

E-1669

Blaine

-3 Blaine ground water
management program

V.2 final hydrogeologic

98199486 report - - Volume 1

98199486

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA USA 98052
Telephone (206) 883-0777
Fax (206) 882-5498



**BLAINE GROUND WATER
MANAGEMENT PROGRAM
FINAL HYDROGEOLOGIC REPORT**

VOLUME II

APPENDICES

**Prepared for
City of Blaine, Washington**

**Funded in Part by the
Washington State Department of Ecology
Through the Centennial Clean Water Fund**

By

**Golder Associates Inc.
Redmond, Washington**

**David Banton
Associate**

**Mark Birch
Project Hydrogeologist**

September 2, 1992

903-1060.406



"The Peace Arch City"

City of Blaine

Department of Public Works

1200 Yew Avenue • Blaine, WA 98230
Bus: (206) 332-8820 Fax: (206) 332-7124

DATE 12/01/95

TO STATE OF WASHINGTON
DEPT. OF ECOLOGY
MAIL STOP 7710
OLYMPIA, WA 98504-7710

RE VOLUME II
FINAL HYDROGEOLOGIC RP

FROM ATTN: DENNIS ERICKSON - EILS

PROJECT BLAINE GWMP

WE ARE SENDING YOU

ATTACHED

DRAWINGS

ORIGINALS

AGREEMENT

DOCUMENTS

COPY OF LETTER

QUANTITY	DESCRIPTION
1	VOLUME II REPORT BY GOLDBE ASSOC.

REMARKS

John Hershman

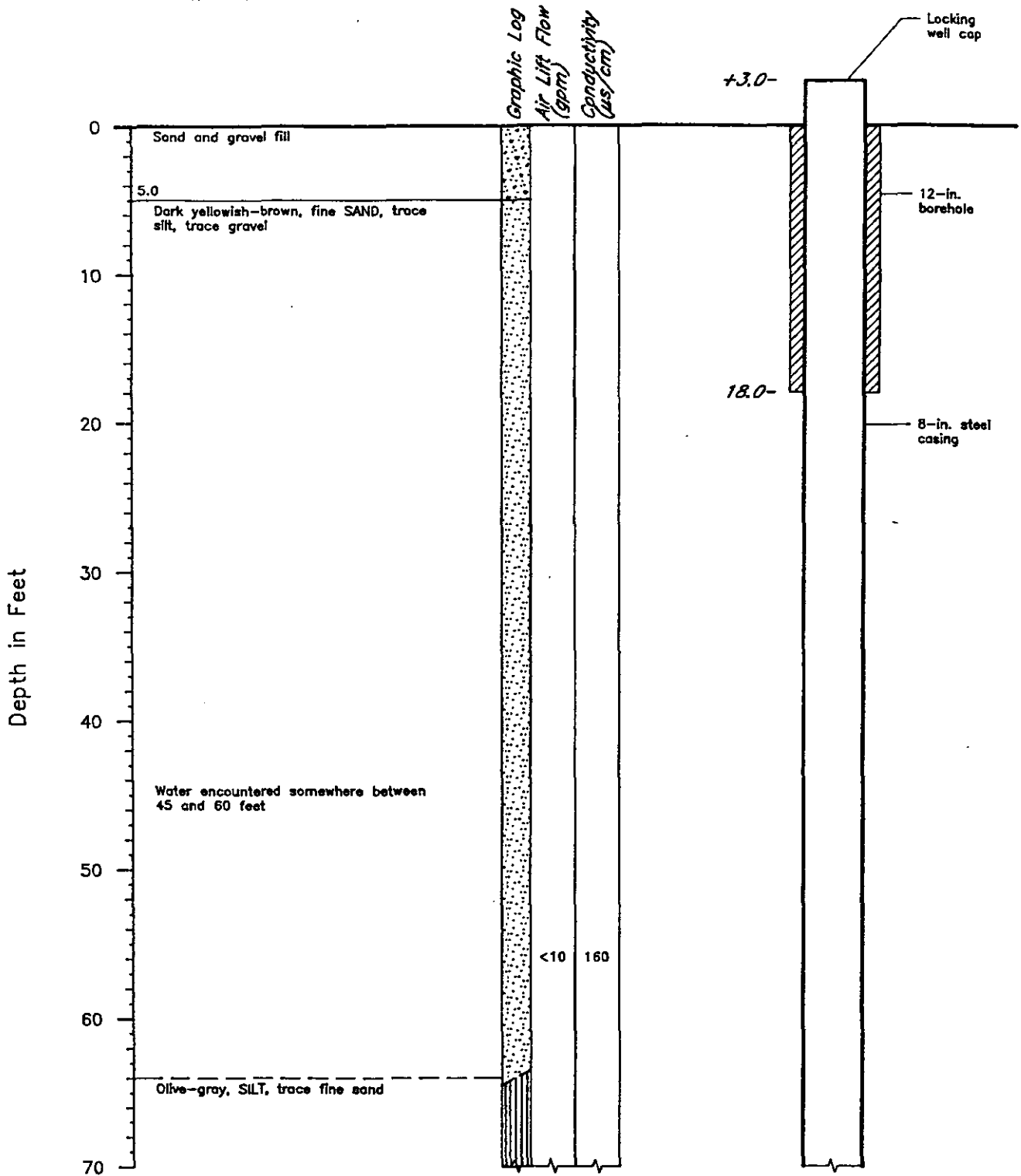
COPIES

APPENDIX A

WELL LOGS

STRATIGRAPHY

WELL COMPLETION



WELL COMPLETION LEGEND:

- Bentonite Grout
- Bentonite Chips
- Pea Gravel
- Water Level
- 8" Steel Casing
- 8-in. telescopic stainless steel wellscreen
- NOT TO SCALE

Date: 8/27/90-8/31/90
 Ground Elevation: -
 T.O.C. Elevation: -
 Drill Rig: Speed Star
 Drill Method: Air rotary

FIGURE A-1
 SHEET 1 OF 4
GWMP-1
RECORD OF BOREHOLE
 BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

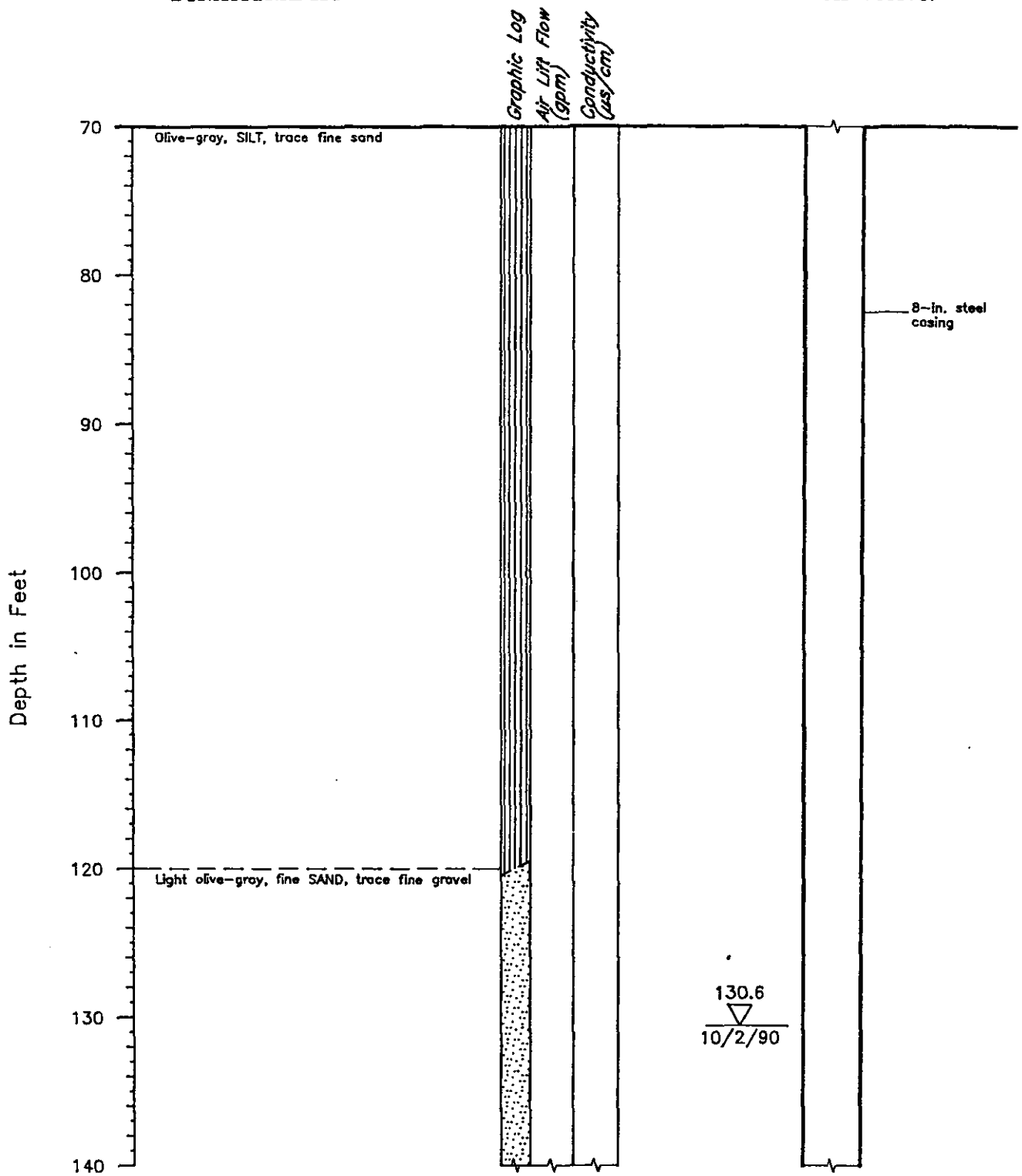


FIGURE **A-1**
SHEET 2 OF 4
GWMP-1
RECORD OF BOREHOLE
BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

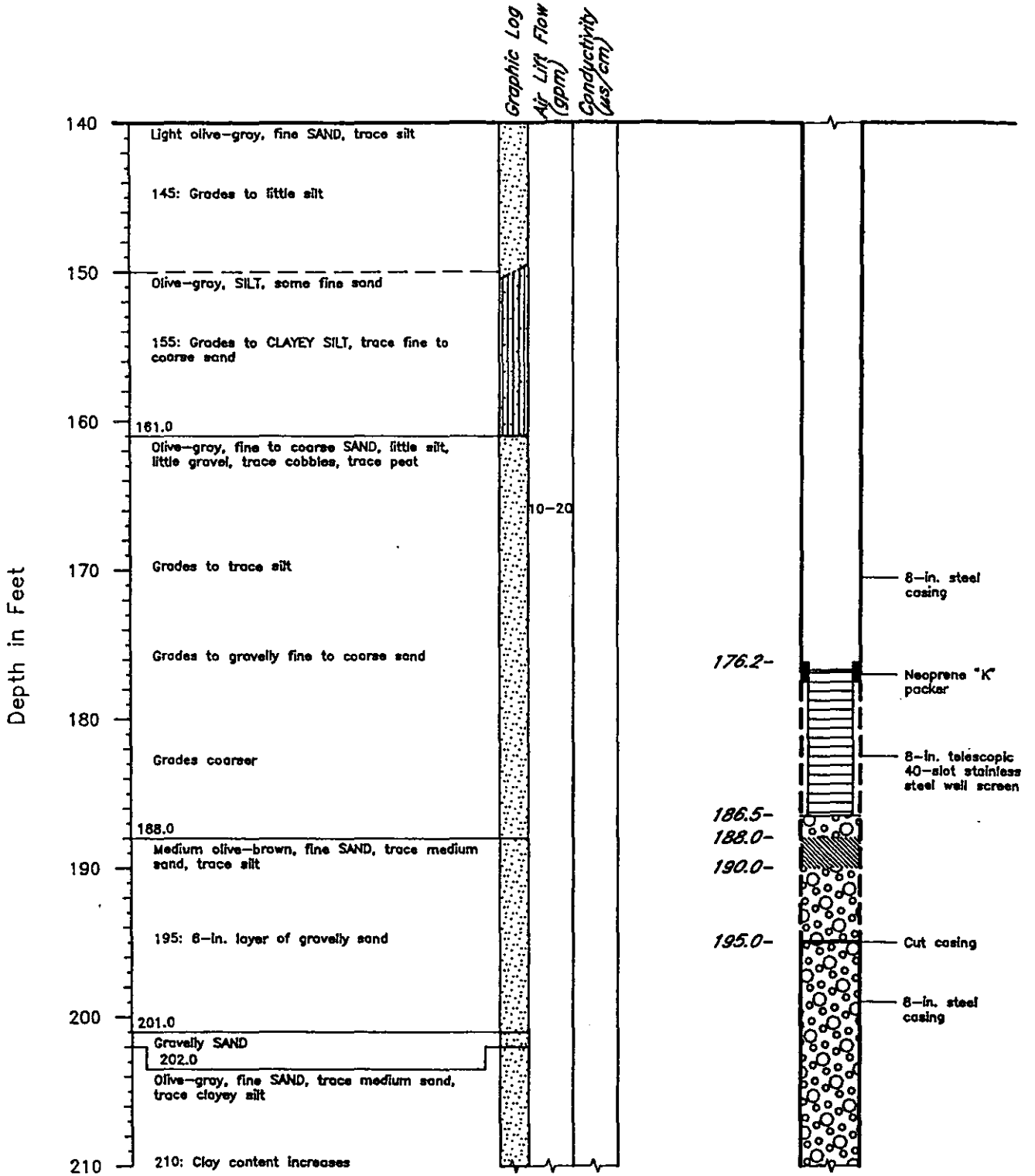


FIGURE A-1
SHEET 3 OF 4
GWMP-1
RECORD OF BOREHOLE
BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

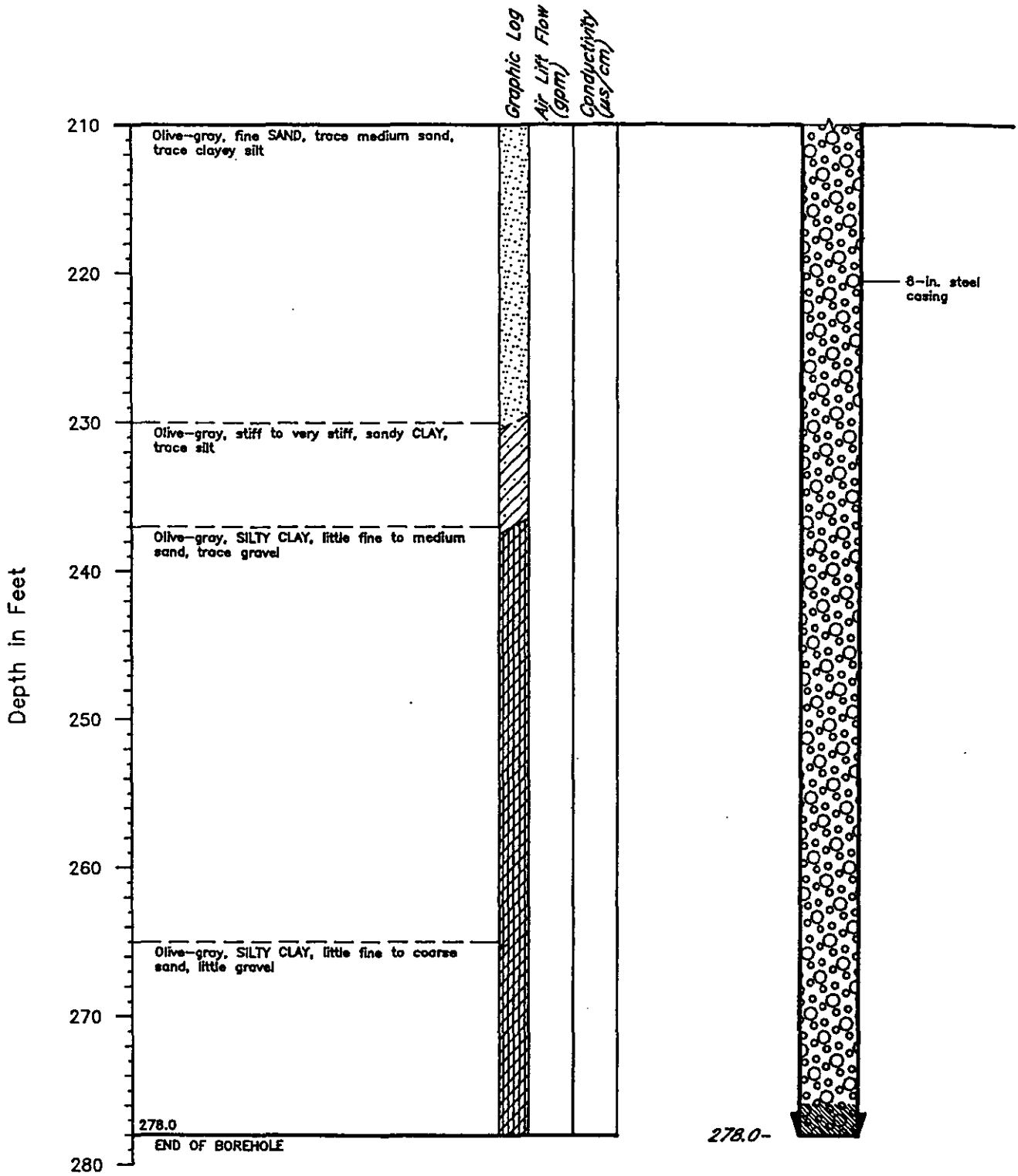
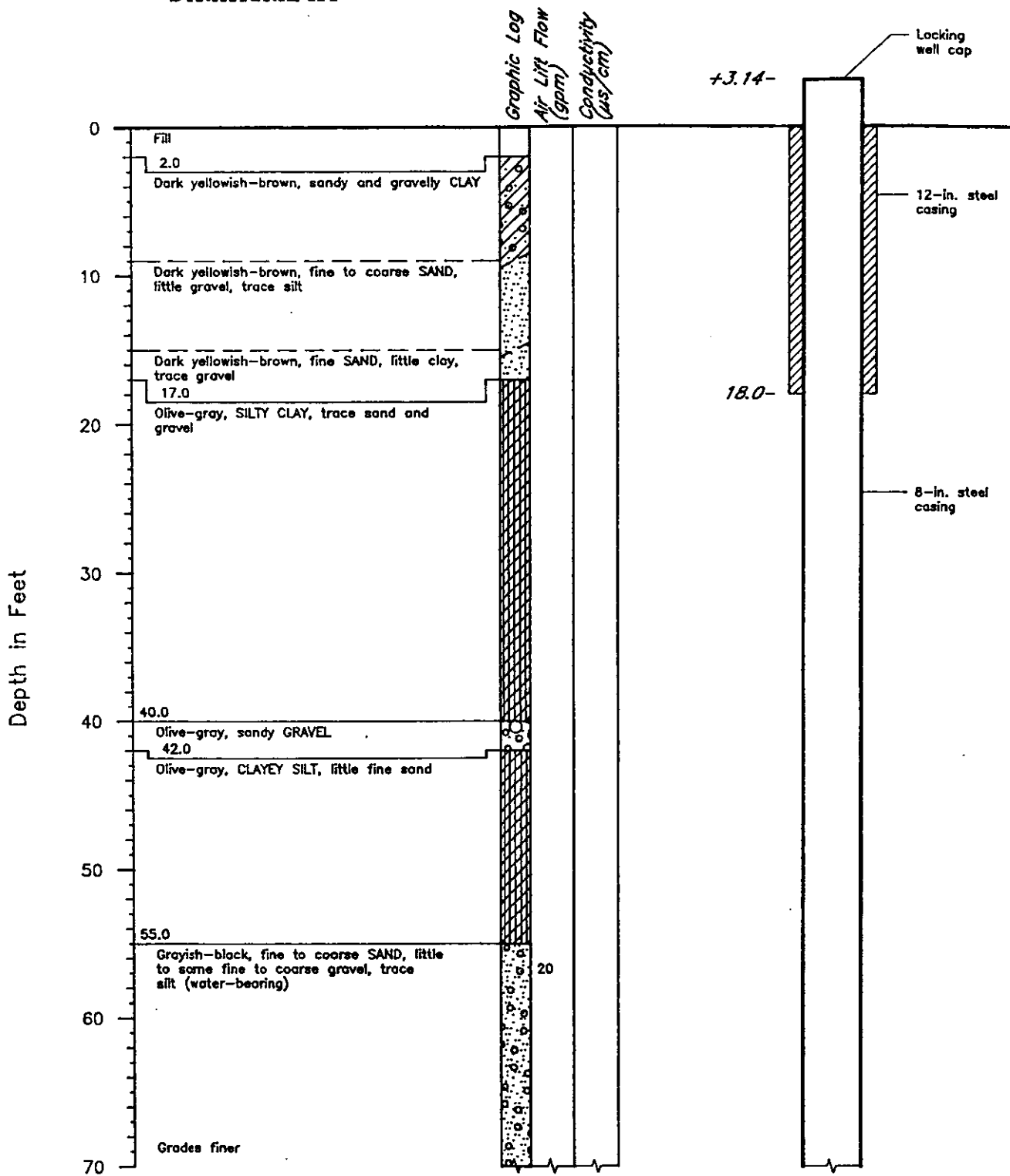


FIGURE A-1
SHEET 4 OF 4
GWMP-1
RECORD OF BOREHOLE
BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION



WELL COMPLETION LEGEND:

- Bentonite Grout
- Bentonite Chips
- Pea Gravel
- Water Level
- 8" Steel Casing
- 8-in., telescopic stainless steel wellscreen
- NOT TO SCALE

Date: 8/4/90-9/10/90
Ground Elevation: -
T.O.C. Elevation: -
Drill Rig: Speed Star
Drill Method: Air rotary

FIGURE A-2
SHEET 1 OF 5
GWMP-2
RECORD OF BOREHOLE
BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

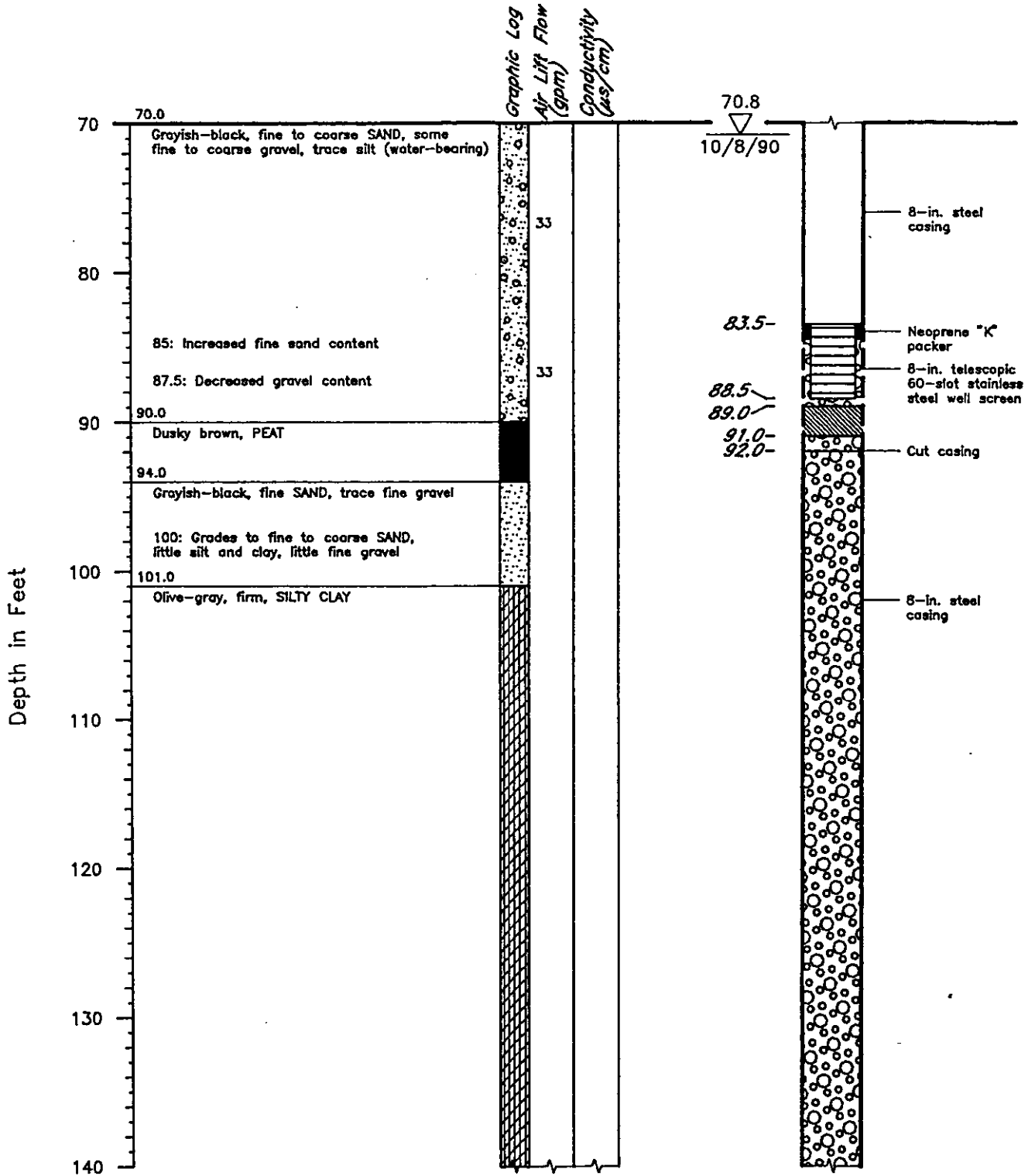


FIGURE A-2
 SHEET 2 OF 5
GWMP-2
RECORD OF BOREHOLE
 BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

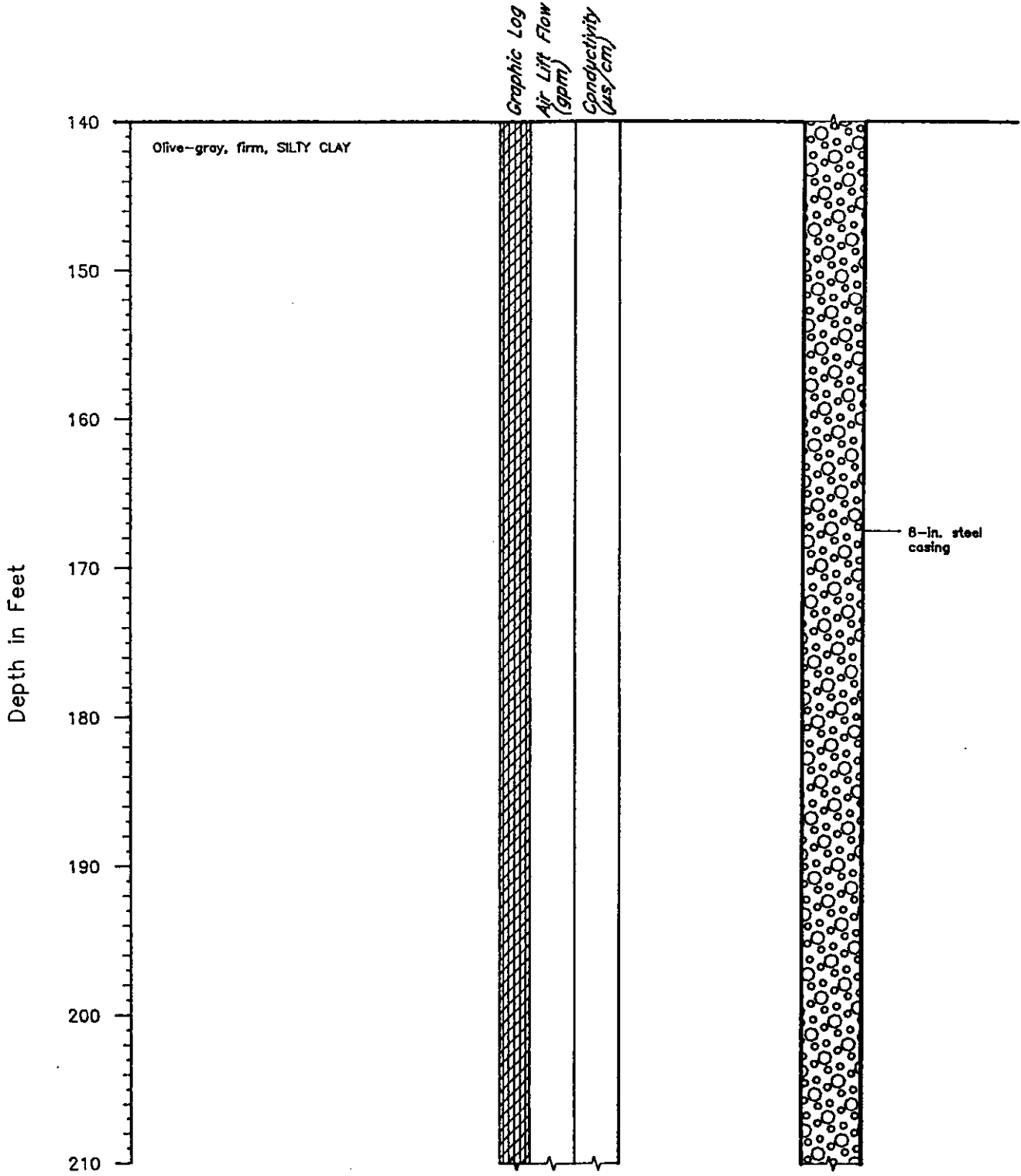


FIGURE A-2
SHEET 3 OF 5
GWMP-2
RECORD OF BOREHOLE
BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

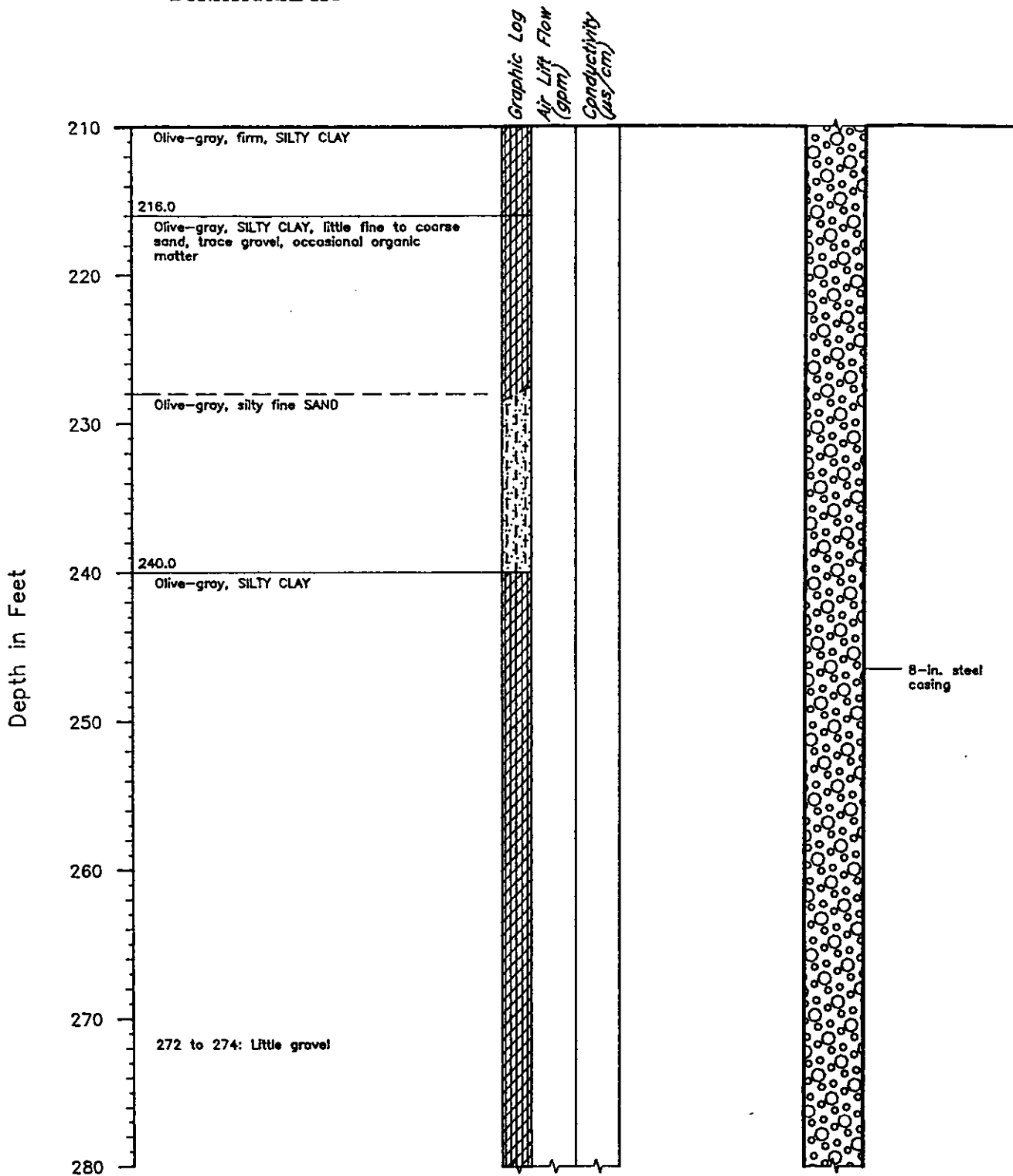


FIGURE A-2
SHEET 4 OF 5
GWMP-2
RECORD OF BOREHOLE
BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

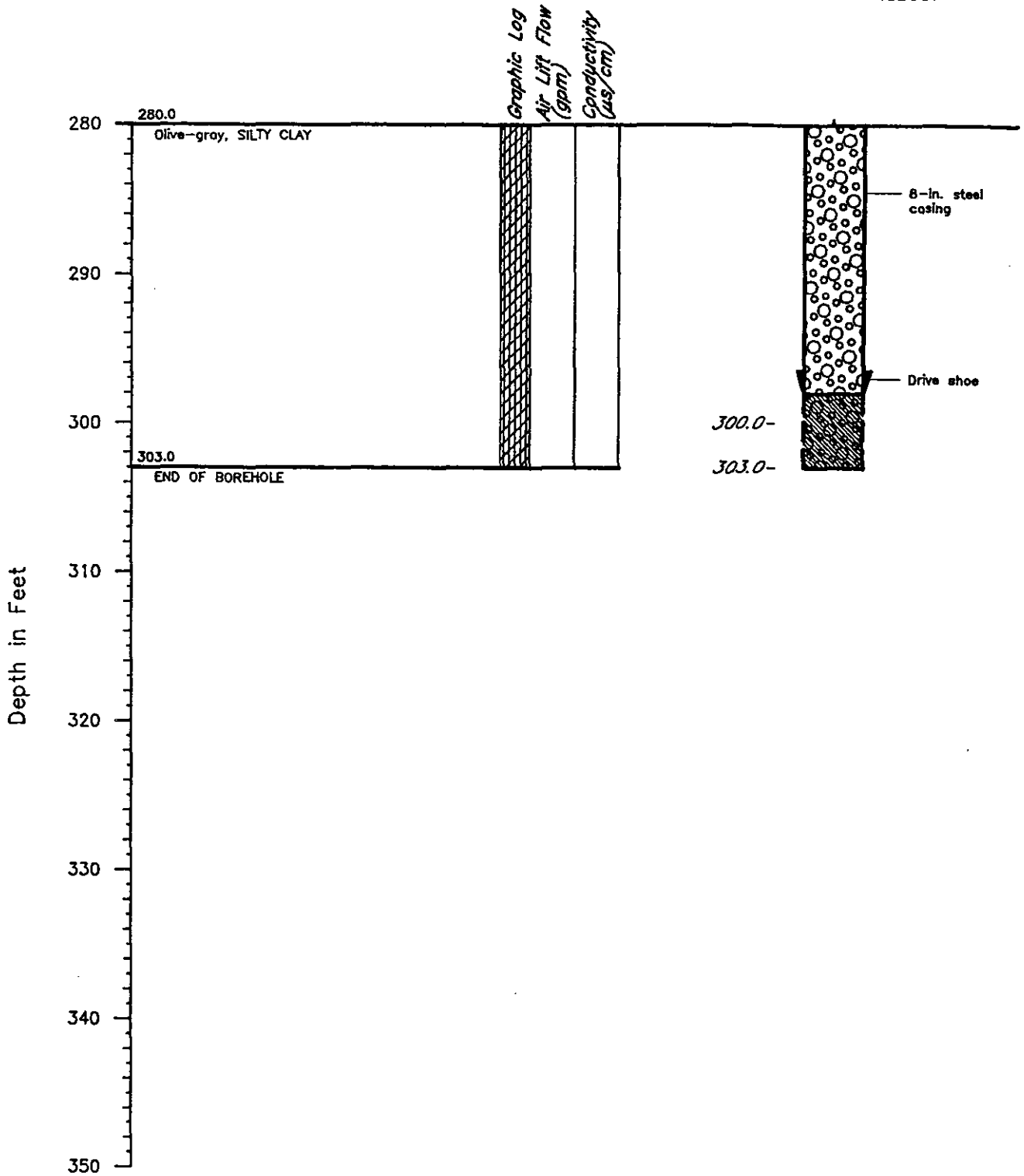
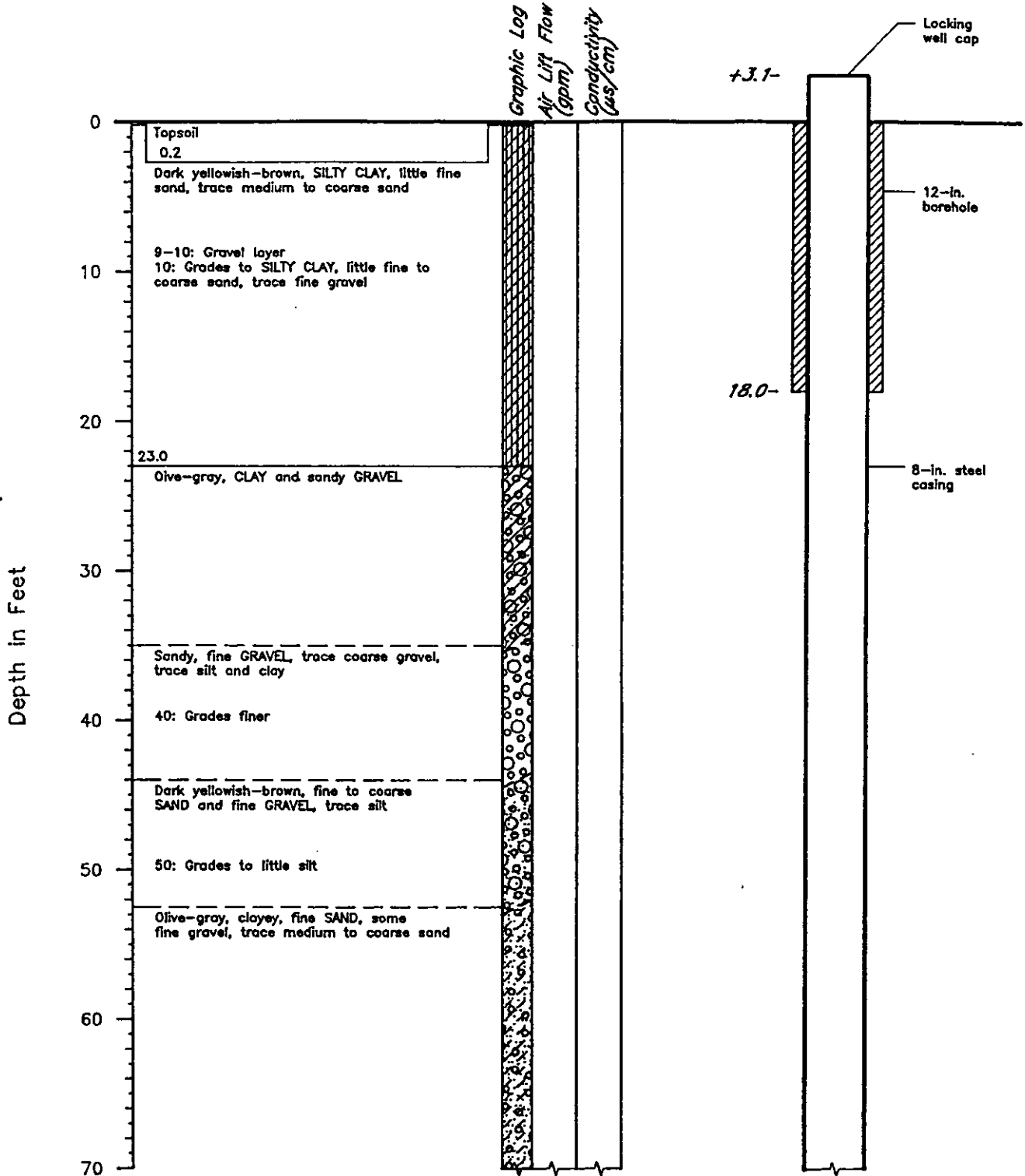


FIGURE **A-2**
SHEET 5 OF 5
GWMP-2
RECORD OF BOREHOLE
BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION



WELL COMPLETION LEGEND:

- Bentonite Grout
 - Bentonite Chips
 - Pea Gravel
 - Water Level
 - 8" Steel Casing
 - 8-in., telescopic stainless steel wellscreen
- NOT TO SCALE

Date: 9/10/90-9/14/90
 Ground Elevation: -
 T.O.C. Elevation: -
 Drill Rig: Speed Star
 Drill Method: Air rotary

FIGURE A-3
 SHEET 1 OF 5
GWMP-3
RECORD OF BOREHOLE
 BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

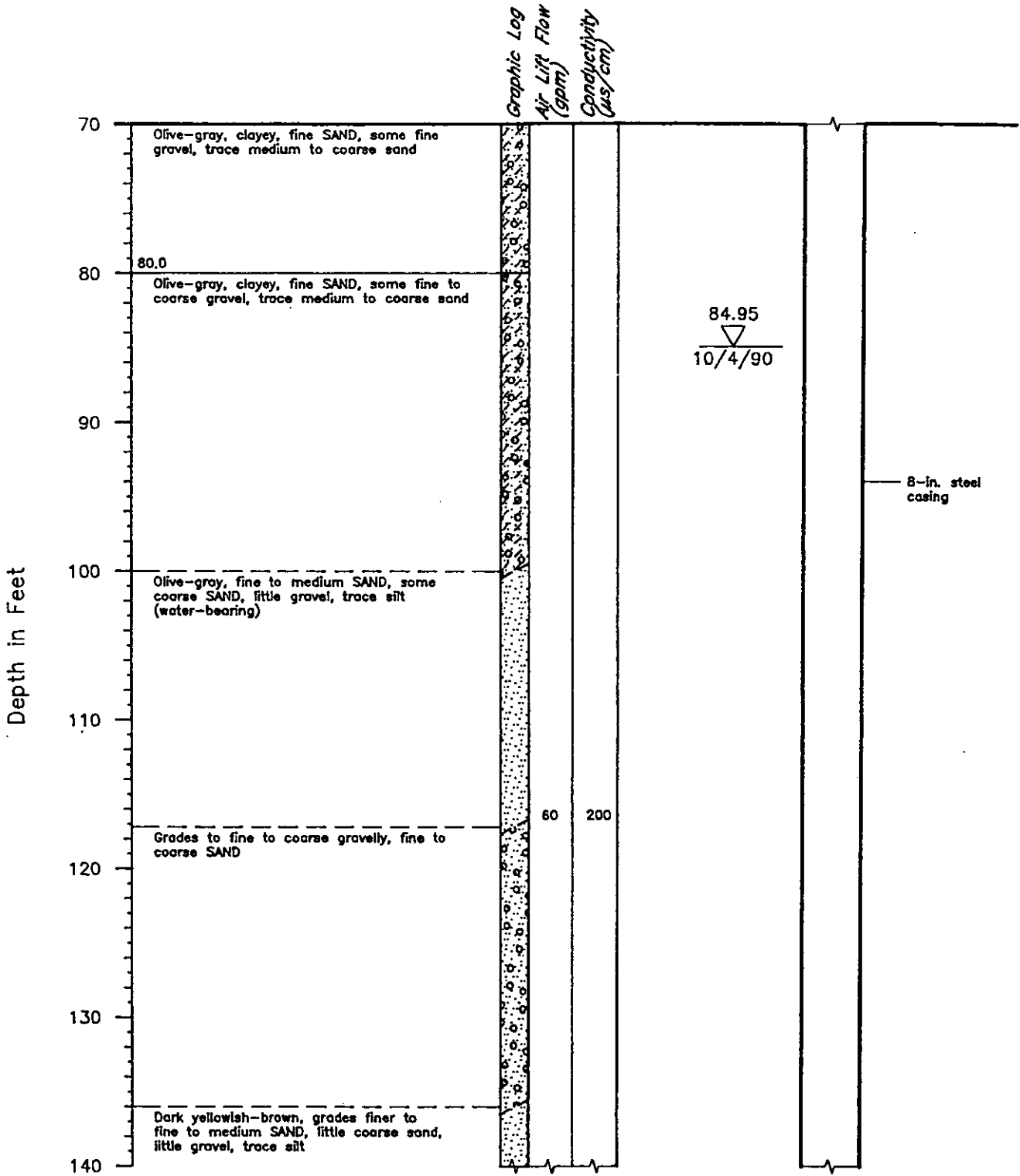


FIGURE **A-3**
 SHEET 2 OF 5
GWMP-3
RECORD OF BOREHOLE
 BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

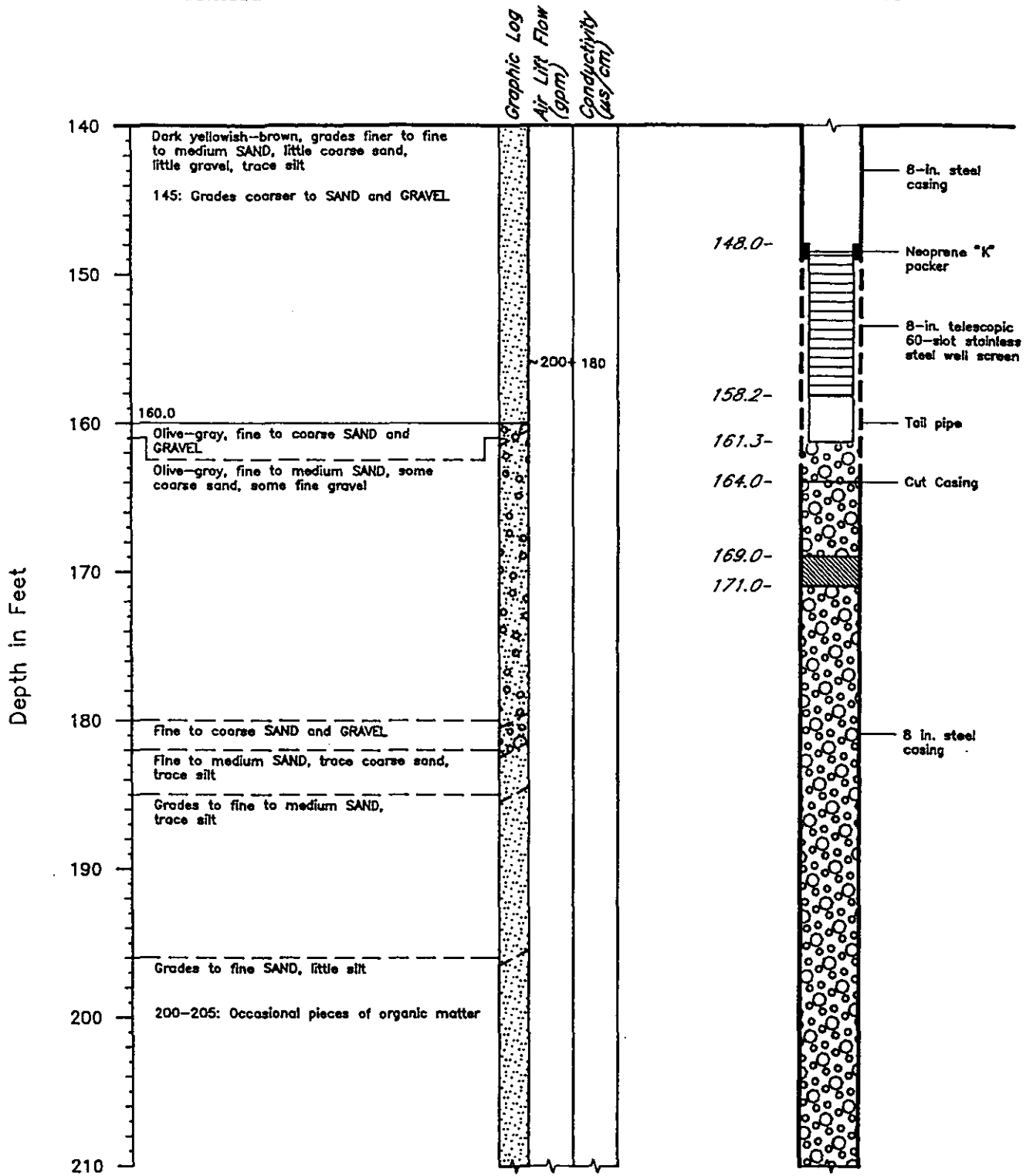


FIGURE A-3
 SHEET 3 OF 5
GWMP-3
RECORD OF BOREHOLE
 BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

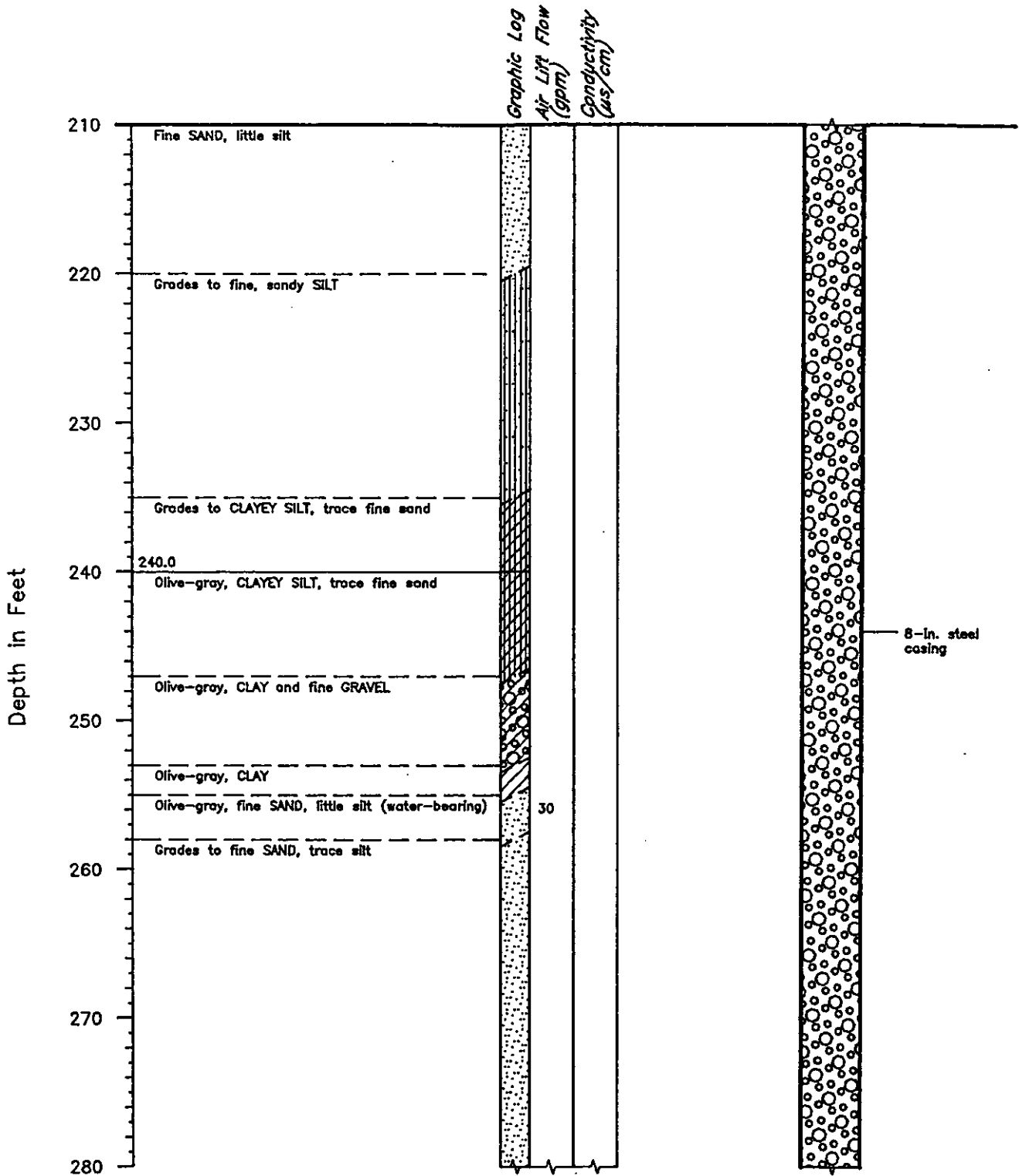


FIGURE **A-3**
SHEET 4 OF 5
GWMP-3
RECORD OF BOREHOLE
BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION

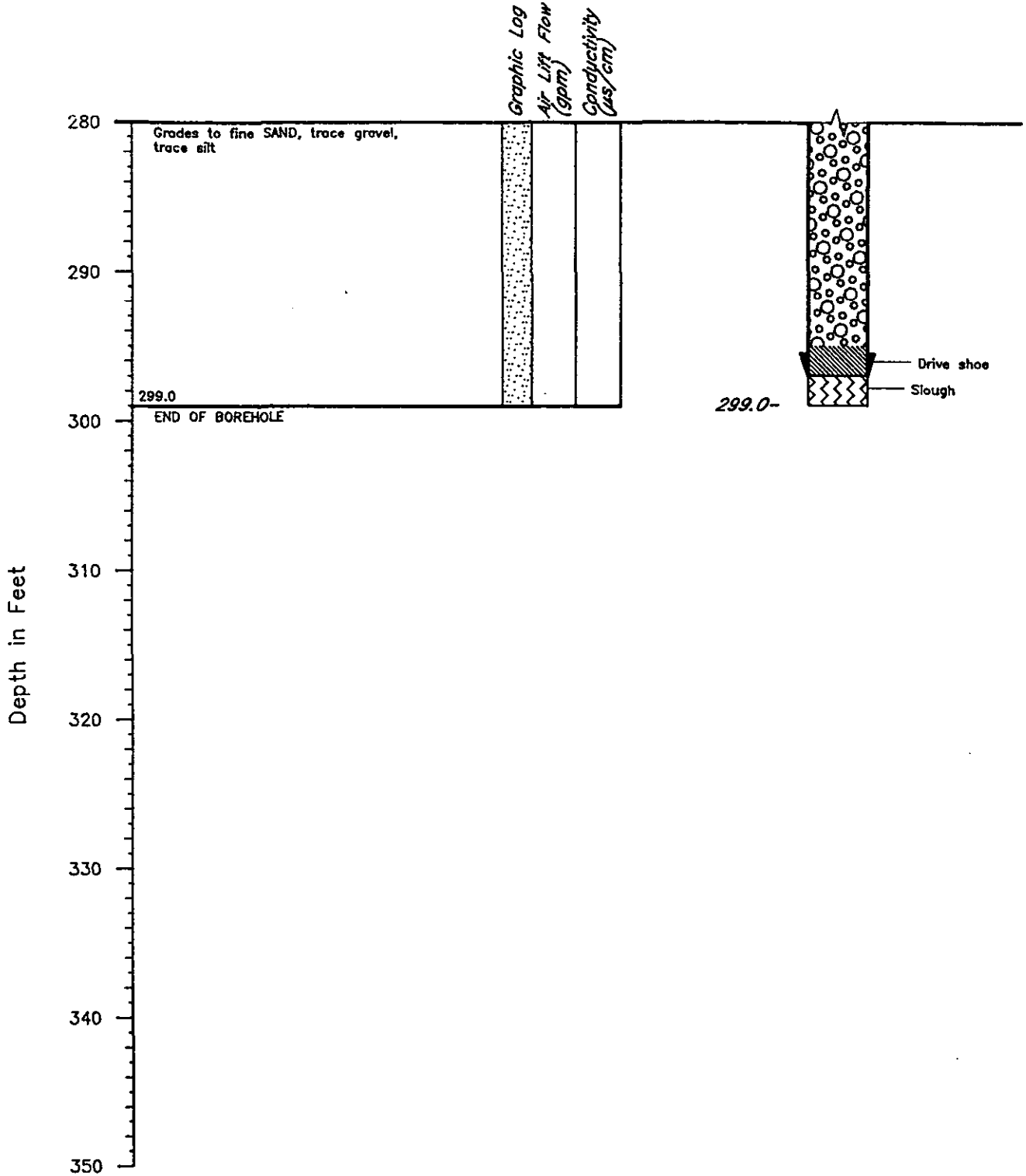
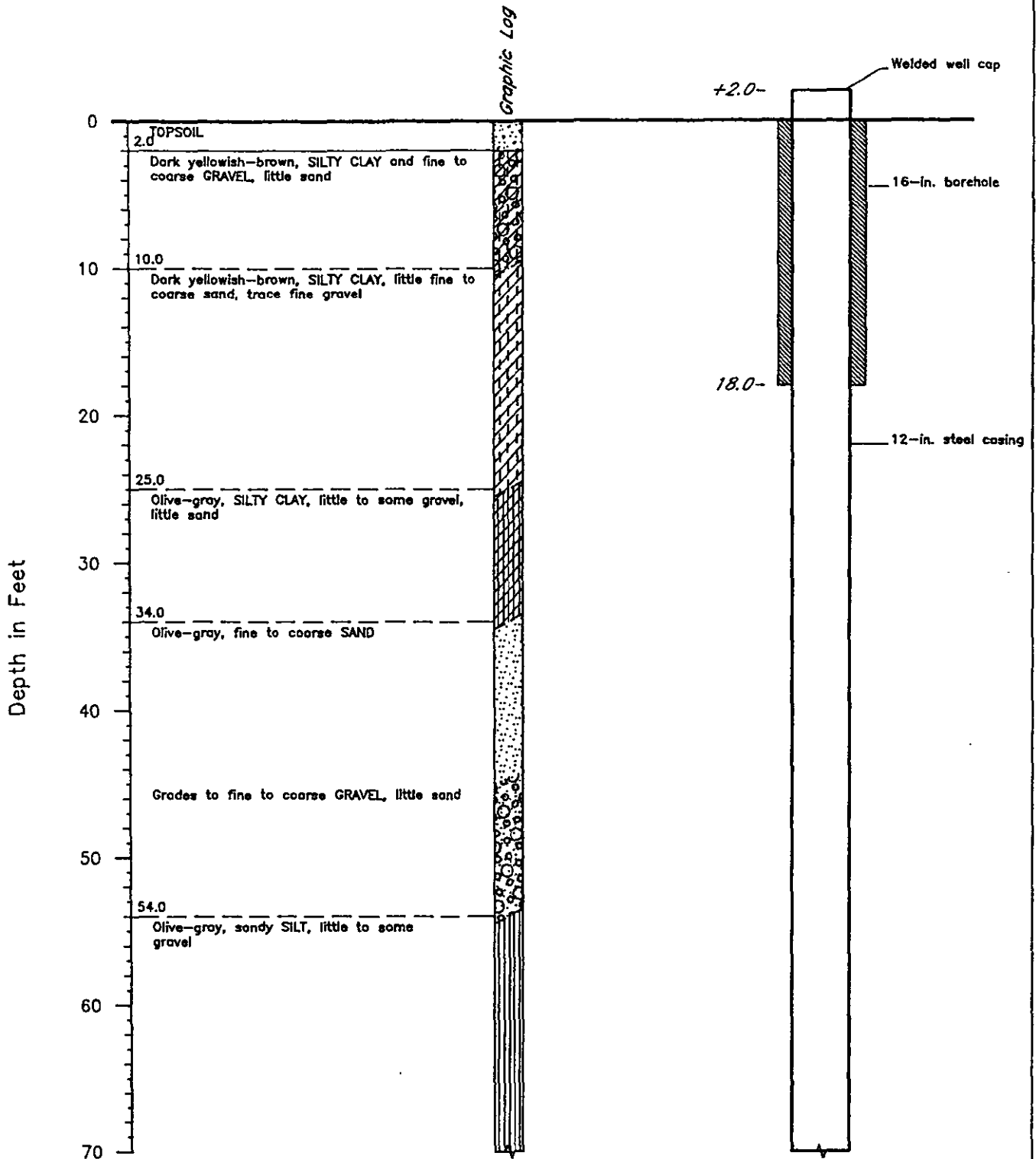


