1110.00	1.676
1120.00	1.676

Research Project	Client: EPA/CMG/CDH
Project No.: 94-1	Location: Breckenridge, CO.

French Gulch Hydrology - QAL Pt, 5alDD



DATA SET:
5aoda.dat
11/10/94

AQUIFER TYPE:
Leaky

SOLUTION METHOD:
Moench

TEST DATE:
11/1/94

TEST WELL:
18

OBS. WELL:
5

ESTIMATED PARAMETERS:
T = 1.172 ft^2/min
S = 0.0008905
r/B= 0.0352
β = 0.01631
Sw = 0.
a = 1.1378E-05

TEST DATA:
Q = 2.005 ft^3/min
r = 118. ft
rc = 0.1667 ft
rw = 0.25 ft

WELL 5DA.DAT

DD ALL. OBS. WELL - ALL. PUMP TST

SE1000B
Environmental Logger
11/08 11:19

Unit# 00525 Test# 1

INPUT 2: Level (F) TOC

Reference 0.00
Scale factor 19.88
Offset - 0.17

Step# 0 11/01 16:01

Elapsed Time	Value
0.0000	-0.00
0.0033	-0.00
0.0066	-0.00
0.0099	-0.00
0.0133	-0.00
0.0166	-0.00
0.0200	-0.00
0.0233	-0.00
0.0266	-0.00
0.0300	0.00
0.0333	0.00
0.0500	-0.00
0.0666	-0.00
0.0833	-0.00
0.1000	-0.00
0.1166	-0.00
0.1333	-0.00
0.1500	0.00
0.1666	-0.00
0.1833	-0.00
0.2000	-0.00
0.2166	-0.00
0.2333	-0.00
0.2500	-0.00
0.2666	-0.00
0.2833	-0.00
0.3000	0.00
0.3166	0.00
0.3333	0.00
0.4167	-0.00
0.5000	-0.00
0.5833	-0.00
0.6667	-0.00
0.7500	-0.00
0.8333	-0.00
0.9167	-0.00
1.0000	-0.00
1.0833	-0.00
1.1667	-0.00
1.2500	-0.00
1.3333	-0.00
1.4166	-0.00
1.5000	-0.00

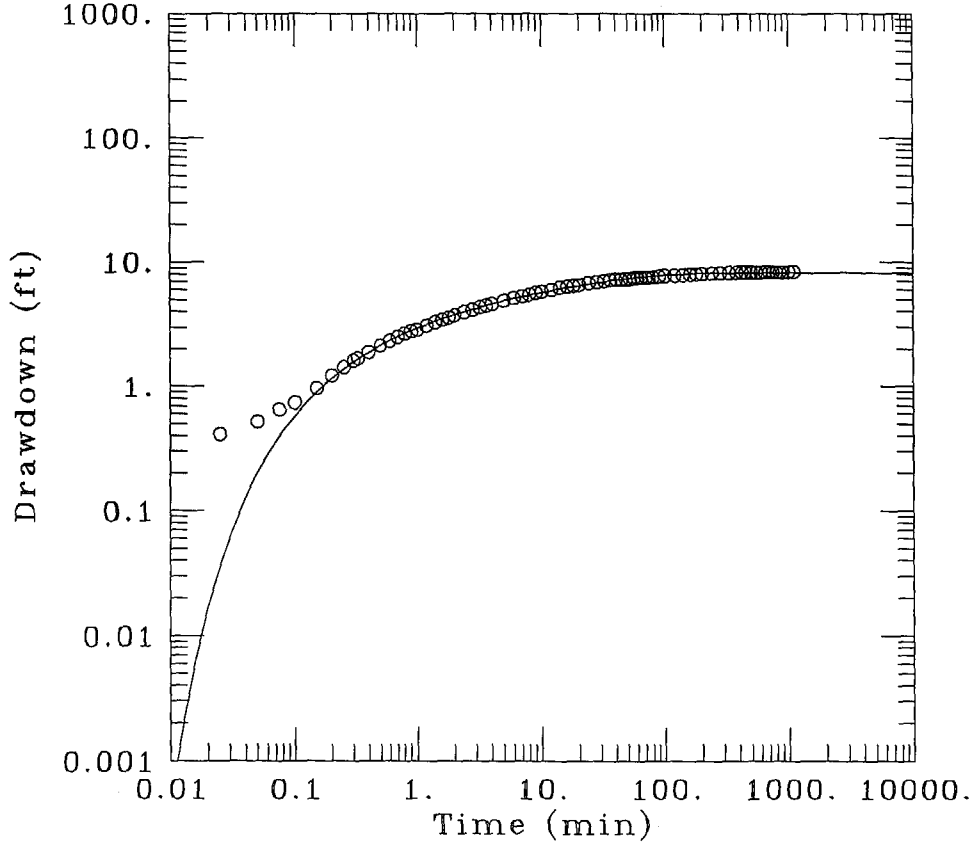
1.5833	-0.00
1.6667	-0.00
1.7500	-0.00
1.8333	-0.00
1.9167	-0.00
2.0000	-0.00
2.5000	0.00
3.0000	0.00
3.5000	0.00
4.0000	0.00
4.5000	0.00
5.0000	0.00
5.5000	0.00
6.0000	0.01
6.5000	0.01
7.0000	0.02
7.5000	0.03
8.0000	0.03
8.5000	0.03
9.0000	0.03
9.5000	0.03
10.0000	0.04
12.0000	0.06
14.0000	0.07
16.0000	0.09
18.0000	0.10
20.0000	0.12
22.0000	0.13
24.0000	0.15
26.0000	0.16
28.0000	0.16
30.0000	0.17
32.0000	0.18
34.0000	0.19
36.0000	0.20
38.0000	0.20
40.0000	0.21
42.0000	0.22
44.0000	0.23
46.0000	0.25
48.0000	0.25
50.0000	0.25
52.0000	0.26
54.0000	0.26
56.0000	0.27
58.0000	0.28
60.0000	0.28
62.0000	0.29
64.0000	0.30
66.0000	0.28
68.0000	0.30
70.0000	0.31
72.0000	0.31
74.0000	0.31
76.0000	0.32
78.0000	0.32
80.0000	0.33
82.0000	0.33
84.0000	0.33
86.0000	0.33

88.0000	0.34
90.0000	0.35
92.0000	0.35
94.0000	0.35
96.0000	0.34
98.0000	0.36
100.000	0.37
110.000	0.38
120.000	0.38
130.000	0.42
140.000	0.41
150.000	0.43
160.000	0.43
170.000	0.44
180.000	0.47
190.000	0.45
200.000	0.47
210.000	0.47
220.000	0.50
230.000	0.48
240.000	0.50
250.000	0.49
260.000	0.50
270.000	0.51
280.000	0.51
290.000	0.51
300.000	0.52
310.000	0.52
320.000	0.52
330.000	0.52
340.000	0.52
350.000	0.53
360.000	0.53
370.000	0.53
380.000	0.54
390.000	0.56
400.000	0.55
410.000	0.55
420.000	0.55
430.000	0.55
440.000	0.55
450.000	0.55
460.000	0.57
470.000	0.55
480.000	0.57
490.000	0.55
500.000	0.56
510.000	0.57
520.000	0.56
530.000	0.56
540.000	0.56
550.000	0.57
560.000	0.57
570.000	0.58
580.000	0.57
590.000	0.58
600.000	0.58
610.000	0.60
620.000	0.58
630.000	0.60

640.000	0.59
650.000	0.58
660.000	0.59
670.000	0.58
680.000	0.59
690.000	0.59
700.000	0.59
710.000	0.60
720.000	0.60
730.000	0.60
740.000	0.60
750.000	0.60
760.000	0.61
770.000	0.62
780.000	0.61
790.000	0.61
800.000	0.62
810.000	0.62
820.000	0.62
830.000	0.62
840.000	0.62
850.000	0.62
860.000	0.63
870.000	0.64
880.000	0.64
890.000	0.64
900.000	0.64
910.000	0.64
920.000	0.64
930.000	0.65
940.000	0.65
950.000	0.65
960.000	0.65
970.000	0.65
980.000	0.65
990.000	0.65
1000.00	0.66
1010.00	0.65
1020.00	0.66
1030.00	0.67
1040.00	0.67
1050.00	0.66
1060.00	0.67
1070.00	0.66
1080.00	0.66
1090.00	0.67
1100.00	0.67
1110.00	0.64
1120.00	0.67

Research Project	Client: EPA/CMG/CDH
Project No.: 94-1	Location: Breckenridge, CO.

French Gulch Hydrology - QAL Pt, 18qalDD



DATA SET:
18apda.dat
11/10/94

AQUIFER TYPE:
Leaky

SOLUTION METHOD:
Hantush

TEST DATE:
11/1/94

TEST WELL:
18

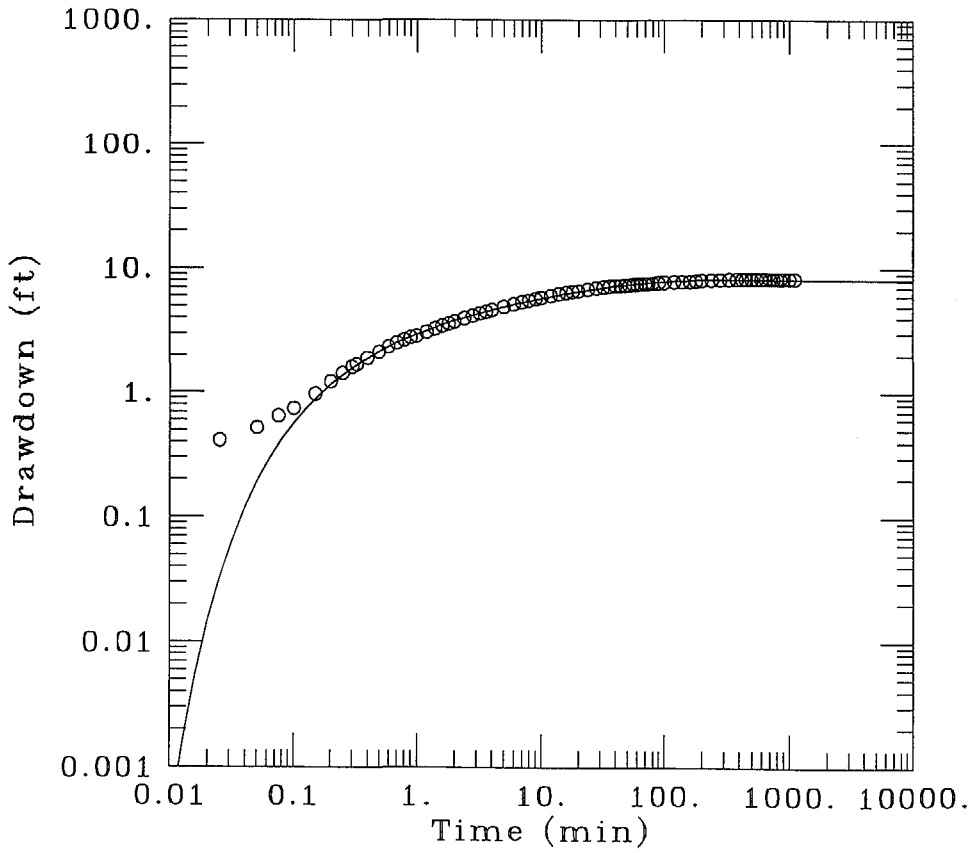
OBS. WELL:
18

ESTIMATED PARAMETERS:
T = 0.1252 ft^2/min
S = 0.334
r/B= 0.04533

TEST DATA:
Q = 2.005 ft^3/min
r = 0.3 ft
rc = 0.1667 ft
rw = 0.25 ft

Research Project	Client: EPA/CMG/CDH
Project No.: 94-1	Location: Breckenridge, CO.

French Gulch Hydrology - QAL Pt, 18qalDD



DATA SET:
18apda.dat
11/10/94

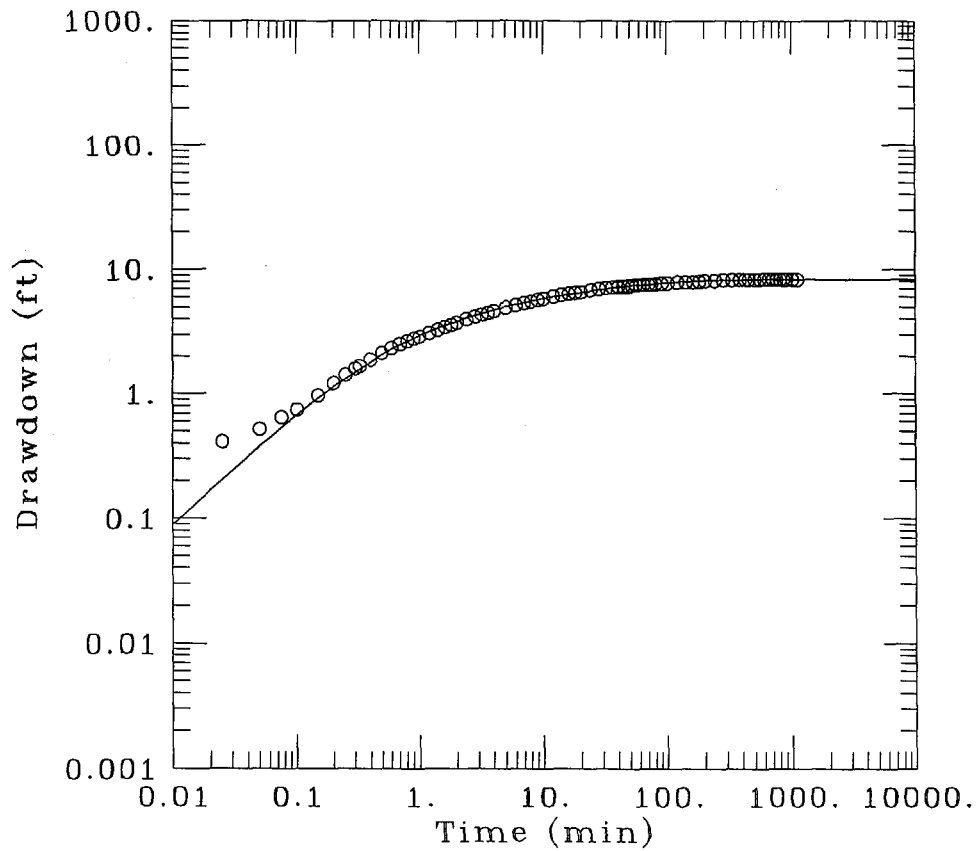
AQUIFER TYPE:
Leaky
SOLUTION METHOD:
Hantush
TEST DATE:
11/1/94
TEST WELL:
18
OBS. WELL:
18

ESTIMATED PARAMETERS:
T = 0.1672 ft^2/min
S = 0.4647
r/B= 0.04405

TEST DATA:
Q = 2.005 ft^3/min
r = 0.3 ft
rc = 0.1667 ft
rw = 0.25 ft
b = 27.4 ft
TEST WELL:
t.o.s. = 7. ft
b.o.s. = 27. ft
OBS. WELL:
t.o.s. = 7. ft
b.o.s. = 27. ft

Research Project	Client: EPA/CMG/CDH
Project No.: 94-1	Location: Breckenridge, CO.

French Gulch Hydrology - QAL Pt, 18qalDD



DATA SET:
18apda.dat
11/10/94

AQUIFER TYPE:
Leaky

SOLUTION METHOD:
Moench

TEST DATE:
11/1/94

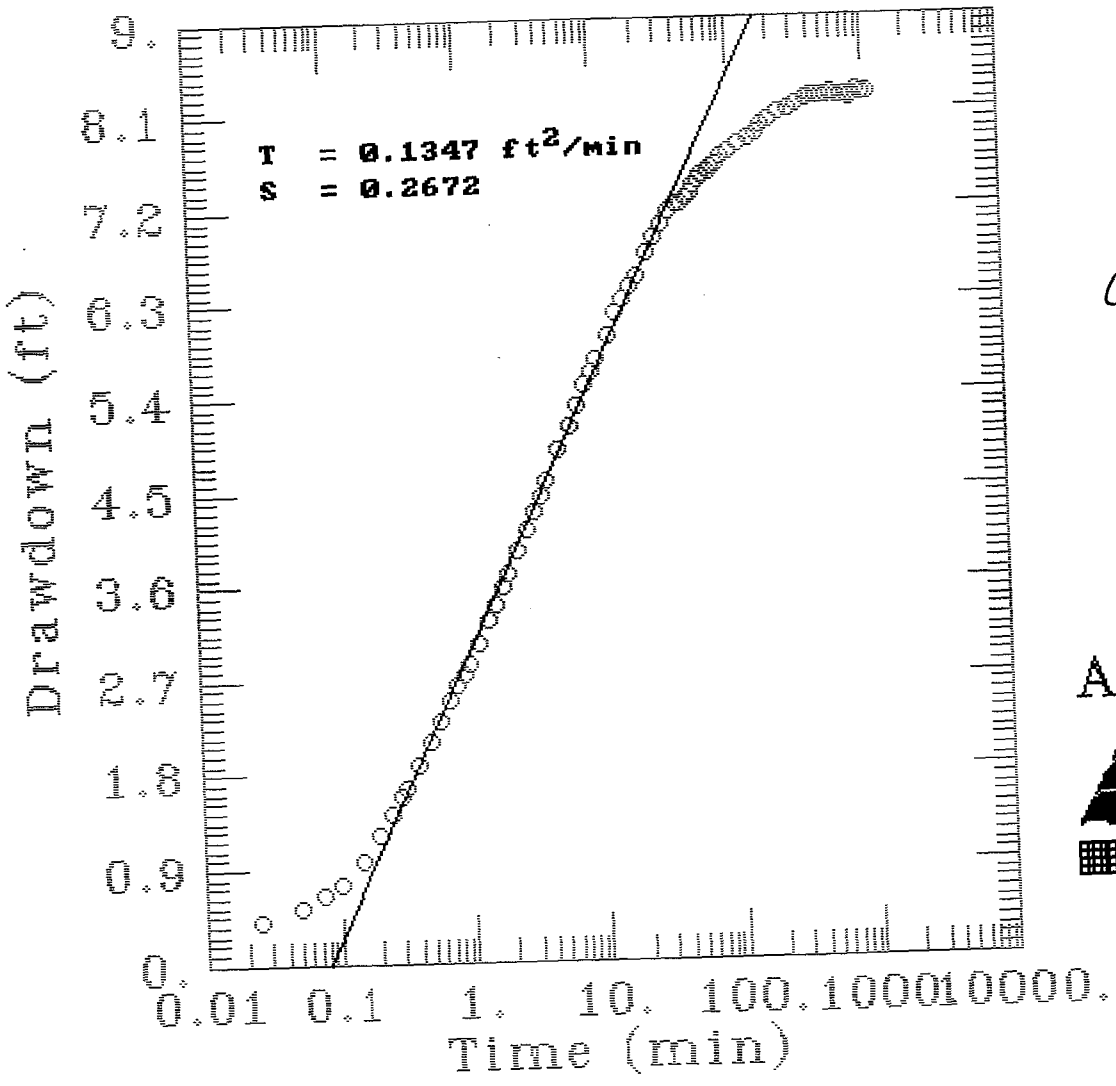
TEST WELL:
18

OBS. WELL:
18

ESTIMATED PARAMETERS:
T = 0.1482 ft^2/min
S = 0.2211
r/B= 0.02482
β = 0.001253
Sw = 0.
a = 0.2104

TEST DATA:
Q = 2.005 ft^3/min
r = 0.3 ft
rc = 0.1667 ft
rw = 0.25 ft

French Gulch Hydrology – QAL Pt, 18qalDD



Cooper + Jacob

AQTESOLV

GERAGHTY & MILLER, INC.

Modeling Group

Well18d.dat Alluvium
PW - DD

SE2000
Environmental Logger
11/08 09:40

Unit# 530 Test 0

INPUT 1: Level (F) TOC

Reference	0.000
PSI at Ref.	7.438
SG	1.000
Linearity	0.000
Scale factor	20.009
Offset	0.000
Delay mSEC	50.000

Step 0 11/01 16:03:20

Elapsed Time	INPUT 1
0.0000	0.303
0.0083	0.341
0.0166	0.341
0.0250	0.410
0.0333	0.417
0.0416	0.473
0.0500	0.518
0.0583	0.562
0.0666	0.600
0.0750	0.644
0.0833	0.676
0.0916	0.713
0.1000	0.739
0.1083	0.783
0.1166	0.815
0.1250	0.846
0.1333	0.884
0.1416	0.935
0.1500	0.966
0.1583	1.010
0.1666	1.042
0.1750	1.086
0.1833	1.130
0.1916	1.168
0.2000	1.213
0.2083	1.244
0.2166	1.276
0.2250	1.314
0.2333	1.345
0.2416	1.383
0.2500	1.415
0.2583	1.434
0.2666	1.478
0.2750	1.497
0.2833	1.529
0.2916	1.560
0.3000	1.592
0.3083	1.617
0.3166	1.636

0.3250	1.668
0.3333	1.686
0.3500	1.743
0.3666	1.788
0.3833	1.832
0.4000	1.882
0.4166	1.920
0.4333	1.952
0.4500	1.996
0.4666	2.034
0.4833	2.072
0.5000	2.110
0.5166	2.148
0.5333	2.186
0.5500	2.211
0.5666	2.249
0.5833	2.280
0.6000	2.312
0.6166	2.337
0.6333	2.375
0.6500	2.400
0.6666	2.426
0.6833	2.451
0.7000	2.489
0.7166	2.508
0.7333	2.533
0.7500	2.558
0.7666	2.590
0.7833	2.609
0.8000	2.634
0.8166	2.659
0.8333	2.685
0.8500	2.704
0.8666	2.723
0.8833	2.742
0.9000	2.754
0.9166	2.767
0.9333	2.786
0.9500	2.798
0.9666	2.817
0.9833	2.830
1.0000	2.849
1.2000	3.051
1.4000	3.253
1.6000	3.418
1.8000	3.569
2.0000	3.702
2.2000	3.822
2.4000	3.936
2.6000	4.037
2.8000	4.125
3.0000	4.214
3.2000	4.296
3.4000	4.384
3.6000	4.448
3.8000	4.523
4.0000	4.593
4.2000	4.650
4.4000	4.713

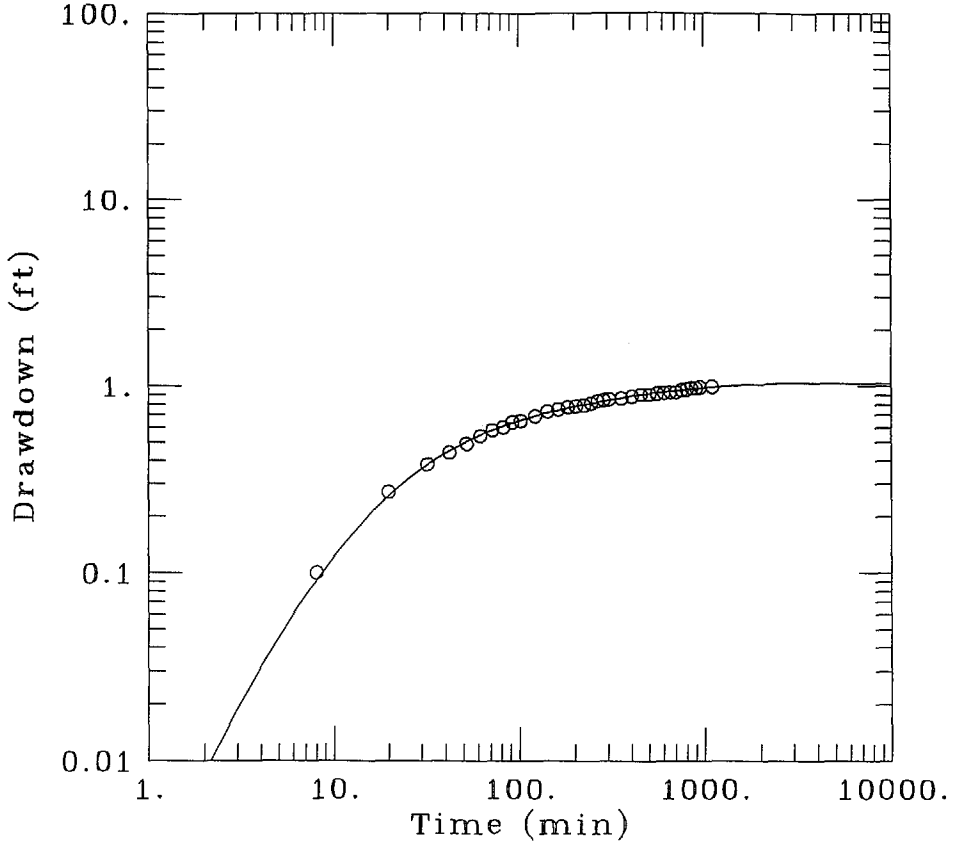
4.8000	4.820
5.0000	4.877
5.2000	4.928
5.4000	4.978
5.6000	5.023
5.8000	5.060
6.0000	5.105
6.2000	5.149
6.4000	5.193
6.6000	5.225
6.8000	5.263
7.0000	5.301
7.2000	5.338
7.4000	5.376
7.6000	5.414
7.8000	5.446
8.0000	5.490
8.2000	5.515
8.4000	5.541
8.6000	5.579
8.8000	5.610
9.0000	5.635
9.2000	5.654
9.4000	5.680
9.6000	5.705
9.8000	5.730
10.0000	5.755
12.0000	5.970
14.0000	6.179
16.0000	6.311
18.0000	6.425
20.0000	6.539
22.0000	6.646
24.0000	6.747
26.0000	6.842
28.0000	6.912
30.0000	6.975
32.0000	7.032
34.0000	7.089
36.0000	7.139
38.0000	7.177
40.0000	7.221
42.0000	7.221
44.0000	7.234
46.0000	7.253
48.0000	7.278
50.0000	7.297
52.0000	7.329
54.0000	7.379
56.0000	7.404
58.0000	7.423
60.0000	7.436
62.0000	7.468
64.0000	7.487
66.0000	7.480
68.0000	7.518
70.0000	7.525
72.0000	7.537
74.0000	7.556
76.0000	7.569

78.0000	7.575
80.0000	7.600
82.0000	7.613
84.0000	7.632
86.0000	7.638
88.0000	7.657
90.0000	7.670
92.0000	7.682
94.0000	7.676
96.0000	7.695
98.0000	7.708
100.000	7.720
110.000	7.758
120.000	7.796
130.000	7.821
140.000	7.834
150.000	7.878
160.000	7.878
170.000	7.929
180.000	7.954
190.000	7.973
200.000	8.011
210.000	8.024
220.000	8.043
230.000	8.049
240.000	8.081
250.000	8.087
260.000	8.106
270.000	8.106
280.000	8.106
290.000	8.093
300.000	8.093
310.000	8.106
320.000	8.099
330.000	8.150
340.000	8.163
350.000	8.182
360.000	8.188
370.000	8.213
380.000	8.201
390.000	8.213
400.000	8.201
410.000	8.213
420.000	8.220
430.000	8.213
440.000	8.220
450.000	8.232
460.000	8.226
470.000	8.232
480.000	8.232
490.000	8.220
500.000	8.232
510.000	8.220
520.000	8.220
530.000	8.226
540.000	8.232
550.000	8.238
560.000	8.226
570.000	8.245
580.000	8.251

590.000	8.245
600.000	8.251
610.000	8.264
620.000	8.257
630.000	8.270
640.000	8.257
650.000	8.220
660.000	8.264
670.000	8.238
680.000	8.238
690.000	8.226
700.000	8.226
710.000	8.213
720.000	8.213
730.000	8.226
740.000	8.226
750.000	8.232
760.000	8.232
770.000	8.238
780.000	8.232
790.000	8.226
800.000	8.207
810.000	8.213
820.000	8.232
830.000	8.232
840.000	8.226
850.000	8.232
860.000	8.213
870.000	8.238
880.000	8.220
890.000	8.270
900.000	8.270
910.000	8.257
920.000	8.264
930.000	8.226
940.000	8.213
950.000	8.201
960.000	8.226
970.000	8.251
980.000	8.251
990.000	8.251
1000.00	8.264
1010.00	8.264
1020.00	8.257
1030.00	8.257
1040.00	8.251
1050.00	8.257
1060.00	8.270
1070.00	8.257
1080.00	8.245
1090.00	8.220
1100.00	8.245
1110.00	8.226
1120.00	8.245

Research Project	Client: EPA/CMG/CDH
Project No.: 94-1	Location: Breckenridge, CO.

