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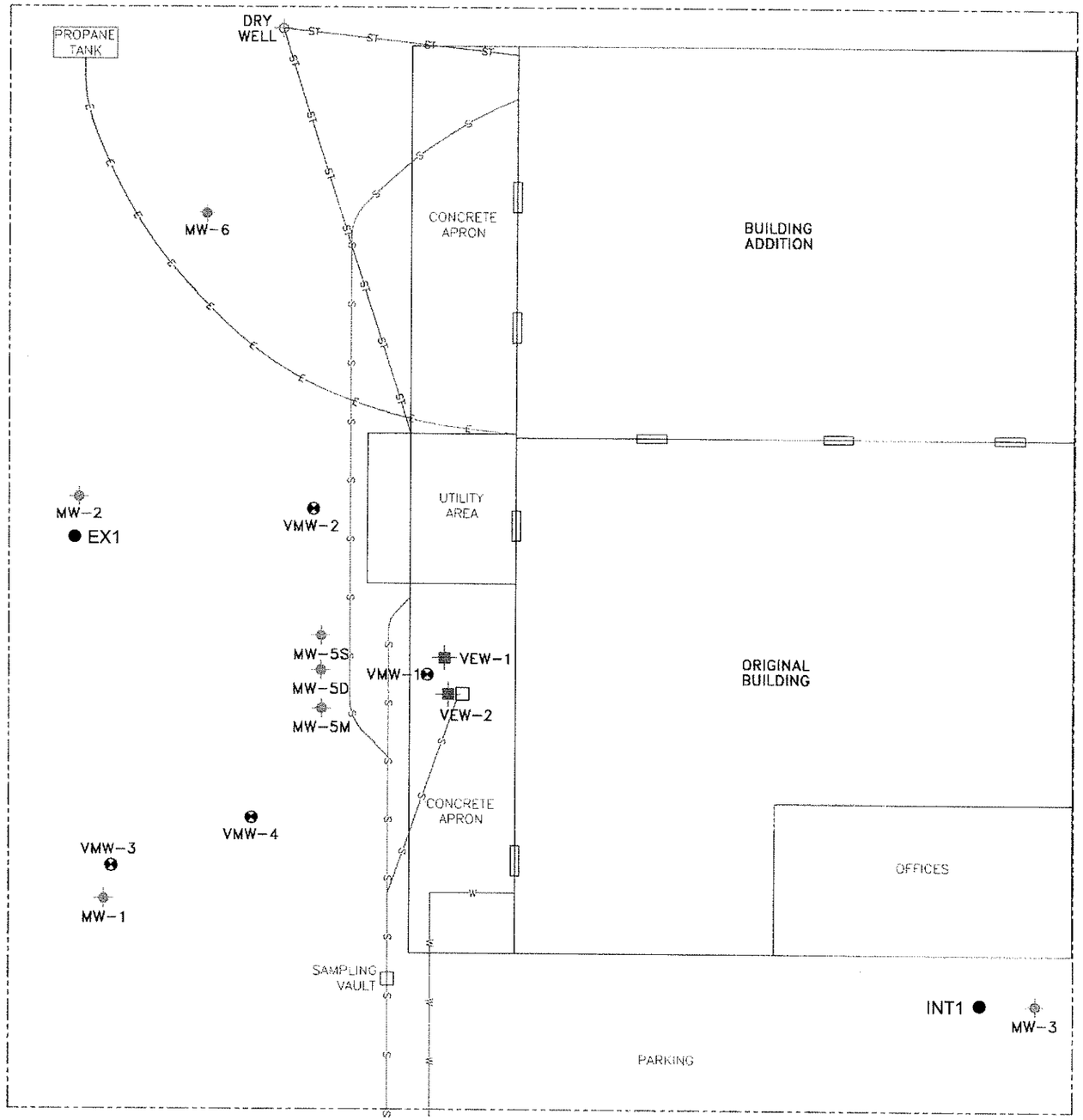
GEOLOGIC LOGS

EX-1
AVB40-07
AVB40-05
AVB77-01
AVB77-03
INJ1



EXPLANATION

- MONITOR WELL
- VAPOR MONITORING WELL
- VAPOR EXTRACTION WELL
- VAULT
- DRY WELL
- WATER LINE
- POWER LINE
- SEWER LINE
- STORM DRAIN
- GROUNDWATER INJECTION/EXTRACTION WELL

N

0 30 60

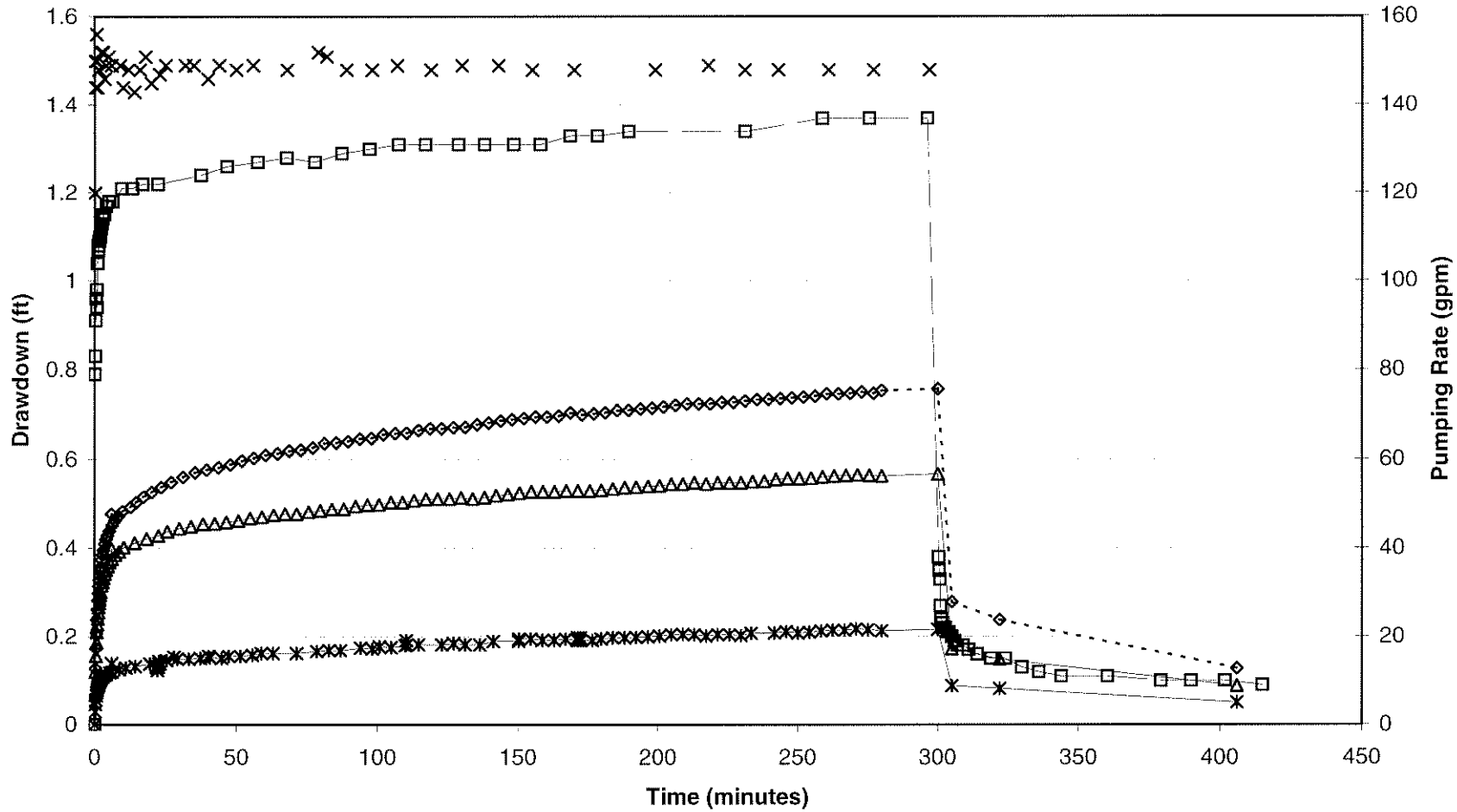
SCALE IN FEET

NOTE: UTILITY, BUILDING, AND PROPERTY LINE LOCATIONS ARE APPROXIMATE AND SHOULD BE VERIFIED PRIOR TO ANY CONSTRUCTION.
SOURCE: FLUOR DANIEL GTI, FIGURE 2 'DRAFT SITE PLAN'. INJECTION AND EXTRACTION WELLS FROM HYDRO GEO CHEM, INC.

HYDRO GEO CHEM, INC.

