



Groundwater Report

Spring 2011

**San Joaquin County
Flood Control and Water Conservation District**



San Joaquin County Flood Control and Water Conservation District

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Copies of the Spring 2011 Groundwater Report may be purchased for \$30 and 36"X48" Contour Maps for \$25 each from:

San Joaquin County Department of Public Works

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Stockton, California 95201

Make checks payable to: San Joaquin County Department of Public Works



Acknowledgements

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This Groundwater Report is a product of the commitment that the San Joaquin County Flood Control and Water Conservation District together with many other interested agencies made to sustain and enhance the groundwater resources of the Eastern San Joaquin Basin. The District extends thanks to...

California Water Service

City of Lathrop

City of Lodi

City of Manteca

City of Stockton Municipal Utilities Department

East Bay Municipal Utility District

Libby-Owens-Ford, Lathrop

Morada Area Association

Newark Sierra Paperboard Company

Pacific Gas and Electric Company

San Joaquin County Department of Public Works

State of California, Department of Water Resources, Central District

Stockton East Water District

United States Bureau of Reclamation

United States Geological Survey

Most of all, we would like to thank all of the individual well owners, who give us access to their wells and in some cases some of their time.



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San Joaquin County Flood Control and Water Conservation District Spring 2011 Groundwater Report

Introduction

Since the fall of 1971, the San Joaquin County Flood Control and Water Conservation District has monitored groundwater levels and groundwater quality and has published the data in the Semi-annual Groundwater Report. This report utilizes data from federal, state and local government agencies as well as non-governmental sources.

Water level data is collected on a semi-annual basis, during the months of April and October, to observe groundwater levels before and after peak groundwater pumping conditions. Over 550 wells, of which 270 are measured by County staff, are included in the Monitoring Program. The exact number of wells varies from year to year, depending on circumstances such as destructions, new well construction, well accessibility, and well condition.

Purpose

The purpose of the Semi-annual Groundwater Report is to provide information on groundwater conditions in San Joaquin County and to publish the results of the groundwater monitoring program which consists of the following:

1. Monitor groundwater quality along a North-South line from the north of the City of Stockton to the City of Lathrop.
2. Measure groundwater levels on a County-wide basis.

In general, water quality data is more meaningful after peak production which usually occurs during the summer months. Therefore, groundwater quality data will be published only in the fall report. The groundwater depth and elevation data will be published both in the spring and fall.

Saline intrusion from the west is a continuing concern affecting the quality of groundwater in the Basin. Groundwater quality analysis is completed on an annual basis, from approximately 18 municipal and domestic supply wells (exact number varies from year to year) located in proximity to the saline front.

Procedure

Groundwater quality sampling is conducted on an annual basis during the month of October, along with the Fall Measurements. Approximately 18 wells are currently sampled. The exact number of wells may vary depending on well access and other conditions. Replicate groundwater samples (two) are analyzed for Chloride (Cl^-) using the Thomas Scientific 675 pH/ISE meter in conjunction with the ISE Cl^- Combination Electrode, and analyzed for Electrical Conductivity (EC) using DiST 3 by Hanna Instruments. Total Dissolved Solids (TDS) are calculated using the formula: $\text{TDS} = 0.64 \times \text{EC (umhos)}$. Data is then stored in a database for accessibility and reporting requirements.

Water Level Measurements are performed with the use of either a steel chain or sounder. Data is then immediately recorded in field books and then stored in a database for accessibility and reporting requirements.

Section 1– Annual Rainfall Distribution

Summary of Annual Rainfall Distribution

The groundwater basin in San Joaquin County responds to changes in annual precipitation. There are four total annual precipitation graphs and four monthly precipitation graphs included in this report (Figures 1-1 through 1-8). These graphs reflect three areas located across San Joaquin County and one area in Calaveras County. The station located at the Stockton Fire Station No. 4 as well as the station located in Tracy, has pertinent beginning in 1940. Lodi station has data from 1949 to 2011. The Camp Pardee station has data available from 1949 to 2011.

Total Water Year Rainfall (Stockton Fire Station 4)

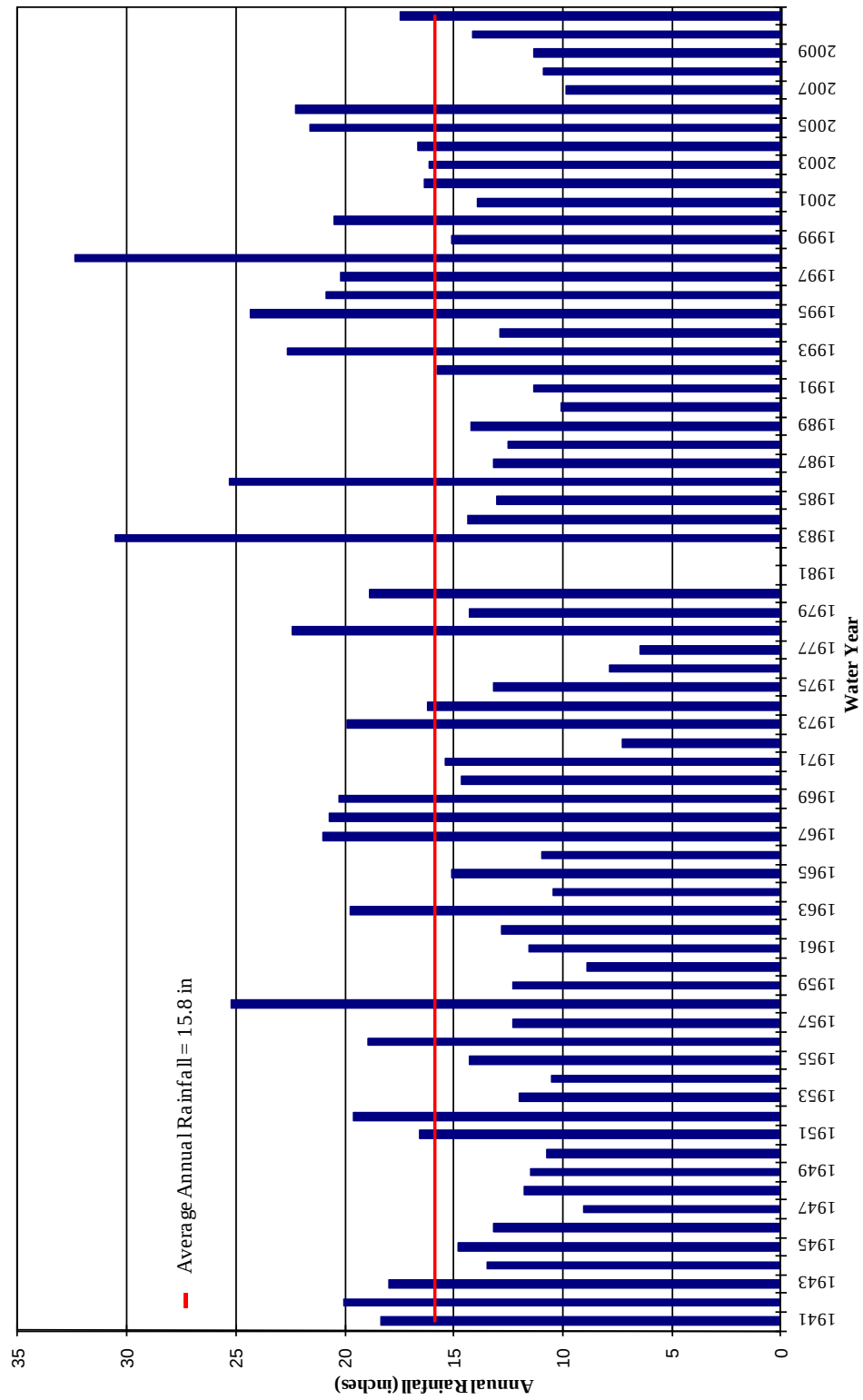


Figure 1-1 Total Annual Rainfall (Stockton Fire Station 4)

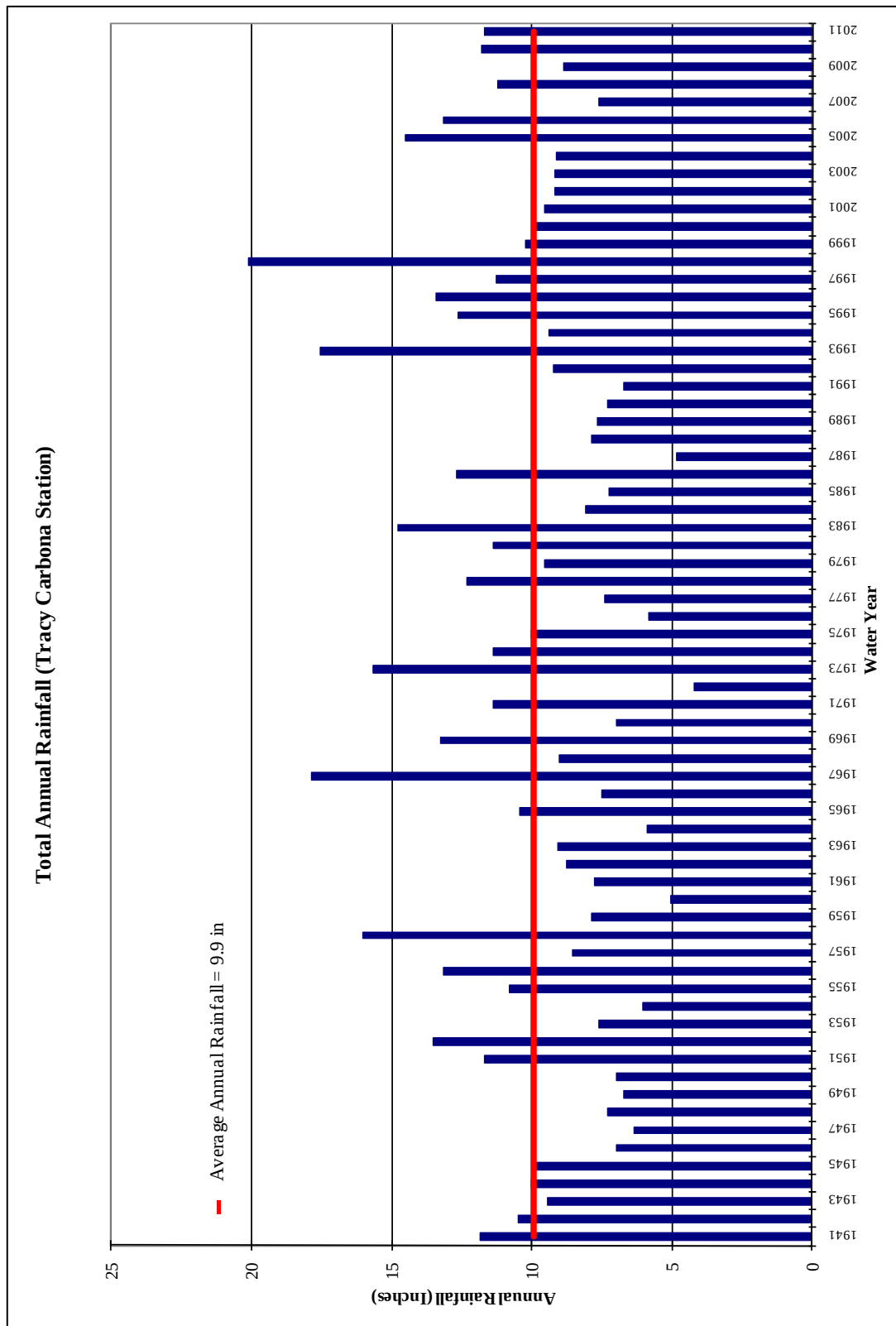


Figure 1-2 Total Annual Rainfall (Tracy Carbona Station)

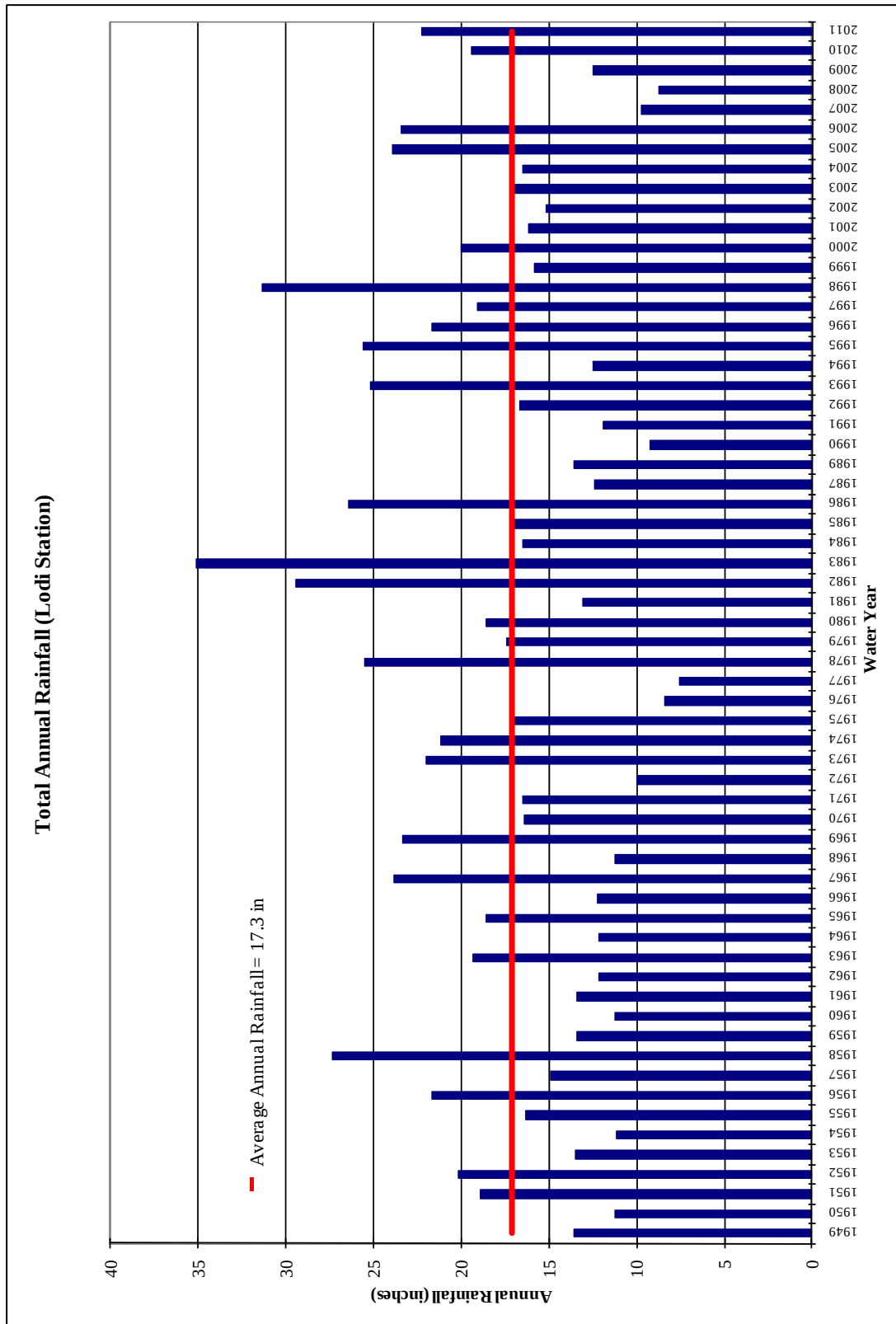


Figure 1-3 Total Annual Rainfall (Lodi Station)

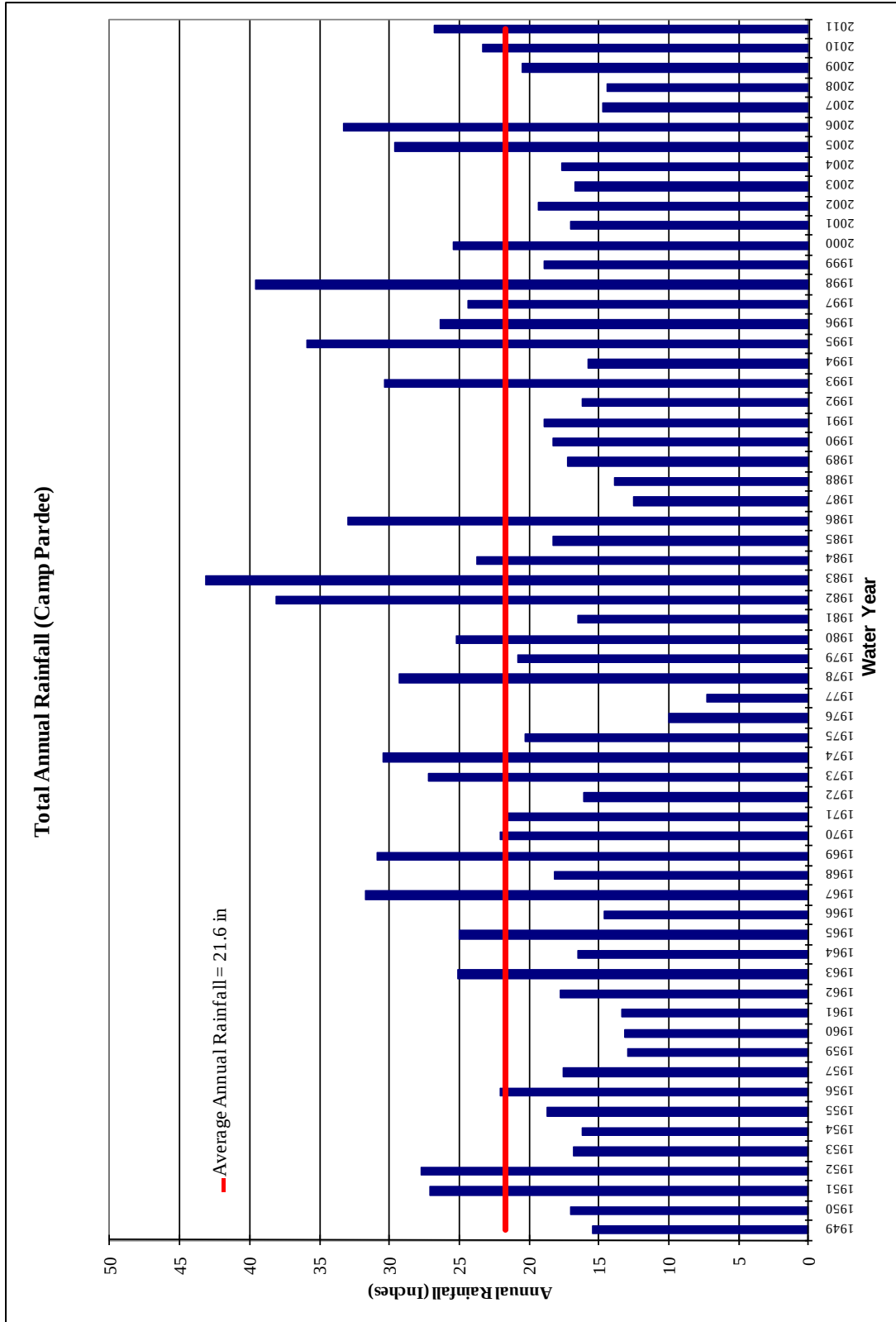


Figure 1-4 Total Annual Rainfall (Camp Pardee)

Monthly Rainfall Distribution

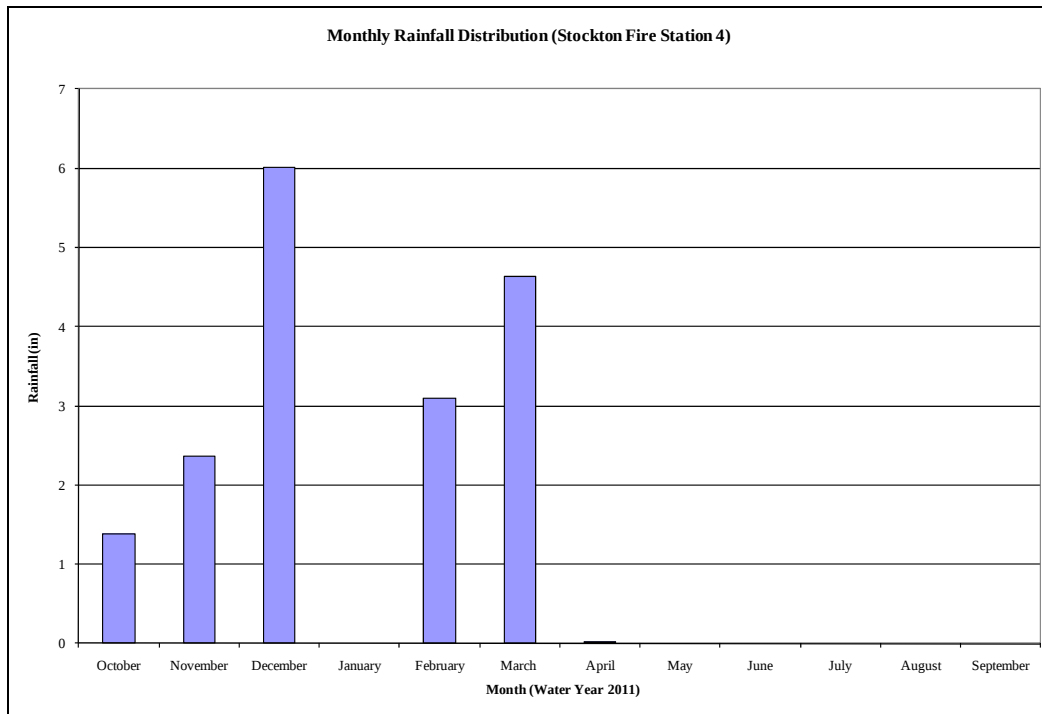


Figure 1-5 Monthly Rainfall Distribution (Stockton Fire Station 4)

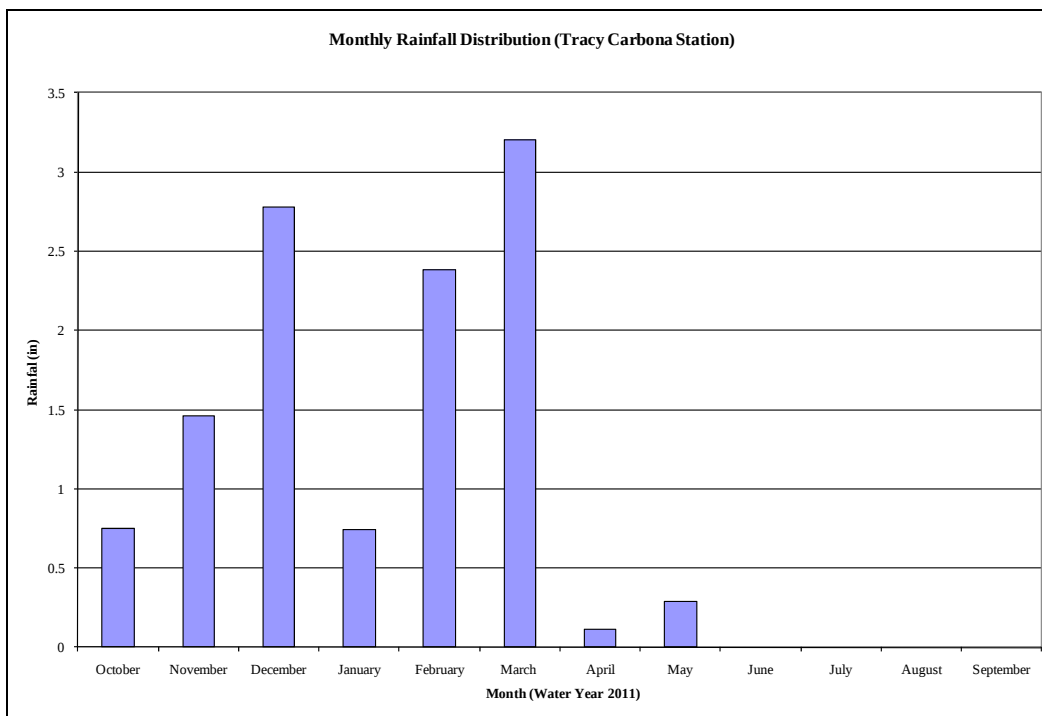


Figure 1-6 Monthly Rainfall Distribution (Tracy Carbona Station)