French Gulch Hydrology - QAL Pt, 16shDD



DATA SET:
16soda.dat
11/10/94

AQUIFER TYPE:
Leaky

SOLUTION METHOD:
Moench

TEST DATE:
11/1/94

TEST WELL:
18

OBS. WELL:
16

ESTIMATED PARAMETERS:
T = 0.9283 ft^2/min
S = 0.001317
r/B= 0.05565
β = 0.004284
Sw = 0.
a = 2.0524E-05

TEST DATA:
Q = 2.005 ft^3/min
r = 51. ft
rc = 0.1667 ft
rw = 0.25 ft

16QMoenc.pgl

16 SOD A.DAT

PUMP-TEST ALLUVIUM

4:04 pm START

DD

TIME (mins)	Δs (ft.)
0	0
8	0.10
20	0.27
32	0.38
42	0.44
52	0.49
62	0.54
72	0.58
82	0.60
92	0.64
102	0.65
122	0.69
142	0.73
162	0.75
182	0.77
202	0.78
223	0.79
243	0.81
263	0.83
283	0.84
303	0.85
353	0.86
403	0.88
453	0.90
503	0.90
553	0.91

SH OW #16

SWL 12.12

Time	Δs
603	0.92
653	0.93
703	0.93
753	0.95
803	0.96
853	0.98
903	0.98
953	0.99
1003	1.00
1103	0.99

Recovery

16 SORA.DAT

0	0.99
10	0.86
20	0.66
30	0.57
40	0.51
50	0.46
60	0.40
70	0.35
80	0.33
90	0.30
100	0.28
120	0.24
140	0.21
160	0.18
180	0.16
190	0.15

(cont back)

NATIONAL 42-182 100 SHEETS Made in U.S.A.

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

PUMP – ALLUVIUM

Observation Well No.:	Project Name:	Project Number:
#16 SHALE		

Date:	Recorded By:	Unit of Measurement:
Nov 15T		

Distance to pumping well:	Bearing to pumping well:	Page	of

4:04 start

Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
4:12 pm	12.22'				
4:24 pm	12.39				
4:36 pm	12.50				
4:46 pm	12.56				
4:56 pm	12.61				
10 MINS 5:06 pm	12.66				
5:16	12.70				
5:26	12.72				
5:36	12.76				
5:46	12.79				
6:06 pm	12.81				
6:26 pm	12.85				
6:46 pm	12.87				
7:06 pm	12.89				
20 MINS 7:26 pm	12.90				
7:47 pm	12.91				
8:07 pm	12.93				WIND PICKING UP –
8:27 pm	12.95				
8:47 pm	12.96				4206 GALLONS PUMPED
9:07	12.97				4534 " "
9:57 pm	12.98				5321 GALS
10:47 pm	13.00				6080
11:37 pm	13.02				6843
50 MINS (16 HOURS) 12:27 AM	13.02				7603

Additional Comments:

1:17 MANUAL BACKUP ON SCREWY XDUCER READINGS.
Static prior to test 12.12'

57
50
07

Distance to pumping well: | ~~Bearing to pumping well:~~ RECOVERY TEST | Page 2 of | #16 WELL

Time	Water Depth from casing	~~Water Depth from surface~~ TIME	Water Elevation RECOVERY TEST	Measuring Instrument	Notes
1:17 AM	13.03	10:55 AM	12.98		8,350 GALS
2:07	13.04	11:05 AM	12.78		9,088
2:57 AM	13:05	11:15 AM	12.69		
3:47 AM	13.05	11:25 AM	12.63		
4:37 AM	13.07	11:35	12.58		
5:27 AM	13.08	11:45	12.52		
6:17 AM	13.10	11:55	12.47		
7:07 AM	13.10	12:05 PM	12.45		
7:57 AM	13.11	12:15	12.42		
8:47 AM	13.12	12:25	12.40		
10:27	13.11	12:45	12.36	40 20 MINS	17,000 GALS
10 MINS		1:05	12.33		
		1:25	12.30		
		1:45	12.28		
SHUTOFF PUMP @ 10:45:30		2:05	12.27		
		2:55	12.24		
		3:45	12.23		50 MINS
		4:35	12.22		
		5:25			
		7:07 AM	12.15		

Additional Comments:

ALLUVIAL PUMP TEST. PUMP ALL (cont.)
MANUAL BACK UP OF SCREWY WELL #16
TRANSDUCER.

10:45 → 100'S
16
10:45

9:47
40
10:27

10:45
11:45
40

11:45
12:45
40
12:25

10:45
11:45

.18
.169
83°
1.06

well 16d. dat Alluvium Test.

SH obs 16 - DD

SE2000
Environmental Logger
11/08 09:59

Unit# 530 Test 0

INPUT 3: Level (F) TOC

Reference	0.000
PSI at Ref.	10.580
SG	1.000
Linearity	0.050
Scale factor	9.837
Offset	0.088
Delay mSEC	50.000

Step 0 11/01 16:03:20

Elapsed Time	INPUT 3
0.0000	2.143
0.0083	2.450
0.0166	2.889
0.0250	3.068
0.0333	3.297
0.0416	3.397
0.0500	3.184
0.0583	3.253
0.0666	8.596
0.0750	3.410
0.0833	4.895
0.0916	3.369
0.1000	3.222
0.1083	2.949
0.1166	2.980
0.1250	3.137
0.1333	3.225
0.1416	3.363
0.1500	3.523
0.1583	3.651
0.1666	3.808
0.1750	3.849
0.1833	4.052
0.1916	4.125
0.2000	4.244
0.2083	4.432
0.2166	4.551
0.2250	4.754
0.2333	4.864
0.2416	4.964
0.2500	5.180
0.2583	5.252
0.2666	5.387
0.2750	5.566
0.2833	5.666
0.2916	5.869
0.3000	5.942
0.3083	6.101
0.3166	6.261

0.3250	6.352
0.3333	6.571
0.3500	5.024
0.3666	4.864
0.3833	4.942
0.4000	5.124
0.4166	5.190
0.4333	5.284
0.4500	5.478
0.4666	5.613
0.4833	5.685
0.5000	5.754
0.5166	5.895
0.5333	6.010
0.5500	6.023
0.5666	6.145
0.5833	6.317
0.6000	6.305
0.6166	6.339
0.6333	6.424
0.6500	6.521
0.6666	6.524
0.6833	6.612
0.7000	6.737
0.7166	6.799
0.7333	6.496
0.7500	6.590
0.7666	6.906
0.7833	6.990
0.8000	6.987
0.8166	6.997
0.8333	7.122
0.8500	7.184
0.8666	7.219
0.8833	7.213
0.9000	7.300
0.9166	7.382
0.9333	7.347
0.9500	7.400
0.9666	7.485
0.9833	7.450
1.0000	7.510
1.2000	2.529
1.4000	2.143
1.6000	2.971
1.8000	4.626
2.0000	3.877
2.2000	4.027
2.4000	3.767
2.6000	3.999
2.8000	3.789
3.0000	3.523
3.2000	3.087
3.4000	3.159
3.6000	3.027
3.8000	2.871
4.0000	2.999
4.2000	3.820
4.4000	3.388
4.6000	4.485

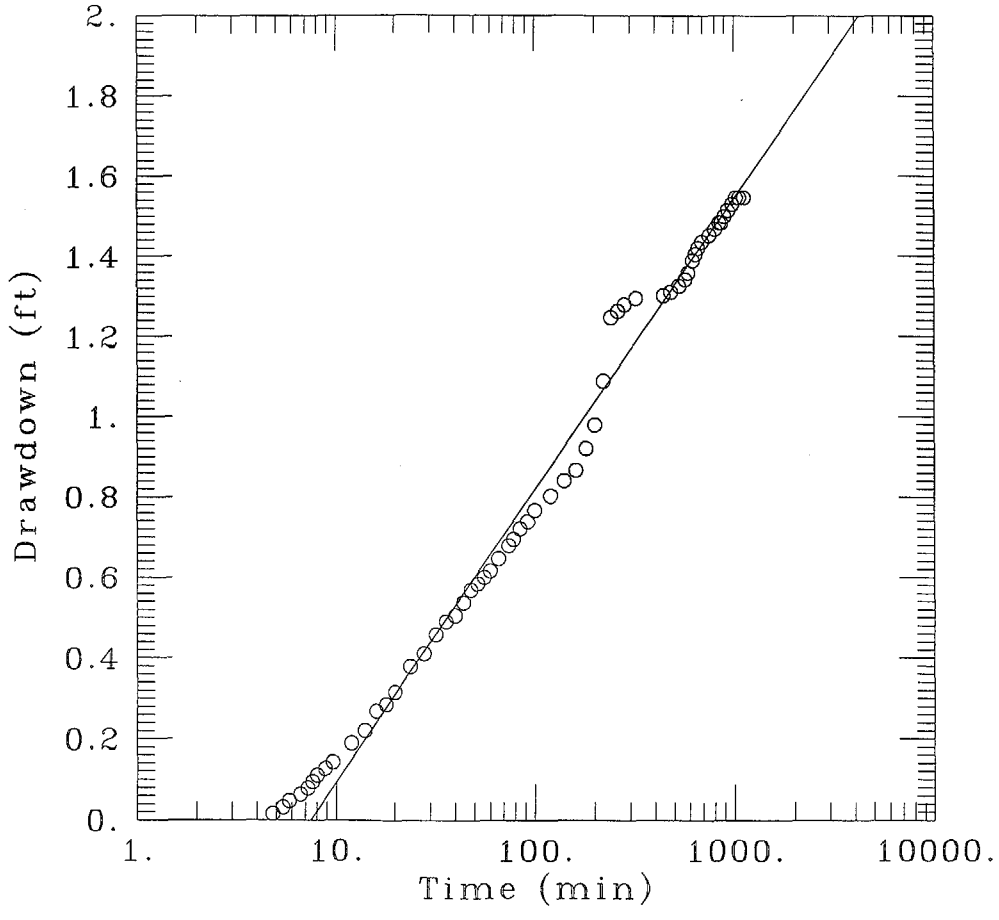
4.8000	5.418
5.0000	5.719
5.2000	5.932
5.4000	5.857
5.6000	6.145
5.8000	6.705
6.0000	6.223
6.2000	6.596
6.4000	7.103
6.6000	7.269
6.8000	6.934
7.0000	6.809
7.2000	6.687
7.4000	6.555
7.6000	6.380
7.8000	6.311
8.0000	6.255
8.2000	6.151
8.4000	6.029
8.6000	6.061
8.8000	6.079
9.0000	5.973
9.2000	5.801
9.4000	5.866
9.6000	5.826
9.8000	5.942
10.0000	5.725
12.0000	4.018
14.0000	3.482
16.0000	2.783
18.0000	2.573
20.0000	2.526
22.0000	2.049
24.0000	1.732
26.0000	1.986
28.0000	2.300
30.0000	2.165
32.0000	1.986
34.0000	1.387
36.0000	1.255
38.0000	1.412
40.0000	1.472
42.0000	1.343
44.0000	0.935
46.0000	0.794
48.0000	0.000
50.0000	0.000
52.0000	3.604
54.0000	4.494
56.0000	6.396
58.0000	6.399
60.0000	7.957
62.0000	6.812
64.0000	7.407
66.0000	8.549
68.0000	8.583
70.0000	7.954
72.0000	7.429
74.0000	6.533
76.0000	6.104

78.0000	1.415
80.0000	0.354
82.0000	0.678
84.0000	1.346
86.0000	1.826
88.0000	1.472
90.0000	0.000
92.0000	0.266
94.0000	3.893
96.0000	2.159
98.0000	2.262
100.000	1.704
110.000	3.767
120.000	25.488
130.000	25.519
140.000	25.522
150.000	25.513
160.000	25.516
170.000	16.015
180.000	10.050
190.000	4.845
200.000	4.610
210.000	2.337
220.000	0.000
230.000	0.000
240.000	0.000
250.000	0.000
260.000	0.000
270.000	0.000
280.000	0.000
290.000	0.000
300.000	0.000
310.000	0.000
320.000	0.000
330.000	0.000
340.000	0.000
350.000	0.000
360.000	0.000
370.000	0.000
380.000	0.000
390.000	0.000
400.000	0.000
410.000	0.000
420.000	0.000
430.000	0.000
440.000	0.000
450.000	0.000
460.000	0.000
470.000	0.000
480.000	0.000
490.000	0.000
500.000	0.000
510.000	0.000
520.000	0.000
530.000	0.000
540.000	0.000
550.000	0.000
560.000	0.000
570.000	0.000
580.000	0.000

590.000	0.000
600.000	0.000
610.000	0.000
620.000	0.000
630.000	0.000
640.000	0.000
650.000	0.000
660.000	0.000
670.000	0.000
680.000	0.000
690.000	0.000
700.000	0.000
710.000	0.000
720.000	0.000
730.000	0.000
740.000	0.000
750.000	0.000
760.000	0.000
770.000	0.000
780.000	0.000
790.000	0.000
800.000	0.000
810.000	0.000
820.000	0.000
830.000	0.000
840.000	0.000
850.000	0.000
860.000	0.000
870.000	0.000
880.000	0.000
890.000	0.000
900.000	0.000
910.000	0.000
920.000	0.000
930.000	0.000
940.000	0.000
950.000	0.000
960.000	0.000
970.000	0.000
980.000	0.000
990.000	0.000
1000.00	0.000
1010.00	0.000
1020.00	0.000
1030.00	0.000
1040.00	0.000
1050.00	0.000
1060.00	0.000
1070.00	0.000
1080.00	0.000
1090.00	0.000
1100.00	0.000
1110.00	0.000
1120.00	0.000

Research Project	Client: EPA/CMG/CDH
Project No.: 94-1	Location: Breckenridge, CO.

French Gulch Hydrology - QAL Pt, 17shDD



DATA SET:
17shoda.dat
11/18/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper-Jacob

TEST DATE:
11/1/94

TEST WELL:
18

OBS. WELL:
17

ESTIMATED PARAMETERS:
T = 0.5059 ft^2/min
S = 0.006753

TEST DATA:
Q = 2.005 ft^3/min
r = 35.5 ft
rc = 0.1667 ft
rw = 0.25 ft

17SCJAL.pgl

well 17d.dat Alluvium Test

St obs 17 — DD

SE2000
Environmental Logger
11/08 10:04

Unit# 530 Test 0

INPUT 4: Level (F) TOC

Reference	0.000
PSI at Ref.	27.484
SG	1.000
Linearity	0.000
Scale factor	49.971
Offset	-0.163
Delay mSEC	50.000

Step 0 11/01 16:03:20

Elapsed Time	INPUT 4
0.0000	-0.094
0.0083	-0.094
0.0166	-0.094
0.0250	-0.094
0.0333	-0.094
0.0416	-0.094
0.0500	-0.094
0.0583	-0.094
0.0666	-0.094
0.0750	-0.078
0.0833	-0.094
0.0916	-0.094
0.1000	-0.094
0.1083	-0.078
0.1166	-0.094
0.1250	-0.094
0.1333	-0.094
0.1416	-0.094
0.1500	-0.094
0.1583	-0.094
0.1666	-0.094
0.1750	-0.094
0.1833	-0.094
0.1916	-0.078
0.2000	-0.094
0.2083	-0.094
0.2166	-0.094
0.2250	-0.094
0.2333	-0.078
0.2416	-0.094
0.2500	-0.094
0.2583	-0.094
0.2666	-0.094
0.2750	-0.078
0.2833	-0.094
0.2916	-0.094
0.3000	-0.078
0.3083	-0.094
0.3166	-0.078

0.3250	-0.094
0.3333	-0.078
0.3500	-0.094
0.3666	-0.078
0.3833	-0.078
0.4000	-0.094
0.4166	-0.094
0.4333	-0.094
0.4500	-0.078
0.4666	-0.094
0.4833	-0.094
0.5000	-0.078
0.5166	-0.078
0.5333	-0.094
0.5500	-0.094
0.5666	-0.078
0.5833	-0.094
0.6000	-0.094
0.6166	-0.094
0.6333	-0.094
0.6500	-0.078
0.6666	-0.078
0.6833	-0.094
0.7000	-0.078
0.7166	-0.078
0.7333	-0.094
0.7500	-0.094
0.7666	-0.078
0.7833	-0.094
0.8000	-0.078
0.8166	-0.094
0.8333	-0.078
0.8500	-0.094
0.8666	-0.094
0.8833	-0.078
0.9000	-0.078
0.9166	-0.078
0.9333	-0.078
0.9500	-0.078
0.9666	-0.078
0.9833	-0.078
1.0000	-0.078
1.2000	-0.078
1.4000	-0.078
1.6000	-0.078
1.8000	-0.031
2.0000	-0.063
2.2000	-0.063
2.4000	-0.063
2.6000	-0.047
2.8000	-0.047
3.0000	-0.047
3.2000	-0.031
3.4000	-0.031
3.6000	-0.015
3.8000	-0.015
4.0000	-0.015
4.2000	0.000
4.4000	0.000
4.6000	0.000

4.8000	0.015
5.0000	0.015
5.2000	0.015
5.4000	0.031
5.6000	0.031
5.8000	0.047
6.0000	0.047
6.2000	0.110
6.4000	0.078
6.6000	0.063
6.8000	0.063
7.0000	0.078
7.2000	0.078
7.4000	0.078
7.6000	0.094
7.8000	0.094
8.0000	0.110
8.2000	0.110
8.4000	0.110
8.6000	0.110
8.8000	0.126
9.0000	0.126
9.2000	0.126
9.4000	0.126
9.6000	0.142
9.8000	0.189
10.0000	0.142
12.0000	0.189
14.0000	0.220
16.0000	0.268
18.0000	0.284
20.0000	0.315
22.0000	0.347
24.0000	0.378
26.0000	0.394
28.0000	0.410
30.0000	0.441
32.0000	0.457
34.0000	0.473
36.0000	0.489
38.0000	0.504
40.0000	0.504
42.0000	0.520
44.0000	0.536
46.0000	0.552
48.0000	0.568
50.0000	0.599
52.0000	0.583
54.0000	0.583
56.0000	0.599
58.0000	0.599
60.0000	0.615
62.0000	0.631
64.0000	0.631
66.0000	0.646
68.0000	0.662
70.0000	0.662
72.0000	0.662
74.0000	0.678
76.0000	0.662

78.0000	0.694
80.0000	0.694
82.0000	0.694
84.0000	0.710
86.0000	0.710
88.0000	0.710
90.0000	0.757
92.0000	0.725
94.0000	0.725
96.0000	0.725
98.0000	0.741
100.000	0.757
110.000	0.773
120.000	0.788
130.000	0.820
140.000	0.820
150.000	0.836
160.000	0.852
170.000	0.867
180.000	0.883
190.000	0.883
200.000	0.899
210.000	0.899
220.000	1.088
230.000	1.230
240.000	1.246
250.000	1.262
260.000	1.262
270.000	1.278
280.000	1.293
290.000	1.293
300.000	1.293
310.000	1.278
320.000	1.309
330.000	1.230
340.000	1.230
350.000	1.246
360.000	1.246
370.000	1.262
380.000	1.262
390.000	1.278
400.000	1.262
410.000	1.262
420.000	1.262
430.000	1.278
440.000	1.293
450.000	1.293
460.000	1.293
470.000	1.293
480.000	1.309
490.000	1.309
500.000	1.309
510.000	1.309
520.000	1.309
530.000	1.325
540.000	1.325
550.000	1.325
560.000	1.325
570.000	1.341
580.000	1.341

590.000	1.357
600.000	1.357
610.000	1.372
620.000	1.388
630.000	1.420
640.000	1.404
650.000	1.404
660.000	1.420
670.000	1.420
680.000	1.420
690.000	1.435
700.000	1.420
710.000	1.435
720.000	1.420
730.000	1.435
740.000	1.435
750.000	1.451
760.000	1.451
770.000	1.451
780.000	1.451
790.000	1.451
800.000	1.467
810.000	1.467
820.000	1.467
830.000	1.467
840.000	1.483
850.000	1.483
860.000	1.483
870.000	1.483
880.000	1.483
890.000	1.499
900.000	1.499
910.000	1.499
920.000	1.499
930.000	1.514
940.000	1.514
950.000	1.514
960.000	1.514
970.000	1.514
980.000	1.530
990.000	1.514
1000.00	1.530
1010.00	1.530
1020.00	1.546
1030.00	1.546
1040.00	1.546
1050.00	1.530
1060.00	1.546
1070.00	1.546
1080.00	1.546
1090.00	1.546
1100.00	1.546
1110.00	1.530
1120.00	1.546

PUMP TEST - ALL
MINE SHAFT OW #3

4:04 pm START SWL 12.06

TIME (mins)	Δs (ft)		
0	0	554	0.93
11	0.22	604	0.94
22	0.35	654	0.95
34	0.45	704	0.96
44	0.51	754	0.97
54	0.55	804	0.98
64	0.595	854	0.99
74	0.64	904	1.00
84	0.66	954	1.00
94	0.67	1004	1.01
104	0.71	1104	1.01
124	0.74		
144	0.76		
164	0.79		
184	0.81		
204	0.81		
224	0.84		
244	0.86		
264	—		
284	0.88		
304	0.88		
354	0.90		
404	0.91		
454	0.92		
504	0.93		

NATIONAL 42-182 100 SHEETS Made in U.S.A.

