

**MARCH 1989 QUARTERLY REPORT  
NAS MOFFETT FIELD, CALIFORNIA  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY  
VOLUME 3: APPENDICES C, D, E, F, G, AND H**

**MARCH 15, 1989**

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MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

THIS RECORD CONTAINS MULTIPLE VOLUMES  
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APPENDIX E

TITLE

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APPENDIX I

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Site 1 Boring Logs are presented in Appendix I of the December 1988 Quarterly Report

**2.0 SITE 2 BORING LOGS**

Site 2 Boring Logs are presented in Appendix I of the December 1988 Quarterly Report

**3.0 SITE 3 BORING LOGS**

GB-13

GB-14

GB-15

GB-16

GB-17

W3-12(B1)

W3-13(B1)

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GB-18

GB-19

GB-20

W4-7(C)

W4-8(C)

W4-9(B2)

**5.0 SITE 5 BORING LOGS**

Site 5 Boring Logs are presented in Appendix I of the December 1988 Quarterly Report

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**6.0 SITE 6**

No wells were drilled at Site 6 during Phase I of the Remedial Investigation.

**7.0 SITE 7 BORING LOGS**

GB-24

W7-16(C)

W7-18(A)

W7-19(A)

W7-20(A)

W7-21(A)

**8.0 SITE 8 BORING LOGS**

GB-25

GB-26

W8-2(B1)

W8-3(C)

W8-4(A)

W8-5(A)

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**9.0 SITES 9 THROUGH 19 BORING LOGS**

Boring Logs for Sites 9, 10, 11, 12, 14, and 19 are presented in Appendix I of the December 1988 Quarterly Report

No borings or wells were drilled at Sites 13, 15, 16, 17, and 18.

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## ABBREVIATIONS

BNAs	Base/neutral and acid extractable priority pollutants
ERM-West	Environmental Resources Management West, Inc.
ESA	Earth Science Associates, Inc.
DCA	Dichloroethane
DCE	Dichloroethene
FS	Feasibility study
GC	Gas chromatograph
gpm	Gallons per minute
IRP	Installation Restoration Program
IT	IT Corporation
ID	Internal Diameter
MEW	Middlefield - Ellis - Whisman
NAS	Naval Air Station
NTU	Nephelometric turbidity unit
PCBs	Polychlorinated biphenyls
ppb	Parts per billion
ppm	Parts per million
RI	Remedial Investigation
SWAT	Solid Waste Assessment Test
TCA	Trichloroethane
TCE	Trichloroethene
TDS	Total dissolved solids
TIP	Total Ionizables Present, Photovac, photoionization detector/pump
TL-#	Transect Lines
TPHC	Total petroleum hydrocarbons
VOCs	Volatile organic priority pollutants

**APPENDIX C**  
**POTENTIOMETRIC SURFACE CONTOUR MAPS**

DRAWING NUMBER 409616-M19  
 DATE 2/28/89  
 CHECKED BY KIK  
 APPROVED BY R/M  
 T. SCHAEFFER  
 11-4-88  
 DRAWN BY  
 GENERAL REMARKS  
 COMMENTS



**LEGEND**

- WI-1A (-5.54) GROUND WATER MONITORING WELL WI-1A (A AQUIFER), AND GROUND WATER ELEVATION (-5.54)
- W2-8F LEACHATE MONITORING WELL W2-8F (FILL). THESE WELLS WERE NOT USED TO CONTOUR THE A AQUIFER POTENTIOMETRIC SURFACE.
- GB-2 IT GEOPHYSICAL BORING
- SBI-1 SOIL BORING SBI-1
- SED-1 SEDIMENT/SURFACE WATER SAMPLE LOCATION AND SAMPLE I.D. NUMBER
- EMB-1 SOIL SAMPLE LOCATION AND SAMPLE I.D. NUMBER
- SUR 4 SURFACE WATER SAMPLE POINT
- - - POTENTIOMETRIC SURFACE CONTOUR INTERVAL IS 1' CONTOUR DASHED WHERE INFERRED.

**NOTE**

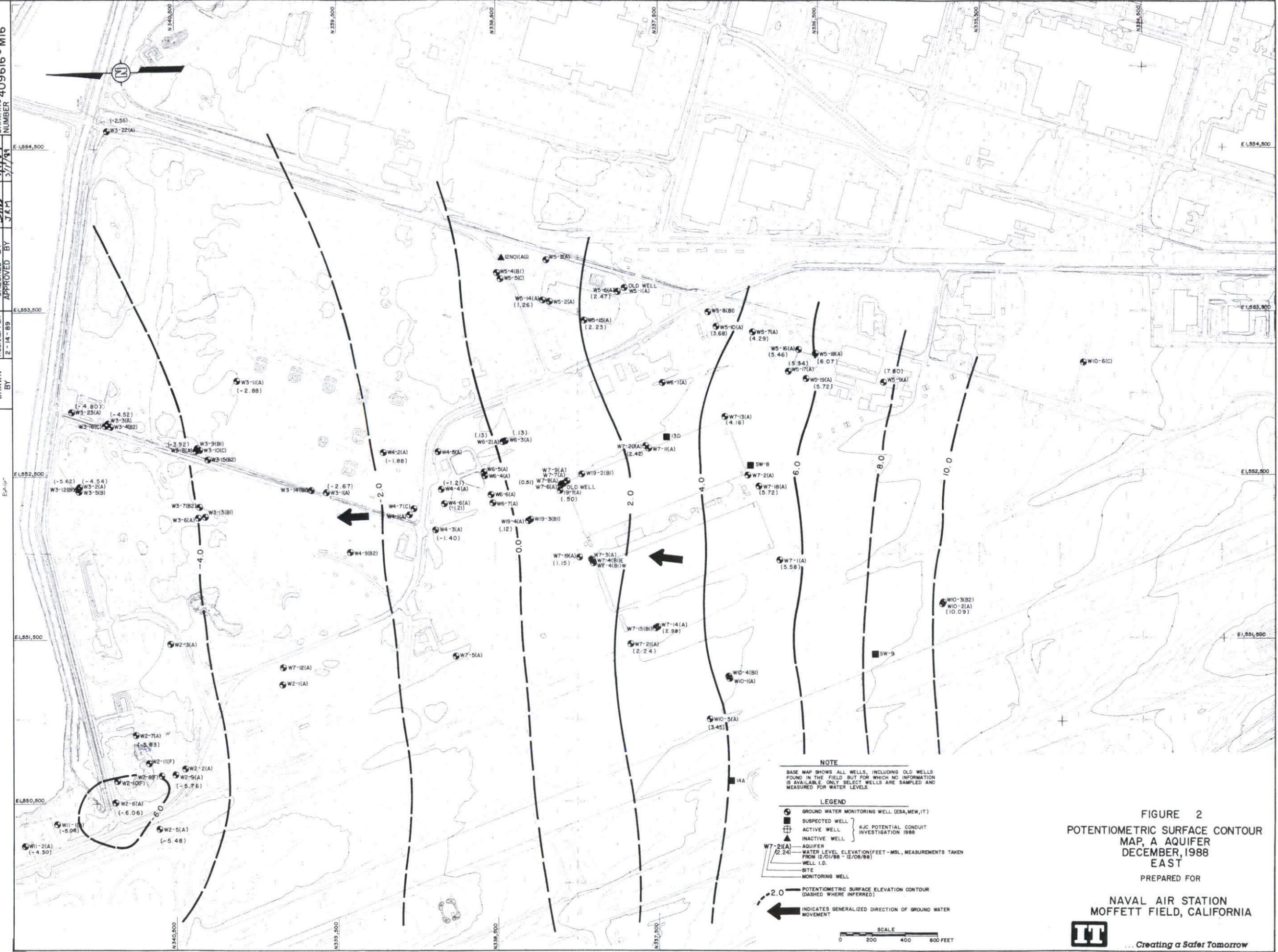
BASE MAP SHOWS ALL WELLS, INCLUDING OLD WELLS FOUND IN THE FIELD BUT FOR WHICH NO INFORMATION IS AVAILABLE. ONLY SELECT WELLS ARE SAMPLED AND MEASURED FOR WATER LEVELS.

**FIGURE 1**  
**SITES 1&2**  
**POTENTIOMETRIC SURFACE CONTOUR MAP**  
**A AQUIFER**  
**DECEMBER, 1988**  
 PREPARED FOR  
**NAVAL AIR STATION**  
**MOFFETT FIELD, CALIFORNIA**

**REFERENCE**  
 TOPOGRAPHY BY: WALKER AND ASSOC., INC.  
 DATE OF PHOTOGRAPHY: 11-3-87  
 SCALE: 1" = 100'

**SCALE**  
 0 100 200 300 FEET  
 TOPOGRAPHIC CONTOUR INTERVAL IS 1'

DRAWING 409616 - M16  
 NUMBER 3/1/79  
 CHECKED BY SJA  
 APPROVED BY JRM  
 DRAWN BY T. SCHAEFFER  
 2-14-89



**NOTE**  
 BASE MAP SHOWS ALL WELLS, INCLUDING OLD WELLS FOUND IN THE FIELD BUT FOR WHICH NO INFORMATION IS AVAILABLE. ONLY SELECT WELLS ARE SAMPLED AND MEASURED FOR WATER LEVELS.

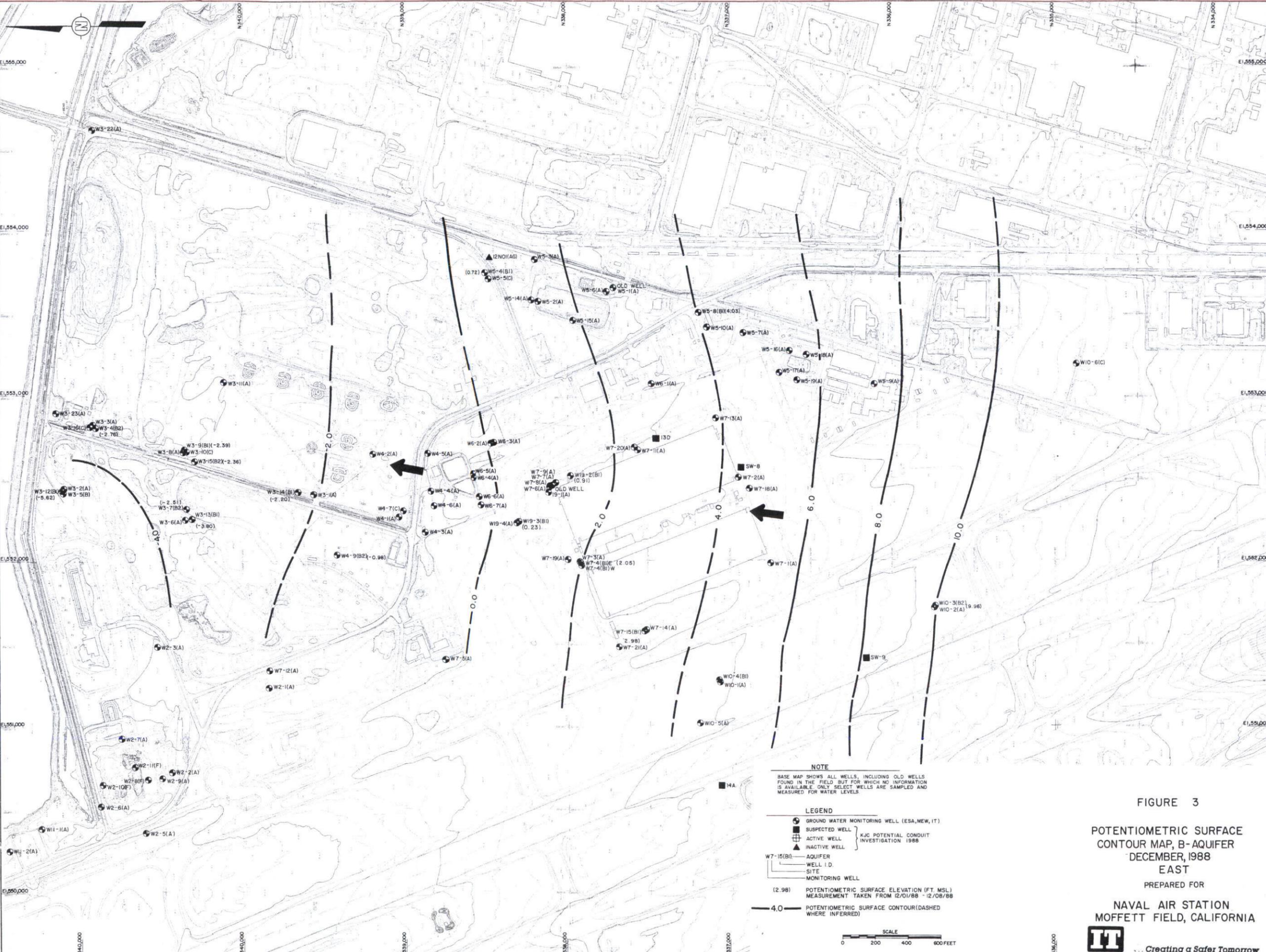
**LEGEND**

- ⊕ GROUND WATER MONITORING WELL (ESA, MEW, IT)
- ⊠ SUSPECTED WELL
- ⊞ ACTIVE WELL
- ⊡ INACTIVE WELL
- ▲ AQUIFER
- WATER LEVEL ELEVATION (FEET - MSL, MEASUREMENTS TAKEN FROM 12/01/88 - 12/08/88)
- WELL I.D.
- SITE
- MONITORING WELL
- POTENTIOMETRIC SURFACE ELEVATION CONTOUR (DASHED WHERE INFERRED)
- ← INDICATES GENERALIZED DIRECTION OF GROUND WATER MOVEMENT

SCALE  
 0 200 400 600 FEET

**FIGURE 2**  
**POTENTIOMETRIC SURFACE CONTOUR**  
**MAP, A AQUIFER**  
**DECEMBER, 1988**  
**EAST**  
 PREPARED FOR  
**NAVAL AIR STATION**  
**MOFFETT FIELD, CALIFORNIA**  
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 APPROVED BY JFM  
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**NOTE**  
 BASE MAP SHOWS ALL WELLS, INCLUDING OLD WELLS FOUND IN THE FIELD BUT FOR WHICH NO INFORMATION IS AVAILABLE. ONLY SELECT WELLS ARE SAMPLED AND MEASURED FOR WATER LEVELS.

**LEGEND**

- GROUND WATER MONITORING WELL (ESA, MEW, IT)
- SUSPECTED WELL
- ACTIVE WELL
- ▲ INACTIVE WELL

W7-15(B) — AQUIFER  
 — WELL I.D.  
 — SITE MONITORING WELL

(2.98) POTENTIOMETRIC SURFACE ELEVATION (FT. MSL)  
 MEASUREMENT TAKEN FROM 12/01/88 - 12/08/88

— 4.0 — POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)

**FIGURE 3**  
**POTENTIOMETRIC SURFACE**  
**CONTOUR MAP, B-AQUIFER**  
**DECEMBER, 1988**  
**EAST**  
 PREPARED FOR  
**NAVAL AIR STATION**  
**MOFFETT FIELD, CALIFORNIA**

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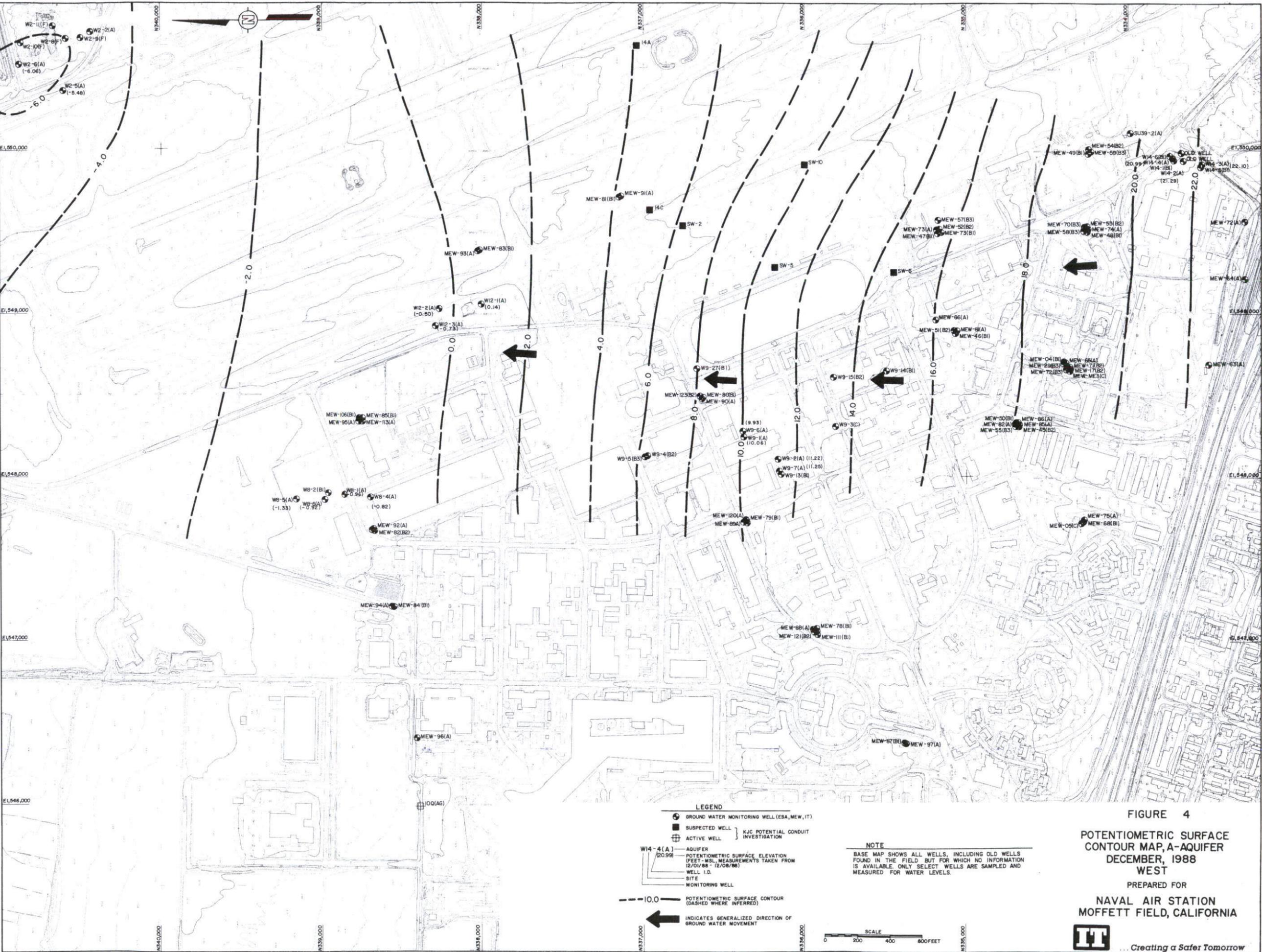


FIGURE 4  
 POTENTIOMETRIC SURFACE  
 CONTOUR MAP, A-AQUIFER  
 DECEMBER, 1988  
 WEST  
 PREPARED FOR  
 NAVAL AIR STATION  
 MOFFETT FIELD, CALIFORNIA



**APPENDIX D**  
**HYDROGRAPHS**

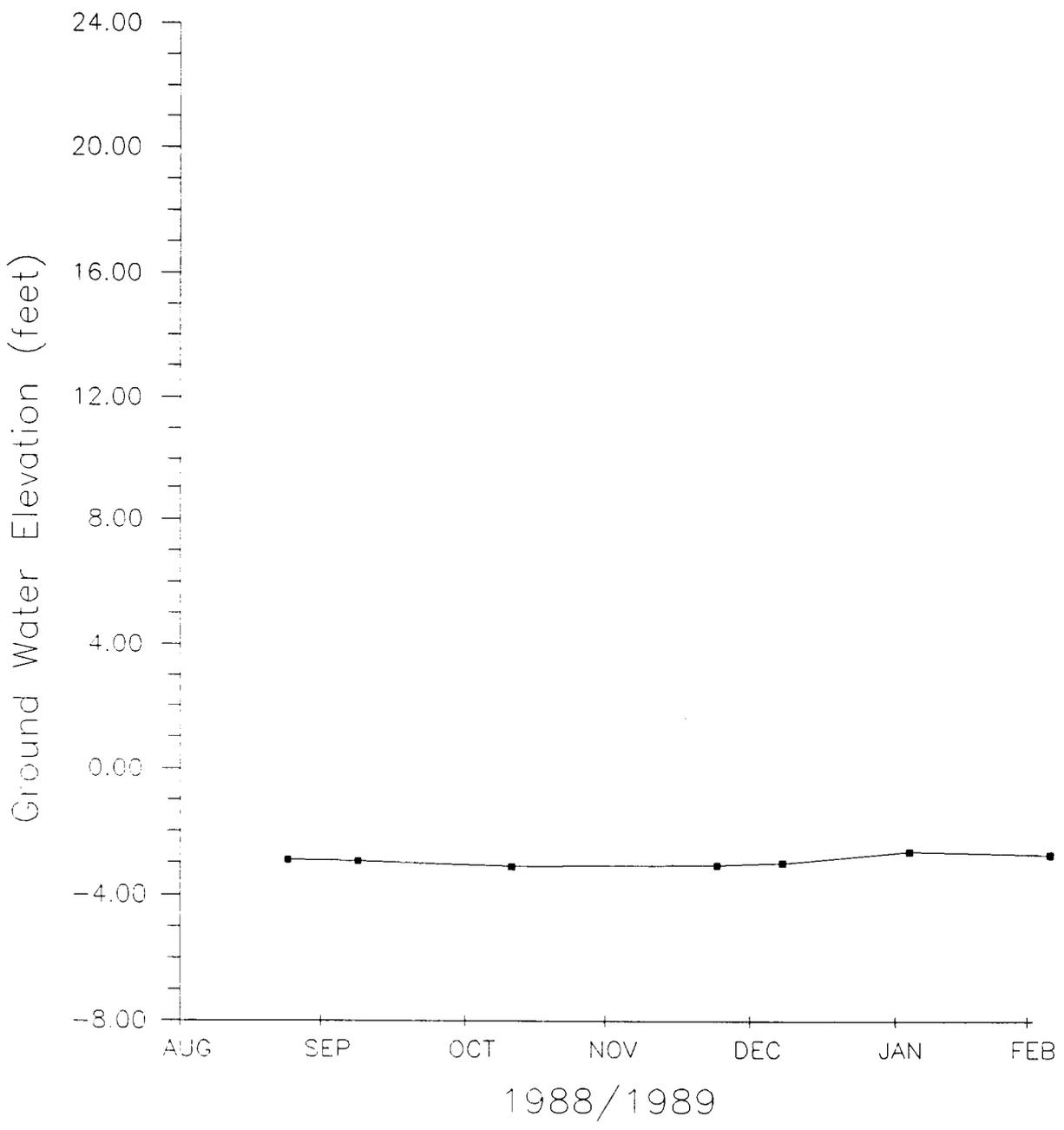
APPENDIX D

SECTION 1.0 – HYDROGRAPHS OF SITE 1 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

DRAWN BY: *W.P.* 2-25-89  
 CHECKED BY: *R.C.F.*  
 APPROVED BY: *R.C.F.*  
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Hydrograph of Well W01-01(A)  
 PREPARED FOR

NAS Moffett Field

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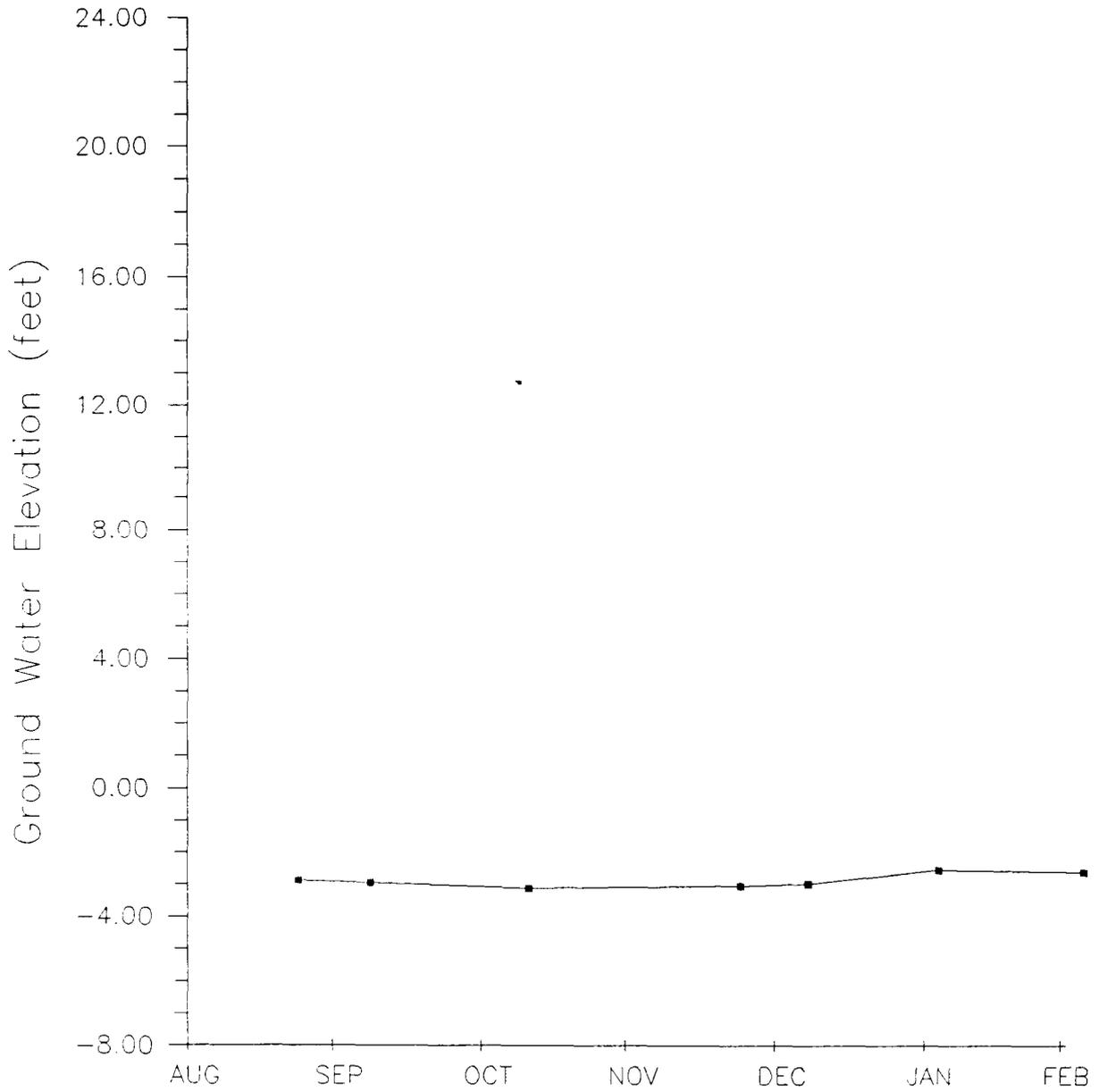
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APPROVED BY

L.H.  
S. J.

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Hydrograph of Well W01-02(A)  
PREPARED FOR

NAS Moffett Field

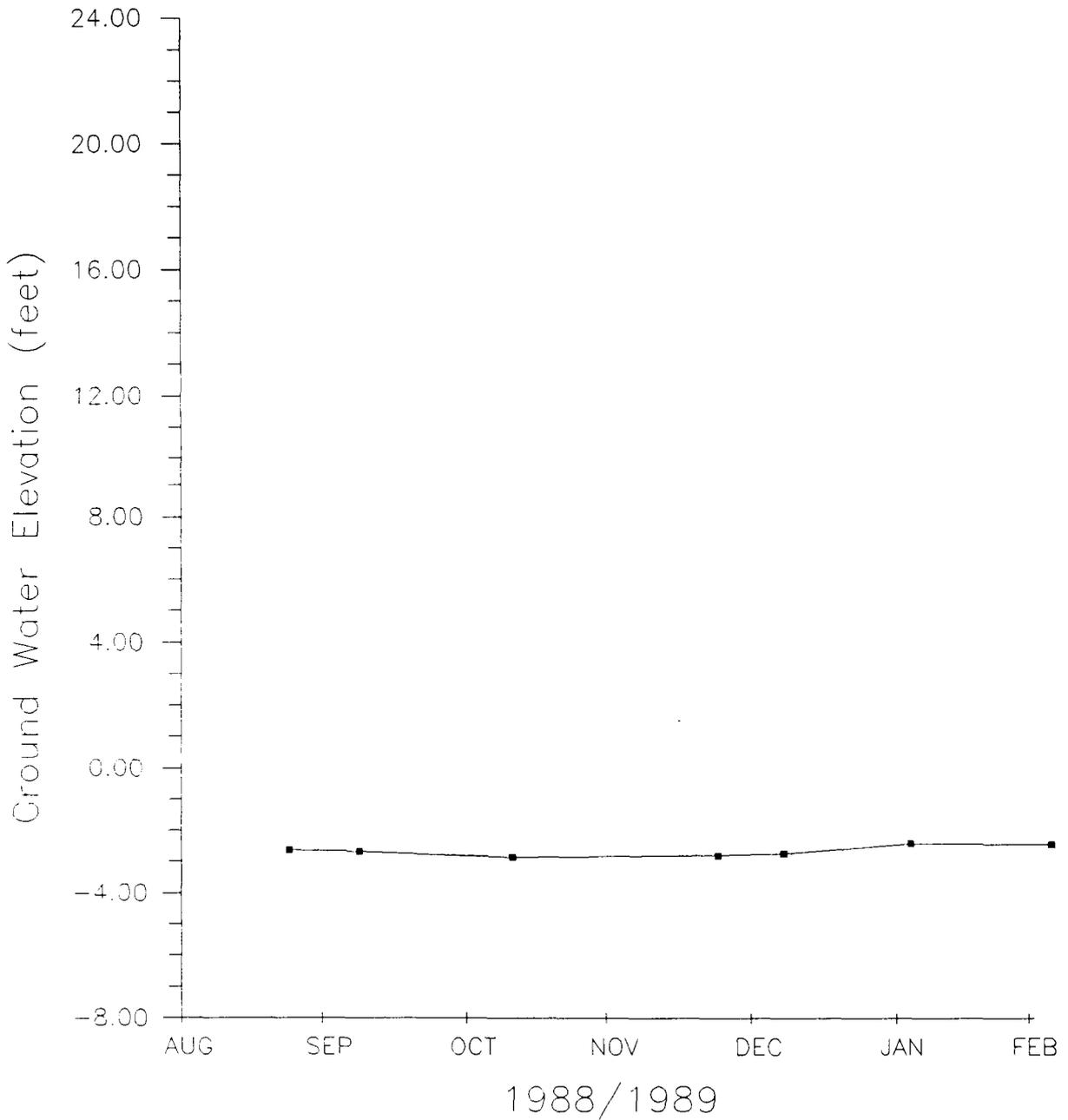
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Hydrograph of Well W01-03(A)  
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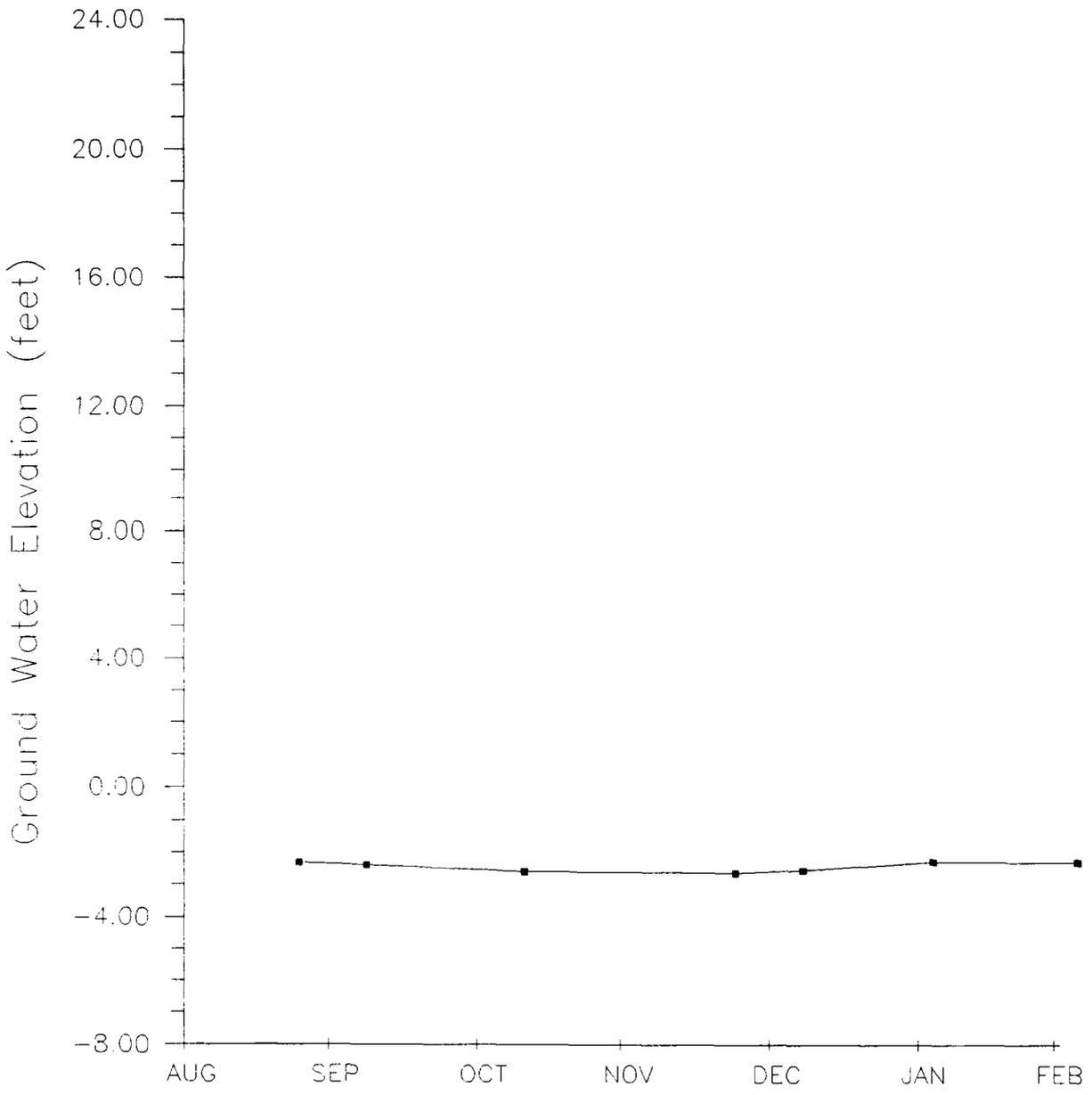
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Hydrograph of Well W01-04(A)  
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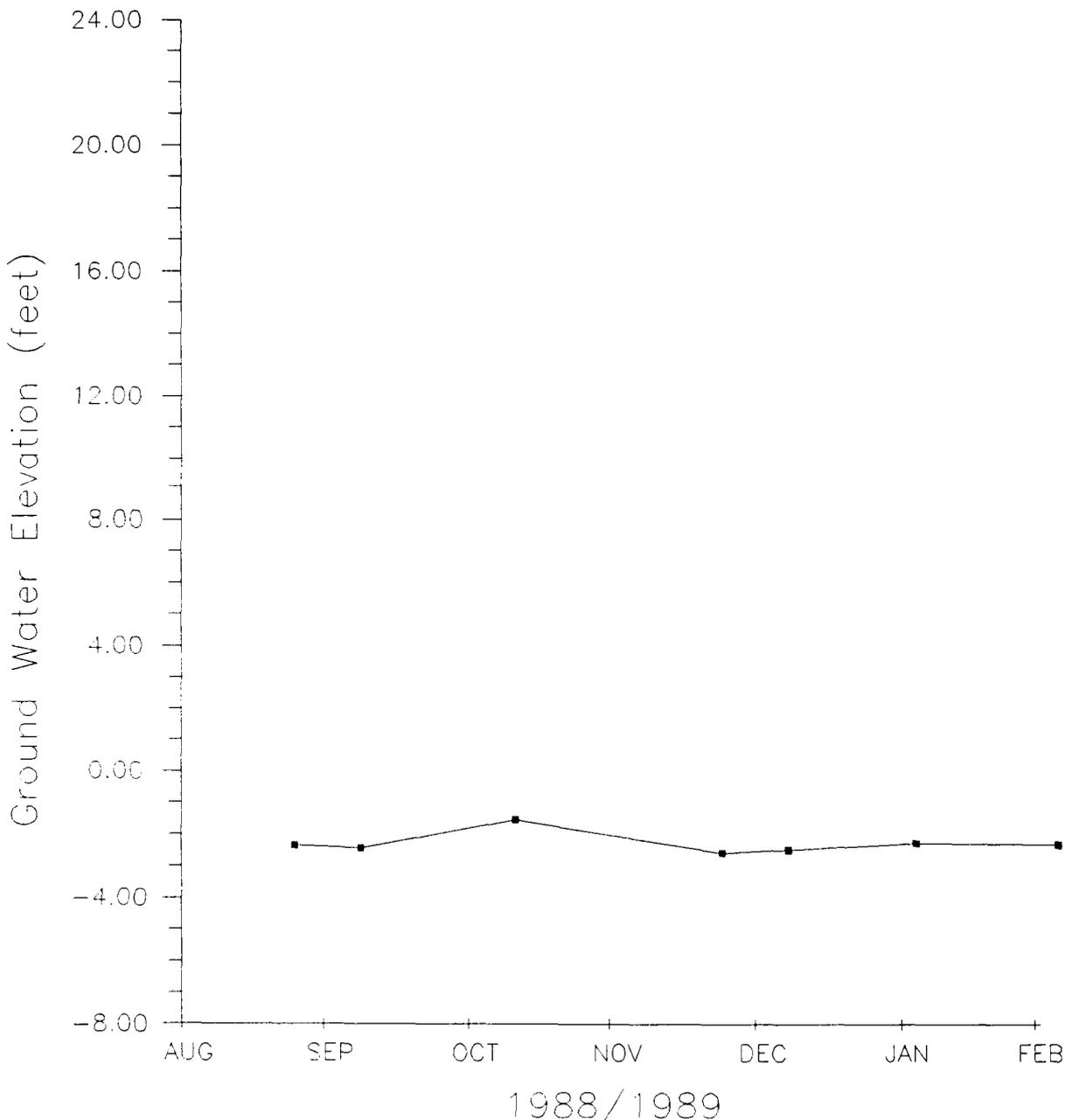
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Hydrograph of Well W01-05(A)  
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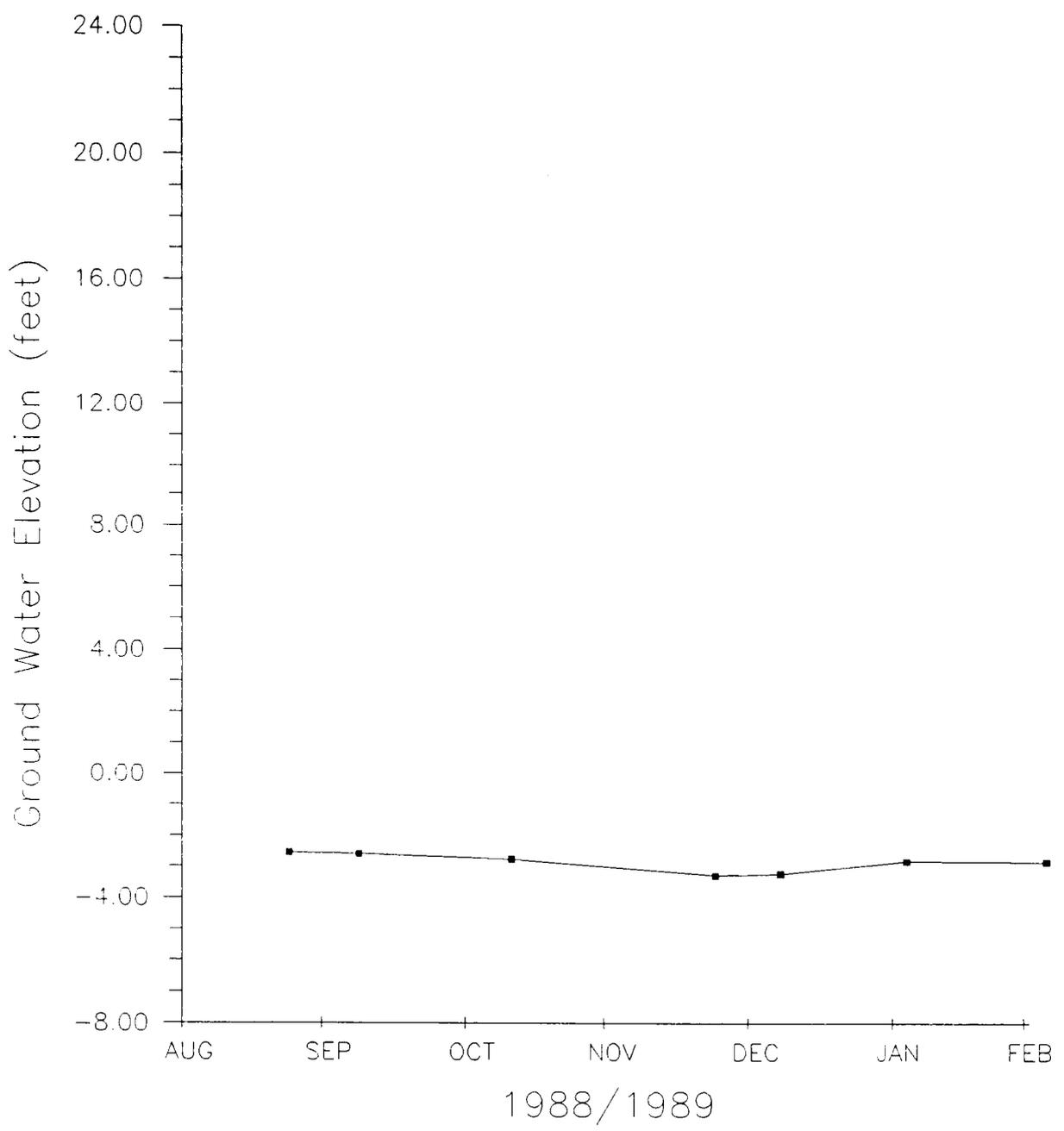
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PLC  
XCF

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APPROVED BY

L.H.  
2-25-89

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Hydrograph of Well W01-06(A)  
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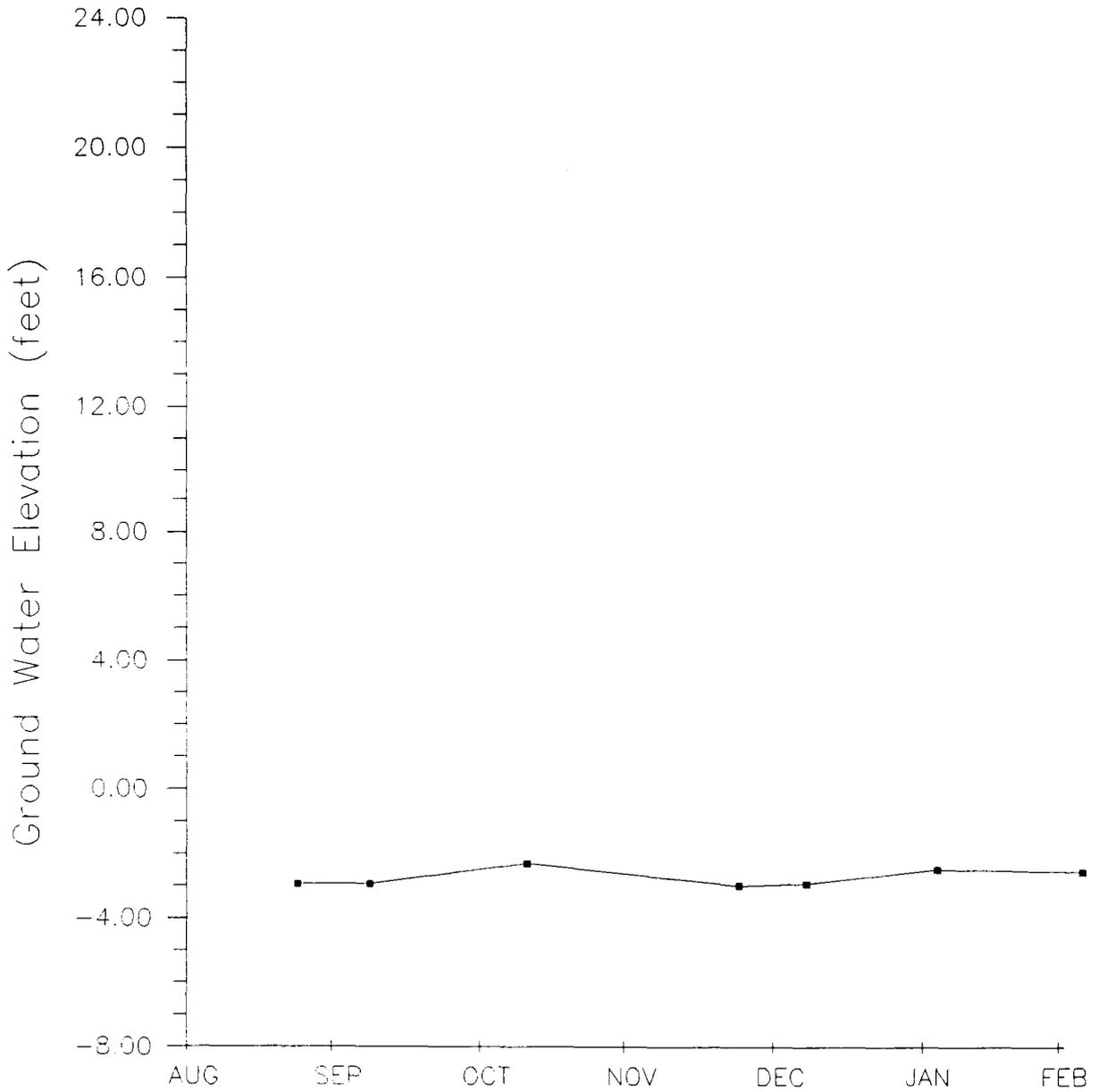
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Hydrograph of Well W01-07(A)  
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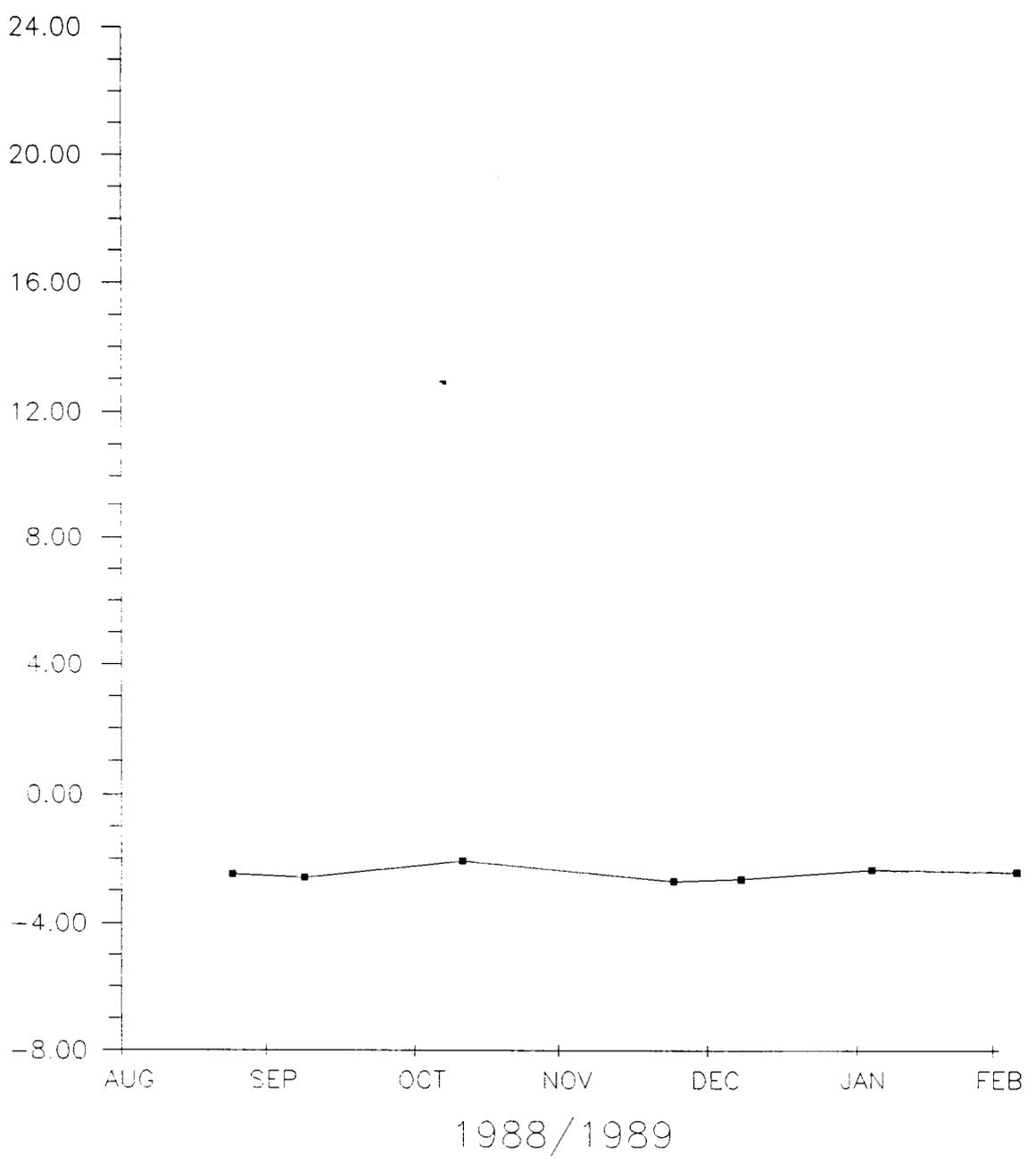
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Ground Water Elevation (feet)



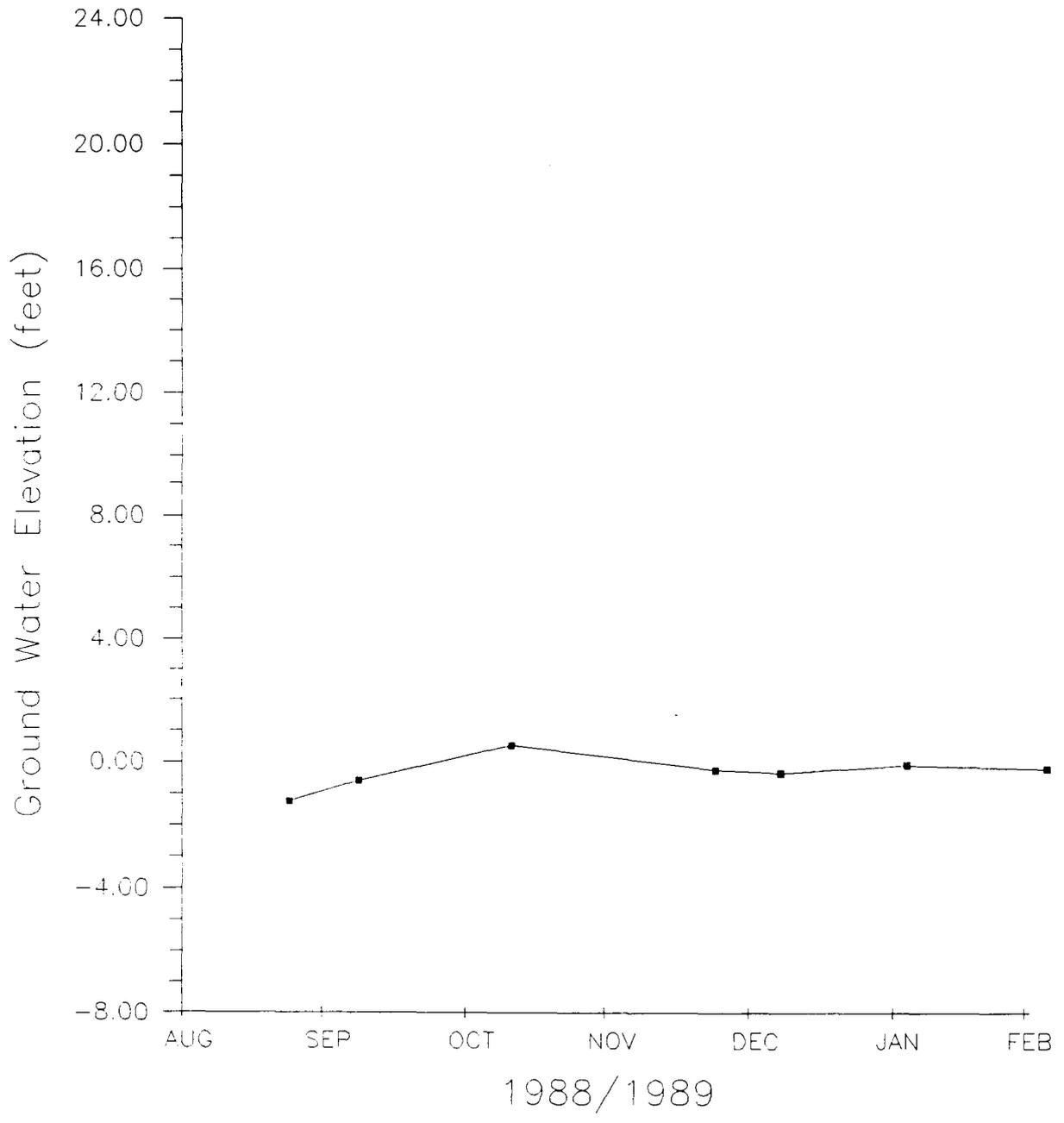
Hydrograph of Well W01-08(A)  
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Hydrograph of Well W01-09(F)  
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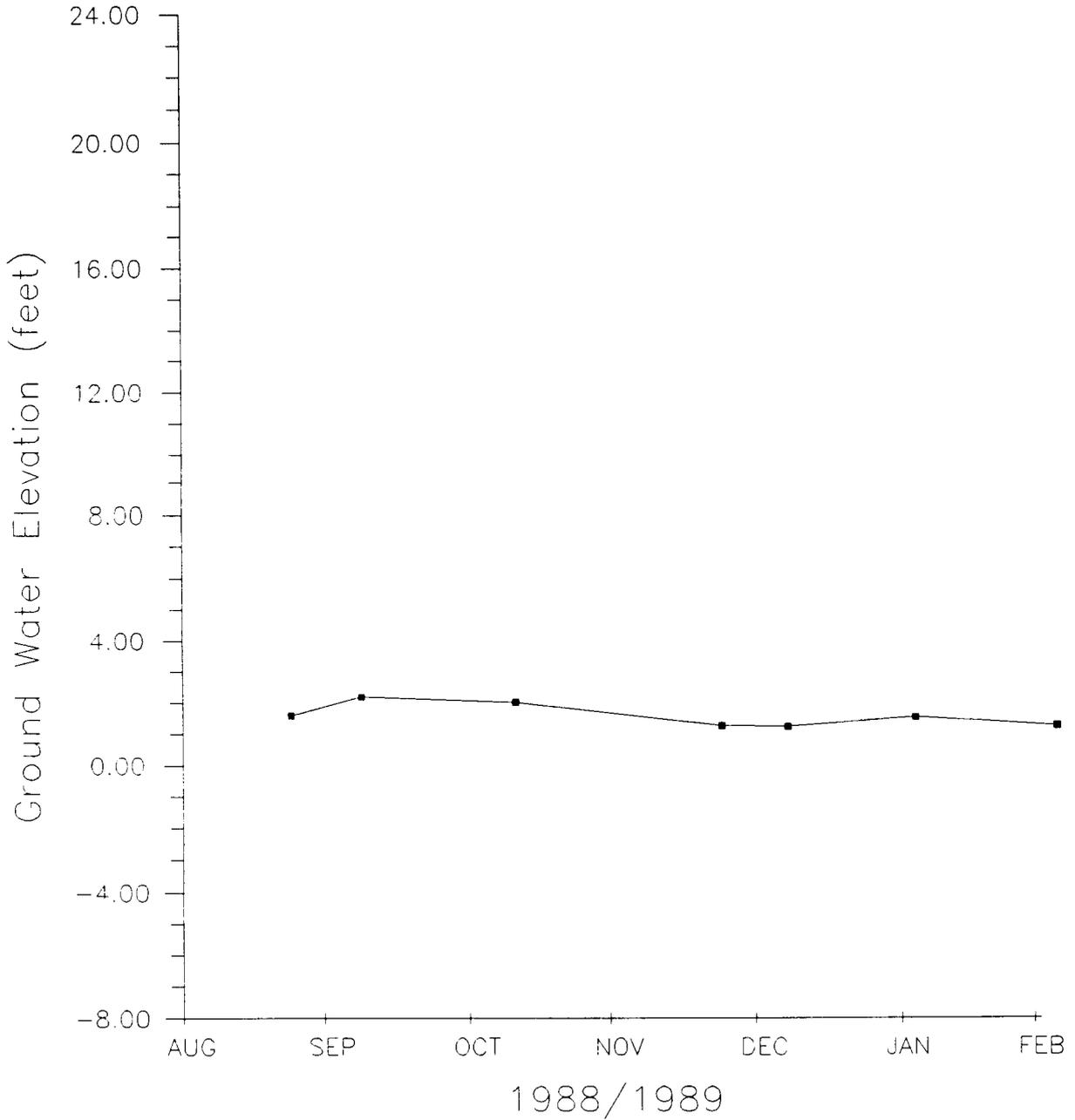
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*[Signature]*

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Hydrograph of Well W01-10(F)  
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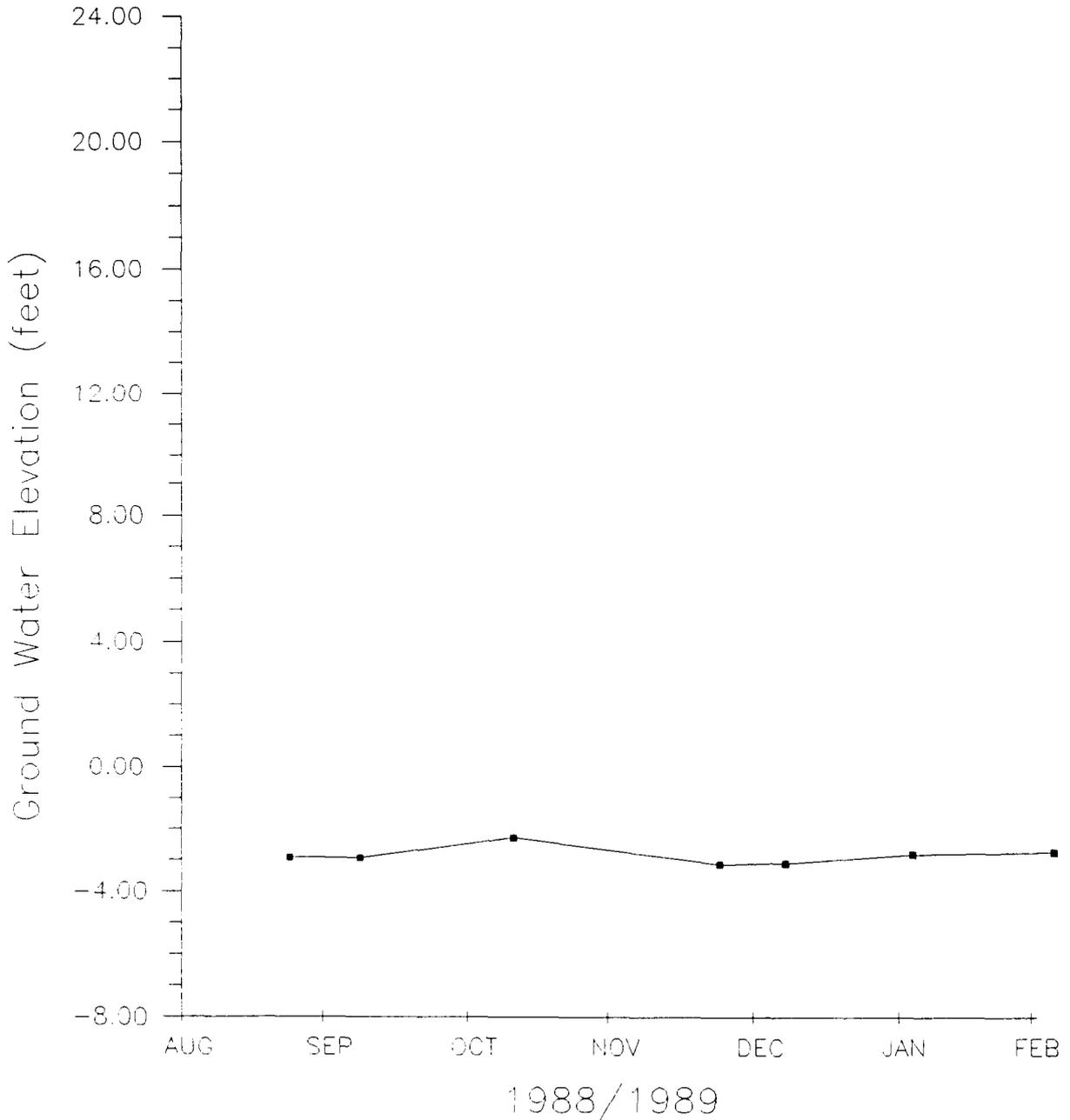