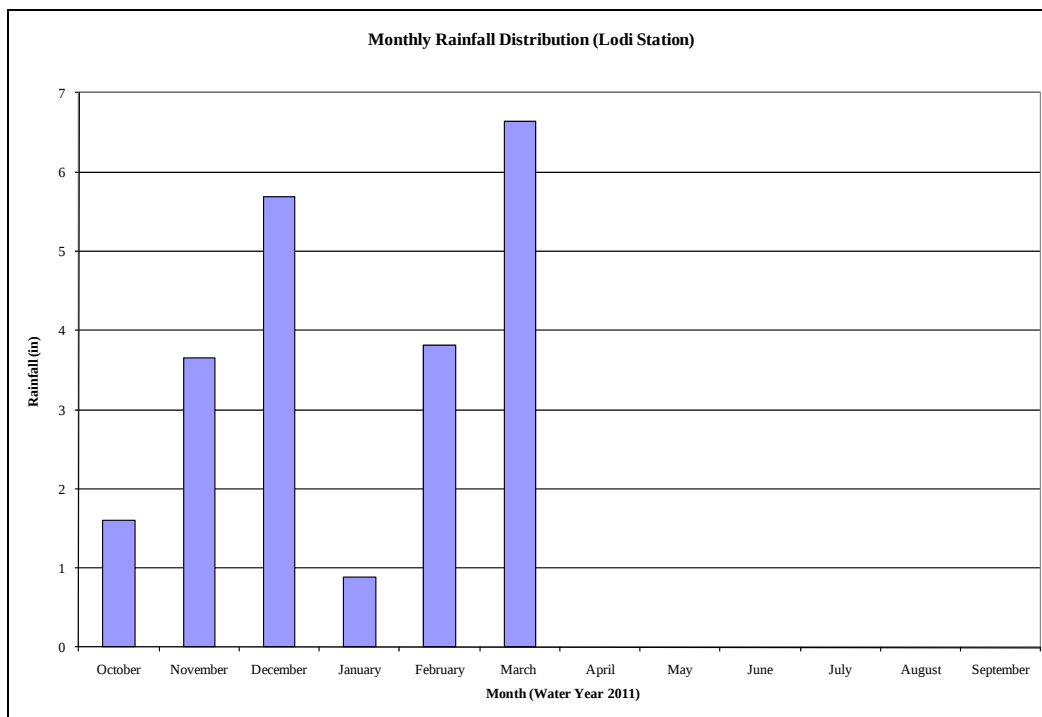


Figure 1-7 Monthly Rainfall Distribution (Lodi Station)

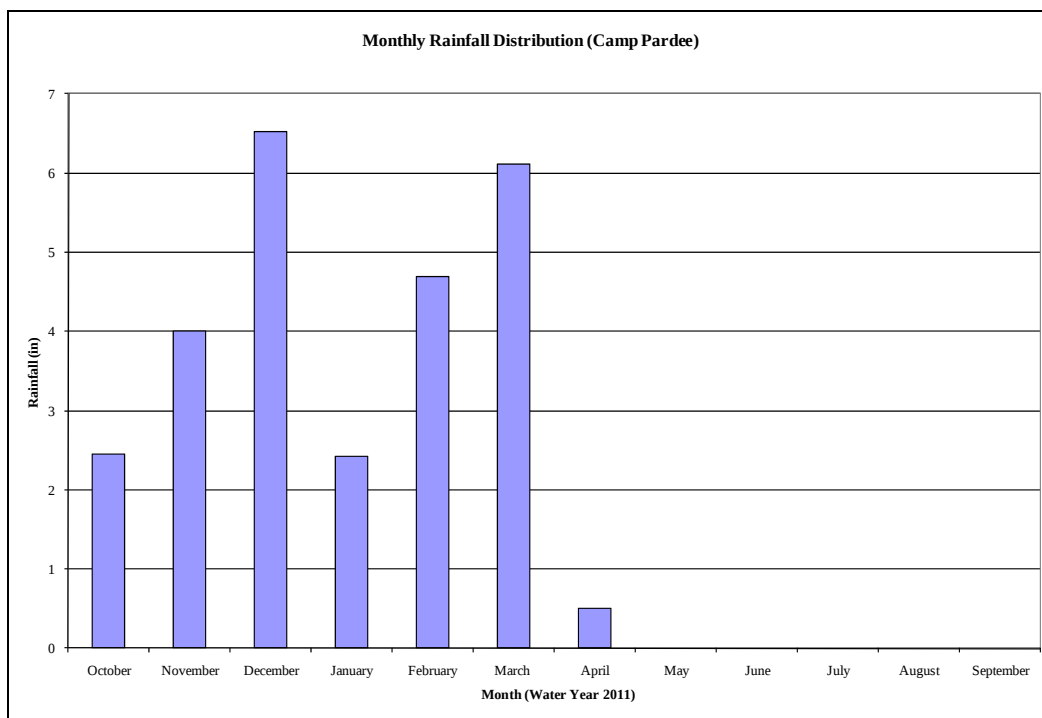


Figure 1-8 Monthly Rainfall Distribution (Camp Pardee)

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Section 2 – Groundwater Elevation Monitoring

Summary of Groundwater Elevations

The information contained in the Spring 2011 Groundwater Report is summarized as follows

GROUNDWATER LEVELS

Banta-Carbona Irrigation District (BCID) – Two wells were compared in the BCID area. Both wells increased in groundwater elevation.

Central San Joaquin Water Conservation District (CSJWCD) – Sixty wells are monitored in CSJWCD. Fifty-one wells were able to be compared. Eight show decreases in groundwater levels. Forty-one wells show an increase in groundwater levels. Two well's groundwater level remained constant.

North San Joaquin Water Conservation District (NSJWCD) – One-hundred thirty-five are monitored in NSJWCD. One-hundred forty-one wells were able to be compared. Seventy-five wells decreased in groundwater levels. Fifty-eight wells increased in groundwater levels. Two wells experienced no change in groundwater level.

Oakdale Irrigation District (OID) – Five wells are monitored in the OID area. Three wells were able to be compared. One well shows a decrease in groundwater levels. Two wells increased in groundwater levels.

Stockton East Water District (SEWD) – One-hundred nineteen wells are monitored in SEWD. Ninety-three wells were able to be compared. Twenty-seven wells decreased in groundwater levels. Sixty-four wells show increases in groundwater levels. Two wells experienced no change in groundwater level.

South San Joaquin Irrigation District (SSJID) – Forty-three wells are monitored in the SSJID area. Forty-one wells were able to be compared. Seven wells show decreases in groundwater levels. Thirty-two wells show increases in groundwater levels. Two wells experienced no change in groundwater level.

Woodbridge Irrigation District (WID) – Thirty-four wells are monitored in the WID. Thirty wells were able to be compared. Five wells decreased in groundwater levels. Twenty-five wells show increases in groundwater levels.

Miscellaneous County Areas – Forty-seven wells are monitored across the County in areas that are not a part of a major irrigation district. Forty-two wells were able to be compared. Eight wells descended in groundwater levels. Thirty-one wells increased in groundwater levels. Three wells stayed constant.

Table 2-1 Comparison of BCID Water Levels

State Well	Spring 2010	Spring 2011	Change
02S06E31N001	53.0	53.5	0.5
03S06E27N001	70.8	73.0	2.2
Total Number of Wells			2
Total Number of Wells Compared			2
Number of Wells with Decrease			0
Number of Wells with Increase			0
Number of Wells with No Change			0
Range of Change			0.5 ft to 2.2 ft
Average Change			1.4

Table 2-2 Comparison of CSJWCD Area Water Levels

State Well	Spring 2010	Spring 2011	Change
01N07E11L001	-37.8	-41.0	-3.2
01N07E11M001	-37.7	-35.5	2.2
01N07E13J002	-41.5	-41.8	-0.3
01N07E14J002	-36.6	-36.1	0.5
01N07E14L001	-38.8	-38.8	0.0
01N07E15M002	-33.5	-30.1	3.4
01N07E24A001	-36.6	-40.6	-4.0
01N07E24R001	-37.0	-38.5	-1.5
01N07E26H003	-33.5	-31.3	2.2
01N07E32A001	-66.5	*	*
01N08E02B001	-35.9	-35.0	0.9
01N08E02J001	-35.1	-32.4	2.7
01N08E07M001	-47.6	-44.9	2.7
01N08E09L001	-44.8	*	*
01N08E11L001	-35.0	*	*
01N08E13J001	-19.7	-17.7	2.0
01N08E15J001	-34.7	-34.4	0.3
01N08E16G001	-35.2	-34.5	0.7
01N08E16H002	-33.5	-32.6	0.9
01N08E16P001	-34.1	-33.3	0.8
01N08E18A002	-37.0	-35.5	1.5
01N08E22J001	-30.5	-29.7	0.8
01N08E26A002	-19.3	-17.3	2.0
01N08E27R002	-25.0	-23.6	1.4
01N08E28K001	-35.4	-34.9	0.5



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

State Well	Spring 2010	Spring 2011	Change
01N08E29M002	-37.0	-30.5	6.5
01N08E35F001	-33.9	*	*
01N08E35R002	*	-18.5	*
01N08E36F001	-25.5	-12.4	13.1
01N09E01C001	-13.2	*	*
01N09E05J001	-15.5	-8.2	7.3
01N09E06N001	-14.0	*	*
01N09E13D001	34.0	*	*
01N09E15B002	3.0	*	*
01N09E17D001	-15.0	-15.0	0.0
01N09E17M001	-8.0	-15.5	-7.5
01N09E19C001	-16.5	-16.0	0.5
01N09E29R001	-3.5	2.5	6.0
01N09E30C005	-10.7	-7.9	2.8
01N09E31J001	-2.0	-1.5	0.5
01S07E01J001	-26.6	-21.1	5.5
01S07E02J001	-26.0	-23.5	2.5
01S08E04R001	-26.5	-19.8	6.7
01S08E05A001	-31.4	-22.4	9.0
01S08E05R001	-23.8	-22.8	1.0
01S08E06D001	-29.6	-22.6	7.0
01S08E09Q001	-12.4	-11.4	1.0
01S08E11F001	-12.9	-9.1	3.8
01S08E14B001	-0.7	-0.2	0.5
01S08E15A001	-10.4	0.0	10.4
01S08E15P001	-6.8	-3.7	3.1
01S08E20B001	-4.7	-4.2	0.5
01S08E23A001	3.5	3.0	-0.5
01S08E27A001	7.2	0.0	-7.2
01S09E05H002	10.0	9.0	-1.0
01S09E07A001	3.7	3.8	0.1
01S09E07N001	6.7	8.1	1.4
01S09E09R001	19.3	20.8	1.5
01S09E18R003	17.0	18.4	1.4
01S09E19Q002	20.0	20.5	0.5

Total Number of Wells	60
Total Number of Wells Compared	51
Number of Wells with Decrease	8
Number of Wells with Increase	41
Number of Wells with No Change	2
Range of Change	-7.5 ft to 13.1 ft
Average Change	1.8



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

Table 2-3 Comparison of NSJWCD Area Water Levels

State Well	Spring 2010	Spring 2011	Change
03N06E04C001	-3.1	-1.5	1.6
03N06E24M003	-28.4	-29.7	-1.3
03N06E25C001	-30.6	-31.0	-0.4
03N06E25H015	-33.3	-33.5	-0.2
03N06E25R005	-37.9	-36.3	1.6
03N06E36N001	-33.8	-32.8	1.0
03N07E02G003	-11.9	-19.7	-7.8
03N07E03R001	-18.3	-17.8	0.5
03N07E05D005	17.3	18.7	1.4
03N07E08B012	-16.0	-15.9	0.1
03N07E08E002	-23.0	-20.8	2.2
03N07E09C001	-19.7	-19.4	0.3
03N07E09P002	-26.2	-26.7	-0.5
03N07E10L004	-26.5	-27.1	-0.6
03N07E12P001	-34.6	-35.6	-1.0
03N07E15C004	-27.5	-29.4	-1.9
03N07E17A006	-25.6	-26.0	-0.4
03N07E17D004	-23.9	-24.6	-0.7
03N07E17K002	-30.0	-30.4	-0.4
03N07E18D012	-25.5	-26.3	-0.8
03N07E18M002	-27.6	-27.2	0.4
03N07E19J004	-44.0	-38.0	6.0
03N07E19Q012	-34.2	-33.3	0.9
03N07E20C012	-32.4	-32.8	-0.4
03N07E21L003	-32.5	-33.6	-1.1
03N07E22C011	-34.9	-36.6	-1.7
03N07E23K011	-40.5	-41.5	-1.0
03N07E26G012	-41.2	-42.6	-1.4
03N07E32Q012	-39.1	-40.0	-0.9
03N07E33G002	-42.1	-42.8	-0.7
03N08E04Q001	-31.9	-33.0	-1.1
03N08E05K011	-32.2	-33.0	-0.8
03N08E07D002	-33.6	-33.9	-0.3
03N08E07J001	-45.3	*	*
03N08E12P011	-30.4	-34.4	-4.0
03N08E17B001	-37.5	-38.4	-0.9
03N08E17Q011	-40.4	-41.2	-0.8
03N08E19C001	-40.3	-40.8	-0.5
03N08E19M003	-40.3	-41.2	-0.9
03N08E22A001	-40.1	-40.8	-0.7
04N06E02R011	-21.7	-21.6	0.1



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

State Well	Spring 2010	Spring 2011	Change
04N06E03A012	-3.9	2.3	6.2
04N06E05Q001	-8.1	2.7	10.8
04N06E06N012	-2.6	0.9	3.5
04N06E12C004	-28.0	-29.1	-1.1
04N06E12N002	-29.3	-23.1	6.2
04N06E15B002	-10.7	-10.7	0.0
04N06E16A011	-8.3	-5.8	2.5
04N06E16C001	-1.0	2.3	3.3
04N06E16K011	2.1	5.4	3.3
04N06E23D004	-13.0	-12.7	0.3
04N06E23K00	-2.5	-2.0	0.5
04N06E24D012	-14.5	-14.6	-0.1
04N06E24F001	-18.0	-19.0	-1.0
04N06E25B001	-9.4	-9.2	0.2
04N06E25R001	-2.0	-1.0	1.0
04N06E27B012	5.8	8.0	2.2
04N06E27D002	18.2	18.6	0.4
04N06E27Q012	14.2	16.7	2.5
04N06E35D011	14.4	17.0	2.6
04N06E36J012	5.5	7.8	2.3
04N07E01B011	-33.1	-31.8	1.3
04N07E02R001	-30.7	-31.8	-1.1
04N07E04B012	-34.4	*	*
04N07E04Q012	-33.6	-34.8	-1.2
04N07E07H011	-31.9	*	*
04N07E11D012	-32.0	-32.8	-0.8
04N07E12E001	-25.0	-32.1	-7.1
04N07E12G012	-28.0	-30.4	-2.4
04N07E14P011	-24.9	-26.0	-1.1
04N07E15B012	-29.1	-30.5	-1.4
04N07E16D001	-29.3	-30.2	-0.9
04N07E17J013	-24.6	-25.6	-1.0
04N07E17N001	-25.3	-26.8	-1.5
04N07E19K001	-16.6	-17.6	-1.0
04N07E19R011	-16.3	-16.3	0.0
04N07E20H003	-21.1	-22.0	-0.9
04N07E21F001	-20.8	-21.3	-0.5
04N07E23J012	-21.8	-21.7	0.1
04N07E24N002	-20.8	-21.0	-0.2
04N07E25G015	*	-18.7	*
04N07E26B011	-15.2	-16.1	-0.9
04N07E27C002	-15.5	-16.0	-0.5
04N07E28J002	-23.7	-12.7	11.0



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

State Well	Spring 2010	Spring 2011	Change
04N07E28P011	9.0	12.0	3.0
04N07E29H001	-11.4	-10.4	1.0
04N07E29N012	-4.8	-3.7	1.1
04N07E31Q031	14.4	16.5	2.1
04N07E32F011	2.7	6.9	4.2
04N07E33H001	26.0	28.1	2.1
04N07E34K011	-6.1	-5.4	0.7
04N07E35C002	-9.3	-8.2	1.1
04N07E35E013	-9.6	-8.7	0.9
04N07E36L001	-13.5	-19.4	-5.9
04N08E01K001	47.7	49.9	2.2
04N08E02E011	-5.9	-6.0	-0.1
04N08E04P014	-21.8	-23.1	-1.3
04N08E06C002	-30.6	-31.5	-0.9
04N08E06N002	-31.7	-35.2	-3.5
04N08E11M012	-2.4	-3.8	-1.4
04N08E12A011	77.4	77.9	0.5
04N08E12B011	50.9	51.5	0.6
04N08E12N001	27.8	28.2	0.4
04N08E14B011	3.2	2.2	-1.0
04N08E14K001	-0.1	-1.3	-1.2
04N08E15D011	-12.6	-13.8	-1.2
04N08E15J011	-8.8	-9.6	-0.8
04N08E17A001	-22.3	-21.3	1.0
04N08E17J001	-21.5	-23.1	-1.6
04N08E18Q011	-25.3	-25.9	-0.6
04N08E19B002	-20.3	-20.8	-0.5
04N08E21M001	-25.6	-26.9	-1.3
04N08E22C015	-14.0	-14.9	-0.9
04N08E26A012	-5.6	-6.6	-1.0
04N08E27J011	-14.2	-14.8	-0.6
04N08E28E001	-25.8	-25.9	-0.1
04N08E32N001	-23.1	-30.4	-7.3
04N08E34Q011	-26.7	-28.1	-1.4
04N08E36P001	-33.0	-32.6	0.4
04N09E06L011	112.1	113.4	1.3
04N09E07D012	84.5	85.0	0.5
04N09E07E011	90.0	90.3	0.3
04N09E16Q002	165.1	166.2	1.1
04N09E17E001	140.3	141.8	1.5
04N09E18A011	152.9	154.8	1.9
04N09E18D002	55.5	55.7	0.2
04N09E18N011	29.4	28.0	-1.4



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

State Well	Spring 2010	Spring 2011	Change
04N09E20M001	116.5	*	*
04N09E21A001	169.4	170.2	0.8
04N09E28C002	185.2	185.4	0.2
05N06E36C003	-38.0	-39.0	-1.0
05N06E36R001	-32.8	-31.9	0.9
05N07E34G001	-41.1	-40.3	0.8
05N07E34Q001	-35.4	-38.3	-2.9
05N08E24Q011	40.6	*	*
05N08E25P011	52.0	51.4	-0.6
05N08E32R011	-27.9	-28.4	-0.5
05N08E35K012	5.3	3.7	-1.6
05N09E30C011	160.7	159.7	-1.0
05N09E30M011	143.7	144.2	0.5
05N09E31L011	127.8	127.3	-0.5

Total Number of Wells	141
Total Number of Wells Compared	135
Number of Wells with Decrease	75
Number of Wells with Increase	58
Number of Wells with No Change	2
Range of Change	-7.8 ft to 4.2 ft
Average Change	0.1

Table 2-4 Comparison of OID Area Water Levels

State Well	Spring 2010	Spring 2011	Change
01S09E14K001	46.3	44.3	-2.0
01S09E21J002	39.5	41.7	2.2
01S09E23N001	52.0	*	*
01S09E24R001	*	*	*
01S09E28M002	40.7	41.2	0.5

Total Number of Wells	5
Total Number of Wells Compared	3
Number of Wells with Decrease	1
Number of Wells with Increase	2
Number of Wells with No Change	0
Range of Change	-2 ft to 2.2 ft
Average Change	0.2



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

Table 2-5 Comparison of SEWD Area Water Levels

State Well	Spring 2010	Spring 2011	Change
01N06E02C001	-23.7	*	*
01N06E03K001	-12.5	*	*
01N06E04J002	-6.2	-5.2	1.0
01N06E05H001	-8.4	-7.6	0.8
01N06E12G001	22.2	*	*
01N06E23J001	-11.5	-8.0	3.5
01N06E27R002	-6.7	-4.7	2.0
01N07E01A002	-45.7	*	*
01N07E01M002	-50.0	-52.0	-2.0
01N07E02G001	-45.8	-44.2	1.6
01N07E03L001	*	*	*
01N07E03M001	5.0	12.5	7.5
01N07E04R001	-28.0	-14.0	14.0
01N07E07F001	-25.9	*	*
01N07E08B001	-33.0	-30.0	3.0
01N07E09E004	-32.0	-25.0	7.0
01N07E09H001	-33.4	-27.7	5.7
01N07E09Q003	-33.3	-30.0	3.3
01N07E10D001	-31.0	-21.0	10.0
01N07E10G001	*	-31.7	*
01N07E19G001	-24.0	*	*
01N07E20G001	-25.0	-22.5	2.5
01N07E21R001	*	-27.9	*
01N07E29A002	-34.1	*	*
01N08E03P001	-40.0	-39.3	0.7
01N08E04E001	-44.0	-43.5	0.5
01N09E05B001	-16.7	-15.9	0.8
01S06E01C002	-6.0	-4.1	1.9
01S06E02D004	-6.2	-5.8	0.4
01S06E02G002	-7.7	-4.0	3.7
01S06E10G001	-3.8	-2.3	1.5
01S06E11E001	-4.5	-2.5	2.0
02N07E33L001	-42.0	-32.0	10.0
02N07E34R001	-37.8	-30.2	7.6
02N07E36H001	-51.5	-52.3	-0.8
02N07E36P002	-49.0	-48.0	1.0
02N08E03G002	-34.0	-35.2	-1.2
02N08E04C001	-43.1	-43.9	-0.8
02N08E05C001	-45.5	-48.5	-3.0
02N08E08N001	-47.5	-46.0	1.5
02N08E09G002	-46.0	*	*



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

State Well	Spring 2010	Spring 2011	Change
02N08E10H002	-40.8	-41.5	-0.7
02N08E12C002	-29.2	-29.4	-0.2
02N08E13K001	-33.1	-32.6	0.5
02N08E14C001	-40.0	-41.0	-1.0
02N08E15M002	-42.6	-43.5	-0.9
02N08E16D001	-46.2	-44.6	1.6
02N08E18C001	-62.2	-63.2	-1.0
02N08E20F001	-49.3	-49.2	0.1
01S07E06M002	-7.0	-3.3	3.7
01S07E08J002	-5.5	-3.0	2.5
02N06E01A001	-37.5	-38.1	-0.6
02N06E11L001	-31.2	*	*
02N06E12H001	-39.3	-40.4	-1.1
02N06E15F001	-29.1	*	*
02N06E17J001	-23.0	*	*
02N06E20F001	-0.4	*	*
02N06E22D001	-27.8	*	*
02N06E24F001	-35.0	-32.5	2.5
02N06E24J003	-37.0	-33.2	3.8
02N06E32G001	-10.9	-10.9	0.0
02N06E35D002	-27.1	*	*
02N07E03D001	-48.5	-50.9	-2.4
02N07E08D001	-51.7	-43.7	8.0
02N07E08K003	-49.7	-49.3	0.4
02N07E08R002	-48.1	-46.7	1.4
02N07E10F002	-46.8	*	*
02N07E11F001	-51.5	-44.0	7.5
02N07E11R002	-52.0	-47.0	5.0
02N07E12A003	-43.5	-42.3	1.2
02N07E15C001	-52.8	-53.8	-1.0
02N07E16F002	-49.9	-49.7	0.2
02N07E16L001	-51.8	-48.9	2.9
02N07E20N002	-42.0	-39.0	3.0
02N07E21A002	-53.3	-53.0	0.3
02N07E21K002	-48.7	-46.5	2.2
02N07E21N001	-42.0	-40.0	2.0
02N07E23B001	-52.8	-48.0	4.8
02N07E24B001	-47.8	-48.7	-0.9
02N07E24Q001	-58.3	-51.0	7.3
02N07E26H003	-67.4	-62.0	5.4
02N07E26N001	-50.2	-48.7	1.5
02N07E28K002	-42.0	-39.0	3.0
02N07E28N004	-44.7	-42.6	2.1



