San Joaquin County
Flood Control and Water Conservation District

Groundwater Report
Fall 2012

San Joaquin County
Flood Control and Water Conservation District

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Copies of the Fall 2012 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
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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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Table of Contents

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San Joaquin County Flood Control and Water Conservation District
Fall 2012 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: 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 underlying groundwater basin levels in San Joaquin County respond 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 Carbona, has pertinent data beginning in 1940. Lodi station has data from 1949 to 2012. The Camp Pardee station has data available from 1949 to 2012.

Annual Rainfall Distribution

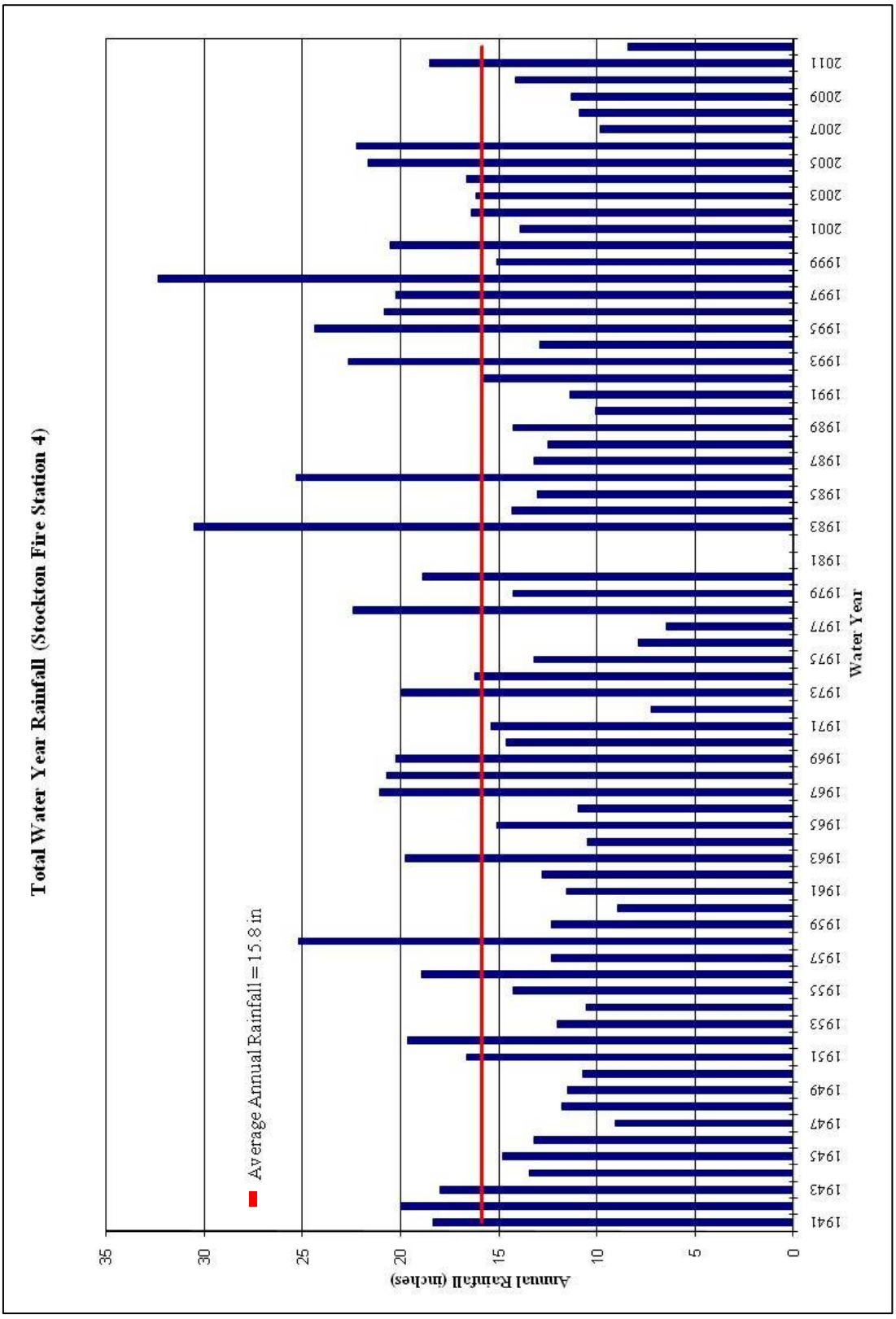

Figure 1-1: Total Annual Rainfall (Stockton Fire Station 4)

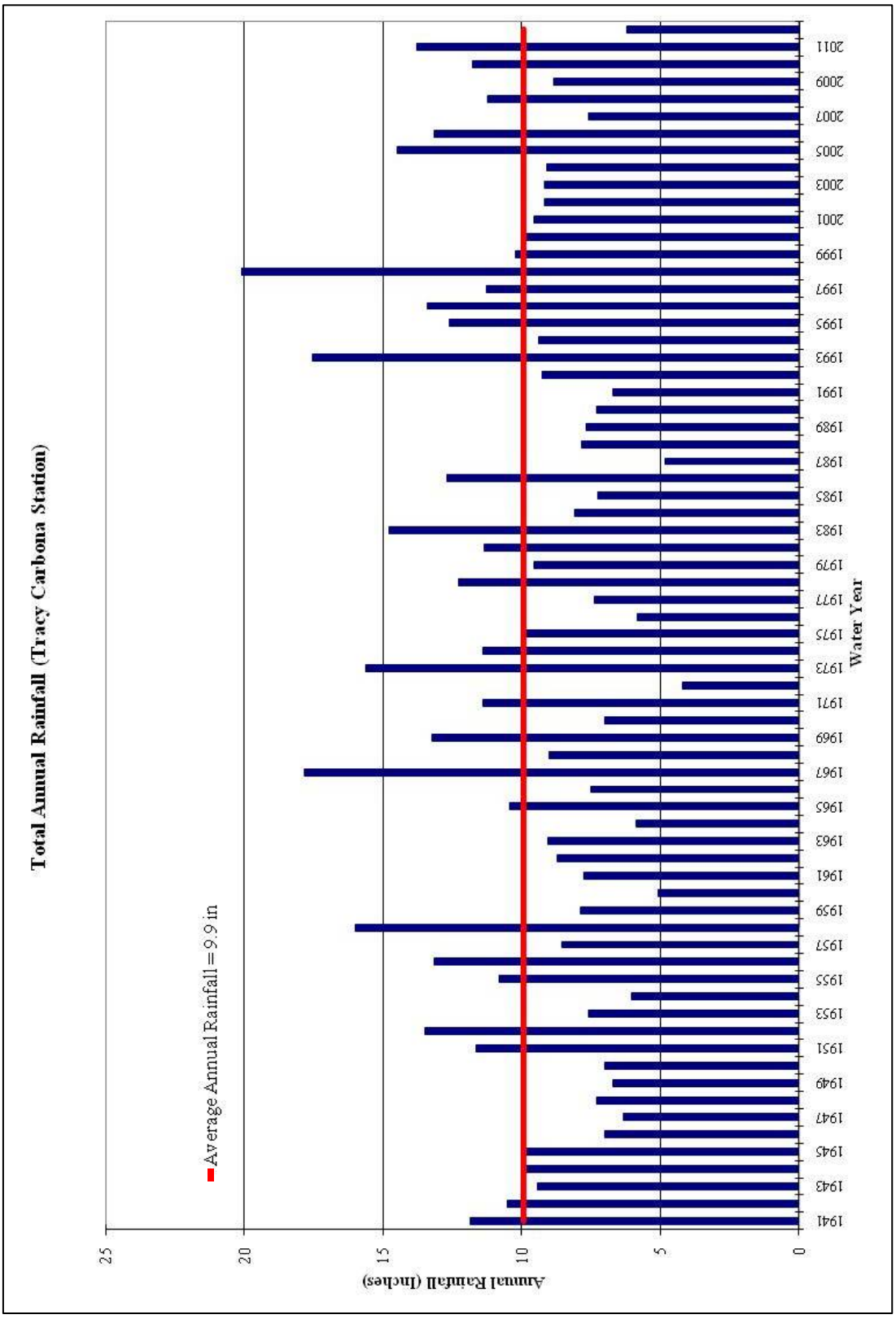

Figure 1-2: Total Annual Rainfall (Tracy Carbona Station)

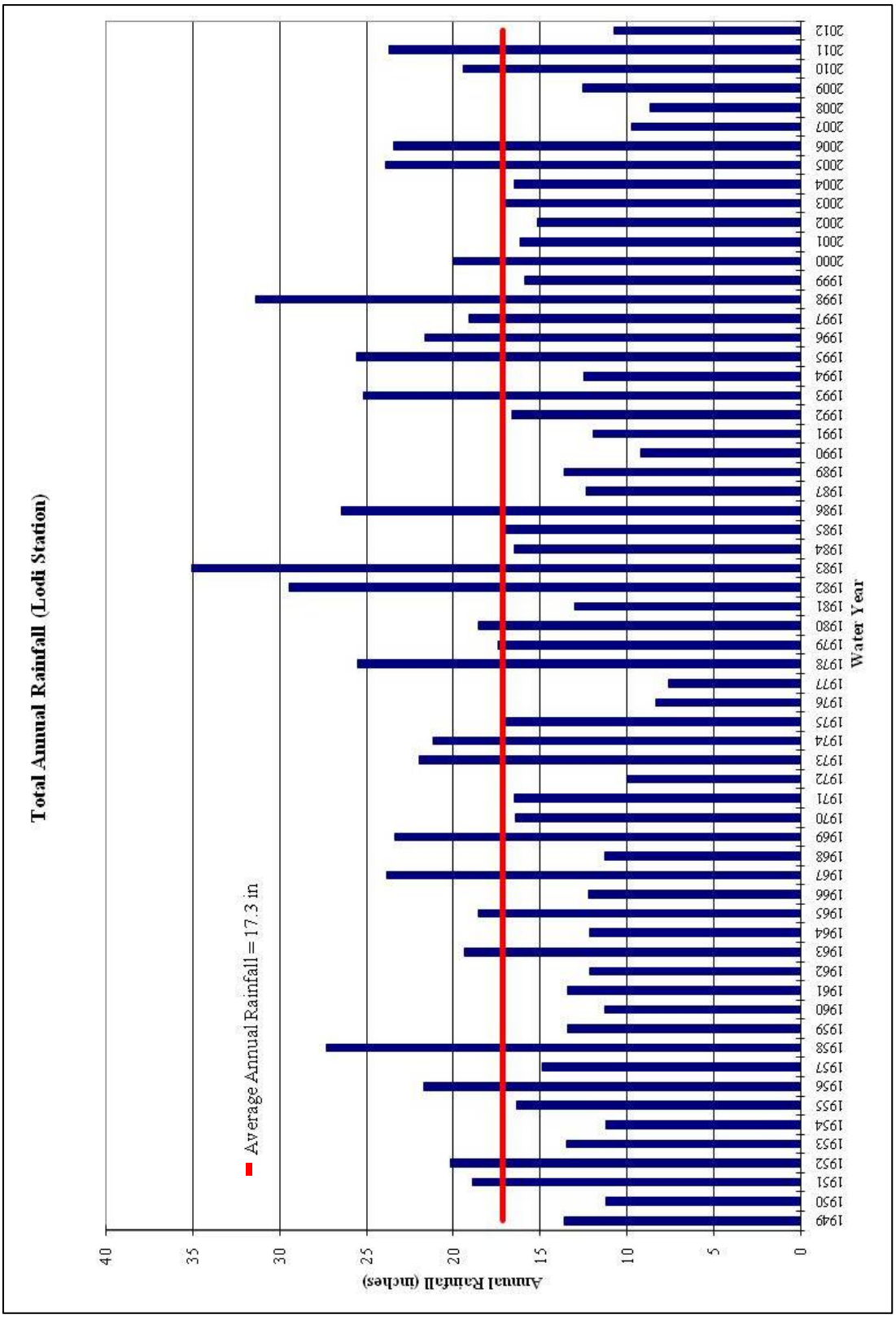

Figure 1-3: Total Annual Rainfall (Lodi Station)

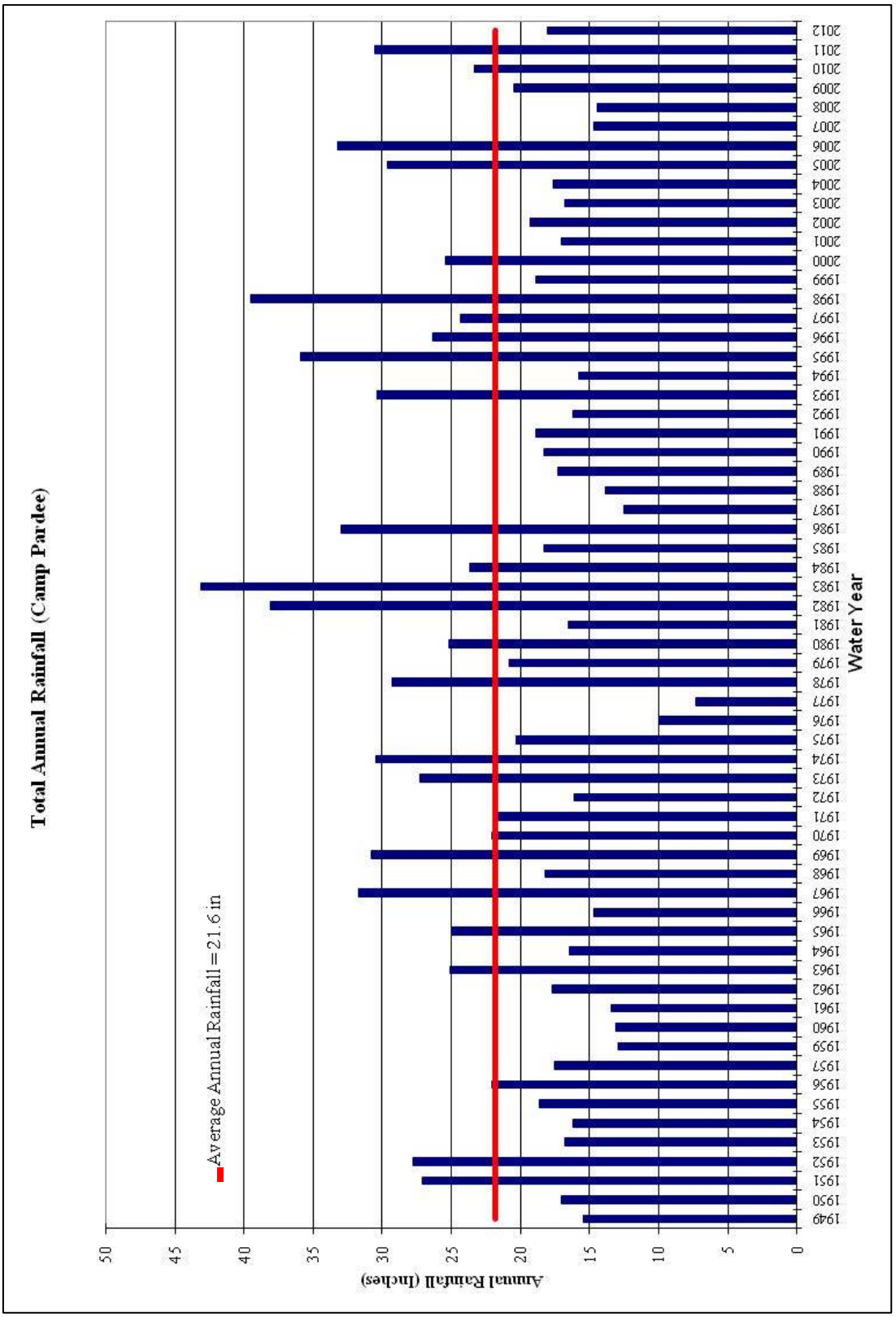

Figure 1-4: Total Annual Rainfall (Camp Pardee)

Monthly Rainfall Distribution

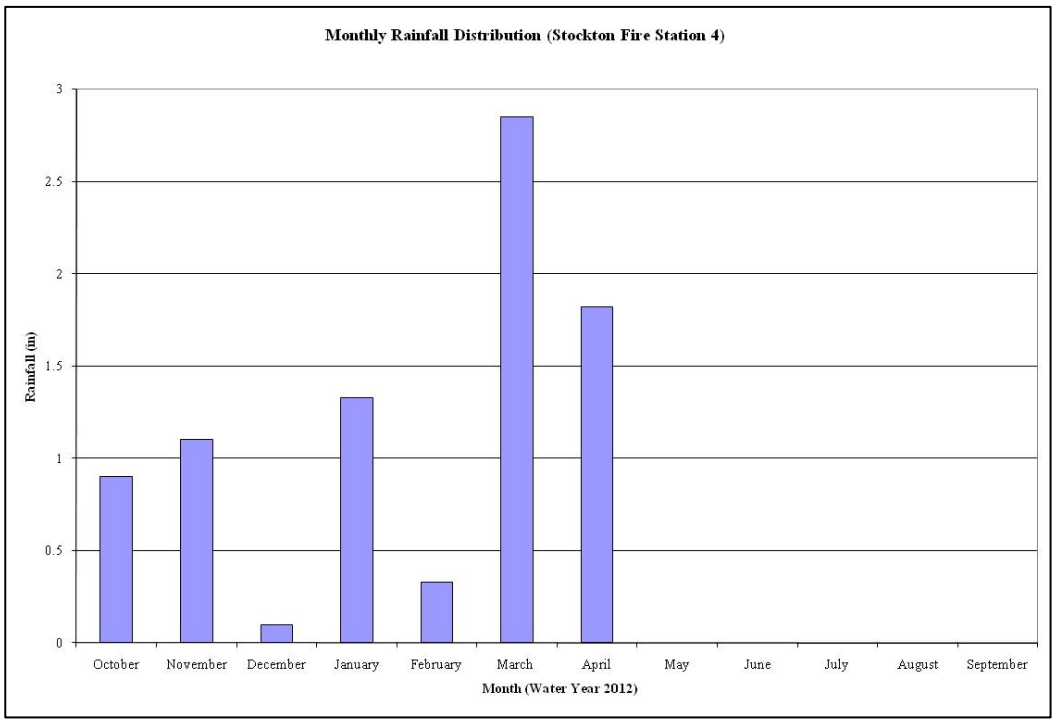

Figure 1-5: Monthly Rainfall Distribution (Stockton Fire Station 4)