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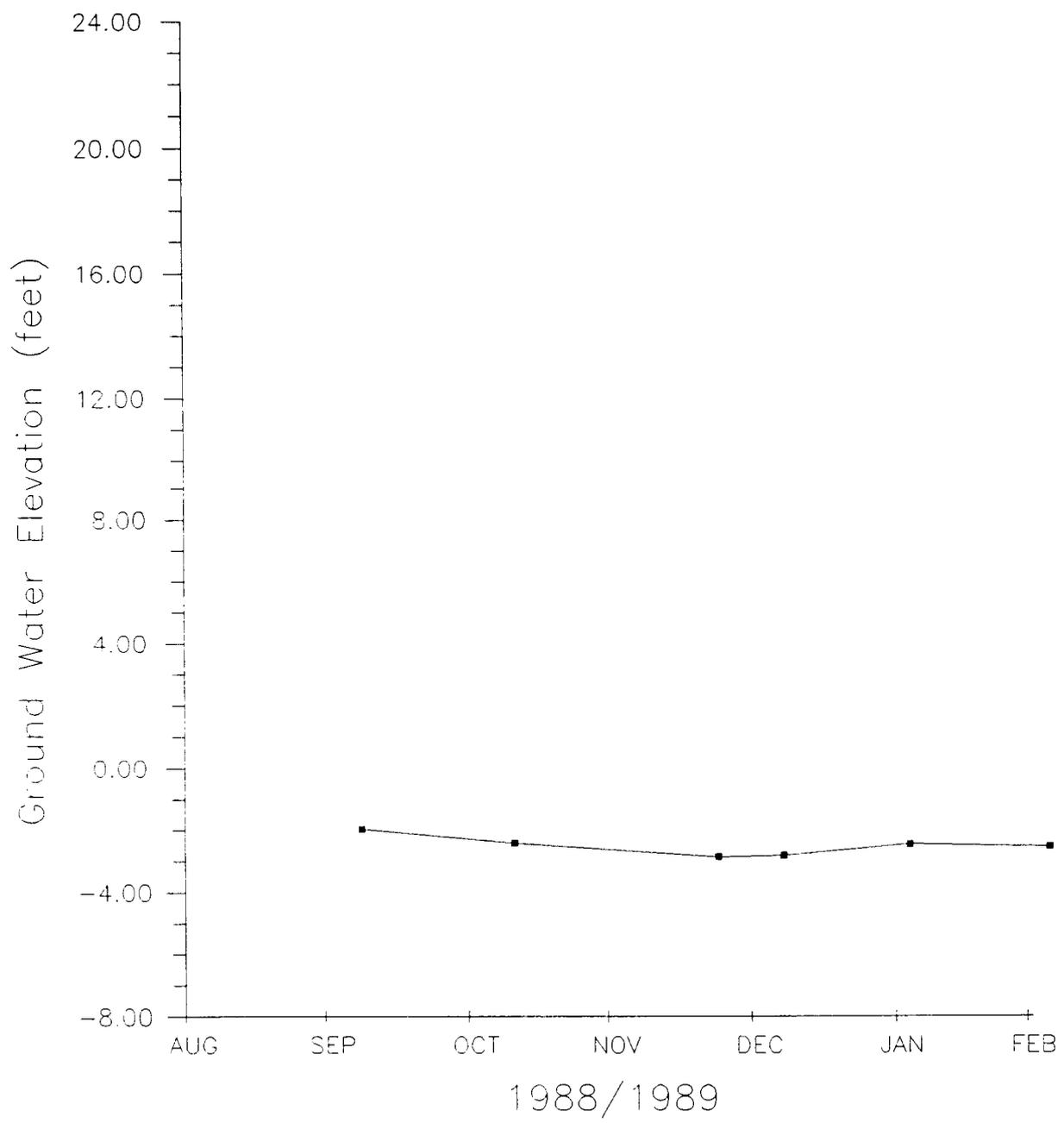


Hydrograph of Well W01-11(F)  
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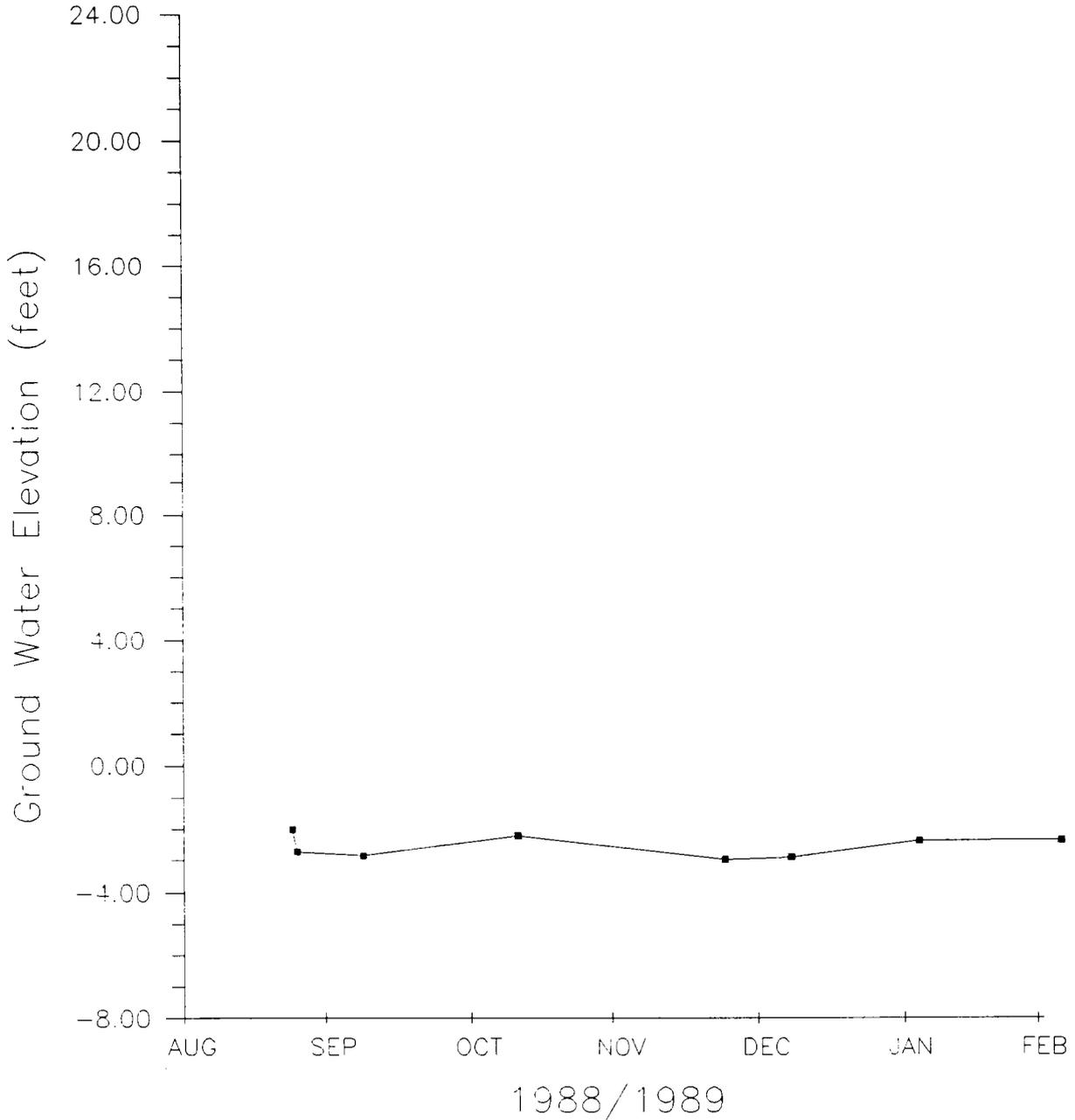
Hydrograph of Well W01-12(A)  
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Hydrograph of Well W01-13(F)  
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MOFFETT FIELD  
SSIC NO. 5090.3

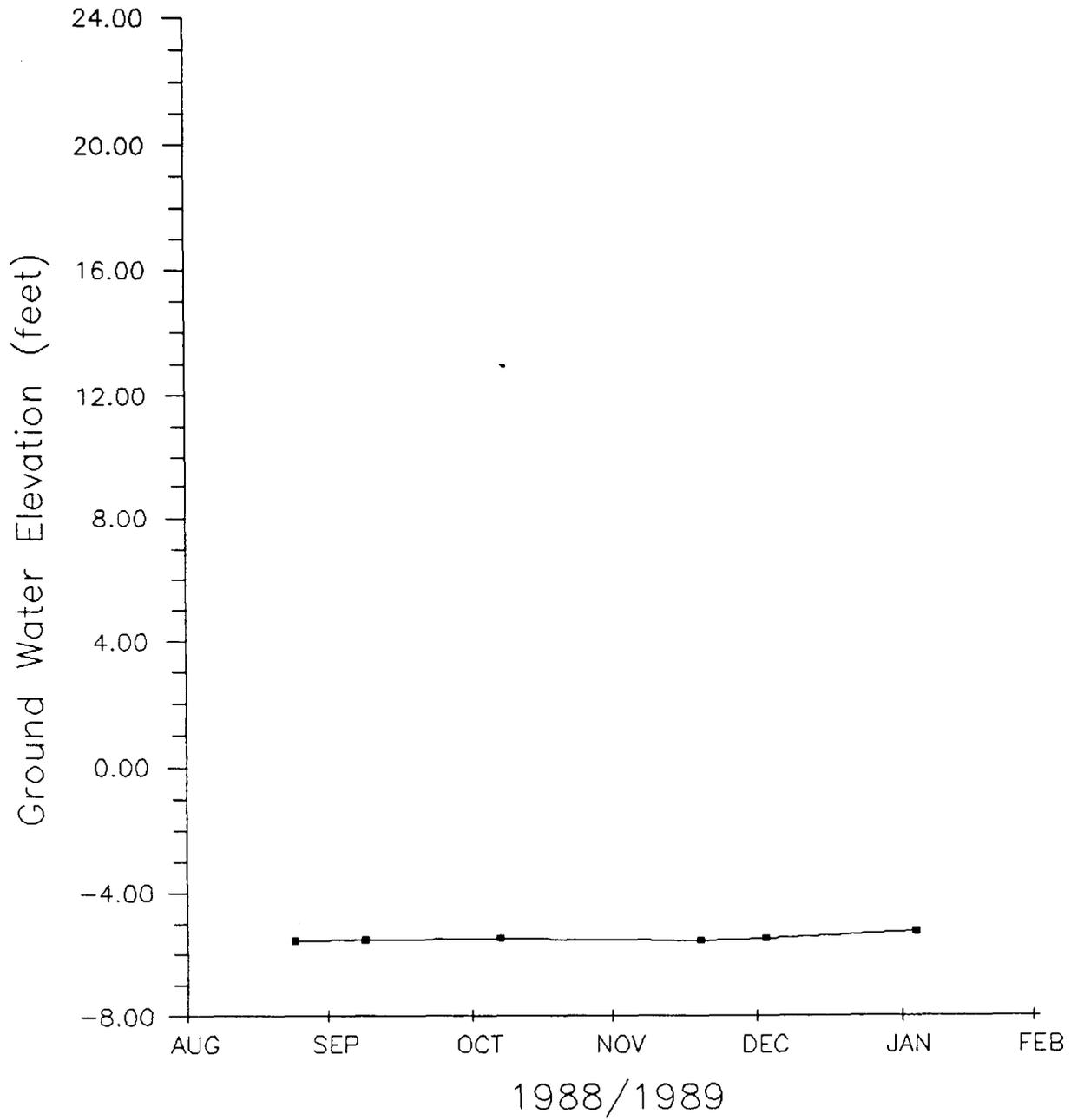
## APPENDIX D

### SECTION 2.0 – HYDROGRAPHS OF SITE 2 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

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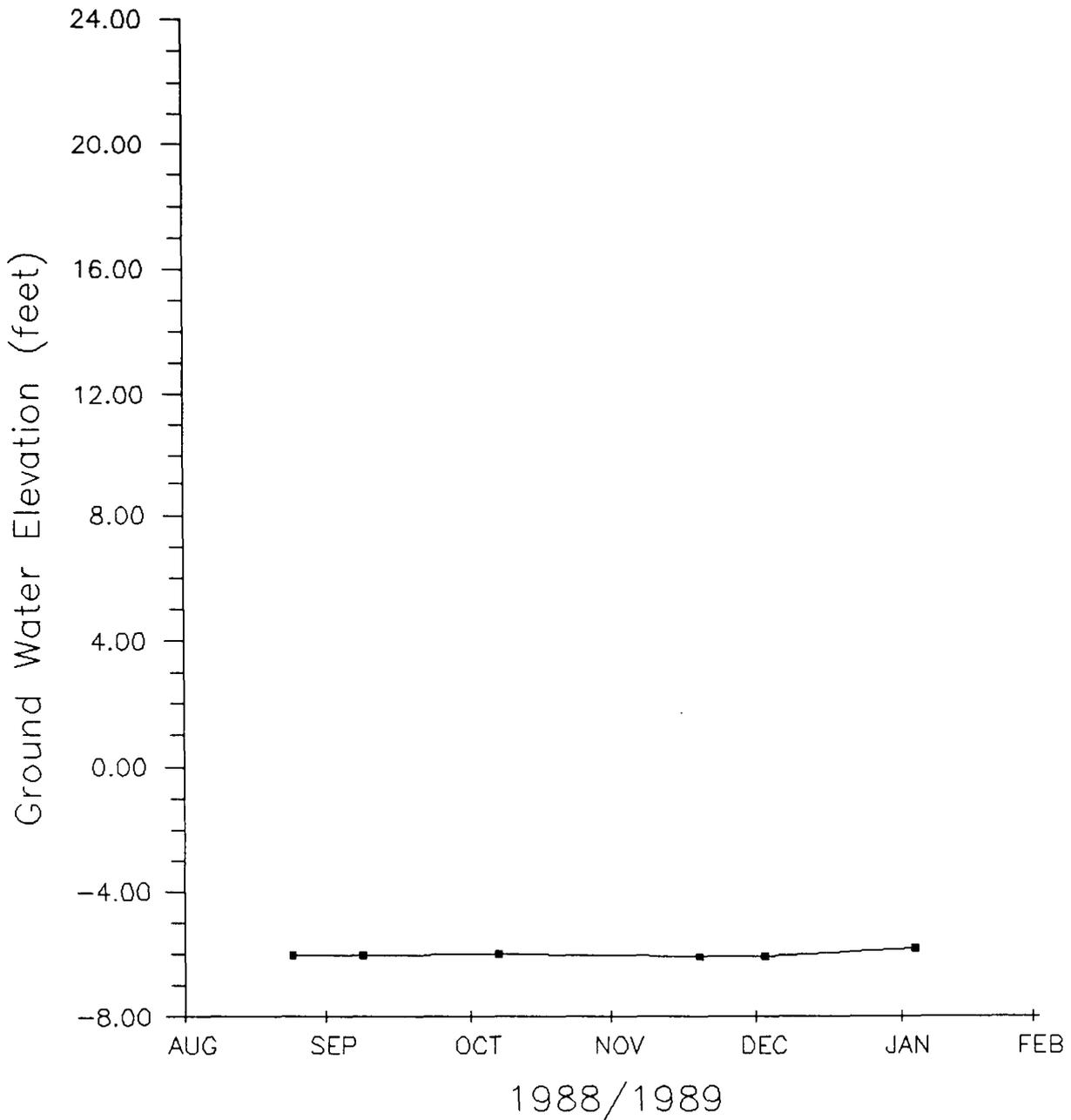


Hydrograph of Well W02-05(A)  
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Hydrograph of Well W02-06(A)  
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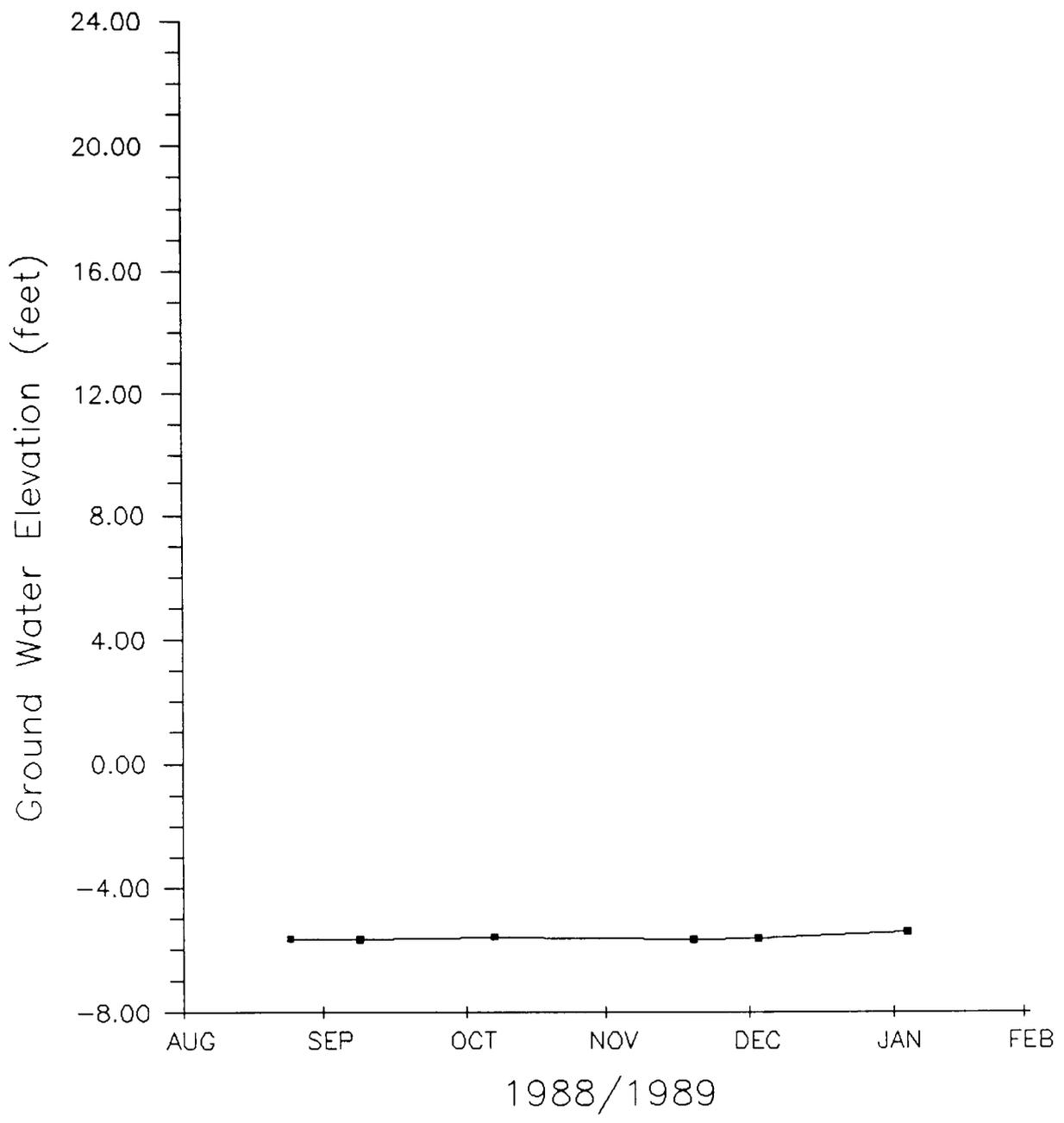
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Hydrograph of Well W02-07(A)  
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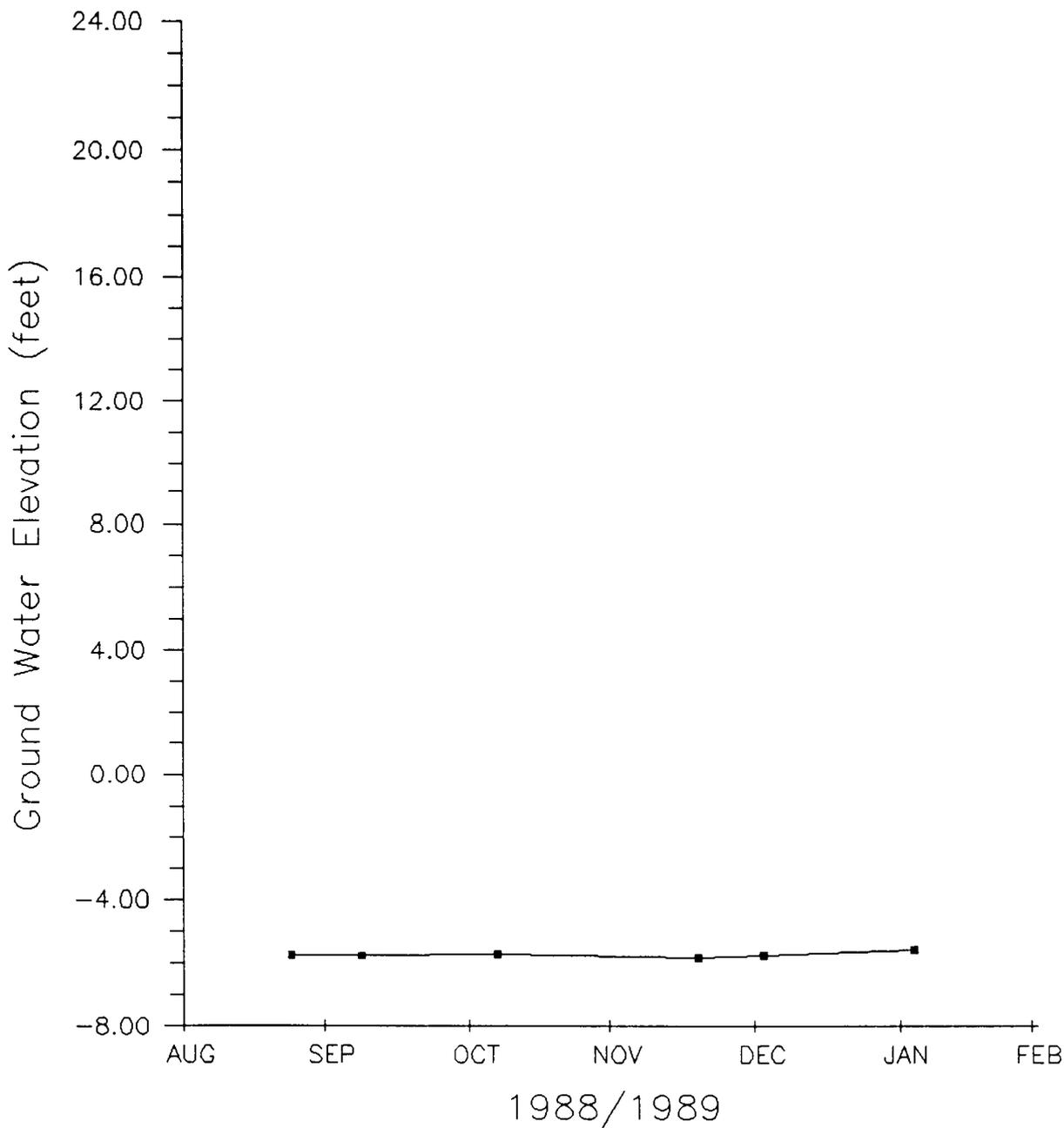
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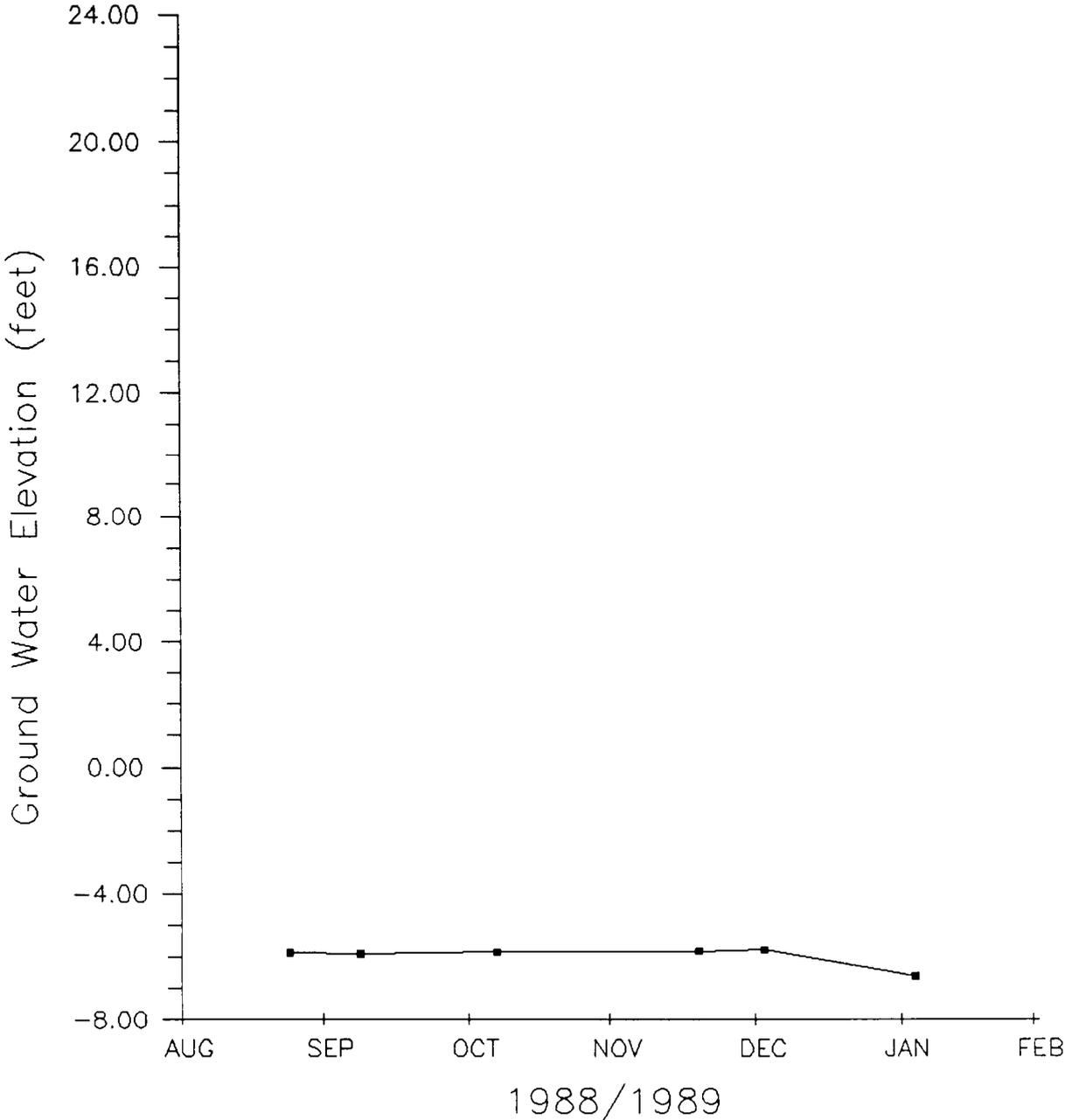


Hydrograph of Well W02-08(F)  
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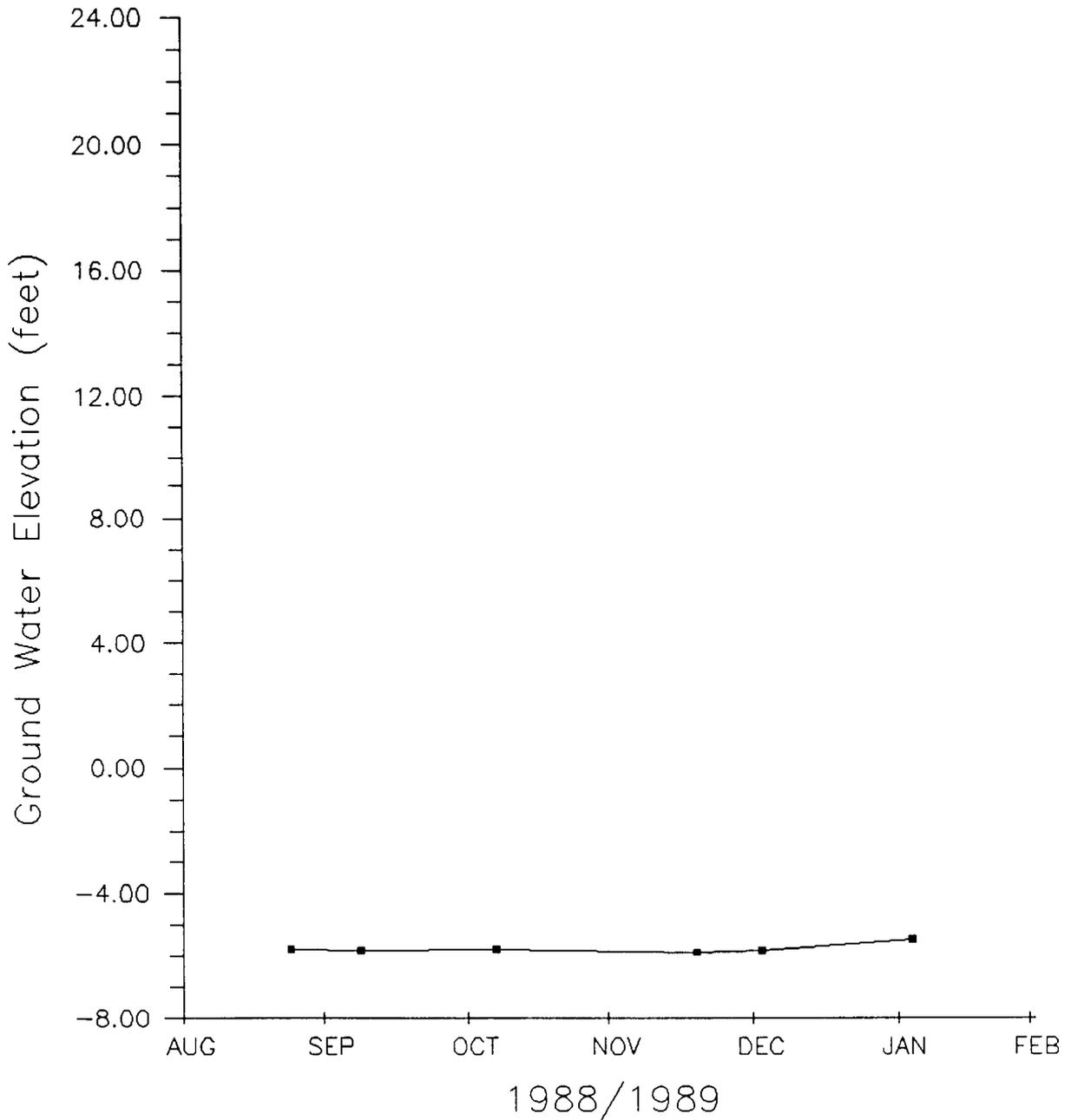


Hydrograph of Well W02-09(A)  
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Hydrograph of Well W02-10(F)  
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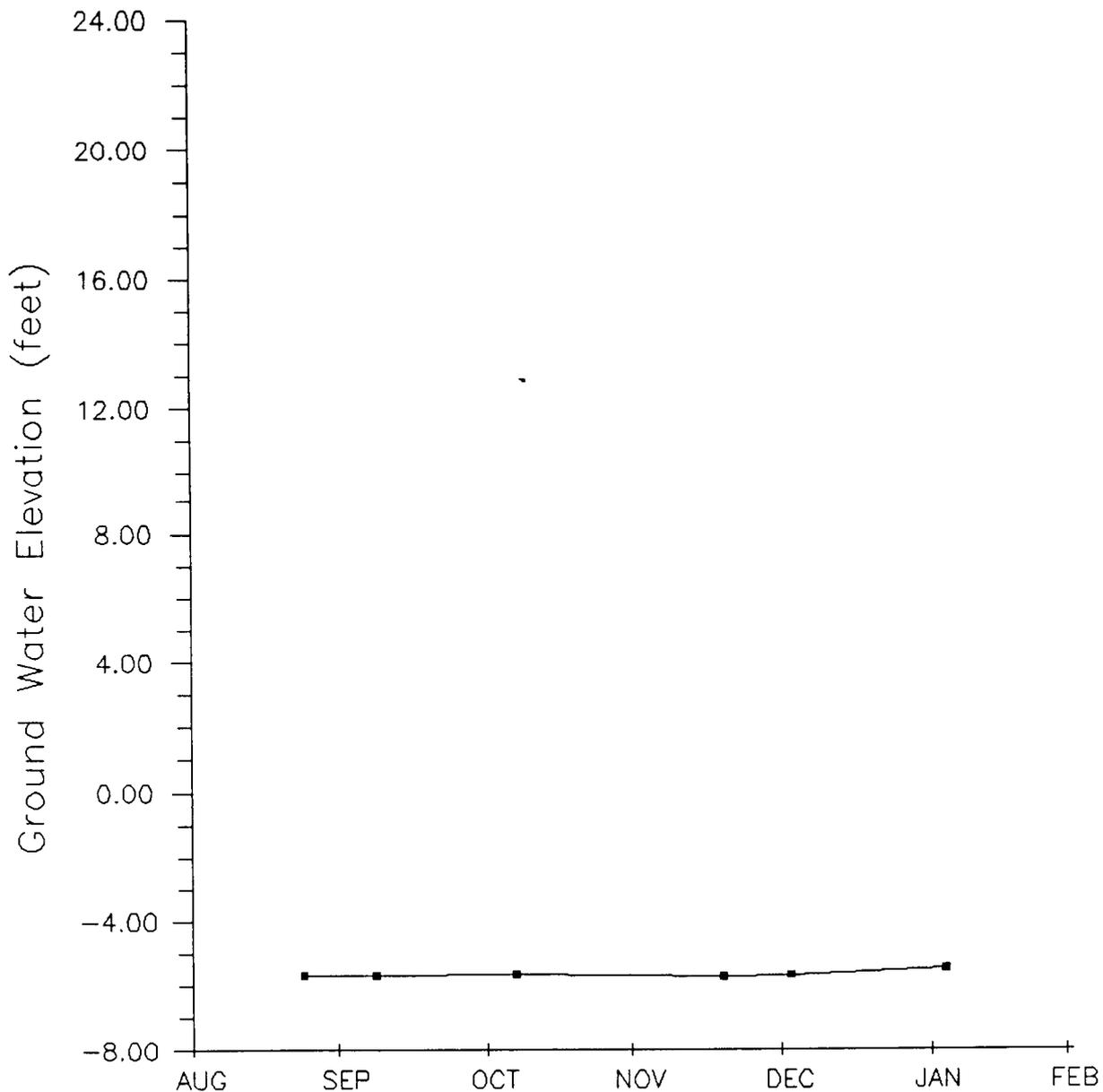


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Hydrograph of Well W02-11(F)  
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APPENDIX D

SECTION 3.0 – HYDROGRAPHS OF SITE 3 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

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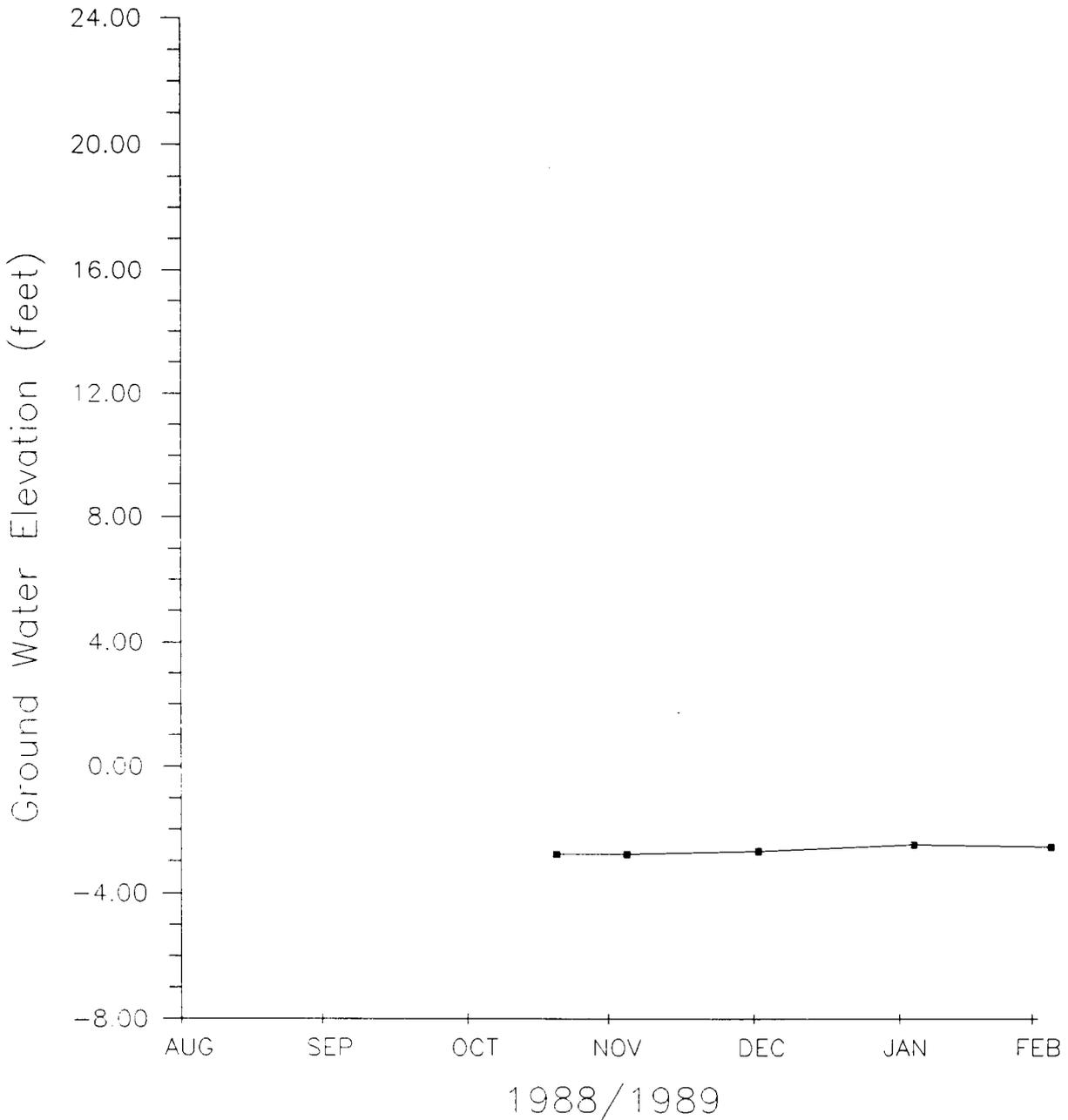
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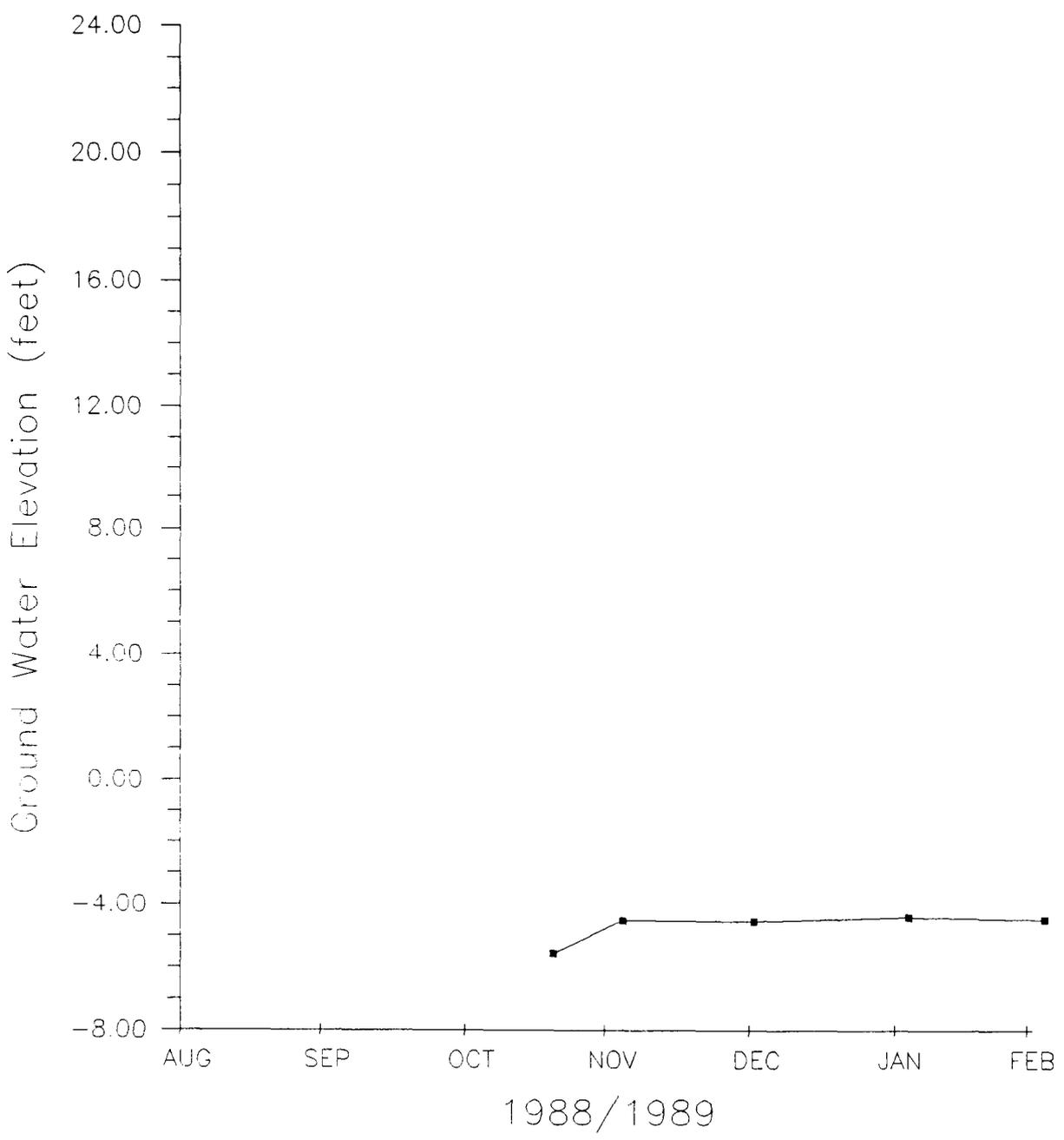


Hydrograph of Well W03-01(A)  
PREPARED FOR

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Hydrograph of Well W03-02(A)  
PREPARED FOR

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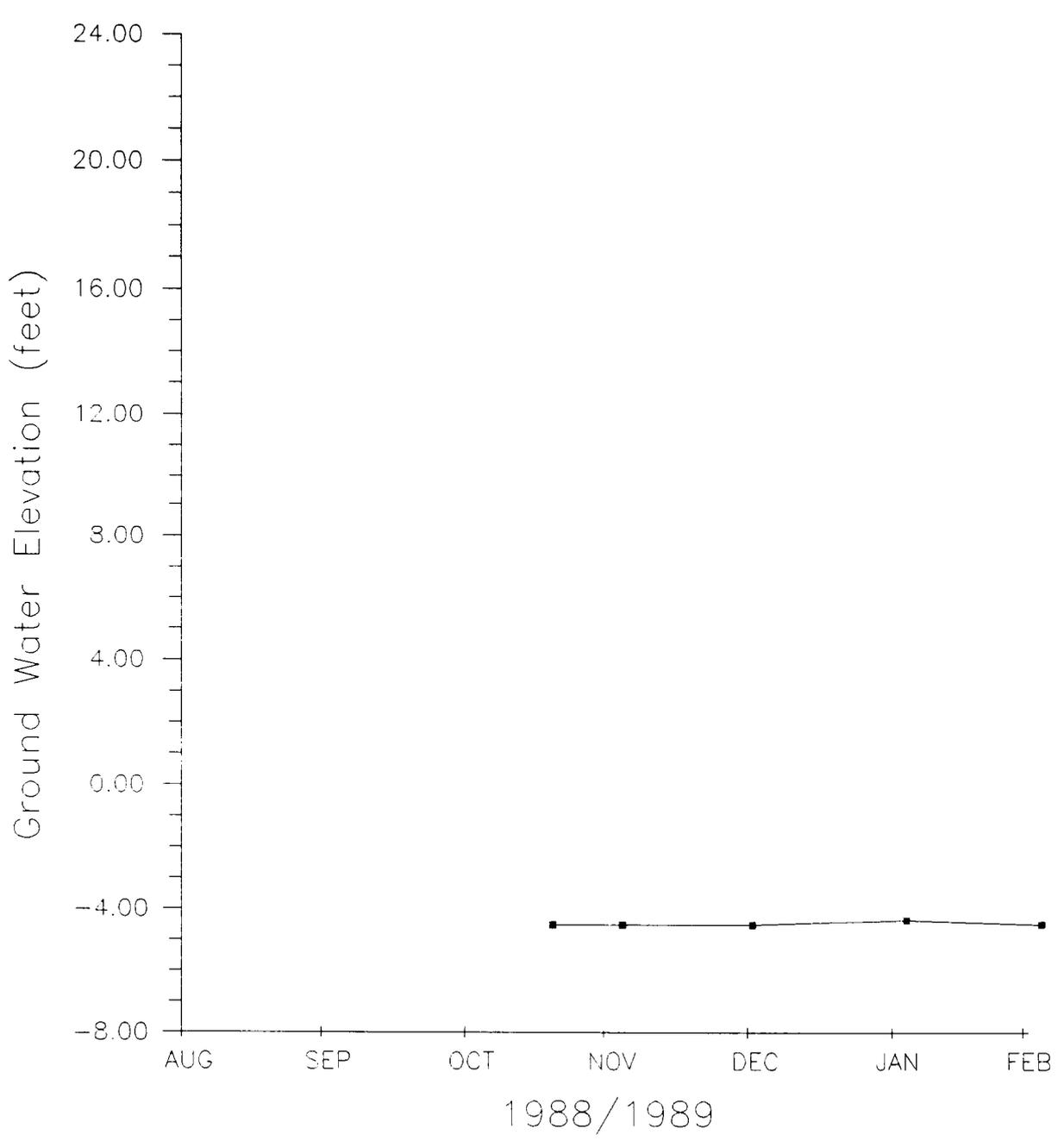
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Hydrograph of Well W03-03(A)  
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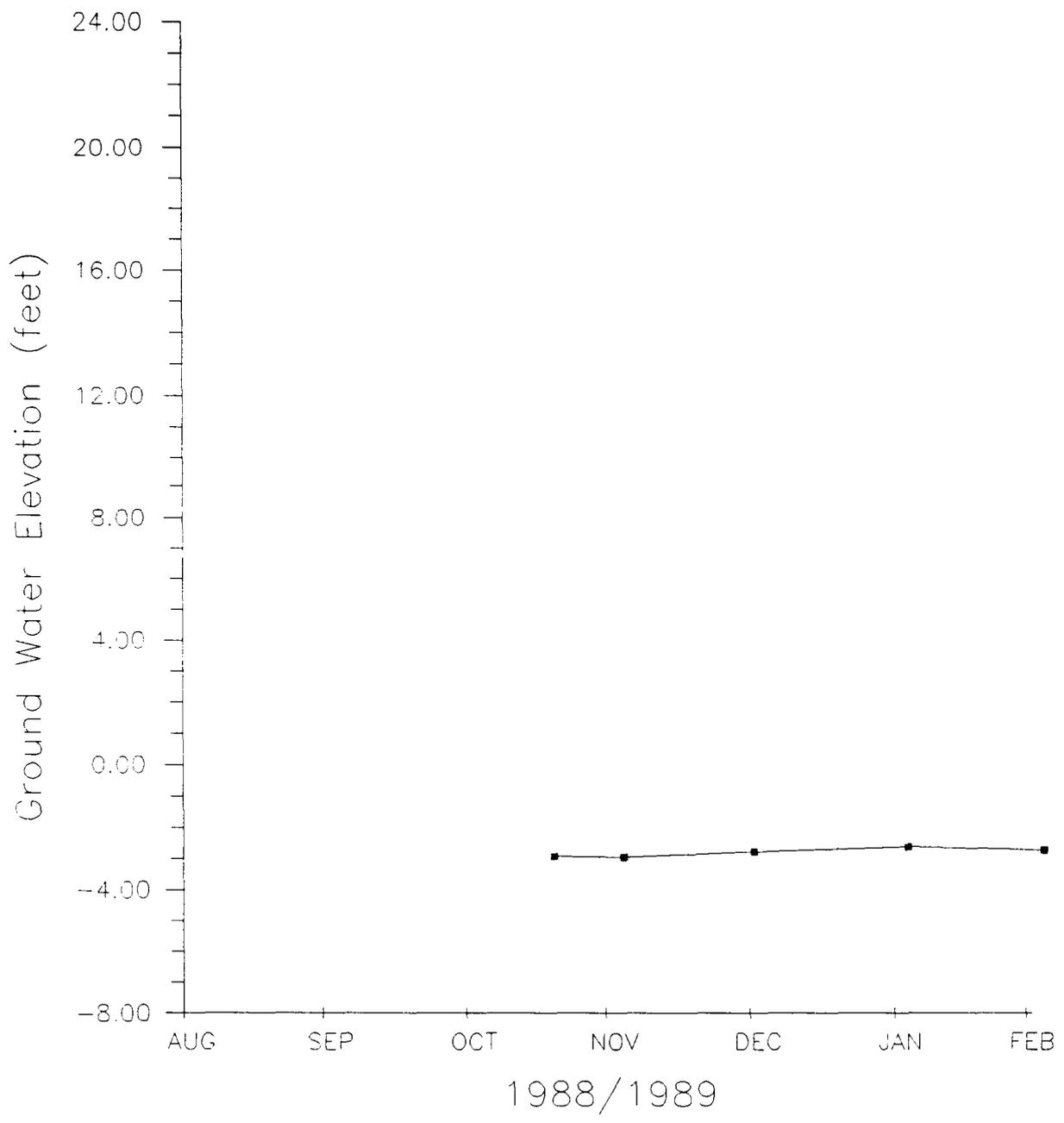
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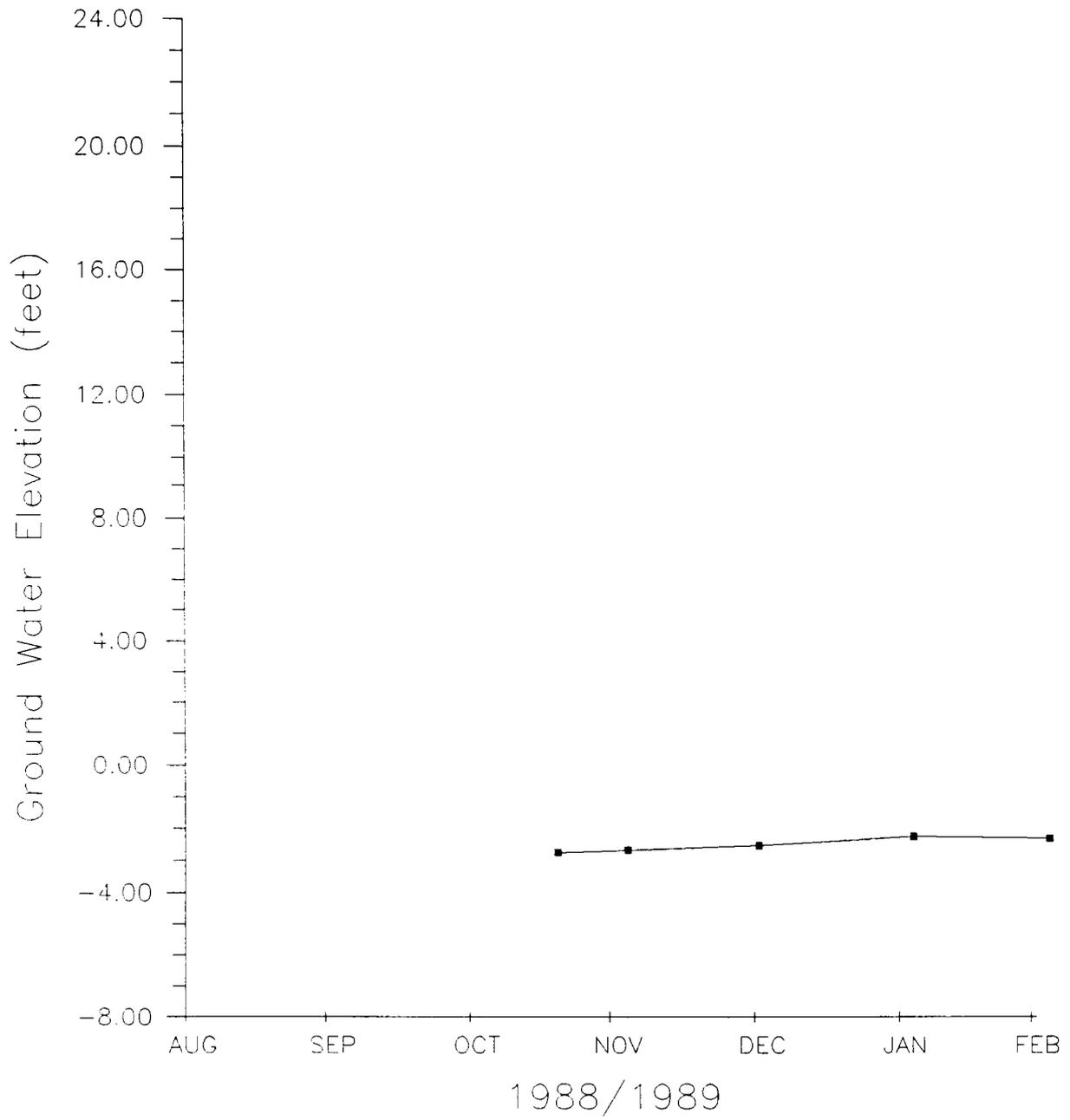
Hydrograph of Well W03-04(B2)  
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Hydrograph of Well W03-07(B2)  
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NAS Moffett Field

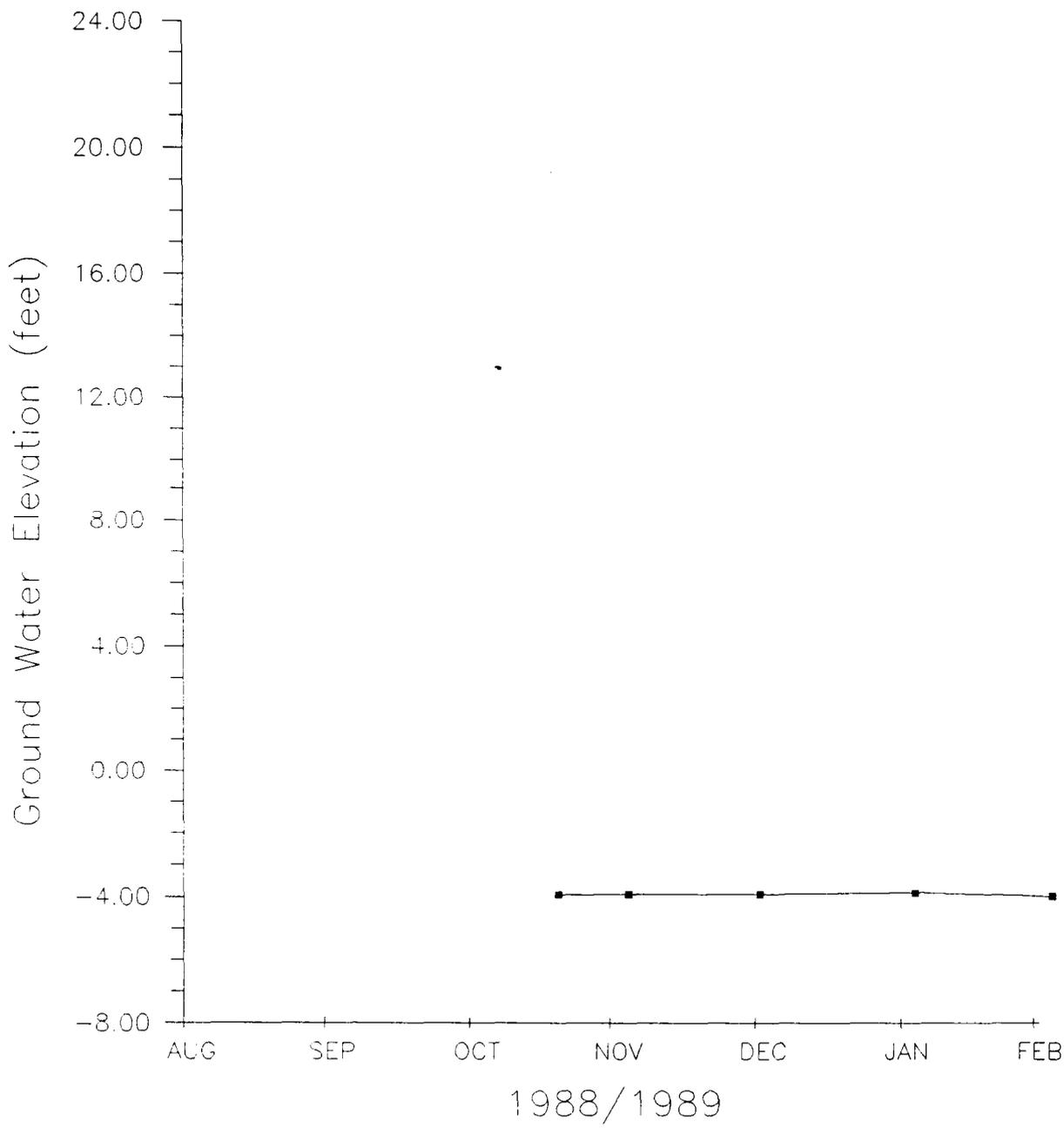
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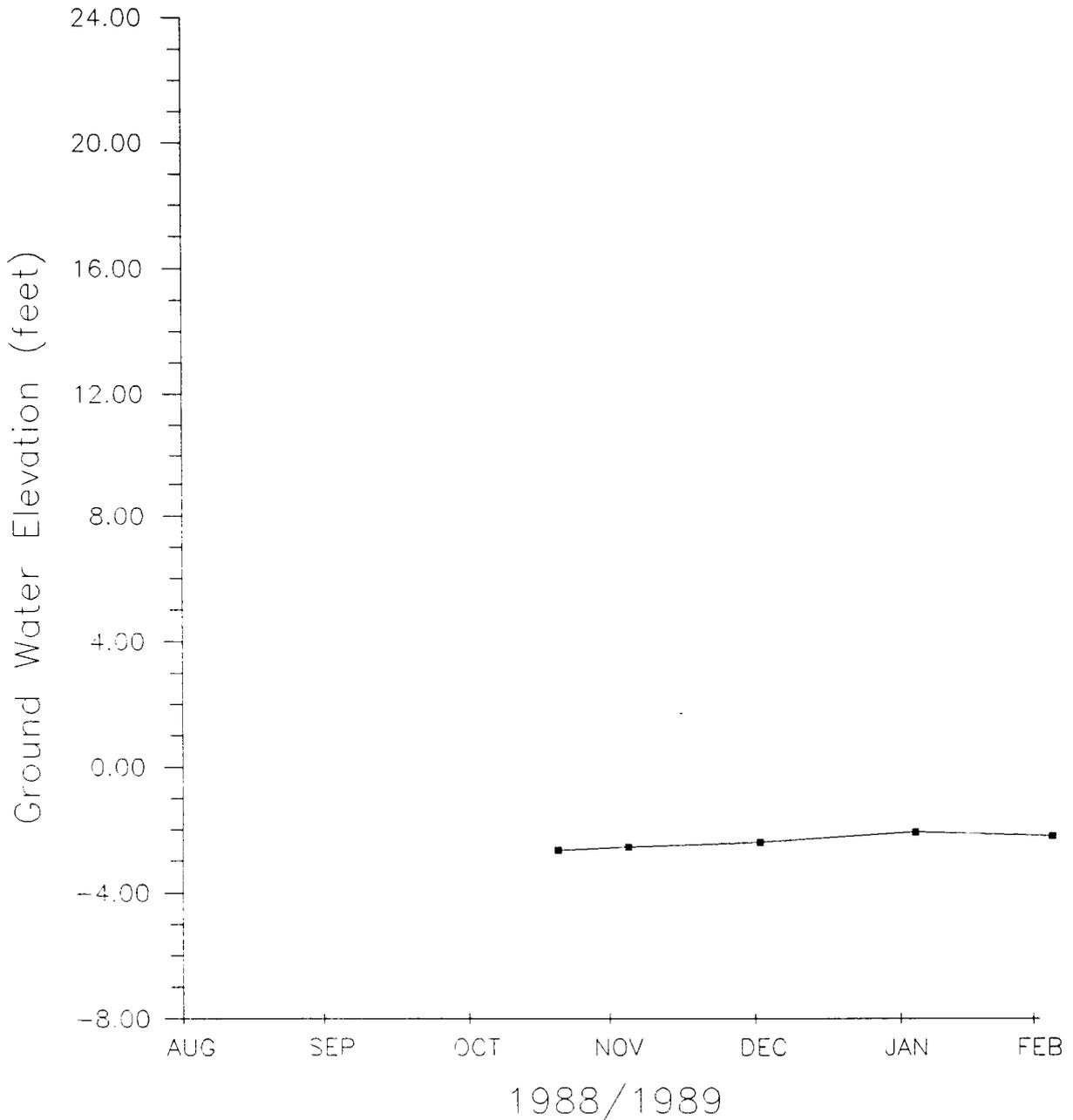
Hydrograph of Well W03-08(A)  
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Hydrograph of Well W03-09(B1)  
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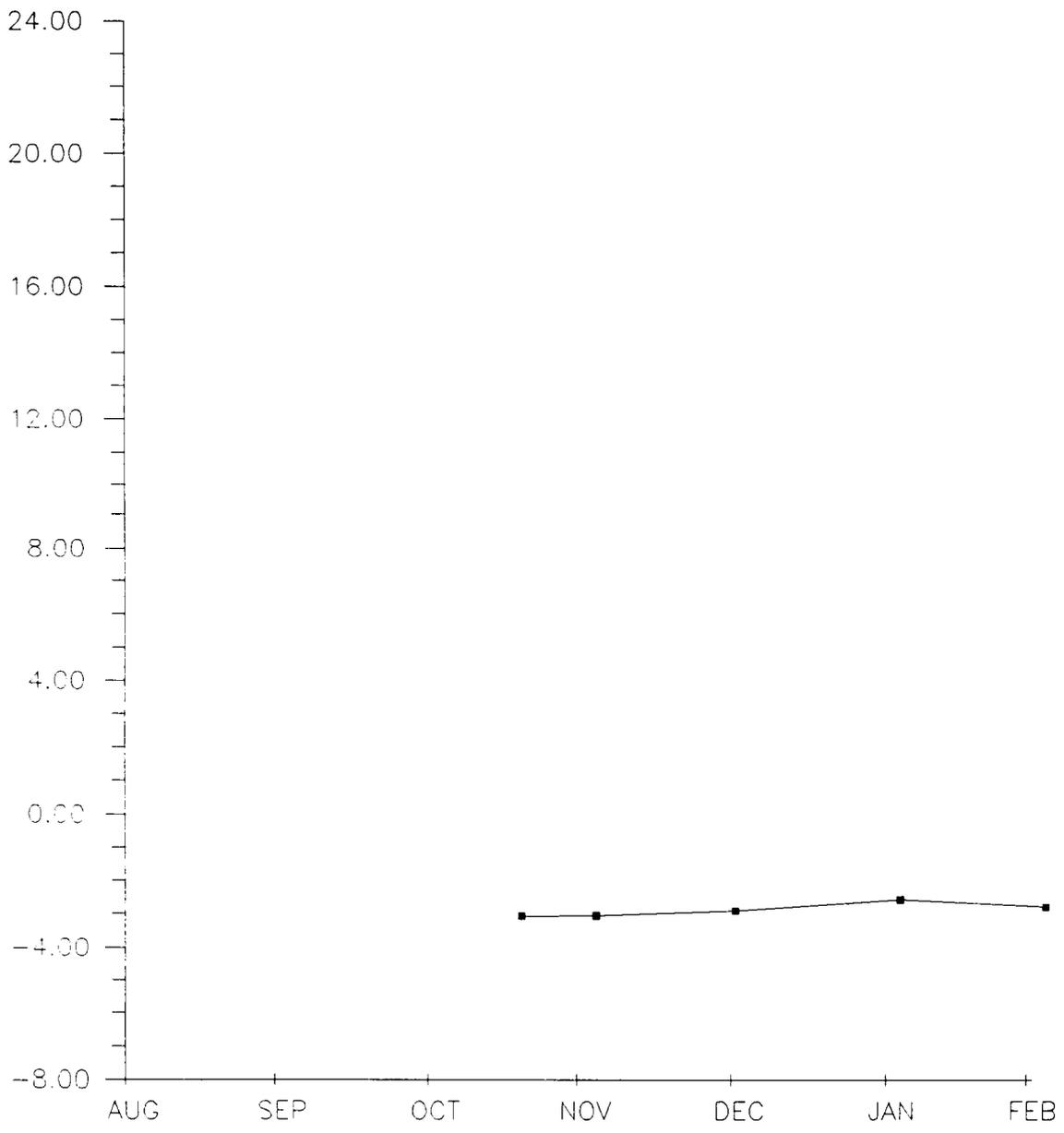
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Ground Water Elevation (feet)



