Groundwater Report

Spring 2017

San Joaquin County
Flood Control and Water Conservation District

San Joaquin County
Flood Control and Water Conservation District

Board of Supervisors

Chuck Winn, Chairman
Miguel Villapudua Vice Chairman
Katherine Miller
Tom Patti
Bob Elliot

Flood Control Engineer
Director of Public Works

Kris Balaji, PMP, P.E.

Deputy Director of Public Works

Fritz Buchman, P.E.

Report Prepared by:

DISTRICT STAFF

Brandon W. Nakagawa, P.E. ……...Water Resources Coordinator
Michael Callahan, P.E. ……...Senior Engineer
Gerardo Dominguez, P.E. ……..……..Associate Engineer
Justin Padilla ……..Engineering Assistant

Copies of the Spring 2017 Groundwater Report may be purchased for $30 and 36”X48” Contour Maps for $25 each from:

San Joaquin County Department of Public Works
P.O. Box 1810
Stockton, California 95201
Make checks payable to: San Joaquin County Department of Public Works

Acknowledgements

. . .

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.

This page intentionally left blank

Table of Contents

. . .

San Joaquin County Flood Control and Water Conservation District
Spring 2017 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^-) by Fruit Growers Laboratory, Inc., and analyzed for Electrical Conductivity (EC) using DiST 3 by Hanna Instruments. Total Dissolved Solids (TDS) are calculated using the formula: TDS = 0.64 X 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–Rainfall Distribution

Summary of 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 as well as the station located in Tracy, has pertinent data beginning in 1940. Lodi station has been collecting data since 1927 and Camp Pardee station has data from 1949 to 2017.

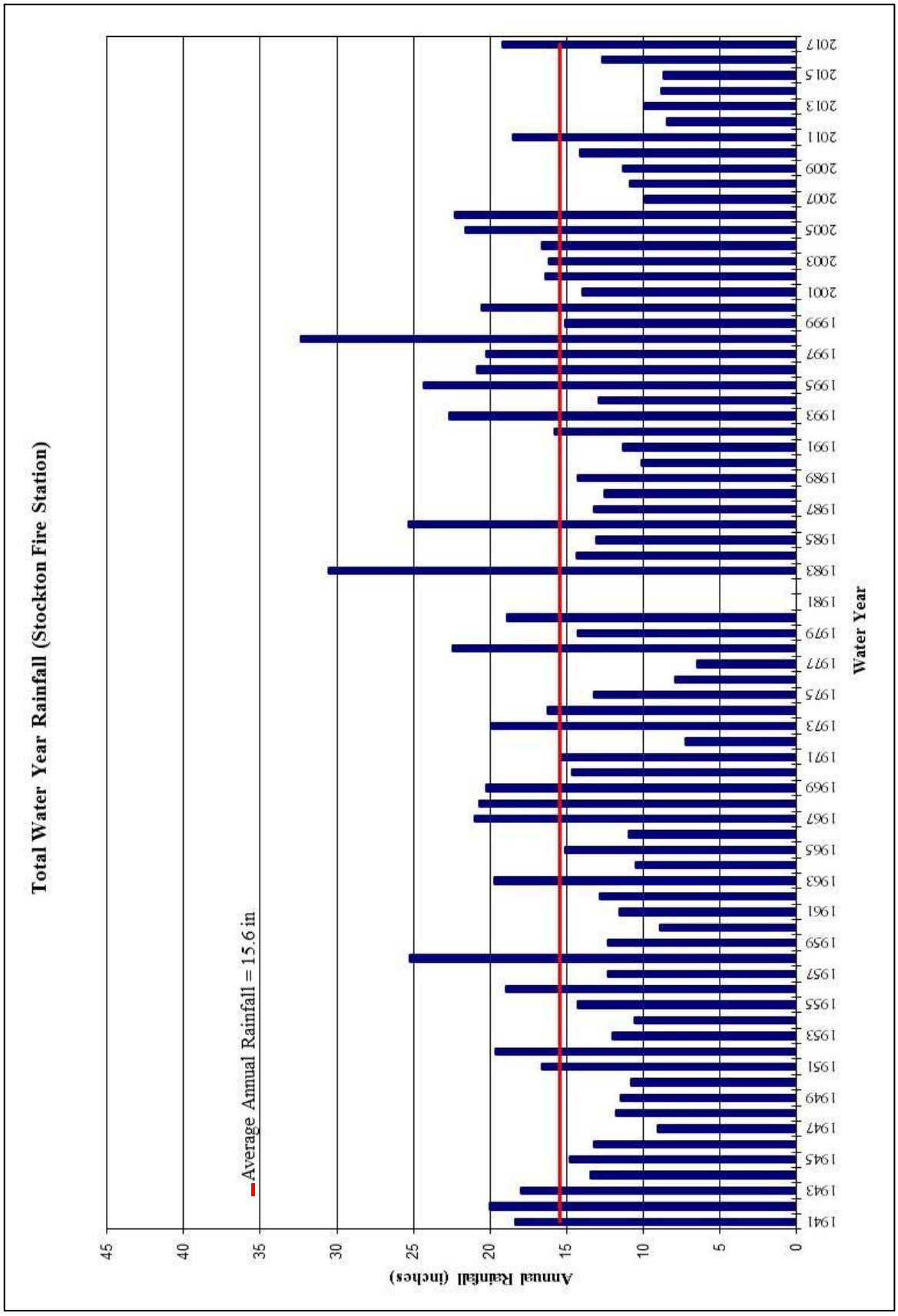

Figure 1-1 Total Annual Rainfall (Stockton Fire Station 4)

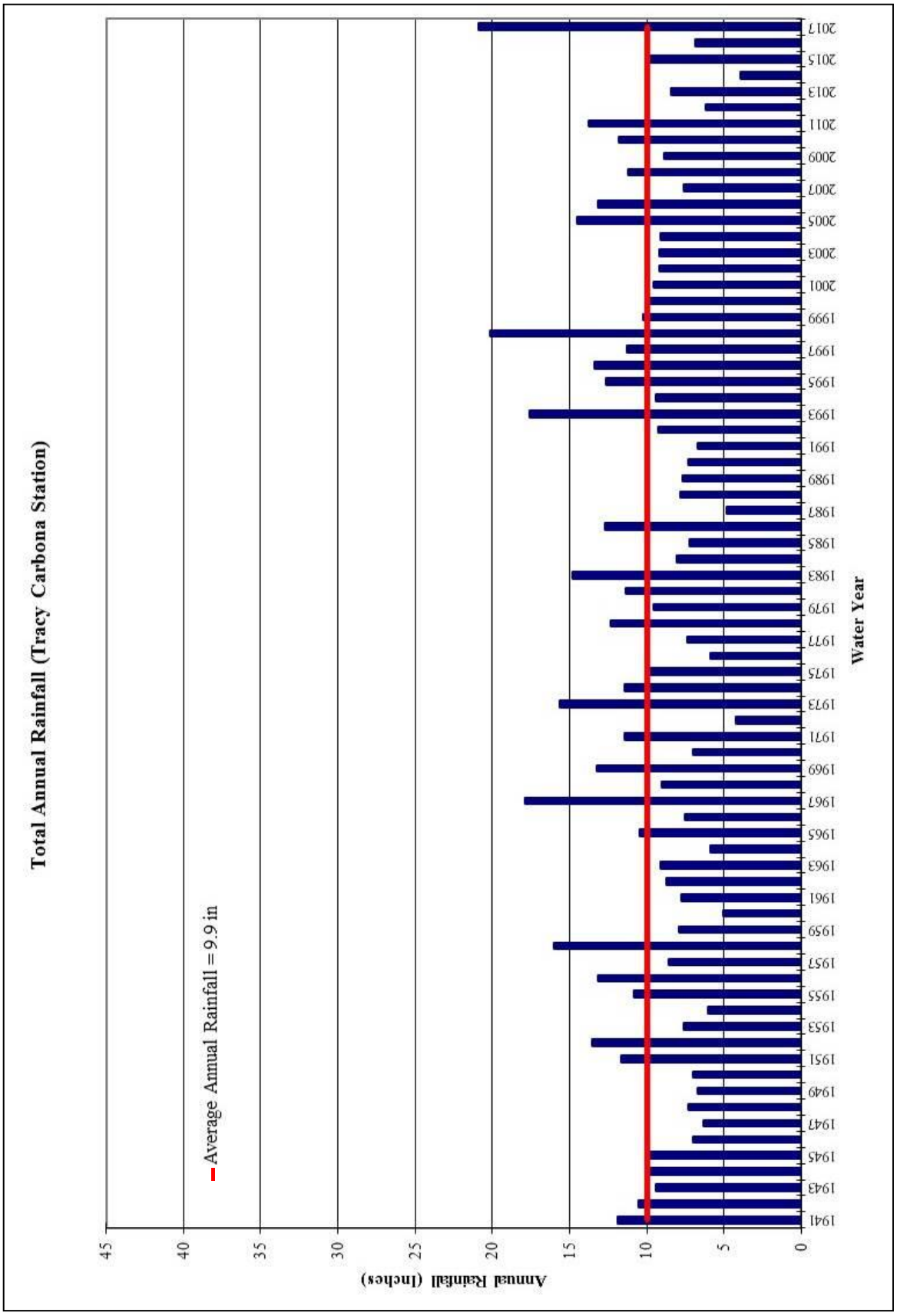

Figure 1-2 Total Annual Rainfall (Tracy Carbona Station)

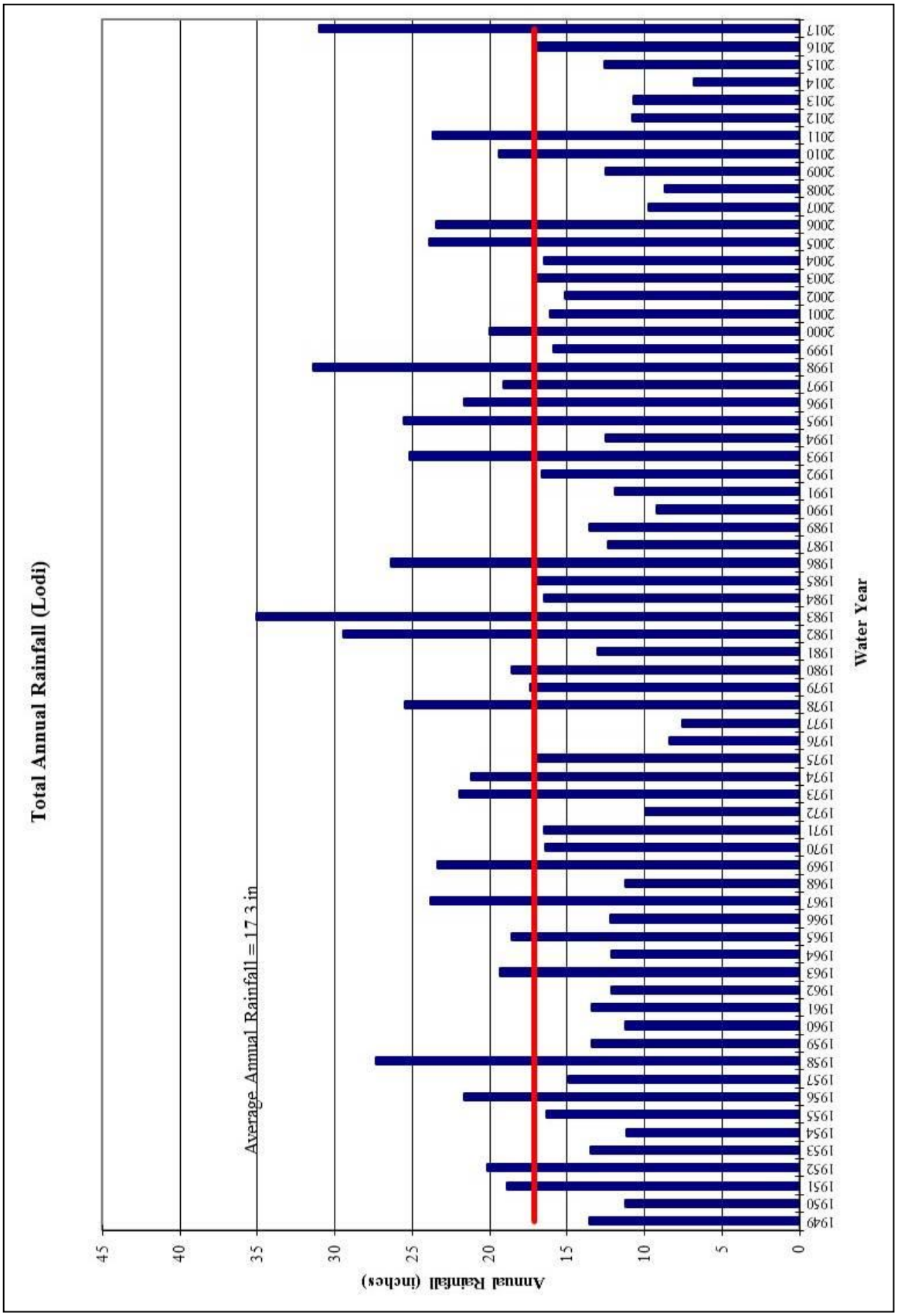

Figure 1-3 Total Annual Rainfall (Lodi)

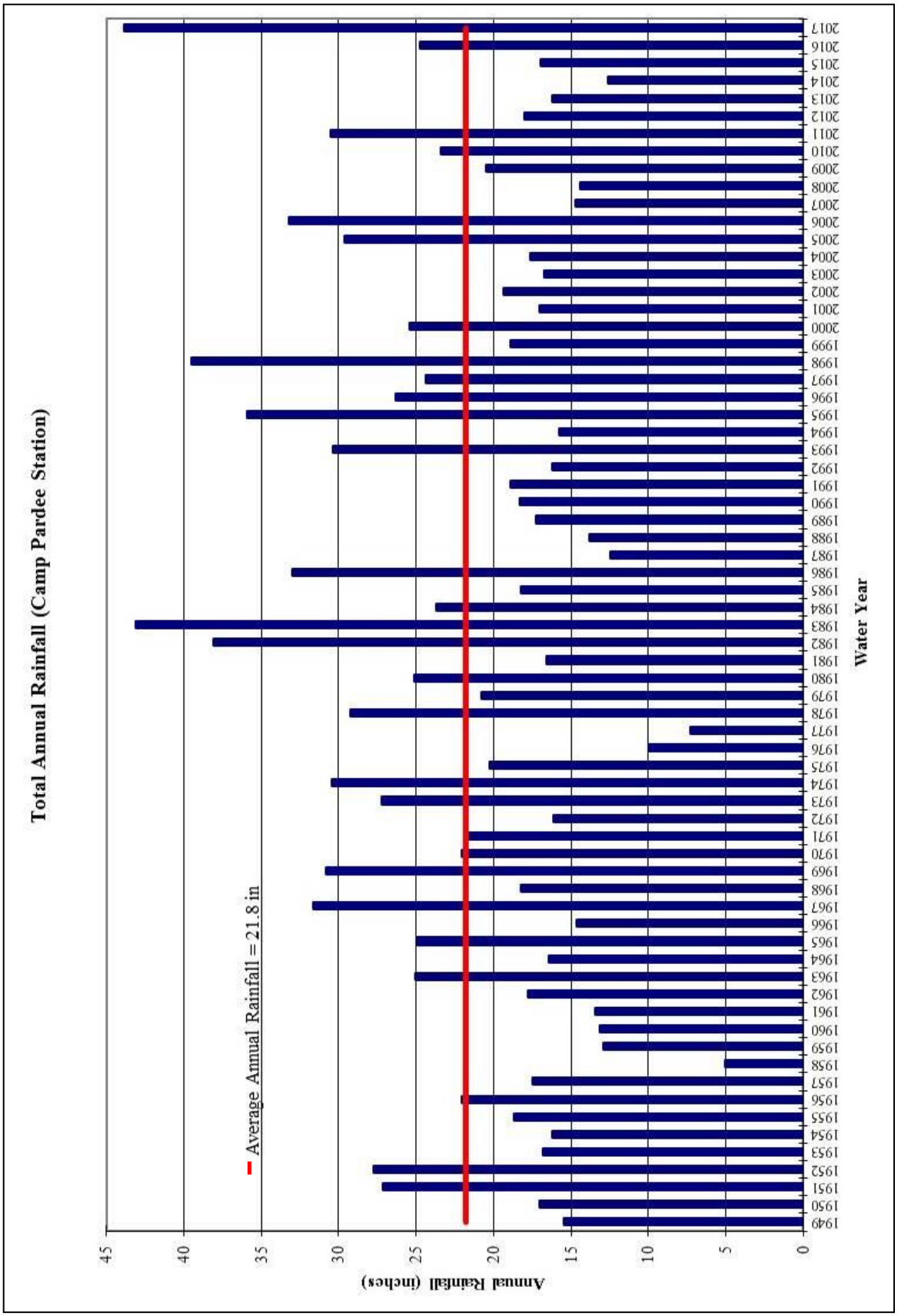

Figure 1-4 Total Annual Rainfall (Camp Pardee)

Monthly Rainfall Distribution

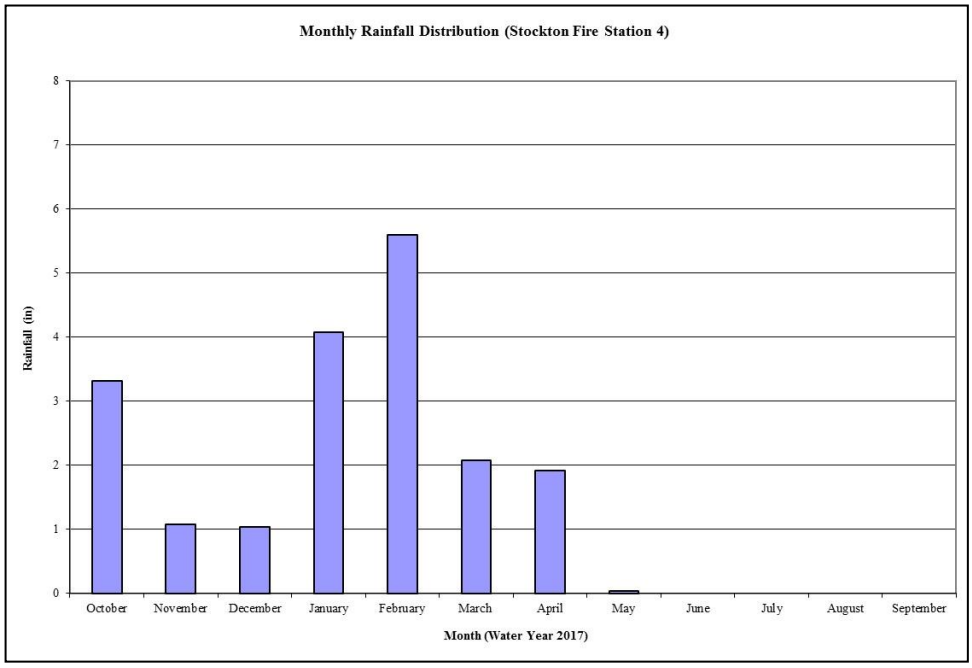

Figure 1-5 Monthly Rainfall Distribution (Stockton Fire Station 4)

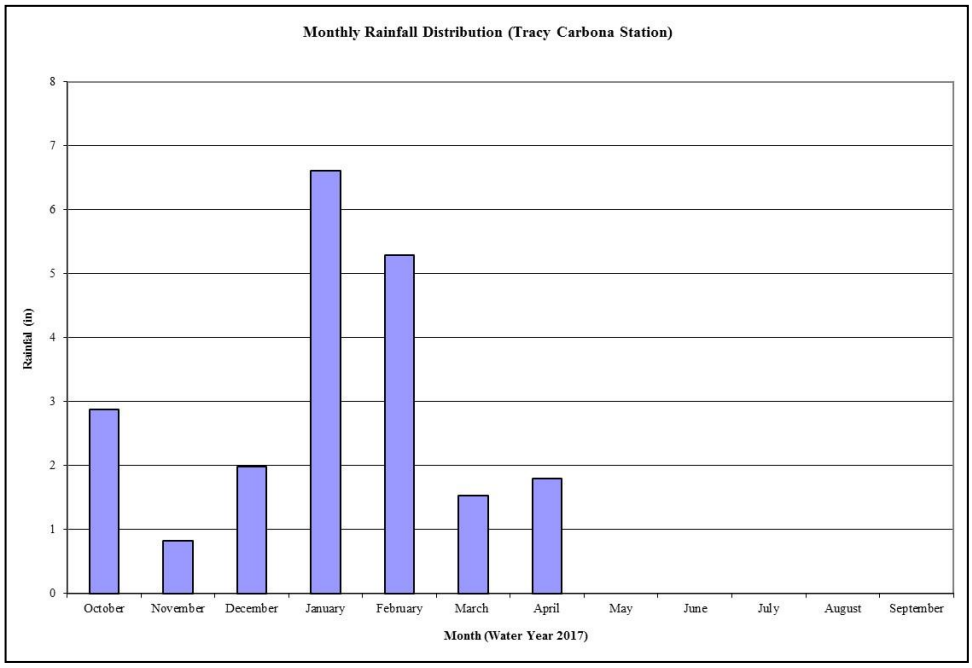

Figure 1-6 Monthly Rainfall Distribution (Tracy Carbona Station)

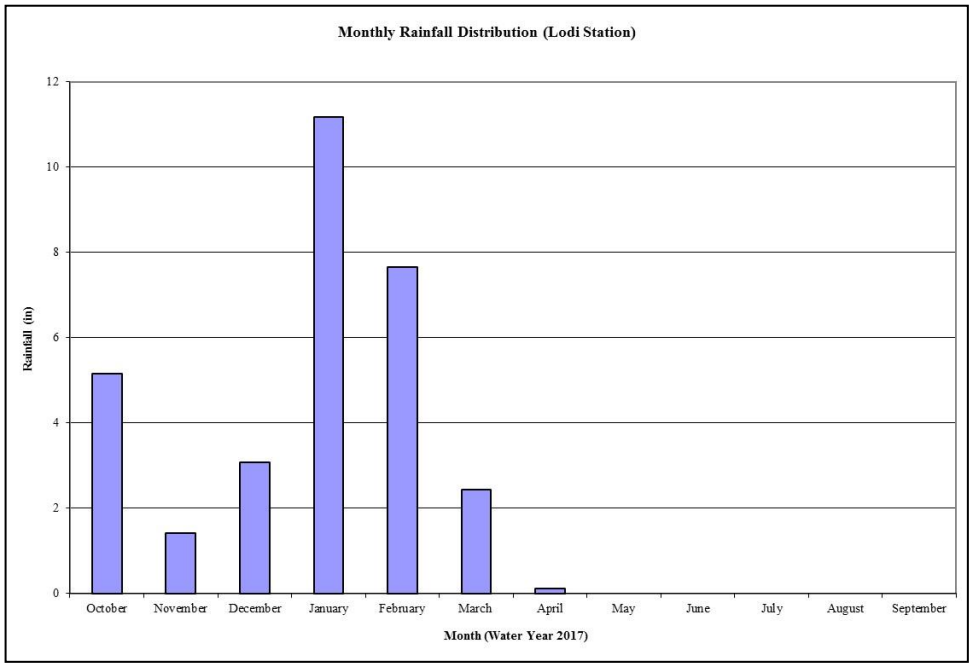

Figure 1-7 Monthly Rainfall Distribution (Lodi)

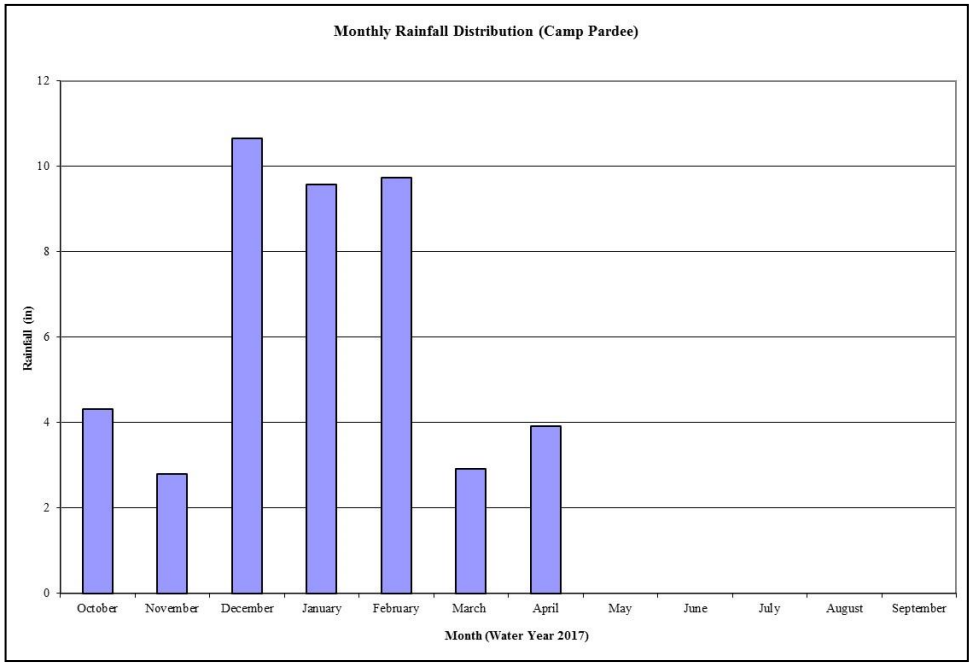

Figure 1-8 Monthly Rainfall Distribution (Camp Pardee)

This page intentionally left blank

Section 2 – Groundwater Elevation Monitoring

Summary of Groundwater Elevations

The information contained in the Spring 2017 Groundwater Report is summarized as follows

GROUNDWATER LEVELS

Central San Joaquin Water Conservation District (CSJWCD) – Sixty-two (62) wells are monitored in CSJWCD. Twenty-two (22) wells were able to be compared. Eighteen (18) show decreases in groundwater levels. Four (4) wells show increases in groundwater levels.