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

PUMP TEST - ALLUVIUM

Observation Well No.: #3 MINE SHAFT	Project Name: FRENCH GULCH	Project Number:
Date: 11/1 to 11/2/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 1 of 2

Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
4:15 pm	12.28				1
4:26 pm	12.41				2
4:38 pm	12.51				3
4:48 pm	12.57				4
4:58 pm	12.61				5
5:08 pm	12.655				6
5:18 pm	12.70				7
5:28 pm	12.72				8
5:38 pm	12.73				9
5:48 pm	12.77				10
6:08 pm	12.80				11
6:28 pm	12.82				12
6:48 pm	12.85				13
7:08 pm	12.87				14
7:28 pm	12.87				15
7:48 pm	12.90				16
8:08	12.92				17
8:28	(MISSED) →		ESTIMATE		18
8:48 pm	12.94				19
9:08	12.94				20
9:58	12.96				21
10:48	12.97				22
11:38	12.98				23
12:28 AM	12.99				24

50 ↓

Additional Comments:

1:18

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

Pump Test - ALLUVIUM

Observation Well No.: #3 Mine Shaft	Project Name: FRENCH GULCH	Project Number:
Date: 11/1 - 11/2/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 2 of 2

Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
1:18AM	12.99				24
2:08AM	13.00				25
2:58AM	13.01				26
3:48AM	13.02				27
4:38 AM	13.03				28
5:28 AM	13.04				29
6:18 AM	13.05				30
7:08 AM	13.06				31
7:58 AM	13.06				32
8:47 AM	13.07				33
10:28	13.07				34
					35
					36

100MW

Additional Comments:

WELL 4DA.dat
(sh screen pickled off)

DD ALL OBS. WELL - ALL PUMP TST

SE1000B
Environmental Logger
11/08 11:12

Unit# 00525 Test# 1

INPUT 1: Level (F) TOC

Reference	0.00
Scale factor	49.96
Offset	- 0.18

Step# 0 11/01 16:01

Elapsed Time	Value
0.0000	0.07
0.0033	0.07
0.0066	0.06
0.0099	0.04
0.0133	0.03
0.0166	0.01
0.0200	0.01
0.0233	0.01
0.0266	0.03
0.0300	0.04
0.0333	0.04
0.0500	0.06
0.0666	0.03
0.0833	0.03
0.1000	0.06
0.1166	0.06
0.1333	0.03
0.1500	0.06
0.1666	0.06
0.1833	0.01
0.2000	0.04
0.2166	0.06
0.2333	0.04
0.2500	0.03
0.2666	0.01
0.2833	0.01
0.3000	0.03
0.3166	0.04
0.3333	0.03
0.4167	0.06
0.5000	0.04
0.5833	0.06
0.6667	0.06
0.7500	0.01
0.8333	0.00
0.9167	0.01
1.0000	0.01
1.0833	0.03
1.1667	-0.03
1.2500	0.01
1.3333	-0.03
1.4166	0.00
1.5000	0.03

1.5833	0.01
1.6667	-0.01
1.7500	0.01
1.8333	0.01
1.9167	-0.01
2.0000	0.03
2.5000	0.01
3.0000	0.03
3.5000	-0.01
4.0000	0.04
4.5000	0.04
5.0000	0.04
5.5000	0.03
6.0000	0.01
6.5000	0.04
7.0000	0.04
7.5000	0.04
8.0000	0.03
8.5000	0.09
9.0000	0.04
9.5000	0.09
10.0000	0.09
12.0000	0.11
14.0000	0.09
16.0000	0.09
18.0000	0.15
20.0000	0.15
22.0000	0.12
24.0000	0.12
26.0000	0.15
28.0000	0.18
30.0000	0.17
32.0000	0.20
34.0000	0.14
36.0000	0.14
38.0000	0.12
40.0000	0.12
42.0000	0.15
44.0000	0.09
46.0000	0.11
48.0000	0.14
50.0000	0.09
52.0000	0.12
54.0000	0.11
56.0000	0.11
58.0000	0.14
60.0000	0.12
62.0000	0.15
64.0000	0.17
66.0000	0.11
68.0000	0.18
70.0000	0.22
72.0000	0.15
74.0000	0.11
76.0000	0.14
78.0000	0.09
80.0000	0.12
82.0000	0.09
84.0000	0.14
86.0000	0.14

88.0000	0.11
90.0000	0.14
92.0000	0.22
94.0000	0.20
96.0000	0.14
98.0000	0.12
100.000	0.17
110.000	0.26
120.000	0.25
130.000	0.23
140.000	0.15
150.000	0.06
160.000	0.07
170.000	0.28
180.000	0.22
190.000	0.20
200.000	0.12
210.000	0.01
220.000	0.18
230.000	0.22
240.000	0.25
250.000	0.28
260.000	0.34
270.000	0.23
280.000	0.28
290.000	0.28
300.000	0.26
310.000	0.28
320.000	0.29
330.000	0.29
340.000	0.33
350.000	0.34
360.000	0.39
370.000	0.36
380.000	0.36
390.000	0.31
400.000	0.37
410.000	0.36
420.000	0.34
430.000	0.31
440.000	0.36
450.000	0.33
460.000	0.33
470.000	0.39
480.000	0.44
490.000	0.39
500.000	0.37
510.000	0.42
520.000	0.36
530.000	0.37
540.000	0.36
550.000	0.29
560.000	0.34
570.000	0.37
580.000	0.34
590.000	0.28
600.000	0.29
610.000	0.23
620.000	0.20
630.000	0.29

640.000	0.36
650.000	0.34
660.000	0.33
670.000	0.26
680.000	0.34
690.000	0.31
700.000	0.34
710.000	0.31
720.000	0.15
730.000	0.09
740.000	0.09
750.000	0.07
760.000	0.04
770.000	0.01
780.000	-0.01
790.000	0.01
800.000	0.01
810.000	0.06
820.000	0.00
830.000	0.00
840.000	-0.01
850.000	0.04
860.000	0.04
870.000	-0.03
880.000	-0.01
890.000	-0.03
900.000	0.00
910.000	0.01
920.000	0.03
930.000	0.03
940.000	0.09
950.000	0.20
960.000	0.33
970.000	0.36
980.000	0.45
990.000	0.50
1000.00	0.67
1010.00	0.63
1020.00	0.77
1030.00	0.78
1040.00	0.88
1050.00	0.85
1060.00	0.93
1070.00	0.88
1080.00	0.99
1090.00	1.04
1100.00	1.08
1110.00	1.00
1120.00	1.15

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

PUMP TEST-ALLUVIUM

Observation Well No.: #8	Project Name: FRENCH GULCH	Project Number:
Date: 11/1 - 11/2/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
1	4:17 pm	13.61				
2	4:30 pm	13.68				
3	4:40 pm	13.69				
4	4:50 pm	13.70				
5	5:00 pm	13.71				
6	5:10 pm	13.72				
7	5:20 pm	13.73				
8	5:30 pm	13.75				
9	5:40 pm	13.76				
10	5:50 pm	13.76				
11	6:10 pm	13.80				
12	6:31 pm	13.81				
13	6:51 pm	13.82				
14	7:11 pm	13.85				
15	7:31 pm	13.85				
16	7:51	13.86				
17	8:11	13.87				
18	8:31	13:89				
19	8:51 pm	13:90				
20	9:11 pm	13.90				
21	10:01 pm	13.92				
22	10:51 pm	13.93				
23	11:41 pm	13.95				
24	12:31 AM	13.97				

50

Additional Comments:

EARLY
10 MIN FIRST 100 MINS
20 MIN 100-200
50 MIN 200 1000 MINS
100 MIN 1000 MINS +

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

PUMP TEST - ALLUVIUM

Observation Well No.: #8		Project Name: FRENCH GULCH	Project Number:
Date: 11/1 - 11/2/94	Recorded By:		Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:		Page 2 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25	1:21 AM	13.99				
26	2:11 AM	14.00				
27	3:01 AM	14.02				
28	3:51 AM	14.03				
29	4:41 AM	14.04				
30	5:31 AM	14.05				
31	6:21 AM	14.06				
32	7:11 AM	14.07				
33	8:01 AM	14.07				
34	8:51 AM	14.07				
35	10:31 AM	14.07				
36						

Additional Comments:

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

PUMP TEST-ALLUVIUM

Observation Well No.: #13	Project Name: FRENCH GULCH	Project Number:
Date: 11/1 - 11/2/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
1	4:20 pm	32.22				
2	4:32 pm	32.20				
3	4:42 pm	32.20				
4	4:52 pm	32.21				
5	5:02 pm	32.21				
6	5:12 pm	32.21				
7	5:24 pm	32.21				
8	5:34 pm	32.21				
9	5:43 pm	32.22				
10	5:53 pm	32.22				
11	6:15 pm	32.25				
12	6:35 pm	32.24				
13	6:55 pm	32.23				
14	7:15 pm	32.24				
15	7:35 pm	32.24				
16	7:55	32.24				
17	8:15 pm	32.25				
18	8:35 pm	32.25				
19	8:55 pm	32.25				
20	9:15 pm	32.25				
50 21	10:05 pm	32.255				
22	10:55 pm	32.255				
23	11:45 pm	32.255				
24	12:35 AM	32.26				

Additional Comments:

1:25 AM

THIS IS BORING

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

Pump Test - ALLUVIUM

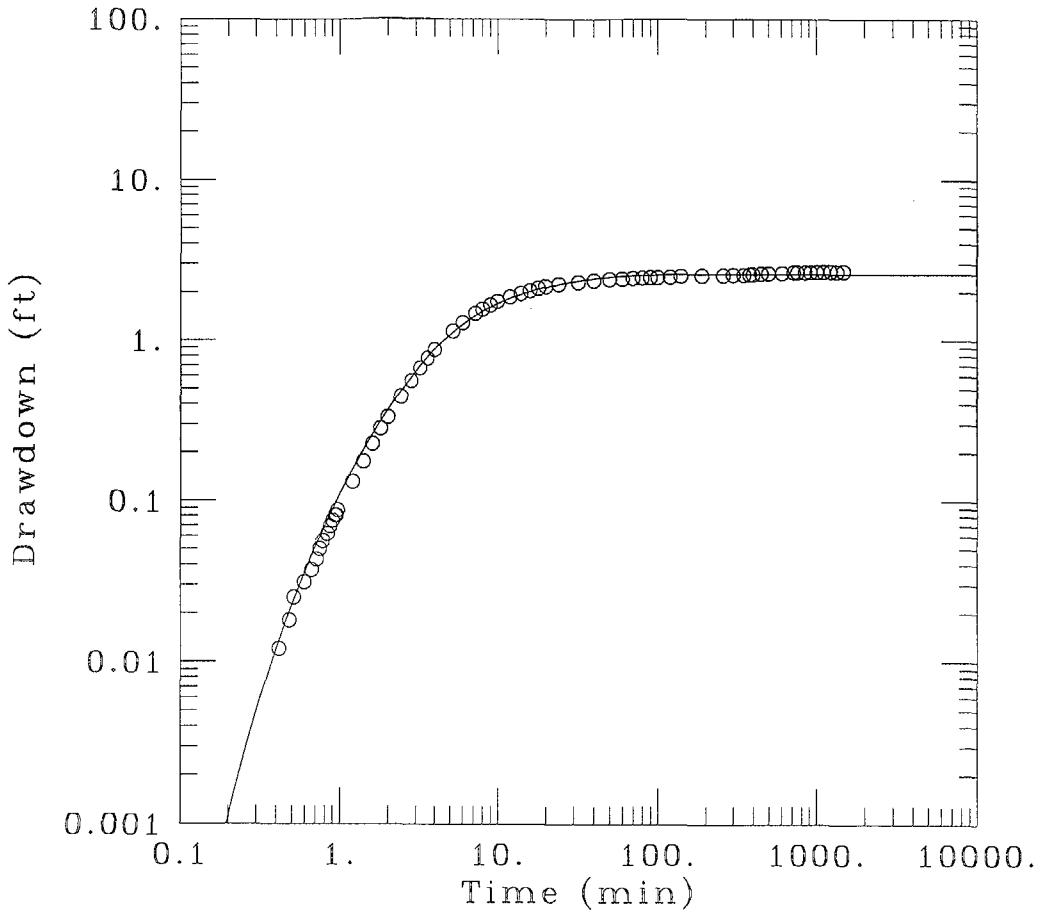
Observation Well No.: #13	Project Name: FRENCH GULCH	Project Number:
Date: 11/1 - 11/2/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 2 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25	1:25 AM	32.26				
26	2:15 AM	32.27				
27	3:05 AM	32.27				
28	3:55 AM	32.28				
29	4:45 AM	32.29				
30	5:35 AM	32.30				
31	6:25 AM	32.31				
32	7:15 AM	32.32				
33	8:05 AM	32.32				
34	8:55 AM	32.32				
35	10:35 AM	32.32				
36						

Additional Comments:

Research Project	Client: EPA/CMG/CDH
Project No.: 94-1	Location: Breckenridge, CO.

French Gulch Hydrology - Sh PT, 16shDD



DATA SET:
16sods.dat
11/11/94

AQUIFER TYPE:
Leaky

SOLUTION METHOD:
Moench

TEST DATE:
11/3/94

TEST WELL:
17

OBS. WELL:
16

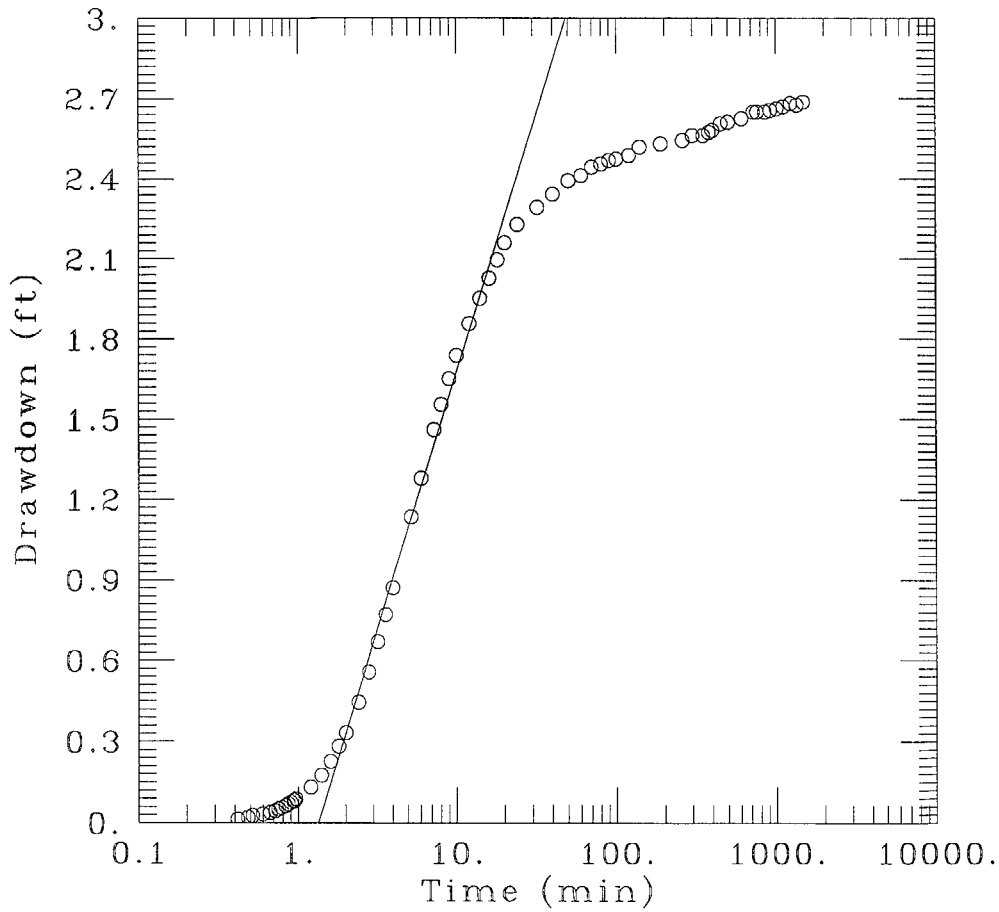
ESTIMATED PARAMETERS:
T = 0.1776 ft^2/min
S = 0.0009597
r/B= 0.1905
β = 0.002229
Sw = 82.59
a = 0.007542

TEST DATA:
Q = 1.604 ft^3/min
r = 16.5 ft
rc = 0.1667 ft
rw = 0.25 ft

16 st mo. pge

Research Project	Client: EPA/CMG/CDH
Project No.: 94-1	Location: Breckenridge, CO.

French Gulch Hydrology - Sh PT, 16shDD



DATA SET:
16sods.dat
11/11/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Cooper-Jacob

TEST DATE:
11/3/94

TEST WELL:
17

OBS. WELL:
16

ESTIMATED PARAMETERS:
T = 0.1527 ft^2/min
S = 0.001691

TEST DATA:
Q = 1.604 ft^3/min
r = 16.5 ft
rc = 0.1667 ft
rw = 0.25 ft

16stcs. pgl.

WELL 16 DS.DAT

DD SH. OBS. WELL - SH PUMP TST

SE2000
Environmental Logger
11/08 10:41

Unit# 530 Test 2

INPUT 3: Level (F) TOC

Reference	0.000
PSI at Ref.	11.854
SG	1.000
Linearity	0.028
Scale factor	19.848
Offset	-0.102
Delay mSEC	50.000

Step 0 11/03 09:59:24

Elapsed Time	INPUT 3
0.0000	0.000
0.0083	0.000
0.0166	0.000
0.0250	0.000
0.0333	0.000
0.0416	0.000
0.0500	0.000
0.0583	0.000
0.0666	0.000
0.0750	0.000
0.0833	0.000
0.0916	0.000
0.1000	0.000
0.1083	0.000
0.1166	0.000
0.1250	0.000
0.1333	0.000
0.1416	0.000
0.1500	0.000
0.1583	0.000
0.1666	0.000
0.1750	0.000
0.1833	0.000
0.1916	0.006
0.2000	0.000
0.2083	0.000
0.2166	0.000
0.2250	0.000
0.2333	0.006
0.2416	0.000
0.2500	0.000
0.2583	0.006
0.2666	0.006
0.2750	0.000
0.2833	0.006
0.2916	0.006
0.3000	0.000
0.3083	0.006
0.3166	0.006

0.3250	0.006
0.3333	0.006
0.3500	0.006
0.3666	0.006
0.3833	0.006
0.4000	0.006
0.4166	0.012
0.4333	0.012
0.4500	0.012
0.4666	0.012
0.4833	0.018
0.5000	0.018
0.5166	0.025
0.5333	0.018
0.5500	0.025
0.5666	0.025
0.5833	0.025
0.6000	0.031
0.6166	0.031
0.6333	0.031
0.6500	0.031
0.6666	0.037
0.6833	0.037
0.7000	0.037
0.7166	0.043
0.7333	0.043
0.7500	0.050
0.7666	0.050
0.7833	0.056
0.8000	0.056
0.8166	0.056
0.8333	0.062
0.8500	0.069
0.8666	0.069
0.8833	0.075
0.9000	0.075
0.9166	0.075
0.9333	0.081
0.9500	0.081
0.9666	0.087
0.9833	0.087
1.0000	0.087
1.2000	0.131
1.4000	0.175
1.6000	0.226
1.8000	0.282
2.0000	0.332
2.2000	0.389
2.4000	0.445
2.6000	0.502
2.8000	0.558
3.0000	0.615
3.2000	0.671
3.4000	0.722
3.6000	0.772
3.8000	0.822
4.0000	0.872
4.2000	0.922
4.4000	0.966
4.6000	1.010

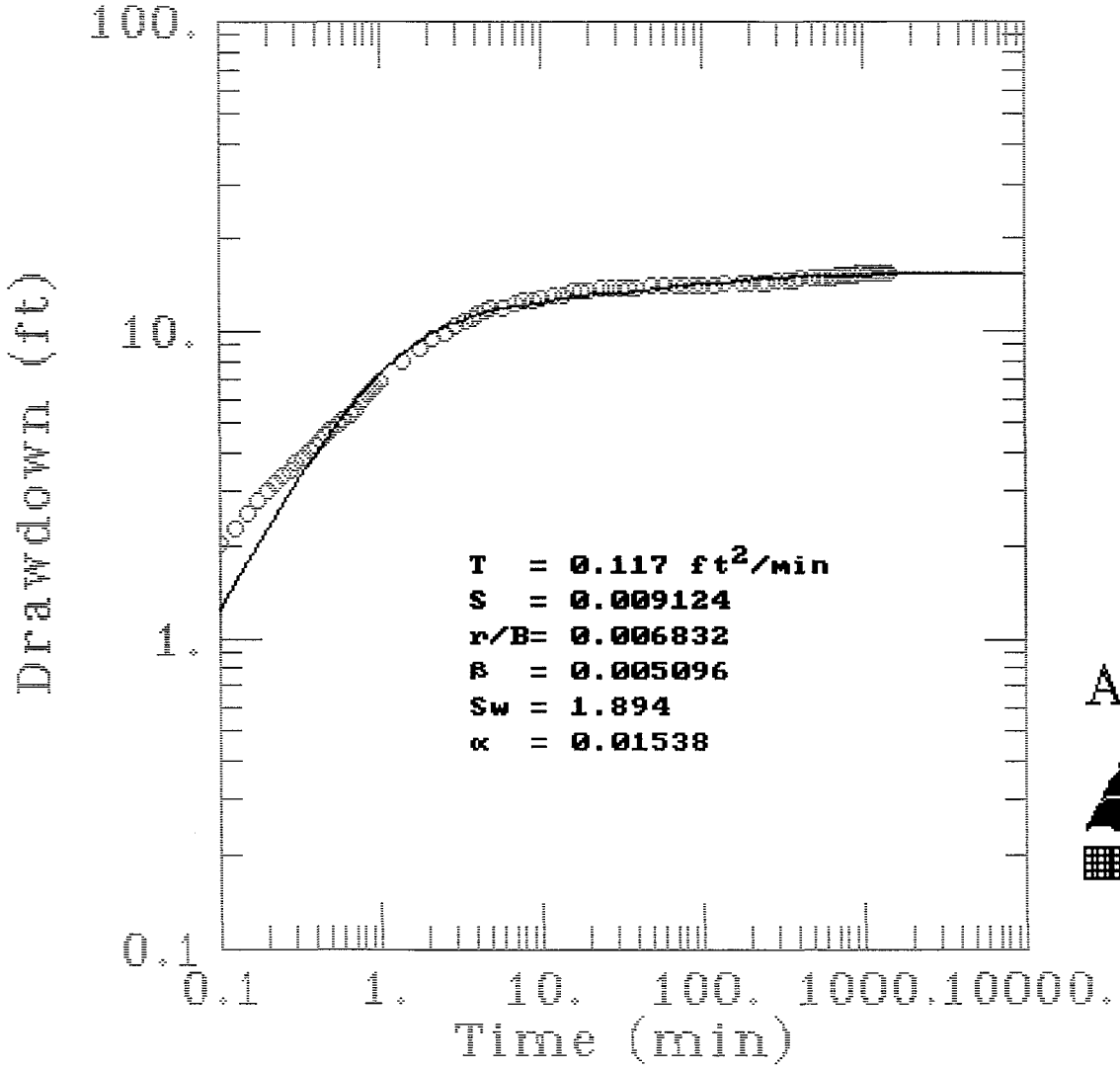
4.8000	1.061
5.0000	1.098
5.2000	1.136
5.4000	1.174
5.6000	1.217
5.8000	1.249
6.0000	1.280
6.2000	1.318
6.4000	1.349
6.6000	1.381
6.8000	1.406
7.0000	1.431
7.2000	1.462
7.4000	1.481
7.6000	1.513
7.8000	1.538
8.0000	1.556
8.2000	1.575
8.4000	1.600
8.6000	1.619
8.8000	1.632
9.0000	1.651
9.2000	1.669
9.4000	1.688
9.6000	1.707
9.8000	1.720
10.0000	1.739
12.0000	1.858
14.0000	1.952
16.0000	2.027
18.0000	2.096
20.0000	2.159
22.0000	2.191
24.0000	2.228
26.0000	2.241
28.0000	2.272
30.0000	2.285
32.0000	2.291
34.0000	2.304
36.0000	2.329
38.0000	2.335
40.0000	2.341
42.0000	2.360
44.0000	2.366
46.0000	2.373
48.0000	2.385
50.0000	2.391
52.0000	2.391
54.0000	2.404
56.0000	2.410
58.0000	2.404
60.0000	2.410
62.0000	2.417
64.0000	2.423
66.0000	2.435
68.0000	2.435
70.0000	2.442
72.0000	2.448
74.0000	2.448
76.0000	2.448

78.0000	2.448
80.0000	2.454
82.0000	2.454
84.0000	2.460
86.0000	2.467
88.0000	2.460
90.0000	2.467
92.0000	2.473
94.0000	2.473
96.0000	2.467
98.0000	2.479
100.000	2.473
110.000	2.486
120.000	2.486
130.000	2.498
140.000	2.517
150.000	2.511
160.000	2.517
170.000	2.517
180.000	2.517
190.000	2.530
200.000	2.523
210.000	2.523
220.000	2.530
230.000	2.523
240.000	2.536
250.000	2.536
260.000	2.542
270.000	2.542
280.000	2.542
290.000	2.548
300.000	2.561
310.000	2.561
320.000	2.567
330.000	2.573
340.000	2.567
350.000	2.561
360.000	2.567
370.000	2.561
380.000	2.573
390.000	2.573
400.000	2.580
410.000	2.586
420.000	2.592
430.000	2.599
440.000	2.605
450.000	2.605
460.000	2.605
470.000	2.605
480.000	2.611
490.000	2.611
500.000	2.611
510.000	2.599
520.000	2.599
530.000	2.605
540.000	2.605
550.000	2.611
560.000	2.617
570.000	2.617
580.000	2.624

590.000	2.617
600.000	2.611
610.000	2.624
620.000	2.624
630.000	2.624
640.000	2.624
650.000	2.624
660.000	2.624
670.000	2.630
680.000	2.624
690.000	2.630
700.000	2.642
710.000	2.649
720.000	2.649
730.000	2.655
740.000	2.649
750.000	2.649
760.000	2.649
770.000	2.649
780.000	2.649
790.000	2.649
800.000	2.655
810.000	2.655
820.000	2.649
830.000	2.642
840.000	2.642
850.000	2.649
860.000	2.649
870.000	2.649
880.000	2.649
890.000	2.649
900.000	2.649
910.000	2.649
920.000	2.655
930.000	2.655
940.000	2.655
950.000	2.655
960.000	2.655
970.000	2.655
980.000	2.655
990.000	2.655
1000.00	2.655
1010.00	2.661
1020.00	2.655
1030.00	2.655
1040.00	2.655
1050.00	2.655
1060.00	2.655
1070.00	2.655
1080.00	2.655
1090.00	2.661
1100.00	2.661
1110.00	2.668
1120.00	2.668
1130.00	2.668
1140.00	2.668
1150.00	2.668
1160.00	2.674
1170.00	2.674
1180.00	2.668

1190.00	2.668
1200.00	2.674
1210.00	2.674
1220.00	2.674
1230.00	2.680
1240.00	2.674
1250.00	2.680
1260.00	2.674
1270.00	2.649
1280.00	2.661
1290.00	2.668
1300.00	2.674
1310.00	2.668
1320.00	2.674
1330.00	2.674
1340.00	2.674
1350.00	2.674
1360.00	2.674
1370.00	2.674
1380.00	2.674
1390.00	2.674
1400.00	2.674
1410.00	2.680
1420.00	2.680
1430.00	2.686
1440.00	2.680
1450.00	2.680
1460.00	2.680
1470.00	2.693
1480.00	2.686

French Gulch Hydrology - SH PT, 17shDD



AQTESOLV

GERAGHTY & MILLER, INC.