FIGURE A-3
SHEET 5 OF 5
GWMP-3
RECORD OF BOREHOLE
BLAINE/GWMP/WA

STRATIGRAPHY

WELL COMPLETION



WELL COMPLETION LEGEND:

- Bentonite pellets
- Colorado silica sand 16-30
- Backfill
- 8-in. dia. pipe size steel riser
- 8-in. dia. telescopic 20-slot stainless steel well screen

NOT TO SCALE

Completion Date: 7/10/91
 Drill Rig: Speed Star
 Drill Method: Cable tool

FIGURE **A-1**
 SHEET 1 OF 5
DEEP WELL
STRATIGRAPHY AND
WELL COMPLETION
 BLAINE

STRATIGRAPHY

WELL COMPLETION

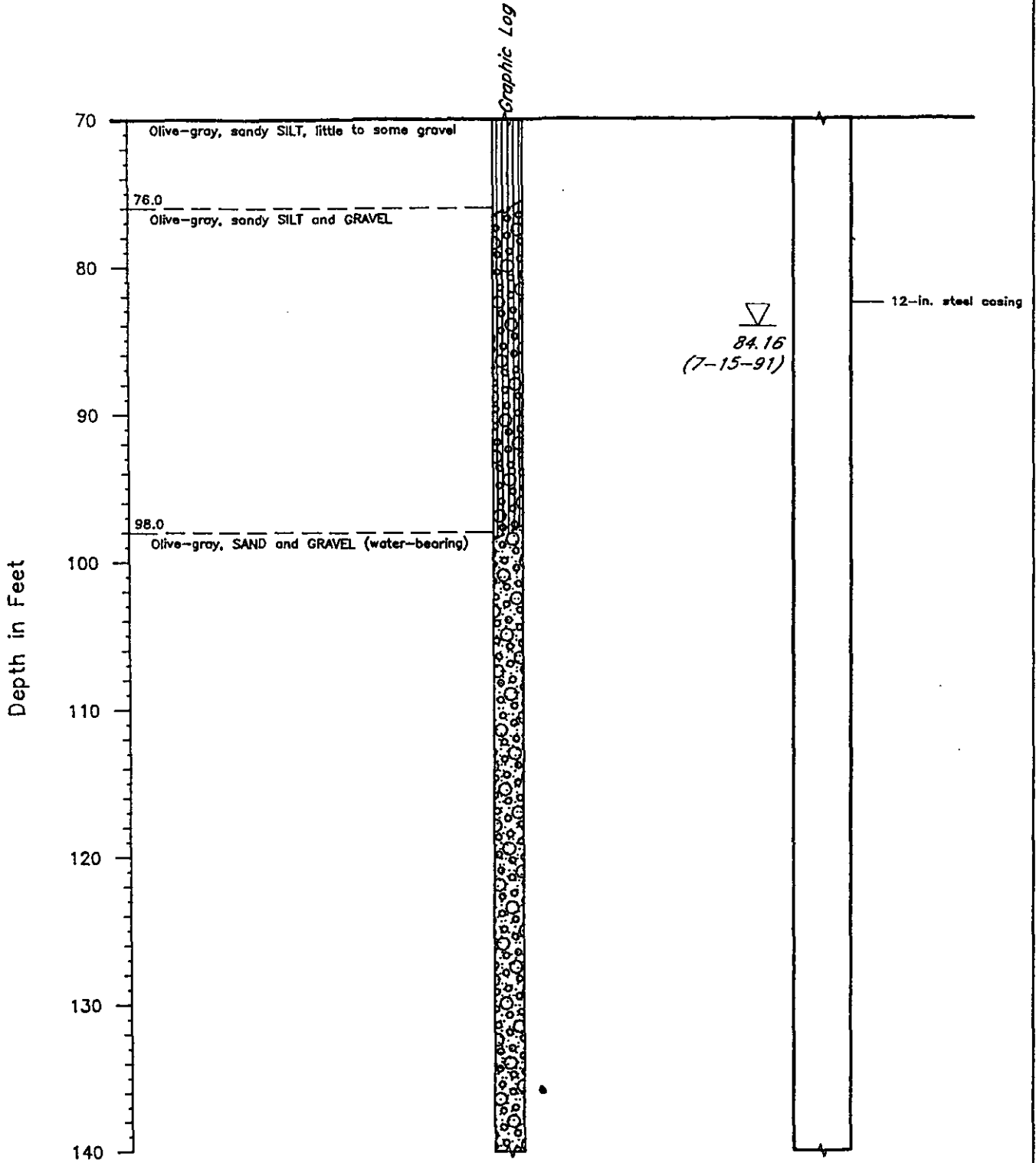


FIGURE **A-1**
SHEET 2 OF 5
DEEP WELL
STRATIGRAPHY AND
WELL COMPLETION
BLAINE

STRATIGRAPHY

WELL COMPLETION

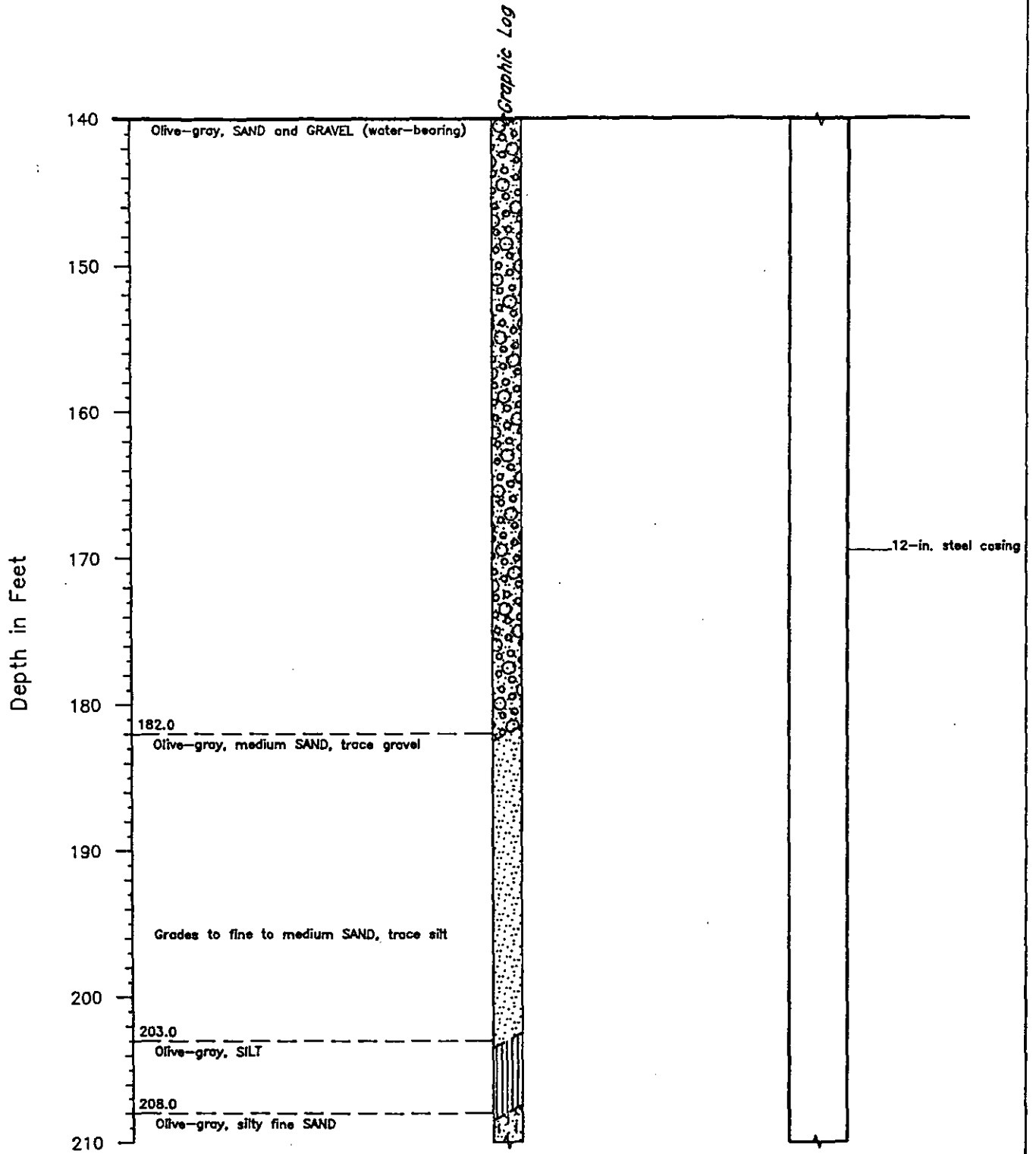


FIGURE **A-1**
SHEET 3 OF 5
DEEP WELL
STRATIGRAPHY AND
WELL COMPLETION
BLAINE

STRATIGRAPHY

WELL COMPLETION

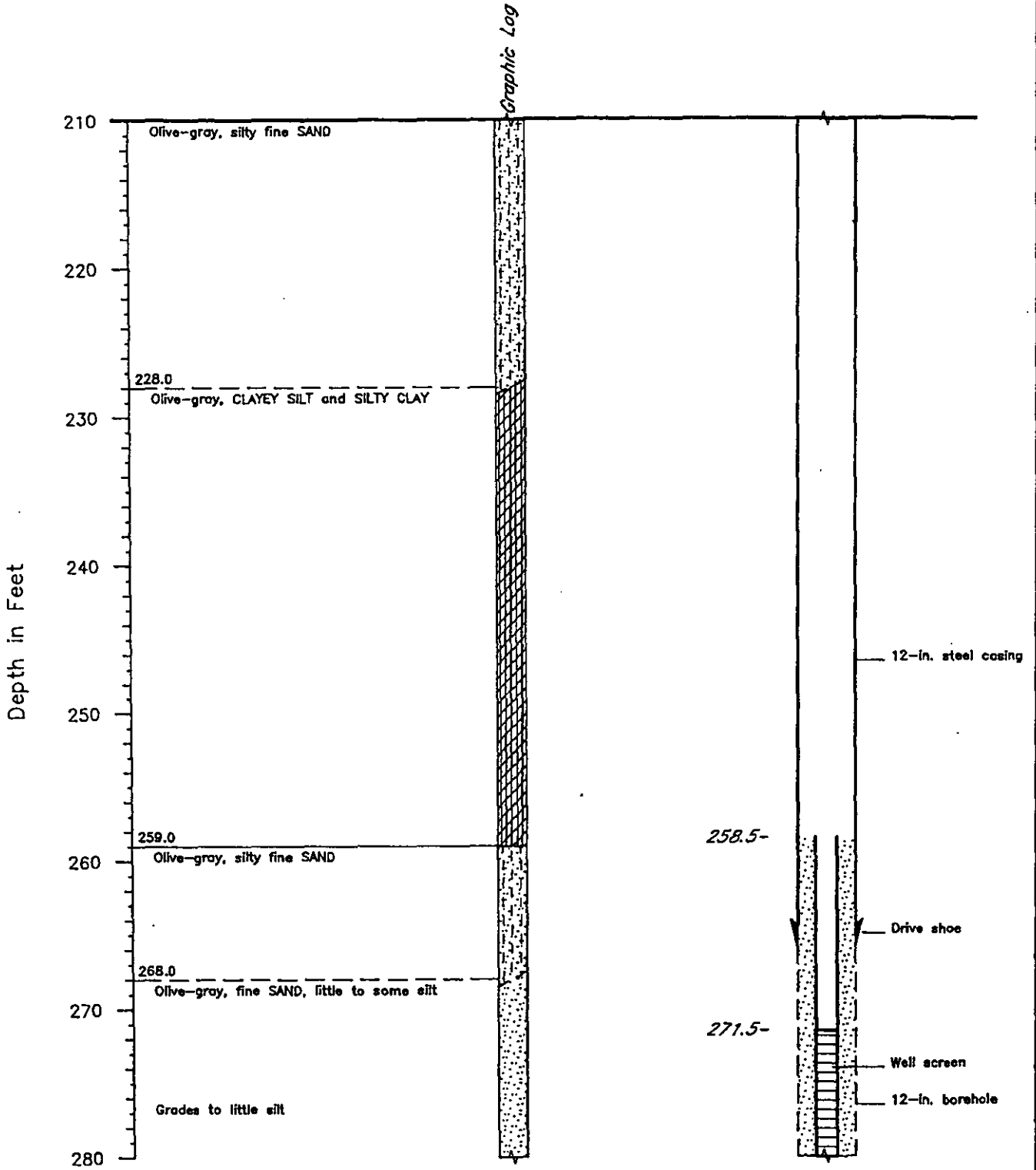


FIGURE **A-1**
SHEET 4 OF 5
DEEP WELL
STRATIGRAPHY AND
WELL COMPLETION
BLAINE

STRATIGRAPHY

WELL COMPLETION

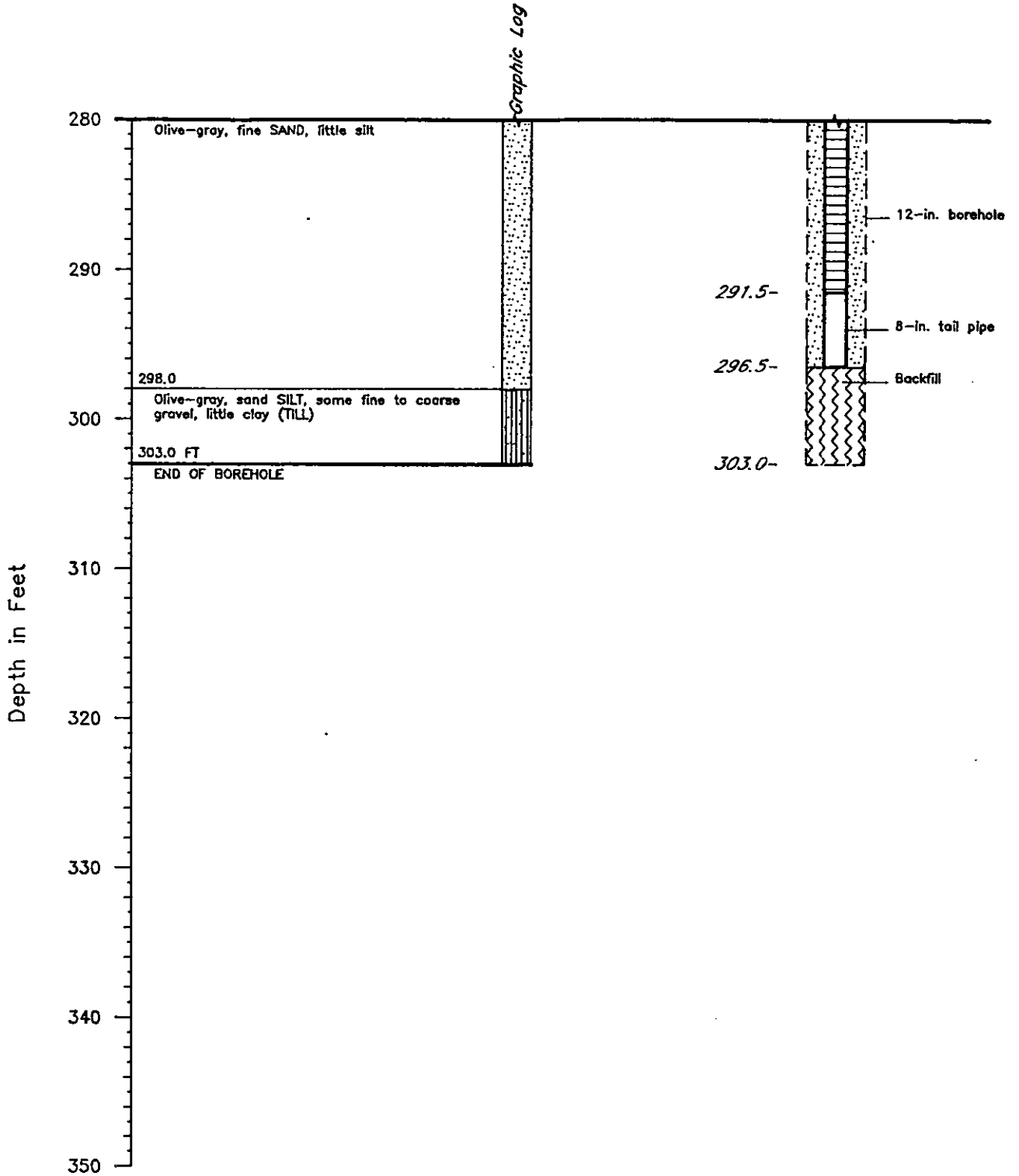


FIGURE **A-1**
SHEET 5 OF 5
DEEP WELL
STRATIGRAPHY AND
WELL COMPLETION
BLAINE

App. #10178
 Per. #9714
 Cer. #6916

STATE OF WASHINGTON
 DEPARTMENT OF CONSERVATION
 DIVISION OF WATER RESOURCES

①
 848

Lincoln Park

Page 1 of 2

48

WELL LOG

Record by.....Driller.....
 Source.....Driller's record.....

Location: State of WASHINGTON
 County.....Whatcom.....
~~400'~~ 400' S & 125' W from S1/16
~~32'~~ corner between Sec. 31 & 32
 SE 1/4 SE 1/4 sec. 31 T. 41N. R. 1 E.

Diagram of Section

Drilling Co. Richardson Well Drilling Co., Inc.
 Address P.O. Box 2266, Tacoma, WA 98444
 Method of Drilling Cable Date Oct. 21, 1969

Owner City of Blaine
 Address City of Blaine, P.O. Box H, Blaine 98230

Land surface, datum 196 ft ^{above} / _{below}
 SWL: 93'6" Date October 14, 1969 Dims.:

CORRE- LATION	MATERIAL	From (feet)	To (feet)
------------------	----------	----------------	--------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

	Top soil	0	3
	Clay & gravel	3	13
	Clay, blue & boulder	13	18
	Clay, blue & boulder	18	28
	Clay, blue	28	72
	Clay, sandy blue & gravel	72	80
	Clay, sandy & gravel	80	91
	Sand, dirty & gravel - water	91	108
	Clay, coated gravel	108	111
	Clay, gray	111	136
	Clay, sandy	136	163
	Sand, fine & gravel	163	167
	Sand, fine, sticky & clay	167	170
	Sand, fine & clay	170	174
	Sand, coarse & fine & gravel	174	190

Turn up

Sheet _____ of _____ sheets

ALJE 318
 File number

~~S1-T40-RI 40/11-4J1~~
 No. of Stein rd. abt. .35 No.
 of Blaine-Sumas rd. NE $\frac{1}{4}$, SW $\frac{1}{4}$, elev.
 220, Radke 1942 Pendleton

	Th	Dp
Soil	3	3
Hardpan	14	17
Blue clay	83	100
Fine sand	17	117

S13-S4-T40-RI 5/40/11-4J1		
abt. .3 mi. No. of Sweet rd. abt. .9 mi. E. of int. with Harvey rd. NE $\frac{1}{4}$, SE $\frac{1}{4}$, elev. abt 177 Jannsen 1929 City of Blaine		
WELL No. 1	Th	Dp
Clay, lower 60' blue	95	95
Hardpan	35	150
Gravel, cemented	80	230
Clay lower 105' blue	136	366
Blue sandy shale	9	375
Gravel, cemented, lower 4 ft has large rocks	33	408
Hard shale	6	414
Gravel, cemented	62	476
Shale	3	479
Gravel	1	480
Shale w/streaks of gravel	59	539
Shale	14	553
Solid rock	1	554
Clay w/gravel and rocks	68	622
Gravel	9	631
Gravel and rocks	7	638
Clay and rocks	45	683

S13 (con't)

	Th	Dp
Sand	8	691
Gravel and rocks	8	699
Gravel, cemented	10	709
Sand and gravel	4	713
Sand, gravel, and clay	31	744
Gravel, cemented	2	746

~~S14-S4-T40-RI 40/11-4J2~~

On Sweet rd. abt .5 mi. E. of Harvey
rd. SW $\frac{1}{4}$, SW $\frac{1}{4}$, elev. abt 60'
Radke 1943 Robinson

	Th	Dp
Soil	4	4
Muck	96	102
Hardpan	2	104
Fine sand, salt water	2	106

~~S15-S4-T40-RI 40/11-4J2~~

On Sweet rd. abt .7 mi. E. of Harvey
rd. SW $\frac{1}{4}$, SE $\frac{1}{4}$, elev. abt 85'
Radke 1944 Neuhauer

	Th	Dp
Soil	3	3
Hardpan	10	13
Blue clay	46	59
Fine sand, water	4	63

E1-4

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
AND DEVELOPMENT

836

City well No. 3

WELL LOG

Date 6-21, 1961

No. Appl. 5086
Cert. 3912-A

Record by well driller

Source driller's record

Location: State of WASHINGTON

County Whatcom

Area _____

Map _____

Map N 1/4 SW 1/4 sec 3 T. 40 N., R. 1 E. Diagram of Section

Drilling Co. G. A. Bezona & Son

Address Ferndale, Wash.

Method of Drilling _____ Date _____, 19____

Owner City of Blaine, Wash.

Address _____

Land surface, datum _____ ft. above
below

40, 1 E 3 M
file number

#3

CORRELATION	MATERIAL	THICKNESS (feet)	DEPTH (feet)
-------------	----------	------------------	--------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

	Sand & gravel (water @ 20')	28	28
	Coarse gravel, water	1	29
	Fine sand, water	9	38
	Loose, coarse gravel, water	18	56
	Hard packed gravel & boulders	3	59
	Coarse, loose gravel, water	12	71
	Hard packed sand	4	75
	(Pulled back to 71 ft.)		
	Dim. 75'x2"		
	DO: 50 ft.		
	Yield: 404 g.p.m.		
	10' perforated casing		
	1/2" slot 8" in length from 65 to 75 ft.		

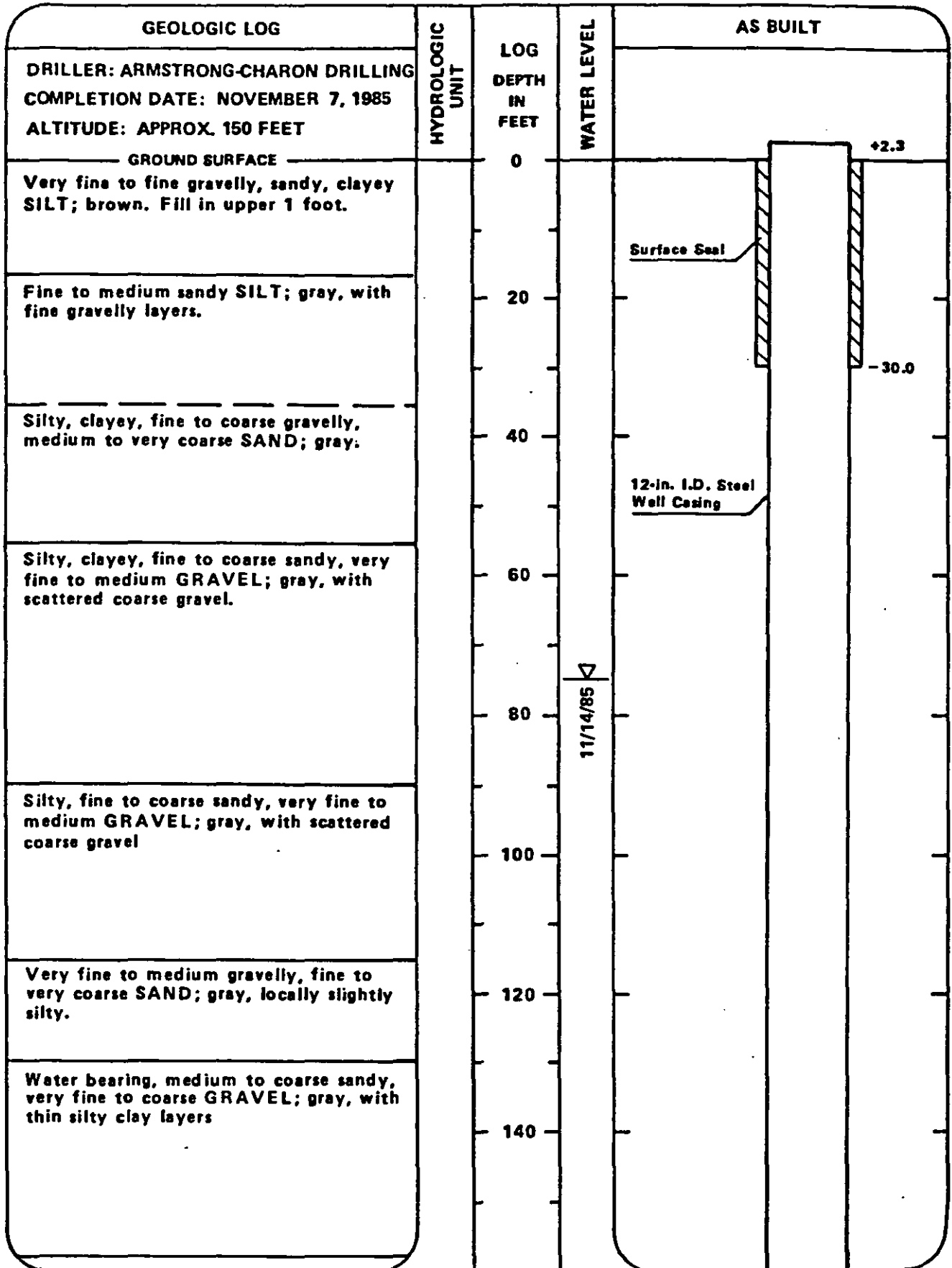
Tape up

Sheet _____ of _____ sheets

Well No. 19

LOG & AS-BUILT DIAGRAM

FIGURE 2



SHANNON & WILSON, INC.



GROUNDWATER SECTION
SEATTLE, WASHINGTON
(206) 632-8020

BLAINE WATERSHED
BLAINE, WASHINGTON

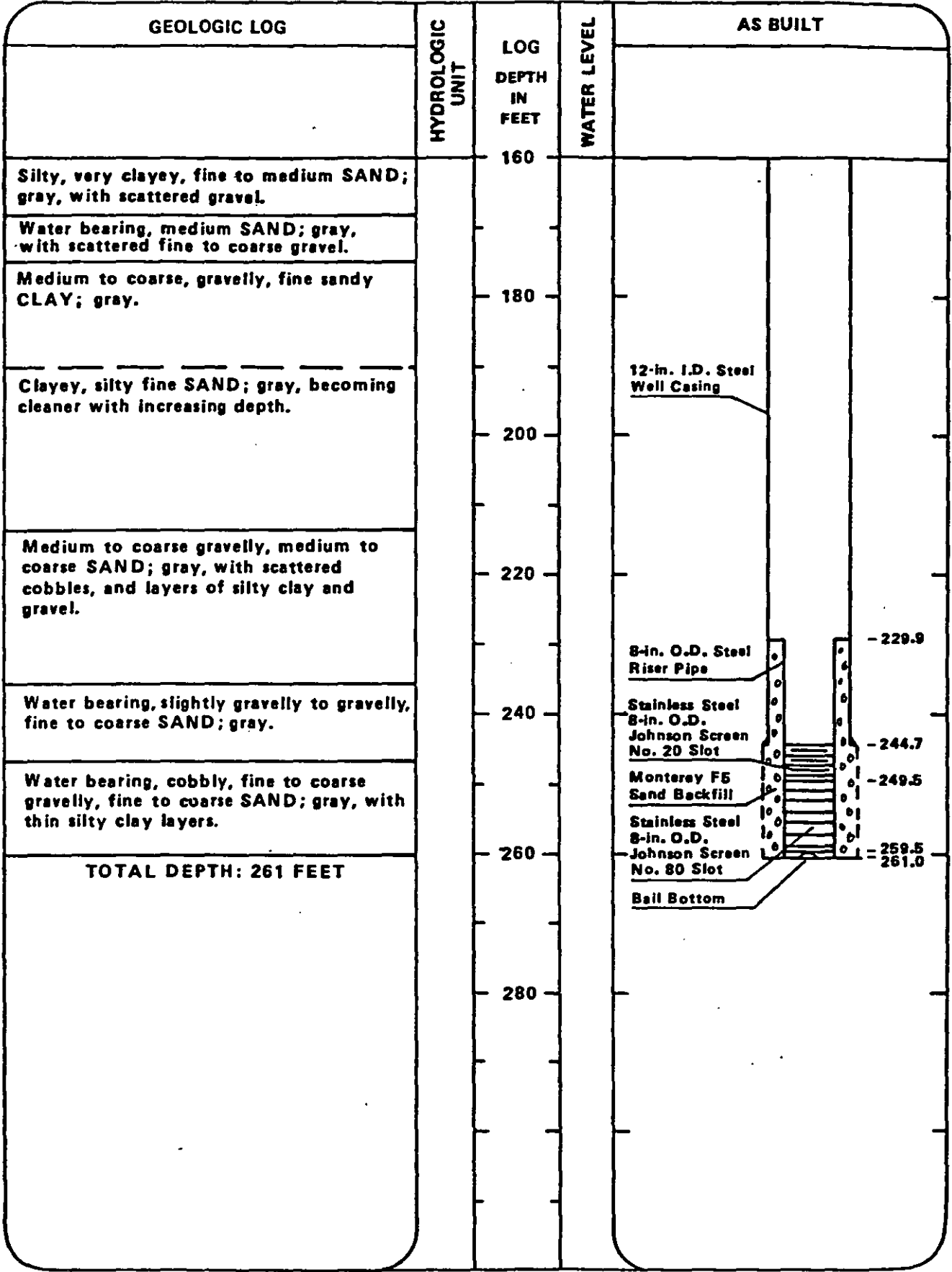
WELL NO. 19

W-4473-01
APRIL 1986

FIG. 2
Sheet 1 of 2

LOG & AS-BUILT DIAGRAM

FIGURE 2



SHANNON & WILSON, INC.
 GROUNDWATER SECTION
 SEATTLE, WASHINGTON
 (206) 632-8020

BLAINE WATERSHED
 BLAINE, WASHINGTON

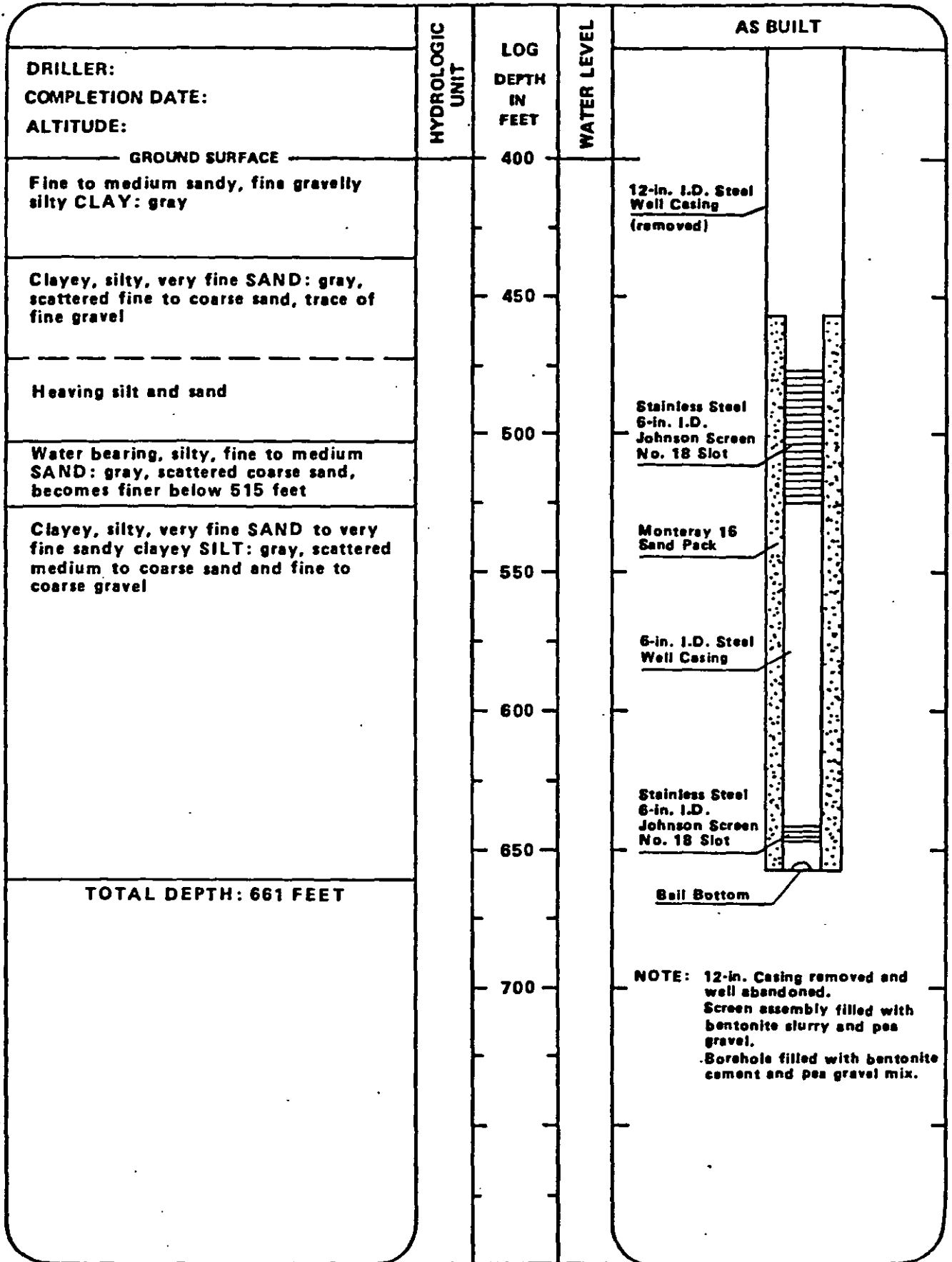
WELL NO. 19

W-4473-01
 APRIL 1986

FIG. 2
 Sheet 2 of 2

LOG & AS-BUILT DIAGRAM

2/2 FIGURE 3



SHANNON & WILSON, INC.



GROUNDWATER SECTION
 SEATTLE, WASHINGTON
 (206) 632-8020

BLAINE WATERSHED
 BLAINE, WASHINGTON

WELL NO. 20

W-4473-01
 APRIL 1986

FIG. 3
 Sheet 2 of 2

TW-1

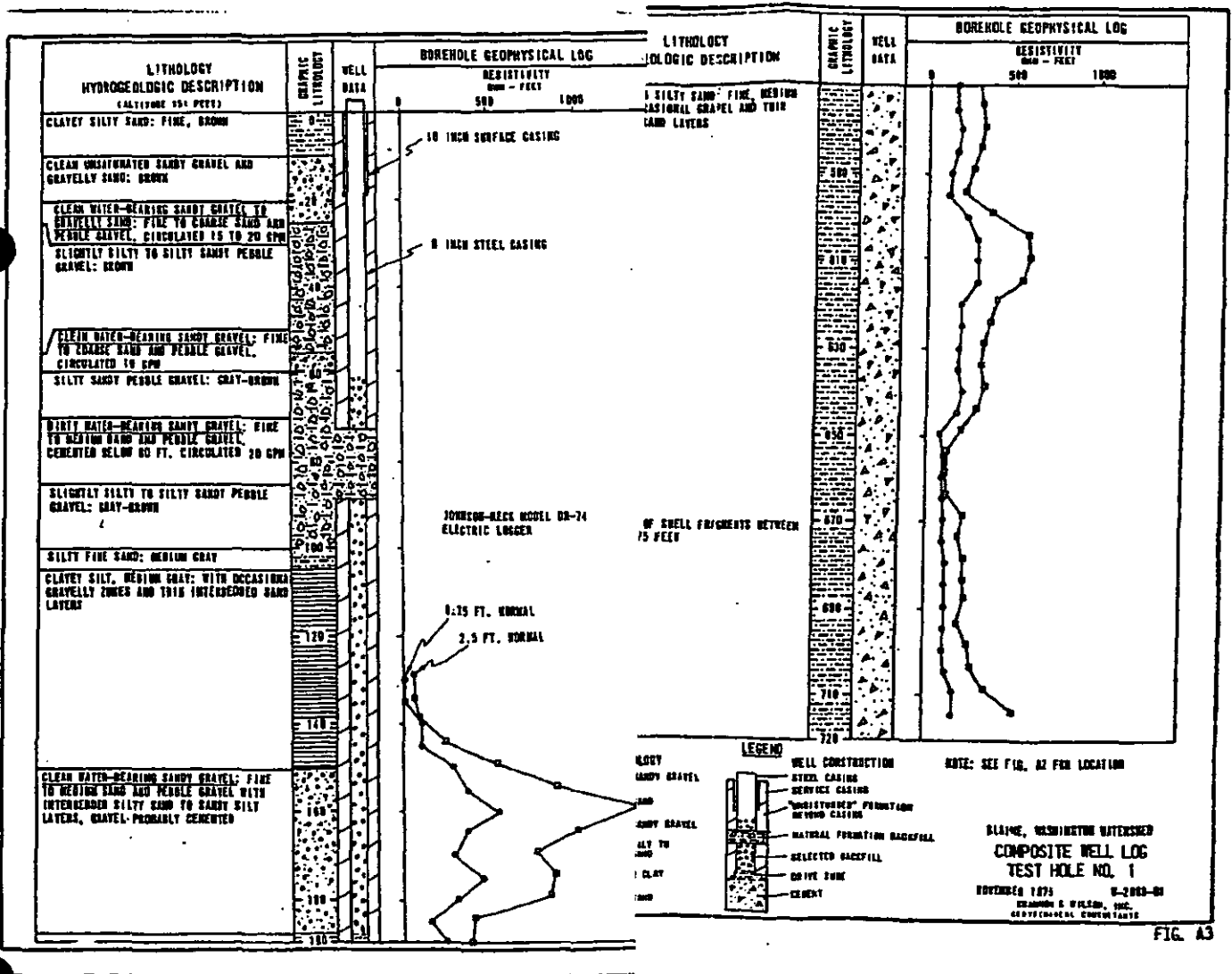
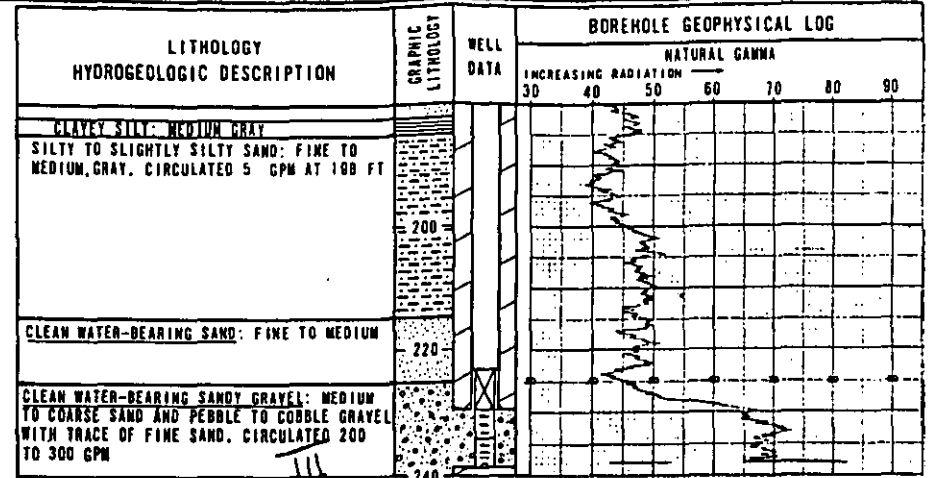
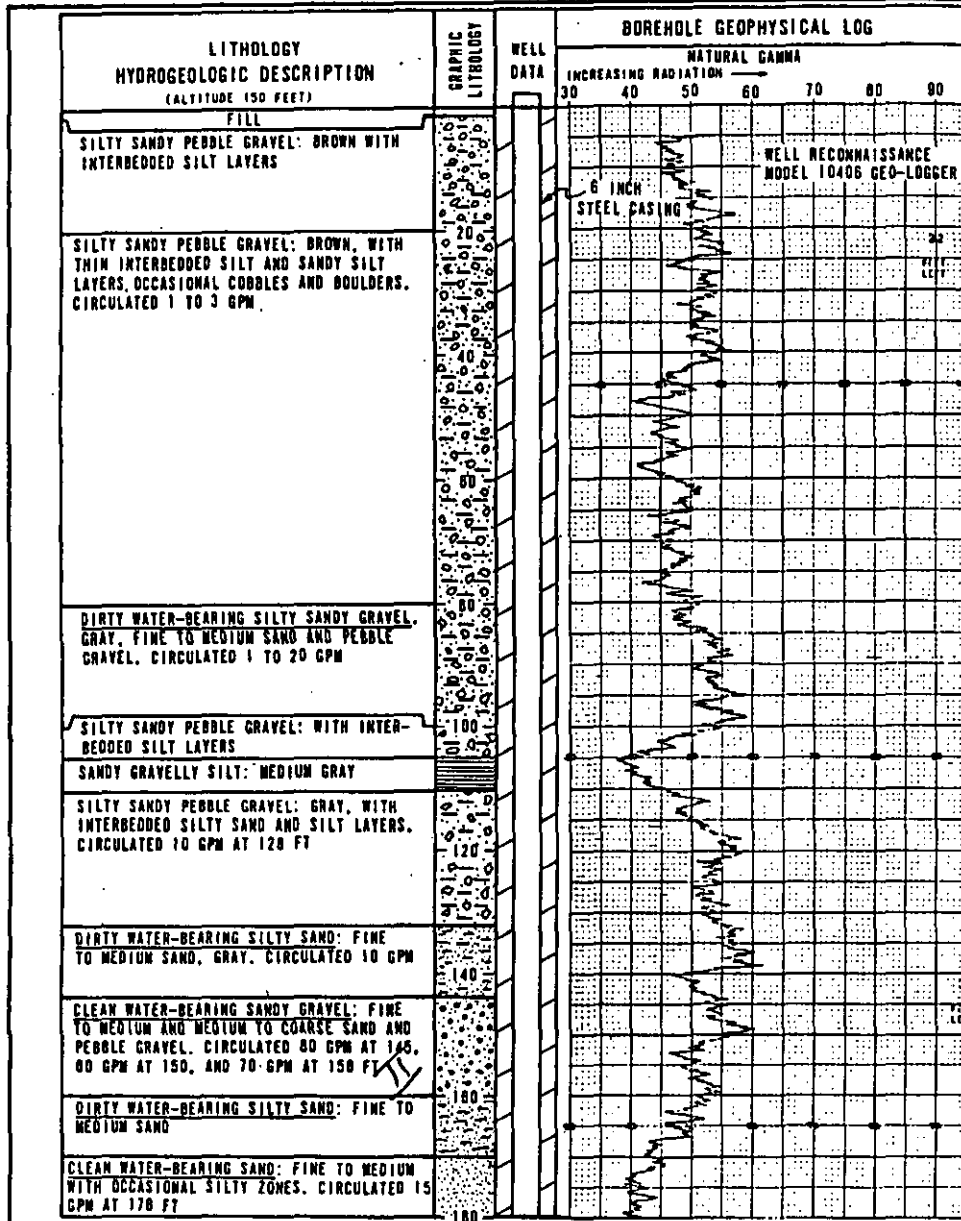
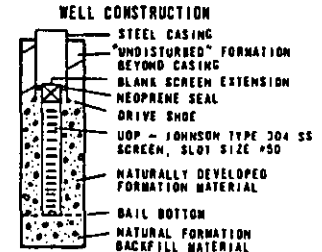


FIG. A3



LEGEND

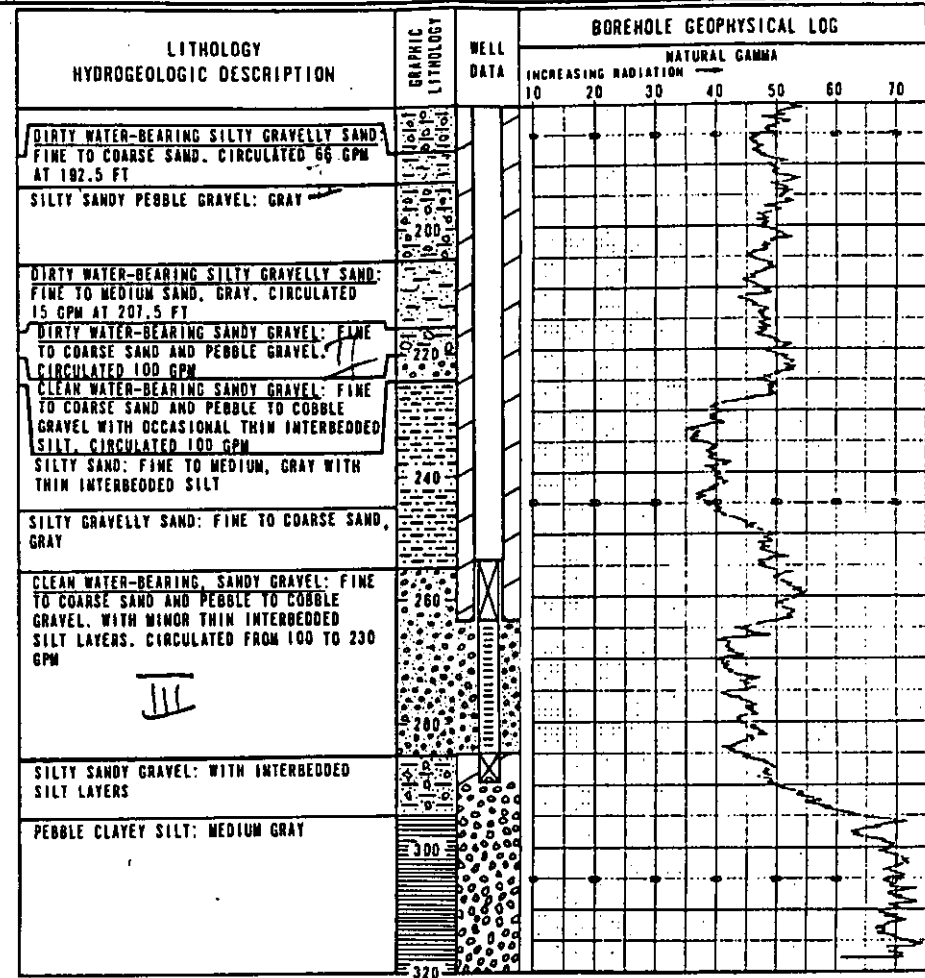
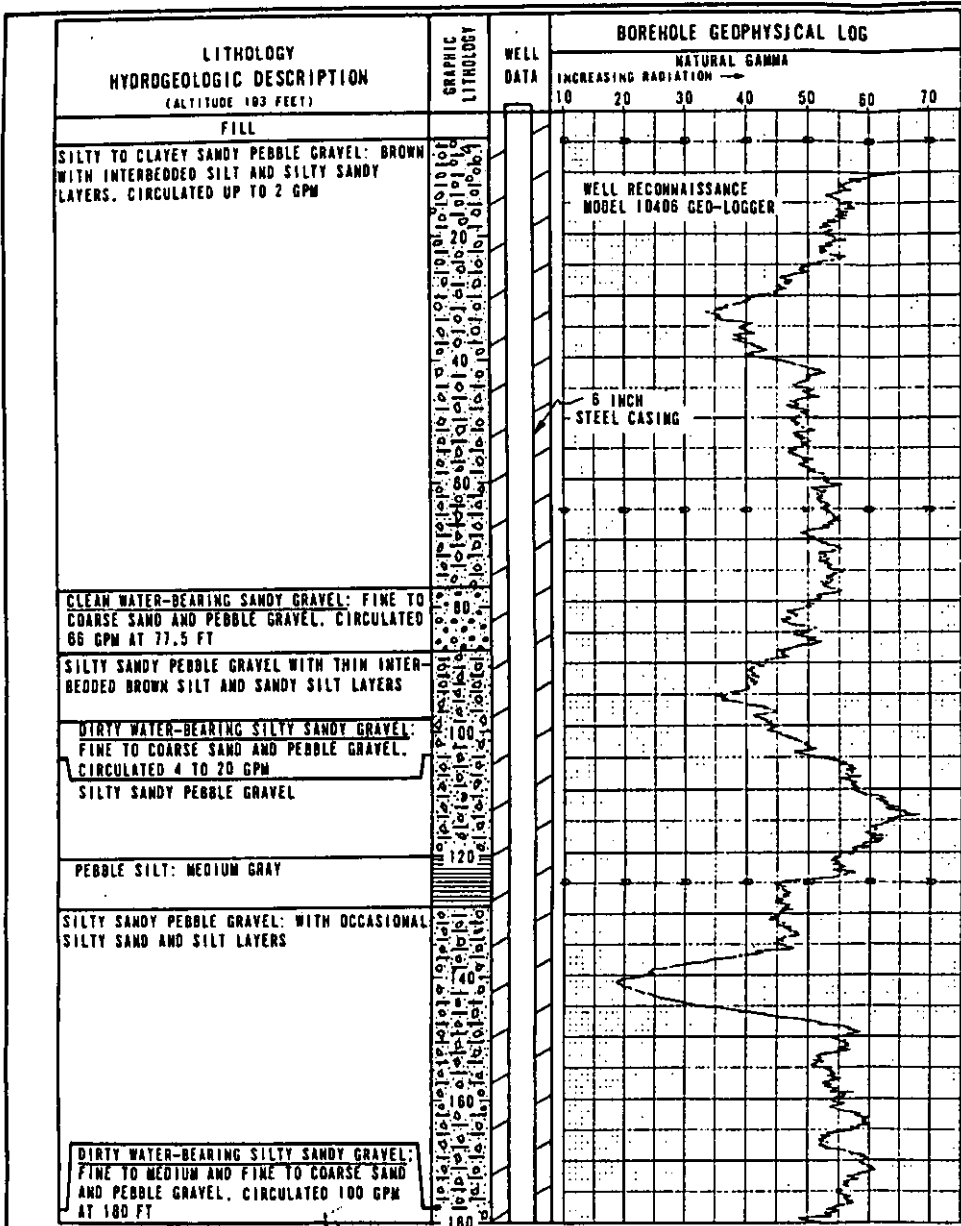
- GEOLOGY**
-  CLEAN SANDY GRAVEL
 -  CLEAN SAND
 -  SILTY SANDY GRAVEL
 -  SANDY SILT TO SILTY SAND
 -  SILT TO CLAY
 -  DIRTY SAND



NOTE: SEE FIG. A2 FOR LOCATION

BLAINE, WASHINGTON WATERSHED
COMPOSITE WELL LOG
TEST WELL NO. 2

NOVEMBER 1975 W-2809-01
SHANNON & WILSON, INC.
GEO-TECHNICAL CONSULTANTS



LEGEND

GEOLOGY

- CLEAN SANDY GRAVEL
- CLEAN SAND
- SILTY SANDY GRAVEL
- SANDY SILT TO SILTY SAND
- SILT TO CLAY
- DIRTY SAND

WELL CONSTRUCTION

NOTE: SEE FIG. A2 FOR LOCATION

BLAINE, WASHINGTON WATERSHED
COMPOSITE WELL LOG
 TEST WELL NO. 3
 NOVEMBER 1975 W-2808-01
 SHANNON & WILSON, INC.
 GEOTECHNICAL CONSULTANTS

~~Colacaveio~~ 40/01-02 D

WATER WELL REPORT **Colacaveio**

STATE OF WASHINGTON

Application No. _____
Permit No. _____

(1) OWNER: Name Dan Colacaveio Address 3287 H St. Blaine, Wa.
 (2) LOCATION OF WELL: County Whatcom - NW 1/4 NW 1/4 Sec. 2 T.40N., R.1E.W.M.
 Bearing and distance from section or subdivision corner 1300' East

(3) PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
 New well Method: Dug Bored
 Deepened Cable Driven
 Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 184 ft. Depth of completed well 184 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: 10" Diam. from 0 ft. to 16 ft.
 Threaded 6" Diam. from _____ ft. to _____ ft.
 Welded 6" Diam. from +1 ft. to 180 ft.
 Perforations: Yes No
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.

Screens: Yes No
 Manufacturer's Name Johson
 Type stainless Model No. _____
 Diam. 5" Slot size .020 from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: _____
 Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes No To what depth? 18 ft.
 Material used in seal Bentonite
 Did any strata contain unusable water? Yes No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
 Type: _____ HP _____

(8) WATER LEVELS: Land-surface elevation above mean sea level 465 ft.
 Static level 165 ft. below top of well Date _____
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes No If yes, by whom? _____
 Yield: gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
 Bailor test 15 gal./min. with 5 ft. drawdown after 4 hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:
 Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Topsoil	0	1
Clay + gravel mix	1	23
Silty sand + gravel	23	178
course gravel aquifer	178	184

Work started 2-5 1987 Completed 4-14 1987

WELL DRILLER'S STATEMENT:
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Berona Well Service
 (Person, firm, or corporation) (Type or print)

Address 7211 Vista Dr. Ferndale

(Signed) David A. Berona
 (Well Driller)

License No. 0597 Date 4-27 1987

WATER WELL REPORT

STATE OF WASHINGTON

Boettcher
Registration No. 30
Permit No. 10

(1) OWNER: Name V.T. Gaines Address H Street Rd, Blaine, Wash.
 (2) LOCATION OF WELL: County Whatcom - NW 1/4 N.W. 1/4 Sec. 3 T.40.N. R.1E.W.M.
 Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
 New well Method: Dug Bored
 Deepened Cable Driven
 Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 178 ft. Depth of completed well 178 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: 8" Diam. from +6 inches ft. to 19 ft.
 Threaded _____" Diam. from _____ ft. to _____ ft.
 Welded _____" Diam. from _____ ft. to _____ ft.

Perforations: Yes No
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.

Screens: Yes No
 Manufacturer's Name Johnson
 Type Stainless Steel Model No. _____
 Diam. 5 in. Slot size .020 from 172 ft. to 178 ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: _____
 Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes No To what depth? 19 ft.
 Material used in seal Bentonite + cement
 Did any strata contain unusable water? Yes No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name Jacuzzi Subm.
 Type: 754B HP 3/4

(8) WATER LEVELS: Land-surface elevation _____ ft.
 above mean sea level. _____ ft.
 Static level 152 ft. below top of well Date 9/11/79
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes No If yes, by whom? Bezeira
 Yield: 10 gal./min. with 167 ft. drawdown after 1 hrs.
 " 7 " " 162 " " 2 "
 " 5 " " 159 " " 3 "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
<u>1:00</u>					

Date of test _____
 Bailor test 10 gal./min. with 14 ft. drawdown after 2 hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water _____ Was a chemical analysis made? Yes No

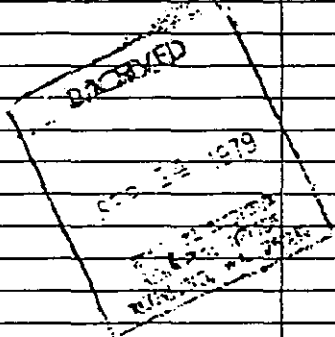
(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
<u>Silty Gravel + boulders</u>	<u>0</u>	<u>5</u>
<u>Coarse gravel</u>	<u>5</u>	<u>8</u>
<u>Glacial Till (hard pan)</u>	<u>8</u>	<u>19</u>
<u>Gravel (Alternating Med. to Coarse 2 in. diam.)</u>	<u>19</u>	<u>110</u>
<u>Mixed gravel + sand (dry)</u>	<u>110</u>	<u>152</u>
<u>Oxidized fine silty sand</u>	<u>152</u>	<u>170</u>
<u>Coarse Sand + gravel mix</u>		
<u>Water Zone</u>	<u>170</u>	<u>178</u>

Static water level at 152 ft.

Total head 26 ft.



Work started 9/1 1979 Completed 9/11 1979

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Bezeira - Drill
 (Person, firm, or corporation) (Type or print)

Address 2564 Douglas Rd, Ferndale,

[Signed] G. B. Bezeira Jr.
 (Well Driller)

License No. 0691 Date 9/12 1979

RECEIVED
NOV 15 1990

Golder Associates

Wood

WELL LOG

Date Drilled Feb 1969 Driller H. Hayes
 Owner George Eden Address Blaine, B.R.
 General Location 3 mi. east of Blaine

Loc. Sec 7 T40 N1
 Casing Diam. 6 Depth 66 ft. Open End Yes
 Screen ft. to ft. Perforated ft. to
 Water Level 2 above surface. Date
below

(Bailed) (Pumped) 7 (gph) (gpm) 4 ft. drawdown
 Installed 2 1/2" P. 95 230r. - 82 gal. float tank
70 ft. of casing & slightly open

Material	Thickness (feet)	Depth (feet)
Surface water in is grown 4 ft. in long	4	4
Tan clay & gravel	6	10
Tan Hoff.	5	15
gray c. & s.	15	30
gray clay	22	52
Mud seam at 52 ft		
Clay - bit of gravel	11	63
Gravel, clay - some water	4	67
Water sand		
Stayed out of sand - avoided screen at low capacity.		

= 7/8 -

Page 1 of 2

40N/01E 04/901

- Abbreviations and Explanations -

S - sand

G - gravel

C - clay

In combination - listed in quantity order

H.P. - Hardpan - cemented; hard, c, s, org.
Quicksand - Excessive amount of clay silt
and flowing sand.

(1) OWNER: Name William Church Address 9159 Starwood Rd Blaine 9973
 (2) LOCATION OF WELL: County Whatcom NW SE Sec 9 T 90 N. R 15 W.M
 Bearing and distance from section or subdivision corner SE End of Bryan Rd

PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
 New well Method: Dug Bored
 Deepened Cable Driven
 Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 3.90 ft. Depth of completed well 3.90 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: 8" Diam. from 0 ft. to 100 ft.
 Threaded 6" Diam. from 0 ft. to 3.79 ft.
 Welded " Diam. from _____ ft. to _____ ft.

Perforations: Yes No H₂O
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.

Screens: Yes No
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: _____
 Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes No To what depth? _____ ft.
 Material used in seal Bentonite
 Did any strata contain unusable water? Yes No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
 Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level 125' ft. below top of well Date 3-4-78
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes No If yes, by whom? _____
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
 for test 4 gal./min. with 0 ft. drawdown after .05 hrs.
 Artesian flow _____ g.p.m. Date 3-4-78
 temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation

MATERIAL	FROM	TO
red clay	0	12
grey clay	12	48
silty clay	48	59
grey clay	59	130
dark grey clay	130	371
fine sand	371	378
hard sand in clay	378	390

Work started 2-14 1978 Completed 3-4 1978

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Star Drilling Service
 (Person, firm, or corporation) (Type or print)

Address 3930 Cliffside Dr. Blaine

[Signed] Herman L. Lehner
 (Well Driller)

License No. 266 Date 3-4-78, 1978

Atter

LIVERMORE & SON, Inc.

Well Drilling Contractors

6053 Portal Way
Ferndale, Washington 98248
November 14, 1990

40NDIE-10A
(Atter)

WELL LOG FOR WELL DRILLED
AUGUST 1978 at 3335 SWEET ROAD

- 0 - 1 Topsoil & gravel
- 1 - 4 Coarse gravel dry
- 4 - 9 Gravel, little clay (brown)
- 9 - 24 Sand, little gravel
- 24 - 55 Sand, little gravel, some clay lenses (brown)
- 55 - 61 Sand little gravel, blue clay
- 61 - 98 Sand, little gravel, brown clay & dry
- 98 -124 Sand, little gravel, brown clay - Water
- 124 -140 Sand, brown clay (no water)

5ft. x 6in. x 30 slot stainless steel screen

Static W.L. 98'-4" from top of casing. Drawdown 10' at 20 GPM

Peda Submergible pump 10B18F101 1HP 230V

Pump set at 115 feet.

WATER WELL REPORT

STATE OF WASHINGTON

(1) OWNER: Name Richard Jensen Address P.O. Box 1274-3667 H. St. Blaine, Va
 (2) LOCATION OF WELL: County Whatcom - NW 1/4 NE 1/4 Sec. 3 T. 40 N. R. 1 E. W.M.
 and distance from section or subdivision corner

(3) PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other
 (4) TYPE OF WORK: Owner's number of well (if more than one) _____
 New well Method: Dug Bored
 Deepened Cable Driven
 Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 297 ft. Depth of completed well 284 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: 6" Diam. from 12 1/2 ft. to 284 ft.
 Threaded " Diam. from _____ ft. to _____ ft.
 Welded " Diam. from _____ ft. to _____ ft.
 Perforations: Yes No
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.