North San Joaquin Water Conservation District (NSJWCD) – One-hundred sixty-nine (169) wells are monitored in NSJWCD. One-hundred eleven (111) wells were able to be compared. Thirty (30) wells decreased in groundwater levels. Eighty-one (81) wells increased in groundwater levels.

Oakdale Irrigation District (OID) – Five (5) wells are monitored in the OID area. One (1) well was able to be compared. One (1) well decreased in groundwater levels.

Stockton East Water District (SEWD) – One-hundred seventy-one (171) wells are monitored in SEWD. Seventy-nine (79) wells were able to be compared. Fifteen (15) wells decreased in groundwater levels. Sixty-three (63) wells show increases in groundwater levels. One (1) well had no change in groundwater elevations.

South San Joaquin Irrigation District (SSJID) – Forty-one (41) wells are monitored in the SSJID area. Twenty-nine (29) wells were able to be compared. Thirteen (13) wells show decreases in groundwater levels. Fifteen (15) wells show increases in groundwater levels. No change was observed in one (1) wells.

Southwest County Areas – Forty-one (41) wells are monitored across the Southwest Area of the County. Twenty-eight (28) wells were able to be compared. One (1) wells decreased in groundwater levels. Twenty-seven (27) wells increased in groundwater levels.

Woodbridge Irrigation District (WID) – Thirty-four (34) wells are monitored in the WID. Twenty-six (26) wells were able to be compared. Twenty-five (25) wells show increases in groundwater levels. . One (1) wells had no change in groundwater elevations.

Table 2-1 Comparison of CSJWCD Water Levels

StateWellID	Spring 2017	Spring 2016	Change
01N07E11L001	*	-57.00	*
01N07E11M001	*	-49.70	*
01N07E13J002	*	*	*
01N07E14J002	*	-45.60	*
01N07E15M002	*	*	*
01N07E24A001	*	*	*
01N07E24R001	*	*	*
01N07E26H003	-38.00	-40.00	2.00
01N07E32A001	-18.39	-21.59	3.20
01N08E09L001	-57.96	-55.86	-2.10
01N08E11L001	*	-48.90	*
01N08E13J001	*	-46.70	*
01N08E15J001	-49.23	-48.93	-0.30
01N08E16G001	-49.70	-47.30	-2.40
01N08E16H002	-51.50	-46.10	-5.40
01N08E16P001	-48.25	-45.85	-2.40
01N08E18A002	-57.50	-56.50	-1.00
01N08E22J001	*	-44.50	*
01N08E26A002	*	-35.30	*
01N08E27R002	*	-37.00	*
01N08E29M002	*	-42.00	*
01N08E35F001	-56.90	-41.90	-15.00
01N08E35R002	*	*	*
01N08E36F001	*	-26.90	*
01N09E01C001	*	-32.70	*
01N09E05J001	*	-18.70	*
01N09E06N001	*	-58.00	*
01N09E13D001	*	1.00	*
01N09E15B002	*	*	*
01N09E17D001	-42.50	-39.50	-3.00
01N09E17M001	-38.00	-46.50	8.50
01N09E19C001	-58.00	-43.00	-15.00
01N09E21J001	*	*	*
01N09E22G002	*	-6.00	*
01N09E26A001	5.37	6.17	-0.80
01N09E29R001	-19.50	-13.50	-6.00
01N09E30C005	*	-22.20	*

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
01N09E31J001	*	*	*
01N09E35K001	1.18	1.38	-0.20
01S07E01J001	-45.60	*	*
01S07E02J001	*	*	*
01S07E12H001	*	*	*
01S07E13J001	*	*	*
01S08E04R001	*	-48.00	*
01S08E05A001	*	-34.40	*
01S08E05R001	-55.80	-37.80	-18.00
01S08E06D001	-32.10	-34.10	2.00
01S08E09Q001	-32.90	-20.90	-12.00
01S08E11F001	*	-29.90	*
01S08E12B001	*	*	*
01S08E14B001	-32.70	-18.70	-14.00
01S08E15P001	*	*	*
01S08E20B001	*	-13.70	*
01S08E23A001	*	-6.50	*
01S09E02R001	*	23.50	*
01S09E05H002	*	-4.20	*
01S09E07A001	*	-6.30	*
01S09E07N001	*	-6.30	*
01S09E09R001	-0.70	-0.20	-0.50
01S09E11J002	17.20	28.50	-11.30
01S09E18R003	*	*	*
01S09E19Q002	-1.00	12.00	-13.00

Total Number of Wells	**62**
Total Number of Comparable Wells	**22**
Number of Wells with Decrease	**18**
Number of Wells with Increase	**4**
Number of Wells with No Change	**0**
Range of Change	**-18.0 to 8.5**
Average Change	**-4.85**

Table 2-2 Comparison of NSJWCD Water Levels

StateWellID	Spring 2017	Spring 2016	Change
03N06E04C001	4.36	-2.24	6.60
03N06E23A003	-27.47	-27.98	0.50

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
03N06E24M003	*	*	*
03N06E25C001	-32.95	-37.15	4.20
03N06E25H015	*	*	*
03N06E36N001	*	*	*
03N07E03R001	-25.30	-30.80	5.50
03N07E05D005	29.17	19.67	9.50
03N07E08B012	-17.75	-19.35	1.60
03N07E08E002	-25.00	-35.00	10.00
03N07E09C001	-24.70	-35.70	11.00
03N07E09C003	-20.78	-23.28	2.50
03N07E09P002	-31.58	-33.48	1.90
03N07E10L004	*	*	*
03N07E12P001	-45.25	-44.45	-0.80
03N07E15C004	-37.50	-36.50	-1.00
03N07E17A006	*	-32.36	*
03N07E17D003	-25.73	-27.33	1.60
03N07E17D004	-27.40	-32.40	5.00
03N07E17K002	*	-38.40	*
03N07E18D012	-28.00	-30.00	2.00
03N07E18M002	-28.83	-33.13	4.30
03N07E19J004	-46.00	-50.50	4.50
03N07E19Q012	-37.38	-39.48	2.10
03N07E20C012	-37.74	-37.54	-0.20
03N07E21L003	*	-55.00	*
03N07E22C011	-43.10	-45.11	2.01
03N07E23C002	-46.00	*	*
03N07E23K011	-49.94	-49.64	-0.30
03N07E25G001	*	*	*
03N07E26G012	-51.47	-51.37	-0.10
03N07E32Q012	-48.85	-49.25	0.40
03N07E33G002	*	-54.20	*
03N08E04Q001	-42.97	*	*
03N08E05K011	*	-40.67	*
03N08E07J001	*	*	*
03N08E17B001	-48.57	-46.97	-1.60
03N08E17Q011	-51.87	-50.27	-1.60
03N08E19C001	*	*	*
03N08E19M003	-51.27	-50.17	-1.10
03N08E22A001	*	-52.30	*

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
04N06E02R011	*	*	*
04N06E03A012	4.50	-2.40	6.90
04N06E06N012	*	-9.10	*
04N06E12C004	-43.00	*	*
04N06E12N002	-28.80	*	*
04N06E15B002	-12.70	-15.80	3.10
04N06E16A011	-3.56	-9.06	5.50
04N06E16C001	4.12	-1.08	5.20
04N06E16K011	15.94	0.74	15.20
04N06E23D004	-11.61	-14.31	2.70
04N06E23K00	-5.00	-8.00	3.00
04N06E24D012	-16.10	-16.80	0.70
04N06E24F001	-17.00	-26.50	9.50
04N06E25B001	-11.40	-11.80	0.40
04N06E25R001	-1.00	-9.00	8.00
04N06E27D002	19.20	13.50	5.70
04N06E27Q012	30.48	16.28	14.20
04N06E35D011	*	*	*
04N06E36J012	15.00	8.50	6.50
04N07E01B011	*	*	*
04N07E02R001	-40.14	-38.54	-1.60
04N07E04B012	-44.05	-43.35	-0.70
04N07E04Q012	-42.41	-38.71	-3.70
04N07E07A001	*	*	*
04N07E07H011	-38.84	-37.94	-0.90
04N07E11D012	-41.13	-39.23	-1.90
04N07E12E001	*	*	*
04N07E12G012	*	*	*
04N07E14P011	-34.11	-32.81	-1.30
04N07E15B012	*	*	*
04N07E16D001	-38.74	*	*
04N07E17J013	*	*	*
04N07E17N001	-33.30	-38.40	5.10
04N07E19K001	-18.60	-30.10	11.50
04N07E19R011	-19.61	-20.31	0.70
04N07E20H003	-98.70	-98.30	-0.40
04N07E21F001	-28.30	*	*
04N07E23J012	-28.73	-28.93	0.20
04N07E24N002	-28.33	-29.44	1.10

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
04N07E25G015	-19.94	-19.94	0.00
04N07E27C002	-12.50	*	*
04N07E28J002	-18.70	-24.70	6.00
04N07E28P011	9.43	4.23	5.20
04N07E29H001	*	*	*
04N07E29N012	-3.92	-6.52	2.60
04N07E31Q031	26.49	*	*
04N07E32F011	9.97	4.47	5.50
04N07E33H001	37.50	*	*
04N07E34K011	-6.93	-11.43	4.50
04N07E35C002	*	*	*
04N07E35E013	*	-17.44	*
04N07E36L001	-27.10	-28.50	1.40
04N08E01K001	44.13	47.03	-2.90
04N08E02E011	-12.57	-10.97	-1.60
04N08E04P014	-47.37	-39.37	-8.00
04N08E06C002	*	-33.07	*
04N08E06N002	*	-42.70	*
04N08E11M012	-10.77	-9.37	-1.40
04N08E12A011	77.13	73.83	3.30
04N08E12B011	50.03	48.33	1.70
04N08E12N001	21.93	20.13	1.80
04N08E14B011	-4.17	-3.07	-1.10
04N08E14K001	-12.10	-19.60	7.50
04N08E15D011	-23.27	*	*
04N08E15J011	-17.57	-15.67	-1.90
04N08E17A001	*	*	*
04N08E17J001	-33.50	-32.50	-1.00
04N08E21M001	-37.60	-36.60	-1.00
04N08E22C015	-22.97	-22.27	-0.70
04N08E26A012	*	*	*
04N08E27J011	-22.57	-22.17	-0.40
04N08E28E001	*	*	*
04N08E32N001	-41.10	-58.10	17.00
04N08E34Q011	-36.96	-35.96	-1.00
04N09E05E099	160.73	151.53	9.20
04N09E06H097	*	*	*
04N09E06H098	177.73	172.53	5.20
04N09E06H099	207.03	204.83	2.20

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
04N09E06J098	207.73	204.33	3.40
04N09E06J099	166.83	160.23	6.60
04N09E06K097	113.63	109.83	3.80
04N09E06K099	124.33	122.23	2.10
04N09E06L011	117.43	111.13	6.30
04N09E06Q098	133.23	130.83	2.40
04N09E07B098	154.03	151.53	2.50
04N09E07B099	153.73	142.93	10.80
04N09E07D012	84.73	80.93	3.80
04N09E07E011	87.63	86.63	1.00
04N09E08N096	176.63	164.23	12.40
04N09E08N097	172.33	161.63	10.70
04N09E08N098	169.13	158.83	10.30
04N09E08N099	173.33	161.43	11.90
04N09E08P099	180.33	169.63	10.70
04N09E08R099	*	177.13	*
04N09E16D099	187.93	*	*
04N09E16Q002	158.33	150.03	8.30
04N09E17A099	176.03	171.83	4.20
04N09E17E001	142.73	131.63	11.10
04N09E17E099	159.13	153.93	5.20
04N09E17F099	165.43	161.03	4.40
04N09E17G099	167.53	164.93	2.60
04N09E18A011	*	149.83	*
04N09E18D002	52.53	52.63	-0.10
04N09E18N011	24.13	24.23	-0.10
04N09E20M001	111.44	111.34	0.10
04N09E21A001	*	166.84	*
04N09E28C002	183.24	185.84	-2.60
05N06E36R001	-36.30	-43.30	7.00
05N07E31J001	-56.00	*	*
05N07E31Q001	*	*	*
05N07E34G001	*	*	*
05N07E34Q001	*	*	*
05N08E24Q011	55.63	49.63	6.00
05N08E25P011	52.33	50.43	1.90
05N08E32R011	-37.17	-38.17	1.00
05N08E35K012	-1.17	0.23	-1.40
05N09E30C011	160.63	160.13	0.50

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
05N09E30M011	144.43	144.23	0.20
05N09E31L011	126.83	125.83	1.00
Harney MW-1	*	*	*
Harney MW-2	-40.01	*	*
Harney MW-3	-47.26	*	*
Harney MW-4	-48.01	*	*
North G-1	*	-53.23	*
North G-3D	*	-51.66	*
North G-4	*	-52.87	*
North G-5	*	*	*
North G-6	*	-49.52	*

Total Number of Wells	**169**
Total Number of Comparable Wells	**111**
Number of Wells with Decrease	**30**
Number of Wells with Increase	**81**
Number of Wells with No Change	**0**
Range of Change	**-8.0 to17.0**
Average Change	**3.27**

Table 2-3 Comparison of OID Water Levels

StateWellID	Spring 2017	Spring 2016	Change
01S09E14K001	31.11	35.91	-4.80
01S09E21J002	*	30.60	*
01S09E23N001	*	*	*
01S09E24R001	*	*	*
01S09E28M002	*	*	*
	*	*	*

Total Number of Wells	**5**
Total Number of Comparable Wells	**1**
Number of Wells with Decrease	1
Number of Wells with Increase	0
Number of Wells with No Change	0
Range of Change	*
Average Change	-4.80

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

Table 2-4 Comparison of SEWD Water Levels

StateWellID	Spring 2017	Spring 2016	Change
DWS-IPS	----	-3.87	----
01N06E01J001	-28.50	-30.50	2.00
01N06E01M001	-33.00	-39.00	6.00
01N06E02C001	-17.33	-20.93	3.60
01N06E04J003	-12.43	-16.53	4.10
01N06E04J004	-6.57	-10.77	4.20
01N06E04J005	-0.91	-4.41	3.50
01N06E05H001	-3.49	-6.99	3.50
01N06E05M004	-7.50	*	*
01N06E12A001	-21.00	-27.00	6.00
01N06E12F001	-46.00	-51.00	5.00
01N06E12K003	-9.00	----	----
01N06E23J001	*	----	----
01N06E27R002	-6.20	-6.20	0.00
01N06E36C003	-11.50	-16.40	4.90
01N06E36C004	-5.00	-10.90	5.90
01N06E36C005	-3.00	-9.30	6.30
01N07E01A002	*	*	*
01N07E01M002	-67.00	-62.00	-5.00
01N07E02G001	*	-59.50	*
01N07E03D002	*	-78.96	*
01N07E03D003	*	-85.43	*
01N07E03D004	*	-50.58	*
01N07E03D005	*	-12.64	*
01N07E03L001	*	*	*
01N07E03M001	*	*	*
01N07E04R001	*	-50.00	*
01N07E05A001	*	-37.00	*
01N07E08B001	*	*	*
01N07E08F002	*	*	*
01N07E08H002	*	*	*
01N07E08P001	-32.50	-37.50	5.00
01N07E09E004	*	-34.00	*
01N07E09H001	*	-44.50	*
01N07E09Q003	-55.00	-50.00	-5.00
01N07E10D001	-40.00	-55.00	15.00
01N07E10G001	*	*	*
01N07E16M001	*	-41.00	*

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
01N07E17D001	*	-30.50	*
01N07E17D002	-39.50	-32.50	-7.00
01N07E18B001	-34.00	-28.00	-6.00
01N07E18D001	-17.00	-21.00	4.00
01N07E18E002	-23.00	*	*
01N07E18E003	-25.00	-24.00	-1.00
01N07E18L001	-23.00	-26.00	3.00
01N07E19G001	*	-18.00	*
01N07E20G001	-24.00	-23.00	-1.00
01N07E21R001	*	*	*
01N08E03P001	*	*	*
01S06E01C002	3.00	-7.00	10.00
01S06E02D004	-0.79	-5.69	4.90
01S06E02G002	1.73	*	*
01S06E10G001	10.20	-4.80	15.00
01S07E06M002	2.00	-7.00	9.00
01S07E08J002	1.00	-10.00	11.00
02N05E01A002	-27.54	-30.24	2.70
02N05E01A003	-15.51	-19.11	3.60
02N05E01A004	-11.06	-15.46	4.40
02N05E01A005	-10.04	-13.54	3.50
02N05E01A006	-6.58	-11.18	4.60
02N06E03A003	-31.80	-42.80	11.00
02N06E06C002	*	*	*
02N06E08N001	-23.98	-27.28	3.30
02N06E08N002	-21.02	-24.92	3.90
02N06E08N003	-17.91	-21.61	3.70
02N06E11H004	-45.40	-49.80	4.40
02N06E11H005	-45.87	-51.07	5.20
02N06E11H006	-39.92	-49.72	9.80
02N06E11H007	-45.85	-49.55	3.70
02N06E13R002	*	*	*
02N06E20E001	-15.00	-18.60	3.60
02N06E20E002	-13.50	-17.00	3.50
02N06E20E003	-12.00	-15.60	3.60
02N06E22B001	-36.00	-35.00	-1.00
02N06E22G001	*	*	*
02N06E22G002	*	*	*
02N06E22Q001	*	*	*

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
02N06E22Q002	*	*	*
02N06E24F001	-31.50	-40.50	9.00
02N06E24J002	*	-54.30	*
02N06E26L001	*	*	*
02N06E27B001	*	*	*
02N06E27H001	*	*	*
02N06E27K001	*	*	*
02N06E27K002	*	*	*
02N06E27L001	-47.00	-28.00	-19.00
02N06E27P001	*	-31.00	*
02N06E32G001	-6.09	-9.39	3.30
02N06E34C001	*	-27.00	*
02N06E35B001	-22.00	*	*
02N06E36A001	-24.00	*	*
02N06E36D001	*	*	*
02N06E36F001	-35.50	-34.50	-1.00
02N06E36G001	*	*	*
02N06E36N003	*	-40.50	*
02N06E36R003	-23.00	-26.00	3.00
02N07E03D001	-70.00	-76.00	6.00
02N07E06P002	-40.80	-46.80	6.00
02N07E08D001	-51.20	-53.70	2.50
02N07E08K003	-69.00	-71.00	2.00
02N07E08R002	-55.04	-58.04	3.00
02N07E10F002	*	-58.50	*
02N07E11F001	-87.00	*	*
02N07E11R002	-58.00	-69.00	11.00
02N07E12A003	-55.75	-57.35	1.60
02N07E15C001	-58.30	*	*
02N07E16F002	-59.94	*	*
02N07E16L001	-56.30	*	*
02N07E18H002	-49.70	-53.70	4.00
02N07E20N002	-44.00	*	*
02N07E21A002	-62.81	*	*
02N07E21K002	-56.50	-72.00	15.50
02N07E21N001	*	-76.00	*
02N07E23B001	-66.00	-81.00	15.00
02N07E24B001	-60.10	-69.10	9.00
02N07E24Q001	*	*	*

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
02N07E26H003	*	*	*
02N07E26N001	-69.20	-71.20	2.00
02N07E28K002	-71.00	-77.00	6.00
02N07E28N004	-52.00	*	*
02N07E28P001	*	*	*
02N07E29B001	-55.50	*	*
02N07E29M002	-39.00	-47.50	8.50
02N07E30E001	*	*	*
02N07E30H001	-38.50	-46.50	8.00
02N07E30K001	*	-29.00	*
02N07E31M001	*	*	*
02N07E32J002	*	-54.00	*
02N07E32M002	*	-49.00	*
02N07E32R001	-15.60	*	*
02N07E33L001	*	-65.00	*
02N07E34R001	*	-56.00	*
02N07E35L001	*	*	*
02N07E36H001	*	*	*
02N08E03G002	-61.70	*	*
02N08E04C001	-57.50	-55.80	-1.70
02N08E05C001	-68.50	*	*
02N08E08N001	-66.50	-71.50	5.00
02N08E09G002	-33.00	*	*
02N08E10H002	-62.10	-77.10	15.00
02N08E13K001	-47.60	*	*
02N08E14C001	-62.00	-53.00	-9.00
02N08E15M002	*	-64.20	*
02N08E16D001	-78.10	-80.10	2.00
02N08E18C001	-58.70	*	*
02N08E20F001	*	*	*
02N08E24J001	-82.10	*	*
02N08E24P001	*	-59.40	*
02N08E28H002	-42.60	-49.60	7.00
02N08E32L002	*	*	*
02N08E33E001	*	-67.60	*
02N09E03A001	*	*	*
02N09E04H001	*	*	*
02N09E05H001	*	-13.30	*
02N09E05N001	-28.19	-25.89	-2.30

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
02N09E08N001	*	*	*
02N09E09D001	-45.80	*	*
02N09E18Q001	-52.60	*	*
02N09E22D001	*	*	*
02N09E28N001	-61.10	*	*
03N07E28K012	-50.16	-60.96	10.80
03N07E35C002	-55.80	-54.20	-1.60
03N07E35L001	-55.50	-68.00	12.50
03N07E36J001	-53.30	-54.30	1.00
03N08E27R001	-64.00	*	*
03N09E25R001	74.00	80.70	-6.70
03N09E36G001	71.20	60.20	11.00
C-1	-58.50	-54.50	-4.00
Foothill MW-1	*	*	*
Foothill MW-2R	38.93	*	*
Foothill MW-3	*	*	*

Total Number of Wells	**171**
Total Number of Comparable Wells	**79**
Number of Wells with Decrease	**15**
Number of Wells with Increase	**63**
Number of Wells with No Change	**1**
Range of Change	**-19.0 to 15.5**
Average Change	**3.98**