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Hydrograph of Well W03-11(A)  
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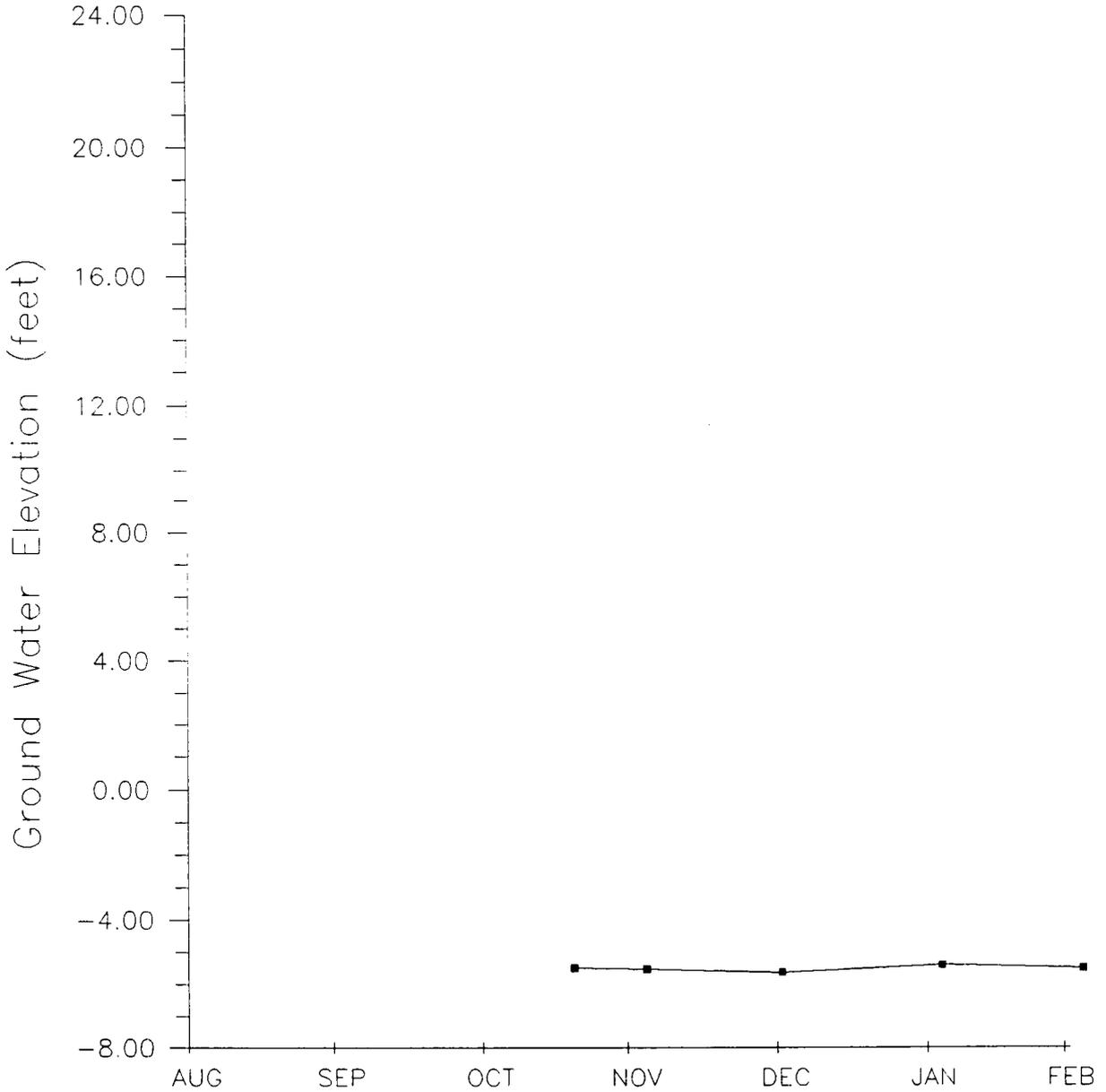
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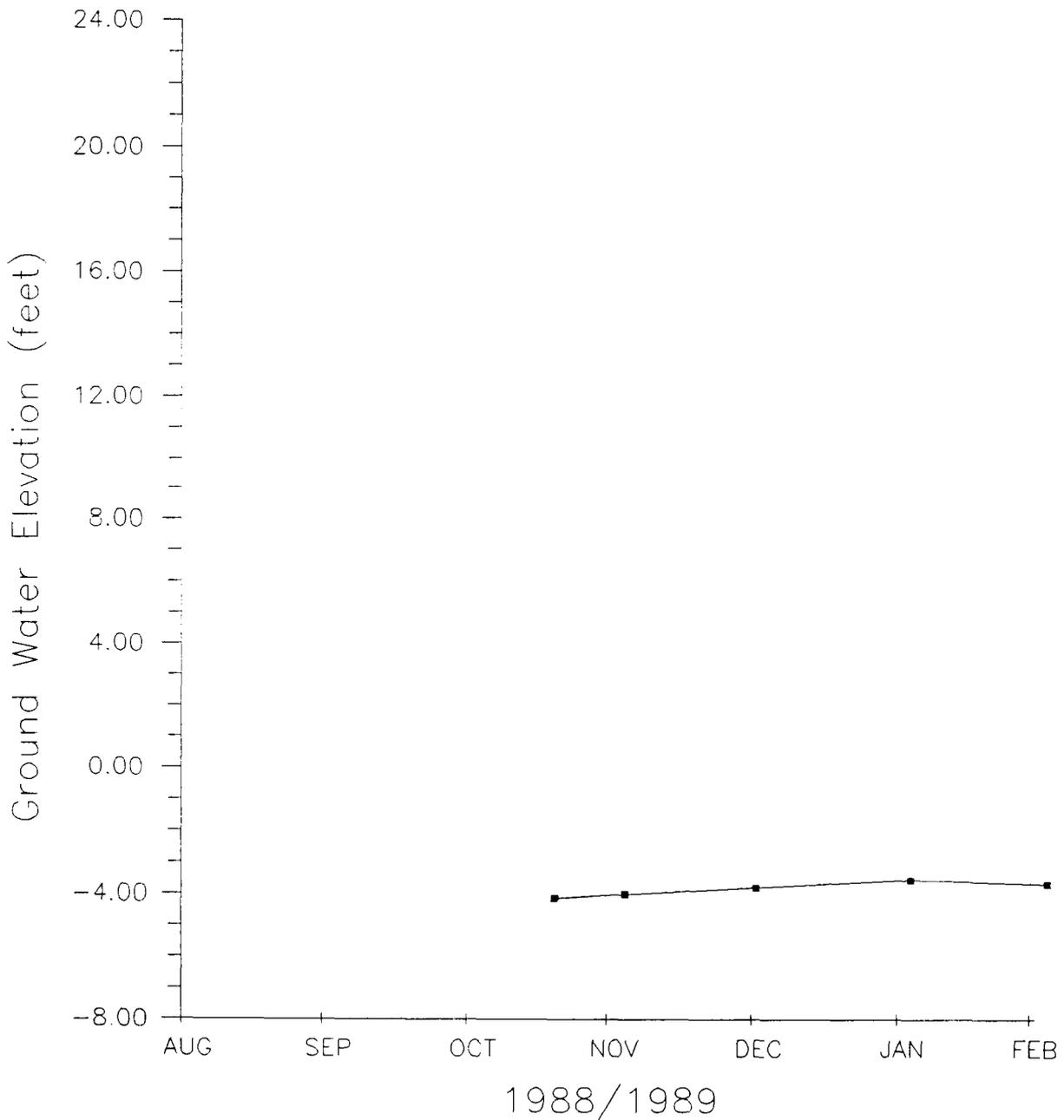
1988/1989

Hydrograph of Well W03-12(B1)  
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Hydrograph of Well W03-13(B1)  
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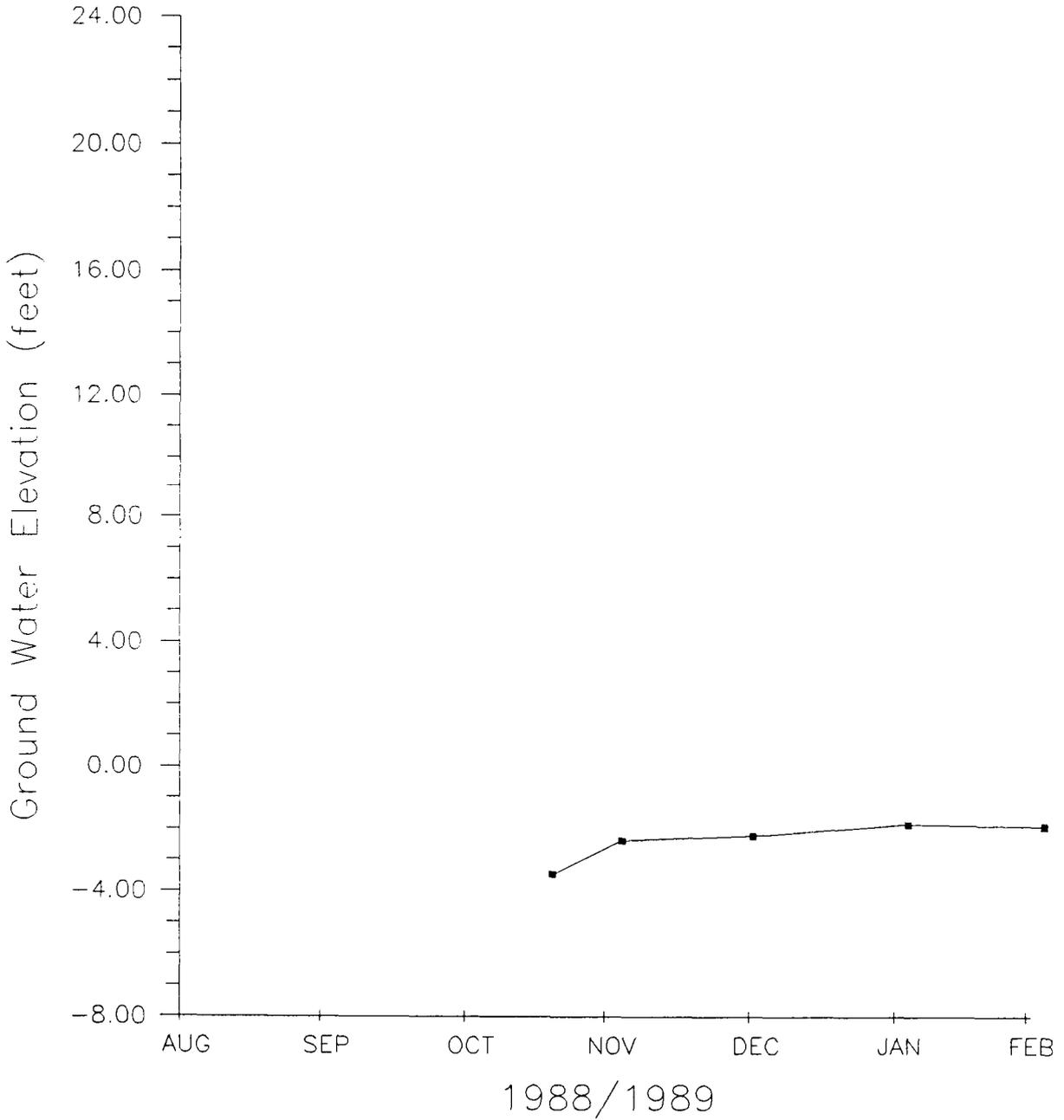
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Hydrograph of Well W03-14(B1)  
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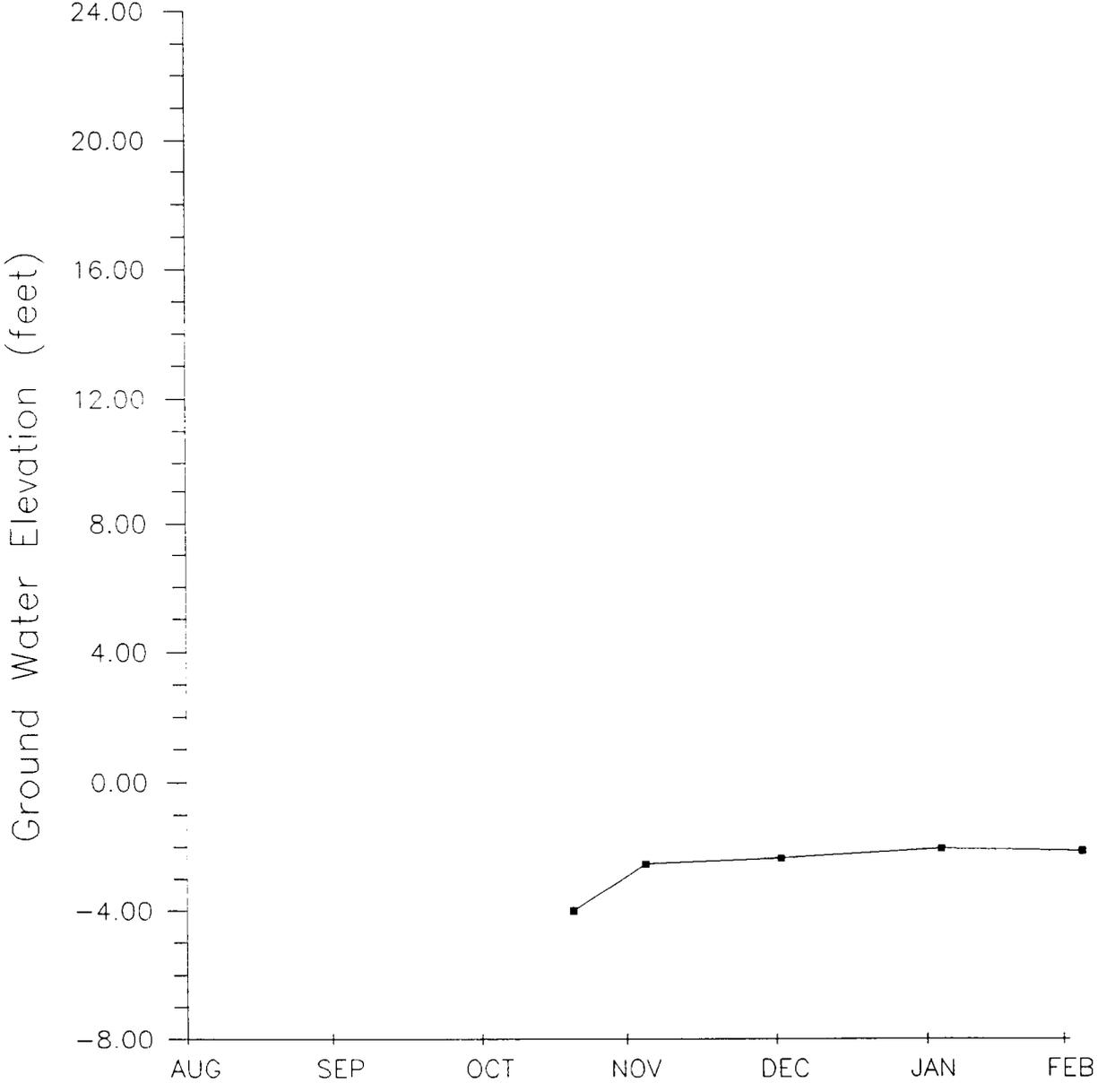
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Hydrograph of Well W03-15(B2)  
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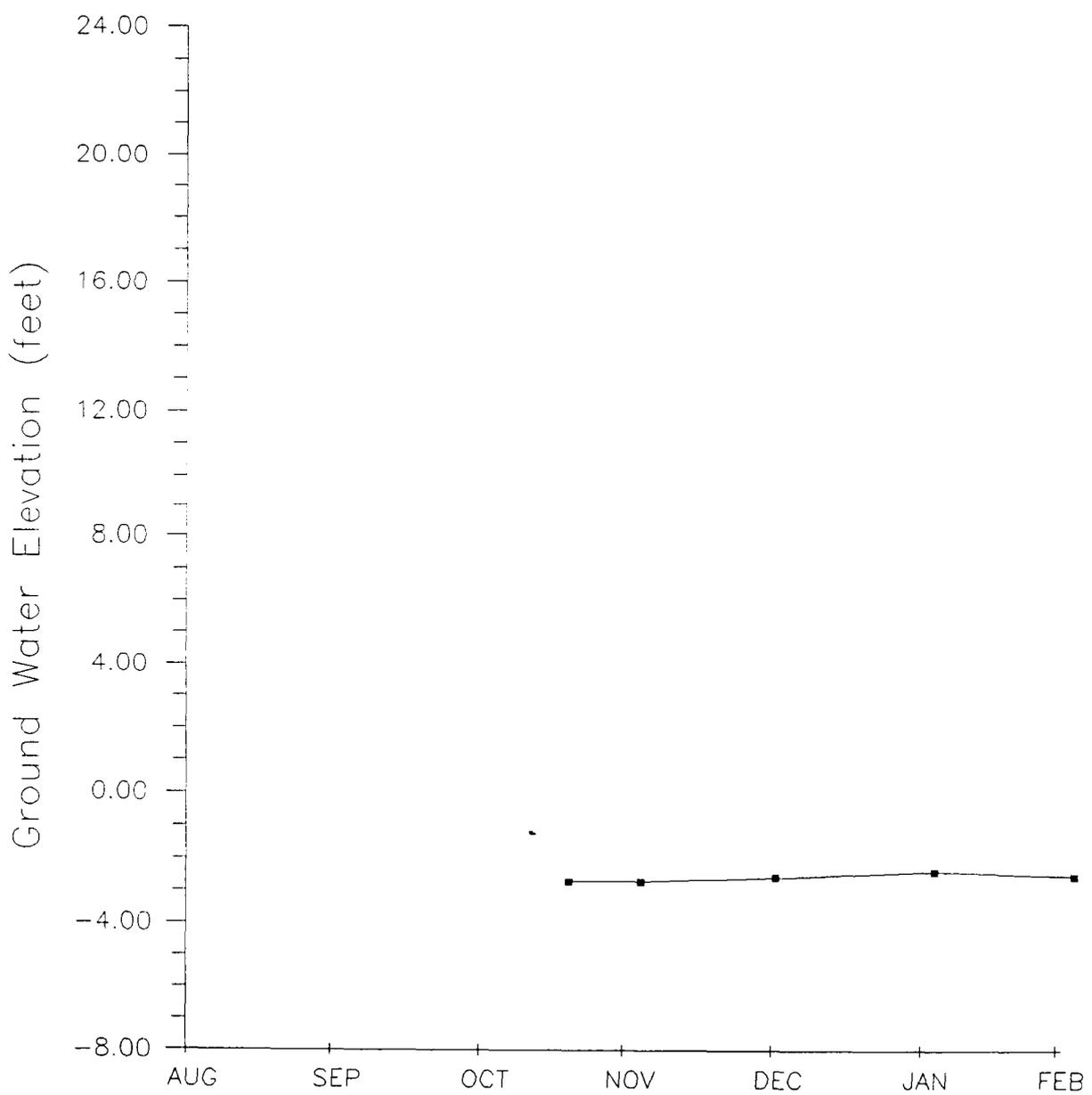
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L.L.  
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Hydrograph of Well W03-22(A)  
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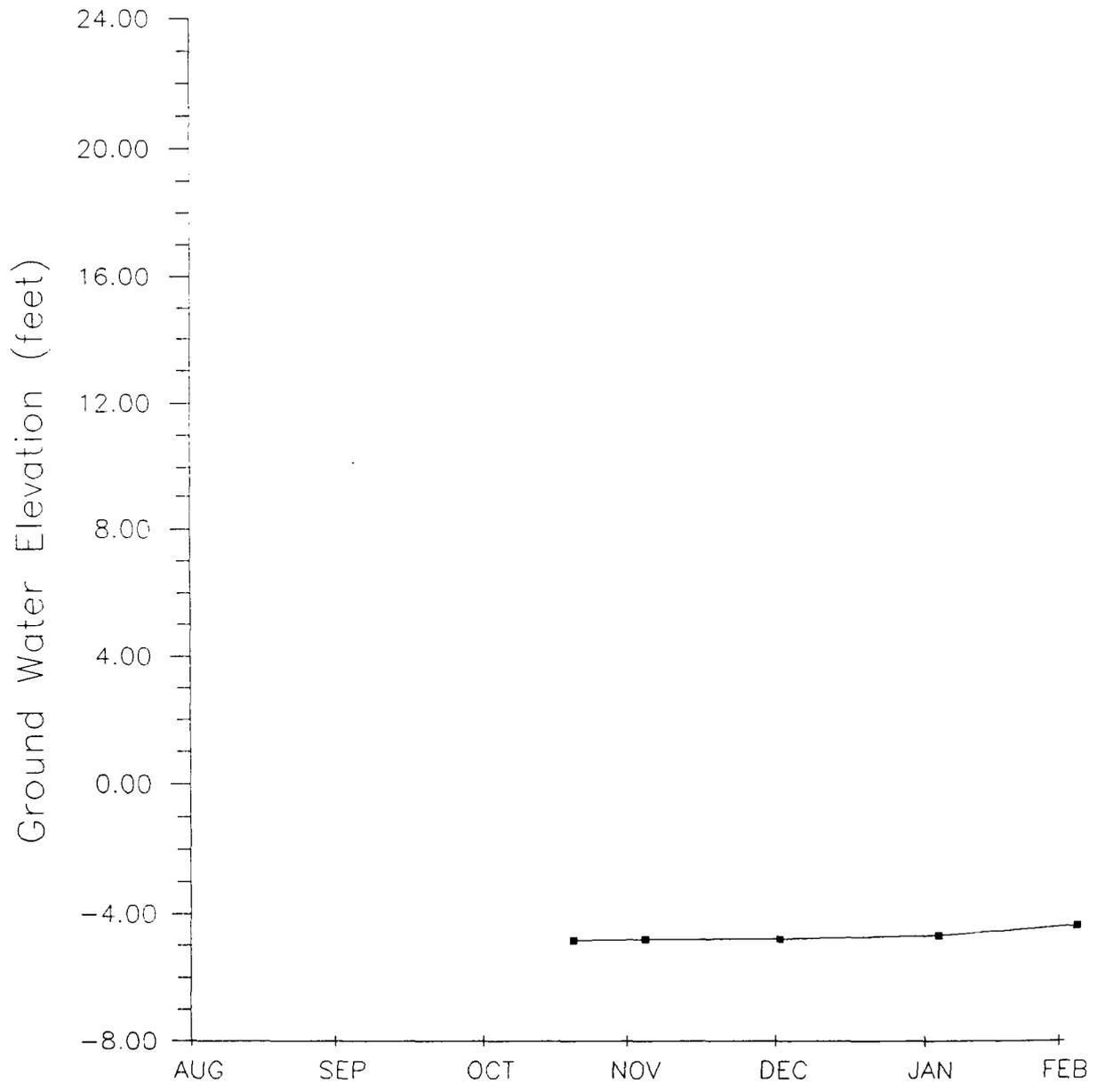
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APPROVED BY

LIP  
2-25-89

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Hydrograph of Well W03-23(A)  
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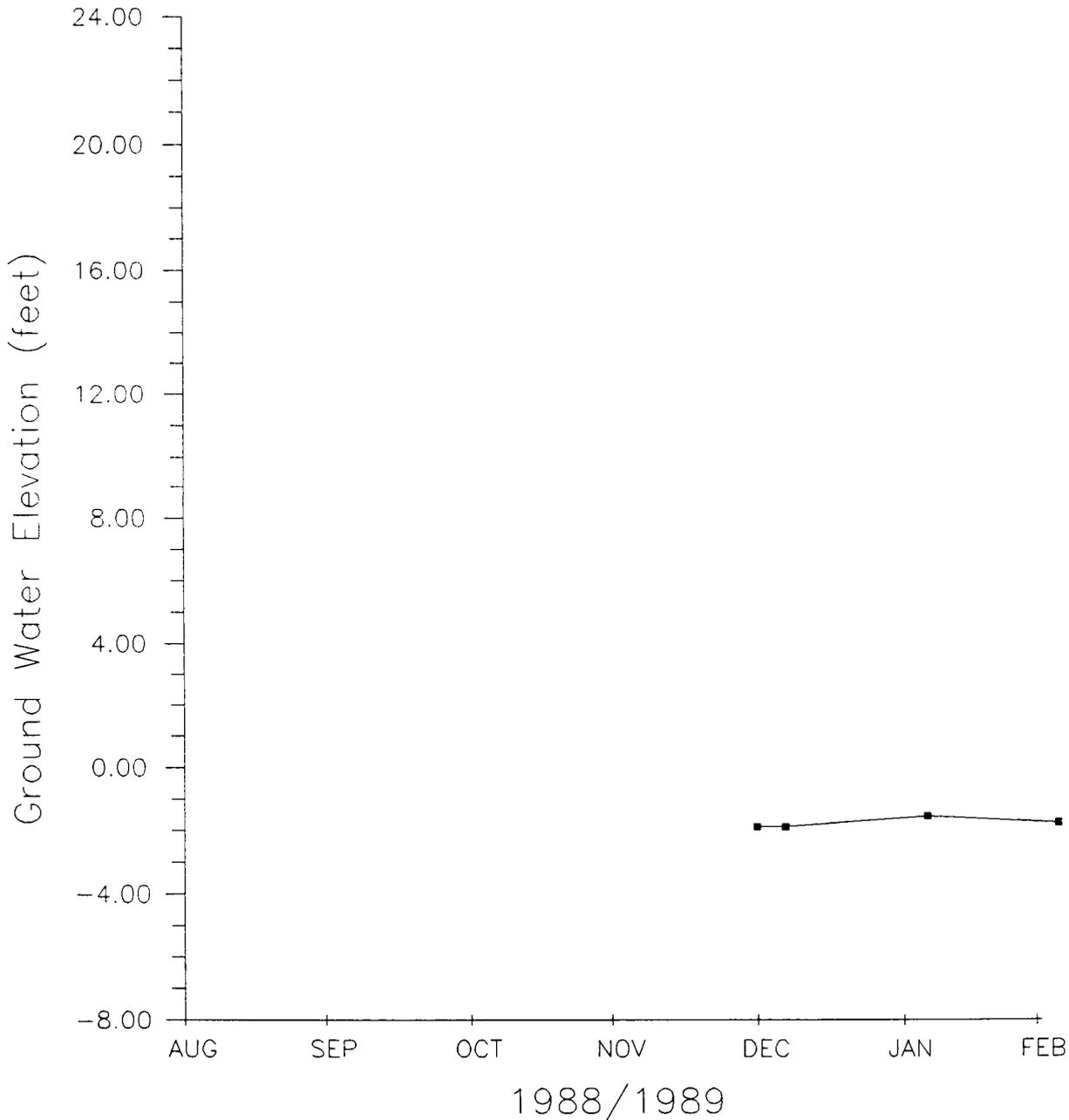
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SECTION 4.0 – HYDROGRAPHS OF SITE 4 WELLS

MARCH 1989 QUARTERLY REPORT  
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DATED 15 MARCH 1989

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Hydrograph of Well W04-02(A)  
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NAS Moffett Field

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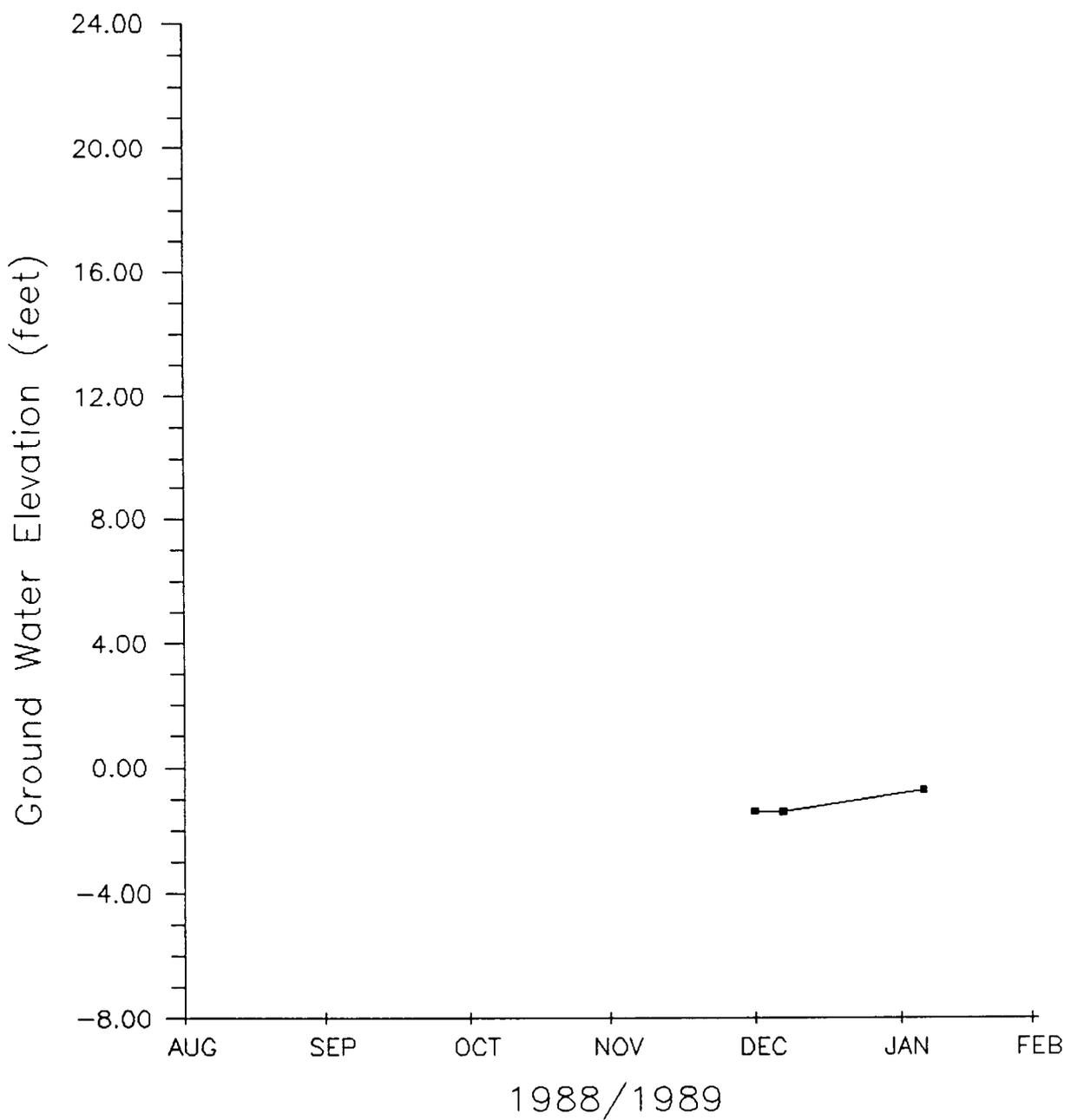
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Hydrograph of Well W04-03(A)  
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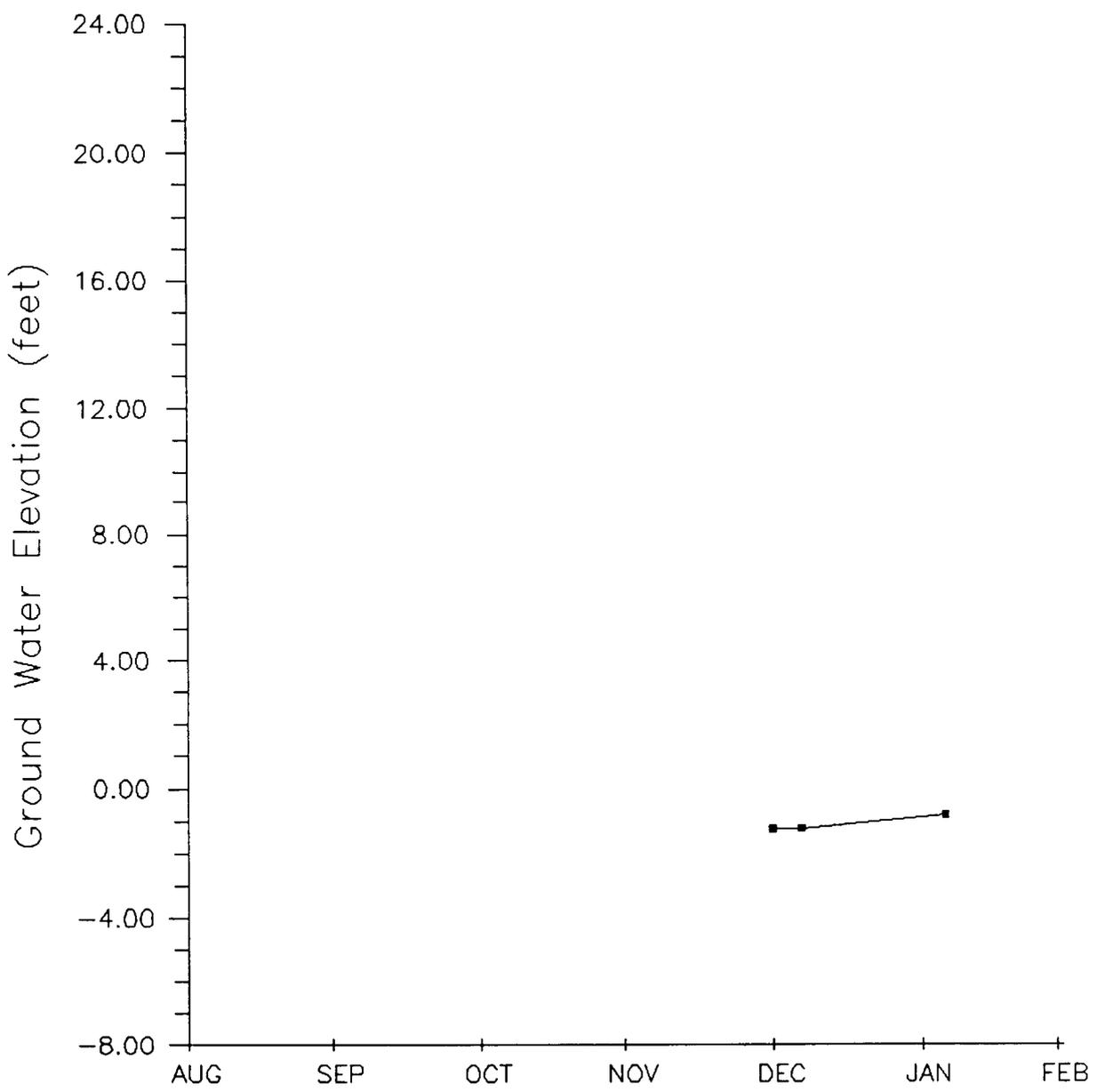
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Hydrograph of Well W04-04(A)  
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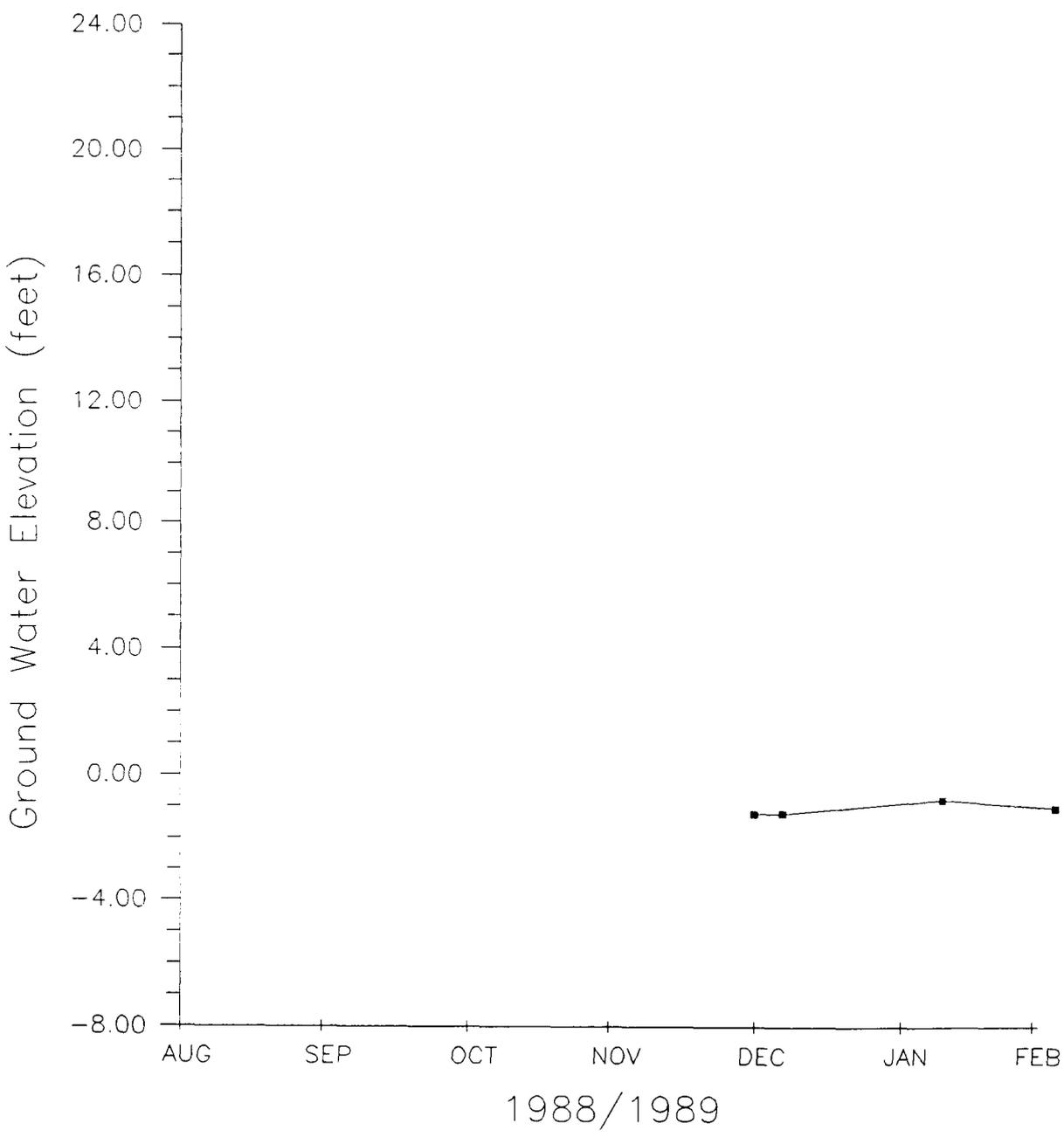
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Hydrograph of Well W04-06(A)  
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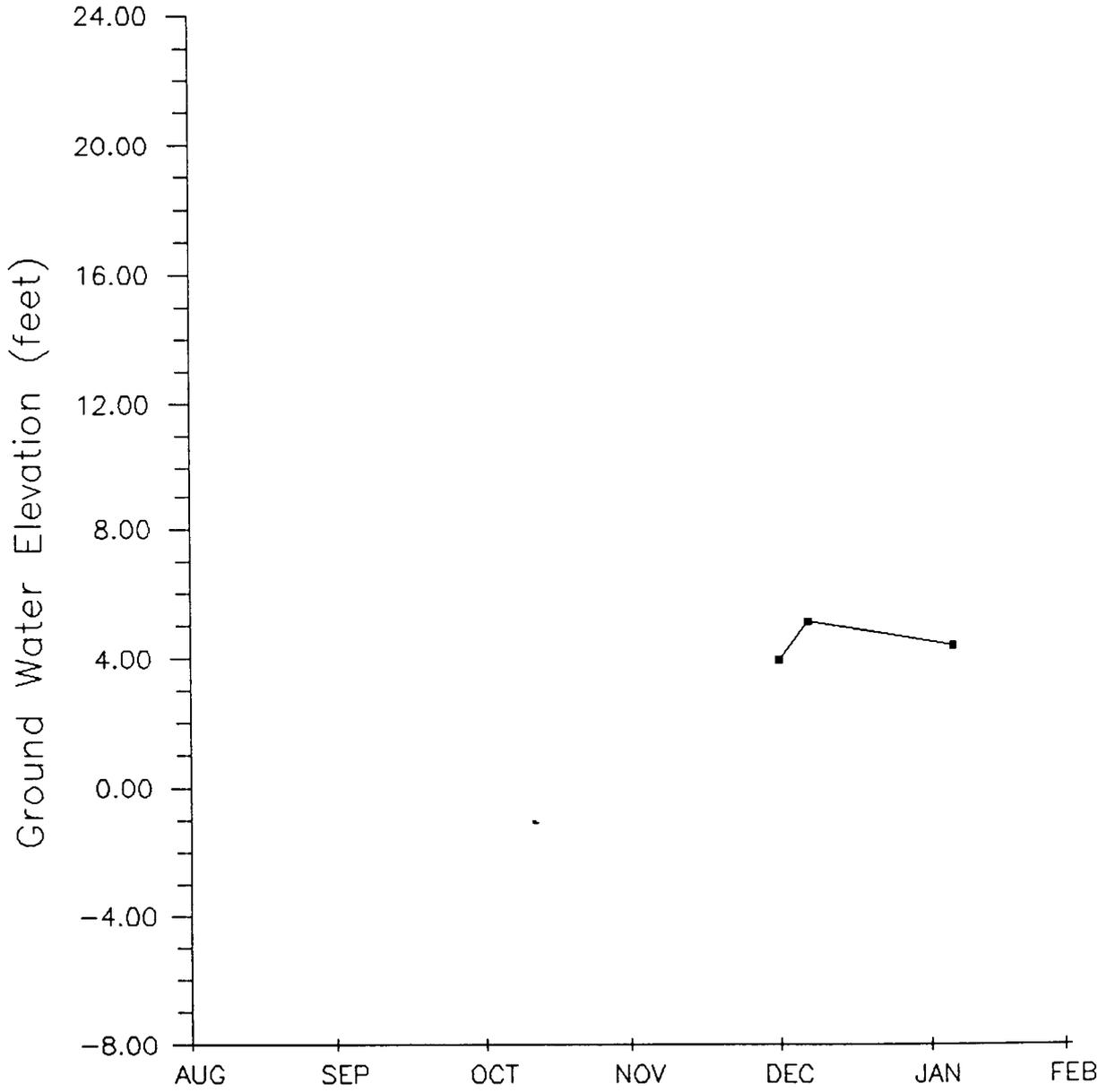
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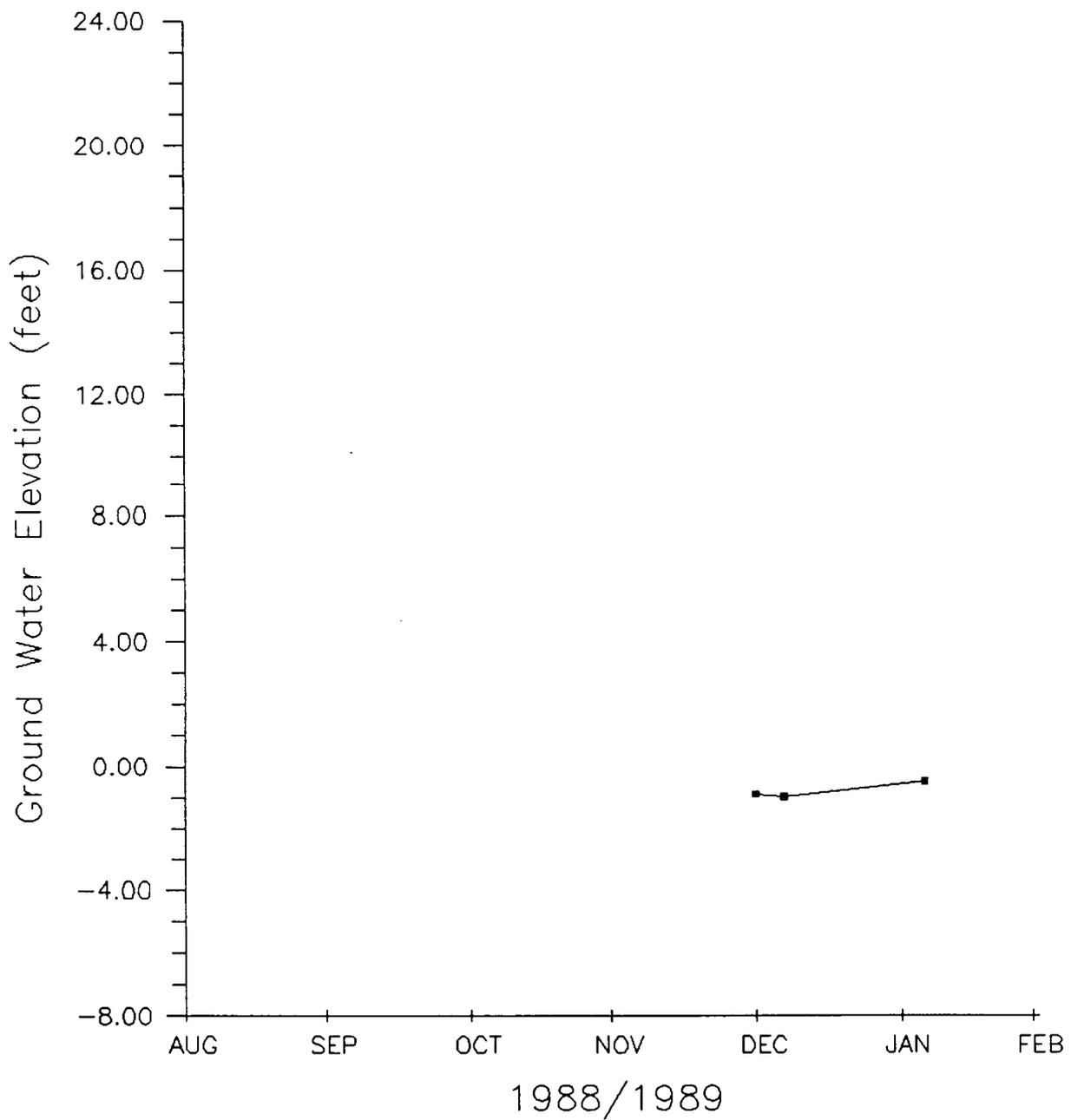
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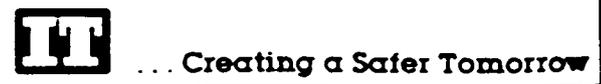
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Hydrograph of Well W04-09(B2)  
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APPENDIX D

SECTION 5.0 – HYDROGRAPHS OF SITE 5 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

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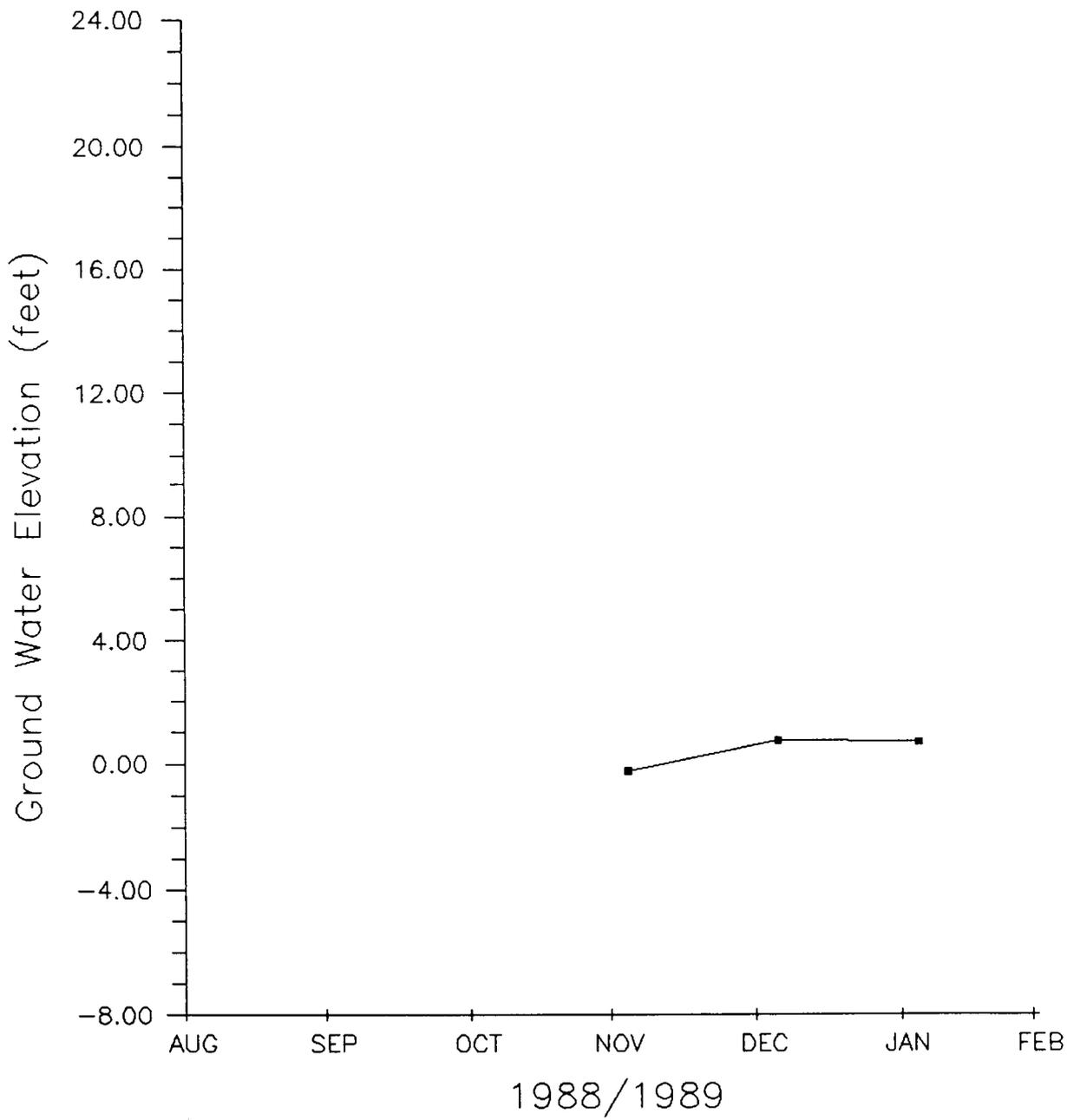
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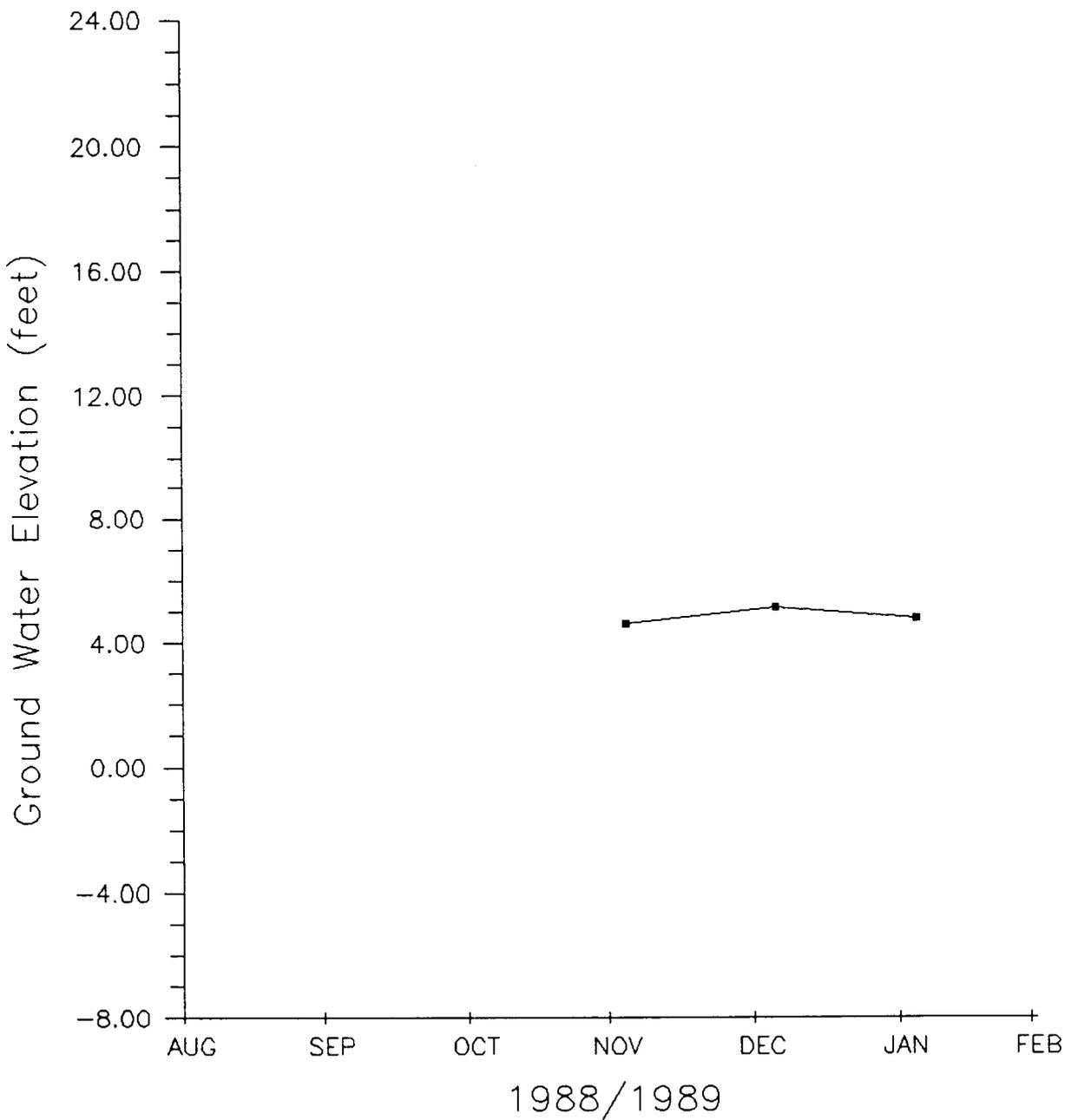