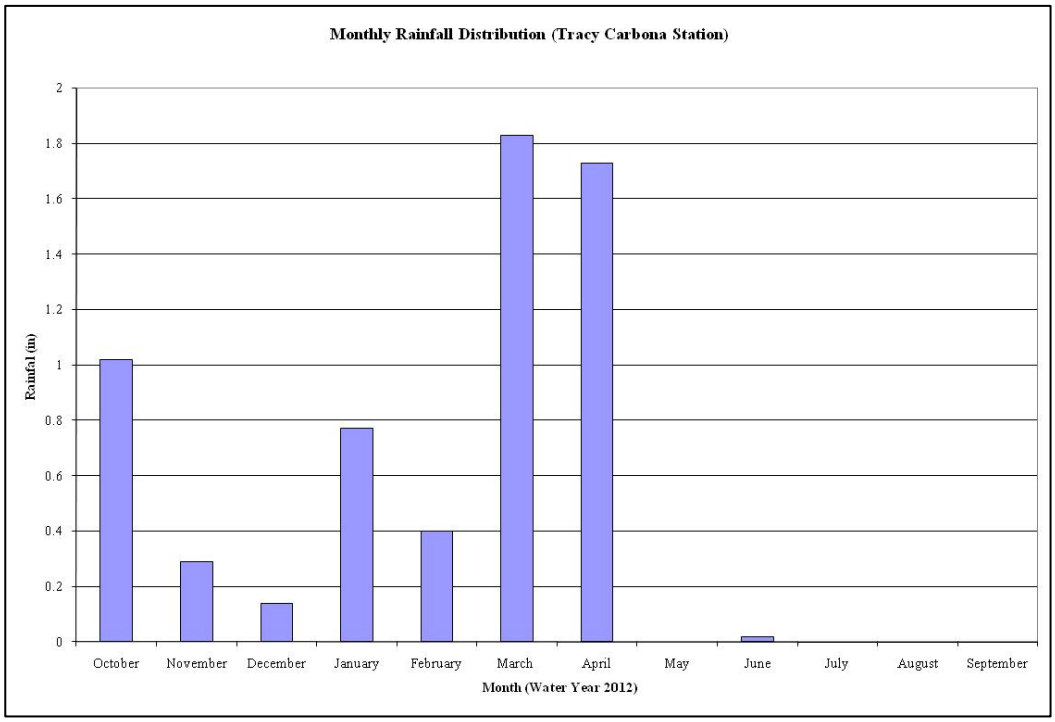

Figure 1-6: Monthly Rainfall Distribution (Tracy Carbona Station)

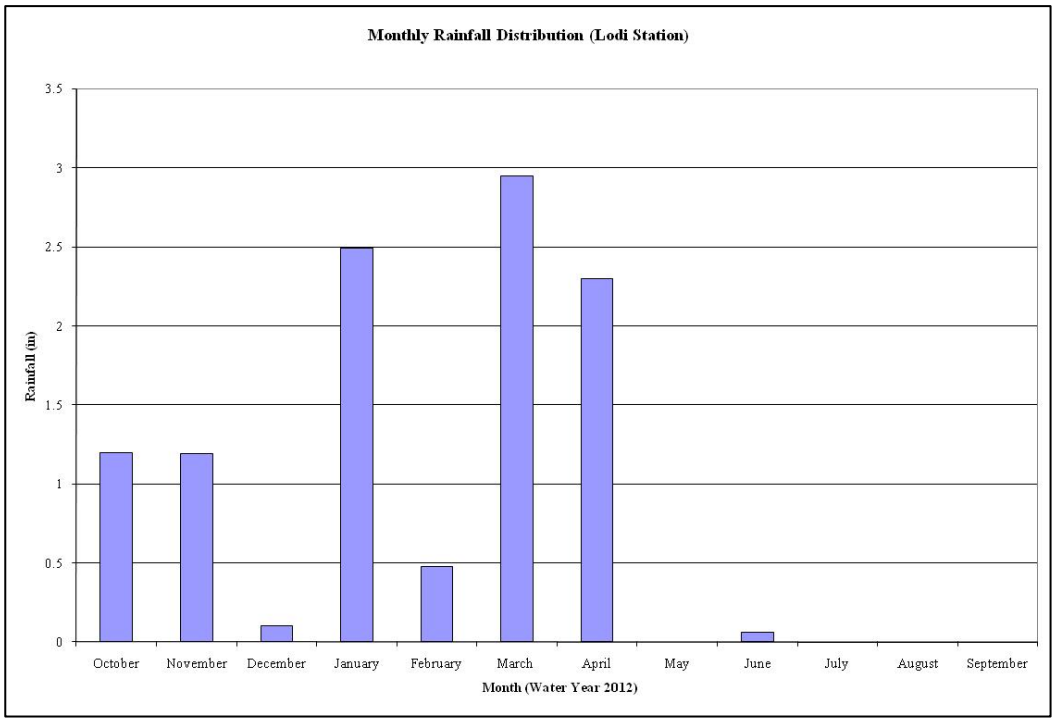

Figure 1-7: Monthly Rainfall Distribution (Lodi Station)

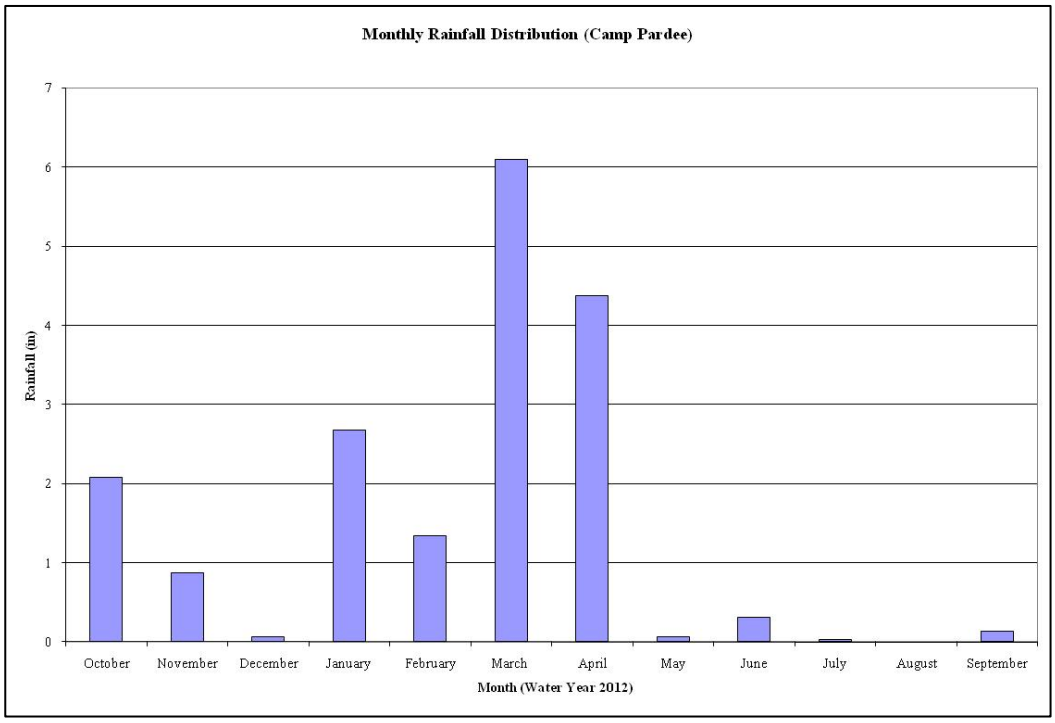

Figure 1-8: Monthly Rainfall Distribution (Camp Pardee)

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Section 2 – Groundwater Quality Monitoring

Summary of Groundwater Quality Results

The information contained in the Fall 2012 Groundwater Report is summarized as follows:

North San Joaquin County – One well was tested for chloride ions (Cl^-), electrical conductivity (EC) and total dissolved solids (TDS). There was a slight decrease in Cl^-, EC, and TDS from the previous measurements in the fall of 2011.

North Stockton – Five wells were tested for Cl^-, EC and TDS in North Stockton. Three of the wells were able to be compared. All the wells decreased in Cl^- concentrations and all three increase in EC and TDS concentrations from the analysis in the fall 2011.

County Hospital Area - Two wells was tested near the San Joaquin County Hospital. There was a slight decrease in Cl^- and a slight increase in EC and TDS from the previous measurements in the fall of 2011 in one of the wells. The other well had the same concentration of Cl^- and an increase in EC and TDS concentrations from the analysis in the fall of 2011.

Lathrop – Two wells were sampled in Lathrop. Both of the wells have decreases in Cl^- concentrations. One well has lower concentrations of EC and TDS and one well has higher concentrations of EC and TDS from the analysis in the fall 2011.

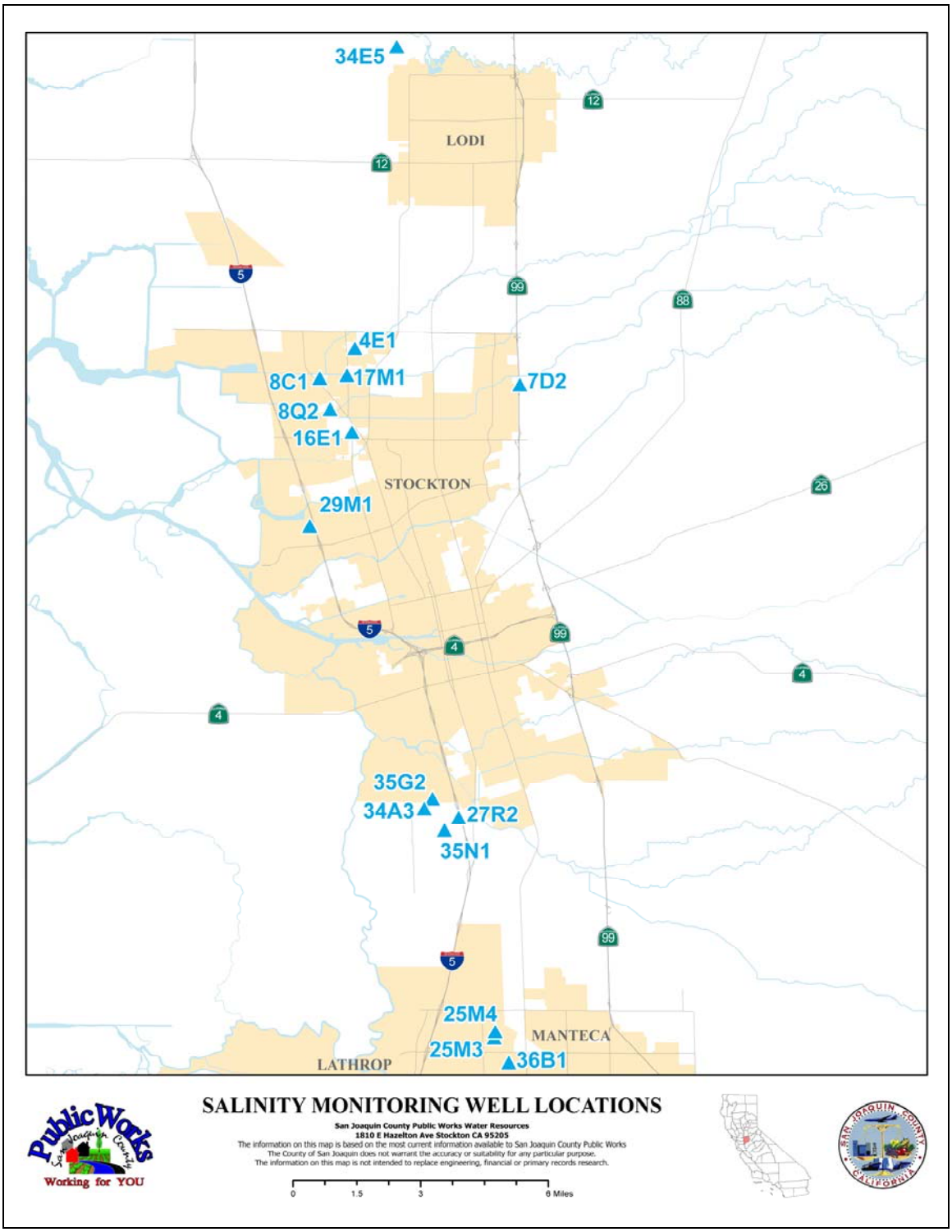

Figure 2-1: Salinity Monitoring Well Locations

Table 2-1: Groundwater Quality Mineral Analysis Fall 2012

Well	Chloride ppm	EC mmho	TDS* ppm
27R2	-	-	-
34A3	2164	6.02	3853
35G2	896	3.02	1933
35N1	478	1.62	1037
25M3	73	0.62	394
25M4	22	0.52	335
36B1	19	0.50	317
4E1	30	0.57	365
8C1	30	0.68	435
8Q2	64	1.00	637
16E1	-	-	-
17M1	21	0.30	194
29M1	86	0.54	-
7D2	9	0.41	-
34E5	23	0.93	595