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

State Well	Spring 2010	Spring 2011	Change
02N07E28P001	-49.0	-45.0	4.0
02N07E29B001	-43.9	-40.5	3.4
02N07E29M002	-40.8	-35.2	5.6
02N07E30E001	-37.1	-31.8	5.3
02N07E30H001	-39.3	-35.5	3.8
02N07E31M001	-29.3	-23.8	5.5
02N07E32J002	-37.5	-28.0	9.5
02N07E32M002	-40.0	*	*
02N07E32R001	-37.1	*	*
02N08E24J001	*	-42.1	*
02N08E24P001	-34.4	-33.9	0.5
02N08E28H002	-42.9	-45.9	-3.0
02N08E32L002	-46.2	-45.7	0.5
02N08E33E001	-44.6	-44.6	0.0
02N09E03A001	62.6	61.6	-1.0
02N09E04H001	*	52.6	*
02N09E05H001	-3.0	-3.9	-0.9
02N09E05N001	-16.9	-17.5	-0.6
02N09E08N001	-23.7	*	*
02N09E09D001	-3.8	-4.8	-1.0
02N09E18Q001	-35.3	-35.9	-0.6
02N09E28N001	-25.6	-8.2	*
03N07E35C002	-41.6	-48.3	-6.7
03N07E35L001	-47.0	-44.0	3.0
03N07E36J001	-40.6	-39.8	0.8
03N08E27R001	-39.5	-39.9	-0.4
03N08E32P001	-42.5	-43.0	-0.5
03N09E25R001	87.0	83.0	-4.0
03N09E36G001	79.8	*	*
03N07E28K012	-42.4	-42.8	-0.4
02N06E06C002	-14.0	-12.8	1.2
02N06E13R002	*	-36.0	*
02N06E24J002	-36.9	-32.7	4.2
02N06E03A003	-30.3	-29.8	0.5
03N06E35P002	-29.5	-29.8	-0.3

Total Number of Wells	119
Total Number of Wells Compared	93
Number of Wells with Decrease	27
Number of Wells with Increase	64
Number of Wells with No Change	2
Range of Change	-6.7 ft to 14 ft
Average Change	1.9



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

Table 2-6 Comparison of SSJID Area Water Levels

State Well	Spring 2010	Spring 2011	Change
01S07E09Q001	-2.2	1.7	3.9
01S07E17N002	2.5	3.8	1.3
01S07E18L001	0.8	3.2	2.4
01S07E21G001	9.3	13.8	4.5
01S07E25E001	10.0	12.0	2.0
01S07E25R001	13.8	14.5	0.7
01S07E26G001	10.5	11.6	1.1
01S07E27K001	11.0	12.3	1.3
01S07E30R001	9.9	10.5	0.6
01S07E33H001	17.6	18.5	0.9
01S07E36D001	16.8	17.8	1.0
01S08E25Q001	*	*	*
01S08E34Q001	20.9	20.8	-0.1
01S08E35R002	29.0	28.4	-0.6
01S09E29M002	33.5	33.0	-0.5
01S09E33J002	53.9	53.5	-0.4
01S09E33P001	50.2	52.0	1.8
01S09E34A001	59.0	59.5	0.5
02S07E07D002	10.0	10.5	0.5
02S07E07Q001	22.9	24.5	1.6
02S07E08R001	25.1	27.0	1.9
02S07E10B002	25.2	25.9	0.7
02S07E11N002	34.0	34.5	0.5
02S07E12G001	29.0	29.8	0.8
02S07E12R001	25.5	26.4	0.9
02S07E12R002	28.5	28.8	0.3
02S07E19H001	20.0	21.0	1.0
02S07E20R002	22.4	23.0	0.6
02S07E22N002	25.2	25.9	0.7
02S07E24R002	33.8	33.2	-0.6
02S07E26B001	30.0	30.6	0.6
02S08E04M001	24.5	24.5	0.0
02S08E06J001	23.0	23.1	0.1
02S08E07R001	33.5	34.6	1.1
02S08E08A001	28.0	28.3	0.3
02S08E08E001	24.2	26.7	2.5
02S08E09J001	35.0	35.0	0.0
02S08E12D001	39.0	39.3	0.3
02S08E14E001	42.3	47.5	5.2

*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

State Well	Spring 2010	Spring 2011	Change
02S09E03K001	61.0	60.5	-0.5
02S09E07D001	42.0	40.4	1.6
02S09E11K001	73.7	*	*
02S09E12R001	71.0	70.2	-0.8
Total Number of Wells			43
Total Number of Wells Compared			41
Number of Wells with Decrease			7
Number of Wells with Increase			32
Number of Wells with No Change			2
Range of Change			-0.8 ft to 5.2 ft
Average Change			1.0

Table 2-7 Comparison of WID Area Water Levels

State Well	Spring 2010	Spring 2011	Change
04N05E09D001	-4.8	-2.8	2.0
05N05E32M001	-3.7	*	*
04N05E10K001	-3.0	2.4	5.4
03N06E05N003	-11.5	*	*
03N06E07H003	-14.0	-11.9	2.1
03N06E10D001	-8.4	-9.8	-1.4
03N06E17A004	-23.7	-21.7	2.0
03N06E26P002	-27.7	-28.9	-1.2
03N06E27E001	-27.7	-28.7	-1.0
04N05E13H001	-2.0	-0.5	1.5
04N05E13R004	-3.0	-0.3	2.7
04N05E14B002	-2.9	1.6	4.5
04N05E24J004	-0.1	2.7	2.8
04N05E36H003	-2.0	0.4	2.4
04N06E19F001	1.0	6.8	5.8
04N06E21D001	6.9	11.7	4.8
04N06E29A001	*	*	*
04N06E29N002	-2.0	-0.7	1.3
04N06E30E001	1.7	3.2	1.5
03N06E04P012	-11.6	-11.0	0.6
03N06E05C002	-3.1	-2.9	0.2
03N06E28B012	-26.2	*	*
04N05E13C012	-1.6	2.1	3.7
04N06E19R012	-0.1	2.1	2.2
03N05E13L001	-11.0	-8.0	3.0
03N05E14C001	-2.8	-1.6	1.2
03N06E18M003	-14.1	-12.6	1.5



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

State Well	Spring 2010	Spring 2011	Change
03N06E20D002	-19.5	-17.0	2.5
03N06E30R001	-20.5	-21.0	-0.5
03N06E32R001	-23.5	-22.0	1.5
04N05E14P001	1.0	3.0	2.0
04N05E22H001	-5.0	-1.1	3.9
04N05E26F001	6.7	3.4	-3.3
03N06E07D013	-7.5	-6.2	1.3
Total Number of Wells			34
Total Number of Wells Compared			30
Number of Wells with Decrease			5
Number of Wells with Increase			25
Number of Wells with No Change			0
Range of Change			-3.3 ft to 5.8 ft
Average Change			1.8

Table 2-8 Comparison of Miscellaneous Area Water Levels

State Well	Spring 2010	Spring 2011	Change
04N09E15D001	184.8	187.6	2.8
04N09E16A001	180.6	181.4	0.8
03N06E09N011	-19.0	-18.4	0.6
01S07E10A001	-14.0	-11.1	2.9
01S07E13J001	-4.0	-4.0	0.0
01S07E14M001	0.9	2.5	1.6
01S07E14P003	-2.8	1.2	4.0
01S07E15F002	6.4	0.6	-5.8
01S08E19R001	6.8	6.5	-0.3
01S08E29K001	10.0	10.0	0.0
01S08E30C002	7.5	8.3	0.8
02S09E19B002	56.8	55.3	-1.5
01N09E21J001	4.3	*	*
01N09E22G002	*	4.6	*
01N09E26A001	17.5	16.9	-0.6
01N09E35K001	-11.1	*	*
01N09E36P001	*	*	*
01S09E02R001	32.3	35.7	3.4
01S09E11J002	42.2	41.0	-1.2
01S05E31R002	0.6	1.0	0.4
01S06E04J001	-1.0	1.1	2.1
01S06E12P001	-4.1	-0.6	3.5



*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

State Well	Spring 2010	Spring 2011	Change
01S06E14F001	-0.6	1.4	2.0
01S06E15F001	1.3	2.4	1.1
01S06E23C003	3.4	4.9	1.5
01S06E26K001	2.8	1.4	1.4
02S05E08B001	-0.2	0.0	0.2
02S05E13N001	12.7	12.3	-0.4
02S06E10K001	4.0	7.0	3.0
02S06E11J001	10.3	*	*
02S06E25J001	15.0	16.3	1.3
02S06E26B001	7.5	10.4	2.9
02S06E27E001	8.5	10.0	1.5
02S07E31N001	14.0	16.0	2.0
03N05E24L001	-8.1	-4.1	4.0
03N06E29C001	-24.3	-24.3	0.0
03S05E04H001	57.0	55.0	-2.0
03S06E03F002	14.5	17.5	3.0
03S06E23C001	20.8	26.8	6.0
03S07E05J001	20.9	22.2	1.3
03S07E06Q001	14.9	16.5	1.6
04N05E03D003	-2.2	-0.7	1.5
05N05E28L003	-2.5	2.8	5.3
04N05E36C004	0.5	3.2	2.7
04N06E18R012	-0.5	1.4	1.9
03N06E15C004	-18.8	-19.3	-0.5
04N06E34J002	18.9	19.2	0.3
Total Number of Wells			47
Total Number of Wells Compared			42
Number of Wells with Decrease			8
Number of Wells with Increase			31
Number of Wells with No Change			3
Range of Change			-5.8 ft to 6 ft
Average Change			1.3

*Measurement wasn't able to be completed due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