Hydrograph of Well W05-04(B1)  
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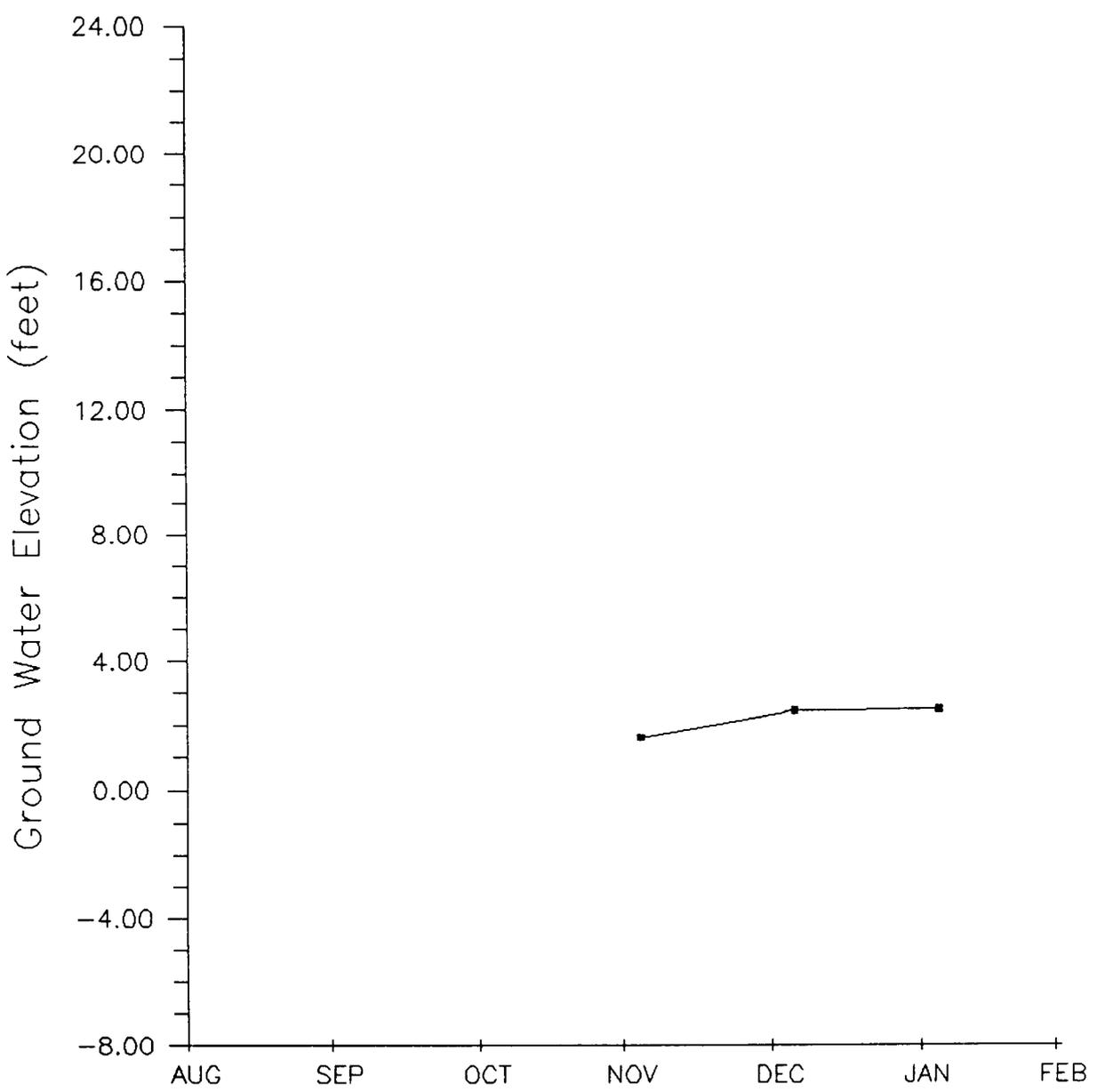
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Hydrograph of Well W05-05(C)  
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Hydrograph of Well W05-06(A)  
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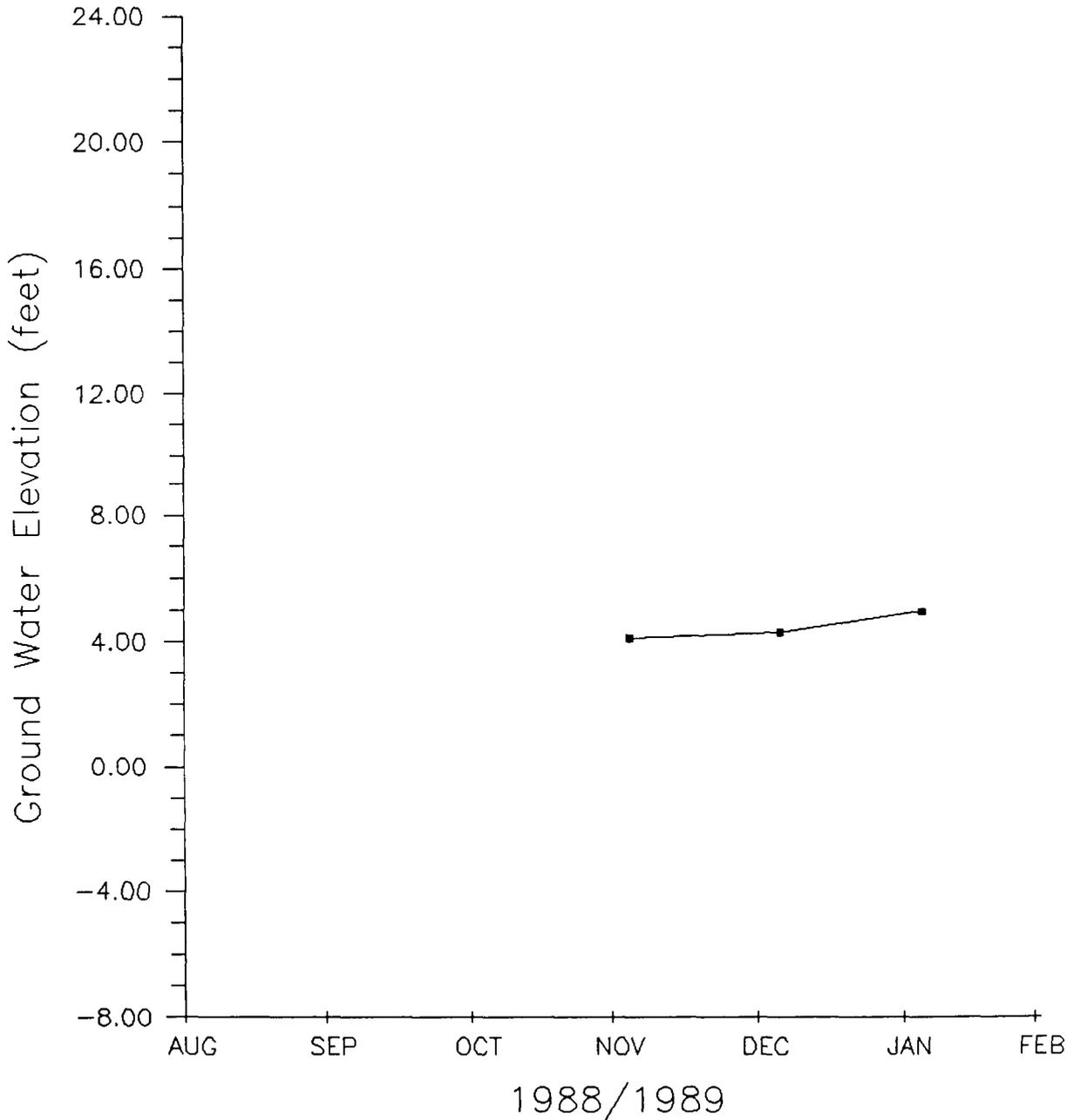
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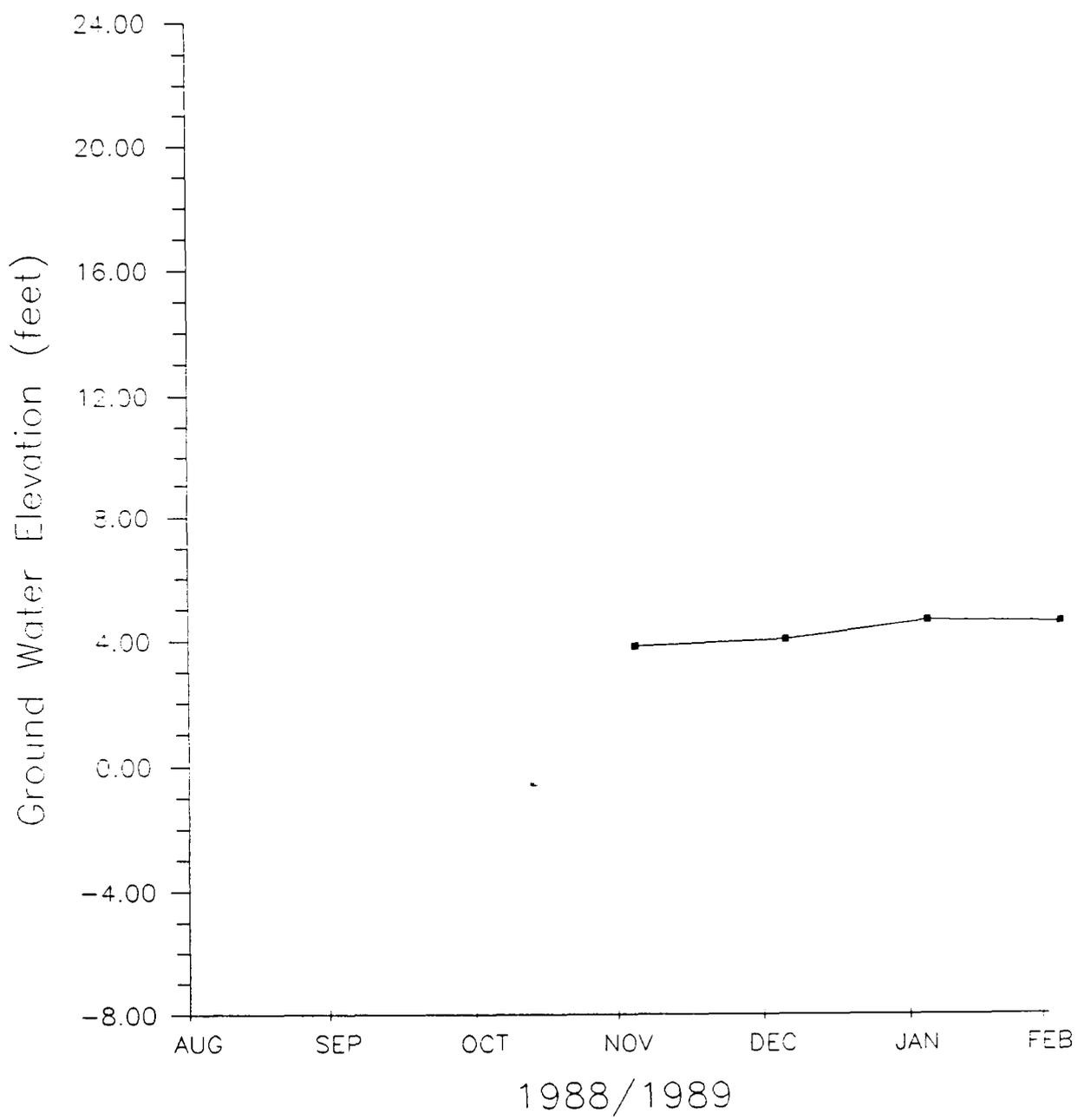


Hydrograph of Well W05-07(A)  
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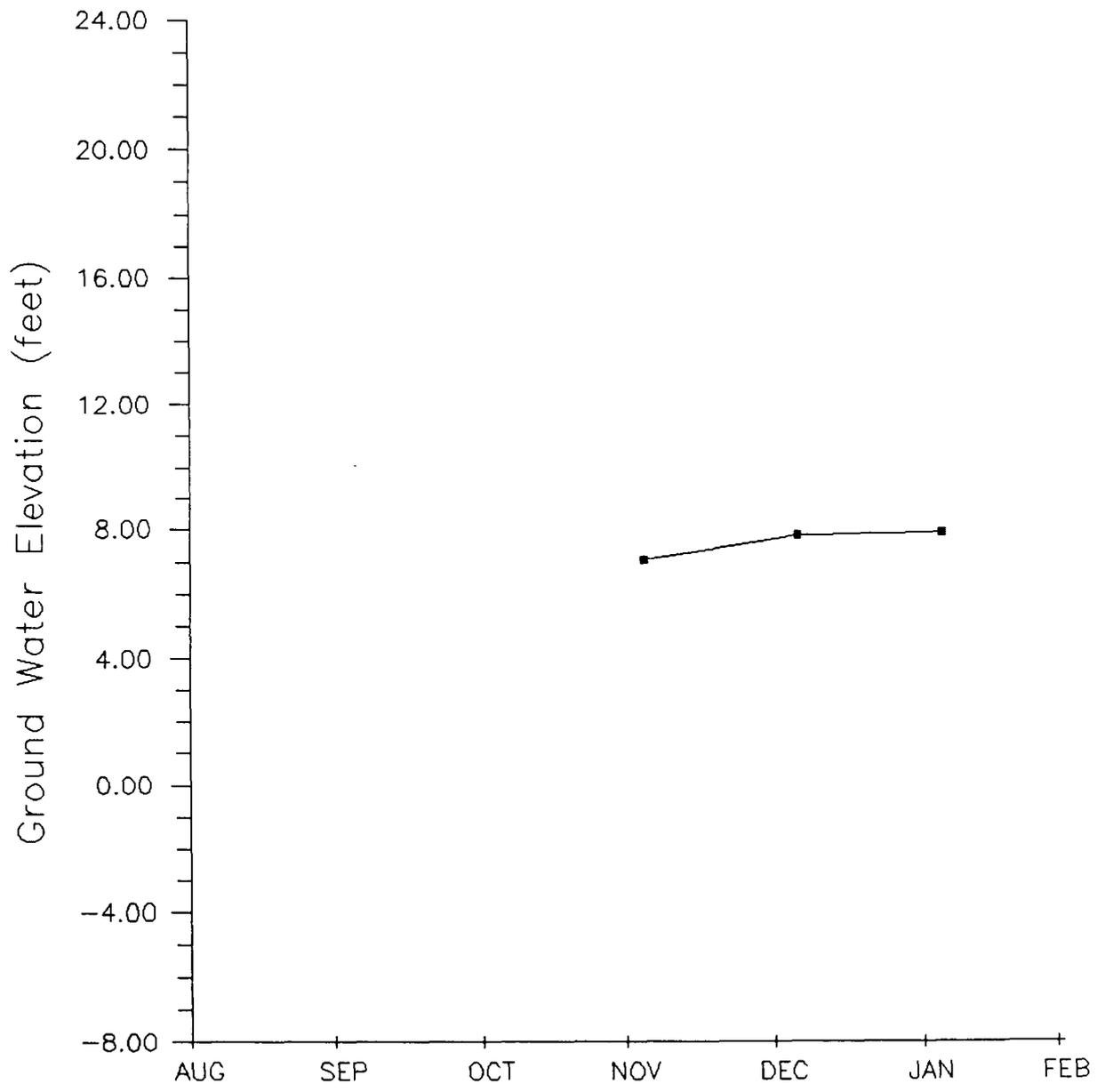
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Hydrograph of Well W05-09(A)  
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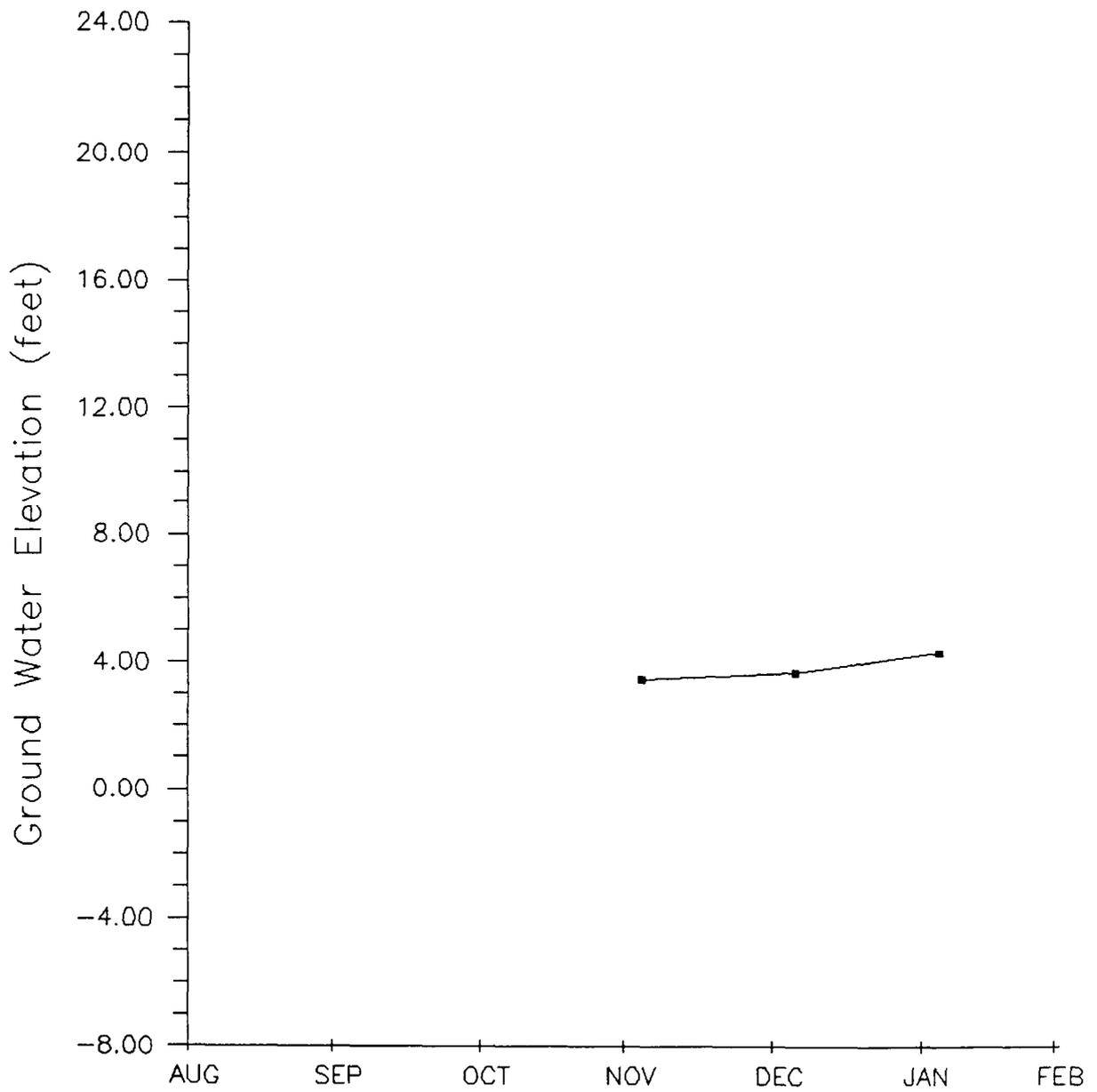
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Hydrograph of Well W05-10(A)  
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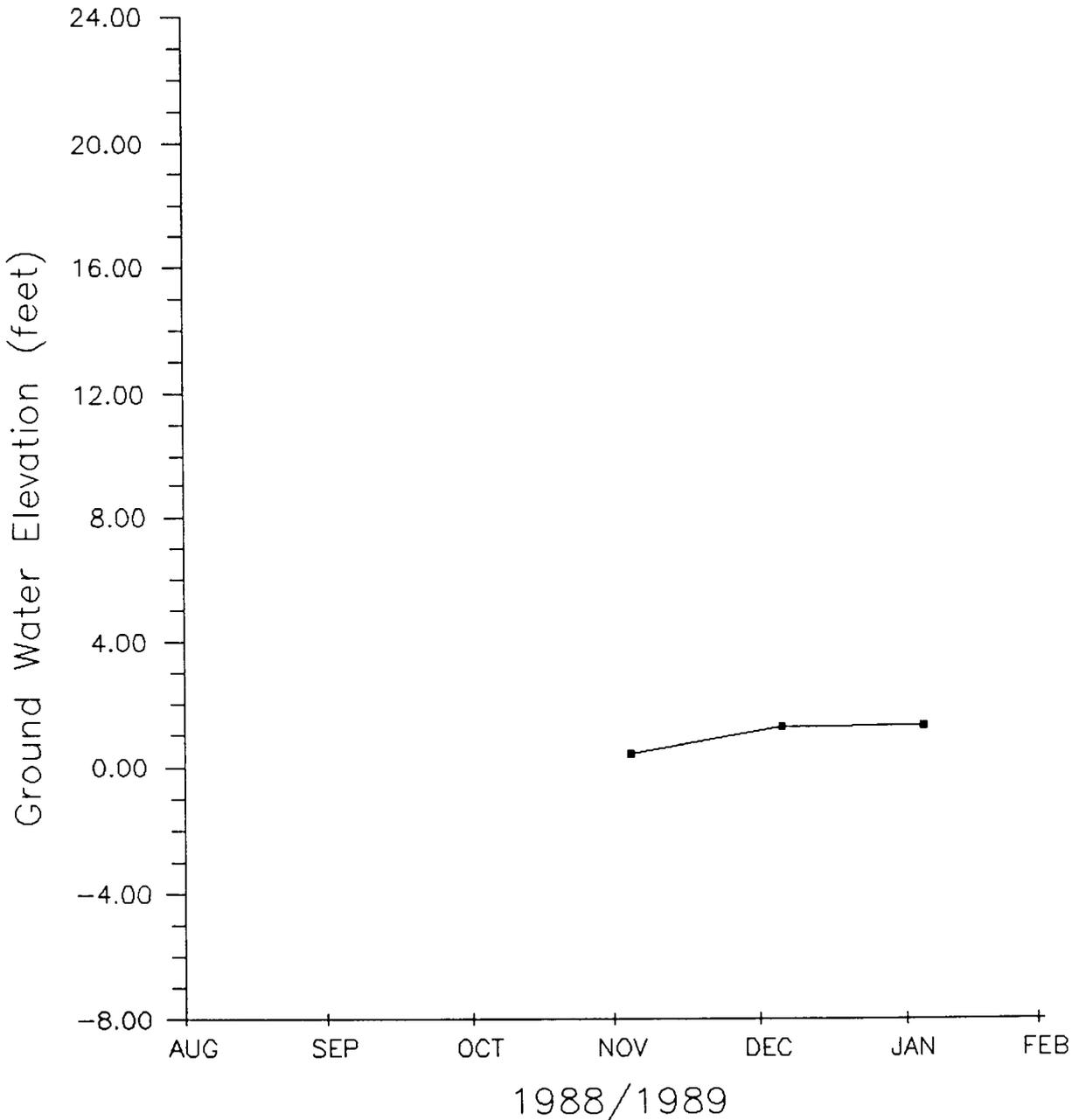
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Hydrograph of Well W05-14(A)  
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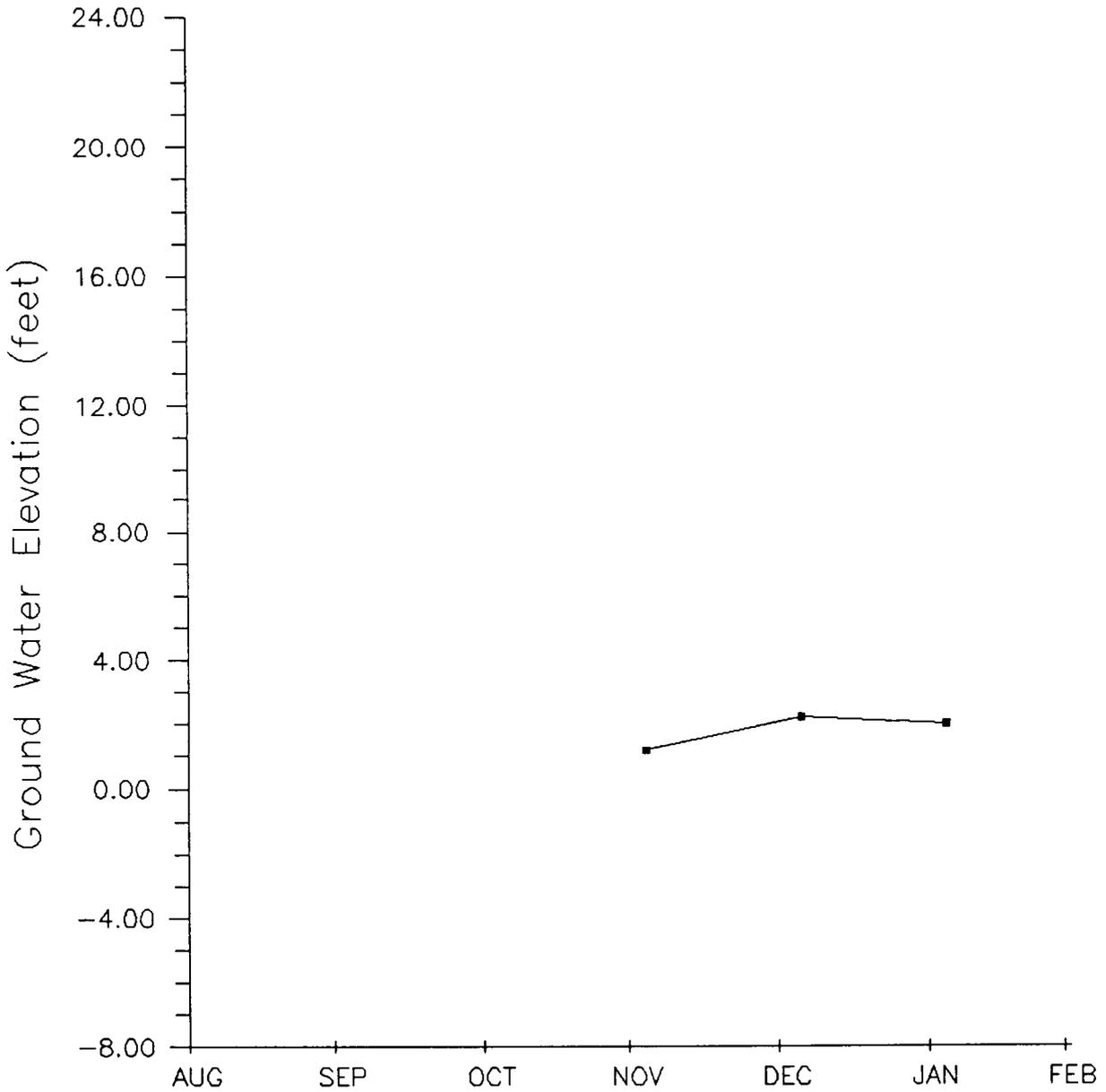
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Hydrograph of Well W05-15(A)  
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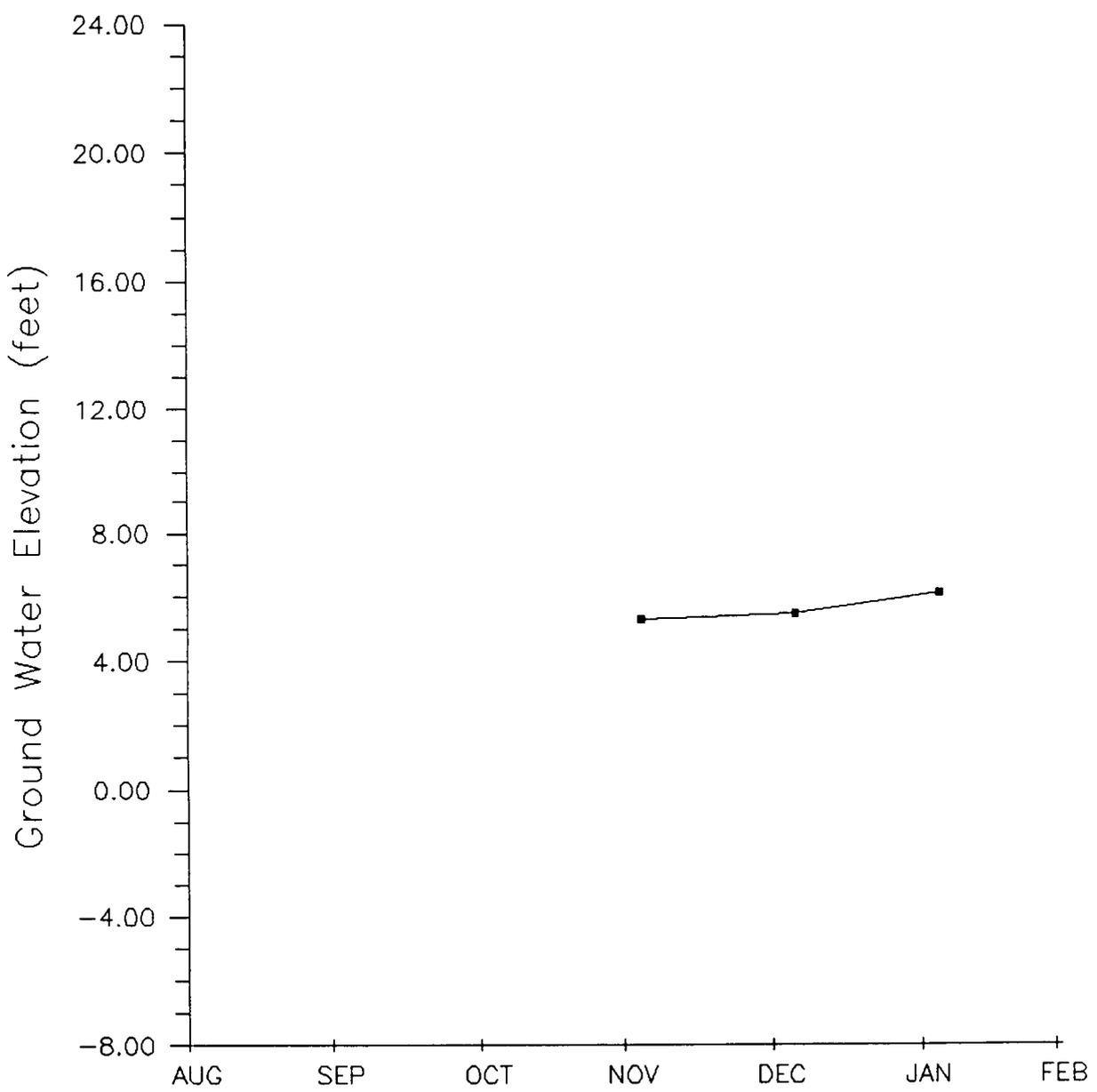
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Hydrograph of Well W05-16(A)  
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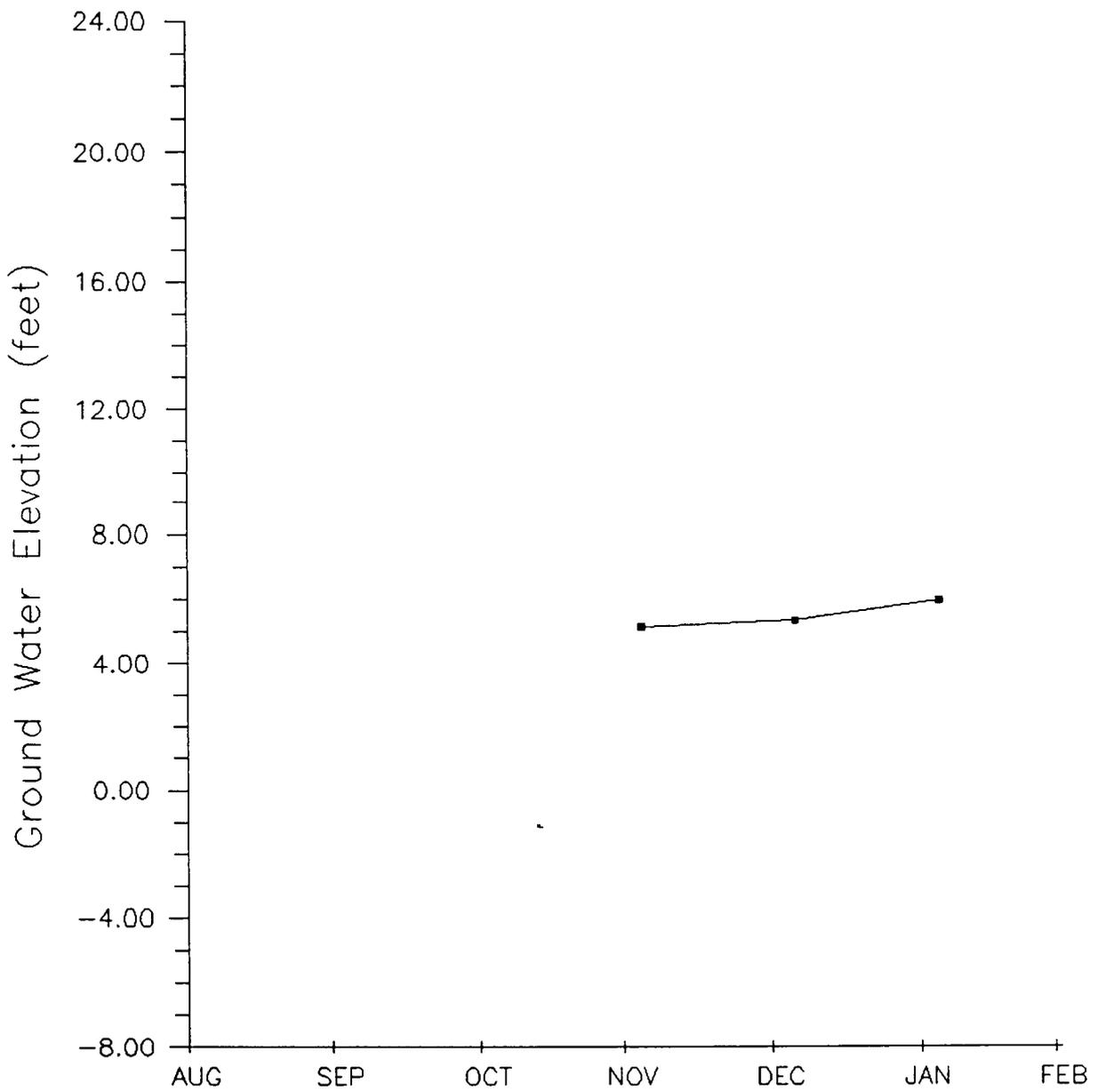
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Hydrograph of Well W05-17(A)  
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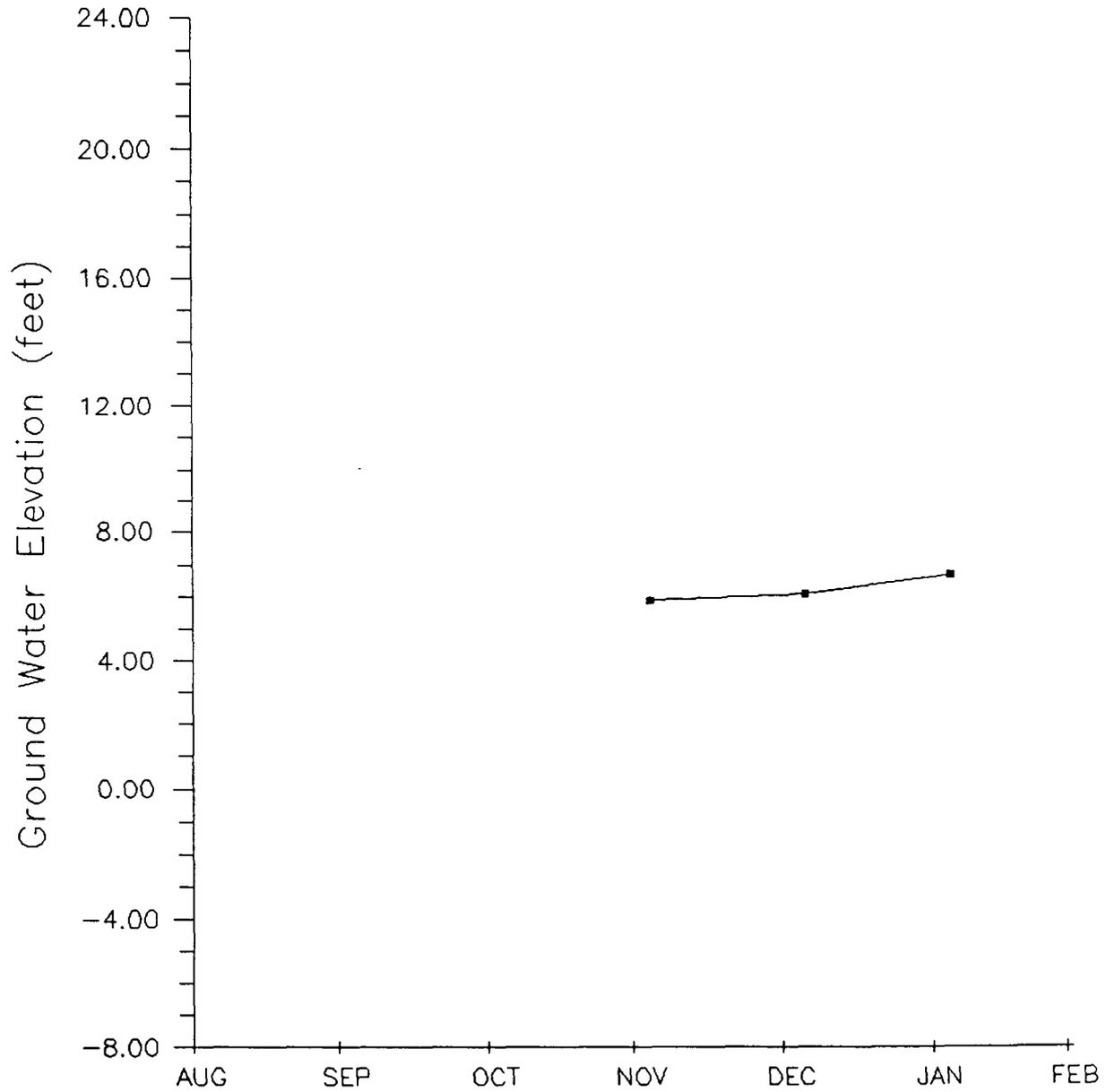
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Hydrograph of Well W05-18(A)  
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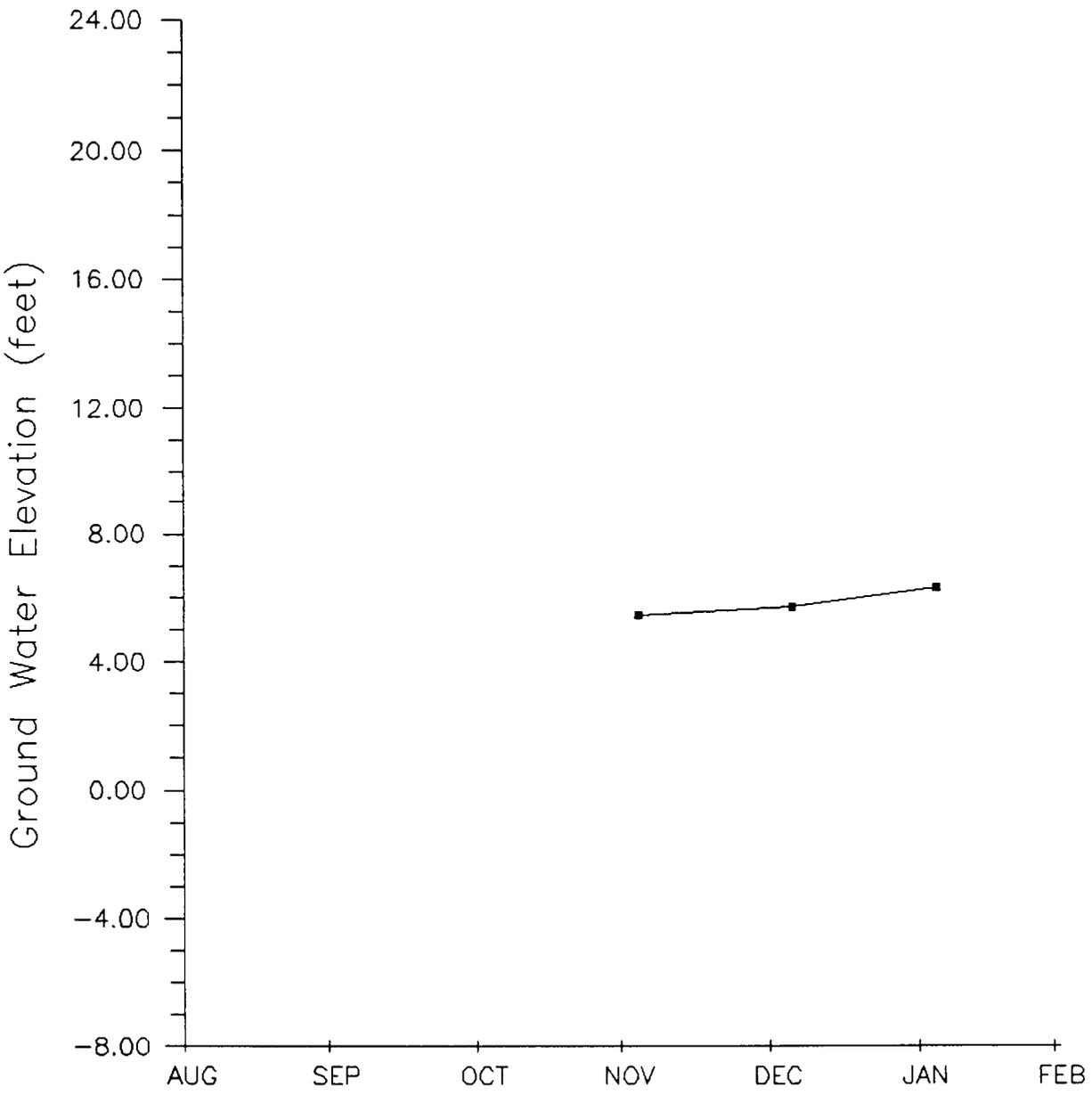
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Hydrograph of Well W05-19(A)  
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SECTION 6.0 – HYDROGRAPHS OF SITE 6 WELLS

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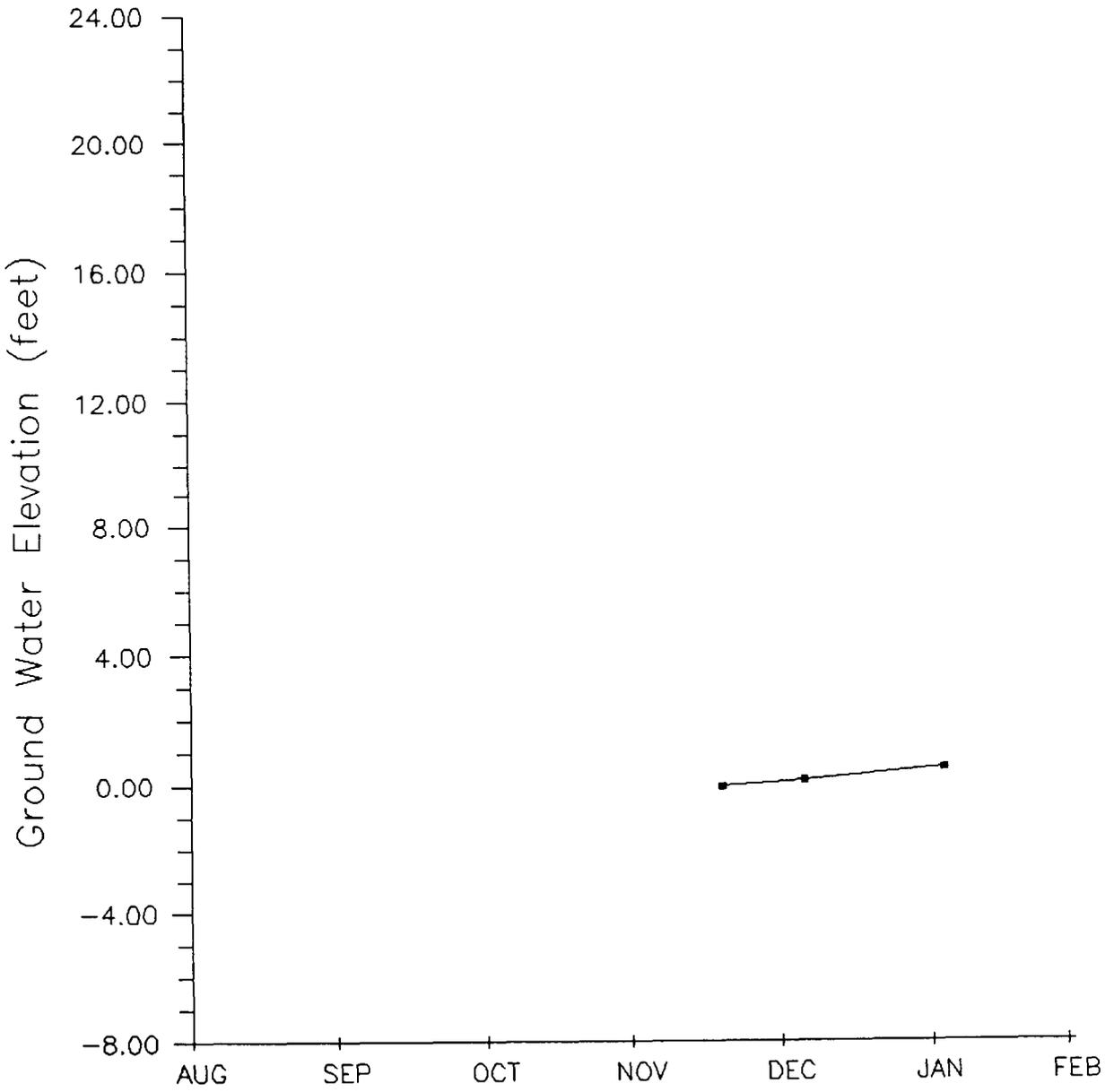
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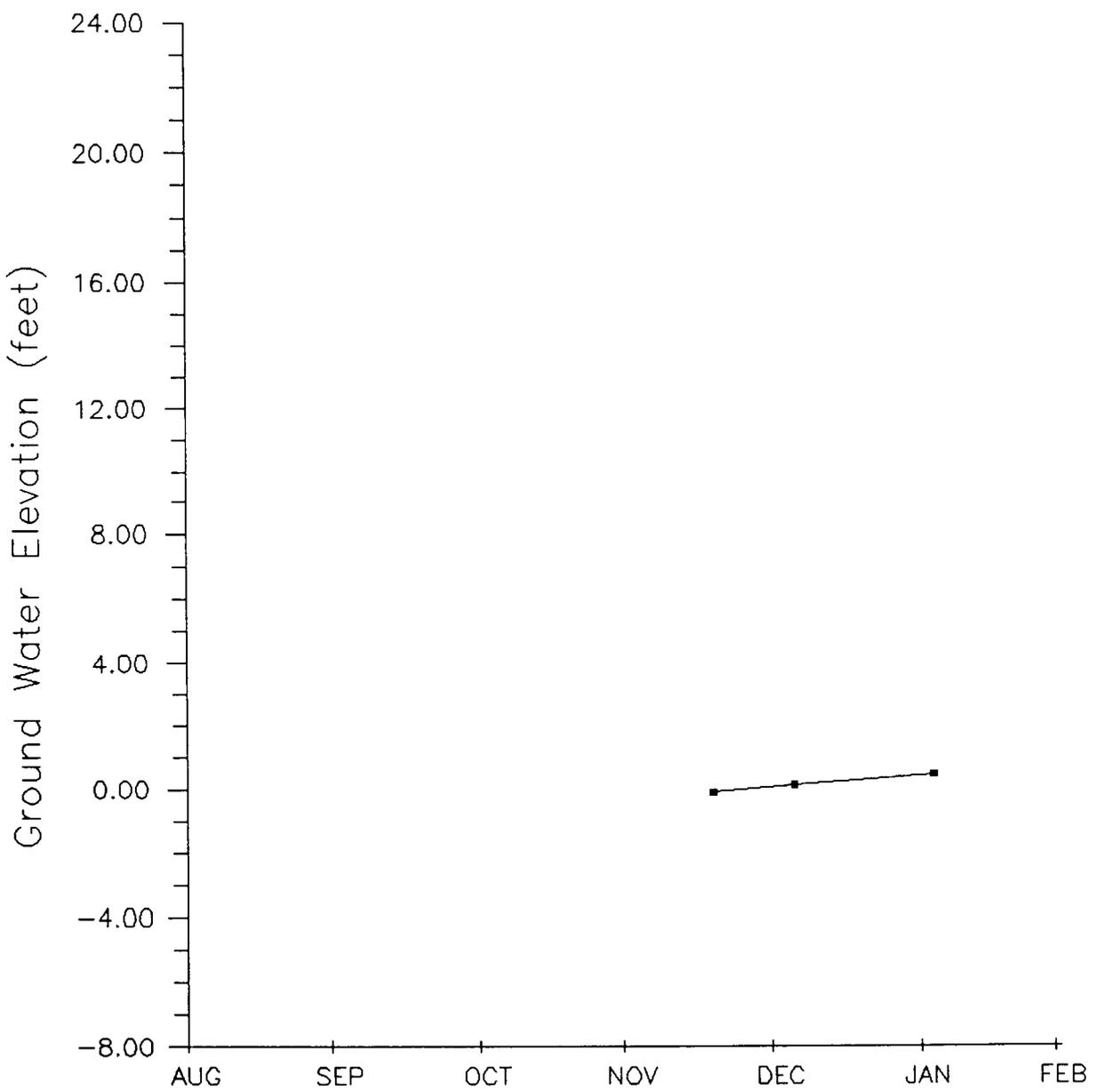
Hydrograph of Well W06-02(A)  
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Hydrograph of Well W06-03(A)  
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MOFFETT FIELD  
SSIC NO. 5090.3