*TDS values are calculated by the following formula: TDS = .64*1000*EC

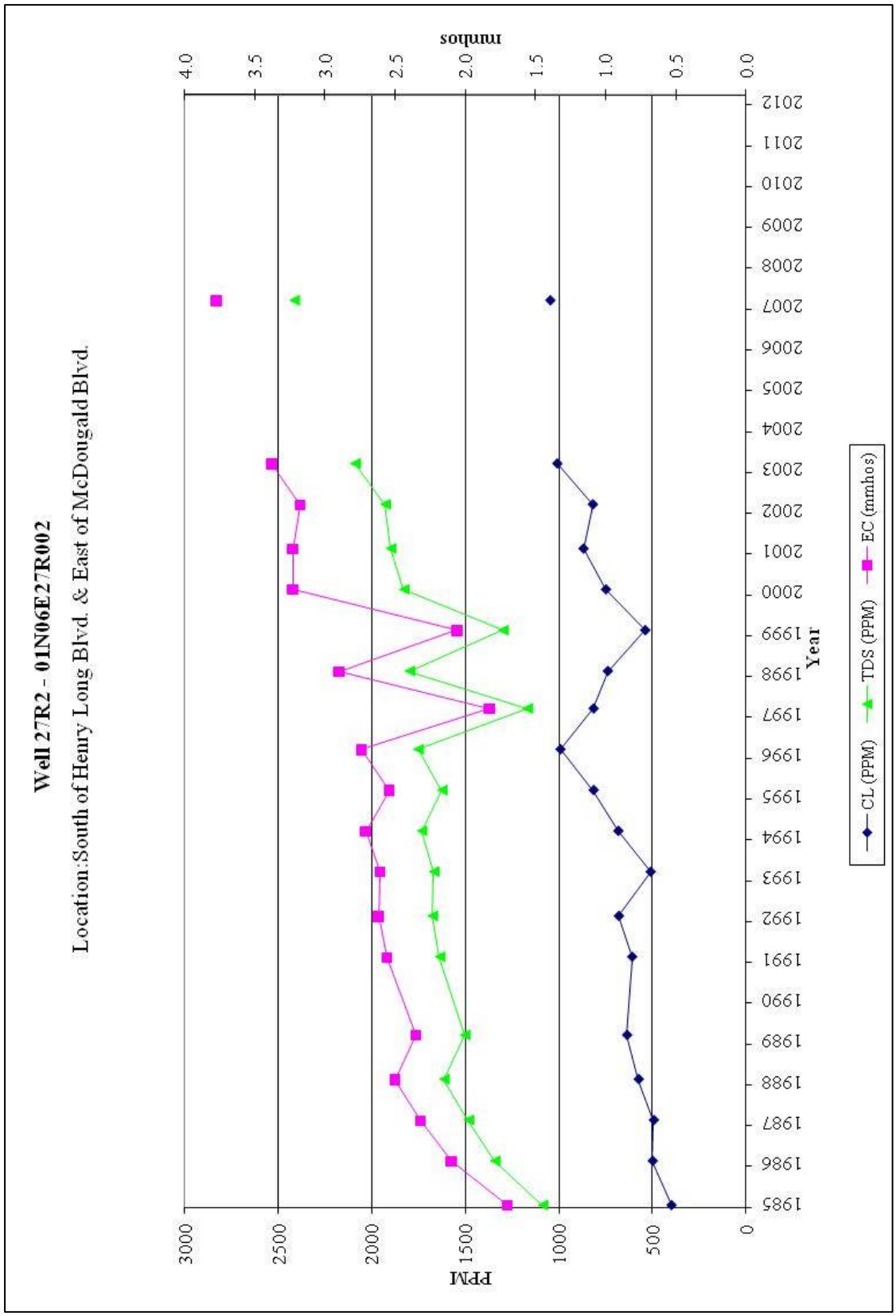

Figure 2-2: Quality Comparison Graph Well 27R2

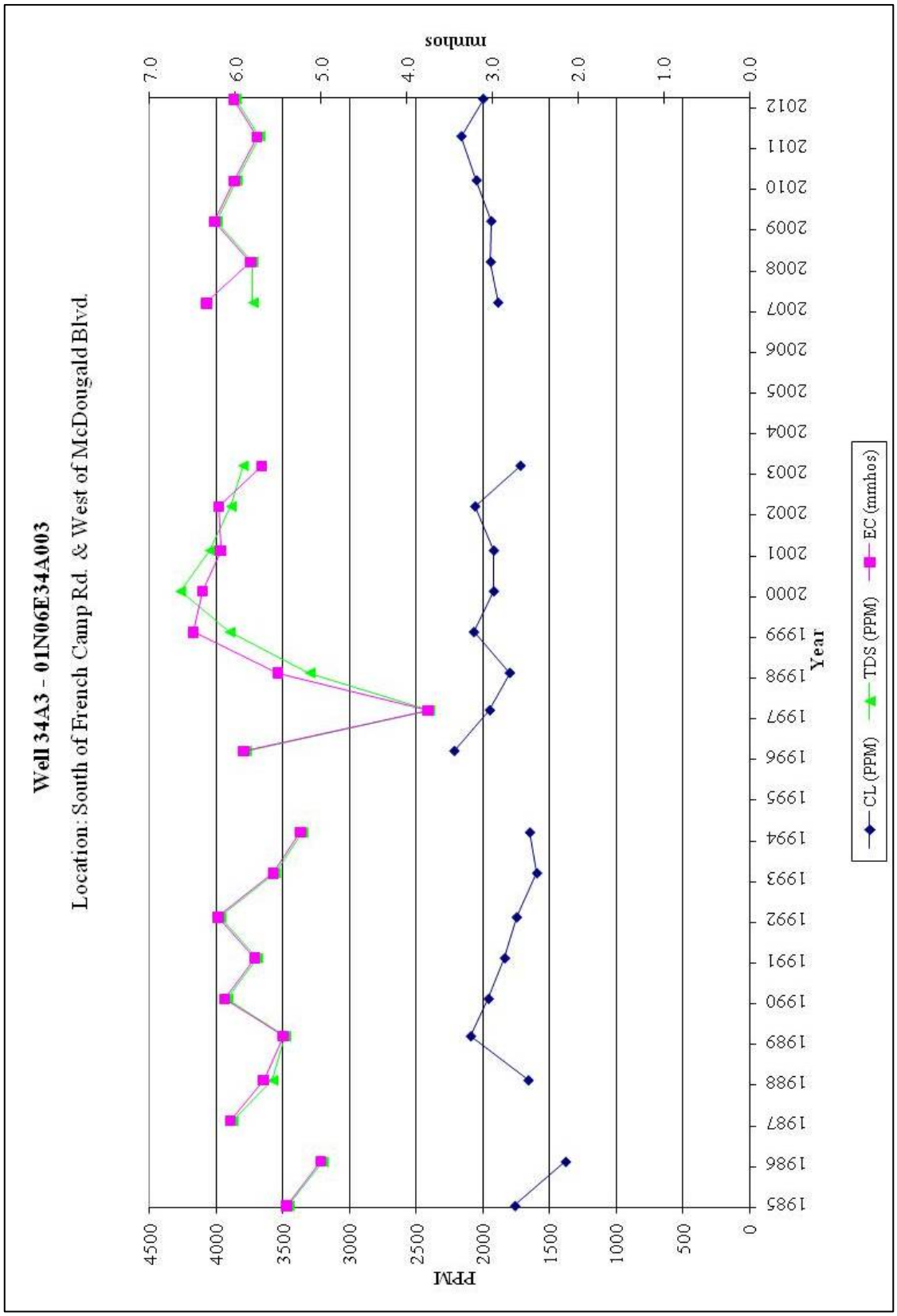

Figure 2-3: Quality Comparison Graph Well 34A3

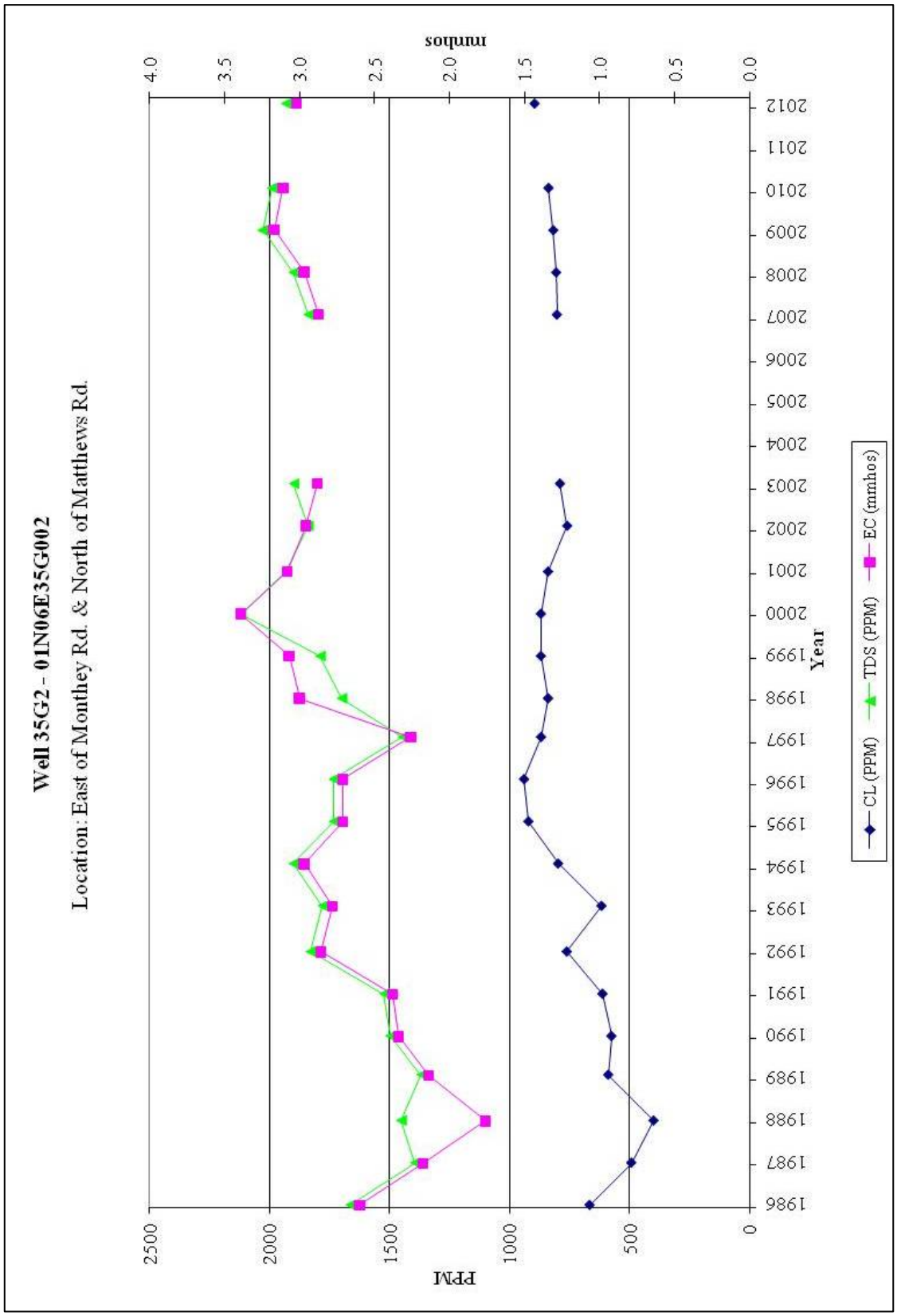

Figure 2-4: Quality Comparison Graph Well 35G2

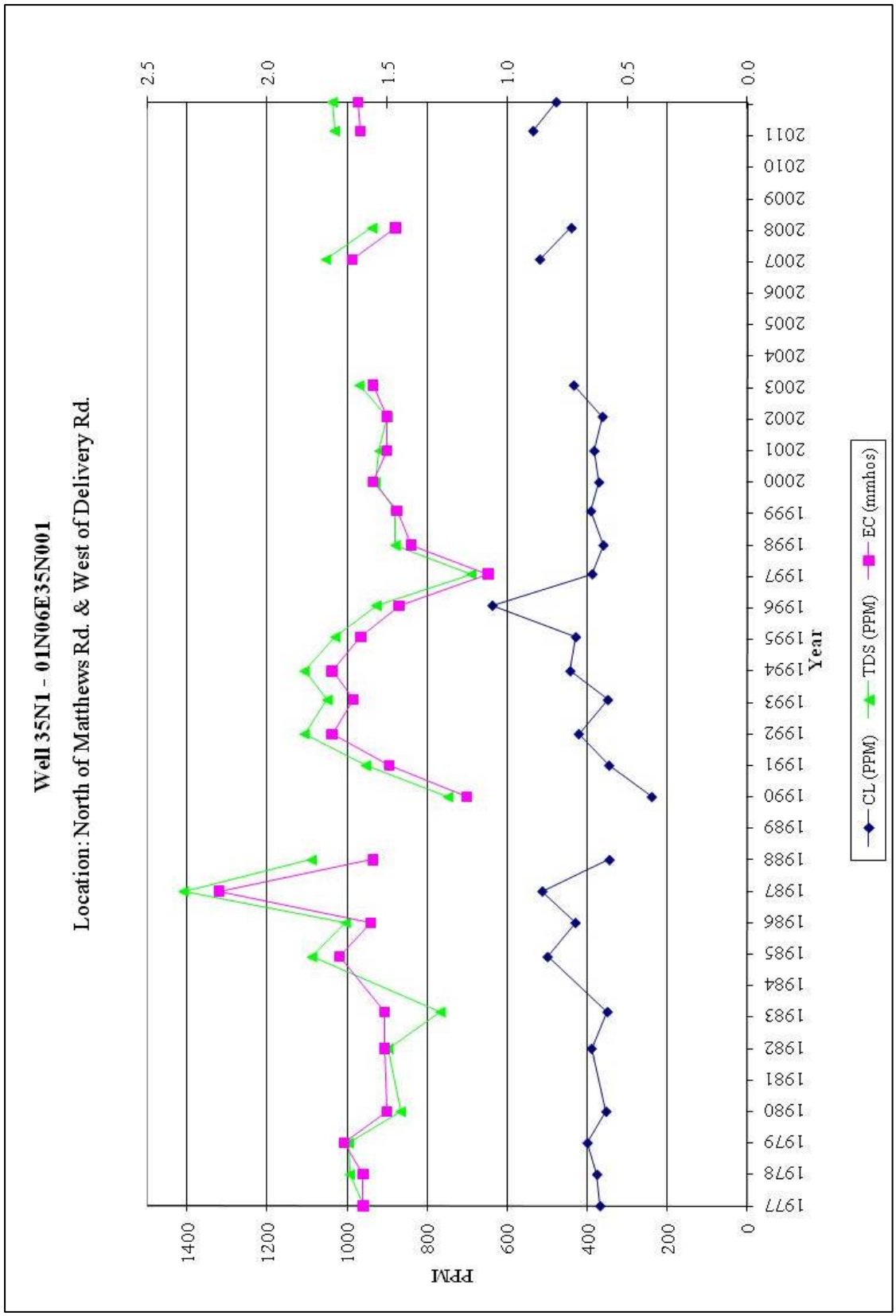

Figure 2-5: Quality Comparison Graph Well 35N1

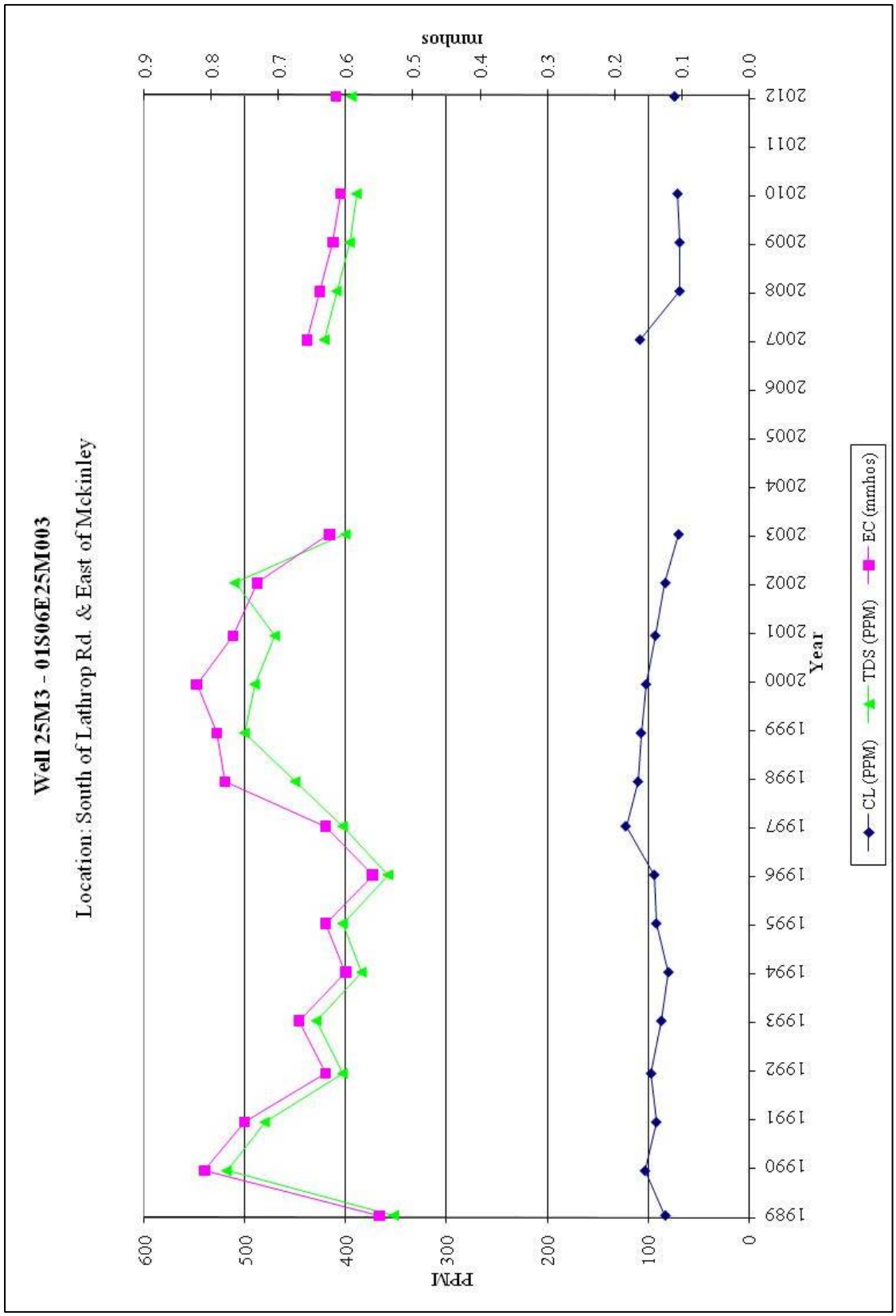

Figure 2-6: Quality Comparison Graph Well 25M3

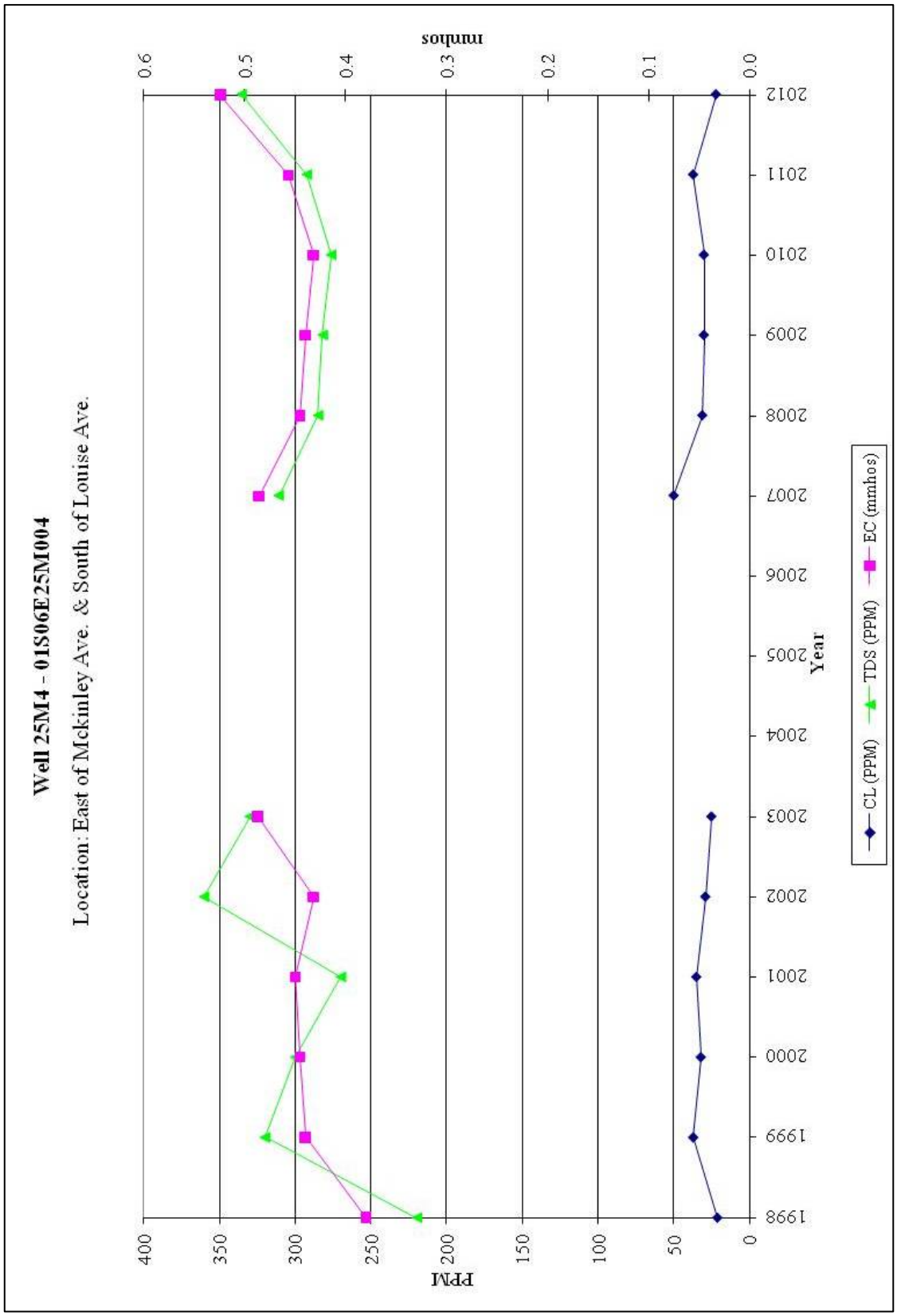

Figure 2-7: Quality Comparison Graph Well 25M4

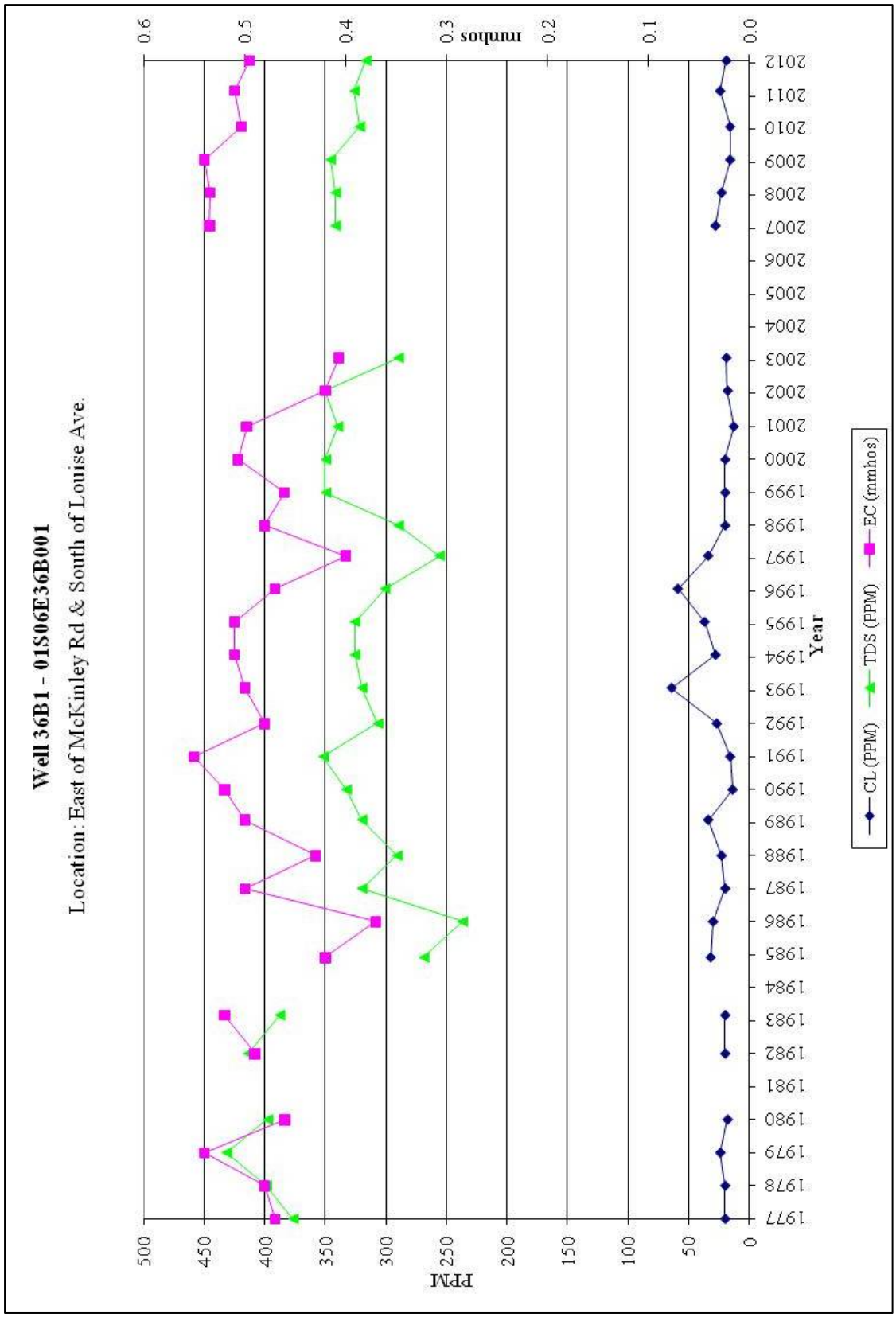

Figure 2-8: Quality Comparison Graph Well 36B1

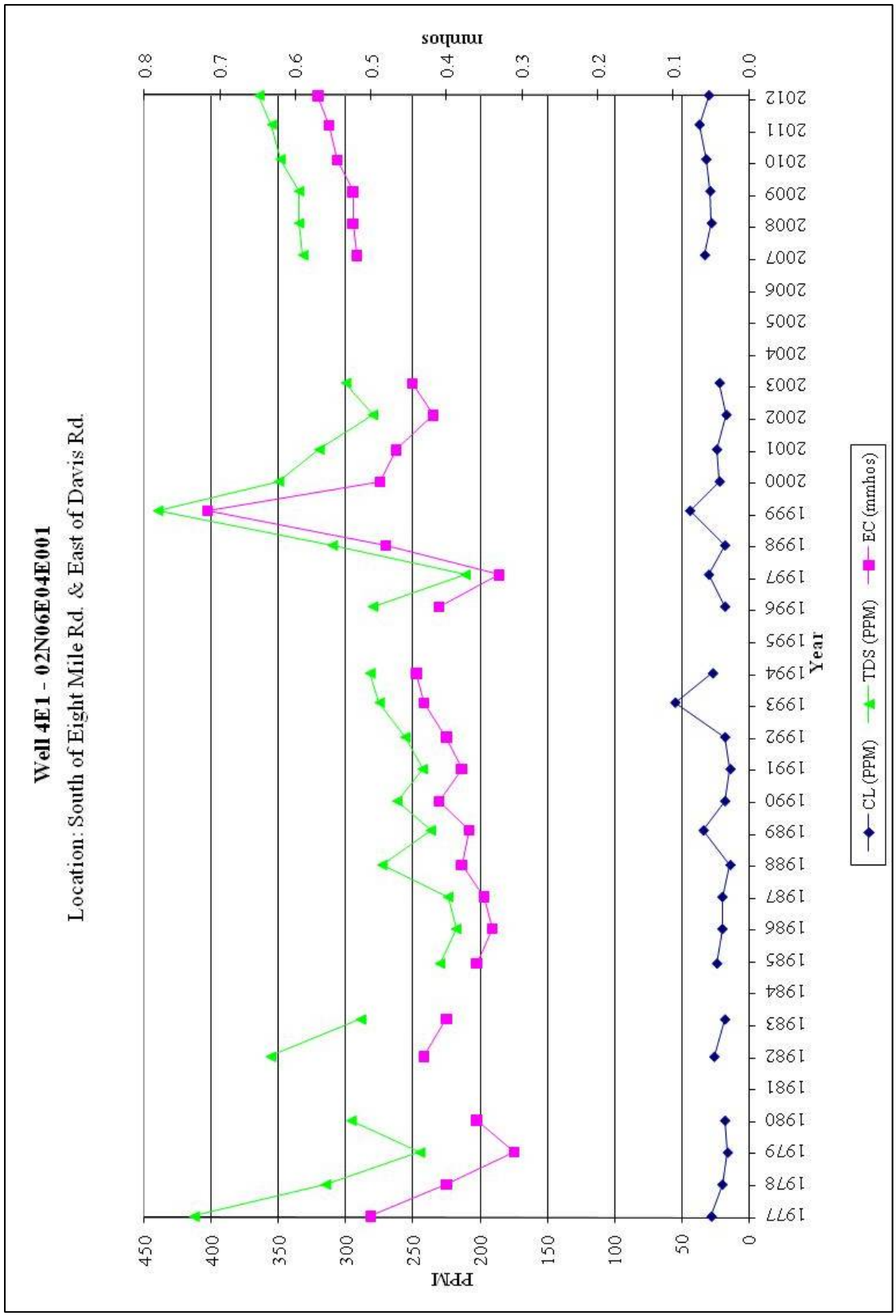

Figure 2-9: Quality Comparison Graph Well 4E1

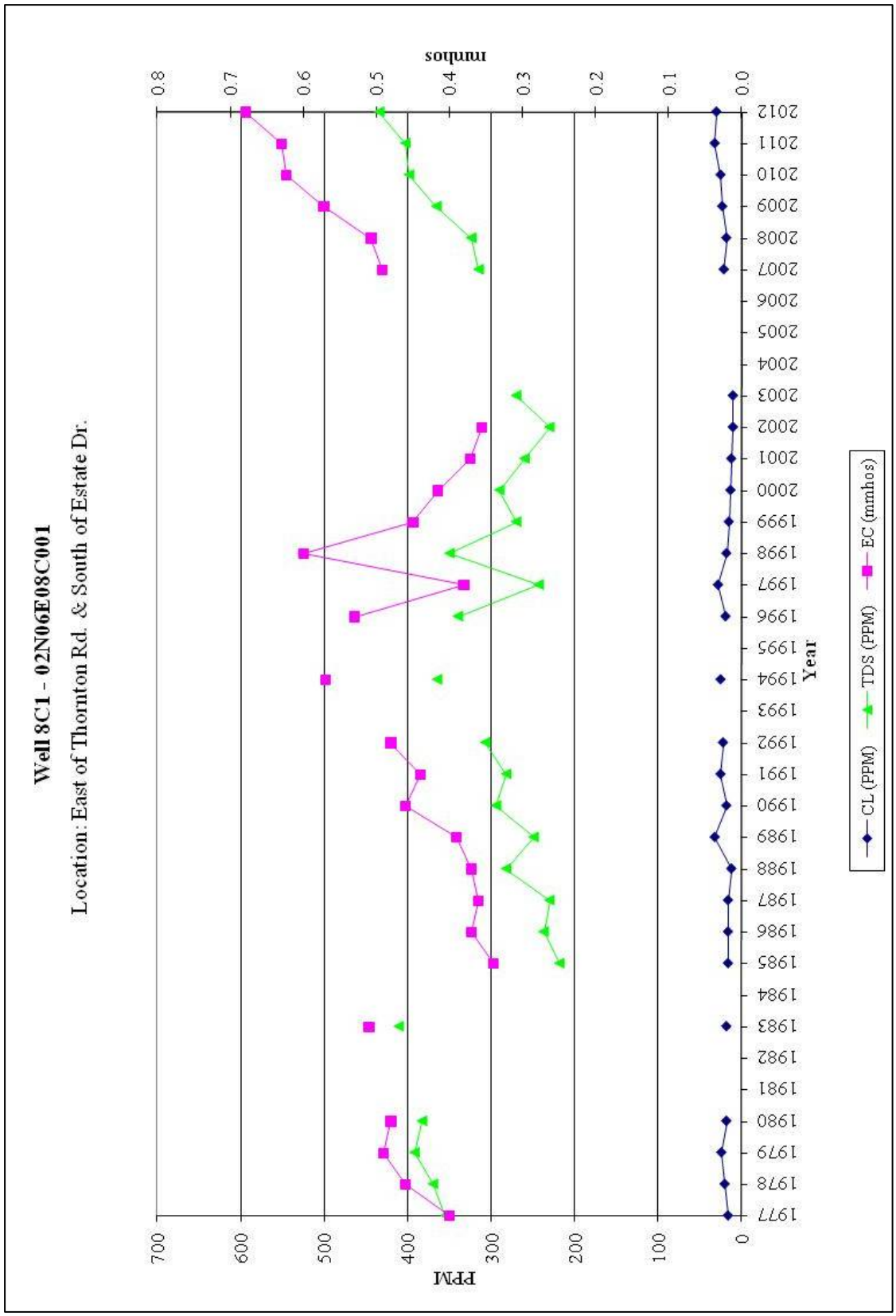

Figure 2-10: Quality Comparison Graph Well 8C1

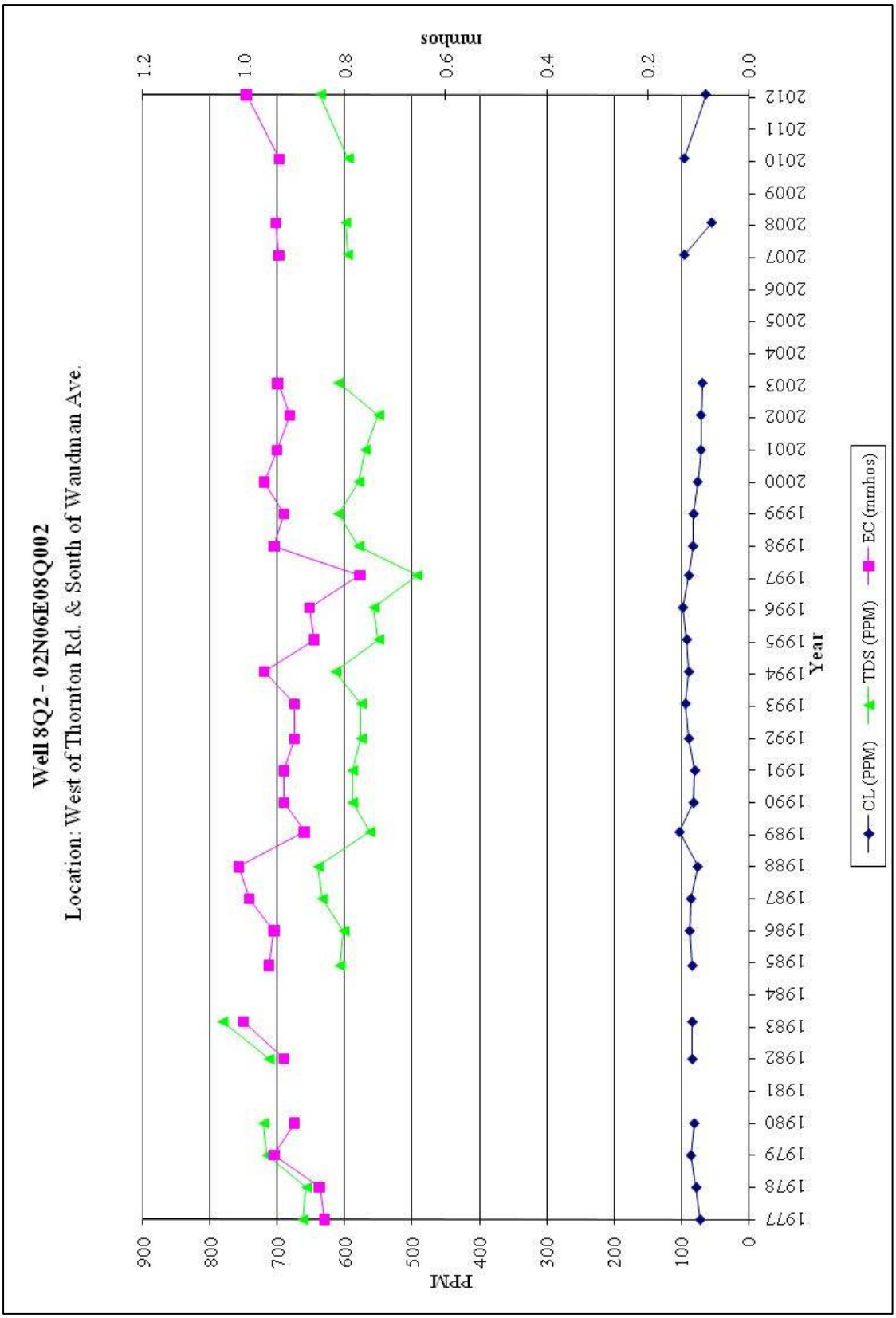

Figure 2-11: Quality Comparison Graph Well 8Q2

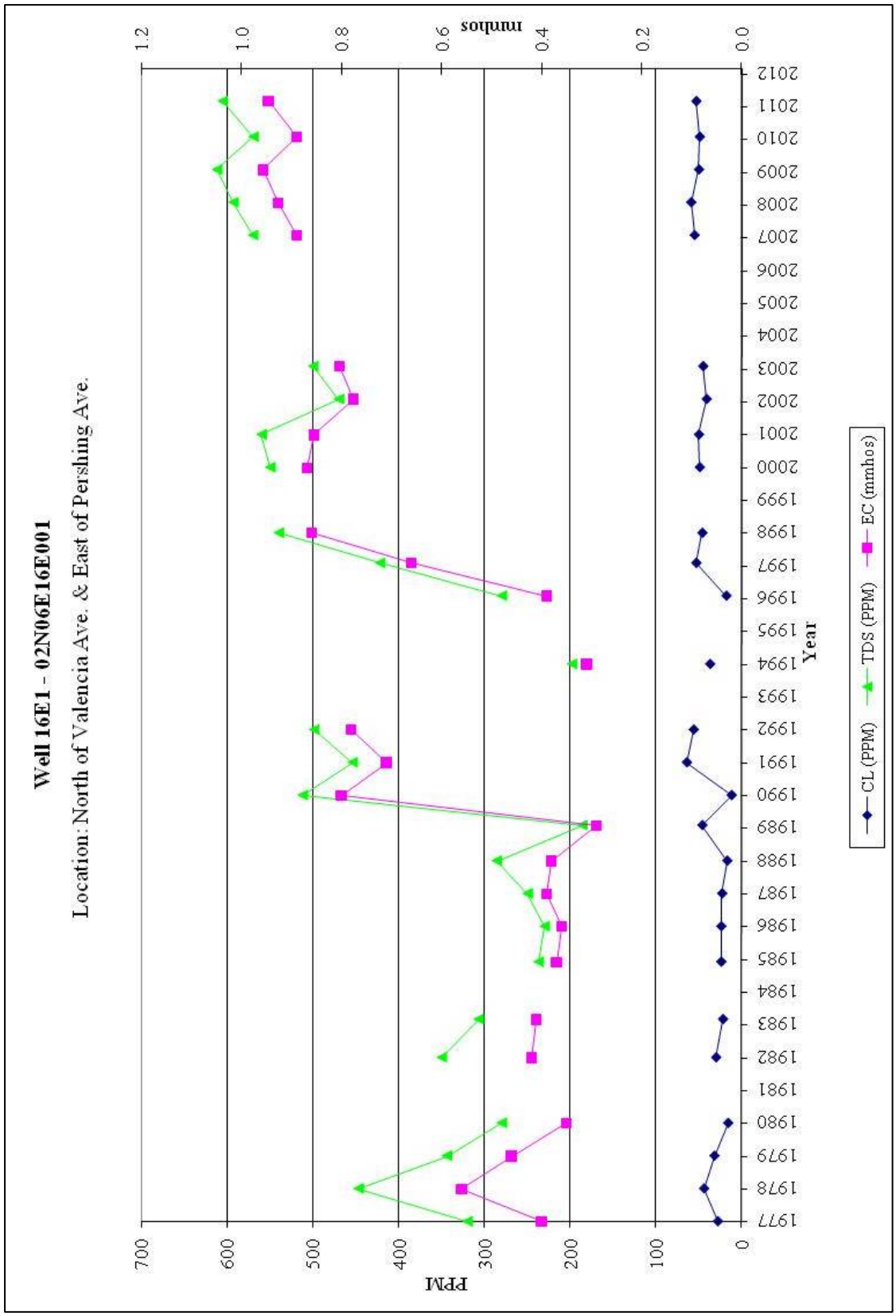

Figure 2-12: Quality Comparison Graph Well 16E1

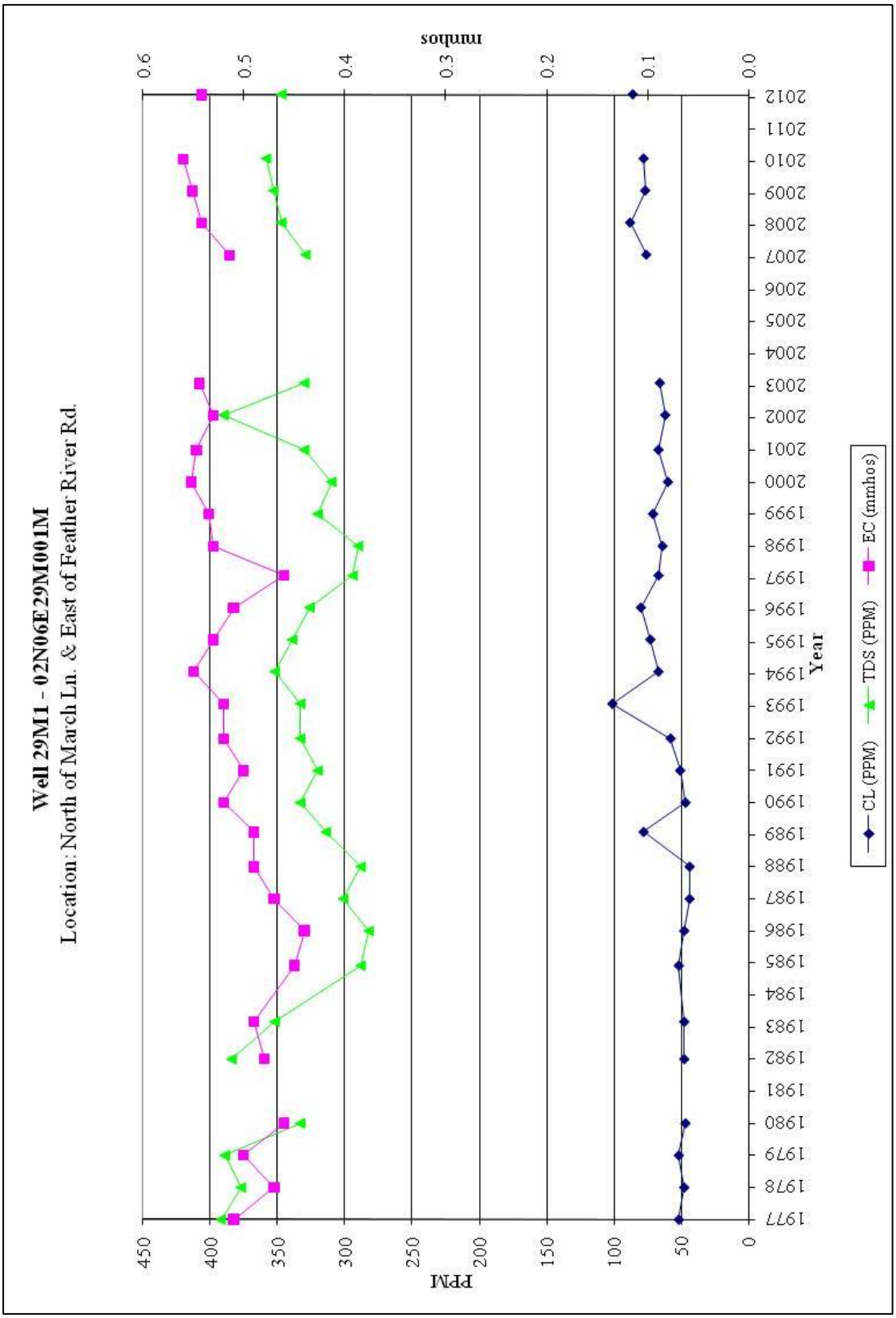

Figure 2-13: Quality Comparison Graph Well 29M1

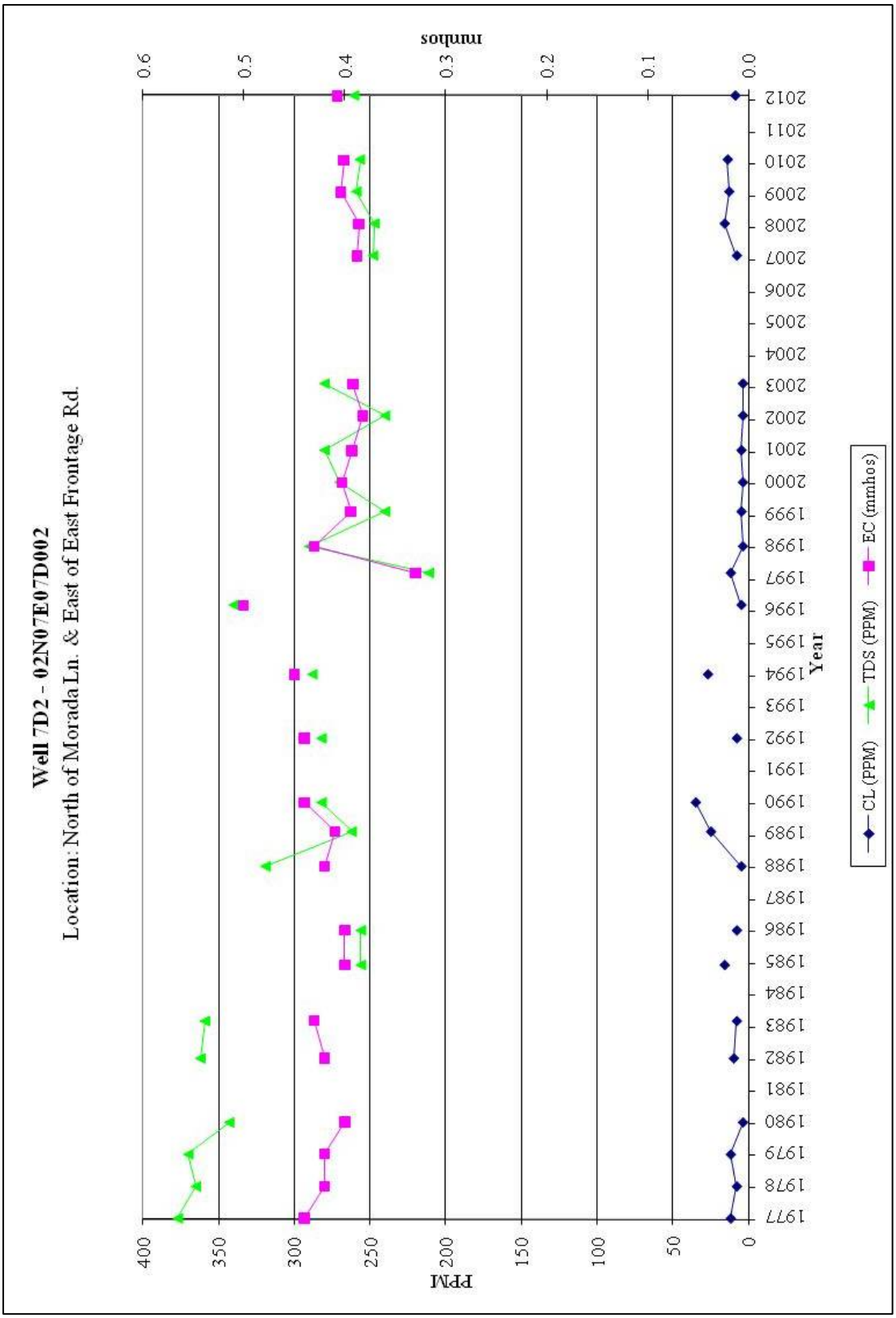

Figure 2-14: Quality Comparison Graph Well 7D2

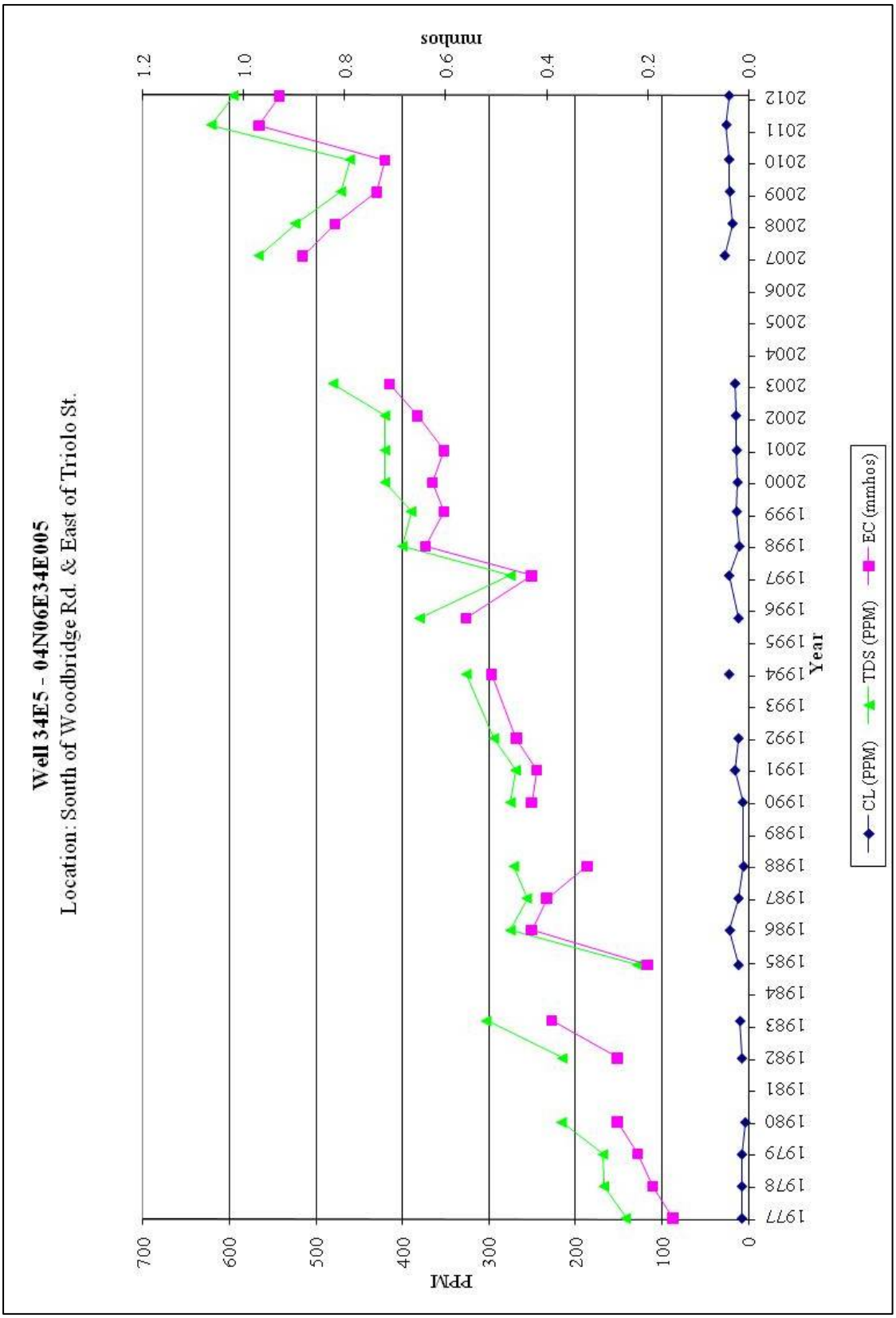

Figure 2-15: Quality Comparison Graph Well 34E5

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Section 3 – Groundwater Elevation Monitoring

Summary of Groundwater Elevations

The information contained in the Fall 2012 Groundwater Report is summarized as follows:

GROUNDWATER LEVELS

Central San Joaquin Water Conservation District (CSJWCD) – Fifty-five wells were able to be compared in CSJWCD. Fifty show decreases in groundwater levels. Five wells show an increase in groundwater levels.

North San Joaquin Water Conservation District (NSJWCD) – One-hundred thirty-five wells were compared in NSJWCD. One-hundred twenty-two wells decreased in groundwater levels. Eleven increased in groundwater levels. One well had no change in groundwater level.

Oakdale Irrigation District (OID) – Three wells were compared in the OID area. Two wells shows decrease in groundwater levels. One well increased in groundwater elevation.

Stockton East Water District (SEWD) – Eighty-three wells were compared in SEWD. Seventy-four wells decreased in groundwater levels. Nine wells show increases in groundwater levels.

South San Joaquin Irrigation District (SSJID) – Forty-two wells were compared in the SSJID area. Twenty-eight wells declined in groundwater elevation. Thirteen show increases in groundwater levels. One well had no change in groundwater level.

Woodbridge Irrigation District (WID) – Thirty-three wells were compared in the WID. Thirty-two wells decreased in groundwater levels. One well shows increase in groundwater level.