HYDROGRAPHS

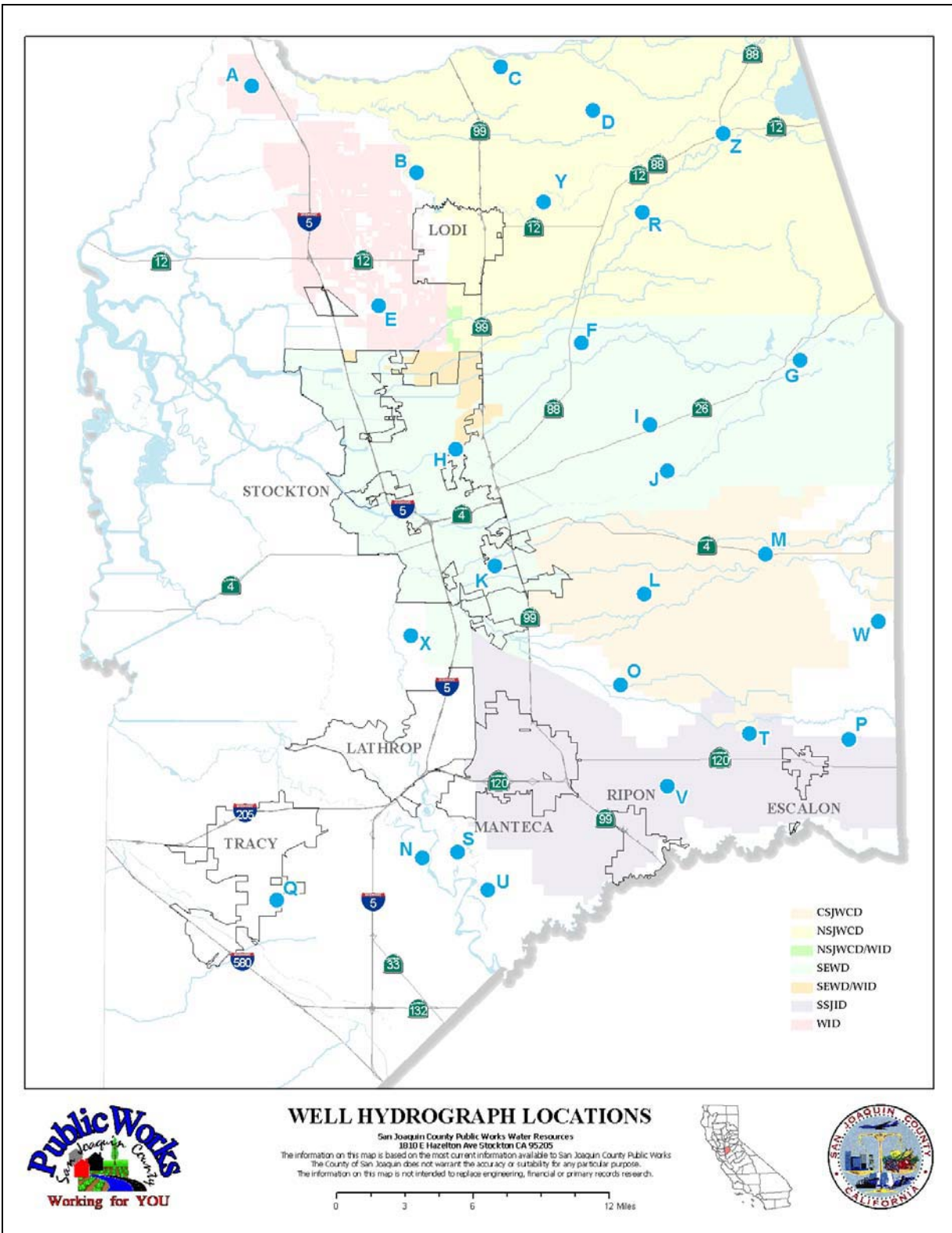


Figure 2-1 Well Hydrograph Locations

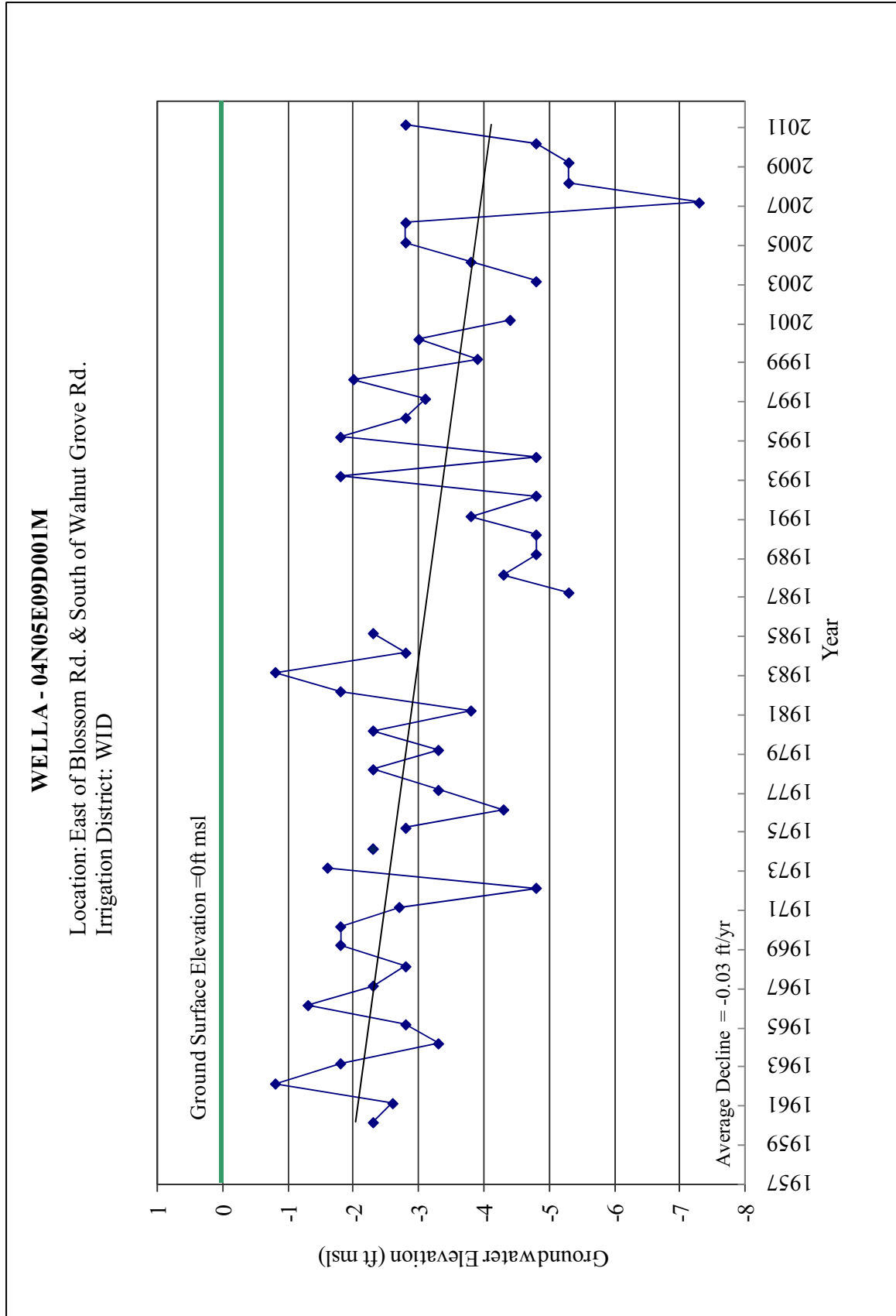


Figure 2-2 Spring Hydrograph Well A

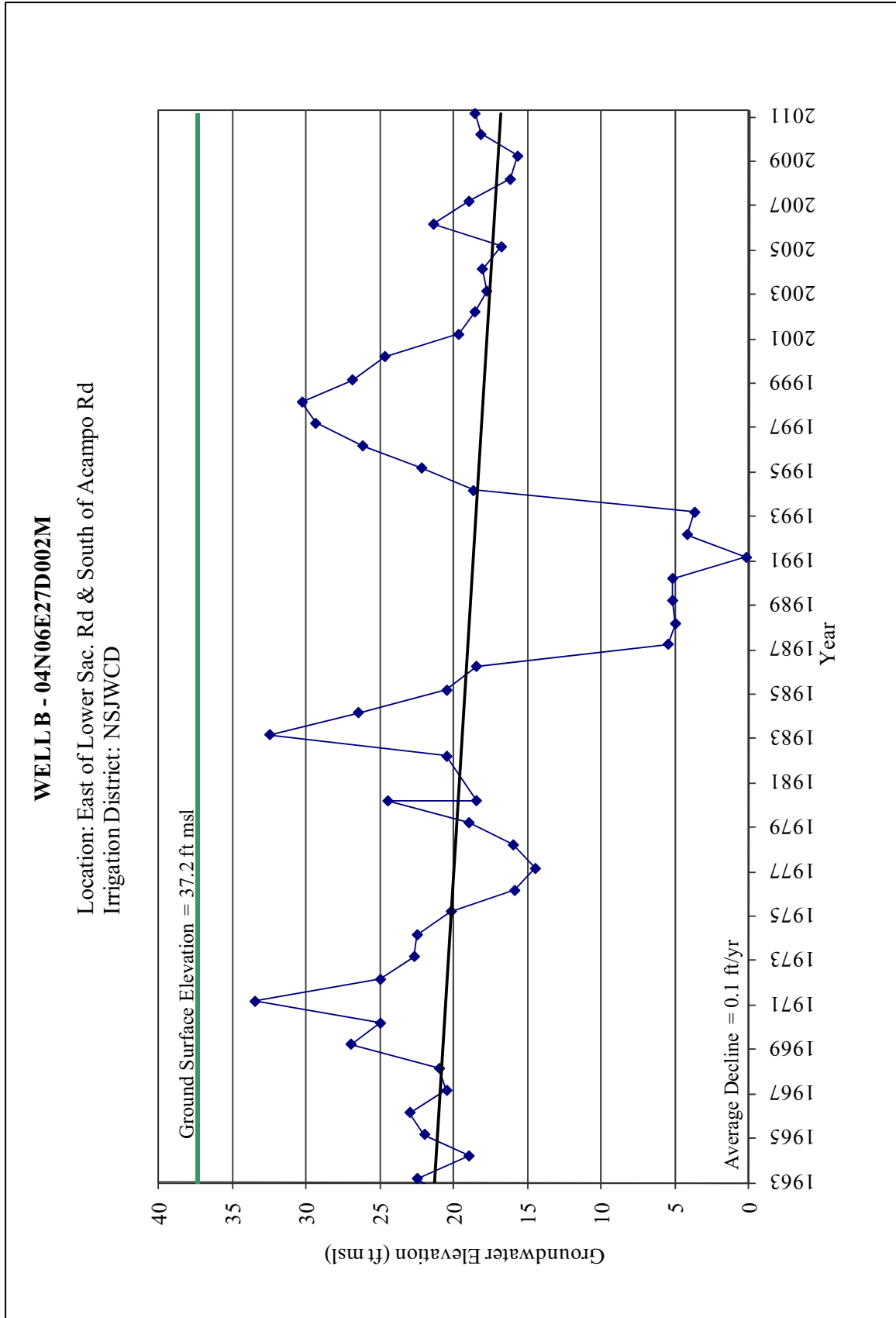


Figure 2-3 Spring Hydrograph Well B

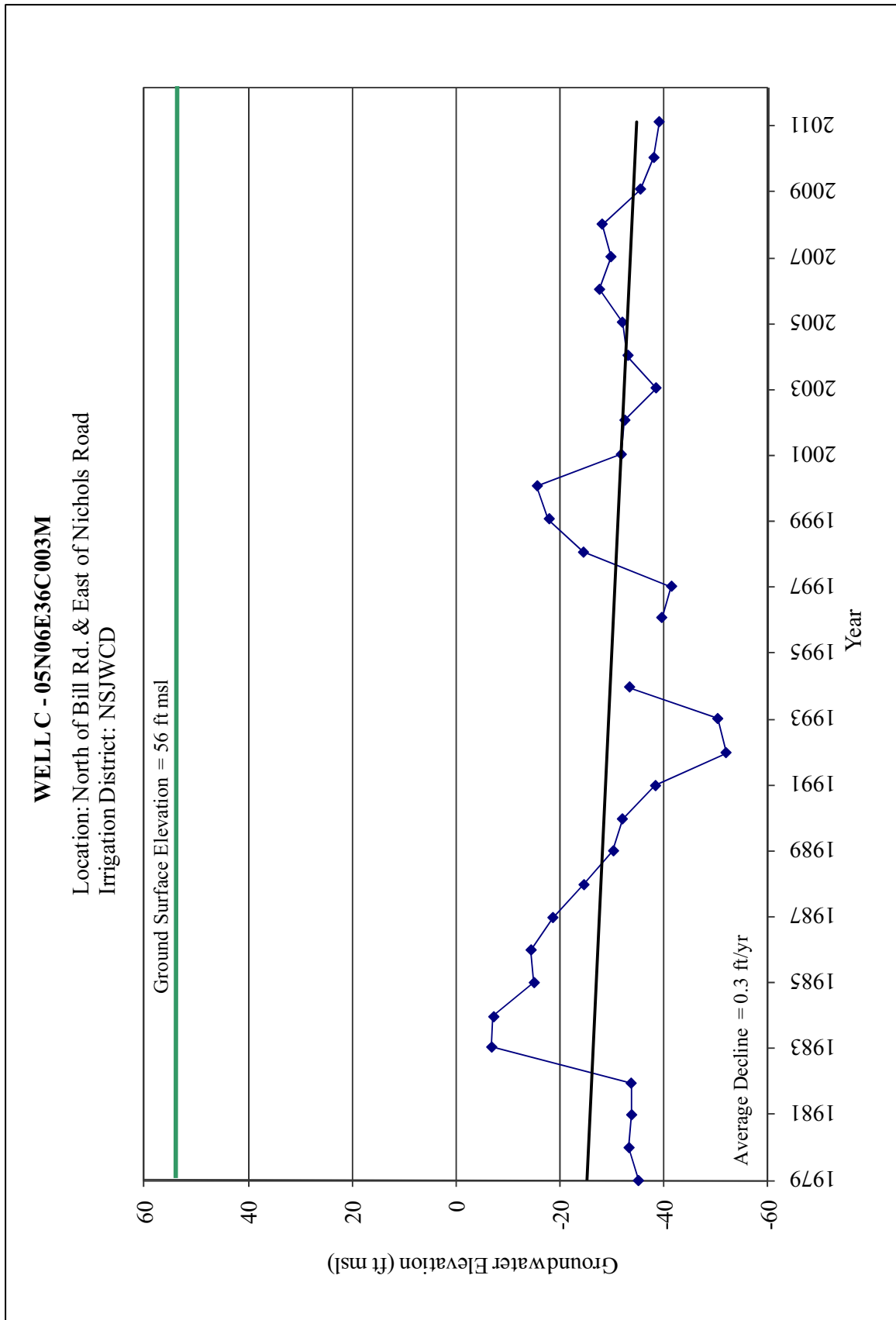


Figure 2-4 Spring Hydrograph Well C

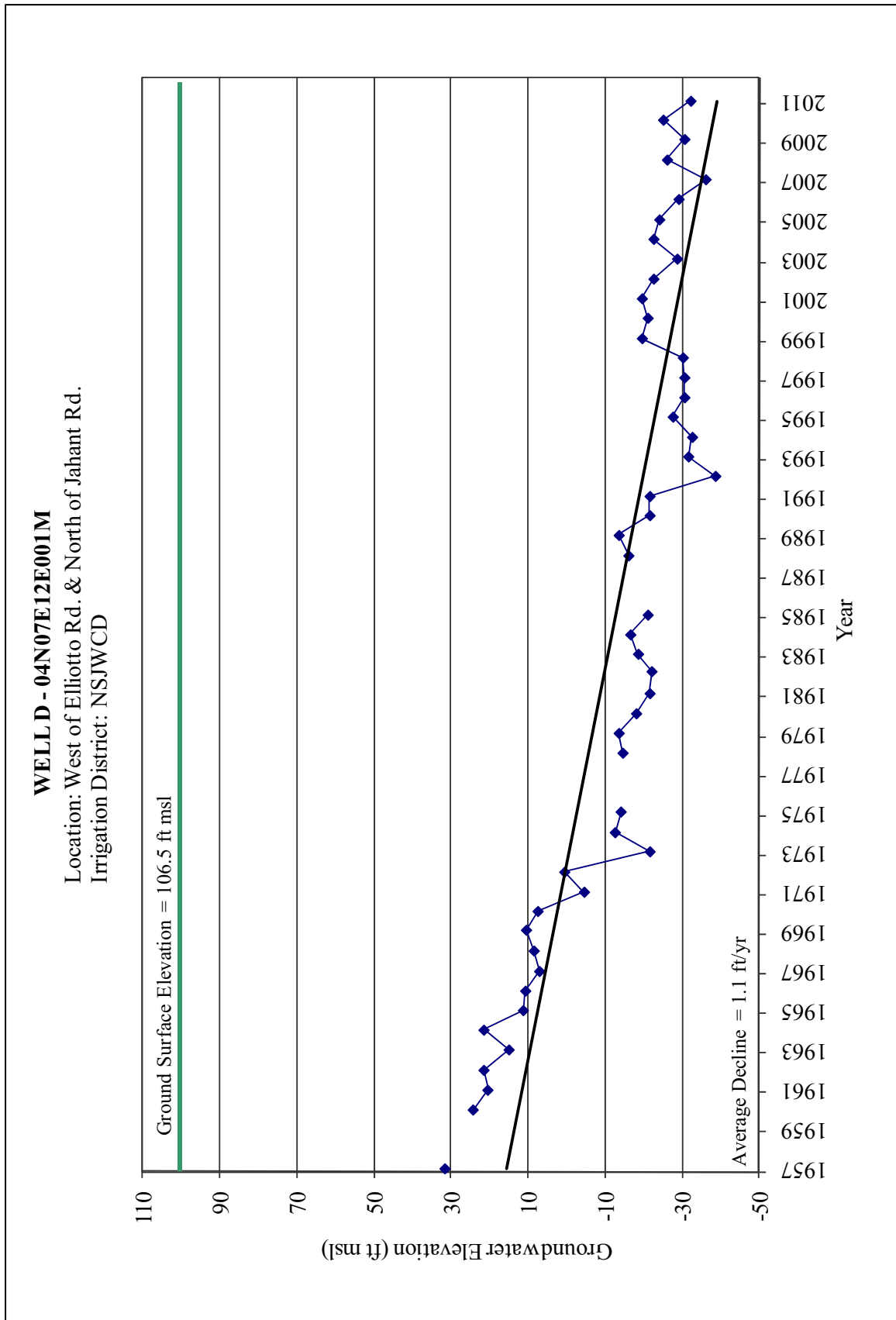


Figure 2-5 Spring Hydrograph Well D

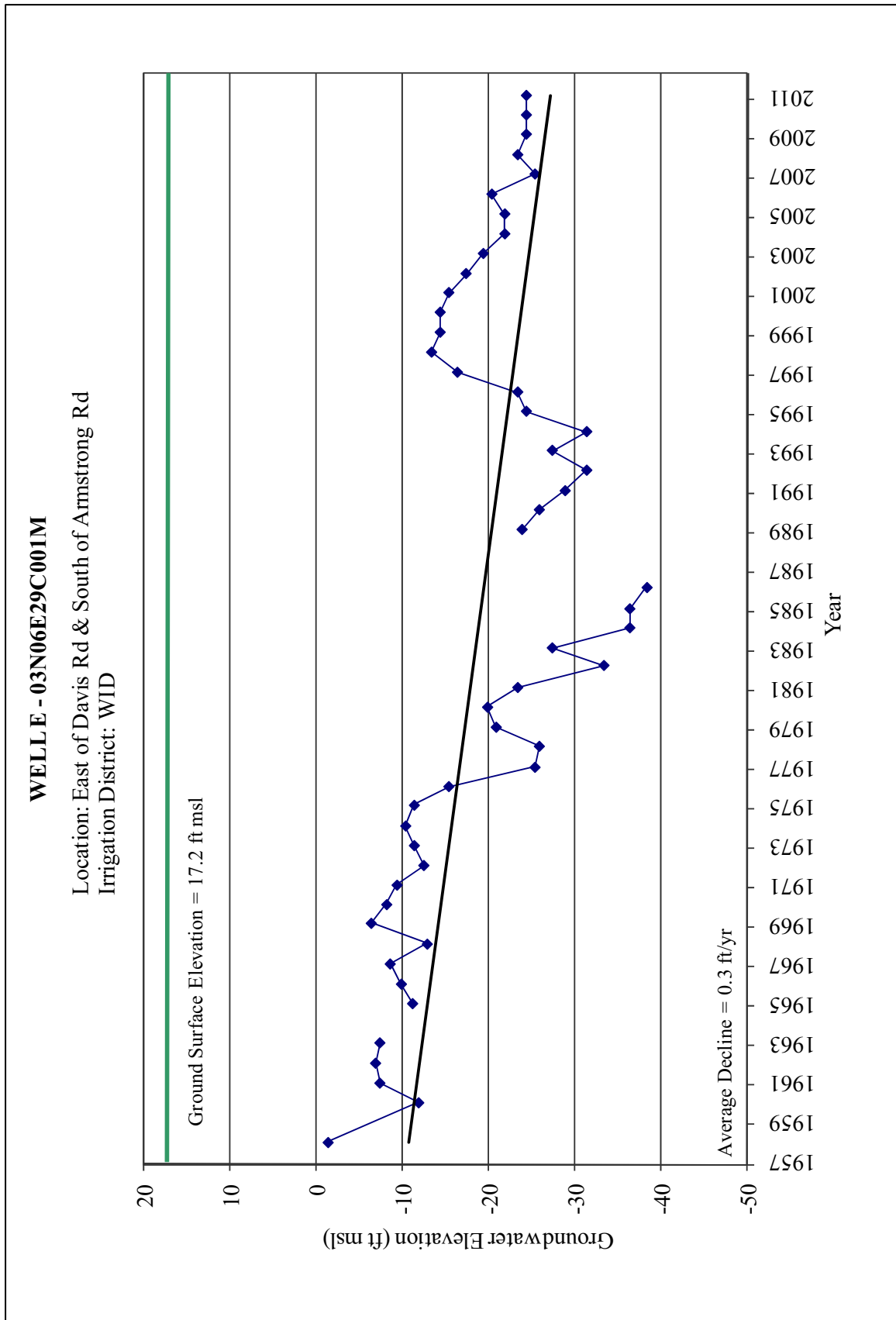


Figure 2-6 Spring Hydrograph Well E

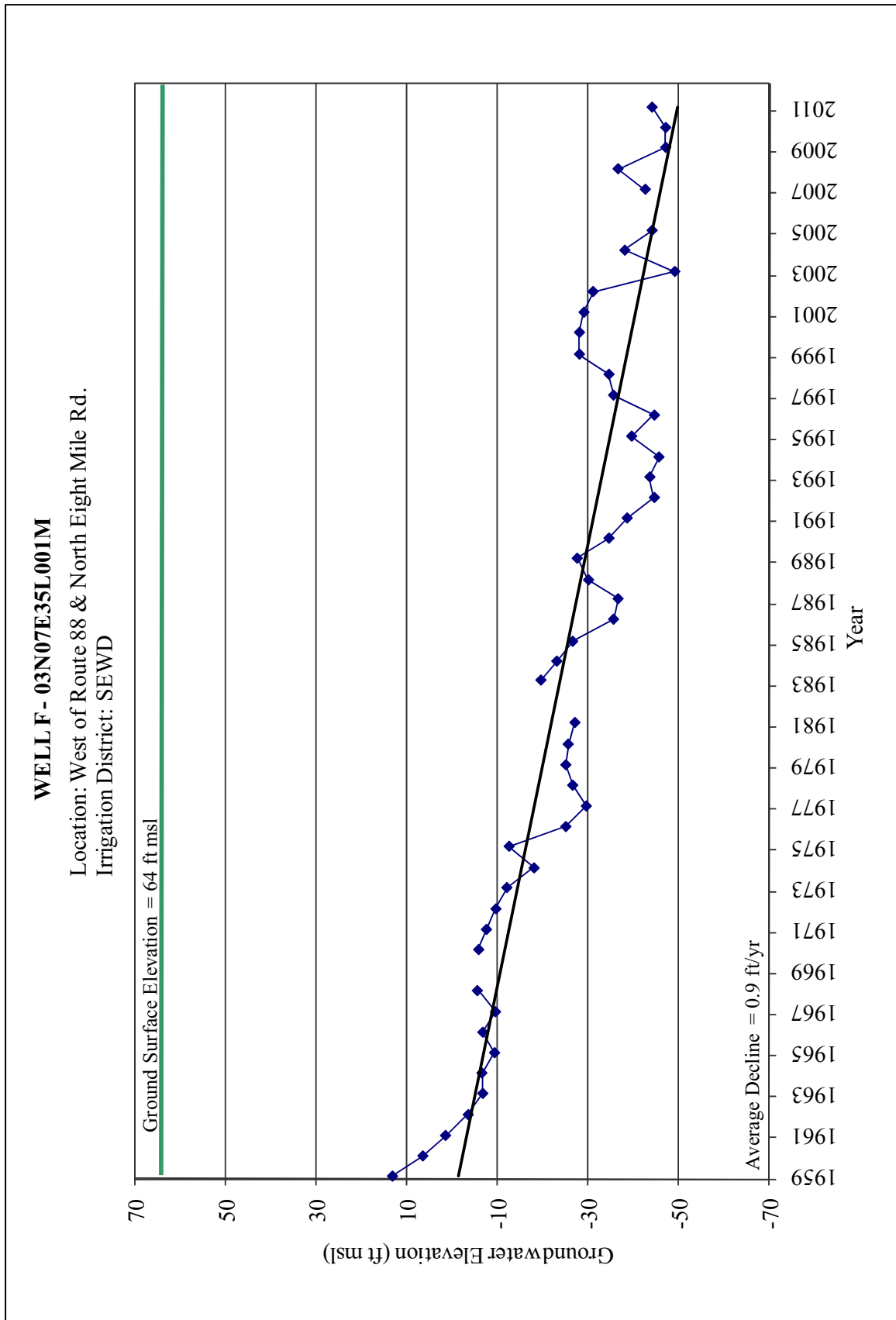


Figure 2-7 Spring Hydrograph Well F

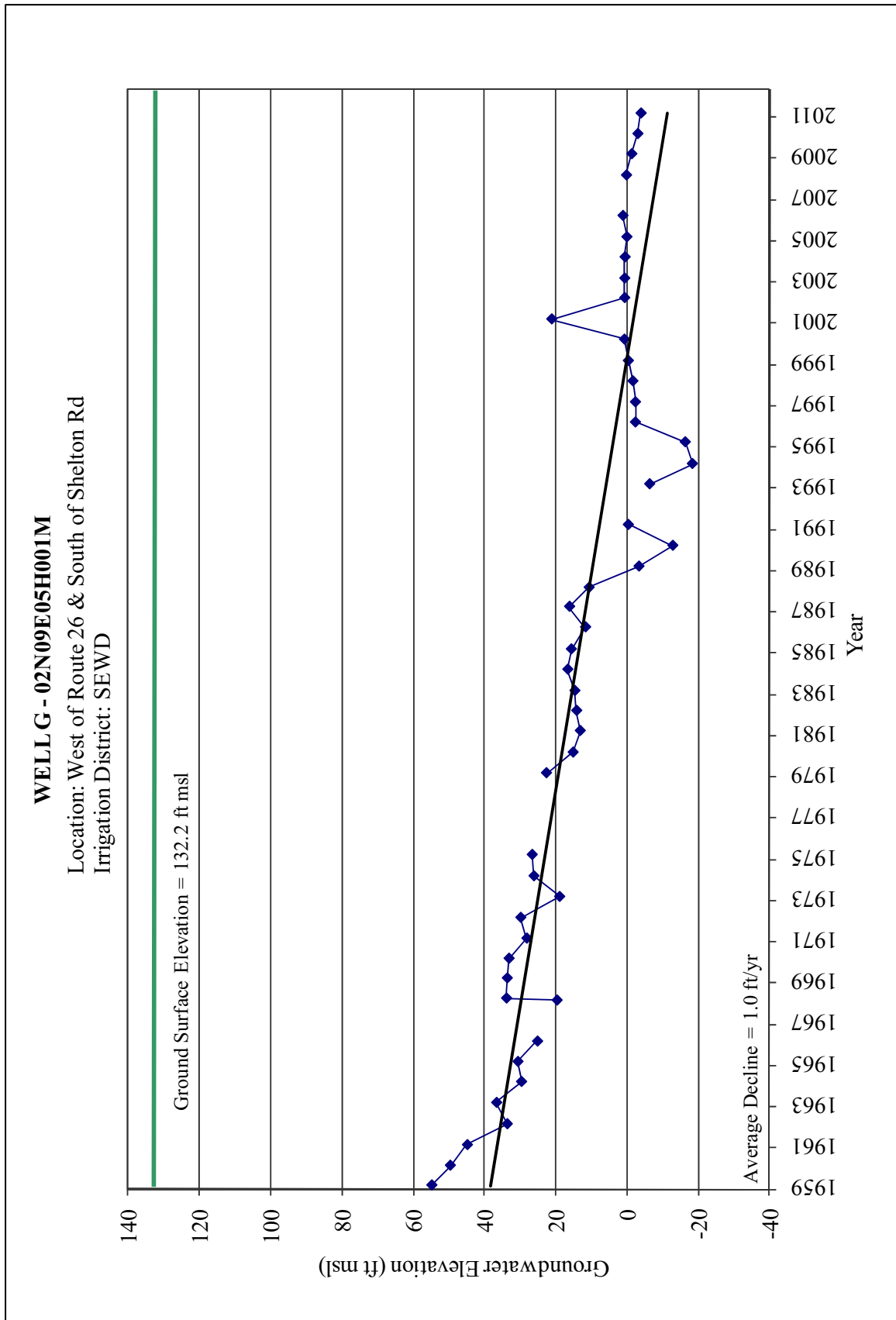


Figure 2-8 Spring Hydrograph Well G