Table 2-5 Comparison of SSJID Water Levels

StateWellID	Spring 2017	Spring 2016	Change
01S07E09Q001	-5.07	-5.17	0.10
01S07E14M001	-15.10	-7.10	-8.00
01S07E14P003	*	-8.80	*
01S07E15F002	-18.60	-11.60	-7.00
01S07E18L001	6.67	-0.13	6.80
01S07E21G001	8.15	5.75	2.40
01S07E25E001	1.00	2.50	-1.50
01S07E25R001	7.55	7.95	-0.40
01S07E26G001	1.00	2.00	-1.00
01S07E27K001	5.00	3.80	1.20
01S07E30R001	11.46	7.96	3.50

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
01S07E36D001	9.95	10.35	-0.40
01S08E19R001	*	*	*
01S08E25Q001	*	*	*
01S08E29K001	*	1.00	*
01S08E30C002	*	-2.00	*
01S08E34Q001	13.96	14.56	-0.60
01S08E35R002	21.57	22.17	-0.60
01S09E29M002	*	23.50	*
01S09E33J002	46.02	47.42	-1.40
01S09E33P001	43.41	44.51	-1.10
01S09E34A001	*	*	*
02S07E07D002	9.00	9.00	0.00
02S07E07Q001	22.26	20.86	1.40
02S07E08R001	23.26	23.46	-0.20
02S07E10B002	21.86	20.86	1.00
02S07E11N002	28.00	25.00	3.00
02S07E12R001	21.85	21.75	0.10
02S07E19H001	22.00	19.00	3.00
02S07E22N002	24.85	23.65	1.20
02S08E04M001	*	17.00	*
02S08E06J001	15.00	16.00	-1.00
02S08E07R001	*	*	*
02S08E08A001	23.00	21.00	2.00
02S08E08E001	18.20	*	*
02S08E09J001	32.26	31.16	1.10
02S08E12D001	34.67	33.47	1.20
02S09E03K001	*	*	*
02S09E07D001	*	35.99	*
02S09E12R001	65.95	66.15	-0.20
02S09E19B002	57.50	54.90	2.60

Total Number of Wells	**41**
Total Number of Comparable Wells	**29**
Number of Wells with Decrease	**13**
Number of Wells with Increase	**15**
Number of Wells with No Change	**1**
Range of Change	**-8.0 to 6.8**
Average Change	**0.25**

*Measurement not taken 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 South West County Area Water Levels

StateWellID	Spring 2017	Spring 2016	Change
01S05E31R002	2.60	1.10	1.50
01S06E04J001	*	-1.00	*
01S06E14F001	-5.60	*	*
01S06E15F001	6.71	2.41	4.30
01S06E23C003	8.63	4.03	4.60
01S06E26K001	5.14	3.14	2.00
02S04E15R001	53.00	52.00	1.00
02S05E08B001	1.30	*	*
02S05E13N001	*	*	*
02S06E10K001	9.00	3.00	6.00
02S06E25J001	18.50	13.80	4.70
02S06E26B001	*	*	*
02S06E27E001	*	7.00	*
02S06E31N001	52.88	51.88	1.00
02S07E31N001	17.00	*	*
03S05E04H001	*	*	*
03S06E03F002	*	7.50	*
03S06E23C001	16.80	1.00	15.80
03S06E27N001	65.63	65.80	-0.17
Corral MW-4	223.53	*	*
Corral MW-5	226.28	*	*
Corral MW-6	-57.76	*	*
Corral MW-7	-1.28	*	*
MW-1A	-9.24	-12.95	3.71
MW-1B	-14.86	-21.15	6.29
MW-1C	-13.36	-19.90	6.54
MW-2A	-17.50	-22.10	4.60
MW-2B	-19.56	-27.17	7.60
MW-2C	-19.85	-27.96	8.11
MW-3A	-21.02	-24.84	3.82
MW-3B	-21.35	-29.82	8.47
MW-3C	-23.39	-34.14	10.75
MW-4A	-15.46	-20.28	4.82
MW-4B	-18.19	-25.91	7.72
MW-4C	-18.46	-25.85	7.39
MW-5A	-11.20	-16.06	4.86
MW-5B	-13.39	-18.64	5.25

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
MW-5C	-14.47	-19.43	4.96
MW-6A	-12.47	-16.66	4.19
MW-6B	-13.68	-18.84	5.16
MW-6C	-14.73	-19.66	4.93

Total Number of Wells	**41**
Total Number of Comparable Wells	**28**
Number of Wells with Decrease	**1**
Number of Wells with Increase	**27**
Number of Wells with No Change	**0**
Range of Change	**-0.17 to 15.8**
Average Change	**5.35**

Table 2-7 Comparison of WID Water Levels

StateWellID	Spring 2017	Spring 2016	Change
03N05E13L001	*	*	*
03N05E14C001	2.20	-3.30	5.50
03N06E04P012	-4.66	-9.56	4.90
03N06E05N003	-8.50	-14.00	5.50
03N06E07D013	-1.88	----	----
03N06E07H003	-13.00	-18.00	5.00
03N06E09N011	-14.48	*	*
03N06E10D001	1.60	-5.90	7.50
03N06E15C004	*	*	*
03N06E17A004	-18.70	-27.70	9.00
03N06E18M003	-8.60	-15.60	7.00
03N06E20D002	-14.50	-18.50	4.00
03N06E26P002	-31.70	-34.70	3.00
03N06E27E001	-30.20	-36.20	6.00
03N06E29C001	-20.80	-30.30	9.50
03N06E30R001	-19.50	-22.70	3.20
03N06E32R001	-20.50	-25.00	4.50
04N05E10K001	3.50	*	*
04N05E13C012	14.17	-2.33	16.50
04N05E13H001	11.50	-8.00	19.50
04N05E13R004	9.00	-10.00	19.00
04N05E14B002	11.10	-11.90	23.00
04N05E14P001	7.50	-2.00	9.50

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

StateWellID	Spring 2017	Spring 2016	Change
04N05E22H001	0.50	*	*
04N05E24J004	10.40	*	*
04N05E26F001	8.20	-2.30	10.50
04N05E36C004	11.01	-3.09	14.10
04N05E36H003	5.50	-7.50	13.00
04N06E17G004	14.50	-3.00	17.50
04N06E18R012	8.00	-4.20	12.20
04N06E19R012	8.42	-5.18	13.60
04N06E29N002	4.10	-9.40	13.50
04N06E30E001	12.70	*	*
04N06E34J002	-2.60	-2.60	0.00
05N05E28L003	3.00	*	*

Total Number of Wells	**34**
Total Number of Comparable Wells	**26**
Number of Wells with Decrease	**0**
Number of Wells with Increase	**25**
Number of Wells with No Change	**1**
Range of Change	**0.0 to 23.0**
Average Change	**9.87**

*Measurement not taken due to one or more of the following reasons: pumping, pump house locked, unable to get tape in casing, insects or dogs.