Southwest County Areas – Twenty-four wells measured across the Southwest County. Twelve wells descended in groundwater levels. Twelve wells increased in groundwater.

Table 3-1 Comparison of CSJWCD Water Levels

StateWellID	Fall 2012	Fall 2011	Change
01N07E11L001	*	-34.00	*
01N07E11M001	-40.70	-34.00	-6.70
01N07E13J002	-46.50	-44.70	-1.80
01N07E14J002	-36.60	-39.10	2.50
01N07E14L001	-39.11	-38.00	-1.11
01N07E15M002	*	-30.80	*
01N07E24A001	*	-39.60	*
01N07E24R001	-53.50	-41.50	-12.00
01N07E26H003	-34.40	-33.60	-0.80
01N07E32A001	-14.59	*	*
01N08E02B001	-42.94	-40.50	-2.44
01N08E02J001	-40.53	-38.20	-2.33
01N08E07M001	*	*	*
01N08E09L001	-50.66	-55.30	4.64
01N08E11L001	-44.80	-44.00	-0.80
01N08E13J001	-30.90	-29.20	-1.70
01N08E15J001	-38.93	-38.00	-0.93
01N08E16G001	-42.60	-39.50	-3.10
01N08E16H002	-41.20	-38.10	-3.10
01N08E16P001	-41.45	-38.70	-2.75
01N08E18A002	-43.50	-40.50	-3.00
01N08E22J001	-39.90	-36.80	-3.10
01N08E26A002	-28.70	-24.90	-3.80
01N08E27R002	-33.30	-30.70	-2.60
01N08E28K001	-36.63	-33.60	-3.03
01N08E29M002	*	-36.30	*
01N08E35F001	-27.40	-26.90	-0.50
01N08E35R002	-25.50	*	*
01N08E36F001	-21.40	-18.40	-3.00
01N09E01C001	15.00	15.50	-0.50
01N09E05J001	-12.50	-10.70	-1.80
01N09E06N001	-34.70	-32.20	-2.50
01N09E13D001	15.60	18.00	-2.40
01N09E15B002	-2.10	*	*
01N09E17D001	-24.90	-22.80	-2.10
01N09E17M001	-25.10	-22.40	-2.70
01N09E19C001	-28.50	-27.00	-1.50
01N09E21J001	*	0.00	*
01N09E22G002	-1.90	*	*
01N09E26A001	13.17	10.70	2.47
01N09E29R001	-10.00	-6.00	-4.00

StateWellID	Fall 2012	Fall 2011	Change
01N09E30C005	-17.20	-14.70	-2.50
01N09E31J001	-8.05	-6.65	-1.40
01N09E36P001	*	*	*
01S07E01J001	-26.30	-23.70	-2.60
01S07E02J001	-29.60	-26.90	-2.70
01S07E10A001	-15.10	-13.80	-1.30
01S07E12H001	*	*	*
01S07E13J001	-9.20	-4.60	-4.60
01S08E04R001	-28.30	-25.80	-2.50
01S08E05A001	-29.40	-27.90	-1.50
01S08E05R001	-28.70	-26.90	-1.80
01S08E06D001	-27.30	-24.90	-2.40
01S08E09Q001	-17.90	-16.40	-1.50
01S08E11F001	-17.60	-15.50	-2.10
01S08E12B001	-11.20	-9.10	-2.10
01S08E14B001	-1.20	-5.70	4.50
01S08E15A001	-27.97	*	*
01S08E15P001	*	-8.50	*
01S08E20B001	-7.30	-5.20	-2.10
01S08E23A001	-5.00	*	*
01S08E27A001	4.95	5.50	-0.55
01S09E02R001	28.10	31.00	-2.90
01S09E05H002	1.50	1.40	0.10
01S09E07A001	-3.50	-3.30	-0.20
01S09E07N001	0.20	1.40	-1.20
01S09E09R001	13.30	15.60	-2.30
01S09E11J002	34.80	37.40	-2.60
01S09E18R003	8.70	11.10	-2.40
01S09E19Q002	15.50	17.90	-2.40

Total Number of Wells	**69**
Total Number of Comparable Wells	**55**
Number of Wells with Decrease	**50**
Number of Wells with Increase	**5**
Number of Wells with No Change	**0**
Range of Change	**-12 to 4.64**
Average Change	**-1.96**

Table 3-2 Comparison of NSJWCD Water Levels

StateWellID	Fall 2012	Fall 2011	Change