ALSCo SITE PLAN

Approved	Date	Revised	Date	Reference:	FIG.
SJS	3/5/99	DRM	2/1/00	6790005A	S-1

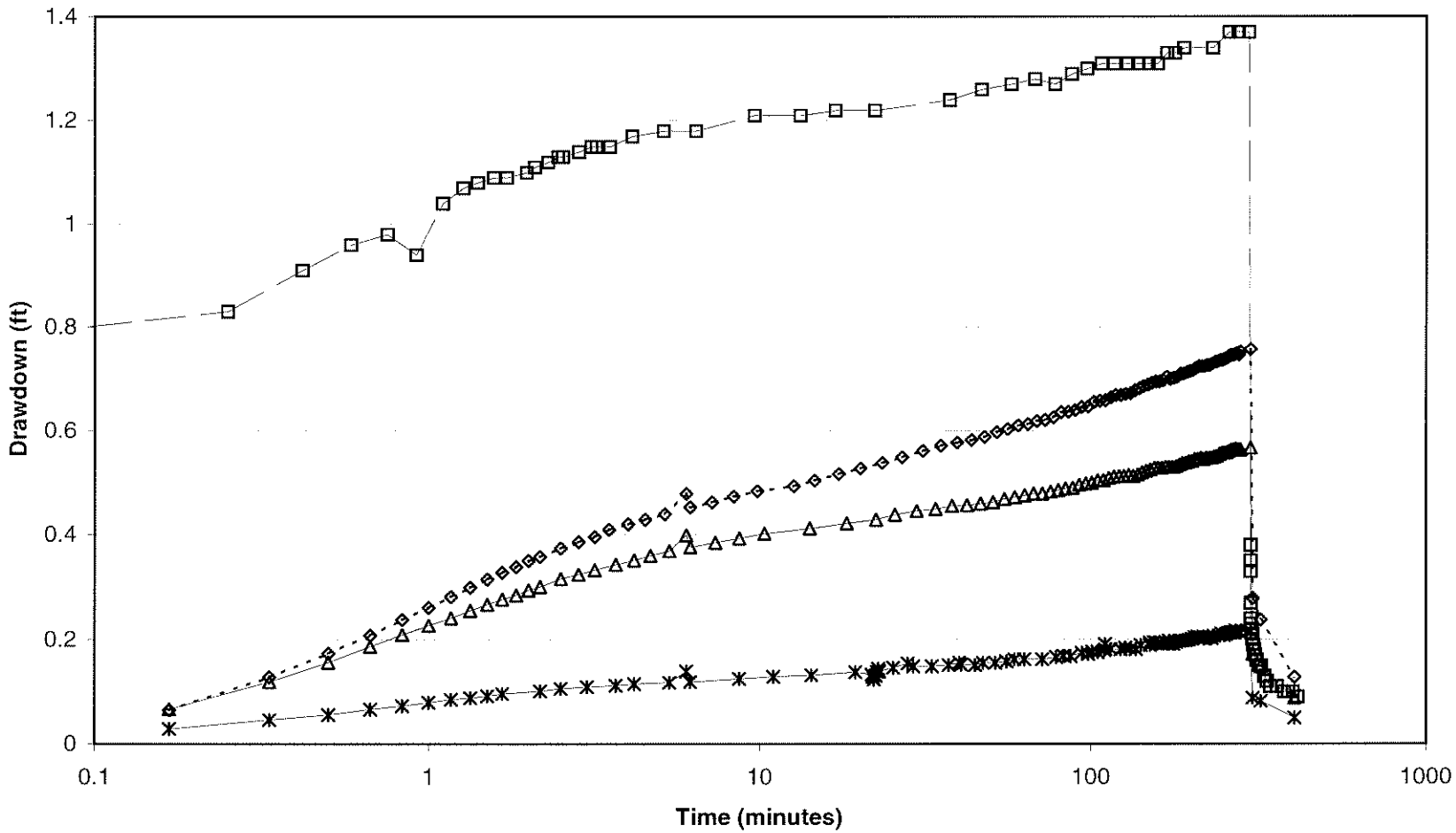


HYDRO GEO CHEM, INC.

MEASURED WATER LEVEL DRAWDOWN AND PUMPING RATES DURING CONSTANT RATE TEST

APPROVED	DATE	REFERENCE	FIGURE
DRM	1/21/00		S-2

h:/679100/pump test/FINAL analysis.xls/Test Data (Arith)



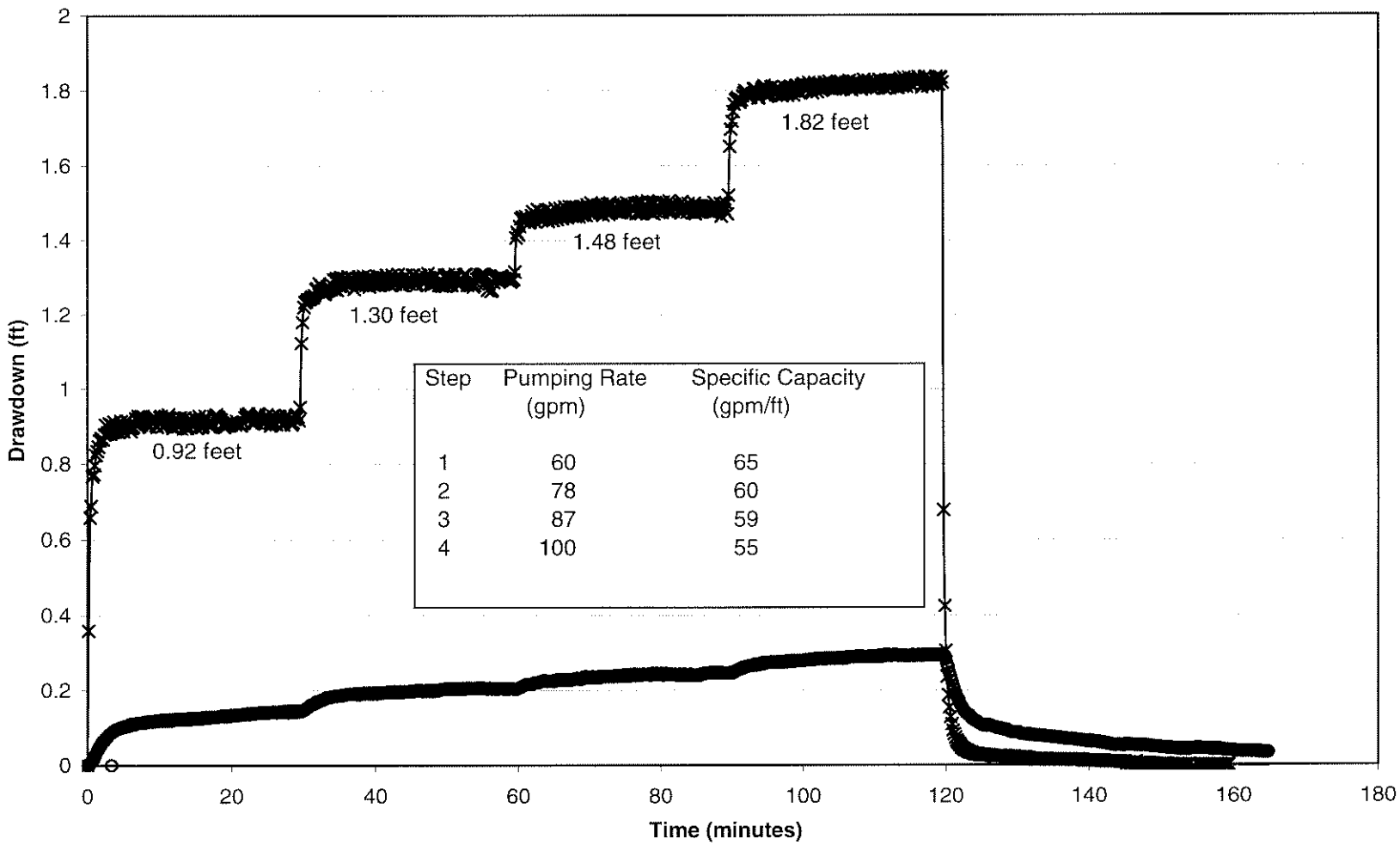
EX1 — MW2 — MW5S — MW5M

HYDRO GEO CHEM, INC.

MEASURED WATER LEVEL DRAWDOWN DURING CONSTANT RATE TEST

APPROVED	DATE	REFERENCE	FIGURE
DRM	1/21/00		S-3

h:/679100/pump test/FINAL analysis.xls:Test Data (LOG)



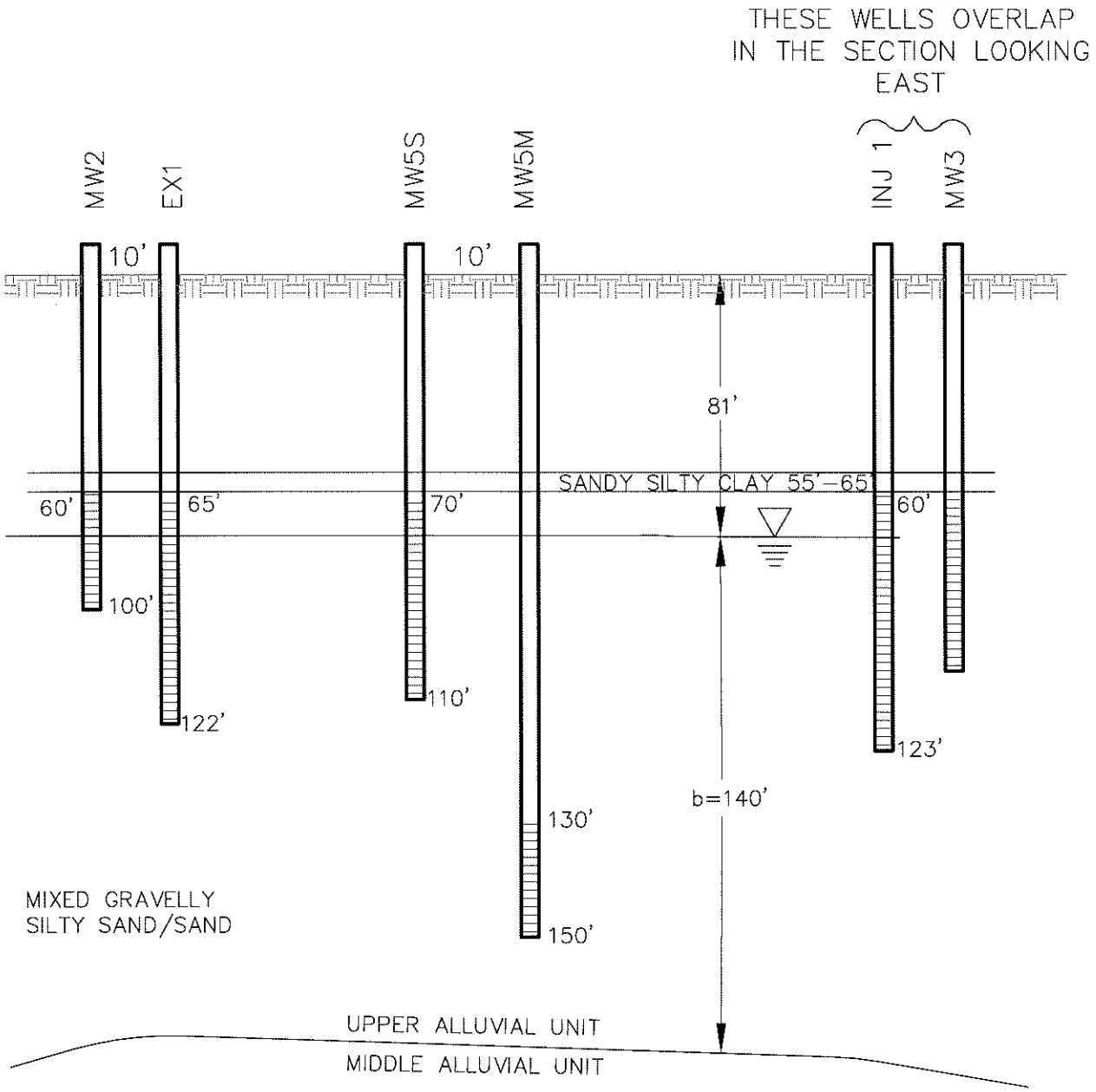
Step	Pumping Rate (gpm)	Specific Capacity (gpm/ft)
1	60	65
2	78	60
3	87	59
4	100	55

HYDRO GEO CHEM, INC.