Modeling Group

Moench

WELL 17 DS. DAT

DD SH. PUMP WELL - SH PUMP TST

SE2000
Environmental Logger
11/08 10:45

Unit# 530 Test 2

INPUT 4: Level (F) TOC

Reference	0.000
PSI at Ref.	27.463
SG	1.000
Linearity	0.000
Scale factor	49.971
Offset	-0.163
Delay mSEC	50.000

Step 0 11/03 09:59:24

Elapsed Time	INPUT 4
0.0000	0.457
0.0083	0.473
0.0166	0.678
0.0250	1.088
0.0333	1.341
0.0416	1.435
0.0500	1.483
0.0583	1.546
0.0666	1.672
0.0750	1.767
0.0833	1.830
0.0916	1.925
0.1000	2.035
0.1083	2.130
0.1166	2.209
0.1250	2.288
0.1333	2.398
0.1416	2.477
0.1500	2.556
0.1583	2.650
0.1666	2.729
0.1750	2.808
0.1833	2.887
0.1916	2.966
0.2000	3.029
0.2083	3.076
0.2166	3.171
0.2250	3.187
0.2333	3.266
0.2416	3.329
0.2500	3.408
0.2583	3.471
0.2666	3.503
0.2750	3.550
0.2833	3.597
0.2916	3.660
0.3000	3.692
0.3083	3.739
0.3166	3.787

0.3250	3.834
0.3333	3.881
0.3500	3.976
0.3666	4.055
0.3833	4.149
0.4000	4.228
0.4166	4.307
0.4333	4.386
0.4500	4.465
0.4666	4.544
0.4833	4.639
0.5000	4.718
0.5166	4.781
0.5333	4.860
0.5500	4.923
0.5666	5.002
0.5833	5.080
0.6000	5.159
0.6166	5.222
0.6333	5.286
0.6500	5.364
0.6666	5.459
0.6833	5.506
0.7000	5.585
0.7166	5.649
0.7333	5.727
0.7500	5.806
0.7666	5.885
0.7833	5.948
0.8000	5.996
0.8166	6.075
0.8333	6.153
0.8500	6.232
0.8666	6.295
0.8833	6.359
0.9000	6.406
0.9166	6.469
0.9333	6.532
0.9500	6.611
0.9666	6.658
0.9833	6.706
1.0000	6.769
1.2000	7.400
1.4000	7.905
1.6000	8.331
1.8000	8.710
2.0000	9.041
2.2000	9.325
2.4000	9.593
2.6000	9.846
2.8000	10.051
3.0000	10.256
3.2000	10.445
3.4000	10.651
3.6000	10.824
3.8000	10.982
4.0000	11.140
4.2000	11.282
4.4000	11.392
4.6000	11.518

4.8000	11.613
5.0000	11.708
5.2000	11.692
5.4000	11.724
5.6000	11.771
5.8000	11.818
6.0000	11.881
6.2000	11.944
6.4000	12.008
6.6000	12.086
6.8000	12.118
7.0000	12.165
7.2000	12.213
7.4000	12.228
7.6000	12.276
7.8000	12.323
8.0000	12.371
8.2000	12.386
8.4000	12.418
8.6000	12.449
8.8000	12.481
9.0000	12.528
9.2000	12.544
9.4000	12.576
9.6000	12.607
9.8000	12.623
10.0000	12.655
12.0000	12.891
14.0000	13.033
16.0000	13.333
18.0000	13.522
20.0000	13.570
22.0000	13.538
24.0000	13.570
26.0000	13.601
28.0000	13.649
30.0000	13.680
32.0000	13.696
34.0000	13.712
36.0000	13.743
38.0000	13.775
40.0000	13.791
42.0000	13.822
44.0000	13.822
46.0000	13.838
48.0000	13.854
50.0000	13.838
52.0000	13.854
54.0000	13.854
56.0000	13.870
58.0000	13.885
60.0000	13.885
62.0000	13.901
64.0000	13.933
66.0000	13.948
68.0000	13.948
70.0000	13.933
72.0000	13.933
74.0000	13.948
76.0000	13.964

78.0000	13.964
80.0000	13.964
82.0000	13.964
84.0000	13.980
86.0000	13.996
88.0000	13.980
90.0000	13.980
92.0000	13.996
94.0000	13.996
96.0000	13.996
98.0000	14.012
100.000	14.027
110.000	14.027
120.000	14.043
130.000	14.154
140.000	14.201
150.000	14.185
160.000	14.201
170.000	14.217
180.000	14.217
190.000	14.280
200.000	14.264
210.000	14.264
220.000	14.280
230.000	14.280
240.000	14.311
250.000	14.390
260.000	14.343
270.000	14.343
280.000	14.343
290.000	14.374
300.000	14.390
310.000	14.406
320.000	14.422
330.000	14.453
340.000	14.453
350.000	14.438
360.000	14.438
370.000	14.469
380.000	14.516
390.000	14.564
400.000	14.564
410.000	14.643
420.000	14.674
430.000	14.706
440.000	14.722
450.000	14.690
460.000	14.674
470.000	14.706
480.000	14.801
490.000	14.816
500.000	14.706
510.000	14.706
520.000	14.706
530.000	14.737
540.000	14.737
550.000	14.769
560.000	14.785
570.000	14.785
580.000	14.785

590.000	14.737
600.000	14.801
610.000	14.816
620.000	14.816
630.000	14.801
640.000	14.832
650.000	14.816
660.000	14.864
670.000	14.864
680.000	14.848
690.000	14.911
700.000	15.006
710.000	15.037
720.000	15.037
730.000	15.053
740.000	15.021
750.000	15.021
760.000	15.053
770.000	15.053
780.000	15.085
790.000	15.116
800.000	15.116
810.000	15.148
820.000	15.100
830.000	15.132
840.000	15.148
850.000	15.163
860.000	15.163
870.000	15.148
880.000	15.163
890.000	15.179
900.000	15.195
910.000	15.211
920.000	15.227
930.000	15.211
940.000	15.227
950.000	15.227
960.000	15.227
970.000	15.242
980.000	15.258
990.000	15.258
1000.00	15.258
1010.00	15.258
1020.00	15.274
1030.00	15.227
1040.00	15.242
1050.00	15.258
1060.00	15.258
1070.00	15.258
1080.00	15.274
1090.00	15.305
1100.00	15.321
1110.00	15.337
1120.00	15.337
1130.00	15.305
1140.00	15.321
1150.00	15.353
1160.00	15.353
1170.00	15.337
1180.00	15.337

1190.00	15.337
1200.00	15.353
1210.00	15.353
1220.00	15.369
1230.00	15.369
1240.00	15.369
1250.00	15.337
1260.00	15.195
1270.00	15.085
1280.00	15.274
1290.00	15.290
1300.00	15.290
1310.00	15.290
1320.00	15.305
1330.00	15.305
1340.00	15.305
1350.00	15.321
1360.00	15.290
1370.00	15.305
1380.00	15.305
1390.00	15.337
1400.00	15.384
1410.00	15.384
1420.00	15.369
1430.00	15.384
1440.00	15.384
1450.00	15.400
1460.00	15.384
1470.00	15.400
1480.00	15.447

WELL1DS.DAT

DD ALL. OBS. WELL - SH PUMP TST

SE2000
Environmental Logger
11/08 10:37

Unit# 530 Test 2

INPUT 2: Level (F) TOC

Reference	0.000
PSI at Ref.	15.110
SG	1.000
Linearity	0.000
Scale factor	20.037
Offset	0.039
Delay mSEC	50.000

Step 0 11/03 09:59:24

Elapsed Time	INPUT 2
0.0000	0.006
0.0083	0.006
0.0166	0.006
0.0250	0.006
0.0333	0.006
0.0416	0.006
0.0500	0.006
0.0583	0.006
0.0666	0.006
0.0750	0.006
0.0833	0.012
0.0916	0.012
0.1000	0.006
0.1083	0.012
0.1166	0.012
0.1250	0.012
0.1333	0.012
0.1416	0.012
0.1500	0.012
0.1583	0.012
0.1666	0.012
0.1750	0.012
0.1833	0.012
0.1916	0.012
0.2000	0.012
0.2083	0.018
0.2166	0.018
0.2250	0.018
0.2333	0.012
0.2416	0.018
0.2500	0.018
0.2583	0.018
0.2666	0.012
0.2750	0.018
0.2833	0.018
0.2916	0.018
0.3000	0.018
0.3083	0.018
0.3166	0.018

0.3250	0.018
0.3333	0.025
0.3500	0.025
0.3666	0.025
0.3833	0.025
0.4000	0.025
0.4166	0.025
0.4333	0.031
0.4500	0.031
0.4666	0.031
0.4833	0.031
0.5000	0.031
0.5166	0.031
0.5333	0.037
0.5500	0.037
0.5666	0.037
0.5833	0.037
0.6000	0.037
0.6166	0.044
0.6333	0.044
0.6500	0.044
0.6666	0.050
0.6833	0.044
0.7000	0.050
0.7166	0.050
0.7333	0.050
0.7500	0.050
0.7666	0.056
0.7833	0.056
0.8000	0.056
0.8166	0.056
0.8333	0.056
0.8500	0.056
0.8666	0.063
0.8833	0.063
0.9000	0.063
0.9166	0.063
0.9333	0.069
0.9500	0.063
0.9666	0.069
0.9833	0.069
1.0000	0.069
1.2000	0.088
1.4000	0.101
1.6000	0.113
1.8000	0.132
2.0000	0.139
2.2000	0.158
2.4000	0.170
2.6000	0.183
2.8000	0.196
3.0000	0.208
3.2000	0.221
3.4000	0.227
3.6000	0.240
3.8000	0.246
4.0000	0.259
4.2000	0.272
4.4000	0.278
4.6000	0.284

4.8000	0.297
5.0000	0.303
5.2000	0.310
5.4000	0.322
5.6000	0.329
5.8000	0.335
6.0000	0.341
6.2000	0.348
6.4000	0.360
6.6000	0.360
6.8000	0.366
7.0000	0.379
7.2000	0.379
7.4000	0.385
7.6000	0.398
7.8000	0.404
8.0000	0.404
8.2000	0.411
8.4000	0.411
8.6000	0.423
8.8000	0.423
9.0000	0.430
9.2000	0.436
9.4000	0.442
9.6000	0.449
9.8000	0.449
10.0000	0.455
12.0000	0.487
14.0000	0.518
16.0000	0.550
18.0000	0.575
20.0000	0.601
22.0000	0.620
24.0000	0.639
26.0000	0.651
28.0000	0.664
30.0000	0.677
32.0000	0.683
34.0000	0.696
36.0000	0.708
38.0000	0.714
40.0000	0.727
42.0000	0.740
44.0000	0.746
46.0000	0.752
48.0000	0.759
50.0000	0.765
52.0000	0.771
54.0000	0.778
56.0000	0.784
58.0000	0.784
60.0000	0.790
62.0000	0.797
64.0000	0.803
66.0000	0.809
68.0000	0.809
70.0000	0.816
72.0000	0.822
74.0000	0.822
76.0000	0.828

78.0000	0.828
80.0000	0.841
82.0000	0.841
84.0000	0.841
86.0000	0.847
88.0000	0.847
90.0000	0.847
92.0000	0.854
94.0000	0.854
96.0000	0.854
98.0000	0.860
100.000	0.860
110.000	0.879
120.000	0.879
130.000	0.892
140.000	0.898
150.000	0.911
160.000	0.911
170.000	0.917
180.000	0.917
190.000	0.936
200.000	0.930
210.000	0.936
220.000	0.936
230.000	0.942
240.000	0.942
250.000	0.949
260.000	0.955
270.000	0.961
280.000	0.968
290.000	0.968
300.000	0.974
310.000	0.980
320.000	0.980
330.000	0.993
340.000	0.987
350.000	0.987
360.000	0.993
370.000	0.993
380.000	0.999
390.000	0.999
400.000	1.006
410.000	1.012
420.000	1.012
430.000	1.025
440.000	1.025
450.000	1.025
460.000	1.031
470.000	1.031
480.000	1.031
490.000	1.031
500.000	1.031
510.000	1.031
520.000	1.031
530.000	1.037
540.000	1.037
550.000	1.044
560.000	1.050
570.000	1.044
580.000	1.056

590.000	1.056
600.000	1.050
610.000	1.056
620.000	1.056
630.000	1.056
640.000	1.062
650.000	1.062
660.000	1.062
670.000	1.069
680.000	1.062
690.000	1.069
700.000	1.069
710.000	1.075
720.000	1.075
730.000	1.081
740.000	1.081
750.000	1.075
760.000	1.075
770.000	1.075
780.000	1.081
790.000	1.075
800.000	1.081
810.000	1.081
820.000	1.081
830.000	1.075
840.000	1.081
850.000	1.088
860.000	1.081
870.000	1.081
880.000	1.081
890.000	1.088
900.000	1.088
910.000	1.088
920.000	1.088
930.000	1.094
940.000	1.094
950.000	1.094
960.000	1.094
970.000	1.094
980.000	1.100
990.000	1.094
1000.00	1.094
1010.00	1.100
1020.00	1.100
1030.00	1.107
1040.00	1.100
1050.00	1.100
1060.00	1.100
1070.00	1.100
1080.00	1.107
1090.00	1.107
1100.00	1.107
1110.00	1.107
1120.00	1.113
1130.00	1.113
1140.00	1.113
1150.00	1.113
1160.00	1.119
1170.00	1.119
1180.00	1.119

1190.00	1.113
1200.00	1.119
1210.00	1.119
1220.00	1.119
1230.00	1.126
1240.00	1.119
1250.00	1.126
1260.00	1.126
1270.00	1.126
1280.00	1.126
1290.00	1.132
1300.00	1.132
1310.00	1.132
1320.00	1.132
1330.00	1.138
1340.00	1.138
1350.00	1.138
1360.00	1.138
1370.00	1.138
1380.00	1.138
1390.00	1.138
1400.00	1.138
1410.00	1.138
1420.00	1.138
1430.00	1.145
1440.00	1.145
1450.00	1.138
1460.00	1.145
1470.00	1.151
1480.00	1.145

MINE 3DS.DAT

DD MINE OBS WELL - SH PUMP TST

SE1000B
Environmental Logger
11/08 11:32

Unit# 00525 Test# 2

INPUT 1: Level (F) TOC

Reference 0.00
Scale factor 49.96
Offset - 0.18

Step# 0 11/03 09:58

Elapsed Time	Value
0.0000	0.04
0.0033	0.04
0.0066	0.04
0.0099	0.04
0.0133	0.04
0.0166	0.04
0.0200	0.04
0.0233	0.04
0.0266	0.04
0.0300	0.04
0.0333	0.04
0.0500	0.04
0.0666	0.04
0.0833	0.04
0.1000	0.04
0.1166	0.04
0.1333	0.04
0.1500	0.04
0.1666	0.04
0.1833	0.04
0.2000	0.04
0.2166	0.04
0.2333	0.04
0.2500	0.04
0.2666	0.04
0.2833	0.04
0.3000	0.04
0.3166	0.04
0.3333	0.04
0.4167	0.04
0.5000	0.04
0.5833	0.04
0.6667	0.04
0.7500	0.04
0.8333	0.04
0.9167	0.04
1.0000	0.04
1.0833	0.04
1.1667	0.04
1.2500	0.04
1.3333	0.04
1.4166	0.04
1.5000	0.06

1.5833	0.06
1.6667	0.06
1.7500	0.06
1.8333	0.06
1.9167	0.06
2.0000	0.06
2.5000	0.07
3.0000	0.07
3.5000	0.09
4.0000	0.09
4.5000	0.09
5.0000	0.11
5.5000	0.11
6.0000	0.12
6.5000	0.12
7.0000	0.14
7.5000	0.14
8.0000	0.15
8.5000	0.15
9.0000	0.15
9.5000	0.17
10.0000	0.17
12.0000	0.18
14.0000	0.22
16.0000	0.23
18.0000	0.29
20.0000	0.37
22.0000	0.44
24.0000	0.47
26.0000	0.47
28.0000	0.53
30.0000	0.58
32.0000	0.53
34.0000	0.53
36.0000	0.53
38.0000	0.55
40.0000	0.48
42.0000	0.48
44.0000	0.47
46.0000	0.45
48.0000	0.47
50.0000	0.48
52.0000	0.47
54.0000	0.47
56.0000	0.50
58.0000	0.50
60.0000	0.47
62.0000	0.47
64.0000	0.47
66.0000	0.50
68.0000	0.53
70.0000	0.55
72.0000	0.56
74.0000	0.56
76.0000	0.56
78.0000	0.58
80.0000	0.58
82.0000	0.59
84.0000	0.58
86.0000	0.59

88.0000	0.61
90.0000	0.59
92.0000	0.63
94.0000	0.67
96.0000	0.66
98.0000	0.67
100.000	0.69
110.000	0.67
120.000	0.69
130.000	0.72
140.000	0.75
150.000	0.78
160.000	0.70
170.000	0.77
180.000	0.75
190.000	0.77
200.000	0.77
210.000	0.88
220.000	0.97
230.000	0.86
240.000	0.82
250.000	0.75
260.000	0.63
270.000	0.58
280.000	0.47
290.000	0.41
300.000	0.39
310.000	0.36
320.000	0.37
330.000	0.39
340.000	0.44
350.000	0.42
360.000	0.36
370.000	0.37
380.000	0.33
390.000	0.33
400.000	0.26
410.000	0.28
420.000	0.23
430.000	0.22
440.000	0.22
450.000	0.18
460.000	0.20
470.000	0.18
480.000	0.18
490.000	0.20
500.000	0.20
510.000	0.20
520.000	0.17
530.000	0.18
540.000	0.18
550.000	0.18
560.000	0.20
570.000	0.22
580.000	0.22
590.000	0.22
600.000	0.22
610.000	0.20
620.000	0.22
630.000	0.22

640.000	0.22
650.000	0.22
660.000	0.22
670.000	0.22
680.000	0.20
690.000	0.22
700.000	0.20
710.000	0.20
720.000	0.20
730.000	0.20
740.000	0.20
750.000	0.20
760.000	0.20
770.000	0.20
780.000	0.20
790.000	0.20
800.000	0.20
810.000	0.20
820.000	0.20
830.000	0.20
840.000	0.20
850.000	0.20
860.000	0.20
870.000	0.22
880.000	0.20
890.000	0.20
900.000	0.20
910.000	0.20
920.000	0.18
930.000	0.18
940.000	0.18
950.000	0.18
960.000	0.18
970.000	0.18
980.000	0.15
990.000	0.14
1000.00	0.12
1010.00	0.12
1020.00	0.12
1030.00	0.14
1040.00	0.12
1050.00	0.09
1060.00	0.07
1070.00	0.07
1080.00	0.07
1090.00	0.07
1100.00	0.09
1110.00	0.09
1120.00	0.11
1130.00	0.09
1140.00	0.11
1150.00	0.09
1160.00	0.09
1170.00	0.09
1180.00	0.09
1190.00	0.09
1200.00	0.09
1210.00	0.09
1220.00	0.09
1230.00	0.09

1240.00	0.09
1250.00	0.07
1260.00	0.09
1270.00	0.06
1280.00	0.06
1290.00	0.04
1300.00	0.06
1310.00	0.06
1320.00	0.06
1330.00	0.06
1340.00	0.07
1350.00	0.09
1360.00	0.07
1370.00	0.11
1380.00	0.12
1390.00	0.15
1400.00	0.14
1410.00	0.15
1420.00	0.15
1430.00	0.15
1440.00	0.23
1450.00	0.26
1460.00	0.25
1470.00	0.26
1480.00	0.33

13.58

SHALE PUMP TEST #4 LOWER SH SCREEN

DD

Time (mins)	Δs (ft)	Time (mins)	Δs (ft)
0	0		
12	0.21	672	.98
22	0.59	722	.98
32	0.63	822	1.00
42	0.67	872	.99
52	0.71	922	.99
62	0.73	972	.98
72	0.75	1022	1.03
82	0.77	1072	1.00
92	0.80	1172	1.05
102	0.84	1272	1.00
122	0.85	1372	1.00
142	0.85	1472	1.02
162	0.86		
182	0.87		
202	0.88		
222	0.88		
272	0.89		
322	0.91		
372	0.92		
422	1.00		
472	1.01		
522	1.04		
572	1.04		
622	1.05		

?

#4 OBS WELL

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

PUMP TEST - SHALE

Observation Well No.: # 4 WELL	Project Name: FRENCH GULCH	Project Number:
Date: 11/3 - 11/4/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
* 1	10:12	13' 9 1/2"	13.79			
2	10:22	14' 2"	14.17			
3	10:32	14' 2 1/2"	14.21			
4	10:42	14' 3"	14.25			
5	10:52	14' 3 1/2"	14.29			
6	11:02	14' 3 3/4"	14.31			
7	11:12	14' 4"	14.33			
8	11:22	14' 4 1/4"	14.35			
9	11:32	14' 4 1/2"	14.38			
10	11:42	14' 5"	14.42			
11	12:02	14' 5 1/8"	14.43			
12	12:22	14' 5 1/8"	14.43			
13	12:42	14' 5 1/4"	14.44			
14	13:02	14' 5 3/8"	14.45			
15	13:22	14' 5 1/2"	14.46			
16	13:42	14' 5 9/16"	14.46			
17	14:32	14' 5 5/8"	14.47			SNOWING
18	15:22	14' 5 7/8"	14.49			
19	16:12	14' 6"	14.5	14.58		
20	17:02	14' 7"	← MIKE WIREMAN'S MEAS. REMARKS			
21	17:52	14' 7 1/8"	14.59			HEAVY
22	18:42	14' 7 1/2	14.62			SNOW
23	19:32	14' 7 1/2	14.62			
24	20:22	14' 7 9/16	14.63			

10

20

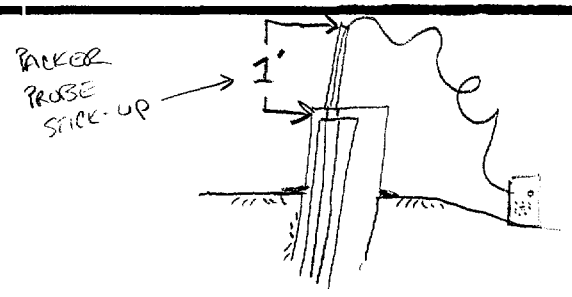
30

Additional Comments:

[MXMNTS ARE NOT AS ACCURATE AS OTHER WELLS ± 1/4"?]