## APPENDIX D

### SECTION 7.0 – HYDROGRAPHS OF SITE 7 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

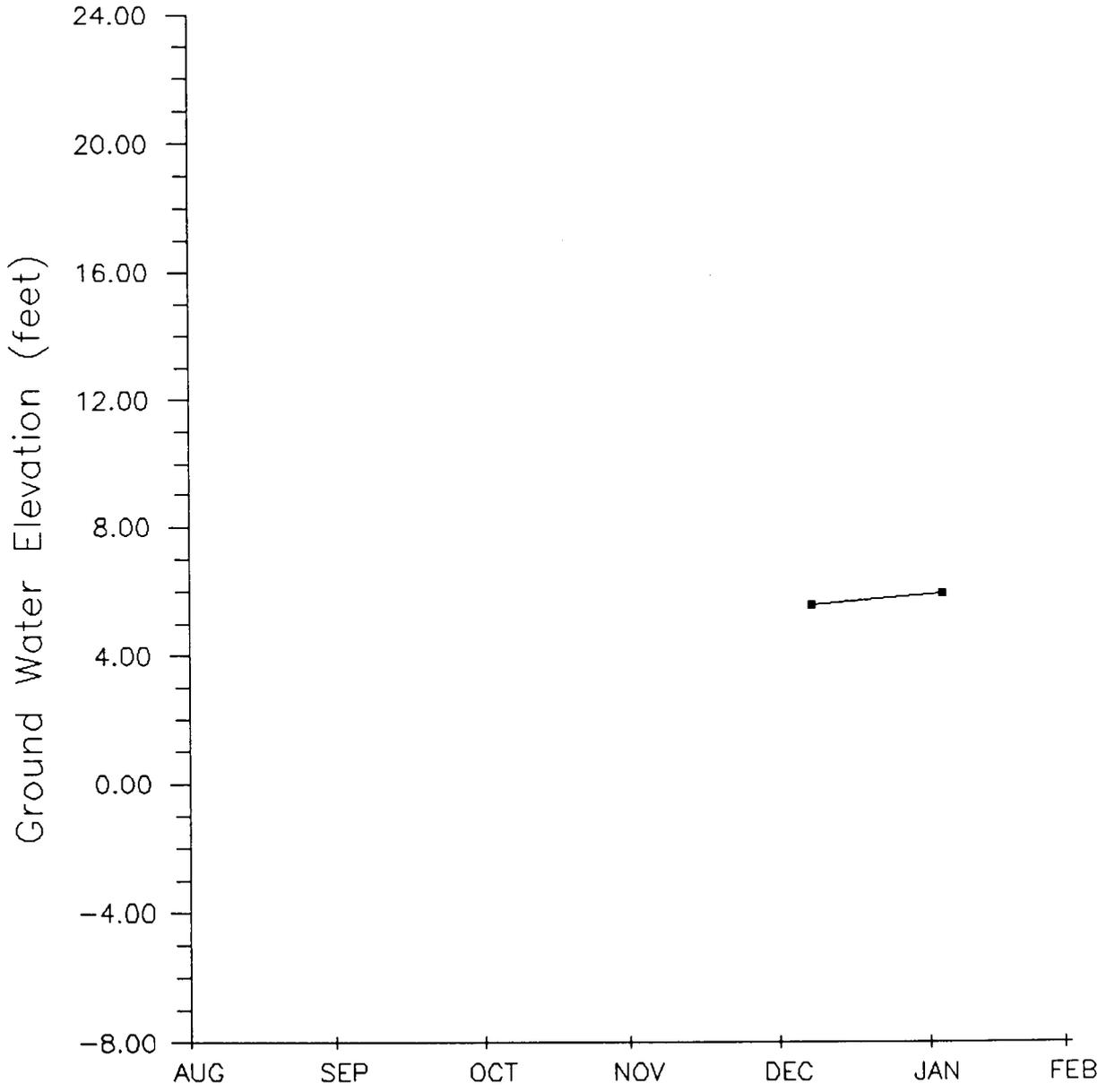
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Hydrograph of Well W07-01(A)  
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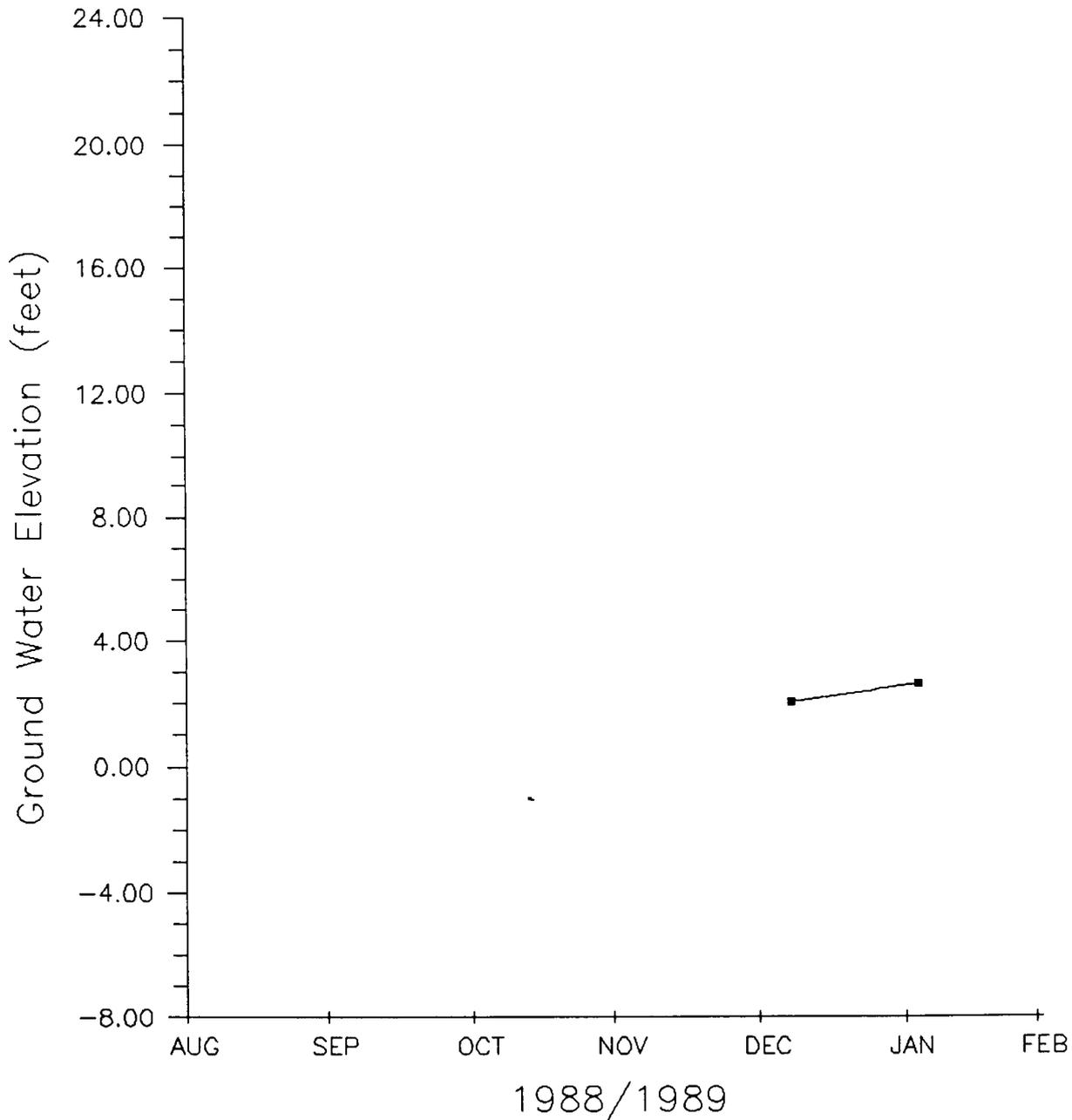
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Hydrograph of Well W07-04(B1)  
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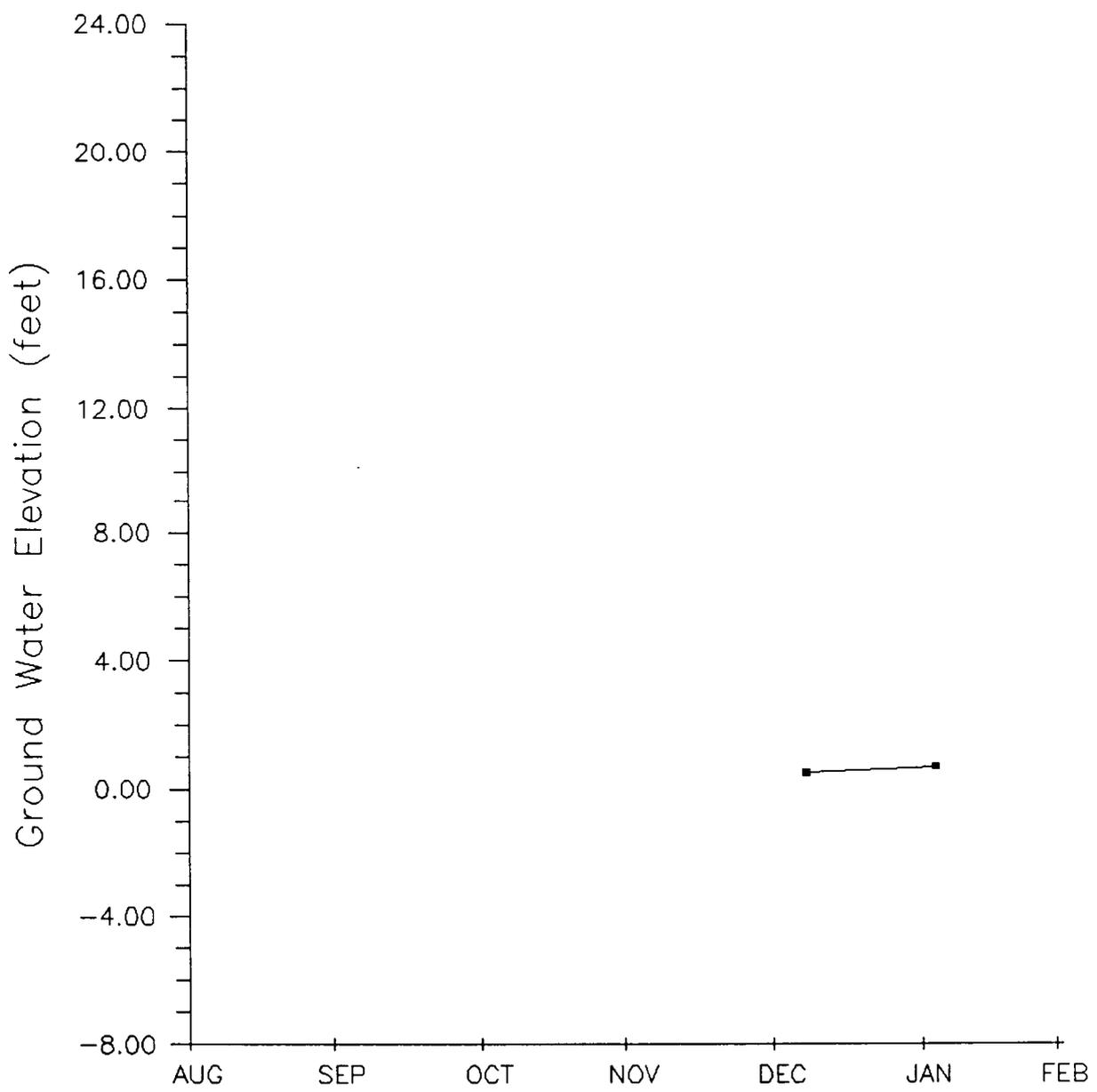
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Hydrograph of Well W07-08(A)  
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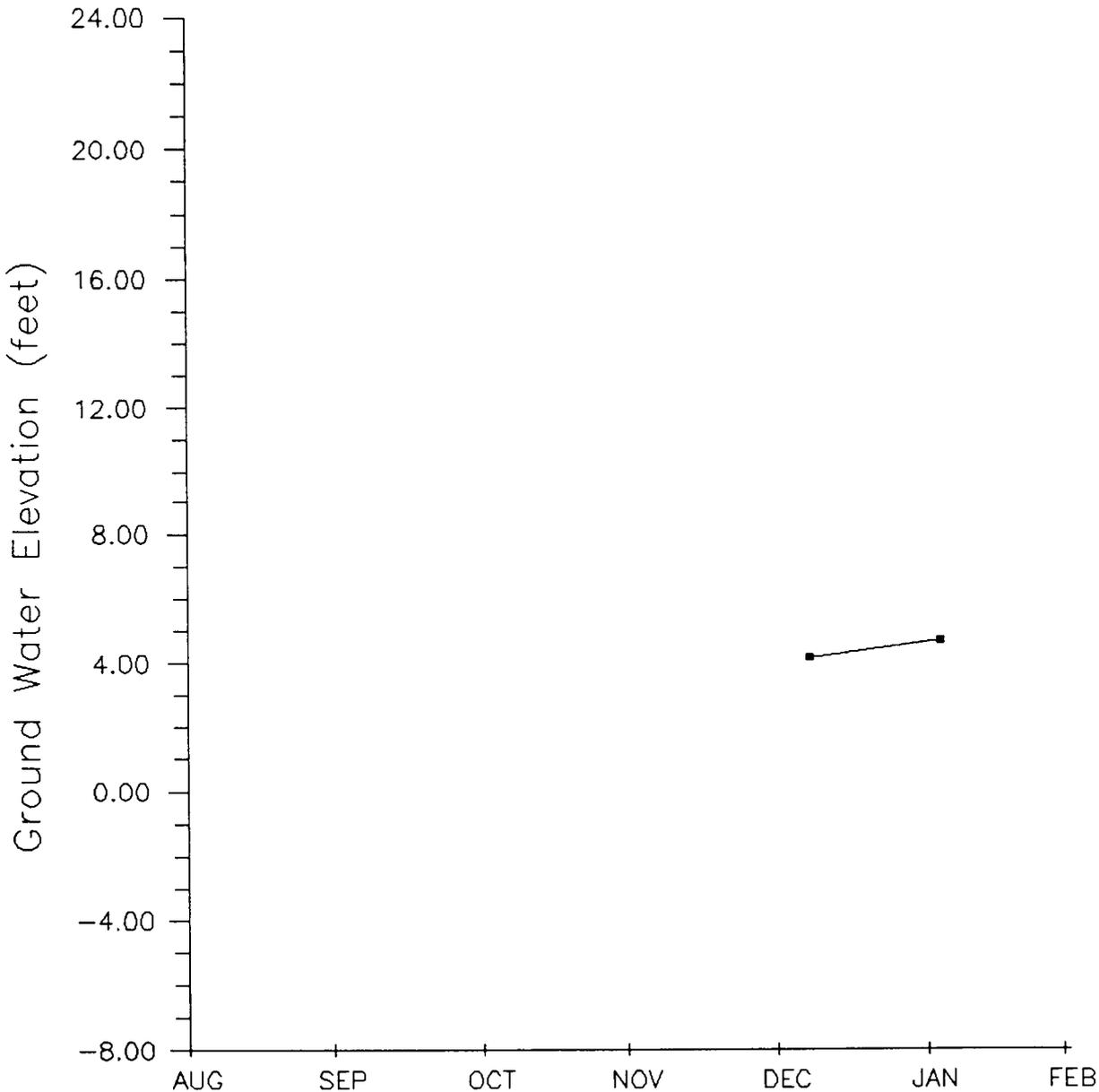
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Hydrograph of Well W07-13(A)  
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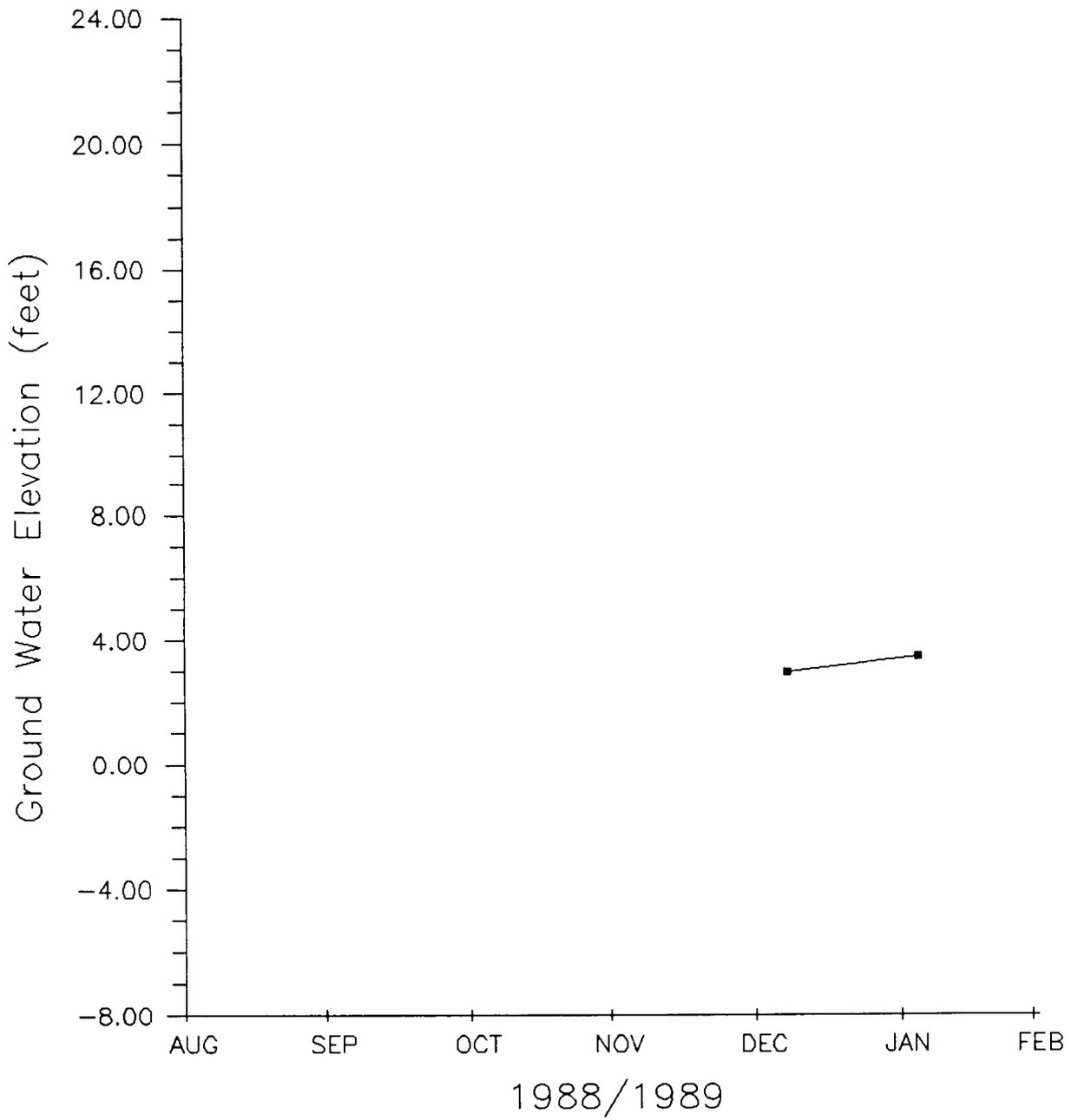
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Hydrograph of Well W07-15(B1)  
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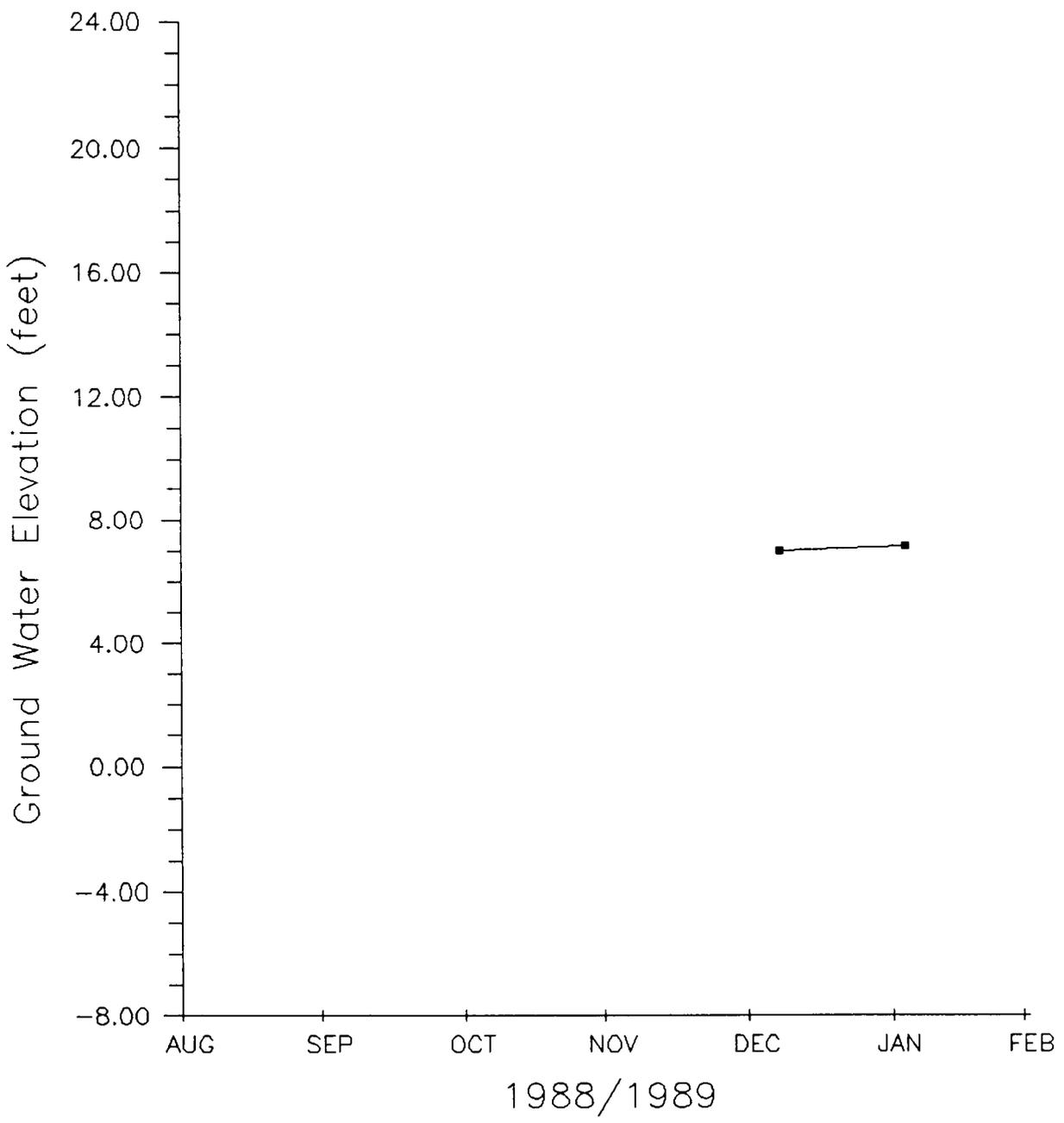
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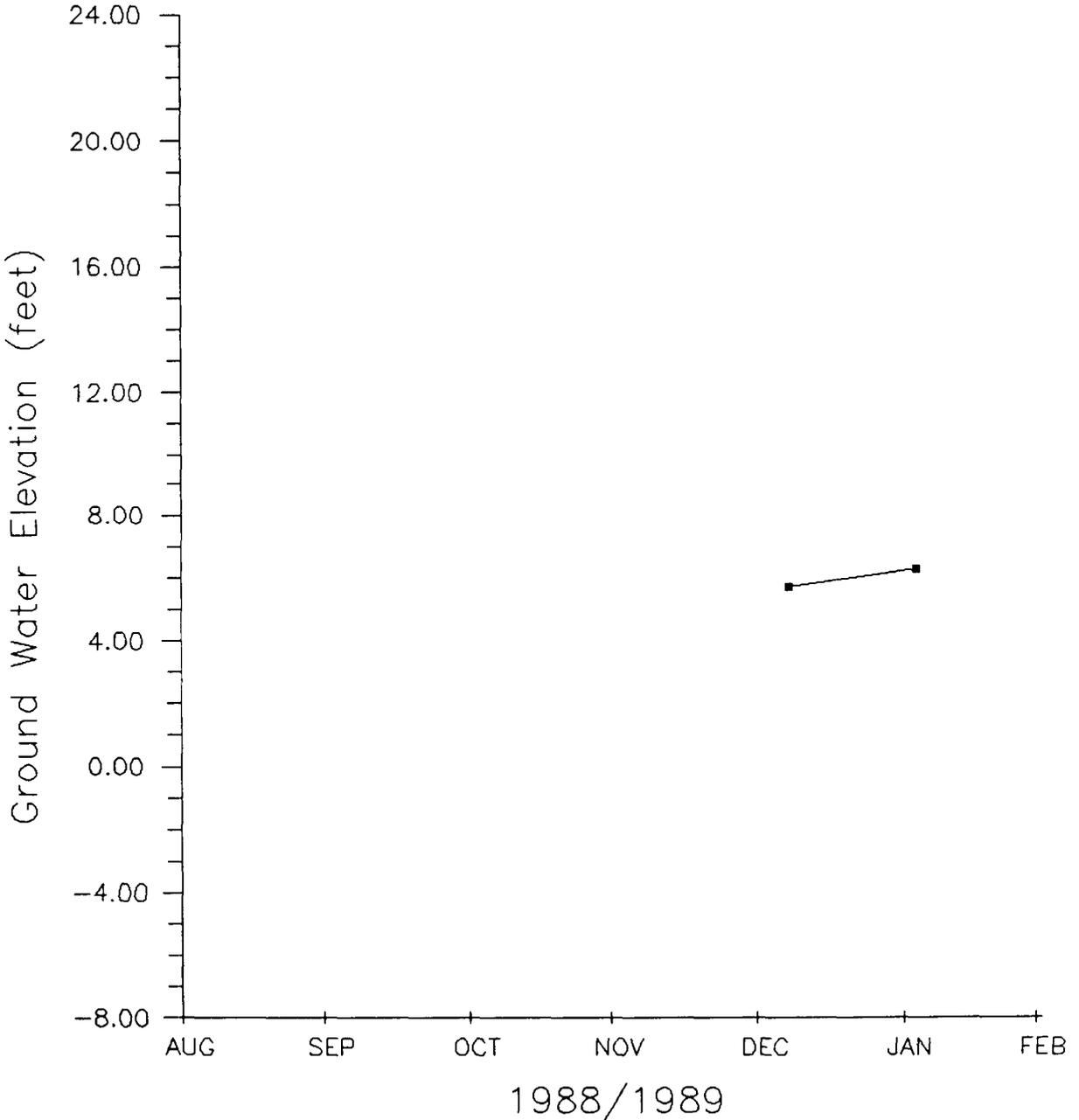
Hydrograph of Well W07-16(C)  
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Hydrograph of Well W07-18(A)  
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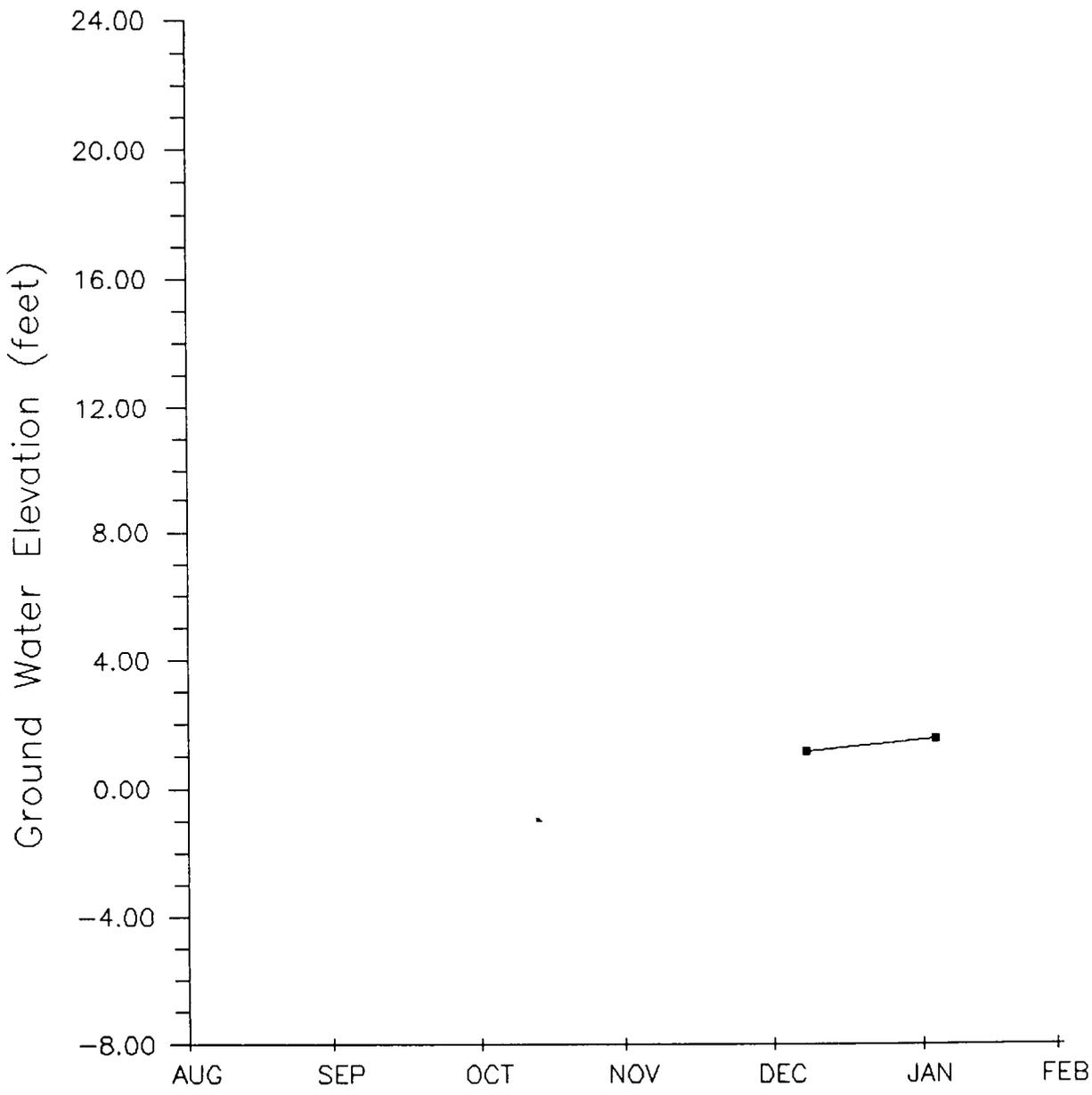


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Hydrograph of Well W07-19(A)  
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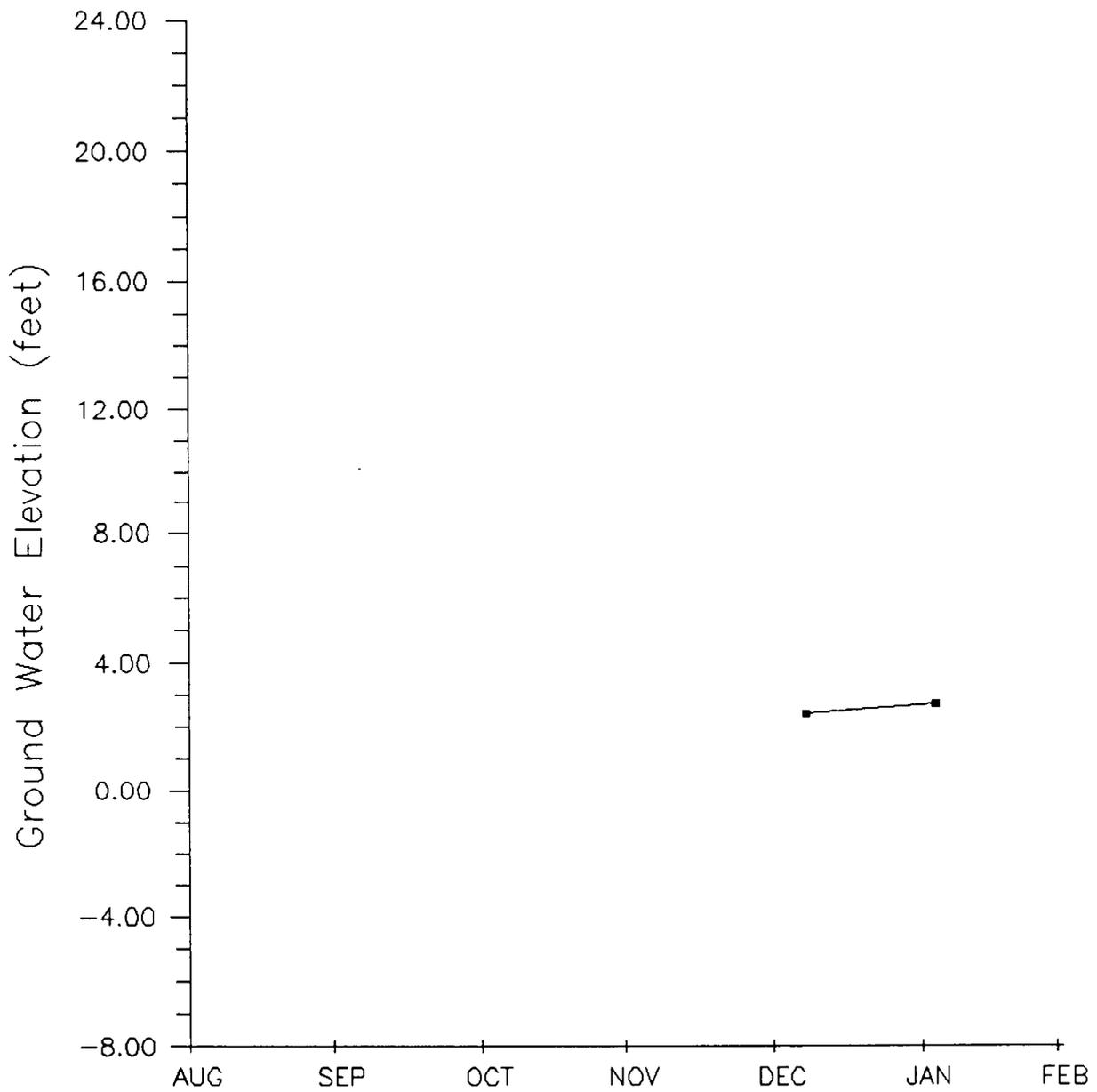
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Hydrograph of Well W07-20(A)  
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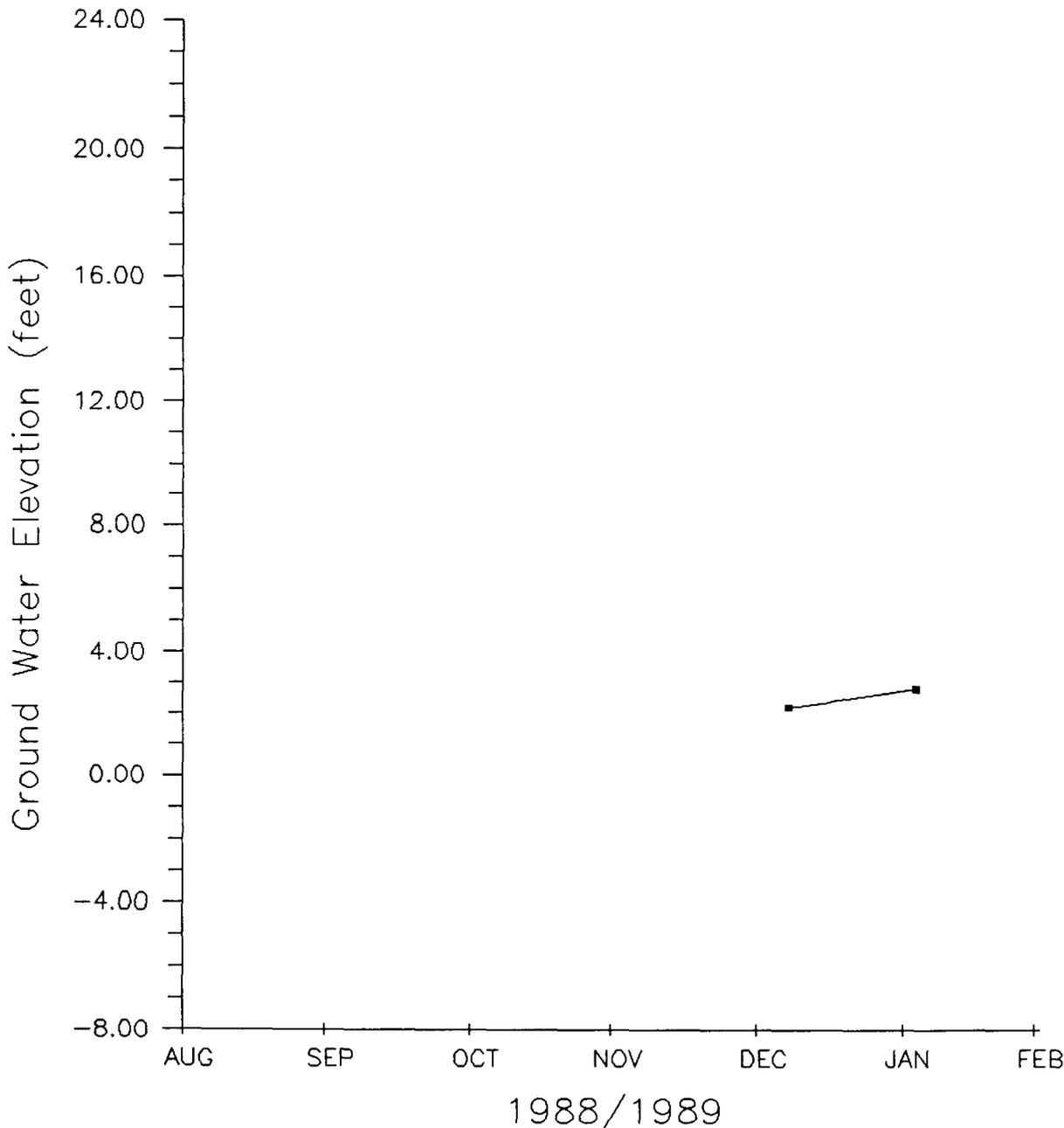


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Hydrograph of Well W07-21(A)  
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### SECTION 8.0 – HYDROGRAPHS OF SITE 8 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

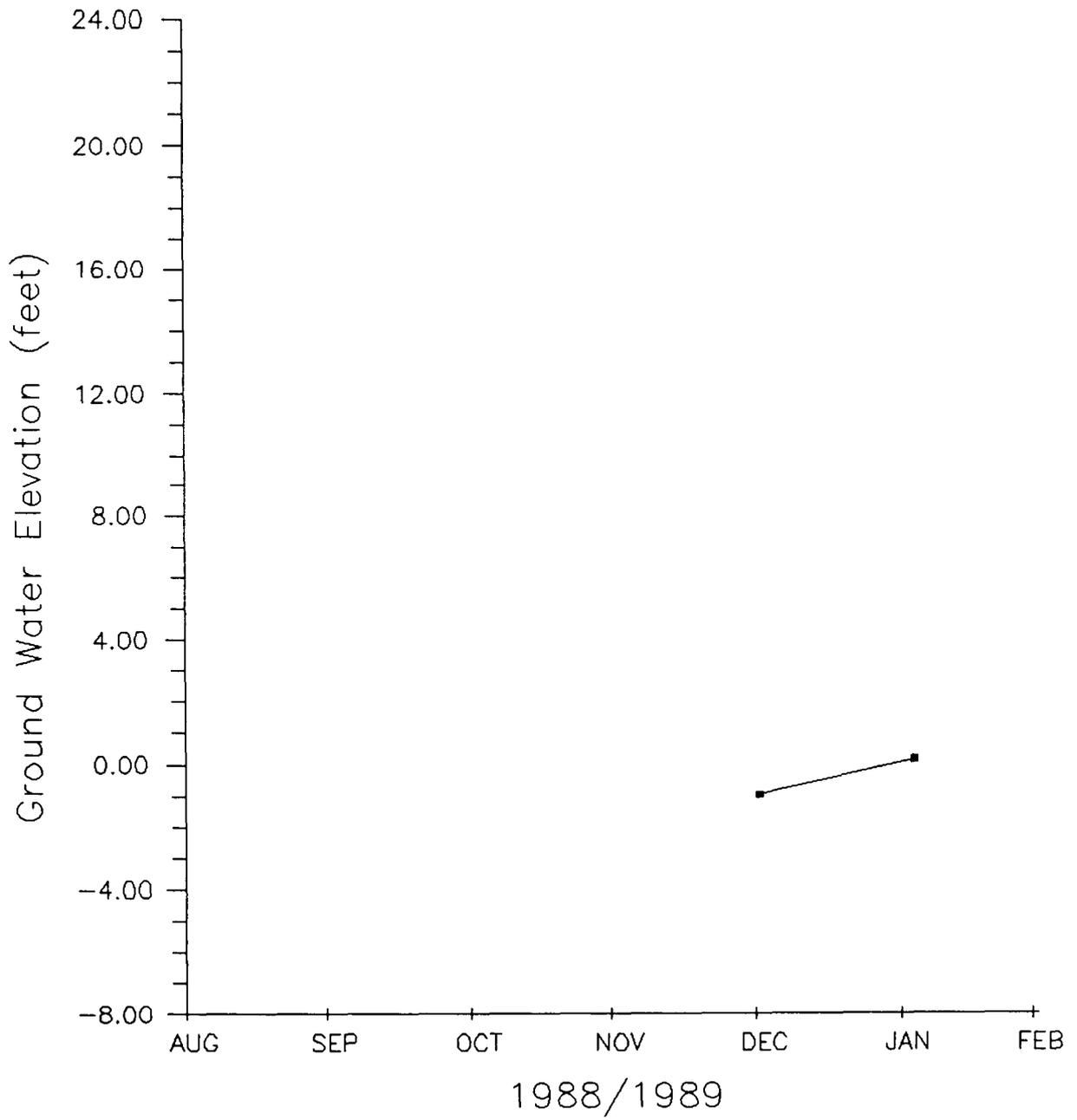
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Hydrograph of Well W08-01(A)  
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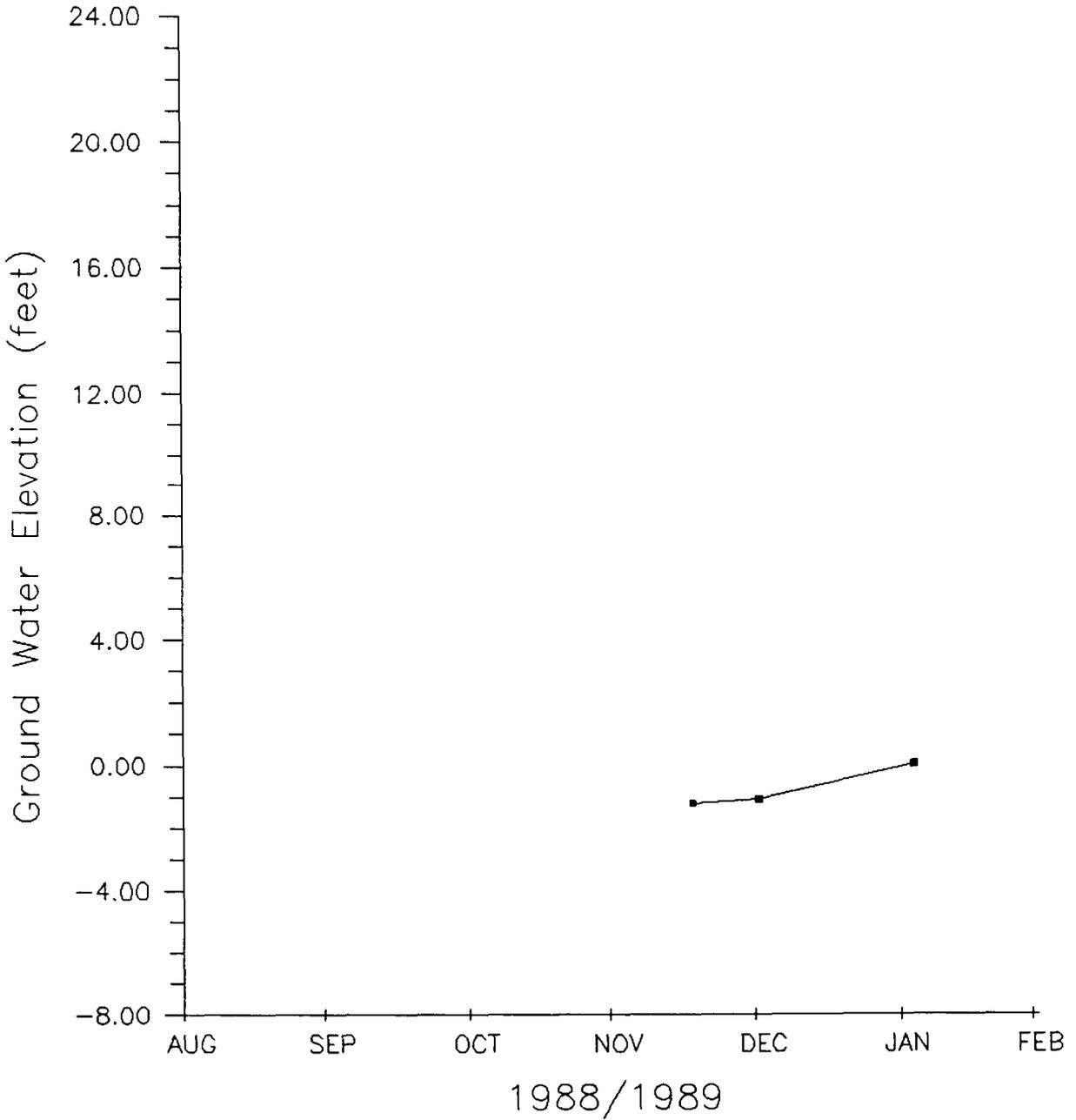
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Hydrograph of Well W08-02(B1)  
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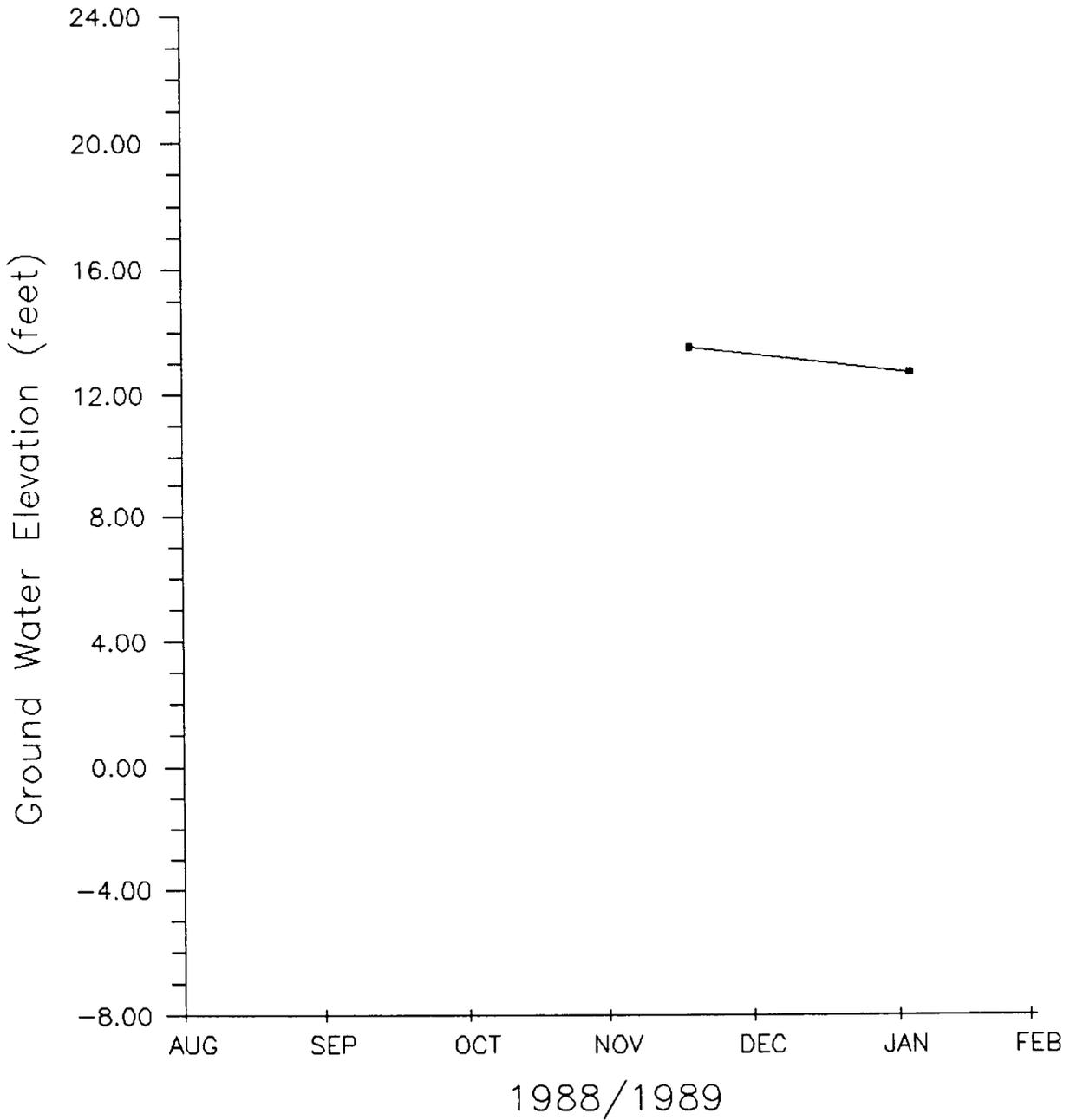


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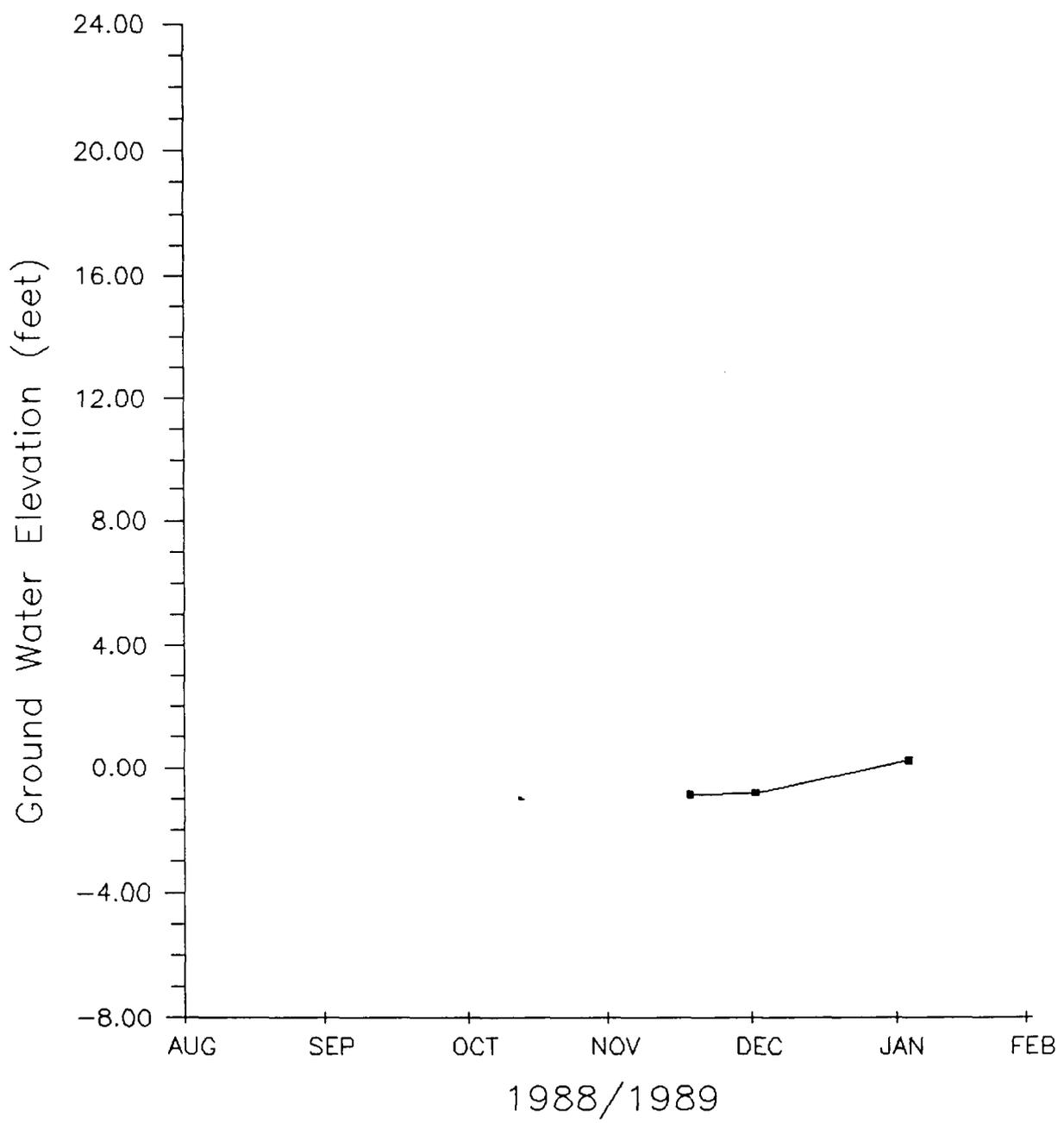


Hydrograph of Well W08-03(C)  
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Hydrograph of Well W08-04(A)  
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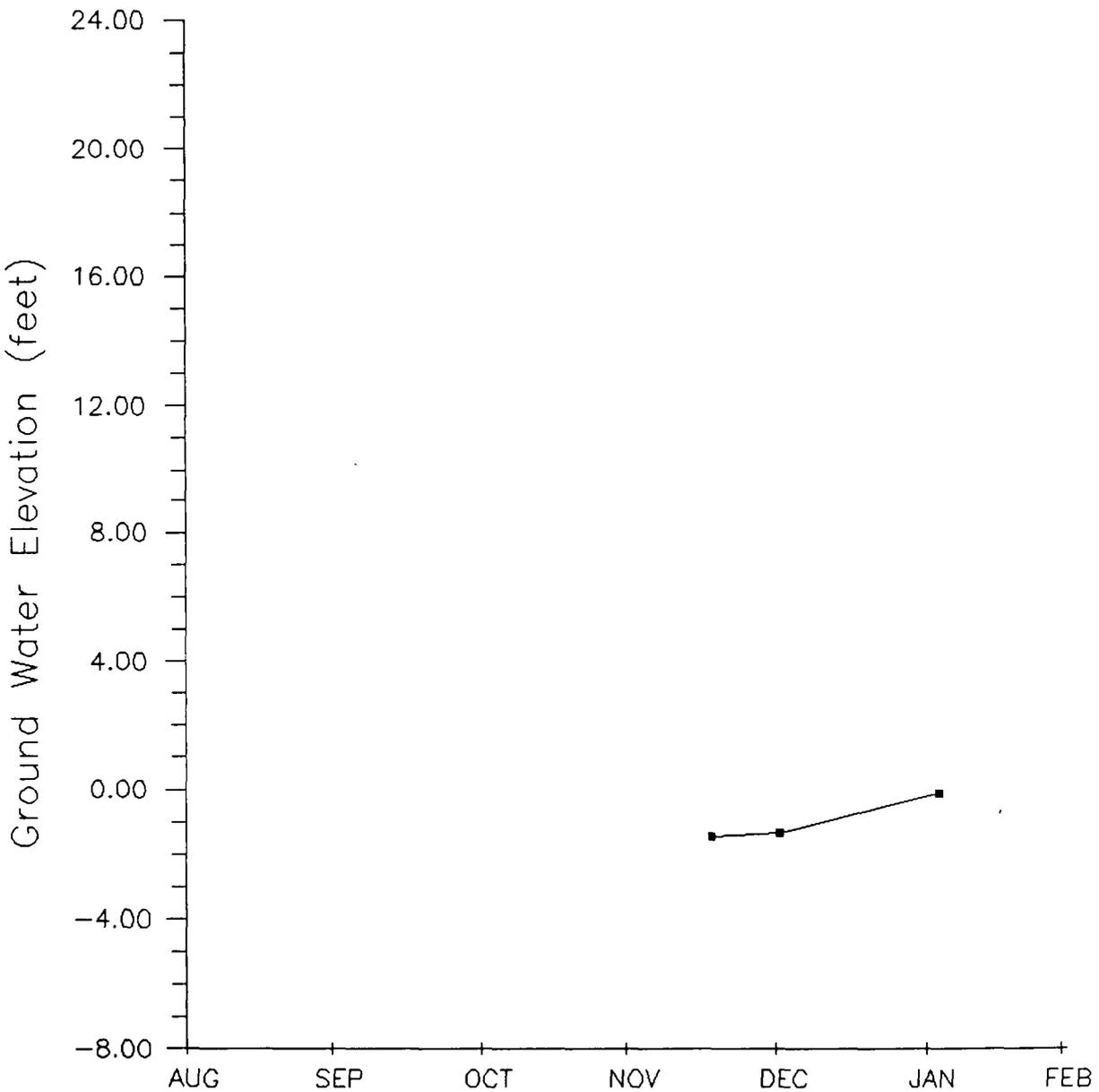
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Hydrograph of Well W08-05(A)  
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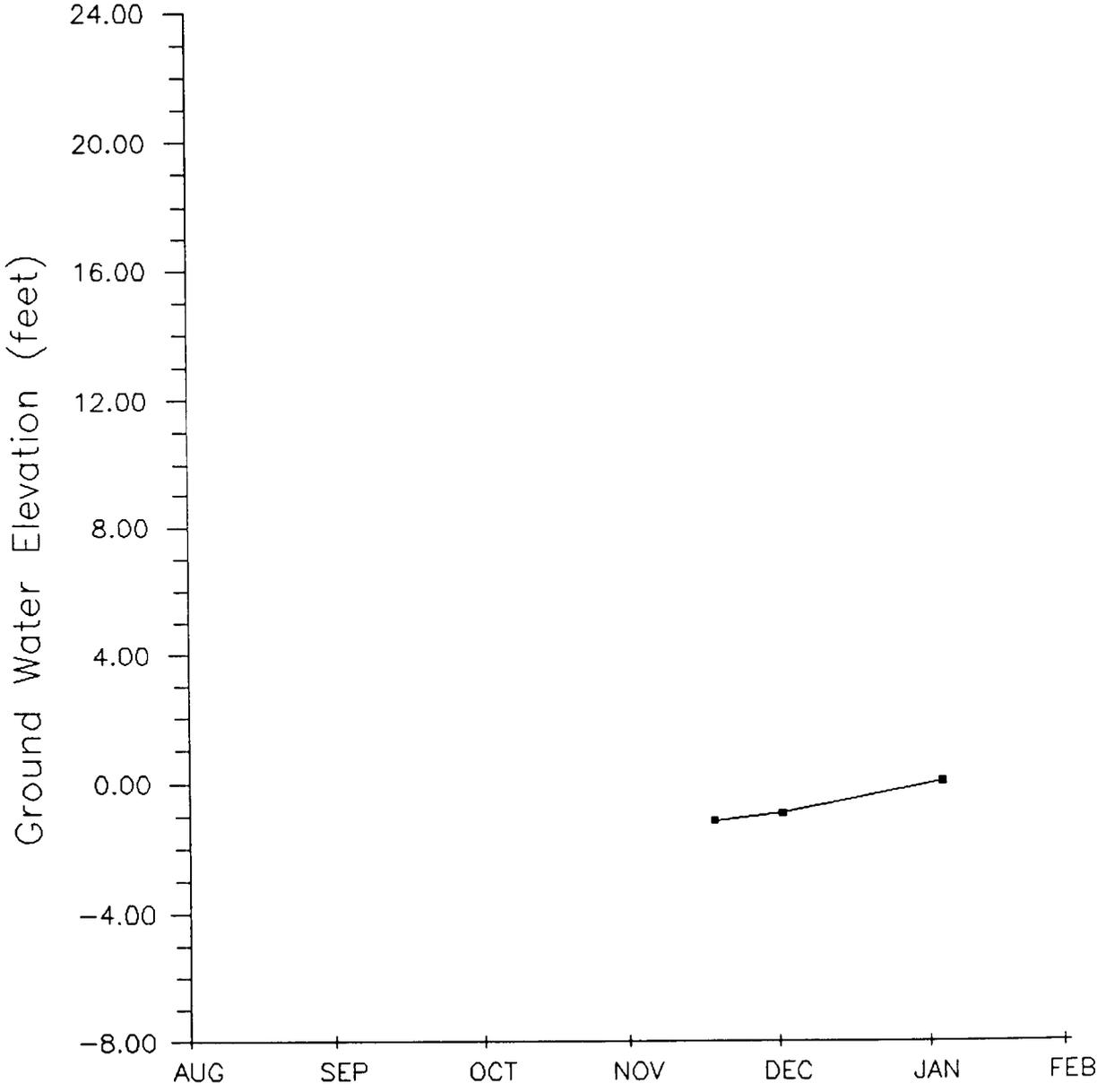
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Hydrograph of Well W08-06(A)  
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## APPENDIX D

### SECTION 9.0 – HYDROGRAPHS OF SITE 9 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

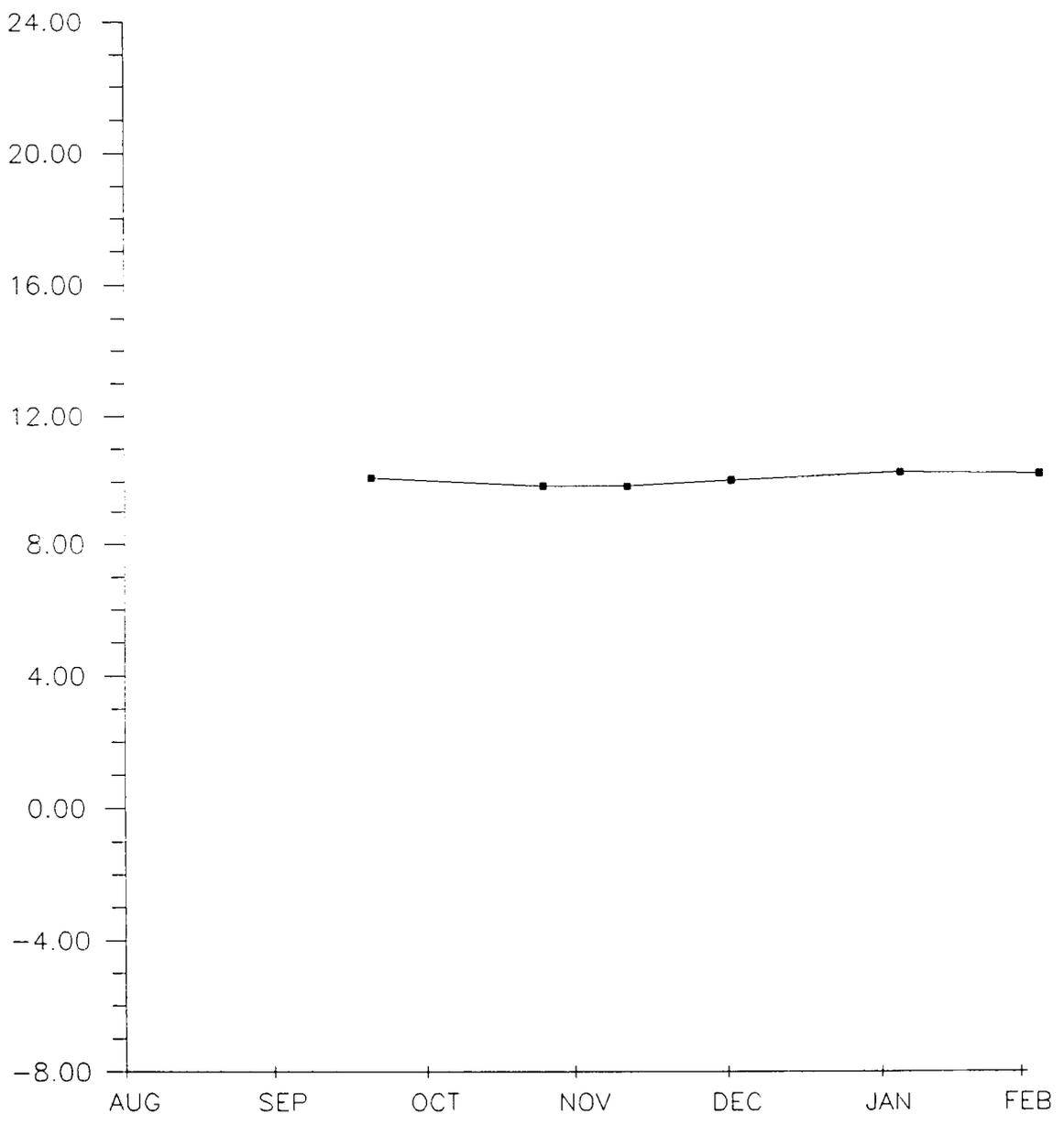
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Ground Water Elevation (feet)



1988/1989

Hydrograph of Well W09-01(A)  
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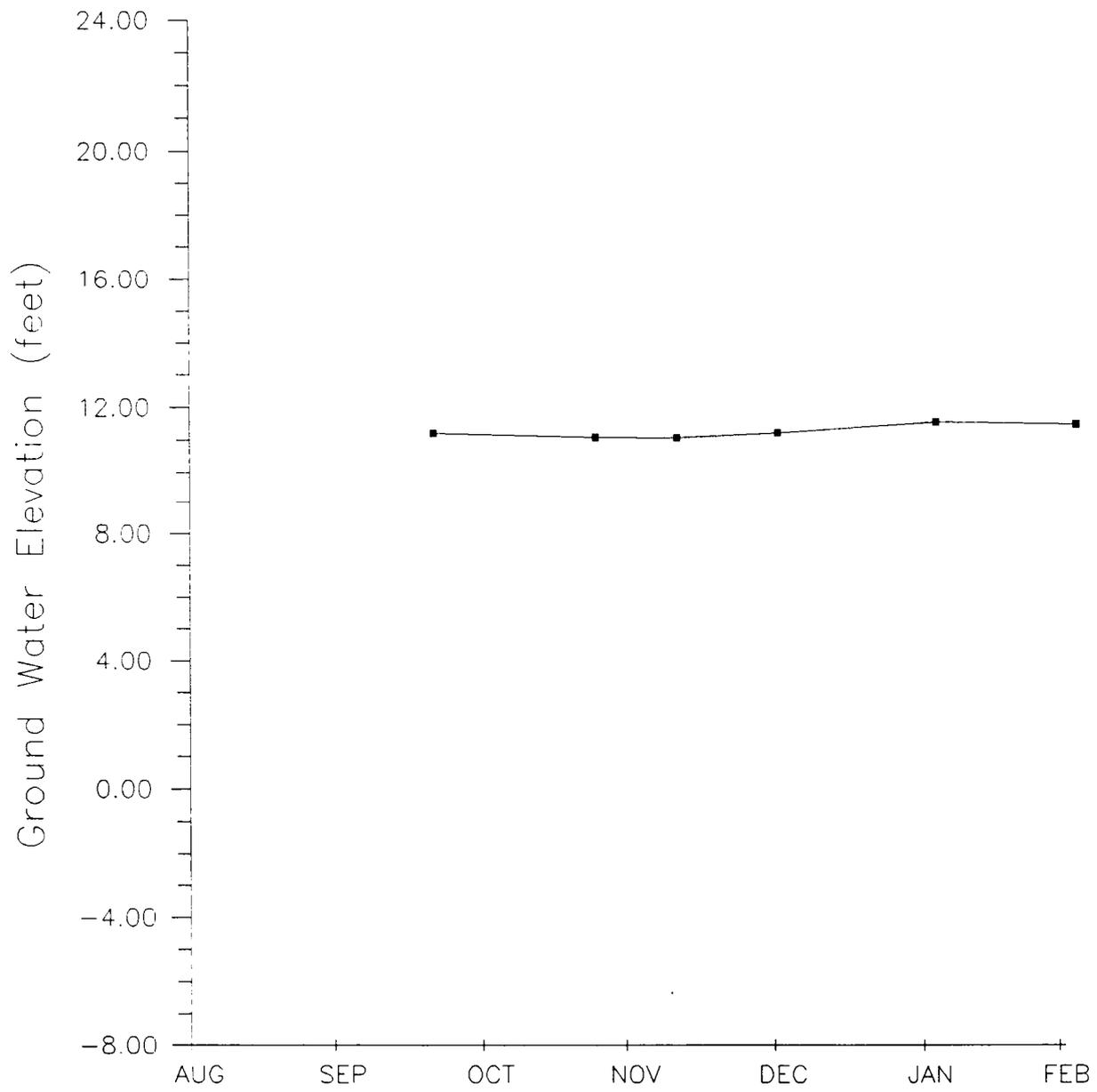


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1988/1989

Hydrograph of Well W09-02(A)  
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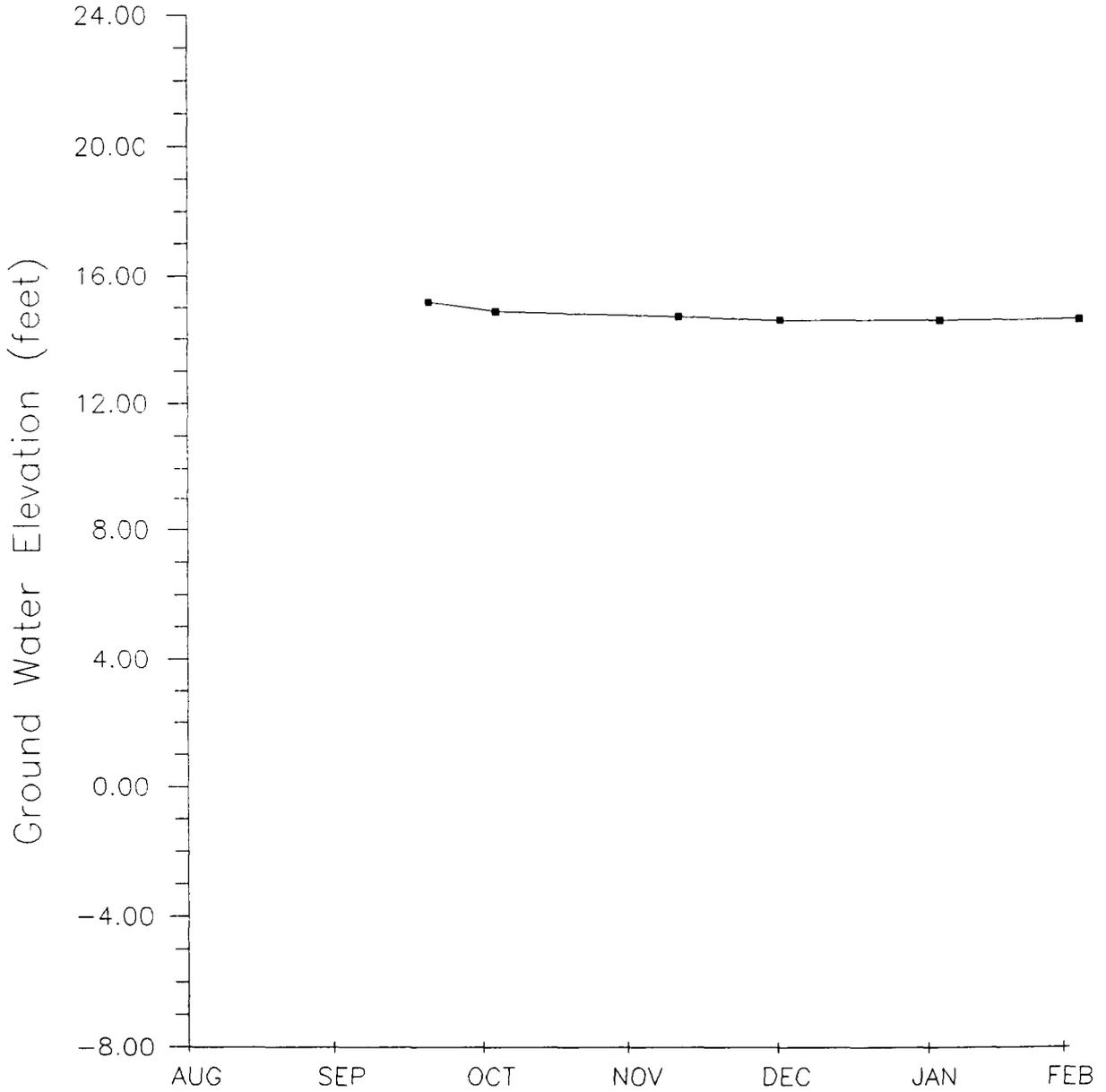
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1988/1989