03N06E04C001	-2.74	-1.30	-1.44
03N06E24M003	-32.62	-32.20	-0.42

StateWellID	Fall 2012	Fall 2011	Change
03N06E25C001	-41.00	-36.40	-4.60
03N06E25H015	*	-44.60	*
03N06E25R005	-40.92	-37.80	-3.12
03N06E36N001	*	*	*
03N07E02G003	-28.34	-24.10	-4.24
03N07E03R001	-25.80	-22.80	-3.00
03N07E05D005	16.40	19.30	-2.90
03N07E08B012	-24.20	-19.30	-4.90
03N07E08E002	-27.00	-22.00	-5.00
03N07E09C001	-25.70	-21.10	-4.60
03N07E09P002	-36.60	-31.50	-5.10
03N07E10L004	-36.00	-31.60	-4.40
03N07E12P001	-44.15	-39.80	-4.35
03N07E15C004	-36.00	-30.00	-6.00
03N07E17A006	-35.90	-32.10	-3.80
03N07E17D004	-30.90	-25.70	-5.20
03N07E17K002	-39.50	-34.70	-4.80
03N07E18D012	-30.50	-27.60	-2.90
03N07E18M002	-38.60	-32.00	-6.60
03N07E19J004	-46.50	-43.50	-3.00
03N07E19Q012	-43.80	-40.20	-3.60
03N07E20C012	-41.80	-38.10	-3.70
03N07E21L003	-49.00	-38.00	-11.00
03N07E22C011	-47.50	-43.10	-4.40
03N07E23C002	*	*	*
03N07E23K011	-48.00	-46.30	-1.70
03N07E25G001	-54.10	*	*
03N07E26G012	-49.60	-48.00	-1.60
03N07E32Q012	*	-46.30	*
03N07E33G002	-44.30	*	*
03N08E04Q001	-40.50	-35.60	-4.90
03N08E05K011	-38.90	-39.60	0.70
03N08E07D002	-41.96	-38.30	-3.66
03N08E07J001	-36.80	*	*
03N08E12P011	-35.80	-33.50	-2.30
03N08E17B001	-47.20	-44.50	-2.70
03N08E17Q011	*	-47.00	*
03N08E19C001	-46.40	-44.30	-2.10
03N08E19M003	-52.10	-49.00	-3.10
03N08E22A001	-53.30	-44.90	-8.40
03N09E05D001	*	*	*
04N06E02R011	-26.50	-22.10	-4.40
04N06E03A012	-7.40	-8.00	0.60

StateWellID	Fall 2012	Fall 2011	Change
04N06E05Q001	-12.98	-5.90	-7.08
04N06E06N012	5.90	8.40	-2.50
04N06E12C004	-31.50	-30.80	-0.70
04N06E12N002	-27.30	-29.30	2.00
04N06E15B002	-15.20	-9.00	-6.20
04N06E16A011	*	-5.50	*
04N06E16C001	-5.70	-6.80	1.10
04N06E16K011	4.90	5.10	-0.20
04N06E23D004	-34.40	-27.20	-7.20
04N06E23K00	-8.00	-3.00	-5.00
04N06E24D012	-20.20	-17.20	-3.00
04N06E24F001	-20.00	-16.00	-4.00
04N06E25B001	-16.10	-11.10	-5.00
04N06E25R001	-5.00	-2.00	-3.00
04N06E27B012	*	5.10	*
04N06E27D002	13.20	18.40	-5.20
04N06E27Q012	11.40	16.60	-5.20
04N06E35D011	14.20	17.60	-3.40
04N07E01B011	*	-37.40	*
04N07E02R001	-44.00	*	*
04N07E04B012	-49.50	-44.40	-5.10
04N07E04Q012	-41.80	-42.70	0.90
04N07E07A001	*	*	*
04N07E07H011	-41.40	-39.80	-1.60
04N07E11D012	*	-42.00	*
04N07E12E001	-46.50	-36.00	-10.50
04N07E12G012	*	-36.30	*
04N07E15B012	*	*	*
04N07E16D001	-41.50	-39.40	-2.10
04N07E17J013	*	-33.00	*
04N07E17N001	-32.30	-29.40	-2.90
04N07E19K001	-22.60	-19.10	-3.50
04N07E19R011	-24.70	-20.00	-4.70
04N07E20H003	-100.50	*	*
04N07E21F001	-29.30	-25.20	-4.10
04N07E23J012	-31.20	-27.10	-4.10
04N07E24N002	-31.40	-25.60	-5.80
04N07E25G015	-26.90	-23.10	-3.80
04N07E27C002	-23.00	-21.50	-1.50
04N07E28J002	-20.70	-15.70	-5.00
04N07E28P011	5.30	8.80	-3.50
04N07E29H001	-22.10	-14.30	-7.80
04N07E29N012	-12.30	-6.50	-5.80