Screens: Yes No
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: _____
 Gravel placed from _____ ft. to _____ ft.
 Surface seal: Yes No To what depth? 20 ft.
 Material used in seal Barlute
 Did any strata contain unusable water? Yes No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
 Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level 186 ft. below top of well Date _____
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes No If yes, by whom? _____
 field: gal./min. with _____ ft. drawdown after _____ hrs.
 " " " " " " " "
 " " " " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

 Date of test _____
 Pump test: 10 gal./min. with 2 ft. drawdown after _____ hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:
 Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
tan gravel loam	0	3
tan clay	3	12
Dry gravel	12	15
gray clay & gravel	15	116
gray clay	116	120
gray clay & gravel	120	160
Dry sand & gravel	160	175
gray clay	175	200
Brown sand & clay seepage	200	230
Brown gravel, sand clay - "	230	233
gray sand & clay - seepage	233	240
gray sandy clay	240	255
Gravel & sand - seepage	255	280
Gravel - water	280	284
sand & gravel - water	284	296
gray clay	296	297

Work started 1-2, 1977 Completed 1-3, 1977

WELL DRILLER'S STATEMENT:
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
 NAME Hayer Well Drilling
 (Person, firm, or corporation) (Type or print)
 Address 1413 Colony Rd. Bow
 [Signed] _____ (Well Driller)
 License No. 178 Date Jan 3, 1977

WATER WELL REPORT STATE OF WASHINGTON

27

40/01-112

Application No. Wilson Permit No.

(1) OWNER: Name Mr. J.E. Wilson Address 3105 Haynie Rd. Custer LOCATION OF WELL: County Whatcom NE SW 11 40 N. R. 1E W.M.

(3) PROPOSED USE: Domestic [X] Industrial [] Municipal [] Irrigation [] Test Well [] Other []

(4) TYPE OF WORK: Owner's number of well (if more than one) New well [X] Method: Dug [] Bored [] Deepened [] Cable [X] Driven [] Reconditioned [] Rotary [] Jetted []

(5) DIMENSIONS: Diameter of well 6 inches. Drilled 237 ft. Depth of completed well 237 ft.

(6) CONSTRUCTION DETAILS: Casing installed: 6" Diam. from +1 ft. to 2226 ft. Threaded [] Welded [X] Perforations: Yes [] No [X] Type of perforator used SIZE of perforations in. by perforations from ft. to ft.

Screens: Yes [X] No [] Manufacturer's Name Johnson Type Stainless Steel Model No. Diam. 6 Slot size 10 from 227 ft. to 232 ft. Diam. 6 Slot size 14 from 232 ft. to 237 ft.

Gravel packed: Yes [] No [X] Size of gravel: Gravel placed from ft. to ft.

Surface seal: Yes [X] No [] To what depth? 30 ft. Material used in seal Puddled blue clay Did any strata contain unusable water? Yes [] No [X] Type of water? Depth of strata Method of sealing strata off

(7) PUMP: Manufacturer's Name Goulds Type Submersible HP 1

(8) WATER LEVELS: Land-surface elevation above mean sea level ft. Static level ft. below top of well Date 2/16/87 Artesian pressure lbs. per square inch Date 2/16/87 Artesian water is controlled by valve (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level Was a pump test made? Yes [] No [X] If yes, by whom? Yield: gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level) Time Water Level Time Water Level Time Water Level Date of test 2/12/87 Baller test 20 gal./min. with 130 ft. drawdown after 2 hrs. Artesian flow g.p.m. Date Temperature of water Was a chemical analysis made? Yes [] No [X]

(10) WELL LOG: Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

Table with columns MATERIAL, FROM, TO. Rows include Top soil (0-1), Sandy loam (1-3), Sand & water (3-10), Sand & blue clay (soft) (10-31), Sand & gravel & blue clay (s) (31-58), Sand & gravel & littel clay (58-92), Blue clay (soft) (92-195), Sand & blue clay (195-219), Sand fine & Water (219-237), Sand & blue clay.

RECEIVED

MAY 1 1987

DEPT. OF ECOLOGY

Work started 2/5/87 19 Completed 2/13/87 19

WELL DRILLER'S STATEMENT: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Livermore & Son, Inc. (Person, firm, or corporation) (Type or print)

Address 6053 Portalway, Ferndale

[Signed] J.E. Wilson (Well Driller)

License No. 272 Date 2/15/87 19

WATER WELL REPORT

40/01/14 E

STATE OF WASHINGTON

Application No.

Permit No.

(1) OWNER: Name Walt Hekala Jr. Address Behme Rd. Blaine, Wa.

(2) LOCATION OF WELL: County Whatcom SE 1/4 NW 1/4 Sec 14 T 40N. R 1E W.M.
 Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well (if more than one)....
 New well Method: Dug Bored
 Deepened Cable Driven
 Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 6 inches
 Drilled 420 ft. Depth of completed well 420 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: 6" Diam. from +3 ft. to 419 ft.
 Threaded " Diam. from ft. to ft.
 Welded " Diam. from ft. to ft.

Perforations: Yes No
 Type of perforator used

SIZE of perforations in. by in.
 perforations from ft. to ft.
 perforations from ft. to ft.
 perforations from ft. to ft.

Screens: Yes No
 Manufacturer's Name

Type Model No.
 Diam. Slot size from ft. to ft.
 Diam. Slot size from ft. to ft.

Gravel packed: Yes No Size of gravel:

Gravel placed from ft. to ft.

Surface seal: Yes No To what depth? 18 ft.
 Material used in seal Puddeling clay
 Did any strata contain unusable water? Yes No
 Type of water? Depth of strata

Method of sealing strata off

(7) PUMP: Manufacturer's Name

Type: HP

(8) WATER LEVELS: Land-surface elevation above mean sea level ft.
 Static level ft. below top of well Date

Artesian pressure lbs. per square inch Date

Artesian water is controlled by (Cap. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? Yes No If yes, by whom?

Yield: gal./min. with ft. drawdown after hrs.
 " " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
.....
.....

Date of test

Baller test 1 gal./min. with ft. drawdown after hrs.
 Artesian flow g.p.m. Date

Temperature of water Was a chemical analysis made? Yes No

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Topsoil	0	1
Brown sand dry	1	19
Brown dirty sand and clay	19	22
Gray clay	22	79
Gray clay gravel and clam shells	79	100
Gray clay and gravel	100	295
Fine gray sand and water dirty	295	302
Gray clay and gravel	302	
<u>Dry</u>		

Work started 9-23 19 83 Completed 9-24 19 83

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Hayes Well Drilling & Pumps Inc.
 (Person, firm, or corporation) (Type or print)

Address 1413 Colony Rd. Bow, Wa.

[Signed] Steve Gillet
 (Well Driller)

License No. 762 Date 10-5, 19 83

40/1-12/A

File Original and First Copy with
Department of Ecology
Second Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. _____

Permit No.

(1) OWNER: Name Dennis Sinsky Address Delta Line
 (2) LOCATION OF WELL: County Whatcom - NE 1/4 NE 1/4 Sec 12 T. 40N. R. 1E W.M.
 Bearing and distance from section or subdivision corner _____

(3) PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
 New well Method: Dug Bored
 Deepened Cable Driven
 Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 2.25 ft. Depth of completed well 224 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: _____ " Diam. from _____ ft. to _____ ft.
 Threaded _____ " Diam. from _____ ft. to _____ ft.
 Welded 6 " Diam. from 0 ft. to 224 ft.

Perforations: Yes No
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.

Screens: Yes No
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: _____
 Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes No To what depth? 14 ft.
 Material used in seal Bestonite Clay
 Did any strata contain unusable water? Yes No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
 Type: _____ HP _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level _____ ft. below top of well Date _____
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes No If yes, by whom? _____
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
 " " " " " " " " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
 Baller test 1.2 gal./min. with 57 ft. drawdown after 4 hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:
 Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Topsoil	0	1
Basin clay	1	8
grey clay	8	90
gravel w/ hardpan	90	105
gravel w/ clay	105	183
gravel w/ hardpan	183	190
sand, gravel cemented	190	180
slushy clay	198	220
gravel w/ clay	220	222
sand gravel silty	222	224

RECEIVED

AUG 24 1983

DEPT. OF ECOLOGY

Work started 3-24 1982 Completed 4-9 1982

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME J & C Well Drilling Inc (Person, firm, or corporation) (Type or print)
 Address 888 Kelly Rd Bellingham
 [Signed] James Nigrali (Well Driller)
 License No. 987 Date 4-9 1982

WATER WELL REPORT
STATE OF WASHINGTON

40/01-119
Application No. _____
Coal Exploration
Field No. _____

(1) OWNER: Name Utah International Inc. Address Custer School Rd.
(2) LOCATION OF WELL: County Whatcom SW 1/4 SE 1/4 Sec. 11 T. 40 N. R. 1 E W.M.
Bearing and distance from section or subdivision corner _____

(3) PROPOSED USE: Domestic Industrial Municipal
Irrigation Test Well Other
(4) TYPE OF WORK: Owner's number of well WL82-10
(if more than one) _____
New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 500 ft. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from +2 ft. to 405 ft.
Threaded " Diam. from _____ ft. to _____ ft.
Welded " Diam. from _____ ft. to _____ ft.
Perforations: Yes No
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes No
Manufacturer's Name _____
Type _____ Model No. _____
Diam. _____ Slot size _____ from _____ ft. to _____ ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.
Surface seal: Yes No To what depth? _____ ft.
Material used in seal _____
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation _____ ft.
above mean sea level. _____ ft.
Static level _____ ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____
(Cap. valve, etc.) _____

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " " " "
" " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Date of test _____
Bailer test 0 gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Sandy top soil	0	2
Brown sand	2	4
Gray sand and water	4	30
Gray clay	30	90
Gray clay and scattered gravel	90	115
Gray clay, gravel and clam shells	115	174
Gray clay and some gravel	174	278
Gray gravel sand and clay	278	292
Gray gravel sand and water	292	296
Gray gravel sand clay and water	296	305
Gray gravel sand and water	305	319 1/2
Gray gravel sand and lots of water, static 14 ft.	319 1/2	368
went to mud at 337 ft.		
Gray gravel and greenish brown sandy clay	368	375
Gray gravel and clay	375	380
Gray gravel and greenish brown clay	380	387
Gray gravel and clay	387	390
Gray gravel sand and boulders	390	398
Gray gravel and boulders	398	457
Silt stone and pieces of coal	457	
Broken drive shoe, gravel caves in		

Work started 12-20, 1982 Completed 1-4, 1983

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Hayes Well Drilling & Pumps Inc.
(Person, firm, or corporation) (Type or print)
Address 1413 Colony Rd. Bow, Washington
[Signed] Steve Gilbert
(Well Driller)
License No. 762 Date 1-6, 1983

WATER WELL REPORT
STATE OF WASHINGTON

41 40102-66

Permit No.

(1) OWNER: Name VINCENT YOUNG Address 2986 HAYMIE RD. CUSTER
 (2) LOCATION OF WELL: County WHAITCOM SW 1/4 Sec. 6 T. 40 S. R. 2E W.M.

(3) PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other

(4) TYPE OF WELL: Diameter of well (ft. or less than one) 1
 New well Method: Drag Bored
 Deepened Cased Driven
 Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 6 inches
 Bored 223 ft. Depth of completed well 223 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: 6" diam. from 0 ft. to 220 ft.
 Type: W diam. from 0 ft. to 0 ft.
 Wellhead: W diam. from 0 ft. to 0 ft.
 Perforations: Yes No
 Type of perforation tool: X
 Size of perforations: in. by in.
 Perforations from ft. to ft.
 Perforations from ft. to ft.
 Perforations from ft. to ft.

Drill Casing: Yes No
 Manufacturer: JOHNSON
 Type: STAINLESS STEEL Model No.
 Size: 6 Slot size 15 from 223 ft. to 220 ft.
 Size: Slot size from ft. to ft.

Gravel packed: Yes No Size of gravel:
 Gravel placed from ft. to ft.

Storage tank: Yes No To what depth? ft.
 Material used in seal: BENTONITE
 Did any strata contain undesirable water? Yes No
 Type of water? SALT Depth of strata 182-186
 Method of sealing strata off: SELF SEALING

(7) PUMP: Manufacturer's name: DISC PIPE ON PAST
 Type: HP

(8) WATER LEVELS: Land surface elevation above mean sea level: ft.
 Static level: 60 ft. below top of well Date:
 Artesian pressure: lbs. per square inch Date:
 Artesian water is controlled by: (See valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes No If yes, by whom: BTC
 Yield: 10 g.p.m. with 5 ft. drawdown after 4 hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Rate of test: 10 gal/min with 5 ft. drawdown after 42 hrs.
 Date: p.m. Date:
 Temperature of water: Was a chemical analysis made? Yes No

(10) WELL LOG:

Formation. Describe by color, character, size of material used structure, and show depth of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
RED CLAY	0	16
GREY CLAY	16	135
CLAY & GRAVEL T/W	135	137
CLAY	137	182
GRAVEL SALT WATER	182	186
CLAY & GRAVEL	186	211
GRAVEL & FINE SAND	211	212
HARD PAN w/ WATER	212	217
FINE GREY SAND	217	223

RECEIVED
OCT 11 1983

DEPARTMENT OF ECOLOGY
NORTHWEST REGION

MUCH TROUBLE WITH CLAY
 COLOR IN WATER
 4 ATTEMPTS
 Work started: 7-13-83 19... Completed: 10-2-83 19...

WELL DRILLER'S STATEMENT:
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME: STAR DRILLING SERVICE
 (Person, firm, or corporation) (Type or print)

Address: 3930 CLIFFSIDE DR. BLHM.

[Signed] William L. Lehman
 (Well Driller)

License No. 266 Date 10-9-83, 19...

WATER WELL REPORT

STATE OF WASHINGTON

4902-18P 30

Application No. _____

Permit No. _____

OWNER: Name Ted Tjalkens Address 8591 Sunrise Lynden

LOCATION OF WELL: County Whatcom SE 1/4 S.W. 1/4 Sec 18 T 40 N. R 2 E W.M.

Bearing and distance from section or subdivision corner _____

(3) PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
 New well Method: Dug Bored
 Deepened Cable Driven
 Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well _____ inches.
 Drilled _____ ft. Depth of completed well _____ ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: _____" Diam. from _____ ft. to _____ ft.
 Threaded _____" Diam. from _____ ft. to _____ ft.
 Welded _____" Diam. from 0 ft. to 257 ft.

Perforations: Yes No
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.

Screens: Yes No
 Manufacturer's Name _____
 Type _____ Model No. _____
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: _____
 Gravel placed from _____ to _____ ft.

Surface seal: yes No To what depth? _____ ft.
 Material used to seal _____
 Did any strata contain unusable water? Yes No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
 Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
 Static level _____ ft. below top of well Date _____
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes No If yes, by whom? _____
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
 Bailor test _____ gal./min. with _____ ft. drawdown after _____ hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
<u>topsoil</u>	<u>0</u>	<u>1</u>
<u>Brown fine sand</u>	<u>1</u>	<u>15</u>
<u>fine gray sand</u>	<u>15</u>	<u>24</u>
<u>Blue clay</u>	<u>24</u>	<u>26</u>
<u>fine sand</u>	<u>26</u>	<u>34</u>
<u>gray blue clay & sand</u>	<u>34</u>	<u>125</u>
<u>hard sand Blue clay</u>	<u>126</u>	<u>133</u>
<u>thick fine sand & clay</u>	<u>133</u>	<u>165</u>
<u>sand fine</u>		
<u>gray clay</u>	<u>165</u>	<u>191</u>
<u>sand clay fine</u>	<u>191</u>	<u>207</u>
<u>sand</u>	<u>207</u>	<u>212</u>
<u>Gravel clayey</u>	<u>212</u>	<u>214</u>
<u>sand</u>	<u>214</u>	<u>217</u>
<u>clayey gravel</u>	<u>217</u>	<u>219</u>
<u>sand gravel mix</u>	<u>219</u>	<u>257</u>
<u>Salt well</u>		
<u>cut pipe 1/4" below ground</u>		
<u>a fill with concrete & shield bit on</u>		

Work started 6-4 1984. Completed 6-7 1984

WELL DRILLER'S STATEMENT:
 This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
 NAME DTC Well Drilling Inc.
 (Person, firm, or corporation) (Type or print)
 Address 888 Kelly Rd. Bellingham
 (Signed) Michael Florence
 (Well Driller)
 License No. 1257 Date 7-27 1987

(1) OWNER: Name ANDREW ZYLSTRA Address BADGER RD
 (2) LOCATION OF WELL: County WACOM SW 1/4 Sec 9 T. 40 N. R. 25 W.
 ing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
 New well Method: Dug Bored
 Deepened Cable Driven
 Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 6 inches.
 Drilled 70 ft. Depth of completed well 66 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: _____ " Diam. from _____ ft. to _____ ft.
 Threaded _____ " Diam. from _____ ft. to _____ ft.
 Welded 6 " Diam. from 0 ft. to 63 ft.
 Perforations: Yes No
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.

Screens: Yes No
 Manufacturer's Name JOHNSON
 Type STAINLESS ST. Model No. _____
 Diam. 6 Slot size _____ from _____ ft. to _____ ft.
 Diam. 6 Slot size 25 from 66 ft. to 63 ft.

Gravel packed: Yes No Size of gravel: _____
 Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes No To what depth? _____ ft.
 Material used in seal BENTONITE
 Did any strata contain unusable water? Yes No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
 Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____
 Static level 18 ft. below top of well Date 12-6-83
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes No If yes, by whom? _____
 Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
 Driller test 30 gal./min. with 12 ft. drawdown after 1 hrs.
 Artesian flow _____ g.p.m. Date _____
 Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG: Zylstra

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
RED CLAY	0	11
GREY CLAY	11	34
HARD PAN	34	37'4"
GRAVEL W/WATER	37'4"	38
HARD PAN	38	48
COARSE GRAVEL w/w	48	50
FINE BLK SAND	50	52
HARD PAN	52	58
FINE SAND	58	60
COARSE GRAVEL w/w	60	66
BLK. SAND w/CLAY	66	70

Work started 12-1-83 Completed 12-5-83

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME STAR DRILLING SERVICE
 (Person, firm, or corporation) (Type or print)

Address 3930 CLIFFSIDE DR BLH1

(Signed) Herman L. Lehmer
 (Well Driller)

License No. 8266 Date 12-6-83, 19__

APPENDIX B
CLIMATIC DATA

MONTHLY TOTAL PRECIPITATION

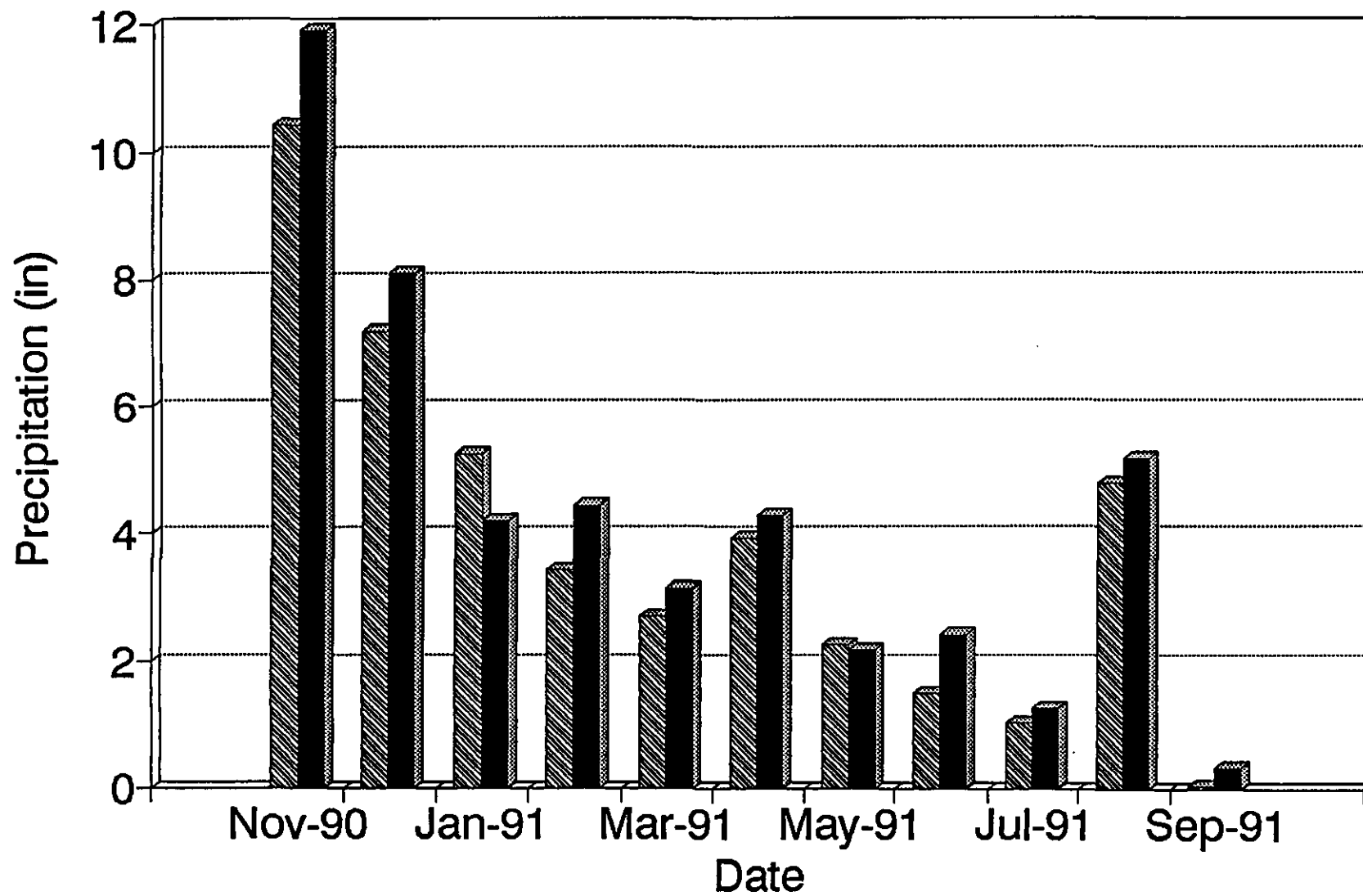


Figure B-1



Blaine Station 1990	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
1	t	0.42	0	0	0.06	0.14	0.1	0	0	0.13	0	0.58
2	t	0.5	0	0.04	0		0	0	0	0	0	0.13
3	0.5	0.5	0.02	0	0	0.94	0	0	0	0.6	0.33	0.38
4	0.33	0	0.02	0	0	0.41	0	0	0	1.38	0.11	1.1
5	0.55	0.28	0	0	0	t	0	0	0	0.09	0	0.04
6	0.25	0.24	0.47	0	0	0.81	0.32	0	0	0	0	0
7	0.4	0.1	0.92	0	t	0.1	0.09	0	0	0	0.43	0
8	0	0.05	0.04	0	0	0.2	0	0	0	0	0.13	1.32
9	0.56	1.23	0.11	0	0	0.15	0	0	0	0	1.97	1.15
10	0	1.7	0	0	0	0.44	0	0	0	0.31	1.61	0.04
11	0.08	0.12	0.07	0.03	0.18	0.13	0	0	0	0.05	0.35	0.1
12	0.02	0	0	0	t	t	0	0	0	0.38	0.33	0.02
13	0.2	0	t	0.15	0.06	0.03	0	0	0	0	0.47	0
14	0	0.06	0.45	0.02	0	0	0	0	0	0.19	0.12	0.15
15	0.05	0.42	0	0	0	0	0	0	0.06	t	0.08	0.24
16	0	0	0	0	0	0	0	0	0.93	0	0.08	0.22
17	0	0	0.13	0.35	0	0	0	0	0.1	0.01	0.43	0.55
18	0	0	0.38	0	0.09	0	0	0.25	0	0.39	0	t
19	0	0	0.06	0.4	0	0	0	0	0	0	0.18	0
20	0	0.49	0.16	0.24	0.1	0	0	0	0	0	0.27	0
21	0.5	0	0	0	0.1	0	0	0.03	0	0.87	0.52	0
22	0.65	0	0	0.13	0.09	0	0	0.13	0	0	0.35	0.04
23	0.1	0	0.04	0.44	0	0	0	0.02	0	0	0.86	0
24	0.61	0.19	0	0.03	0	t	0	0	0	0	0.6	0.06
25	0.33	0	0	0.6	0	0	0	t	0.03	0.16	0.16	0.12
26	0.01	0	0	t	t	0	0	0	0	0.12	0.02	0.08
27	0.22	0	0	0.23	0.06	0.02	0	0	0	0	0.08	0
28	0.12	0	0	0.39	t	0.02	0	0	0	0.17	0.02	0.34
29	0.38		0	0	0.06	0	0	0.32	0.03	0.12	0.7	0
30	0.33		0	0	0	0.1	0	0.22	0	0.27	0.26	0.5
31	0.06		0		0.83		0	0.58		0		0.05
Monthly Total	6.25	6.3	2.87	3.05	1.63	3.49	0.51	1.55	1.15	5.24	10.46	7.21

t = trace, nr = no record, na = not available

Blaine Station 1989	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
1	0.22	0	0.05	0.19	0	0	0.3	0.25	0	0	0	0
2	0.4	0	0	0.15	0	0	0.07	0	0	0	0.02	0.33
3	0.56	0	0	0.08	0	0	0	0.01	0	0	1.78	0.58
4	0	0	0	0.34	0	0	0	0	0	0.01	1.14	1.15
5	0.06	0	0.57	0.42	0	0	0	0	0	0.01	0.01	0.11
6	0	0	t	0.46	0.19	0	0	0	0	0	0.48	0.21
7	0	0	0.08	0	0	0	0	0	0	0	0	0.25
8	0.4	0	t	0	0	0	0	0	0	t	0.67	0.45
9	0.51	0	0.16	0	0	0.03	0	0	0	0	1.39	0
10	t	0	0.2	0	0	0	0	0	0	0.1	1.83	0
11	0.05	0	0.24	0	0.18	0	0	0	0	0.48	0.24	0
12	0.05	0	0.59	0	0	0	0	0	0	0.25	0.03	0
13	0.42	0	0.16	0	0	0.07	0.03	0	0	0.45	0.09	0
14	0.12	0	0	0	0	0.48	0	0.52	0	t	0	0
15	0.72	0	0	0	0	0	0	2.75	0	0	0	0
16	0.97	0.1	0.09	0	0	0	0.31	0.25	0	0	0.2	0
17	0.42	0.43	0	0	0.36	0.08	0.2	0	0.09	0	0.04	0
18	0.96	0.39	0.28	0	0.43	0.13	0	0	0	0.27	0.11	0
19	0	0.22	0	0.07	0.03	0.11	0	0	0	0	0.06	0.22
20	0.15	0.05	0	0.35	0	0.08	0	0.05	0	0.12	0.66	0.18
21	0.03	0.06	0.33	0	0	0	0	1.3	0	0.1	0.19	0.15
22	0.35	0.8	0	0.01	0	0	0	0.08	0	0.04	0	0
23	0	0.11	0	0	0.28	0	0	0	0	0.41	0.23	0
24	0	0.12	0.06	0	0.31	0	0	0	0	0.41	0.48	0
25	t	0	0.76	0	t	0	0	0	0	0	0.34	0
26	0	0	0.13	0.02	0.34	0	0	0	0.44	0.67	0.16	0
27	0.09	0.02	0.13	0	1.2	0.03	0	0.02	0	0	0.16	0.3
28	0	0	0.04	0	0.09	0.22	0	0	0	0	0	0
29	0.06		0.7	0	0	0.02	0	0	0	0	0	0.02
30	0.17		0.14	0	0	0.01	0	0	0	0.11	0	0.1
31	0		0.05		0		0	0		0		0.07
Monthly Total	6.71	2.3	4.76	2.09	3.41	1.26	0.91	5.23	0.53	3.43	10.31	4.12

t = trace, nr = no record, na = not available

Blaine Station 1991	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1	0	0.11	0.3	0.1	0	0	0	0	t			
2	0	nr	0.71	0.37	0	t	0	0	0			
3	0	0.36	0.36	0.65	0	0.05	0	0	0			
4	0	0.45	0.02	0.89	0	0.19	0	0	0			
5	0	0.14	0	0.35	0.24	0	0	0	0			
6	0.14	0	0.2	0.07	0.2	t	0	0	0			
7	0.88	0.1	0.02	0.13	0.17	0.06	0	0.19	0			
8	0.44	0.5	0.04	0.07	0.62	0	0	0.46	0			
9	1.05	0	0.01	0.89	0.05	0	0	0.57	0			
10	0.11	0	0	0	0	0.05	0	0.07	0			
11	0.58	0.02	0.1	0	0	0.05	0	0.14	0			
12	0.51	0.35	0.15	0	0	0.01	0.04	0.15	0.02			
13	0.3	0.18	0	0	0.02	0.09	0.15	0.03	0.22			
14	0.17	0.29	0	0.01	0	0	0	0	0			
15	0	0.13	0	0	0	0.06	0.45	0	0			
16	0.29	t	0	0	0	0.18	0.03	0	0			
17	0.15	0.1	0	0	0.34	0.15	0	0	0			
18	0.1	0.2	0	0	0.05	0	0	0	0			
19	0	0.5	0.38	0	0	0	0	0	0			
20	0	0	0	0	0	0.1	0.05	0	0			
21	0	0	0.11	0	0	0.08	0.2	0	0			
22	0	0	0.06	0	0	0.06	0	0	0			
23	t	0	0	0.01	0	0.03	0	0	0			
24	0	0	0	0.05	0.34	0	t	0	0			
25	0	0	0	0.16	0.1	0.34	0.11	0	0			
26	0	0	0	0	0.02	0	0	0.16	0			
27	0	0	0	0	0	0	0	1.26	t			
28	0.07	0	0	0.16	0	0	0	0.17	0.05			
29	0	0	0.13	0	0.03	0	0	0.25	0			
30	0		0.1	0	0.08	0	0	0.7				
31	0.45		t		0		0	0.63				
Monthly Total	5.24	3.43	2.69	3.91	2.26	1.5	1.03	4.78	0.29			

t = trace, nr = no record, na = not available

Boundary Upland	1990			1991												1992	
	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb
1	t	t	1	0	0.35	t	0.06	0	0	0	0	0.03	t	0.12	0.05	0.1	0.14
2		0	0.4	0	0.05	0.36	0.18	0	0	0	0	0	t	0.01	0.12	0.41	0.55
3		t	0.5	0	0.1	0.86	0.51	0	0.05	0	0	0	t	0	0.16	t	0.32
4		0.5	t	0	0.5	0.33	1.41	0	0.36	0	0	t	0.01	1.23	0.16	0.14	0
5		t	0.3	0	0.5	0	0.51	0	0.11	0	0	t	0	0.58	0.21	0.2	0
6		0	0.1	0	0	0.21	0.05	0.01	0	0	0	0	0	0.02	0.61	0.01	0.01
7		0.4	t	0.4	0.01	0.01	0.17	0.34	0.03	0	0.01	0.02	0	0.01	0.07	0	0
8		0	0.45	0.7	0.64	0.06	0.03	0.3	0.1	0	0.34	0.01	t	0.3	0.43	0	0.01
9		1.05	1.7	0.5	t	0.01	0.79	0.38	0	0	0.44	t	t	0.01	0.65	0.15	0.02
10		3.6	0.3	0	0.01	0.02	0.14	t	0	0	0.49	t	0	0.2	t	0.64	0.03
11		0.85	0.1	0.3	t	t	t	0	0.1	0	0.15	t	t	0.7	0.05	0.76	0
12		t	t	0.4	0.51	0.38	t	0	0.01	0.04	0.05	t	t	0.41	0.18	0.03	t
13		0.8	0.05	0.35	0.11	0.03	0	0.01	0.03	0	0.16	t	t	0.26	0.02	0.01	0.04
14		0.1	0.05	0.4	0.51	0.06	0	0	0.02	0.31	t	0.24	0	0.18	0	0	0.04
15		0.15	0.1	0.2	0.09	0.02	0	0	0.07	0.37	t	t	0	t	0	0	0.5
16		0.05	0.4	0.2	0.01	t	0	0	0.58	0.09	0	t	0.04	t	0	0.73	0.02
17	0	0.45	0.4	0.3	0.14	0	0	0.03	0.2	0.08	0	t	0.27	0.98	0	0	t
18	0.3	t	0.5	0.2	t	0	0	0.47	0.02	t	0	0	0.01	0.51	0.02	0	0.15
19	0.05	t	0.05	t	0.81	0.29	0	t	0	0	0	0	t	0.18	0.02	0.02	0.16
20	0	0.6	0	0	0.11	0.04	0	t	t	0	0	0	0	0.92	0.2	0	0.05
21	0.95	0.2	0	0	t	0	0	0	0.21	0	0	0	0.15	0.03	0	0.04	0.54
22	0	0.4	0.1	0	t	0.16	0	0	0.08	0.25	0	0	0.33	0.01	0.03	0.08	1.05
23	0	0.2	0	0	0	0.08	0	0	0.06	t	0	t	0	0	0	1.49	0.01
24	0	1.1	t	0	t	t	0.06	0.13	t	0	0	t	0.43	0.37	0	1.11	0.39
25	0	0.8	0.1	0	0	0.11	0.12	0.33	0.09	0	t	0	0.18	0.49	t	0.01	0.03
26	0.3	t	0.1	0	0	0	t	0.04	0.25	0.12	0	t	0.07	0.15	0.11	0.08	t
27	0	0.05	0.2	0	0	0	0.01	0.03	t	0.01	1.73	0	0	0.69	0.08	0.18	0
28	0.1	t	0.2	t	0	0	0	t	0	t	0.4	t	0	t	0.31	0.88	0
29	0.1	0.45	0	0	0	0	0.24	0	0	0	0.12	0.03	t	0.11	0.04	0.4	
30	0.4	0.15	0.7	0		0.11	t	0.1	0.03	0	1.29	t	0	0.01	0.1	0.55	
31	t		0.3	0.25		t		0.01		t		t	t		0.1	1.41	
Monthly Total		11.9	8.1	4.2	4.45	3.14	4.28	2.18	2.4	1.27	5.18	0.33	1.49	8.48	3.72	9.43	4.06