ALL MXMNTS ARE IN INCHES NOT FEET

ALSO, SUBTRACT 1 FT FROM REMARKS TO = TOP OF WELL CASING



American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

#4 WELL

OBSERVATION WELL DATA FORM

PUMP TEST - SHALE

Observation Well No.: ~~#3 Alluvial Shaft~~	Project Name: FRENCH GULCH	Project Number:
Date: 11/3 - 11/4/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 2 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25	9:12	14'6 3/4	14.56		Alluvium ↓	COULD NOT GET A REPEATABLE READING
26	10:02	14'6 3/4	14.56		12.69 ←	ALLUVIAL SCREEN
27	10:52	14'7"	14.58		12.70	
28	11:42 PM	14'6 7/8"	14.57		12.70	
29	12:32 AM	14'6 7/8	14.57		12.70	
30	1:22	14'6 3/4	14.56		12.71	
31	2:12	14'7 9/16	14.63			
32	3:02	14'7'	14.58			
33	4:42	14'7 1/2"	14.63			
34	6:22	14'7"	14.58			
35	8:02	14'7"	14.58			
36	9:42	14'7 1/4"	14.60			

100

END

Additional Comments:

To. A. Dicker
From. A Morrissey

SHALE PUMP TEST #5 Qal well

OD

Time (mins)	Δs (ft)	Time (mins)	Δs (ft)
0	0		
10	0.18	770	0.83
20	0.33	820	0.83
40	0.45	870	0.83
50	0.48	920	0.84
60	0.51	970	0.84
70	0.53	1020	0.85
80	0.55	1120	0.87
100	0.57	1220	0.87
120	0.60	1320	0.84
140	0.61	1420	0.88
160	0.625	1485	0.90
180	0.635		
200	0.635		
220	0.65		
270	0.68		
320	0.71		
370	0.72		
420	0.75		
470	0.78		
520	0.78		
570	0.785		
620	0.80		
670	0.81		
720	0.82		

PUMP TEST, SHALE | OBSERVATION WELL No. 5 | DATE 10/3/94 → 10/4

STATIC @ START: 6.70 | FRENCH GULCH

DRAWDOWN START: 10:00:24 AM

TIME	WATER DEPTH FROM CASING		
10:10	6.88	1	
10:20	7.03	2	
10:40	7.15	3	
10:50	7.18	4	10'
11:00	7.21	5	
11:10	7.23	6	
11:20	7.25	7	
11:40	7.27	8	
12:00	7.30	9	
12:20	7.31	10	
12:40	7.325	11	20'
13:00	7.335	12	
13:20	7.335	13	
13:40	7.35	14	
4:30	7.38	15	
15:20	7.41	16	
16:10	7.42	17	SNOWING
17:00	7.45	18	
17:50	7.48	19	50'
18:40	7.48	20	
19:30	7.485	21	
20:20	7.50	22	
21:10	7.51	23	
22:00	7.52	24	
22:50	7.53	25	
23:40	7.53	26	
00:30	7.53	27	QUIT SNOWING
1:20	7.54	28	
2:10	7.54	29	
3:00	7.55	30	
4:40	7.57		
6:20	7.57		100 MINS
8:00	7.59		
9:40	7.58		
10 HRS 10:48	7.60 Pump off		

RECOVERY TIME	TEST START: WATER DEPTH FROM CASING	
Pump off → 10:48		
10:58	7.40	
11:12	7.18	
11:21	7.12	
11:37	7.05	
11:47	7.02	
12:03	6.98	
12:14	6.97	
12:24	6.94	
12:34	6.93	
12:54	6.91	
1:12	6.89	
1:31	6.87	
1:50	6.86	
2:10	6.85	83% Rec
3:00	6.83	86% Rec
3:50	6.82	

.9 DD

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OBSERVATION WELL DATA FORM

PUMP TEST - SHALE #17 WELL

Observation Well No.: #8	Project Name: FRENCH GULCH	Project Number:
Date: 11/3 - 11/4/94	Recorded By: BKS	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
1	10:14	13.89				
2	10:24	13.92				
3	10:34	13.93				
4	10:44	13.94				
5	10:54	13.95				
6	11:04	13.96				
7	11:14	13.97				
8	11:24	13.98				
9	11:34	13.98				
10	11:44	13.98				
11	12:04	13.99				
12	12:24	13.995				
13	12:44	14.0				
14	13:04	14.025				
15	13:24	14.01				
16	13:44	14.02				
17	14:34	14.05				SNOWING - ↓
18	15:24	14.07				TAPER HEAVY NOW
19	16:14	14.09				
20	17:04	14.13				
21	17:54	14.15				
22	18:44	14.15				
23	19:34	14.17				
24	20:24	14.19				

10

50

Additional Comments:

American Geological Services, Inc.
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Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

PUMP TEST - SHALE

Observation Well No.: #8	Project Name: FRENCH GULCH	Project Number:
Date: 11/3 - 11/4/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 2 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25	9:14	14.20				
26	10:04	14.21				
27	10:54	14.22				
28	11:44	14.23				
29	12:34 pm	14.23				
30	1:24 AM	14.25				
31	2:14	14.26				
32	3:04	14.28				
33	4:44	14.34				
34	6:24	14.34				
35	8:04	14.35				
36	9:44	14.36				

100

END

Additional Comments:

American Geological Services, Inc.
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Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

PUMP TEST - SHALE

Observation Well No.: #13

Project Name: FRENCH GULCH

Project Number:

Date: 11/3 - 11/4/94

Recorded By:

Unit of Measurement: FEET

Distance to pumping well:

Bearing to pumping well:

Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
1	10:17	32.35				
2	27	32.35				
3	37	32.34				
4	47	do				
5	57	do				
6	11:07	do				
7	17	do				
8	27	do				
9	37	do				
10	:47	do				
11	12:07	do				
12	:27	do				
13	:47	do				
14	13:07	do				
15	:27	do				
16	:47	do				
17	14:37	32.35				SNOW
18	15:27	32.37				
19	16:17	32.37				
20	17:07	32.38				HEAVY SNOW
21	17:57	32.38				" "
22	18:47	32.39				" "
23	19:37	32.40				
24	20:27	32.40				

10'

20'

50'

Additional Comments:

SNOWING HEAVY FROM
17:07 → 1:30

American Geological Services, Inc.
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Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

POMP TEST - SHALE

Observation Well No.: #13	Project Name: FRENCH GULCH	Project Number:
Date: 11/3 - 11/4/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 2 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25	9:17	32.40				
26	10:07	32.40				SNOWING
27	10:57	32.41				
28	11:47	32.41				
29	12:37 PM	32.42				
30	1:27 AM	32.42				SNOW QUIT
31	2:17	32.41				
32	3:07	34.42				
33	4:47	32.44				
34	6:27	32.44				
35	8:07	32.46				
36	9:47	32.46				
END						

Additional Comments:

WELL18DS.DAT

ALL. OBS. WELL
SH. TEST DD

SE2000
Environmental Logger
11/08 10:26

Unit# 530 Test 2

INPUT 1: Level (F) TOC

Reference	0.000
PSI at Ref.	7.413
SG	1.000
Linearity	0.000
Scale factor	20.009
Offset	0.000
Delay mSEC	50.000

Step 0 11/03 09:59:24

Elapsed Time	INPUT 1
0.0000	0.000
0.0083	0.000
0.0166	0.000
0.0250	0.000
0.0333	0.006
0.0416	0.000
0.0500	0.000
0.0583	0.000
0.0666	0.006
0.0750	0.000
0.0833	0.006
0.0916	0.000
0.1000	0.000
0.1083	0.000
0.1166	0.000
0.1250	0.000
0.1333	0.000
0.1416	0.000
0.1500	0.000
0.1583	0.000
0.1666	0.000
0.1750	0.006
0.1833	0.000
0.1916	0.006
0.2000	0.000
0.2083	0.000
0.2166	0.000
0.2250	0.006
0.2333	0.000
0.2416	0.000
0.2500	0.006
0.2583	0.000
0.2666	0.000
0.2750	0.000
0.2833	0.000
0.2916	0.000
0.3000	0.000
0.3083	0.000
0.3166	0.000

0.3250	0.006
0.3333	0.000
0.3500	0.000
0.3666	0.000
0.3833	0.000
0.4000	0.000
0.4166	0.000
0.4333	0.000
0.4500	0.000
0.4666	0.000
0.4833	0.000
0.5000	0.000
0.5166	0.000
0.5333	0.000
0.5500	0.000
0.5666	0.000
0.5833	0.000
0.6000	0.000
0.6166	0.000
0.6333	0.000
0.6500	0.006
0.6666	0.000
0.6833	0.000
0.7000	0.000
0.7166	0.000
0.7333	0.000
0.7500	0.000
0.7666	0.000
0.7833	0.000
0.8000	0.000
0.8166	0.000
0.8333	0.000
0.8500	0.000
0.8666	0.000
0.8833	0.000
0.9000	0.006
0.9166	0.000
0.9333	0.000
0.9500	0.000
0.9666	0.006
0.9833	0.006
1.0000	0.000
1.2000	0.006
1.4000	0.006
1.6000	0.006
1.8000	0.012
2.0000	0.012
2.2000	0.012
2.4000	0.018
2.6000	0.025
2.8000	0.025
3.0000	0.031
3.2000	0.037
3.4000	0.037
3.6000	0.037
3.8000	0.044
4.0000	0.050
4.2000	0.056
4.4000	0.056
4.6000	0.063

4.8000	0.069
5.0000	0.069
5.2000	0.075
5.4000	0.082
5.6000	0.088
5.8000	0.088
6.0000	0.094
6.2000	0.094
6.4000	0.101
6.6000	0.107
6.8000	0.107
7.0000	0.113
7.2000	0.113
7.4000	0.120
7.6000	0.126
7.8000	0.126
8.0000	0.132
8.2000	0.139
8.4000	0.139
8.6000	0.145
8.8000	0.145
9.0000	0.151
9.2000	0.157
9.4000	0.157
9.6000	0.164
9.8000	0.164
10.0000	0.170
12.0000	0.202
14.0000	0.233
16.0000	0.265
18.0000	0.290
20.0000	0.315
22.0000	0.334
24.0000	0.353
26.0000	0.372
28.0000	0.391
30.0000	0.404
32.0000	0.410
34.0000	0.423
36.0000	0.435
38.0000	0.448
40.0000	0.454
42.0000	0.467
44.0000	0.480
46.0000	0.486
48.0000	0.499
50.0000	0.505
52.0000	0.511
54.0000	0.518
56.0000	0.524
58.0000	0.530
60.0000	0.530
62.0000	0.543
64.0000	0.549
66.0000	0.556
68.0000	0.562
70.0000	0.562
72.0000	0.568
74.0000	0.574
76.0000	0.574

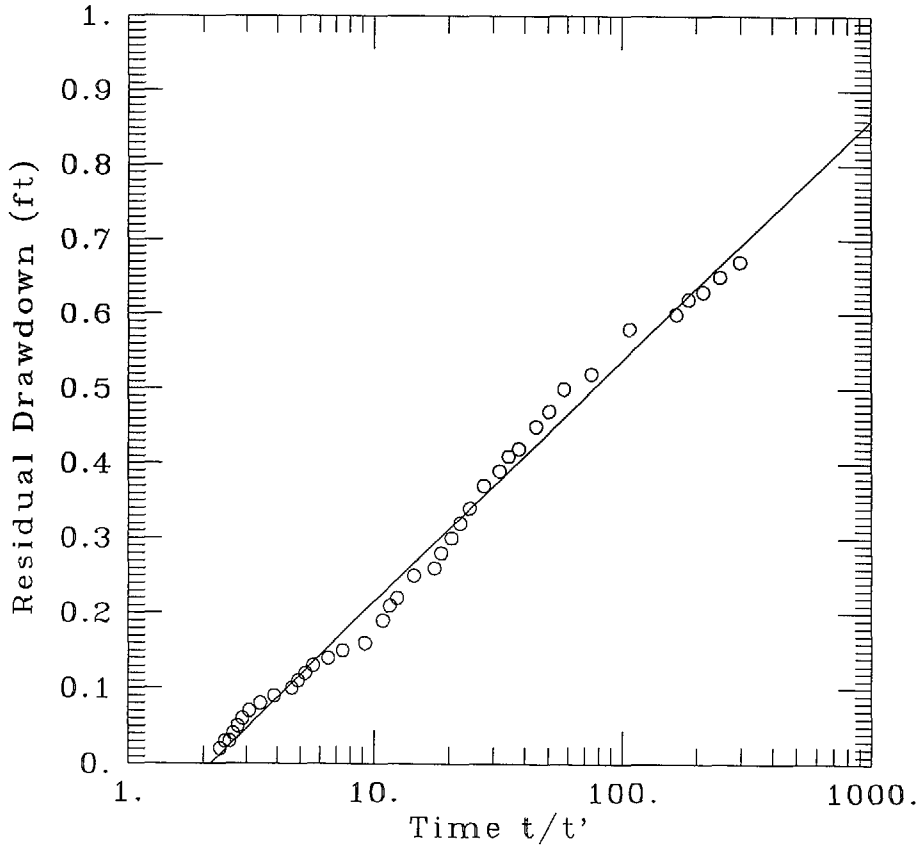
78.0000	0.581
80.0000	0.581
82.0000	0.587
84.0000	0.593
86.0000	0.593
88.0000	0.600
90.0000	0.600
92.0000	0.606
94.0000	0.612
96.0000	0.606
98.0000	0.619
100.000	0.619
110.000	0.625
120.000	0.638
130.000	0.650
140.000	0.669
150.000	0.669
160.000	0.676
170.000	0.682
180.000	0.688
190.000	0.695
200.000	0.701
210.000	0.701
220.000	0.707
230.000	0.707
240.000	0.720
250.000	0.720
260.000	0.726
270.000	0.732
280.000	0.732
290.000	0.745
300.000	0.751
310.000	0.751
320.000	0.764
330.000	0.764
340.000	0.764
350.000	0.770
360.000	0.770
370.000	0.770
380.000	0.777
390.000	0.777
400.000	0.783
410.000	0.789
420.000	0.796
430.000	0.802
440.000	0.802
450.000	0.802
460.000	0.808
470.000	0.815
480.000	0.815
490.000	0.808
500.000	0.815
510.000	0.815
520.000	0.815
530.000	0.827
540.000	0.827
550.000	0.827
560.000	0.834
570.000	0.834
580.000	0.840

590.000	0.846
600.000	0.840
610.000	0.846
620.000	0.846
630.000	0.852
640.000	0.846
650.000	0.852
660.000	0.846
670.000	0.852
680.000	0.852
690.000	0.852
700.000	0.859
710.000	0.865
720.000	0.865
730.000	0.865
740.000	0.865
750.000	0.865
760.000	0.865
770.000	0.865
780.000	0.865
790.000	0.865
800.000	0.871
810.000	0.871
820.000	0.865
830.000	0.871
840.000	0.871
850.000	0.871
860.000	0.871
870.000	0.871
880.000	0.871
890.000	0.871
900.000	0.871
910.000	0.878
920.000	0.878
930.000	0.878
940.000	0.884
950.000	0.884
960.000	0.884
970.000	0.878
980.000	0.878
990.000	0.884
1000.00	0.884
1010.00	0.890
1020.00	0.890
1030.00	0.884
1040.00	0.884
1050.00	0.884
1060.00	0.890
1070.00	0.890
1080.00	0.897
1090.00	0.897
1100.00	0.897
1110.00	0.903
1120.00	0.903
1130.00	0.903
1140.00	0.903
1150.00	0.903
1160.00	0.903
1170.00	0.909
1180.00	0.909

1190.00	0.909
1200.00	0.909
1210.00	0.909
1220.00	0.909
1230.00	0.909
1240.00	0.909
1250.00	0.916
1260.00	0.916
1270.00	0.916
1280.00	0.916
1290.00	0.922
1300.00	0.922
1310.00	0.922
1320.00	0.928
1330.00	0.928
1340.00	0.928
1350.00	0.928
1360.00	0.928
1370.00	0.928
1380.00	0.928
1390.00	0.928
1400.00	0.928
1410.00	0.935
1420.00	0.928
1430.00	0.935
1440.00	0.935
1450.00	0.935
1460.00	0.928
1470.00	0.941
1480.00	0.935

Research Project	Client: EPA/CMG/CDH
Project No.: 94-1	Location: Breckenridge, CO.

French Gulch Hydrology - QAL Pt, 5alRec



DATA SET:
5aora.dat
11/10/94

AQUIFER TYPE:
Confined

SOLUTION METHOD:
Theis Recovery

TEST DATE:
11/2/94

TEST WELL:
18

OBS. WELL:
5

ESTIMATED PARAMETERS:
T = 1.14 ft^2/min
S' = 2.159

TEST DATA:
Q = 2.005 ft^3/min
t pumping = 1480. min

WELL 5RA.DAT

Recovery ALL. OBS. WELL-ALL PUMP TST

SE1000B
Environmental Logger
11/08 11:28

Unit# 00525 Test# 1

INPUT 2: Level (F) TOC

Reference	0.00
Scale factor	19.88
Offset	- 0.17

Step# 1 11/02 10:43

Elapsed Time	Value
0.0000	0.67
0.0033	0.67
0.0066	0.67
0.0099	0.67
0.0133	0.67
0.0166	0.67
0.0200	0.67
0.0233	0.67
0.0266	0.67
0.0300	0.67
0.0333	0.67
0.0500	0.67
0.0666	0.67
0.0833	0.67
0.1000	0.67
0.1166	0.68
0.1333	0.67
0.1500	0.67
0.1666	0.67
0.1833	0.67
0.2000	0.67
0.2166	0.67
0.2333	0.67
0.2500	0.67
0.2666	0.67
0.2833	0.67
0.3000	0.67
0.3166	0.67
0.3333	0.67
0.4167	0.67
0.5000	0.67
0.5833	0.67
0.6667	0.67
0.7500	0.67
0.8333	0.67
0.9167	0.67
1.0000	0.67
1.0833	0.67
1.1667	0.67
1.2500	0.67
1.3333	0.67
1.4166	0.67
1.5000	0.67

1.5833	0.67
1.6667	0.67
1.7500	0.67
1.8333	0.68
1.9167	0.68
2.0000	0.68
2.5000	0.67
3.0000	0.66
3.5000	0.67
4.0000	0.67
4.5000	0.67
5.0000	0.67
5.5000	0.66
6.0000	0.65
6.5000	0.64
7.0000	0.63
7.5000	0.62
8.0000	0.62
8.5000	0.61
9.0000	0.60
9.5000	0.60
10.0000	0.60
12.0000	0.62
14.0000	0.58
16.0000	0.55
18.0000	0.57
20.0000	0.52
22.0000	0.52
24.0000	0.52
26.0000	0.50
28.0000	0.48
30.0000	0.47
32.0000	0.46
34.0000	0.45
36.0000	0.44
38.0000	0.45
40.0000	0.42
42.0000	0.43
44.0000	0.41
46.0000	0.42
48.0000	0.39
50.0000	0.40
52.0000	0.40
54.0000	0.35
56.0000	0.37
58.0000	0.38
60.0000	0.37
62.0000	0.32
64.0000	0.34
66.0000	0.37
68.0000	0.32
70.0000	0.32
72.0000	0.34
74.0000	0.30
76.0000	0.30
78.0000	0.32
80.0000	0.30
82.0000	0.34
84.0000	0.28
86.0000	0.32

88.0000	0.30
90.0000	0.26
92.0000	0.29
94.0000	0.29
96.0000	0.26
98.0000	0.30
100.000	0.28
110.000	0.25
120.000	0.27
130.000	0.22
140.000	0.21
150.000	0.19
160.000	0.20
170.000	0.19
180.000	0.16
190.000	0.20
200.000	0.16
210.000	0.16
220.000	0.16
230.000	0.15
240.000	0.15
250.000	0.15
260.000	0.15
270.000	0.14
280.000	0.13
290.000	0.13
300.000	0.13
310.000	0.13
320.000	0.13
330.000	0.13
340.000	0.13
350.000	0.12
360.000	0.11
370.000	0.11
380.000	0.11
390.000	0.11
400.000	0.11
410.000	0.10
420.000	0.10
430.000	0.10
440.000	0.10
450.000	0.10
460.000	0.11
470.000	0.10
480.000	0.10
490.000	0.10
500.000	0.10
510.000	0.09
520.000	0.08
530.000	0.09
540.000	0.09
550.000	0.09
560.000	0.09
570.000	0.10
580.000	0.09
590.000	0.09
600.000	0.09
610.000	0.08
620.000	0.08
630.000	0.08

640.000	0.08
650.000	0.08
660.000	0.08
670.000	0.08
680.000	0.08
690.000	0.08
700.000	0.06
710.000	0.07
720.000	0.06
730.000	0.06
740.000	0.06
750.000	0.06
760.000	0.06
770.000	0.07
780.000	0.06
790.000	0.06
800.000	0.06
810.000	0.06
820.000	0.06
830.000	0.05
840.000	0.05
850.000	0.05
860.000	0.05
870.000	0.05
880.000	0.05
890.000	0.05
900.000	0.04
910.000	0.04
920.000	0.04
930.000	0.04
940.000	0.04
950.000	0.03
960.000	0.03
970.000	0.03
980.000	0.03
990.000	0.03
1000.00	0.03
1010.00	0.03
1020.00	0.03
1030.00	0.03
1040.00	0.03
1050.00	0.04
1060.00	0.03
1070.00	0.03
1080.00	0.03
1090.00	0.04
1100.00	0.04
1110.00	0.04
1120.00	0.04
1130.00	0.04
1140.00	0.05
1150.00	0.05
1160.00	0.05
1170.00	0.05
1180.00	0.05
1190.00	0.05
1200.00	0.05
1210.00	0.05
1220.00	0.05
1230.00	0.05

1240.00	0.05
1250.00	0.04
1260.00	0.04
1270.00	0.10
1280.00	0.38
1290.00	0.52
1300.00	0.60
1310.00	-10.94
1320.00	18.70
1330.00	18.70

WELL 1R.DAT ALLUVIUM TST

ALL. OBS. WELL - RECOVERY

SE2000
Environmental Logger
11/08 10:15

Unit# 530 Test 0

INPUT 2: Level (F) TOC

Reference	0.000
PSI at Ref.	15.129
SG	1.000
Linearity	0.000
Scale factor	20.037
Offset	0.039
Delay mSEC	50.000

Step 1 11/02 10:44:48

Elapsed Time	INPUT 2
0.0000	1.683
0.0083	1.689
0.0166	1.683
0.0250	1.689
0.0333	1.689
0.0416	1.689
0.0500	1.683
0.0583	1.689
0.0666	1.683
0.0750	1.683
0.0833	1.683
0.0916	1.683
0.1000	1.683
0.1083	1.683
0.1166	1.683
0.1250	1.683
0.1333	1.683
0.1416	1.683
0.1500	1.683
0.1583	1.683
0.1666	1.683
0.1750	1.683
0.1833	1.676
0.1916	1.683
0.2000	1.676
0.2083	1.676
0.2166	1.676
0.2250	1.676
0.2333	1.676
0.2416	1.676
0.2500	1.670
0.2583	1.670
0.2666	1.670
0.2750	1.670
0.2833	1.670
0.2916	1.670
0.3000	1.670
0.3083	1.670
0.3166	1.664

0.3250	1.664
0.3333	1.664
0.3500	1.657
0.3666	1.657
0.3833	1.657
0.4000	1.657
0.4166	1.651
0.4333	1.651
0.4500	1.651
0.4666	1.645
0.4833	1.645
0.5000	1.645
0.5166	1.645
0.5333	1.638
0.5500	1.638
0.5666	1.638
0.5833	1.638
0.6000	1.632
0.6166	1.632
0.6333	1.632
0.6500	1.626
0.6666	1.626
0.6833	1.619
0.7000	1.619
0.7166	1.619
0.7333	1.613
0.7500	1.619
0.7666	1.613
0.7833	1.613
0.8000	1.607
0.8166	1.613
0.8333	1.607
0.8500	1.607
0.8666	1.607
0.8833	1.600
0.9000	1.600
0.9166	1.600
0.9333	1.594
0.9500	1.594
0.9666	1.594
0.9833	1.594
1.0000	1.588
1.2000	1.569
1.4000	1.550
1.6000	1.531
1.8000	1.512
2.0000	1.499
2.2000	1.480
2.4000	1.461
2.6000	1.448
2.8000	1.436
3.0000	1.423
3.2000	1.410
3.4000	1.392
3.6000	1.379
3.8000	1.366
4.0000	1.354
4.2000	1.341
4.4000	1.328
4.6000	1.322

4.8000	1.309
5.0000	1.297
5.2000	1.284
5.4000	1.271
5.6000	1.265
5.8000	1.252
6.0000	1.246
6.2000	1.233
6.4000	1.221
6.6000	1.214
6.8000	1.208
7.0000	1.202
7.2000	1.189
7.4000	1.183
7.6000	1.170
7.8000	1.164
8.0000	1.157
8.2000	1.151
8.4000	1.138
8.6000	1.132
8.8000	1.126
9.0000	1.119
9.2000	1.107
9.4000	1.100
9.6000	1.094
9.8000	1.088
10.0000	1.081
12.0000	1.012
14.0000	0.955
16.0000	0.904
18.0000	0.860
20.0000	0.816
22.0000	0.784
24.0000	0.759
26.0000	0.727
28.0000	0.696
30.0000	0.670
32.0000	0.645
34.0000	0.626
36.0000	0.607
38.0000	0.582
40.0000	0.563
42.0000	0.544
44.0000	0.531
46.0000	0.518
48.0000	0.499
50.0000	0.487
52.0000	0.468
54.0000	0.455
56.0000	0.442
58.0000	0.436
60.0000	0.417
62.0000	0.404
64.0000	0.398
66.0000	0.392
68.0000	0.379
70.0000	0.373
72.0000	0.366
74.0000	0.354
76.0000	0.341

78.0000	0.335
80.0000	0.329
82.0000	0.329
84.0000	0.316
86.0000	0.316
88.0000	0.303
90.0000	0.297
92.0000	0.291
94.0000	0.291
96.0000	0.278
98.0000	0.278
100.000	0.272
110.000	0.253
120.000	0.234
130.000	0.208
140.000	0.189
150.000	0.170
160.000	0.158
170.000	0.151
180.000	0.139
190.000	0.139
200.000	0.120
210.000	0.113
220.000	0.107
230.000	0.101
240.000	0.101
250.000	0.088
260.000	0.094
270.000	0.075
280.000	0.069
290.000	0.069
300.000	0.069
310.000	0.069
320.000	0.069
330.000	0.063
340.000	0.063
350.000	0.050
360.000	0.050
370.000	0.050
380.000	0.050
390.000	0.050
400.000	0.044
410.000	0.044
420.000	0.037
430.000	0.037
440.000	0.031
450.000	0.031
460.000	0.031
470.000	0.031
480.000	0.031
490.000	0.031
500.000	0.025
510.000	0.025
520.000	0.018
530.000	0.018
540.000	0.025
550.000	0.025
560.000	0.018
570.000	0.018
580.000	0.018

590.000	0.018
600.000	0.012
610.000	0.018
620.000	0.012
630.000	0.012
640.000	0.012
650.000	0.012
660.000	0.006
670.000	0.006
680.000	0.006
690.000	0.006
700.000	0.006
710.000	0.000
720.000	-0.006
730.000	0.000
740.000	-0.006
750.000	-0.006
760.000	-0.006
770.000	0.000
780.000	0.000
790.000	-0.006
800.000	-0.012
810.000	-0.006
820.000	-0.006
830.000	-0.012
840.000	-0.012
850.000	-0.012
860.000	-0.018
870.000	-0.012
880.000	-0.012
890.000	-0.012
900.000	-0.018
910.000	-0.018
920.000	-0.018
930.000	-0.018
940.000	-0.018
950.000	-0.025
960.000	-0.025
970.000	-0.031
980.000	-0.025
990.000	-0.025
1000.00	-0.025
1010.00	-0.025
1020.00	-0.025
1030.00	-0.025
1040.00	-0.025
1050.00	-0.018
1060.00	-0.025
1070.00	-0.018
1080.00	-0.018
1090.00	-0.018
1100.00	-0.018
1110.00	-0.018
1120.00	-0.018
1130.00	-0.018
1140.00	-0.012
1150.00	-0.012
1160.00	-0.012
1170.00	-0.006
1180.00	-0.006