Hydrograph of Well W09-03(C)  
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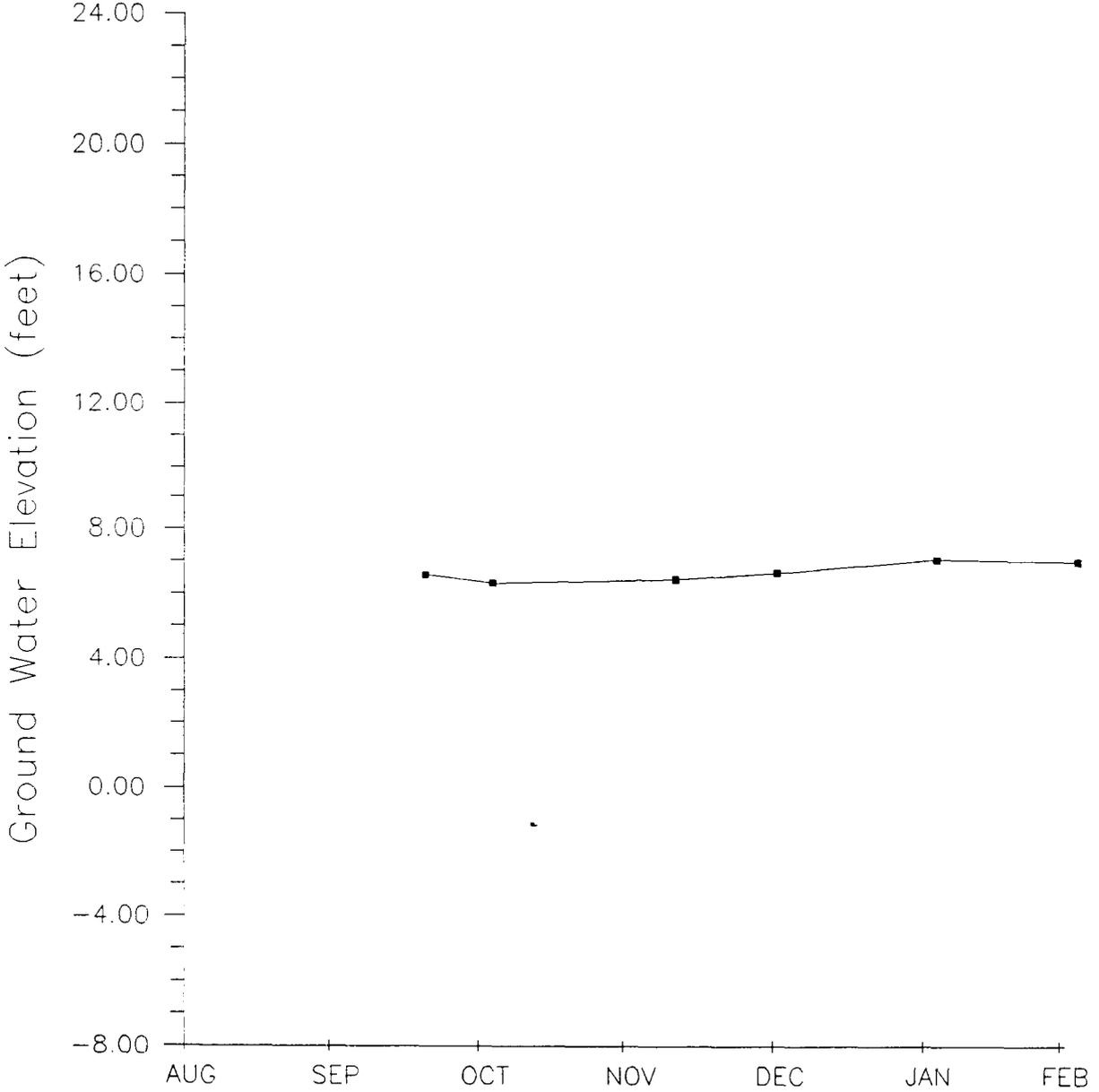
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1988/1989

Hydrograph of Well W09-04(B2)  
PREPARED FOR

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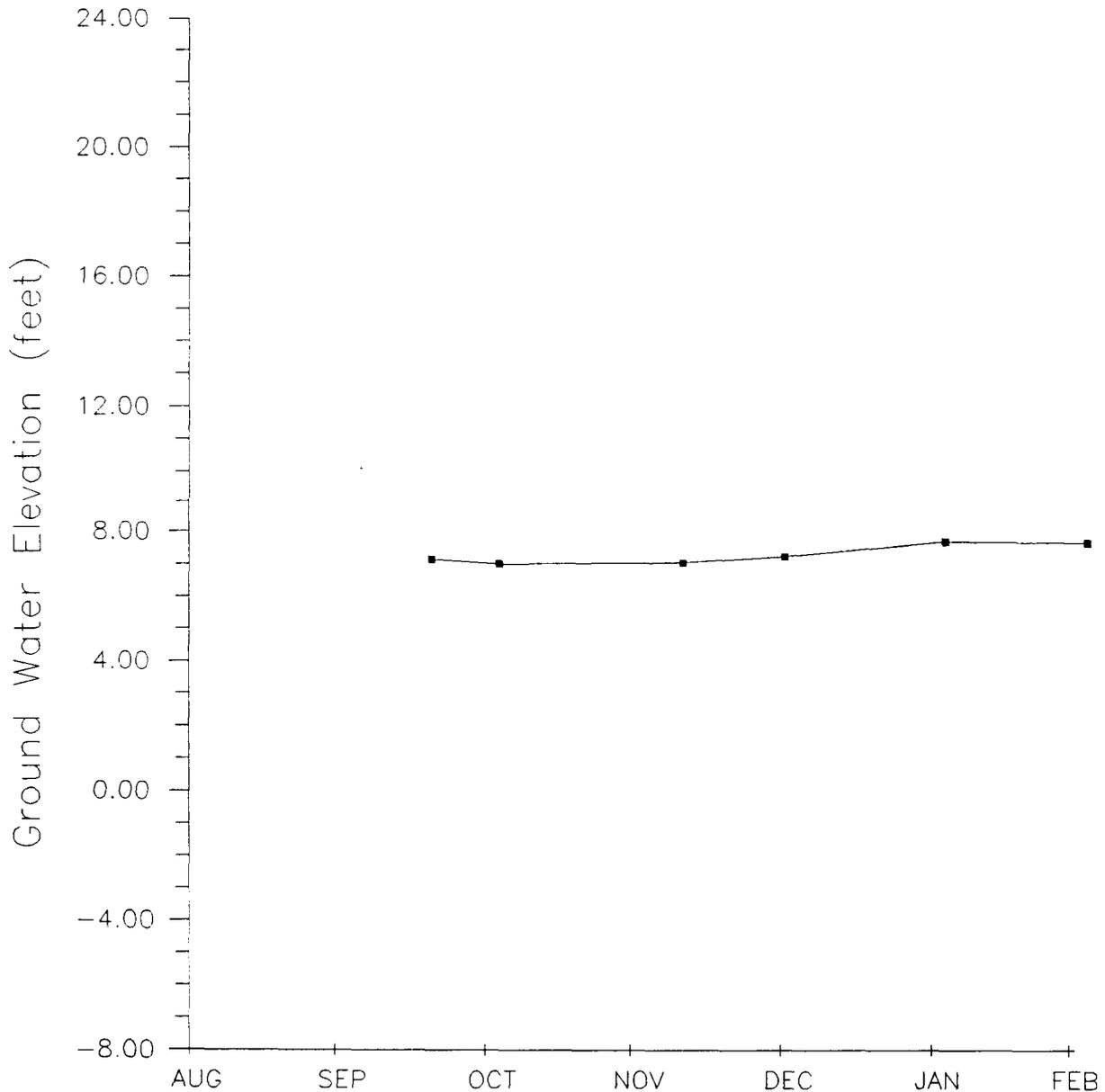
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Hydrograph of Well W09-05(B3)  
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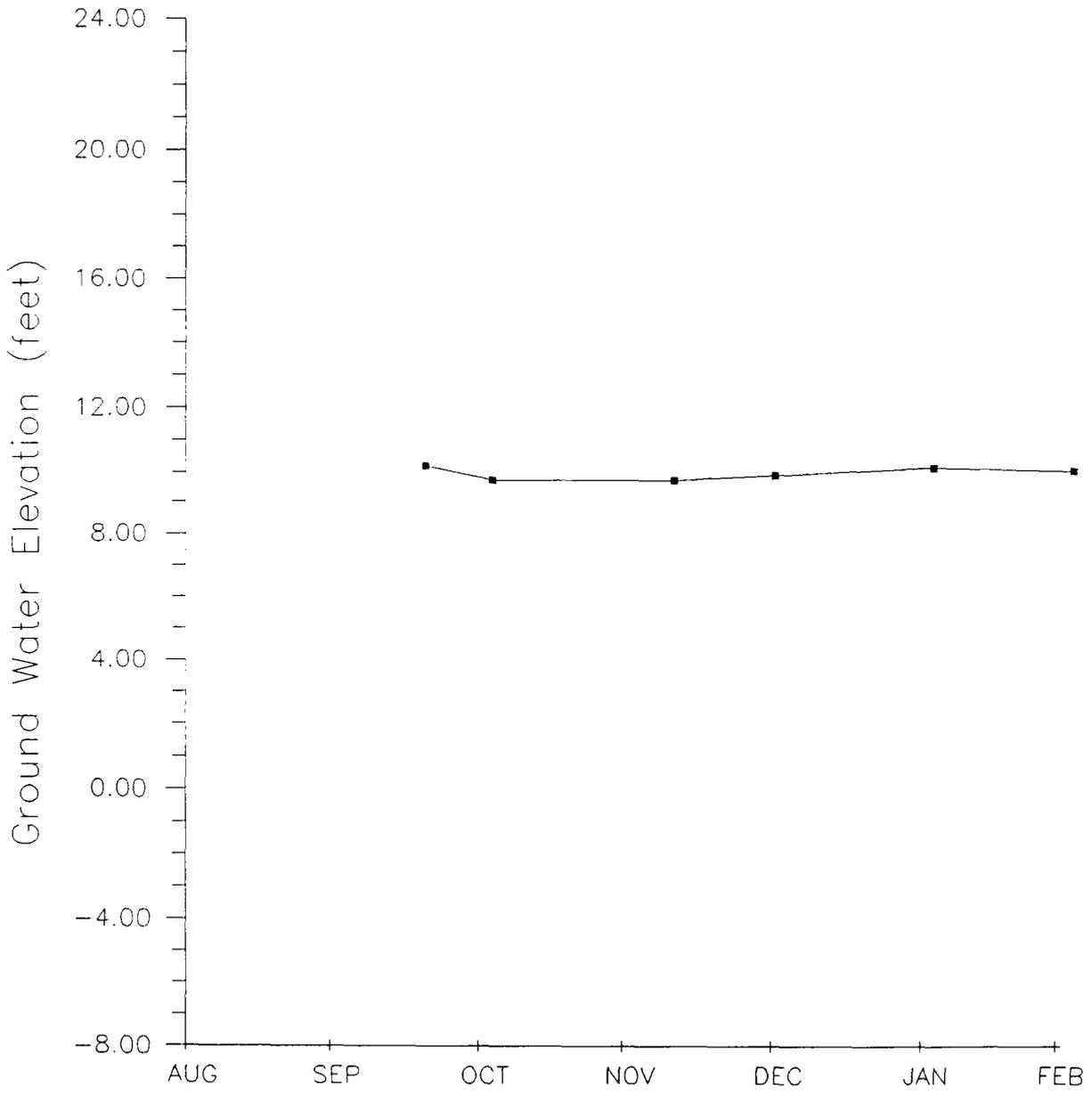
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1988/1989

Hydrograph of Well W09-06(A)  
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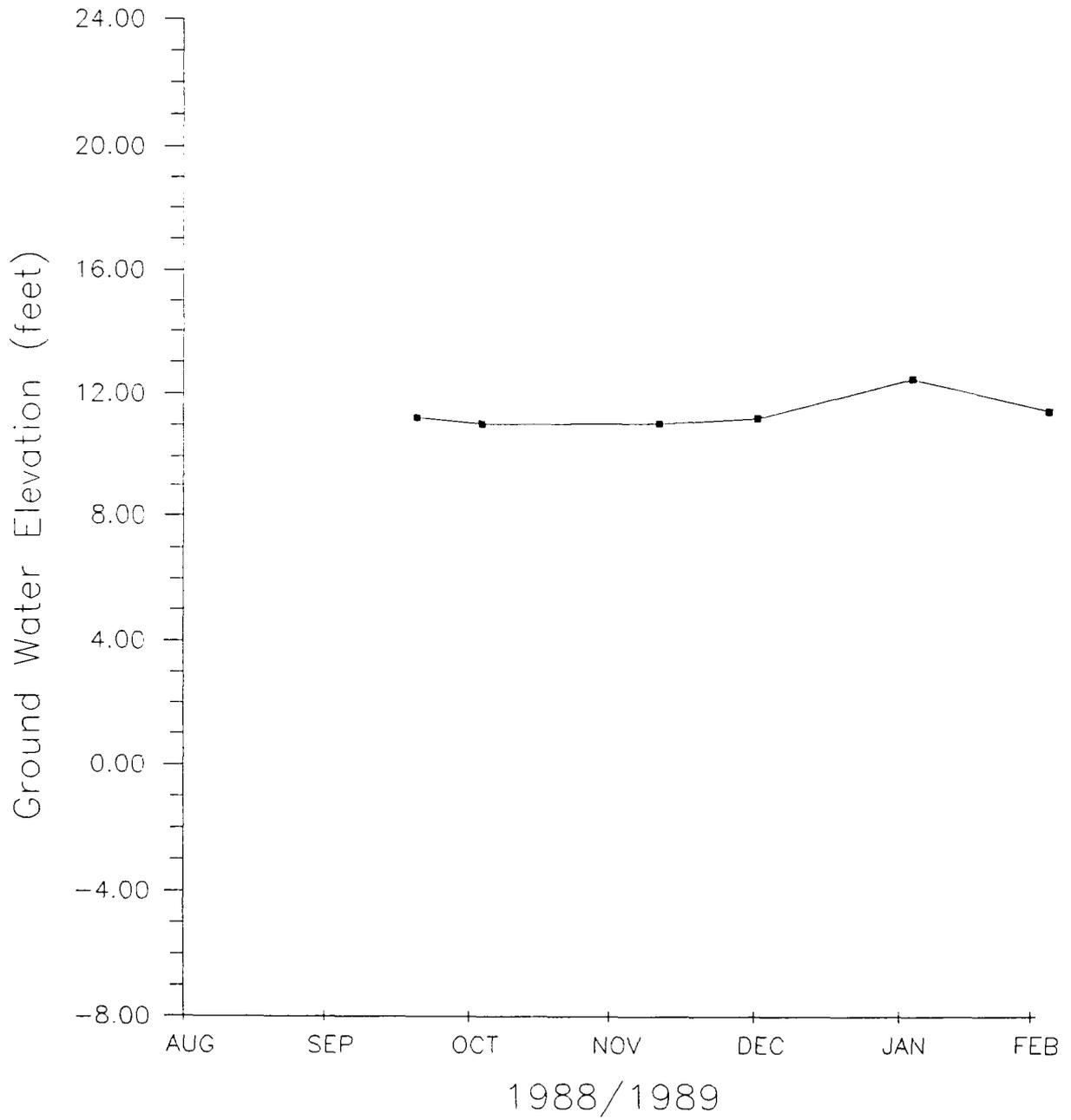
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Hydrograph of Well W09-07(A)  
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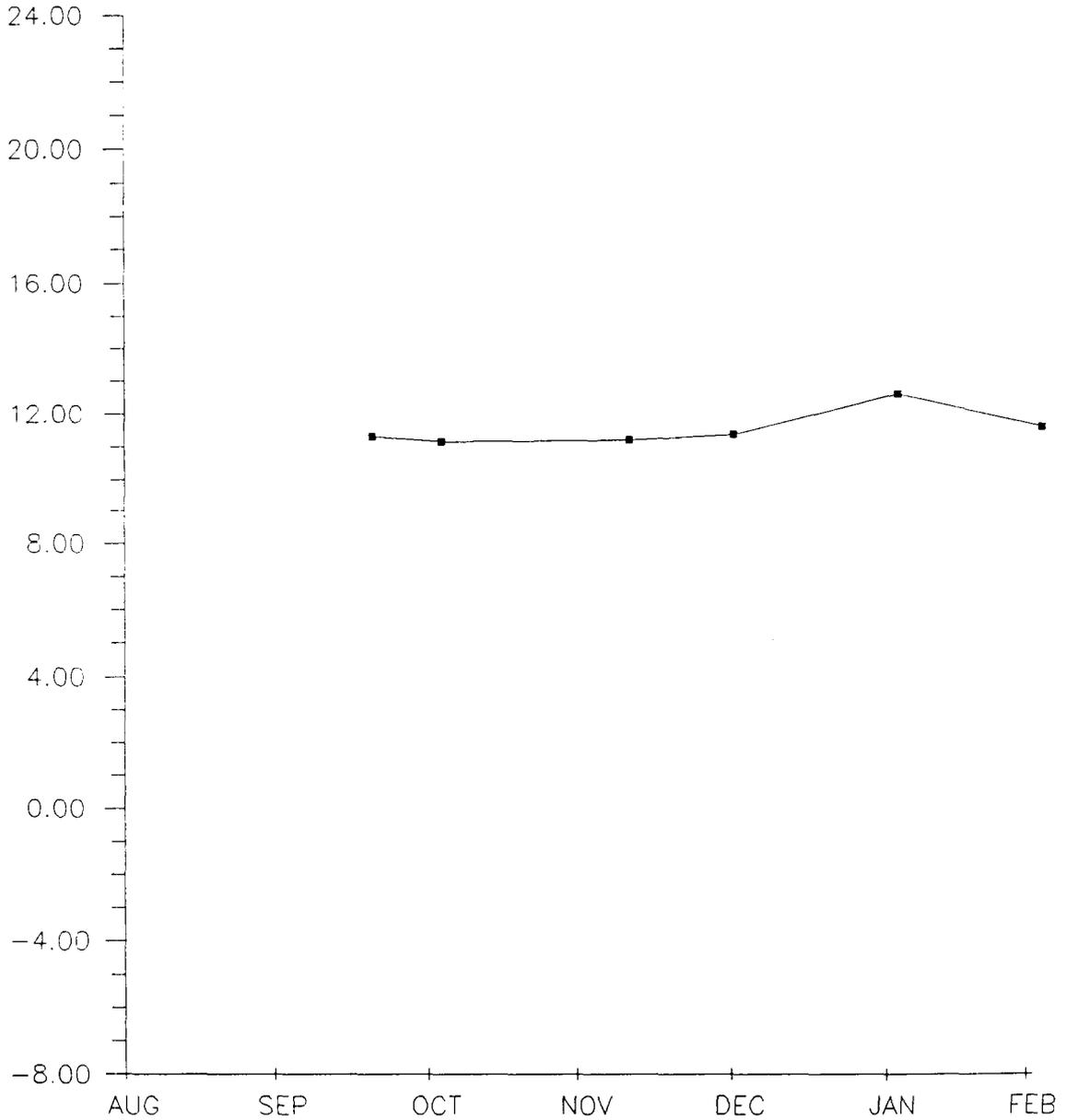
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Ground Water Elevation (feet)



1988/1989

Hydrograph of Well W09-13(B1)  
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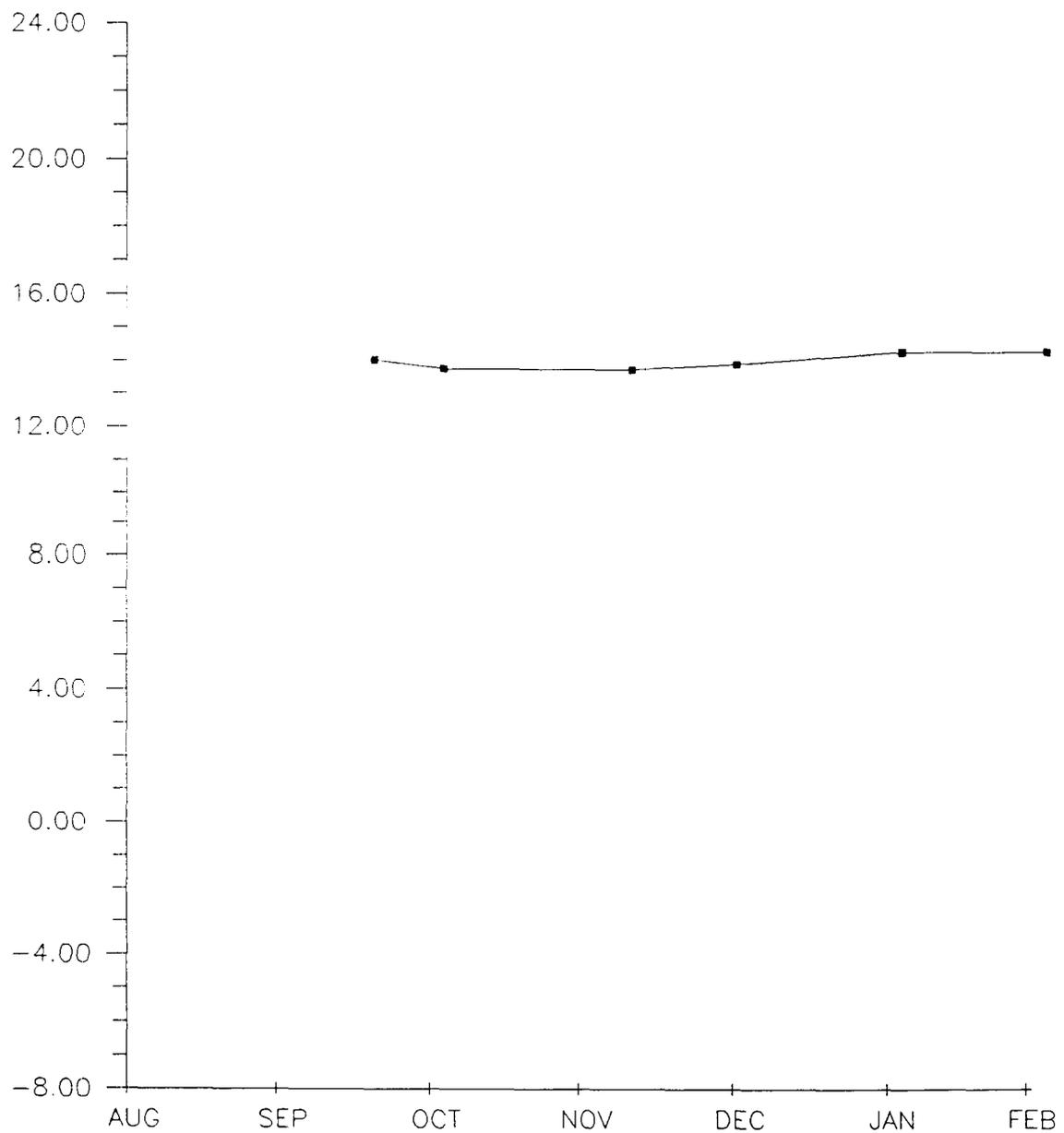
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DRAWING NUMBER 409616-

Ground Water Elevation (feet)



1988/1989

Hydrograph of Well W09-14(B1)  
PREPARED FOR

NAS Moffett Field



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DRAWING NUMBER 409616-

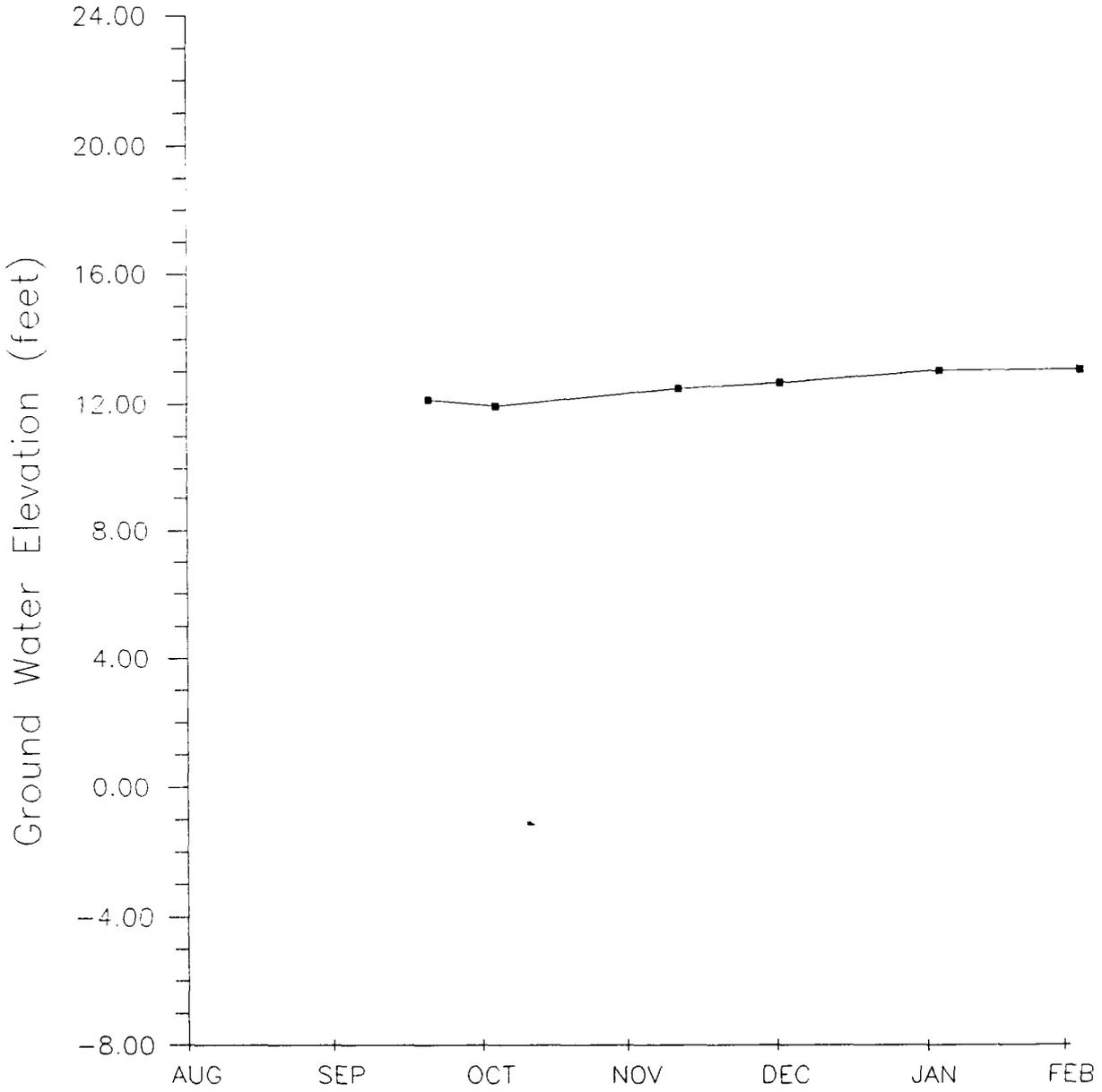
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PKC  
XCF

CHECKED BY  
APPROVED BY

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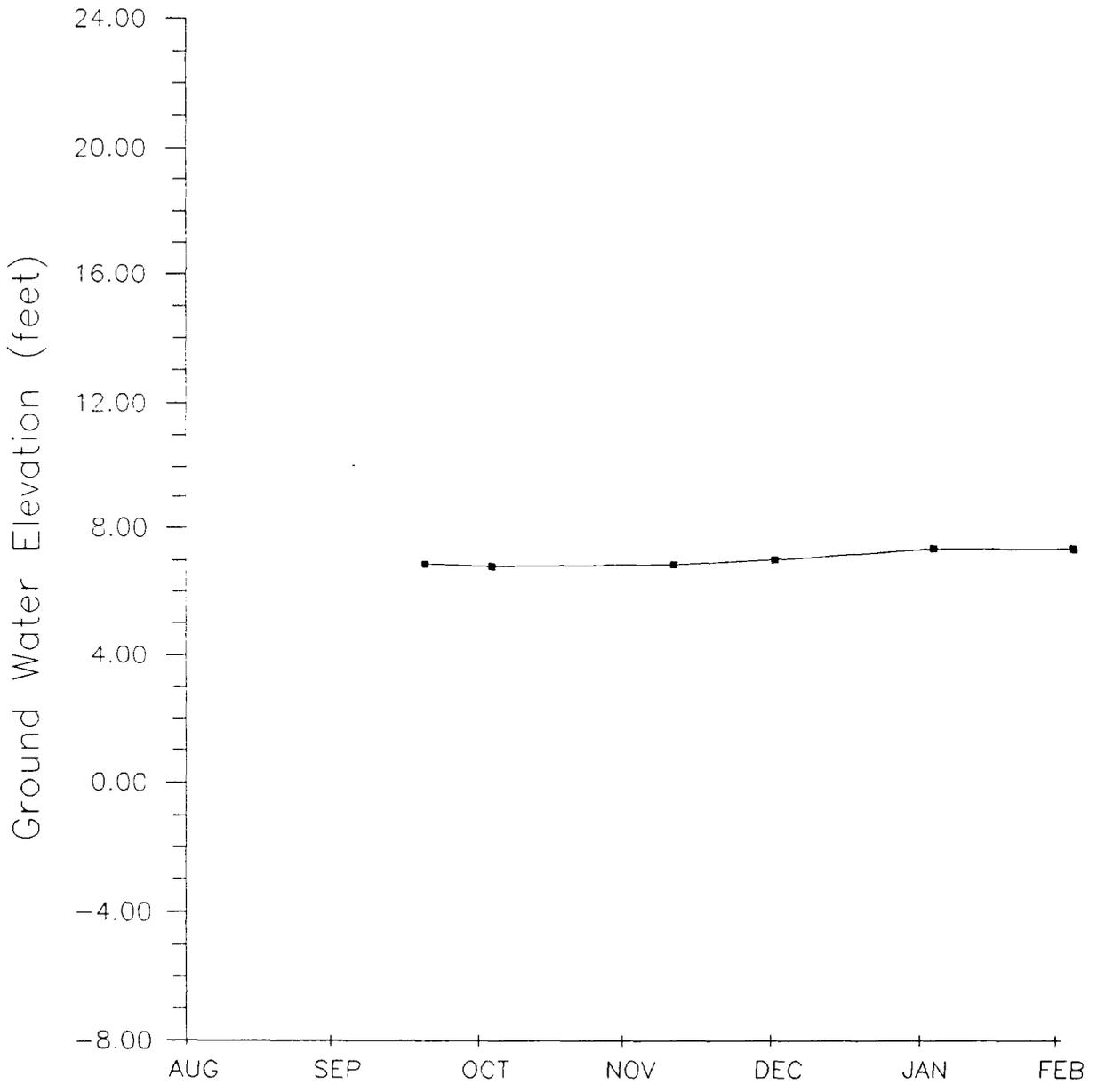
1988/1989

Hydrograph of Well W09-15(B2)  
PREPARED FOR

NAS Moffett Field



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1988/1989

Hydrograph of Well W09-27(B1)  
 PREPARED FOR

NAS Moffett Field



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APPENDIX D

SECTION 10.0 – HYDROGRAPHS OF  
SITE 10 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

DRAWING NUMBER 409616 -

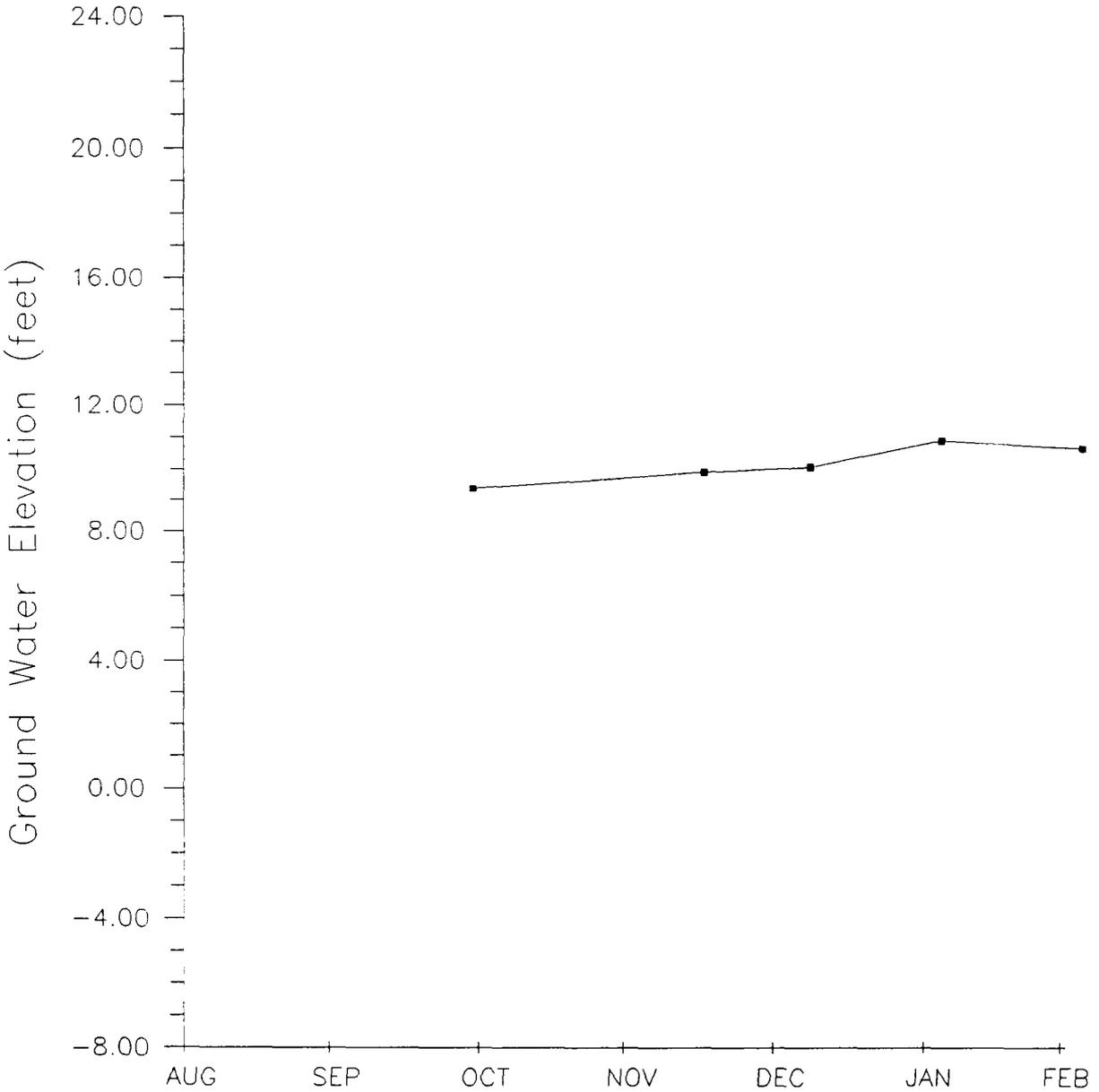
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PLP  
RPF

CHECKED BY  
APPROVED BY

WLF  
RPF

DRAWN BY



1988/1989

Hydrograph of Well W10-02(A)  
PREPARED FOR

NAS Moffett Field

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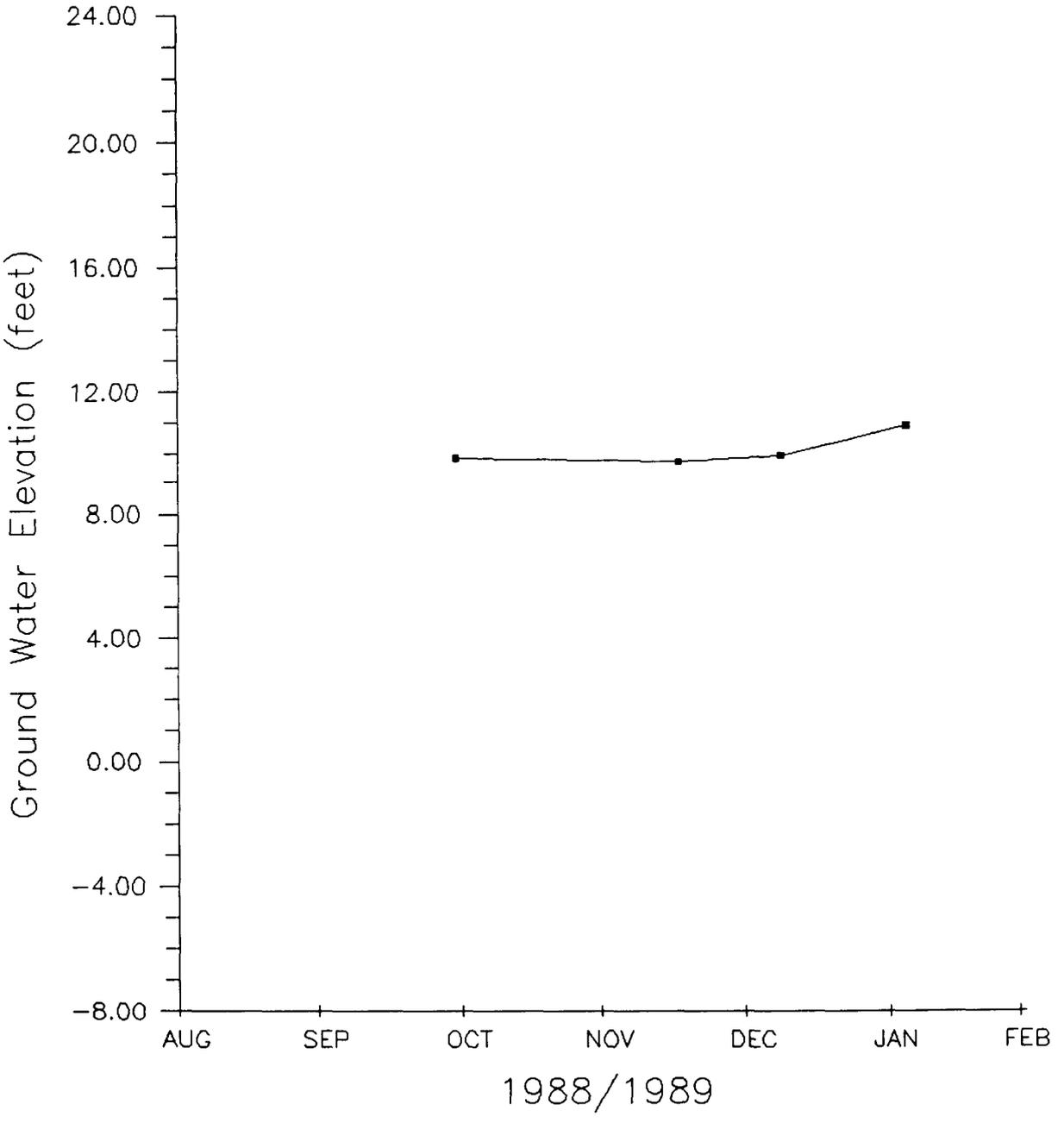
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APPROVED BY

2-25-89

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Hydrograph of Well W10-03(B2)  
PREPARED FOR

NAS Moffett Field



DRAWING NUMBER 409616-

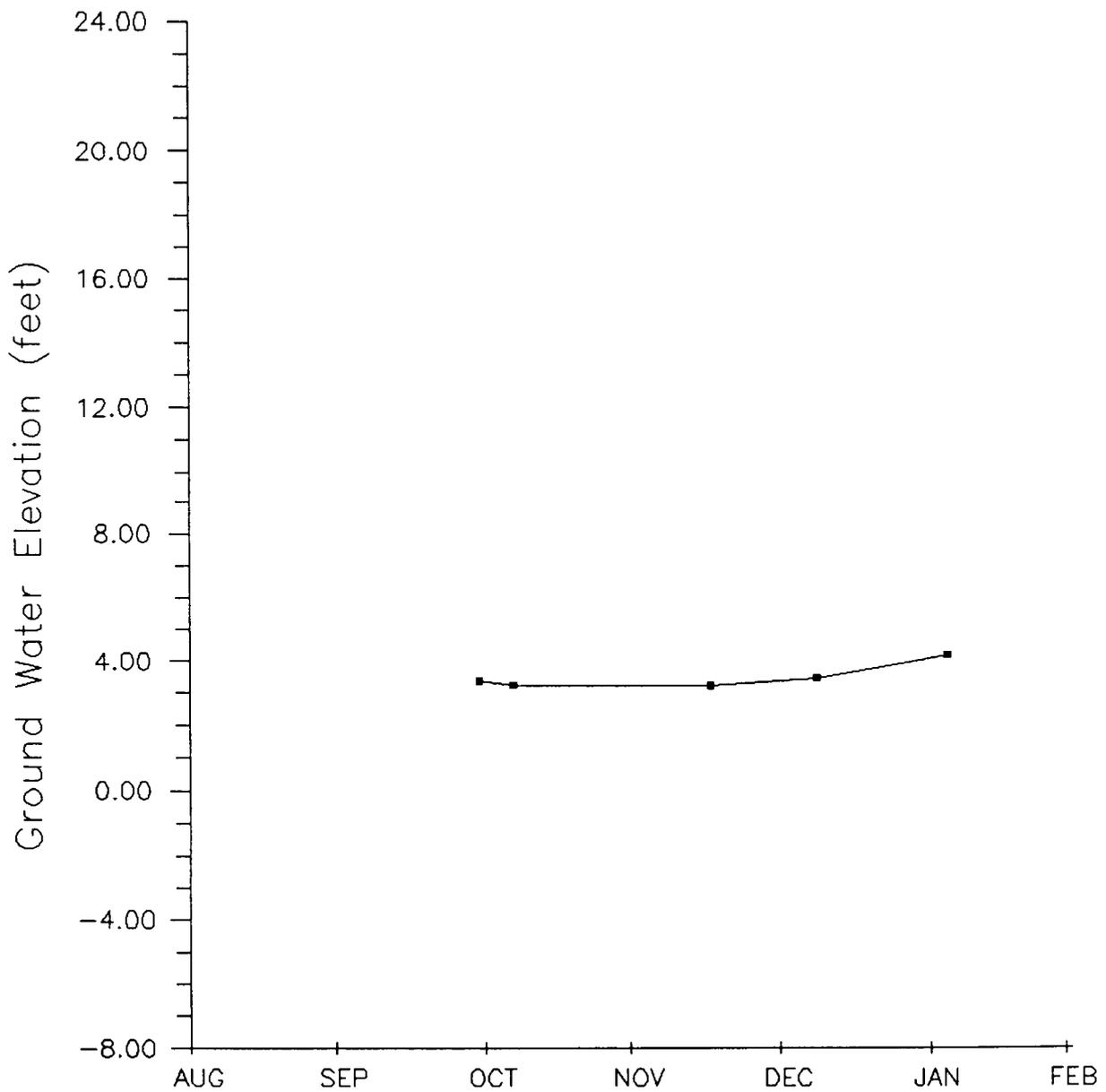
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2-25-89

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1988/1989

Hydrograph of Well W10-05(A)  
PREPARED FOR

NAS Moffett Field

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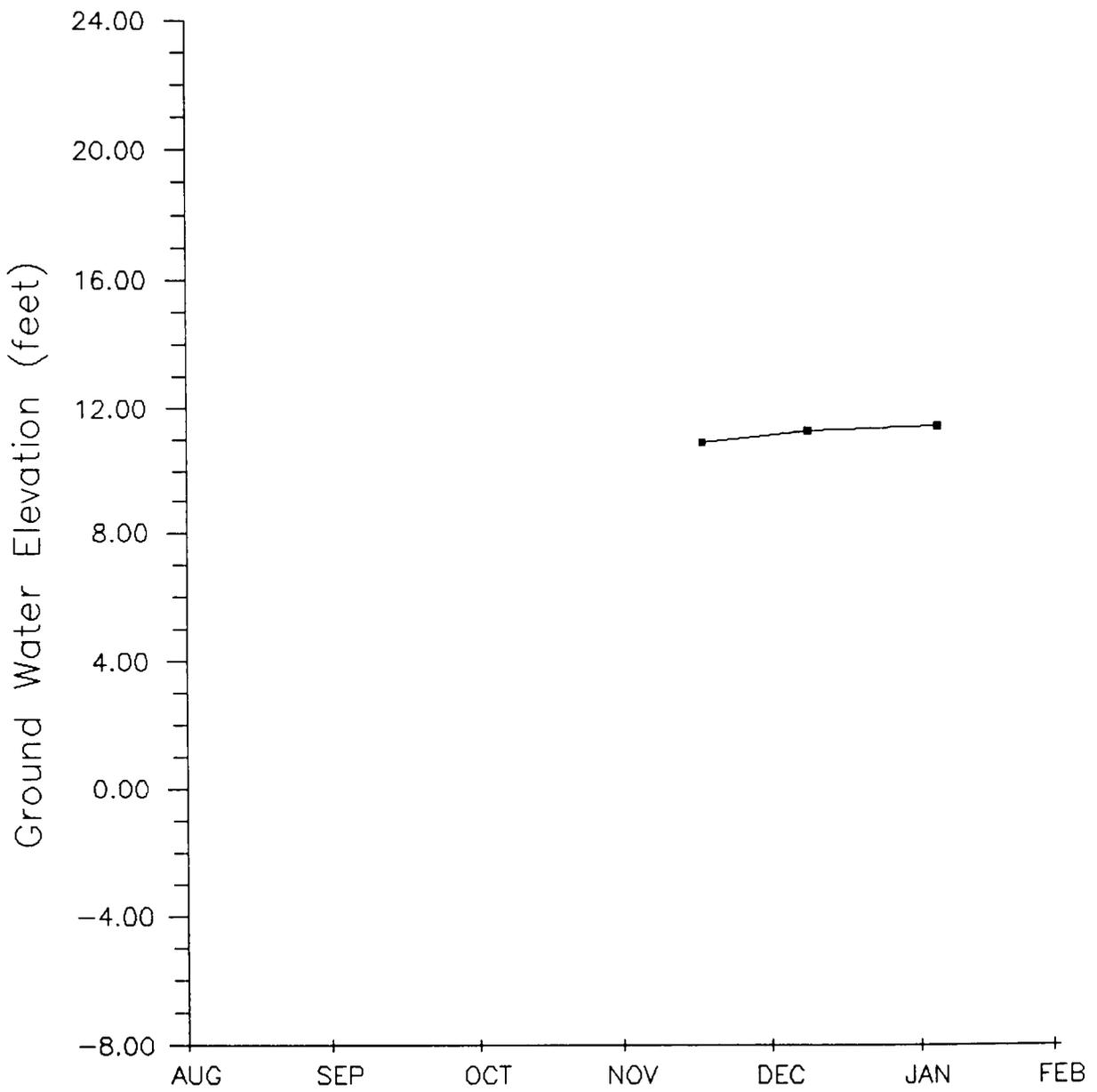
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1988/1989

Hydrograph of Well W10-06(C)  
PREPARED FOR

NAS Moffett Field



N00296.000597  
MOFFETT FIELD  
SSIC NO. 5090.3

## APPENDIX D

### SECTION 11.0 – HYDROGRAPHS OF SITE 11 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

DRAWING NUMBER 409616 -

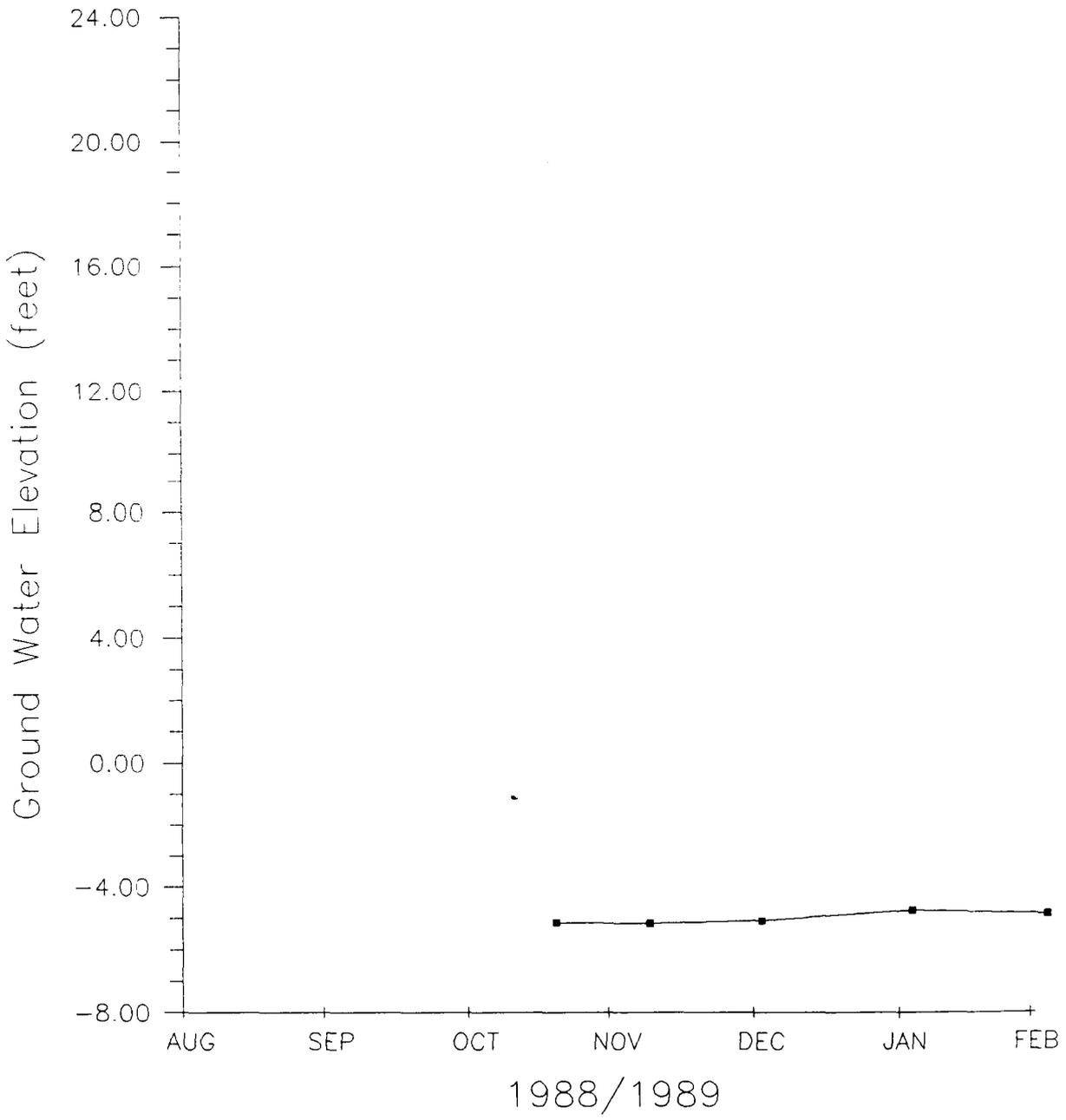
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APPROVED BY [Signature]

DRAWN BY [Signature]



Hydrograph of Well W11-01(A)  
PREPARED FOR

NAS Moffett Field

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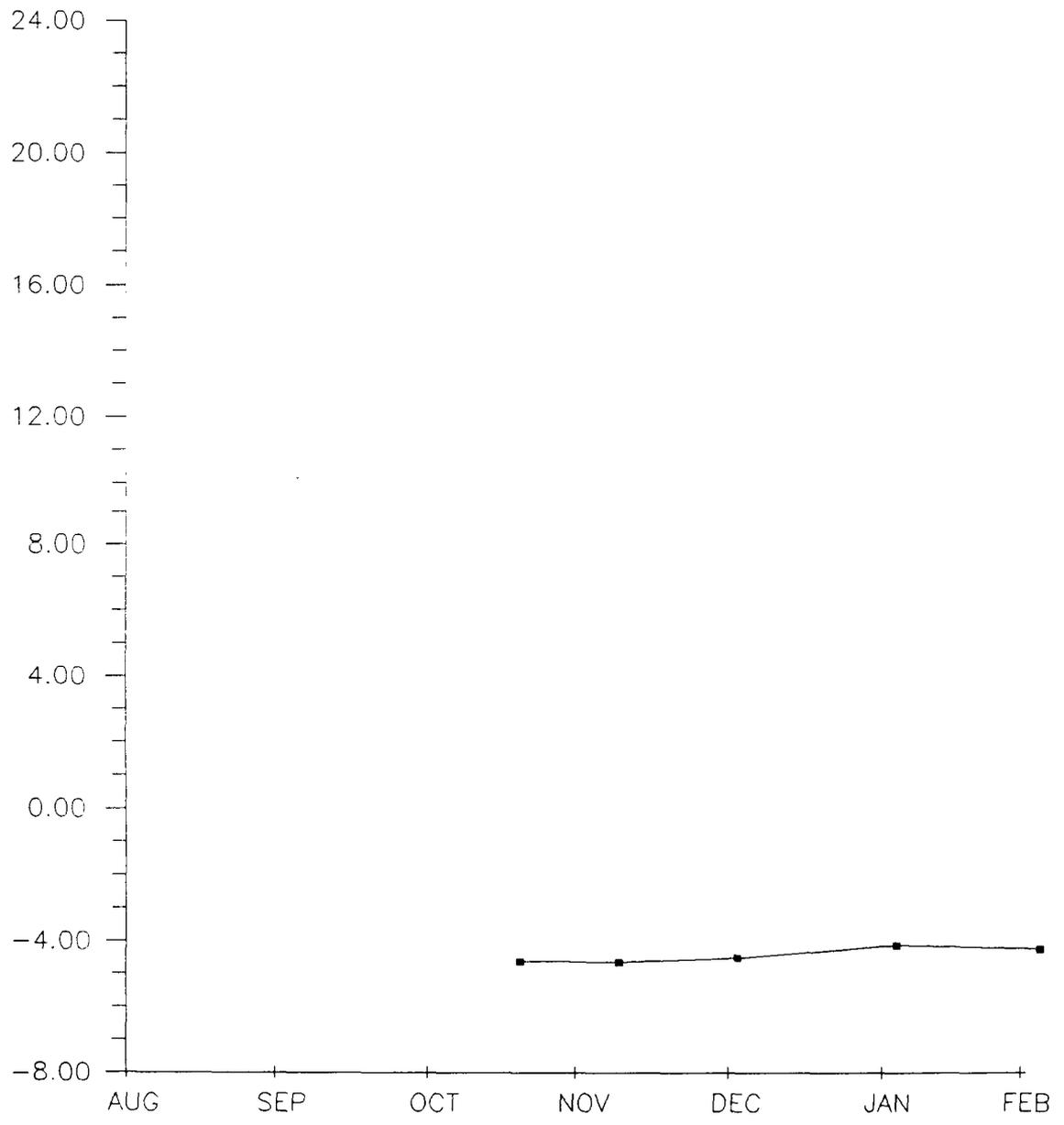
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2-25-89  
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APPROVED BY

DRAWN BY

Ground Water Elevation (feet)



1988/1989

Hydrograph of Well W11-02(A)  
PREPARED FOR

NAS Moffett Field

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APPENDIX D

SECTION 12.0 – HYDROGRAPHS OF  
SITE 12 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

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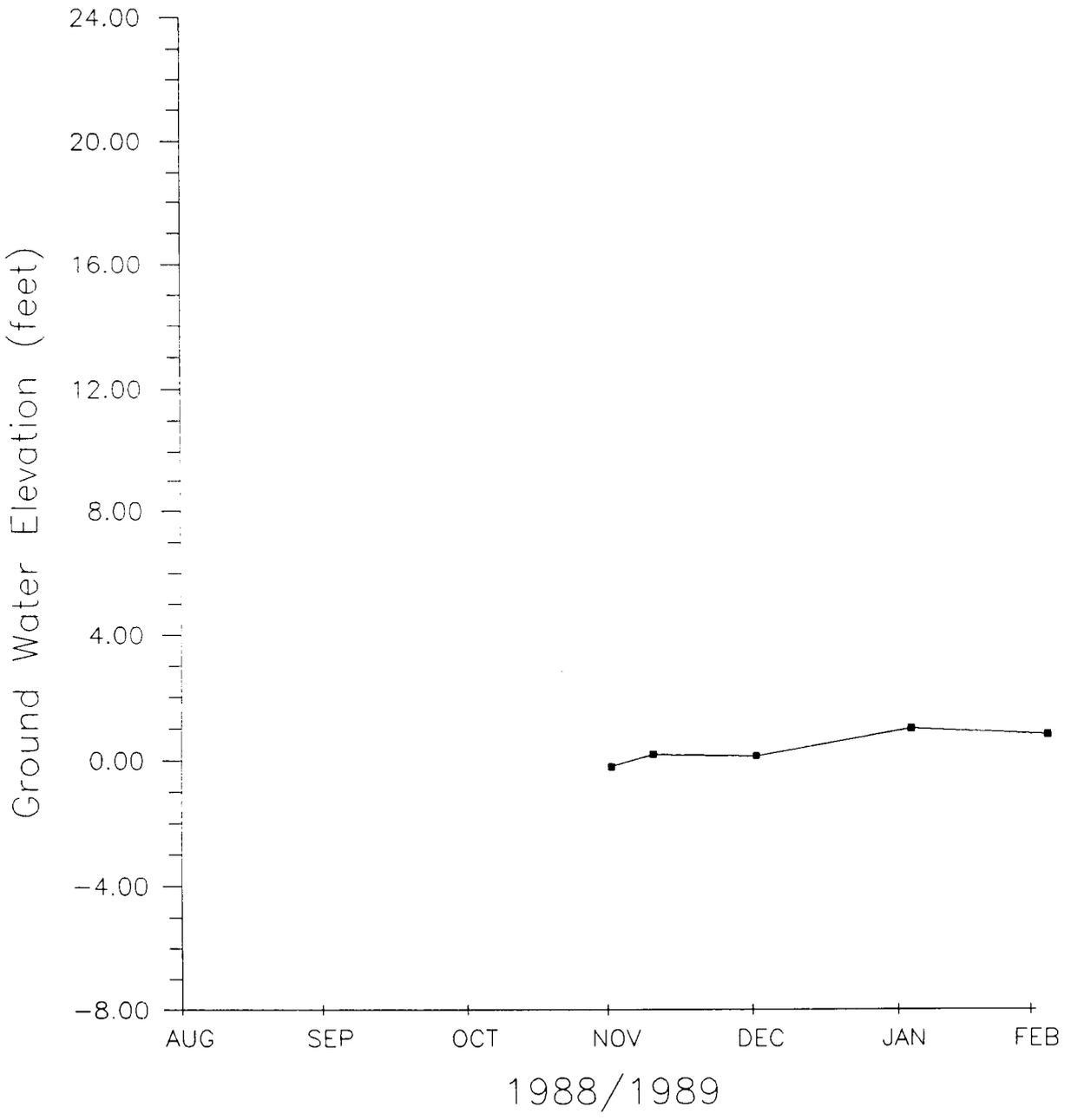
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PLC  
PLC

CHECKED BY  
APPROVED BY

L.H.  
L.H.