t = trace, nr = no record, na = not available

APPENDIX C
STREAM FLOW DATA

HYDROGRAPH

Dakota Creek

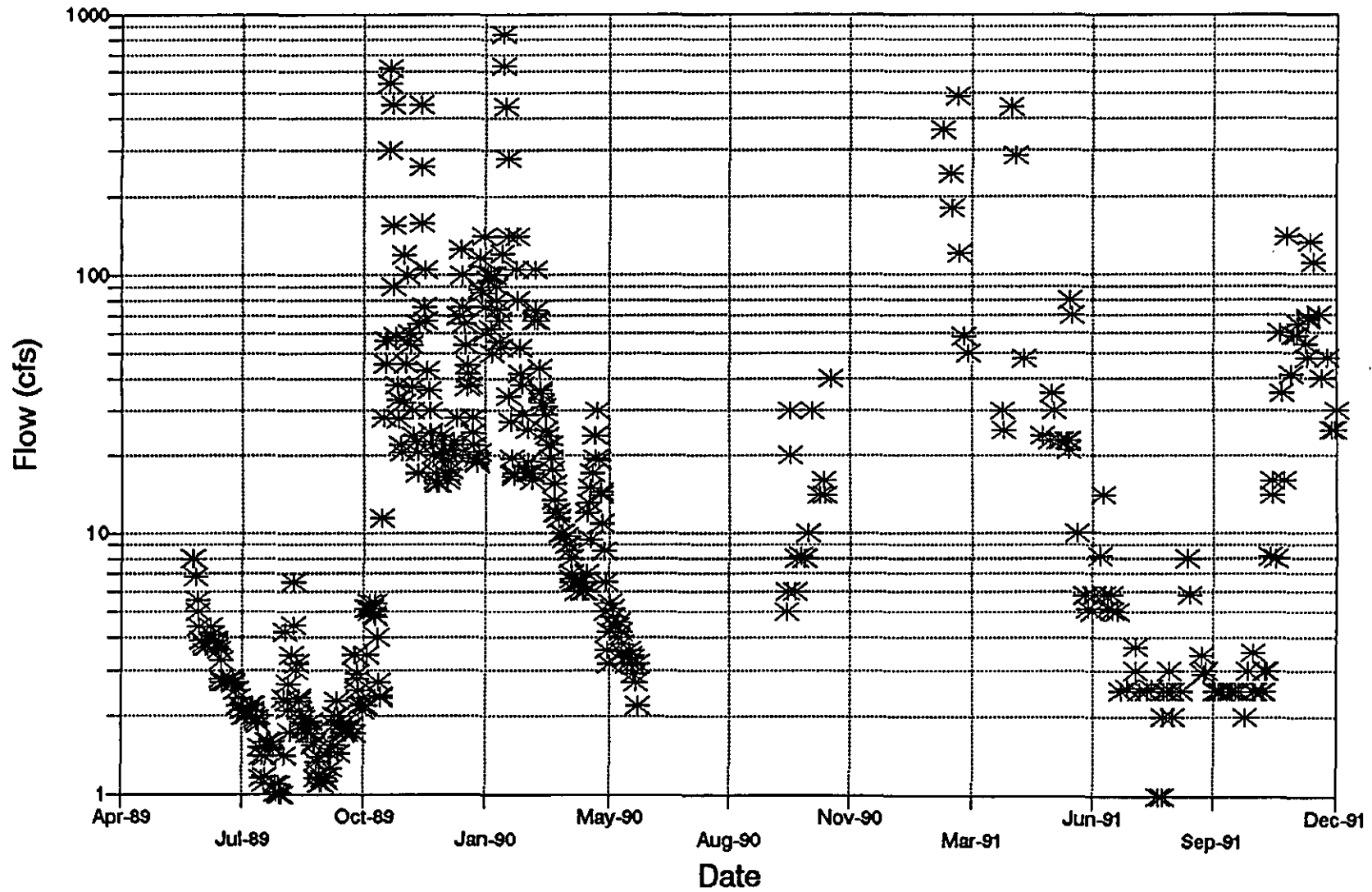


Figure C-1

HYDROGRAPH

Blaine Watershed Stream

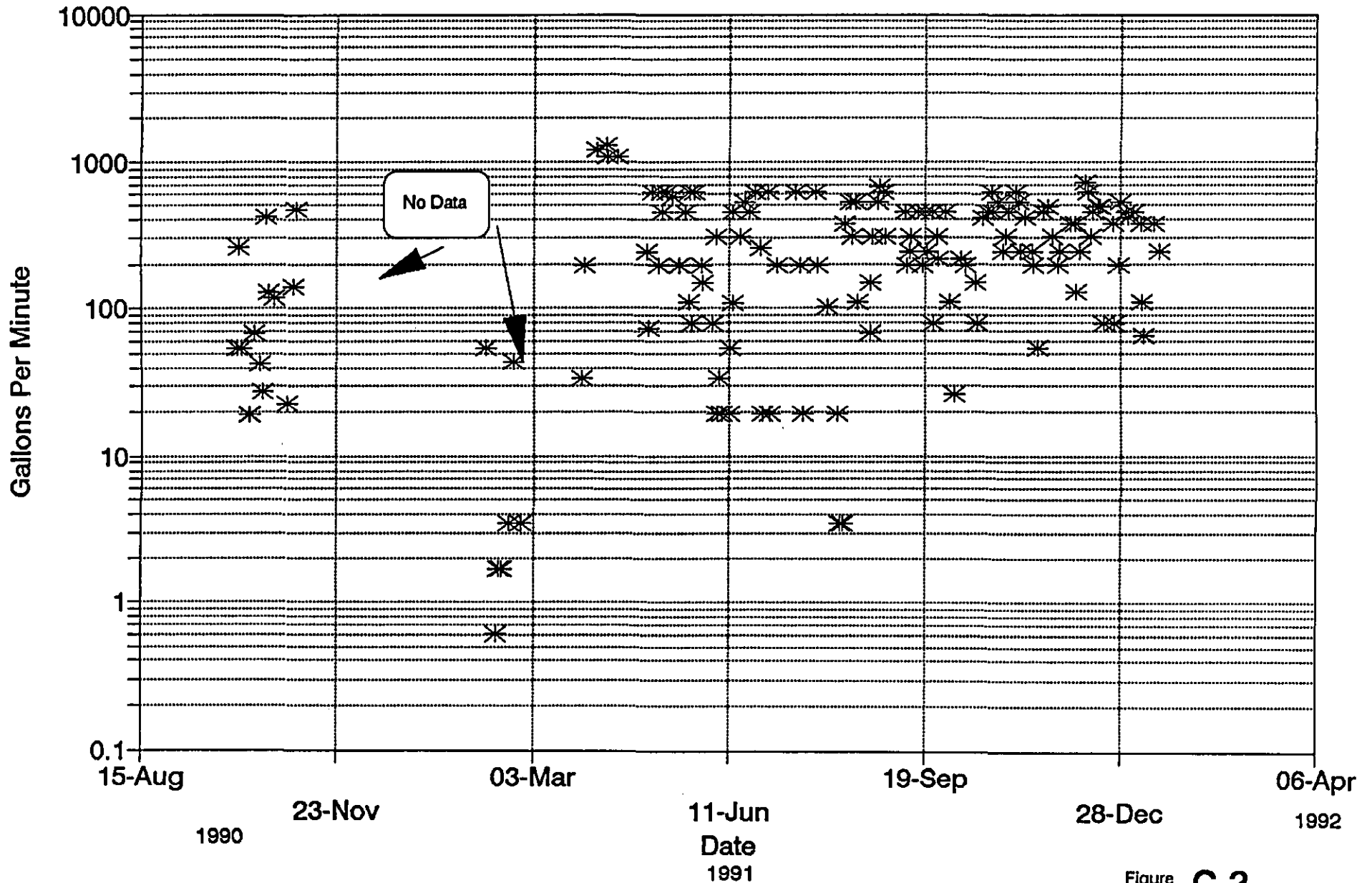


Figure C-2

APPENDIX D
WATER LEVEL DATA

HYDROGRAPH

Aller Well

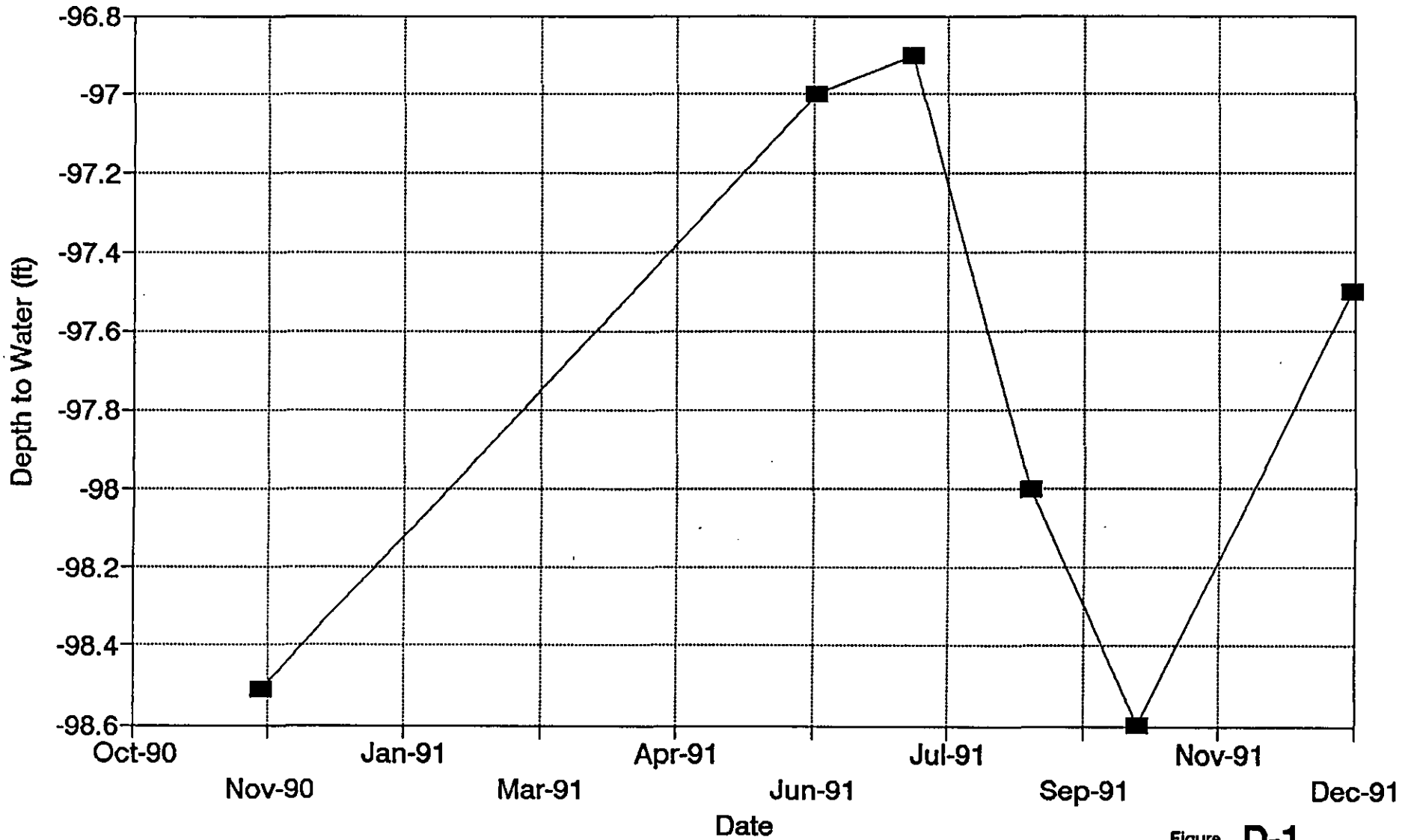


Figure D-1

HYDROGRAPH

Berg Well

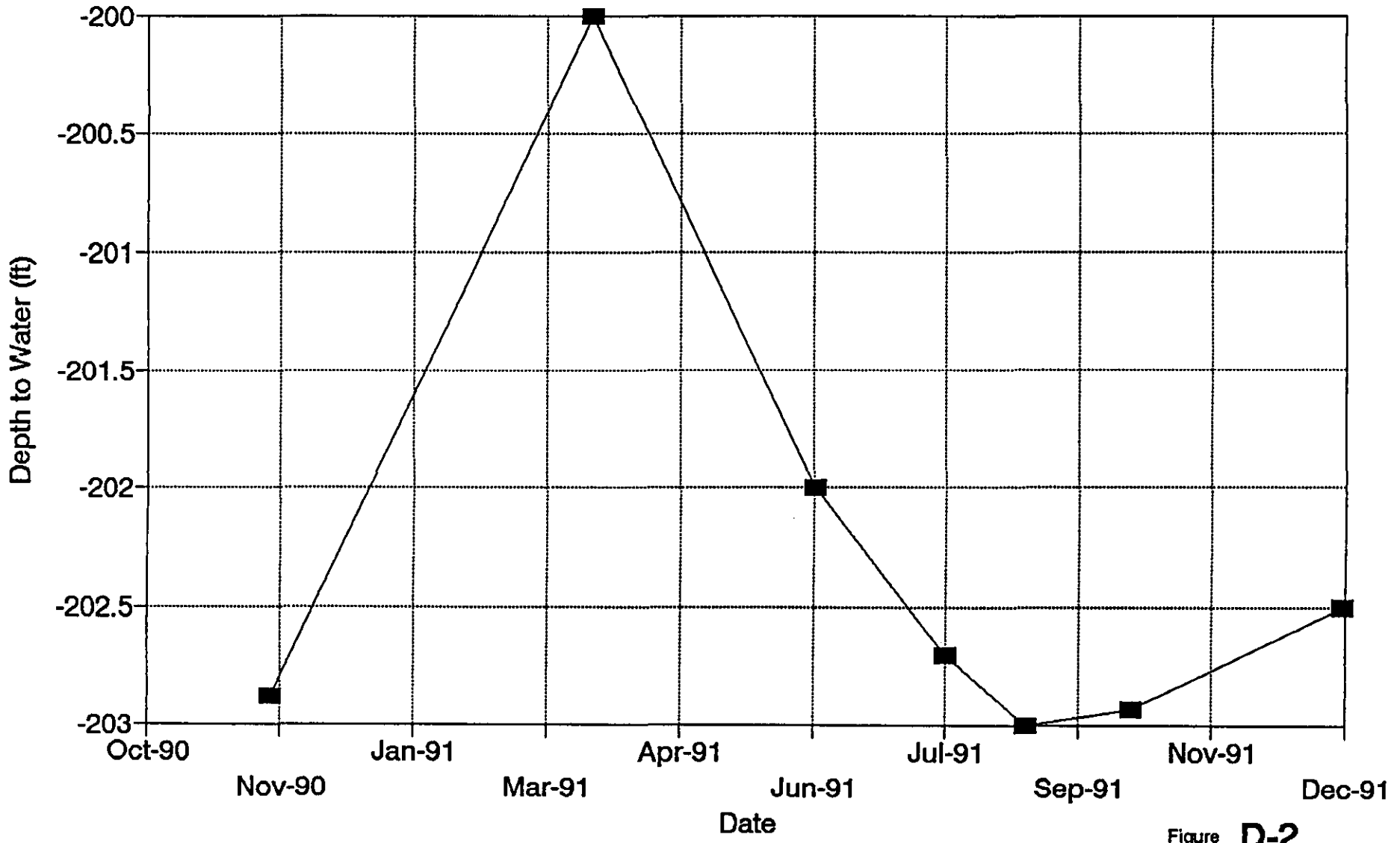


Figure **D-2**

HYDROGRAPH

Colacurcio Well

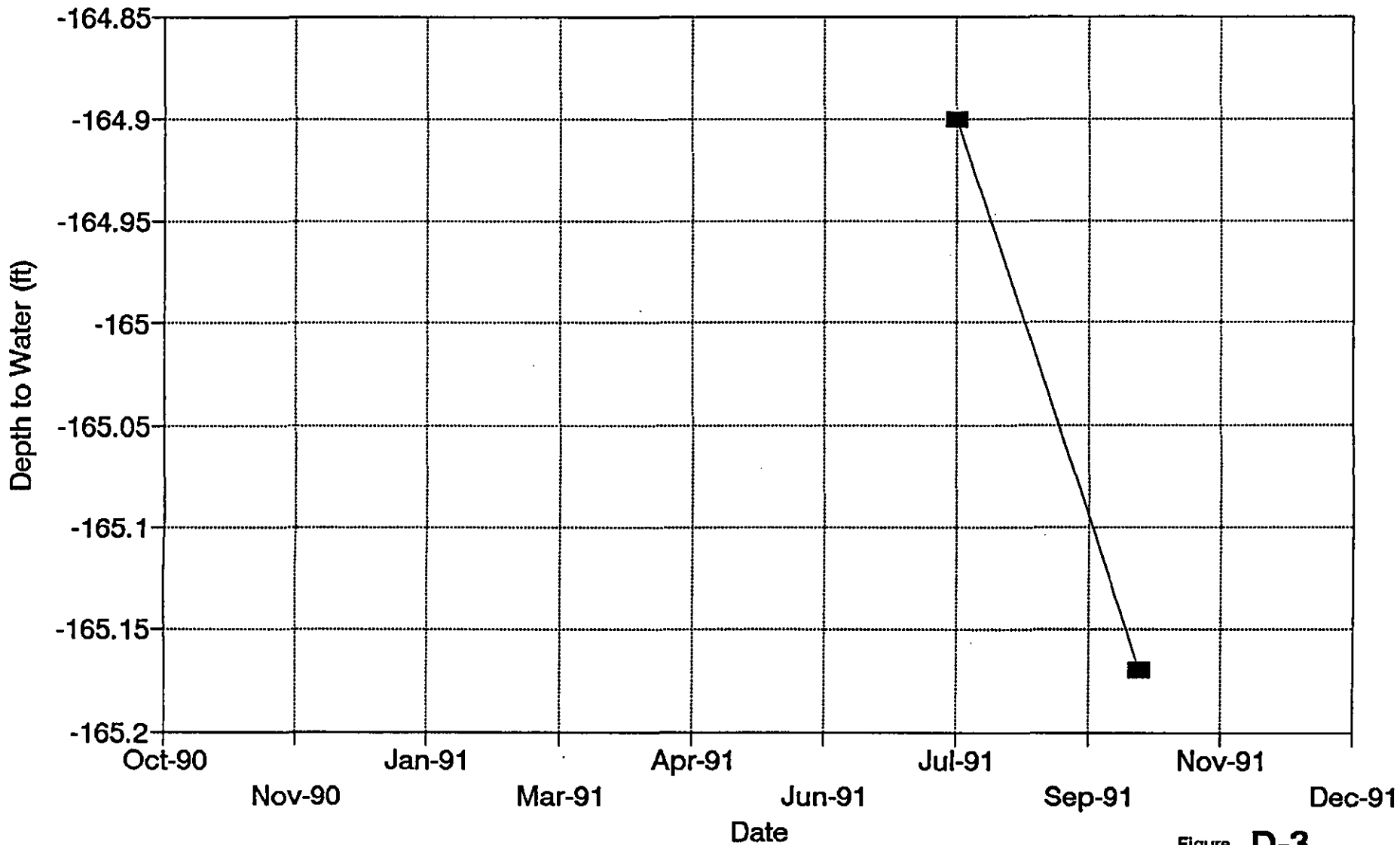


Figure D-3

HYDROGRAPH

Deep Well

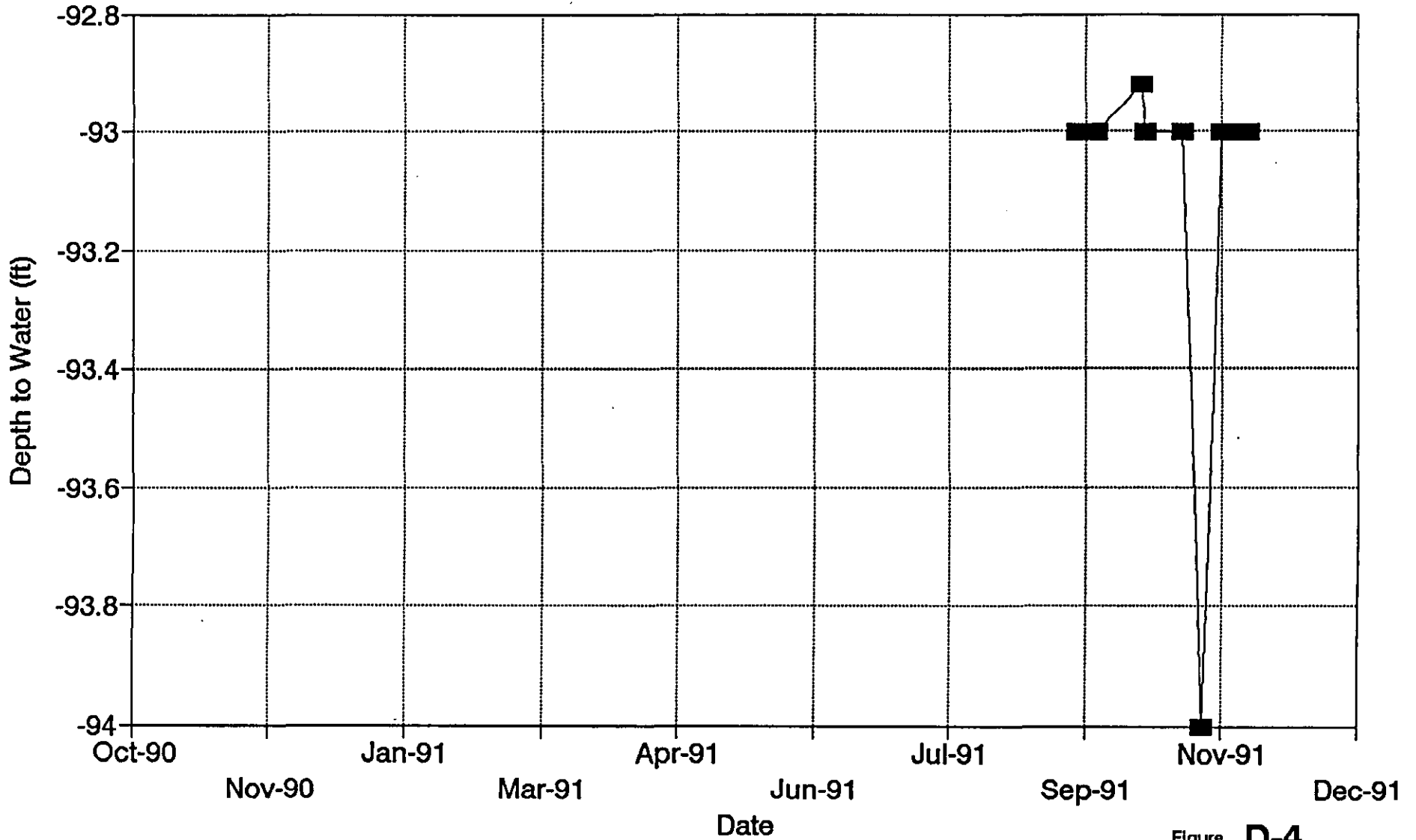


Figure D-4

HYDROGRAPH

DeKubber Well

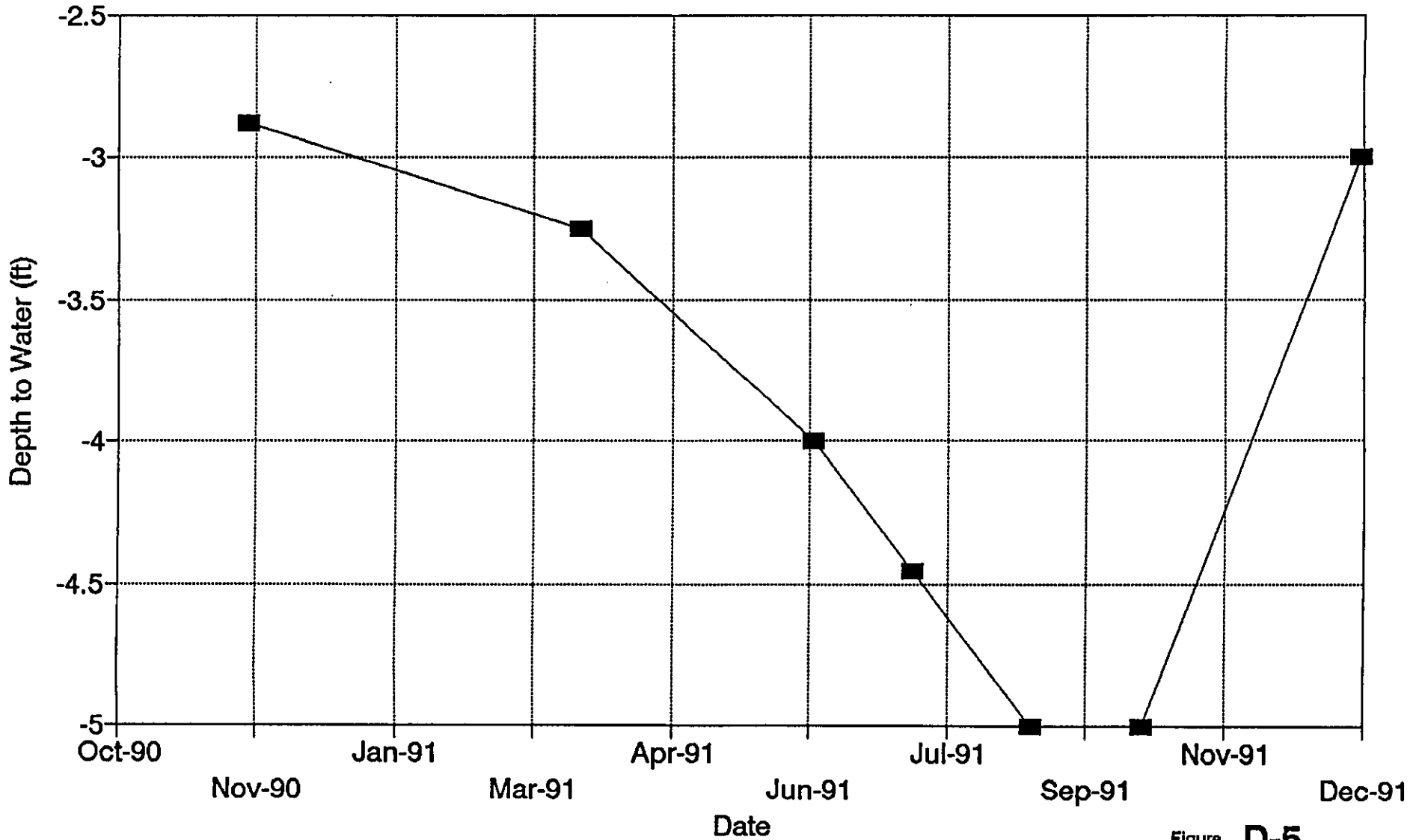


Figure D-5

HYDROGRAPH

Well GWMP-1

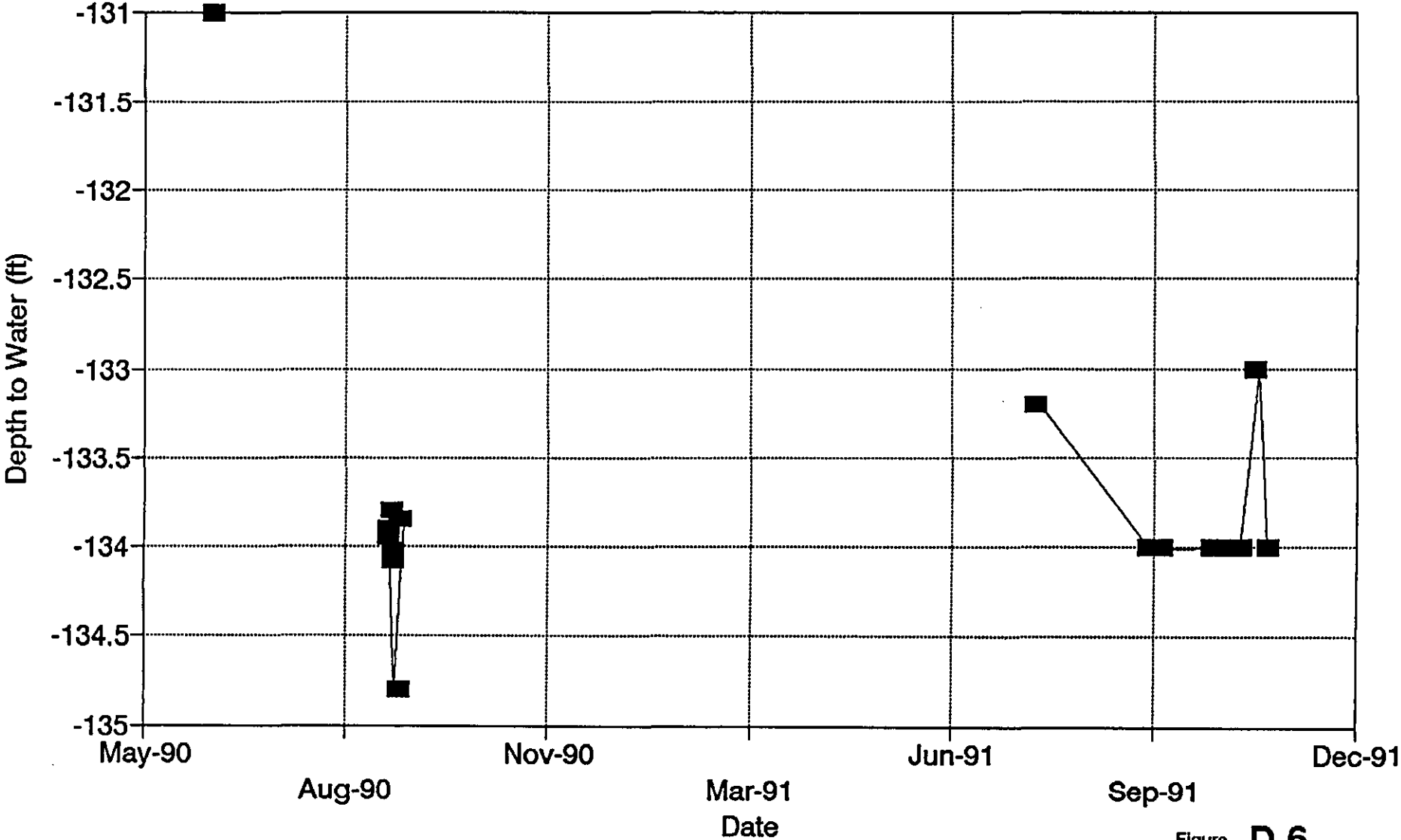


Figure D-6

HYDROGRAPH

Well GWMP-2

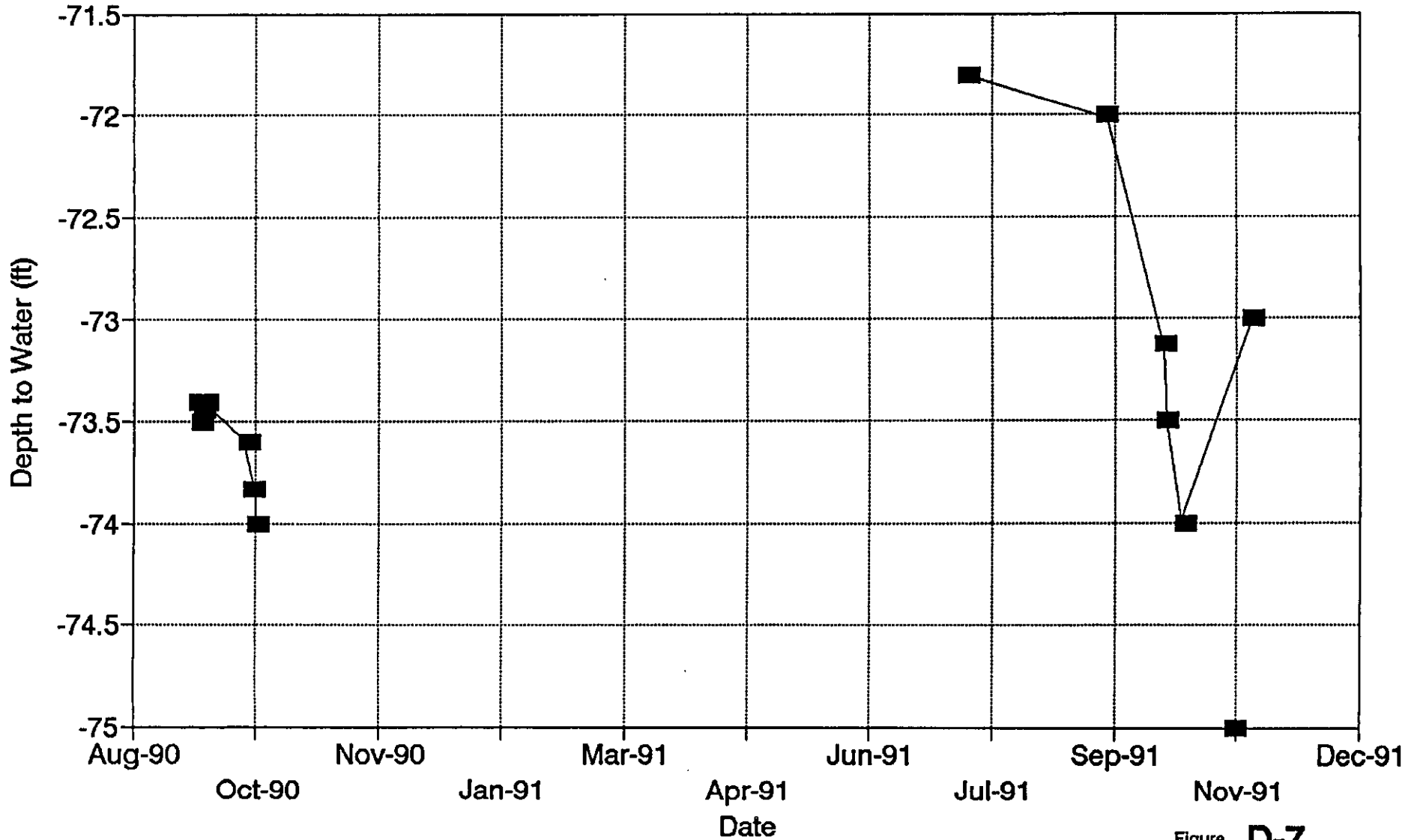


Figure D-7

HYDROGRAPH

Well GWMP-3

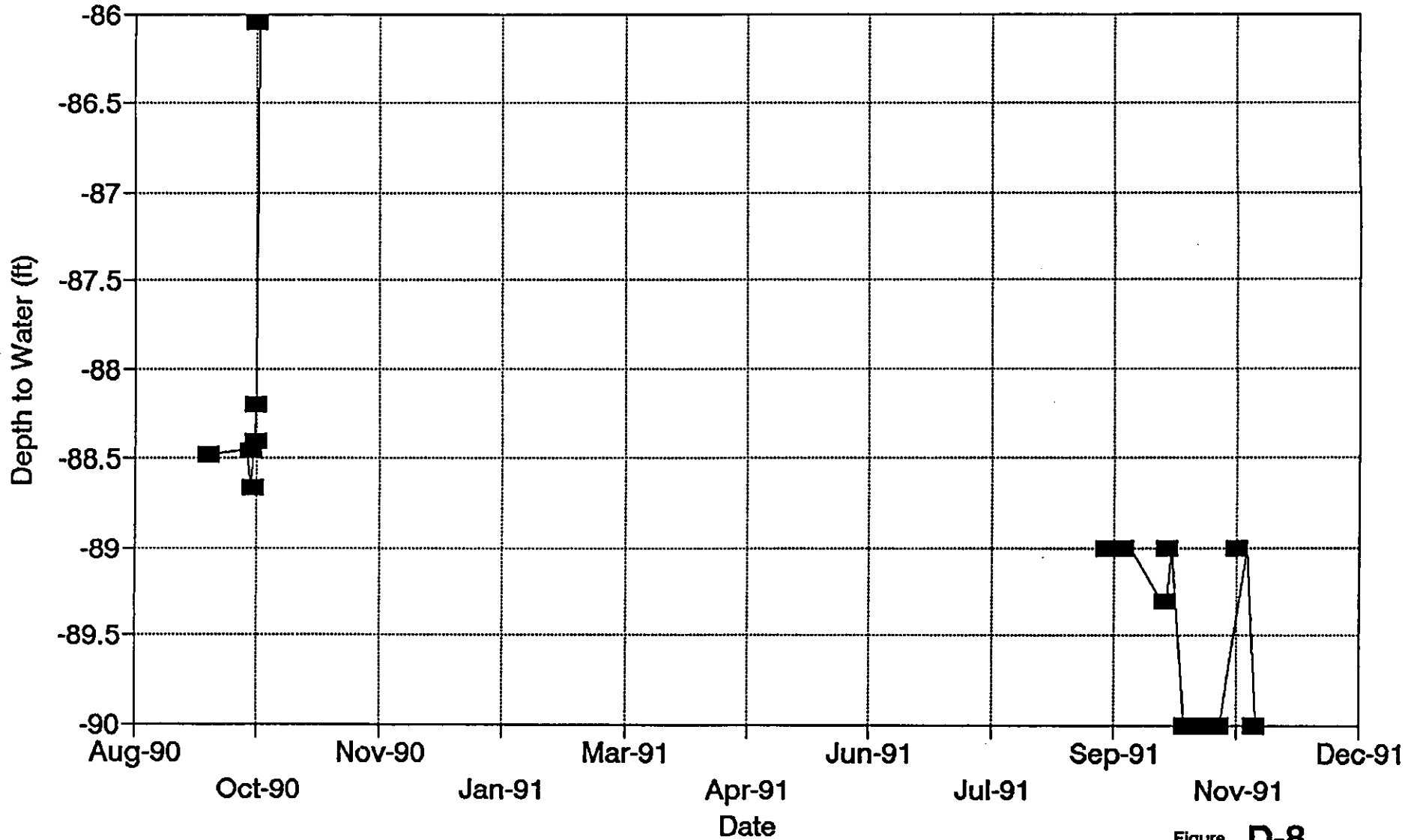


Figure D-8

HYDROGRAPH

Leer Well

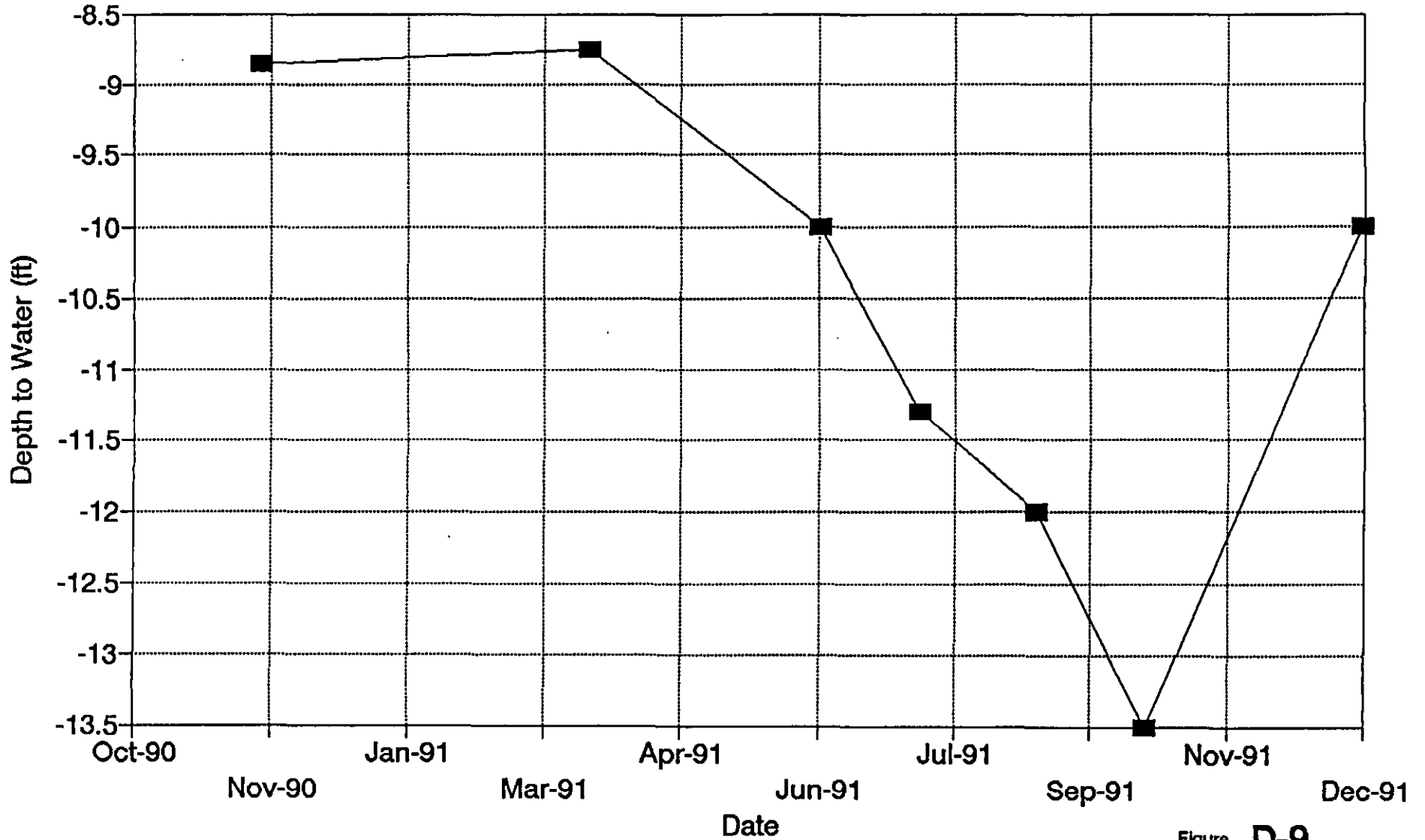


Figure D-9

HYDROGRAPH

Lincoln Park Well

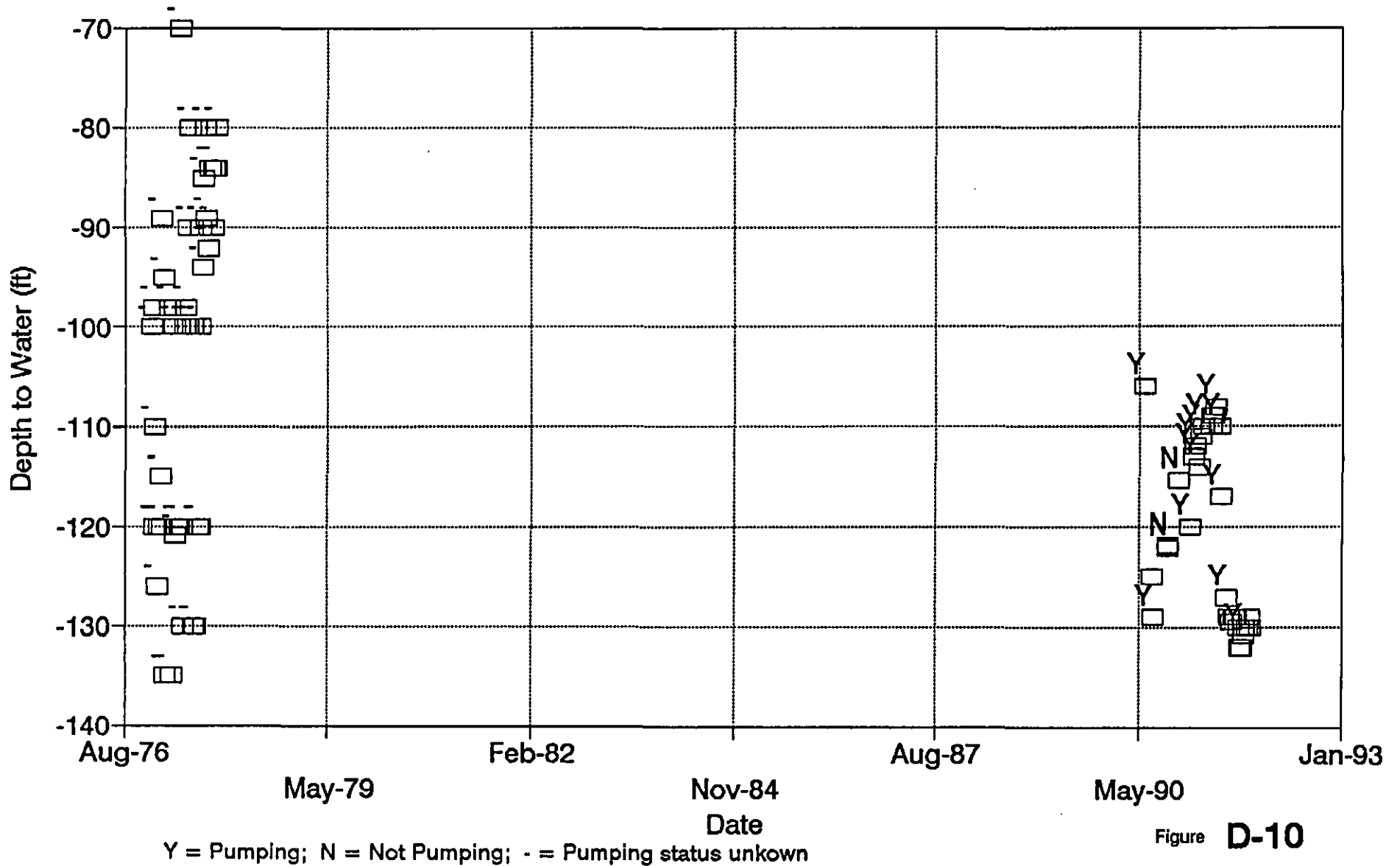
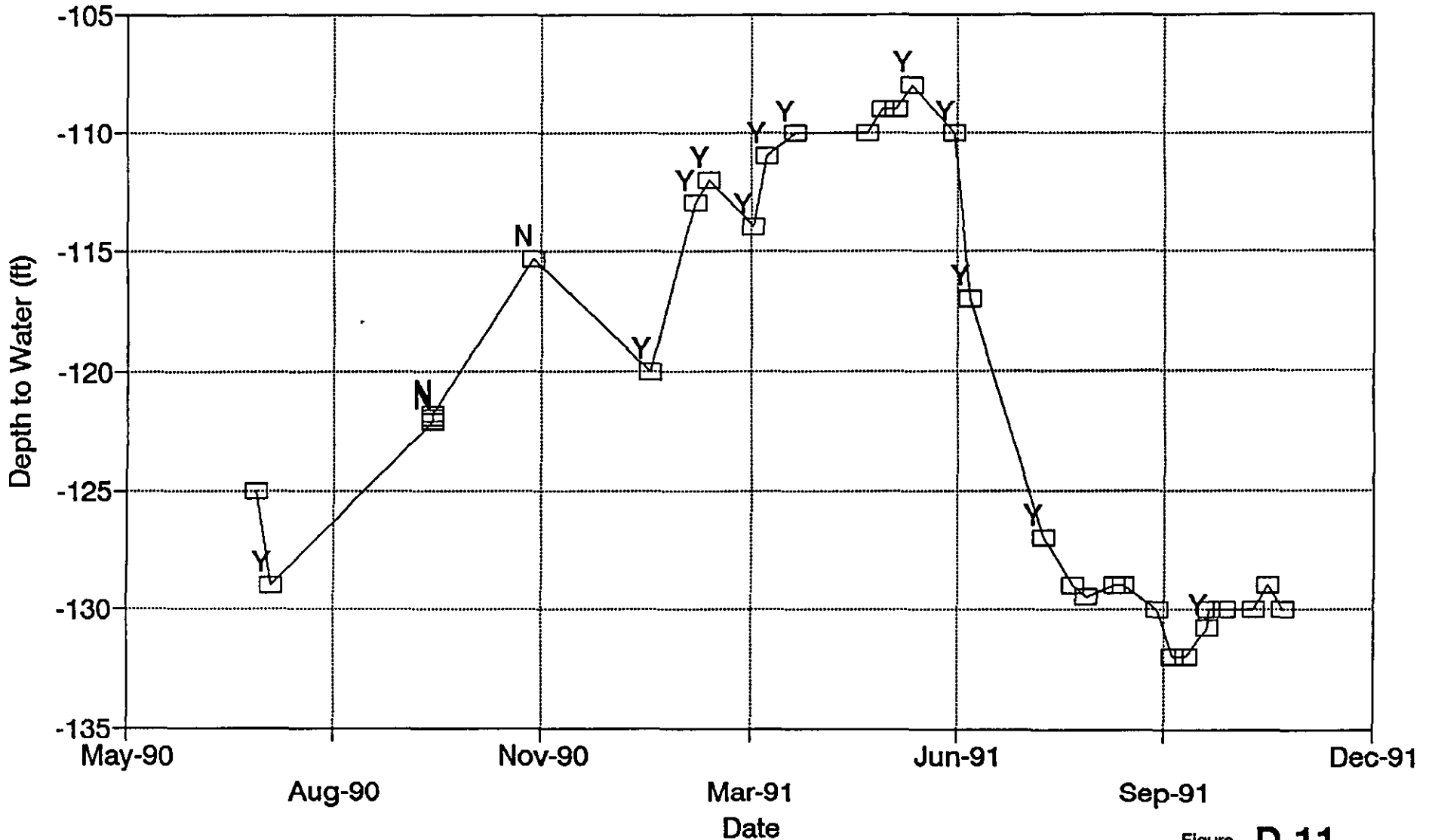


Figure D-10

HYDROGRAPH

Lincoln Park Well



Y = Pumping; N = Not Pumping; no label = Pumping status unknown

Figure D-11

HYDROGRAPH

Well No. 1

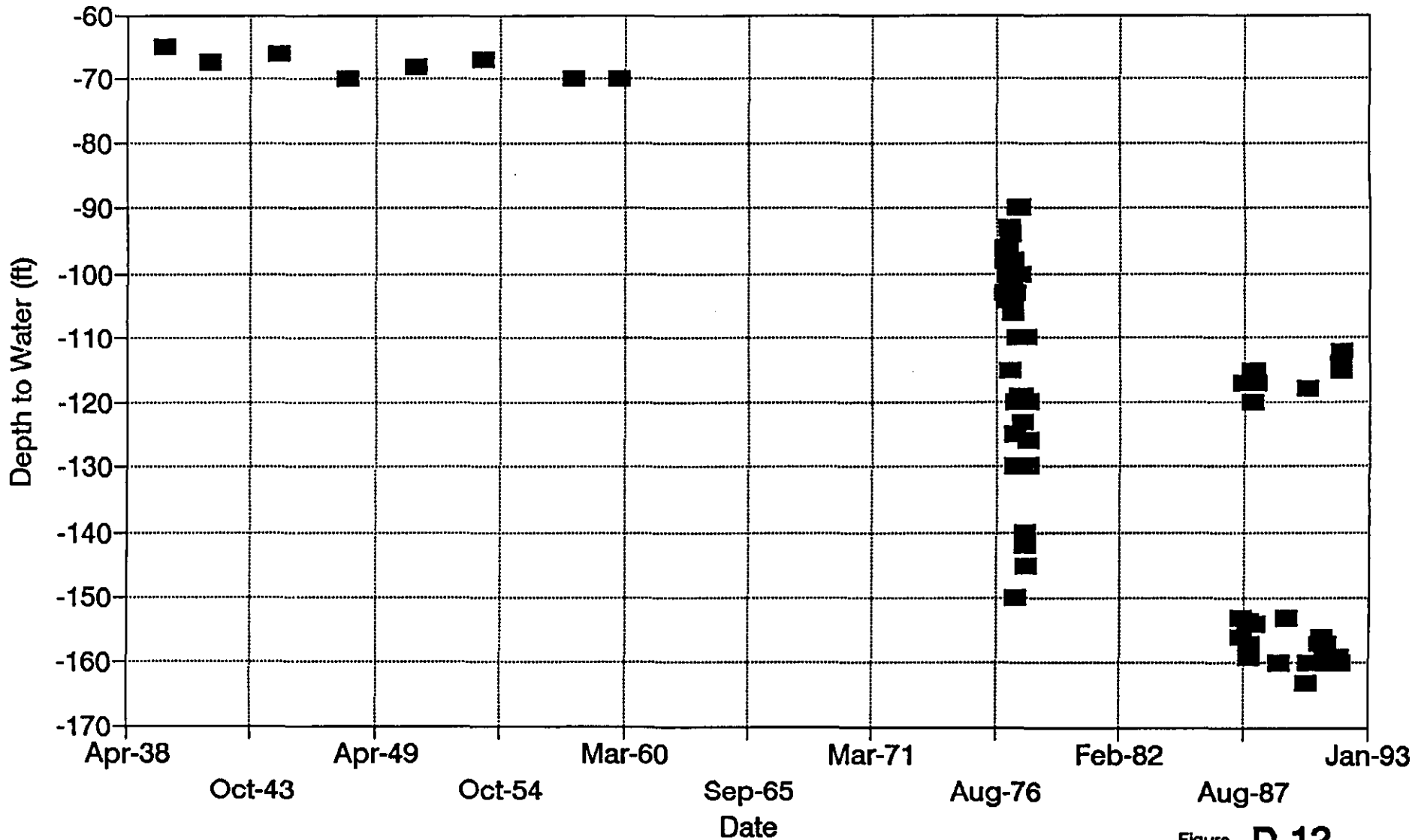


Figure D-12

HYDROGRAPH

Well No. 1

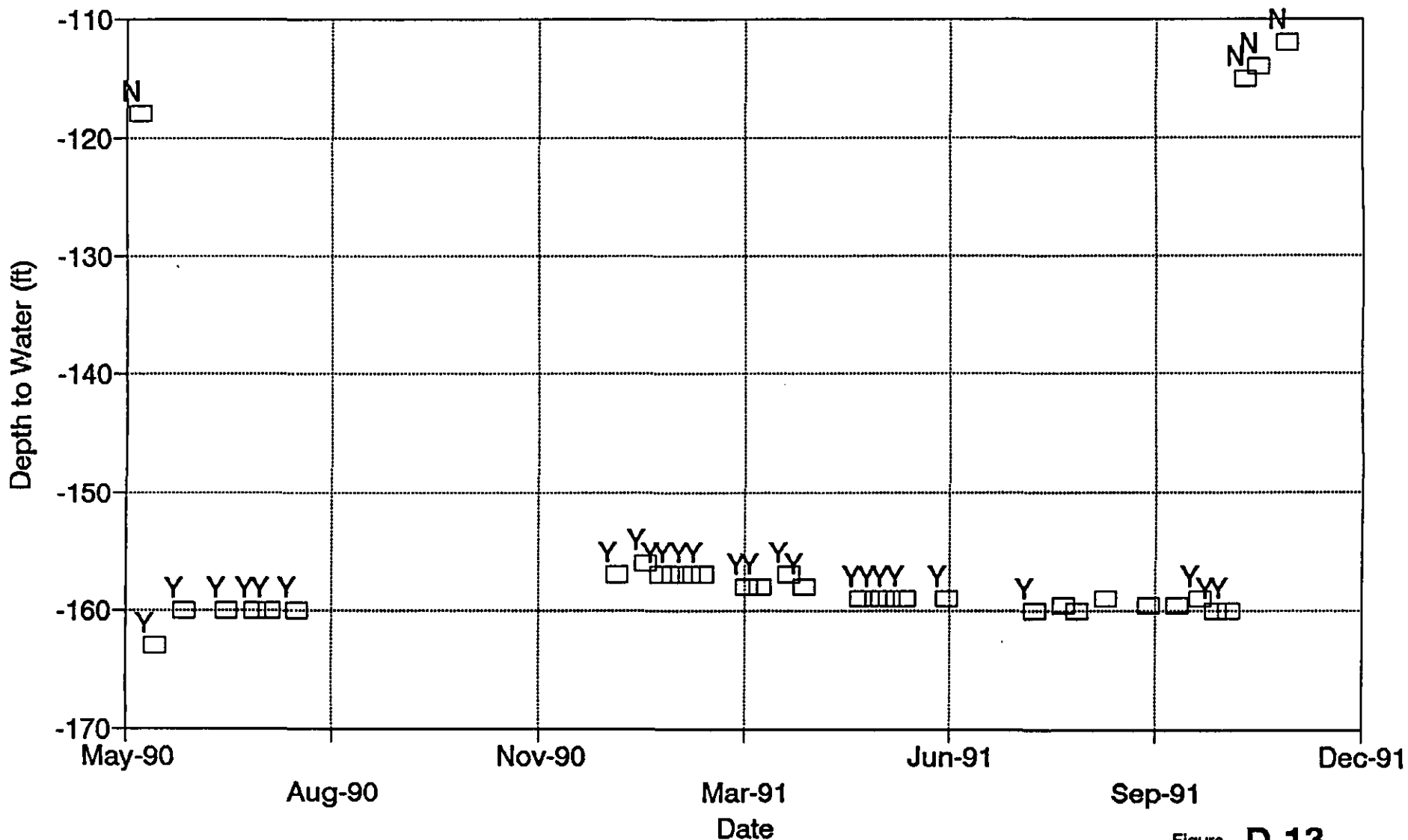


Figure **D-13**

HYDROGRAPH

Well NO. 2

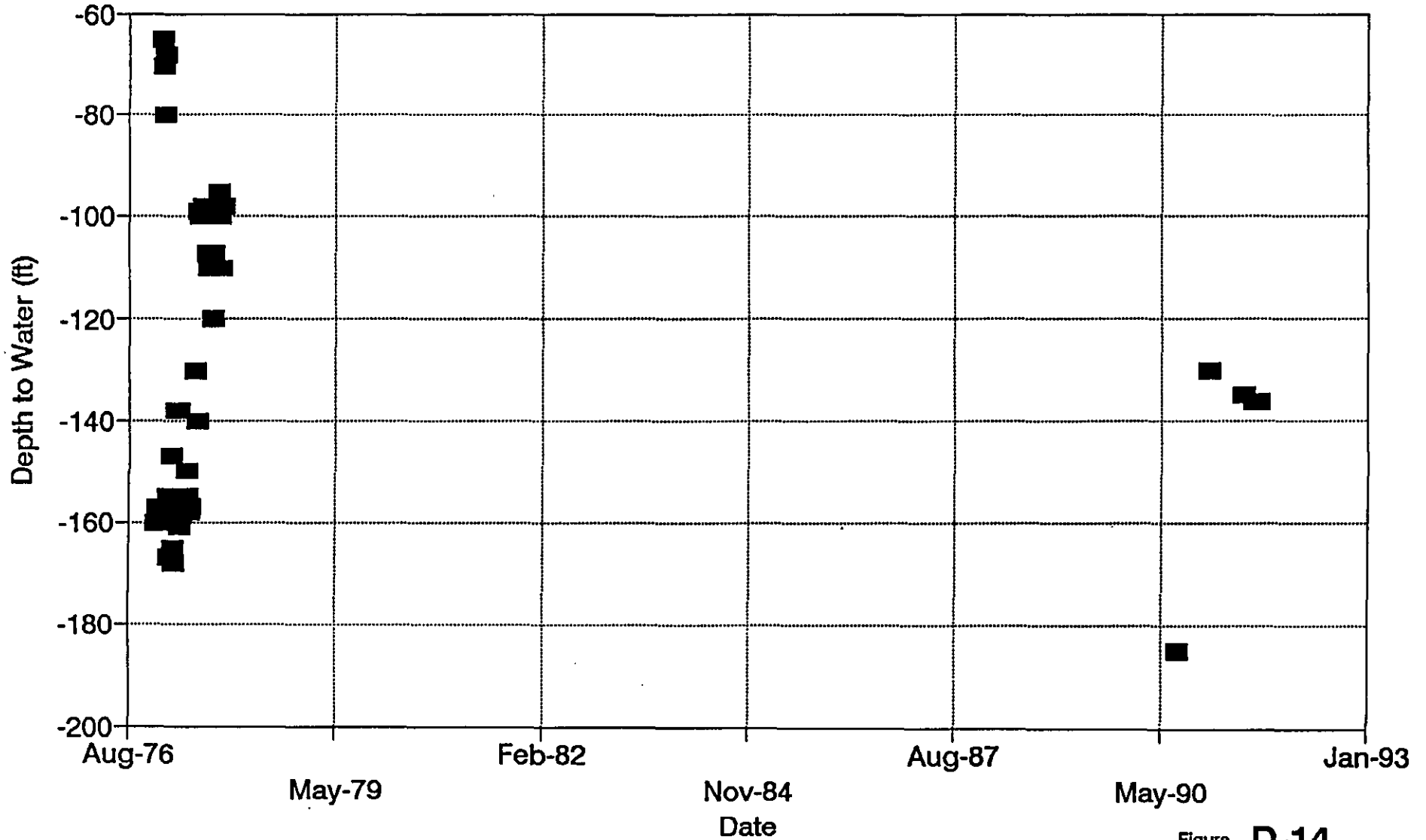


Figure D-14

HYDROGRAPH

Well No. 4

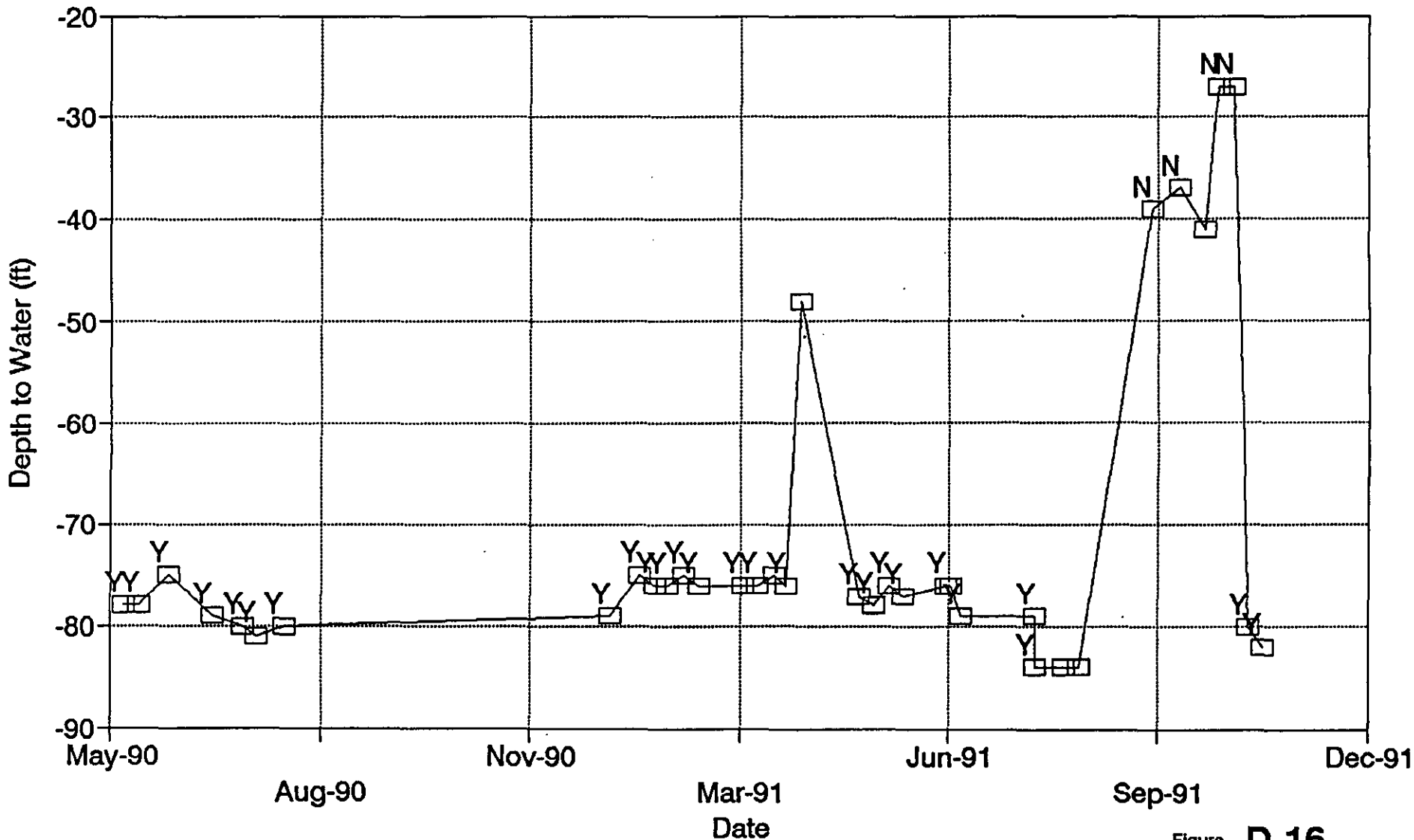


Figure **D-16**

HYDROGRAPH

Well No. 5

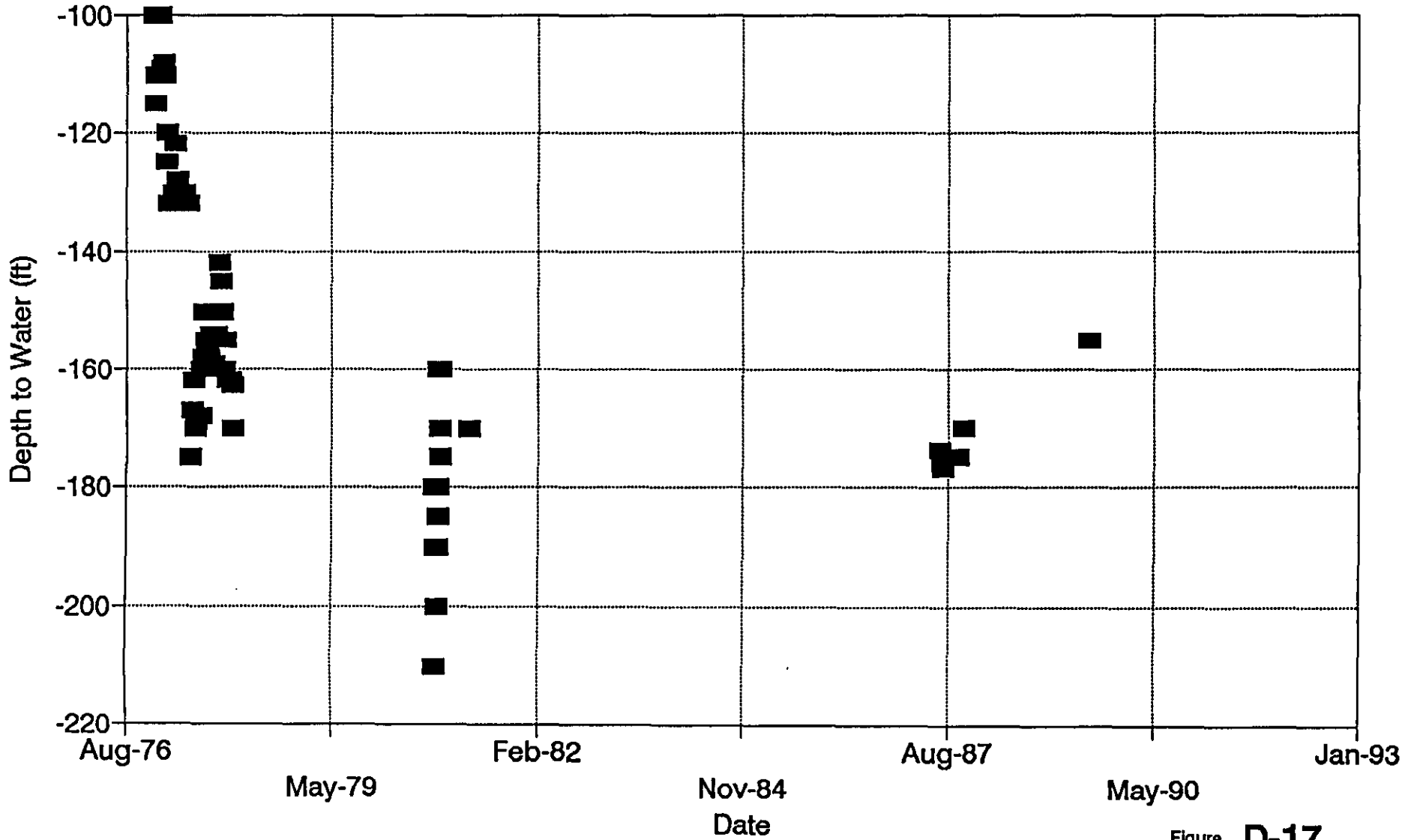


Figure **D-17**

HYDROGRAPH

Well No. 7 (Obs. Well)

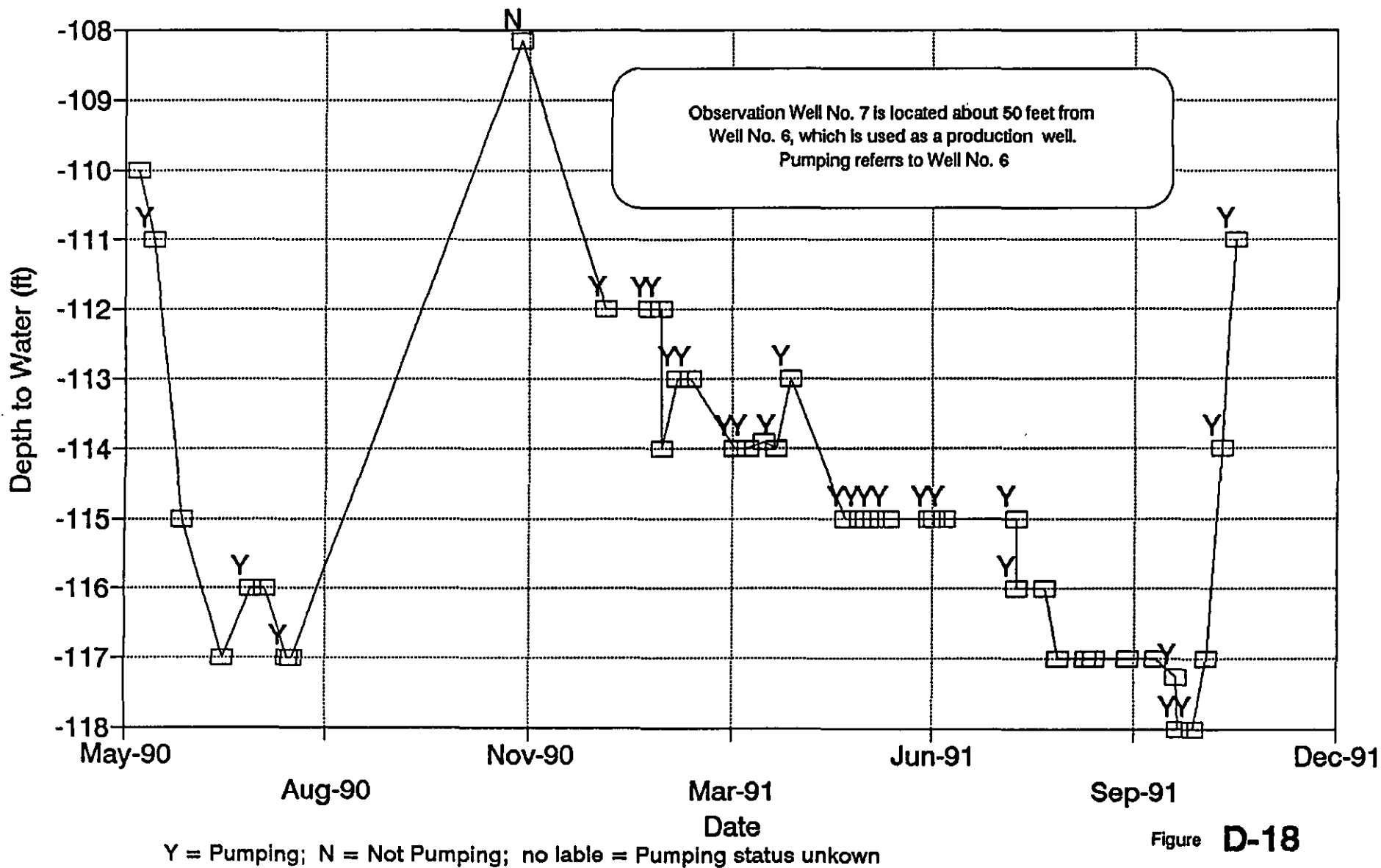


Figure D-18

HYDROGRAPH

Nymeyer Well

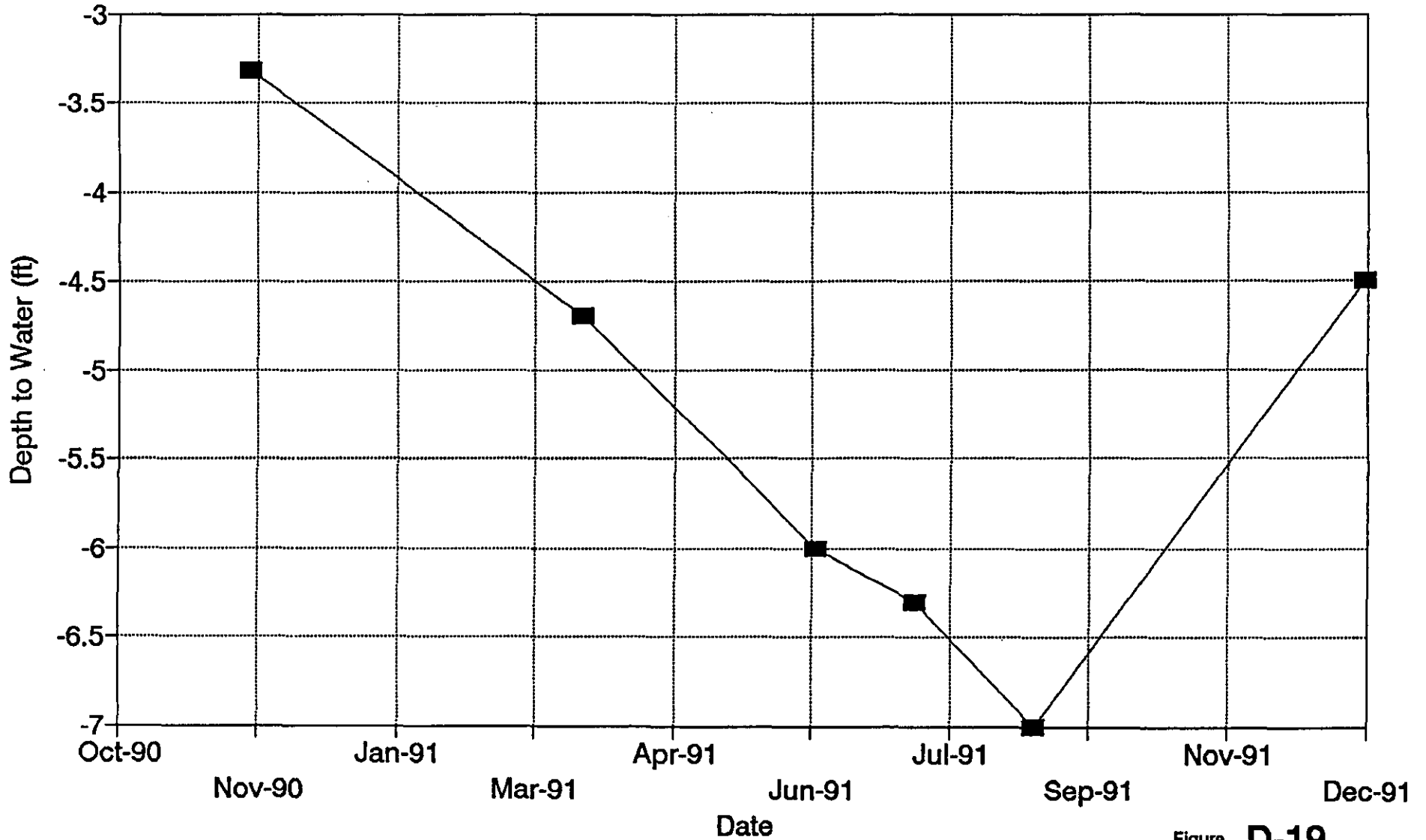


Figure D-19

HYDROGRAPH

Rodenberger Well

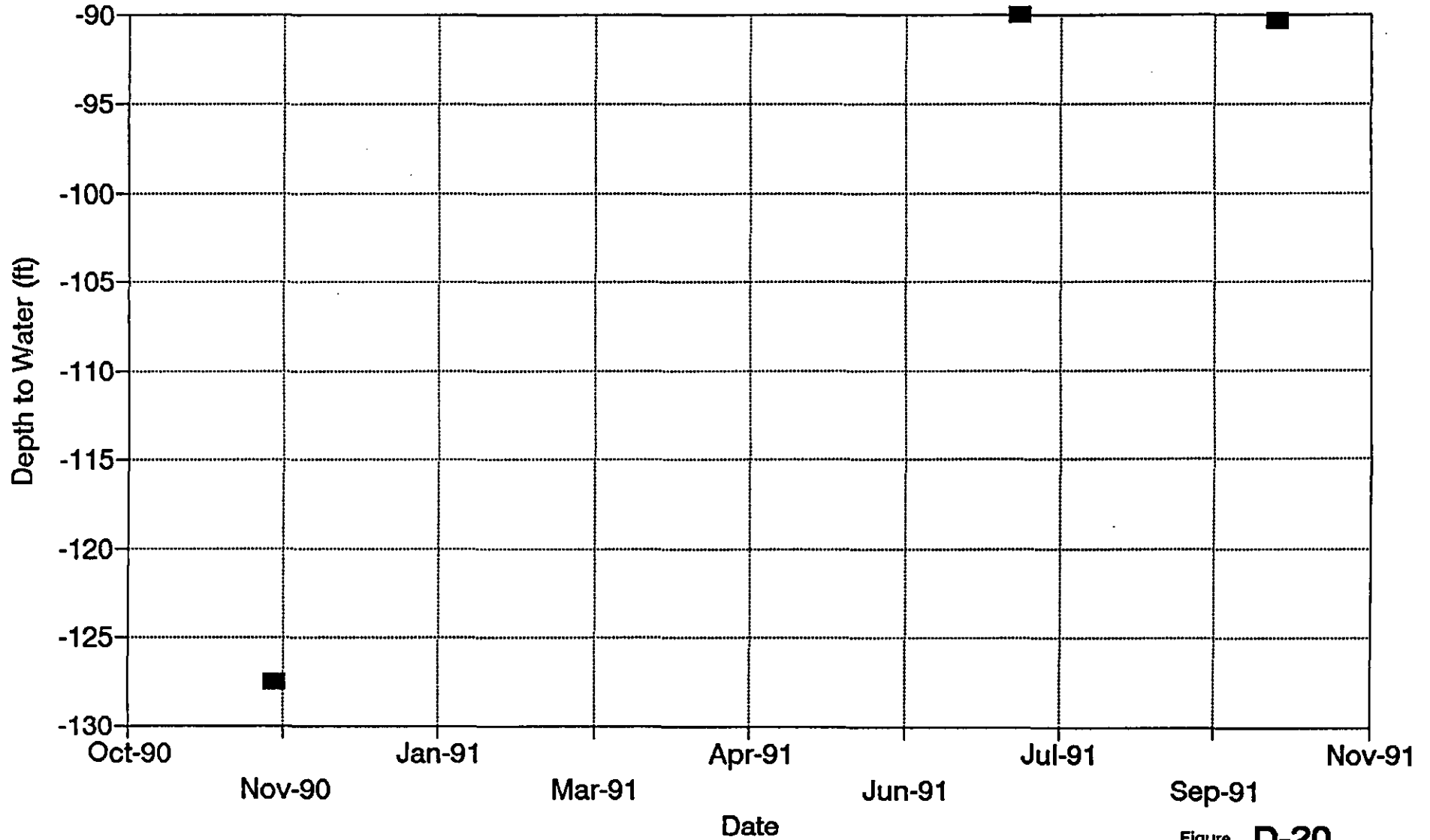


Figure **D-20**

HYDROGRAPH

Wood Well

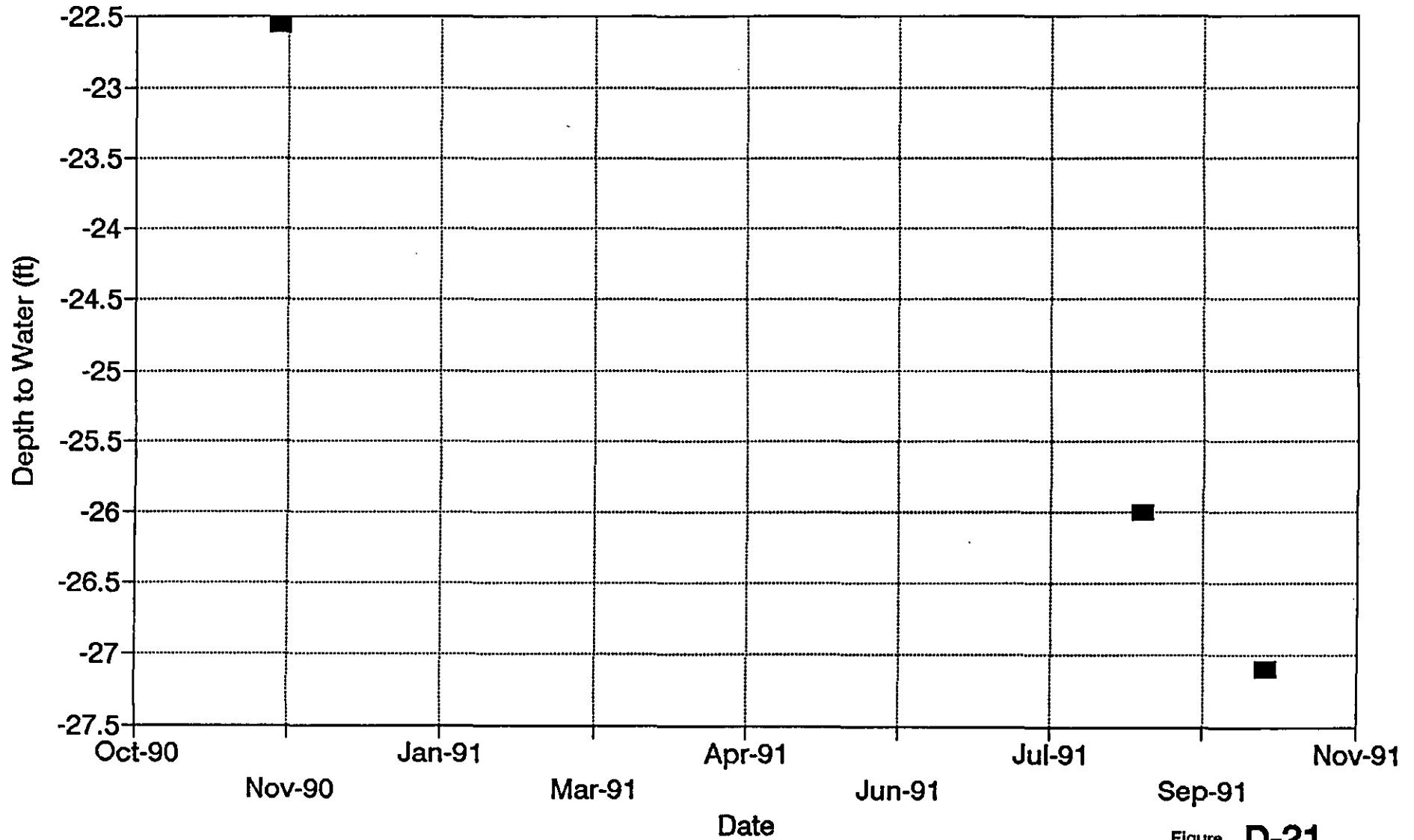


Figure **D-21**

HYDROGRAPH

Zylstra Well

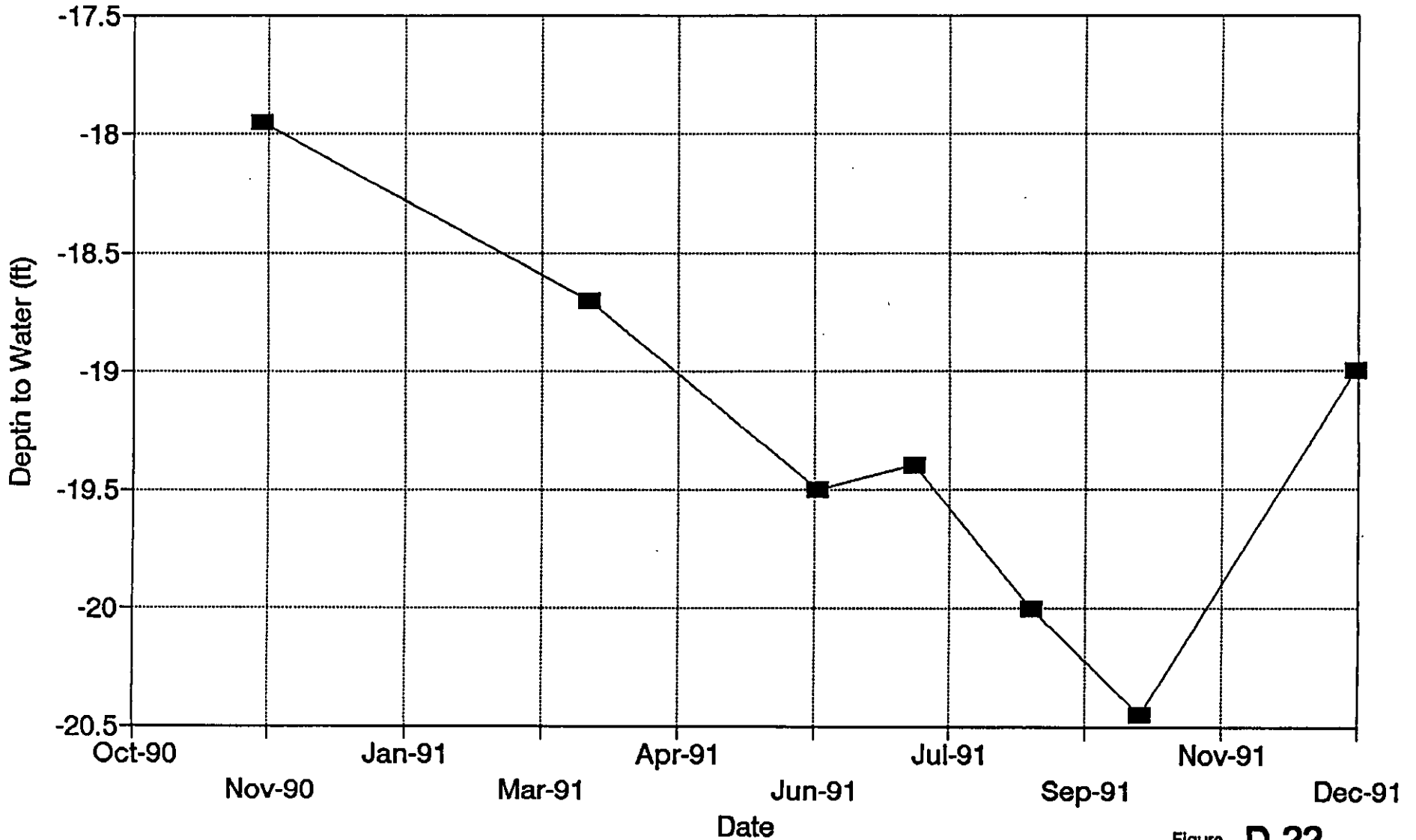


Figure D-22

APPENDIX F
WATER QUALITY DATA VALIDATION

APPENDIX F

WATER QUALITY DATA VALIDATION

As part of the hydrogeologic study of the Blaine Ground Water Management Area, four quarterly rounds of water quality samples were collected from three test wells, four City of Blaine municipal wells, and 11 domestic wells between October 1990 and October 1991. The findings of the water quality study are presented in the text (Section 3.7). This Appendix summarizes an analysis of the water quality data to determine the validity of the data, and to ensure that the requirements of the QAQCP were met. The QAQCP was developed based on the guidelines established by the Department of Ecology.