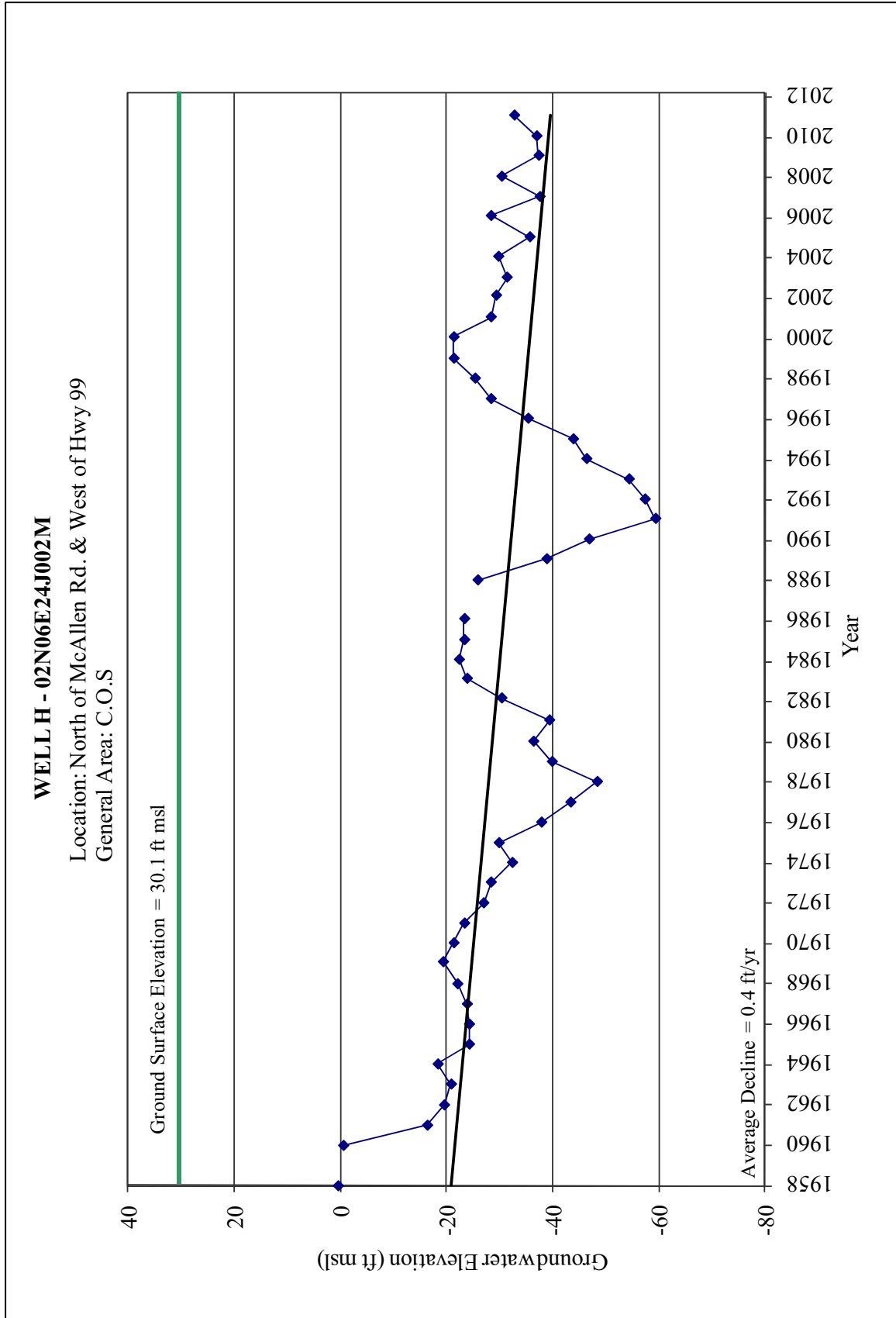


Figure 2-9 Spring Hydrograph Well H

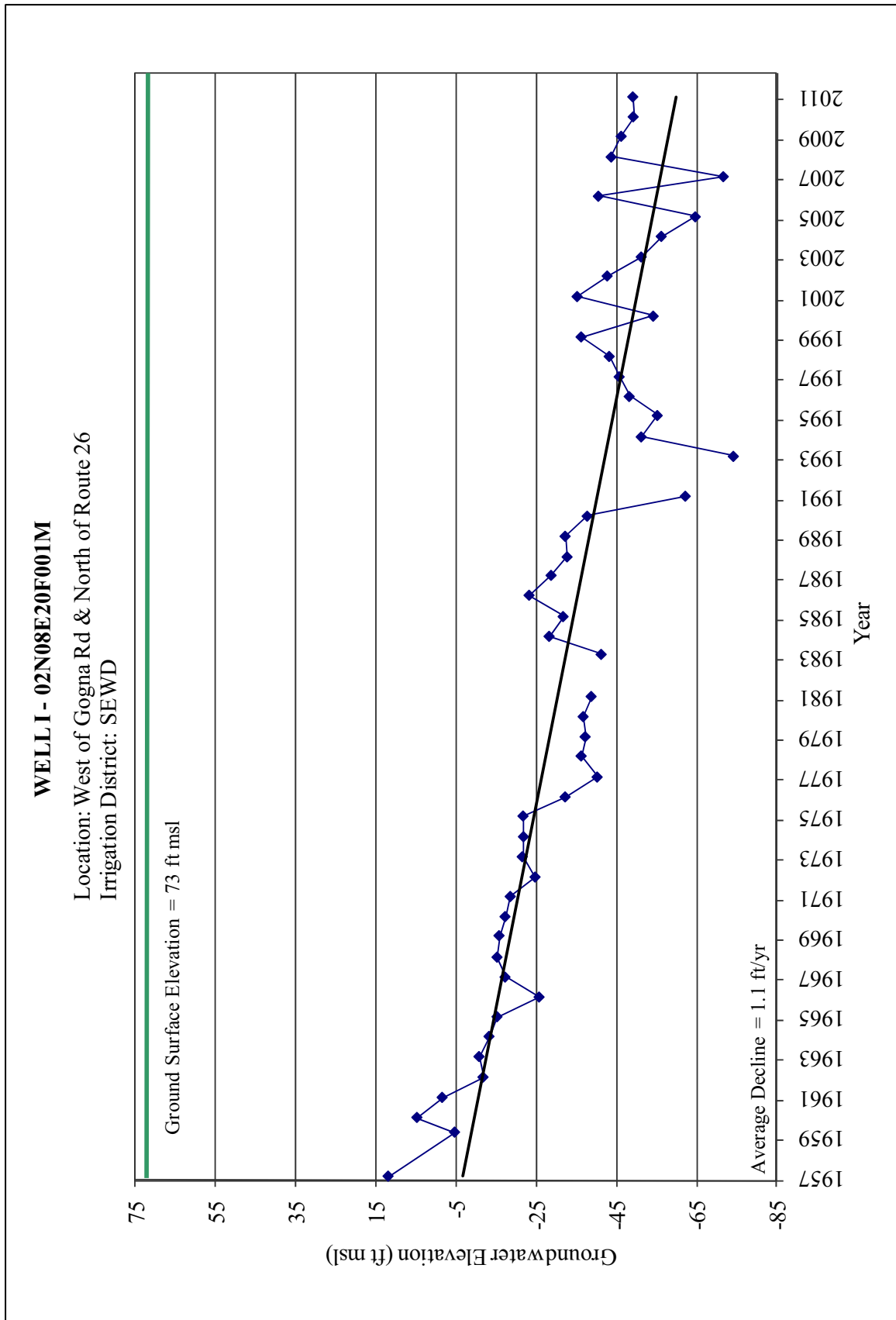


Figure 2-10 Spring Hydrograph Well I

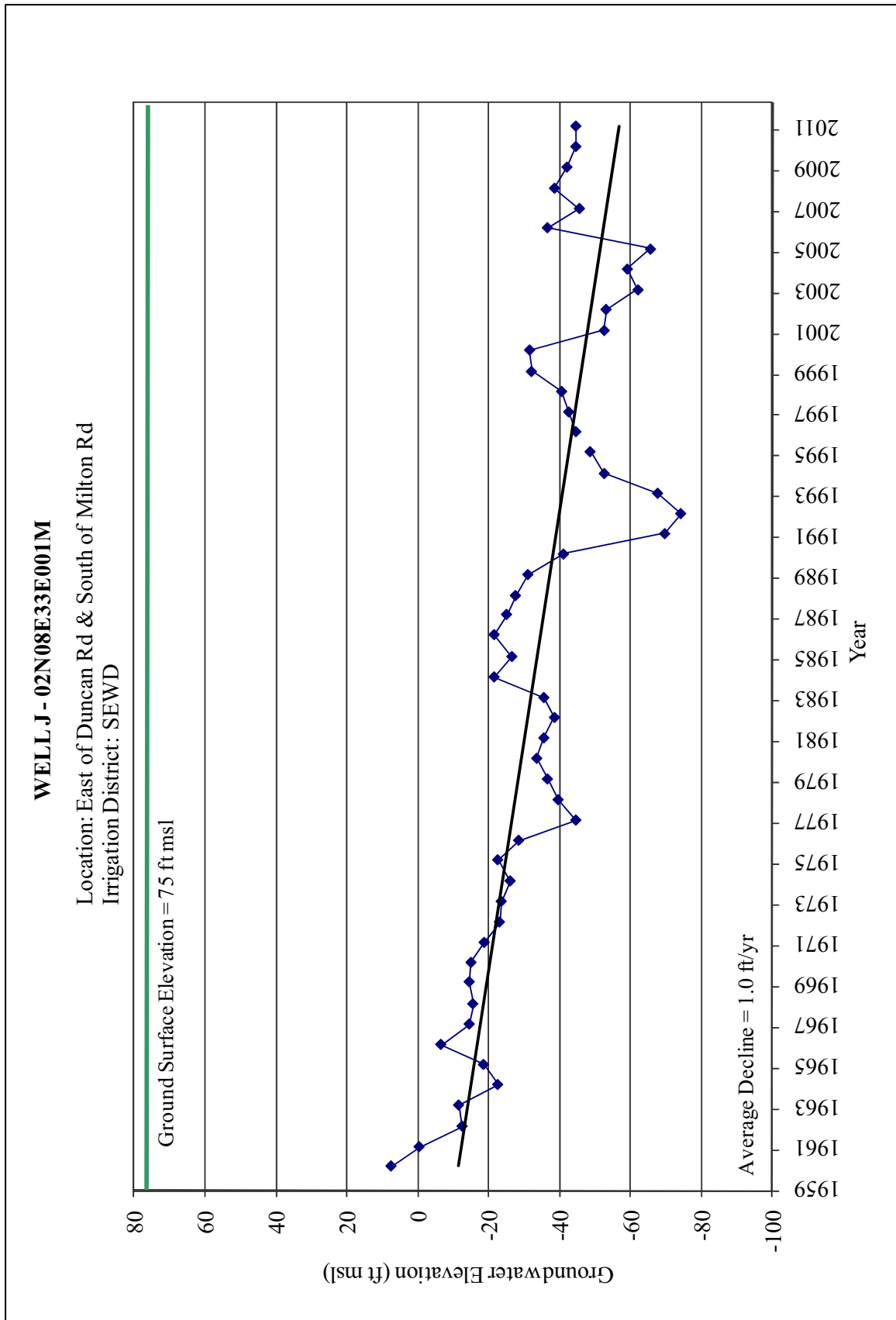


Figure 2-11 Spring Hydrograph Well J

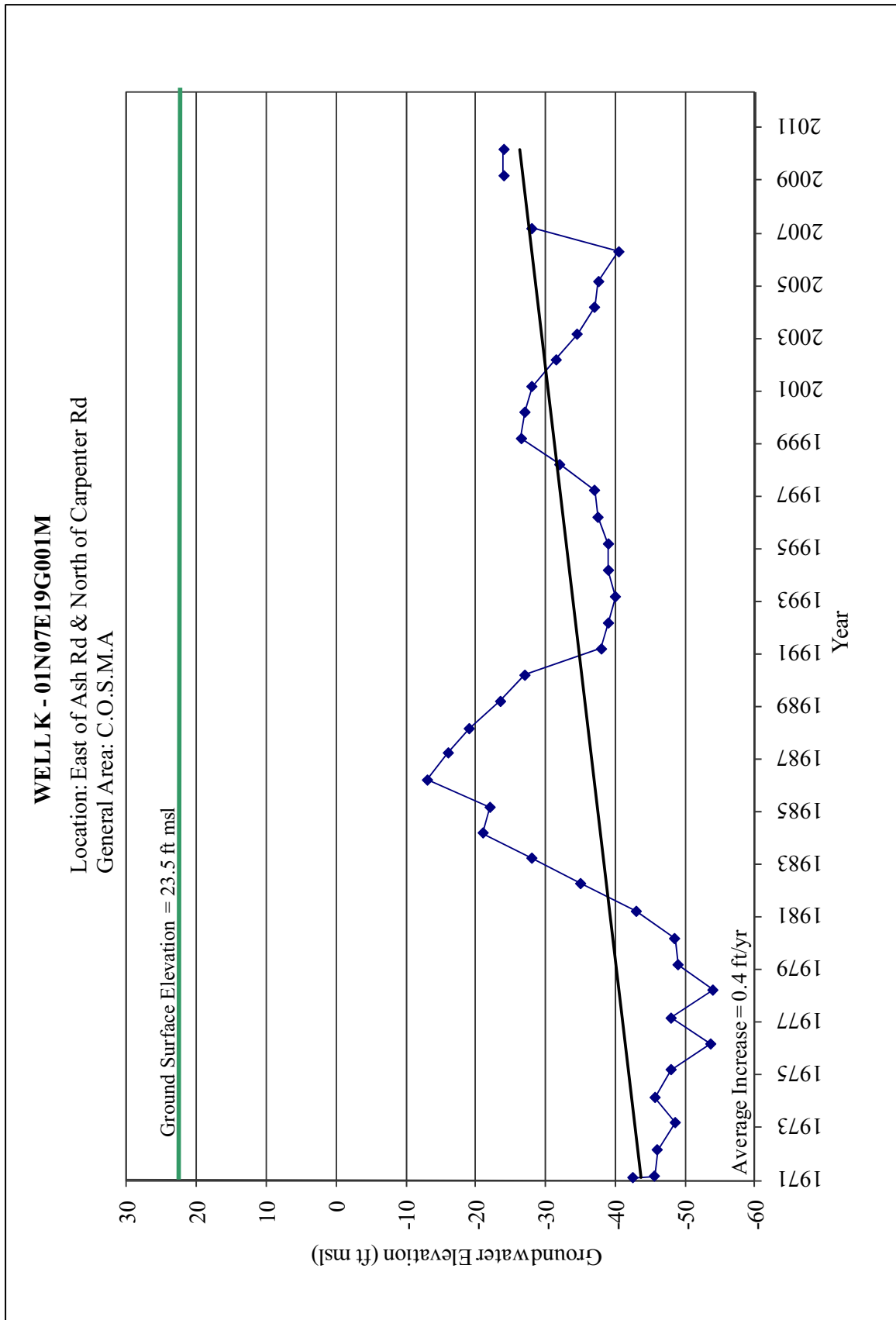


Figure 2-12 Spring Hydrograph Well K

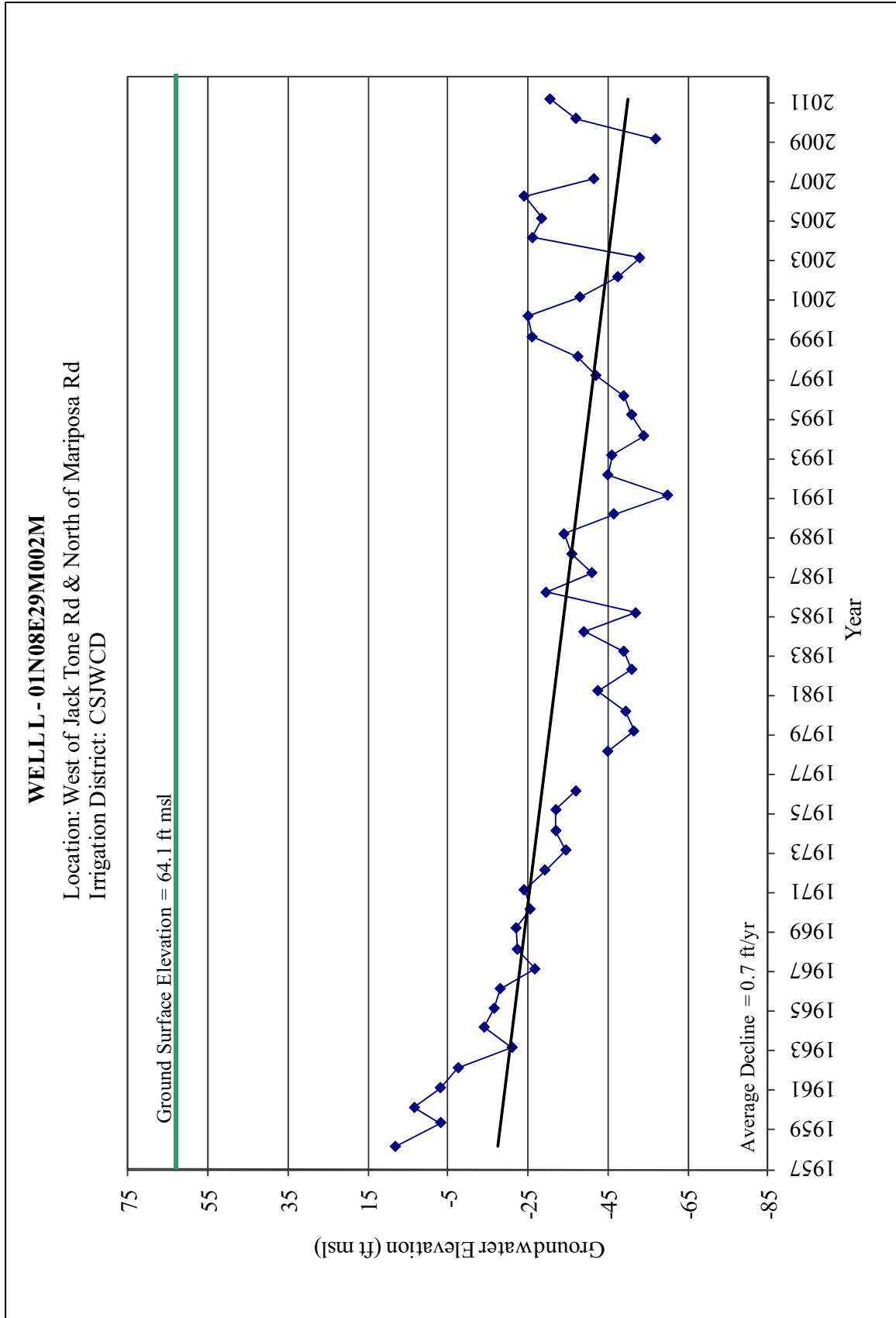


Figure 2-13 Spring Hydrograph Well L

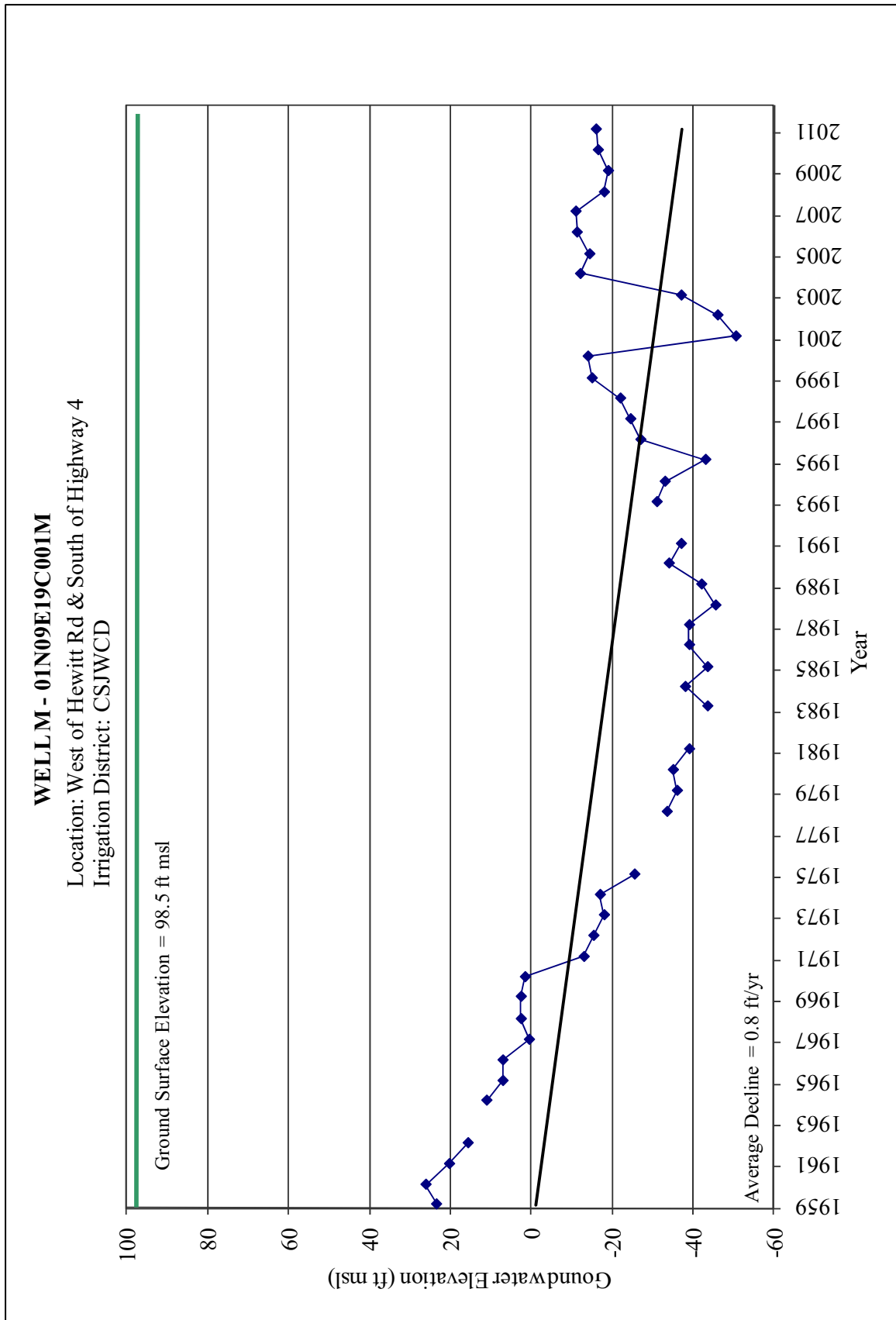


Figure 2-14 Spring Hydrograph Well M

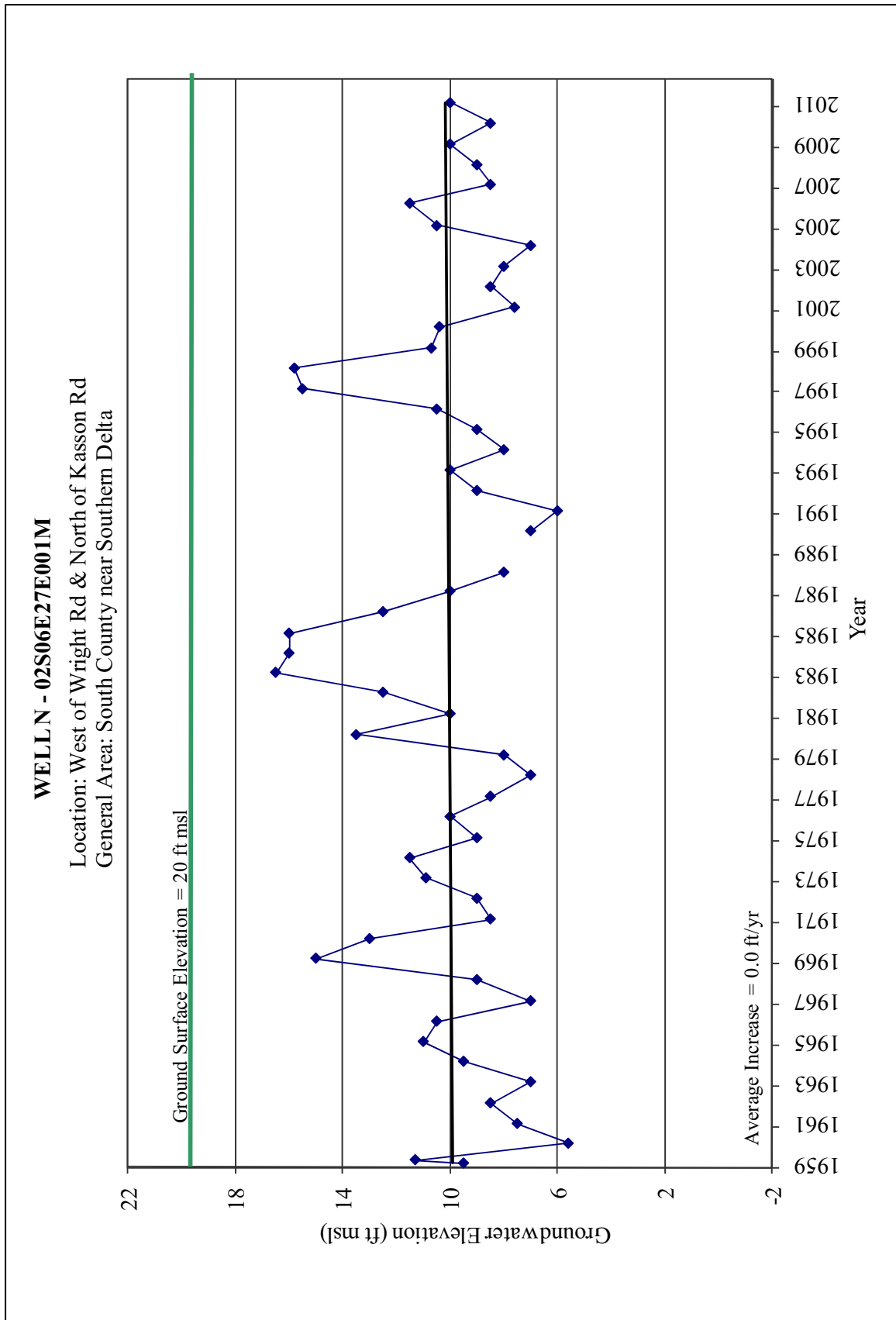


Figure 2-15 Spring Hydrograph Well N

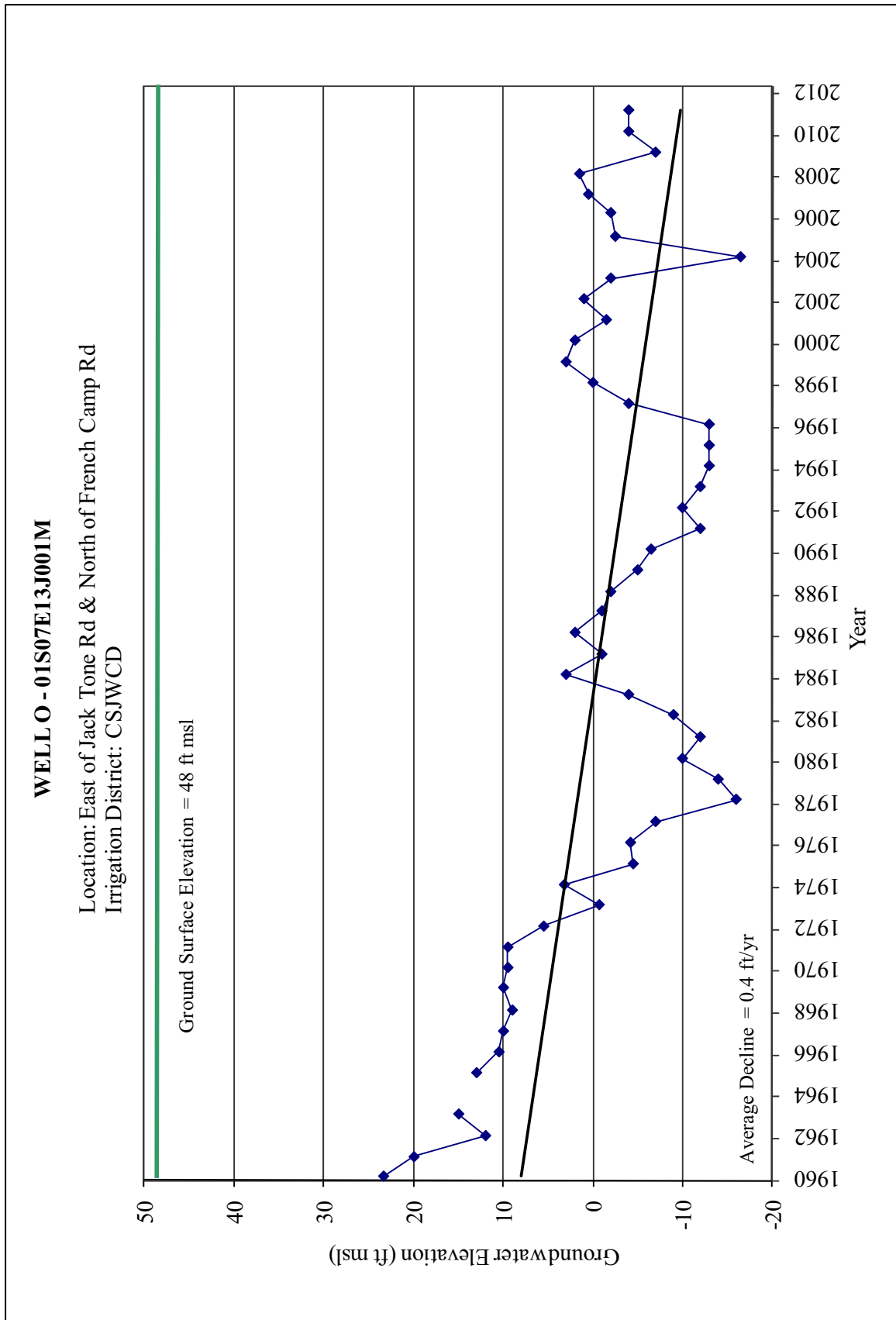