DRAWN BY



Hydrograph of Well W12-01(A)  
PREPARED FOR

NAS Moffett Field



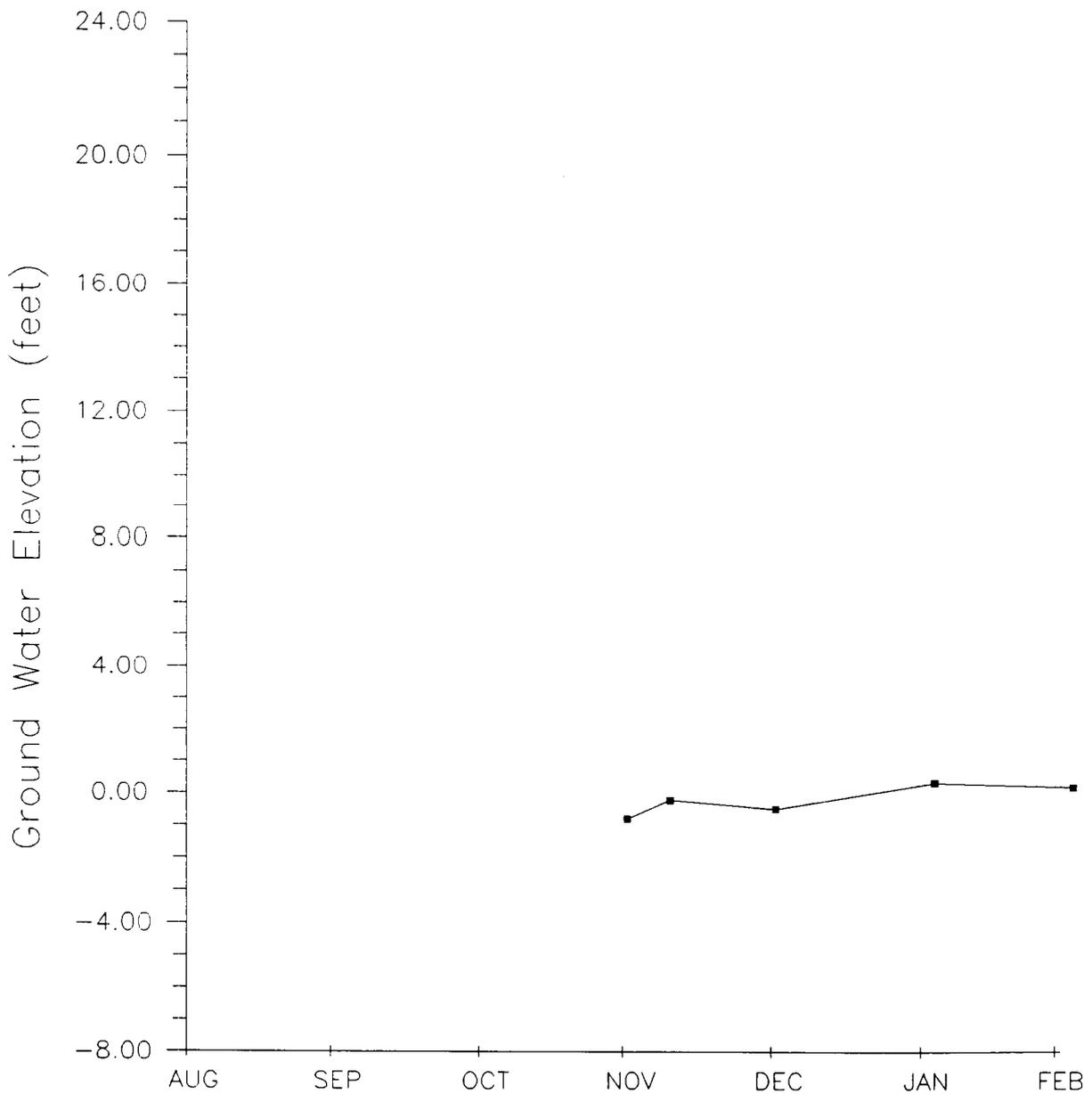
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DRAWING NUMBER 409616-

2-25-89  
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APPROVED BY

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1988/1989

Hydrograph of Well W12-02(A)  
PREPARED FOR

NAS Moffett Field

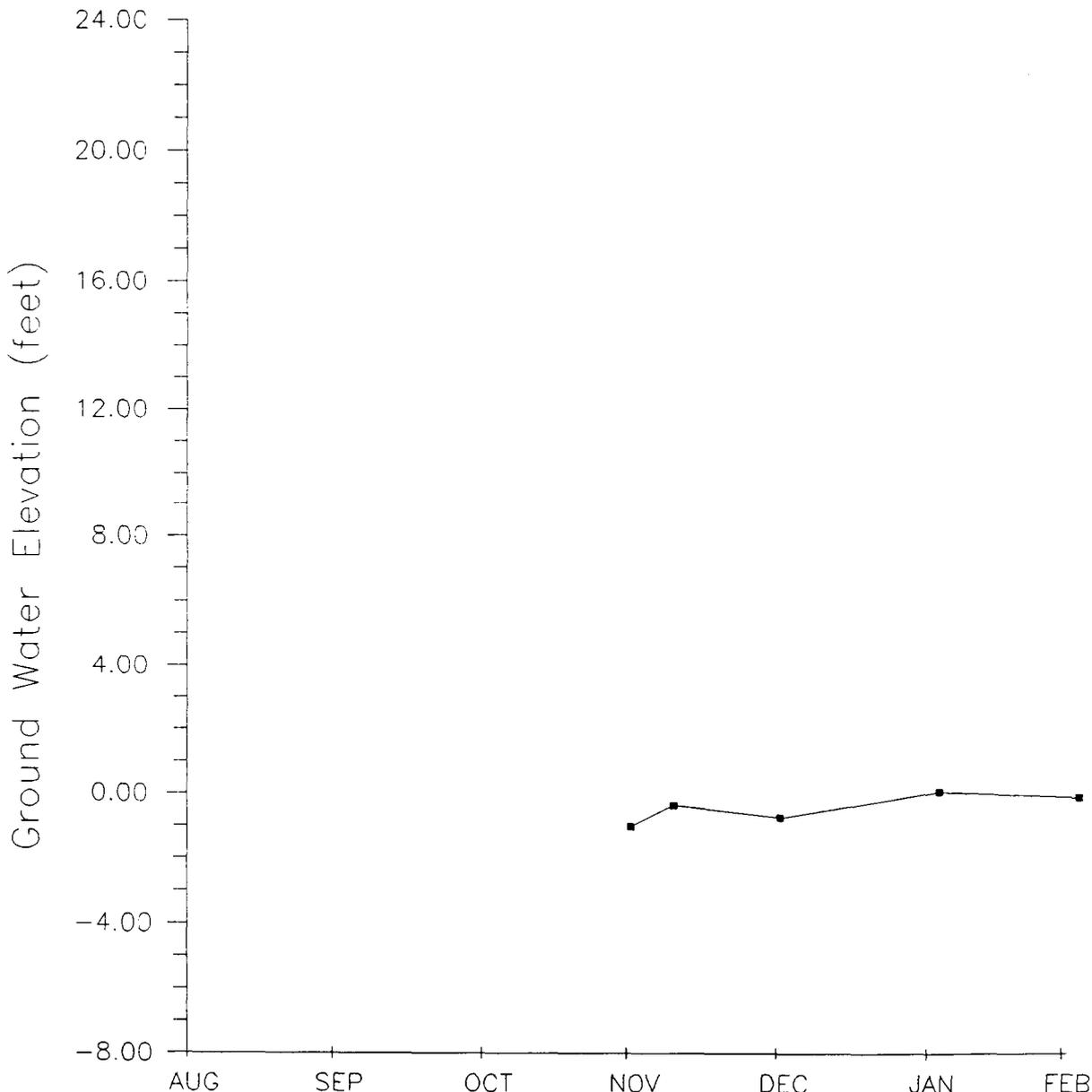


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3-25-89

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APPROVED BY

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1988/1989

Hydrograph of Well W12-03(A)  
PREPARED FOR

NAS Moffett Field



APPENDIX D

SECTION 13.0 – NO FIELD ACTIVITIES  
OCCURRED AT SITE 13.

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

N00296.000597  
MOFFETT FIELD  
SSIC NO. 5090.3

## APPENDIX D

### SECTION 14.0 – HYDROGRAPHS OF SITE 14 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

DRAWING NUMBER 409616 -

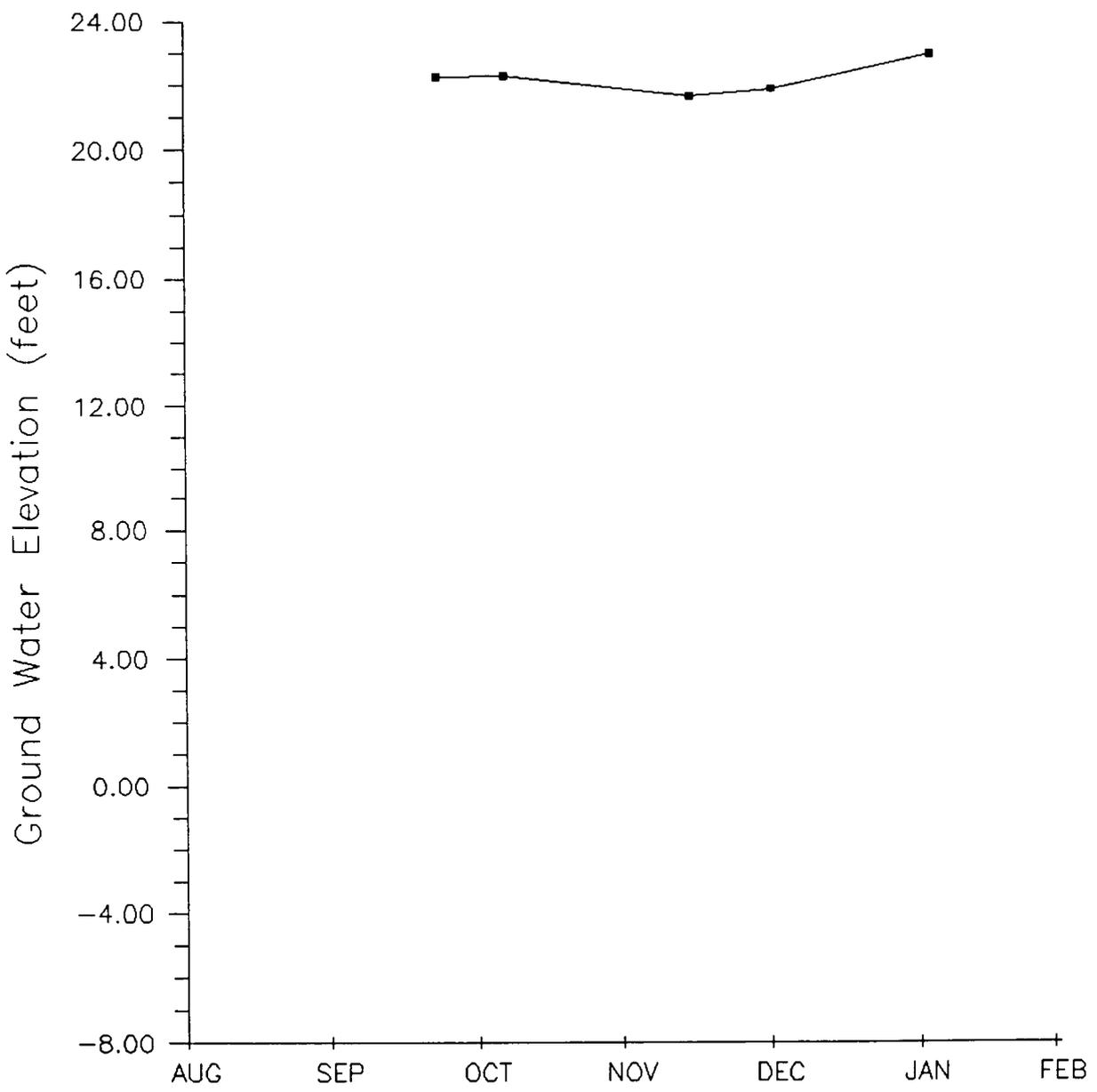
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CHK  
XCF

CHECKED BY  
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BY



1988/1989

Hydrograph of Well W14-01(B1)  
PREPARED FOR

NAS Moffett Field



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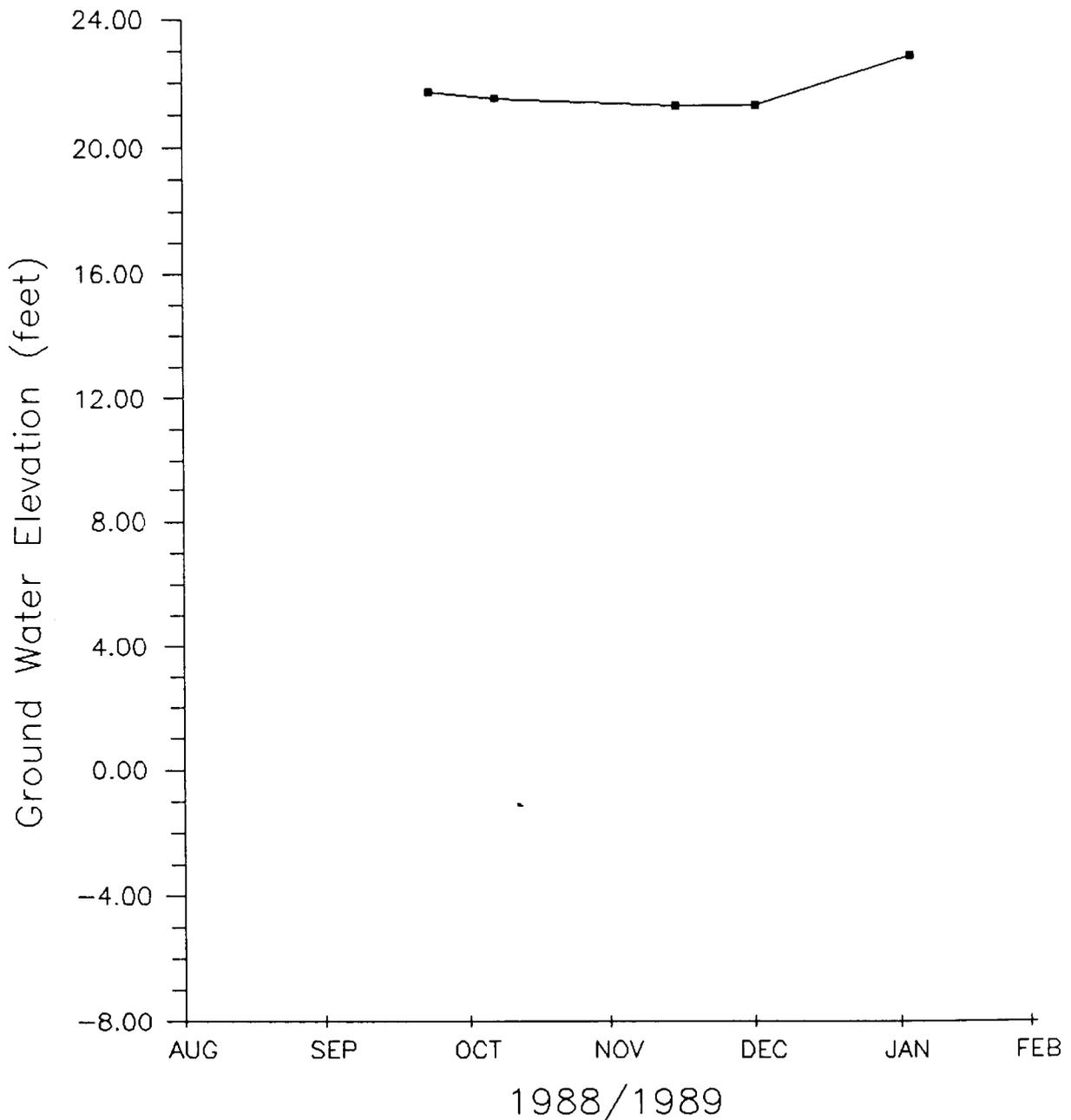
CHECKED BY: [Signature]

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DATE: 2-25-89

DATE: 2-25-89

DRAWING NUMBER 409616-



Hydrograph of Well W14-02(A)  
PREPARED FOR

NAS Moffett Field



DRAWING NUMBER 409616-

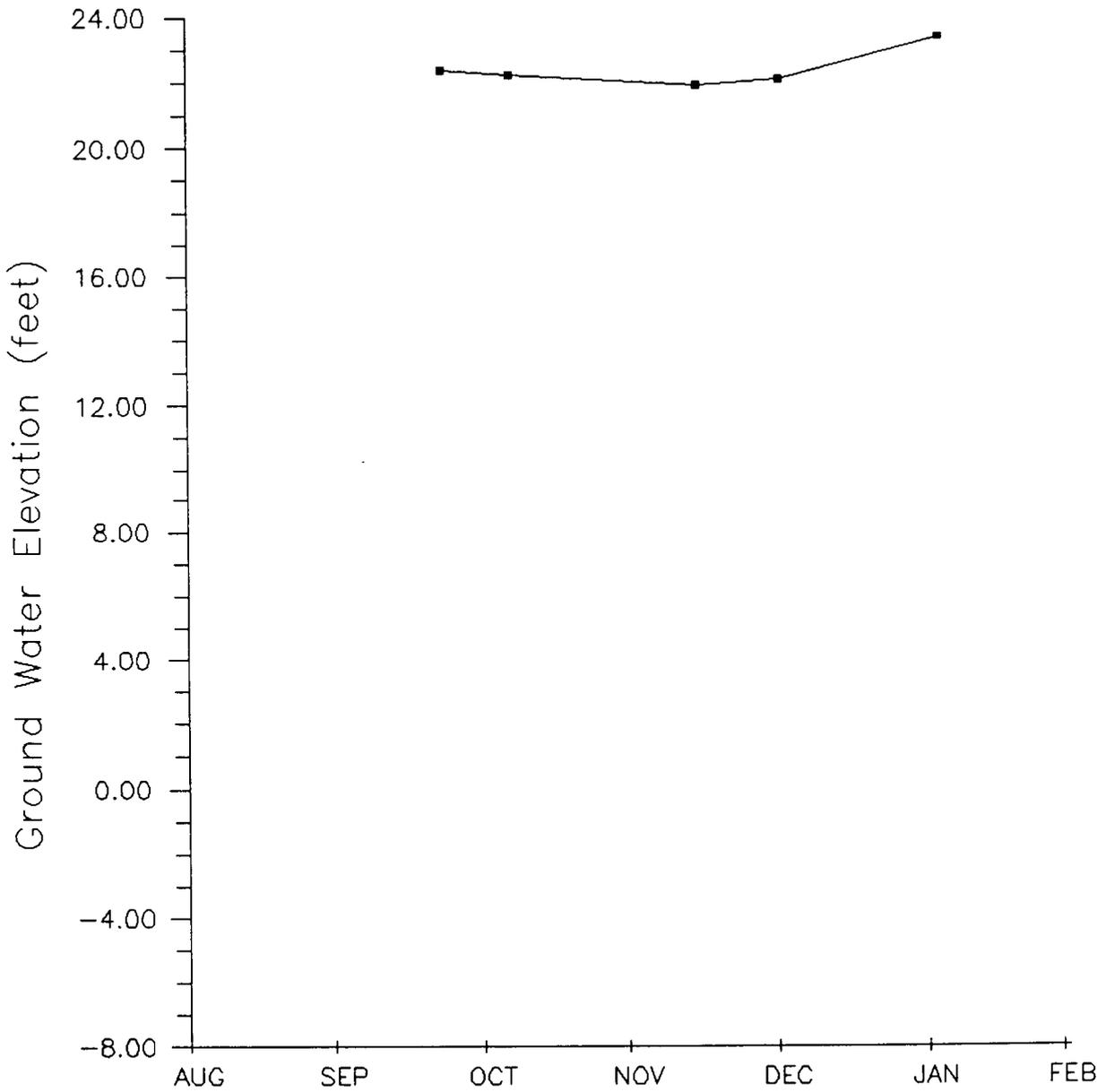
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1988/1989

Hydrograph of Well W14-03(A)  
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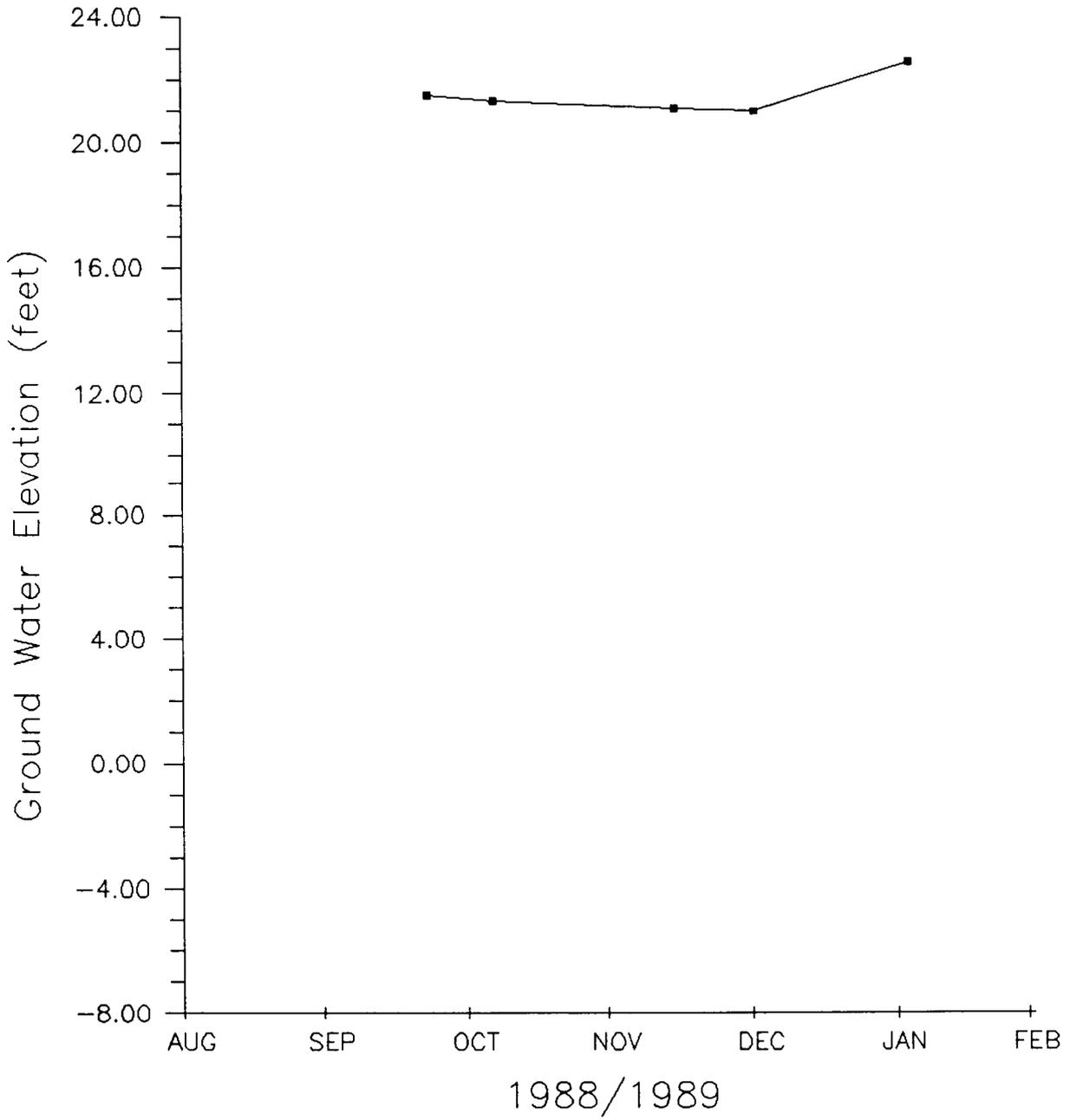
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2-25-89

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Hydrograph of Well W14-04(A)  
PREPARED FOR

NAS Moffett Field

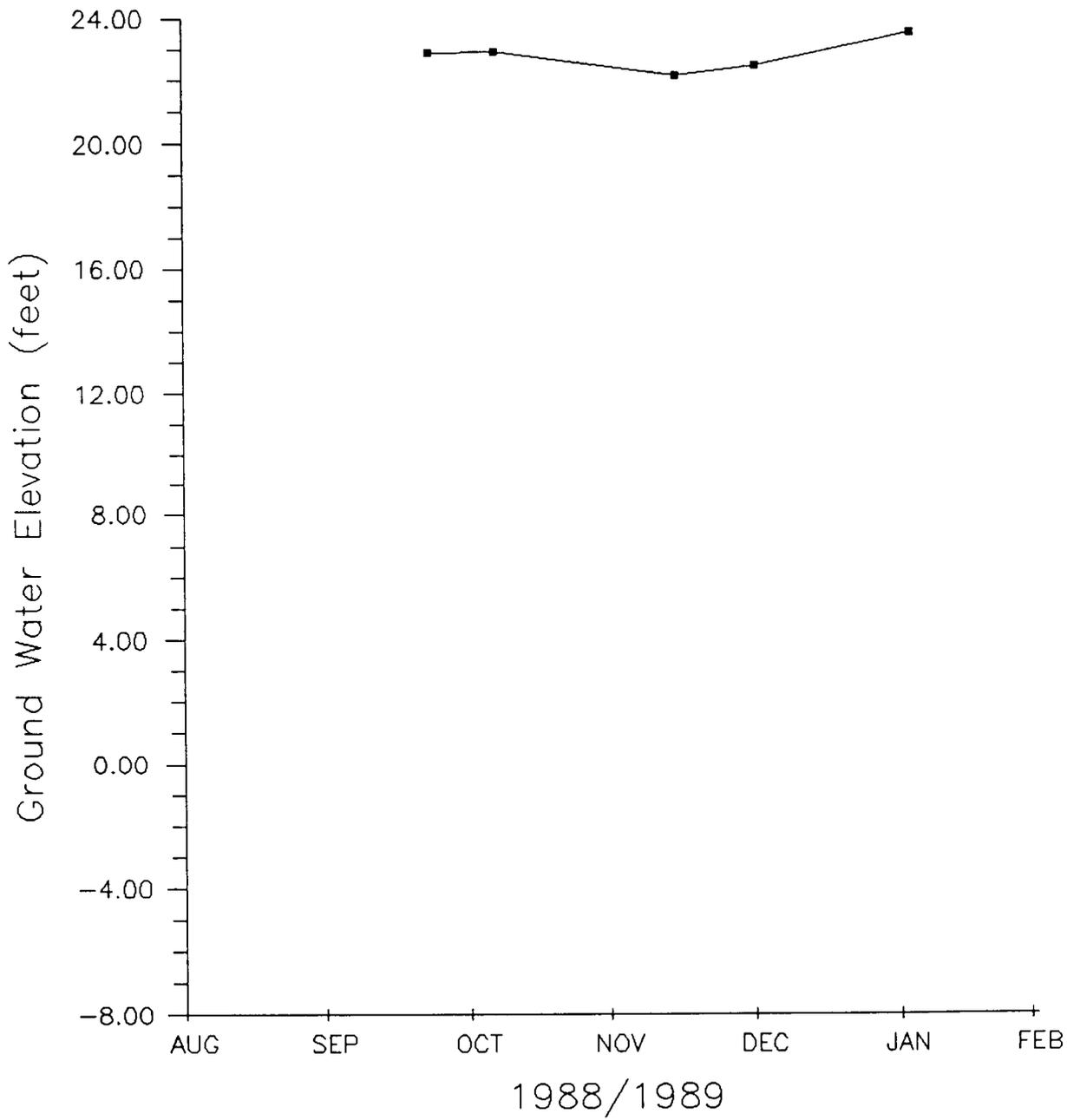


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BY [Signature]



Hydrograph of Well W14-05(B1)  
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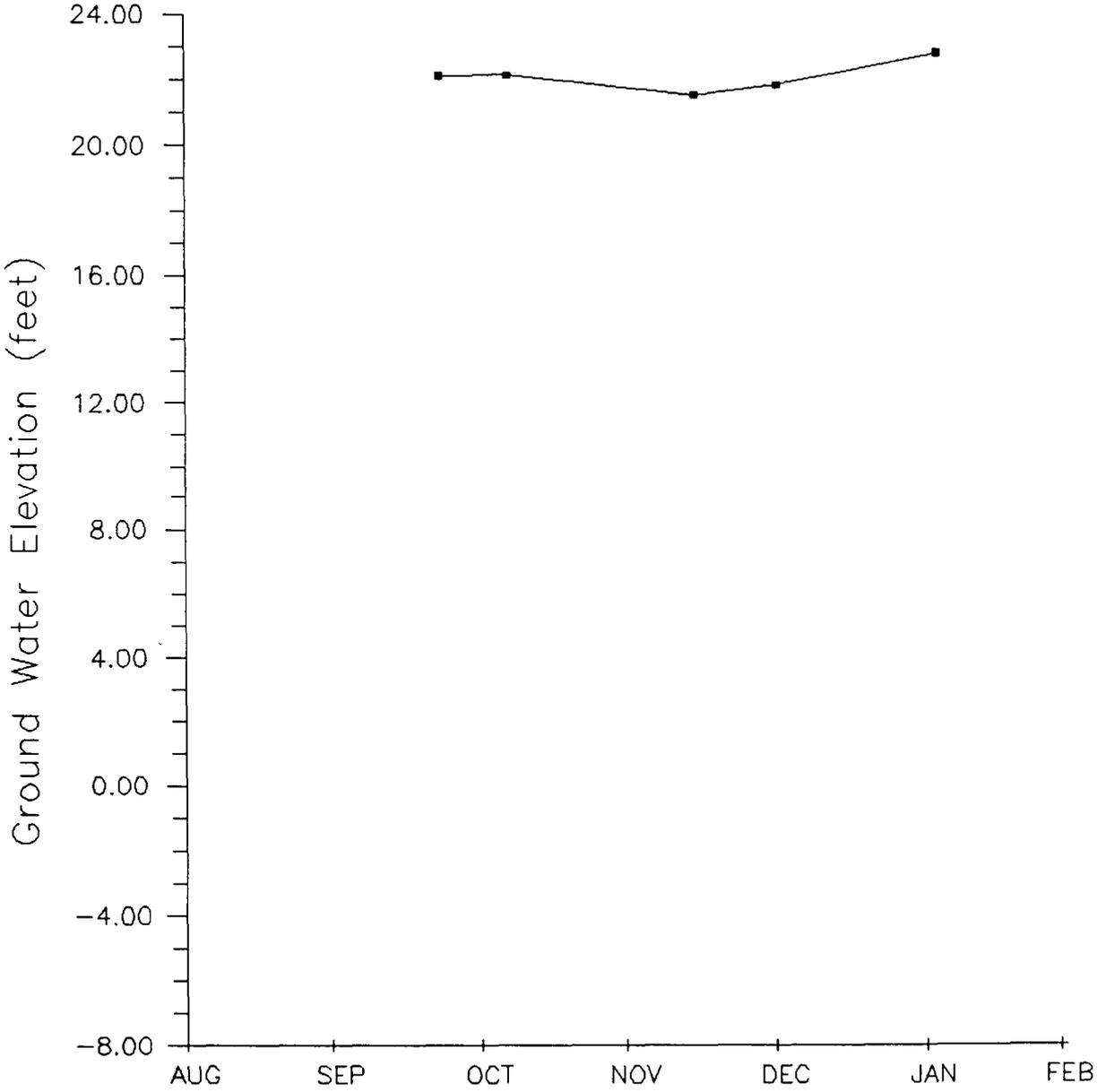
DRAWING NUMBER 409616-

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2-25-89

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1988/1989

Hydrograph of Well W14-06(B1)  
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APPENDIX D

SECTION 15.0 – SAMPLING ACTIVITIES HAD NOT  
YET BEGUN AT SITE 15 AT THE TIME.

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

APPENDIX D

SECTION 16.0 – SAMPLING ACTIVITIES HAD NOT  
YET BEGUN AT SITE 16 AT THE TIME.

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

## APPENDIX D

SECTION 17.0 – NO FIELD ACTIVITIES HAD BEEN  
INITIATED AT SITE 17 AT THE TIME.

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

APPENDIX D

SECTION 18.0 – NO FIELD ACTIVITIES HAD  
BEGUN AT SITE 18 AT THE TIME.

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

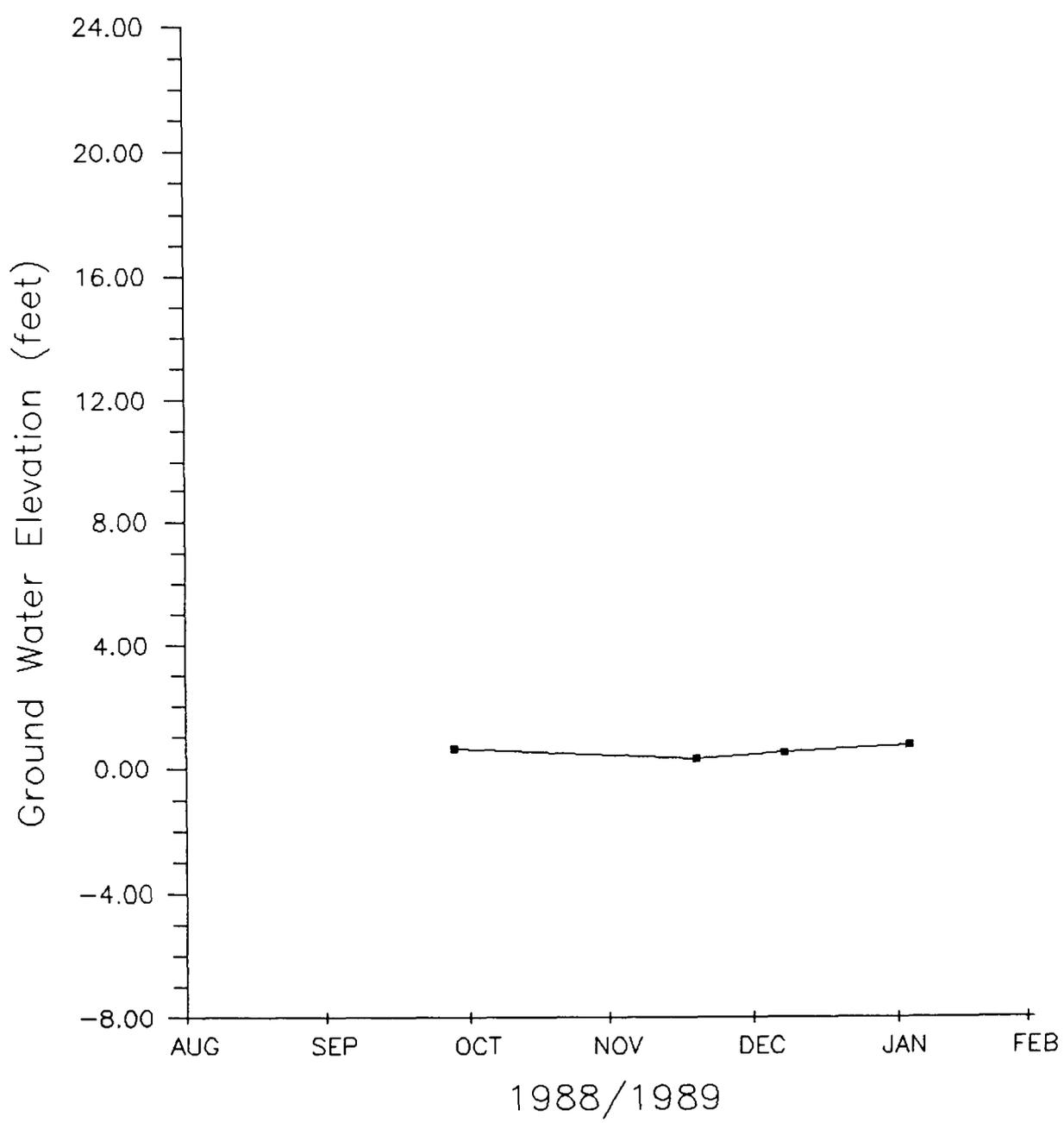
APPENDIX D

SECTION 19.0 – HYDROGRAPHS OF  
SITE 19 WELLS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

DATED 15 MARCH 1989

DRAWN BY: ELP  
 CHECKED BY: PLP  
 APPROVED BY: PLP  
 DATE: 2-25-89  
 DRAWING NUMBER: 409616



Hydrograph of Well W19-01(A)  
 PREPARED FOR  
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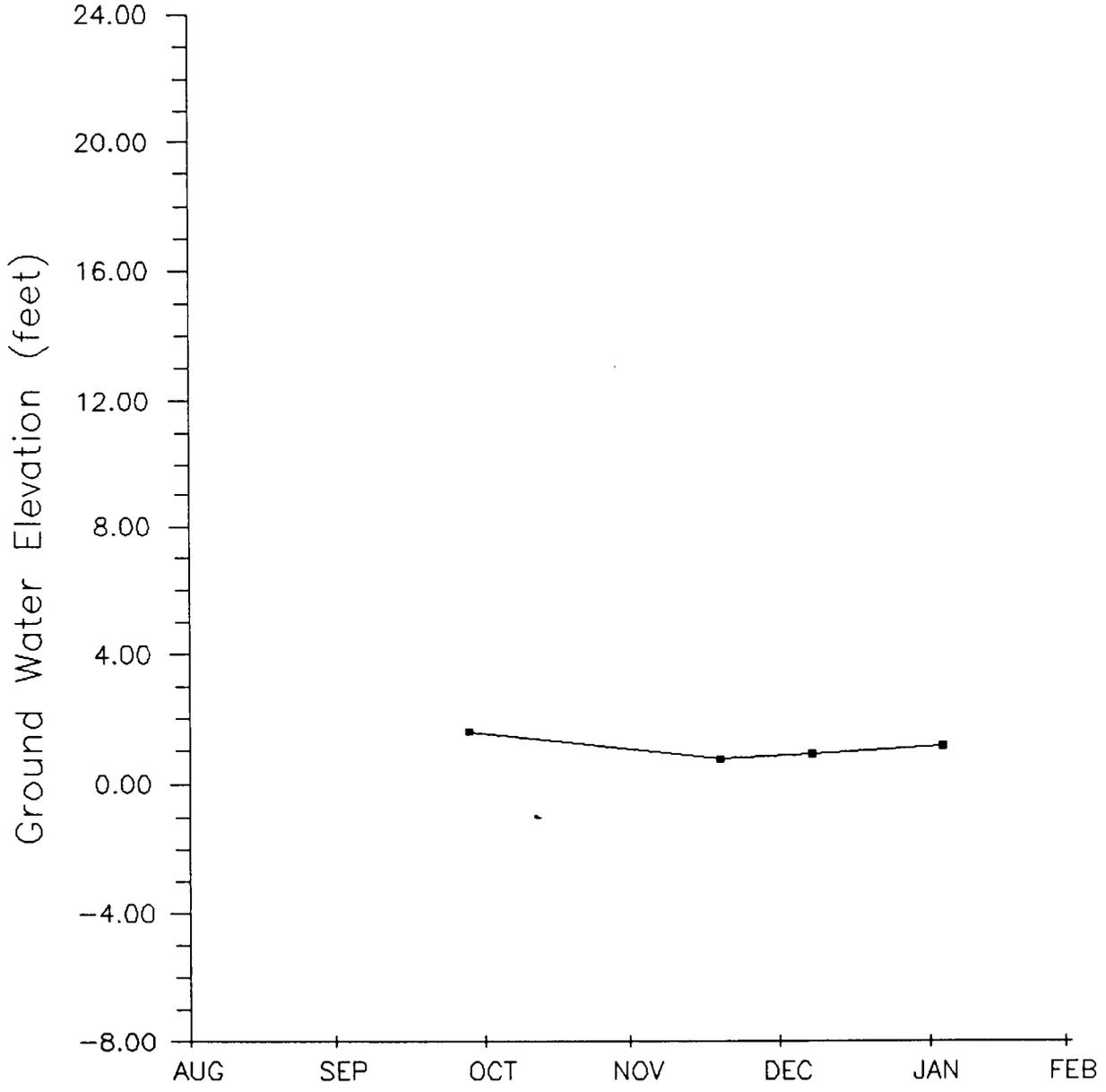
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2-25-89

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APPROVED BY

ELK  
2-25-89

DRAWN BY



1988/1989

Hydrograph of Well W19-02(B1)  
PREPARED FOR

NAS Moffett Field



DRAWING NUMBER 409016-

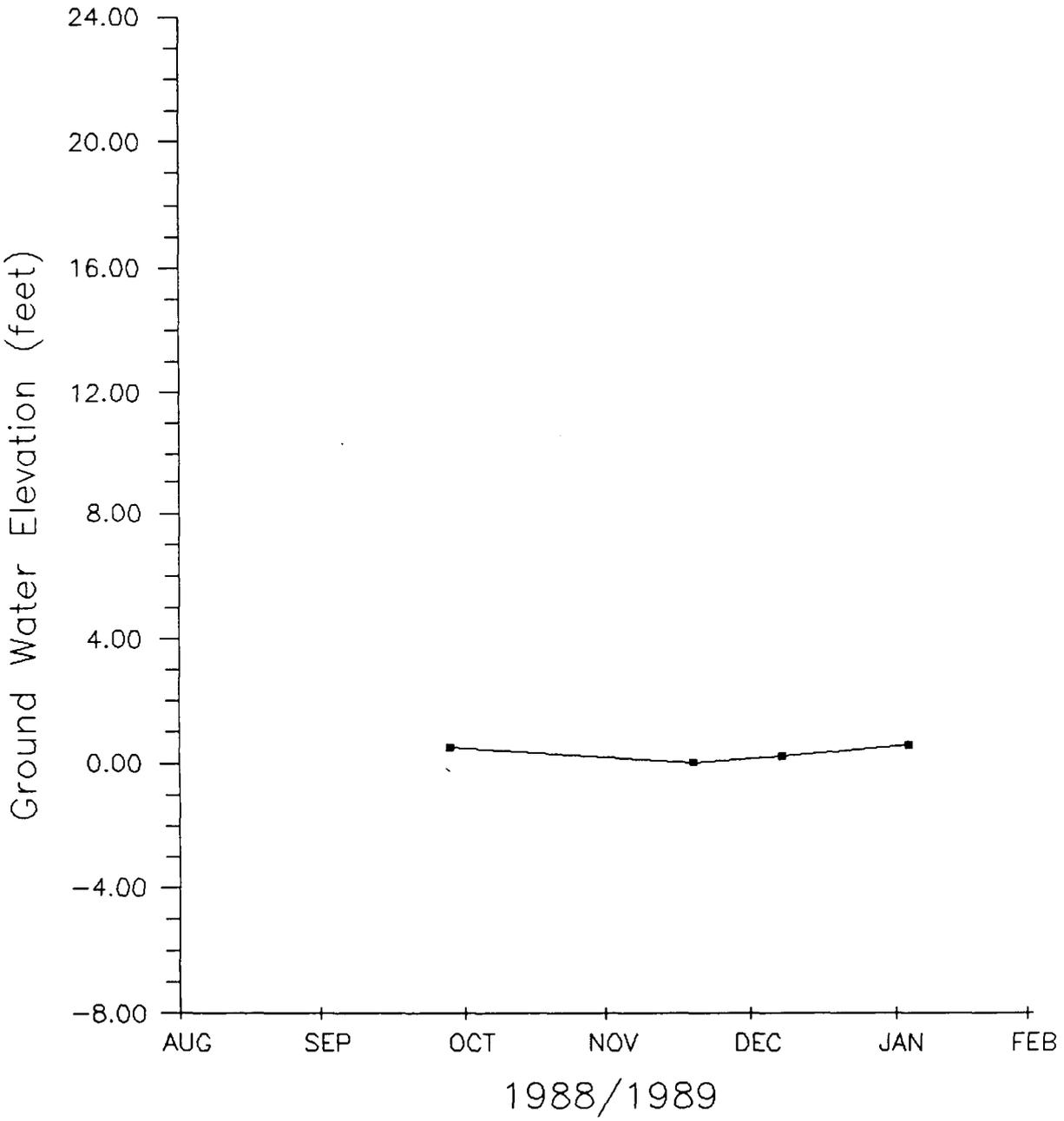
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2-25-89

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Hydrograph of Well W19-03(B1)  
PREPARED FOR

NAS Moffett Field

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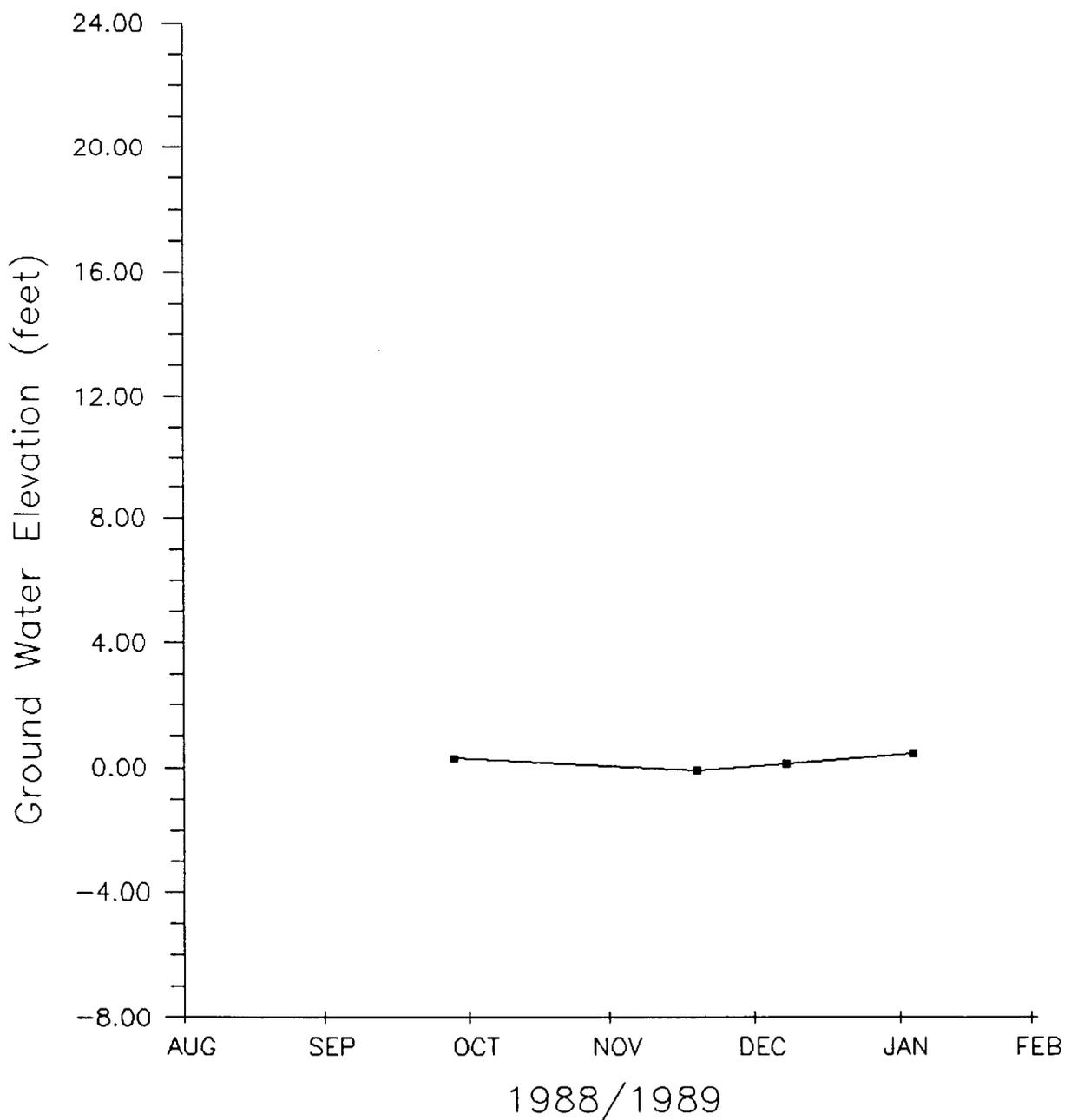
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CHECKED BY [Signature]  
APPROVED BY [Signature]



Hydrograph of Well W19-04(A)  
PREPARED FOR

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**APPENDIX E**  
**WATER LEVEL MEASUREMENTS**

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 1

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W1-1(A)	2.75	2.60	-2.91	08/23/88	
W1-2(A)	4.46	4.30	-2.87	08/23/88	
W1-3(A)	16.55	16.80	-2.63	08/23/88	
W1-6(A)	.76	1.20	-2.55	08/23/88	
W1-7(A)	1.57	.40	-2.93	08/23/88	
W1-8(A)	4.31	1.60	-2.48	08/23/88	
W1-9(F)	19.92	17.10	-1.23	08/23/88	
W1-10(F)	6.92	7.30	1.59	08/23/88	
W1-11(F)	16.15	13.10	-2.91	08/23/88	
W1-13(F)	7.46	4.70	-2.01	08/23/88	
W1-4(A)	2.33	2.00	-2.30	08/24/88	
W1-5(A)	4.71	2.40	-2.35	08/24/88	
W1-13(F)	7.46	4.70	-2.72	08/24/88	
W1-1(A)	2.75	2.60	-2.95	09/07/88	
W1-2(A)	4.46	4.30	-2.94	09/07/88	
W1-3(A)	16.55	16.80	-2.67	09/07/88	
W1-4(A)	2.33	2.00	-2.38	09/07/88	
W1-5(A)	4.71	2.40	-2.44	09/07/88	
W1-6(A)	.76	1.20	-2.59	09/07/88	
W1-7(A)	1.57	.40	-2.93	09/07/88	
W1-8(A)	4.31	1.60	-2.58	09/07/88	
W1-9(F)	19.92	17.10	-.57	09/07/88	
W1-10(F)	6.92	7.30	2.21	09/07/88	
W1-11(F)	16.15	13.10	-2.93	09/07/88	
W1-12(A)	2.30	-3.00	-1.96	09/07/88	
W1-13(F)	7.46	4.70	-2.84	09/07/88	
W1-1(A)	2.75	2.60	-3.11	10/10/88	
W1-2(A)	4.46	4.30	-3.11	10/10/88	
W1-3(A)	16.55	16.80	-2.85	10/10/88	
W1-4(A)	2.33	2.00	-2.57	10/10/88	
W1-5(A)	4.71	2.40	-1.53	10/10/88	
W1-6(A)	.76	1.20	-2.76	10/10/88	
W1-7(A)	1.57	.40	-2.29	10/10/88	
W1-8(A)	4.31	1.60	-2.05	10/10/88	
W1-9(F)	19.92	17.10	.54	10/10/88	
W1-10(F)	6.92	7.30	2.04	10/10/88	
W1-11(F)	16.15	13.10	-2.27	10/10/88	
W1-12(A)	2.30	-3.00	-2.40	10/10/88	
W1-13(F)	7.46	4.70	-2.19	10/10/88	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 1

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W1-1(A)	2.75	2.60	-3.07	11/23/88	
W1-2(A)	4.46	4.30	-3.03	11/23/88	
W1-3(A)	16.55	16.80	-2.79	11/23/88	
W1-4(A)	2.33	2.00	-2.61	11/23/88	
W1-5(A)	4.71	2.40	-2.58	11/23/88	
W1-6(A)	.76	1.20	-3.30	11/23/88	
W1-7(A)	1.57	.40	-2.97	11/23/88	
W1-8(A)	4.31	1.60	-2.69	11/23/88	
W1-9(F)	19.92	17.10	-.23	11/23/88	
W1-10(F)	6.92	7.30	1.27	11/23/88	
W1-11(F)	16.15	13.10	-3.12	11/23/88	
W1-12(A)	2.30	-3.00	-2.85	11/23/88	
W1-13(F)	7.46	4.70	-2.96	11/23/88	
W1-1(A)	2.75	2.60	-2.99	12/07/88	
W1-2(A)	4.46	4.30	-2.96	12/07/88	
W1-3(A)	16.55	16.80	-2.72	12/07/88	
W1-4(A)	2.33	2.00	-2.52	12/07/88	
W1-5(A)	4.71	2.40	-2.48	12/07/88	
W1-6(A)	.76	1.20	-3.24	12/07/88	
W1-7(A)	1.57	.40	-2.91	12/07/88	
W1-8(A)	4.31	1.60	-2.63	12/07/88	
W1-9(F)	19.92	17.10	-.31	12/07/88	
W1-10(F)	6.92	7.30	1.25	12/07/88	
W1-11(F)	16.15	13.10	-3.08	12/07/88	
W1-12(A)	2.30	-3.00	-2.80	12/07/88	
W1-13(F)	7.46	4.70	-2.88	12/07/88	
W1-1(A)	2.75	2.60	-2.63	01/03/89	
W1-2(A)	4.46	4.30	-2.52	01/03/89	
W1-3(A)	16.55	16.80	-2.40	01/03/89	
W1-4(A)	2.33	2.00	-2.24	01/03/89	
W1-5(A)	4.71	2.40	-2.26	01/03/89	
W1-6(A)	.76	1.20	-2.82	01/03/89	
W1-7(A)	1.57	.40	-2.47	01/03/89	
W1-8(A)	4.31	1.60	-2.33	01/03/89	
W1-9(F)	19.92	17.10	-.06	01/03/89	
W1-10(F)	6.92	7.30	1.55	01/03/89	
W1-11(F)	16.15	13.10	-2.80	01/03/89	
W1-12(A)	2.30	-3.00	-2.45	01/03/89	
W1-13(F)	7.46	4.70	-2.36	01/03/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 1

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W1-1(A)	2.75	2.60	-2.73	02/02/89	
W1-2(A)	4.46	4.30	-2.59	02/02/89	
W1-3(A)	16.55	16.80	-2.43	02/02/89	
W1-4(A)	2.33	2.00	-2.26	02/02/89	
W1-5(A)	4.71	2.40	-2.30	02/02/89	
W1-6(A)	.76	1.20	-2.85	02/02/89	
W1-7(A)	1.57	.40	-2.54	02/02/89	
W1-8(A)	4.31	1.60	-2.41	02/02/89	
W1-9(F)	19.92	17.10	-.18	02/02/89	
W1-10(F)	6.92	7.30	1.27	02/02/89	
W1-11(F)	16.15	13.10	-2.73	02/02/89	
W1-12(A)	2.30	-3.00	-2.53	02/02/89	
W1-13(F)	7.46	4.70	-2.34	02/02/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 2

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W2-5(A)	2.20	-.70	-5.56	08/23/88	
W2-6(A)	2.62	-.30	-6.03	08/23/88	
W2-7(A)	3.35	.60	-5.66	08/23/88	
W2-8(F)	5.87	3.10	-5.75	08/23/88	
W2-9(A)	4.32	1.30	-5.86	08/23/88	
W2-10(F)	3.73	1.10	-5.77	08/23/88	
W2-11(F)	10.00	7.10	-5.68	08/23/88	
W2-5(A)	2.20	-.70	-5.54	09/07/88	
W2-6(A)	2.62	-.30	-6.03	09/07/88	
W2-7(A)	3.35	.60	-5.68	09/07/88	
W2-8(F)	5.87	3.10	-5.76	09/07/88	
W2-9(A)	4.32	1.30	-5.89	09/07/88	
W2-10(F)	3.73	1.10	-5.81	09/07/88	
W2-11(F)	10.00	7.10	-5.67	09/07/88	
W2-5(A)	2.20	-.70	-5.48	10/06/88	
W2-6(A)	2.62	-.30	-5.99	10/06/88	
W2-7(A)	3.35	.60	-5.59	10/06/88	
W2-8(F)	5.87	3.10	-5.71	10/06/88	
W2-9(A)	4.32	1.30	-5.83	10/06/88	
W2-10(F)	3.73	1.10	-5.79	10/06/88	
W2-11(F)	10.00	7.10	-5.63	10/06/88	
W2-5(A)	2.20	-.70	-5.55	11/18/88	
W2-6(A)	2.62	-.30	-6.08	11/18/88	
W2-7(A)	3.35	.60	-5.67	11/18/88	
W2-8(F)	5.87	3.10	-5.81	11/18/88	
W2-9(A)	4.32	1.30	-5.80	11/18/88	
W2-10(F)	3.73	1.10	-5.87	11/18/88	
W2-11(F)	10.00	7.10	-5.70	11/18/88	
W2-5(A)	2.20	-.70	-5.48	12/02/88	
W2-6(A)	2.62	-.30	-6.06	12/02/88	
W2-7(A)	3.35	.60	-5.63	12/02/88	
W2-8(F)	5.87	3.10	-5.75	12/02/88	
W2-9(A)	4.32	1.30	-5.76	12/02/88	
W2-10(F)	3.73	1.10	-5.82	12/02/88	
W2-11(F)	10.00	7.10	-5.66	12/02/88	
W2-5(A)	2.20	-.70	-5.24	01/03/89	
W2-6(A)	2.62	-.30	-5.81	01/03/89	
W2-7(A)	3.35	.60	-5.42	01/03/89	
W2-8(F)	5.87	3.10	-5.56	01/03/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 2

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W2-9(A)	4.32	1.30	-6.61	01/03/89	
W2-10(F)	3.73	1.10	-5.45	01/03/89	
W2-11(F)	10.00	7.10	-5.47	01/03/89	
W2-5(A)	2.20	-.70	-5.35	02/01/89	
W2-6(A)	2.62	-.30	-5.94	02/01/89	
W2-7(A)	3.35	.60	-5.52	02/01/89	
W2-8(F)	5.87	3.10	-5.67	02/01/89	
W2-9(A)	4.32	1.30	-5.72	02/01/89	
W2-10(F)	3.73	1.10	-5.46	02/01/89	
W2-11(F)	10.00	7.10	-5.57	02/01/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 3

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W3-1(A)	2.80	3.15	-2.77	10/19/88	
W3-2(A)	-1.83	N/A	-5.55	10/19/88	
W3-3(A)	-.60	-.39	-4.53	10/19/88	
W3-4(B2)	-.66	-.51	-2.91	10/19/88	
W3-7(B2)	.22	2.30	-2.72	10/19/88	
W3-8(A)	.65	.53	-3.93	10/19/88	
W3-9(B1)	.70	2.60	-2.64	10/19/88	
W3-11(A)	-.17	2.20	-3.04	10/19/88	
W3-12(B1)	-2.22	N/A	-5.48	10/19/88	
W3-13(B1)	-1.21	-1.06	-4.13	10/19/88	
W3-14(B1)	2.89	3.32	-3.45	10/19/88	
W3-15(B2)	-.49	-.13	-4.01	10/19/88	
W3-16(C)	.79	.04	----	10/19/88	FLOWING WELL
W3-22(A)	2.00	N/A	-2.70	10/19/88	
W3-23(A)	.37	N/A	-4.84	10/19/88	
W3-1(A)	2.80	3.15	-2.77	11/03/88	
W3-2(A)	-1.83	N/A	-4.51	11/03/88	
W3-3(A)	-.60	-.39	-4.53	11/03/88	
W3-4(B2)	-.66	-.51	-2.94	11/03/88	
W3-7(B2)	.22	2.30	-2.65	11/03/88	
W3-8(A)	.65	.53	-3.92	11/03/88	
W3-9(B1)	.70	2.60	-2.54	11/03/88	
W3-11(A)	-.17	2.20	-3.03	11/03/88	
W3-12(B1)	-2.22	N/A	-5.52	11/03/88	
W3-13(B1)	-1.21	-1.06	-4.00	11/03/88	
W3-14(B1)	2.89	3.32	-2.36	11/03/88	
W3-15(B2)	-.49	-.13	-2.54	11/03/88	
W3-16(C)	.79	.04	----	11/03/88	FLOWING WELL
W3-22(A)	2.00	N/A	-2.70	11/03/88	
W3-23(A)	.37	N/A	-4.81	11/03/88	
W3-1(A)	2.80	3.15	-2.67	12/01/88	
W3-2(A)	-1.83	N/A	-4.54	12/01/88	
W3-3(A)	-.60	-.39	-4.52	12/01/88	
W3-4(B2)	-.66	-.51	-2.76	12/01/88	
W3-7(B2)	.22	2.30	-2.51	12/01/88	
W3-8(A)	.65	.53	-3.92	12/01/88	
W3-9(B1)	.70	2.60	-2.39	12/01/88	
W3-11(A)	-.17	2.20	-2.88	12/01/88	
W3-12(B1)	-2.22	N/A	-5.62	12/01/88	
W3-13(B1)	-1.21	-1.06	-3.80	12/01/88	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 3

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W3-14(B1)	2.89	3.32	-2.20	12/01/88	
W3-15(B2)	-.49	-.13	-2.36	12/01/88	
W3-16(C)	.79	.04	----	12/01/88	FLOWING WELL
W3-22(A)	2.00	N/A	-2.56	12/01/88	
W3-23(A)	.37	N/A	-4.80	12/01/88	
W3-1(A)	2.80	3.15	-2.47	01/03/89	
W3-2(A)	-1.83	N/A	-4.40	01/03/89	
W3-3(A)	-.60	-.39	-4.36	01/03/89	
W3-4(B2)	-.66	-.51	-2.61	01/03/89	
W3-7(B2)	.22	2.30	-2.23	01/03/89	
W3-8(A)	.65	.53	-3.87	01/03/89	
W3-9(B1)	.70	2.60	-2.06	01/03/89	
W3-11(A)	-.17	2.20	-2.55	01/03/89	
W3-12(B1)	-2.22	N/A	-5.40	01/03/89	
W3-13(B1)	-1.21	-1.06	-3.55	01/03/89	
W3-14(B1)	2.89	3.32	-1.83	01/03/89	
W3-15(B2)	-.49	-.13	-2.06	01/03/89	
W3-16(C)	.79	.04	----	01/03/89	FLOWING WELL
W3-22(A)	2.00	N/A	-2.38	01/03/89	
W3-23(A)	.37	N/A	-4.69	01/03/89	
W3-1(A)	2.80	3.15	-2.54	02/01/89	
W3-2(A)	-1.83	N/A	-4.49	02/01/89	
W3-3(A)	-.60	-.39	-4.50	02/01/89	
W3-4(B2)	-.66	-.51	-2.71	02/01/89	
W3-7(B2)	.22	2.30	-2.29	02/01/89	
W3-8(A)	.65	.53	-3.99	02/01/89	
W3-9(B1)	.70	2.60	-2.18	02/01/89	
W3-11(A)	-.17	2.20	-2.77	02/01/89	
W3-12(B1)	-2.22	N/A	-5.50	02/01/89	
W3-13(B1)	-1.21	-1.06	-3.68	02/01/89	
W3-14(B1)	2.89	3.32	-1.91	02/01/89	
W3-15(B2)	-.49	-.13	-2.14	02/01/89	
W3-22(A)	2.00	N/A	-2.52	02/01/89	
W3-23(A)	.37	N/A	-4.36	02/01/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 4

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W4-2(A)	4.12	4.43	-1.88	11/30/88	
W4-3(A)	5.35	5.48	-1.39	11/30/88	
W4-4(A)	5.39	5.47	-1.22	11/30/88	
W4-6(A)	5.19	5.19	-1.22	11/30/88	
W4-7(C)	4.97	4.34	----	11/30/88	FLOWING WELL
W4-8(C)	6.74	4.11	3.94	11/30/88	
W4-9(B2)	2.85	3.19	-.89	11/30/88	
W4-2(A)	4.12	4.43	-1.88	12/06/88	
W4-3(A)	5.35	5.48	-1.40	12/06/88	
W4-4(A)	5.39	5.47	-1.21	12/06/88	
W4-6(A)	5.19	5.19	-1.21	12/06/88	
W4-7(C)	4.97	4.34	----	12/06/88	FLOWING WELL
W4-8(C)	6.74	4.11	5.09	12/06/88	
W4-9(B2)	2.85	3.19	-.98	12/06/88	
W4-2(A)	4.12	4.43	-1.55	01/05/89	
W4-3(A)	5.35	5.48	-.73	01/05/89	
W4-4(A)	5.39	5.47	-.79	01/05/89	
W4-7(C)	4.97	4.34	----	01/05/89	FLOWING WELL
W4-8(C)	6.74	4.11	4.36	01/05/89	
W4-9(B2)	2.85	3.19	-.47	01/05/89	
W4-6(A)	5.19	5.19	-.78	01/09/89	
W4-2(A)	4.12	4.43	-1.77	02/02/89	
W4-3(A)	5.35	5.48	-1.17	02/02/89	
W4-4(A)	5.39	5.47	-1.09	02/02/89	
W4-6(A)	5.19	5.19	-1.04	02/02/89	
W4-8(C)	6.74	4.11	4.43	02/02/89	
W4-9(B2)	2.85	3.19	-.59	02/02/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 5