The water quality samples collected were as follows:

- Round 1 - Three ground water samples were collected between October 2 and October 9, 1990 from the newly installed test wells, and 19 samples were collected from the City and domestic wells between November 19, 1990 and November 21, 1990;
- Round 2 - Six ground water samples were collected on March 19, 1991, nine samples were collected on March 20, 1991, and three samples were collected on March 25, 1991. The samples collected on March 20, 1991 were not delivered to the lab within the required 24-hour holding time for coliform. In addition, no duplicate samples were collected. Thus nine wells were re-sampled for total coliform on April 15, 1991, and three duplicates were taken.
- Round 3 - Twelve ground water samples were collected on July 18, 1991, eight samples were collected on July 22, 1991, and one sample was collected on July 30, 1991 from the test wells, domestic and City wells; and
- Round 4 - Twenty one ground water samples were collected on October 9 and 10, 1991 from the test wells, domestic and City wells.

All samples were analyzed by Analytical Technologies, Inc. of Renton, Washington. The following observations were made regarding the water quality data evaluation:

- Sample identification on the data reports compare correctly with the Chain of Custody forms;
- The data reports are legible and reproducible;
- Sample receipt, tracking, and identification was clearly recorded via Chain of Custody documentation;
- Identification of the laboratory, and of individuals responsible for sample analysis are shown on the data report;
- Dates of analysis were recorded in the reports, except for the first Round 1 report. At the request of Golder Associates, ATI provided this information via facsimile. All holding times were met, except for color and turbidity for

the three samples collected between October 2 and October 9, 1990, and color and total organic halide for first-round samples collected between October 19 and October 21, 1990, and for turbidity for fourth-round samples;

- Internal calibration documentation, equipment used, etc. is standard laboratory QA/QC, and is not normally provided with the data report. This information, however, may be obtained through ATI, if the data were suspect; and
- Laboratory analysis included matrix spikes and duplicates, percent recovery, and precision data were included within the data report.

The following checks were made, including the verification of the precision and accuracy requirements specified in Table 4-1 of the QAQCP:

- Analysis methods: Most of the laboratory methods were as specified in the QAQCP. Alternative methods used by the laboratory meet the specified requirements of precision and accuracy (Table 4-1, QAQCP);
- Relative Percent Difference (RPD): RPD (defined as the difference between duplicate concentrations divided by the average concentration, multiplied by 100) values all fall within the required 25 percent, except for total organic halide for the first-round Dekubber well sample (53 percent), and for turbidity for the fourth-round GWMP-2 sample (40 percent). The GWMP-2 sample, however, had a very low turbidity of about 0.04, which could have lead to the high RPD value;
- %Rec: Percent recovery values all fall within the required 25 percent, except for nitrite for the second-round Leer well sample (65 percent);
- Random data calculations were conducted to ensure RPD and %Rec data were calculated correctly. No errors were discovered;
- pH (measured in the field) during the first sampling round was compared with alkalinity to ensure that carbonate was detected only if the field pH was greater than 8.3. All checked results were valid;
- TDS: Reported TDS was consistent with estimated TDS based on field measured specific conductance collected during the first sampling round;
- Cation/Anion Balances Cation/anion balances were calculated to further evaluate the quality of the laboratory data, and to ensure that all major cations and anions have been identified.

Twelve of the 18 samples collected during the first sampling round had balances within 10 percent, which is considered acceptable. Of the remaining six samples, four had balances within 20 percent. Three of these four (Leer, Nymeyer, and Aller wells) had calculated anion concentrations that were higher than the cation concentrations. This may be explained in part by the

use of half of the detection limits in the calculation of the cation/anion balances, which induced a bias towards the anions because a disproportionate number of anions per sample were undetected, and the detection limits were higher for the anions than for the cations. The average cation/anion balance for all 18 samples of about 95 percent supports this conclusion. The reason for the fourth sample (Wilson well) having a higher cation concentration than anion concentration may be due to analytical error induced by matrix effects.

Two samples had balances outside of 20 percent, GWMP-1 (147 percent) and Well No. 4 (63 percent). The results for GWMP-1 may have been biased towards the cations as a result of a large concentration of metals being released from suspended particles as a result of the high turbidity of the sample (18 NTU). The cation/anion balance for Well No. 4, may be due to laboratory error, possibly in the reporting of one of the anions; and

- Duplicates: Two duplicate samples and one field blank were collected during the first sampling round. All constituents compared within 30 percent except for carbonate alkalinity and turbidity in the Wilson well sample. Carbonate alkalinity and turbidity were reported at concentrations of 8.8 mg/L and 0.2 NTU in one sample, and 5.6 mg/L and 2.0 NTU in the duplicate sample (36 percent and 90 percent difference, respectively). The field blank taken during the first sampling round had a turbidity concentration of 1 NTU, which was higher than some of the other collected samples, indicating either laboratory inaccuracy or contamination of the field blank.

Two duplicate samples for coliform were collected during the second sampling round in which no coliform was detected in any of the duplicates.

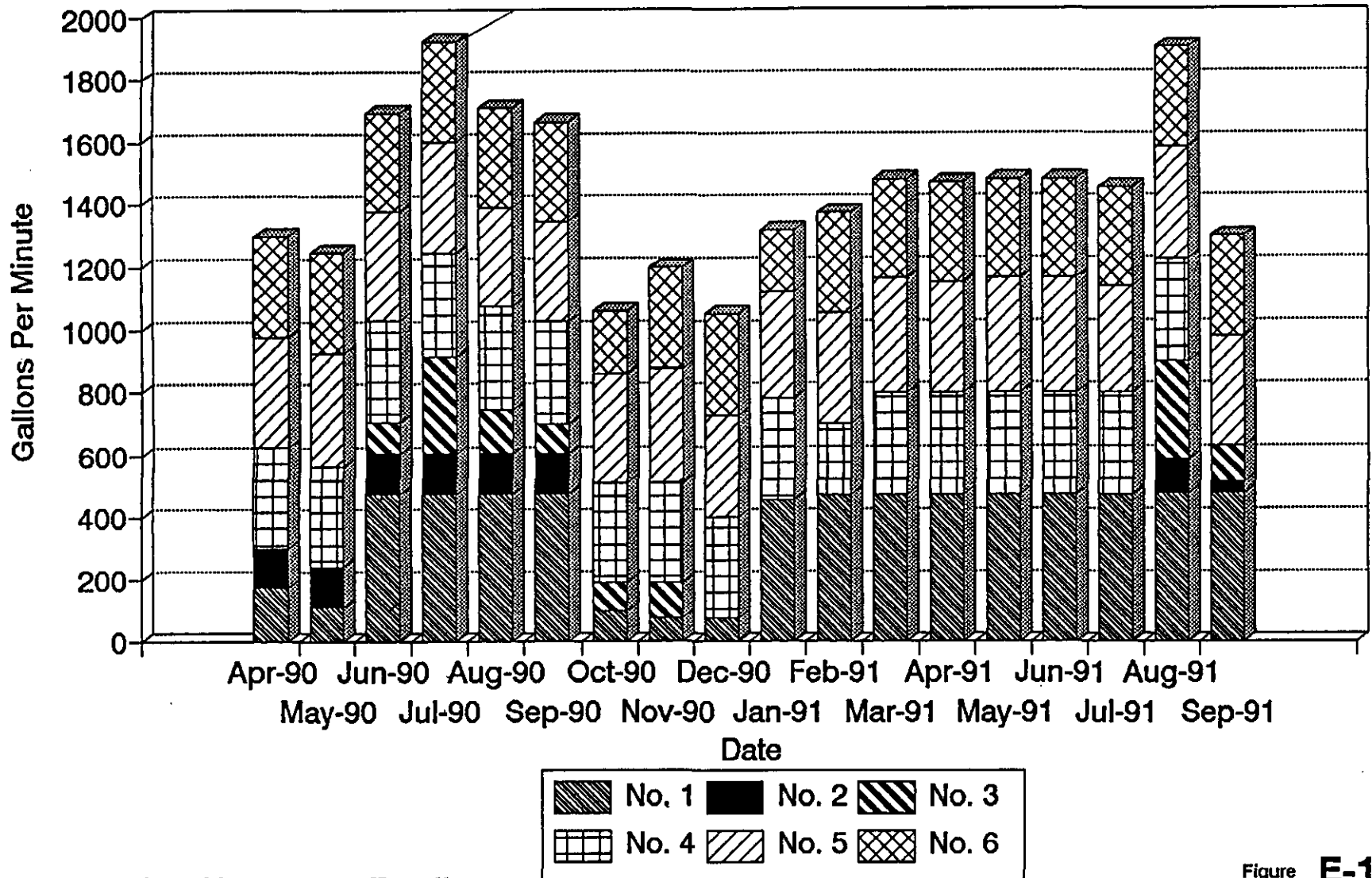
Two duplicate samples were collected during the third sampling round, with all reported results all within 15 percent. One field-blank (De-ionized water) was collected during the third round in which iron was reported at a concentration of 0.15 mg/L, and turbidity at 1.6 NTU's. These values are higher than was reported for other samples, suggesting that the de-ionized water had been contaminated.

Three duplicate samples were collected during the fourth sampling round. Reported results were all within 20 percent except for turbidity, which for the Lincoln Park sample was 0.04 and 0.11 NTU's, and for the GWMP-2 sample was 0.16 NTU's in one duplicate and undetected in the other. These results, along with the RPD value reported by the lab indicate that turbidity measurements are relatively inaccurate for low turbidity waters. However, these values are well below the State standard of 1 NTU.

In summary, the ground water quality data appears to accurately reflect the ground water quality conditions present at the locations sampled, with only minor exceptions.

APPENDIX E
GROUND WATER WITHDRAWALS

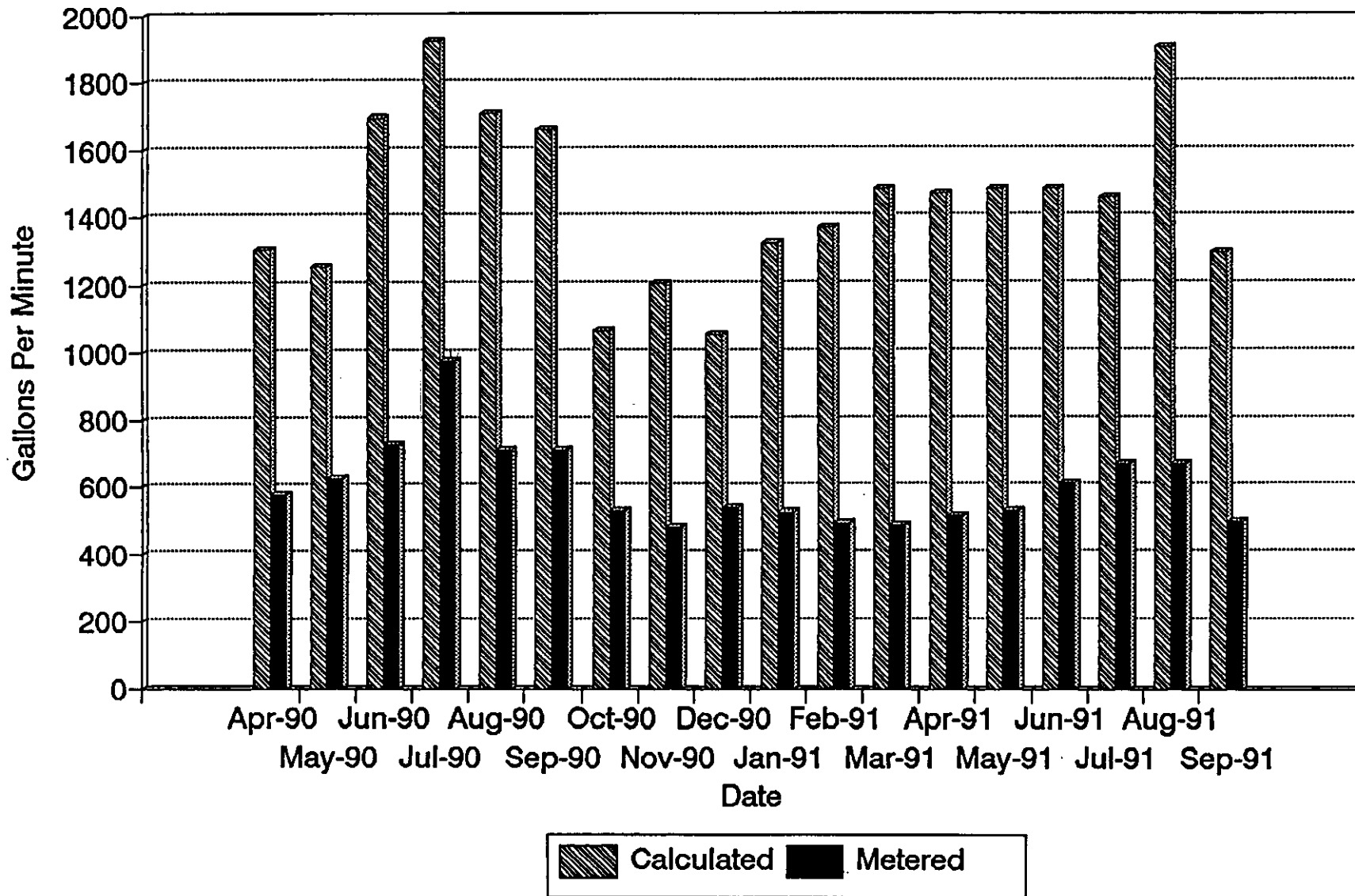
TOTAL MONTHLY AVERAGE PUMPING * Watershed Wells



* Based on Hour-meter Readings

Figure E-1

Watershed Pumping: Metered Vs Calculated



Note: Total flow from Watershed was metered, but production from individual wells can only be determined by using the hour-meters installed on each well. This figure shows the error associated with estimating pumpage by using the hour-meters

Figure **E-2**

CITY OF BLAINE

Annual Average Sales

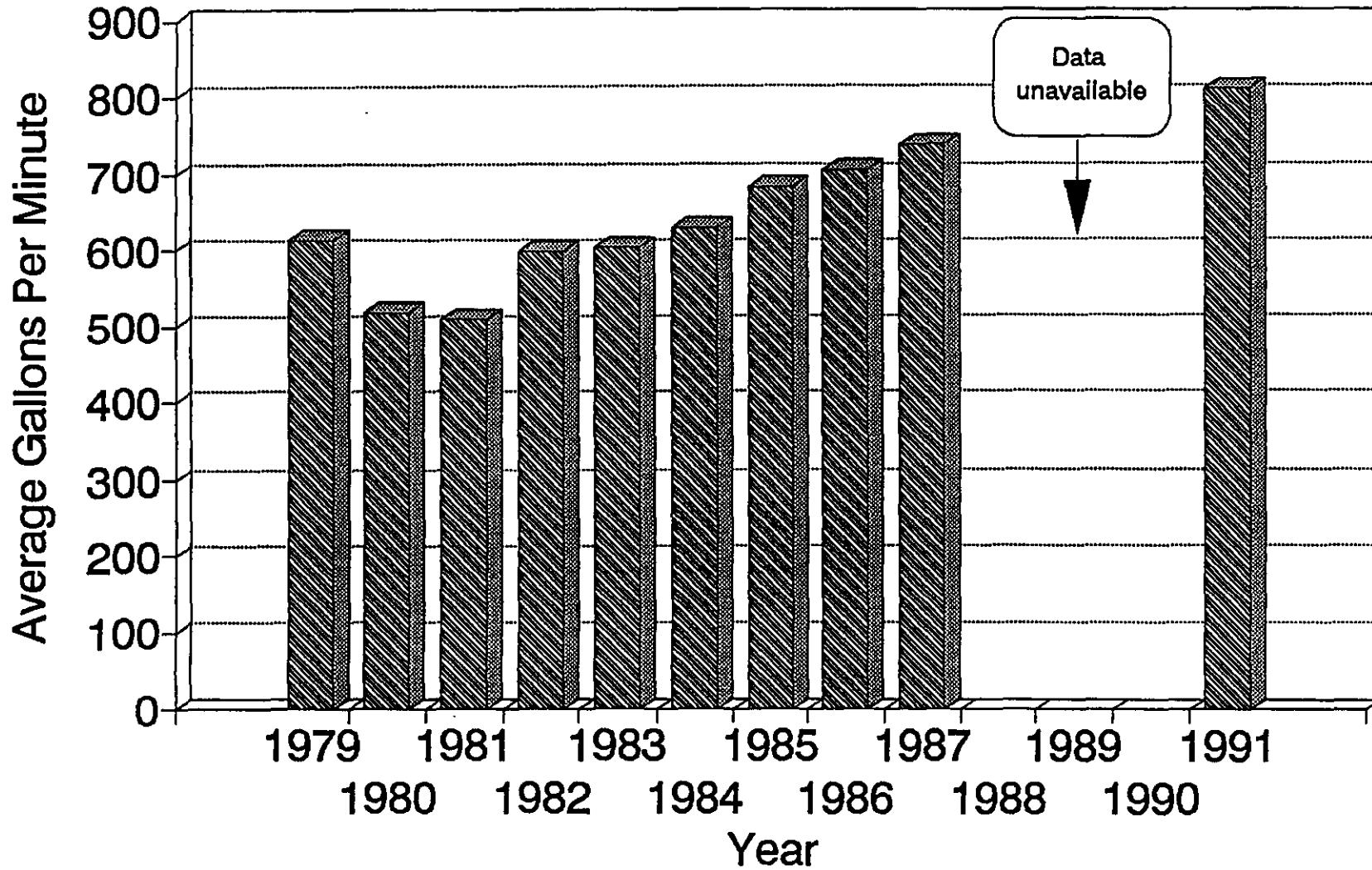
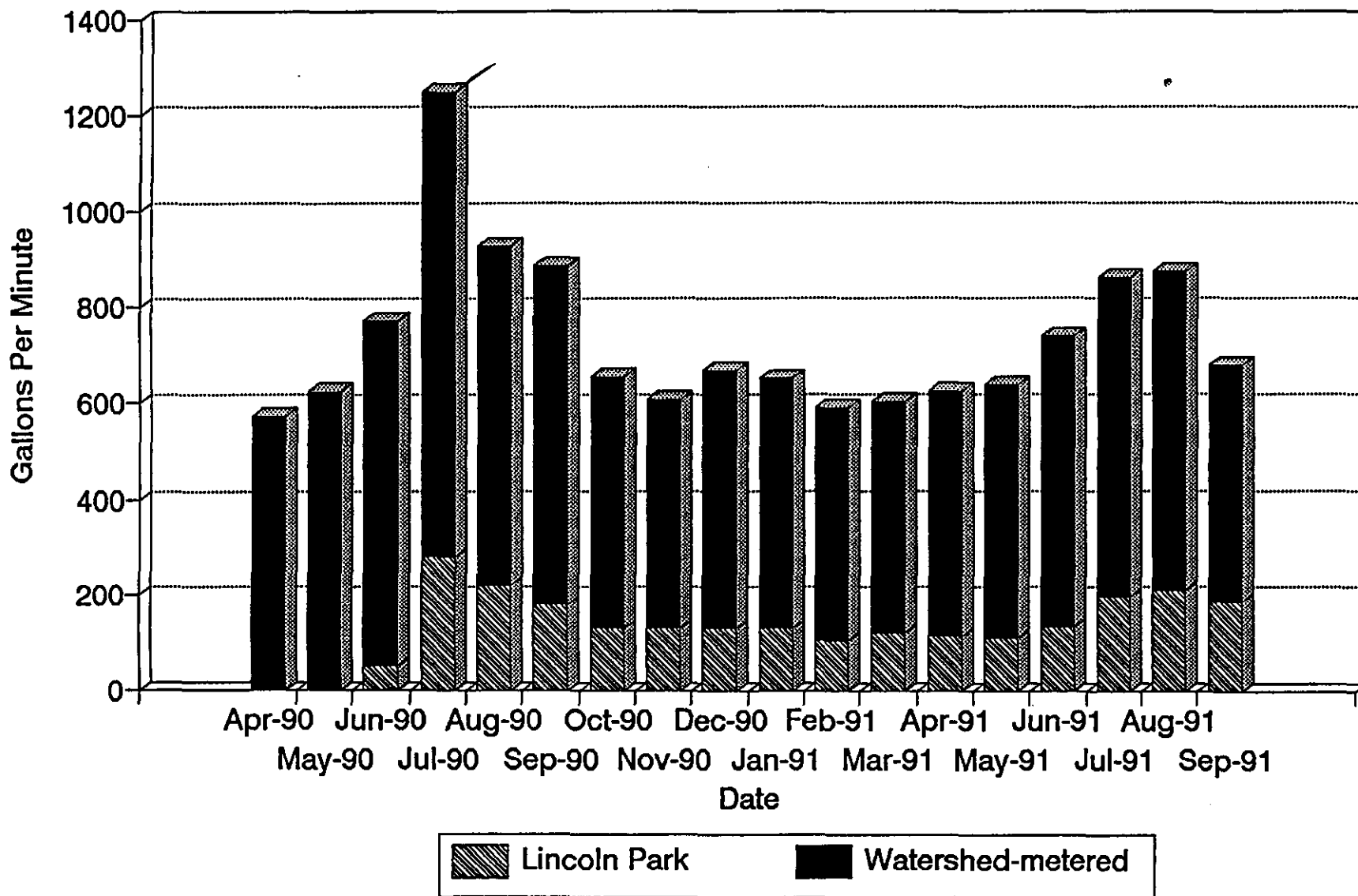


Figure E-3

AVERAGE MONTHLY PUMPING RATE

Lincoln Park* and Watershed-metered

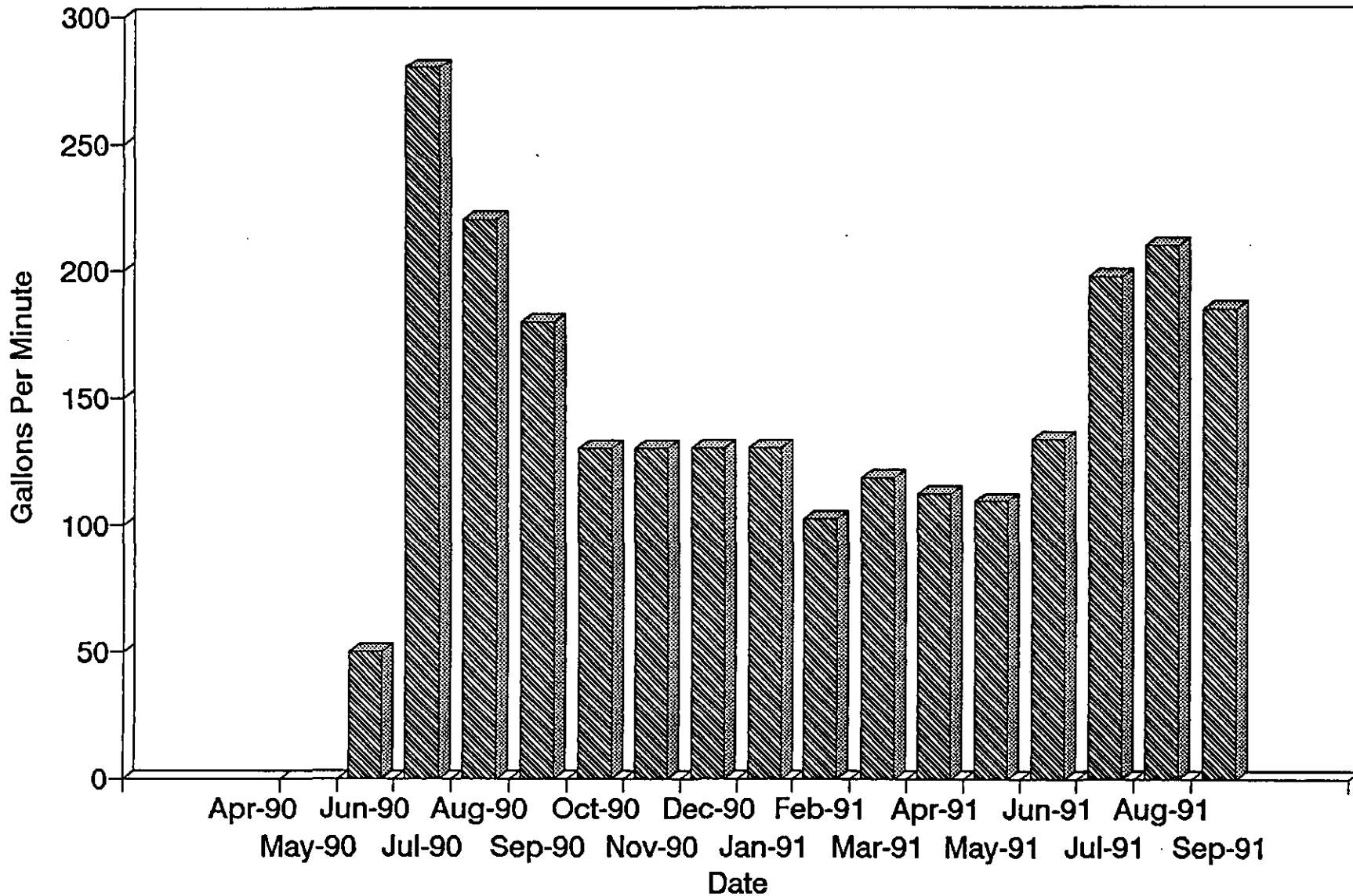


* Calculated from hour-meter readings

Figure E-4

AVERAGE MONTHLY PUMPING RATE*

LINCOLN PARK WELL

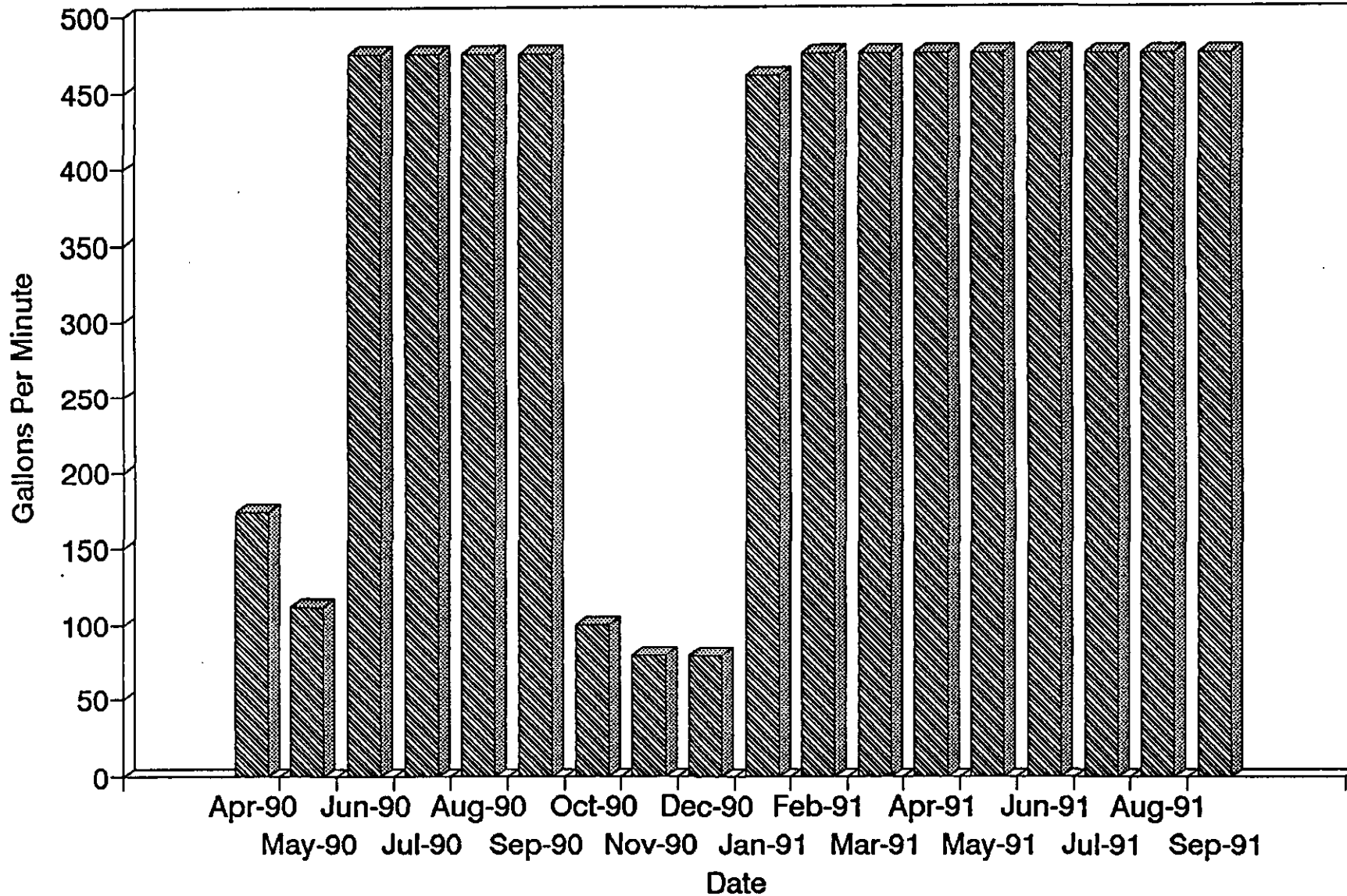


* Based on hour-meter readings

Figure E-5

AVERAGE MONTHLY PUMPING RATE*

WELL NO. 1

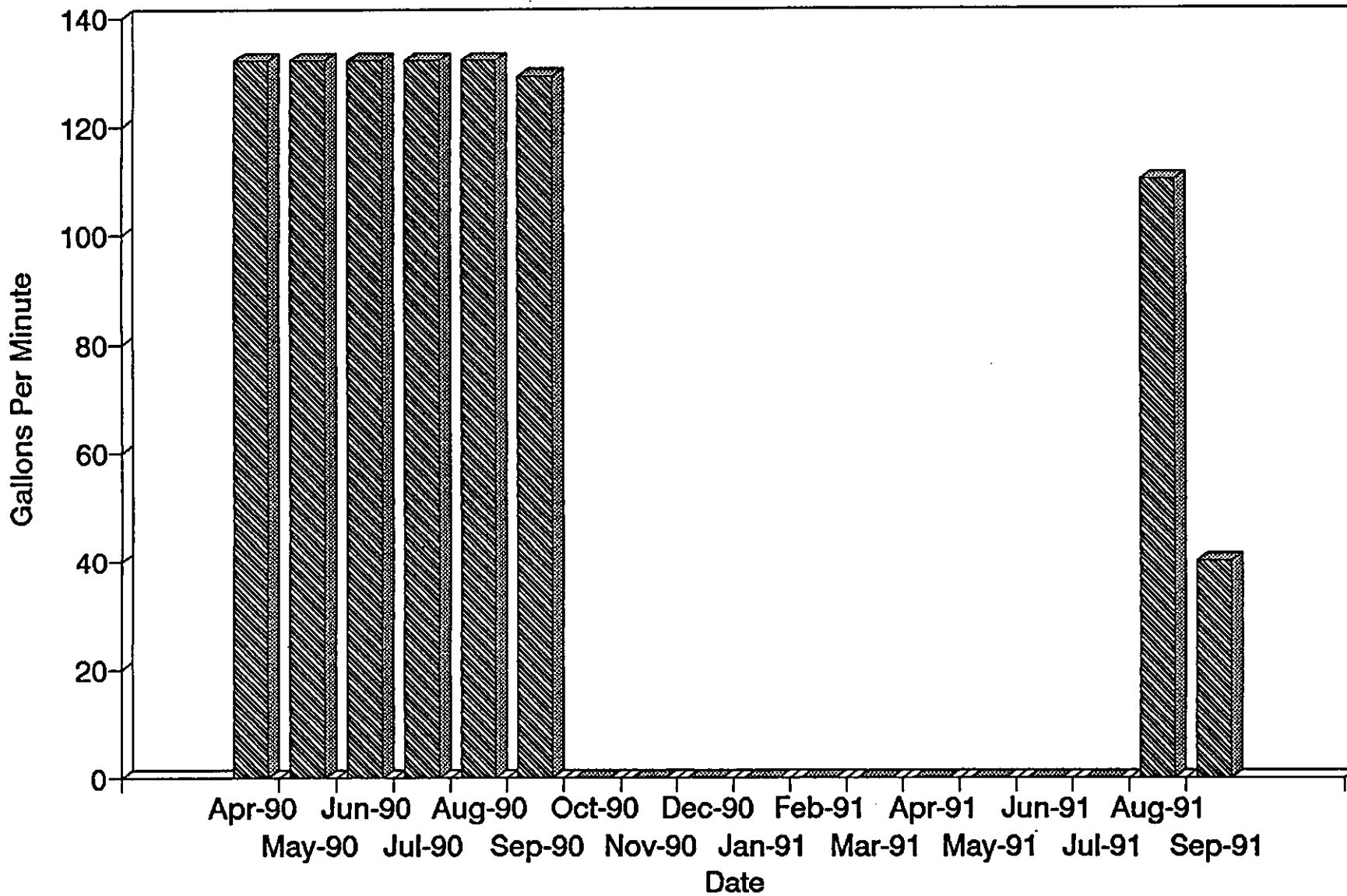


* Based on hour-meter readings

Figure E-6

AVERAGE MONTHLY PUMPING RATE*

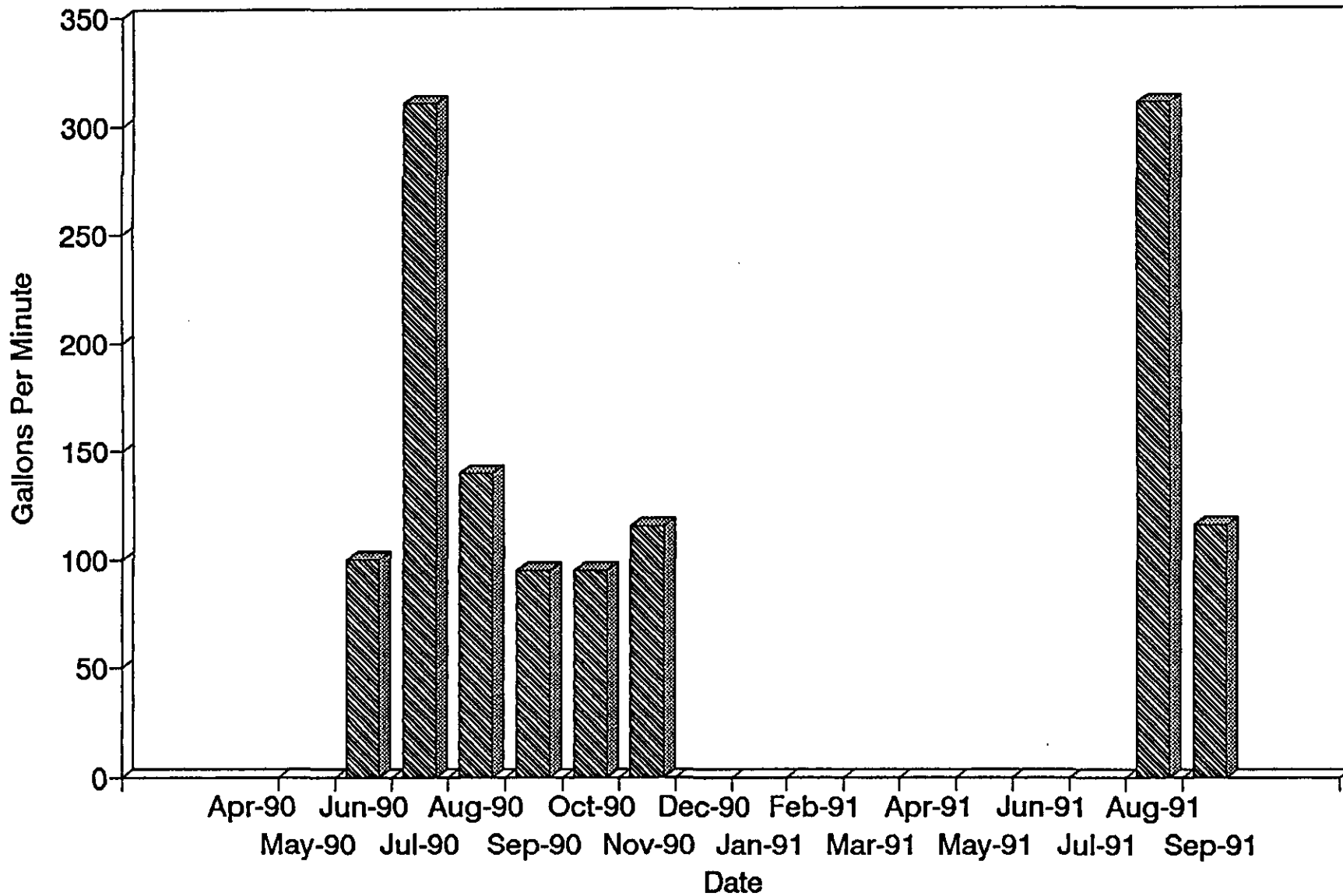
WELL NO. 2



* Based on hour-meter readings

Figure E-7

AVERAGE MONTHLY PUMPING RATE* WELL NO. 3

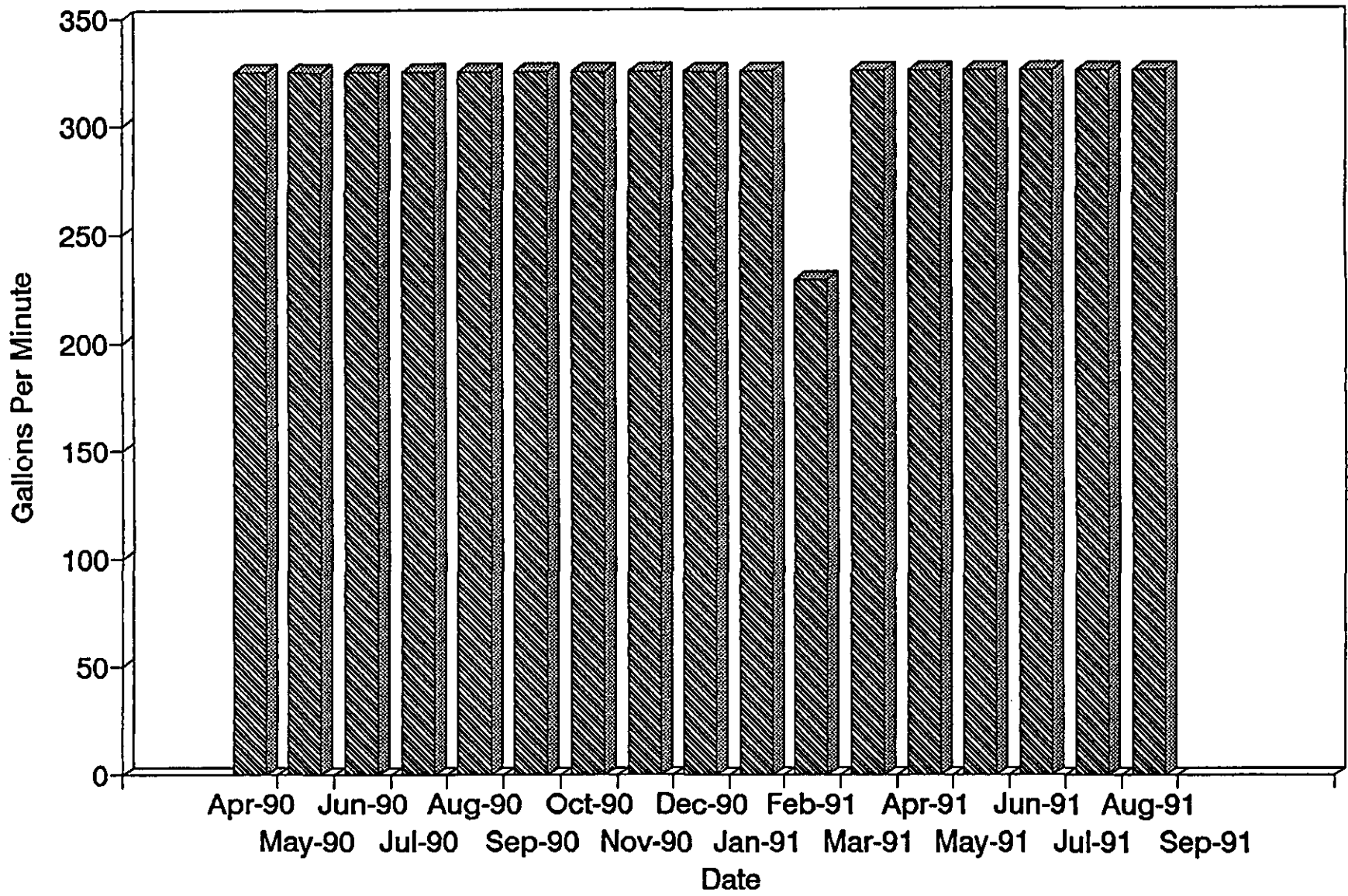


* Based on hour-meter readings

Figure E-8

AVERAGE MONTHLY PUMPING RATE*

WELL NO. 4

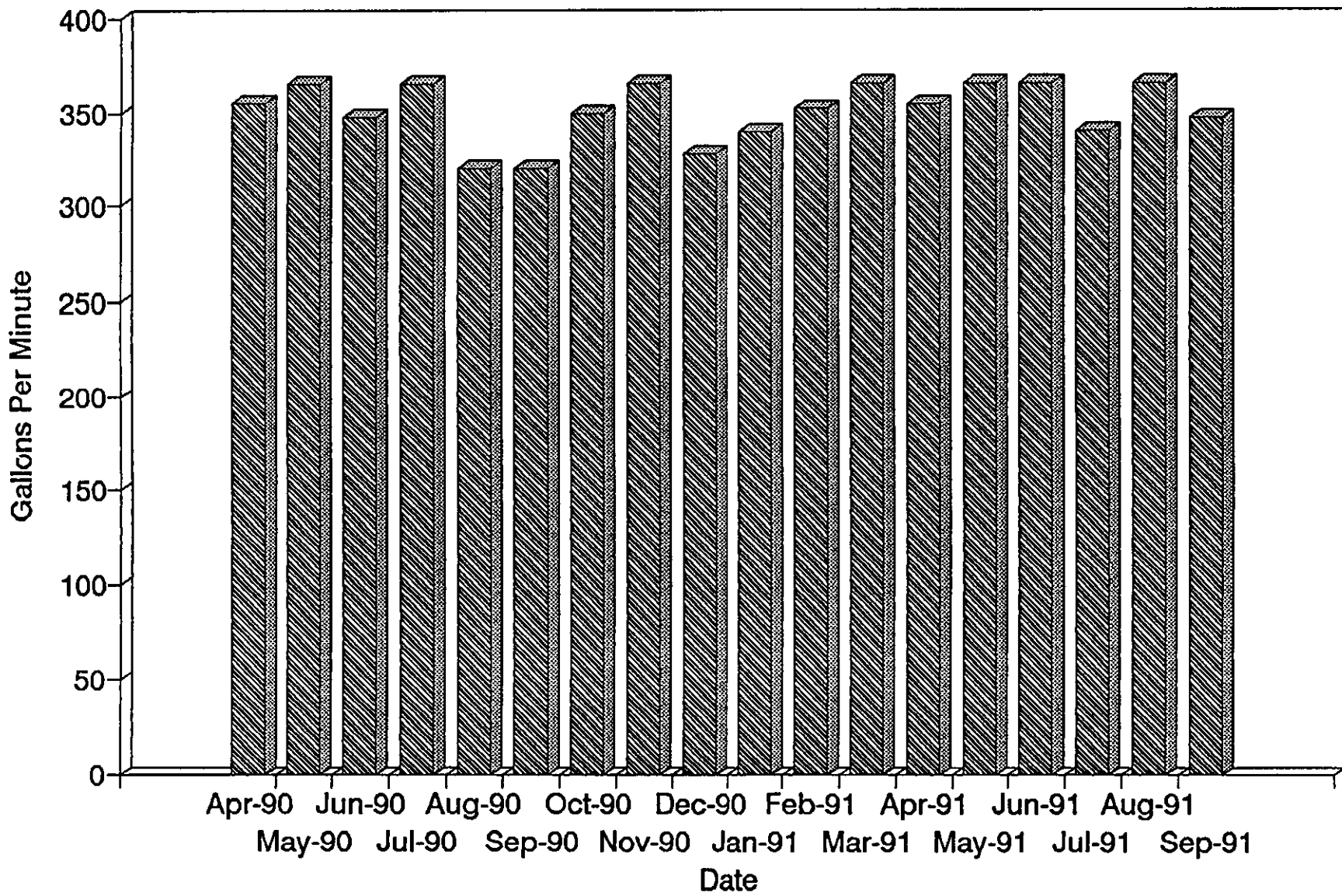


* Based on hour-meter readings

Figure E-9

AVERAGE MONTHLY PUMPING RATE*

WELL NO. 5

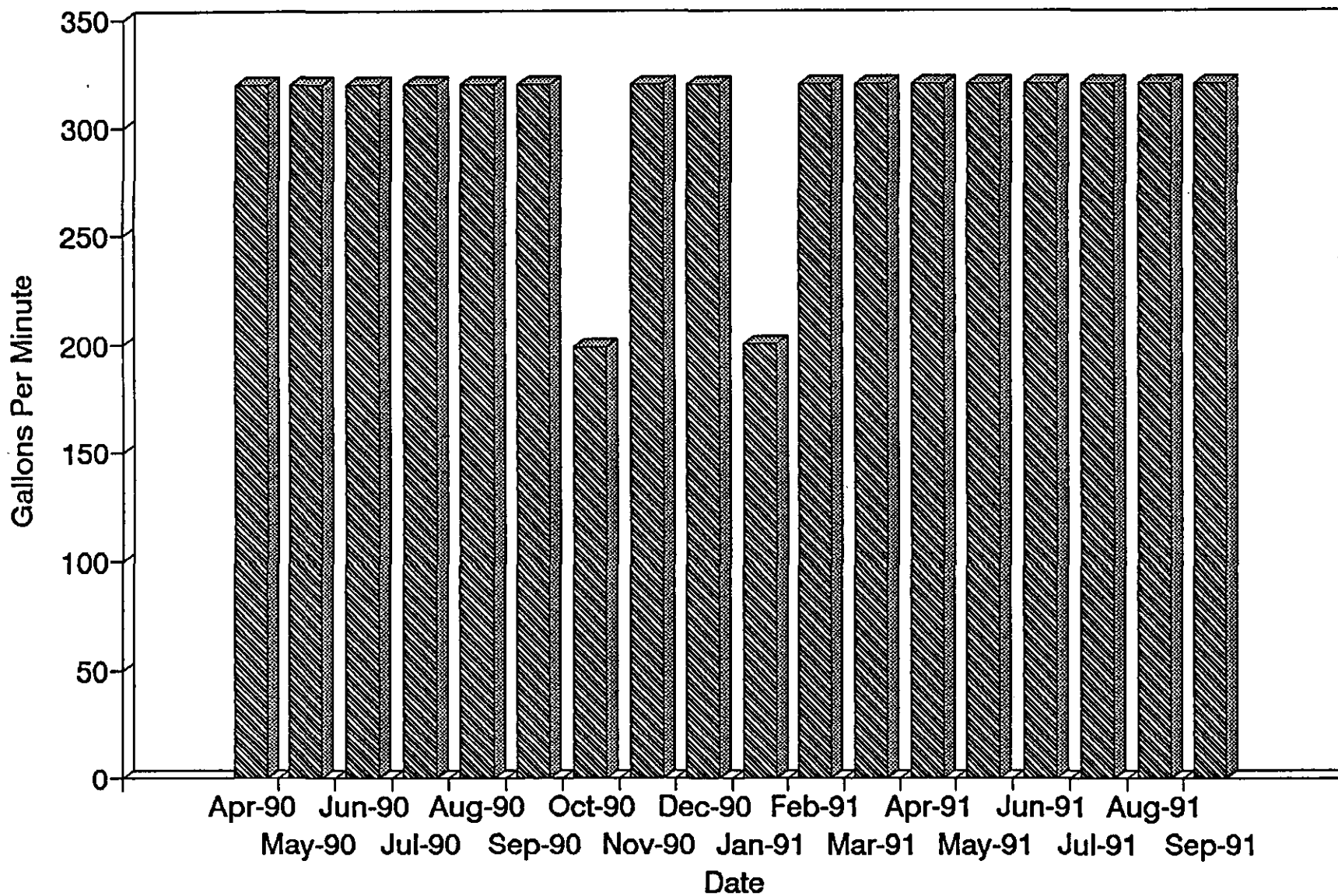


* Based on hour-meter readings

Figure E-10

AVERAGE MONTHLY PUMPING RATE*

WELL NO. 6



* Based on hour-meter readings

Figure E-11

APPENDIX G
WATER QUALITY DATA



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055. (206) 228-8335

1st Round

ATI I.D. # 9010-092

November 1, 1990

Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052

Attention : David Banton

Project Number : 903 1060.900⁴⁰²

Project Name : City of Blaine, WA

On October 9, 1990, Analytical Technologies, Inc. received three water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Donna M. McKinney
Project Manager

FWG/elf

Frederick W. Grothkopp
Frederick W. Grothkopp
Technical Manager

SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903 1060.900
PROJECT NAME : CITY OF BLAINE, WA.

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9010-092-1	GOLDER/CCY-GWMP-1-A	10/02/90	WATER
9010-092-2	GOLDER/CCY-GWMP-3-A	10/04/90	WATER
9010-092-3	GOLDER/CCY-GWMP-3-B	10/05/90	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	3

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903 1060.900
PROJECT NAME : CITY OF BLAINE, WA.

ANALYSIS	TECHNIQUE	REFERENCE	LAB
ARSENIC	AA/GF	EPA 7060	R
BARIUM	AA/F	EPA 7080	R
CADMIUM	AA/GF	EPA 7131	R
CALCIUM	AA/F	EPA 7140	R
CHROMIUM	AA/F	EPA 7190	R
COPPER	AA/F	EPA 7210	R
IRON	AA/F	EPA 7380	R
LEAD	AA/GF	EPA 7421	R
MAGNESIUM	AA/F	EPA 7450	R
MANGANESE	AA/F	EPA 7460	R
MERCURY	AA/COLD VAPOR	EPA 7470	R
POTASSIUM	AA/F	EPA 7610	R
SELENIUM	AA/GF	EPA 7740	R
SILVER	AA/F	EPA 7760	R
SODIUM	AA/F	EPA 7770	R
ZINC	AA/F	EPA 7950	R
ALKALINITY	TITRIMETRIC	EPA 310.1	R
BICARBONATE	TITRIMETRIC	EPA 310.1	R
CARBONATE	TITRIMETRIC	EPA 310.1	R
CATION/ANION BALANCE	CALCULATION	SM 104C	R

CONTINUED NEXT PAGE

ANALYTICAL SCHEDULE
 CONTINUED

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903 1060.900
 PROJECT NAME : CITY OF BLAINE, WA.

ANALYSIS	TECHNIQUE	REFERENCE	LAB
CHLORIDE	TITRIMETRIC	EPA 325.3	R
COLOR	COLORIMETRIC	EPA 110.2	SD
CONDUCTIVITY	ELECTRODE	EPA 9050	R
FLUORIDE	ELECTRODE	EPA 340.2	SD
TOTAL HARDNESS	CALCULATION	SM 314A	R
HYDROXIDE	TITRIMETRIC	EPA 310.1	R
NITRATE-NITRITE AS NITROGEN	COLORIMETRIC	EPA 353.1	SD
SILICA	COLORIMETRIC	EPA 370.1	SD
SULFATE	TURBIMETRIC	EPA 375.4	R
TOTAL DISSOLVED SOLIDS	GRAVIMETRIC	EPA 160.1	R
TURBIDITY	NEPHELOMETRIC	EPA 180.1	R

R = ATI - Renton
 SD = ATI - San Diego
 T = ATI - Tempe
 PNR = ATI - Pensacola
 FC = ATI - Fort Collins
 SUB = Subcontract

METALS RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903 1060.900
PROJECT NAME : CITY OF BLAINE, WA.

MATRIX : WATER

UNITS : mg/L

PARAMETER	GOLDER/CCY-GWMP-1-A -1	GOLDER/CCY-GWMP-3-B -3
ARSENIC	<0.005	0.008
BARIUM	<0.06	<0.06
CADMIUM	<0.0003	<0.0003
CALCIUM	16	14
CHROMIUM	<0.03	<0.03
COPPER	<0.02	<0.02
IRON	0.48	<0.03
LEAD	<0.005	<0.005
MAGNESIUM	7.6	6.2
MANGANESE	0.05	0.05
MERCURY	<0.0005	<0.0005
POTASSIUM	3.3	3.0
SELENIUM	<0.005	<0.005
SILVER	<0.02	<0.02
SODIUM	8.2	8.7
ZINC	0.22	0.02

METALS QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
 PROJECT # : 903 1060.900
 PROJECT NAME : CITY OF BLAINE, WA. UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ARSENIC	9010-088-4	<0.005	<0.005	0	0.044	0.050	88
BARIUM	9010-088-4	<0.06	<0.06	0	20.1	20.0	101
CADMIUM	9010-088-4	<0.0003	<0.0003	0	0.0023	0.0020	115
CALCIUM	9010-088-4	31	32	3	51	20	100
CHROMIUM	9010-088-4	<0.02	<0.02	0	2.04	2.00	102
COPPER	9010-088-4	<0.02	<0.02	0	0.95	1.00	95
IRON	9010-088-4	0.39	0.39	0	2.35	2.00	98
LEAD	9010-088-4	<0.005	<0.005	0	0.058	0.050	116
MAGNESIUM	9010-088-4	29	29	0	48	20	95
MANGANESE	9010-088-4	0.69	0.68	1	2.48	2.00	90
MERCURY	9010-108-1	<0.0005	<0.0005	0	0.0019	0.0020	95
POTASSIUM	9010-088-4	8.9	8.9	0	21.5	12.0	105
SELENIUM	9010-088-4	<0.005	<0.005	0	0.038	0.050	76
SILVER	9010-088-4	<0.02	<0.02	0	0.94	1.00	94
SODIUM	9010-088-4	44	44	0	N/A	N/A	N/A
SODIUM	BLANK SPIKE	N/A	N/A	N/A	21.9	20.0	110
ZINC	9010-088-4	<0.01	<0.01	0	0.48	0.50	96

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903 1060.900
PROJECT NAME : CITY OF BLAINE, WA.

MATRIX : WATER

UNITS : mg/L

PARAMETER	GOLDER/CCY-GWMP-1-A -1	GOLDER/CCY-GWMP-3-B -3
ALKALINITY	52	84
BICARBONATE	52	84
CARBONATE	<5	<5
CHLORIDE	<5	6
FLUORIDE	<0.5	<0.5
TOTAL HARDNESS	71	60
HYDROXIDE	<5	<5
NITRATE-NITRITE as NITROGEN	<0.05	<0.05
SILICA	22.2	25.3
SULFATE	6	<5
TOTAL DISSOLVED SOLIDS	130	130

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903 1060.900
 PROJECT NAME : CITY OF BLAINE, WA.

MATRIX : WATER

UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
ALKALINITY	9010-092-3	84	88	5	276	200	96
CHLORIDE	9010-108-1	5	5	0	212	200	104
FLUORIDE	9010-092-3	<0.5	<0.5	0	4.97	5.00	99
TOTAL HARDNESS	9010-088-4	196	199	2	N/A	N/A	N/A
NITRATE-NITRITE as NITROGEN	01016601	<0.05	<0.05	0	1.9	2.0	95
SILICA	01016601	25.7	26.6	3	68.0	40.0	105
SULFATE	9010-108-1	<5	<5	0	9.7	10	97
TOTAL DISSOLVED SOLIDS	9010-092-3	130	120	8	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903 1060.900
PROJECT NAME : CITY OF BLAINE, WA.

MATRIX : WATER

UNITS : -

PARAMETER	GOLDER/CCY-GWMP-1-A -1	GOLDER/CCY-GWMP-3-B -3
COLOR	<5	<5
CATION/ANION BALANCE	1.21	0.76

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903 1060.900
 PROJECT NAME : CITY OF BLAINE, WA.

MATRIX : WATER

UNITS : -

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
COLOR	9010-092-3	<5	<5	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903 1060.900
PROJECT NAME : CITY OF BLAINE, WA. UNITS : umhos/cm

PARAMETER	GOLDER/CCY-GWMP-1-A -1	GOLDER/CCY-GWMP-3-B -3
CONDUCTIVITY	200	160

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903 1060.900
 PROJECT NAME : CITY OF BLAINE, WA.

MATRIX : WATER
 UNITS : umhos/cm

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
CONDUCTIVITY	9010-108-1	130	150	14	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903 1060.900
PROJECT NAME : CITY OF BLAINE, WA.

MATRIX : WATER

UNITS : NTU

PARAMETER	GOLDER/CCY-GWMP-1-A -1	GOLDER/CCY-GWMP-3-B -3
TURBIDITY	18	<0.5

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903 1060.900
 PROJECT NAME : CITY OF BLAINE, WA.