WATER LEVEL DRAWDOWN DURING STEP TEST OF WELL INJ1

APPROVED	DATE	REFERENCE	FIGURE
DRM	1/30/00		S-4

H:\679100\pump test\step.xlsDDN Plot

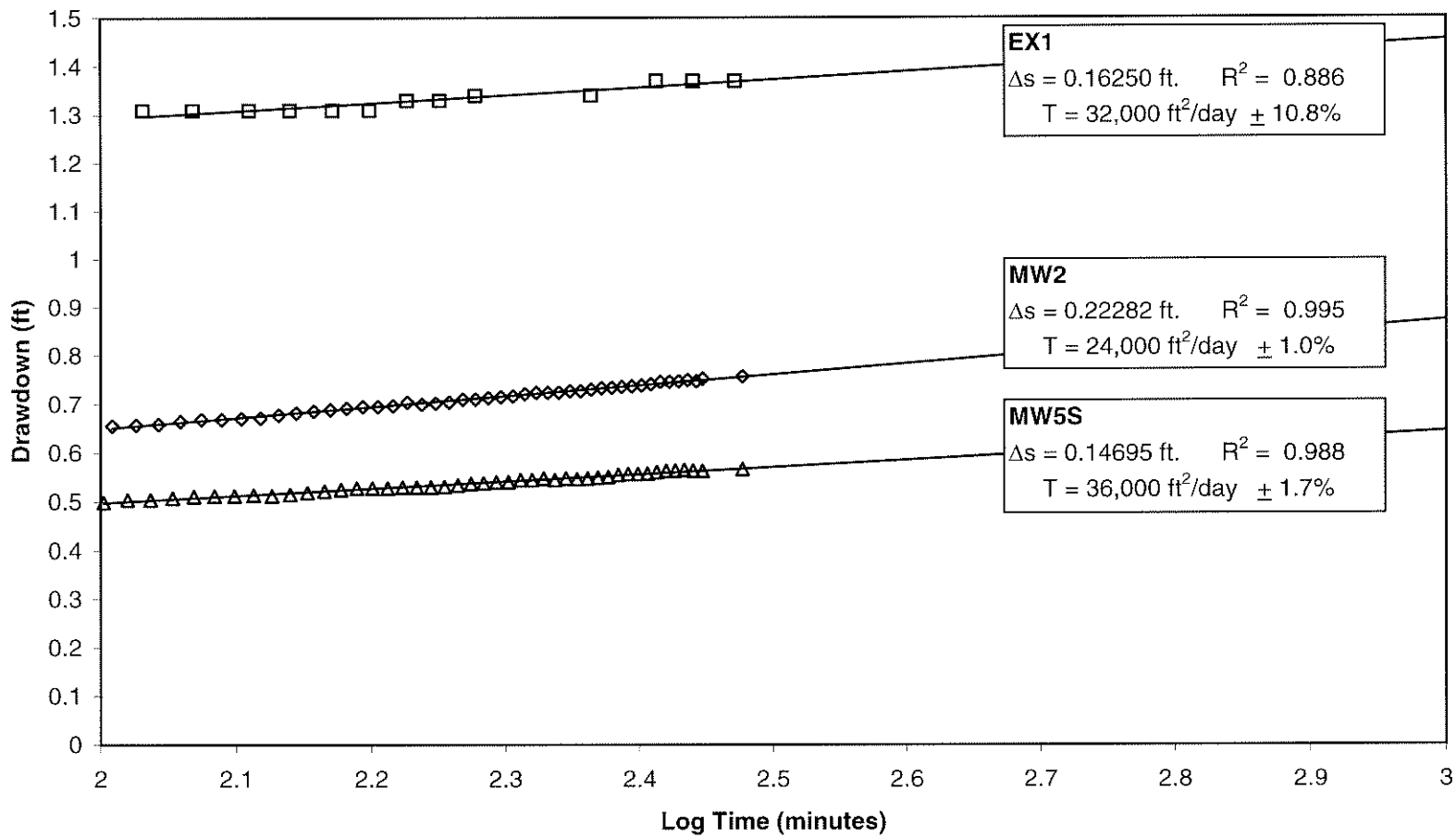


NOT TO SCALE

HYDRO GEO CHEM, INC.

SUBSURFACE VIEW OF ALSCo SITE LOOKING EAST

Approved	Date	Revised	Date	Reference:	FIG.
AF	01/12/00			67910002	S-5



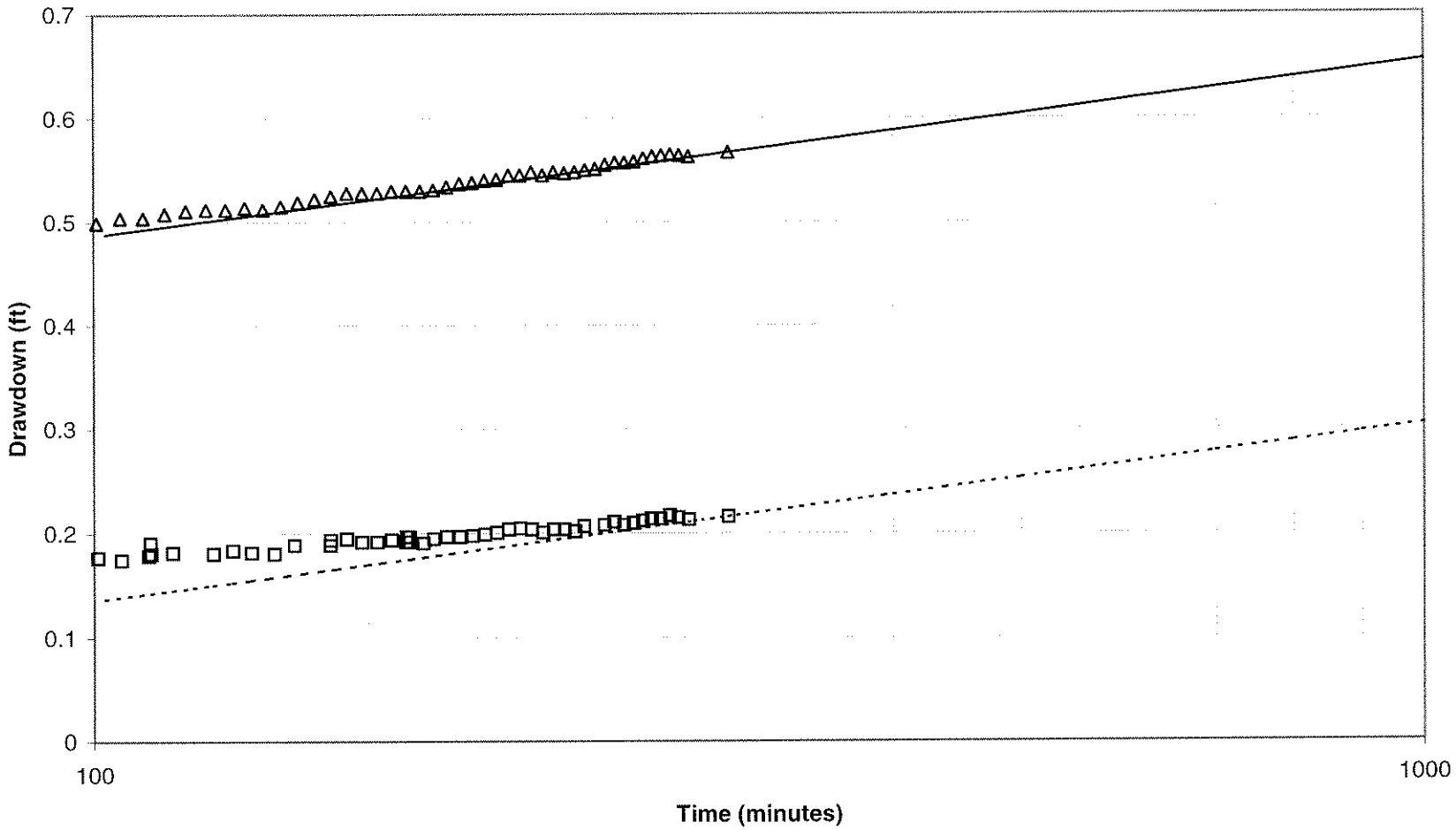
□ EX1 ◇ MW2 △ MW5S

HYDRO GEO CHEM, INC.