StateWellID	Fall 2012	Fall 2011	Change
04N07E32F011	1.60	5.20	-3.60
04N07E33H001	25.00	28.30	-3.30
04N07E34K011	-16.90	-10.30	-6.60
04N07E35C002	*	-11.60	*
04N07E35E013	-20.70	*	*
04N07E36L001	-26.50	*	*
04N08E01K001	49.00	48.90	0.10
04N08E02E011	*	-6.90	*
04N08E04P014	-27.50	-25.60	-1.90
04N08E06C002	-33.27	-36.10	2.83
04N08E06N002	-40.20	-37.20	-3.00
04N08E11M012	-6.80	-5.60	-1.20
04N08E12A011	69.40	74.10	-4.70
04N08E12B011	50.10	51.10	-1.00
04N08E12N001	22.60	24.80	-2.20
04N08E14B011	-3.30	-0.60	-2.70
04N08E14K001	-7.60	-3.50	-4.10
04N08E15D011	-16.50	-16.80	0.30
04N08E15J011	-13.90	-11.50	-2.40
04N08E17A001	-24.80	*	*
04N08E17J001	-28.00	-23.00	-5.00
04N08E21M001	-33.60	-30.20	-3.40
04N08E22C015	-20.60	-17.10	-3.50
04N08E26A012	-11.10	-9.00	-2.10
04N08E27J011	-20.60	-18.60	-2.00
04N08E28E001	-31.66	-30.40	-1.26
04N08E32N001	-36.10	-33.60	-2.50
04N08E34Q011	-34.20	-31.50	-2.70
04N09E05E099	158.50	162.00	-3.50
04N09E05E099	158.50	162.00	-3.50
04N09E06H097	160.00	161.40	-1.40
04N09E06H098	180.00	182.90	-2.90
04N09E06H099	207.90	209.50	-1.60
04N09E06J098	206.90	208.60	-1.70
04N09E06J099	165.90	168.40	-2.50
04N09E06K097	107.50	108.80	-1.30
04N09E06K099	121.20	122.00	-0.80
04N09E06L011	110.60	112.90	-2.30
04N09E06Q098	132.50	133.50	-1.00
04N09E07B098	156.40	157.90	-1.50
04N09E07B099	153.30	154.50	-1.20
04N09E07D012	77.90	81.30	-3.40
04N09E07E011	89.20	89.90	-0.70

StateWellID	Fall 2012	Fall 2011	Change
04N09E08N096	172.70	175.80	-3.10
04N09E08N097	168.80	171.50	-2.70
04N09E08N098	167.40	169.80	-2.40
04N09E08N099	170.70	173.60	-2.90
04N09E08P099	175.40	178.70	-3.30
04N09E08R099	179.80	180.90	-1.10
04N09E15D001	185.30	185.80	-0.50
04N09E16A001	180.60	181.30	-0.70
04N09E16D099	184.00	186.00	-2.00
04N09E16Q002	163.80	165.90	-2.10
04N09E17A099	174.10	175.30	-1.20
04N09E17E001	137.30	139.80	-2.50
04N09E17E099	155.70	157.10	-1.40
04N09E17F099	160.70	161.90	-1.20
04N09E17G099	162.60	164.00	-1.40
04N09E18A011	154.60	156.00	-1.40
04N09E18D002	49.40	50.00	-0.60
04N09E18N011	19.00	20.20	-1.20
04N09E20M001	111.30	111.30	0.00
04N09E21A001	169.60	170.80	-1.20
04N09E28C002	185.90	184.80	1.10
04N09E31M001	*	-16.40	*
05N06E36C003	*	-36.40	*
05N06E36R001	*	-27.80	*
05N07E31J001	*	*	*
05N07E31Q001	*	*	*
05N07E34G001	-47.10	-46.60	-0.50
05N07E34Q001	-49.90	-44.60	-5.30
05N08E24Q011	51.70	*	*
05N08E25P011	50.00	51.10	-1.10
05N08E32R011	*	-34.90	*
05N08E35K012	0.80	2.20	-1.40
05N09E30C011	159.60	159.50	0.10
05N09E30M011	143.70	143.50	0.20
05N09E31L011	123.60	123.70	-0.10

Total Number of Wells	**166**
Total Number of Comparable Wells	**135**
Number of Wells with Decrease	**123**
Number of Wells with Increase	**11**
Number of Wells with No Change	**1**
Range of Change	**-11 to 2.83**
Average Change	**-2.9**

Table 3-3 Comparison of OID Water Levels

StateWellID	Fall 2012	Fall 2011	Change
01S09E14K001	43.31	41.90	1.41
01S09E21J002	38.20	39.80	-1.60
01S09E23N001	48.60	*	*
01S09E24R001	66.60	68.90	-2.30
01S09E28M002	37.20	*	*

Total Number of Wells	**5**
Total Number of Comparable Wells	**3**
Number of Wells with Decrease	**2**
Number of Wells with Increase	**1**
Number of Wells with No Change	**0**
Range of Change	**-2.3 to 1.41**
Average Change	**-0.8**

Table 3-4 Comparison of SEWD Water Levels

StateWellID	Fall 2012	Fall 2011	Change
01N06E02C001	*	-17.80	*
01N06E03K001	-7.54	-11.70	4.16
01N06E05H001	-7.09	-8.20	1.11
01N06E05M004	*	*	*
01N06E23J001	*	-10.50	*
01N06E27R002	-7.00	-5.70	-1.30
01N07E01A002	*	*	*
01N07E01M002	-50.20	-47.00	-3.20
01N07E02G001	-43.00	*	*
01N07E03L001	*	*	*
01N07E03M001	-5.00	8.50	-13.50
01N07E04R001	-14.00	-11.20	-2.80
01N07E08B001	-26.00	-27.00	1.00
01N07E09E004	-24.00	-24.70	0.70
01N07E09H001	-26.50	*	*
01N07E09Q003	-30.00	-29.50	-0.50
01N07E10D001	-22.00	-19.00	-3.00
01N07E10G001	*	*	*
01N07E19G001	-17.50	*	*
01N07E20G001	-21.20	-21.50	0.30
01N07E21R001	*	-26.60	*
01N08E03P001	-49.50	-43.00	-6.50
01N08E04E001	-56.00	-49.50	-6.50
01N09E05B001	-17.59	-17.20	-0.39

StateWellID	Fall 2012	Fall 2011	Change
01S06E01C002	-5.90	-3.10	-2.80
01S06E02D004	-5.59	-5.50	-0.09
01S06E02G002	-5.57	-5.40	-0.17
01S06E10G001	-8.60	-4.30	-4.30
01S06E11E001	-4.63	-3.40	-1.23
01S07E05A001	*	28.50	*
01S07E06M002	-4.80	-1.30	-3.50
01S07E08J002	-3.20	-0.50	-2.70
02N06E03A003	-31.80	-29.80	-2.00
02N06E06C002	-14.10	-13.70	-0.40
02N06E12H001	-39.69	-40.00	0.31
02N06E13R002	*	*	*
02N06E24F001	-30.50	-32.00	1.50
02N06E24J002	-31.40	-29.30	-2.10
02N06E24J003	-31.17	-30.60	-0.57
02N06E32G001	*	-11.20	*
02N07E03D001	-51.00	*	*
02N07E08D001	-51.20	-49.50	-1.70
02N07E08K003	-58.10	-54.50	-3.60
02N07E08R002	-57.24	-51.60	-5.64
02N07E10F002	-55.50	*	*
02N07E11F001	-54.50	-52.00	-2.50
02N07E11R002	-58.00	-54.20	-3.80
02N07E12A003	-54.05	-51.60	-2.45
02N07E15C001	-62.30	-56.30	-6.00
02N07E16F002	-58.34	-54.34	-4.00
02N07E16L001	-57.30	-54.60	-2.70
02N07E20N002	-40.00	-39.00	-1.00
02N07E21A002	-62.41	-58.31	-4.10
02N07E21K002	-54.50	-49.60	-4.90
02N07E21N001	*	*	*
02N07E23B001	-65.00	-58.10	-6.90
02N07E24B001	-59.10	-56.10	-3.00
02N07E24J001	*	*	*
02N07E24Q001	-62.00	-57.60	-4.40
02N07E26H003	-61.50	-57.10	-4.40
02N07E26N001	-57.70	-52.90	-4.80
02N07E28K002	-59.50	*	*
02N07E28N004	-43.50	*	*
02N07E28P001	*	-51.00	*
02N07E29B001	-50.50	-42.80	-7.70
02N07E29M002	-36.00	-34.30	-1.70
02N07E30E001	-31.80	-30.10	-1.70

StateWellID	Fall 2012	Fall 2011	Change
02N07E30H001	-34.50	-34.10	-0.40
02N07E31M001	-20.80	-23.80	3.00
02N07E32J002	-29.50	*	*
02N07E32M002	-26.00	-25.50	-0.50
02N07E32R001	-25.60	-24.10	-1.50
02N07E33L001	-33.00	-30.00	-3.00
02N07E34R001	-31.00	-27.30	-3.70
02N07E35L001	*	-49.00	*
02N07E36H001	-62.20	-58.50	-3.70
02N07E36P002	-52.23	-49.60	-2.63
02N08E03G002	-49.40	-35.60	-13.80
02N08E04C001	-54.00	-50.40	-3.60
02N08E05C001	-56.50	-51.00	-5.50
02N08E08N001	-58.30	*	*
02N08E09G002	-58.00	*	*
02N08E10H002	-49.70	-47.00	-2.70
02N08E12C002	*	-32.70	*
02N08E13K001	-39.60	-34.60	-5.00
02N08E14C001	-50.50	-47.50	-3.00
02N08E15M002	-54.50	-51.00	-3.50
02N08E16D001	-56.90	-53.70	-3.20
02N08E18C001	-62.20	-60.70	-1.50
02N08E20F001	-60.80	-57.10	-3.70
02N08E24J001	-63.60	-49.60	-14.00
02N08E24P001	-40.80	-38.50	-2.30
02N08E28H002	-50.10	-48.10	-2.00
02N08E32L002	-59.30	-51.40	-7.90
02N08E33E001	-57.60	-51.10	-6.50
02N09E03A001	59.40	60.80	-1.40
02N09E04H001	50.10	*	*
02N09E05H001	-6.00	-4.70	-1.30
02N09E05N001	-18.99	-19.50	0.51
02N09E08N001	-28.60	*	*
02N09E09D001	-14.80	-11.80	-3.00
02N09E18Q001	-40.00	-38.00	-2.00
02N09E22D001	-2.40	*	*
02N09E28N001	-11.30	-9.90	-1.40
03N06E35P002	-30.54	-30.00	-0.54
03N07E28K012	*	*	*
03N07E35C002	-51.70	-48.80	-2.90
03N07E35L001	-52.50	-48.50	-4.00
03N07E36J001	-52.30	-47.30	-5.00
03N08E27R001	-48.60	-43.70	-4.90

StateWellID	Fall 2012	Fall 2011	Change
03N08E32P001	-59.52	-52.30	-7.22
03N09E25R001	83.60	84.90	-1.30
03N09E36G001	181.20	*	*

Total Number of Wells	**113**
Total Number of Comparable Wells	**83**
Number of Wells with Decrease	**74**
Number of Wells with Increase	**9**
Number of Wells with No Change	**0**
Range of Change	**-14 to 4.16**
Average Change	**-3.0**

Table 3-5 Comparison of SSJID Water Levels

StateWellID	Fall 2012	Fall 2011	Change
01S07E09Q001	0.23	2.20	-1.97
01S07E14M001	1.00	3.60	-2.60
01S07E14P003	-1.80	1.70	-3.50
01S07E15F002	-1.90	1.30	-3.20
01S07E18L001	5.77	6.30	-0.53
01S07E21G001	14.45	14.30	0.15
01S07E25E001	5.50	13.40	-7.90
01S07E25R001	14.55	15.20	-0.65
01S07E26G001	5.00	13.40	-8.40
01S07E27K001	10.00	13.30	-3.30
01S07E28D001	*	13.20	*
01S07E30R001	*	10.70	*
01S07E33H001	*	17.20	*
01S07E36D001	21.45	21.20	0.25
01S08E19R001	-0.70	3.80	-4.50
01S08E25Q001	21.60	*	*
01S08E29K001	5.00	7.50	-2.50
01S08E30C002	4.50	7.60	-3.10
01S08E34Q001	18.66	19.20	-0.54
01S08E35R002	27.77	28.60	-0.83
01S09E29M002	30.10	31.90	-1.80
01S09E33J002	54.32	53.50	0.82
01S09E33P001	49.91	50.00	-0.09
01S09E34A001	55.30	56.60	-1.30
02S07E07D002	9.40	10.30	-0.90
02S07E07Q001	24.26	23.20	1.06
02S07E08R001	27.46	26.50	0.96
02S07E10B002	26.16	26.40	-0.24

StateWellID	Fall 2012	Fall 2011	Change
02S07E11N002	34.40	37.20	-2.80
02S07E12G001	*	30.50	*
02S07E12R001	25.35	23.70	1.65
02S07E12R002	30.65	29.50	1.15
02S07E19H001	21.00	21.00	0.00
02S07E20R002	*	22.30	*
02S07E22N002	27.25	26.00	1.25
02S07E24R002	37.55	36.50	1.05
02S07E26B001	30.20	30.00	0.20
02S08E04M001	26.00	22.50	3.50
02S08E06J001	19.60	22.00	-2.40
02S08E07R001	31.90	35.40	-3.50
02S08E08A001	22.40	26.80	-4.40
02S08E08E001	24.70	25.70	-1.00
02S08E09J001	35.06	35.70	-0.64
02S08E12D001	39.67	40.60	-0.93
02S08E14E001	45.07	47.40	-2.33
02S09E03K001	58.80	*	*
02S09E07D001	39.89	44.70	-4.81
02S09E11K001	75.24	74.00	1.24
02S09E12R001	71.85	71.50	0.35
02S09E19B002	37.40	*	*

Total Number of Wells	**50**
Total Number of Comparable Wells	**42**
Number of Wells with Decrease	**28**
Number of Wells with Increase	**13**
Number of Wells with No Change	**1**
Range of Change	**-8.4 to 3.5**
Average Change	**-1.4**

Table 3-6 Comparison of WID Water Levels

StateWellID	Fall 2012	Fall 2011	Change
03N05E13L001	-11.00	-8.50	-2.50
03N05E14C001	-4.30	-3.00	-1.30
03N05E24L001	-4.74	-7.70	2.96
03N06E04P012	-12.50	-11.30	-1.20
03N06E05C002	-7.50	1.70	-9.20
03N06E05N003	-12.00	*	*
03N06E07D013	-9.10	-5.90	-3.20
03N06E07H003	-15.90	-13.10	-2.80
03N06E09N011	*	*	*

StateWellID	Fall 2012	Fall 2011	Change
03N06E10D001	*	-8.90	*
03N06E15C004	-23.30	-21.30	-2.00
03N06E17A004	-24.20	-22.20	-2.00
03N06E18M003	-15.80	-12.40	-3.40
03N06E20D002	-20.50	-17.50	-3.00
03N06E26P002	-31.70	-29.40	-2.30
03N06E27E001	-32.20	-29.20	-3.00
03N06E29C001	-28.30	-26.30	-2.00
03N06E30R001	-25.40	-23.00	-2.40
03N06E32R001	-24.50	-23.40	-1.10
04N05E03D003	*	*	*
04N05E09D001	*	*	*
04N05E10K001	-6.00	-4.90	-1.10
04N05E13C012	-7.00	1.30	-8.30
04N05E13H001	-6.00	1.00	-7.00
04N05E13R004	-6.50	0.20	-6.70
04N05E14B002	-5.90	-0.40	-5.50
04N05E14P001	-1.50	1.50	-3.00
04N05E22H001	*	-7.40	*
04N05E24J004	-1.60	6.00	-7.60
04N05E26F001	0.70	2.40	-1.70
04N05E36C004	-2.40	*	*
04N05E36H003	0.00	3.40	-3.40
04N06E17G004	-3.00	4.50	-7.50
04N06E18R012	-5.20	-0.30	-4.90
04N06E19F001	-1.40	7.00	-8.40
04N06E19R012	0.30	6.50	-6.20
04N06E21D001	5.64	10.90	-5.26
04N06E29A001	*	*	*
04N06E29N002	-3.00	2.90	-5.90
04N06E30E001	0.70	6.70	-6.00
04N06E34J002	20.40	22.40	-2.00
05N05E28L003	*	*	*
05N05E32M001	*	*	*

Total Number of Wells	**43**
Total Number of Comparable Wells	**33**
Number of Wells with Decrease	**32**
Number of Wells with Increase	**1**
Number of Wells with No Change	**0**
Range of Change	**-9.2 to 2.96**
Average Change	**-3.9**

Table 3-7 Comparison of South West County Area Water Levels

StateWellID	Fall 2012	Fall 2011	Change
01S05E31R002	0.60	0.90	-0.30
01S06E04J001	-1.70	-1.40	-0.30
01S06E12P001	-1.18	-2.80	1.62
01S06E14F001	-1.60	-0.10	-1.50
01S06E15F001	1.61	-0.10	1.71
01S06E23C003	4.43	2.90	1.53
01S06E26K001	2.24	2.00	0.24
02S04E15R001	56.00	55.50	0.50
02S05E08B001	-5.40	-1.20	-4.20
02S05E13N001	14.60	14.20	0.40
02S06E10K001	3.00	5.00	-2.00
02S06E11J001	18.36	9.40	8.96
02S06E25J001	15.80	16.90	-1.10
02S06E26B001	*	9.30	*
02S06E27E001	9.40	10.90	-1.50
02S06E31N001	53.50	54.00	-0.50
02S06E31N001	56.88	54.00	2.88
02S07E31N001	14.50	16.00	-1.50
03S05E04H001	57.50	58.00	-0.50
03S06E03F002	15.50	18.50	-3.00
03S06E23C001	9.50	10.30	-0.80
03S06E27N001	75.80	74.30	1.50
03S06E27N001	77.73	74.30	3.43
03S07E05J001	24.96	22.90	2.06
03S07E06Q001	18.96	17.30	1.66

Total Number of Wells	**25**
Total Number of Comparable Wells	**24**
Number of Wells with Decrease	**12**
Number of Wells with Increase	**12**
Number of Wells with No Change	**0**
Range of Change	**-4.2 to 8.96**
Average Change	**0.4**