MATRIX : WATER

UNITS : NTU

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
TURBIDITY	9010-108-1	<0.5	<0.5	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

9010-092

9010-092

CHAIN OF CUSTODY RECORD

(Ca, Mg, Na, Fe, Ni, Pb, Zn, Cu, Mn, Se, Si, Al, Hg, Cd, Cr, As, Ba, Co, Ni, Mn, Pb, Zn, Cu, Fe, Cr, V, Ni, Mo, Sb, Sn, Bi, W, I, Br, F, Cl, B, S, P, C, O, H, N)

U.7

PRQJ. NO.	SITE / LOCATION					NO. OF CONTAINERS	AMOUNT / PRESERVATIVE							SEAL NO.	SEAL INTACT? (YorN)	REMARKS (with initials)			
903 10100 #900	City of Blaine, Wa						COBALT ION	TOTAL PHOSPHORUS	HEAVY METALS	NITROGEN	CATION ANION	PHOSPHORUS	SEAL NO.				SEAL INTACT? (YorN)	REMARKS (with initials)	
SAMPLERS: (Signature)							SAMPLERS: (Signature)										SAMPLERS: (Signature)		
STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION	AMOUNT / PRESERVATIVE							SEAL NO.	SEAL INTACT? (YorN)	REMARKS (with initials)				
1	-1	10/2/90	1335	H ₂ O	CCY-GWMP-1-A	*													
2	2	10/4/90	855	H ₂ O	CCY-GWMP-3-A	*													
3	3	10/5/90	-	H ₂ O	GOLDER/CCY-GWMP-3-B	*													
1	4	10/2/90	1335	H ₂ O	CCY-GWMP-1-A	*	*												
2	5	10/4/90	855	H ₂ O	GOLDER/CCY-GWMP-3-A	*	*												
3	6	10/5/90	1330	H ₂ O	GOLDER/CCY-GWMP-3-B	*	*												
1	7	10/2/90	1335	H ₂ O	CCY-GWMP-1-A	*	*												
2	8	10/4/90	855	H ₂ O	CCY-GWMP-3-A				*										
3	9	10/5/90	-	H ₂ O	CCY-GWMP-3-B				*										
1	10	10/2/90	1335	H ₂ O	CCY-GWMP-1-A					*									
2	11	10/4/90	855	H ₂ O	CCY-GWMP-3-A					*									
3	12	10/5/90	-	H ₂ O	CCY-GWMP-3-B					*									
1	13	10/2/90	1335	H ₂ O	CCY-GWMP-1-A						*								
2	14	10/4/90	855	H ₂ O	CCY-GWMP-3-A						*								
3	15	10/5/90	1330	H ₂ O	CCY-GWMP-3-B						*								

Relinquished by: (Signature/Firm) Christina D. Jensen	Date/Time 10/9/90 1330	Received by: (Signature/Firm) ATT 10/9/90	Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)
Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)	Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)
Relinquished by: (Signature/Firm)	Date/Time	Received by: (Signature/Firm)	Date/Time	Remarks (attachments if necessary) TOX in plastic	

9010-092

CHAIN OF CUSTODY RECORD

PROJ. NO. 903-1060 900		SITE/LOCATION City of Blaine / WA				NO. OF CONTAINERS	AMOUNT/PRESERVATIVE SILICA / F-	SEAL NO.	SEAL INTACT? (YorN)	REMARKS (with initials)	
SAMPLERS: (Signature)											
STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION						
1	10/2/90	1335		H ₂ O	CCY-GWMP-1-A	1	*				
2	10/4/90	855		H ₂ O	CCY-GWMP-3-A	1	*				
3	10/5/90	-		H ₂ O	CCY-GWMP-3-B	1	*				
Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)		Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)	
Clinton's Man		10/9/90 1330		[Signature] 10/9/90 2300							
Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)		Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)	
Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)		Date / Time		Remarks (attachments if necessary)			



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

1st Round

RECEIVED
NOV 2 1990
Golder Associates

ATI I.D. # 9010-108

November 1, 1990

Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052

Attention : David Banton

Project Number : 903-1060

Project Name : Blaine/Pump Testing/WA

On October 11, 1990, Analytical Technologies, Inc. received one water sample for analysis. The sample was analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Donna M. McKinney
Project Manager

FWG/elf

Frederick W. Grothkopp
Frederick W. Grothkopp
Technical Manager

SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060
PROJECT NAME : BLAINE/PUMP TESTING/WA

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9010-108-1	CCY-GWMP-2-B	10/09/90	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	1

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060
PROJECT NAME : BLAINE/PUMP TESTING/WA

ANALYSIS	TECHNIQUE	REFERENCE	LAB
ARSENIC	AA/GF	EPA 7060	R
BARIUM	AA/F	EPA 7080	R
CADMIUM	AA/GF	EPA 7131	R
CALCIUM	AA/F	EPA 7140	R
CHROMIUM	AA/F	EPA 7190	R
COPPER	AA/F	EPA 7210	R
IRON	AA/F	EPA 7380	R
LEAD	AA/GF	EPA 7421	R
MAGNESIUM	AA/F	EPA 7450	R
MANGANESE	AA/F	EPA 7460	R
MERCURY	AA/COLD VAPOR	EPA 7470	R
POTASSIUM	AA/F	EPA 7610	R
SELENIUM	AA/GF	EPA 7740	R
SILVER	AA/F	EPA 7760	R
SODIUM	AA/F	EPA 7770	R
ZINC	AA/F	EPA 7950	R
ALKALINITY	TITRIMETRIC	EPA 310.1	R
BICARBONATE	TITRIMETRIC	EPA 310.1	R
CARBONATE	TITRIMETRIC	EPA 310.1	R
CATION/ANION BALANCE	CALCULATION	SM 104C	R

CONTINUED NEXT PAGE

ANALYTICAL SCHEDULE
 CONTINUED

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060
 PROJECT NAME : BLAINE/PUMP TESTING/WA

ANALYSIS	TECHNIQUE	REFERENCE	LAB
CHLORIDE	TITRIMETRIC	EPA 325.3	R
COLOR	COLORIMETRIC	EPA 110.2	SD
CONDUCTIVITY	ELECTRODE	EPA 9050	R
FLUORIDE	ELECTRODE	EPA 340.2	SD
HARDNESS	CALCULATION	SM 314A	R
HYDROXIDE	TITRIMETRIC	EPA 310.1	R
NITRATE -NITRITE AS NITROGEN	COLORIMETRIC	EPA 353.1	SD
SILICA	COLORIMETRIC	EPA 370.1	SD
SULFATE	TURBIMETRIC	EPA 375.4	R
TOTAL DISSOLVED SOLIDS	GRAVIMETRIC	EPA 160.1	R
TURBIDITY	NEPHELOMETRIC	EPA 180.1	R

R = ATI - Renton
 SD = ATI - San Diego
 T = ATI - Tempe
 PNR = ATI - Pensacola
 FC = ATI - Fort Collins
 SUB = Subcontract

METALS RESULTS

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903-1060
PROJECT NAME : BLAINE/PUMP TESTING/WA UNITS : mg/L

PARAMETER CCY-GWMP-2-B
-1

ARSENIC	<0.005
BARIUM	<0.06
CADMIUM	<0.0003
CALCIUM	13
CHROMIUM	<0.02
COPPER	<0.02
IRON	0.11
LEAD	<0.005
MAGNESIUM	5.3
MANGANESE	0.10
MERCURY	<0.0005
POTASSIUM	2.2
SELENIUM	<0.005
SILVER	<0.02
SODIUM	9.5
ZINC	0.04

METALS QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES

MATRIX : WATER

PROJECT # : 903-1060

PROJECT NAME : BLAINE/PUMP TESTING/WA

UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ARSENIC	9010-088-4	<0.005	<0.005	0	0.044	0.050	88
BARIUM	9010-088-4	<0.06	<0.06	0	20.1	20.0	101
CADMIUM	9010-088-4	<0.0003	<0.0003	0	0.0023	0.0020	115
CALCIUM	9010-088-4	31	32	3	51	20	100
CHROMIUM	9010-088-4	<0.02	<0.02	0	2.04	2.00	102
COPPER	9010-088-4	<0.02	<0.02	0	0.95	1.00	95
IRON	9010-088-4	0.39	0.39	0	2.35	2.00	98
LEAD	9010-088-4	<0.005	<0.005	0	0.058	0.050	116
MAGNESIUM	9010-088-4	29	29	0	48	20	95
MANGANESE	9010-088-4	0.69	0.68	1	2.48	2.00	90
MERCURY	9010-108-1	<0.0005	<0.0005	0	0.0019	0.0020	95
POTASSIUM	9010-088-4	8.9	8.9	0	21.5	12.0	105
SELENIUM	9010-088-4	<0.005	<0.005	0	0.038	0.050	76
SILVER	9010-088-4	<0.02	<0.02	0	0.94	1.00	94
SODIUM	9010-088-4	44	44	0	N/A	N/A	N/A
SODIUM	BLANK SPIKE	N/A	N/A	N/A	21.9	20.0	110
ZINC	9010-088-4	<0.01	<0.01	0	0.48	0.50	96

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060
PROJECT NAME : BLAINE/PUMP TESTING/WA

MATRIX : WATER
UNITS : mg/L

PARAMETER CCY-GWMP-2-B
-1

ALKALINITY	80
BICARBONATE	80
CARBONATE	<5
CHLORIDE	5
FLUORIDE	<0.5
TOTAL HARDNESS	54
HYDROXIDE	<5
NITRATE-NITRITE as NITROGEN	<0.05
SILICA	25.7
SULFATE	<5
TOTAL DISSOLVED SOLIDS	130

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060
 PROJECT NAME : BLAINE/PUMP TESTING/WA

MATRIX : WATER
 UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
ALKALINITY	9010-092-3	84	88	5	276	200	96
CHLORIDE	9010-108-1	5	5	0	212	200	104
FLUORIDE	01016003	0.6	0.6	0	5.17	5.00	103
TOTAL HARDNESS	9010-088-4	196	199	2	N/A	N/A	N/A
NITRATE-NITRITE as NITROGEN	9010-108-1	<0.05	<0.05	0	1.9	2.0	95
SILICA	9010-108-1	25.7	26.6	3	68.0	40.0	105
SULFATE	9010-108-1	<5	<5	0	9.7	10	97
TOTAL DISSOLVED SOLIDS	9010-108-1	130	150	14	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903-1060
PROJECT NAME : BLAINE/PUMP TESTING/WA UNITS : -

PARAMETER CCY-GWMP-2-B
-1

COLOR <5

CATION/ANION
BALANCE 0.74

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060
 PROJECT NAME : BLAINE/PUMP TESTING/WA

MATRIX : WATER
 UNITS : -

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
COLOR	01016502	<5	<5	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903-1060
PROJECT NAME : BLAINE/PUMP TESTING/WA UNITS : umhos/cm

PARAMETER CCY-GWMP-2-B
-1

CONDUCTIVITY 130

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060
PROJECT NAME : BLAINE/PUMP TESTING/WA

MATRIX : WATER
UNITS : umhos/cm

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
CONDUCTIVITY	9010-108-1	130	150	14	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903-1060
PROJECT NAME : BLAINE/PUMP TESTING/WA UNITS : NTU

PARAMETER CCY-GWMP-2-B
-1

TURBIDITY <0.5

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060
 PROJECT NAME : BLAINE/PUMP TESTING/WA

MATRIX : WATER
 UNITS : NTU

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
TURBIDITY	9010-108-1	<0.5	<0.5	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

GOLDER

CHAIN OF CUSTODY RECORD

9010-108

PROJ. NO.		SITE / LOCATION				NO. OF CONTAINERS	AMOUNT / PRESERVATIVE	Color / Cond	Silica / Fe	Al + SO ₄ TDS	Total Solids	APB / MBS / HANCO	U-35	SEAL NO.	SEAL INTACT? (YorN)	REMARKS (with initials)
903-1060		Blaine / Pump Testing / WA														
SAMPLERS: (Signature)		Pm David Benton														
STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION											
GUMP-2	10/9/90	16:25	GRAB	H ₂ O	(CY-GUMP-2-B)	1	X							✓	Turb?	
↓	↓	↓	↓	↓	↓	1		X						✓		
↓	↓	↓	↓	↓	↓	1			X					✓		
↓	↓	↓	↓	↓	↓	1				X				✓		
↓	↓	↓	↓	↓	↓	1					X			✓		
Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)		Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)						
D. Yates / Golder		10/11/90 10:35		J. P. [Signature] 10/11/90 300p												
Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)		Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)						
Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)		Date / Time		Remarks (attachments if necessary)		Cold intact seals ok.						
								rec. via ENA courier								



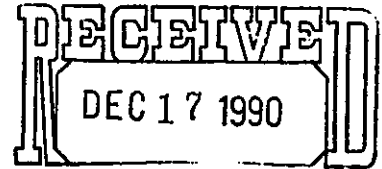
Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055. (206) 228-8335

1st Round

ATI I.D. # 9011-167

December 13, 1990



Golder Associates

Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052

Attention : David Banton

Project Number : 903-1060-402

Project Name : GWMP/Blaine

On November 21, 1990, Analytical Technologies, Inc., received 19 water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.

Mary C. Silva
Senior Project Manager

FWG/tc

Frederick W. Grothkopp
Technical Manager

WELL IDENTIFICATION

CCY-1-11.19	12th Street
CCY-2-11.19	Lincoln Park
CCY-2-11.19-D	Lincoln Park Duplicate
CCY-3-11.191	Well No. 6
CCY-7-11.19	Well No. 4
CCY-8-11.19	Boettcher Well
CCY-10-11.19	Colacurcio Well
CCY-11-11.19	Leer Well
CCY-14-11.20	DeKubber Well
CCY-14-11.20-D	DeKubber Well Duplicate
CCY-16-11.20	Zylstra Well
CCY-00-11.20-FB	Field Blank
CCY-6-11.20	Berg Well
CCY-15-11.20	Nymeyer Well
CCY-4-11.20	Wood Well
CCY-9-11.20	Aller Well
CCY-13-11.20	Rodenberger Well
CCY-12-11.21	Wilson Well
CCY-12-11.21-D	Wilson Well Duplicate

SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060-402
 PROJECT NAME : GWMP/BLAINE

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9011-167-1	CCY-1-11.19	11/19/90	WATER
9011-167-2	CCY-2-11.19	11/19/90	WATER
9011-167-3	CCY-2-11.19-D	11/19/90	WATER
9011-167-4	CCY-3-11.19	11/19/90	WATER
9011-167-5	CCY-7-11.19	11/19/90	WATER
9011-167-6	CCY-8-11.19	11/19/90	WATER
9011-167-7	CCY-10-11.19	11/19/90	WATER
9011-167-8	CCY-11-11.19	11/19/90	WATER
9011-167-9	CCY-14-11.20	11/20/90	WATER
9011-167-10	CCY-14-11.20-D	11/20/90	WATER
9011-167-11	CCY-16-11.20	11/20/90	WATER
9011-167-12	CCY-00-11.20-FB	11/20/90	WATER
9011-167-13	CCY-6-11.20	11/20/90	WATER
9011-167-14	CCY-15-11.20	11/20/90	WATER
9011-167-15	CCY-4-11.20	11/20/90	WATER
9011-167-16	CCY-9-11.20	11/20/90	WATER
9011-167-17	CCY-13-11.20	11/20/90	WATER
9011-167-18	CCY-12-11.21	11/21/90	WATER
9011-167-19	CCY-12-11.21-D	11/21/90	WATER

----- TOTALS -----

MATRIX	# SAMPLES
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WATER	19

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060-402
 PROJECT NAME : GWMP/BLAINE

ANALYSIS	TECHNIQUE	REFERENCE	LAB
CALCIUM	AA/F	EPA 7140	R
IRON	AA/F	EPA 7380	R
MAGNESIUM	AA/F	EPA 7450	R
MANGANESE	AA/F	EPA 7460	R
POTASSIUM	AA/F	EPA 7610	R
SODIUM	AA/F	EPA 7770	R
ALKALINITY	TITRIMETRIC	EPA 310.1	R
BICARBONATE	TITRIMETRIC	EPA 310.1	R
CARBONATE	TITRIMETRIC	EPA 310.1	R
CHLORIDE	TITRIMETRIC	EPA 325.3	R
COLOR	COLORIMETRIC	EPA 110.2	SD
HARDNESS	CALCULATION	SM 314A	R
HYDROXIDE	TITRIMETRIC	EPA 310.1	R
NITRATE-NITRITE AS NITROGEN	COLORIMETRIC	EPA 353.1	SD
SILICA	COLORIMETRIC	EPA 370.1	SD
SULFATE	TURBIMETRIC	EPA 375.4	R
TOTAL DISSOLVED SOLIDS	GRAVIMETRIC	EPA 160.1	SD
TOTAL ORGANIC HALIDES	TOX ANALYZER	EPA 9020	SD
TURBIDITY	NEPHELOMETRIC	EPA 180.1	R

R = ATI - Renton
 SD = ATI - San Diego
 T = ATI - Tempe

PNR = ATI - Pensacola
 FC = ATI - Fort Collins
 SUB = ATI - Subcontract

METALS RESULTS

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060-402
 PROJECT NAME : GWMP/BLAINE
 MATRIX : WATER
 UNITS : mg/L

ATI I.D. #	CLIENT I.D.	CALCUIM	IRON	MAGNESIUM
9011-167-1	CCY-1-11.19	13	0.25	7
9011-167-2	CCY-2-11.19	16	<0.05	6
9011-167-3	CCY-2-11.19-D	16	<0.05	6
9011-167-4	CCY-3-11.19	16	0.29	7
9011-167-5	CCY-7-11.19	10	<0.05	4
9011-167-6	CCY-8-11.19	8	1.7	4
9011-167-7	CCY-10-11.19	8	<0.05	4
9011-167-8	CCY-11-11.19	4	0.07	2
9011-167-9	CCY-14-11.20	13	0.37	4
9011-167-10	CCY-14-11.20-D	13	0.26	4
9011-167-11	CCY-16-11.20	16	<0.05	8
9011-167-12	CCY-00-11.20-FB	<0.5	<0.05	<0.5
9011-167-13	CCY-6-11.20	10	0.26	6
9011-167-14	CCY-15-11.20	11	1.0	3
9011-167-15	CCY-4-11.20	12	<0.05	5
9011-167-16	CCY-9-11.20	8	<0.05	3
9011-167-17	CCY-13-11.20	9	1.0	12
9011-167-18	CCY-12-11.21	2	<0.05	1
9011-167-19	CCY-12-11.21-D	2	<0.05	1

METALS RESULTS

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060-402
 PROJECT NAME : GWMP/BLAINE

MATRIX : WATER

UNITS : mg/L

ATI I.D. #	CLIENT I.D.	MANGANESE	POTASSIUM	SODIUM
9011-167-1	CCY-1-11.19	0.06	3.8	12
9011-167-2	CCY-2-11.19	0.04	4.0	11
9011-167-3	CCY-2-11.19-D	0.04	3.9	11
9011-167-4	CCY-3-11.19	0.03	2.4	9.1
9011-167-5	CCY-7-11.19	<0.02	1.4	5.7
9011-167-6	CCY-8-11.19	0.18	1.1	5.6
9011-167-7	CCY-10-11.19	<0.02	1.2	5.8
9011-167-8	CCY-11-11.19	0.04	0.57	5.9
9011-167-9	CCY-14-11.20	0.07	5.0	10
9011-167-10	CCY-14-11.20-D	0.07	5.1	10
9011-167-11	CCY-16-11.20	<0.02	2.6	19
9011-167-12	CCY-00-11.20-FB	<0.02	<0.5	<0.5
9011-167-13	CCY-6-11.20	0.11	1.5	7.7
9011-167-14	CCY-15-11.20	0.04	0.93	5.3
9011-167-15	CCY-4-11.20	0.04	3.1	14
9011-167-16	CCY-9-11.20	<0.02	1.4	5.3
9011-167-17	CCY-13-11.20	0.03	11	370
9011-167-18	CCY-12-11.21	<0.02	3.5	92
9011-167-19	CCY-12-11.21-D	<0.02	3.4	94

METALS QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060-402
 PROJECT NAME : GWMP/BLAINE
 MATRIX : WATER
 UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CALCIUM	9011-167-10	13	13	0	48	40	88
CALCIUM	9011-167-19	2	2	0	37	40	88
IRON	9011-167-10	0.26	0.24	8	52.7	50.0	105
IRON	9011-167-19	<0.05	<0.05	0	50.7	50.0	101
MAGNESIUM	9011-167-10	4	4	0	22	20	90
MAGNESIUM	9011-167-19	1	1	0	20	20	95
MANGANESE	9011-167-10	0.07	0.07	0	5.01	5.00	99
MANGANESE	9011-167-19	<0.02	<0.02	0	4.88	5.00	98
POTASSIUM	9011-167-10	5.1	5.1	0	8.88	6.00	63
POTASSIUM	9011-167-19	3.4	3.5	3	8.08	6.00	78
POTASSIUM	BLANK SPIKE	N/A	N/A	N/A	6.31	6.00	105
SODIUM	9011-167-10	10	10	0	17.6	10.0	76
SODIUM	9011-167-19	94	90	4	**	**	**
SODIUM	BLANK SPIKE	N/A	N/A	N/A	12.1	10.0	121

** Due to the necessary dilution of the sample, result was not attainable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060-402
PROJECT NAME : GWMP/BLAINE

MATRIX : WATER

UNITS : mg/L

ATI I.D.#	CLIENT I.D.	ALKALINITY	BICARBONATE	CARBONATE
9011-167-1	CCY-1-11.19	85	85	<5
9011-167-2	CCY-2-11.19	94	94	<5
9011-167-3	CCY-2-11.19-D	97	97	<5
9011-167-4	CCY-3-11.19	82	82	<5
9011-167-5	CCY-7-11.19	80	80	<5
9011-167-6	CCY-8-11.19	42	42	<5
9011-167-7	CCY-10-11.19	46	46	<5
9011-167-8	CCY-11-11.19	13	13	<5
9011-167-9	CCY-14-11.20	23	23	<5
9011-167-10	CCY-14-11.20-D	22	22	<5
9011-167-11	CCY-16-11.20	110	110	<5
9011-167-12	CCY-00-11.20-FB	<5	<5	<5
9011-167-13	CCY-6-11.20	63	63	<5
9011-167-14	CCY-15-11.20	27	27	<5
9011-167-15	CCY-4-11.20	86	86	<5
9011-167-16	CCY-9-11.20	46	46	<5
9011-167-17	CCY-13-11.20	220	210	10
9011-167-18	CCY-12-11.21	200	190	8.8
9011-167-19	CCY-12-11.21-D	200	190	5.6

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060-402
PROJECT NAME : GWMP/BLAINE

MATRIX : WATER

UNITS : mg/L

ATI I.D.#	CLIENT I.D.	CHLORIDE	HARDNESS	HYDROXIDE
9011-167-1	CCY-1-11.19	5	63	<5
9011-167-2	CCY-2-11.19	5	68	<5
9011-167-3	CCY-2-11.19-D	<5	67	<5
9011-167-4	CCY-3-11.19	<5	68	<5
9011-167-5	CCY-7-11.19	<5	44	<5
9011-167-6	CCY-8-11.19	<5	35	<5
9011-167-7	CCY-10-11.19	<5	37	<5
9011-167-8	CCY-11-11.19	7.1	17	<5
9011-167-9	CCY-14-11.20	16	47	<5
9011-167-10	CCY-14-11.20-D	16	47	<5
9011-167-11	CCY-16-11.20	7.1	74	<5
9011-167-12	CCY-00-11.20-FB	<5	<5	<5
9011-167-13	CCY-6-11.20	<5	50	<5
9011-167-14	CCY-15-11.20	7.4	38	<5
9011-167-15	CCY-4-11.20	<5	51	<5
9011-167-16	CCY-9-11.20	<5	33	<5
9011-167-17	CCY-13-11.20	370	71	<5
9011-167-18	CCY-12-11.21	5.9	8	<5
9011-167-19	CCY-12-11.21-D	6.0	8	<5

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060-402
PROJECT NAME : GWMP/BLAINE

MATRIX : WATER

UNITS : -

ATI I.D.#	CLIENT I.D.	COLOR *
9011-167-1	CCY-1-11.19	<5
9011-167-2	CCY-2-11.19	5
9011-167-3	CCY-2-11.19-D	<5
9011-167-4	CCY-3-11.19	<5
9011-167-5	CCY-7-11.19	<5
9011-167-6	CCY-8-11.19	<5
9011-167-7	CCY-10-11.19	<5
9011-167-8	CCY-11-11.19	<5
9011-167-9	CCY-14-11.20	<5
9011-167-10	CCY-14-11.20-D	<5
9011-167-11	CCY-16-11.20	<5
9011-167-12	CCY-00-11.20-FB	<5
9011-167-13	CCY-6-11.20	<5
9011-167-14	CCY-15-11.20	<5
9011-167-15	CCY-4-11.20	<5
9011-167-16	CCY-9-11.20	<5
9011-167-17	CCY-13-11.20	20
9011-167-18	CCY-12-11.21	100
9011-167-19	CCY-12-11.21-D	100

* Samples analyzed past the recommended 48 hour hold time.

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060-402
 PROJECT NAME : GWMP/BLAINE

MATRIX : WATER

UNITS : mg/L

ATI I.D.#	CLIENT I.D.	NITRATE-NITRITE AS NITROGEN	SILICA	SULFATE
9011-167-1	CCY-1-11.19	<0.05	26	7
9011-167-2	CCY-2-11.19	<0.05	21	6
9011-167-3	CCY-2-11.19-D	<0.05	20	6
9011-167-4	CCY-3-11.19	<0.05	14	12
9011-167-5	CCY-7-11.19	0.87	20	6
9011-167-6	CCY-8-11.19	1.7	22	<5
9011-167-7	CCY-10-11.19	1.7	21	<5
9011-167-8	CCY-11-11.19	1.9	6.8	<5
9011-167-9	CCY-14-11.20	5.9	16	20
9011-167-10	CCY-14-11.20-D	5.9	15	16
9011-167-11	CCY-16-11.20	2.2	13	<5
9011-167-12	CCY-00-11.20-FB	<0.05	<0.5	<5
9011-167-13	CCY-6-11.20	<0.05	12	9
9011-167-14	CCY-15-11.20	0.93	9.4	20
9011-167-15	CCY-4-11.20	<0.05	9.8	7
9011-167-16	CCY-9-11.20	0.38	20	<5
9011-167-17	CCY-13-11.20	<0.05	17	200
9011-167-18	CCY-12-11.21	<0.05	37	<5
9011-167-19	CCY-12-11.21-D	<0.05	27	<5

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060-402
 PROJECT NAME : GWMP/BLAINE

MATRIX : WATER
 UNITS : mg/L

ATI I.D.#	CLIENT I.D.	TOTAL DISSOLVED SOLIDS	TOTAL ORGANIC HALIDE
9011-167-1	CCY-1-11.19	110	0.009 **
9011-167-2	CCY-2-11.19	120	<0.008 **
9011-167-3	CCY-2-11.19-D	94	<0.008 **
9011-167-4	CCY-3-11.19	130	0.011 **
9011-167-5	CCY-7-11.19	72	<0.008 **
9011-167-6	CCY-8-11.19	68	0.018 **
9011-167-7	CCY-10-11.19	72	<0.008 **
9011-167-8	CCY-11-11.19	<20	<0.008 **
9011-167-9	CCY-14-11.20	140	0.014 **
9011-167-10	CCY-14-11.20-D	98	0.040 **
9011-167-11	CCY-16-11.20	150	0.032 **
9011-167-12	CCY-00-11.20-FB	<20	0.036 **
9011-167-13	CCY-6-11.20	40	<0.008 **
9011-167-14	CCY-15-11.20	78	<0.008 **
9011-167-15	CCY-4-11.20	52	0.020 **
9011-167-16	CCY-9-11.20	66	<0.008 **
9011-167-17	CCY-13-11.20	1000	0.018 **
9011-167-18	CCY-12-11.21	200	0.028
9011-167-19	CCY-12-11.21-D	260	0.019

** Samples analyzed 2 days past the recommended 7 day hold time.

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060-402
PROJECT NAME : GWMP/BLAINE

MATRIX : WATER

UNITS : NTU

ATI I.D.#	CLIENT I.D.	TURBIDITY
9011-167-1	CCY-1-11.19	7
9011-167-2	CCY-2-11.19	0.8
9011-167-3	CCY-2-11.19-D	0.6
9011-167-4	CCY-3-11.19	5
9011-167-5	CCY-7-11.19	0.3
9011-167-6	CCY-8-11.19	4
9011-167-7	CCY-10-11.19	0.6
9011-167-8	CCY-11-11.19	4
9011-167-9	CCY-14-11.20	1
9011-167-10	CCY-14-11.20-D	1
9011-167-11	CCY-16-11.20	<0.5
9011-167-12	CCY-00-11.20-FB	1
9011-167-13	CCY-6-11.20	0.7
9011-167-14	CCY-15-11.20	8
9011-167-15	CCY-4-11.20	0.3
9011-167-16	CCY-9-11.20	0.2
9011-167-17	CCY-13-11.20	8
9011-167-18	CCY-12-11.21	0.2
9011-167-19	CCY-12-11.21-D	2

GENERAL CHEMISTRY QUALITY CONTROL

 CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060-402
 PROJECT NAME : GWMP/BLAINE

SAMPLE MATRIX : WATER

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
ALKALINITY	mg/L	9011-167-9	23	23	0	212	195	97
ALKALINITY	mg/L	9011-167-19	200	200	0	343	195	99
P-ALKALINITY	mg/L	9011-167-9	<2	<2	0	145	181	80
P-ALKALINITY	mg/L	9011-167-19	2.8	3.6	22	180	181	98
CHLORIDE	mg/L	9011-167-10	16	17	6	216	200	100
CHLORIDE	mg/L	9011-167-19	6.0	5.7	5	212	200	103
COLOR	-	9011-167-15	<5	<5	0	N/A	N/A	N/A
COLOR	-	9011-167-7	<5	<5	0	N/A	N/A	N/A
HARDNESS	mg/L	9011-167-10	47	47	0	N/A	N/A	N/A
NITRATE-NITRITE AS NITROGEN	mg/L	9011-167-10	5.9	6.1	3	25.8	20.0	99
NITRATE-NITRITE AS NITROGEN	mg/L	9011-167-19	<0.05	<0.05	0	2.1	2.0	105
SILICA	mg/L	9011-167-10	15.3	14.5	5	56.0	40.0	103
SILICA	mg/L	9011-167-13	12.3	12.8	4	46.7	40.0	85
SILICA	mg/L	9011-167-16	19.6	18.7	5	59.4	40.0	101
SULFATE	mg/L	9011-167-10	16	16	0	24	10	80
SULFATE	mg/L	9011-167-19	<5	<5	0	7.6	10	76
TOTAL DISSOLVED SOLIDS	mg/L	9011-167-08	<20	<20	0	N/A	N/A	N/A

CONTINUED

GENERAL CHEMISTRY QUALITY CONTROL
 (CONTINUED)

 CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060-402
 PROJECT NAME : GWMP/BLAINE

SAMPLE MATRIX : WATER

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
TOTAL DISSOLVED SOLIDS	mg/L	9011-167-18	196	252	25	N/A	N/A	N/A
TOTAL ORGANIC HALIDE	mg/L	9011-167-10	0.040	0.023	53	0.24	0.20	104
TOTAL ORGANIC HALIDE	mg/L	9011-167-16	<0.008	<0.016	0	0.19	0.20	95
TURBIDITY	NTU	9011-167-10	1	1	0	N/A	N/A	N/A
TURBIDITY	NTU	9011-167-19	2	2	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Chain of Custody LABORATORY NUMBER: 9011-167

PROJECT MANAGER: David Burton
 COMPANY: Guides Assoc.
 ADDRESS: 4104 148th Ave NE
Redmond WA 98052
 PHONE: 206 883-0777 SAMPLED BY: Cindy Yates

ANALYSIS REQUEST

8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/MH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9090	TOX 9020	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	TCLP ONLY			NUMBER OF CONTAINERS			
																		8090 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2)		Metals (8) <u>99 16 5</u>	GENERAL **	

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010	8020	BETX ONLY	8240	8270	8310	8080	PCB's ONLY	8140	8150	WDOE PAH/MH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9090	TOX 9020	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	8090 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2)	Metals (8) <u>99 16 5</u>	GENERAL **	NUMBER OF CONTAINERS	
CCY-1-11.19	11/19/90	14:29	H ₂ O	-1																											
CCY-2-11.19		13:05		-2																											
CCY-2-11.19-D		"		-3																											
CCY-3-11.19		13:55		-4																											
CCY-7-11.19		13:35		-5																											
CCY-8-11.19		19:15		-6																											
CCY-10-11.19		16:30		-7																											
CCY-11-11.19		17:15		-8																											
CCY-14-11.20	11/20/90	9:07		-9																											
CCY-14-11.20-D		"		-10																											
CCY-16-11.20		10:35		-11																											
CCY-02-11.20-EB		11:40		-12																											

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1	RELINQUISHED BY: 2	RELINQUISHED BY: 3
PROJECT NUMBER: <u>903-1060-402</u>	TOTAL NUMBER OF CONTAINERS: <u>76</u>			Signature: <u>Cindy Yates</u>	Signature:	Signature:
PROJECT NAME: <u>Glomp/Brine</u>	COC SEALS/INTACT? <u>Y/N/A</u>			Time: <u>15:50</u>	Time:	Time:
PURCHASE ORDER NUMBER:	RECEIVED GOOD COND./COLD: <u>Y</u>			Printed Name: <u>Cindy Yates</u>	Printed Name:	Printed Name:
ONGOING PROJECT? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	RECEIVED VIA: <u>Hand</u>			Date: <u>11/21/90</u>	Date:	Date:
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS						
TAT: (NORMAL) <input checked="" type="checkbox"/> 2WKS	(RUSH) <input type="checkbox"/> 24HR	<input type="checkbox"/> 48 HRS	<input type="checkbox"/> 72 HRS	<input type="checkbox"/> 1 WK		
GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)						
SPECIAL INSTRUCTIONS: <u>GENERAL TO INCLUDE: **</u> <u>HARDNESS, Bicarbonate, Carbonate, Silica</u> <u>Score Including TDS TOX</u>						
				RECEIVED BY: 1	RECEIVED BY: 2	RECEIVED BY: (LAB) 3
				Signature: <u>Dk Thomas</u>	Signature:	Signature:
				Time: <u>15:50</u>	Time:	Time:
				Printed Name: <u>Dk Thomas</u>	Printed Name:	Printed Name:
				Date: <u>11-21-90</u>	Date:	Date:
				Company: <u>ATI</u>	Company:	Analytical Technologies, Inc.

PROJECT MANAGER: David Benton
COMPANY: Golder Assoc
ADDRESS: 4104 148th Ave NE
Redmond WA 98052
PHONE: 206 883-0777 SAMPLED BY: Cindy Yates

SAMPLE DISPOSAL INSTRUCTIONS

ATI Disposal @ \$5.00 each Return

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
CCY-6-11.20	11/20/90	4:20	H2O	-13
CCY-15-11.20		11:45		-14
CCY-4-11.20		15:20		-15
CCY-9-11.20		16:05		-16
CCY-13-11.20	∇	17:25	∇	-17
CCY-12-11.21	11/21/90	10:25	∇	-18
CCY-12-11.21-D	"	"	"	-19

ANALYSIS REQUEST																	TCLP ONLY	Metals (9) CA 44-5	CI - SDY NO3	GENERAL **	NUMBER OF CONTAINERS																
8010	8020	BETX ONLY	8240	8270	8310	8080	PCB's ONLY	8140	8150	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2	8015	TOC	TOX	%						EP TOX	Priority	8080	8240	8270	8150										
										Grease & Oil		(Modified)		9060		9020		(8) EP EXT		(13)																	

PROJECT INFORMATION

PROJECT NUMBER: 903-1060.402

PROJECT NAME: GWMP1 Blains

PURCHASE ORDER NUMBER:

ONGOING PROJECT? YES NO

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS

COC SEALS/INTACT? Y/N/NA NA

RECEIVED GOOD COND/COLD

RECEIVED VIA: Hand

RELINQUISHED BY:	1	RELINQUISHED BY:	2	RELINQUISHED BY:	3
Signature:	Time:	Signature:	Time:	Signature:	Time:
<u>Cindy Yates</u>	<u>15:50</u>				
Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
<u>Cindy Yates</u>	<u>11/20/90</u>				
Company:		Company:		Company:	
<u>Golder</u>					
RECEIVED BY:	1	RECEIVED BY:	2	RECEIVED BY:	(LAB) 3
Signature:	Time:	Signature:	Time:	Signature:	Time:
<u>Dk Thomas</u>	<u>15:50</u>				
Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
<u>Dk Thomas</u>	<u>11-21-90</u>				
Company:		Company:		Analytical Technologies, Inc.	
<u>ATE</u>					

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

TAT: (NORMAL) 2WKS (RUSH) 24HR 48 HRS 72 HRS 1 WK

GREATER THAN 24 HR. NOTICE? YES NO (LAB USE ONLY)

SPECIAL INSTRUCTIONS: GENERAL to include:
HAZARDOUS BICARBONATE CARBONATE SILICA **
Calcium Turbidity 4/4 TDS TOX

903-1060.402



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055. (206) 228-8335

2nd Round

RECEIVED

ATI I.D. # 9103-240

MAY 17 1991

Golder Associates

May 16, 1991

Golder Associates, Inc.
4104 148th Avenue N.E.
Redmond, WA 98052

Attention : David Banton

Project Number : 903-1060.402

Project Name : Blaine

On March 26, 1991, Analytical Technologies, Inc., received three water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.

Mary C. Silva
Senior Project Manager

FWG/elf

Frederick W. Grothkopp
Technical Manager

SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9103-240-1	GWMP #2	03/25/91	WATER
9103-240-2	GWMP #3	03/25/91	WATER
9103-240-3	GWMP #1	03/25/91	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	3

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

ANALYSIS	TECHNIQUE	REFERENCE	LAB
IRON	ICAP	EPA 6010	R
MANGANESE	ICAP	EPA 6010	R
NITRATE AS NITROGEN	ELECTRODE	SM 418B	R
NITRITE AS NITROGEN	COLORIMETRIC	EPA 354.1	R
TURBIDITY	NEPHELOMETRIC	EPA 180.1	R

R = ATI - Renton
SD = ATI - San Diego
T = ATI - Tempe
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

METALS ANALYSIS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE
SAMPLE MATRIX : WATER

PARAMETER	DATE PREPARED	DATE ANALYZED
IRON	04/03/91	05/10/91
MANGANESE	04/03/91	05/10/91

METALS RESULTS

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE UNITS : mg/L

PARAMETER	GWMP #2 -1	GWMP #3 -2	GWMP #1 -3	REAGENT BLANK
IRON	0.30	0.94	3.9	0.01
MANGANESE	0.12	0.11	0.091	<0.001



METALS QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

MATRIX : WATER

UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
IRON	9104-197-3	0.57	0.56	2	2.74	2.50	87
MANGANESE	9104-197-3	3.73	3.78	1	6.02	2.50	92

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



GENERAL CHEMISTRY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE
SAMPLE MATRIX : WATER

PARAMETER DATE ANALYZED

NITRATE AS NITROGEN 04/02/91

NITRITE AS NITROGEN 03/26/91

TURBIDITY 03/26/91



GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

MATRIX : WATER

UNITS : mg/L

PARAMETER	GWMP #2 -1	GWMP #3 -2	GWMP #1 -3	REAGENT BLANK
NITRATE AS NITROGEN	<0.05	<0.05	<0.05	<0.05
NITRITE AS NITROGEN	<0.005	<0.005	<0.005	<0.005



GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

MATRIX : WATER

UNITS : NTU

PARAMETER	GWMP #2 -1	GWMP #3 -2	GWMP #1 -3
TURBIDITY	<0.5	3	5

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060.402
 PROJECT NAME : BLAINE

MATRIX : WATER

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
NITRATE AS NITROGEN	mg/L	9103-240-3	<0.05	<0.05	NC	0.32	0.40	80
NITRITE AS NITROGEN	mg/L	9103-240-3	<0.005	<0.005	NC	0.035	0.040	88
TURBIDITY	NTU	9103-240-1	5.0	5.6	11	N/A	N/A	N/A

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Chain of Custody

LABORATORY NUMBER: 7103-240

PROJECT MANAGER: David Barton
 COMPANY: Golden Associates
 ADDRESS: 4104 148th Ave. NE
Redmond, WA 98052
 PHONE: 883-0777 SAMPLED BY: _____

ANALYSIS REQUEST

SAMPLE DISPOSAL INSTRUCTIONS
 ATI Disposal @ \$5.00 each Return

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAHMH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9060 NO ₃	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	TCLP ONLY				NUMBER OF CONTAINERS
																								8080 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2) Metals (8)	
GWINP #2	3-25-91	1136	Water	1																X					X	X	3	
GWINP #3	3-25-91	1300		2																X						X	X	3
GWINP #1	3-25-91	1332		3															X						X	X	3	

PROJECT INFORMATION			SAMPLE RECEIPT			RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
PROJECT NUMBER: <u>903-1060.402</u>	TOTAL NUMBER OF CONTAINERS	<u>9</u>	COC SEALS/INTACT? Y/N/NA	<u>Y</u>	<u>Y</u>	Signature: <u>Frank A. ...</u>	Time: <u>14:30</u>	Signature: <u>Dave Freeman</u>	Time: <u>16:28</u>	Signature: <u>[Signature]</u>	Time: _____
PROJECT NAME: <u>Blaine</u>	RECEIVED GOOD COND./COLD	<u>Y</u>	RECEIVED VIA: <u>Truck</u>	<u>Y</u>	Printed Name: <u>Frank A. ...</u>	Date: <u>3-25-91</u>	Printed Name: <u>D. Freeman</u>	Date: <u>16:28</u>	Printed Name: _____	Date: _____	Date: _____
PURCHASE ORDER NUMBER: _____	ONGOING PROJECT? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	RECEIVED VIA: _____	COMPANY: _____	COMPANY: _____	COMPANY: _____	COMPANY: _____	COMPANY: _____	COMPANY: _____	COMPANY: _____	COMPANY: _____	COMPANY: _____
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS						RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB) 3.	
TAT: (NORMAL) <input checked="" type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK	GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)	Signature: <u>Dave Freeman</u>	Time: <u>Same</u>	Signature: <u>[Signature]</u>	Time: <u>11:00</u>	Signature: <u>[Signature]</u>	Time: _____	Signature: <u>[Signature]</u>	Time: _____	Signature: <u>[Signature]</u>	Time: _____
SPECIAL INSTRUCTIONS: _____						Printed Name: <u>Dave Freeman</u>	Date: <u>3-25-91</u>	Printed Name: <u>[Signature]</u>	Date: <u>[Signature]</u>	Printed Name: <u>T. Landreth</u>	Date: <u>3/26/91</u>
						Company: <u>Sawwithmail</u>	Company: _____	Company: _____	Company: _____	Company: <u>Analytical Technologies, Inc.</u>	Company: _____

APPENDIX

RECEIVED APR - 8 1991

AMTEST

AmTest Inc.

Professional
Analytical
Services

14603 N.E. 87th St.
Redmond, WA
98052

Fax: 206 883 3495

Tel: 206 885 1664

ANALYSIS REPORT

CLIENT: A.T.I.

DATE RECEIVED: 03/26/91

REPORT TO: Mary Silva
560 Naches Avenue SW
Suite 101
Renton, WA 98055

DATE REPORTED: 03/31/91

PROJECT NO.: 903.1060.402

Laboratory Sample No.	Client Identification	Total Coliform (CFU/100 ml)
106205	GWMP 1	< 2.5
106206	GWMP 2	< 2.5
106207	GWMP 3	< 2.5

< = less than

91-L-455

REPORTED BY

Robin M. Lacey
Robin Lacey

CHAIN OF CUSTODY RECORD

PROJ. NO. 903-1060.402		SITE / LOCATION Blaine				NO. OF CONTAINERS	AMOUNT / PRESERVATIVE Total Coliforms	SEAL NO.	SEAL INTACT? (YorN)	REMARKS (with initials)	
SAMPLERS: (Signature)											
STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION						
GWMP #2	3-25-91	1130		Water			X				
GWMP #3	3-25-91	1300		↓			X				
GWMP #1	3-25-91	1332					X				
Relinquished by: (Signature/Firm) <i>Frank Dunath</i> City of Blaine		Date / Time 3-25-91 1438		Received by: (Signature/Firm) <i>Dave K Freeman</i>			Relinquished by: (Signature/Firm) <i>Pam Furr</i>		Date / Time 3-25-91 16:25		Received by: (Signature/Firm)
Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm) <i>[Signature]</i>			Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm)
Relinquished by: (Signature/Firm)		Date / Time		Received by: (Signature/Firm) <i>Ronald Marshall</i>			Date / Time 3/26/91 10:10am		Remarks (attachments if necessary)		

ATTEST



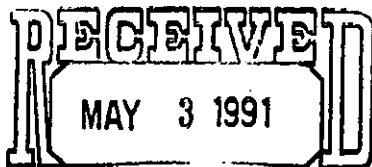
Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

2nd Round

ATI I.D. # 9103-183

May 3, 1991



Golder Associates

Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052

Attention : David Banton

Project Number : 903-1060.402

Project Name : Blaine

On March 20, 1991, Analytical Technologies, Inc., received six water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.

Cari Trimble for
Mary C. Silva
Senior Project Manager

FWG/tc

Frederick W. Grothkopp
Frederick W. Grothkopp
Technical Manager

WELL IDENTIFICATION

B7	Well No. 4
B3	Well No. 6
B1	12th Street Well
8	Boettcher Well
B2	Lincoln Park
11	Leer Well



SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

Table with 4 columns: ATI #, CLIENT DESCRIPTION, DATE SAMPLED, MATRIX. Rows include sample IDs 9103-183-1 through 9103-183-6 with descriptions B7, B3, B1, 8, B2, 11 and dates 03/19/91, all with matrix WATER.

----- TOTALS -----

Summary table with 2 columns: MATRIX, # SAMPLES. Row: WATER, 6

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

ANALYSIS	TECHNIQUE	REFERENCE	LAB
IRON	AA/F	EPA 7380	R
MANGANESE	AA/F	EPA 7460	R
TOTAL COLIFORM	MEMBRANE FILTRATION	SM 9222B	SUB
NITRATE AS NITROGEN	COLORIMETRIC	EPA 353.3	R
NITRITE AS NITROGEN	COLORIMETRIC	EPA 354.1	R
TURBIDITY	NEPHELOMETRIC	EPA 180-1	R

R = ATI - Renton
SD = ATI - San Diego
T = ATI - Tempe
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

METALS ANALYSIS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE
SAMPLE MATRIX : WATER

PARAMETER	DATE PREPARED	DATE ANALYZED
IRON	04/03/91	04/25/91
MANGANESE	04/03/91	04/25/91

METALS RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

MATRIX : WATER

UNITS : mg/L

PARAMETER	B7 -1	B3 -2	B1 -3	8 -4	B2 -5	11 -6	REAGENT BLANK
IRON	<0.03	0.15	1.0	0.10	0.05	0.09	<0.03
MANGANESE	<0.01	0.03	0.06	<0.01	0.04	0.02	<0.01



METALS QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

MATRIX : WATER
UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
IRON	9103-183-6	0.09	0.08	12	2.7	2.5	104
MANGANESE	9103-183-6	0.02	0.02	0	2.4	2.5	95

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



GENERAL CHEMISTRY

CLIENT : GOLDR ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE
SAMPLE MATRIX : WATER

PARAMETER	DATE ANALYZED
NITRATE AS NITROGEN	04/01/91
NITRITE AS NITROGEN	03/20/91
TURBIDITY	03/20/91

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

MATRIX : WATER

UNITS : mg/L

PARAMETER B7 B3 B1 8 B2 11 REAGENT
 -1 -2 -3 -4 -5 -6 BLANK

NITRATE AS NITROGEN <0.05 <0.05 <0.05 <0.05 <0.05 <0.05 <0.05

NITRITE AS NITROGEN <0.005 <0.005 0.005 <0.005 <0.005 <0.005 <0.005



GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE

MATRIX : WATER

UNITS : NTU

PARAMETER	B7 -1	B3 -2	B1 -3	8 -4	B2 -5	11 -6	REAGENT BLANK
TURBIDITY	<0.5	<0.5	5.8	<0.5	<0.5	<0.5	<0.5

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060.402
 PROJECT NAME : BLAINE

SAMPLE MATRIX : WATER

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
NITRATE AS NITROGEN	mg/L	9103-183-6	<0.05	<0.05	NC	0.499	0.40	125
NITRITE AS NITROGEN	mg/L	9103-183-6	<0.005	<0.005	NC	0.026	0.040	65
TURBIDITY	NTU	9103-183-6	<0.5	<0.5	NC	N/A	N/A	N/A

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

Chain of Custody LABORATORY NUMBER: 9103 183

PROJECT MANAGER: David Barton
 COMPANY: Goldex Associates
 ADDRESS: 4104 148th AV NE
Redmond WA 98052
 PHONE: 883-0777 SAMPLED BY: _____

SAMPLE DISPOSAL INSTRUCTIONS
 ATI Disposal @ \$5.00 each **Return**

ANALYSIS REQUEST																																
SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BVA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 3020 NO3	% Moisture	EP TOX Metals (8) EP EXT	TCMP ONLY				Fe, Mn	NO2, Turb	NUMBER OF CONTAINERS			
																							Priority Pollutant Metals (13)	8080 Pesticide (4)	8240 ZH-EXT	8270				8150 Herbicides (2)	Metals (8)	
B7	3-19-91	930	Water	1																X									X	X	3	
B3	3-19-91	1000		2																X										X	X	3
B1	3-19-91	1130		3																X									X	X	3	
8	3-19-91	1210		4																X									X	X	3	
B2	3-19-91	1330		5																X									X	X	3	
11	3-19-91	1415		6																X									X	X	3	

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT NUMBER: <u>903-1060-402</u>	TOTAL NUMBER OF CONTAINERS	<u>18</u>
PROJECT NAME: <u>Blaine</u>	COC SEALS/INTACT? Y/N/NA	<u>4</u>
PURCHASE ORDER NUMBER:	RECEIVED GOOD COND./COLD	<u>4</u>
ONGOING PROJECT? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	RECEIVED VIA: <u>Shirley Dell</u>	
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS		
TAT: (NORMAL) <input checked="" type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK		
GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)		
SPECIAL INSTRUCTIONS:		

RELINQUISHED BY: 1	RELINQUISHED BY: 2	RELINQUISHED BY: 3
Signature: <u>Frank Bennett</u> Time: <u>1500</u>	Signature: <u>Mark Birch</u> Time: <u>830</u>	Signature: _____ Time: _____
Printed Name: _____ Date: _____	Printed Name: <u>Mark Birch</u> Date: <u>3-20-91</u>	Printed Name: _____ Date: _____
Company: <u>City of Blaine</u>	Company: <u>Goldex</u>	Company: _____
RECEIVED BY: 1	RECEIVED BY: 2	RECEIVED BY: (LAB) 3
Signature: <u>Mark Birch</u> Time: <u>830</u>	Signature: <u>V. Pennick</u> Time: <u>830</u>	Signature: _____ Time: _____
Printed Name: <u>Mark Birch</u> Date: _____	Printed Name: <u>V. Pennick</u> Date: <u>3/20/91</u>	Printed Name: _____ Date: _____
Company: <u>Goldex</u>	Company: <u>ATI-WA</u>	Company: <u>Analytical Technologies, Inc.</u>



APPENDIX

RECEIVED APR 14 1991

AMTEST

AmTest Inc.
Professional
Analytical
Services
14603 N.E. 87th St.
Redmond, WA
98052
Fax: 206 883 3495
Tel: 206 885 1664

ANALYSIS REPORT

CLIENT: A.T.I.
REPORT TO: Mary Silva
560 Naches Avenue SW
Suite 101
Renton, WA 98055

DATE RECEIVED: 03/20/91
DATE REPORTED: 03/31/91
PROJECT NO.: 903.1060.402

Laboratory Sample No.	Client Identification	Total Coliform (CFU/100 ml)
105660	B1	< 2.5
105661	B2	< 2.5
105662	B3	< 2.5
105663	B7	< 2.5
105664	8	< 2.5
105665	11	5.0

< = less than

91-L-454

REPORTED BY Robin M. Lacey
Robin Lacey

CHAIN OF CUSTODY RECORD

PROJ. NO.		SITE / LOCATION				NO. OF CONTAINERS	AMOUNT / PRESERVATIVE <i>Total Coliform</i>					SEAL NO.	SEAL INTACT? (YorN)	REMARKS (with initials)
923-1060.402		Blaine												
SAMPLERS: (Signature)														
STA. NO.	DATE	TIME	SAMPLE TYPE	MEDIA	SAMPLE IDENTIFICATION									
	3-19-91	930	Water	Water	B7	1	X							
	3-19-91	1000			B3		X							
	3-19-91	1136			B1		X							
	3-19-91	1210			8		X							
	3-19-91	1330			B2		X							
	3-19-91	1415			11		X							
													results to Mary Silva ② AT7	
Relinquished by: (Signature / Firm)		Date / Time		Received by: (Signature / Firm)		Relinquished by: (Signature / Firm)		Date / Time		Received by: (Signature / Firm)				
Frank Dinet / Blaine		3-19-91 1500		Mark Bush (Gutter)										
Relinquished by: (Signature / Firm)		Date / Time		Received by: (Signature / Firm)		Relinquished by: (Signature / Firm)		Date / Time		Received by: (Signature / Firm)				
Mark Bush (Gutter)		3-20-91 915												
Relinquished by: (Signature / Firm)		Date / Time		Received by: (Signature / Firm)		Date / Time		Remarks (attachments if necessary)						
				Beverly Marshall		3/20/91 9:15am								

WELL IDENTIFICATION

4	Wood Well
6	Berg Well
9	Aller Well
10	Colacurcio Well
12	Wilson Well
13	Rodenberger Well
14	DeKubber Well
15	Nymeyer Well
16	Zylstra Well
20	Wilson Well Duplicate
21	Wood Well Duplicate
22	DeKubber Well

Boston

GOLDER ASSOCIATES, INC.
WESTERN U.S.A.

APR 20 1991

RECEIVED - ACCOUNTING

903-1060.702

2nd Round

AMTEST

AmTest Inc.

Professional
Analytical
Services

14603 N.E. 87th St.
Redmond, WA
98052

Fax: 206 883 3495

Tel: 206 885 1664

ANALYSIS REPORT

CLIENT: Golder Associates
REPORT TO: Frank Arnett
4104 - 148th Avenue NE
Redmond, WA 98052

DATE RECEIVED: 04/16/91
DATE REPORTED: 04/19/91
PROJECT NO.:
903-1060.402

Laboratory Sample No.	Client Identification	Total Coliforms (CFU/100 mls.)
107981	4	<2.5
107982	6	<2.5
107983	9	<2.5
107984	10	<2.5
107985	12	<2.5
107986	13	53.
107987	14	<2.5
107988	15	<2.5
107989	16	<2.5
107990	20	<2.5
107991	21	<2.5
107992	22	<2.5

< = less than

KW/pb

REPORTED BY

Karen Weller

Karen Weller



Analytical **Technologies, Inc.**

2nd Round
560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 9103-199

May 3, 1991

Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052

Attention : David Banton

Project Number : ~~903-1329-003~~

903-1060.402
Project Name : Blaine

On March 21, 1991, Analytical Technologies, Inc., received nine water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.

Cari Tumble for
Mary C. Silva
Senior Project Manager

FWG/hbb

Frederick W. Grothkopp
Frederick W. Grothkopp
Technical Manager

WELL IDENTIFICATION

16	Zylstra Well
14	DeKubber Well
15	Nymeyer Well
13	Rodenberger Well
10	Colacurcio Well
9	Aller Well
4	Wood Well
12	Wilson Well
6	Berg Well

SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1329.003
PROJECT NAME : BLAINE

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9103-199-1	16	03/20/91	WATER
9103-199-2	14	03/20/91	WATER
9103-199-3	15	03/20/91	WATER
9103-199-4	13	03/20/91	WATER
9103-199-5	10	03/20/91	WATER
9103-199-6	9	03/20/91	WATER
9103-199-7	4	03/20/91	WATER
9103-199-8	12	03/20/91	WATER
9103-199-9	6	03/20/91	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	9

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1329.003
PROJECT NAME : BLAINE

ANALYSIS	TECHNIQUE	REFERENCE	LAB
IRON	AA/F	EPA 7380	R
MANGANESE	AA/F	EPA 7460	R
NITRATE AS NITROGEN	COLORIMETRIC	EPA 353.3	R
NITRITE AS NITROGEN	COLORIMETRIC	EPA 354.1	R
TURBIDITY	NEPHELOMETRIC	EPA 180.1	R

R = ATI - Renton
SD = ATI - San Diego
T = ATI - Tempe
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract



METALS ANALYSIS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1329.003
PROJECT NAME : BLAINE
SAMPLE MATRIX : WATER

PARAMETER	DATE PREPARED	DATE ANALYZED
IRON	04/03/91	04/25/91
MANGANESE	04/03/91	04/25/91

METALS RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1329.003
PROJECT NAME : BLAINE

MATRIX : WATER

UNITS : mg/L

ATI I.D. #	CLIENT I.D.	IRON	MANGANESE
9103-199-1	16	0.11	<0.01
9103-199-3	15	1.2	0.03
9103-199-4	13	0.67	0.03
9103-199-5	10	0.09	<0.01
9103-199-6	9	0.09	<0.01
9103-199-9	6	0.42	0.07
REAGENT BLANK	-	<0.03	<0.01



METALS QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1329.003
PROJECT NAME : BLAINE

MATRIX : WATER
UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
IRON	9103-133-12	0.08	0.07	13	2.67	2.50	104
MANGANESE	9103-144-12	<0.01	<0.01	NC	2.37	2.50	95

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



GENERAL CHEMISTRY

CLIENT : GOLDR ASSOCIATES
PROJECT # : 903-1329.003
PROJECT NAME : BLAINE
SAMPLE MATRIX : WATER

PARAMETER	DATE ANALYZED
NITRATE AS NITROGEN	04/02/91
NITRITE AS NITROGEN	03/21/91
TURBIDITY	03/25/91



GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1329.003
PROJECT NAME : BLAINE

MATRIX : WATER
UNITS : mg/L

ATI I.D.#	CLIENT I.D.	NITRATE AS NITROGEN
9103-199-1	16	1.5
9103-199-2	14	2.0
9103-199-3	15	0.74
9103-199-4	13	<0.05
9103-199-5	10	0.24
9103-199-6	9	0.57
9103-199-7	4	<0.05
9103-199-8	12	<0.05
9103-199-9	6	<0.05
REAGENT BLANK	-	<0.05

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1329.003
PROJECT NAME : BLAINE

MATRIX : WATER

UNITS : mg/L

ATI I.D.#	CLIENT I.D.	NITRITE AS NITROGEN
9103-199-1	16	<0.005
9103-199-2	14	<0.005
9103-199-3	15	<0.005
9103-199-4	13	<0.005
9103-199-5	10	<0.005
9103-199-6	9	<0.005
9103-199-7	4	<0.005
9103-199-8	12	<0.005
9103-199-9	6	<0.005
REAGENT BLANK	-	<0.005

GENERAL CHEMISTRY RESULTS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1329.003
PROJECT NAME : BLAINE

MATRIX : WATER

UNITS : NTU

ATI I.D.#	CLIENT I.D.	TURBIDITY
9103-199-1	16	<0.5
9103-199-2	14	2
9103-199-3	15	5
9103-199-4	13	3
9103-199-5	10	<0.5
9103-199-6	9	<0.5
9103-199-7	4	<0.5
9103-199-8	12	<0.5
9103-199-9	6	1.4

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1329.003
 PROJECT NAME : BLAINE

MATRIX : WATER

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
NITRATE AS NITROGEN	mg/L	9103-240-3	<0.05	<0.05	NC	0.32	0.40	80
NITRITE AS NITROGEN	mg/L	9103-199-9	<0.005	<0.005	NC	0.040	0.040	100
TURBIDITY	NTU	9103-199-9	1.4	1.5	7	N/A	N/A	N/A

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Analytical Technologies, Inc.

560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

DATE 3-21-91 PAGE 1 OF 1

Chain of Custody LABORATORY NUMBER: 9103-199

PROJECT MANAGER: David Benton
 COMPANY: Golden Associates
 ADDRESS: 4104 148th Ave NE
Redmond WA 98052
 PHONE: 883-7777 SAMPLED BY: _____

ANALYSIS REQUEST

SAMPLE DISPOSAL INSTRUCTIONS
 ATI Disposal @ \$5.00 each Return

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
16	3-20-91	0850	Water	-1
14	3-20-91	0930		-2
15	3-20-91	1000		-3
13	3-20-91			-4
10	3-20-91	1100		-5
9	3-20-91	1200		-6
4	3-20-91	1220		-7
12	3-20-91	1240		-8
6	3-20-91	1320		-9

8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAHHH (WAC 179)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TEX-9920	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	TCLP ONLY				NUMBER OF CONTAINERS
																			8080 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2)	
															X							X	X
															X							Cancel	X
															X							X	X
															X							X	X
															X							Cancel	X
															X							Cancel	X
															X							X	X

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1		RELINQUISHED BY: 2		RELINQUISHED BY: 3		
PROJECT NUMBER: <u>903-1389.003</u>	TOTAL NUMBER OF CONTAINERS: <u>27</u>	COC SEALS/INTACT? Y/N/NA: <u>4</u>		Signature: <u>Frank Arnett</u>	Time: <u>1410</u>	Signature: <u>Larry Ross</u>	Time: <u>16:00</u>	Signature: _____	Time: _____	
PROJECT NAME: <u>Blaine</u>	RECEIVED GOOD COND/COLD: <u>11</u>	RECEIVED VIA: <u>FedEx</u>		Printed Name: <u>FRANK ARNETT</u>	Date: <u>3-20-91</u>	Printed Name: <u>LARRY ROSS</u>	Date: <u>3-20-91</u>	Printed Name: _____	Date: _____	
PURCHASE ORDER NUMBER: _____	PRIORITY AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS		Company: _____		Company: _____		Company: _____		Company: _____	
ONGOING PROJECT? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	TAT: (NORMAL) <input checked="" type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK	GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)		RECEIVED BY: 1		RECEIVED BY: 2		RECEIVED BY: (LAB) 3		
SPECIAL INSTRUCTIONS:	Signature: <u>Larry Ross</u>		Time: <u>1415</u>		Signature: <u>Donna</u>		Time: <u>9:45</u>		Signature: <u>D Thomas</u>	
	Printed Name: <u>LARRY ROSS</u>		Date: <u>3-20-91</u>		Printed Name: _____		Date: _____		Printed Name: _____	
	Company: _____		Company: _____		Company: _____		Company: _____		Analytical Technologies, Inc.	