COOPER-JACOB SOLUTION USING REGRESSION OF LATE TIME DRAWDOWN OBSERVATIONS

APPROVED	DATE	REFERENCE	FIGURE
DRM	1/21/00		S-6

h:/679100/pump test/FINAL analysis.xls:ddn plot - straight line



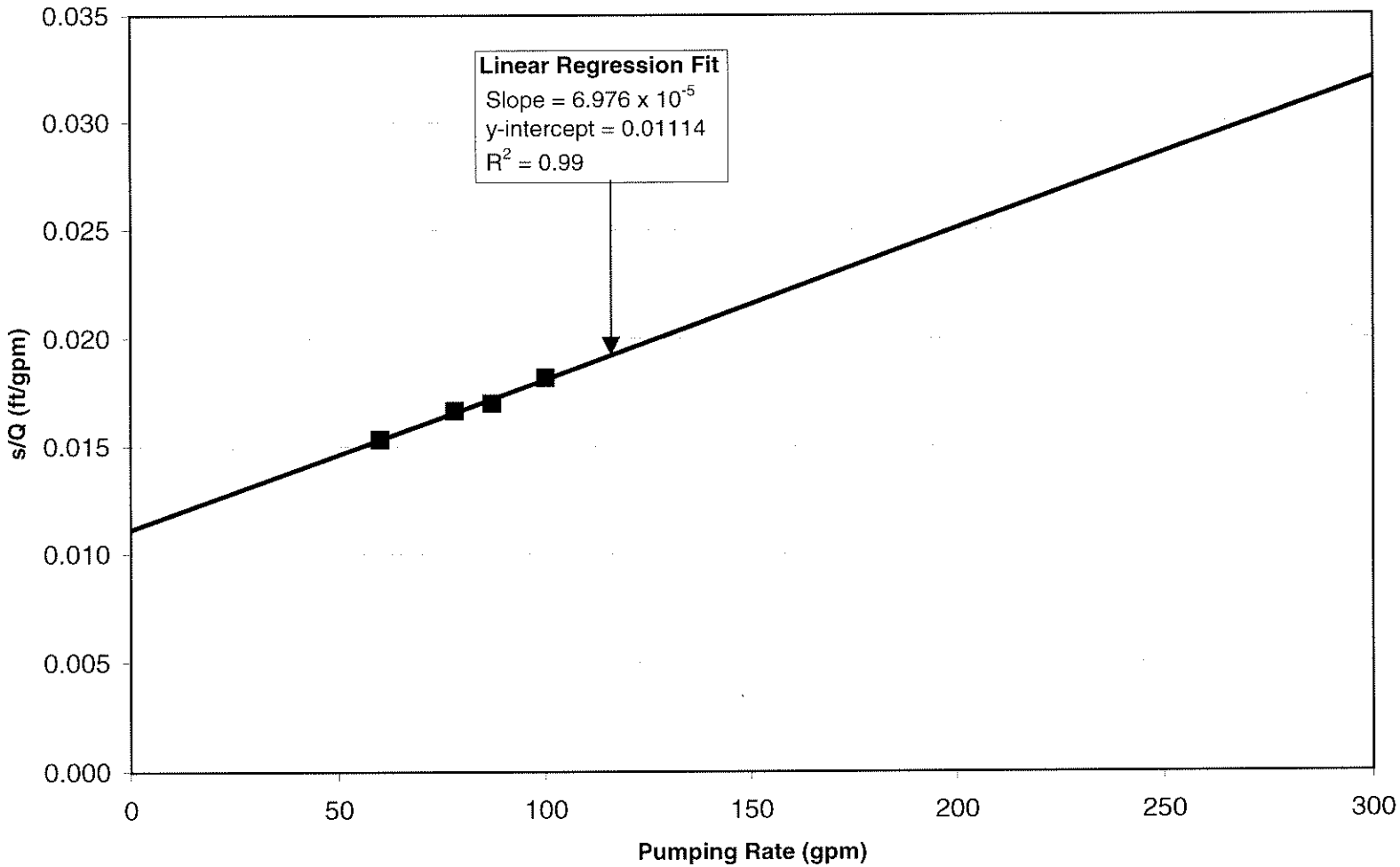
Observed MW5S
Observed MW5M
Computed MW5S
Computed MW5M

HYDRO GEO CHEM, INC.

WHIP SOLUTION - CURVE MATCH TO ESTIMATE VERTICAL HYDRAULIC CONDUCTIVITY

APPROVED	DATE	REFERENCE	FIGURE
ADF	1/11/00		S-7

h:/679100/pump test/FINAL analysis.xls:ddn plot - VALP



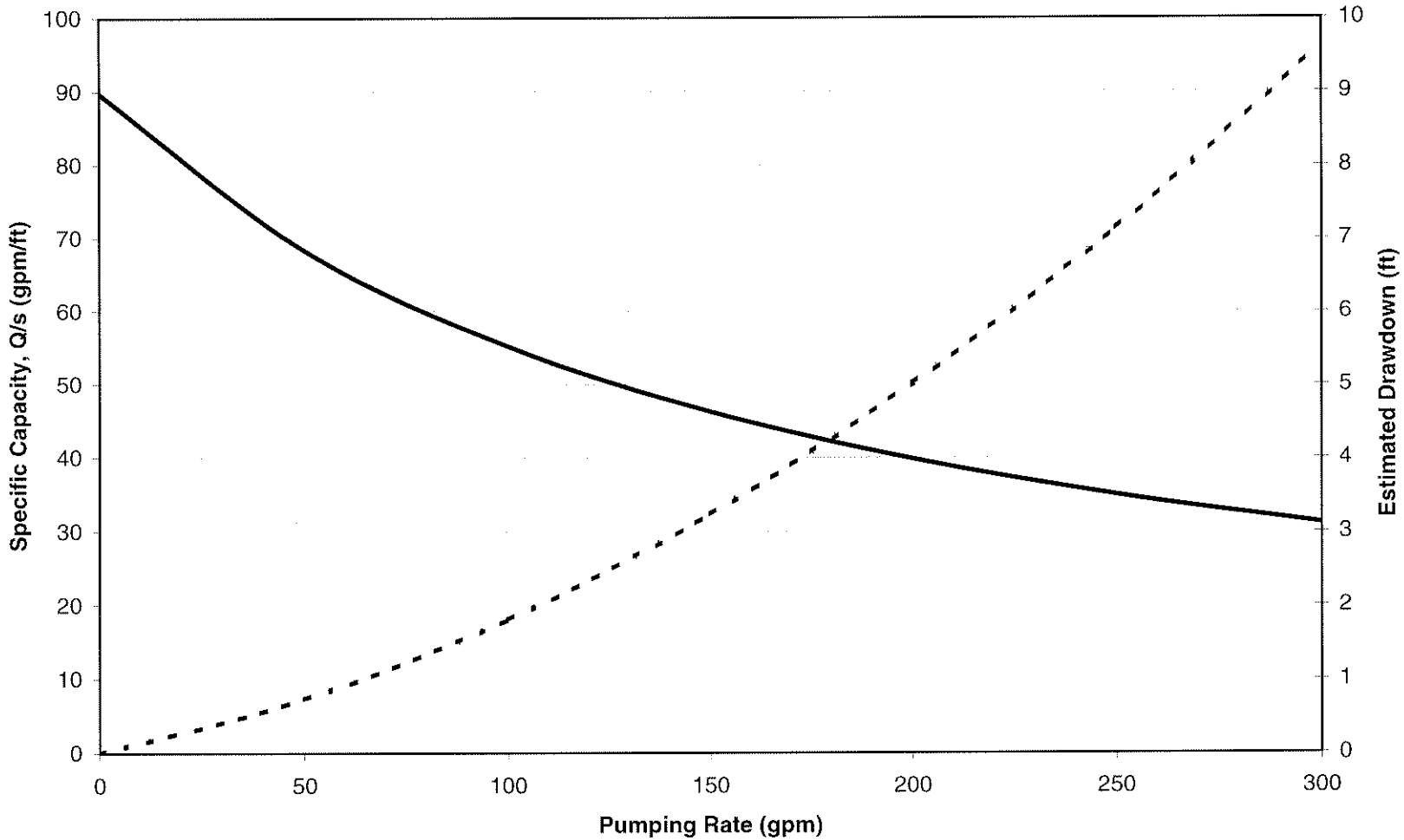
■ Observed at INJ1

HYDRO GEO CHEM, INC.

BIERSCHENK'S METHOD OF ANALYSIS OF WELL INJ1

APPROVED	DATE	REFERENCE	FIGURE
DRM	1/28/00		S-8

h:/679100/pump test/step.xls:Bierschenk Plot



Specific Capacity

Estimated Drawdown

HYDRO GEO CHEM, INC.

PROJECTED PERFORMANCE OF WELL INJ1 BASED ON BIERSCHENK'S REGRESSION FIT

APPROVED	DATE	REFERENCE	FIGURE
DRM	1/28/00		S-9

h:/679100/pump test/step.xls:INJ1 Performance Plot

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMPLE NO.	BLOWS/ FOOT	PID ppm	BORING COMPLETION	WELL DESCRIPTION
			Asphalt					
1		SM	Silty fine sand, dark brown, slightly moist, trace clay.					
2								
3								
4								
5								
6								
7								
8								
9								
10		SW	Poorly sorted sand with trace clay, silt & gravel, brown, slightly moist.					
11								
12								
13								
14								
15		SM	Silty fine sand, brown, slightly moist, trace clay.					
16								
17								
18								
19		SG	Gravelly sand, brown, dry, sand medium to coarse, gravel angular to slightly rounded.					
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								

PROJ.#: 03103102-2	DRILL DATE: 11/19-11/24/99
LOGGED BY: A. Gordon	
PROJECT MANAGER: R. Petrus	
NOTES: N/A	
DEPTH TO WATER: 83' bgs	
RIG TYPE: AP 1000	DIAMETER: 12"
DRILLER: THF	TOTAL DEPTH: 125' bgs
DRILLING METHOD: Percussion Hammer	

BESK/TerraNext

EX-1
FIELD BOREHOLE LOG
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMERICAN LINEN & SUPPLY COMPANY
PHOENIX, ARIZONA

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMPLE NO.	BLOWS/ FOOT	PID ppm	BORING COMPLETION	WELL DESCRIPTION
31		GW	Sandy gravel, brown, dry, fine sand with trace silt.					
32								
33								
34								
35		GP	Gravel with some sand, brown, dry, gravel rounded to semi-rounded.					
36								
37								
38								
39								
40		SW	Poorly sorted sand with gravel & silt, brown, dry, sand fine.					
41								
42								
43								
44		SG	Gravelly sand with silt, brown, dry, sand fine.			95	From cuttings blown out of cyclone - baggie reading	
45								
46								
47								
48								
49								
50		SM	Silty sand with gravel, dark brown, slightly moist, trace clay, sand fine.					
51								
52								
53								
54								
55		ML	Silt with trace clay, brown, dry, occasional gravel.					
56								
57								
58								
59								

PROJ.#: 03103102-2	DRILL DATE: 11/19-11/24/99
LOGGED BY: A. Gordon	
PROJECT MANAGER: R. Petrus	
NOTES: N/A	
DEPTH TO WATER: 63' bgs	
RIG TYPE: AP 1000	DIAMETER: 12"
DRILLER: THF	TOTAL DEPTH: 125' bgs
DRILLING METHOD: Percussion Hammer	