HYDROGRAPHS

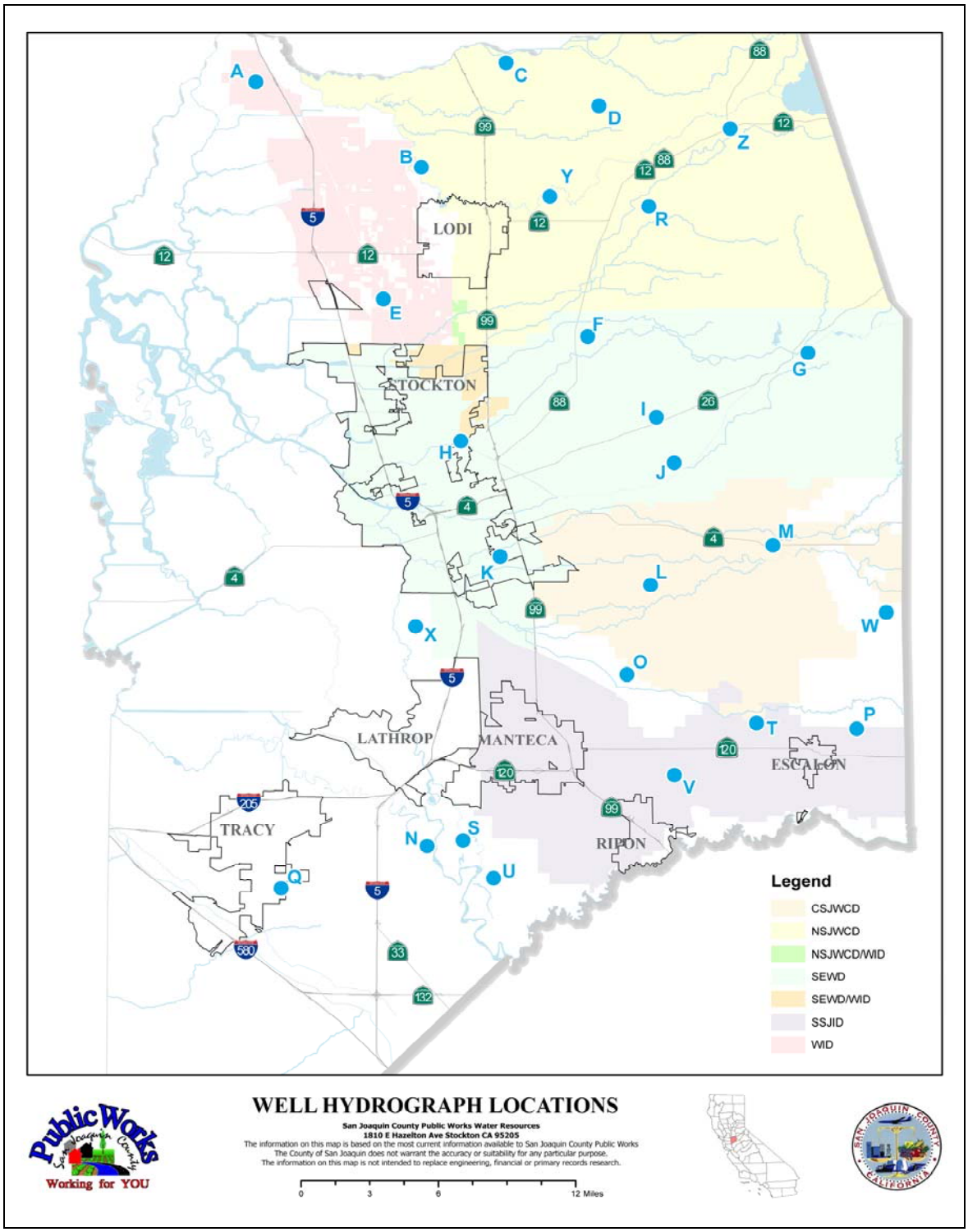


Figure 3-1: Well Hydrograph Locations

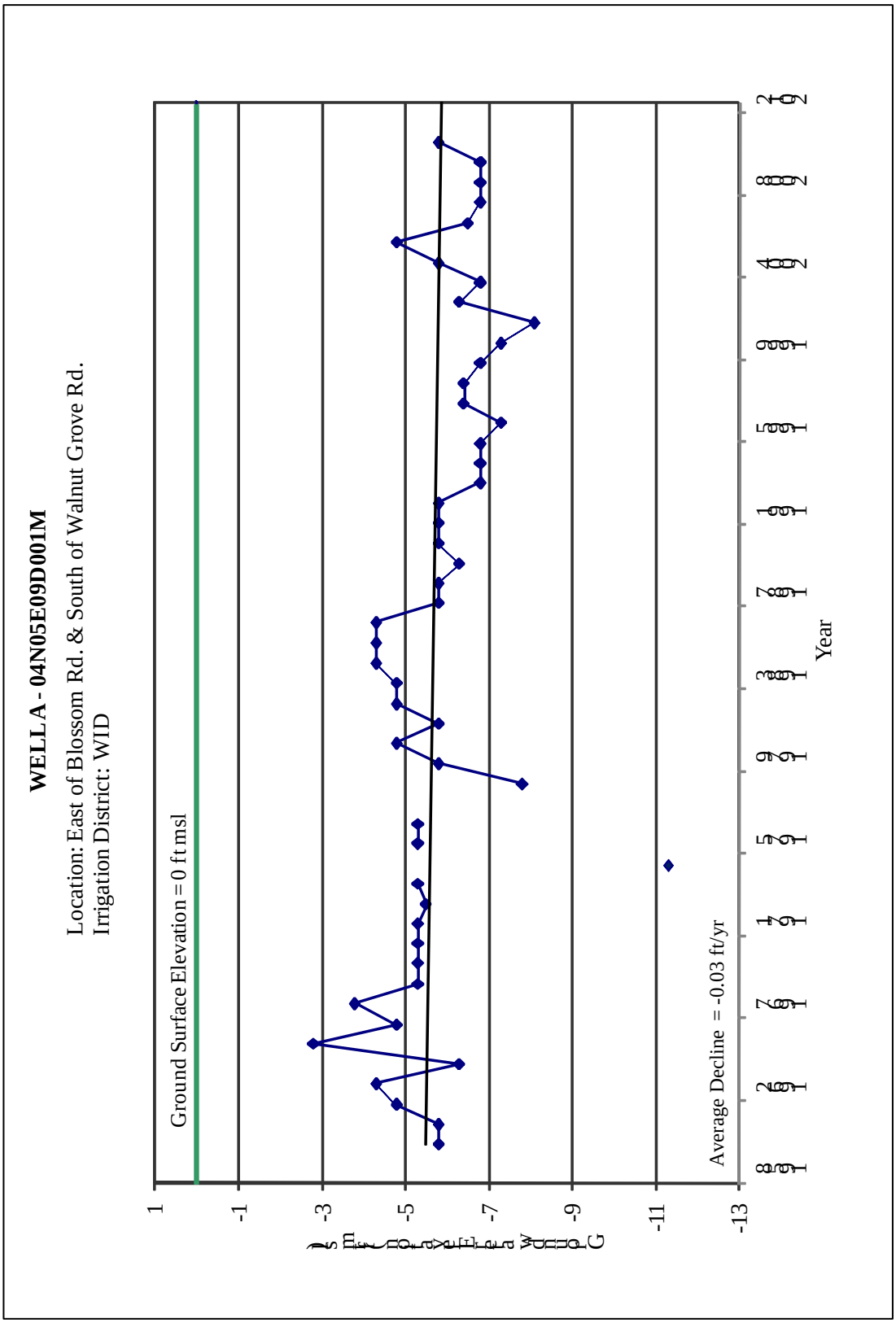


Figure 3-2: Fall Hydrograph Well A

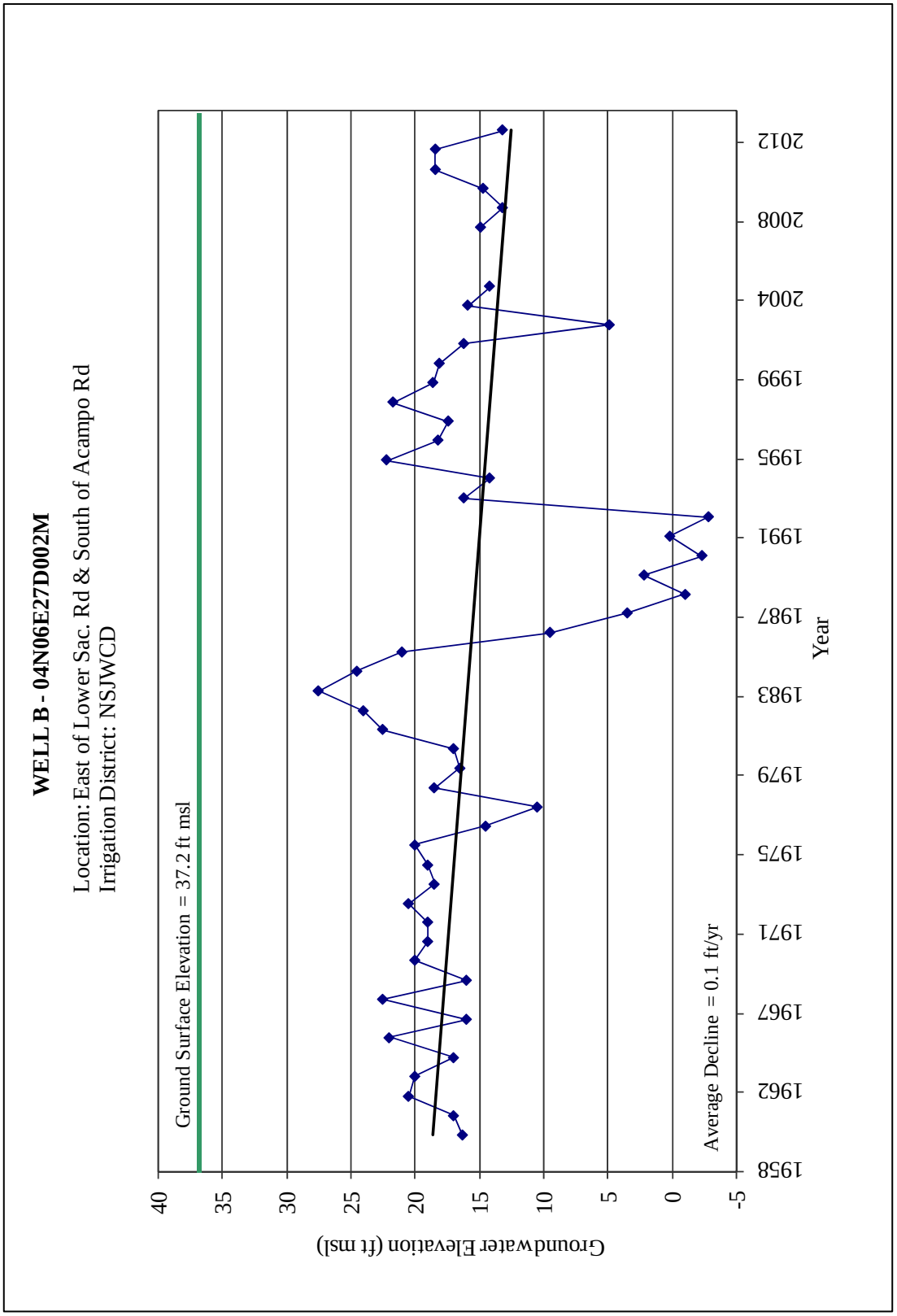


Figure 3-3: Fall Hydrograph Well B

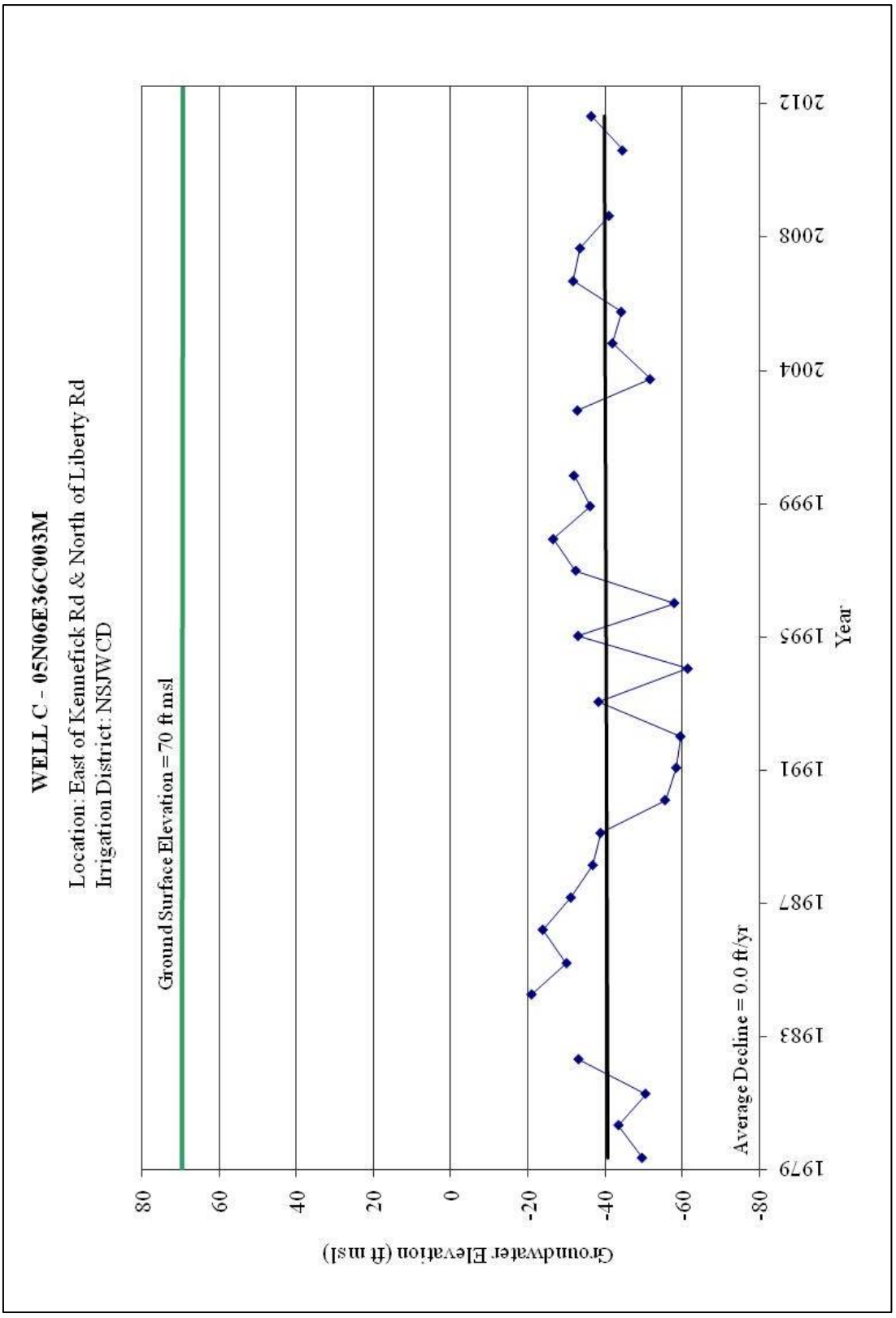


Figure 3-4: Fall Hydrograph Well C

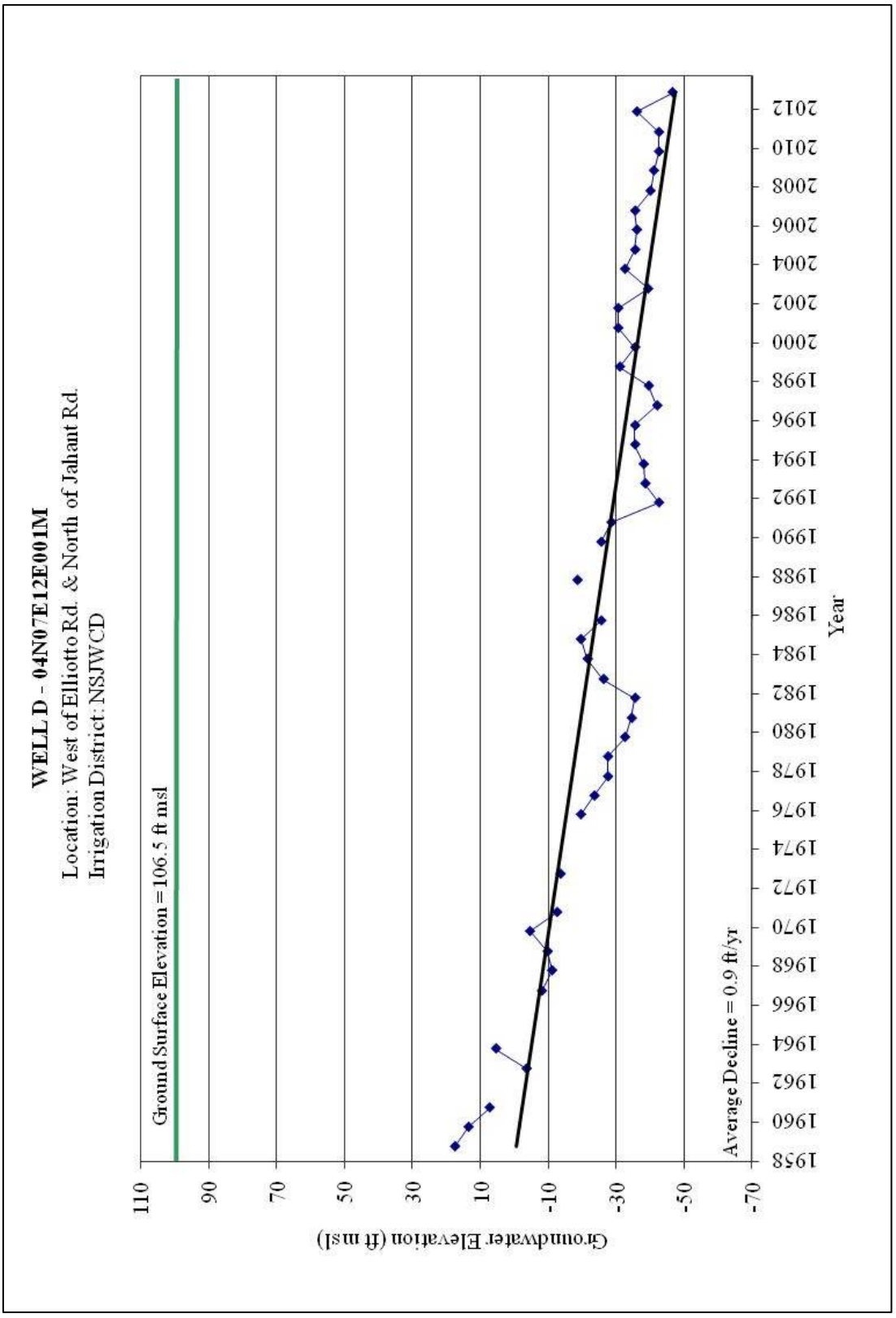


Figure 3-5: Fall Hydrograph Well D