HYDROGRAPHS

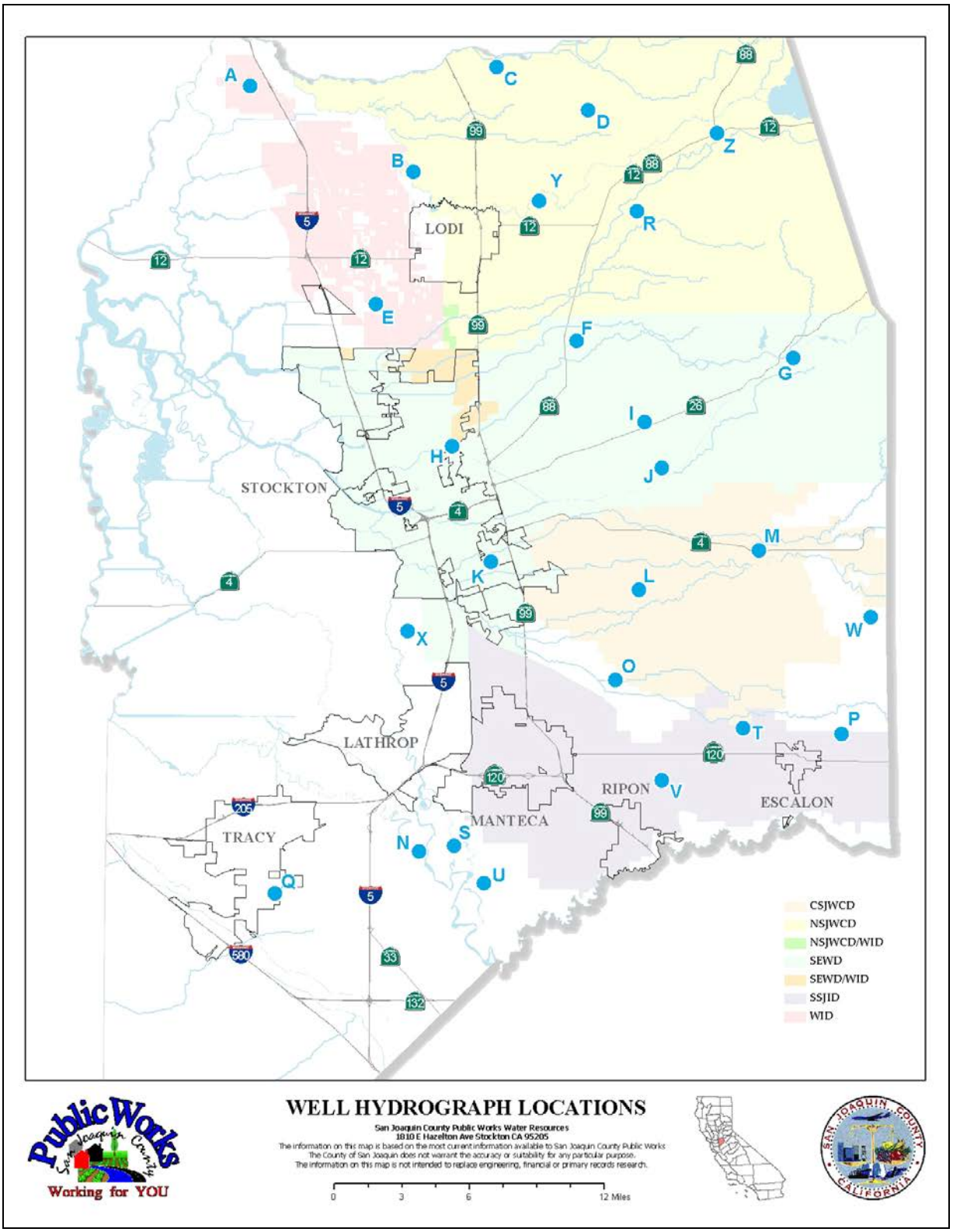

Figure 2-1 Well Hydrograph Locations

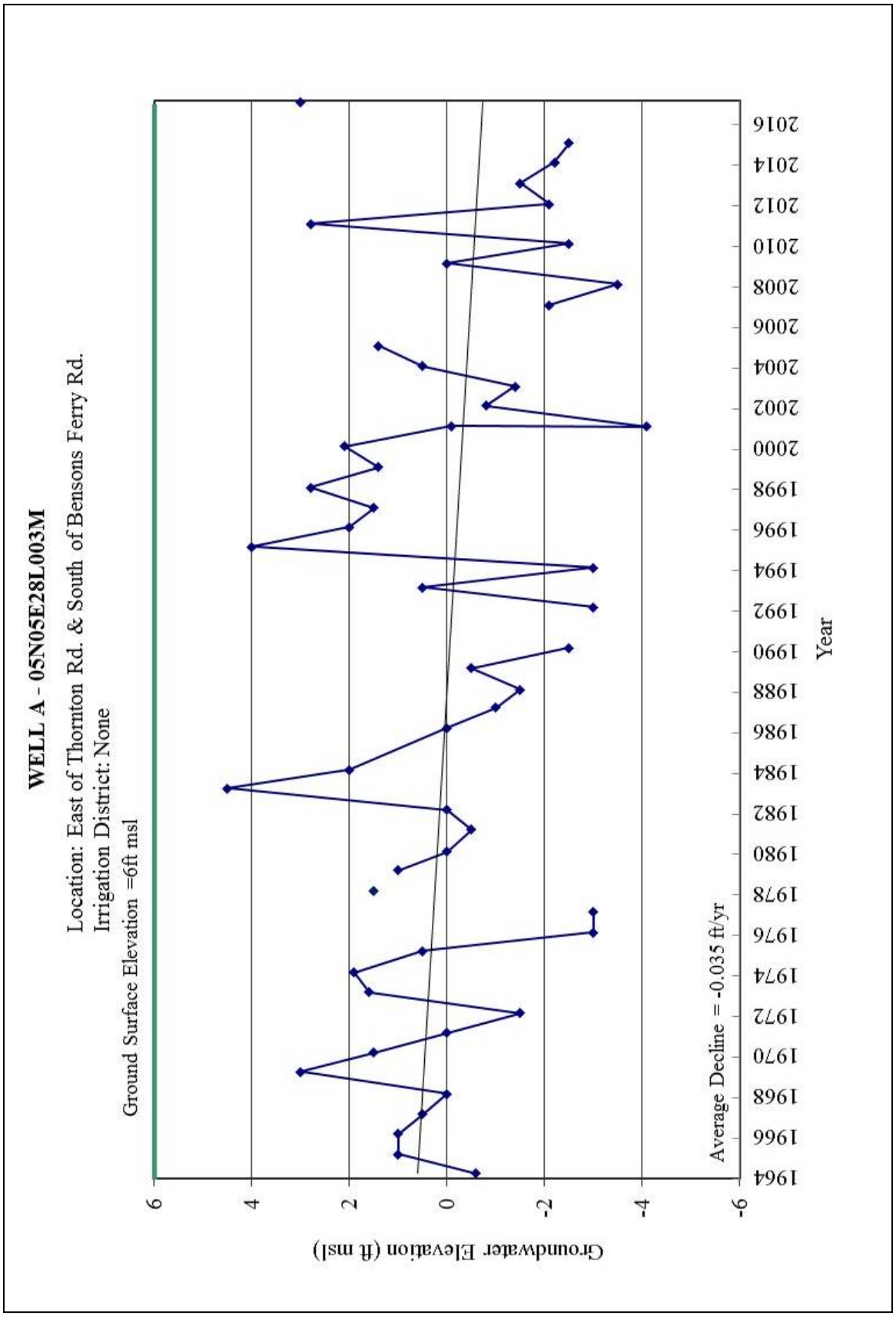

Figure 2-2 Spring Hydrograph Well A

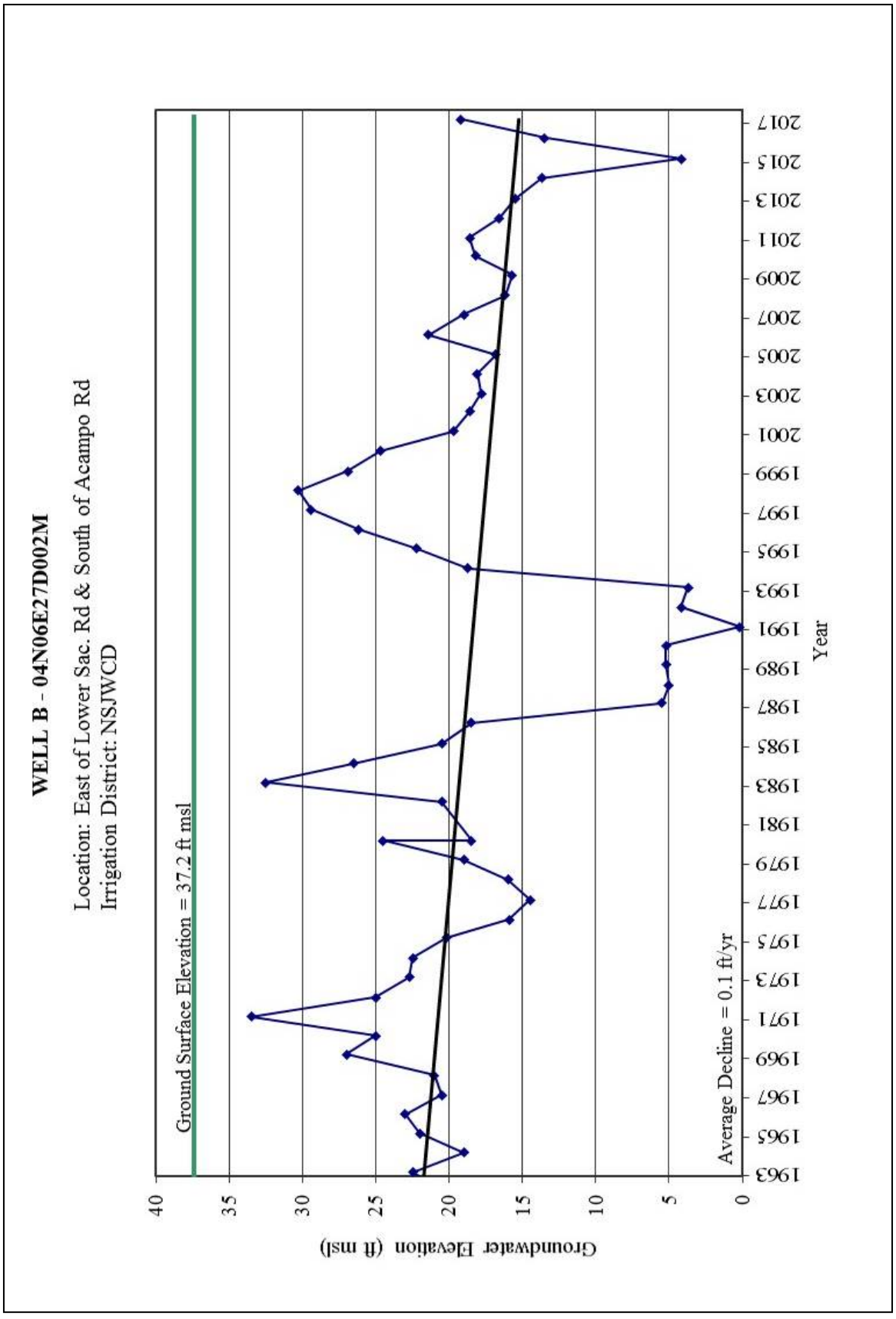

Figure 2-3 Spring Hydrograph Well B

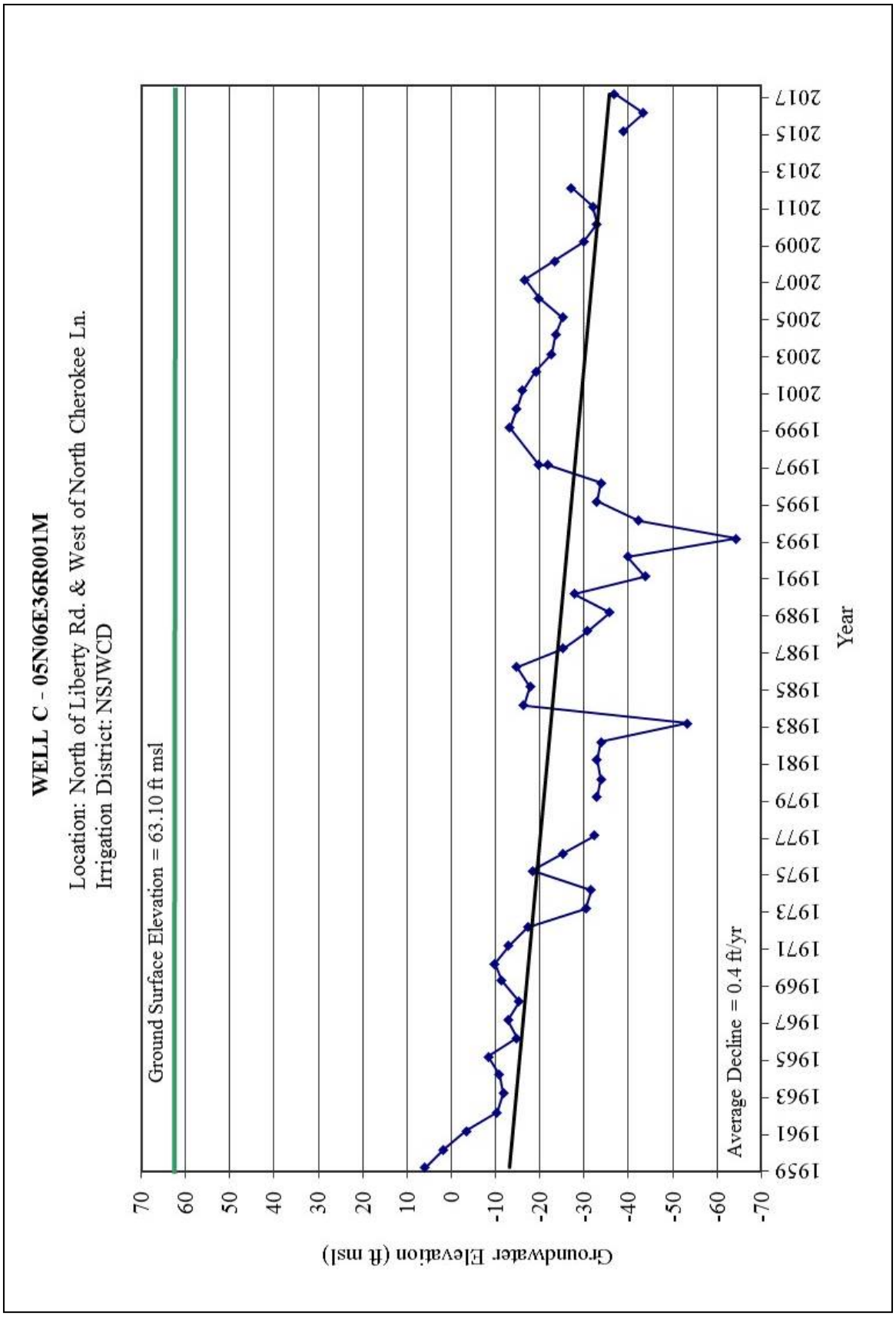

Figure 2-4 Spring Hydrograph Well C

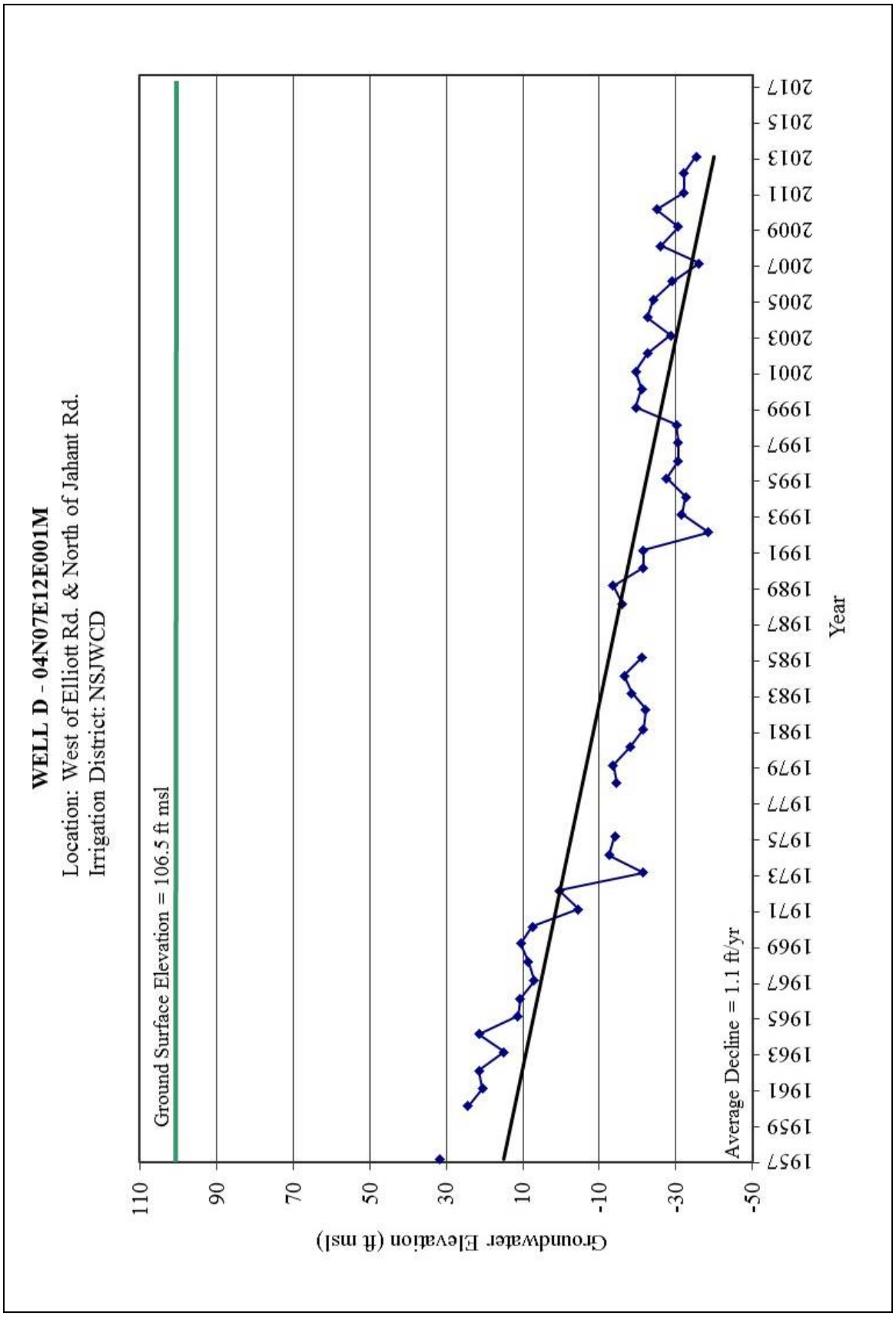

Figure 2-5 Spring Hydrograph Well D

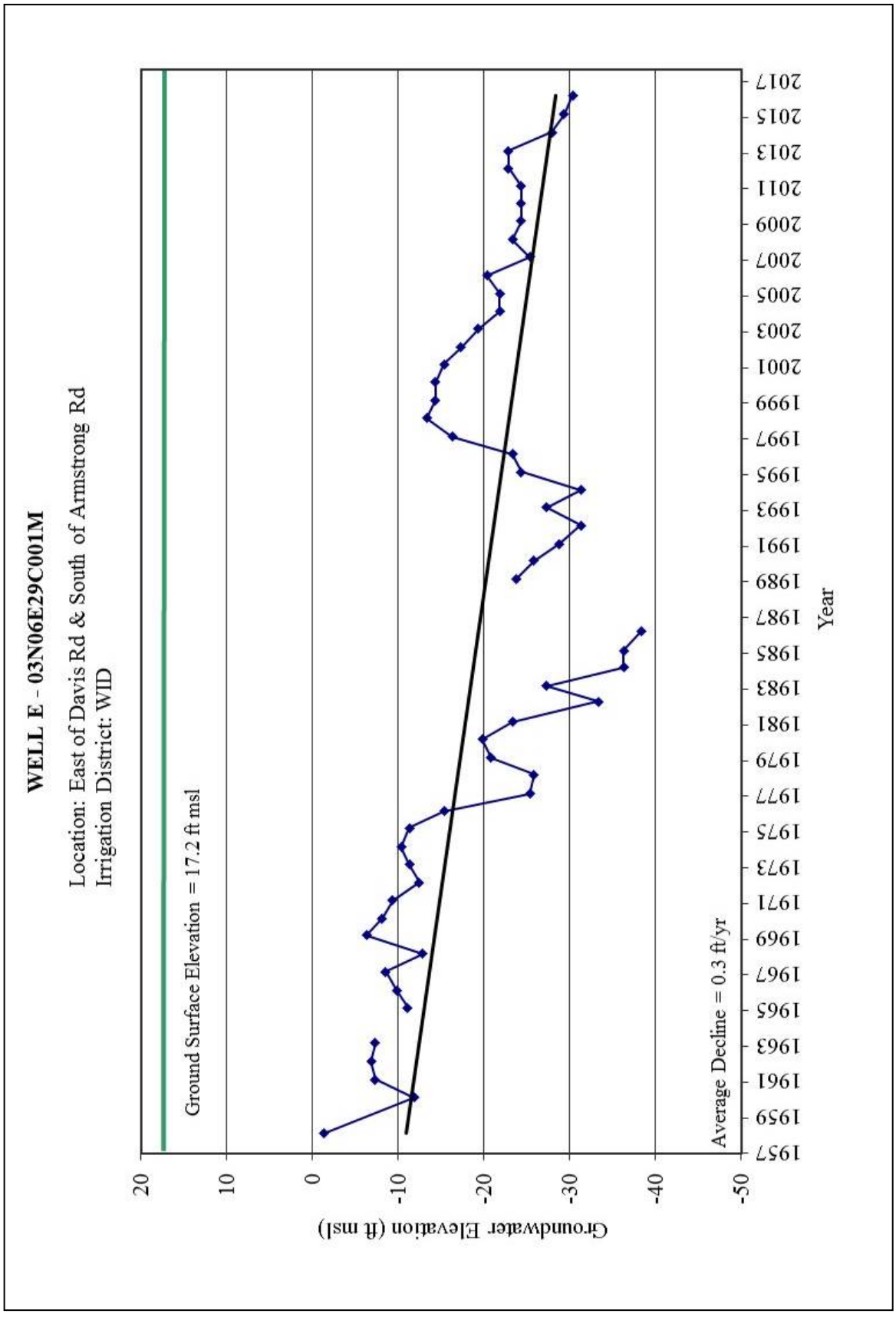

Figure 2-6 Spring Hydrograph Well E

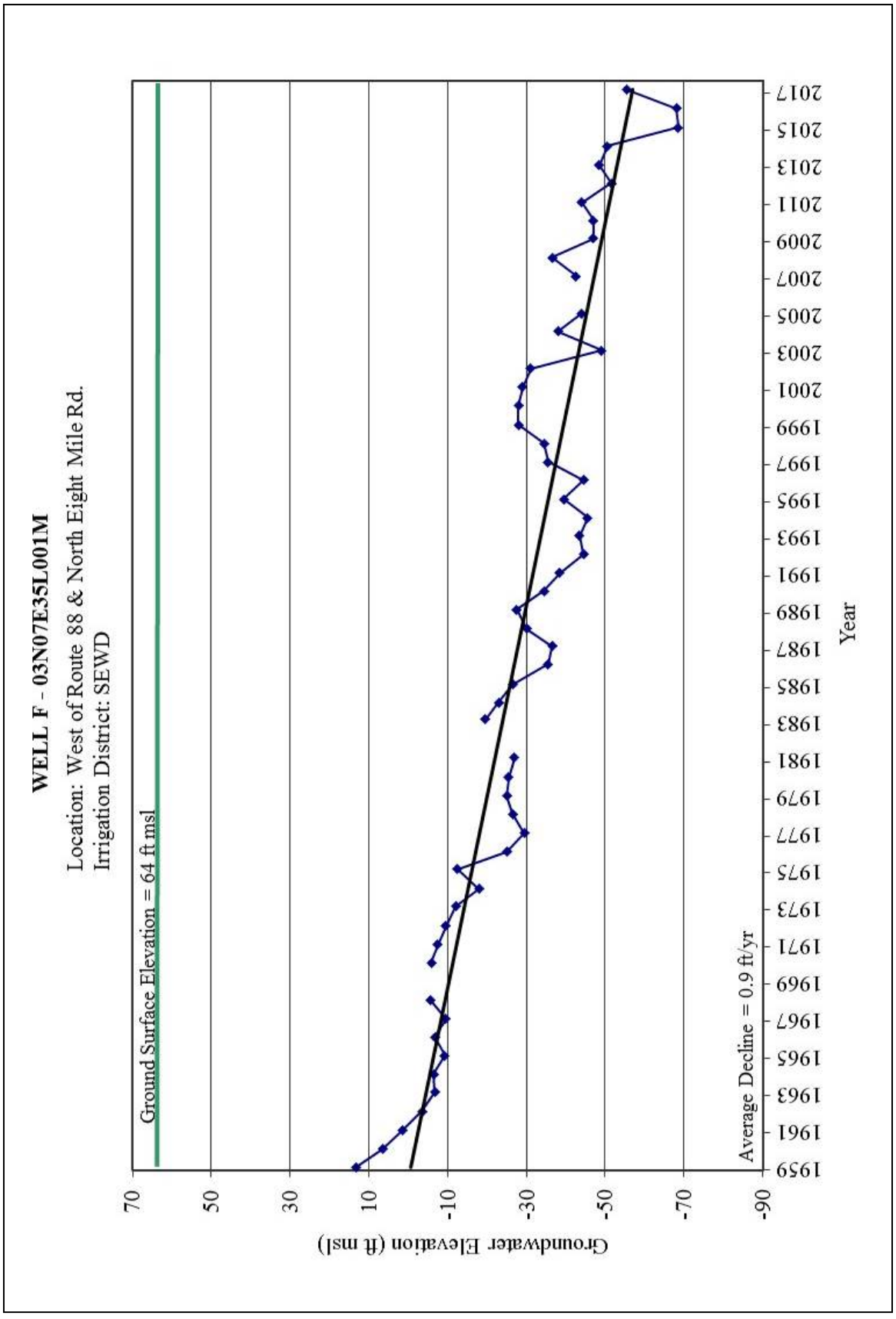

Figure 2-7 Spring Hydrograph Well F

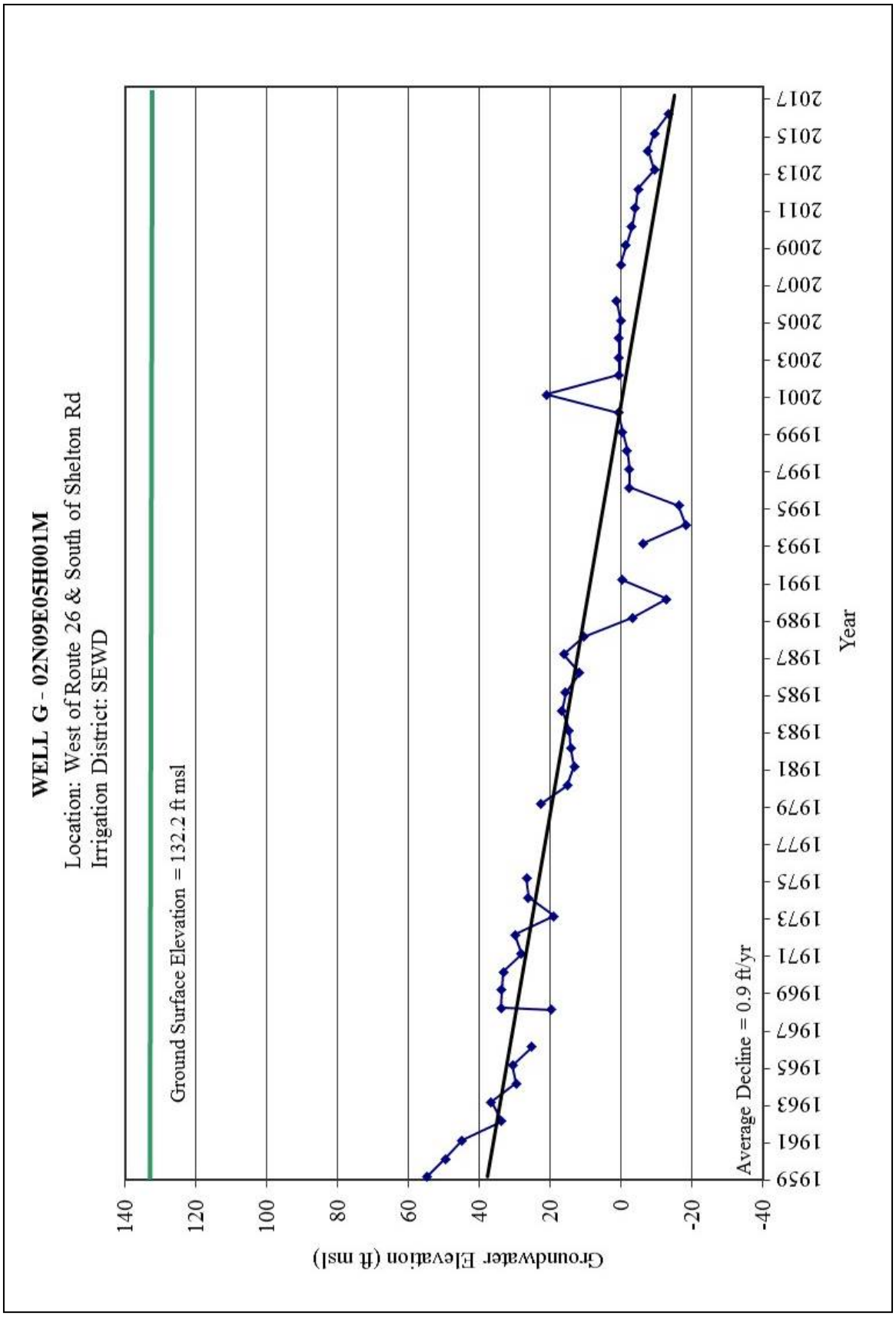