1190.00	-0.006
1200.00	-0.012
1210.00	-0.006
1220.00	-0.006

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - ALLUVIUM

Observation Well No.: #3 Mine Shaft	Project Name: FRENCH GULCH	Project Number:
Date: 11/2 - 11/3/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
1	10:56 AM	12.80				
2	11:06 AM	12.68				NICE & WARM IN SUN
3	11:16 AM	12.58				
4	11:27	12.51				
5	11:37	12.47				
6	11:47	12.42				
7	11:57	12.39				
8	12:07 pm	12.35				
9	12:17	12.33				
10	12:27	12.31				
↓20 11	12:47	12.27				
12	1:07	12.25				
13	1:27	12.22				
14	1:47	12.21				
15	2:07	12.20				
16	2:57	12.18				
↓50 17	3:47	12.16				
18	4:37 pm	12.15				
19						
20	7:09 AM	12.11				
21						
22						
23						
24						

Additional Comments:

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - ALLUVIUM

Observation Well No.: #3 Mine Shaft	Project Name: FRENCH GULCH	Project Number:
Date: 11/2 - 11/3/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 2 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25	~~11:01~~					
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Additional Comments:

WELL 4RA.DAT

(S4 screen pack-off)

Recovery ALL OBS well - ALL PUMP TST

SE1000B
Environmental Logger
11/08 11:23

Unit# 00525 Test# 1

INPUT 1: Level (F) TOC

Reference	0.00
Scale factor	49.96
Offset	- 0.18

Step# 1 11/02 10:43

Elapsed Time	Value
0.0000	1.16
0.0033	1.15
0.0066	1.13
0.0099	1.15
0.0133	1.18
0.0166	1.16
0.0200	1.13
0.0233	1.16
0.0266	1.18
0.0300	1.13
0.0333	1.19
0.0500	1.19
0.0666	1.18
0.0833	1.13
0.1000	1.15
0.1166	1.13
0.1333	1.13
0.1500	1.15
0.1666	1.15
0.1833	1.13
0.2000	1.15
0.2166	1.13
0.2333	1.15
0.2500	1.18
0.2666	1.18
0.2833	1.18
0.3000	1.16
0.3166	1.15
0.3333	1.15
0.4167	1.16
0.5000	1.16
0.5833	1.19
0.6667	1.16
0.7500	1.18
0.8333	1.15
0.9167	1.18
1.0000	1.16
1.0833	1.21
1.1667	1.16
1.2500	1.19
1.3333	1.19
1.4166	1.19
1.5000	1.11

1.5833	1.11
1.6667	1.13
1.7500	1.13
1.8333	1.13
1.9167	1.13
2.0000	1.13
2.5000	1.11
3.0000	1.10
3.5000	1.11
4.0000	1.13
4.5000	1.15
5.0000	1.16
5.5000	1.16
6.0000	1.16
6.5000	1.11
7.0000	1.10
7.5000	1.07
8.0000	1.05
8.5000	1.04
9.0000	1.00
9.5000	0.96
10.0000	0.93
12.0000	0.97
14.0000	0.97
16.0000	0.88
18.0000	0.86
20.0000	0.77
22.0000	0.67
24.0000	0.66
26.0000	0.64
28.0000	0.63
30.0000	0.58
32.0000	0.52
34.0000	0.48
36.0000	0.48
38.0000	0.47
40.0000	0.47
42.0000	0.48
44.0000	0.44
46.0000	0.55
48.0000	0.52
50.0000	0.48
52.0000	0.66
54.0000	0.56
56.0000	0.50
58.0000	0.52
60.0000	0.59
62.0000	0.52
64.0000	0.44
66.0000	0.50
68.0000	0.42
70.0000	0.37
72.0000	0.48
74.0000	0.48
76.0000	0.39
78.0000	0.42
80.0000	0.39
82.0000	0.56
84.0000	0.53
86.0000	0.58

88.0000	0.63
90.0000	0.59
92.0000	0.55
94.0000	0.63
96.0000	0.50
98.0000	0.56
100.000	0.67
110.000	0.45
120.000	0.58
130.000	0.31
140.000	0.28
150.000	0.26
160.000	0.50
170.000	0.55
180.000	0.36
190.000	0.39
200.000	0.33
210.000	0.47
220.000	0.45
230.000	0.41
240.000	0.41
250.000	0.36
260.000	0.34
270.000	0.33
280.000	0.28
290.000	0.04
300.000	-0.04
310.000	-0.09
320.000	-0.12
330.000	-0.14
340.000	-0.15
350.000	-0.18
360.000	-0.20
370.000	-0.31
380.000	-0.36
390.000	-0.36
400.000	-0.28
410.000	-0.33
420.000	-0.28
430.000	-0.25
440.000	-0.23
450.000	-0.23
460.000	-0.23
470.000	-0.26
480.000	-0.25
490.000	-0.26
500.000	-0.26
510.000	-0.26
520.000	-0.29
530.000	-0.31
540.000	-0.31
550.000	-0.34
560.000	-0.34
570.000	-0.37
580.000	-0.34
590.000	-0.36
600.000	-0.41
610.000	-0.41
620.000	-0.42
630.000	-0.39

640.000	-0.41
650.000	-0.47
660.000	-0.48
670.000	-0.44
680.000	-0.48
690.000	-0.50
700.000	-0.58
710.000	-0.59
720.000	-0.53
730.000	-0.52
740.000	-0.52
750.000	-0.47
760.000	-0.50
770.000	-0.53
780.000	-0.48
790.000	-0.48
800.000	-0.48
810.000	-0.50
820.000	-0.50
830.000	-0.48
840.000	-0.50
850.000	-0.52
860.000	-0.50
870.000	-0.50
880.000	-0.48
890.000	-0.52
900.000	-0.52
910.000	-0.50
920.000	-0.53
930.000	-0.52
940.000	-0.52
950.000	-0.52
960.000	-0.50
970.000	-0.50
980.000	-0.53
990.000	-0.52
1000.00	-0.55
1010.00	-0.55
1020.00	-0.55
1030.00	-0.55
1040.00	-0.56
1050.00	-0.55
1060.00	-0.55
1070.00	-0.56
1080.00	-0.58
1090.00	-0.59
1100.00	-0.63
1110.00	-0.64
1120.00	-0.64
1130.00	-0.66
1140.00	-0.64
1150.00	-0.64
1160.00	-0.66
1170.00	-0.67
1180.00	-0.67
1190.00	-0.70
1200.00	-0.77
1210.00	-0.83
1220.00	-0.82
1230.00	-0.75

1240.00	-0.82
1250.00	23.97
1260.00	24.06
1270.00	24.11
1280.00	24.35
1290.00	24.41
1300.00	24.47
1310.00	24.33
1320.00	24.27
1330.00	24.22

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - ALLUVIUM

Observation Well No.: #8 STATIC: 13.60

Project Name:

Project Number:

Date: 11/2 - 11/3/94

Recorded By:

Unit of Measurement: FEET

Distance to pumping well:

Bearing to pumping well:

Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
1	10:59 AM	14.04				
2	11:09 AM	14.02				
3	11:19 AM	14.00				
4	11:29	13.99				
5	11:39	13.98				
6	11:49	13.97				
7	11:59	13.96				
8	12:09 PM	13.95				
9	12:19	13.95				
10	12:29	13.95				
11	12:49	13.92				
12	1:09	13.91				
13	1:29	13.90				
14	2:09	13.89				
15	2:59	13.88				
16	3:49	13.87				
17	4:39 pm	13.86				
18						
19	7:15 AM	13.81				
20						
21						
22						
23						
24						

Additional Comments:

American Geological Services, Inc.
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Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - ALLUVIUM

Observation Well No.: #8	Project Name:	Project Number:
Date: 11/2 - 11/3/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Additional Comments:

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - ALLUVIUM

Observation Well No.: #13
Project Name: FRENCH GULCH
Project Number:
Date: 11/2 - 11/3/94
Recorded By: BKS/AM
Unit of Measurement: FEET
Distance to pumping well:
Bearing to pumping well:
Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
1	11:02 AM	32.31				
2	11:12 AM	32.31				
3	11:22 AM	32.30				
4	11:32 AM	32.32				
5	11:42	32.32				
6	11:52	32.31				
10 7	12:02 PM	32.31				
8	12:12	32.31				
9	12:22	32.31				
10	12:32	32.31				
4	12:52	32.31				
20 12	1:12	32.31				
13	1:32	32.31				
14	1:52	32.31				
15	2:12	32.32				
16	3:02	32.33	— DBL ✓'D	??		
17	3:52	32.325				
18	4:42 PM	32.325				
19						
20	7:19 AM	32.345				
21						
22						
23						
24						

Additional Comments:

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - ALLUVIUM

Observation Well No.: #13	Project Name: FRENCH GULCH	Project Number:
Date: 11/2 - 11/3/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 2 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Additional Comments:

Well 16R.dat - sh-obs Recovery

Alluvium Test.

BAD TRANSDUCER

SE2000
Environmental Logger
11/08 10:19

Unit# 530 Test 0

INPUT 3: Level (F) TOC

Reference	0.000
PSI at Ref.	10.580
SG	1.000
Linearity	0.050
Scale factor	9.837
Offset	0.088
Delay mSEC	50.000

Step 1 11/02 10:44:48

Elapsed Time	INPUT 3
0.0000	0.000
0.0083	0.000
0.0166	0.000
0.0250	0.000
0.0333	0.000
0.0416	0.000
0.0500	0.000
0.0583	0.000
0.0666	0.000
0.0750	0.000
0.0833	0.000
0.0916	0.000
0.1000	0.000
0.1083	0.000
0.1166	0.000
0.1250	0.000
0.1333	0.000
0.1416	0.000
0.1500	0.000
0.1583	0.000
0.1666	0.000
0.1750	0.000
0.1833	0.000
0.1916	0.000
0.2000	0.000
0.2083	0.000
0.2166	0.000
0.2250	0.000
0.2333	0.000
0.2416	0.000
0.2500	0.000
0.2583	0.000
0.2666	0.000
0.2750	0.000
0.2833	0.000
0.2916	0.000
0.3000	0.000
0.3083	0.000
0.3166	0.000

0.3250	0.000
0.3333	0.000
0.3500	0.000
0.3666	0.000
0.3833	0.000
0.4000	0.000
0.4166	0.000
0.4333	0.000
0.4500	0.000
0.4666	0.000
0.4833	0.000
0.5000	0.000
0.5166	0.000
0.5333	0.000
0.5500	0.000
0.5666	0.000
0.5833	0.000
0.6000	0.000
0.6166	0.000
0.6333	0.000
0.6500	0.000
0.6666	0.000
0.6833	0.000
0.7000	0.000
0.7166	0.000
0.7333	0.000
0.7500	0.000
0.7666	0.000
0.7833	0.000
0.8000	0.000
0.8166	0.000
0.8333	0.000
0.8500	0.000
0.8666	0.000
0.8833	0.000
0.9000	0.000
0.9166	0.000
0.9333	0.000
0.9500	0.000
0.9666	0.000
0.9833	0.000
1.0000	0.000
1.2000	0.000
1.4000	0.000
1.6000	0.000
1.8000	0.000
2.0000	0.000
2.2000	0.000
2.4000	0.000
2.6000	0.000
2.8000	0.000
3.0000	0.000
3.2000	0.000
3.4000	0.000
3.6000	0.000
3.8000	0.000
4.0000	0.000
4.2000	0.000
4.4000	0.000
4.6000	0.000

4.8000	0.000
5.0000	0.000
5.2000	0.000
5.4000	0.000
5.6000	0.000
5.8000	0.000
6.0000	0.000
6.2000	0.000
6.4000	0.000
6.6000	0.000
6.8000	0.000
7.0000	0.000
7.2000	0.000
7.4000	0.000
7.6000	0.000
7.8000	0.000
8.0000	0.000
8.2000	0.000
8.4000	0.000
8.6000	0.000
8.8000	0.000
9.0000	0.000
9.2000	0.000
9.4000	0.000
9.6000	0.000
9.8000	0.000
10.0000	0.000
12.0000	0.000
14.0000	0.000
16.0000	0.000
18.0000	0.000
20.0000	0.000
22.0000	0.000
24.0000	0.000
26.0000	0.000
28.0000	0.000
30.0000	0.000
32.0000	0.000
34.0000	0.000
36.0000	0.000
38.0000	0.000
40.0000	0.000
42.0000	0.000
44.0000	0.000
46.0000	0.000
48.0000	0.000
50.0000	0.000
52.0000	0.000
54.0000	0.000
56.0000	0.000
58.0000	0.000
60.0000	0.000
62.0000	0.000
64.0000	0.000
66.0000	0.000
68.0000	0.000
70.0000	0.000
72.0000	0.000
74.0000	0.000
76.0000	0.000

78.0000	0.000
80.0000	0.000
82.0000	0.000
84.0000	0.000
86.0000	0.000
88.0000	0.000
90.0000	0.000
92.0000	0.000
94.0000	0.000
96.0000	0.000
98.0000	0.000
100.000	0.000
110.000	0.000
120.000	0.000
130.000	0.000
140.000	0.000
150.000	0.000
160.000	0.000
170.000	0.000
180.000	0.000
190.000	0.000
200.000	0.000
210.000	0.000
220.000	0.000
230.000	0.000
240.000	0.000
250.000	0.000
260.000	0.000
270.000	0.000
280.000	0.000
290.000	0.000
300.000	0.000
310.000	0.000
320.000	0.000
330.000	0.000
340.000	0.000
350.000	0.000
360.000	0.000
370.000	0.000
380.000	0.000
390.000	0.000
400.000	0.000
410.000	0.000
420.000	0.000
430.000	0.000
440.000	0.000
450.000	0.000
460.000	0.000
470.000	0.000
480.000	0.000
490.000	0.000
500.000	0.000
510.000	0.000
520.000	0.000
530.000	0.000
540.000	0.000
550.000	0.000
560.000	0.000
570.000	0.000
580.000	0.000

590.000	0.000
600.000	0.000
610.000	0.000
620.000	0.000
630.000	0.000
640.000	0.000
650.000	0.000
660.000	0.000
670.000	0.000
680.000	0.000
690.000	0.000
700.000	0.000
710.000	0.000
720.000	0.000
730.000	0.000
740.000	0.000
750.000	0.000
760.000	0.000
770.000	0.000
780.000	0.000
790.000	0.000
800.000	0.000
810.000	0.000
820.000	0.000
830.000	0.000
840.000	0.000
850.000	0.000
860.000	0.000
870.000	0.000
880.000	0.000
890.000	0.000
900.000	0.000
910.000	0.000
920.000	0.000
930.000	0.000
940.000	0.000
950.000	0.000
960.000	0.000
970.000	0.000
980.000	0.000
990.000	0.000
1000.00	0.000
1010.00	0.000
1020.00	0.000
1030.00	0.000
1040.00	0.000
1050.00	0.000
1060.00	0.000
1070.00	0.000
1080.00	0.000
1090.00	0.000
1100.00	0.000
1110.00	0.000
1120.00	0.000
1130.00	0.000
1140.00	0.000
1150.00	0.000
1160.00	0.000
1170.00	0.000
1180.00	0.000

1190.00	0.000
1200.00	0.000
1210.00	0.000
1220.00	0.000

WELL17R.DAT

SH OBS. WELL - RECOVERY
ALL. PUMP TEST

SE2000
Environmental Logger
11/08 10:32

Unit# 530 Test 0

INPUT 4: Level (F) TOC

Reference	0.000
PSI at Ref.	27.484
SG	1.000
Linearity	0.000
Scale factor	49.971
Offset	-0.163
Delay mSEC	50.000

Step 1 11/02 10:44:48

Elapsed Time	INPUT 4
0.0000	1.972
0.0083	2.003
0.0166	2.035
0.0250	2.003
0.0333	2.019
0.0416	2.019
0.0500	2.035
0.0583	2.019
0.0666	2.019
0.0750	2.019
0.0833	2.019
0.0916	2.019
0.1000	2.019
0.1083	2.035
0.1166	2.035
0.1250	2.035
0.1333	2.035
0.1416	2.019
0.1500	2.019
0.1583	2.019
0.1666	2.019
0.1750	2.019
0.1833	2.035
0.1916	2.035
0.2000	2.035
0.2083	2.035
0.2166	2.035
0.2250	2.035
0.2333	2.035
0.2416	2.019
0.2500	2.019
0.2583	2.035
0.2666	2.035
0.2750	2.035
0.2833	2.035
0.2916	2.019
0.3000	2.035
0.3083	2.035
0.3166	2.019

0.3250	2.035
0.3333	2.035
0.3500	2.051
0.3666	2.051
0.3833	2.051
0.4000	2.051
0.4166	2.067
0.4333	2.051
0.4500	2.051
0.4666	2.051
0.4833	2.051
0.5000	2.051
0.5166	2.051
0.5333	2.067
0.5500	2.051
0.5666	2.035
0.5833	2.051
0.6000	2.051
0.6166	2.051
0.6333	2.051
0.6500	2.035
0.6666	2.051
0.6833	2.051
0.7000	2.051
0.7166	2.051
0.7333	2.051
0.7500	2.051
0.7666	2.051
0.7833	2.051
0.8000	2.051
0.8166	2.035
0.8333	2.051
0.8500	2.051
0.8666	2.051
0.8833	2.051
0.9000	2.035
0.9166	2.035
0.9333	2.035
0.9500	2.035
0.9666	2.035
0.9833	2.019
1.0000	2.035
1.2000	2.003
1.4000	1.988
1.6000	1.972
1.8000	1.956
2.0000	1.940
2.2000	1.925
2.4000	1.925
2.6000	1.909
2.8000	1.909
3.0000	1.909
3.2000	1.909
3.4000	1.909
3.6000	1.909
3.8000	1.893
4.0000	1.893
4.2000	1.893
4.4000	1.893
4.6000	1.877

4.8000	1.877
5.0000	1.877
5.2000	1.861
5.4000	1.846
5.6000	1.861
5.8000	1.846
6.0000	1.846
6.2000	1.830
6.4000	1.830
6.6000	1.814
6.8000	1.814
7.0000	1.814
7.2000	1.798
7.4000	1.798
7.6000	1.783
7.8000	1.783
8.0000	1.783
8.2000	1.798
8.4000	1.767
8.6000	1.767
8.8000	1.735
9.0000	1.735
9.2000	1.719
9.4000	1.719
9.6000	1.704
9.8000	1.704
10.0000	1.278
12.0000	1.230
14.0000	1.183
16.0000	1.151
18.0000	1.136
20.0000	1.088
22.0000	1.072
24.0000	1.041
26.0000	1.025
28.0000	1.009
30.0000	0.978
32.0000	0.962
34.0000	0.946
36.0000	0.930
38.0000	0.930
40.0000	0.899
42.0000	0.899
44.0000	0.883
46.0000	0.883
48.0000	0.852
50.0000	0.836
52.0000	0.852
54.0000	0.820
56.0000	0.820
58.0000	0.820
60.0000	0.804
62.0000	0.773
64.0000	0.788
66.0000	0.788
68.0000	0.757
70.0000	0.757
72.0000	0.757
74.0000	0.741
76.0000	0.725

78.0000	0.725
80.0000	0.725
82.0000	0.741
84.0000	0.710
86.0000	0.725
88.0000	0.710
90.0000	0.694
92.0000	0.694
94.0000	0.694
96.0000	0.662
98.0000	0.694
100.000	0.678
110.000	0.646
120.000	0.662
130.000	0.615
140.000	0.615
150.000	0.583
160.000	0.599
170.000	0.583
180.000	0.568
190.000	0.583
200.000	0.536
210.000	0.552
220.000	0.536
230.000	0.536
240.000	0.536
250.000	0.536
260.000	0.536
270.000	0.520
280.000	0.504
290.000	0.504
300.000	0.504
310.000	0.504
320.000	0.504
330.000	0.504
340.000	0.489
350.000	0.489
360.000	0.489
370.000	0.489
380.000	0.489
390.000	0.489
400.000	0.489
410.000	0.473
420.000	0.473
430.000	0.473
440.000	0.473
450.000	0.473
460.000	0.473
470.000	0.457
480.000	0.473
490.000	0.457
500.000	0.457
510.000	0.457
520.000	0.457
530.000	0.457
540.000	0.457
550.000	0.457
560.000	0.457
570.000	0.457
580.000	0.457

590.000	0.457
600.000	0.441
610.000	0.441
620.000	0.441
630.000	0.441
640.000	0.441
650.000	0.441
660.000	0.441
670.000	0.441
680.000	0.441
690.000	0.426
700.000	0.426
710.000	0.426
720.000	0.426
730.000	0.426
740.000	0.426
750.000	0.426
760.000	0.426
770.000	0.426
780.000	0.426
790.000	0.426
800.000	0.410
810.000	0.410
820.000	0.410
830.000	0.410
840.000	0.410
850.000	0.410
860.000	0.394
870.000	0.410
880.000	0.410
890.000	0.394
900.000	0.394
910.000	0.394
920.000	0.394
930.000	0.394
940.000	0.394
950.000	0.394
960.000	0.394
970.000	0.394
980.000	0.394
990.000	0.394
1000.00	0.394
1010.00	0.394
1020.00	0.394
1030.00	0.394
1040.00	0.394
1050.00	0.394
1060.00	0.394
1070.00	0.394
1080.00	0.394
1090.00	0.394
1100.00	0.394
1110.00	0.394
1120.00	0.394
1130.00	0.394
1140.00	0.394
1150.00	0.394
1160.00	0.410
1170.00	0.394
1180.00	0.410

1190.00	0.410
1200.00	0.394
1210.00	0.410
1220.00	0.410

WELL 18R.DAT ALLUVIUM TST

ALL. PUMP WELL - RECOVERY

SE2000
Environmental Logger
11/08 10:11

Unit# 530 Test 0

INPUT 1: Level (F) TOC

Reference	0.000
PSI at Ref.	7.438
SG	1.000
Linearity	0.000
Scale factor	20.009
Offset	0.000
Delay mSEC	50.000

Step 1 11/02 10:44:48

Elapsed Time	INPUT 1
0.0000	8.137
0.0083	7.992
0.0166	7.885
0.0250	7.777
0.0333	7.695
0.0416	7.600
0.0500	7.518
0.0583	7.436
0.0666	7.360
0.0750	7.291
0.0833	7.221
0.0916	7.158
0.1000	7.095
0.1083	7.032
0.1166	6.975
0.1250	6.918
0.1333	6.867
0.1416	6.817
0.1500	6.766
0.1583	6.722
0.1666	6.672
0.1750	6.634
0.1833	6.589
0.1916	6.552
0.2000	6.514
0.2083	6.476
0.2166	6.444
0.2250	6.413
0.2333	6.381
0.2416	6.349
0.2500	6.318
0.2583	6.292
0.2666	6.267
0.2750	6.242
0.2833	6.217
0.2916	6.191
0.3000	6.172
0.3083	6.147
0.3166	6.135

0.3250	6.109
0.3333	6.097
0.3500	6.065
0.3666	6.027
0.3833	5.996
0.4000	5.964
0.4166	5.926
0.4333	5.894
0.4500	5.863
0.4666	5.831
0.4833	5.800
0.5000	5.768
0.5166	5.736
0.5333	5.705
0.5500	5.673
0.5666	5.648
0.5833	5.623
0.6000	5.591
0.6166	5.566
0.6333	5.541
0.6500	5.509
0.6666	5.484
0.6833	5.458
0.7000	5.433
0.7166	5.414
0.7333	5.389
0.7500	5.364
0.7666	5.338
0.7833	5.319
0.8000	5.294
0.8166	5.275
0.8333	5.250
0.8500	5.231
0.8666	5.212
0.8833	5.187
0.9000	5.168
0.9166	5.149
0.9333	5.124
0.9500	5.111
0.9666	5.086
0.9833	5.067
1.0000	5.048
1.2000	4.846
1.4000	4.662
1.6000	4.504
1.8000	4.365
2.0000	4.239
2.2000	4.119
2.4000	4.012
2.6000	3.910
2.8000	3.822
3.0000	3.734
3.2000	3.658
3.4000	3.582
3.6000	3.506
3.8000	3.443
4.0000	3.373
4.2000	3.323
4.4000	3.253
4.6000	3.197

4.8000	3.146
5.0000	3.095
5.2000	3.045
5.4000	2.994
5.6000	2.950
5.8000	2.906
6.0000	2.862
6.2000	2.824
6.4000	2.780
6.6000	2.742
6.8000	2.697
7.0000	2.666
7.2000	2.628
7.4000	2.596
7.6000	2.565
7.8000	2.533
8.0000	2.502
8.2000	2.470
8.4000	2.438
8.6000	2.413
8.8000	2.381
9.0000	2.356
9.2000	2.331
9.4000	2.306
9.6000	2.280
9.8000	2.255
10.0000	2.236
12.0000	2.034
14.0000	1.857
16.0000	1.712
18.0000	1.598
20.0000	1.484
22.0000	1.402
24.0000	1.326
26.0000	1.257
28.0000	1.194
30.0000	1.137
32.0000	1.086
34.0000	1.042
36.0000	1.004
38.0000	0.966
40.0000	0.928
42.0000	0.897
44.0000	0.859
46.0000	0.846
48.0000	0.815
50.0000	0.783
52.0000	0.770
54.0000	0.732
56.0000	0.707
58.0000	0.701
60.0000	0.676
62.0000	0.650
64.0000	0.638
66.0000	0.631
68.0000	0.600
70.0000	0.587
72.0000	0.587
74.0000	0.562
76.0000	0.543