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

3rd Round

ATI I.D. # 9107-216

August 8, 1991

Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052

Attention : David Banton

Project Number : 903-1060.402

Project Name : Blaine/Water Quality

On July 19, 1991, Analytical Technologies, Inc. received 12 water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Donna M. McKinney
Senior Project Manager

Dana M. Walker for
Frederick W. Grothkopp
Laboratory Manager

FWG/elf

WELL IDENTIFICATION

3-8	Boettcher Well
3-6	Berg Well
3-A	Field Blank
3-10	Colacurcio Well
3-11	Leer Well
3-13	Rodenberger Well
3-16	Zylstra Well
3-15	Nymeyer Well
3-14	DeKubber Well
3-12	Wilson Well
3-9	Aller Well
3-B	DeKubber Well Duplicate

ATI I.D. # 9107-216

SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9107-216-1	3-8	07/18/91	WATER
9107-216-2	3-6	07/18/91	WATER
9107-216-3	3-A	07/18/91	WATER
9107-216-4	3-10	07/18/91	WATER
9107-216-5	3-11	07/18/91	WATER
9107-216-6	3-13	07/18/91	WATER
9107-216-7	3-16	07/18/91	WATER
9107-216-8	3-15	07/18/91	WATER
9107-216-9	3-14	07/18/91	WATER
9107-216-10	3-12	07/18/91	WATER
9107-216-11	3-9	07/18/91	WATER
9107-216-12	3-B	07/18/91	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	12

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

ANALYSIS	TECHNIQUE	REFERENCE	LAB
IRON	ICAP	EPA 6010	SD
MANGANESE	ICAP	EPA 6010	SD
COLIFORM	MEMBRANE FILTRATION	SM 909A & C	SUB
NITRATE-NITRITE AS NITROGEN	COLORIMETRIC	EPA 353.2	SD
TURBIDITY	NEPHELOMETRIC	EPA 180.1	R

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

ATI I.D. # 9107-216

METALS ANALYSIS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

ELEMENT	DATE PREPARED	DATE ANALYZED
IRON	07/23/91	07/26/91
MANGANESE	07/23/91	07/26/91

ATI I.D. # 9107-216

**METALS ANALYSIS
DATA SUMMARY**

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

ATI I.D. #	CLIENT I.D.	IRON	MANGANESE
9107-216-1	3-8	0.06	<0.01
9107-216-2	3-6	0.31	0.12
9107-216-3	3-A	0.15	<0.01
9107-216-4	3-10	0.03	<0.01
9107-216-5	3-11	0.04	0.02
9107-216-6	3-13	0.55	0.04
9107-216-7	3-16	1.5	0.02
9107-216-8	3-15	1.4	0.05
9107-216-9	3-14	0.63	0.08
9107-216-10	3-12	0.08	0.02
9107-216-11	3-9	0.04	<0.01
9107-216-12	3-B	0.64	0.08
REAGENT BLANK	-	0.03	<0.01

ATI I.D. # 9107-216

METALS ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

ELEMENT	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
IRON	9107-216-6	0.55	0.54	2	6.3	6.0	96
MANGANESE	9107-216-6	0.04	0.04	0	3.9	4.0	97

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9107-216

GENERAL CHEMISTRY ANALYSIS

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

PARAMETER	DATE PREPARED	DATE ANALYZED
COLIFORM	-	07/19/91
NITRATE-NITRITE AS NITROGEN		07/24/91
TURBIDITY	-	07/19/91



ATI I.D. # 9107-216

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY UNITS : per 100 mls

ATI I.D. #	CLIENT I.D.	TOTAL COLIFORM	FECAL COLIFORM
9107-216-6	3-13	3	0

ATI I.D. # 9107-216

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

ATI I.D. #	CLIENT I.D.	NITRATE-NITRITE AS NITROGEN
9107-216-1	3-8	1.6
9107-216-2	3-6	<0.05
9107-216-3	3-A	<0.05
9107-216-4	3-10	1.6
9107-216-5	3-11	1.8
9107-216-6	3-13	<0.05
9107-216-7	3-16	2.4
9107-216-8	3-15	1.1
9107-216-9	3-14	4.0
9107-216-10	3-12	<0.05
9107-216-11	3-9	0.38
9107-216-12	3-B	3.5
REAGENT BLANK	-	<0.05

ATI I.D. # 9107-216

 GENERAL CHEMISTRY ANALYSIS
 QUALITY CONTROL DATA

 CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060.402
 PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
NITRATE-NITRITE AS NITROGEN	107343-06	<0.05	<0.05	NC	1.9	2.0	95
NITRATE-NITRITE AS NITROGEN	9107-216-6	<0.05	<0.05	NC	1.9	2.0	95

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9107-216

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : NTU

ATI I.D. #	CLIENT I.D.	TURBIDITY
9107-216-1	3-8	1.6
9107-216-2	3-6	2.5
9107-216-3	3-A	1.6
9107-216-4	3-10	1.5
9107-216-5	3-11	1.4
9107-216-6	3-13	3.6
9107-216-7	3-16	3.8
9107-216-8	3-15	5.6
9107-216-9	3-14	2.4
9107-216-10	3-12	1.4
9107-216-11	3-9	1.3
9107-216-12	3-B	2.3

ATI I.D. # 9107-216

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : NTU

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
TURBIDITY	9107-216-10	1.4	1.4	0	N/A	N/A	N/A
TURBIDITY	9107-230-3	3.3	3.3	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Analytical Technologies, Inc.

560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

Chain of Custody

LABORATORY NUMBER: 9107-216

DATE 7-19-91 PAGE 1

PROJECT MANAGER: DAVID BANTON
 COMPANY: Golden & Assoc
 ADDRESS: 4104 148th Av NE
Riverview WA 98052
 PHONE: 206-333-0777 SAMPLED BY: Miguel F. Arment

SAMPLE DISPOSAL INSTRUCTIONS:
 ATI Disposal @ \$5.00 each Return

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	ANALYSIS REQUEST																																				
					8010 Halogenated Volatiles	8020 Aromatic Volatiles	8020 BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	8080 PCB'S ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/H (MAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	Melamine Coliform	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	8060 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2)	Herbicides Turb	Fe Mn	1107/1105	NUMBER OF CONTAINERS										
3-8	7/18/91	0830	Water	-1																																		X	X	X	3
3-6	7/18/91	0930		2																																	X	X	X	3	
3-A	7/18/91	0930		3																																X	X	X	3		
3-10	7/18/91	1040		4																															X	X	X	3			
3-11	7/18/91	1100		5																															X	X	X	3			
3-13	7/18/91	1148		6																															X	X	X	4			
3-16	7/18/91	1210		7																															X	X	X	3			
3-15	7/18/91	1325		8																															X	X	X	3			
3-14	7/18/91	1405		9																															X	X	X	3			
3-12	7/18/91	1450		10																															X	X	X	3			
3-9	7/18/91	1545		11																															X	X	X	3			
3-13	7/18/91	1425	✓	12																															X	X	X	3			

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
PROJECT NUMBER: <u>903-1060-402</u>		TOTAL NUMBER OF CONTAINERS <u>37</u>		Signature: <u>Mark Birch 7-19-91</u>		Signature:		Signature:	
PROJECT NAME: <u>Blaire/Water Project</u>		COC SEALS/INTACT? <u>Y/N/A</u>		Printed Name:		Printed Name:		Printed Name:	
PURCHASE ORDER NUMBER:		RECEIVED GOOD COND/COLD <u>Y/Y</u>		Date: <u>7-19-91</u>		Date:		Date:	
ONGOING PROJECT? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		RECEIVED VIA: <u>Hand Delv</u>		Company:		Company:		Company:	
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS									
TAT: (NORMAL) <input checked="" type="checkbox"/> 2WKS		(RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK		RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB) 3.	
GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)		SPECIAL INSTRUCTIONS:		Signature: <u>Ruena Butera</u>		Signature:		Signature:	
				Printed Name: <u>RUENA BUTERA</u>		Printed Name:		Printed Name:	
				Date: <u>7/19/91</u>		Date:		Date:	
				Company: <u>ATI - WA.</u>		Company:		Analytical Technologies, Inc.	


Chain of Custody LABORATORY NUMBER: 107362

PROJECT MANAGER: <u>DUNNA MCKINNEY</u>					ANALYSIS REQUEST																																		
COMPANY: <u>ATI-WA</u>					8010	8020	8020	8240	8270	8310	8080	8080	8140	8150	WDOE	418.1	413.2	8015	TOC	TOX	%	EP	Priority	8080	8240	8270	8150	Metals											
ADDRESS:					Halogenated	Aromatic	BETX ONLY	GCMS	GCMS	HPLC	Pesticides & PCB's	PCB's ONLY	Phosphate	Herbicides	PAH/HH (WAC 173)	(TPH)	Grease & Oil	(Modified)	9060	9020	Moisture	Metals (8) EP EXT	Metals (13)	Pesticide (4)	ZH-EXT	Herbicides (2)	Metals (8)												
PHONE: <u>(206) 228-8335</u> SAMPLED BY:					TCLP ONLY																																		
SAMPLE DISPOSAL INSTRUCTIONS																																							
<input type="checkbox"/> ATI Disposal @ \$5.00 each																																							
<input type="checkbox"/> Return																																							
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																																			
91CT216 -1	7/19/91		WATER	01																																			
2				02																																			
3				03																																			
4				04																																			
5				05																																			
6				06																																			
7				07																																			
8				08																																			
9				09																																			
10				10																																			
11				11																																			
12				12																																			

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1	RELINQUISHED BY: 2	RELINQUISHED BY: 3
PROJECT NUMBER:	TOTAL NUMBER OF CONTAINERS	24		Signature:	Time:	Signature:
PROJECT NAME: <u>CLIFF BLAINE</u>	COC SEALS/INTACT? Y/N/NA			Signature:	Time:	Signature:
PURCHASE ORDER NUMBER:	RECEIVED GOOD COND./COLD			Printed Name:	Date:	Printed Name:
ONGOING PROJECT? YES <input type="checkbox"/> NO <input type="checkbox"/>	RECEIVED VIA:	FX		Printed Name:	Date:	Printed Name:
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS				Company: <u>ATI</u>	Company:	Company:
TAT: (NORMAL) <input type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK				RECEIVED BY: 1	RECEIVED BY: 2	RECEIVED BY: (LAB) 3
GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)				Signature:	Time:	Signature:
SPECIAL INSTRUCTIONS:				Signature:	Time:	Signature:
<u>See 9/2/91 normal 8-1099</u>				Printed Name:	Date:	Printed Name:
				Printed Name:	Date:	Printed Name:
				Company:	Company:	Analytical Technologies, Inc.



APPENDIX



**WATER
MANAGEMENT
LABORATORIES INC.**

1515 80th St. E.
Tacoma, WA 98404
531-3121

July 23, 1991

Analytical Technologies
560 Naches Ave. SW, Suite 101
Renton, WA 98055
Attn: Donna McKinney

Dear Ms. McKinney:

Results of analysis of one environmental water sample taken on 7-18-91 at 11:48 a.m. and received 7-19-91 at 9:45 a.m. are as follows:

Project Number: 9107-216
Project Name: Golder / Blaine

<u>Sample Identification</u>	<u>Total Coliform (per 100 mls)</u>	<u>Fecal Coliform (per 100 mls)</u>
----------------------------------	---	---

9107216-6 Source 3 - 13	3	0
----------------------------	---	---

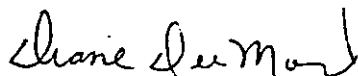
Lab number 89-14292
P.O. number 05773

Samples were analyzed by membrane filtration procedures employing decimal dilutions according to Standard Methods for the Examination of Water and Wastewater, 16th Edition, Sections 909A and 909C.

Please note that the Washington State Dept of Ecology requires that samples for bacteriological analysis must be received within 6 hours of taking the samples. These results should be interpreted with caution.

Chain of custody is attached.

Sincerely,



Diane DuMond
Lab Coordinator

PROJECT MANAGER: DONNA MCKINNEY
 COMPANY: ATI-WA
 ADDRESS: 560 NACHES AVE SW, #101
RENTON, WA 98055
 PHONE: (206) 228-8335 SAMPLED BY: _____

ANALYSIS REQUEST

SAMPLE DISPOSAL INSTRUCTIONS
 ATI Disposal @ \$5.00 each Return

8010 Halogenated Volatiles	8020 Aromatic Volatiles	8020 BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	8080 PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/H (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	8080 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2) Metals (8)	NUMBER OF CONTAINERS	
																								1

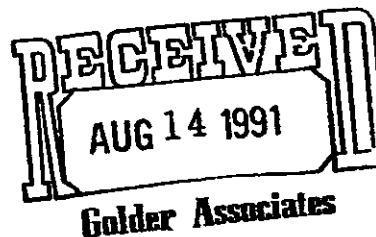
SAMPLE ID	DATE	TIME	MATRIX	LAB ID
9107216-6	7/18/91	11:48		

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1	RELINQUISHED BY: 2	RELINQUISHED BY: 3
PROJECT NUMBER: <u>9107216</u>	TOTAL NUMBER OF CONTAINERS: <u>1</u>	COC SEALS/INTACT? Y/N/NA		Signature: <u>Rosena Satubay</u> Time: <u>8:50</u>	Signature: <u>Deane Dumond</u> Time: <u>9:45am</u>	Signature: _____ Time: _____
PROJECT NAME: <u>GOLDER/BLAINE</u>	RECEIVED GOOD COND./COLD	RECEIVED VIA:		Printed Name: <u>7/19/91</u> Date: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
PURCHASE ORDER NUMBER: <u>05773</u>	RECEIVED VIA:		Signature: <u>ROSENA SATUBAY</u> Date: <u>7/19/91</u>		Signature: <u>DIANE DUMOND</u> Date: <u>7/19/91</u>	
ONGOING PROJECT? YES <input type="checkbox"/> NO <input type="checkbox"/>	RECEIVED VIA:		Company: <u>ATI-WA</u>		Company: _____	
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS				RECEIVED BY: 1	RECEIVED BY: 2	RECEIVED BY: (LAB) 3
TAT: (NORMAL) <input type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK	GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)		Signature: _____ Time: _____		Signature: _____ Time: _____	Signature: _____ Time: _____
SPECIAL INSTRUCTIONS: <u>total 1/2 feed</u>				Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
				Company: _____	Company: _____	Analytical Technologies, Inc.

Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055. (206) 228-8335

ATI I.D. # 9107-244



August 13, 1991

Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052

Attention : David Banton


Project Number : 903-1060.402

Project Name : Blaine/Water Quality

On July 23, 1991, Analytical Technologies, Inc. received eight water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.


Donna M. McKinney
Senior Project Manager

FWG/ew


Frederick W. Grothkopp
Laboratory Manager

WELL IDENTIFICATION

3-4	Wood Well
3-7	Well No. 4
3-3	Well No. 6
3-2	Lincoln Park
3-1	12th Street
3-6	12th Street Duplicate
3-18	GWMP-2
3-17	GWMP-1

ATI I.D. # 9107-244

SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9107-244-1	3-4	07/22/91	WATER
9107-244-2	3-7	07/22/91	WATER
9107-244-3	3-3	07/22/91	WATER
9107-244-4	3-2	07/22/91	WATER
9107-244-5	3-1	07/22/91	WATER
9107-244-6	3-6	07/22/91	WATER
9107-244-7	3-18	07/22/91	WATER
9107-244-8	3-17	07/22/91	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	8

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

ANALYSIS	TECHNIQUE	REFERENCE	LAB
IRON	ICAP	EPA 6010	SD
MANGANESE	ICAP	EPA 6010	SD
NITRATE/NITRITE AS NITROGEN	COLORIMETRIC	EPA 353.3	SD
TURBIDITY	NEPHELOMETRIC	EPA 180.1	R

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

ATI I.D. # 9107-244

METALS ANALYSIS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

ELEMENT	DATE PREPARED	DATE ANALYZED
IRON	-	07/31/91
MANGANESE	-	07/31/91

ATI I.D. # 9107-244

METALS ANALYSIS
DATA SUMMARYCLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

ATI I.D. #	CLIENT I.D.	IRON	MANGANESE
9107-244-1	3-4	0.43	0.05
9107-244-2	3-7	<0.01	<0.01
9107-244-3	3-3	<0.01	0.04
9107-244-4	3-2	0.02	0.05
9107-244-5	3-1	0.01	0.04
9107-244-6	3-6	0.01	0.04
9107-244-7	3-18	0.13	0.12
9107-244-8	3-17	0.42	0.30
REAGENT BLANK	-	<0.01	<0.01

ATI I.D. # 9107-244

METALS ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

ELEMENT	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
IRON	107370-01	<0.01	<0.01	NC	9.6	10.0	96
MANGANESE	107370-01	0.02	0.02	0	10.2	10.0	102

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



ATI I.D. # 9107-244

GENERAL CHEMISTRY ANALYSIS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

PARAMETER	DATE PREPARED	DATE ANALYZED
NITRATE/NITRITE AS NITROGEN	-	08/03/91
TURBIDITY	-	07/24/91

ATI I.D. # 9107-244

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER
UNITS : mg/L

ATI I.D. #	CLIENT I.D.	NITRATE/NITRITE AS NITROGEN
9107-244-1	3-4	<0.05
9107-244-2	3-7	1.0
9107-244-3	3-3	<0.05
9107-244-4	3-2	<0.05
9107-244-5	3-1	<0.05
9107-244-6	3-6	<0.05
9107-244-7	3-18	<0.05
9107-244-8	3-17	<0.05
REAGENT BLANK	-	<0.05

ATI I.D. # 9107-244

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
NITRATE/NITRITE AS NITROGEN	9107-244-8	<0.05	<0.05	NC	1.7	2.0	85

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9107-244

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : NTU

ATI I.D. #	CLIENT I.D.	TURBIDITY
9107-244-1	3-4	1.5
9107-244-2	3-7	0.3
9107-244-3	3-3	0.2
9107-244-4	3-2	0.3
9107-244-5	3-1	0.3
9107-244-6	3-6	0.3
9107-244-7	3-18	0.4
9107-244-8	3-17	1.8

PROJECT MANAGER: DONNA MCKINNEY
 COMPANY: ATI - Renton
 ADDRESS: _____
 PHONE: (206) 256-8171 SAMPLED BY: _____

ANALYSIS REQUEST

SAMPLE DISPOSAL INSTRUCTIONS
 ATI Disposal @ \$5.00 each Return

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010	8020	8020	8240	8270	8310	8080	8080	8140	8150	WDOE	418.1	413.2	8015	TOC	TOX	%	EP TOX	Priority	8080	8240	8270	8150	Metals	NO3/NO2	Total Fe, Ni	NUMBER OF CONTAINERS
					Halogenated	Aromatic	BETX ONLY	GCMS	GCMS	HPLC	Pesticides & PCB's	PCB's ONLY	Phosphate	Herbicides	PAYHH (MAC 173)	(TPH)	Grease & Oil	(Modified)	9060	9020	Moisture	Metal (8) EP EXT	Pollutant Metals (13)	Pesticide (4)	ZH-EXT	Herbicides (2)	(8)				
9107-244-1	7/22/91		H2O	01																								X	X	2	
2				02																								X	X		
3				03																								X	X		
4				04																								X	X		
5				05																								X	X		
6				06																								X	X		
7				07																								X	X		
8				08																								X	X		

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NUMBER: <u>9107-244</u>	TOTAL NUMBER OF CONTAINERS: <u>16</u>		
PROJECT NAME: <u>GAS/903-1060.402</u>	COC SEALS/INTACT? <u>Y/N/A</u>	<u>Y</u>	
PURCHASE ORDER NUMBER: <u>-</u>	RECEIVED GOOD COND./COLD		
ONGOING PROJECT? YES <input type="checkbox"/> NO <input type="checkbox"/>	RECEIVED VIA: <u>Fed X</u>		
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS			
TAT: (NORMAL) <input type="checkbox"/> 2WKS	(RUSH) <input type="checkbox"/> 24HR	<input type="checkbox"/> 48 HRS	<input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK
GREATER THAN 24 HRL. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/>		(LAB USE ONLY)	
SPECIAL INSTRUCTIONS: <u>due 8/5/91 -10%</u>			

RELINQUISHED BY: 1	RELINQUISHED BY: 2	RELINQUISHED BY: 3
Signature: <u>[Signature]</u> Time: <u>16:00</u>	Signature: _____ Time: _____	Signature: _____ Time: _____
Printed Name: <u>Donna McKinney</u> Date: <u>7/23/91</u>	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
Company: <u>ATI</u>	Company: _____	Company: _____
RECEIVED BY: 1	RECEIVED BY: 2	RECEIVED BY: (LAB) 3
Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: <u>[Signature]</u> Time: <u>0930</u>
Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: <u>Mark Miller</u> Date: <u>7/24/91</u>
Company: _____	Company: _____	Company: <u>Analytical Technologies, Inc.</u>



Chain of Custody

LABORATORY NUMBER: 9107-244

PROJECT INFORMATION					ANALYSIS REQUEST																													
PROJECT MANAGER: <u>David Banton</u>					8010	8020	8020	8240	8270	8310	8080	8080	8140	8150	WDOE	418.1	419.2	8015	TOC	TOX	% Moisture	EP TOX	Priority	8080	8240	8270	8150	Metals	Fe	Mn	(Totals)	NO ₃	NO ₂	NUMBER OF CONTAINERS
COMPANY: <u>Golden Associates</u>					Halogenated	Aromatic	BETX ONLY	GC/MS	GC/MS	HPLC	Pesticides & PCB's	PCB's ONLY	Phosphate	Herbicides	PAH/HH (WAC 173)	(TPH)	Grease & Oil	(Modified)	9060	9020	Moisture Turb	(8) EP EXT	(13)	Pesticide (4)	ZH-EXT		Herbicides (2)							
ADDRESS: <u>4104 145th Ave NE</u> <u>Richmond WA 98052</u>					SAMPLE DISPOSAL INSTRUCTIONS																													
PHONE: <u>823-0777</u> SAMPLED BY: <u>Mr. Birch</u>					<input checked="" type="checkbox"/> ATI Disposal @ \$5.00 each <input type="checkbox"/> Return																													
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																														
3-4	7-22	1220	water	-1																	X											X	X	3
3-7	7-22	1400		-2																	X											X	X	3
3-3		1410		-3																	X											X	X	3
3-2		1435		-4																	X											X	X	3
3-1		1450		-5																	X											X	X	3
3-C		1450		-6																	X											X	X	3
3-18		1535		-7																	X											X	X	3
3-17		1730		-8																	X											X	X	3

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1		RELINQUISHED BY: 2		RELINQUISHED BY: 3	
PROJECT NUMBER: <u>903-1060.402</u>	TOTAL NUMBER OF CONTAINERS: <u>24</u>	COC SEALS/INTACT? <u>Y/N/NA</u>		Signature: <u>Mark Birch</u>	Time: <u>845</u>	Signature:	Time:	Signature:	Time:
PROJECT NAME: <u>Blaine Water Quality</u>	RECEIVED GOOD COND./COLD: <u>Y/N</u>	RECEIVED VIA: <u>Hand Del</u>		Printed Name: <u>Mark Birch</u>	Date: <u>7-23-9</u>	Printed Name:	Date:	Printed Name:	Date:
PURCHASE ORDER NUMBER:	ONGOING PROJECT? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS		Company: <u>Golden</u>	Company:	Company:	Company:	Company:	Company:
TAT: (NORMAL) <input checked="" type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK	GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)	RECEIVED BY: 1		Signature: <u>U Pennick</u>	Time: <u>845A</u>	Signature:	Time:	Signature:	Time:
SPECIAL INSTRUCTIONS:		RECEIVED BY: 2		Printed Name: <u>U Pennick</u>	Date: <u>7/23/91</u>	Printed Name:	Date:	Printed Name:	Date:
		RECEIVED BY: (LAB) 3		Company: <u>ATI</u>	Company:	Company:	Company:	Company:	Company:

903-1060.40

3rd Round



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055. (206) 228-8335

ATI I.D. # 9107-315

August 20, 1991

Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052


Attention : David Banton

Project Number : 903-1060.402

Project Name : Blaine/Water Quality

On July 30, 1991, Analytical Technologies, Inc. received one water sample for analysis. The sample was analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.


Donna M. McKinney
Senior Project Manager


Frederick W. Grothkopp
Laboratory Manager

FWG/elf

WELL IDENTIFICATION

3-F GWMP-3



SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDR ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

Table with 4 columns: ATI #, CLIENT DESCRIPTION, DATE SAMPLED, MATRIX. Row 1: 9107-315-1, 3-F, 07/29/91, WATER

----- TOTALS -----

Table with 2 columns: MATRIX, # SAMPLES. Row 1: WATER, 1

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 9107-315

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

ANALYSIS	TECHNIQUE	REFERENCE	LAB
IRON	ICAP	EPA 6010	SD
MANGANESE	ICAP	EPA 6010	SD
NITRATE-NITRITE AS NITROGEN	COLORIMETRIC	EPA 353.2	SD
TURBIDITY	NEPHELOMETRIC	EPA 180.1	R

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract



ATI I.D. # 9107-315

METALS ANALYSIS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

ELEMENT	DATE PREPARED	DATE ANALYZED
IRON	-	08/08/91
MANGANESE	-	08/08/91



ATI I.D. # 9107-315

METALS ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

ATI I.D. #	CLIENT I.D.	IRON	MANGANESE
9107-315-1	3-F	0.05	0.10
REAGENT BLANK	-	0.02	<0.01

ATI I.D. # 9107-315

METALS ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

ELEMENT	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
IRON	108018-02	<0.01	<0.01	NC	9.8	10.0	98
MANGANESE	108018-02	<0.01	<0.01	NC	10.5	10.0	102

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9107-315

GENERAL CHEMISTRY ANALYSIS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

PARAMETER	DATE PREPARED	DATE ANALYZED
NITRATE-NITRITE AS NITROGEN	-	08/14/91
TURBIDITY	-	07/31/91



ATI I.D. # 9107-315

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT	: GOLDER ASSOCIATES	MATRIX	: WATER
PROJECT #	: 903-1060.402		
PROJECT NAME	: BLAINE/WATER QUALITY	UNITS	: mg/L

ATI I.D. #	CLIENT I.D.	NITRATE-NITRITE AS NITROGEN
9107-315-1	3-F	<0.05
REAGENT BLANK	-	<0.05



ATI I.D. # 9107-315

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060.402
 PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
NITRATE-NITRITE AS NITROGEN	107510-05	<0.05	<0.05	NC	1.7	2.0	85

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



ATI I.D. # 9107-315

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : NTU

ATI I.D. #	CLIENT I.D.	TURBIDITY
9107-315-1	3-F	0.1



ATI I.D. # 9107-315

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060.402
 PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : NTU

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
TURBIDITY	9107-337-3	1.2	1.2	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



TU 5D

Chain of Custody LABORATORY NUMBER: _____

PROJECT MANAGER: DONNA MCKINNEY
 COMPANY: ATI - RENTON
 ADDRESS: _____
 PHONE: _____ SAMPLED BY: _____

SAMPLE DISPOSAL INSTRUCTIONS
 ATI Disposal @ \$5.00 each Return

ANALYSIS REQUEST					8010 Halogenated Volatiles	8020 Aromatic Volatiles	8020 BETX ONLY	8240 GC/MS Volatiles	8270 GC/MS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	8080 PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	8080 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2)	Metals (8)	NUMBER OF CONTAINERS	
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																										TC/PC ONLY
01 2107-315-1	7/20/01	1545	H ₂ O																									X	X	2

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NUMBER: <u>2107-315</u>	TOTAL NUMBER OF CONTAINERS: <u>2</u>	COC SEALS/INTACT? Y/N/NA: <u>1/1/1</u>	RECEIVED GOOD COND./COLD: <u>Y</u>
PROJECT NAME: <u>GAS/NO3-1000-402</u>	RECEIVED VIA: <u>EX</u>	RECEIVED VIA:	
PURCHASE ORDER NUMBER: <u>-</u>	RECEIVED VIA:		
ONGOING PROJECT? YES <input type="checkbox"/> NO <input type="checkbox"/>	RECEIVED VIA:		
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS			
TAT: (NORMAL) <input type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK	GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)		
SPECIAL INSTRUCTIONS:			

RELINQUISHED BY: 1		RELINQUISHED BY: 2		RELINQUISHED BY: 3	
Signature: <u>[Signature]</u>	Time: <u>16:00</u>	Signature: _____	Time: _____	Signature: _____	Time: _____
Printed Name: <u>Donna McKinney</u>	Date: <u>7/20/01</u>	Printed Name: _____	Date: _____	Printed Name: _____	Date: _____
Company: <u>ATI</u>	Company: _____	Company: _____	Company: _____	Company: _____	Company: _____
RECEIVED BY: 1		RECEIVED BY: 2		RECEIVED BY: (LAB) 3	
Signature: _____	Time: _____	Signature: _____	Time: _____	Signature: <u>[Signature]</u>	Time: <u>16:00</u>
Printed Name: _____	Date: _____	Printed Name: _____	Date: _____	Printed Name: <u>Donna McKinney</u>	Date: <u>7/20/01</u>
Company: _____	Company: _____	Company: _____	Company: _____	Company: <u>Analytical Technologies, Inc.</u>	Company: _____

2107-315-1

ATI normal-1000

Chain of Custody LABORATORY NUMBER: 5107-315

PROJECT MANAGER: David Benton
 COMPANY: Golden Assoc
 ADDRESS: 4104 148th Ave NE
Redmond WA 98052
 PHONE: 883-0777 SAMPLED BY: M. Birch

ANALYSIS REQUEST

SAMPLE DISPOSAL INSTRUCTIONS

ATI Disposal @ \$5.00 each Return

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010	8020	8020	8240	8270	8310	8080	8080	8140	8150	WDOE	418.1	413.2	8015	TOC	TOX	EP TOX	Priority	8080	8240	8270	8150	Metals	NUMBER OF CONTAINERS	
					Halogenated	Aromatic	BETX ONLY	GCMS	GCMS	HPLC	Pesticides & PCB's	PCB's ONLY	Phosphate	Herbicides	PAH/HH (WAC 173)	(TPH)	Grease & Oil	(Modified)	9060	9020	Metals (9) EP EXT	Pollutant Metals (13)	Pesticide (4)	ZH-EXT	Metals (8)	Herbicides (2)	Metals (8)		
<u>3-F</u>	<u>7-29</u>	<u>1545</u>	<u>Water</u>	<u>-1</u>																	<u>X</u>						<u>X</u>	<u>X</u>	<u>3</u>

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.		
PROJECT NUMBER: <u>903-1060-402</u>	TOTAL NUMBER OF CONTAINERS: <u>3</u>	COC SEALS/INTACT? Y/N/NA: <u>NA</u>		Signature: <u>Mark Birch</u>	Time: <u>840</u>	Signature:	Time:	Signature:	Time:	
PROJECT NAME: <u>Blaine/Water Quality</u>	RECEIVED GOOD COND./COLD: <u>Y</u>	RECEIVED VIA: <u>J. Dol</u>		Printed Name: <u>Mark Birch</u>	Date: <u>7-30</u>	Printed Name:	Date:	Printed Name:	Date:	
PURCHASE ORDER NUMBER:	RECEIVED VIA:	RECEIVED VIA:		Company: <u>Golden</u>	Company:	Company:	Company:	Company:	Company:	
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS				RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB) 3.		
TAT: (NORMAL) <input checked="" type="checkbox"/> 2WKS	(RUSH) <input type="checkbox"/> 24HR	<input type="checkbox"/> 48 HRS	<input type="checkbox"/> 72 HRS	<input type="checkbox"/> 1 WK	Signature: <u>J. Pennice</u>	Time: <u>540</u>	Signature:	Time:	Signature:	Time:
GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)		GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)		Printed Name: <u>J. Pennice</u>	Date: <u>7/30/11</u>	Printed Name:	Date:	Printed Name:	Date:	
SPECIAL INSTRUCTIONS:				Company: <u>ATI</u>	Company:	Company:	Company:	Company:	Company:	
				Analytical Technologies, Inc.		Analytical Technologies, Inc.		Analytical Technologies, Inc.		

913-1153.00



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

Deep Well

ATI I.D. # 9107-188

August 5, 1991

Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052

Attention : David Banton

Project Number : 913-1153.002

Project Name : Blaine/Deep Well/WA

On July 17, 1991, Analytical Technologies, Inc. received one water sample for analysis. The sample was analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Donna M. McKinney
Senior Project Manager

FWG/elf

Frederick W. Grothkopp
Frederick W. Grothkopp
Laboratory Manager

WELL IDENTIFICATION

PWI#1 Deep Well

ATI I.D. # 9107-188

SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL/WA

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9107-188-1	PWI#1	07/16/91	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	1

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL/WA

ANALYSIS	TECHNIQUE	REFERENCE	LAB
CALCIUM	ICAP	EPA 6010	SD
IRON	ICAP	EPA 6010	SD
MAGNESIUM	ICAP	EPA 6010	SD
MANGANESE	ICAP	EPA 6010	SD
POTASSIUM	ICAP	EPA 6010	SD
SODIUM	ICAP	EPA 6010	SD
ALKALINITY	TITRIMETRIC	EPA 310.1	SD
CHLORIDE	COLORIMETRIC	EPA 9251	SD
NITRATE-NITRITE AS NITROGEN	COLORIMETRIC	EPA 353.2	SD
SULFATE	TURBIDIMETRIC	EPA 9038	SD
TURBIDITY	NEPHELOMETRIC	EPA 180.1	R

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

ATI I.D. # 9107-188

METALS ANALYSIS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL/WA

MATRIX : WATER

ELEMENT	DATE PREPARED	DATE ANALYZED
CALCIUM	-	07/26/91
IRON	-	07/26/91
MAGNESIUM	-	07/26/91
MANGANESE	-	07/26/91
POTASSIUM	-	07/26/91
SODIUM	-	07/26/91

ATI I.D. # 9107-188

METALS ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL/WA

MATRIX : WATER

UNITS : mg/L

ELEMENT	PWI#1 -1	REAGENT BLANK
CALCIUM	16	<0.05
IRON	0.02	<0.01
MAGNESIUM	7.6	<0.01
MANGANESE	0.04	<0.01
POTASSIUM	2.7	0.1
SODIUM	15	<0.1

ATI I.D. # 9107-188

METALS ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL/WA

MATRIX : WATER

UNITS : mg/L

ELEMENT	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
CALCIUM	107273-01	94.0	93.2	1	194	100	100
IRON	107273-01	0.01	0.01	0	10.1	10.0	101
MAGNESIUM	107273-01	27.4	27.1	1	136	100	109
MANGANESE	107273-01	<0.01	<0.01	NC	10.9	10.0	109
POTASSIUM	107273-01	4.7	4.6	2	103	100	98
SODIUM	107273-01	32.6	32.2	1	126	100	93

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



GENERAL CHEMISTRY ANALYSIS

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 913-1153.002
 PROJECT NAME : BLAINE/DEEP WELL/WA

MATRIX : WATER

PARAMETER	DATE PREPARED	DATE ANALYZED
ALKALINITY	-	07/24/91
CHLORIDE	-	07/23/91
NITRATE-NITRITE AS NITROGEN	-	07/24/91
SULFATE	-	07/24/91



GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL/WA

MATRIX : WATER
UNITS : mg/L

PARAMETER	PWI#1 -1	REAGENT BLANK
TOTAL ALKALINITY *	100	-
BICARBONATE ALKALINITY *	100	-
CARBONATE ALKALINITY *	<5	-
HYDROXIDE * ALKALINITY	<5	-
CHLORIDE	<5	<5
NITRATE-NITRITE AS NITROGEN	<0.05	<0.05
SULFATE	<10.0	<10.0

* mg/L as CaCO3

ATI I.D. # 9107-188

 GENERAL CHEMISTRY ANALYSIS
 QUALITY CONTROL DATA

 CLIENT : GOLDER ASSOCIATES
 PROJECT # : 913-1153.002
 PROJECT NAME : BLAINE/DEEP WELL/WA

MATRIX : WATER

UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
TOTAL ALKALINITY	107306-01	<5	<5	NC	N/A	N/A	N/A
BICARBONATE ALKALINITY	107306-01	<5	<5	NC	N/A	N/A	N/A
CARBONATE ALKALINITY	107306-01	<5	<5	NC	N/A	N/A	N/A
HYDROXIDE ALKALINITY	107306-01	<5	<5	NC	N/A	N/A	N/A
CHLORIDE	107332-01	60	50	18	100	40	100
NITRATE-NITRITE AS NITROGEN	107298-07	0.27	0.24	12	2.2	2.0	97
SULFATE	107275-01	67.6	67.6	0	257	200	95

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9107-188

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL/WA

MATRIX : WATER

UNITS : NTU

PARAMETER PWI#1
 -1

TURBIDITY <0.5

ATI I.D. # 9107-188

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL/WA

MATRIX : WATER

UNITS : NTU

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
TURBIDITY	9107-188-1	<0.5	<0.5	NC	N/A	N/A	N/A

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



Chain of Custody

LABORATORY NUMBER: 9117-148

PROJECT MANAGER: <u>David Baunton</u>					ANALYSIS REQUEST																											
COMPANY: <u>Golden Associates</u>					8010 Halogenated Volatiles	8020 Aromatic Volatiles	8020 BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	8080 PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	10X 9020 <u>NO₂/NO_x</u>	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	8080 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2)	Metals (8)	Alk, Cl, SO ₄ , Turb	Misc	NUMBER OF CONTAINERS	
ADDRESS: <u>4104 145th Av NE</u>					SAMPLE DISPOSAL INSTRUCTIONS																											
PHONE: <u>883-0772</u> SAMPLED BY: <u>JL Birch</u>					<input checked="" type="checkbox"/> ATI Disposal @ \$5.00 each <input type="checkbox"/> Return																											
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																												
<u>PW1#1</u>	<u>7-16</u>	<u>1830</u>	<u>Water</u>	<u>-1</u>																												

PROJECT INFORMATION			SAMPLE RECEIPT			RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
PROJECT NUMBER: <u>913-1153.002</u>			TOTAL NUMBER OF CONTAINERS: <u>3</u>			Signature: <u>[Signature]</u> Time: <u>1050</u>		Signature: _____ Time: _____		Signature: _____ Time: _____	
PROJECT NAME: <u>Blaine/Deepwell/WA</u>			COC SEALS/INTACT? Y/N/NA: <u>NA</u>			Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
PURCHASE ORDER NUMBER: _____			RECEIVED GOOD COND/COLD: <u>Y/N</u>			Company: <u>Golden</u>		Company: _____		Company: _____	
ONGOING PROJECT? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>			RECEIVED VIA: <u>Hand Del</u>			RECEIVED BY: 1. Signature: <u>[Signature]</u> Time: _____		RECEIVED BY: 2. Signature: _____ Time: _____		RECEIVED BY: (LAB) 3. Signature: _____ Time: _____	
TAT: (NORMAL) <input checked="" type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK			GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)			Printed Name: <u>Rowena Satiray</u> Date: <u>7/17/01</u>		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
SPECIAL INSTRUCTIONS:			* ON HOLD FOR RUSH (DETERMINING TESTS) 7/17			Company: <u>ATI-WA</u>		Company: Analytical Technologies, Inc.		Company: _____	
* To, Mn, Ca, Mg, Na, K											

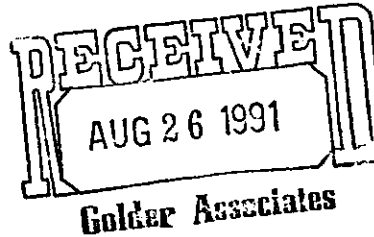


Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055. (206) 228-8335

ATI I.D. # 9107-316

August 22, 1991



Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052

Attention : David Banton

Project Number : 913-1153.002

Project Name : Blaine/Deep Well 1

On July 30, 1991, Analytical Technologies, Inc. received one water sample for analysis. The sample was analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.


Donna M. McKinney
Senior Project Manager

FWG/ew


Frederick W. Grothkopp
Laboratory Manager

ATI I.D. # 9107-316

SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9107-316-1	PW1#2	07/29/91	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	1

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

ANALYSIS	TECHNIQUE	REFERENCE	LAB
PURGEABLE HALOCARBONS	GC/ELCD	EPA 8010	R
PURGEABLE AROMATICS	GC/PID	EPA 8020	R
ORGANOCHLORINE PESTICIDES & PCBs	GC/ECD	EPA 8080	PHX
CHLORINATED HERBICIDES	GC/ECD	EPA 8150	PHX
ARSENIC	AA/GF	EPA 7060	SD
BARIUM	ICAP	EPA 6010	SD
CADMIUM	ICAP	EPA 6010	SD
CALCIUM	ICAP	EPA 6010	SD
CHROMIUM	ICAP	EPA 6010	SD
COPPER	ICAP	EPA 6010	SD
IRON	ICAP	EPA 6010	SD
LEAD	AA/GF	EPA 7421	SD
MAGNESIUM	ICAP	EPA 6010	SD
MANGANESE	ICAP	EPA 6010	SD
MERCURY	AA/COLD VAPOR	EPA 7471	SD
POTASSIUM	ICAP	EPA 6010	SD
SELENIUM	AA/GF	EPA 7740	SD
SILVER	ICAP	EPA 6010	SD
SODIUM	ICAP	EPA 6010	SD
ZINC	ICAP	EPA 6010	SD

CONTINUED ON NEXT PAGE

ANALYTICAL SCHEDULE
CONTINUED

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

ANALYSIS	TECHNIQUE	REFERENCE	LAB
ALKALINITY, TOTAL	TITRIMETRIC	EPA 310.1	SD
BICARBONATE ALKALINITY	TITRIMETRIC	EPA 310.1	SD
CARBONATE ALKALINITY	TITRIMETRIC	EPA 310.1	SD
CHLORIDE	TITRIMETRIC	EPA 9251	SD
TOTAL COLIFORM	MEMBRANE FILTRATION	SM 909A & C	SUB
FLUORIDE	ELECTRODE	EPA 340.2	SD
GROSS ALPHA RADIATION	COUNTING	SM 9110B	SUB
GROSS BETA RADIATION	COUNTING	SM 9110B	SUB
HYDROXIDE ALKALINITY	TITRIMETRIC	EPA 310.1	SD
NITRATE/NITRITE AS NITROGEN	COLORIMETRIC	EPA 353.3	SD
SULFATE	TURBIDIMETRIC	EPA 9038	SD
TURBIDITY	NEPHELOMETRIC	EPA 180.1	R

R = ATI - Renton
SD = ATI - San Diego
PHX = ATI - Phoenix
PNR = ATI - Pensacola
FC = ATI - Fort Collins
SUB = Subcontract

VOLATILE ORGANIC ANALYSIS
 DATA SUMMARY

CLIENT	: GOLDER ASSOCIATES	DATE SAMPLED	: N/A
PROJECT #	: 913-1153.002	DATE RECEIVED	: N/A
PROJECT NAME	: BLAINE/DEEP WELL 1	DATE EXTRACTED	: N/A
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 08/06/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010/8020	DILUTION FACTOR	: 1

COMPOUND	RESULT
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<1.0
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<1.0
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<1.0
TOTAL XYLENES	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	110
BROMOFLUOROBENZENE	117

ATI I.D. # 9107-316-1

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY

CLIENT	: GOLDER ASSOCIATES	DATE SAMPLED	: 07/29/91
PROJECT #	: 913-1153.002	DATE RECEIVED	: 07/30/91
PROJECT NAME	: BLAINE/DEEP WELL 1	DATE EXTRACTED	: N/A
CLIENT I.D.	: PW1#2	DATE ANALYZED	: 08/06/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010/8020	DILUTION FACTOR	: 1

COMPOUND	RESULT
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BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<1.0
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<1.0
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,2-DICHLOROBENZENE	<0.5
1,3-DICHLOROBENZENE	<0.5
1,4-DICHLOROBENZENE	<0.5
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<1.0
TOTAL XYLENES	<0.5

0.3

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	95
BROMOFLUOROBENZENE	115

ATI I.D. # 9107-316

 VOLATILE ORGANIC ANALYSIS
 QUALITY CONTROL DATA

CLIENT	: GOLDER ASSOCIATES	SAMPLE I.D. #	: BLANK SPIKE
PROJECT #	: 913-1153.002	DATE EXTRACTED	: N/A
PROJECT NAME	: BLAINE/DEEP WELL 1	DATE ANALYZED	: 07/25/91
EPA METHOD	: 8010/8020	UNITS	: ug/L
SAMPLE MATRIX	: WATER		

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
BENZENE	<0.5	8.00	7.79	97	N/A	N/A	N/A
CHLOROBENZENE	<0.5	8.00	8.14	102	N/A	N/A	N/A
1,1-DICHLOROETHENE	<0.2	8.00	8.31	104	N/A	N/A	N/A
TETRACHLOROETHENE	<0.2	8.00	7.39	92	N/A	N/A	N/A
TOLUENE	<0.5	8.00	7.65	96	N/A	N/A	N/A
TRICHLOROETHENE	<0.2	8.00	6.05	76	N/A	N/A	N/A
TOTAL XYLENES	<0.5	24.0	23.7	99	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9107-316

ORGANOCHLORINE PESTICIDE AND PCB ANALYSIS
DATA SUMMARY

CLIENT	: GOLDER ASSOCIATES	DATE SAMPLED	: N/A
PROJECT #	: 913-1153.002	DATE RECEIVED	: N/A
PROJECT NAME	: BLAINE/DEEP WELL 1	DATE EXTRACTED	: 08/05/91
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 08/07/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8080	DILUTION FACTOR	: 1

COMPOUND	RESULT
ALDRIN	<0.050
ALPHA-BHC	<0.050
BETA-BHC	<0.050
GAMMA-BHC (LINDANE)	<0.050
DELTA-BHC	<0.050
CHLORDANE	<0.50
P, P'-DDD	<0.10
P, P'-DDE	<0.10
P, P'-DDT	<0.10
DIELDRIN	<0.10
ENDOSULFAN I	<0.050
ENDOSULFAN II	<0.10
ENDOSULFAN SULFATE	<0.10
ENDRIN	<0.10
ENDRIN KETONE	<0.10
HEPTACHLOR	<0.050
HEPTACHLOR EPOXIDE	<0.050
METHOXYCHLOR	<0.50
TOXAPHENE	<1.0
PCB 1016	<1.0
PCB 1221	<1.0
PCB 1232	<1.0
PCB 1242	<1.0
PCB 1248	<1.0
PCB 1254	<1.0
PCB 1260	<1.0

SURROGATE PERCENT RECOVERIES

DIBUTYLCHORENDATE

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ATI I.D. # 9107-316-1

ORGANOCHLORINE PESTICIDE AND PCB ANALYSIS
DATA SUMMARY

CLIENT	: GOLDER ASSOCIATES	DATE SAMPLED	: 07/29/91
PROJECT #	: 913-1153.002	DATE RECEIVED	: 07/30/91
PROJECT NAME	: BLAINE/DEEP WELL 1	DATE EXTRACTED	: 08/05/91
CLIENT I.D.	: PW1#2	DATE ANALYZED	: 08/08/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8080	DILUTION FACTOR	: 1

COMPOUND	RESULT
ALDRIN	<0.050
ALPHA-BHC	<0.050
BETA-BHC	<0.050
GAMMA-BHC (LINDANE)	<0.050
DELTA-BHC	<0.050
CHLORDANE	<0.50
P, P'-DDD	<0.10
P, P'-DDE	<0.10
P, P'-DDT	<0.10
DIELDRIN	<0.10
ENDOSULFAN I	<0.050
ENDOSULFAN II	<0.10
ENDOSULFAN SULFATE	<0.10
ENDRIN	<0.10
ENDRIN KETONE	<0.10
HEPTACHLOR	<0.050
HEPTACHLOR EPOXIDE	<0.050
METHOXYCHLOR	<0.50
TOXAPHENE	<1.0
PCB 1016	<1.0
PCB 1221	<1.0
PCB 1232	<1.0
PCB 1242	<1.0
PCB 1248	<1.0
PCB 1254	<1.0
PCB 1260	<1.0

SURROGATE PERCENT RECOVERIES

DIBUTYLCHORENDATE

117

ATI I.D. # 9107-316

 ORGANOCHLORINE PESTICIDE AND PCB ANALYSIS
 QUALITY CONTROL DATA

CLIENT	: GOLDER ASSOCIATES	SAMPLE I.D. #	: 10899903
PROJECT #	: 913-1153.002	DATE EXTRACTED	: 08/03/91
PROJECT NAME	: BLAINE/DEEP WELL 1	DATE ANALYZED	: 08/07/91
EPA METHOD	: 8080	UNITS	: ug/L
SAMPLE MATRIX	: WATER		

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
GAMMA-BHC (LINDANE)	<0.050	2.00	2.20	110	2.30	115	4
HEPTACHLOR	<0.050	2.00	2.10	105	2.20	110	5
ALDRIN	<0.050	2.00	2.10	105	2.10	105	0
DIELDRIN	<0.10	2.00	2.20	110	2.30	115	4
ENDRIN	<0.10	2.00	2.30	115	2.30	115	0
P, P'-DDT	<0.10	2.00	1.90	95	2.00	100	5

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$



ATI I.D. # 9107-316

CHLORINATED HERBICIDES
DATA SUMMARY

CLIENT	: GOLDER ASSOCIATES	DATE SAMPLED	: N/A
PROJECT #	: 913-1153.002	DATE RECEIVED	: N/A
PROJECT NAME	: BLAINE/DEEP WELL 1	DATE EXTRACTED	: 08/05/91
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 08/11/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8150	DILUTION FACTOR	: 1

COMPOUNDRESULT

2,4-D	<0.40
2,4,5-TP (SILVEX)	<0.20

SURROGATE PERCENT RECOVERIES

DICAMBA

127

ATI I.D. # 9107-316-1

CHLORINATED HERBICIDES
DATA SUMMARY

CLIENT	: GOLDER ASSOCIATES	DATE SAMPLED	: 07/29/91
PROJECT #	: 913-1153.002	DATE RECEIVED	: 07/30/91
PROJECT NAME	: BLAINE/DEEP WELL 1	DATE EXTRACTED	: 08/05/91
CLIENT I.D.	: PW1#2	DATE ANALYZED	: 08/11/91
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8150	DILUTION FACTOR	: 1

COMPOUNDRESULT

2,4-D	<0.40
2,4,5-TP (SILVEX)	<0.20

SURROGATE PERCENT RECOVERIES

DICAMBA

128

ATI I.D. # 9107-316

CHLORINATED HERBICIDES
QUALITY CONTROL DATA

CLIENT	: GOLDER ASSOCIATES	SAMPLE I.D. #	: 10899903
PROJECT #	: 913-1153.002	DATE EXTRACTED	: 08/05/91
PROJECT NAME	: BLAINE/DEEP WELL 1	DATE ANALYZED	: 08/11/91
EPA METHOD	: 8150	UNITS	: ug/L
SAMPLE MATRIX	: WATER		

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED RESULT	% REC.	DUP. SPIKED RESULT	DUP. % REC.	RPD
2,4-D	<0.40	16.7	16.3	98	16.2	97	1
2,4,5-TP (SILVEX)	<0.20	3.30	3.70	112	3.80	115	3

$$\% \text{ Recovery} = \frac{(\text{Spiked Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Dup. Spike Result})|}{\text{Average Result}} \times 100$$

ATI I.D. # 9107-316

METALS ANALYSIS

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

MATRIX : WATER

ELEMENT	DATE PREPARED	DATE ANALYZED
ARSENIC	08/02/91	08/07/91
BARIUM	08/02/91	08/06/91
CADMIUM	08/02/91	08/06/91
CALCIUM	08/02/91	08/06/91
CHROMIUM	08/02/91	08/06/91
COPPER	08/02/91	08/06/91
IRON	08/02/91	08/06/91
LEAD	08/02/91	08/07/91
MAGNESIUM	08/02/91	08/06/91
MANGANESE	08/02/91	08/06/91
MERCURY	08/02/91	08/08/91
POTASSIUM	08/02/91	08/06/91
SELENIUM	08/02/91	08/06/91
SILVER	08/02/91	08/06/91
SODIUM	08/02/91	08/06/91
ZINC	08/02/91	08/06/91

ATI I.D. # 9107-316

**METALS ANALYSIS
DATA SUMMARY**

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 913-1153.002
 PROJECT NAME : BLAINE/DEEP WELL 1

MATRIX : WATER

UNITS : mg/L

ELEMENT	PW1#2 -1	REAGENT BLANK
ARSENIC	0.007	<0.002
BARIUM	0.07	<0.01
CADMIUM	<0.005	<0.005
CALCIUM	14.4	0.3
CHROMIUM	<0.01	<0.01
COPPER	<0.02	<0.02
IRON	<0.01	0.04
LEAD	<0.002	<0.002
MAGNESIUM	7.3	0.09
MANGANESE	0.05	<0.01
MERCURY	<0.0005	<0.0005
POTASSIUM	2.4	<0.1
SELENIUM	<0.002	<0.002
SILVER	<0.01	<0.01
SODIUM	15.0	2.1
ZINC	<0.05	<0.05

ATI I.D. # 9107-316

METALS ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

MATRIX : WATER

UNITS : mg/L

ELEMENT	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
ARSENIC	107495-06	<0.002	<0.002	NC	2.1	2.0	105
BARIUM	107517-03	0.14	0.14	0	4.2	4.0	102
CADMIUM	107517-03	<0.005	<0.005	NC	2.0	2.0	100
CALCIUM	107517-03	46.5	47.4	2	65.9	20.0	97
CHROMIUM	107517-03	<0.01	<0.01	NC	2.0	2.0	100
COPPER	107517-03	<0.02	<0.02	NC	2.1	2.0	105
IRON	107517-03	0.15	0.13	14	4.2	4.0	101
LEAD	107517-05	0.002	0.003	40	2.0	2.0	100
MAGNESIUM	107517-03	6.1	6.3	3	16.5	10.0	104
MANGANESE	107517-03	0.01	0.02	67	4.0	4.0	100
MERCURY	107408-01	<0.0005	<0.0005	NC	0.0052	0.0050	104
POTASSIUM	107517-03	1.6	1.6	0	10.3	10.0	87
SELENIUM	107495-06	<0.002	<0.002	NC	1.0	1.2	83
SILVER	107517-03	<0.01	<0.01	NC	2.0	2.0	100
SODIUM	107517-03	5.6	6.0	7	25.8	24.0	84
ZINC	107517-03	0.05	<0.05	NC	2.0	2.0	98

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100.$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9107-316

GENERAL CHEMISTRY ANALYSIS

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 913-1153.002
 PROJECT NAME : BLAINE/DEEP WELL 1

MATRIX : WATER

PARAMETER	DATE PREPARED	DATE ANALYZED
ALKALINITY, TOTAL	-	08/01/91
BICARBONATE ALKALINITY	-	08/01/91
CARBONATE ALKALINITY	-	08/01/91
CHLORIDE	-	08/05/91
TOTAL COLIFORM	-	07/29/91
FLUORIDE	-	08/05/91
GROSS ALPHA RADIATION	-	08/01/91 - 08/05/91
GROSS BETA RADIATION	-	08/01/91 - 08/05/91
HYDROXIDE ALKALINITY	-	08/01/91
NITRATE/NITRITE AS NITROGEN	-	08/14/91
SULFATE	-	08/07/91
TURBIDITY	-	07/31/91

ATI I.D. # 9107-316

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

MATRIX : WATER

UNITS : mg/L

PARAMETER	PW1#2 -1	REAGENT BLANK
ALKALINITY, TOTAL	105	-
BICARBONATE ALKALINITY	105	-
CARBONATE ALKALINITY	<5	-
CHLORIDE	<5.0	<5.0
FLUORIDE	<0.5	<0.5
HYDROXIDE ALKALINITY	<5	-
NITRATE/NITRITE AS NITROGEN	<0.05	<0.05
SULFATE	<10.0	<10.0

ATI I.D. # 9107-316

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

MATRIX : WATER

UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
ALKALINITY, TOTAL	9107-316-1	105	97	8	N/A	N/A	N/A
BICARBONATE ALKALINITY	9107-316-1	105	97	8	N/A	N/A	N/A
CARBONATE ALKALINITY	9107-316-1	<5	<5	NC	N/A	N/A	N/A
CHLORIDE	107503-01	220	260	17	260	40	100
FLUORIDE	108018-02	0.5	0.5	0	6.0	5.0	110
HYDROXIDE ALKALINITY	9107-316-1	<5	<5	NC	N/A	N/A	N/A
NITRATE/NITRITE AS NITROGEN	107510-05	<0.05	<0.05	NC	1.7	2.0	85
SULFATE	107510-05	37.0	37.0	<1	24.1	20.0	102

NC = Not calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9107-316

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

MATRIX : WATER

UNITS : NTU

ATI I.D. #	CLIENT I.D.	TURBIDITY
------------	-------------	-----------

9107-316-1

PW1#2

<0.1



ATI I.D. # 9107-316

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

MATRIX : WATER

UNITS : NTU

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
TURBIDITY	9107-337-3	1.2	1.2	0	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9107-316

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

MATRIX : WATER
UNITS : CFU/100ml

ATI I.D. #	CLIENT I.D.	TOTAL COLIFORM
9107-316-1	PW1#2	<2



ATI I.D. # 9107-316

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 913-1153.002
PROJECT NAME : BLAINE/DEEP WELL 1

MATRIX : WATER

UNITS : pCi/l

ATI I.D. #	CLIENT I.D.	GROSS ALPHA RADIATION	GROSS BETA RADIATION
9107-316-1	PW1#2	1.7 ± 2.3	4.5 ± 2.0



Analytical Technologies, Inc.

560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

PHOENIX

DATE 7/30/91 PAGE 1 OF 1

Chain of Custody LABORATORY NUMBER: 107944

PROJECT MANAGER: Donna McKinney
 COMPANY: ATI
 ADDRESS: _____
 PHONE: (206) 228-8335 SAMPLED BY: _____

ANALYSIS REQUEST

SAMPLE DISPOSAL INSTRUCTIONS
 ATI Disposal @ \$5.00 each Return

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	8020 BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	8080 PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/H (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	8080 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2) Metals (8)	NUMBER OF CONTAINERS	
9107-316-1	7/29/91	1230	H ₂ O	1							X			X															6

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NUMBER: <u>9107-316</u>	TOTAL NUMBER OF CONTAINERS: <u>6</u>		
PROJECT NAME: <u>GAS/913-1153.002</u>	COC SEALS/INTACT? <u>Y/N/A</u>		
PURCHASE ORDER NUMBER: <u>—</u>	RECEIVED GOOD COND./COLD: <u>Y</u>		
ONGOING PROJECT? YES <input type="checkbox"/> NO <input type="checkbox"/>	RECEIVED VIA: <u>Y</u>		
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS			
TAT: (NORMAL) <input type="checkbox"/> 2WKS	(RUSH) <input type="checkbox"/> 24HR	<input type="checkbox"/> 48 HRS	<input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK
GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/>		(LAB USE ONLY)	
SPECIAL INSTRUCTIONS: <u>DUE: 8/12/91 \$ normal</u>			

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: <u>D. McKinney</u> Time: <u>16:00</u>	Signature: _____ Time: _____	Signature: _____ Time: _____
Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
Company: <u>ATI WA</u>	Company: _____	Company: _____
RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: _____ Time: _____	Signature: _____ Time: _____	Signature: <u>Linda Eshelman</u> Time: <u>10:00</u>
Printed Name: _____ Date: _____	Printed Name: _____ Date: _____	Printed Name: <u>Linda Eshelman</u> Date: <u>7/31/91</u>
Company: _____	Company: _____	Company: <u>Analytical Technologies, Inc.</u>

DATE: 11/12/10 PAGE: 1 OF 1

Chain of Custody LABORATORY NUMBER: 111

PROJECT MANAGER: Donna Ashkinney
 COMPANY: ATI
 ADDRESS: _____
 PHONE: 206-228-8335 SAMPLED BY: _____

SAMPLE DISPOSAL INSTRUCTIONS

ATI Disposal @ \$5.00 each. Return

ANALYSIS REQUEST													NUMBER OF CONTAINERS															
8010	8020	8020	8240	8270	8310	8080	8080	8140	8150	WDOE PAHHH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil		8015 (Modified)	TOC 9060	TOX 9020	% Moisture	EP TOX Metals (6) EP EXT	Priority Pollutant Metals (13)	8080 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2)	Metals (6)				
																				TCLP ONLY								↑

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
907-116-1	11/10/10	12:30	H2O	

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
PROJECT NUMBER: <u>SAUT-510</u>	TOTAL NUMBER OF CONTAINERS: <u>21</u>	COC SEALS INTACT? <u>Y/N/A</u>		Signature: <u>[Signature]</u>		Signature: _____		Signature: _____	
PROJECT NAME: <u>GAS/413-1153-1112</u>	RECEIVED GOOD COND./COLD	RECEIVED VIA: <u>EX</u>		Printed Name: _____		Printed Name: _____		Printed Name: _____	
PURCHASE ORDER NUMBER: _____				Date: _____		Date: _____		Date: _____	
ONGOING PROJECT? YES <input type="checkbox"/> NO <input type="checkbox"/>	PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS		Company: <u>ATI</u>		Company: _____		Company: _____		
TAT: (NORMAL) <input type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK	GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)		RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB) 3.		
SPECIAL INSTRUCTIONS: * * Ag. As. Pa. Ca. H. Cr. Co. Fe. Hg. B. N. Pb. Zn. Cu. Pb. Zn. Cu.				Signature: _____		Signature: _____		Signature: <u>[Signature]</u>	
				Printed Name: _____		Printed Name: _____		Printed Name: <u>[Name]</u>	
				Date: _____		Date: _____		Date: _____	
				Company: _____		Company: _____		Analytical Technologies, Inc.	