Figure 2-8 Spring Hydrograph Well G

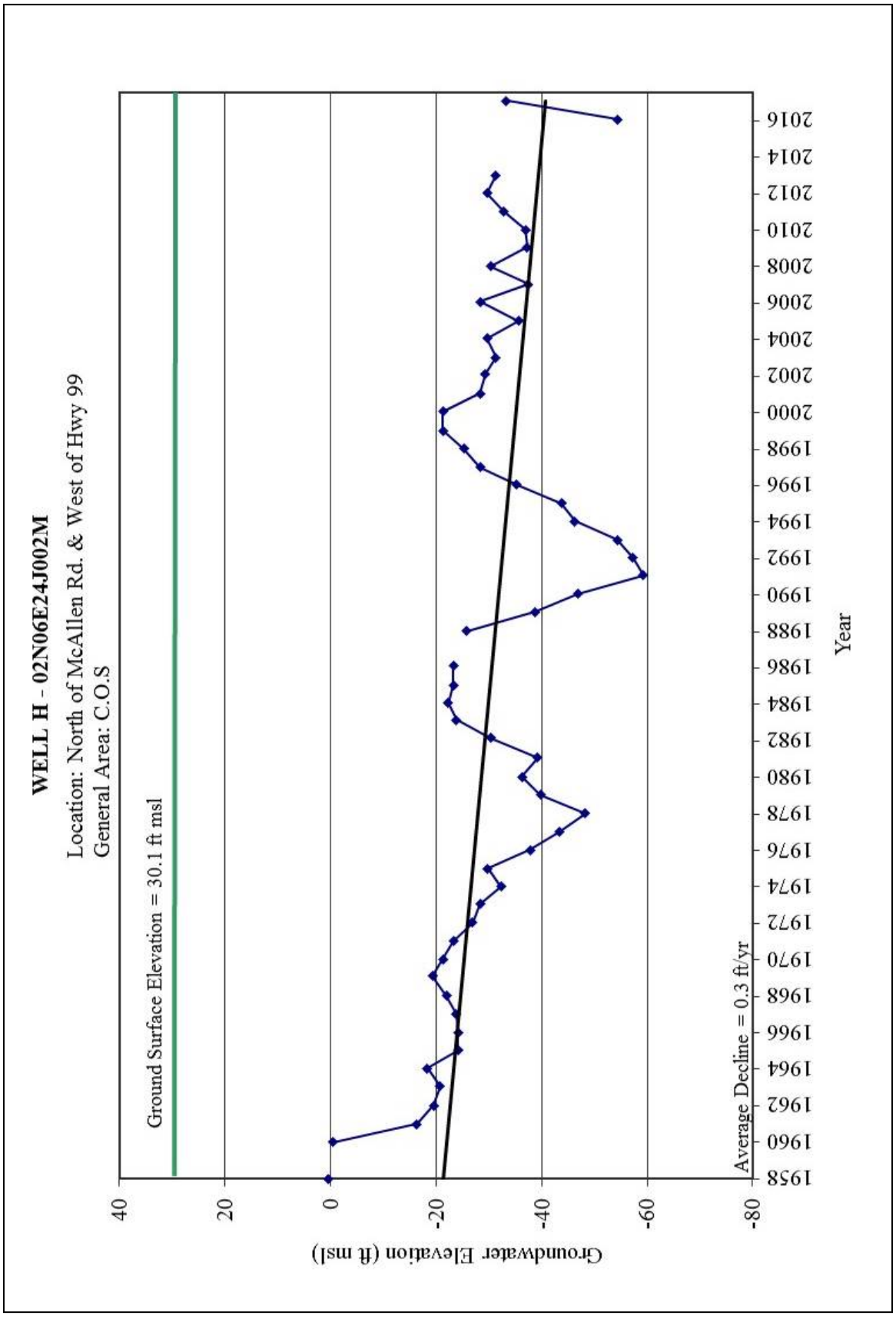

Figure 2-9 Spring Hydrograph Well H

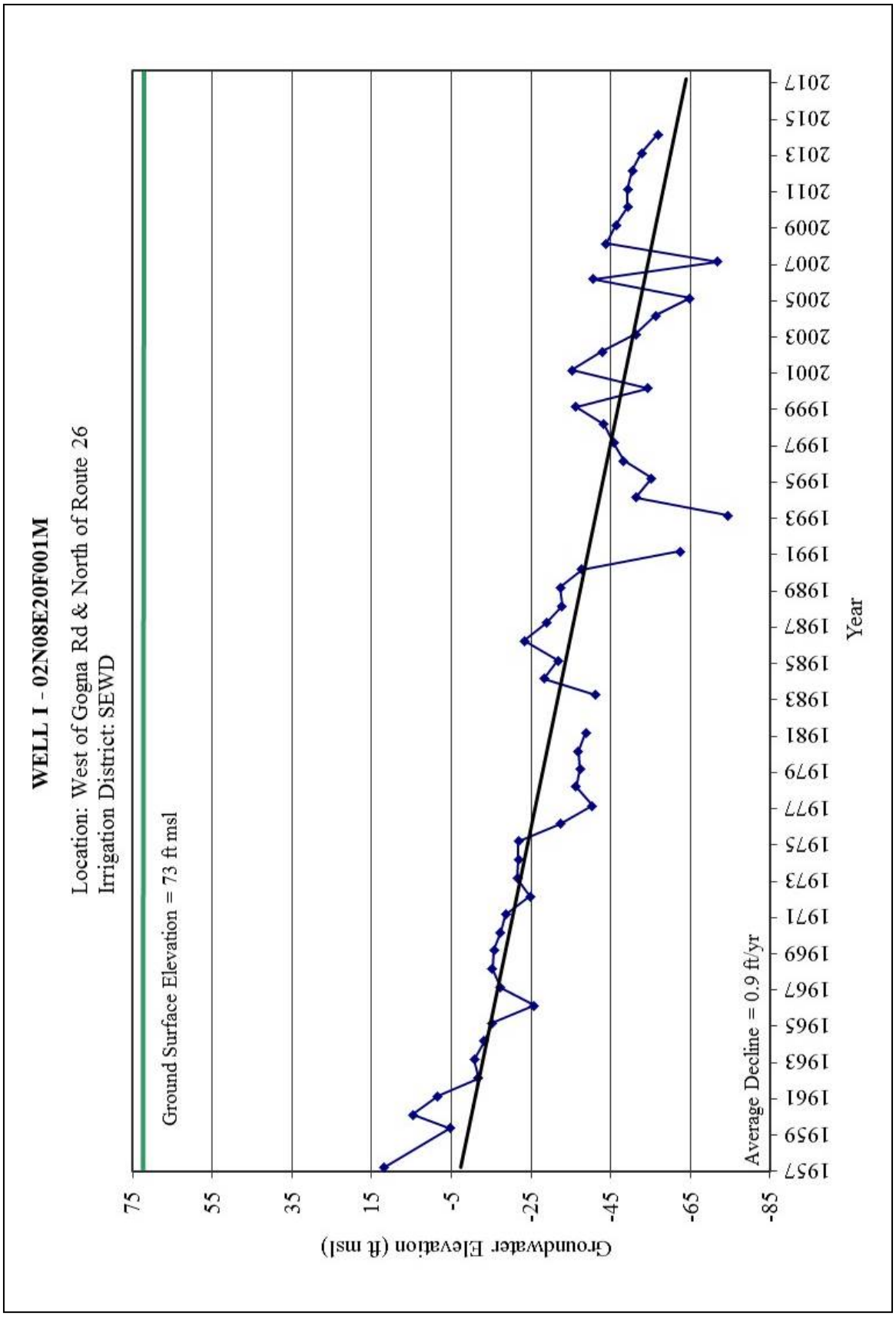

Figure 2-10 Spring Hydrograph Well I

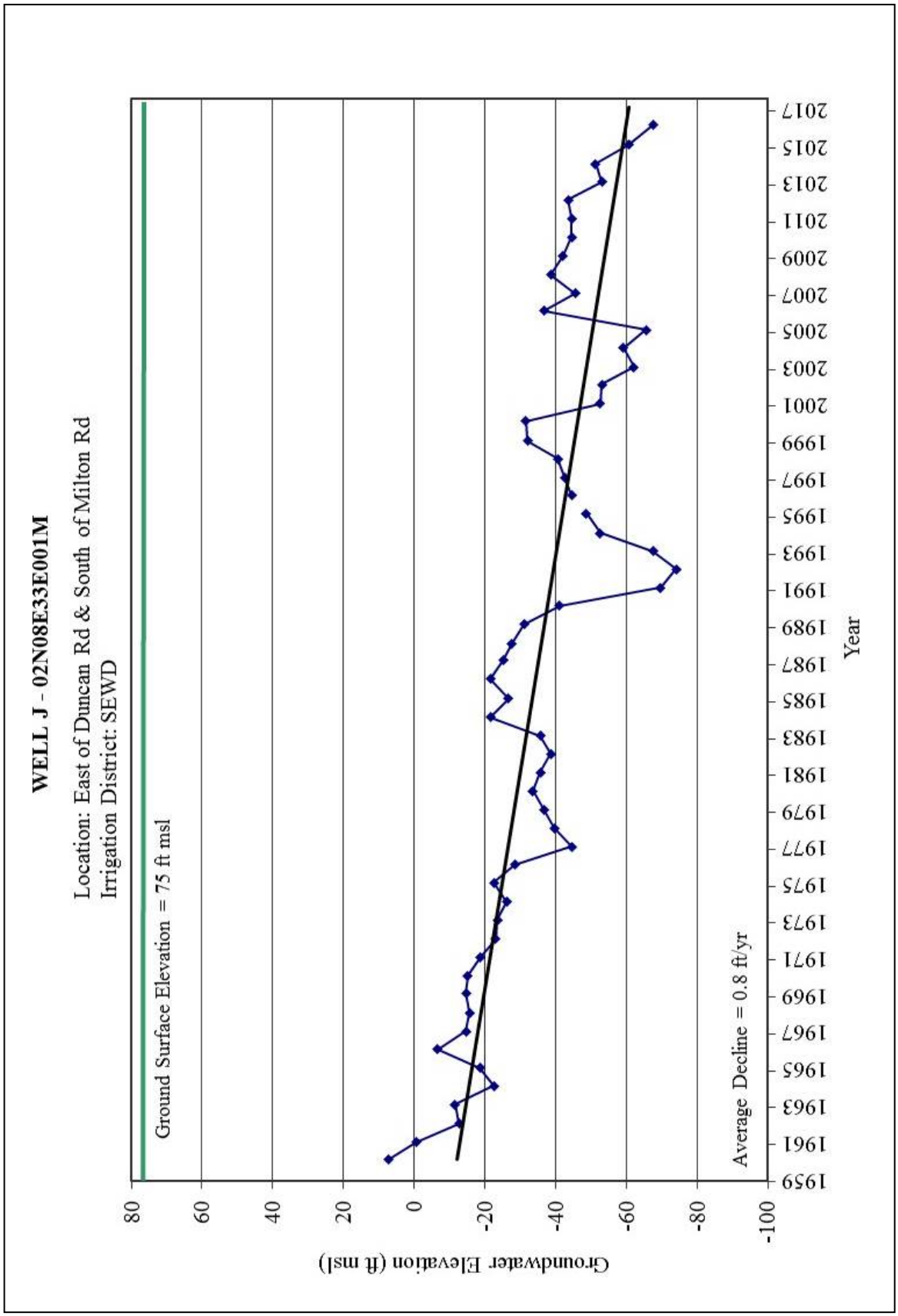

Figure 2-11 Spring Hydrograph Well J

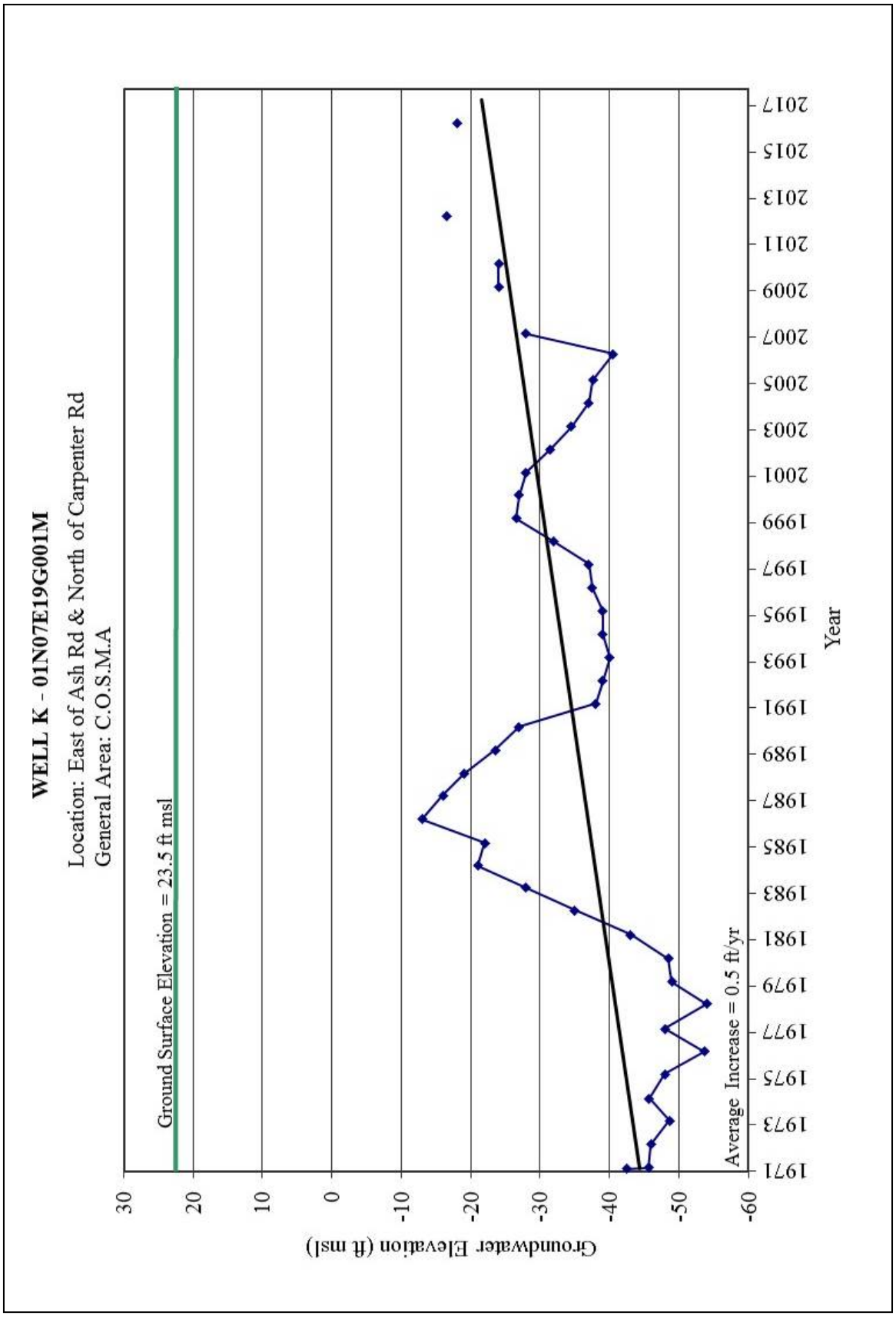

Figure 2-12 Spring Hydrograph Well K

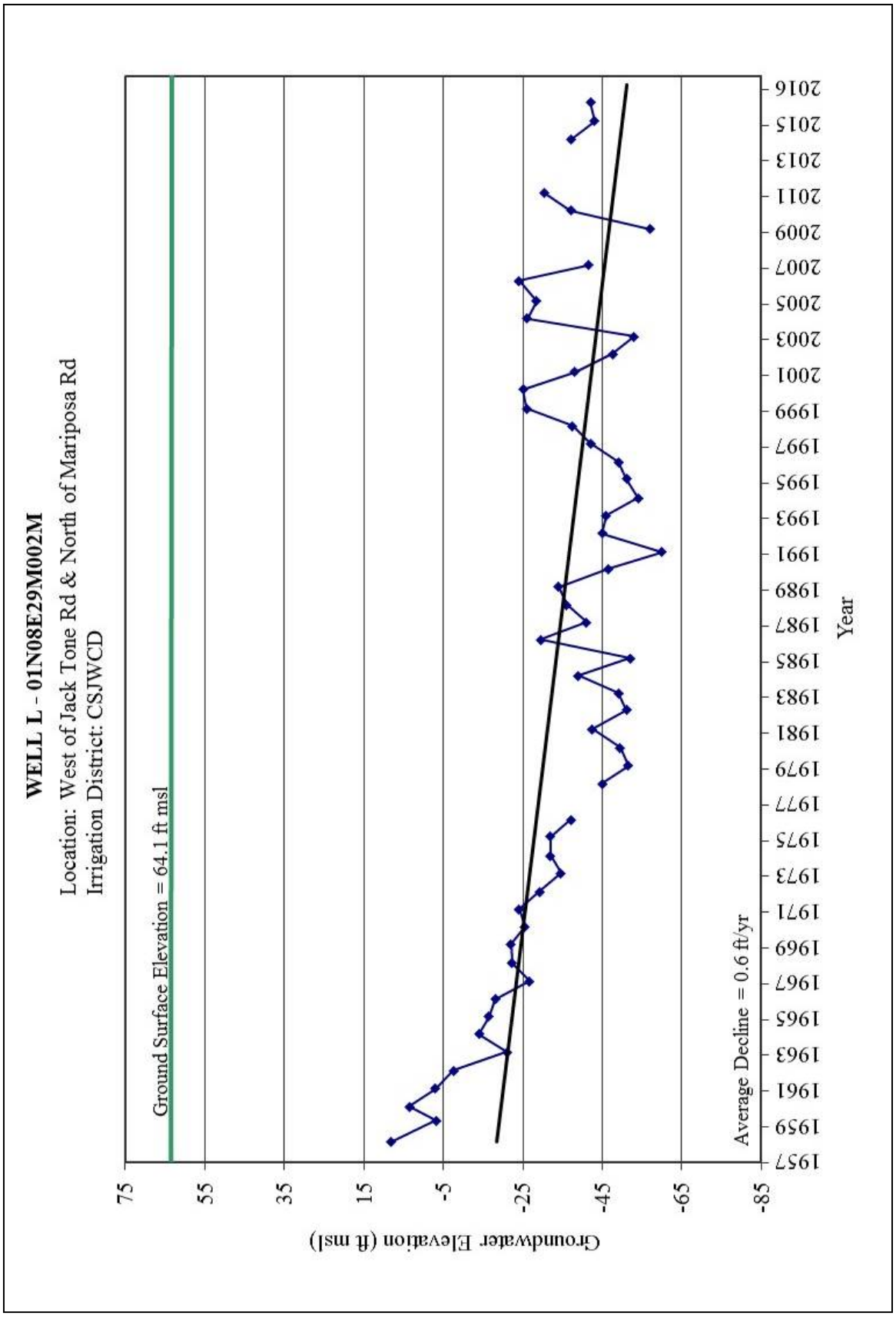

Figure 2-13 Spring Hydrograph Well L

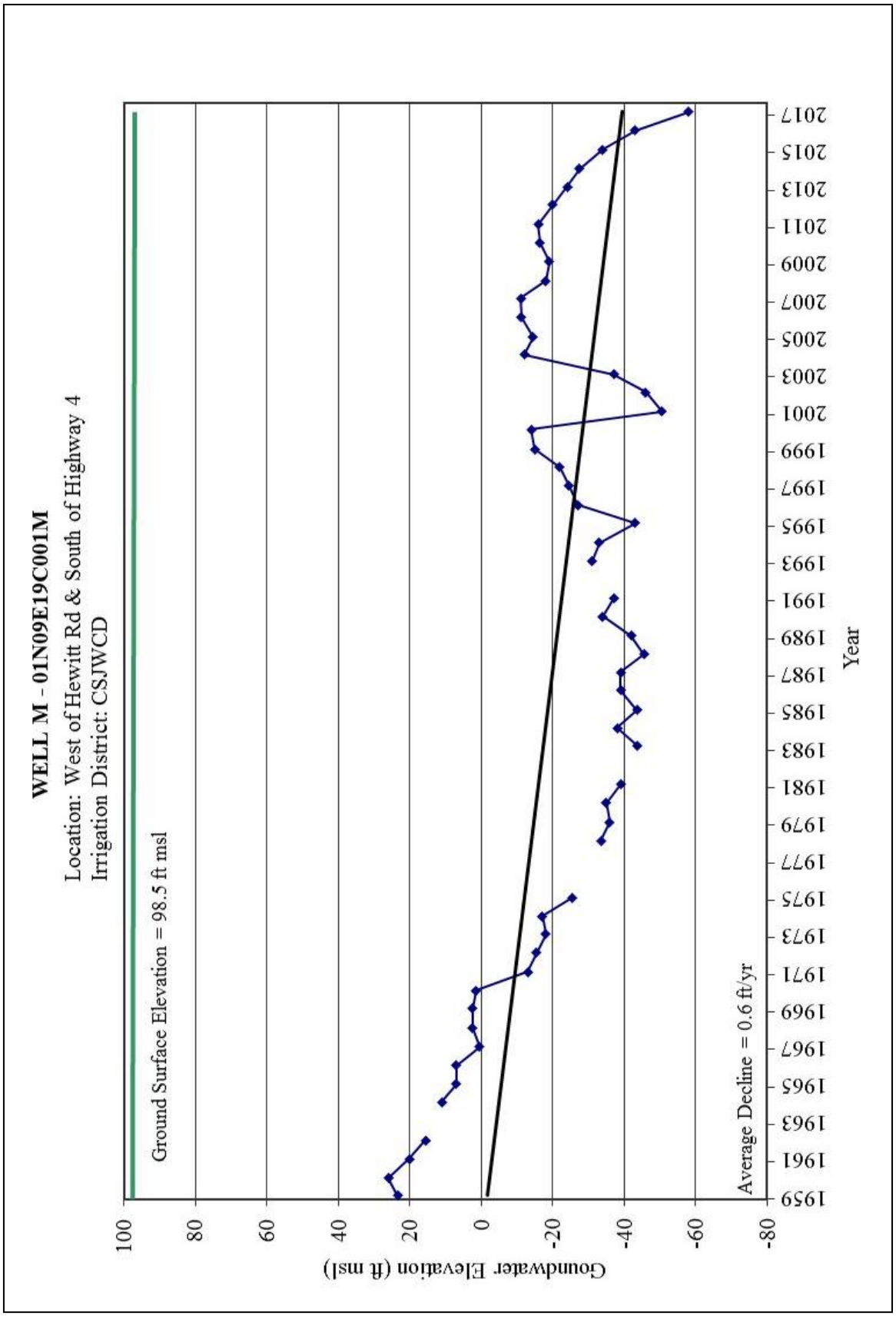

Figure 2-14 Spring Hydrograph Well M

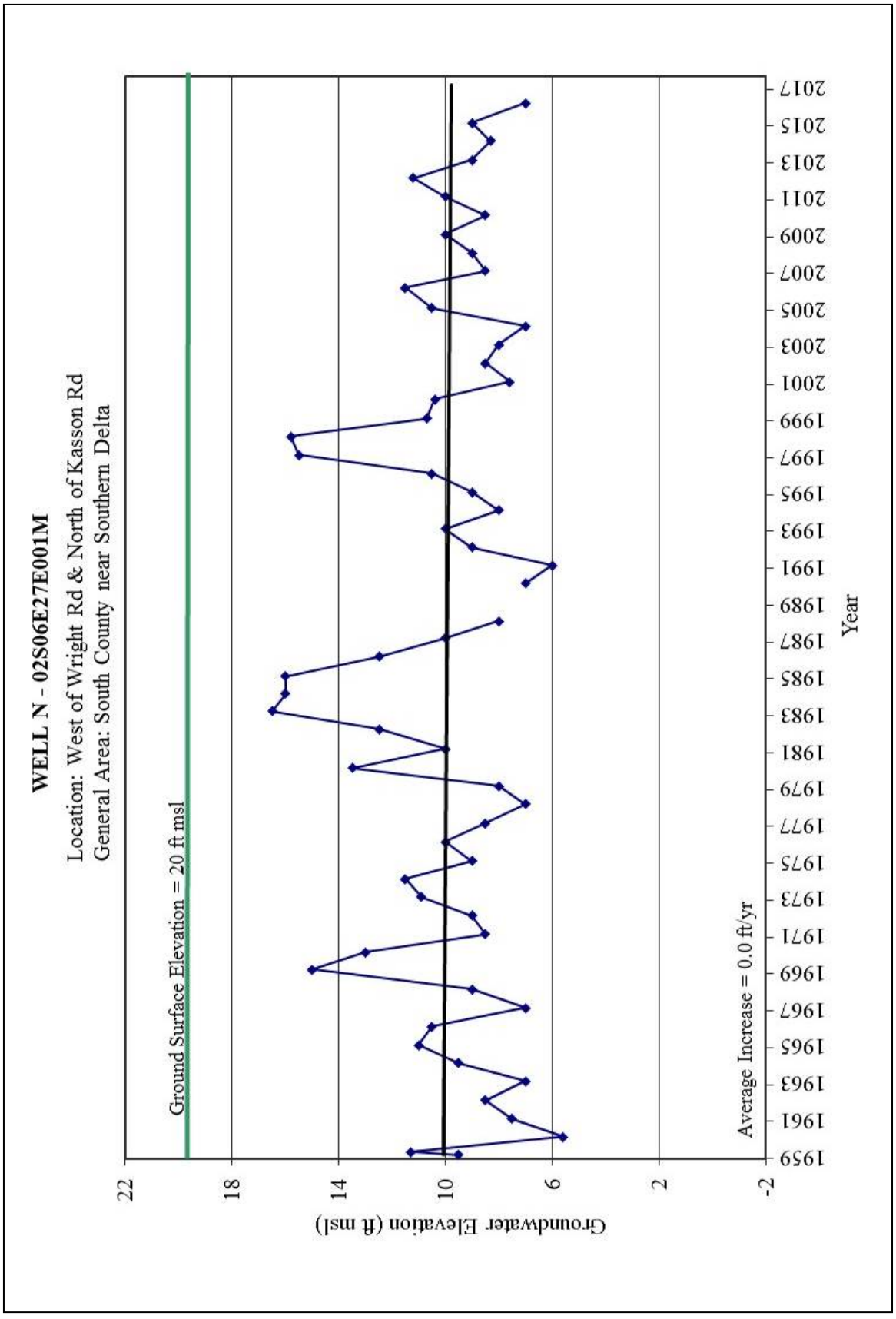

Figure 2-15 Spring Hydrograph Well N

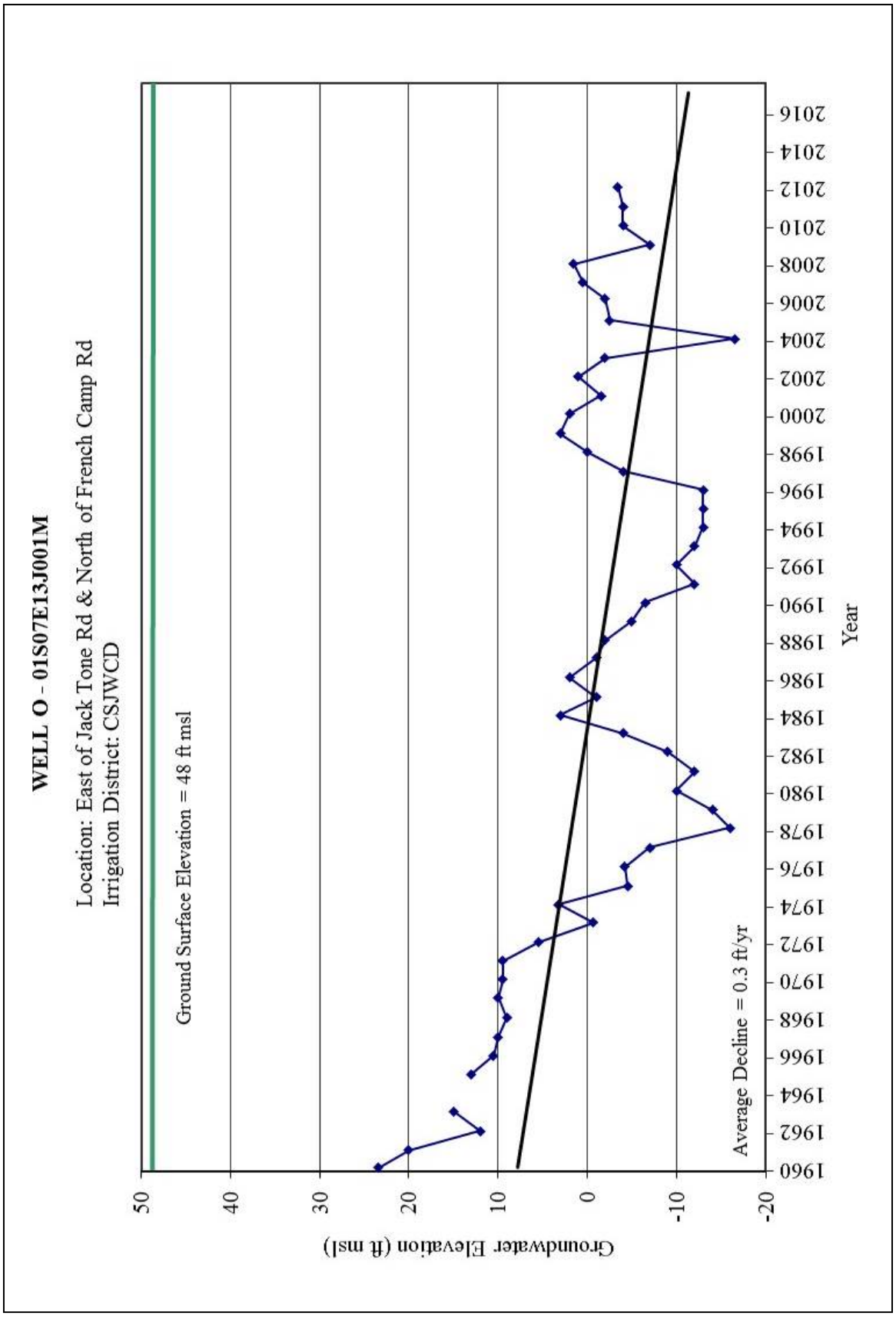