78.0000	0.537
80.0000	0.524
82.0000	0.530
84.0000	0.505
86.0000	0.505
88.0000	0.486
90.0000	0.467
92.0000	0.461
94.0000	0.461
96.0000	0.435
98.0000	0.442
100.000	0.435
110.000	0.391
120.000	0.379
130.000	0.328
140.000	0.309
150.000	0.278
160.000	0.271
170.000	0.252
180.000	0.227
190.000	0.233
200.000	0.202
210.000	0.195
220.000	0.189
230.000	0.176
240.000	0.170
250.000	0.157
260.000	0.151
270.000	0.145
280.000	0.132
290.000	0.126
300.000	0.126
310.000	0.120
320.000	0.120
330.000	0.107
340.000	0.107
350.000	0.101
360.000	0.094
370.000	0.094
380.000	0.094
390.000	0.082
400.000	0.088
410.000	0.082
420.000	0.075
430.000	0.069
440.000	0.069
450.000	0.069
460.000	0.069
470.000	0.063
480.000	0.063
490.000	0.056
500.000	0.056
510.000	0.050
520.000	0.050
530.000	0.044
540.000	0.050
550.000	0.050
560.000	0.044
570.000	0.044
580.000	0.044

590.000	0.044
600.000	0.037
610.000	0.037
620.000	0.037
630.000	0.031
640.000	0.031
650.000	0.031
660.000	0.031
670.000	0.031
680.000	0.025
690.000	0.025
700.000	0.025
710.000	0.018
720.000	0.012
730.000	0.018
740.000	0.012
750.000	0.012
760.000	0.012
770.000	0.012
780.000	0.012
790.000	0.012
800.000	0.006
810.000	0.000
820.000	0.006
830.000	0.000
840.000	0.000
850.000	-0.006
860.000	-0.006
870.000	0.000
880.000	0.000
890.000	-0.006
900.000	-0.012
910.000	-0.012
920.000	-0.006
930.000	-0.006
940.000	-0.012
950.000	-0.012
960.000	-0.018
970.000	-0.018
980.000	-0.018
990.000	-0.012
1000.00	-0.018
1010.00	-0.018
1020.00	-0.018
1030.00	-0.025
1040.00	-0.018
1050.00	-0.012
1060.00	-0.018
1070.00	-0.012
1080.00	-0.012
1090.00	-0.006
1100.00	-0.012
1110.00	-0.012
1120.00	-0.012
1130.00	-0.012
1140.00	-0.006
1150.00	-0.006
1160.00	0.000
1170.00	-0.006
1180.00	0.000

1190.00	0.000
1200.00	-0.006
1210.00	-0.006
1220.00	0.000

WELL1RS.DAT

RECOVERY ALL OBS. WELL
SH PUMP TEST

SE2000
Environmental Logger
11/08 10:53

Unit# 530 Test 2

INPUT 2: Level (F) TOC

Reference	0.000
PSI at Ref.	15.110
SG	1.000
Linearity	0.000
Scale factor	20.037
Offset	0.039
Delay mSEC	50.000

Step 1 11/04 10:47:02

Elapsed Time	INPUT 2
0.0000	1.145
0.0083	1.145
0.0166	1.145
0.0250	1.145
0.0333	1.151
0.0416	1.145
0.0500	1.145
0.0583	1.151
0.0666	1.145
0.0750	1.151
0.0833	1.151
0.0916	1.145
0.1000	1.151
0.1083	1.151
0.1166	1.145
0.1250	1.145
0.1333	1.145
0.1416	1.145
0.1500	1.145
0.1583	1.145
0.1666	1.145
0.1750	1.145
0.1833	1.145
0.1916	1.145
0.2000	1.145
0.2083	1.151
0.2166	1.145
0.2250	1.145
0.2333	1.145
0.2416	1.145
0.2500	1.145
0.2583	1.145
0.2666	1.145
0.2750	1.145
0.2833	1.145
0.2916	1.145
0.3000	1.145
0.3083	1.145
0.3166	1.145

0.3250	1.145
0.3333	1.145
0.3500	1.145
0.3666	1.145
0.3833	1.145
0.4000	1.145
0.4166	1.145
0.4333	1.145
0.4500	1.138
0.4666	1.145
0.4833	1.138
0.5000	1.138
0.5166	1.138
0.5333	1.138
0.5500	1.138
0.5666	1.138
0.5833	1.138
0.6000	1.138
0.6166	1.132
0.6333	1.138
0.6500	1.132
0.6666	1.132
0.6833	1.138
0.7000	1.132
0.7166	1.132
0.7333	1.132
0.7500	1.132
0.7666	1.132
0.7833	1.132
0.8000	1.126
0.8166	1.126
0.8333	1.126
0.8500	1.126
0.8666	1.126
0.8833	1.126
0.9000	1.126
0.9166	1.119
0.9333	1.119
0.9500	1.119
0.9666	1.119
0.9833	1.119
1.0000	1.119
1.2000	1.107
1.4000	1.094
1.6000	1.081
1.8000	1.069
2.0000	1.056
2.2000	1.037
2.4000	1.025
2.6000	1.012
2.8000	0.993
3.0000	0.980
3.2000	0.968
3.4000	0.955
3.6000	0.942
3.8000	0.930
4.0000	0.911
4.2000	0.904
4.4000	0.892
4.6000	0.879

4.8000	0.873
5.0000	0.860
5.2000	0.854
5.4000	0.841
5.6000	0.835
5.8000	0.828
6.0000	0.816
6.2000	0.809
6.4000	0.803
6.6000	0.797
6.8000	0.790
7.0000	0.784
7.2000	0.778
7.4000	0.771
7.6000	0.765
7.8000	0.759
8.0000	0.752
8.2000	0.746
8.4000	0.740
8.6000	0.740
8.8000	0.733
9.0000	0.727
9.2000	0.721
9.4000	0.714
9.6000	0.714
9.8000	0.708
10.0000	0.702
12.0000	0.658
14.0000	0.620
16.0000	0.588
18.0000	0.563
20.0000	0.537
22.0000	0.518
24.0000	0.499
26.0000	0.480
28.0000	0.468
30.0000	0.455
32.0000	0.436
34.0000	0.423
36.0000	0.411
38.0000	0.398
40.0000	0.392
42.0000	0.385
44.0000	0.373
46.0000	0.360
48.0000	0.354
50.0000	0.354
52.0000	0.348
54.0000	0.341
56.0000	0.329
58.0000	0.329
60.0000	0.316
62.0000	0.316
64.0000	0.310
66.0000	0.303
68.0000	0.297
70.0000	0.297
72.0000	0.291
74.0000	0.291
76.0000	0.278

78.0000	0.278
80.0000	0.272
82.0000	0.272
84.0000	0.265
86.0000	0.265
88.0000	0.265
90.0000	0.253
92.0000	0.253
94.0000	0.246
96.0000	0.240
98.0000	0.240
100.000	0.240
110.000	0.221
120.000	0.208
130.000	0.202
140.000	0.196
150.000	0.183
160.000	0.177
170.000	0.170
180.000	0.164
190.000	0.164
200.000	0.151
210.000	0.151
220.000	0.151
230.000	0.145
240.000	0.145
250.000	0.139
260.000	0.139
270.000	0.132
280.000	0.132
290.000	0.126
300.000	0.132
310.000	0.126
320.000	0.126
330.000	0.126

MINE 3RS.DAT

RECOVERY MINE OBS. WELL

SH. PUMP TST

BAD TRANSDUCER @ 320

SE1000B
Environmental Logger
11/08 11:37

Unit# 00525 Test# 2

INPUT 1: Level (F) TOC

Reference	0.00
Scale factor	49.96
Offset	- 0.18

Step# 1 11/04 10:45

Elapsed Time	Value
0.0000	0.31
0.0033	0.31
0.0066	0.31
0.0099	0.31
0.0133	0.31
0.0166	0.31
0.0200	0.31
0.0233	0.31
0.0266	0.31
0.0300	0.31
0.0333	0.31
0.0500	0.31
0.0666	0.31
0.0833	0.31
0.1000	0.31
0.1166	0.31
0.1333	0.31
0.1500	0.31
0.1666	0.31
0.1833	0.31
0.2000	0.31
0.2166	0.31
0.2333	0.31
0.2500	0.31
0.2666	0.29
0.2833	0.29
0.3000	0.29
0.3166	0.29
0.3333	0.29
0.4167	0.29
0.5000	0.29
0.5833	0.29
0.6667	0.29
0.7500	0.29
0.8333	0.29
0.9167	0.29
1.0000	0.29
1.0833	0.29
1.1667	0.29
1.2500	0.29
1.3333	0.29
1.4166	0.29
1.5000	0.31

1.5833	0.31
1.6667	0.31
1.7500	0.31
1.8333	0.33
1.9167	0.33
2.0000	0.33
2.5000	0.33
3.0000	0.33
3.5000	0.33
4.0000	0.29
4.5000	0.26
5.0000	0.25
5.5000	0.22
6.0000	0.18
6.5000	0.17
7.0000	0.15
7.5000	0.15
8.0000	0.14
8.5000	0.14
9.0000	0.14
9.5000	0.14
10.0000	0.14
12.0000	0.09
14.0000	0.15
16.0000	0.09
18.0000	0.07
20.0000	0.11
22.0000	0.09
24.0000	0.09
26.0000	0.03
28.0000	0.00
30.0000	0.03
32.0000	0.01
34.0000	0.04
36.0000	0.03
38.0000	0.00
40.0000	-0.04
42.0000	-0.01
44.0000	0.07
46.0000	0.06
48.0000	-0.06
50.0000	-0.04
52.0000	0.06
54.0000	0.07
56.0000	-0.01
58.0000	0.04
60.0000	0.00
62.0000	0.06
64.0000	0.04
66.0000	0.03
68.0000	0.06
70.0000	-0.01
72.0000	-0.04
74.0000	-0.09
76.0000	0.04
78.0000	0.03
80.0000	0.00
82.0000	-0.06
84.0000	-0.12
86.0000	-0.01

88.0000	-0.09
90.0000	-0.11
92.0000	-0.11
94.0000	-0.12
96.0000	-0.17
98.0000	-0.15
100.000	-0.06
110.000	-0.03
120.000	0.00
130.000	0.00
140.000	0.04
150.000	0.06
160.000	0.01
170.000	0.01
180.000	0.00
190.000	0.01
200.000	0.00
210.000	-0.09
220.000	-0.11
230.000	-0.17
240.000	-0.18
250.000	-0.23
260.000	-0.28
270.000	-0.33
280.000	-0.33
290.000	-0.37
300.000	-0.39
310.000	-0.42
320.000	18.95
330.000	18.95
340.000	18.95
350.000	18.95
360.000	18.95
370.000	18.95
380.000	18.95
390.000	18.95
400.000	18.95
410.000	18.95
420.000	18.95
430.000	18.95
440.000	18.95
450.000	18.95
460.000	18.95
470.000	18.95
480.000	18.95
490.000	18.95
500.000	18.95
510.000	18.95
520.000	18.95
530.000	18.95
540.000	18.95
550.000	18.95
560.000	18.95
570.000	18.95
580.000	18.95
590.000	18.95
600.000	18.95
610.000	18.95
620.000	18.95
630.000	18.95

SH PUMP TST #4 Lower Sh (screen)

Recovery

Time (mins)	Δ s (ft)
0	1.02
2	0.94
10	0.63
20	0.46
30	0.34
40	0.34
50	0.34
60	0.30
70	0.30
80	0.30
90	0.25
100	0.21
120	0.13
140	0.13
160	0.13
180	0.13
200	0.13
250	0.13

Pump off 10:48 am

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST-SHALE

Observation Well No.: WELL NO 4 ~~[illegible]~~	Project Name: FRENCH GULCH	Project Number:
Date: 11/4/94 - 11/5/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 1 of 2

	Time	Water Depth * from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
1	10:50	14.52				
2	10:58	14.21				
3	11:08	14.04				
4	11:18	13.92				
5	11:28	13.92				
6	11:38	13.92				
7	11:48	13.88				
8	11:58	13.88				
9	12:08	13.88				
10	12:18	13.83				
11	12:28	13.79				
12	12:48	13.71				
13	1:08	13.71				
14	1:28	13.71				
15	1:48	13.71				
16	2:08	13.71				
17	2:58	13.71				
18	3:48					
19						
20						
21						
22						
23						
24						

8690 nce

Additional Comments:

~ 1' stand-up pump above csg - not corrected

static -13.58
.94 DD

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - SHALE

Observation Well No.: #3 Mine Shaft	Project Name: FRENCH GULCH	Project Number:
Date: 11/4 - 11/5/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 2 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Additional Comments:

SHALE PUMP TEST #5 Qal Well

Rec. Time (mins)	Δs (ft)
0	0.90
10	0.70
24	0.48
33	0.42
49	0.35
59	0.32
75	0.28
86	0.27
96	0.24
106	0.23
126	0.21
144	0.19
163	0.17
182	0.16
202	0.15
252	0.13
302	0.12

13.85 = STATIC

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - SHALE

Observation Well No.: #8	Project Name: FRENCH GULCH	Project Number:
Date: 11/3 - 11/4/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
1	10:48	PUMP	OFF			
2	11:00	14.31				
3	11:10	14.28				
4	11:24	14.27				
5	11:34	14.25				
6	11:50	14.22				
7	12:00	14.22				
8	12:11	14.21				
9	12:21	14.21				
10	12:31	14.21				
11	12:55	14.21				
12	1:15	14.19				
13	1:35	14.18				
14	1:55	14.175				
15	2:15	14.17				
16	3:04	14.17				
17	3:54	14.17				
18						
19						
20						
21						
22						
23						
24						

Auto Rec.

Additional Comments:

.45 - .5 ~ DD
.32 ~ 64°

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - SHALE

Observation Well No.: #8	Project Name: FRENCH GULCH	Project Number:
Date: 11/3 - 11/4/84	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 2 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Additional Comments:

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - SHALE

Observation Well No.: #13

Project Name: FRENCH GULCH

Project Number:

Date: 11/4 - 11/5/94

Recorded By:

Unit of Measurement: FEET

Distance to pumping well:

Bearing to pumping well:

Page 1 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring instrument	Notes
1	10:58	32.47				
2	11:08	32.47				
3	11:18	32.47				
4	11:28	32.45				
5	11:38	do				
6	11:48	do				
7	11:58	do				
8	12:08	do				
9	12:18	do				
10	12:28	do				
11	12:58	32.45				
12	1:08	32.45				
13	1:38	"				
14	1:58	"				
15	2:18	"				
16	3:08	32.46				
17	3:58	32.46				
18						
19						
20						
21						
22						
23						
24						

Additional Comments:

American Geological Services, Inc.
13701 West Jewell Ave., Suite 263
Lakewood, CO 80228
Tel.: (303) 988-1845

OBSERVATION WELL DATA FORM

RECOVERY TEST - SHALE

Observation Well No.: #13	Project Name: FRENCH GULCH	Project Number:
Date: 11/4/94 - 11/5/94	Recorded By:	Unit of Measurement: FEET
Distance to pumping well:	Bearing to pumping well:	Page 2 of 2

	Time	Water Depth from casing	Water Depth from surface	Water Elevation	Measuring Instrument	Notes
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Additional Comments:

Well 17BS.dat SH PW well

~~Alluvium~~ Test Recy.

SHALE

SE2000
Environmental Logger
11/08 10:22

Unit# 530 Test 2

INPUT 4: Level (F) TOC

Reference	0.000
PSI at Ref.	27.463
SG	1.000
Linearity	0.000
Scale factor	49.971
Offset	-0.163
Delay mSEC	50.000

Step 1 11/04 10:47:02

Elapsed Time	INPUT 4
0.0000	15.416
0.0083	15.416
0.0166	15.416
0.0250	14.406
0.0333	14.501
0.0416	14.927
0.0500	14.943
0.0583	14.627
0.0666	14.296
0.0750	14.059
0.0833	13.901
0.0916	13.743
0.1000	13.570
0.1083	13.380
0.1166	13.207
0.1250	13.049
0.1333	12.891
0.1416	12.733
0.1500	12.591
0.1583	12.449
0.1666	12.307
0.1750	12.165
0.1833	12.023
0.1916	11.897
0.2000	11.771
0.2083	11.645
0.2166	11.518
0.2250	11.408
0.2333	11.298
0.2416	11.187
0.2500	11.077
0.2583	10.966
0.2666	10.871
0.2750	10.777
0.2833	10.682
0.2916	10.587
0.3000	10.493
0.3083	10.414
0.3166	10.335

0.3250	10.240
0.3333	10.161
0.3500	10.019
0.3666	9.877
0.3833	9.751
0.4000	9.625
0.4166	9.499
0.4333	9.372
0.4500	9.262
0.4666	9.136
0.4833	9.025
0.5000	8.915
0.5166	8.789
0.5333	8.694
0.5500	8.583
0.5666	8.473
0.5833	8.363
0.6000	8.268
0.6166	8.157
0.6333	8.063
0.6500	7.968
0.6666	7.873
0.6833	7.779
0.7000	7.684
0.7166	7.605
0.7333	7.510
0.7500	7.416
0.7666	7.337
0.7833	7.258
0.8000	7.179
0.8166	7.100
0.8333	7.006
0.8500	6.927
0.8666	6.864
0.8833	6.785
0.9000	6.706
0.9166	6.643
0.9333	6.564
0.9500	6.501
0.9666	6.422
0.9833	6.359
1.0000	6.295
1.2000	5.506
1.4000	4.891
1.6000	4.370
1.8000	3.929
2.0000	3.550
2.2000	3.218
2.4000	2.934
2.6000	2.698
2.8000	2.493
3.0000	2.319
3.2000	2.161
3.4000	2.035
3.6000	1.909
3.8000	1.814
4.0000	1.719
4.2000	1.641
4.4000	1.577
4.6000	1.530

4.8000	1.467
5.0000	1.420
5.2000	1.372
5.4000	1.341
5.6000	1.293
5.8000	1.262
6.0000	1.230
6.2000	1.199
6.4000	1.183
6.6000	1.151
6.8000	1.136
7.0000	1.104
7.2000	1.088
7.4000	1.072
7.6000	1.057
7.8000	1.041
8.0000	1.025
8.2000	1.009
8.4000	0.994
8.6000	0.978
8.8000	0.962
9.0000	0.946
9.2000	0.946
9.4000	0.930
9.6000	0.915
9.8000	0.899
10.0000	0.899
12.0000	0.804
14.0000	0.741
16.0000	0.678
18.0000	0.631
20.0000	0.599
22.0000	0.568
24.0000	0.552
26.0000	0.520
28.0000	0.504
30.0000	0.489
32.0000	0.473
34.0000	0.457
36.0000	0.441
38.0000	0.426
40.0000	0.410
42.0000	0.410
44.0000	0.394
46.0000	0.378
48.0000	0.378
50.0000	0.362
52.0000	0.378
54.0000	0.362
56.0000	0.347
58.0000	0.362
60.0000	0.331
62.0000	0.331
64.0000	0.315
66.0000	0.315
68.0000	0.315
70.0000	0.299
72.0000	0.299
74.0000	0.299
76.0000	0.299

78.0000	0.299
80.0000	0.284
82.0000	0.284
84.0000	0.268
86.0000	0.284
88.0000	0.268
90.0000	0.252
92.0000	0.268
94.0000	0.252
96.0000	0.252
98.0000	0.236
100.000	0.252
110.000	0.220
120.000	0.220
130.000	0.205
140.000	0.205
150.000	0.189
160.000	0.173
170.000	0.189
180.000	0.173
190.000	0.173
200.000	0.157
210.000	0.157
220.000	0.157
230.000	0.142
240.000	0.157
250.000	0.142
260.000	0.142
270.000	0.142
280.000	0.142
290.000	0.126
300.000	0.126
310.000	0.126
320.000	0.126
330.000	0.126

WELL18RS.DAT

RECOVERY ALL OBS WELL
SH PUMP TST

SE2000
Environmental Logger
11/08 10:49

Unit# 530 Test 2

INPUT 1: Level (F) TOC

Reference	0.000
PSI at Ref.	7.413
SG	1.000
Linearity	0.000
Scale factor	20.009
Offset	0.000
Delay mSEC	50.000

Step 1 11/04 10:47:02

Elapsed Time	INPUT 1
0.0000	0.928
0.0083	0.928
0.0166	0.928
0.0250	0.928
0.0333	0.928
0.0416	0.928
0.0500	0.928
0.0583	0.928
0.0666	0.928
0.0750	0.928
0.0833	0.928
0.0916	0.928
0.1000	0.928
0.1083	0.928
0.1166	0.928
0.1250	0.928
0.1333	0.928
0.1416	0.928
0.1500	0.928
0.1583	0.928
0.1666	0.928
0.1750	0.928
0.1833	0.928
0.1916	0.928
0.2000	0.928
0.2083	0.928
0.2166	0.928
0.2250	0.928
0.2333	0.928
0.2416	0.928
0.2500	0.928
0.2583	0.928
0.2666	0.928
0.2750	0.928
0.2833	0.928
0.2916	0.928
0.3000	0.928
0.3083	0.928
0.3166	0.928

0.3250	0.928
0.3333	0.928
0.3500	0.928
0.3666	0.928
0.3833	0.928
0.4000	0.928
0.4166	0.928
0.4333	0.928
0.4500	0.928
0.4666	0.928
0.4833	0.928
0.5000	0.928
0.5166	0.928
0.5333	0.928
0.5500	0.928
0.5666	0.928
0.5833	0.928
0.6000	0.928
0.6166	0.928
0.6333	0.928
0.6500	0.928
0.6666	0.928
0.6833	0.928
0.7000	0.928
0.7166	0.928
0.7333	0.928
0.7500	0.928
0.7666	0.928
0.7833	0.928
0.8000	0.928
0.8166	0.928
0.8333	0.928
0.8500	0.928
0.8666	0.928
0.8833	0.928
0.9000	0.928
0.9166	0.928
0.9333	0.928
0.9500	0.928
0.9666	0.928
0.9833	0.928
1.0000	0.928
1.2000	0.928
1.4000	0.928
1.6000	0.928
1.8000	0.928
2.0000	0.928
2.2000	0.928
2.4000	0.922
2.6000	0.922
2.8000	0.916
3.0000	0.909
3.2000	0.909
3.4000	0.903
3.6000	0.903
3.8000	0.897
4.0000	0.890
4.2000	0.884
4.4000	0.878
4.6000	0.871

4.8000	0.865
5.0000	0.865
5.2000	0.859
5.4000	0.852
5.6000	0.852
5.8000	0.846
6.0000	0.840
6.2000	0.834
6.4000	0.834
6.6000	0.827
6.8000	0.821
7.0000	0.821
7.2000	0.815
7.4000	0.808
7.6000	0.808
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8.2000	0.796
8.4000	0.789
8.6000	0.789
8.8000	0.783
9.0000	0.783
9.2000	0.777
9.4000	0.770
9.6000	0.770
9.8000	0.764
10.0000	0.758
12.0000	0.726
14.0000	0.695
16.0000	0.663
18.0000	0.638
20.0000	0.612
22.0000	0.587
24.0000	0.568
26.0000	0.543
28.0000	0.524
30.0000	0.511
32.0000	0.499
34.0000	0.480
36.0000	0.467
38.0000	0.454
40.0000	0.442
42.0000	0.435
44.0000	0.423
46.0000	0.410
48.0000	0.398
50.0000	0.391
52.0000	0.385
54.0000	0.379
56.0000	0.366
58.0000	0.366
60.0000	0.353
62.0000	0.353
64.0000	0.347
66.0000	0.334
68.0000	0.328
70.0000	0.322
72.0000	0.322
74.0000	0.309
76.0000	0.309

78.0000	0.303
80.0000	0.296
82.0000	0.290
84.0000	0.284
86.0000	0.284
88.0000	0.278
90.0000	0.271
92.0000	0.271
94.0000	0.265
96.0000	0.259
98.0000	0.259
100.000	0.259
110.000	0.233
120.000	0.221
130.000	0.208
140.000	0.202
150.000	0.195
160.000	0.183
170.000	0.183
180.000	0.170
190.000	0.170
200.000	0.157
210.000	0.151
220.000	0.145
230.000	0.145
240.000	0.145
250.000	0.139
260.000	0.132
270.000	0.132
280.000	0.132
290.000	0.126
300.000	0.126
310.000	0.120
320.000	0.120
330.000	0.126