BE&K/TerraNext

EX-1
FIELD BOREHOLE LOG
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMERICAN LINEN & SUPPLY COMPANY
PHOENIX, ARIZONA

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMPLE NO.	BLOWS/ FOOT	PID ppm	BORING COMPLETION	WELL DESCRIPTION
61		CL	Silty clay with trace gravel, brown, slightly moist.	EX1-60	30/60			
				Poor recovery				
62								
63								
64								
65		CL	Silty clay, brown, slightly moist.					
66								
67								
68								
69								
70		GW	Gravel, poorly sorted with sand, silt, & trace clay, brown, slightly moist.	EX1-70	17/21/30			
71								
72								
73								
74								
75		SG	Gravelly sand with silt, brown, slightly moist, sand fine.					
76								
77								
78								
79								
80		SG	Gravelly sand, brown, wet, coarse sand.	EX-1-80	20/50/53			Water added to aid in circulation
81								
83								
84								
85		GP	Gravel, some cobbles and sand, wet.					
86								
87								
88								
89								

PROJ.#: 03103102-2	DRILL DATE: 11/18-11/24/99
LOGGED BY: A. Gordon	
PROJECT MANAGER: R. Petrus	
NOTES: N/A	
DEPTH TO WATER: 83' bgs	
RIG TYPE: AP 1000	DIAMETER: 12"
DRILLER: THF	TOTAL DEPTH: 125' bgs
DRILLING METHOD: Percussion Hammer	

BEM/TerraNext

EX-1
FIELD BOREHOLE LOG
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMERICAN LINEN & SUPPLY COMPANY
PHOENIX, ARIZONA

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMPLE NO.	BLOWS/ FOOT	PID ppm	BORING COMPLETION	WELL DESCRIPTION
91		SP	Sand, well sorted, medium grained, trace silt & clay, wet.	EX1-90	83/98			
92								
93								
94								
95		GW	Gravel, poorly sorted with sand & silt, wet.					
96								
97								
98								
99								
100		GP	Gravel, well sorted, trace sand, wet.					
101								
102								
103								
104								
105		GP	Gravel, well sorted, trace sand, wet.					
106								
107								
108								
109								
110		GW	Gravel, poorly sorted, with sand & silt, wet.					
111								
112								
113								
114								
115		GP	Gravel, well sorted, trace coarse sand, wet, gravel rounded to semi-rounded.					
116								
117								
118								
119								

ROJ.#: 03103102-2 | DRILL DATE: 11/19-11/24/99
OGGED BY: A. Gordon
ROJECT MANAGER: R. Petrus
OTES: N/A
EPTH TO WATER: 83' bgs
IG TYPE: AP 1000 | DIAMETER: 12"
RILLER: THF | TOTAL DEPTH: 125' bgs
RILLING METHOD: Percussion Hammer

BE&K/TerraNext

EX-1
FIELD BOREHOLE LOG
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMERICAN LINEN & SUPPLY COMPANY
PHOENIX, ARIZONA

DEPTH	SOIL SYMBOLS	USCS	SOIL DESCRIPTION	SAMPLE NO.	BLOWS/ FOOT	PID ppm	BORING COMPLETION	WELL DESCRIPTION
121		GW	Gravel, poorly sorted, with sand & silt, wet					
122								
123								
124								
125			Total Depth = 125'					
126								
127								
128								
129								
130								
131								
132								
133								
134								
135								
136								
137								
138								
139								
140								
141								
142								
143								
144								
145								
146								
147								
148								
149								

PROJ.#: 03103102-2 | DRILL DATE: 11/19-11/24/99
LOGGED BY: A. Gordon
PROJECT MANAGER: R. Petrus
NOTES: N/A
DEPTH TO WATER: 83' bgs
RIG TYPE: AP 1000 | DIAMETER: 12"
DRILLER: THF | TOTAL DEPTH: 125' bgs
DRILLING METHOD: Percussion Hammer

BE&K/TetraNext

EX-1
FIELD BOREHOLE LOG
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
AMERICAN LINEN & SUPPLY COMPANY
PHOENIX, ARIZONA

SOIL BORING LOG

WATER RESOURCES ASSOCIATES, INC.

Hydrologists * Hydrogeologists * Engineers * Forensic Hydrologists

BORING NO. MW-2 SHEET 1 OF 2

PROJECT Meryen Industries	PROJECT NO. AZ11791	ELEVATION	LOCATION 720 West Southern
DRILLING AGENCY Layne Environmental Services		DRILLING EQUIPMENT AP-1000 Becker Rig	
FOREMAN Gabby Rodriguez	DATE STARTED 08-06-92		DATE FINISHED 08-06-92
COMPLETION DEPTH 109 feet	METHOD OF BACKFILLING OR COMPLETION see monitor well design		INSPECTOR WGN

FIELD DATA*

GROUND WATER DEPTH	DEPTH (feet)		SPT (blows/foot)	SOIL DESCRIPTION	(PID) FIELD READING (Parts per million)
	0				
			6-9-8 (17 b/ft)	CLAY (CL); light to dark brown; silty; with gravels	0 ppm
	5				
				GRAVEL (GP); tan, brown, red; clayey; silty; sandy; with cobbles	0 ppm
	10				
	15				
	20			GRAVEL (GP); tan, brown, red; silty; sandy; with cobbles	0 ppm
	25				
	30			GRAVEL (GP); tan, brown, red; silty; sandy; with cobbles	0 ppm
	35				
	40			SAND (SC); white, brown, red; very fine to fine-grained; unconsolidated; silty	0 ppm
	45				
	50				

* EXPLANATION

☐ Standard Penetration Test 140 lb. Hammer - 30" fall

■ Undisturbed Driven Sample (S&H Brass Rings)

5 1992

WATER RESOURCES ASSOCIATES, INC.
Hydrologists • Hydrogeologists • Engineers • Forensic Hydrologists

BORING NO. MW-2 SHEET 2 OF 2

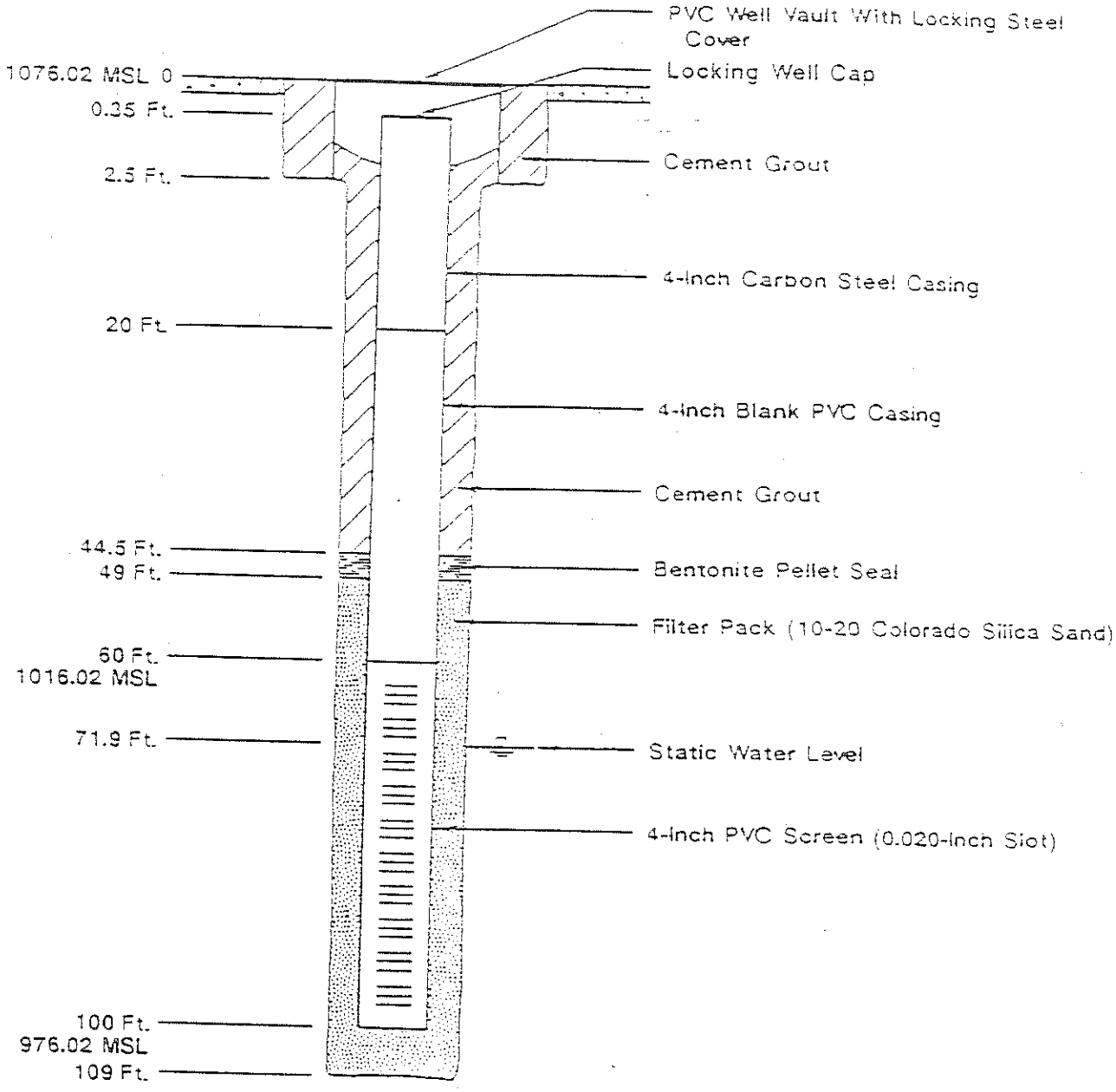
FIELD DATA*

GROUND WATER DEPTH	DEPTH (feet)		SPT (blows/foot)	SOIL DESCRIPTION	(PID) FIELD READING (Parts per million)
	50			GRAVEL (GP); tan, red, brown; clayey; silty; sandy; with cobbles	0 ppm
	55				
	60		8-18-31 (49 b/ft)	CLAY (CL); brown; silty	40 ppm
	65				
	70			GRAVEL (GP); tan, brown, red; silty; sandy; with cobbles	0 ppm
	75				
				GRAVEL (GP); tan, red, brown; clayey; silty; sandy; with cobbles	0 ppm
	80				
	85				
	90				
	95				
				GRAVEL (GP); tan, brown, red; clayey; silty; sandy; with cobbles	0 ppm
	100				
	105				
				Boring terminated at 109 feet	0 ppm
	110				

* EXPLANATION

☐ Standard Penetration Test 140 lb. Hammer - 30" fall

■ Undisturbed Driven Sample (S&H Brass Rings)



MSL - Mean Sea Level

5 282

Water Resources Associates, Inc.