Figure 2-16 Spring Hydrograph Well O

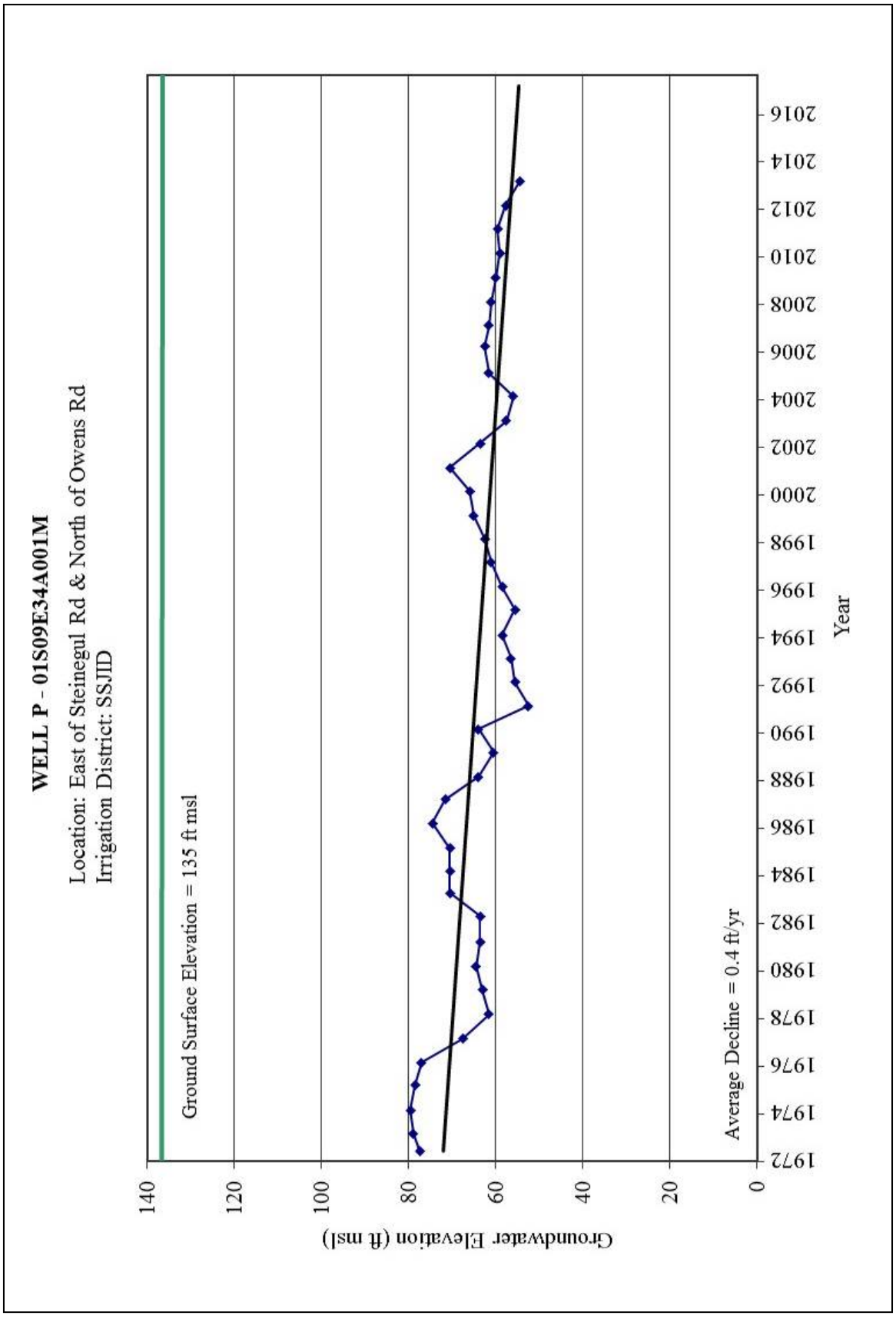

Figure 2-17 Spring Hydrograph Well P

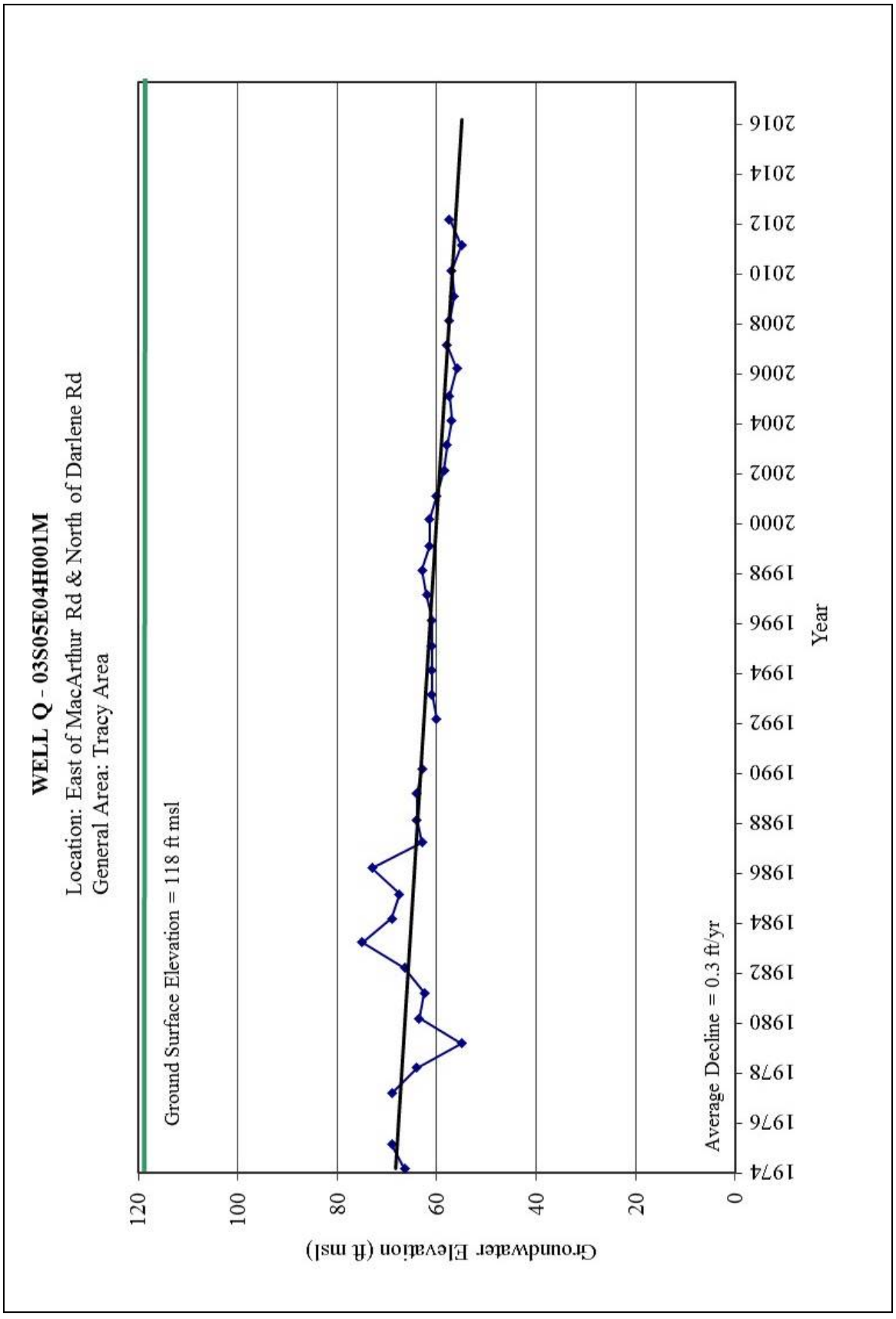

Figure 2-18 Spring Hydrograph Well Q

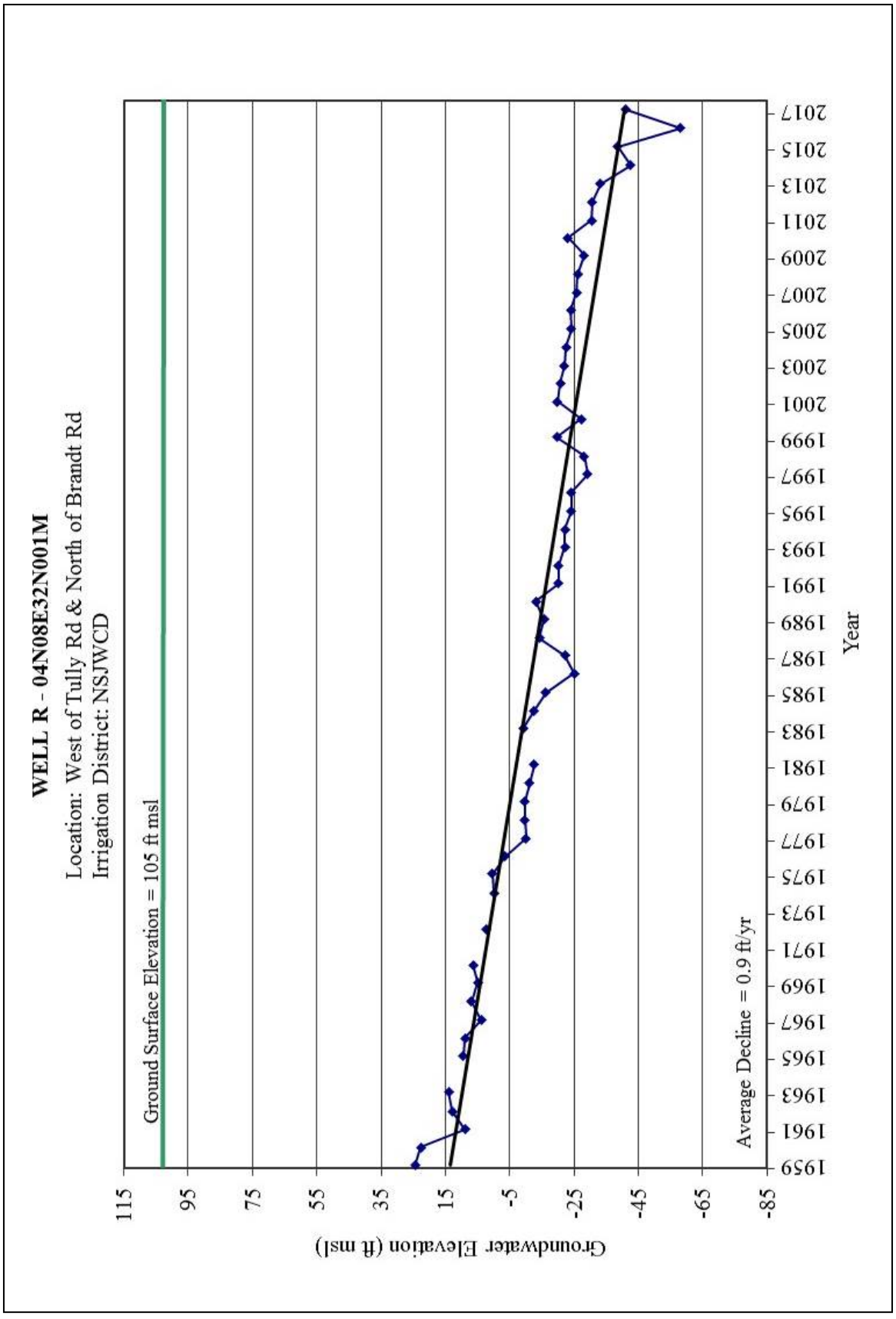

Figure 2-19 Spring Hydrograph Well R

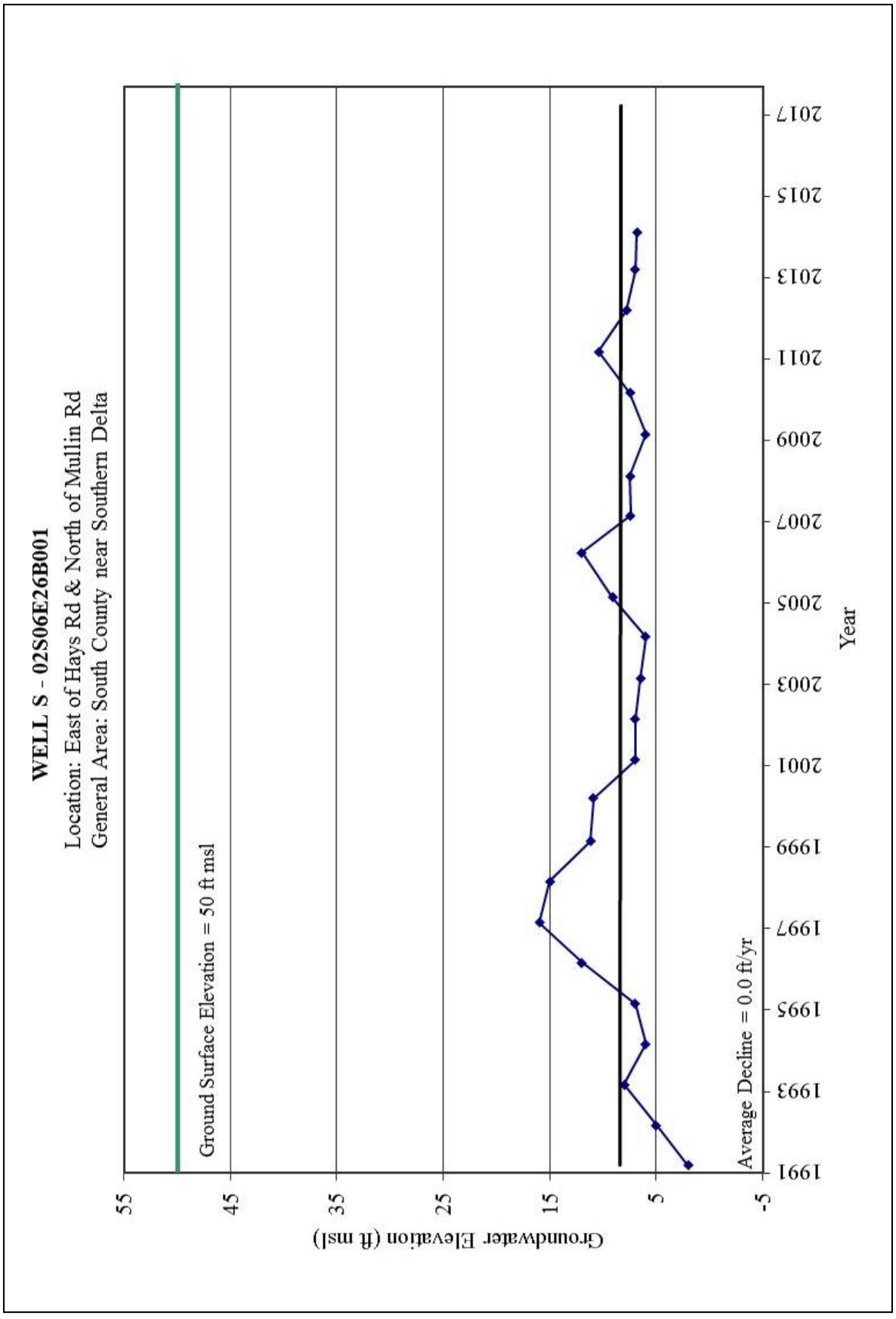

Figure 2-20 Spring Hydrograph Well S

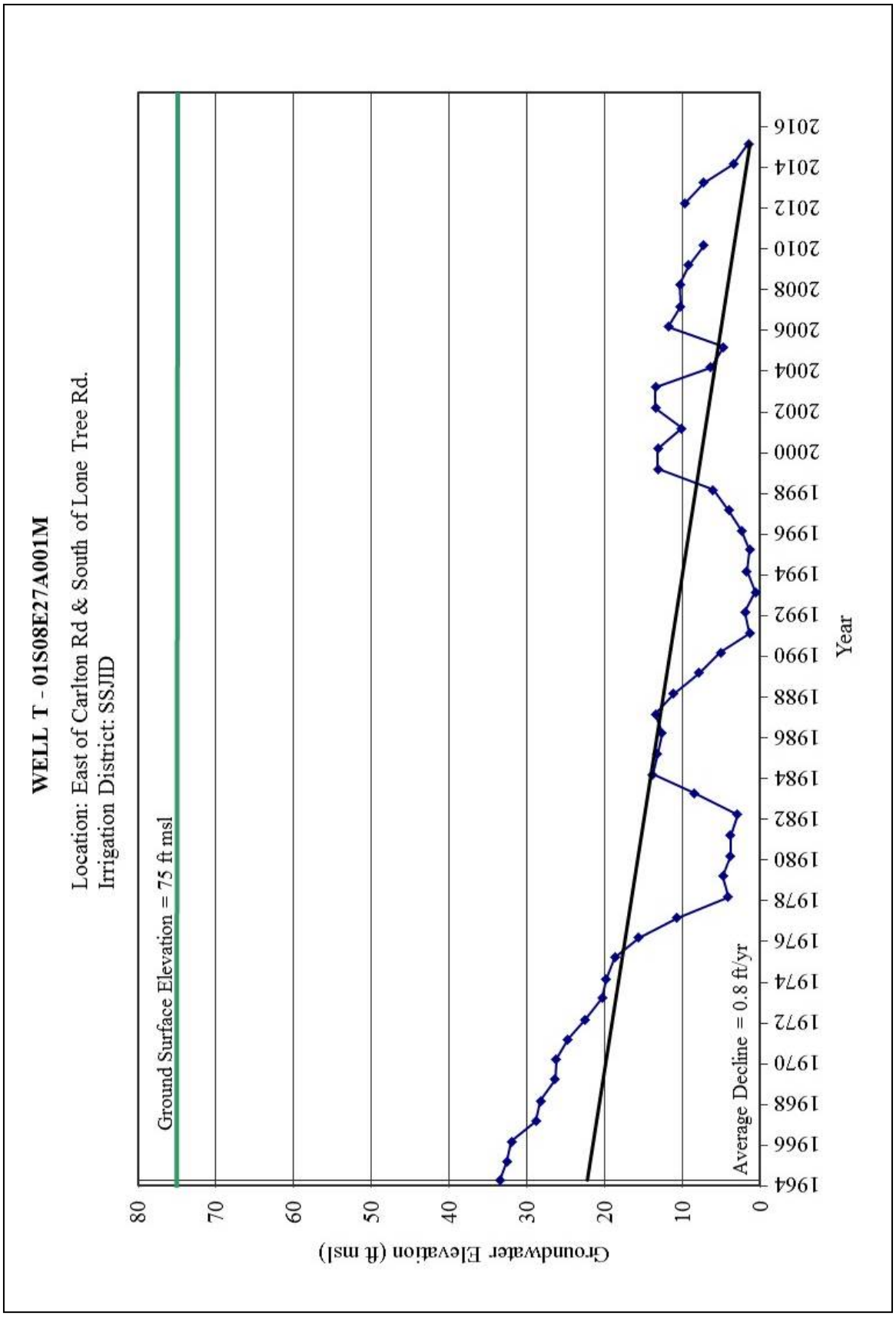

Figure 2-21 Spring Hydrograph Well T

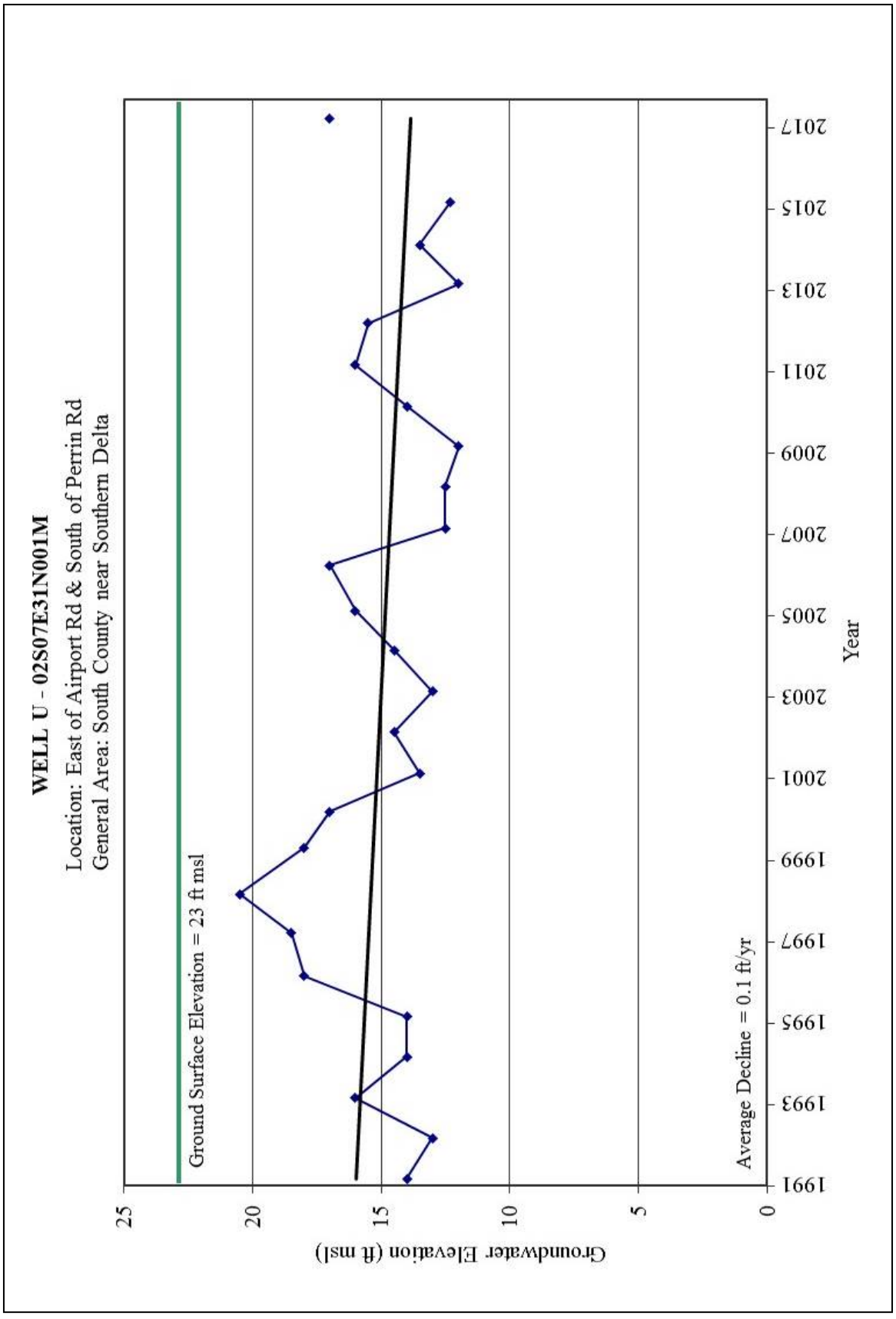

Figure 2-22 Spring Hydrograph Well U

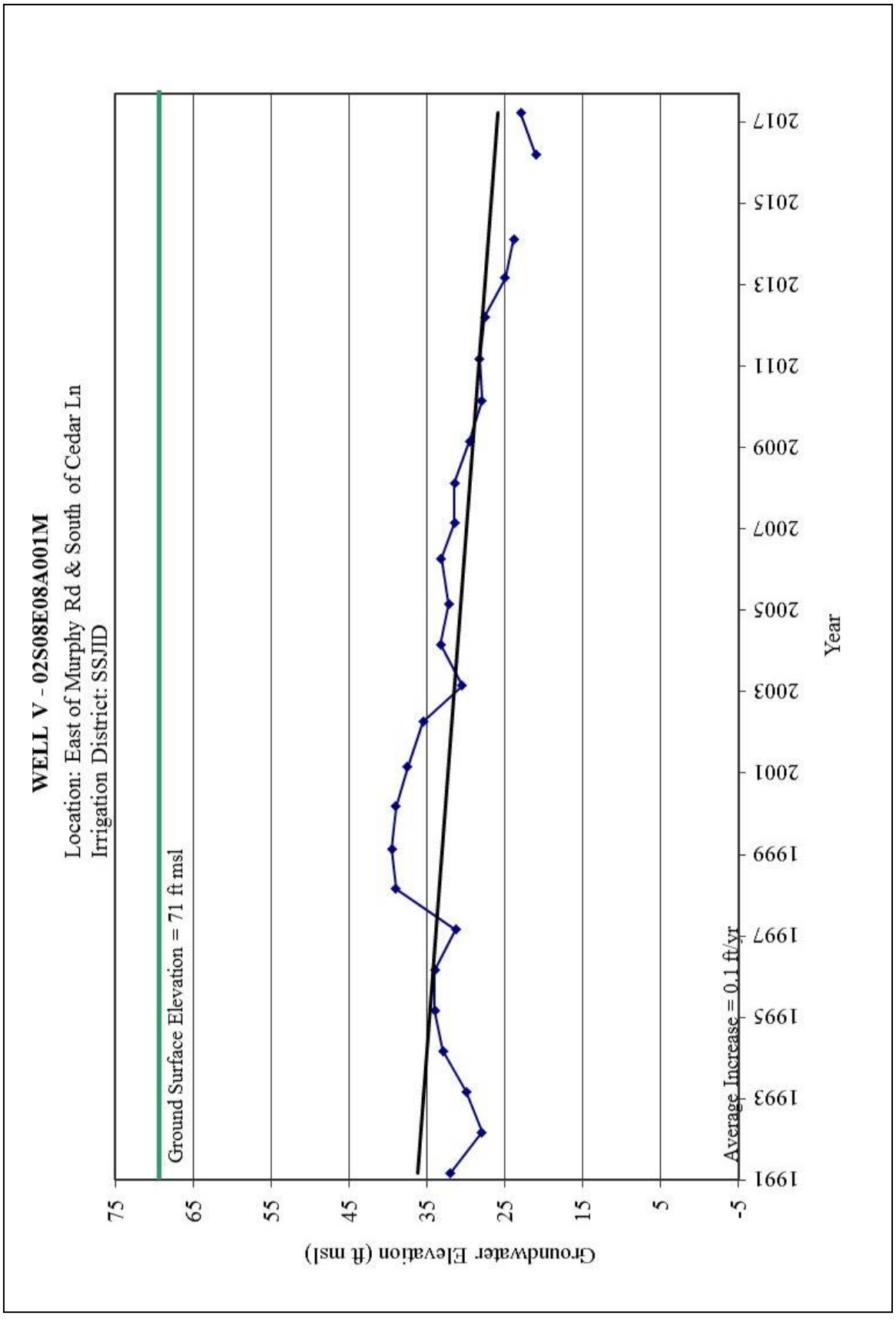

Figure 2-23 Spring Hydrograph Well V