Figure 2-16 Spring Hydrograph Well O

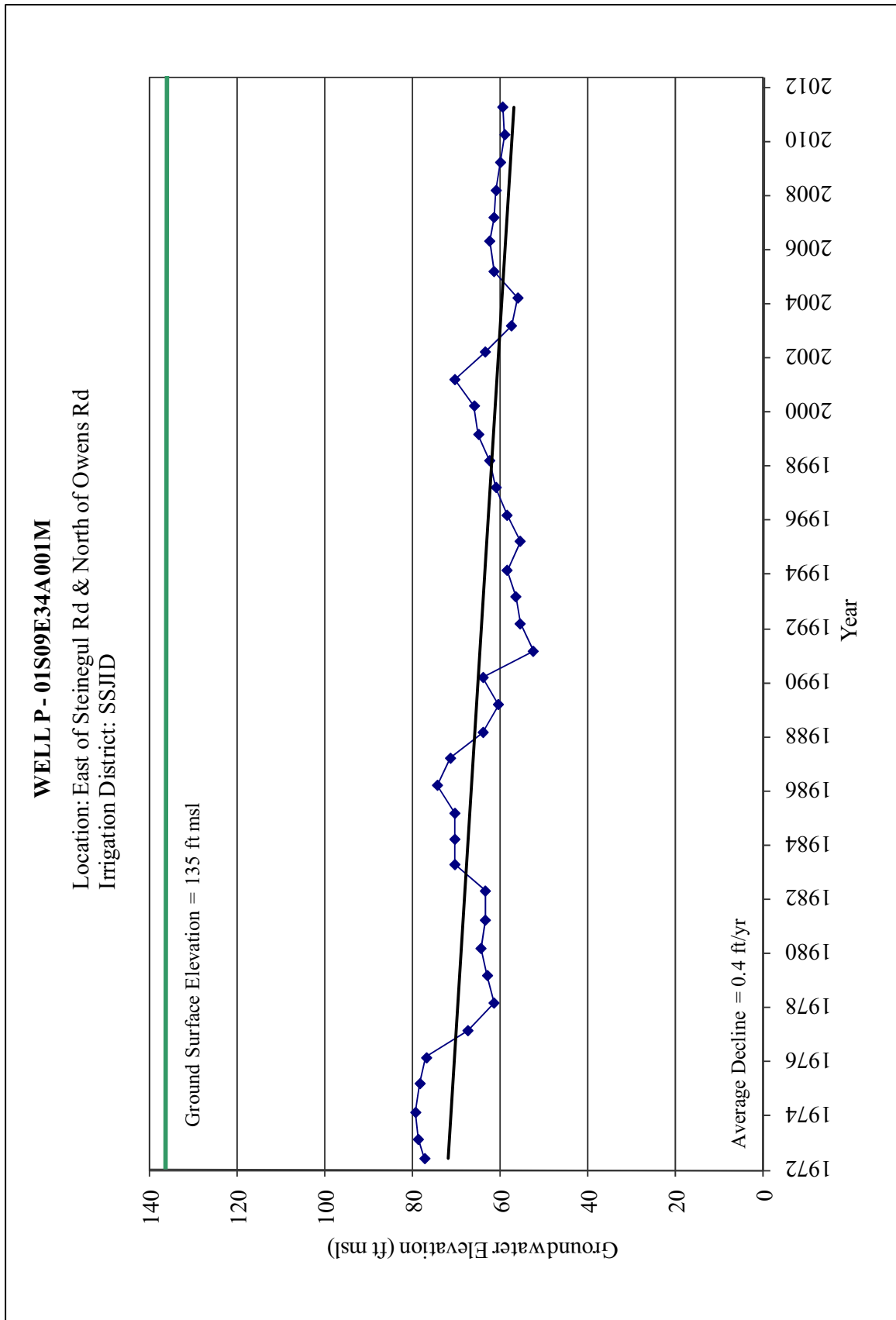


Figure 2-17 Spring Hydrograph Well P

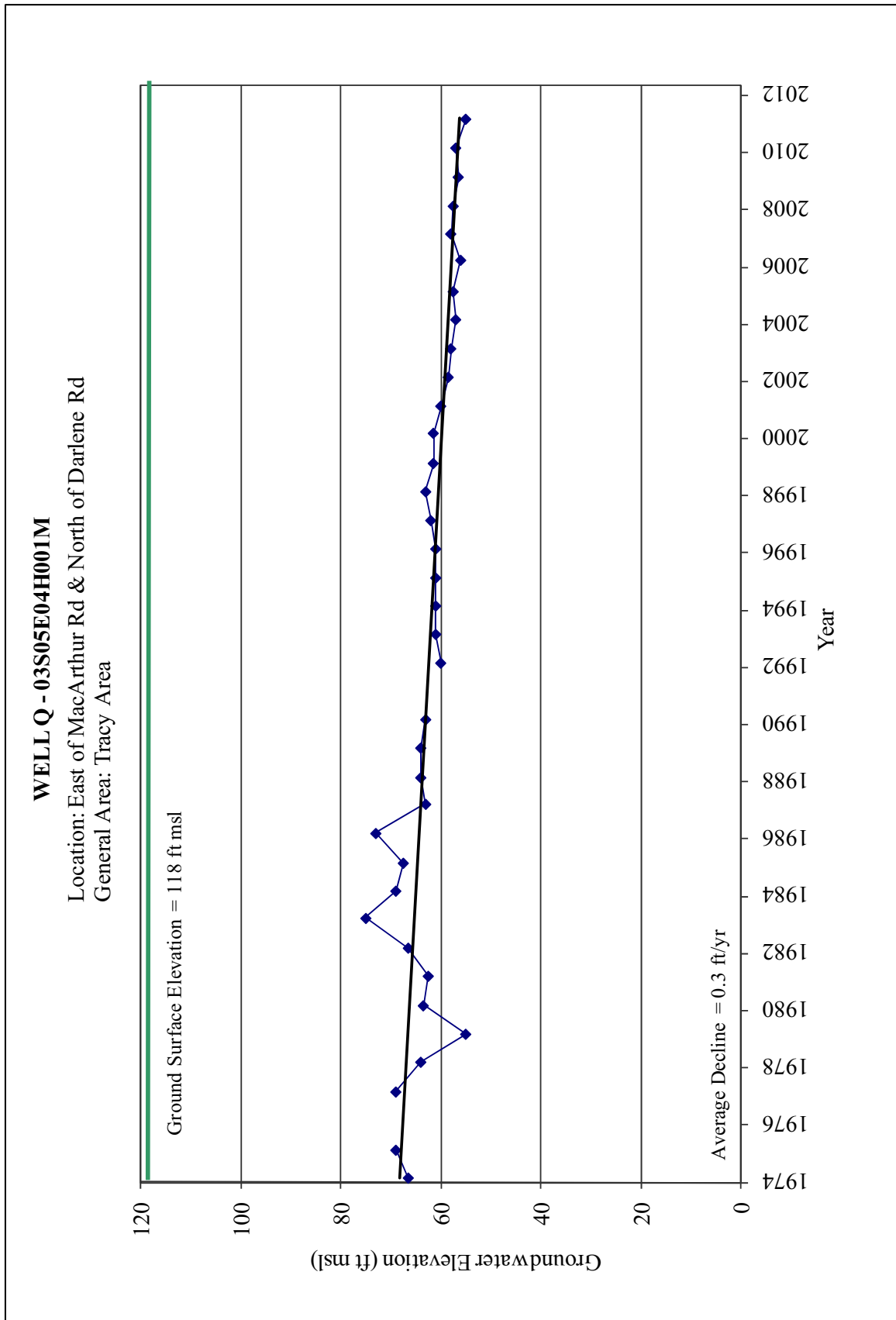


Figure 2-18 Spring Hydrograph Well Q

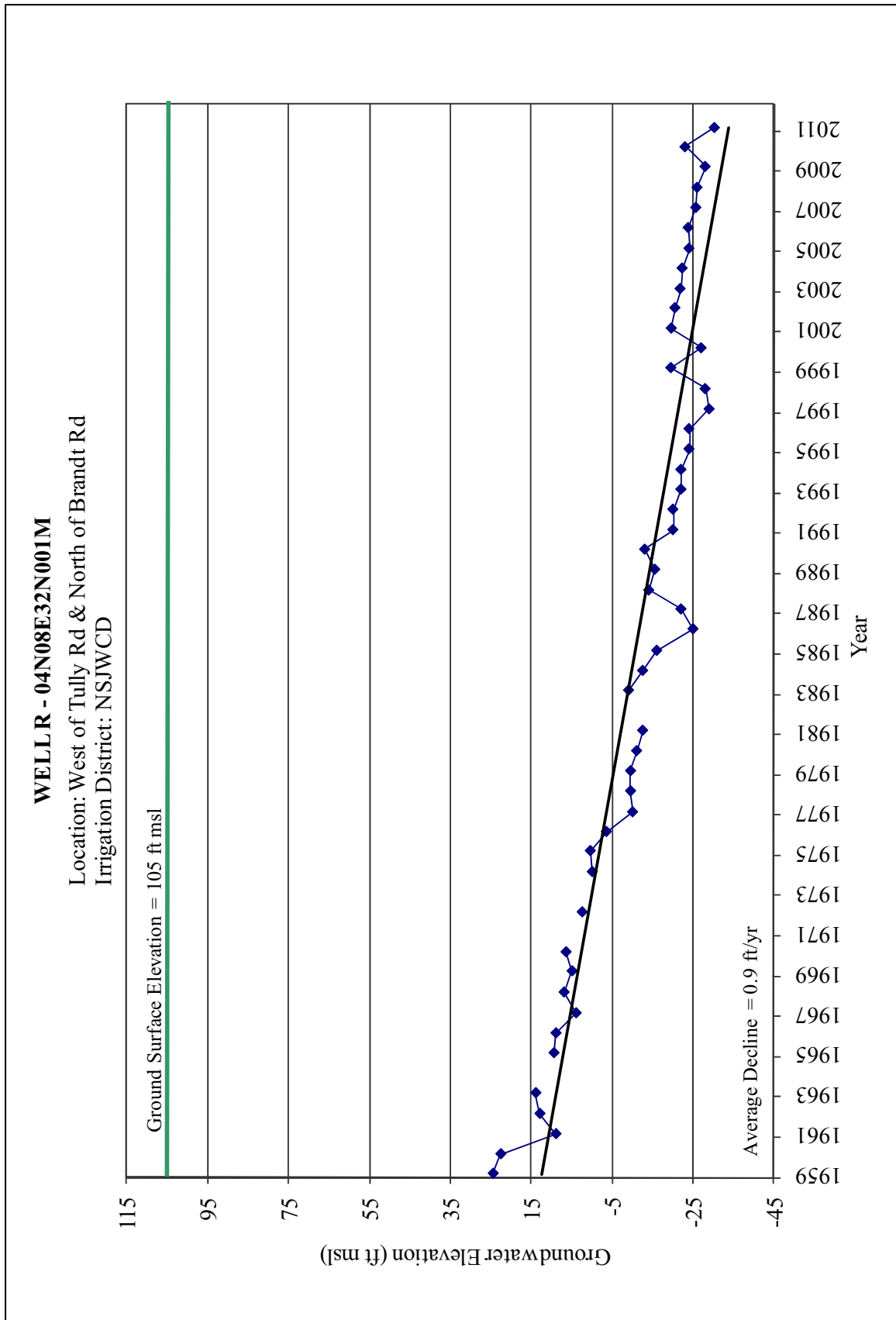


Figure 2-19 Spring Hydrograph Well R

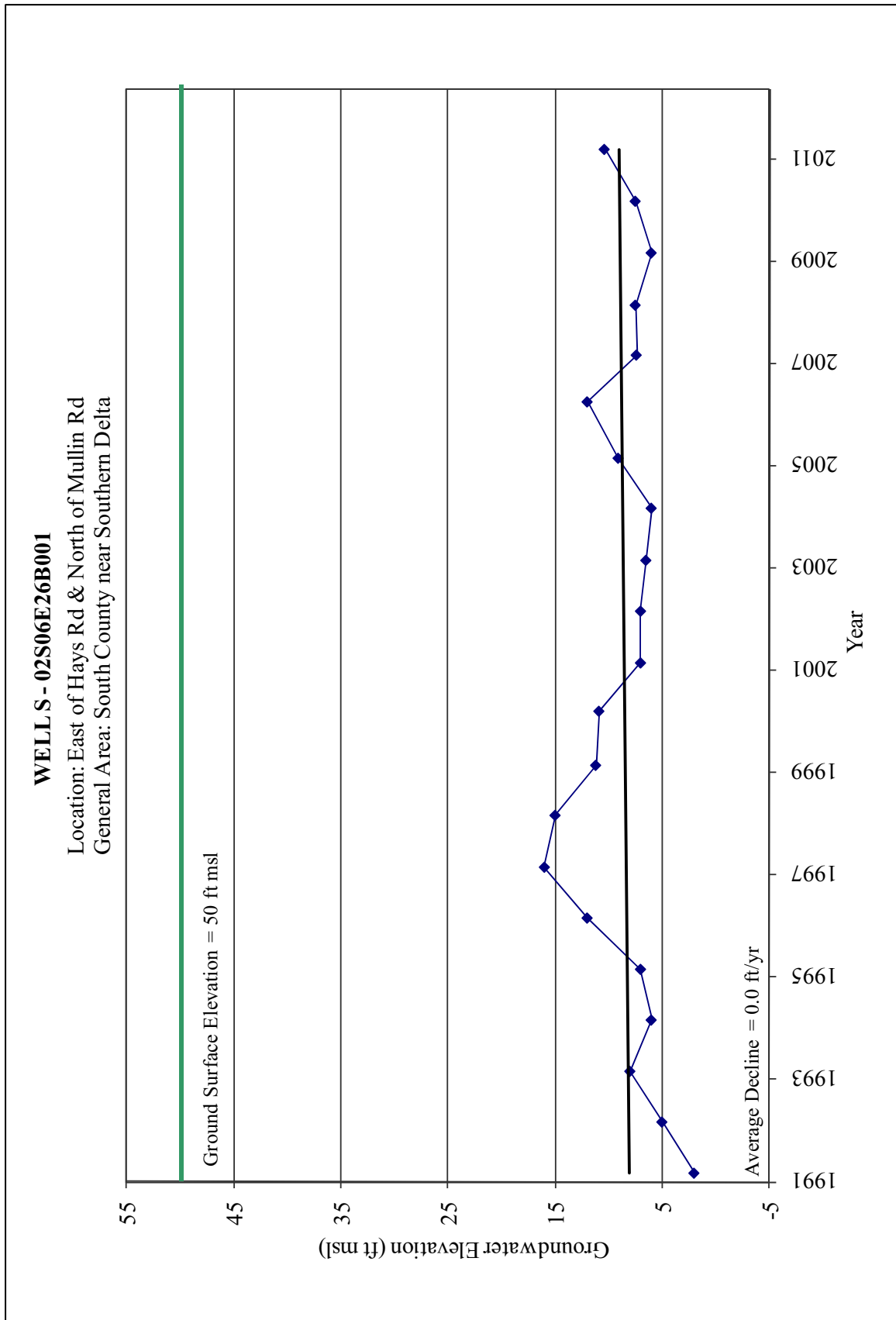


Figure 2-20 Spring Hydrograph Well S

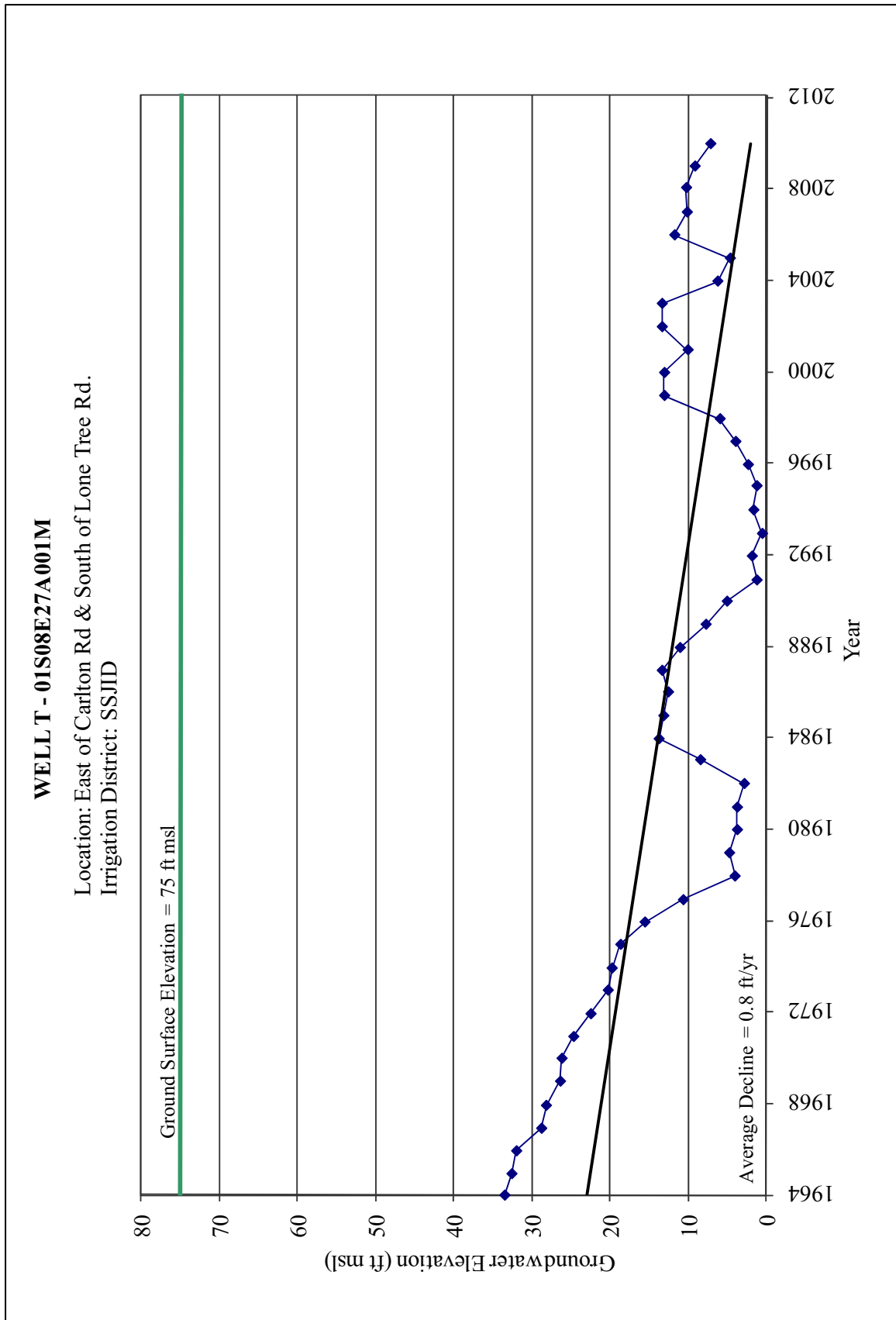


Figure 2-21 Spring Hydrograph Well T

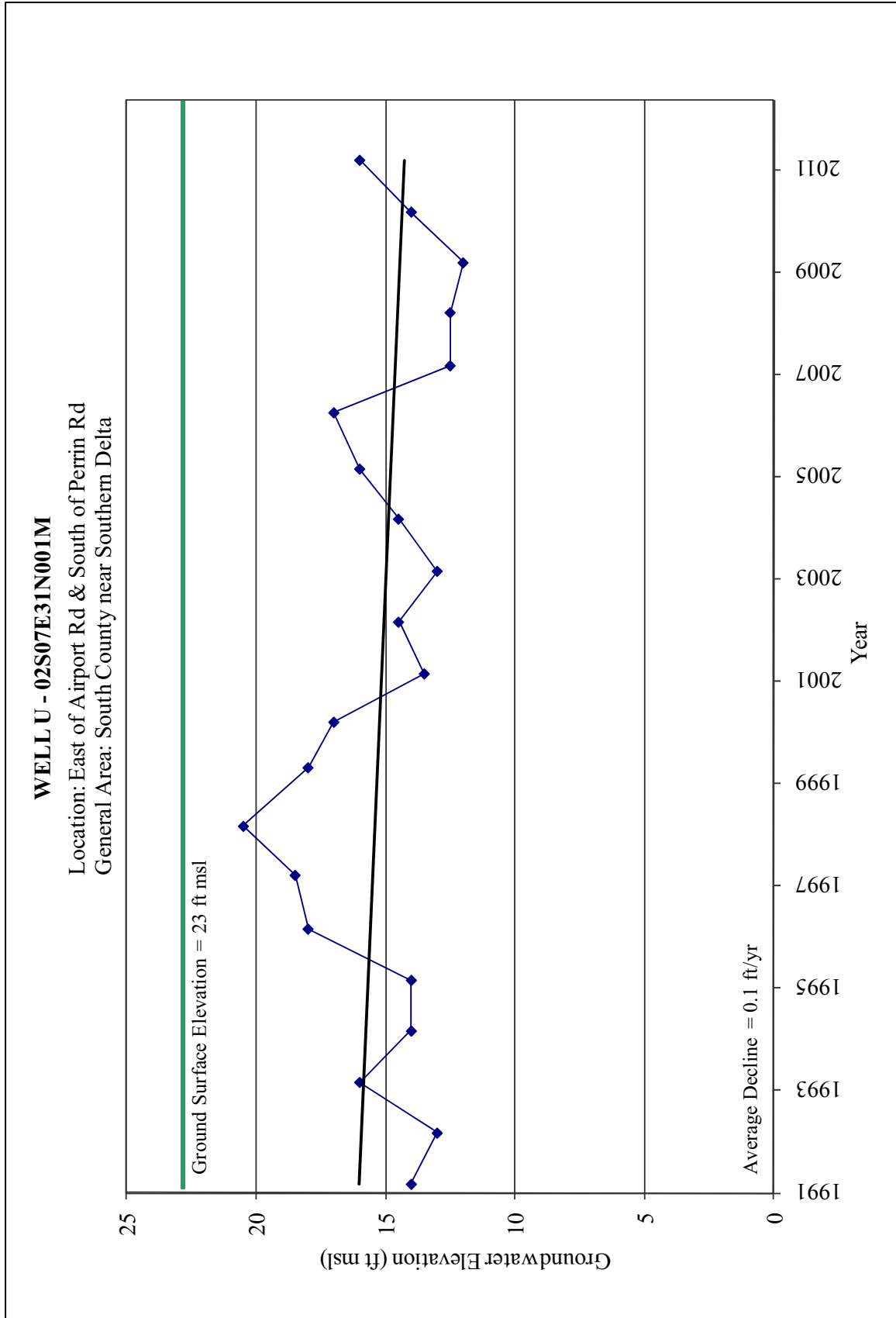


Figure 2-22 Spring Hydrograph Well U

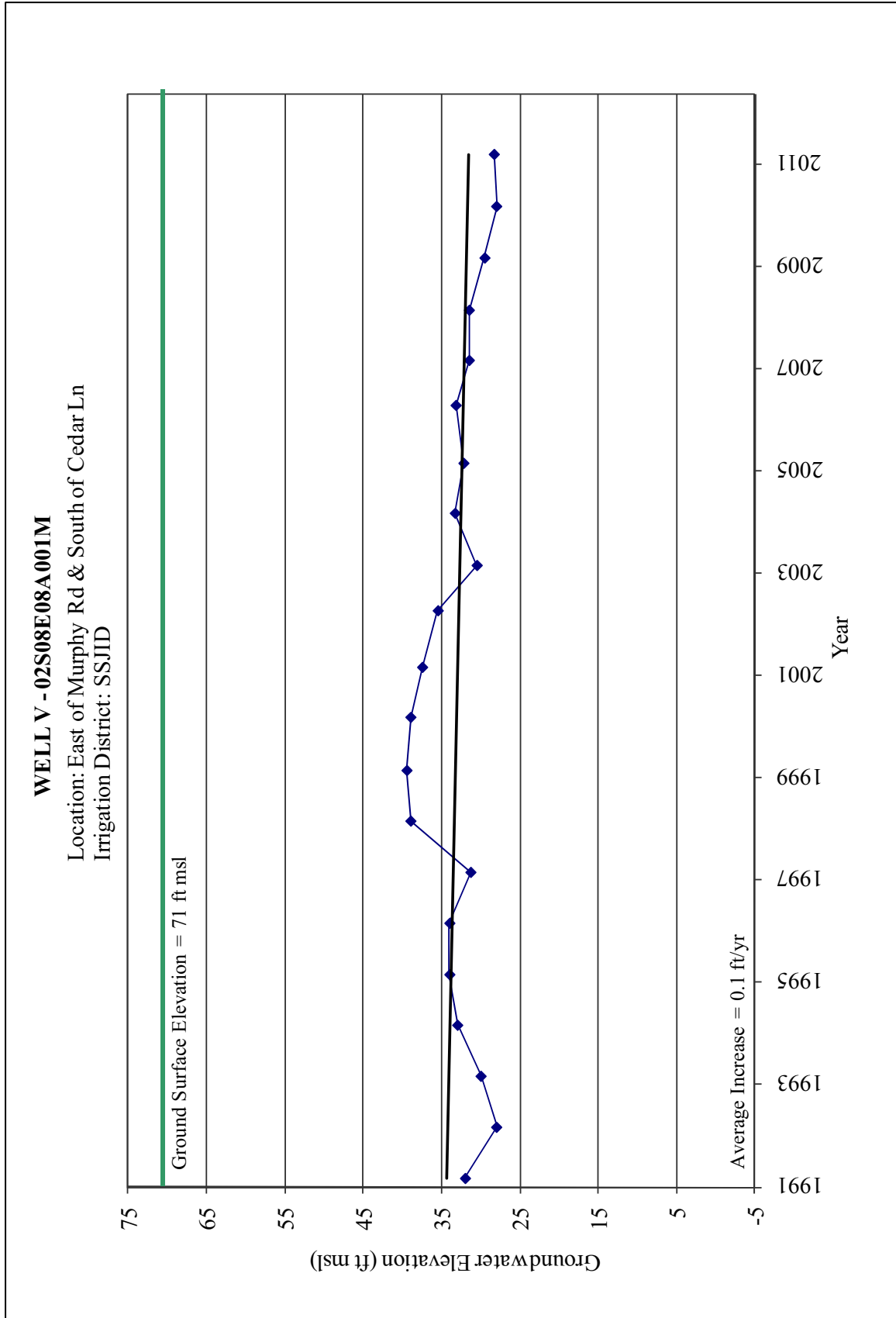


Figure 2-23 Spring Hydrograph Well V

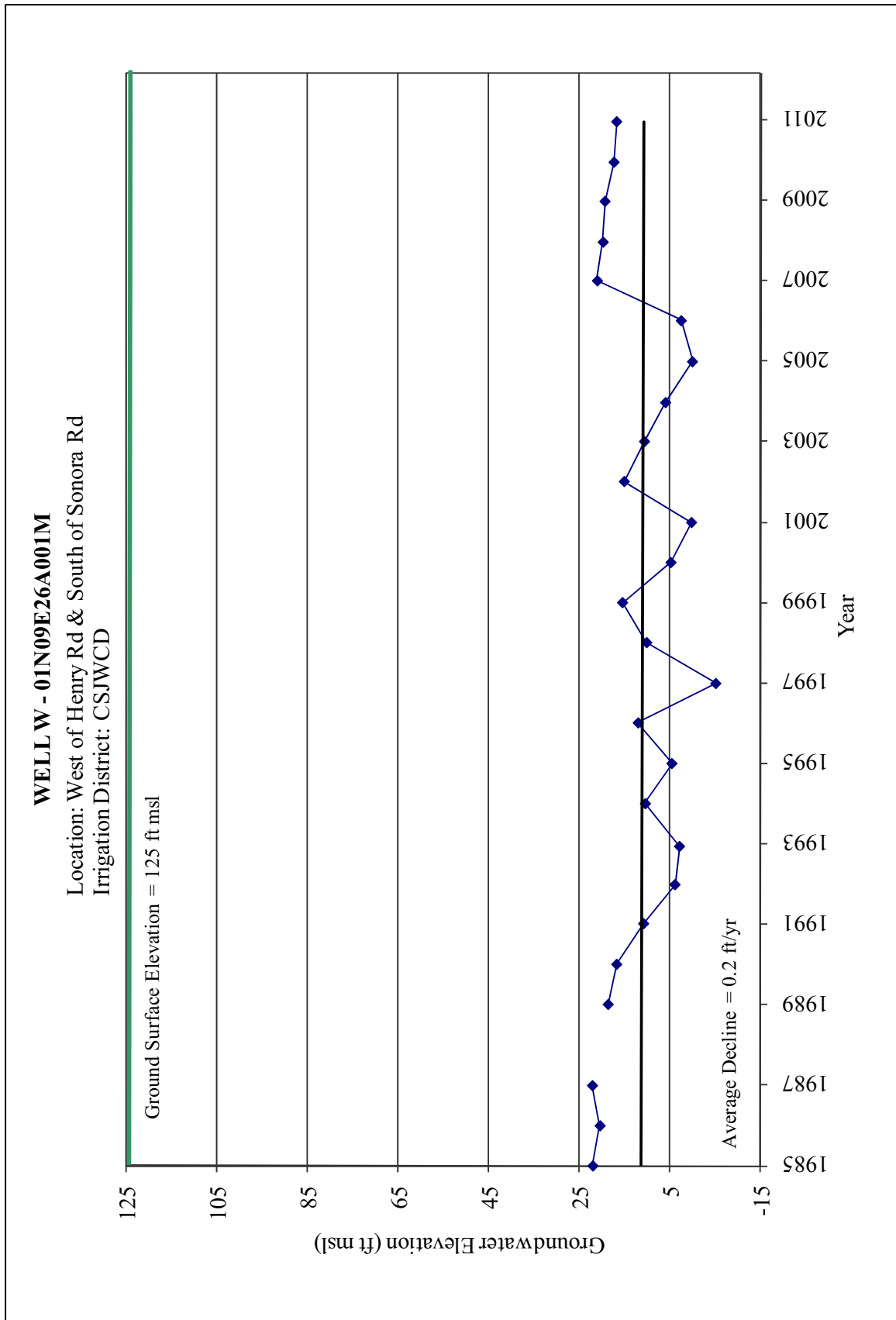