A Subsidiary of Yellowstone Environmental Services, Inc.

PROJECT NO. AE11791 | DRAWN BY KMA

DATE 8/7/92 | CHECKED BY WGN

MONITOR WELL AS-BUILT
MW-2

MARYATT INDUSTRIES

SOIL BORING LOG

WATER RESOURCES ASSOCIATES, INC.

Hydrologists * Hydrogeologists * Engineers * Forensic Hydrologists

BORING NO. MW-3 SHEET 1 OF 2

PROJECT Maryan Industries	PROJECT NO. AE11791	ELEVATION	LOCATION 720 West Bechman
DRILLING AGENCY Layne Environmental Services		DRILLING EQUIPMENT AP-1000 Becker Rig	
FOREMAN Gabby Rodriguez	DATE STARTED 08-04-92		DATE FINISHED 08-04-92
COMPLETION DEPTH 109 feet	METHOD OF BACKFILLING OR COMPLETION see manner well design		INSPECTOR WCN

FIELD DATA*

GROUND WATER DEPTH	DEPTH (feet)		SPT (blows/foot)	SOIL DESCRIPTION	(PID) FIELD READING (Parts per million)
	0				
	5	■	35-23-20 (43 b/ft)	CLAY (CL); reddish brown; sandy; gravelly	0 ppm
	10			GRAVEL (GC); tan, brown, red; clayey; silty	0 ppm
	15			GRAVEL (GP); tan, brown, red; clayey; silty; sandy; with cobbles	0 ppm
	20				
	25			GRAVEL (GP); tan, brown, red; silty; sandy; with cobbles	0 ppm
	30				
	35				
	40			GRAVEL (GP); tan, brown, red, sandy; with cobbles	0 ppm
	45			SAND (SW); white, brown, red; uncolsolidated; fine to medium-grained; with gravel	0 ppm
	50				

* EXPLANATION

□ Standard Penetration Test 140 lb. Hammer - 30" fall

■ Undisturbed Driven Sample (S&H Brass Rings)

WATER RESOURCES ASSOCIATES, INC.
Hydrologists * Hydrogeologists * Engineers * Forensic Hydrologists

BORING NO. MW-3 SHEET 2 OF 2

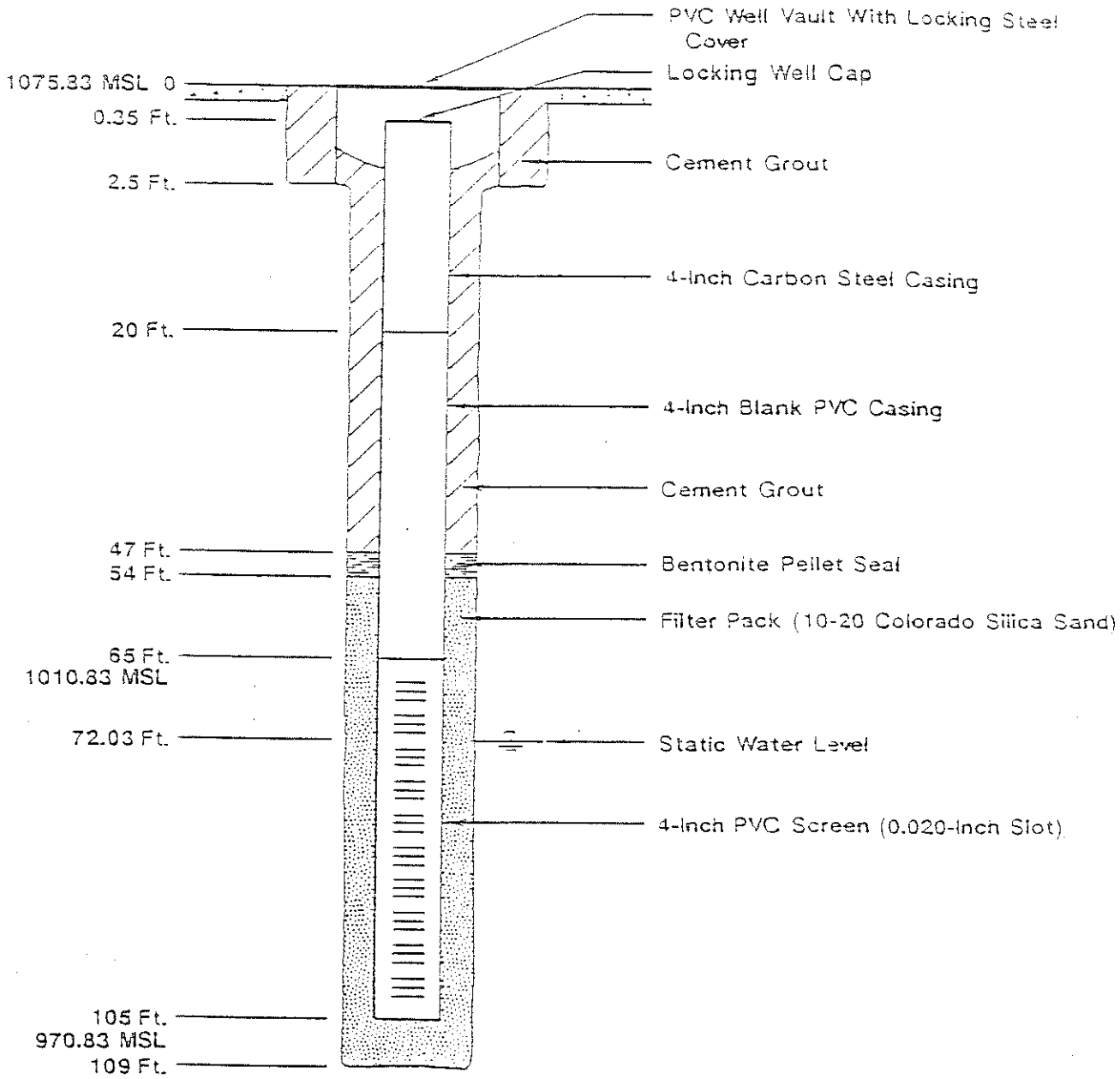
FIELD DATA*

GROUND WATER DEPTH	DEPTH (feet)		SPT (blows/foot)	SOIL DESCRIPTION	(PID) FIELD READING (Parts per million)
	50		66/3"	no sample recovered	
	55				
	60		10-19-30 (49 b/ft)	CLAY (CL); reddish brown; silty	10 ppm
	65			GRAVEL (GP); tan, brown, red; sandy; with cobbles	0 ppm
	70				
	75			SAND (SW); tan, brown, red; quartz; very fine to medium-grained; unconsolidated; gravelly	0 ppm
	80				
	85				
	90			GRAVEL (GP); brown, red; clayey; silty; sandy; with cobbles	0 ppm
	95				
				GRAVEL (GC); tan, brown, red; clayey; silty; sandy; with cobbles	0 ppm
	100				
	105				
				GRAVEL (GC); same as above	
				Boring terminated at 109 feet	
	110				

* EXPLANATION

☐ Standard Penetration Test 140 lb. Hammer - 30" fall

■ Undisturbed Driven Sample (S&H Brass Rings)



MSL - Mean Sea Level

5 283

Water Resources Associates, Inc.

A Subsidiary of Yellowstone Environmental Services, Inc.

PROJECT NO. AE11791 | DRAWN BY KMA

DATE 8/5/92 | CHECKED BY WGN

MONITOR WELL AS-BUILT
MW-3

MARYATT INDUSTRIES

GROUNDWATER TECHNOLOGY

Drilling Log

Monitoring Well UAU-MW5-S

Project ADEQ/ALSCo Owner Arizona Dept of Environmantal Quality
Location 720 W. Buchanan St., Phoenix, AZ Proj. No. 103260
Surface Elev. _____ Total Hole Depth 112 ft. Diameter 8 in.
Top of Casing 1076.16 ft. Water Level Initial 73 ft. Static 75.18 ft.
Screen: Dia 4 in. Length 40 ft. Type/Size SCH 80 PVC/0.020 in.
Casing: Dia 4 in. Length 70 ft. Type SCH 80 PVC
Fill Material Colorado 10/20 Sand Rig/Core RT - 1800
Drill Co. THF Method ODEX Air Rotary
Driller V. Christensen Log By M. Nation Date 04/14/98 Permit # 55-567443
Checked By _____ License No. AZ21616

See Site Map For Boring Location

COMMENTS:

All USCS soil type boundaries are gradational. All percentages are approximate

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0					SP	**0 – 5 Feet: Gravelly Silty Sand** Dark brown, damp, moderately well sorted, loose. Gravel is fine, subrounded to subangular. Sand is fine to medium grained, subangular to angular. Sand 50%, silt 30%, gravel 20%.
2		3				
4						
6		2			SW	**5 – 10 Feet: Silty Gravelly Sand** Brown, dry to damp, moderately well sorted, loose. Gravel is fine to coarse, subrounded to subangular. Sand is fine to coarse grained, subangular to angular. Sand 50%, gravel 30%, silt 20%.
8						
10		2			SP	**10 – 15 Feet: Gravelly Sand** Tan, dry, moderately well sorted, loose. Gravel is fine to coarse, subrounded to subangular. Sand is fine to medium grained, subangular to angular. Much drier. Sand 60%, gravel 30%, silt <10%.
12						
14		2				
16					SP/GP	**15 – 20 Feet: Gravelly Sand** Tannish brown, dry to damp, moderately well sorted, loose. Gravel is fine to coarse, subrounded to subangular. Sand is fine to medium grained, subangular to angular. Increase in gravel percentage and size. Sand 50%, gravel 40-45%, silt <10%.
18						
20		1			SP	**20 – 25 Feet: Gravelly Sand** Brown, damp to moist, well sorted, loose. Gravel is fine, subrounded to subangular. Sand is fine to medium grained, subangular to angular Sand 70%, gravel 20%, silt <10%.
22						
24						