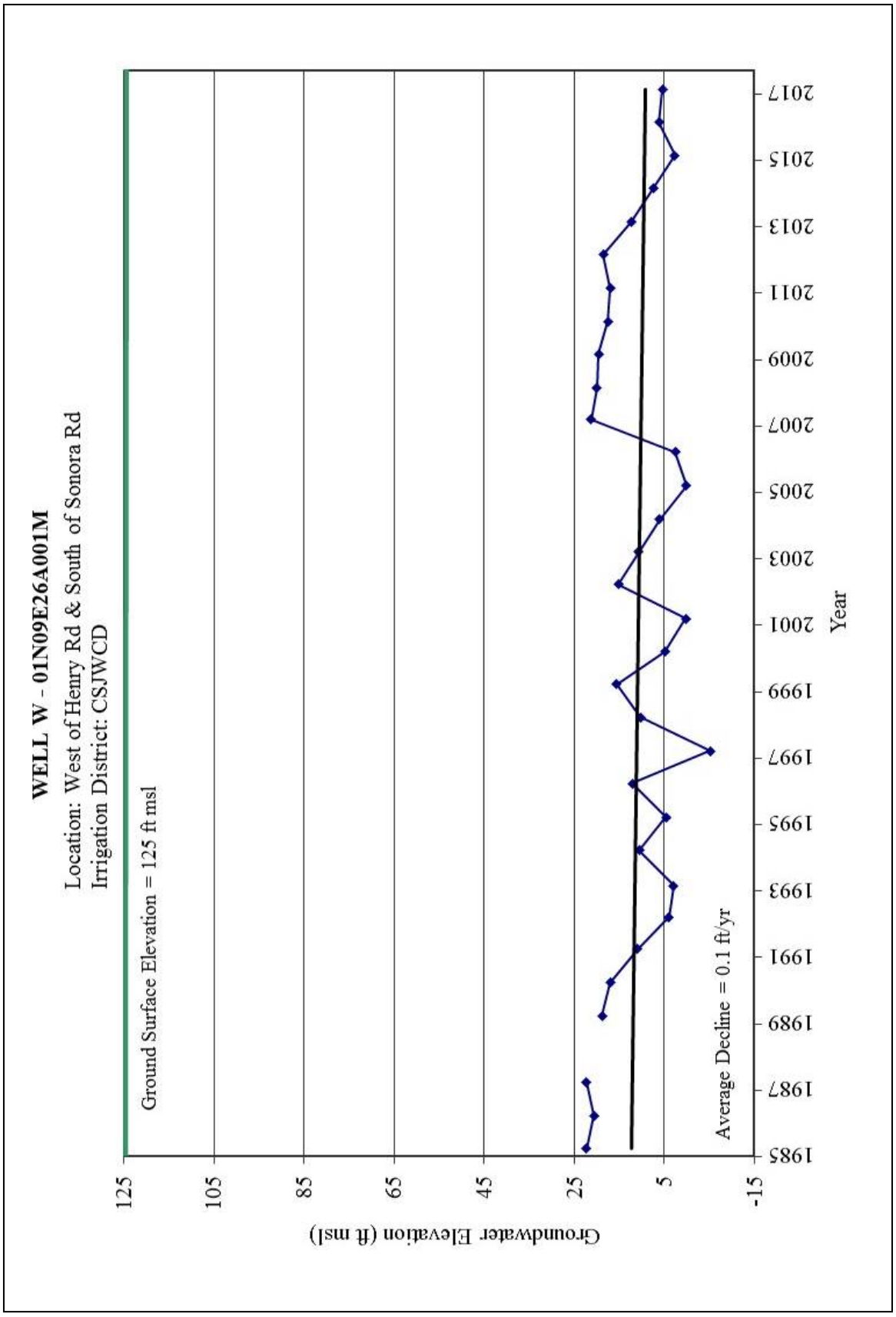

Figure 2-24 Spring Hydrograph Well W

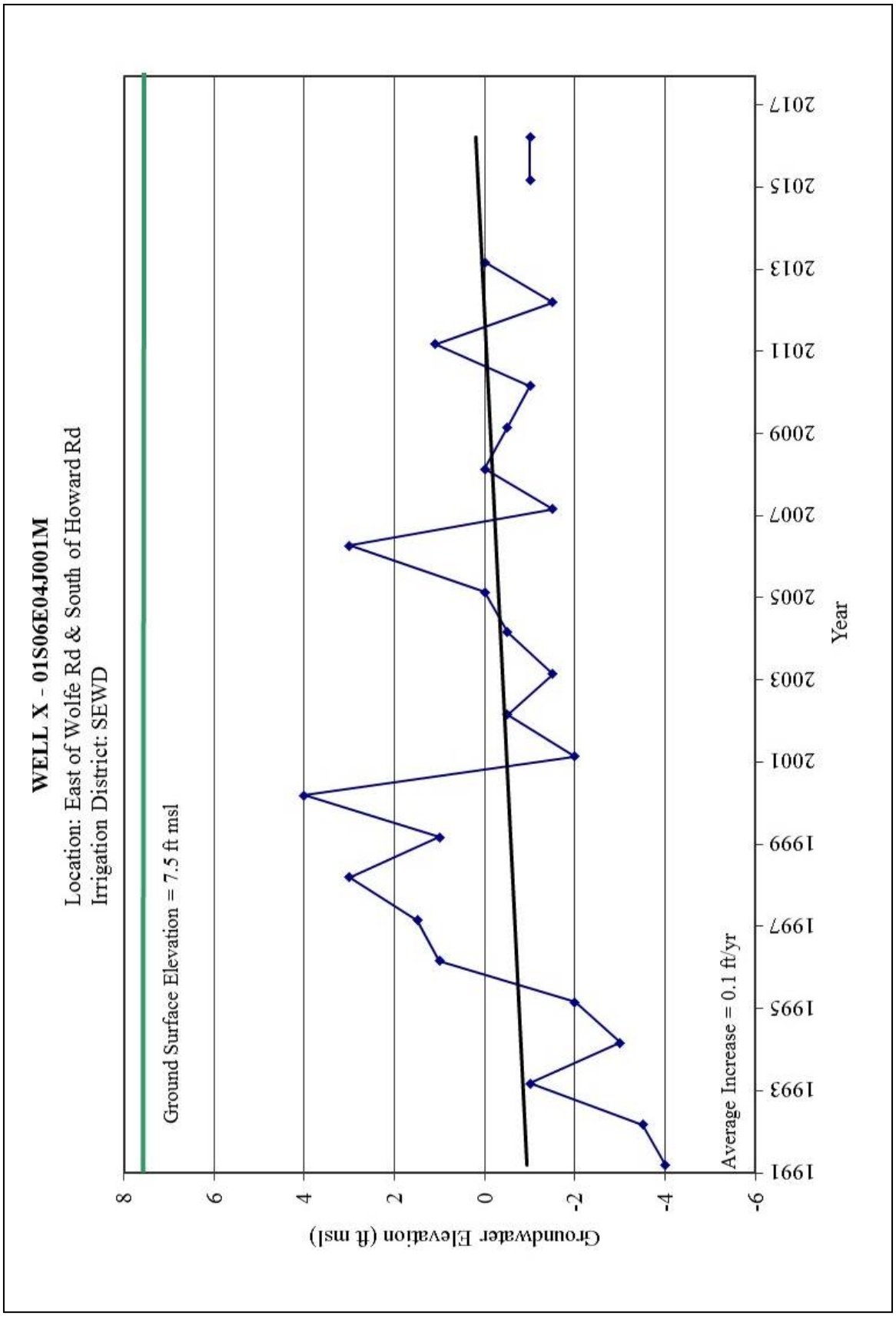

Figure 2-25 Spring Hydrograph Well X

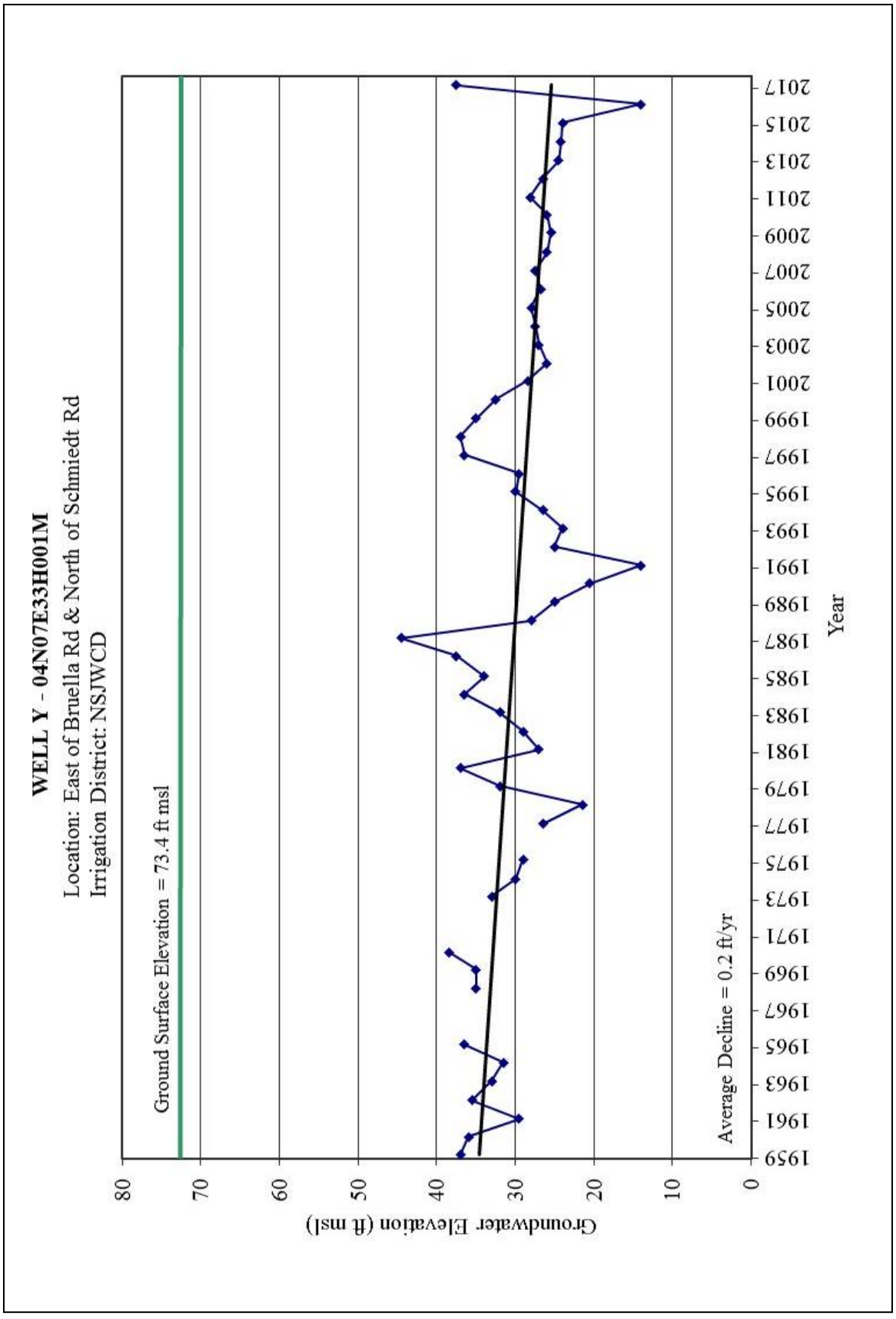

Figure 2-26 Spring Hydrograph Well Y

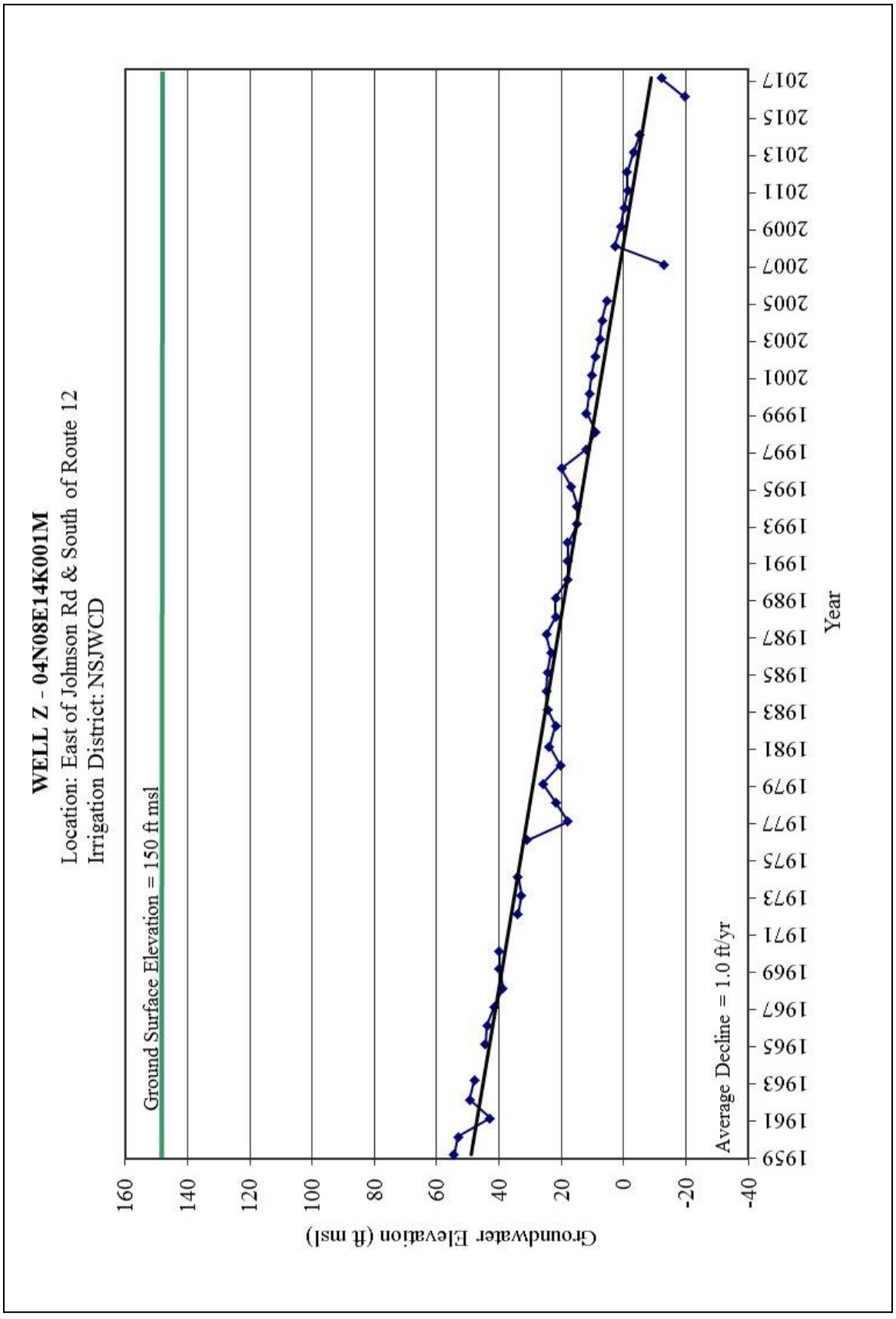

Figure 2-27 Spring Hydrograph Well Z

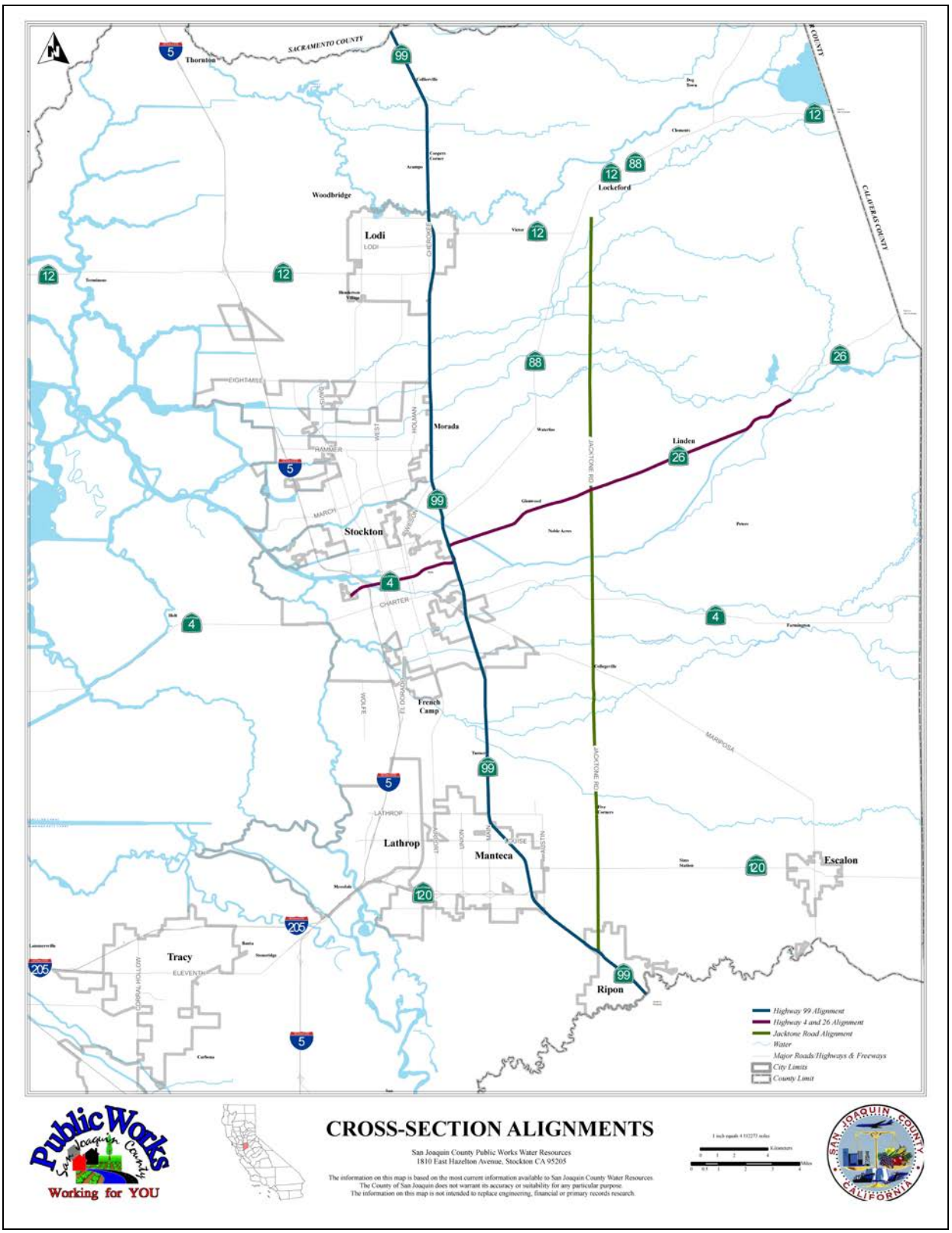

Figure 2-28 Cross Section Alignments

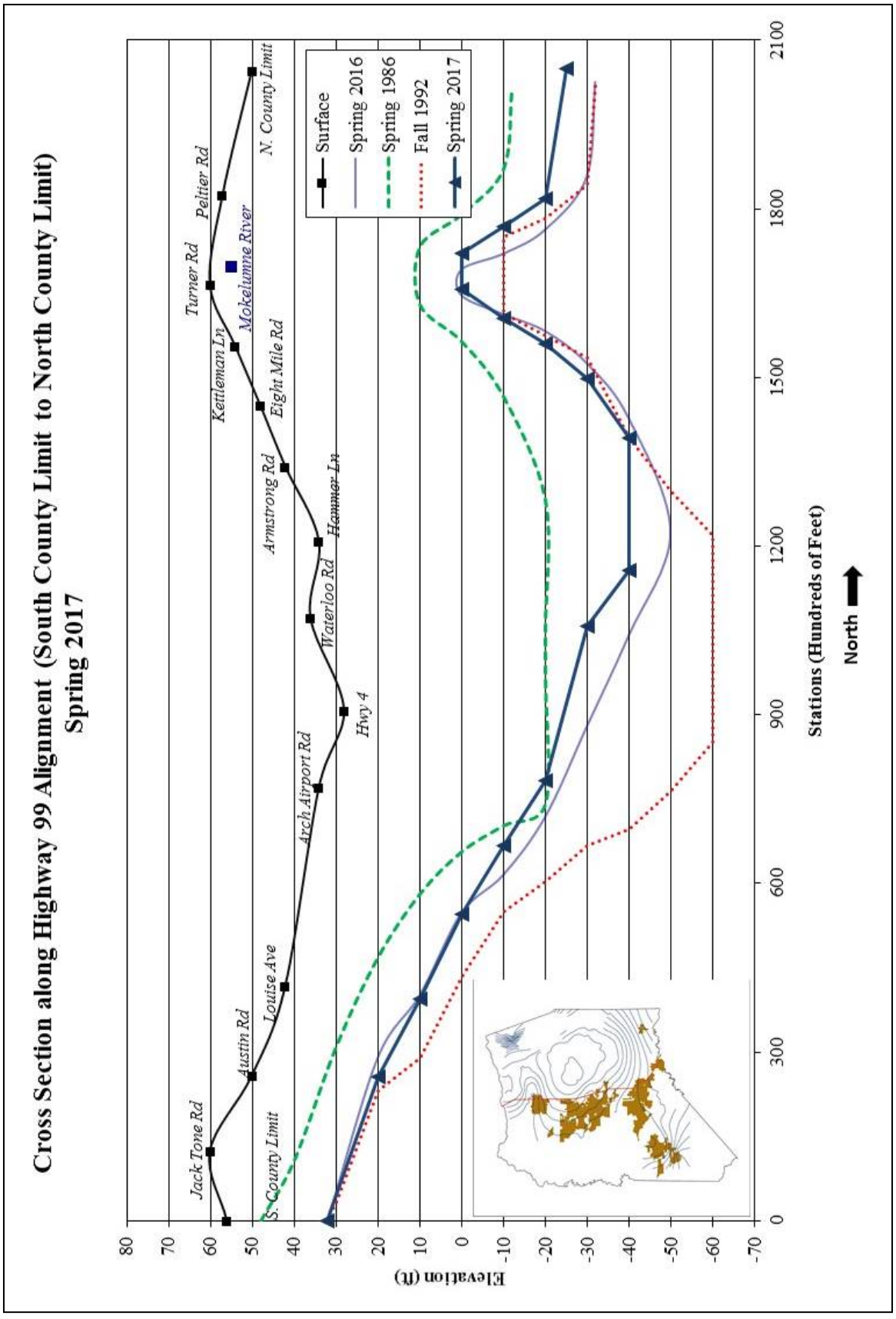

Figure 2-29 Highway 99 Cross Section Spring 2017

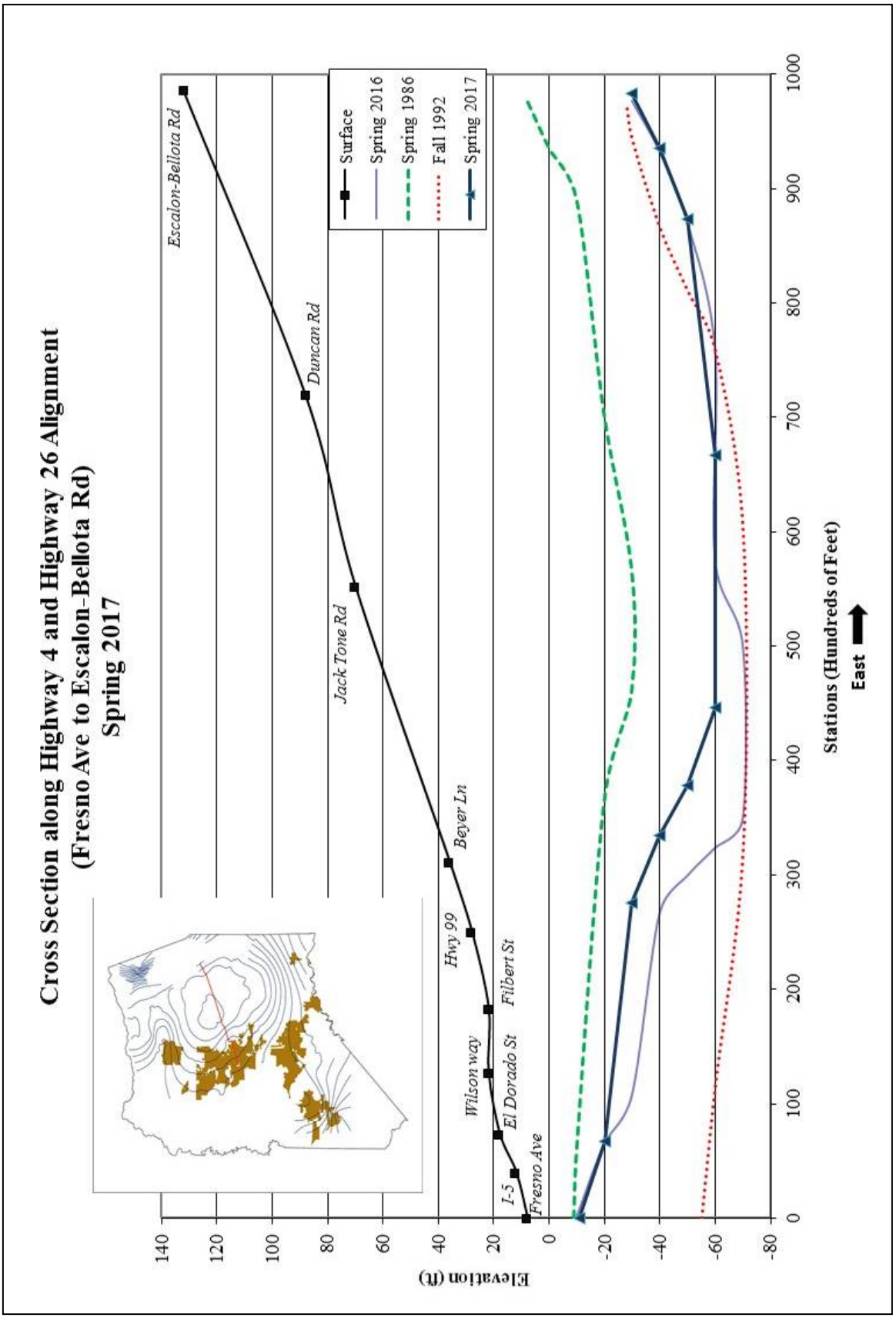

Figure 2-30 Highway 4 & Highway 26 Cross Section Spring 2017

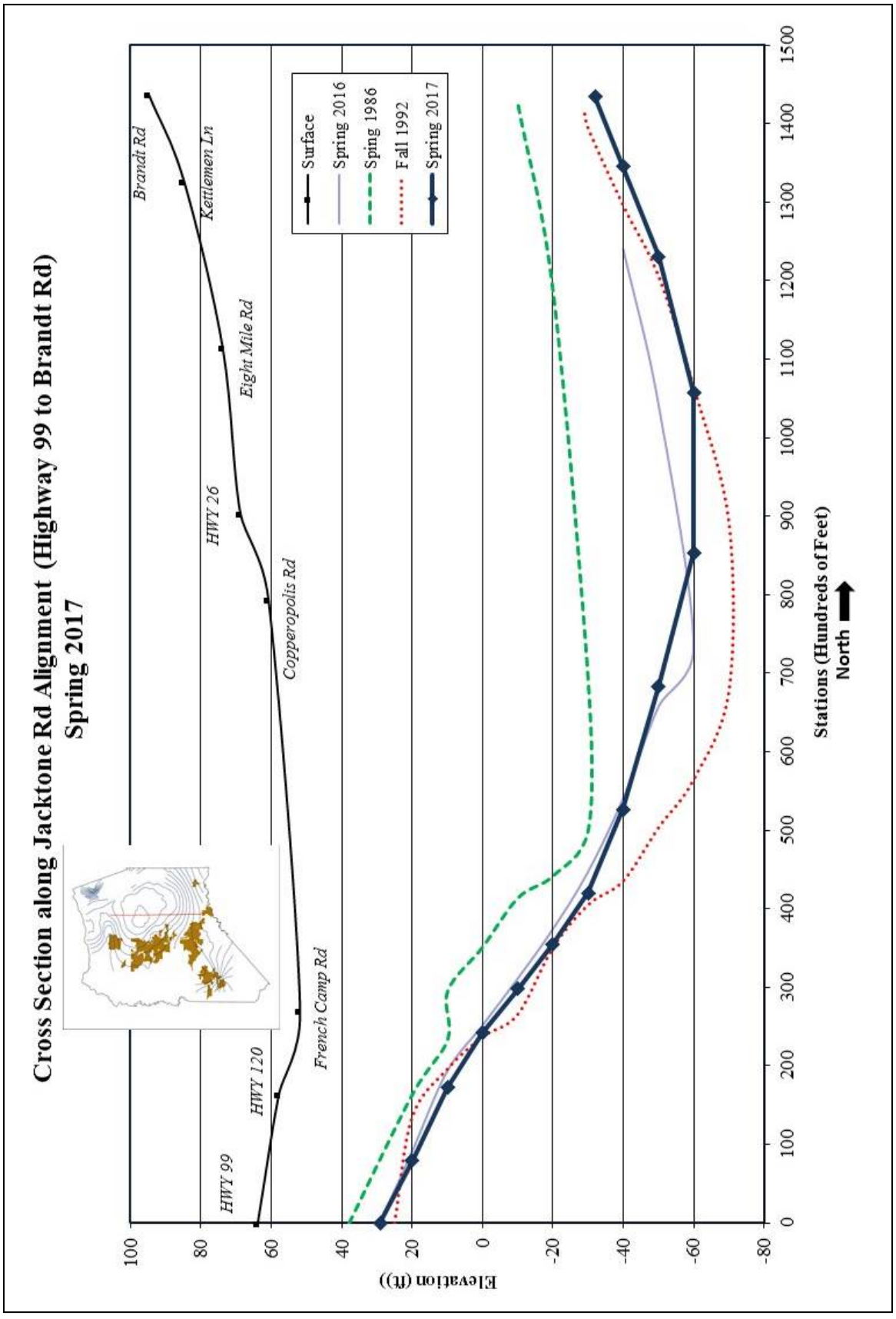