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W5-4(B1)	6.15	6.55	-.22	11/03/88	
W5-5(C)	6.16	6.68	4.62	11/03/88	
W5-6(A)	9.00	N/A	1.63	11/03/88	
W5-7(A)	13.27	13.69	4.12	11/03/88	
W5-8(B1)	13.47	13.47	3.82	11/03/88	
W5-9(A)	13.25	13.93	7.07	11/03/88	
W5-10(A)	13.20	13.47	3.47	11/03/88	
W5-14(A)	7.25	7.64	.41	11/03/88	
W5-15(A)	9.67	10.28	1.18	11/03/88	
W5-16(A)	11.68	12.05	5.28	11/03/88	
W5-17(A)	12.14	12.55	5.14	11/03/88	
W5-18(A)	11.77	12.13	5.87	11/03/88	
W5-19(A)	12.11	12.47	5.47	11/03/88	
W5-4(B1)	6.15	6.55	.72	12/05/88	
W5-5(C)	6.16	6.68	5.15	12/05/88	
W5-6(A)	9.00	N/A	2.47	12/05/88	
W5-7(A)	13.27	13.69	4.29	12/05/88	
W5-8(B1)	13.47	13.47	4.03	12/05/88	
W5-9(A)	13.25	13.93	7.80	12/05/88	
W5-10(A)	13.20	13.47	3.68	12/05/88	
W5-14(A)	7.25	7.64	1.26	12/05/88	
W5-15(A)	9.67	10.28	2.23	12/05/88	
W5-16(A)	11.68	12.05	5.46	12/05/88	
W5-17(A)	12.14	12.55	5.34	12/05/88	
W5-18(A)	11.77	12.13	6.07	12/05/88	
W5-19(A)	12.11	12.47	5.72	12/05/88	
W5-4(B1)	6.15	6.55	.68	01/04/89	
W5-5(C)	6.16	6.68	4.79	01/04/89	
W5-6(A)	9.00	N/A	2.50	01/04/89	
W5-7(A)	13.27	13.69	4.95	01/04/89	
W5-8(B1)	13.47	13.47	4.62	01/04/89	
W5-9(A)	13.25	13.93	7.89	01/04/89	
W5-10(A)	13.20	13.47	4.31	01/04/89	
W5-14(A)	7.25	7.64	1.29	01/04/89	
W5-15(A)	9.67	10.28	2.01	01/04/89	
W5-16(A)	11.68	12.05	6.09	01/04/89	
W5-17(A)	12.14	12.55	5.97	01/04/89	
W5-18(A)	11.77	12.13	6.67	01/04/89	
W5-19(A)	12.11	12.47	6.32	01/04/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 5

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W5-4(B1)	6.15	6.55	.45	02/01/89	
W5-5(C)	6.16	6.68	4.86	02/01/89	
W5-6(A)	9.00	N/A	2.36	02/01/89	
W5-7(A)	13.27	13.69	4.86	02/01/89	
W5-8(B1)	13.47	13.47	4.57	02/01/89	
W5-9(A)	13.25	13.93	7.81	02/01/89	
W5-10(A)	13.20	13.47	4.24	02/01/89	
W5-14(A)	7.25	7.64	1.10	02/01/89	
W5-15(A)	9.67	10.28	1.83	02/01/89	
W5-16(A)	11.62	12.05	5.98	02/01/89	
W5-17(A)	12.14	12.55	5.84	02/01/89	
W5-18(A)	11.77	12.13	6.58	02/01/89	
W5-19(A)	12.11	12.47	6.21	02/01/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 6

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W6-2(A)	5.53	6.19	-.07	11/18/88	
W6-3(A)	5.51	6.10	-.10	11/18/88	
W6-2(A)	5.53	6.19	.13	12/05/88	
W6-3(A)	5.51	6.10	.13	12/05/88	
W6-2(A)	5.53	6.19	.50	01/03/89	
W6-3(A)	5.51	6.10	.46	01/03/89	
W6-2(A)	5.53	6.19	.29	02/01/89	
W6-3(A)	5.51	6.10	.27	02/01/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 7

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W7-1(A)	11.20	11.31	5.58	12/07/88	
W7-4(B1)	10.37	10.31	2.05	12/07/88	
W7-8(A)	9.59	9.90	.51	12/07/88	
W7-13(A)	11.28	11.31	4.16	12/07/88	
W7-15(B1)	8.10	8.30	2.98	12/07/88	
W7-16(C)	10.39	11.15	6.98	12/07/88	
W7-18(A)	10.79	11.19	5.72	12/07/88	
W7-19(A)	8.95	9.40	1.15	12/07/88	
W7-20(A)	10.20	10.51	2.42	12/07/88	
W7-21(A)	7.38	7.86	2.24	12/07/88	
W7-1(A)	11.20	11.31	5.93	01/03/89	
W7-4(B1)	10.37	10.31	2.61	01/03/89	
W7-8(A)	9.59	9.90	.71	01/03/89	
W7-13(A)	11.28	11.31	4.69	01/03/89	
W7-16(C)	10.39	11.15	7.13	01/03/89	
W7-18(A)	10.79	11.19	6.27	01/03/89	
W7-19(A)	8.95	9.40	1.55	01/03/89	
W7-20(A)	10.20	10.51	2.71	01/03/89	
W7-21(A)	7.38	7.86	2.83	01/03/89	
W7-15(B1)	8.10	8.30	3.47	01/04/89	
W7-1(A)	11.20	11.31	5.81	02/01/89	
W7-4(B1)	10.37	10.31	2.31	02/01/89	
W7-8(A)	9.59	9.90	.62	02/01/89	
W7-13(A)	11.28	11.31	4.53	02/01/89	
W7-15(B1)	8.10	8.30	3.33	02/01/89	
W7-16(C)	10.39	11.15	7.27	02/01/89	
W7-18(A)	10.79	11.19	5.32	02/01/89	
W7-19(A)	8.95	9.40	1.37	02/01/89	
W7-20(A)	10.20	10.51	2.60	02/01/89	
W7-21(A)	7.38	7.86	2.69	02/01/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 8

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W8-1(A)	8.03	8.16	----	11/17/88	UNABLE LOCATE
W8-2(B1)	7.24	7.79	-1.21	11/17/88	
W8-3(C)	13.50	N/A	13.50	11/17/88	
W8-4(A)	7.47	7.91	-.86	11/17/88	
W8-5(A)	6.03	6.55	-1.43	11/17/88	
W8-6(A)	7.42	7.86	-1.14	11/17/88	
W8-1(A)	8.03	8.16	-.96	12/01/88	
W8-2(B1)	7.24	7.79	-1.08	12/01/88	
W8-3(C)	13.50	N/A	----	12/01/88	FLOWING WELL
W8-4(A)	7.47	7.91	-.82	12/01/88	
W8-5(A)	6.03	6.55	-1.33	12/01/88	
W8-6(A)	7.42	7.86	-.92	12/01/88	
W8-1(A)	8.03	8.16	.17	01/03/89	
W8-2(B1)	7.24	7.79	.06	01/03/89	
W8-3(C)	13.50	N/A	12.70	01/03/89	
W8-4(A)	7.47	7.91	.24	01/03/89	
W8-5(A)	6.03	6.55	-.13	01/03/89	
W8-6(A)	7.42	7.86	.05	01/03/89	
W8-1(A)	8.03	8.16	.03	02/01/89	
W8-2(B1)	7.24	7.79	-.08	02/01/89	
W8-3(C)	13.50	N/A	12.70	02/01/89	
W8-4(A)	7.47	7.91	.09	02/01/89	
W8-5(A)	6.03	6.55	-.22	02/01/89	
W8-6(A)	7.42	7.86	-.02	02/01/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 9

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W9-1(A)	18.72	18.86	10.13	09/19/88	
W9-3(C)	19.70	20.00	15.19	09/19/88	
W9-4(B2)	13.34	13.86	6.58	09/19/88	
W9-5(B3)	13.32	13.72	7.16	09/19/88	
W9-6(A)	18.23	18.50	10.23	09/19/88	
W9-7(A)	19.22	19.66	11.26	09/19/88	
W9-13(B1)	19.32	19.60	11.32	09/19/88	
W9-14(B1)	20.53	20.90	14.04	09/19/88	
W9-15(B2)	18.34	18.77	12.14	09/19/88	
W9-27(B1)	16.39	16.79	6.90	09/19/88	
W9-2(A)	19.44	19.63	11.21	09/20/88	
W9-3(C)	19.70	20.00	14.89	10/03/88	
W9-4(B2)	13.34	13.86	6.33	10/03/88	
W9-5(B3)	13.32	13.72	7.02	10/03/88	
W9-6(A)	18.23	18.50	9.77	10/03/88	
W9-7(A)	19.22	19.66	11.05	10/03/88	
W9-13(B1)	19.32	19.60	11.17	10/03/88	
W9-14(B1)	20.53	20.90	13.78	10/03/88	
W9-15(B2)	18.34	18.77	11.94	10/03/88	
W9-27(B1)	16.39	16.79	6.82	10/03/88	
W9-1(A)	18.72	18.86	9.88	10/24/88	
W9-2(A)	19.44	19.63	11.09	10/24/88	
W9-1(A)	18.72	18.86	9.87	11/10/88	
W9-2(A)	19.44	19.63	11.07	11/10/88	
W9-3(C)	19.70	20.00	14.73	11/10/88	
W9-4(B2)	13.34	13.86	6.45	11/10/88	
W9-5(B3)	13.32	13.72	7.06	11/10/88	
W9-6(A)	18.23	18.50	9.77	11/10/88	
W9-7(A)	19.22	19.66	11.08	11/10/88	
W9-13(B1)	19.32	19.60	11.22	11/10/88	
W9-14(B1)	20.53	20.90	13.75	11/10/88	
W9-15(B2)	18.34	18.77	12.49	11/10/88	
W9-27(B1)	16.39	16.79	6.89	11/10/88	
W9-1(A)	18.72	18.86	10.06	12/01/88	
W9-2(A)	19.44	19.63	11.22	12/01/88	
W9-3(C)	19.70	20.00	14.60	12/01/88	
W9-4(B2)	13.34	13.86	6.65	12/01/88	
W9-5(B3)	13.32	13.72	7.26	12/01/88	
W9-6(A)	18.23	18.50	9.93	12/01/88	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 9

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W9-7(A)	19.22	19.66	11.25	12/01/88	
W9-13(B1)	19.32	19.60	11.38	12/01/88	
W9-14(B1)	20.53	20.90	13.91	12/01/88	
W9-15(B2)	18.34	18.77	12.67	12/01/88	
W9-27(B1)	16.39	16.79	7.05	12/01/88	
W9-2(A)	19.44	19.63	11.53	01/03/89	
W9-3(C)	19.70	20.00	14.59	01/03/89	
W9-4(B2)	13.34	13.86	7.06	01/03/89	
W9-5(B3)	13.32	13.72	7.71	01/03/89	
W9-6(A)	18.23	18.50	10.18	01/03/89	
W9-7(A)	19.22	19.66	12.50	01/03/89	
W9-13(B1)	19.32	19.60	12.62	01/03/89	
W9-14(B1)	20.53	20.90	14.27	01/03/89	
W9-15(B2)	18.34	18.77	13.04	01/03/89	
W9-27(B1)	16.39	16.79	7.40	01/03/89	
W9-1(A)	18.72	18.86	10.30	01/04/89	
W9-1(A)	18.72	18.86	10.25	02/01/89	
W9-2(A)	19.44	19.63	11.46	02/01/89	
W9-3(C)	19.70	20.00	14.66	02/01/89	
W9-4(B2)	13.34	13.86	6.98	02/01/89	
W9-5(B3)	13.32	13.72	7.66	02/01/89	
W9-6(A)	18.23	18.50	10.08	02/01/89	
W9-7(A)	19.22	19.66	11.48	02/01/89	
W9-13(B1)	19.32	19.60	11.62	02/01/89	
W9-14(B1)	20.53	20.90	14.28	02/01/89	
W9-15(B2)	18.34	18.77	13.06	02/01/89	
W9-27(B1)	16.39	16.79	7.37	02/01/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 10

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W10-2(A)	15.55	15.50	9.43	09/29/88	
W10-3(B2)	15.58	15.55	9.88	09/29/88	
W10-5(A)	9.05	9.72	3.36	09/29/88	
W10-5(A)	9.05	9.72	3.24	10/06/88	
W10-2(A)	15.55	15.50	9.94	11/16/88	
W10-3(B2)	15.58	15.55	9.75	11/16/88	
W10-5(A)	9.05	9.72	3.23	11/16/88	
W10-6(C)	18.06	18.85	10.91	11/16/88	
W10-2(A)	15.55	15.50	10.09	12/08/88	
W10-3(B2)	15.58	15.55	9.96	12/08/88	
W10-5(A)	9.05	9.72	3.45	12/08/88	
W10-6(C)	18.06	18.85	11.27	12/08/88	
W10-2(A)	15.55	15.50	10.91	01/04/89	
W10-3(B2)	15.58	15.55	10.91	01/04/89	
W10-5(A)	9.05	9.72	4.16	01/04/89	
W10-6(C)	18.06	18.85	11.39	01/04/89	
W10-2(A)	15.55	15.50	10.65	02/02/89	
W10-3(B2)	15.58	15.55	10.77	02/02/89	
W10-5(A)	9.05	9.72	3.99	02/02/89	
W10-6(C)	18.06	18.85	11.62	02/02/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 11

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W11-1(A)	4.13	1.44	-5.14	10/19/88	
W11-2(A)	4.86	1.67	-4.62	10/19/88	
W11-1(A)	4.13	1.44	-5.17	11/08/88	
W11-2(A)	4.86	1.67	-4.64	11/08/88	
W11-1(A)	4.13	1.44	-5.08	12/02/88	
W11-2(A)	4.86	1.67	-4.50	12/02/88	
W11-1(A)	4.13	1.44	-4.75	01/03/89	
W11-2(A)	4.86	1.67	-4.12	01/03/89	
W11-1(A)	4.13	1.44	-4.86	02/01/89	
W11-2(A)	4.86	1.67	-4.23	02/01/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 12

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W12-1(A)	8.31	8.88	-.19	10/31/88	
W12-2(A)	8.54	8.99	-.80	10/31/88	
W12-3(A)	5.42	5.79	-1.01	10/31/88	
W12-1(A)	8.31	8.88	.19	11/09/88	
W12-2(A)	8.54	8.99	-.23	11/09/88	
W12-3(A)	5.42	5.79	-.35	11/09/88	
W12-1(A)	8.31	8.88	.14	12/01/88	
W12-2(A)	8.54	8.99	-.50	12/01/88	
W12-3(A)	5.42	5.79	-.73	12/01/88	
W12-1(A)	8.31	8.88	1.01	01/03/89	
W12-2(A)	8.54	8.99	.32	01/03/89	
W12-3(A)	5.42	5.79	.07	01/03/89	
W12-1(A)	8.31	8.88	.81	02/01/89	
W12-2(A)	8.54	8.99	.18	02/01/89	
W12-3(A)	5.42	5.79	-.09	02/01/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 14

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W14-1(B1)	29.94	30.33	22.25	09/22/88	
W14-2(A)	29.85	30.51	21.73	09/22/88	
W14-3(A)	31.37	31.65	22.40	09/22/88	
W14-4(A)	29.09	29.54	21.51	09/22/88	
W14-5(B1)	31.25	31.62	22.89	09/22/88	
W14-6(B1)	29.19	29.63	22.10	09/22/88	
W14-1(B1)	29.94	30.33	22.29	10/06/88	
W14-2(A)	29.85	30.51	21.52	10/06/88	
W14-3(A)	31.37	31.65	22.26	10/06/88	
W14-4(A)	29.09	29.54	21.34	10/06/88	
W14-5(B1)	31.25	31.62	22.93	10/06/88	
W14-6(B1)	29.19	29.63	22.13	10/06/88	
W14-1(B1)	29.94	30.33	21.64	11/14/88	
W14-2(A)	29.85	30.51	21.30	11/14/88	
W14-3(A)	31.37	31.65	21.93	11/14/88	
W14-4(A)	29.09	29.54	21.09	11/14/88	
W14-5(B1)	31.25	31.62	22.15	11/14/88	
W14-6(B1)	29.19	29.63	21.52	11/14/88	
W14-1(B1)	29.94	30.33	21.88	12/01/88	
W14-2(A)	29.85	30.51	21.29	12/01/88	
W14-3(A)	31.37	31.65	22.10	12/01/88	
W14-4(A)	29.09	29.54	20.99	12/01/88	
W14-5(B1)	31.25	31.62	22.46	12/01/88	
W14-6(B1)	29.19	29.63	21.81	12/01/88	
W14-1(B1)	29.94	30.33	22.94	01/03/89	
W14-2(A)	29.85	30.51	22.82	01/03/89	
W14-3(A)	31.37	31.65	23.41	01/03/89	
W14-4(A)	29.09	29.54	22.57	01/03/89	
W14-5(B1)	31.25	31.62	23.50	01/03/89	
W14-6(B1)	29.19	29.63	22.76	01/03/89	
W14-1(B1)	29.94	30.33	22.80	02/01/89	
W14-2(A)	29.85	30.51	22.25	02/01/89	
W14-3(A)	31.37	31.65	23.11	02/01/89	
W14-4(A)	29.09	29.54	21.95	02/01/89	
W14-5(B1)	31.25	31.62	23.38	02/01/89	
W14-6(B1)	29.19	29.63	22.71	02/01/89	

Monthly Water Level Measurements  
Sorted by Site, Date, Well  
Site 19

Report date: 03/09/89

Well Number	Elevation Reference Point (ft. MSL)	Elevation Ground Level (ft. MSL)	Elevation Water Level (ft. MSL)	Measure- ment Date	Remarks
W19-1(A)	9.26	9.78	.63	09/27/88	
W19-2(B1)	10.02	10.31	1.60	09/27/88	
W19-3(B1)	7.68	8.18	.53	09/27/88	
W19-3(B1)	7.68	8.18	.53	09/27/88	
W19-4(A)	7.77	8.25	.29	09/27/88	
W19-1(A)	9.26	9.78	.31	11/18/88	
W19-2(B1)	10.02	10.31	.75	11/18/88	
W19-3(B1)	7.68	8.18	.03	11/18/88	
W19-4(A)	7.77	8.25	-.09	11/18/88	
W19-1(A)	9.26	9.78	.50	12/07/88	
W19-2(B1)	10.02	10.31	.91	12/07/88	
W19-3(B1)	7.68	8.18	.23	12/07/88	
W19-4(A)	7.77	8.25	.12	12/07/88	
W19-1(A)	9.26	9.78	.72	01/03/89	
W19-2(B1)	10.02	10.31	1.17	01/03/89	
W19-3(B1)	7.68	8.18	.59	01/03/89	
W19-4(A)	7.77	8.25	.44	01/03/89	
W19-1(A)	9.26	9.78	.61	02/01/89	
W19-2(B1)	10.02	10.31	1.11	02/01/89	
W19-3(B1)	7.68	8.18	.43	02/01/89	
W19-4(A)	7.77	8.25	.26	02/01/89	

**APPENDIX F**  
**MAJOR/SIGNIFICANT PROJECT MEETINGS**

## MAJOR/SIGNIFICANT PROJECT MEETINGS

Meetings with regulatory agencies and others have been conducted on an as needed basis. Meetings that have been held since November 1, 1988 are as follows:

- DATE: November 12, 1988
- TOPIC: Horizontal Conduits
- LOCATION: NAS Moffett Field, CA
- ATTENDEES: WESTDIV MMES  
NAS Moffett Field  
IT Corporation
- MEETING SUMMARY: IT Corporation presented a proposed schedule and approach to evaluating the sewer and storm drain systems as horizontal conduits.
  
- DATE: November 13, 1988
- TOPIC: Horizontal Conduits
- LOCATION: NAS Moffett Field
- ATTENDEES: NASA-ARC Fairchild/Landels  
MMES OGC/Navy  
NAS Moffett Field Intel/McCutchen  
Schlumberger Raytheon/Cooley  
WESTDIV IT Corporation  
HLA Canone Engineering Services
- MEETING SUMMARY: IT Corporation presented a proposed schedule and approach to evaluating the sewer and storm drain systems as horizontal conduits. There was also a discussion on the MEW Companies perspective of the situation and approach to the task.
  
- DATE: January 9, 1989
- TOPIC: NAS Moffett Field Environmental Cleanup Process - Public Meeting
- LOCATION: NAS Moffett Field

- ATTENDEES: Interested members of the public  
 NAS Moffett Field                      Media  
 RWQCB                                      USEPA Region IX  
 WESTDIV                                    IT Corporation
- MEETING SUMMARY: Mr. Michael Cain of NAS Moffett Field lead a discussion on:
  - site history
  - current and planned activities
  - overview of community and relations activities.

Members of the public made known their interest/concerns about the site and planned actions. Additionally, the public had an opportunity to ask specific questions of a panel comprised of representatives from NAS Moffett Field, USEPA Region IX, RWQCB, and IT Corporation. A bus tour of the site was also scheduled during which, additional questions were raised and answered.

- DATE: January 26, 1989
- TOPIC: NAS Moffett Field Management Plan
- LOCATION: WESTDIV, San Bruno, CA
- ATTENDEES: NAS Moffett Field                      WESTDIV  
 RWQCB    USEPA Region IX  
 DHS    IT Corporation

MEETING SUMMARY: The development of a comprehensive and dynamic Management Plan (MP) for environmental and hazardous materials/wastes related activities at NAS Moffett Field was discussed. The MP will be the primary tool for tracking the activities mentioned above for the Navy as well as the public. A proposed outline for the MP was generated and a follow up meeting scheduled where deliverables and milestones will be established.

**APPENDIX G**  
**PROJECT VARIANCES**

VARIANCE NO. 31  
PAGE 1 OF 1  
DATE: 10/24/88

NAS MOFFETT FIELD  
PROJECT VARIANCE  
IT JOB NO. 409616

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**VARIANCE:**

- There will be no A well installed at the location designated W4-11(A).

**APPLICABLE DOCUMENT/SECTION:**

- Sampling and Analysis Plan, Section 2.7.3.

**EXPLANATION/JUSTIFICATION:**

- By using geophysical logs and drilling to 99', no acceptable A or B1 aquifer could be found for screening a well. No shallow aquifer well will be installed at this location, due to field conditions.

**DATE OF VARIANCE:**

- October, 1988.

---

cc: Keith Bradley, Knoxville  
Jack Doyle, Knoxville  
Marie McCloskey, Knoxville  
Ric Sorbo, Martinez  
Howard Fleck, Martinez  
Russ Mount, Martinez  
Sarah Bartling, Martinez  
Sam Wright, Martinez  
IT Martinez File:  
Project 409616, Q-2

REQUESTED BY: Howard C. Fleck Date: 11/15/88  
APPROVED BY: Keith Bradley Date: 12/20/88  
Project Manager  
DM Robinson Date: 12-6-88  
Deputy Project Manager 12/31/88  
Sam Wright Date: 12/4/88  
Quality Assurance Officer(s)

VARIANCE NO. 32  
PAGE 1 OF 1  
DATE: 10-28-88

NAS MOFFETT FIELD  
PROJECT VARIANCE  
IT JOB NO. 409616

---

**VARIANCE:**

- The Standard Operating Procedure previously submitted for TPH by GC for High Boiling Point Fuel Hydrocarbons has been reviewed and updated. The Method Detection Limits have been revised based on internal studies. The revised procedure is attached.

**APPLICABLE DOCUMENT/SECTION:**

- Quality Assurance Project Plan, Appendix A.

**EXPLANATION/JUSTIFICATION:**

- The procedure has been revised to indicate achievable detection limits for the specified sample size. Per attached telecon between IT-Cerritos and Energy Systems, this change has been approved.

**DATE OF VARIANCE:**

- September, 1988.

---

cc: Keith Bradley, Knoxville  
Jack Doyle, Knoxville  
Marie McCloskey, Knoxville  
Ric Sorbo, Martinez  
Howard Fleck, Martinez  
Russ Mount, Martinez  
Sarah Bartling, Martinez  
Sam Wright, Martinez  
IT Martinez File:  
Project 409616, Q-2

REQUESTED BY: Cheryl Inguson Date: 1/25/89  
Approved By: Keith Bradley Date: 1/30/89  
Project Manager  
J.M. Rubino Date: 2-9-89  
Deputy Project Manager  
R.O. Mahood JAD 2/22/89 Date: 1/30/89  
Quality Assurance Officer(s)  
R.O. Mahood

PHONE LOG

<u>CONTACT</u> <u>GLORIA MEEGER</u>	<u>DATE</u> <u>9-21-88</u>
<u>PROJECT</u> <u>MOFFETT + HAZUAP</u>	<u>TIME</u> <u>9:00</u>
<u>IT CONTACT</u> <u>Guy</u>	<u>PERSON(S) TO BE INFORMED</u>
	<u>ERIC, CHERYL</u>
	<u>KEVIN, PAT</u>

COMMENTS/DISCUSSION

① 8015 - MMES HAS NO PROBLEM WITH A VARIANCE FROM THE MOB-0015 METHOD STATING THAT; WITH "REAL SAMPLES" TAN DETECTION LIMIT ORIGINALLY STATED IS NOT ACHIEVABLE. THEREFORE; WE MAY CHANGE THE SOP TO REFLECT D.L.'s ACTUALLY ACHIEVABLE.

② ALL NAVY PROJECTS REQUIRE MONTHLY PROGRESS REPORTS TO GLORIA, MMES. TO INCLUDE:

- ① SAMPLES REC'D
- ② ANALYSIS COMPLETE
- ③ Q.L. RECOVERIES.

Title: Standard Operating Procedure  
Modified 8015 for TPH by GC  
High Boiling Point Fuel  
Hydrocarbons

SOP No. \_\_\_\_\_GC8015\_\_\_\_\_  
Date Issued 08-18-88  
Revision No. 0  
Revision Date \_\_\_\_\_  
Page 1 of 7

IT CORPORATION

Approvals: Prepared by *Jerry Lytle*  
QA/QC Coordinator *Dwayne G. Isidine*

- 1.0 Purpose - To describe the Modified 8015 Method for the analysis of TPH by GC.
- 2.0 Scope and Application - High Boiling Point Fuel Hydrocarbon (Modified 8015) method provides gas chromatographic conditions for the detection of petroleum hydrocarbons in fuel constituents. Hydrocarbon constituents include commercial jet fuel (C10-C16), diesel fuel (C9-C22), and motor oils in contaminated ground water, sludges, and soils.
- 3.0 References - California State Water Resources Board  
Leaking Underground Fuel Tank (LUFT)  
Field Manual, December 1987  
  
California Regional Water Quality Control  
Board, San Francisco Bay Region, November  
1986  
  
IT-Cerritos Quality Control (Lab Specific)  
Manual, January 1986
- 4.0 Associated SOP's - SOP #1012 Quality Control Charts  
SOP #1220 Traceability Through Logbooks  
SOP #1300 Nonconformance and  
Corrective Action
- 5.0 Associated MSDS's - diesel fuel  
jet fuel  
high boiling hydrocarbons  
hexane  
methylene chloride
- 6.0 Summary - The method (SOP) is purposely non-specific (a single hydrocarbon is not specified) to allow the operator the option of selecting an appropriate volatile fuel hydrocarbon. Any fuel hydrocarbon in the range given in Section 2.0 may be analyzed by this method, ie: commercial jet fuel, diesel fuel, motor oil, etc. The method can be calibrated for specific fuel hydrocarbon, yet the chromatographic conditions will detect all of the mentioned fuels if requested.

Title: Standard Operating Procedure

SOP No. \_\_\_\_\_GC8015\_\_\_\_

Modified 8015 for TPH by GC  
High Boiling Point Fuel  
Hydrocarbons

Date Issued \_08-18-88\_

Revision No. \_\_\_\_0\_\_\_\_

Revision Date \_\_\_\_\_

Page 2 of 7

If no hydrocarbon is specified then the sample is screened and quantitated against the standard with the closest chromatographic pattern. A 5-point linearity check is performed and the sample is quantitated against the nearest standard.

The sensitivity of this method is dependent on the level of interferences rather than instrument limitations. Table I lists the limits of quantitation when no interferences are present. (Aged fuels may not show a normal pattern.)

The samples (both liquids and soils) are extracted in hexane (GC grade) and directly injected into a gas chromatograph equipped with a flame ionization detector.

Table I.

PARAMETER	MATRIX	METHOD DETECTION LIMIT (ppm)
Diesel	soil	50.0 mg/kg
Commercial Jet Fuel	liquid	0.50 mg/L

Method Detection Limit (MDL) shall be defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the value is above zero.

- 7.0 Interferences - Solvents, reagents, glassware, and other sample processing hardware must be demonstrated to be free from interferences under the conditions of analysis by analyzing method blanks.

Prior to analysis of samples, standards, or blanks the analyst must first demonstrate daily, through the analysis of solvent blanks, that the entire GC system is interference free.

A field sample blank prepared from organic-free reagent water and carried through sampling and subsequent storage and handling can serve as a check on contamination introduced to the sample.

Title: Standard Operating Procedure

Modified 8015 for TPH by GC  
High Boiling Point Fuel  
Hydrocarbons

IT CORPORATION  
SOP No. \_\_\_\_\_GC8015\_\_\_\_\_  
Date Issued \_08-18-88\_  
Revision No. \_\_\_\_\_0\_\_\_\_\_  
Revision Date \_\_\_\_\_  
Page 3 of 7

#### 8.0 Apparatus and Materials -

Gas chromatograph: analytical system complete with a gas chromatograph suitable for on-column injections, all required accessories, including detectors, column supplies, recorder, intergrater, gases, syringes, autosampler, and data system utilized for measuring peak heights and/or peak areas.

Detector: Flame Ionization (FID)

GC column: 10 feet by 1/8 inch ID glass column packed with 10% sp-2100 on supelcoport 80/100 mesh.

Kuderna-Danish (K-D) flask: with 10 ml concentrator tube.

Gas tight syringe: one cubic centimeter (cc) with chromatographic needles.

Vials with teflon caps: 8 dram, 40 ml capacity with screw cap.

Septum: Teflon-faced silicon. Microsyringe: 2-5ul, 100ul, 200ul.

Carrier gas: nitrogen at 30ml/min.

Injector temperature: 180 C

Detector temperature: 330 C

Column temperature: 40 C hold for 3 minutes, 10 C/min run rate to 320 C or until at least 95% of all components are eluted.

#### 9.0 Reagents -

Stock diesel, jet fuel, motor oil, etc...

Stock standards: Stock solutions are prepared from commercial fuels in hexane that has been checked for contamination.

Calibration standards: Prepare a minimum of 5 concentration levels in hexane by a secondary dilution of the stock standard (concentrations of 50, 500, 2500, 6000 and 12000 micrograms per milliliter).

Title: Standard Operating Procedure  
 Modified 8015 for TPH by GC  
 High Boiling Point Fuel  
 Hydrocarbons.

SOP No. \_\_\_\_\_GC8015\_\_\_\_  
 Date Issued \_08-18-88\_  
 Revision No. \_\_\_\_\_0\_\_\_\_\_  
 Revision Date \_\_\_\_\_  
 Page 4 of 7

Fresh standards: are prepared quarterly or sooner if problems are indicated.

Documentation: standards are documented in QA logbooks to record preparation procedures, traceability, dates, and protocols (See SOP #1220 Traceability Through Logbooks).

anhydrous magnesium sulfate - powder

hexane - GC grade which has been analyzed for impurities.

methylene chloride - GC grade which has been analyzed for impurities.

10.0 Procedure -

Extraction for liquids: Shake one liter of sample with 60 ml of methylene chloride for 10 minutes. Drain the organic layer into a K-D flask fitted with a 10 ml receiver. Repeat twice, collecting all three extracts in the same K-D flask. Concentrate the sample on a steam bath. Exchange the solvent with hexane when the volume is less than 5 ml. Concentrate the sample to less than 5 ml. Cool and bring to 5 ml with hexane.

Extraction for soils and sediments: Weigh 10 grams of sample. Add enough magnesium sulfate to yield a dry sandy soil. Then add 10.0 ml of hexane and mix on a vortex mixer for a minimum of 60 seconds. Allow the mixture to stand for at least ten minutes until there is a clear separation. Use the hexane layer for the analysis.

Injection: Inject 2-5ul of the hexane extract, using the solvent flush technique, onto the column. Analyze hexane blanks between each sample when using the auto sampler. Analyze a check standard every 20 samples.

Calculation: Compare the total area of all peaks to the standard whose total area is nearest that of the sample. For soils:

$$\frac{\text{Total area of sample peaks}}{\text{Total area of standard peaks}} \times \text{Concentration of standard (mcg/ml)} \times \frac{\text{Sample dilutions(mls)}}{\text{Sample wt (g)}} = \text{mcg/g of high boiling fuel hydrocarbon}$$

Title: Standard Operating Procedure  
 Modified 8015 for TPH by GC  
 High Boiling Point Fuel  
 Hydrocarbons

SOP No. \_\_\_\_\_GC8015\_\_\_\_\_  
 Date Issued \_08-18-88\_  
 Revision No. \_\_\_\_\_0\_\_\_\_\_  
 Revision Date \_\_\_\_\_  
 Page 5 of 7

For liquids:

Total area of sample peaks	X	Standard concentration	X	Sample dilutions(ml)	=	mcg/L of high boiling fuel hydrocarbon
-----		(mcg/ml)		-----		
Total area of standard peaks				Sample size (L)		

If an appropriate standard for calibration does not exist, as in the case of an "aged" fuel, calibration is done using a "non-aged" representative (as based upon the pattern found in the chromatogram) fuel standard. Detection limit is based upon five times the noise level.

11.0 Sample Collection, Preservation, and Holding Times -

Matrix	Preservatives	Volume Req. Container	Holding Times
Soils	cool to 4 C	40ml vial, G or tube, B	14 days
Liquids	cool to 4 C	1 liter, G	14/28 days (extraction/analysis)

G=glass  
 B=brass

12.0 Quality Control -

The IT-Cerritos Laboratory quality control program for the Modified 8015 Method is as follows:

Preventive Maintenance - All maintenance operations are documented in an instrument specific logbook (see SOP #1220 Traceability Through Logbooks). Routine and non-routine maintenance is recorded in this logbook. Frequency of maintenance performed is based on experience, manufacturer's recommendations and the regulatory methods. Replacement of the column packing, cleaning the detectors, changing the glass wool plug, cleaning the insert, replacing the septa, and checking the gas purity are all part of the documented routine maintenance required for this analysis. -

Title: Standard Operating Procedure  
 Modified 8015 for TPH by GC  
 High Boiling Point Fuel  
 Hydrocarbons

SOP No. \_\_\_\_\_GC8015\_\_\_\_  
 Date Issued \_08-18-88\_  
 Revision No. \_\_\_\_\_0\_\_\_\_\_  
 Revision Date \_\_\_\_\_  
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QC Samples - QC samples are routinely analyzed to track trends and to alert the analyst to out-of-control situations. These QC samples include reagent blanks, duplicates, check standards, matrix spikes, matrix spike duplicates, external standards, and/or reference standards.

Matrix spikes / matrix spike duplicates (MS/MSD) analyses are performed to evaluate the accuracy and precision of the method. Spikes are added to the samples at the time of extraction. MS/MSD's are analyzed at least 10% of the time and more frequently when requested. The spiking levels are as follows:

SOILS: Spike 1 mL of the 6,000 ug/mL standard into a 10.0 gram aliquot of sample prior to extraction.

LIQUIDS: Spike 250 uL of the 12,000 ug/mL standard into a 1.0 liter sample prior to the extraction process.

Accuracy data are generated based upon percent recovery and precision data are generated based upon relative percent difference (RPD). Accuracy and precision data are statistically utilized to generate control charts (see SOP #1012 Quality Control Charts). The control charts indicate the recovery and RPD criteria for the 8015 analysis. (see table II, below)

$$\text{Percent Recovery (\% Rec.)} = \frac{\text{MS(D)} - \text{SR} \times 100}{\text{SA}}$$

$$\text{Relative Percent Difference} = \frac{\text{MS} - \text{MSD}}{(\text{MS} + \text{MSD})/2} \times 100$$

MS = Concentration matrix spike  
 MSD = Concentration matrix spike duplicate  
 SR = Sample result  
 SA = Spike added (concentration)

TABLE II

	RPD	% RECOVERY
Liquids	less than 20	80-120
Soils	less than 50	50-150

Criteria is based on all hydrocarbons analyzed.

Title: Standard Operating Procedure

SOP No. \_\_\_\_\_GC8015\_\_\_\_

Modified 8015 for TPH by GC  
High Boiling Point Fuel  
Hydrocarbons

Date Issued \_08-18-88\_

Revision No. \_\_\_\_\_0\_\_\_\_\_

Revision Date \_\_\_\_\_

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Recoveries and RPD out of limits will cause the analyst to generate a nonconformance memo and to take the appropriate corrective action (see SOP #1300 Nonconformance and Corrective Action) which may include instrument maintenance, re-extraction and, re-analysis, verification of standard or spike concentrations, etc.

VARIANCE NO. 34  
PAGE 1 OF 1  
DATE: 10/24/88

NAS MOFFETT FIELD  
PROJECT VARIANCE  
IT JOB NO. 409616

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**VARIANCE:**

- The method of drilling for (3) C aquifer wells will be changed from an air rotary casing hammer rig to a dual tube percussion rig.

**APPLICABLE DOCUMENT/SECTION:**

- Sampling and Analysis Plan, Section 5.2.1.

**EXPLANATION/JUSTIFICATION:**

- Due to availability and the poor performance of the air rotary casing hammer drilling rig on the deep (C) aquifer wells, a dual tube percussion rig will be used to drill the remaining (3) C wells. The use of this rig has been approved by Howard Fleck (IT), Russ Mount (IT), and Tom Sturdivant (ASG, Inc./MMES).

**DATE OF VARIANCE:**

- October, 1988.

---

cc: Keith Bradley, Knoxville  
Jack Doyle, Knoxville  
Marie McCloskey, Knoxville  
Ric Sorbo, Martinez  
Howard Fleck, Martinez  
Russ Mount, Martinez  
Sarah Bartling, Martinez  
Sam Wright, Martinez  
IT Martinez File:  
Project 409616, Q-2

REQUESTED BY: Howard C. Fleck Date: 11/15/88  
Approved By: Tom Sturdivant Date: 12/20/88  
Project Manager  
DM Robinson Date: 12-6-88  
Deputy Project Manager  
Sam Wright Date: 12/21/88  
Quality Assurance Officer(s)

NAS MOFFETT FIELD  
PROJECT VARIANCE  
IT JOB NO. 409616

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**VARIANCE:**

Two items specified in work plan documents will not be undertaken:

1. Permeability tests will not be performed on soil samples taken on the Site 1 and 2 landfill embankments.
2. A soil boring will not be taken at the "burn pit" located within the Site 2 landfill.

**APPLICABLE DOCUMENT/SECTION:**

SWAT Work Plan, Section 4.6 (Item 1).

Response to RWQCB comments dated May 6, 1988, Sampling and Analysis Plan: Comment #3 (Item 2).

**EXPLANATION/JUSTIFICATION:**

- Item 1: At Site 1, the landfill embankment consists predominantly of asphalt and concrete rip-rap, and thus permeability measurements are unnecessary and meaningless. It was originally believed that the landfill embankment consisted of native material or fill.

At Site 2, no embankment exists per se. Field inspection of the site indicates that disposal occurred in "mounds", as opposed to operations requiring an embankment.

- Item 2: Although aerial photographs appear to indicate the presence of a burn pit (or similar structure), field investigations have been unable to confirm the suspected presence/location of the pit. Attempting to install a boring would not be practical, since the scale of the aerial photographs does not allow for "exact" placement of the boring.

**DATE OF VARIANCE:**

- September, 1988.
-

cc: Keith Bradley, Knoxville  
Jack Doyle, Knoxville  
Marie McCloskey, Knoxville  
Ric Sorbo, Martinez  
Howard Fleck, Martinez  
Russ Mount, Martinez  
Sarah Bartling, Martinez  
Sam Wright, Martinez  
IT Martinez File:  
Project 409616, Q-2

REQUESTED BY: Howard C. Fleck Date: 11/14/88  
Approved By: Keith Bradley Date: 12/20/88  
Project Manager  
DM. Robinson Date: 12/11/88  
Deputy Project Manager  
Scema Wright Date: 12/21/88  
Quality Assurance Officer(s)  
12/4/88

VARIANCE NO. 36  
PAGE 1 OF 1  
DATE: 11-29-88

NAS MOFFETT FIELD  
PROJECT VARIANCE  
IT JOB NO. 409616

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**VARIANCE:**

- Initial soil gas sample measurements will not be made adjacent to shallow monitoring wells that indicate the presence of organic compounds.
- Soil gas samples for GC analysis will be collected at sample stations recording significant concentrations of VOCs along any transect line. Where GC analysis identifies a variation in chemical composition in a sample area, additional samples will be collected for GC analysis to assess the distribution of the various compounds.

**APPLICABLE DOCUMENT/SECTION:**

- Sampling Plan Section 5.1.2 and Appendix A  
QAPP Section 11.1.3

**EXPLANATION/JUSTIFICATION:**

- Initial soil gas sampling will be conducted prior to receiving sample analytical results, and monitoring wells are commonly in areas where the paved surface inhibits soil gas sampling.
- TIP measurements of soil gas in areas where VOCs are present are commonly above detection limits for all sample stations. However, the levels of VOCs indicated are generally less than 10 ppm and 10 to 100 times less than "hot spots" along the transect line. GC analysis of all low concentration samples does not provide significant, if any, information due to low levels of individual constituent concentrations which are often below detection limits.

**DATE OF VARIANCE:**

- December 2, 1988.
-

c: Keith Bradley, Knoxville  
Jack Doyle, Knoxville  
Marie McCloskey, Knoxville  
Ric Sorbo, Martinez  
Howard Fleck, Martinez  
Russ Mount, Martinez  
Sarah Bartling, Martinez  
Sam Wright, Martinez  
IT Martinez File:  
Project 409616, Q-2

REQUESTED BY: Jacob [Signature] Date: 12-2-88  
Approved By: Keith Bradley Date: 12/20/88  
Project Manager  
DM. Robin Date: 12-6-88  
Deputy Project Manager  
Sam Wright Date: 12/31/88  
Quality Assurance Officer(s) Date: 12/4/88

VARIANCE NO. 37  
PAGE 1 OF 1  
DATE: 11/28/88

NAS MOFFETT FIELD  
PROJECT VARIANCE  
IT JOB NO. 409616

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**VARIANCE:**

- Replace lexan liners with brass liners for the shallow soil program for Sites 7, 8, and 12.

**APPLICABLE DOCUMENT/SECTION:**

- Sampling and Analysis Plan, Vol. II, Section 5.6.1
- QAPP Vol IV, Section 6, Table 6-1

**EXPLANATION/JUSTIFICATION:**

- The lexan liners are thicker walled than the brass liners. This has caused problems for the collection of soils, especially at shallow depths.

**DATE OF VARIANCE:**

- November, 17 1988, verbal approval from Keith Bradley.
- 

cc: Keith Bradley, Knoxville  
Jack Doyle, Knoxville  
Marie McCloskey, Knoxville  
Ric Sorbo, Martinez  
Howard Fleck, Martinez  
Sam Wright, Martinez  
IT Martinez File:  
Project 409616, Q-2

REQUESTED BY: H. Fleck Date: 1-23-89  
APPROVED BY: Keith Bradley Date: 2/22/89  
Project Manager  
JM Robins Date: 2-9-89  
Deputy Project Manager  
Richard O. Mahood RD 2/22/89 Date: 2/1/89  
Quality Assurance Officer(s)

APPENDIX G – PROJECT VARIANCES

VARIANCE NO. 38

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

THE ABOVE IDENTIFIED PAGE IS NOT  
AVAILABLE.

EXTENSIVE RESEARCH WAS PERFORMED BY  
NAVFAC SOUTHWEST TO LOCATE THIS PAGE.  
THIS PAGE HAS BEEN INSERTED AS A  
PLACEHOLDER AND WILL BE REPLACED  
SHOULD THE MISSING ITEM BE LOCATED.

QUESTIONS MAY BE DIRECTED TO:

**DIANE C. SILVA**  
**RECORDS MANAGEMENT SPECIALIST**  
**NAVAL FACILITIES ENGINEERING COMMAND**  
**SOUTHWEST**  
**1220 PACIFIC HIGHWAY**  
**SAN DIEGO, CA 92132**

**TELEPHONE: (619) 532-3676**

VARIANCE NO. 39  
PAGE 1 OF 1  
DATE: 12-12-88

NAS MOFFETT FIELD  
PROJECT VARIANCE  
IT JOB NO. 409616

---

**VARIANCE:**

- Use of Series "200" sample containers at W5-6(A), W5-19(A), W5-18(A), W5-14(A), W5-15(A), W5-16(A), W5-9(A). December samples, 1 liter glass only.

**APPLICABLE DOCUMENT/SECTION:**

- Moffett NAS Quality Assurance Project Plan (QAPP) Section 6 pg 2 of 7

**EXPLANATION/JUSTIFICATION:**

- There was a shipping error on the part of the sample container supplier. Rather than have sampling crews sit idle, use of readily available "200" Series bottles was proposed.

**DATE OF VARIANCE:**

- 12/12 - 12/13

---

cc: Keith Bradley, Knoxville  
Jack Doyle, Knoxville  
Marie McCloskey, Knoxville  
Dennis Robinson, Martinez  
Don Cox, Martinez  
Rich Mahood, Martinez  
IT Martinez File:  
Project 409616, Q-2

REQUESTED BY: J. Bowen III Date: 12/12/88  
Approved By: Keith Bradley Date: 2/2/89  
Project Manager  
DM Robinson Date: 1-23-89  
Deputy Project Manager  
Richard O. Mahood / Richard O. Mahood Date: 1/20/89  
Quality Assurance Officer(s)

VARIANCE NO. 40  
PAGE 1 OF 1  
DATE: 1/12/89

NAS MOFFETT FIELD  
PROJECT VARIANCE  
IT JOB NO. 409616

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**VARIANCE:**

- Continuous water level monitoring will be performed in all wells affected by tide to investigate tidal influences on ground water levels and to serve for correcting water levels to a common mean tide datum. Continuous monitoring will not be necessary.

**APPLICABLE DOCUMENT/SECTION:**

- Sampling and Analysis Plan: Section 5.5.3.

**EXPLANATION/JUSTIFICATION:**

- Measurements from a representative group of A-, B- and C-aquifer wells close enough to the bay to be within the influence of tidal action, were repeatedly collected using a mechanical Stevens Float recorder over a period of eight hours. None of the water levels in these wells were found to be influenced by the daily fluctuations of tidal action. Therefore, continuous water level monitoring of these wells as well as monitor wells further away from the bay will not be necessary.

**DATE OF VARIANCE:**

- January, 1989.

---

cc: Keith Bradley, Knoxville  
Jack Doyle, Knoxville  
Marie McCloskey, Knoxville  
Russ Mount, Martinez  
Sarah Bartling, Martinez  
Dennis Robinson, Martinez  
Don Cox, Martinez  
Rich Mahood, Martinez  
IT Martinez File:  
Project 409616, Q-2

REQUESTED BY: Donald A. Cox Date: 1/12/89  
Approved By: Keith Bradley Date: 2/22/89  
Project Manager  
D.M. Robinson Date: 2-9-89  
Deputy Project Manager  
R.O. Mahood RM Date: 2/1/89  
Quality Assurance Officer(s)

**APPENDIX H**  
**AQUIFER TEST OF WELL W19-1(A)**

## AQUIFER TEST OF WELL W19-1(A)

An aquifer test was performed on well W19-1(A) to characterize the hydraulic properties of the A and B1 Aquifers at Site 19. The A Aquifer at this location contains high concentrations of volatile organic compounds. Data from this test will be used to evaluate the remediation of this aquifer.

The locations of the wells described in this section are shown on Figures 1-20 and 1-21 in Section 1.0 of Appendix A. Boring logs for these wells are included in Appendix I of the December 1988 Quarterly Report.

Well W19-1(A) was selected as the pumping well for the aquifer test. This well had a relatively high development discharge of 2.5 gallons per minute during its development as shown in Table 1. It is screened within the A Aquifer, which at this location, has some of the highest levels of volatile organic compounds in ground water at Moffett.

Four observation wells monitored changes in water level: (1) a two-inch observation well located 20 feet northwest of W19-1(A); (2) well W19-2(B1), screened in the B1 Aquifer and located 146 feet northeast of well W19-1(A); (3) well W7-19(A) located 458 feet southwest of well W19-1(A); and (4) well W7-21(A) located 1,061 feet southwest of well W19-1(A). Water levels from wells W7-19(A) and W7-21(A) provided background information on regional, tidal and barometric effects; these wells were not affected by pumping at well W19-1(A). The two-inch observation well was drilled to a depth of 40 feet and then screened its entire length to intercept the same sand screened in the pumped well.

### Drawdown Test

The pumping rate of well W19-1(A) for this test was chosen as 15 gallons per minute (gpm), on the basis of a step drawdown test. This ensured that the water level would not decline below top of well screen during the test.

Well W19-1(A) was pumped for 24 hours beginning 0630 November 16, 1988. The pumping rate was 17 gpm for the first ten minutes but was controlled at 15 gpm for the remainder of the pumping period.

Water levels were measured with a Solinst electrical water level sounder and three Stevens Type F continuous chart recorders. The Stevens recorders were installed in the two-inch observation well, well W19-2(B1), and well W7-21(A). Additionally, the Solinst was periodically used as a check on the water levels in the wells where the Stevens Recorders were installed.

Aquifer test data from all the wells are shown in Tables 2 through 6. It is significant that during the test there was a measurable decline of water level in Well W19-2(B1), indicating that the A and B Aquifers are hydraulically connected at this location.

The quality of water pumped from well W19-1(A) was monitored during the aquifer test by measuring its temperature, electrical conductivity, and pH at six-hour intervals. These data are displayed in Table 7. These three parameters remained consistent until the end of the pumping period when an anomalously high electrical conductivity reading of 9,850  $\mu$ mhos was measured. Previous readings of this parameter had ranged between 1,185 and 1,200  $\mu$ mhos. This anomalously high value could be a reading error, as the other parameters of pH and temperature remained relatively stable over time, as shown in Table 7.

Calculations of hydraulic coefficients are in progress. Preliminary indications are that the values are not reliable, an interpretation supported by the heterogeneous nature of the subsurface materials.

TABLE 1  
SUMMARY OF DISCHARGE OBTAINED DURING DEVELOPMENT  
OF MONITORING WELLS IN SITES 4, 7, AND 19

<u>WELL</u>	<u>DISCHARGE (GALS/MIN)*</u>
W4-9(B2)	4.0
W7-19(A)	2.2
W7-21(A)	3.0
W7-20(A)	0.7
W19-1(A)	2.5
W19-2(B1)	2.5
W19-3(B1)	12.0
W19-4(A)	2.5

---

\*Based on end-of-development volume/time.

TABLE 2  
AQUIFER TEST DATA FROM WELL W19-1(A)

Pumped well data

Reference point for depth to water measurements: north rim of monument

Depth to static water level: 8.83 feet

TIME FROM BEGINNING <sup>(1)</sup> OF PUMPING (minutes)	RECORDING INSTRUMENT	DRAWDOWN (ft)	PUMPING RATE (gpm)
0	Solinst	0.0	17
2	Solinst	7.47	17
5	Solinst	8.39	17
10	Solinst	8.36	15
20	Solinst	8.19	15
50	Solinst	8.99	15
100	Solinst	9.16	15
200	Solinst	9.62	15
500	Solinst	10.08	15
1000	Solinst	10.39	15
1440	Solinst	10.46	15
1442	Solinst	0.20	0
1445	Solinst	-0.58	0
1450	Solinst	0.37	0
1460	Solinst	0.29	0
1490	Solinst	0.27	0
1540	Solinst	0.12	0
1640	Solinst	0.10	0
1940	Solinst	0.05	0
2160	Solinst	0.0	0

<sup>(1)</sup> Pumping period was 24 hours (1,440 minutes) on well W19-1(A), observation period was 36 hours (2,160 minutes) on all wells.

**TABLE 3**  
**AQUIFER TEST DATA FROM TWO-INCH OBSERVATION WELL**

A Aquifer observation well data

Reference point for depth to water measurements: top of casing

Depth to static water level: 12.50 Feet

Distance from pumped well: 20 feet

TIME FROM BEGINNING <sup>(1)</sup> OF PUMPING (minutes)	RECORDING <sup>(2)</sup> INSTRUMENT	DRAWDOWN (ft)
0	Solinst	0.00
2	Solinst	0.00
5	Solinst	0.05
10	Solinst	0.08
20	Solinst	0.07
50	Solinst	-0.10
70	Stevens R.	0.05
100	Solinst	-0.05
132	Stevens R.	0.10
185	Stevens R.	0.15
200	Solinst	0.18
245	Stevens R.	0.20
325	Stevens R.	0.25
385	Stevens R.	0.30
450	Stevens R.	0.35
490	Stevens R.	0.37
500	Solinst	0.25
635	Stevens R.	0.49
745	Stevens R.	0.56
875	Stevens R.	0.61
1000	Solinst	0.51
1060	Stevens R.	0.66
1365	Stevens R.	0.71
1440	Stevens R.	0.72

TABLE 3  
AQUIFER TEST DATA FROM TWO-INCH OBSERVATION WELL  
(CONTINUED)

TIME FROM BEGINNING <sup>(1)</sup> OF PUMPING (minutes)	RECORDING <sup>(2)</sup> INSTRUMENT	DRAWDOWN (ft)
1440	Solinst	0.67
1442	Solinst	0.63
1445	Solinst	0.62
1450	Solinst	0.64
1460	Solinst	0.50
1470	Stevens R.	0.68
1490	Solinst	0.65
1540	Solinst	0.63
1545	Stevens R.	0.66
1630	Stevens R.	0.60
1640	Solinst	0.54
1710	Stevens R.	0.56
1800	Stevens R.	0.51
1895	Stevens R.	0.46
1940	Solinst	0.40
1990	Stevens R.	0.42
2120	Stevens R.	0.36
2160	Solinst	0.26
2160	Stevens R.	0.35

<sup>(1)</sup> Pumping period was 24 hours (1,440 minutes) on well W19-1(A), observation period was 36 hours (2,160 minutes) on all wells.

<sup>(2)</sup> Solinst used as a comparison to Stevens.

**TABLE 4**  
**AQUIFER TEST DATA FROM WELL W19-2(B1)**

B1 Aquifer monitoring well data

Reference point for depth to water measurements: north rim of monument

Depth to static water level: 9.25 feet

Distance from pumped well: 146.3 feet

TIME FROM BEGINNING <sup>(1)</sup> OF PUMPING (minutes)	RECORDING <sup>(2)</sup> INSTRUMENT	DRAWDOWN (ft)
0	Stevens R.	0.00
2	Solinst	0.00
5	Solinst	0.00
10	Solinst	-0.11
20	Solinst	-0.14
50	Solinst	-0.13
100	Solinst	-0.07
120	Stevens R.	0.04
200	Solinst	-0.05
240	Stevens R.	0.08
360	Stevens R.	0.09
480	Stevens R.	0.10
500	Solinst	0.10
600	Stevens R.	0.10
720	Stevens R.	0.12
840	Stevens R.	0.12
960	Stevens R.	0.13
1000	Solinst	0.13
1080	Stevens R.	0.14
1200	Stevens R.	0.14
1320	Stevens R.	0.14
1440	Solinst	0.15
1440	Stevens R.	0.15
1442	Solinst	0.14

TABLE 4  
AQUIFER TEST DATA FROM WELL W19-2(B1)  
(CONTINUED)

TIME FROM BEGINNING <sup>(1)</sup> OF PUMPING (minutes)	RECORDING <sup>(2)</sup> INSTRUMENT	DRAWDOWN (ft)
1445	Solinst	0.03
1450	Solinst	0.03
1460	Solinst	0.07
1490	Solinst	0.04
1540	Solinst	-0.03
1560	Stevens R.	0.11
1640	Solinst	-0.06
1680	Stevens R.	0.06
1800	Stevens R.	0.02
1830	Solinst	-0.15
1920	Stevens R.	0.0
2040	Stevens R.	0.0
2130	Stevens R.	0.0

<sup>(1)</sup> Pumping period was 24 hours (1,440 minutes) on well W19-1(A), observation period was 36 hours (2,160 minutes) on all wells.

<sup>(2)</sup> Solinst used as a comparison to Stevens.

**TABLE 5**  
**AQUIFER TEST DATA FROM WELL W7-21(A)**

A Aquifer monitoring well; background data

Reference point for depth to water measurements: north rim of monument

Distance from pumped well: 1,061 feet

TIME FROM BEGINNING <sup>(1)</sup> OF PUMPING (minutes)	RECORDING <sup>(2)</sup> INSTRUMENT	DEPTH TO <sup>(3)</sup> WATER (ft)
0	Solinst	5.35
2	Solinst	5.35
5	Solinst	5.35
10	Solinst	5.35
20	Solinst	5.35
50	Solinst	5.35
100	Solinst	5.35
200	Solinst	5.38
200	Stevens R.	5.35
385	Stevens R.	5.33
500	Solinst	5.35
500	Stevens R.	5.32
750	Stevens R.	5.32
1000	Stevens R.	5.33
1000	Solinst	5.33
1440	Stevens R.	5.31
1442	Solinst	5.34
1445	Solinst	5.34
1450	Solinst	5.34
1460	Solinst	5.34
1490	Solinst	5.34
1540	Solinst	5.34
1630	Stevens R.	5.31
1640	Solinst	5.34
1710	Stevens R.	5.30

TABLE 5  
AQUIFER TEST DATA FROM WELL W7-21(A)  
(CONTINUED)

TIME FROM BEGINNING <sup>(1)</sup> OF PUMPING (minutes)	RECORDING <sup>(2)</sup> INSTRUMENT	DEPTH TO <sup>(3)</sup> WATER (ft)
1800	Stevens R.	5.30
1940	Solinst	5.32
1990	Stevens R.	5.30
2120	Stevens R.	5.30
2120	Solinst	5.31
2160	Stevens R.	5.30
2160	Solinst	5.32

- <sup>(1)</sup> Pumping period was 24 hours (1,440 minutes) on well W19-1(A), observation period was 36 hours (2,160 minutes) on all wells.
- <sup>(2)</sup> Solinst used as a comparison to Stevens.
- <sup>(3)</sup> Drawdown not expected in background wells. Well to provide data on regional effect, e.g., tidal and barometric.

**TABLE 6**  
**AQUIFER TEST DATA FROM WELL W7-19A**

A Aquifer monitoring well; background data

Reference point for depth to water measurements: north rim of monument

Distance from pumped well: 458 feet

TIME FROM BEGINNING <sup>(1)</sup> OF PUMPING (minutes)	RECORDING INSTRUMENT	DEPTH TO <sup>(2)</sup> WATER (ft)
0	Solinst	8.00
2	Solinst	8.00
5	Solinst	8.00
10	Solinst	8.02
20	Solinst	8.00
50	Solinst	8.00
100	Solinst	8.00
200	Solinst	8.00
500	Solinst	8.00
1000	Solinst	8.02
1440	Solinst	8.05
1442	Solinst	8.00
1445	Solinst	8.00
1450	Solinst	8.00
1460	Solinst	8.00
1490	Solinst	8.00
1540	Solinst	7.99
1640	Solinst	8.01
1940	Solinst	7.97
2160	Solinst	7.98

<sup>(1)</sup> Pumping period was 24 hours (1,440 minutes) on well W19-1(A), observation period was 36 hours (2,160 minutes) on all wells.

<sup>(2)</sup> Drawdown not expected in background wells. Well to provide data on regional effects, e.g., tidal and barometric.

TABLE 7  
 SUMMARY OF WATER QUALITY DATA FROM  
 W19-1(A) MEASURED DURING AQUIFER TEST

DATE	TIME	TEMPERATURE (°C)	pH	ELECTRICAL CONDUCTIVITY (μmhos/cm)
11/16/88	0630	17.5	6.95	1200
11/16/88	1230	18.9	7.22	1190
11/16/88	1830	17.5	7.22	1185
11/17/88	0030	17.6	7.32	1200
11/17/88	0630	16.5	7.34	9850 <sup>(1)</sup>

<sup>(1)</sup>The electrical conductivity meter was calibrated the morning before the test started and after the test ended on the morning of November 17, 1988. At the post calibration, the meter read 100 μmhos low. It is believed that the geologist misread the meter and should have read 985 μmhos. Adding 100 μmhos to this number, as the post calibration suggests, brings the last number to 1085 which is not inconsistent with the other readings.

APPENDIX H – AQUIFER TEST

TABLE 8 – SUMMARY OF CALCULATED  
AQUIFER COEFFICIENTS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

THE ABOVE IDENTIFIED TABLE IS NOT  
AVAILABLE.

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**DIANE C. SILVA**  
**RECORDS MANAGEMENT SPECIALIST**  
**NAVAL FACILITIES ENGINEERING COMMAND**  
**SOUTHWEST**  
**1220 PACIFIC HIGHWAY**  
**SAN DIEGO, CA 92132**

**TELEPHONE: (619) 532-3676**

APPENDIX H – AQUIFER TEST

TABLE 9 – CALCULATIONS OF  
AQUIFER COEFFICIENTS

MARCH 1989 QUARTERLY REPORT  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

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