GROUNDWATER TECHNOLOGY

Drilling Log

Monitoring Well UAU-MW5-S

Project ADEQ/Alsco Owner Arizona Dept of Environmantal Quality
Location 720 W. Buchanan Proj. No. 103260

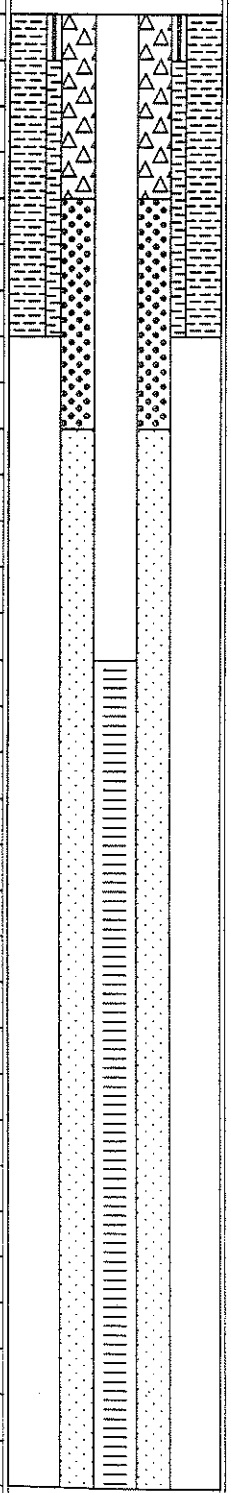
Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44		1, 1			SP	**25 – 30 Feet: Gravelly Sand** Brown, damp to moist, moderately well sorted, loose. Gravel is fine to coarse, round to subangular. Sand is fine to medium grained, subangular to angular. Sand 65%, gravel 25%, silt <10%. **30 – 45 Feet: Gravelly Sand** Tan, dry, well to moderately well sorted, loose. Gravel is fine, subrounded to subangular. Sand is fine to medium grained, subangular to angular. Sand 75–80%, gravel 10–15%, silt 10%.
46, 48, 50		2, 2			SM	**45 – 50 Feet: Gravelly Clayey Silty Sand** Dark brown, moist, moderately well sorted, loose. Gravel is fine, subangular. Sand is fine to medium grained, subangular to angular. Sand 50%, silt 30%, clay <10%, gravel <10%.
52, 54, 56					SM/ML	**50 – 57 Feet: Clayey Sandy Silt** Reddish brown, moist, well to moderately well sorted. Sand is fine to medium grained, subangular to angular. Silt 40%, sand 40%, clay 20%.

GROUNDWATER TECHNOLOGY

Drilling Log

Monitoring Well UAU-MW5-S

Project ADEQ/ALSCo Owner Arizona Dept of Environmantal Quality
Location 720 W. Buchanan St., Phoenix, AZ Proj. No. 103260

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
56						SM ML	
58		7					**57 – 63 Feet: Sandy Silty Clay** Light brown, dry, very well sorted, soft to semi-hard. Gravel is fine. Sand is fine grained, subrounded to subangular. Clay 50%, silt 20%, sand <20%, gravel ≤5-10%.
60						CL	
62							
64		18.4					**63 – 75 Feet: Clayey Silty Gravelly Sand** Light brown, dry to damp, moderately well sorted, semi-hard. Gravel is fine, subrounded to subangular. Sand is fine to coarse grained. Sand 50%, gravel 30-40%, clay-silt ≤10-20%.
66		18.5					
68							
70		18.3					
72							
74						SW	
76		17.4					**75 – 85 Feet: Gravelly Sand** Light tan, damp to moist, moderately well sorted, semi-hard. Gravel is fine to medium, subrounded to subangular. Sand is fine to coarse grained, subrounded to subangular. Sand 55-65%, gravel 30-40%, clay/silt ≤5%.
78							
80		22.4					
82							
84							
86		11.9				SP	**85 – 87 Feet: Sand** Light tan, moist to wet, well sorted, soft. Trace of gravel is fine, subrounded. Sand is fine to coarse grained, subrounded to subangular. Sand 90%, gravel ≤5%, clay-silt ≤5%.
88						SW	

GROUNDWATER TECHNOLOGY

Drilling Log

Monitoring Well UAU-MW5-S

Project ADEQ/ALSCo Owner Arizona Dept of Environmantal Quality
Location 720 W. Buchanan St., Phoenix, AZ Proj. No. 103260

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
88							
90		7.8				SW	**87 – 90 Feet: Gravelly Sand** Light tan, damp to moist, moderately well sorted, semi-hard. Gravel is fine to medium, subrounded to subangular. Sand is fine to coarse grained, subrounded to subangular. Sand 55–65%, gravel 30–40%, clay-silt ≤5%.
92						SP	**90 – 96 Feet: Sand** Light tan, wet, moderately well sorted, semi-hard. Trace of gravel is fine. Sand is fine to coarse grained, subangular. Sand 85%, gravel ≤10%, clay-silt ≤5%.
94							
96		18.8					
98						SW	**96 – 107 Feet: Gravelly Sand** Light tan, wet, moderately well to poorly sorted. Gravel is fine to medium, subrounded to subangular. Sand is medium to coarse grained. Sand 55%, gravel 40%, clay-silt ≤5%.
100		19.3					
102							
104		21					
106							
108						GP	**107 – 112 Feet: Sandy Gravel** Light tan, wet, moderately well to poorly sorted, semi-hard. Sand is medium to coarse grained, subrounded to subangular. Gravel is medium to coarse, subrounded. Gravel 55%, sand 45%, clay-silt ≤5%.
110		20.1					
112							**112 Feet: Total depth of well UAU-MW5-S**
114							
116							
118							
120							

GROUNDWATER TECHNOLOGY

Drilling Log

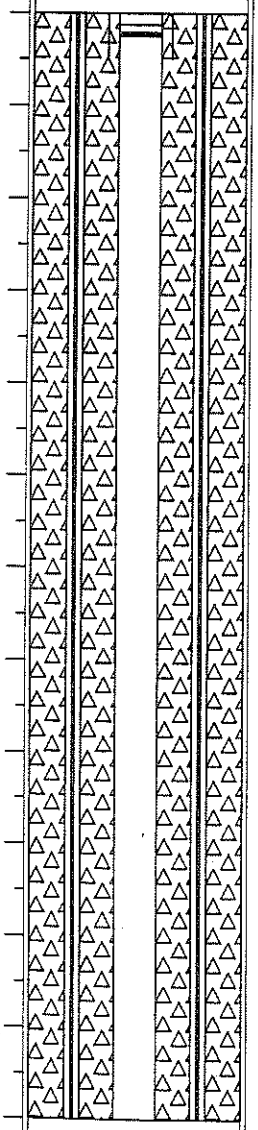
Monitoring Well UAU-MW5-M

Project ADEQ/ALSCo Owner Arizona Dept of Environmantal Quality
Location 720 W. Buchanan St., Phoenix, AZ Proj. No. 103260
Surface Elev. _____ Total Hole Depth 150 ft. Diameter 8 in.
Top of Casing 1075.41 ft. Water Level Initial 73 ft. Static 74.57 ft.
Screen: Dia 4 in. Length 20 ft. Type/Size SCH 80 PVC/0.020 in.
Casing: Dia 4 in. Length 130 ft. Type SCH 80 PVC
Fill Material Colorado 10/20 Sand Rig/Core RT - 1800
Drill Co. THF Method ODEX Air Rotary
Driller V. Christensen Log By M. Nation Date 04/14/98 Permit # 55-567444
Checked By _____ License No. AZ21616

See Site Map For Boring Location

COMMENTS:

All USCS soil type boundaries are gradational. All percentages are approximate

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0						
2		8			SP	**0 - 5 Feet: Gravelly Silty Sand** Dark brown, damp, moderately well sorted, loose. Gravel is fine, subrounded to subangular. Sand is fine to medium grained, subangular to angular. Sand 50%, silt 30%, gravel 20%.
4						
6		5			SW	**5 - 10 Feet: Silty Gravelly Sand** Brown, dry to damp, moderately well sorted, loose. Gravel is fine to coarse, subrounded to subangular. Sand is fine to medium grained, subangular to angular. Sand 60%, gravel 25%, silt 15%.
8						
10		4			SW/GW	**10 - 25 Feet: Silty Gravelly Sand** Brown, dry to damp, moderately well to poorly sorted, loose. Gravel is fine to coarse, subrounded to subangular. Sand is fine to medium grained, subangular to angular. Sand 45-50%, gravel 40%, silt 10-15%.
12						
14		4				
16						
18						
20						
22						
24						

GROUNDWATER TECHNOLOGY

Drilling Log

Monitoring Well UAU-MW5-M

Project ADEQ/ALSCo Owner Arizona Dept of Environmantal Quality
Location 720 W. Buchanan St., Phoenix, AZ Proj. No. 103260

Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24						SW GW	
26		3				SP	**25 – 30 Feet: Silty Gravelly Sand** Brown, dry to damp, moderately well sorted, loose. Gravel is fine, subrounded to subangular. Sand is fine to medium grained, subangular to angular. Sand 80%, gravel 10%, silt 10%.
28							
30		3				SP SM	**30 – 40 Feet: Silty Gravelly Sand** Tan, dry to damp, well to moderately well sorted, loose. Gravel is fine, subrounded to subangular. Sand is fine to medium grained, subangular to angular. Sand 65%, gravel 20%, silt 15%.
32							
34		3					
36							
38							
40						SW	**40 – 45 Feet: Gravelly Sand** Brown, damp to moist, well sorted, loose. Gravel is fine, subround to subangular. Sand is fine to medium grained, subangular to angular. Sand 80%, gravel 15%, silt 5%.
42							
44		9				SM ML	**45 – 55 Feet: Clayey Gravelly Sandy Silt** Brown, damp to moist, well sorted, loose. Gravel is fine, subrounded to subangular. Sand is fine to medium grained, subangular to angular. Silt 40%, sand 30%, clay 10%, gravel 10%.
46							
48							
50							
52							
54		13				CL	
56							