Figure 2-31 Jacktone Rd Cross Section Spring 2017

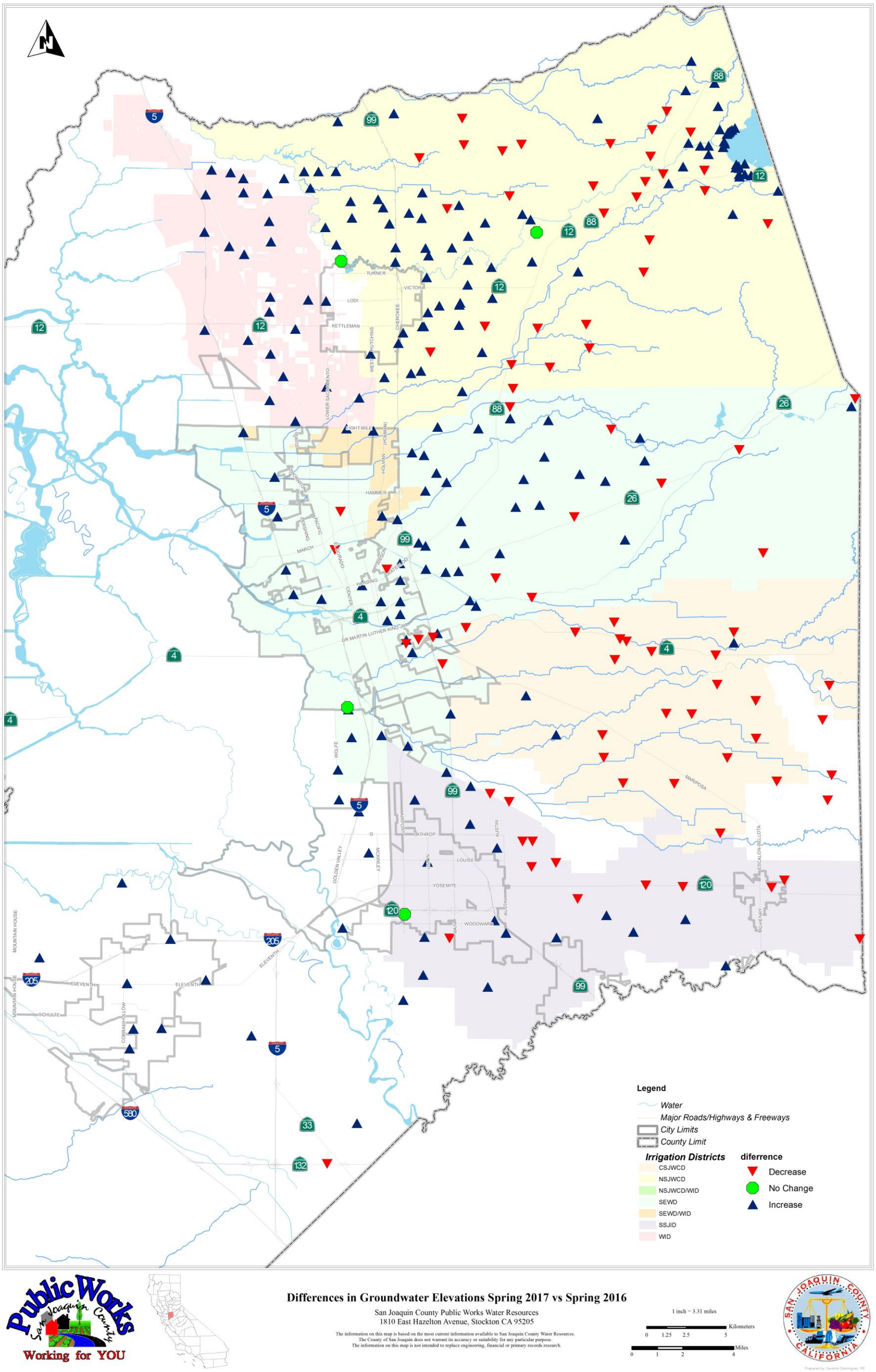

Figure 2-32 Differences in Groundwater Elevations Spring 2017 (Spring 2017 and Spring 2016 Comparisons)

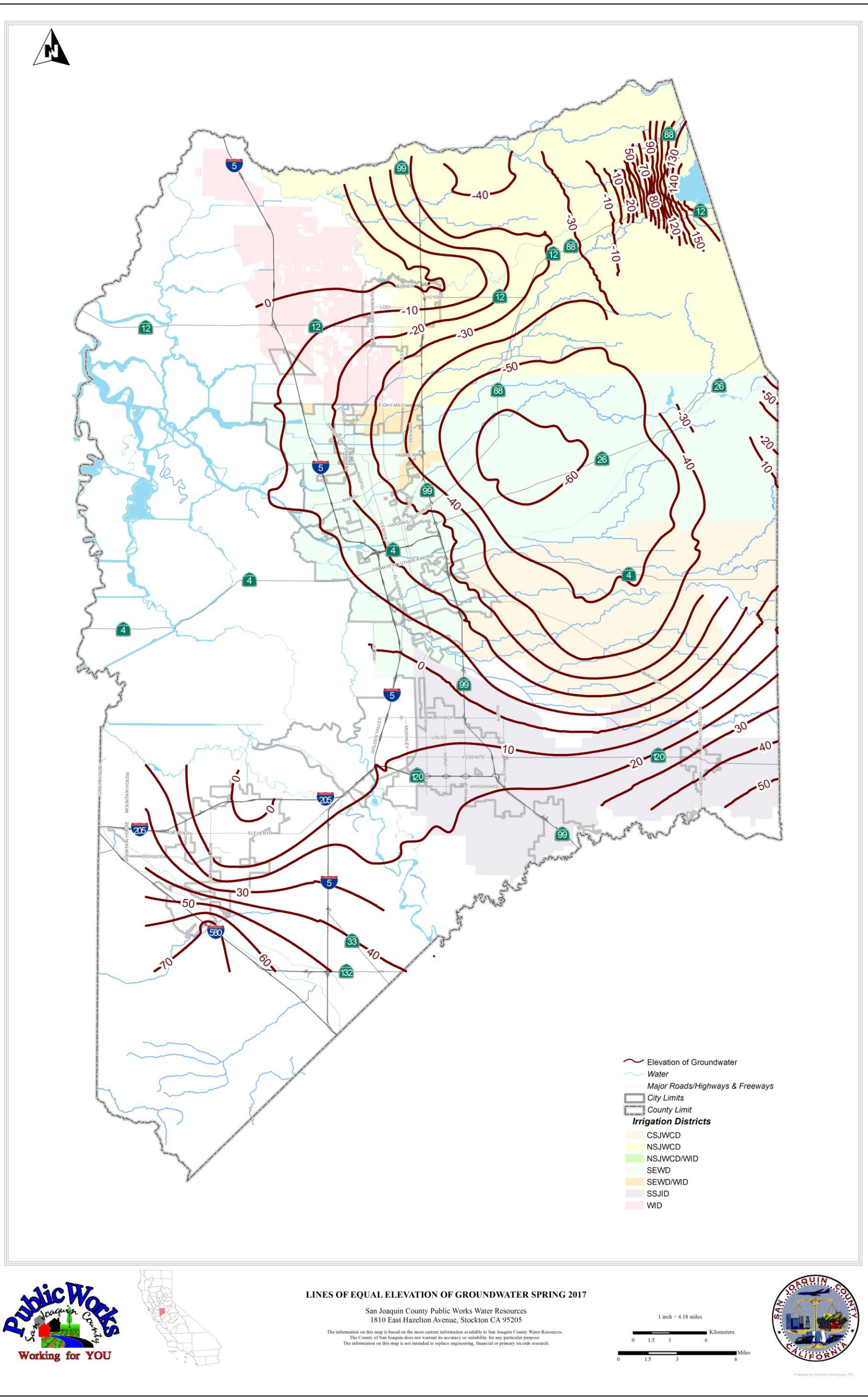

Figure 2-33 Lines of Equal Elevation of Groundwater Spring 2017

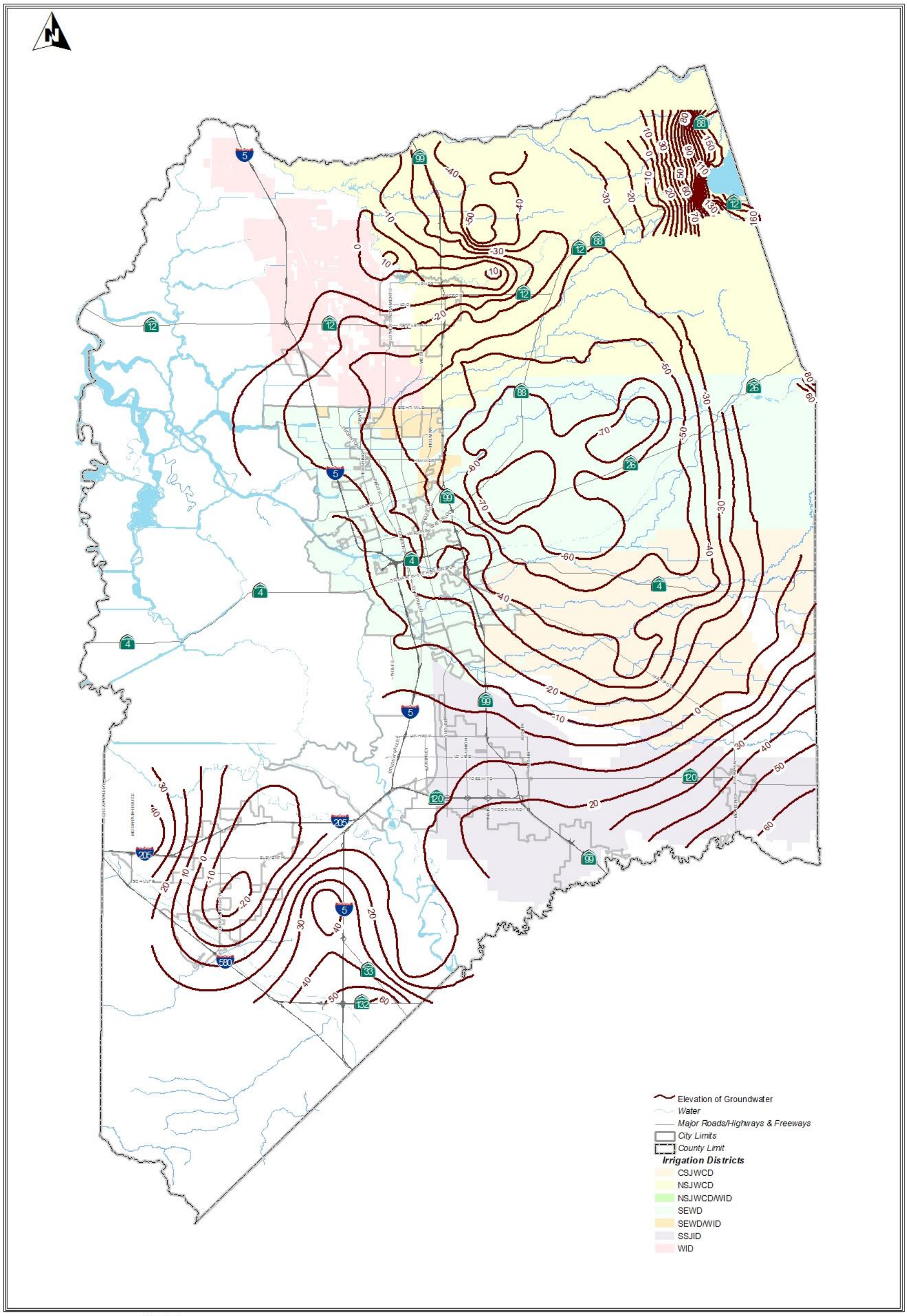

Figure 2-34 Lines of Equal Elevation of Groundwater Spring 2016

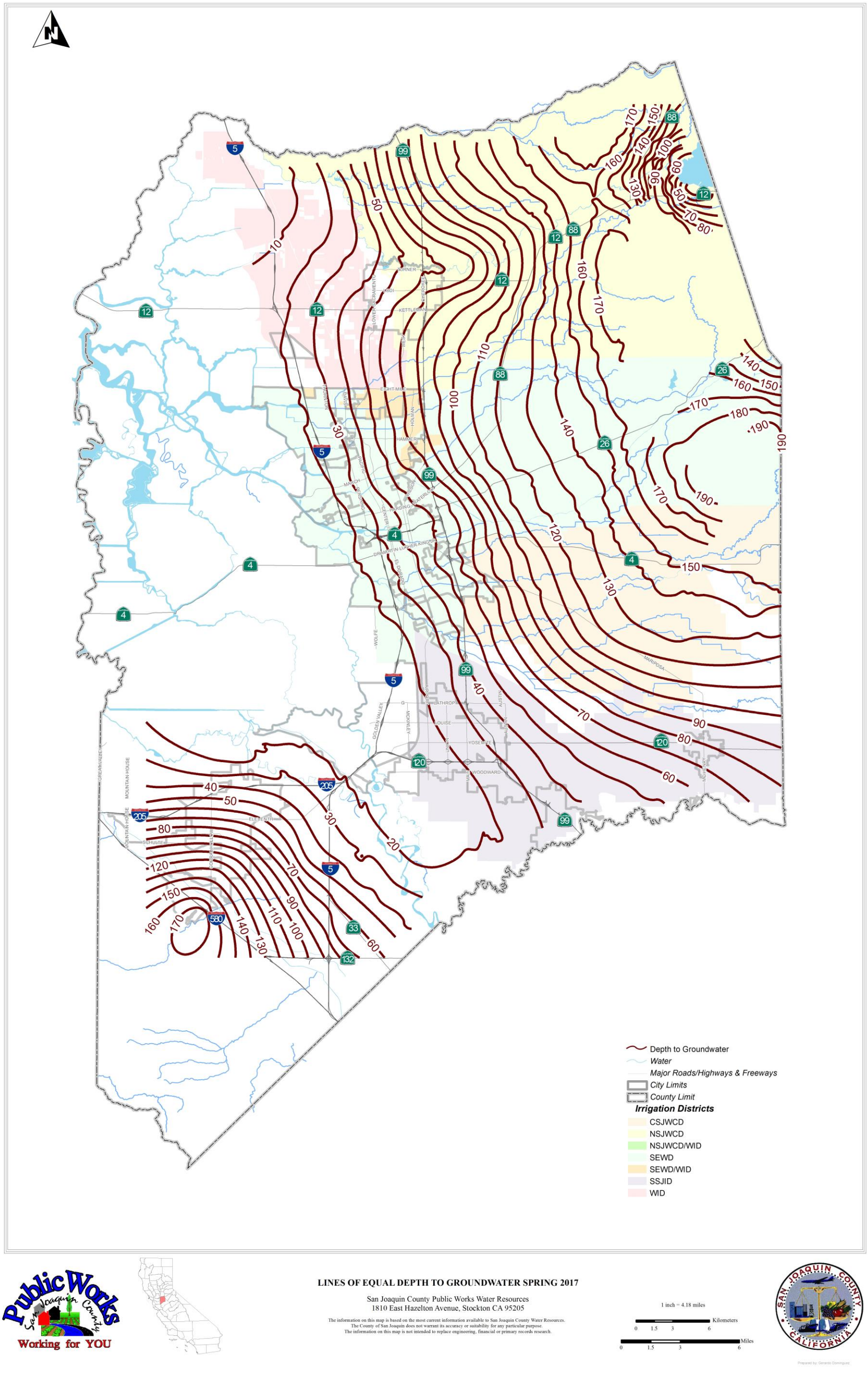

Figure 2-35 Lines of Equal Depth to Groundwater Spring 2017

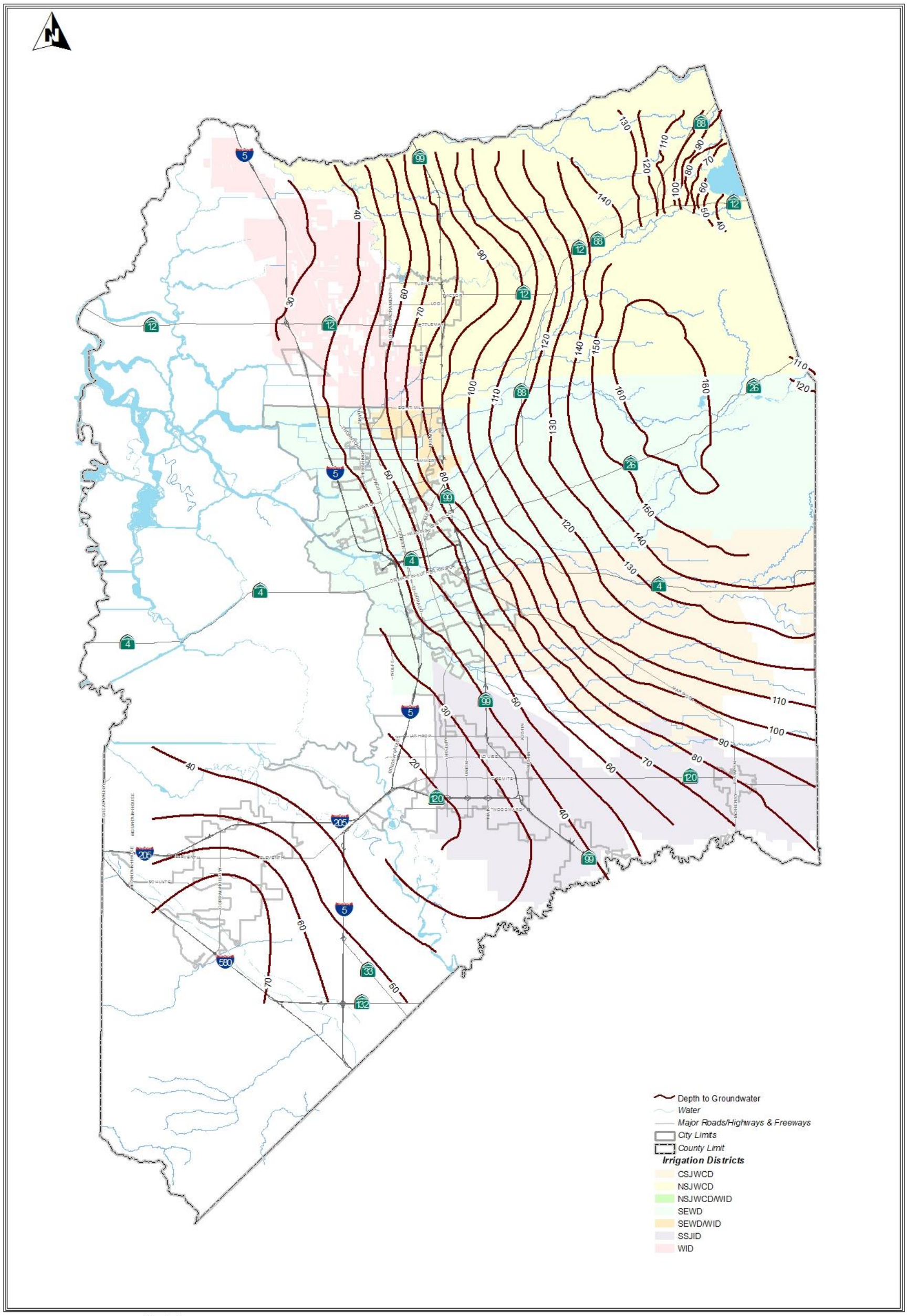

Figure 2-36 Lines of Equal Depth to Groundwater Spring 2016