DUE 8/12/11
 H. Ashkinney - 10/10

APPENDIX



BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

6-Aug-91

Mary Silva
ANALYTICAL TECHNOLOGIES, INC. (WA)
560 Naches Avenue SW, Ste. 101
Renton, WA 98055

Page: 1
Copy: 1 of 2
Set : 1

Attn: Donna McKinney
Project: GAS/913-1153.002

Received: 31-Jul-91 10:19
PO #: 05784

Job: 911401E Status: Final

Sample Type: Water

Sample	Gross Alpha Error		Gross Beta Error	
	Total pCi/l	2σ	Total pCi/l	2σ
9107-316	1.7	±2.3	4.5	±2.0

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

6-Aug-91

Mary Silva
ANALYTICAL TECHNOLOGIES, INC. (WA)
560 Naches Avenue SW, Ste. 101
Renton, WA 98055

Page: 2
Copy: 1 of 2
Set : 2

Attn: Donna McKinney
Project: GAS/913-1153.002

Received: 31-Jul-91 10:19

PO #: 05784

Job: 911401E

Status: Final

Abbreviations:

Units:

pCi/l : picoCuries per liter
2 σ : Counting error at the 95% confidence level, 2 σ

Job approved by:

Signed:

Ellen La Riviere
.....

Ellen La Riviere
Radiochemistry Laboratory Manager

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

6-Aug-91

Mary Silva
ANALYTICAL TECHNOLOGIES, INC. (WA)
560 Naches Avenue SW, Ste. 101
Renton, WA 98055

Page: 1
Copy: 1 of 2
Set: 1

Attn: Donna McKinney
Project: GAS/913-1153.002

Received: 31-Jul-91 10:19
PO #: 05784

Job: 911401E

Status: Final

QUALITY CONTROL REPORT

Sample Type: Water

Sample Id	Gross Alpha Error		Gross Beta Error	
	Total pCi/l	2 σ	Total pCi/l	2 σ
Duplicate	10	± 10	3.3	± 6.7
Duplicate	9.0	± 9.4	8.4	± 6.9
Duplicate % diff.	5.3	---	43	---
Std (actual value)	187	± 5	110	± 2
Std (expected value)	206	---	106	---
Std % diff.	9.2	---	3.8	---
Blank	0.0	± 0.2	0.0	± 0.3
Spike % rec.	---	---	---	---

6-Aug-91

Mary Silva
ANALYTICAL TECHNOLOGIES, INC. (WA)
560 Naches Avenue SW, Ste. 101
Renton, WA 98055

Page: 2
Copy: 1 of 2
Set : 2

Attn: Donna McKinney
Project: GAS/913-1153.002

Received: 31-Jul-91 10:19
PO #: 05784

Job: 911401E Status: Final
QUALITY CONTROL REPORT

Abbreviations:

Units:

pCi/l : picoCuries per liter
2 σ : Counting error at the 95% confidence level, 2 σ

Job approved by:

Signed: *Stephen A. [Signature]*
.....
Approved
Quality Assurance Department

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

6-Aug-91

Mary Silva
ANALYTICAL TECHNOLOGIES, INC. (WA)
560 Naches Avenue SW, Ste. 101
Renton, WA 98055

Page: 3
Copy: 1 of 2

Attn: Donna McKinney
Project: GAS/913-1153.002

Received: 31-Jul-91 10:19
PO #: 05784

Job: 911401E

Status: Final

QUALITY CONTROL REPORT

QUALITY CONTROL DATA SHEET


Received by: gr

Via: Federal Express

Sample Container Type: 2 Pl L btl
Sample Type: Water
Preservative When Received: None
Additional Lab Preparation: None

Parameter	Method	LLD	Preser- vative	Analyst	Date(s) of Analysis
Gross Alpha	900.0	2 pCi/l	none	Marshall	8/ 1- 8/ 5
Gross Beta	900.0	1 pCi/l	none	Marshall	8/ 1- 8/ 5

Signed:


.....
Mark Burkhardt, Ph.D.
Laboratory Director



BARKINGER

Chain of Custody

 LABORATORY NUMBER: _____

PROJECT MANAGER: <u>DONNA MCKINNEY</u>					ANALYSIS REQUEST																											
COMPANY: _____					8010 Halogenated Volatiles	8020 Aromatic Volatiles	8020 BETX ONLY	8240 GCMS Volatiles	8270 GCMS BVA	8310 HPLC PNA	8080 Pesticides & PCB's	8080 PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/H (MAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9050	TOX 9020	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	8080 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2)	Metals (8)	GROSS α	GROSS β	NUMBER OF CONTAINERS	
ADDRESS: _____					<input checked="" type="checkbox"/> ATI Disposal @ \$5.00 each <input type="checkbox"/> Return SAMPLE ID DATE TIME MATRIX LAB ID																											
PHONE: _____ SAMPLED BY: _____																																
SAMPLE DISPOSAL INSTRUCTIONS																																
SAMPLE ID: <u>9107-316</u>																																
DATE: <u>7/30/91</u>																																
TIME: <u>1230</u>																																
MATRIX: <u>H₂O</u>																																
LAB ID: _____																																

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
PROJECT NUMBER: <u>9107-316</u>	TOTAL NUMBER OF CONTAINERS	Signature: <u>D. McKinney</u> Time: <u>10:21</u>		Signature: _____ Time: _____		Signature: _____ Time: _____		Signature: _____ Time: _____	
PROJECT NAME: <u>GAS 1913-1153.002</u>	COC SEALS/INTACT? <u>Y/N/A</u>	Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
PURCHASE ORDER NUMBER: <u>05784</u>	RECEIVED GOOD COND./COLD	Company: <u>ATI WA</u>		Company: _____		Company: _____		Company: _____	
ONGOING PROJECT? YES <input type="checkbox"/> NO <input type="checkbox"/>	RECEIVED VIA:	Signature: _____ Time: _____		Signature: _____ Time: _____		Signature: _____ Time: _____		Signature: _____ Time: _____	
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS				RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB) 3.	
TAT: (NORMAL) <input type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK	Signature: _____ Time: _____		Signature: _____ Time: _____		Signature: _____ Time: _____		Signature: _____ Time: _____		
GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)	Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		
SPECIAL INSTRUCTIONS: <u>Please include proj # on invoice</u>				Company: _____		Company: _____		Company: _____	
<u>due 8/12/91</u>				Signature: _____ Time: _____		Signature: _____ Time: _____		Signature: <u>Gina Reichert</u> Time: <u>9:30</u>	
				Company: _____		Company: _____		Analytical Technologies, Inc.	



ANALYSIS REPORT

AmTest Inc.
Professional
Analytical
Services
14603 N.E. 87th St.
Redmond, WA
98052
Fax: 206 883 3495
Tel: 206 885 1664

Analytical Technologies, Inc.
560 Naches Avenue SW
Suite 101
Renton, WA 98055
Attention: Donna McKinney

Date Received: 7/30/91
Date Reported: 8/ 6/91

Project Name: GAS913-1153.002
Project #: I107-316
PO Number: 05783
Date Sampled: 7/29/91

PARAMETER	UNITS	RESULT
91-A005365 Client ID: I107-316-1 Total Coliforms	CFU/100ml	< 2

Reported by: Robin L. Forgey
Robin Forgey



AT 1087

DATE 1/11/10 PAGE 1 OF 1

560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

Chain of Custody **LABORATORY NUMBER:** _____

PROJECT MANAGER: TERRA MCKINLEY
 COMPANY: ATI
 ADDRESS: _____
 PHONE: 206 228 8335 SAMPLED BY: _____

SAMPLE DISPOSAL INSTRUCTIONS

ATI Disposal @ \$5.00 each Return

					ANALYSIS REQUEST													NUMBER OF CONTAINERS												
SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	8020 BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	8080 PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil		8015 (Modified)	TOC 9060	TOX 9020	% Moisture	EP TOX Metals (6) EP EXT	Priority Pollutant Metals (13)	8090 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2)	Metals (8)	
10107-311-1	7/24/09	12:30	H ₂ O																					TCLP ONLY						

PROJECT INFORMATION	SAMPLE RECEIPT	RELINQUISHED BY: 1	RELINQUISHED BY: 2	RELINQUISHED BY: 3
PROJECT NUMBER: <u>10107-311</u>	TOTAL NUMBER OF CONTAINERS	Signature: <u>V. Kennel</u>	Signature: _____	Signature: _____
PROJECT NAME: <u>Water / H₂O</u>	COC SEALS/INTACT? Y/N/NA	Time: _____	Time: _____	Time: _____
PURCHASE ORDER NUMBER:	RECEIVED GOOD COND./COLD	Printed Name: _____	Printed Name: _____	Printed Name: _____
ONGOING PROJECT? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	RECEIVED VIA:	Date: _____	Date: _____	Date: _____
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS				
TAT: (NORMAL) <input type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK		Company: <u>ATI</u>	Company: _____	Company: _____
GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> (LAB USE ONLY)		RECEIVED BY: 1	RECEIVED BY: 2	RECEIVED BY: (LAB) 3
SPECIAL INSTRUCTIONS:		Signature: _____	Signature: _____	Signature: _____
<u>analysis include #16 #17 #18 #19 #20 #21</u>		Time: _____	Time: _____	Time: _____
		Printed Name: _____	Printed Name: _____	Printed Name: _____
		Date: _____	Date: _____	Date: _____
		Company: _____	Company: _____	Analytical Technologies, Inc.



Chain of Custody LABORATORY NUMBER: 5107-316

PROJECT MANAGER: David Banton
 COMPANY: Golden Associates
 ADDRESS: 4104 148th Av NE
Redmond, WA 98052
 PHONE: 883-0777 SAMPLED BY: Mark Birch

SAMPLE DISPOSAL INSTRUCTIONS

ATI Disposal @ \$5.00 each Return

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	ANALYSIS REQUEST													NUMBER OF CONTAINERS																				
					8010 Halogenated Volatiles	8020 Aromatc Volatiles	8020 BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	8080 PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAHs (WAC 173)	4100 HEP Aik, Cl, SO ₂	4100 Grease & Oil Turb		8015 (Modified) NO, NO ₂	TOX 9000	TOX 9020	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	8080 Pesticide (4)	8240 ZH-EXT	8270	8150 Herbicides (2)	Metals (8)									
BEF PW1#2	7-29	1230	Water	-1	X	X				X	X	X	X	X	X	X																			X	X	13	15

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1:		RELINQUISHED BY: 2:		RELINQUISHED BY: 3:	
PROJECT NUMBER: <u>913-1153.002</u>		TOTAL NUMBER OF CONTAINERS: <u>15</u>		Signature: <u>Mark Birch</u> Time: <u>840</u>		Signature: _____ Time: _____		Signature: _____ Time: _____	
PROJECT NAME: <u>Blaine / Deepwell</u>		COC SEALS/INTACT? <u>Y/N/A</u>		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
PURCHASE ORDER NUMBER: _____		RECEIVED GOOD COND/COLD: <u>4</u>		Mark Birch 7-30					
ONGOING PROJECT? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		RECEIVED VIA: <u>Del</u>		Company: <u>Golden</u>		Company: _____		Company: _____	
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS									
TAT: (NORMAL) <input checked="" type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK		GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)		RECEIVED BY: 1:		RECEIVED BY: 2:		RECEIVED BY: (LAB) 3:	
SPECIAL INSTRUCTIONS:				Signature: _____ Time: <u>846</u>		Signature: _____ Time: _____		Signature: _____ Time: _____	
<u>Na, Pb, Se, Zn</u>				Printed Name: <u>V. PENNICK</u> Date: <u>7/30/01</u>		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
<u>* Metals - Ag, As, Ba, Ca, Cd, Cr, Cu, Fe, Hg, K, Mg, Mn</u>				Company: <u>ATI</u>		Company: _____		Analytical Technologies, Inc.	

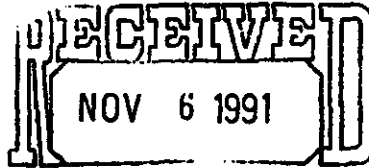
903-1060.402

4th Round



Analytical **Technologies, Inc.**

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055. (206) 228-8335



ATI I.D. # 9110-150

Golder Associates

November 5, 1991

Golder Associates
4104 148th Avenue N.E.
Redmond, WA 98052


Attention : David Banton

Project Number : 903-1060.402

Project Name : Blaine/Water Quality

On October 10, 1991, Analytical Technologies, Inc., received 21 water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.


Mary C. Silva
Senior Project Manager


Frederick W. Grothkopp
Laboratory Manager

FWG/hal/ew

WELL IDENTIFICATION

4-A	Lincoln Park Duplicate
#6	Well No. 6
#4	Well No. 4
4-B	Well No. 6 Duplicate
4-C	GWMP-2 Duplicate

ATI I.D. # 9110-150

SAMPLE CROSS REFERENCE SHEET

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060.402
 PROJECT NAME : BLAINE/WATER QUALITY

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9110-150-1	BOETTCHER	10/09/91	WATER
9110-150-2	BERG	10/09/91	WATER
9110-150-3	LEER	10/09/91	WATER
9110-150-4	COLACURCIO	10/09/91	WATER
9110-150-5	RODENBERGER	10/09/91	WATER
9110-150-6	ZYLSTRA	10/09/91	WATER
9110-150-7	NYMEYER	10/09/91	WATER
9110-150-8	DEKUBBER	10/09/91	WATER
9110-150-9	WILSON	10/09/91	WATER
9110-150-10	ALLER	10/09/91	WATER
9110-150-11	WOOD	10/09/91	WATER
9110-150-12	LINCOLN	10/10/91	WATER
9110-150-13	4-A	10/10/91	WATER
9110-150-14	12TH ST.	10/10/91	WATER
9110-150-15	#6	10/10/91	WATER
9110-150-16	#4	10/10/91	WATER
9110-150-17	GWMP-1	10/10/91	WATER
9110-150-18	GWMP-3	10/10/91	WATER
9110-150-19	GWMP-2	10/10/91	WATER
9110-150-20	4-B	10/10/91	WATER
9110-150-21	4-C	10/10/91	WATER

----- TOTALS -----

MATRIX	# SAMPLES
WATER	21

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 9110-150

ANALYTICAL SCHEDULE

CLIENT : GOLDER ASSOCIATES
 PROJECT # : 903-1060.402
 PROJECT NAME : BLAINE/WATER QUALITY

ANALYSIS	TECHNIQUE	REFERENCE	LAB
IRON	ICAP	EPA 6010	SD
MANGANESE	ICAP	EPA 6010	SD
NITRATE/NITRITE AS NITROGEN	COLORIMETRIC	EPA 353.2	SUB
NITRITE AS NITROGEN	COLORIMETRIC	EPA 354.1	SUB
TURBIDITY	NEPHELOMETRIC	EPA 180.1	SUB

R = ATI - Renton
 SD = ATI - San Diego
 PHX = ATI - Phoenix
 PNR = ATI - Pensacola
 FC = ATI - Fort Collins
 SUB = Subcontract

ATI I.D. # 9110-150

METALS ANALYSIS

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

ELEMENT	DATE PREPARED	DATE ANALYZED
IRON	10/18/91	10/23/91
MANGANESE	10/18/91	10/23/91

ATI I.D. # 9110-150

**METALS ANALYSIS
DATA SUMMARY**

CLIENT : GOLDER ASSOCIATES **MATRIX** : WATER
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY **UNITS** : mg/L

ATI I.D. #	CLIENT I.D.	IRON	MANGANESE
9110-150-1	BOETTCHER	0.14	<0.01
9110-150-2	BERG	0.48	0.12
9110-150-3	LEER	0.04	0.02
9110-150-4	COLACURCIO	<0.01	<0.01
9110-150-5	RODENBERGER	0.41	0.03
9110-150-6	ZYLSTRA	0.03	<0.01
9110-150-7	NYMEYER	1.5	0.05
9110-150-8	DEKUBBER	0.43	0.08
9110-150-9	WILSON	0.05	0.02
9110-150-10	ALLER	<0.01	<0.01
9110-150-11	WOOD	0.38	0.05
9110-150-12	LINCOLN	<0.01	0.05
9110-150-13	4-A	<0.01	0.05
9110-150-14	12TH ST.	<0.01	0.04
9110-150-15	#6	<0.01	0.04
9110-150-16	#4	<0.01	<0.01
9110-150-17	GWMP-1	0.24	0.05
9110-150-18	GWMP-3	0.08	0.10
9110-150-19	GWMP-2	0.13	0.12
9110-150-20	4-B	<0.01	0.04
9110-150-21	4-C	0.16	0.12
REAGENT BLANK	-	<0.01	<0.01

ATI I.D. # 9110-150

**METALS ANALYSIS
QUALITY CONTROL DATA**

CLIENT : GOLDR ASSOCIATES
 PROJECT # : 903-1060.402
 PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

ELEMENT	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
IRON	9110-150-8	0.43	0.42	2	4.4	4.0	99
IRON	9110-150-18	0.08	0.07	13	4.1	4.0	101
MANGANESE	9110-150-8	0.08	0.08	0	4.1	4.0	101
MANGANESE	9110-150-18	0.10	0.10	0	4.2	4.0	103

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 9110-150

GENERAL CHEMISTRY ANALYSIS

CLIENT : GOLDER ASSOCIATES MATRIX : WATER
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

PARAMETER	DATE PREPARED	DATE ANALYZED
NITRATE/NITRITE AS NITROGEN	-	10/16/91
NITRITE AS NITROGEN	-	10/11/91
TURBIDITY	-	10/14/91

ATI I.D. # 9110-150

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

ATI I.D. #	CLIENT I.D.	NITRATE/NITRITE AS NITROGEN	NITRITE AS NITROGEN
9110-150-1	BOETTCHER	1.7	<0.001
9110-150-2	BERG	<0.01	0.001
9110-150-3	LEER	1.4	<0.001
9110-150-4	COLACURCIO	1.7	<0.001
9110-150-5	RODENBERGER	<0.01	<0.001
9110-150-6	ZYLSTRA	3.2	<0.001
9110-150-7	NYMEYER	0.39	0.001
9110-150-8	DEKUBBER	5.5	0.004
9110-150-9	WILSON	<0.01	0.002
9110-150-10	ALLER	0.20	0.001
9110-150-11	WOOD	<0.01	0.001
9110-150-12	LINCOLN	<0.01	<0.001
9110-150-13	4-A	<0.01	0.001
9110-150-14	12TH ST.	<0.01	<0.001
9110-150-15	#6	<0.01	0.001
9110-150-16	#4	0.57	<0.001
9110-150-17	GWMP-1	<0.01	<0.001
9110-150-18	GWMP-3	<0.01	<0.001
9110-150-19	GWMP-2	<0.01	<0.001
9110-150-20	4-B	<0.01	0.001
9110-150-21	4-C	<0.01	<0.001
REAGENT BLANK	-	<0.01	<0.001

ATI I.D. # 9110-150

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
NITRATE/NITRITE AS NITROGEN	9110-150-9	<0.010	<0.010	NC	N/A	N/A	N/A
NITRATE/NITRITE AS NITROGEN	9110-150-10	0.20	N/A	N/A	N/A	2.5	108
NITRATE/NITRITE AS NITROGEN	9110-150-19	<0.010	<0.010	NC	N/A	N/A	N/A
NITRATE/NITRITE AS NITROGEN	9110-150-20	<0.010	N/A	N/A	N/A	2.5	102
NITRATE/NITRITE AS NITROGEN	9110-150-21	<0.010	<0.010	NC	N/A	2.5	102
NITRITE AS NITROGEN	9110-150-1	<0.001	<0.001	NC	N/A	0.020	92
NITRITE AS NITROGEN	9110-150-21	<0.001	<0.001	NC	N/A	0.020	95

NC = Not Calculable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



ATI I.D. # 9110-150

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : NTU

ATI I.D. #	CLIENT I.D.	TURBIDITY
9110-150-1	BOETTCHER	0.68
9110-150-2	BERG	2.2
9110-150-3	LEER	0.25
9110-150-4	COLACURCIO	<0.01
9110-150-5	RODENBERGER	1.5
9110-150-6	ZYLSTRA	0.12
9110-150-7	NYMEYER	9.5
9110-150-8	DEKUBBER	2.1
9110-150-9	WILSON	1.3
9110-150-10	ALLER	<0.01
9110-150-11	WOOD	1.4
9110-150-12	LINCOLN	<0.01
9110-150-13	4-A	0.16
9110-150-14	12TH ST.	<0.01
9110-150-15	#6	<0.01
9110-150-16	#4	<0.01
9110-150-17	GWMP-1	1.6
9110-150-18	GWMP-3	0.15
9110-150-19	GWMP-2	0.11
9110-150-20	4-B	<0.01
9110-150-21	4-C	0.06
REAGENT BLANK	-	<0.01

ATI I.D. # 9110-150

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATA

CLIENT : GOLDER ASSOCIATES
PROJECT # : 903-1060.402
PROJECT NAME : BLAINE/WATER QUALITY

MATRIX : WATER

UNITS : NTU

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
TURBIDITY	9110-150-17	1.6	1.5	2.6	N/A	N/A	N/A
TURBIDITY	9110-150-21	0.06	0.04	40	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Chain of Custody

LABORATORY NUMBER: 9110-150

PROJECT MANAGER: <u>David Barton</u>					ANALYSIS REQUEST																										
COMPANY: <u>Golden</u>					8010	8020	8020	8240	8270	8310	8080	8080	8140	8150	WDOE	418.1	413.2	8015	TOC	TOX	%	EP	Priority	8080	8240	8270	8150	Metals			
ADDRESS: _____					Halogenated	Aromatic	BETX ONLY	GCMS	GCMS	HPLC	Pesticides & PCB's	PCB's ONLY	Phosphate	Herbicides	PAH/HH (WAC 173)	(TPH)	Grease & Oil	(Modified)	9050	<u>102/103</u>	Moisture	EP TOX	Metals (13)	Pesticide (4)	ZH-EXT		Herbicides (2)	(B)			
PHONE: _____ SAMPLED BY: <u>M.B.</u>																															
SAMPLE DISPOSAL INSTRUCTIONS																															
<input checked="" type="checkbox"/> ATI Disposal @ \$5.00 each <input type="checkbox"/> Return																															
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																			TCLP ONLY								
LINCOLN	10/10/91	0845	Water	-12																											
4-A	10/10/91	0850		13																											
12th st.	10/10/91	0910		14																											
#6	10/10/91	0945		15																											
#4	10/10/91	1008		16																											
Gump-1	10/10/91	1025		17																											
Gump-3	10/10/91	1105		18																											
Gump-2	10/10/91	1145		19																											
4-B	10/10/91	0950		20																											
4-C	10/10/91	1150		21																											

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1		RELINQUISHED BY: 2		RELINQUISHED BY: 3	
PROJECT NUMBER: <u>903-1060-402</u>	TOTAL NUMBER OF CONTAINERS: <u>30</u>	COSEALS/INTACT? <u>Y/N/A</u>	RECEIVED VIA: <u>HAND DELIV</u>	Signature: <u>[Signature]</u>	Time: <u>1645</u>	Signature: _____	Time: _____	Signature: _____	Time: _____
PROJECT NAME: <u>Blaine Water Quality</u>	RECEIVED GOOD COND./COLD: <u>Y/N</u>	RECEIVED VIA: <u>HAND DELIV</u>	RECEIVED VIA: <u>HAND DELIV</u>	Printed Name: <u>Mary Birch</u>	Date: <u>10/5</u>	Printed Name: _____	Date: _____	Printed Name: _____	Date: _____
ONGOING PROJECT? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	RECEIVED VIA: <u>HAND DELIV</u>	RECEIVED VIA: <u>HAND DELIV</u>	RECEIVED VIA: <u>HAND DELIV</u>	Company: <u>Golden</u>	Company: _____	Company: _____	Company: _____	Company: _____	Company: _____
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS				RECEIVED BY: 1		RECEIVED BY: 2		RECEIVED BY: (LAB) 3	
TAT: (NORMAL) <input checked="" type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK	GREATER THAN 24 HR. NOTICE? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)	Signature: <u>[Signature]</u>	Time: <u>1045</u>	Signature: _____	Time: _____	Signature: _____	Time: _____	Signature: _____	Time: _____
SPECIAL INSTRUCTIONS:		Printed Name: <u>RULENA SATURAY</u>	Date: <u>10/31</u>	Printed Name: _____	Date: _____	Printed Name: _____	Date: _____	Printed Name: _____	Date: _____
		Company: <u>ATI-WA</u>	Company: _____	Company: _____	Company: _____	Company: _____	Company: _____	Company: _____	Company: Analytical Technologies, Inc.



Analytical Technologies, Inc.

560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

Chain of Custody LABORATORY NUMBER: 112229

PROJECT-MANAGER: <u>MARY SILVA</u>					ANALYSIS REQUEST																										
ANALYTICAL TECHNOLOGIES, INC. 560 NACHES AVE SW, SUITE 101 RENTON, WA 98055 (206) 228-8335					8240 GC/MS Volatiles	8270 GC/MS BNA'S	8310 HPLC PNA'S	8080 Pest/PCB'S	PCB's only	8150 Herbicides	TOC 9060	TOX 9020	BOD	COD	CYANIDE	MBAS	NITRATE/NITRITE	PP METALS	EPTOX METALS	TCLP METALS	TCLP 8240 (ZHE)	TCLP 8270	TCLP 8150	TCLP 8080	PHENOLS, total	% MOISTURE	TOTAL Fe, Mn	DIEST	NUMBER OF CONTAINERS		
SAMPLE DISPOSAL INSTRUCTIONS																															
<input checked="" type="checkbox"/> ATI Disposal					<input type="checkbox"/> Return																										
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																											
13 9110-150-13	10/11/91		WATER																												
14 14																															
15 15																															
16 16																															
17 17																															
18 18																															
19 19																															
20 20																															
21 21																															

PROJECT INFORMATION		SAMPLE RECEIPT		RELINQUISHED BY: 1.		RELINQUISHED BY: 2.		RELINQUISHED BY: 3.	
ATI PROJ #: <u>9110-150</u>	TOTAL NUMBER OF CONTAINERS <u>2</u>	COC SEALS/INTACT? Y/N/NA <u>N</u>		Signature: <u>Mary Silva</u>	Time: <u>10/11/91</u>	Signature:	Time:	Signature:	Time:
ATI PROJ NAME: <u>GULFAR</u>	RECEIVED GOOD COND./COLD <u>N</u>	RECEIVED VIA: <u>FED EX</u>		Printed Name: <u>Mary Silva</u>	Date: <u>10/11/91</u>	Printed Name:	Date:	Printed Name:	Date:
CLIENT PROJ: <u>9033-1060-402</u>	SPECIAL INSTRUCTIONS:		RECEIVED BY: 1.		RECEIVED BY: 2.		RECEIVED BY: (LAB) 3.		
VERBALS DUE: <u>10/24</u>			Signature:		Signature:		Signature: <u>Michael Malbran</u>		Time: <u>10/11/91</u>
HARD COPY DUE: <u>10/31</u>			Time:		Time:		Printed Name: <u>Michael Malbran</u>		Date: <u>10/11/91</u>
PRICE: _____ DISC: _____			Printed Name:		Printed Name:		Printed Name:		Date:
DIGESTION NEEDED? <u>YES PLEASE</u>			Company: <u>ATI</u>		Company:		Company:		Analytical Technologies, Inc.



APPENDIX

Analytical Technologies, Inc.
560 Naches Avenue SW
Suite 101
Renton, WA 98055
Attention: Mary Silva

Date Received: 10/11/91
Date Reported: 10/17/91

Project Name: Golder
Project #: 9110-150
PO Number: 11992
Date Sampled: 10/ 9/91

PARAMETER	UNITS	RESULT
91-A010042		
Client ID: 9110-150-1		
Nitrate + Nitrite	mg/l	1.7
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	0.68
91-A010043		
Client ID: 9110-150-2		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	0.001
Turbidity	NTU	2.2
91-A010044		
Client ID: 9110-150-3		
Nitrate + Nitrite	mg/l	1.4
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	0.25
91-A010045		
Client ID: 9110-150-4		
Nitrate + Nitrite	mg/l	1.7
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	< 0.01
91-A010046		
Client ID: 9110-150-5		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	1.5
91-A010047		
Client ID: 9110-150-6		
Nitrate + Nitrite	mg/l	3.2
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	0.12
91-A010048		
Client ID: 9110-150-7		
Nitrate + Nitrite	mg/l	0.39
Nitrite Nitrogen	mg/l	0.001
Turbidity	NTU	9.5

AMTEST

ANALYSIS REPORT

Analytical Technologies, Inc.

Date Received: 10/11/91

Attention: Mary Silva

Date Reported: 10/17/91

PARAMETER	UNITS	RESULT
91-A010049		
Client ID: 9110-150-8		
Nitrate + Nitrite	mg/l	5.5
Nitrite Nitrogen	mg/l	0.004
Turbidity	NTU	2.1
91-A010050		
Client ID: 9110-150-9		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	0.002
Turbidity	NTU	1.3
91-A010051		
Client ID: 9110-150-10		
Nitrate + Nitrite	mg/l	0.20
Nitrite Nitrogen	mg/l	0.001
Turbidity	NTU	< 0.01
91-A010052		
Client ID: 9110-150-11		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	0.001
Turbidity	NTU	1.4
91-A010053		
Client ID: 9110-150-12		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	< 0.01
91-A010054		
Client ID: 9110-150-13		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	0.001
Turbidity	NTU	0.16
91-A010055		
Client ID: 9110-150-14		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	< 0.01
91-A010056		
Client ID: 9110-150-15		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	0.001
Turbidity	NTU	< 0.01

AMTEST

ANALYSIS REPORT

Analytical Technologies, Inc.

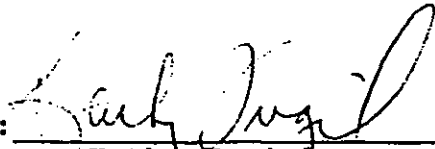
Date Received: 10/11/91

Attention: Mary Silva

Date Reported: 10/17/91

PARAMETER	UNITS	RESULT
91-A010057		
Client ID: 9110-150-16		
Nitrate + Nitrite	mg/l	0.57
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	< 0.01
91-A010058		
Client ID: 9110-150-17		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	1.6
91-A010059		
Client ID: 9110-150-18		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	0.15
91-A010060		
Client ID: 9110-150-19		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	0.11
91-A010061		
Client ID: 9110-150-20		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	0.001
Turbidity	NTU	< 0.01
91-A010062		
Client ID: 9110-150-21		
Nitrate + Nitrite	mg/l	< 0.01
Nitrite Nitrogen	mg/l	< 0.001
Turbidity	NTU	0.06

Reported by:


Kathy Fugiel

ANALYSIS REPORT

AmTest Inc.

Professional
Analytical
Services

14603 N.E. 87th St.
Redmond, WA
98052

Fax: 206 883 3495

Tel: 206 885 1664

Analytical Technologies, Inc.

DATE RECEIVED: 10/11/91

Mary Silva
560 Naches Avenue SW, Suite 101
Renton, WA 98055

DATE REPORTED: 10/21/91

QUALITY CONTROL - DUPLICATE ANALYSIS

ANALYTE	SAMPLE NUMBERS	DUPLICATE #1 (mg/l)	DUPLICATE #2 (mg/l)	RELATIVE PERCENT DIFFERENCE (%)
Turbidity	91-A010058	1.6	1.5	2.6
	91-A010062	0.06	0.04	40.
Nitrite Nitrogen	91-A010042	<0.001	<0.001	-
	91-A010062	<0.001	<0.001	-
Nitrate + Nitrogen	91-A010050	<0.010	<0.010	-
	91-A010060	<0.010	<0.010	-
	91-A010062	<0.010	<0.010	-

< = less than

Analytical Technologies, Inc.

DATE RECEIVED: 10/11/91

Mary Silva

DATE REPORTED: 10/21/91

QUALITY CONTROL - SPIKE RECOVERY DATA

ANALYTE	SAMPLE NUMBERS	SPIKED ADDED (mg/l)	RECOVERY (%)
Nitrite Nitrogen	91-A010042	0.020	92.
	91-A010062	0.020	95.
Nitrate + Nitrite Nitrogen	91-A010051	2.5	108.
	91-A010061	2.5	102.
	91-A010062	2.5	102.

REPORTED BY


Kathy Ruziel

KF/pb

METHODOLOGY REPORT

AM TEST IDENTIFICATION NUMBER 91-A010042
CLIENT ID 9110-150-1

ANALYTE	METHOD	METHOD REFERENCE	DETECTION LIMIT	DATE ANALYZED
Nitrate + Nitrite	353.2	EPA	0.010	10/16/91
Nitrite Nitrogen	354.1	EPA	0.001	10/11/91
Turbidity	180.1	EPA	0.01	10/14/91



Analytical Technologies, Inc.

560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

ANALYST

DATE _____ PAGE _____ OF _____

Chain of Custody LABORATORY NUMBER: _____

PROJECT MANAGER: <u>MARY SILVA</u>					ANALYSIS REQUEST																										
COMPANY: _____					8010	8020	8020	8240	8270	8310	8080	8080	8140	8150	WDOE	418.1	413.2	8015	TOC	TOX	%	EP	Priority	8080	8240	8270	8150	Metals	805.102	Turbidity	NUMBER
ADDRESS: _____					Halogenated	Aromatic	BETX ONLY	GCMS	GCMS	HPLC	Pesticides & PCB's	PCB's ONLY	Phosphate	Herbicides	PAH/HH (WAC 173)	(TPH)	Grease & Oil	(Modified)	9060	9020	Moisture	Metals (9) EP EXT	Metals (13)	Pesticide (4)	ZH-EXT	Herbicides (2)	Metals (8)				
PHONE: _____ SAMPLED BY: _____																															
SAMPLE DISPOSAL INSTRUCTIONS																															
<input checked="" type="checkbox"/> ATI Disposal @ \$5.00 each					<input type="checkbox"/> Return																										
SAMPLE ID	DATE	TIME	MATRIX	LAB ID																											
110-150-1	10-25-01	0550	110																												
2		1025																													
3		1125																													
4		1111																													
5		1200																													
6		1245																													
7		1520																													
8		1525																													
9		1425																													
10		1445																													
11		1420																													
12	10-10-01	0545																													

PROJECT INFORMATION			SAMPLE RECEIPT			RELINQUISHED BY: 1		RELINQUISHED BY: 2		RELINQUISHED BY: 3	
PROJECT NUMBER: <u>5110-150</u>	TOTAL NUMBER OF CONTAINERS		COC SEALS/INTACT? Y/N/NA		Signature: <u>[Signature]</u> Time: <u>1450</u>		Signature: _____ Time: _____		Signature: _____ Time: _____		
PROJECT NAME: <u>FIELDER</u>	RECEIVED GOOD COND/COLD		RECEIVED VIA: <u>DELIVER</u>		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		
PURCHASE ORDER NUMBER: <u>11092</u>	ONGOING PROJECT? YES <input type="checkbox"/> NO <input type="checkbox"/>		RECEIVED VIA: <u>DELIVER</u>		Company: <u>ATI</u>		Company: _____		Company: _____		
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS						RECEIVED BY: 1		RECEIVED BY: 2		RECEIVED BY: (LAB) 3	
TAT: (NORMAL) <input type="checkbox"/> 2WKS (RUSH) <input type="checkbox"/> 24HR <input type="checkbox"/> 48 HRS <input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK	GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/> (LAB USE ONLY)				Signature: _____ Time: _____		Signature: _____ Time: _____		Signature: _____ Time: _____		
SPECIAL INSTRUCTIONS:						Printed Name: _____ Date: _____		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
* HOLD TIMES NEARLY UP * (DATE 10-25-01)						Company: _____		Company: _____		Analytical Technologies, Inc.	



Analytical Technologies, Inc.

560 Naches Avenue SW, Suite 101 Renton, WA 98055 (206)228-8335

ANALYST

Chain of Custody

DATE 10-10-99 PAGE 1 OF 2

LABORATORY NUMBER: _____

PROJECT MANAGER: MARY SILVA
 COMPANY: _____
 ADDRESS: _____
 PHONE: _____ SAMPLED BY: _____

SAMPLE DISPOSAL INSTRUCTIONS

ATI Disposal @ \$5.00 each Return

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
110-150-13	10-10-99	0950	H2O	
14		0910		
15		0945		
16		1008		
17		1024		
18		1105		
19		1145		
20		0950		
21		1150		

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	8020 BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	8080 PCB'S ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAHHH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	EP TOX Metals (8) EP EXT	Priority Pollutant Metals (13)	TCLP ONLY			Asbestos	Lead	NUMBER OF CONTAINERS	
13	10-10-99	0950	H2O																											3
14		0910																												3
15		0945																												3
16		1008																												3
17		1024																												3
18		1105																												3
19		1145																												3
20		0950																												3
21		1150																												3

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NUMBER: <u>110-150</u>	TOTAL NUMBER OF CONTAINERS: _____	PROJECT NAME: <u>GOLDER</u>	COC SEALS/INTACT? <u>Y/N/A</u>
PURCHASE ORDER NUMBER: <u>11392</u>	RECEIVED GOOD COND/COLD: _____	ONGOING PROJECT? YES <input type="checkbox"/> NO <input type="checkbox"/>	RECEIVED VIA: <u>see pg 1</u>
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS			
TAT: (NORMAL) <input type="checkbox"/> 2WKS	(RUSH) <input type="checkbox"/> 24HR	<input type="checkbox"/> 48 HRS	<input type="checkbox"/> 72 HRS <input type="checkbox"/> 1 WK
GREATER THAN 24 HR. NOTICE? YES <input type="checkbox"/> NO <input type="checkbox"/>		(LAB USE ONLY)	
SPECIAL INSTRUCTIONS:			

RELINQUISHED BY: 1	RELINQUISHED BY: 2	RELINQUISHED BY: 3
Signature: _____	Signature: _____	Signature: _____
Time: _____	Time: _____	Time: _____
Printed Name: _____	Printed Name: _____	Printed Name: _____
Date: _____	Date: _____	Date: _____
Company: <u>ATI</u>	Company: _____	Company: _____
RECEIVED BY: 1	RECEIVED BY: 2	RECEIVED BY: (LAB) 3
Signature: _____	Signature: _____	Signature: _____
Time: _____	Time: _____	Time: _____
Printed Name: _____	Printed Name: _____	Printed Name: _____
Date: _____	Date: _____	Date: _____
Company: _____	Company: _____	Analytical Technologies, Inc.

APPENDIX H
GROUND WATER RECHARGE

Table H-1

Summary Water Balance
Boundary Upland Area

1990-1991										Maximum SMD Runoff	6.00 in 25.00 %
Month	Precip P (in)	Precip TI-R (in)	Pot Evap ETp (in)	Act Evap ETa (in)	Balance X (in)	Inflit I (in)	Available Q (in)	Pot SMD Dp (in)	Act SMD Da (in)	Recharge R (in)	
Jun	3.81	2.86	3.83	3.83	-0.97	0.00	0.97	2.02	2.02	0.00	
Jul	0.56	0.42	4.72	4.40	-4.30	0.00	4.30	6.32	6.00	0.00	
Aug	2.15	1.61	4.22	1.61	-2.61	0.00	2.61	8.61	6.00	0.00	
Sep	1.26	0.95	2.97	0.95	-2.03	0.00	2.03	8.03	6.00	0.00	
Oct	5.72	4.29	1.65	1.65	2.64	2.64	0.00	3.36	3.36	0.00	
Nov	11.90	8.93	0.89	0.89	8.04	8.04	0.00	-4.68	0.00	4.68	
Dec	8.10	6.07	0.01	0.01	6.06	6.06	0.00	-6.06	0.00	6.06	
Jan	4.20	3.15	0.12	0.12	3.03	3.03	0.00	-3.03	0.00	3.03	
Feb	4.45	3.34	0.00	0.00	3.34	3.34	0.00	-3.34	0.00	3.34	
Mar	3.14	2.36	0.93	0.93	1.42	1.42	0.00	-1.42	0.00	1.42	
Apr	4.28	3.21	1.79	1.79	1.42	1.42	0.00	-1.42	0.00	1.42	
May	2.18	1.64	3.01	3.01	-1.37	0.00	1.37	1.37	1.37	0.00	
Totals =	51.75	38.81	24.14	19.19		25.95	11.28			19.95	

Evapotranspiration (ETS)

$$ETS = \begin{cases} SROS & \text{if } SROS < PETS \\ PETS & \text{if } SROS \geq PETS \end{cases}$$

Where PETS = Potential Evapotranspiration
Assume ETS before INF

Precipitation

$$\text{Surface Water Runoff (SRO)} = \begin{cases} \frac{(SROS - SROS \times S)^2}{SROS + S - S \times SROC} & \text{if } SROS \geq 0.2 \times S \\ 0 & \text{otherwise} \end{cases}$$

$$S = \frac{1000}{SROP} - 10 \text{ where } 0 < SROP < 100$$

Surface Storage (SROS)

Assume SRO before ETS or INF

Infiltration (INF)

$$INF = PINF \times SROS$$

where

$$PINF = \begin{cases} CINF \left(1 - \frac{GWS}{GWSM}\right) & \text{if } GWS < GWSM \\ 0 & \text{if } GWS \geq GWSM \end{cases}$$

GWSM = Ground Water Storage Available

Ground Water Storage (GWS)

Ground Water Runoff (GWRO)

$$GWRO = PGWRO [1 - \text{EXP}(-CGWS \times GWS)]$$

where
PGWRO = "Discharge" Capacity

Total Runoff

Fitting Coefficients

SROC for Surface Water Runoff
CINF for Infiltration
CGWS for Ground Water Runoff

FIGURE H-1
SCHEMATIC OPTIMIZATION
WATER BALANCE MODEL
BLAINE/FINAL REPORT/WA

Table H-2

Summary Water Balance
Boundary Upland Area

1990-1991										
								Maximum SMD Runoff	6.00 in 10.00 %	
Month	Precip P (in)	Precip TI-R (in)	Pot Evap ETp (in)	Act Evap ETa (in)	Balance X (in)	Infilt I (in)	Available Q (in)	Pot SMD Dp (in)	Act SMD Da (in)	Recharge R (in)
Jun	3.81	3.43	3.83	3.83	-0.40	0.00	0.40	1.78	1.78	0.00
Jul	0.56	0.50	4.72	4.72	-4.22	0.00	4.22	5.99	5.99	0.00
Aug	2.15	1.93	4.22	1.94	-2.29	0.00	2.29	8.28	6.00	0.00
Sep	1.26	1.13	2.97	1.13	-1.84	0.00	1.84	7.84	6.00	0.00
Oct	5.72	5.15	1.65	1.65	3.50	3.50	0.00	2.50	2.50	0.00
Nov	11.90	10.71	0.89	0.89	9.82	9.82	0.00	-7.32	0.00	7.32
Dec	8.10	7.29	0.01	0.01	7.28	7.28	0.00	-7.28	0.00	7.28
Jan	4.20	3.78	0.12	0.12	3.66	3.66	0.00	-3.66	0.00	3.66
Feb	4.45	4.01	0.00	0.00	4.01	4.01	0.00	-4.01	0.00	4.01
Mar	3.14	2.83	0.93	0.93	1.90	1.90	0.00	-1.90	0.00	1.90
Apr	4.28	3.85	1.79	1.79	2.06	2.06	0.00	-2.06	0.00	2.06
May	2.18	1.96	3.01	3.01	-1.05	0.00	1.05	1.05	1.37	0.00
Totals =	51.75	46.58	24.14	20.03		32.22	9.79			26.22

Upper Dakota Creek Water Balance 1989-1990

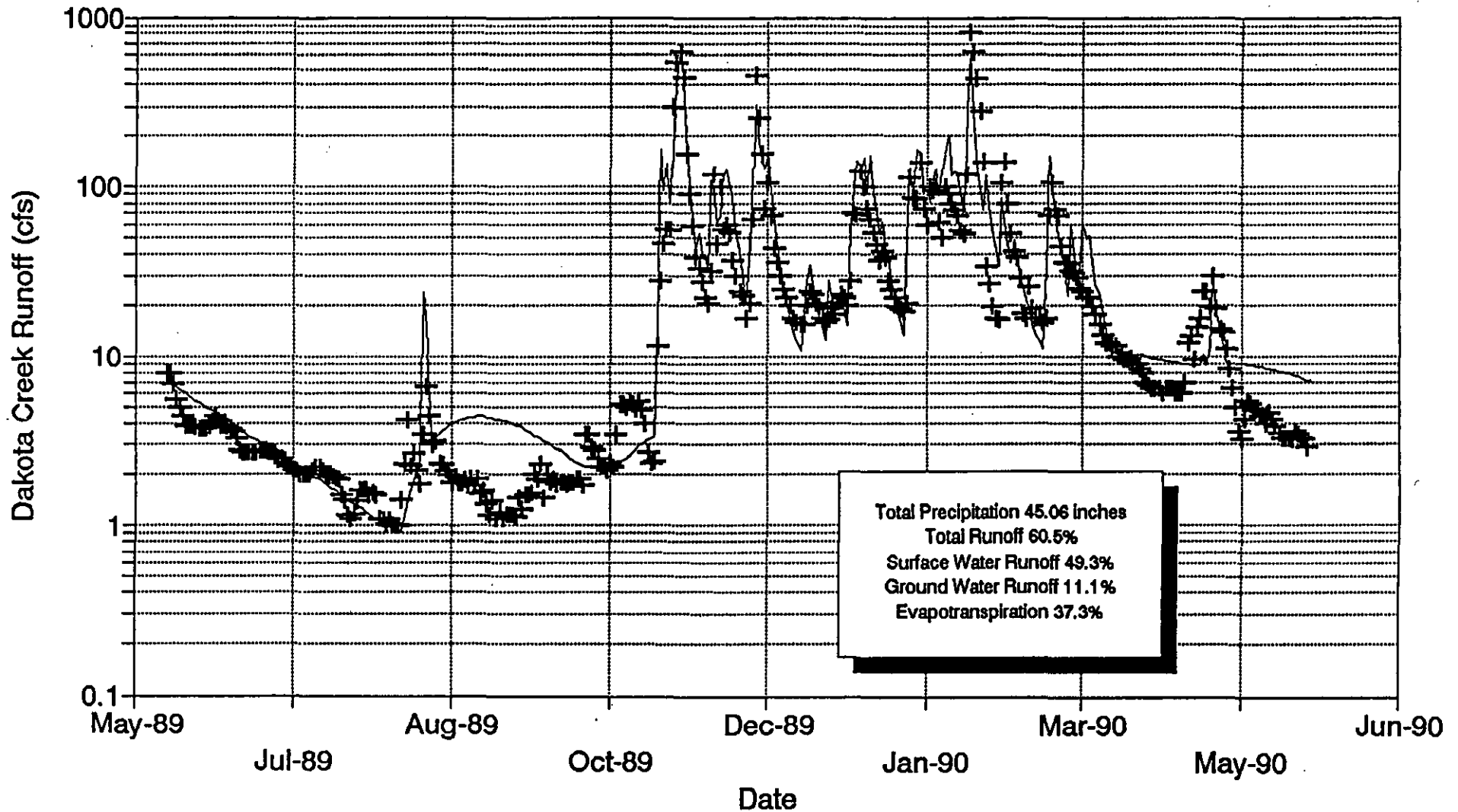


Figure H-2

Upper Dakota Creek Water Balance 1989-1990

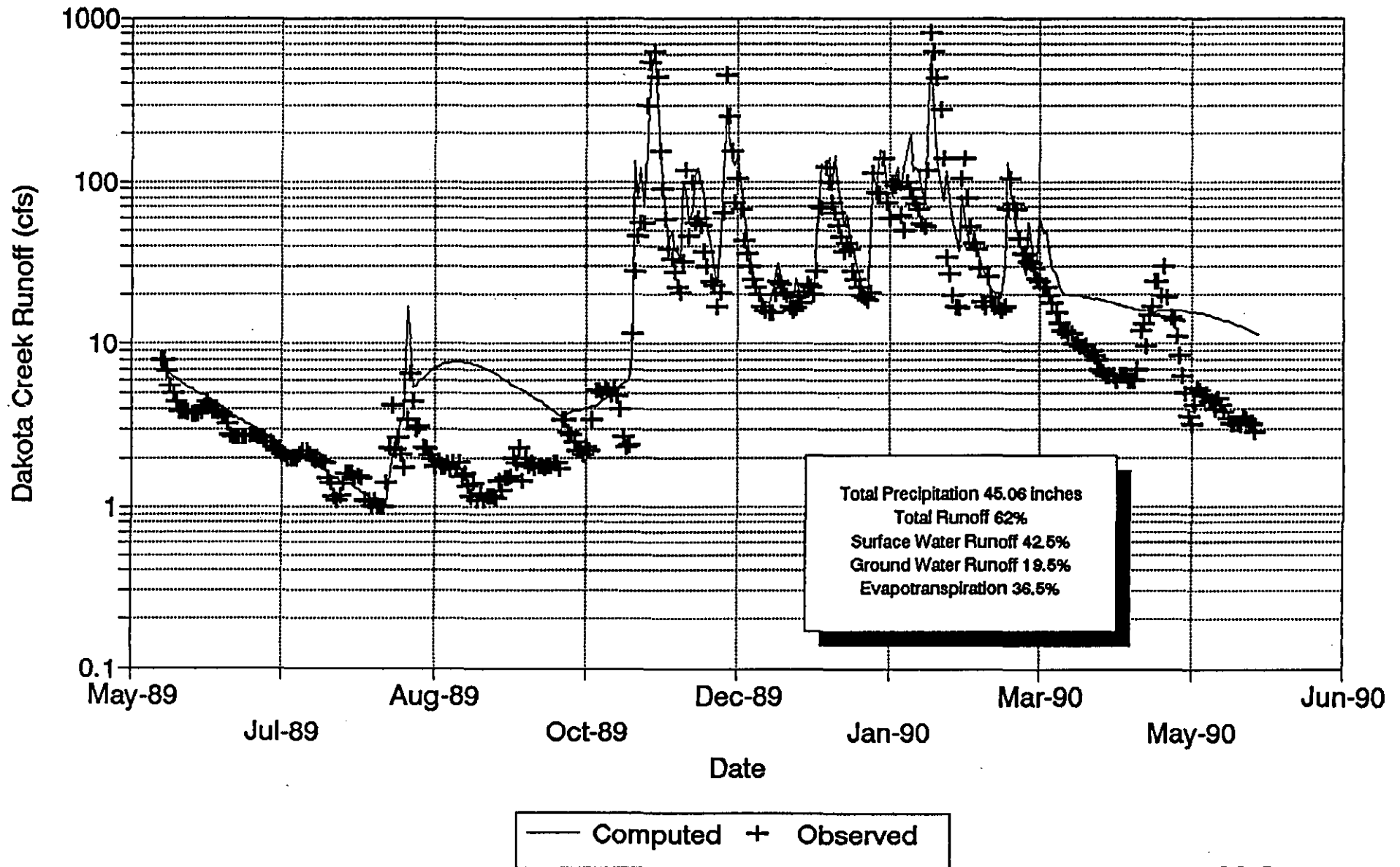


Figure H-3

Upper Dakota Creek Water Balance 1990-91

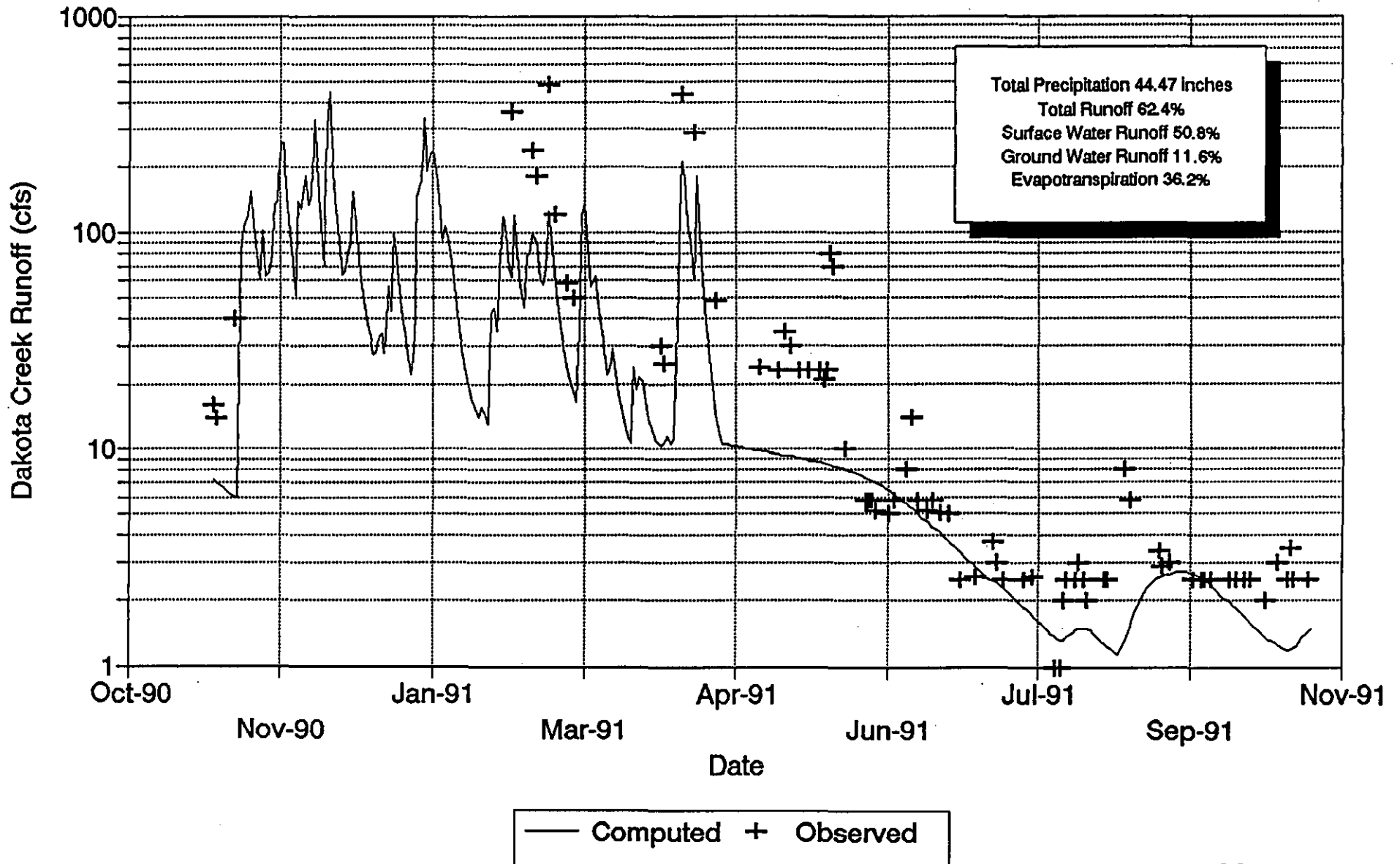


Figure H-4

Upper Dakota Creek Water Balance 1990-91

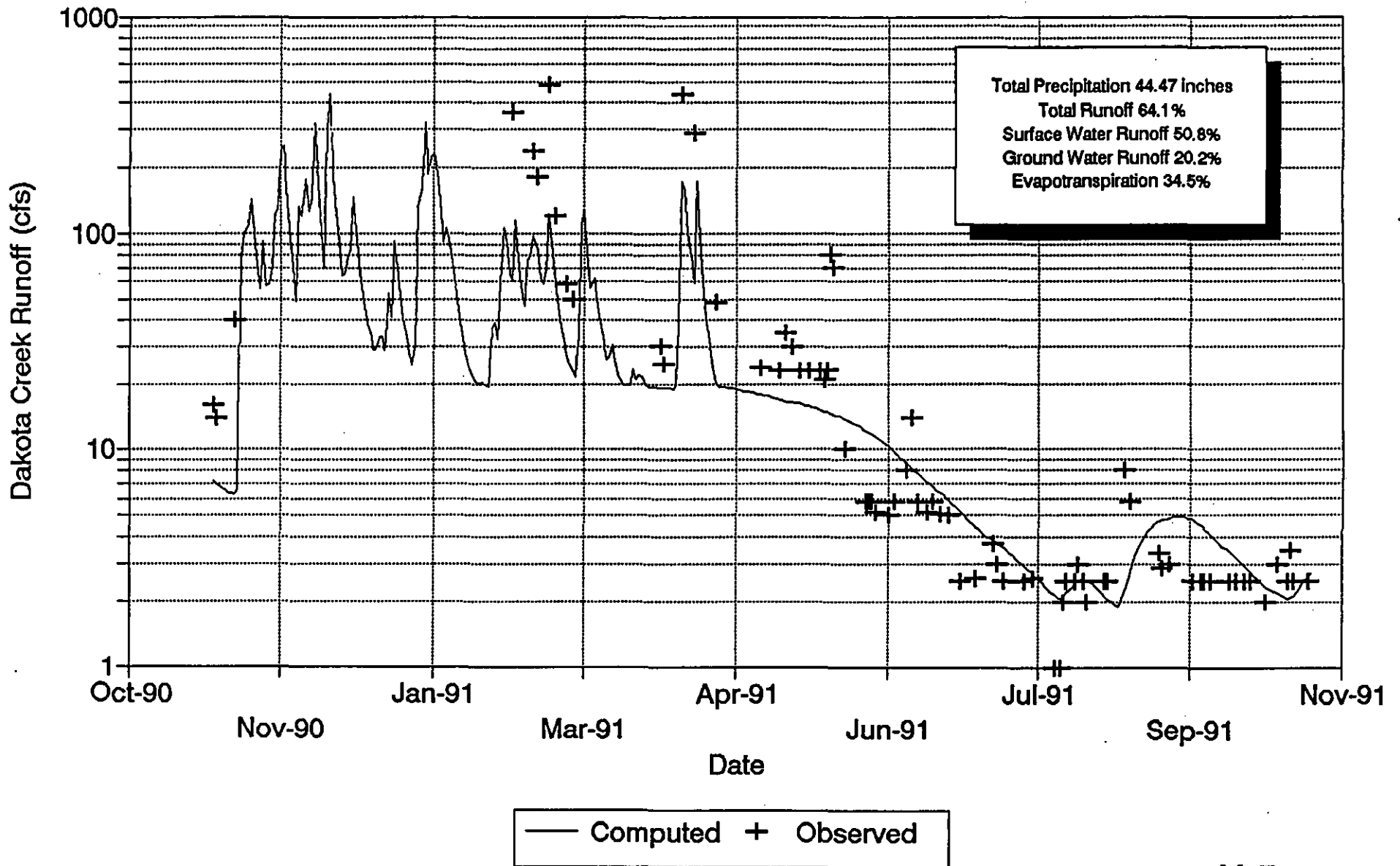


Figure H-5