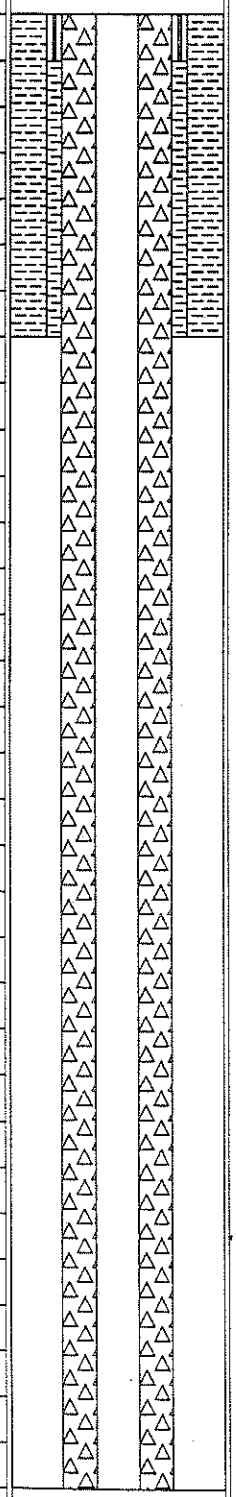
06/30/1998 lithmcp-jan96

GROUNDWATER TECHNOLOGY

Drilling Log

Monitoring Well UAU-MW5-M

Project ADEQ/ALSCo Owner Arizona Dept of Environmantal Quality
Location 720 W. Buchanan St., Phoenix, AZ Proj. No. 103260

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
56, 58, 60, 62					CL	**55 – 63 Feet: Sandy Silty Clay** Light brown, dry, very well sorted, soft to semi-hard. Trace of gravel is fine, subangular. Sand is fine grained, subrounded to subangular. Clay 55-60%, silt 20%, sand <20%, gravel ≤5%.
64, 66, 68, 70, 72, 74, 76, 78					SW	**63 – 78 Feet: Silty Gravelly Sand** Light tan, damp to moist, moderately well sorted, soft to semi-hard. Gravel is fine to medium, subrounded to subangular. Sand is fine to coarse grained. Sand 40-60%, gravel 30-40%, silt ≤20%, clay ≤5%.
80, 82, 84					GW	**78 – 85 Feet: Sandy Gravel** Light tan, damp to moist, moderately well to poorly sorted, semi-hard. Sand is fine to coarse grained, subrounded to subangular. Gravel is fine to coarse, subrounded to subangular. Gravel 50%, sand 45%, clay-silt ≤5%.
86, 88					SP	**85 – 89 Feet: Sand** Light tan, damp to moist, well sorted, semi-hard. Gravel is fine to medium, subrounded to subangular. Sand is fine to medium grained. Sand 85-90%, gravel ≤-10%, clay-silt ≤5%.

GROUNDWATER TECHNOLOGY

Drilling Log

Monitoring Well UAU-MW5-M

Project ADEQ/ALSCo Owner Arizona Dept of Environmantal Quality
Location 720 W. Buchanan St., Phoenix, AZ Proj. No. 103260

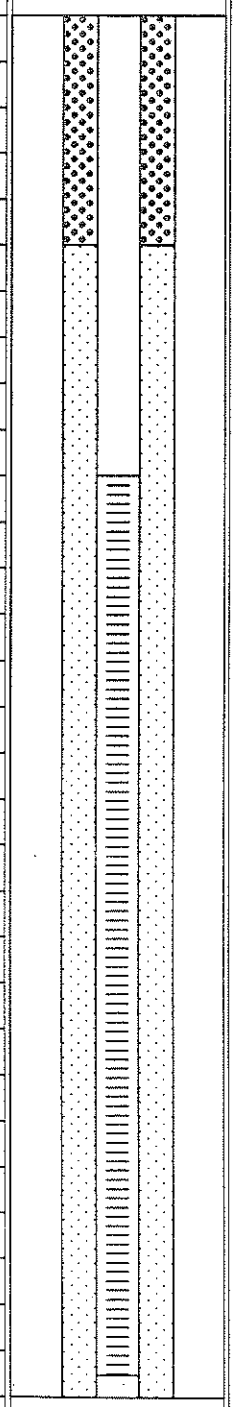
Depth (ft.)	Well Completion	PID (ppm)	Sample ID	Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
88						SP	
90							**89 – 108 Feet: Gravelly Sand** Light tan, damp to moist, well to moderately well sorted. Gravel is fine to medium, subrounded to subangular. Sand is fine to coarse grained. Sand 55-65%, gravel 30-40%, clay-silt ≤5%.
92							
94							
96							
98							
100							
102							
104						SW	
106							
108							**108 – 110 Feet: Gravelly Sand** Light tan, moist to wet, well to moderately well sorted, soft to semi-hard. Gravel is fine to medium, subrounded to subangular. Sand is fine to coarse grained. Sand 75%, gravel 20%, clay-silt ≤5%.
110							**110 – 150 Feet: Gravelly Sand** Light tan, damp to moist, well to moderately well sorted, soft to semi-hard. Gravel is fine to medium, subrounded to subangular. Sand is fine to coarse grained, subrounded to subangular. Percentages of gravel and silt-clay vary to 150 feet at approximately similar values to those dor 108 to 110 feet. Sand 55-65%, gravel 30-40%, clay-silt ≤5%.
112							
114							
116							
118							
120							

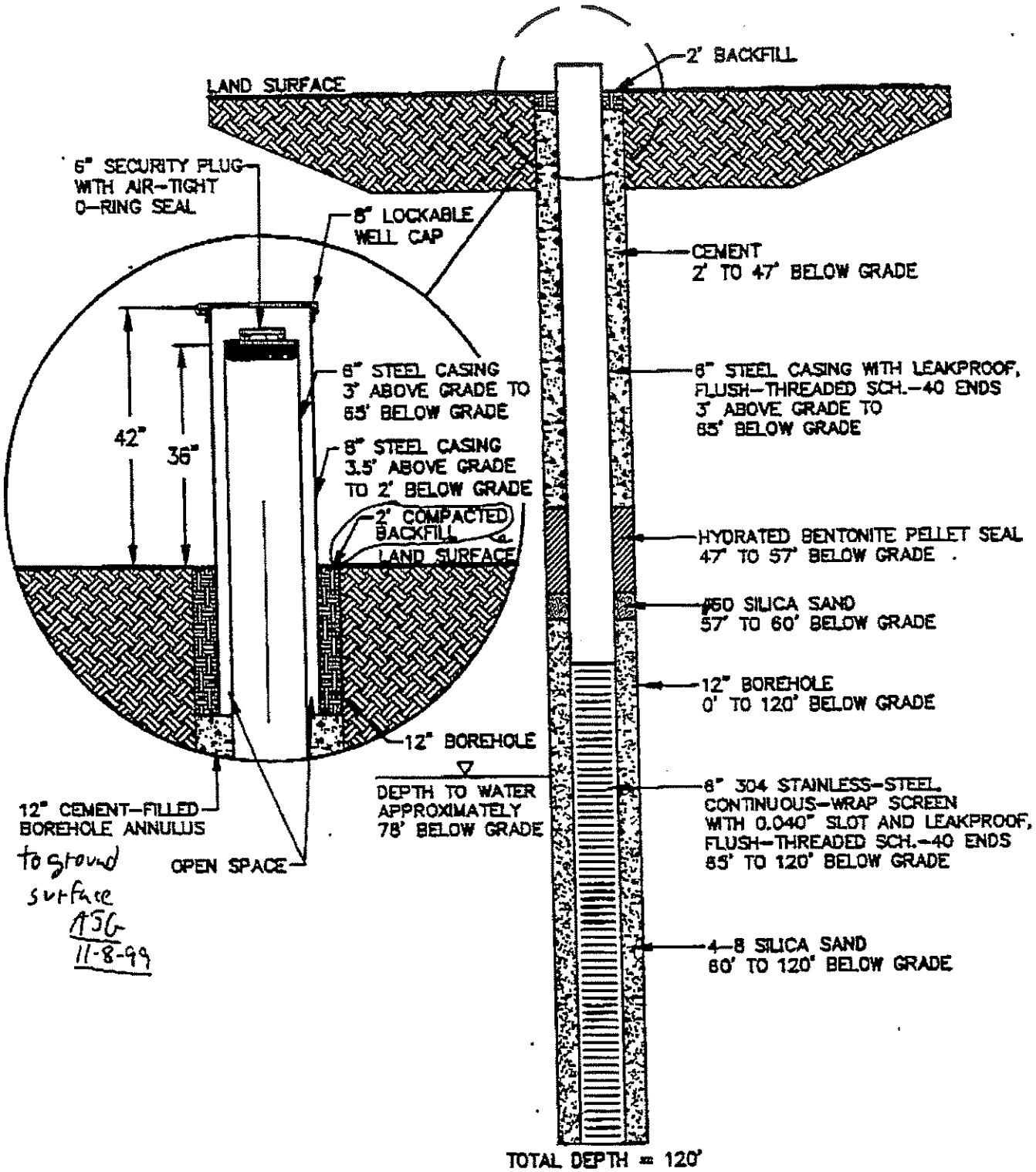
GROUNDWATER TECHNOLOGY

Drilling Log

Monitoring Well UAU-MW5-M

Project ADEQ/ALSCo Owner Arizona Dept of Environmantal Quality
Location 720 W. Buchanan St., Phoenix, AZ Proj. No. 103260

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
120						**Silty Gravelly Sand** (continued)
122						
124						
126						
128						
130						
132						
134					SW	
136						
138						
140						
142						
144						
146						
148						
150						150 Feet: Total depth of well UAU-MW5-M
152						



NOT TO SCALE

HYDRO GEO CHEM, INC.

INJECTION ~~EXTRACTION~~ WELL DESIGN FOR AQUIFER PUMPING TEST

55-577924

Approved	Date	Revised	Date	Reference	FIG.
DRM	8/12/99			87910001	1