Figure 2-24 Spring Hydrograph Well W

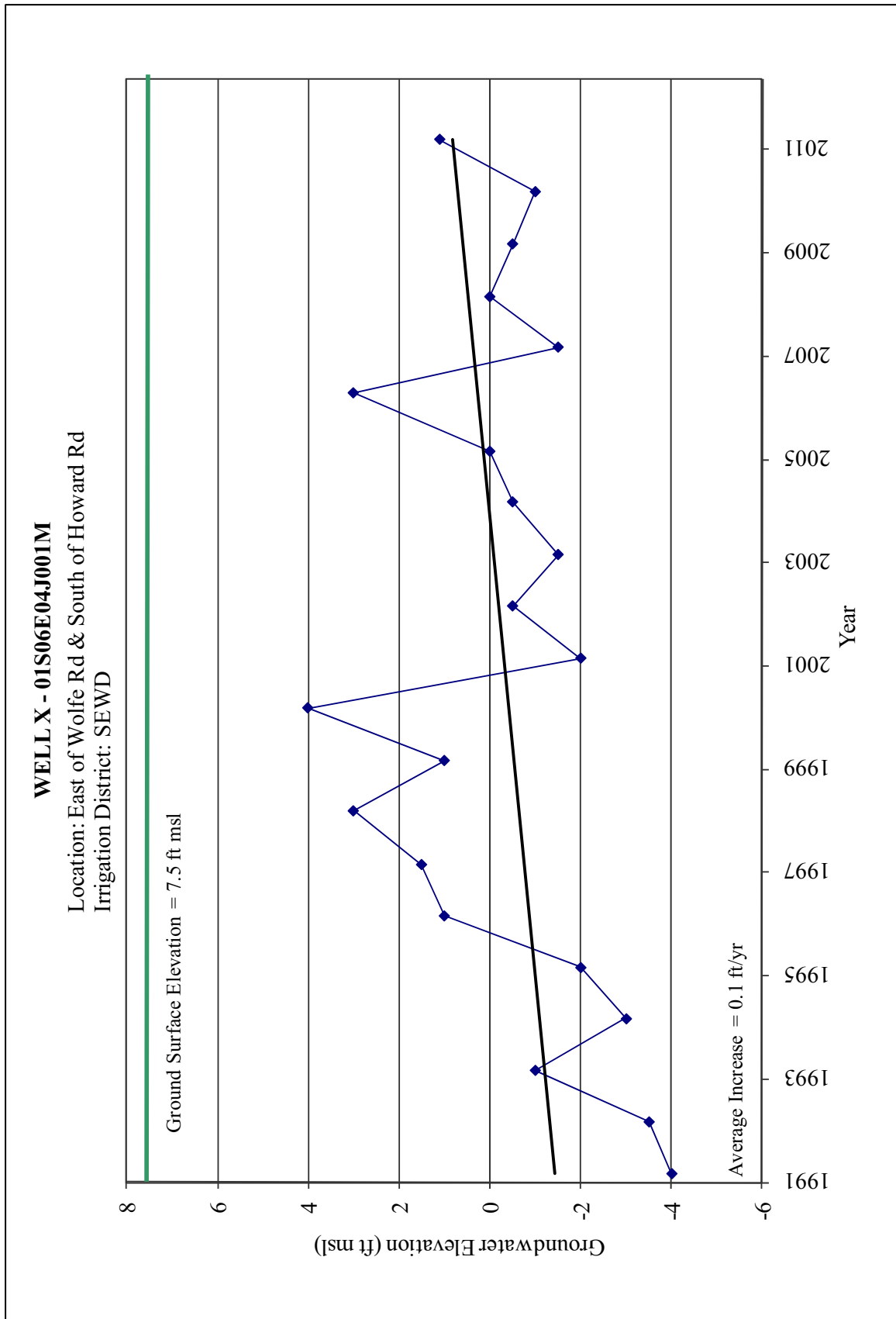


Figure 2-25 Spring Hydrograph Well X

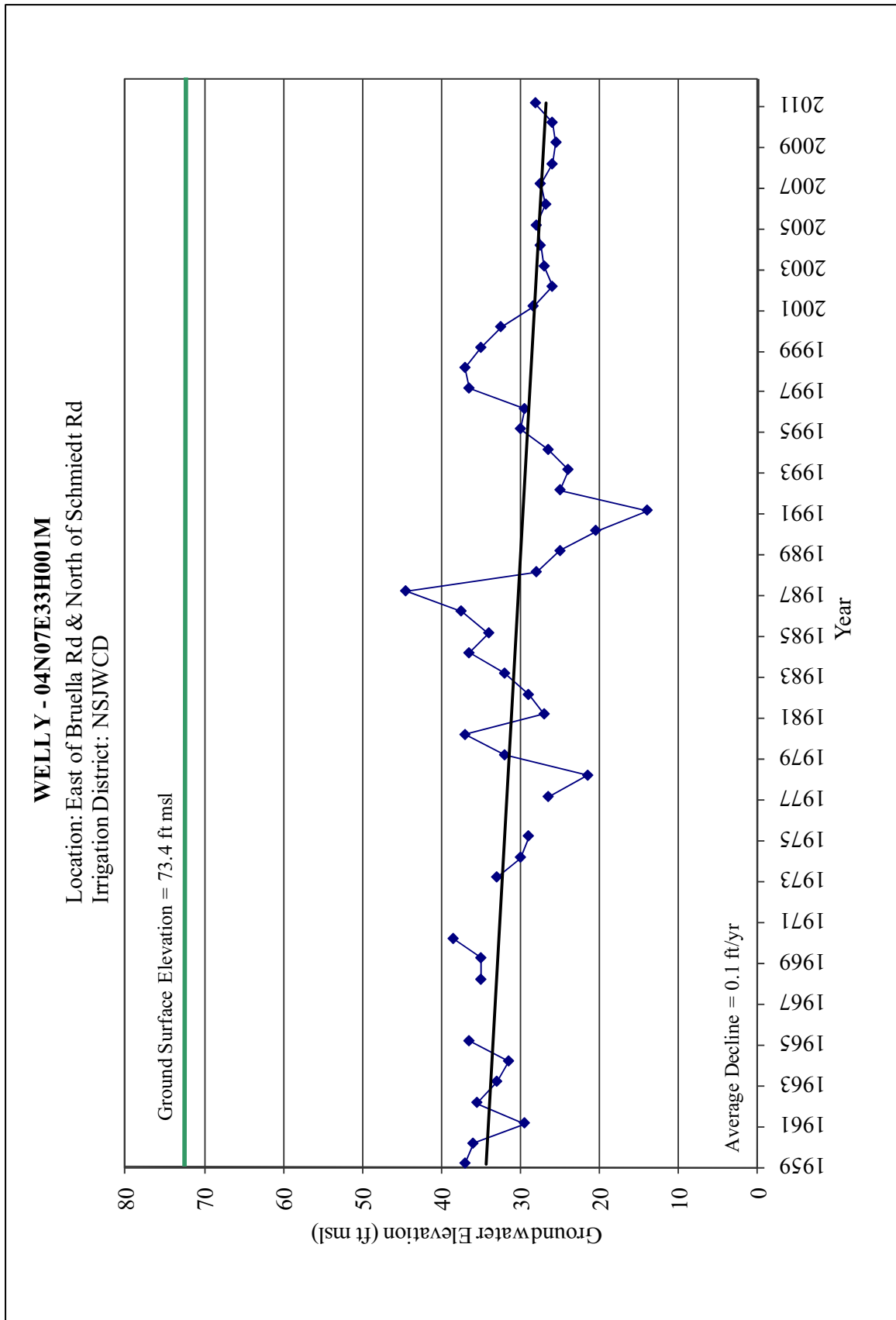


Figure 2-26 Spring Hydrograph Well Y

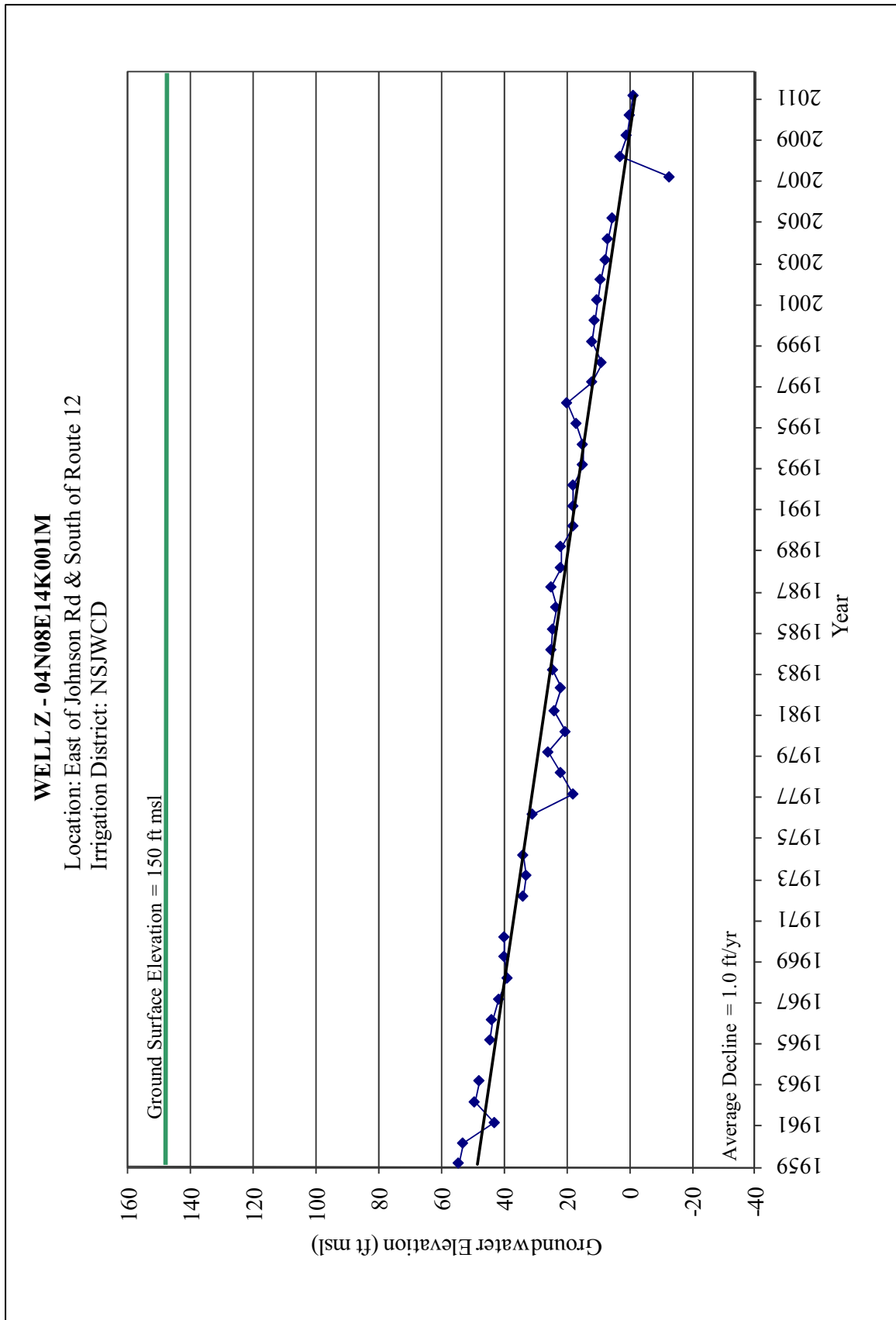


Figure 2-27 Spring Hydrograph Well Z

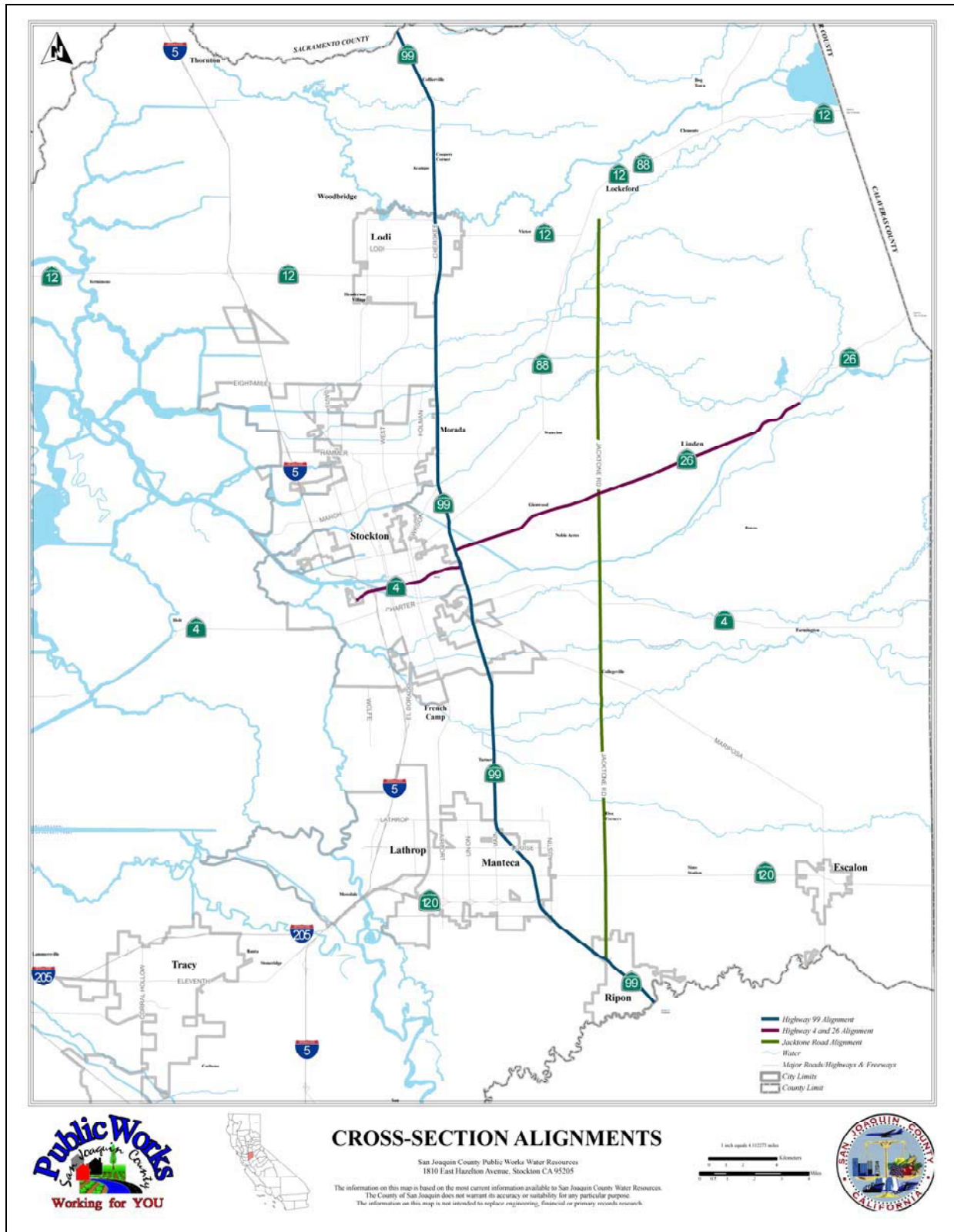


Figure 2-28 Cross Section Alignments

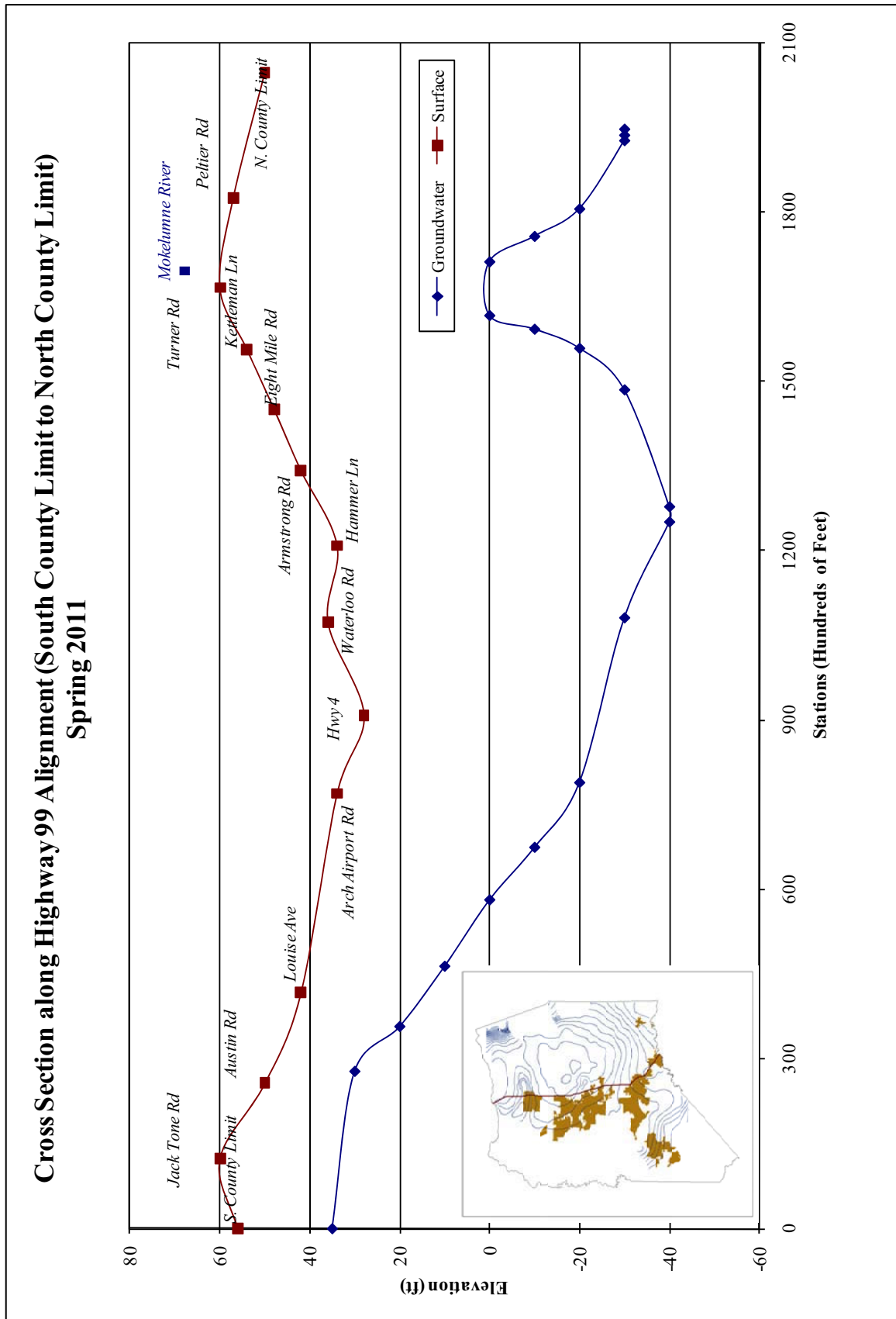


Figure 2-29 Highway 99 Cross Section Spring 2010

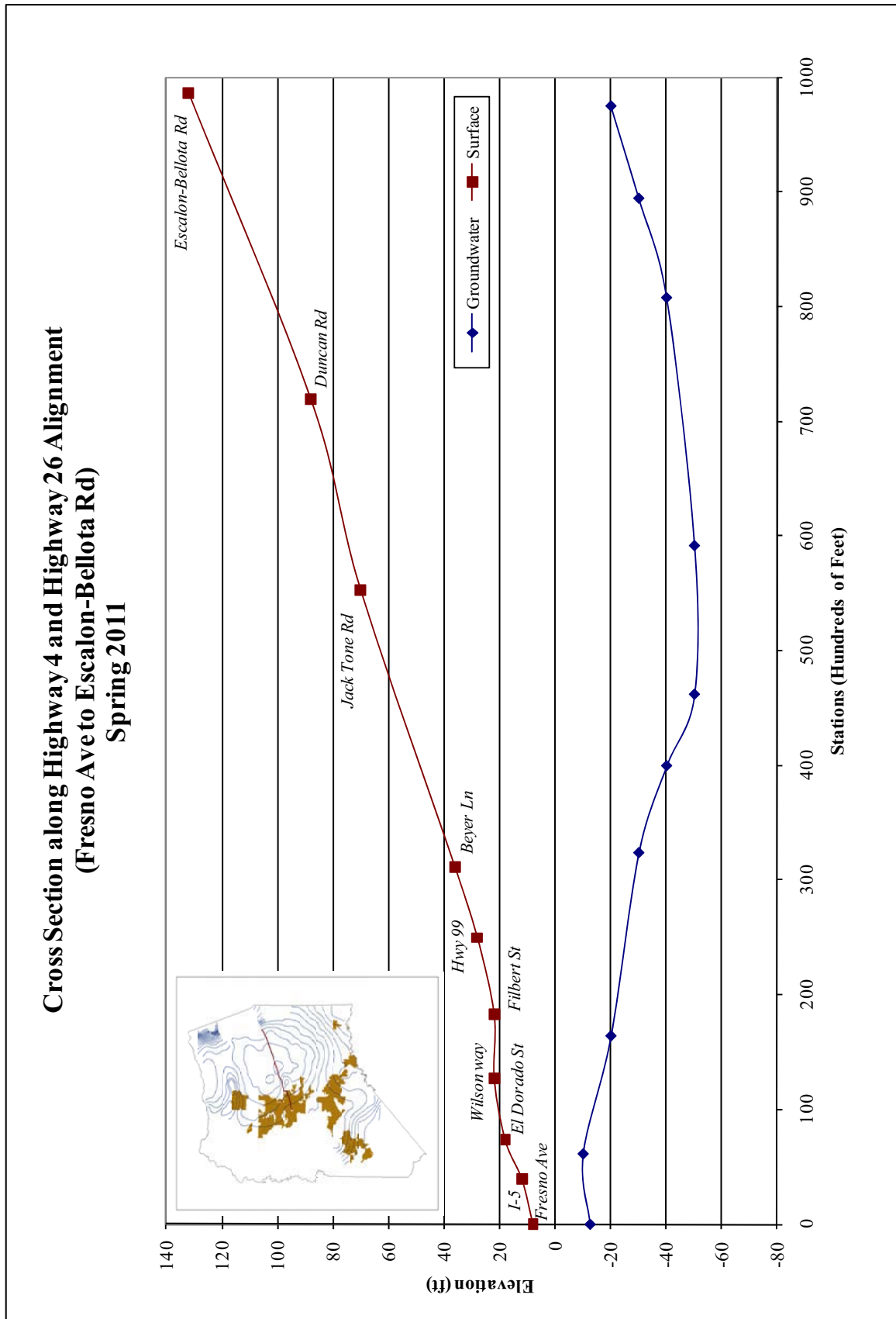


Figure 2-30 Highway 4 & Highway 26 Cross Section Spring 2011

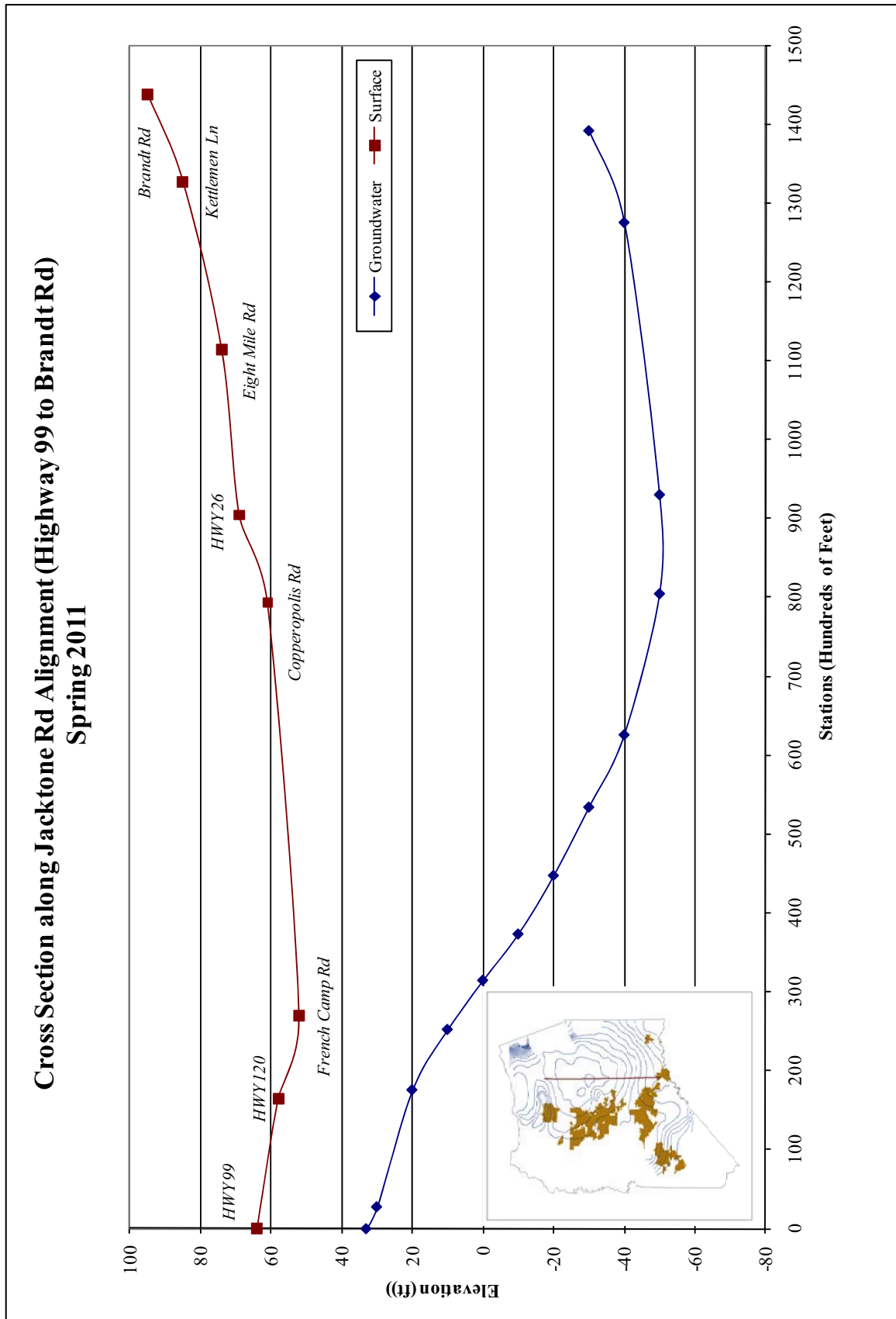


Figure 2-31 Jacktone Rd Cross Section Spring 2011