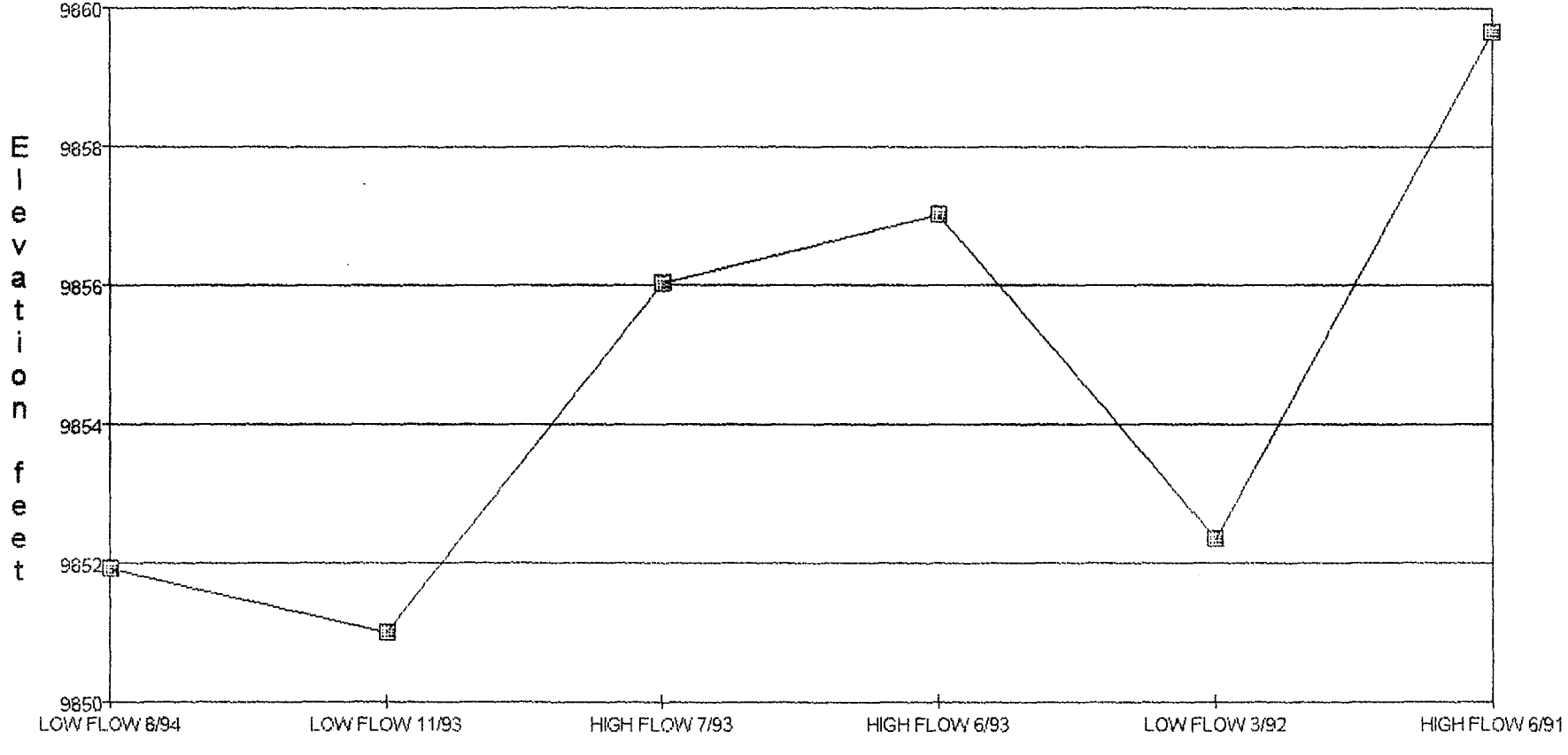
APPENDIX
G

STATIC GROUND-WATER LEVELS VERSUS TIME

FRENCH GULCH MONITORING WELLS

#2
#3
#4
#5
#6
#8
#3 MINE RELIEF WELL & #1

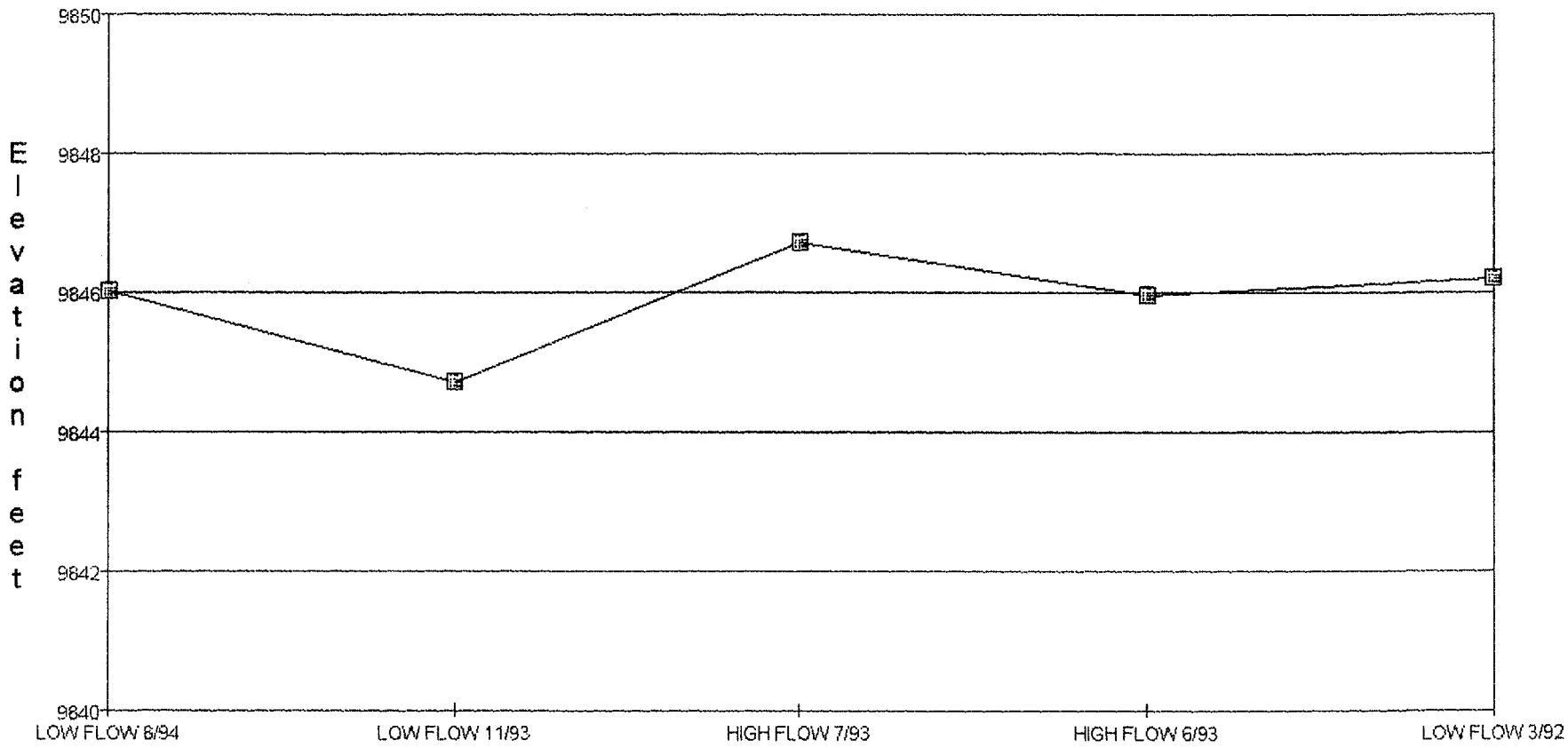
French Gulch Well #2



STATIC WATER LEVELS

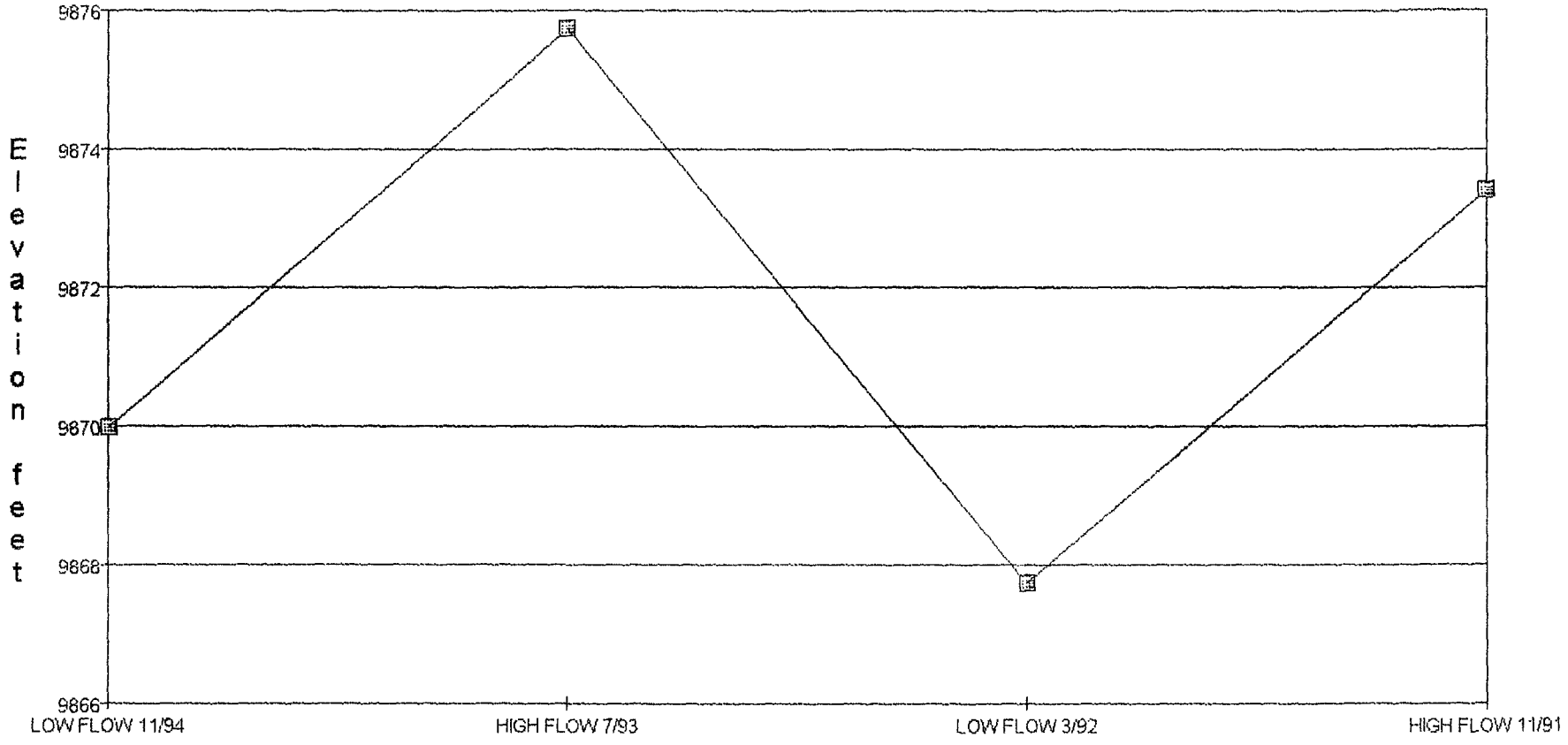
6

French Gulch Well #3



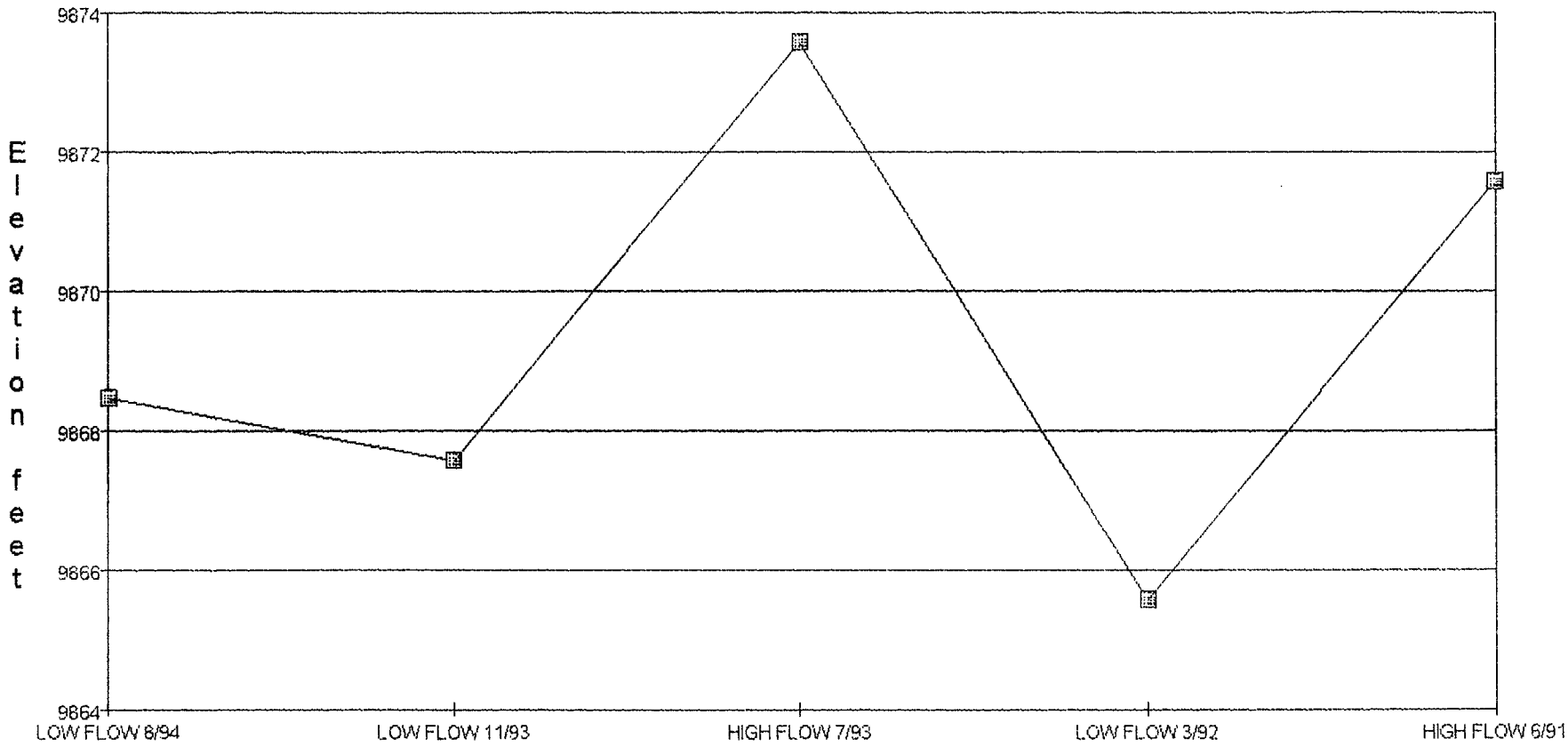
STATIC WATER LEVELS

French Gulch Well #4



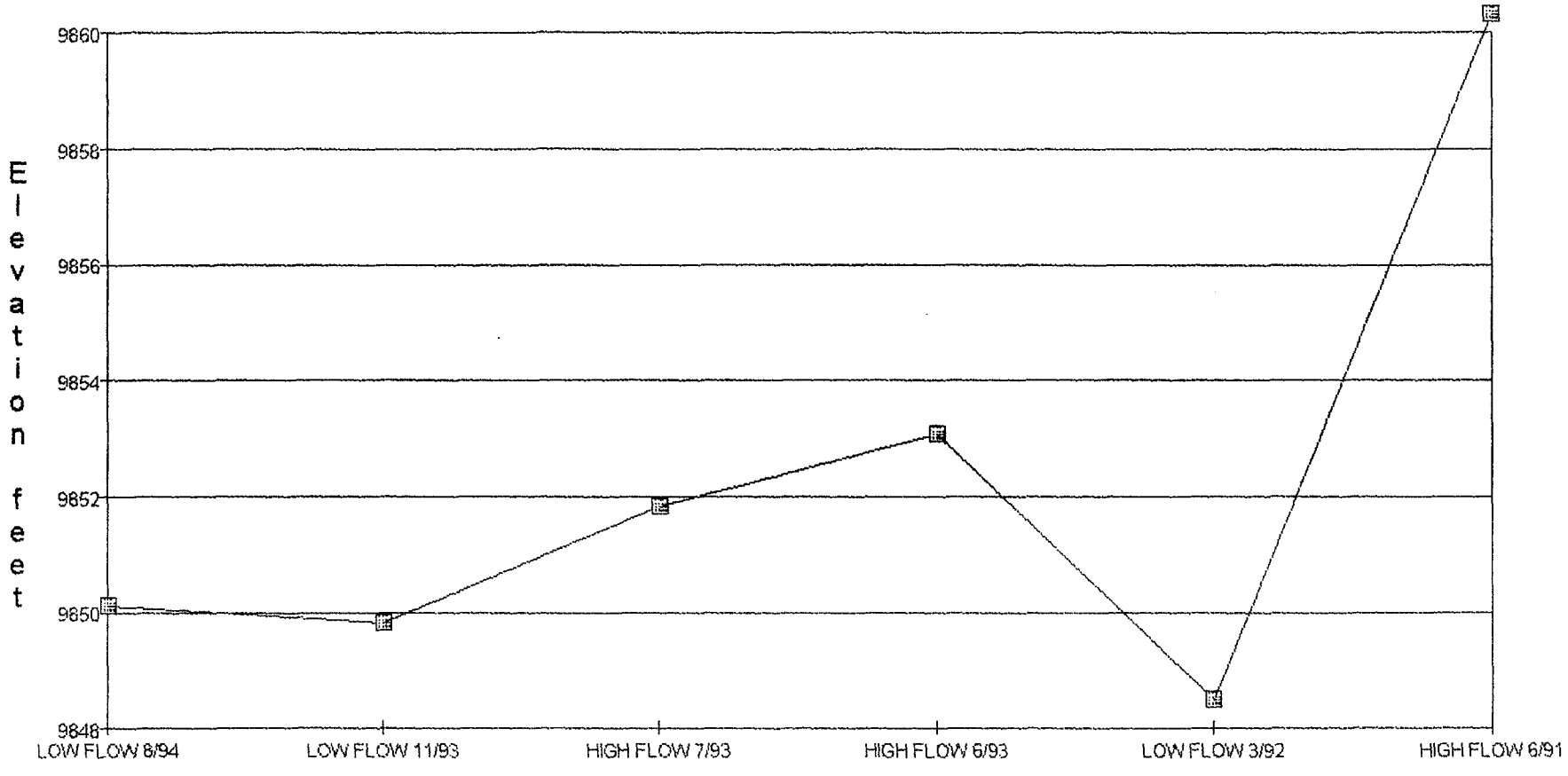
STATIC WATER LEVELS

French Gulch Well #5



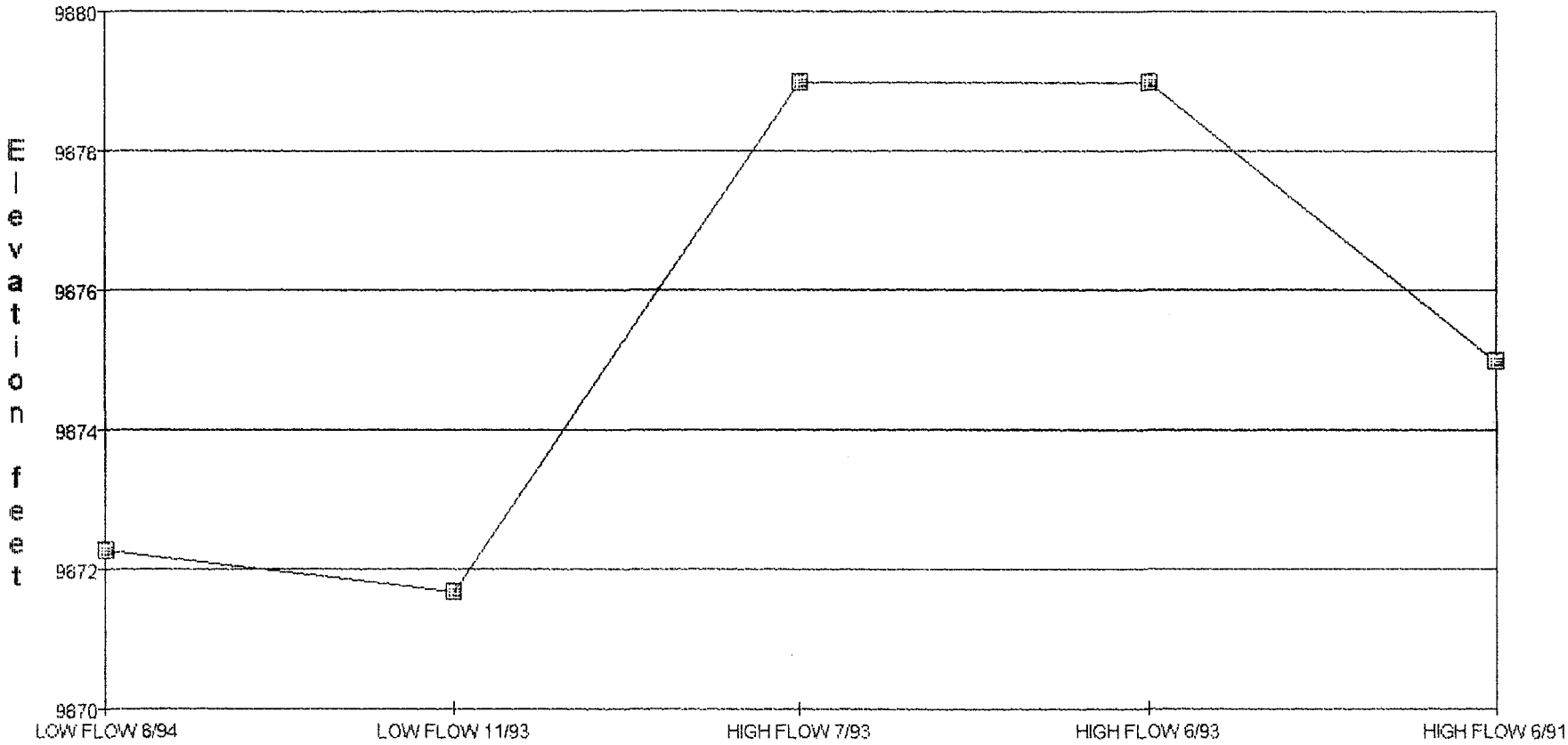
STATIC WATER LEVELS

French Gulch Well #6



STATIC WATER LEVELS

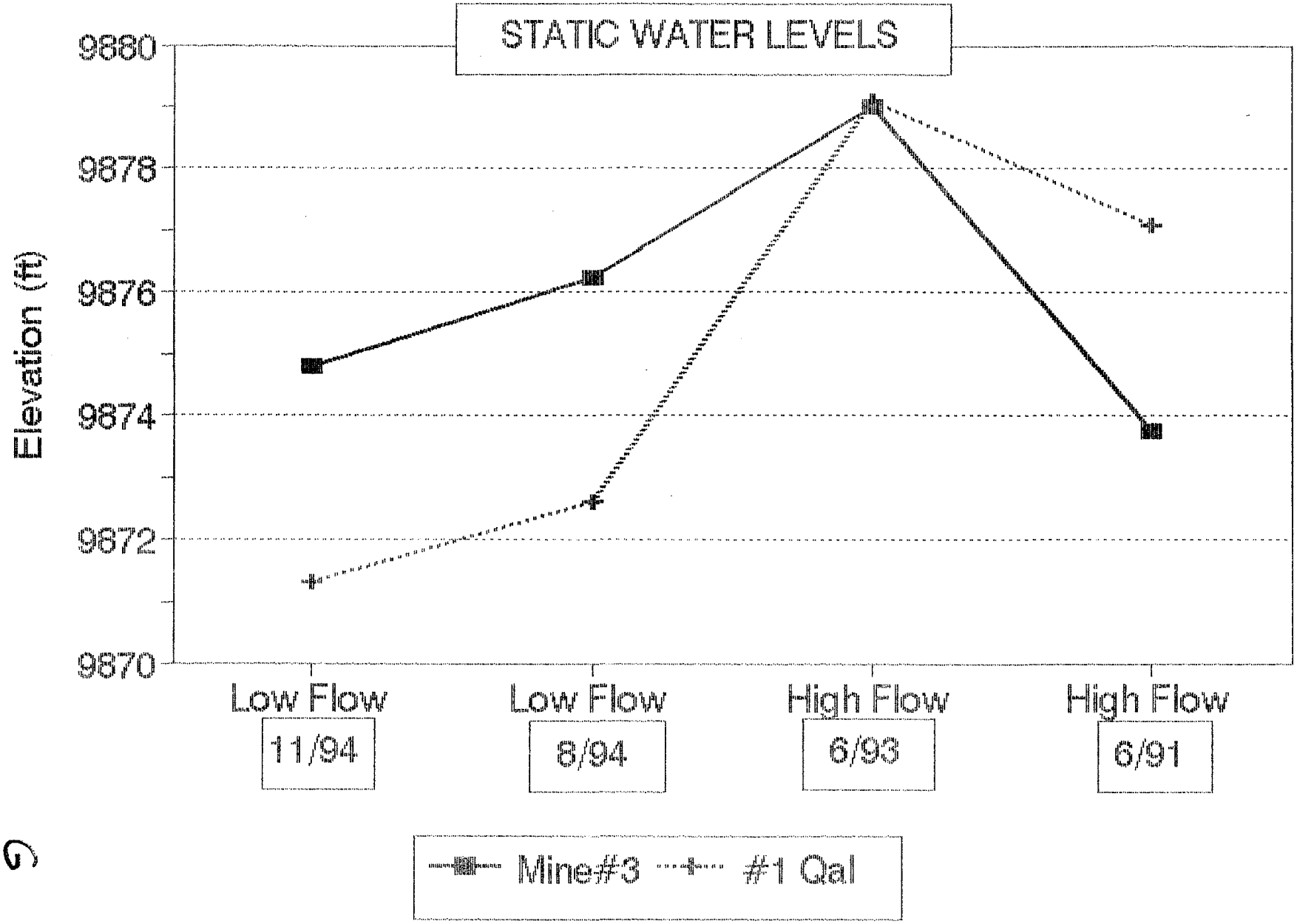
French Gulch Well #8



STATIC WATER LEVELS

French Gulch

Alluvium vs Mine



APPENDIX
H

POTENTIOMETRIC SURFACE MAPPING

H-1	POTENTIOMETRIC SURFACE MAP 11/93 ALL DATA
H-2	POTENTIOMETRIC SURFACE MAP 6/91 ALLUVIAL WELLS & SURFACE WATER
H-3	POTENTIOMETRIC SURFACE MAP 11/93 ALLUVIAL WELLS & SURFACE WATER
H-4	POTENTIOMETRIC SURFACE MAP 8/94 ALLUVIAL WELLS & SURFACE WATER
H-5	POTENTIOMETRIC SURFACE MAP 8/94 ALL WELLS & NO SURFACE WATER

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