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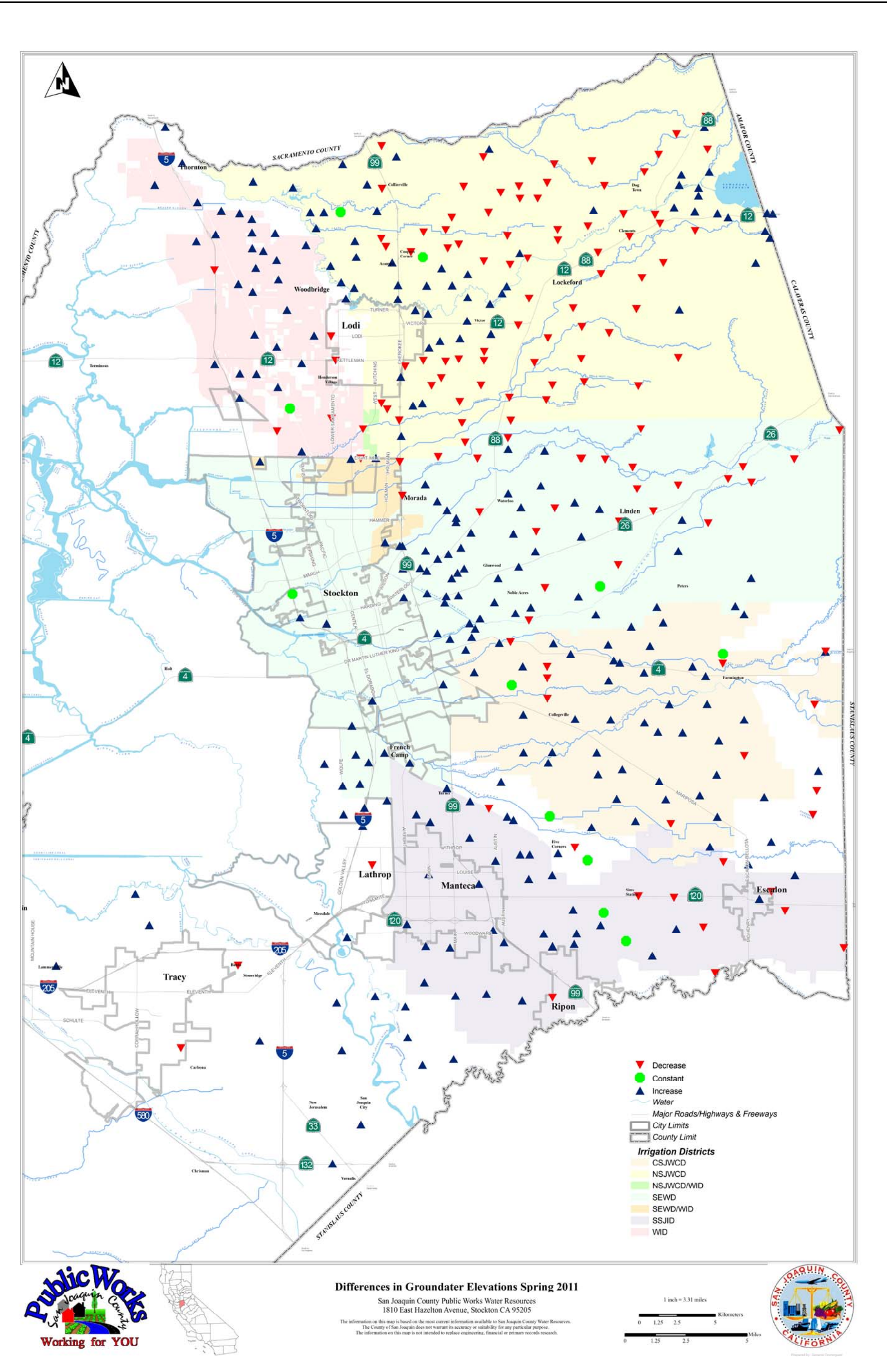


Figure 2-32 Differences in Groundwater Elevations Spring 2011 (Spring 2011 and Spring 2010 Comparisons)

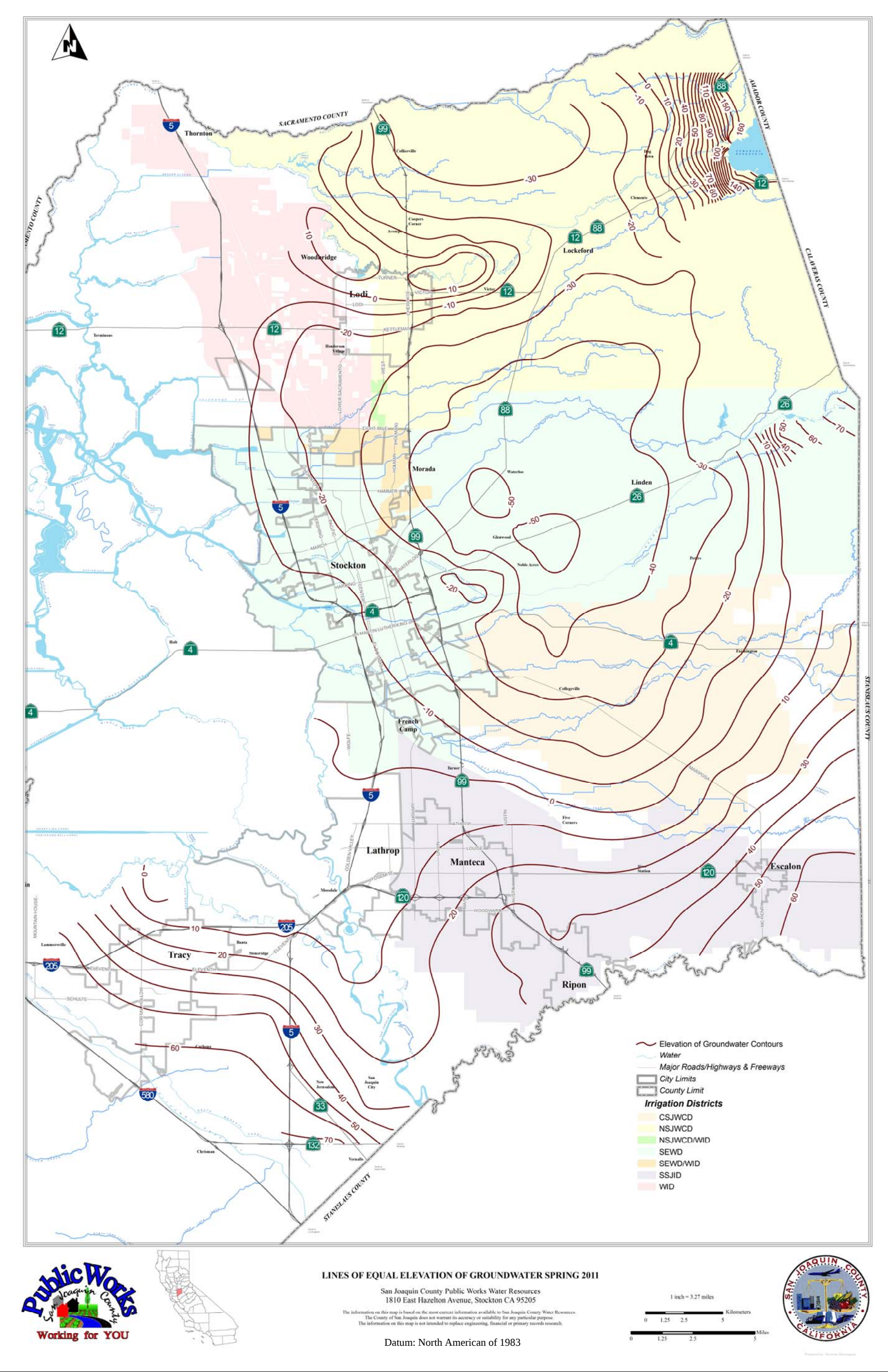


Figure 2-33 Lines of Equal Elevation of Groundwater Spring 2011

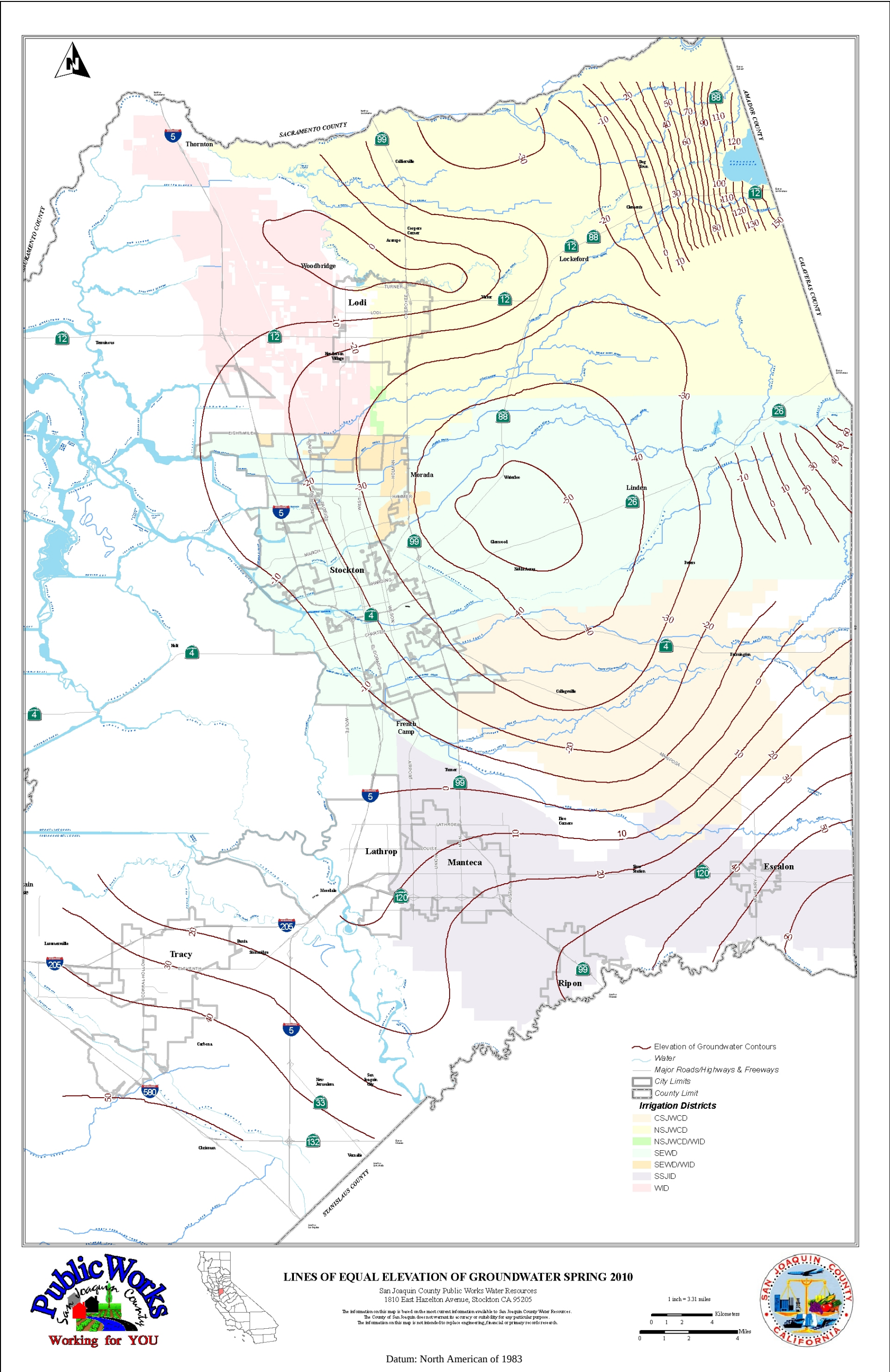


Figure 2-34 Lines of Equal Elevation of Groundwater Spring 2010

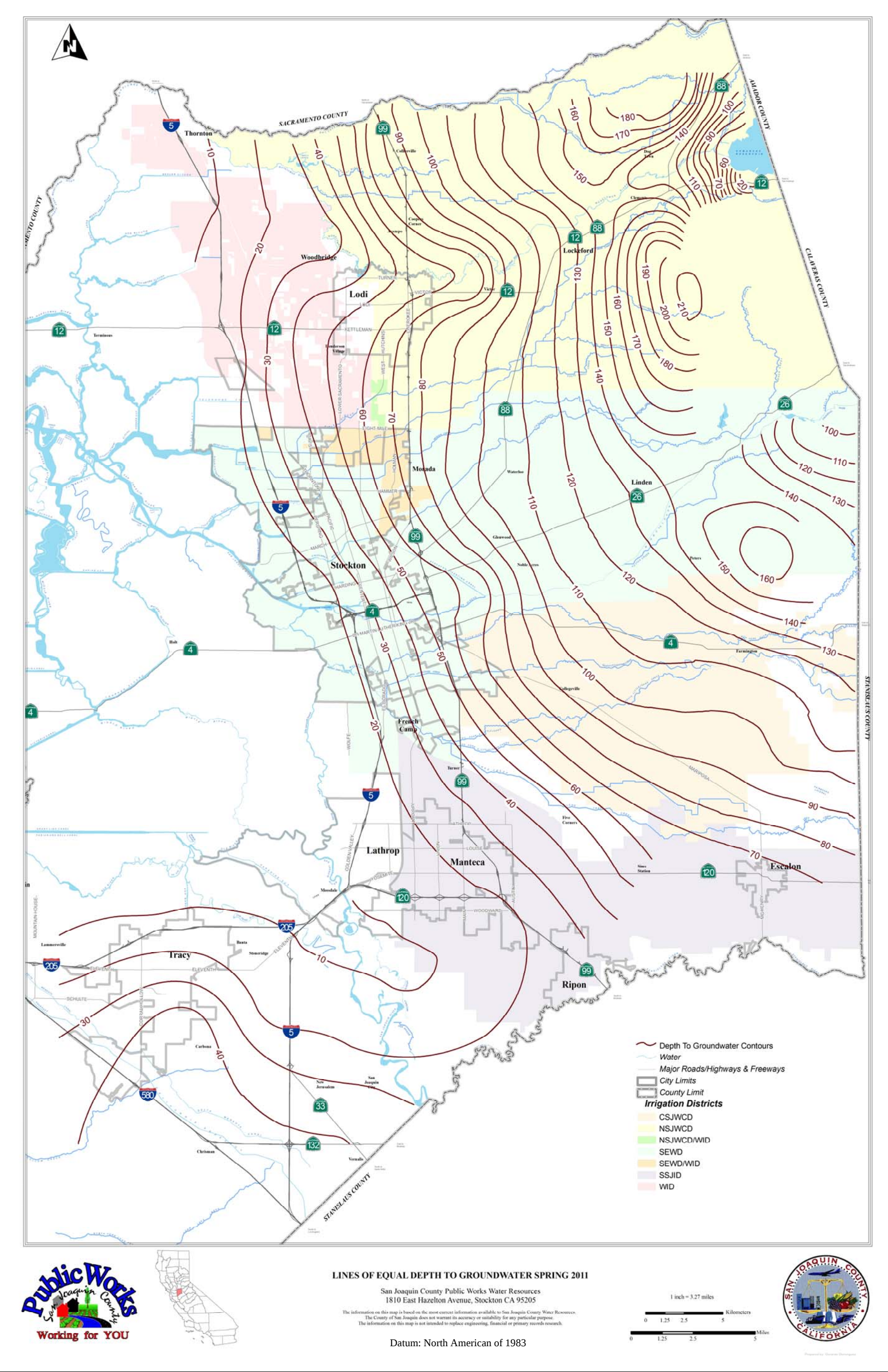


Figure 2-35 Lines of Equal Depth to Groundwater Spring 2011

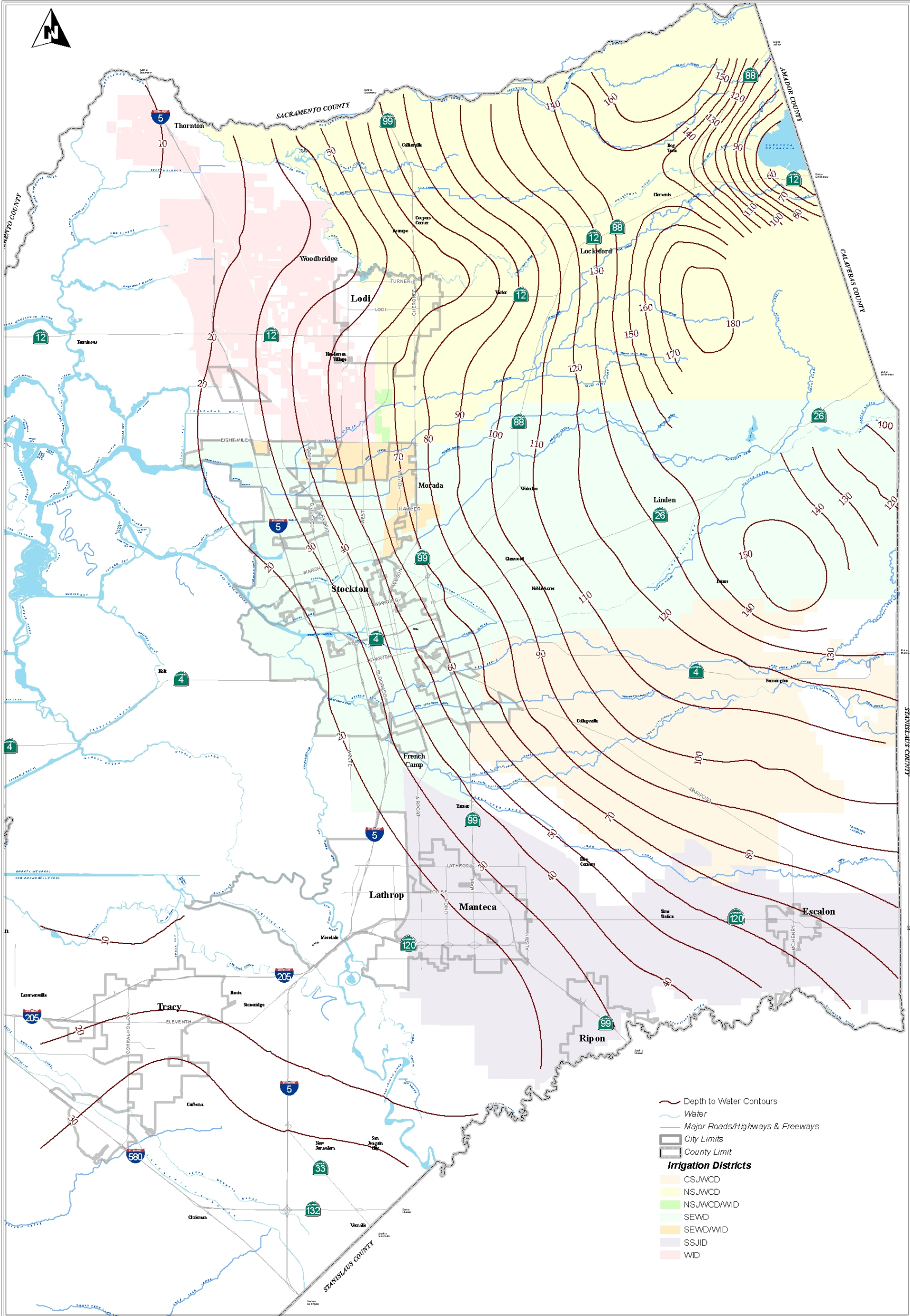


Figure 2-36 Lines of Equal Depth to Groundwater Spring 2010