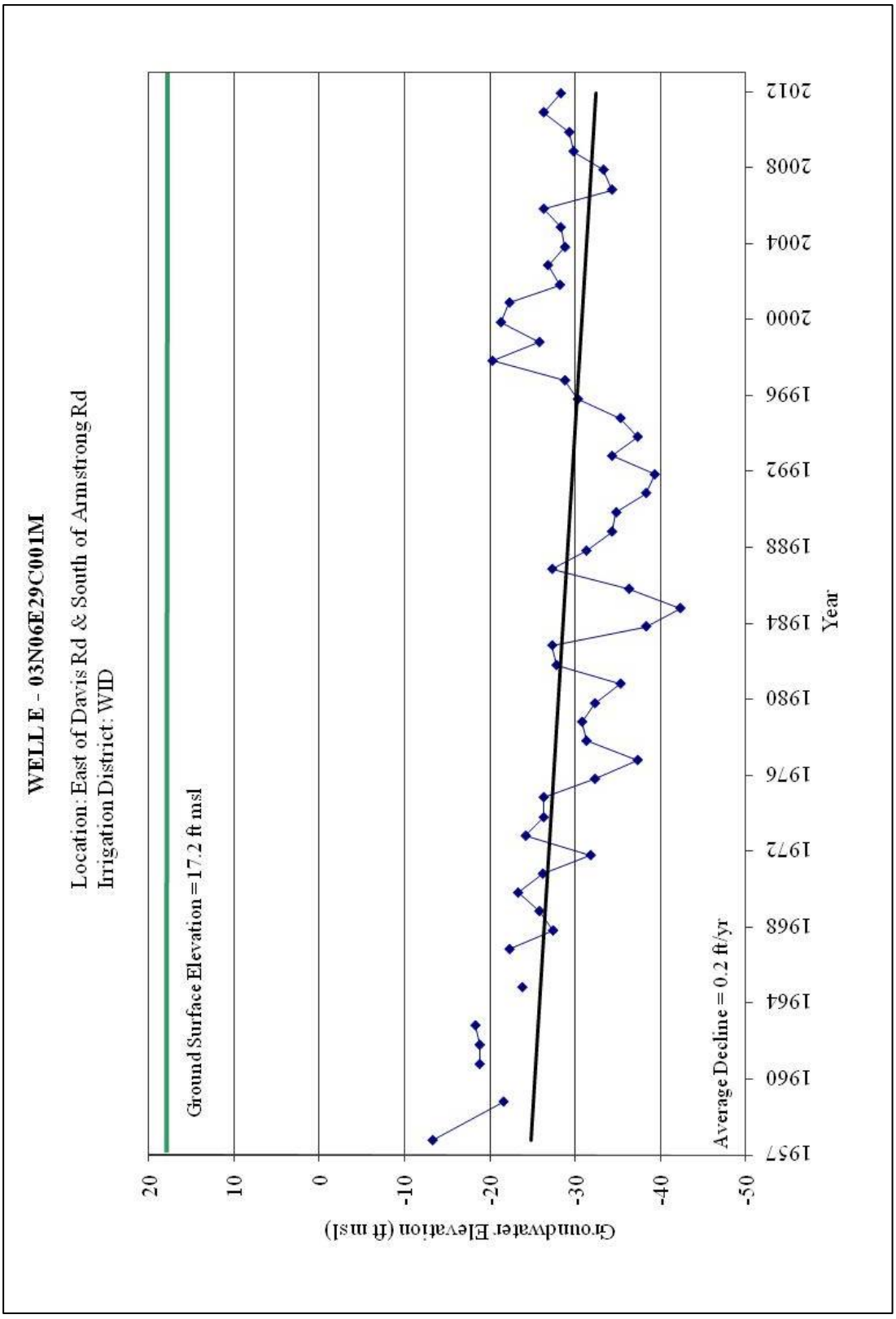


Figure 3-6: Fall Hydrograph Well E

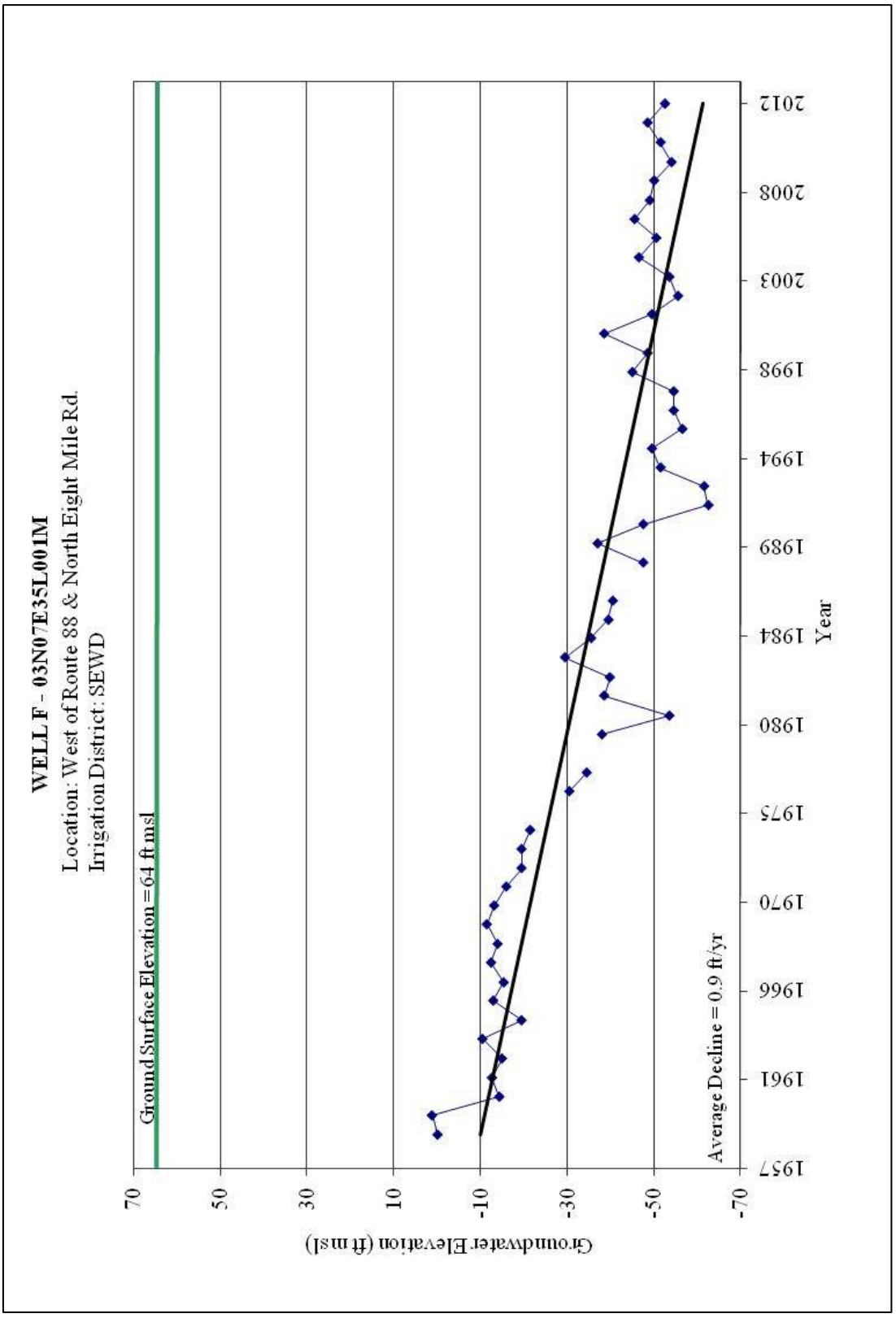


Figure 3-7: Fall Hydrograph Well F

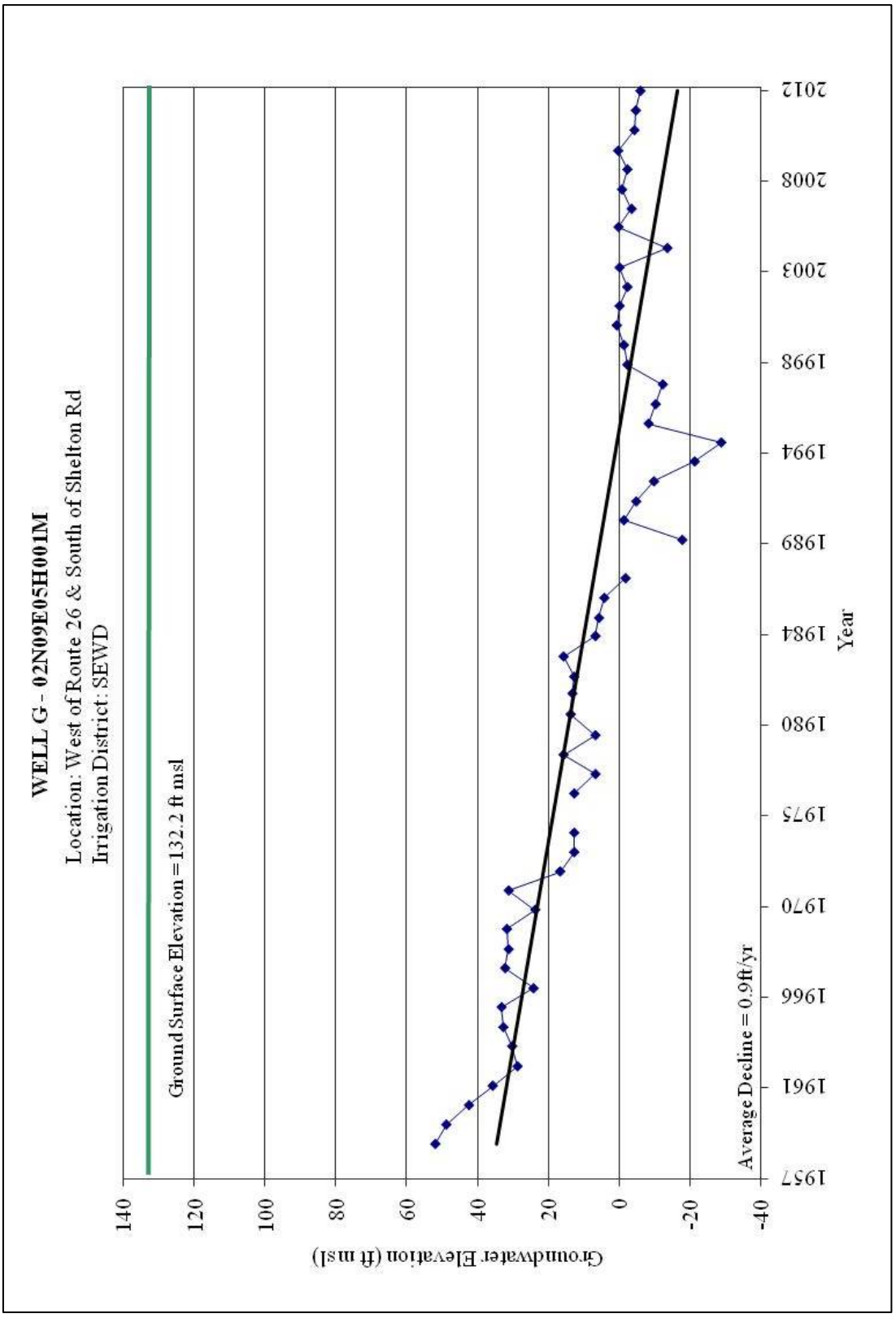


Figure 3-8: Fall Hydrograph Well G

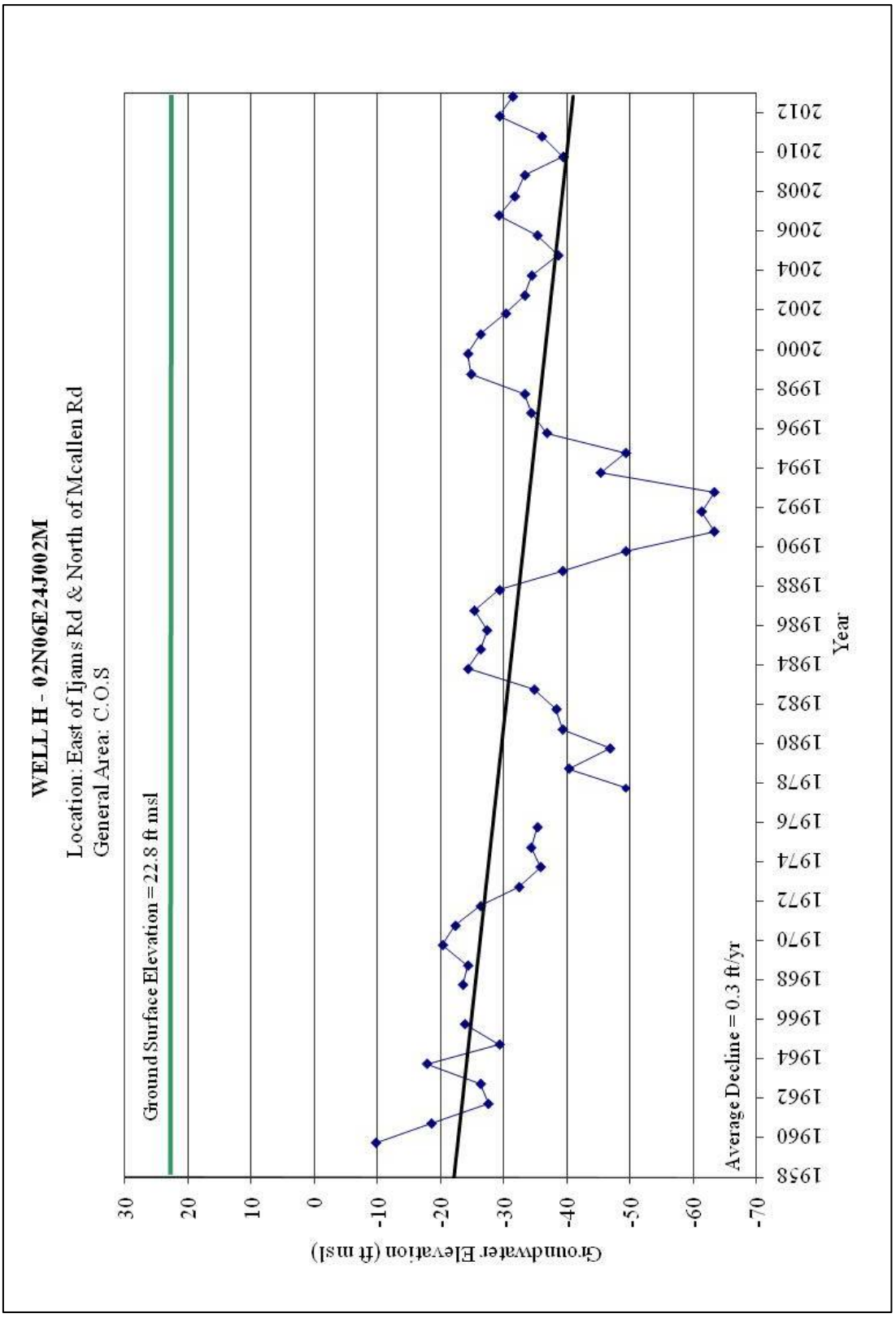


Figure 3-9: Fall Hydrograph Well H

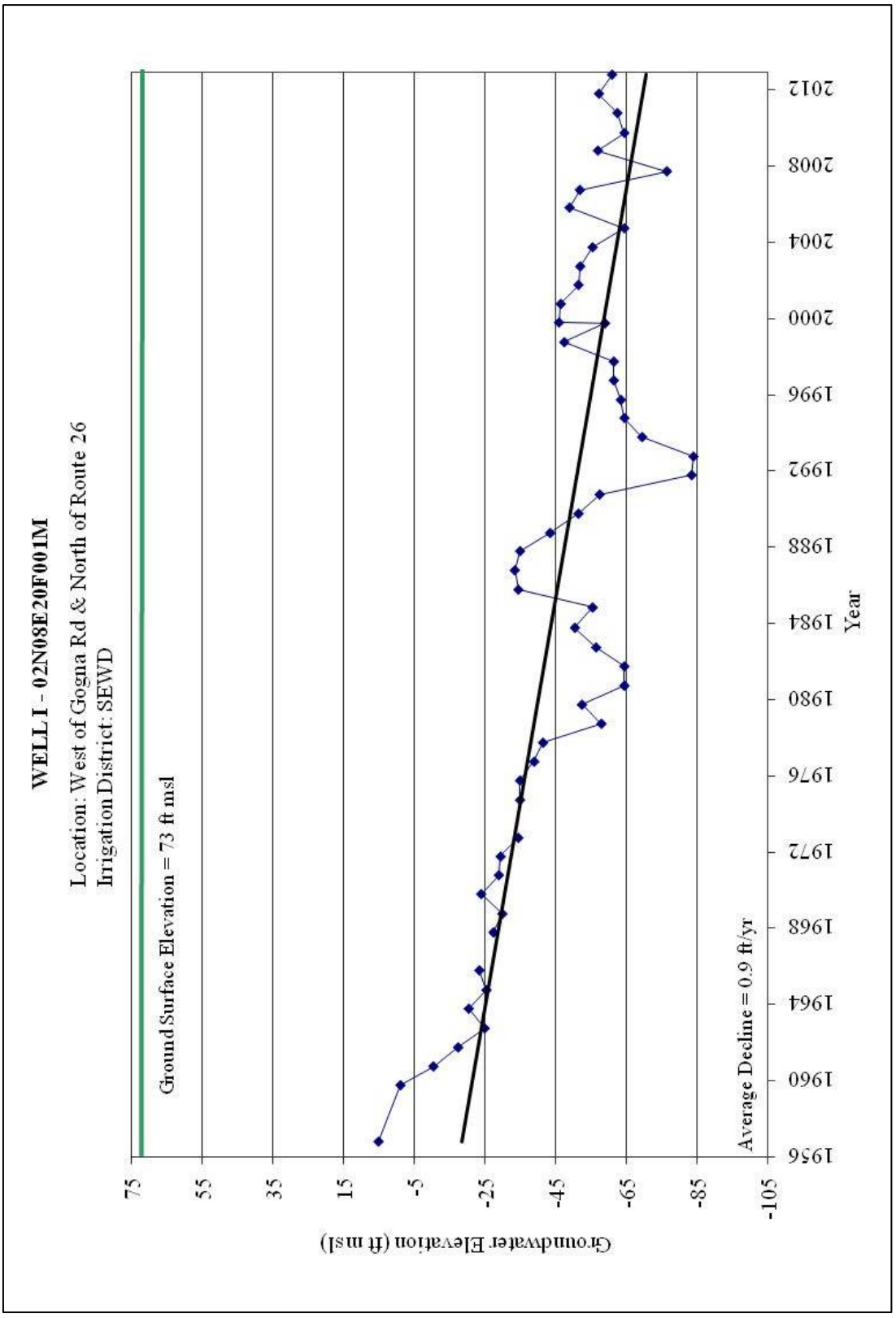


Figure 3-10: Fall Hydrograph Well I

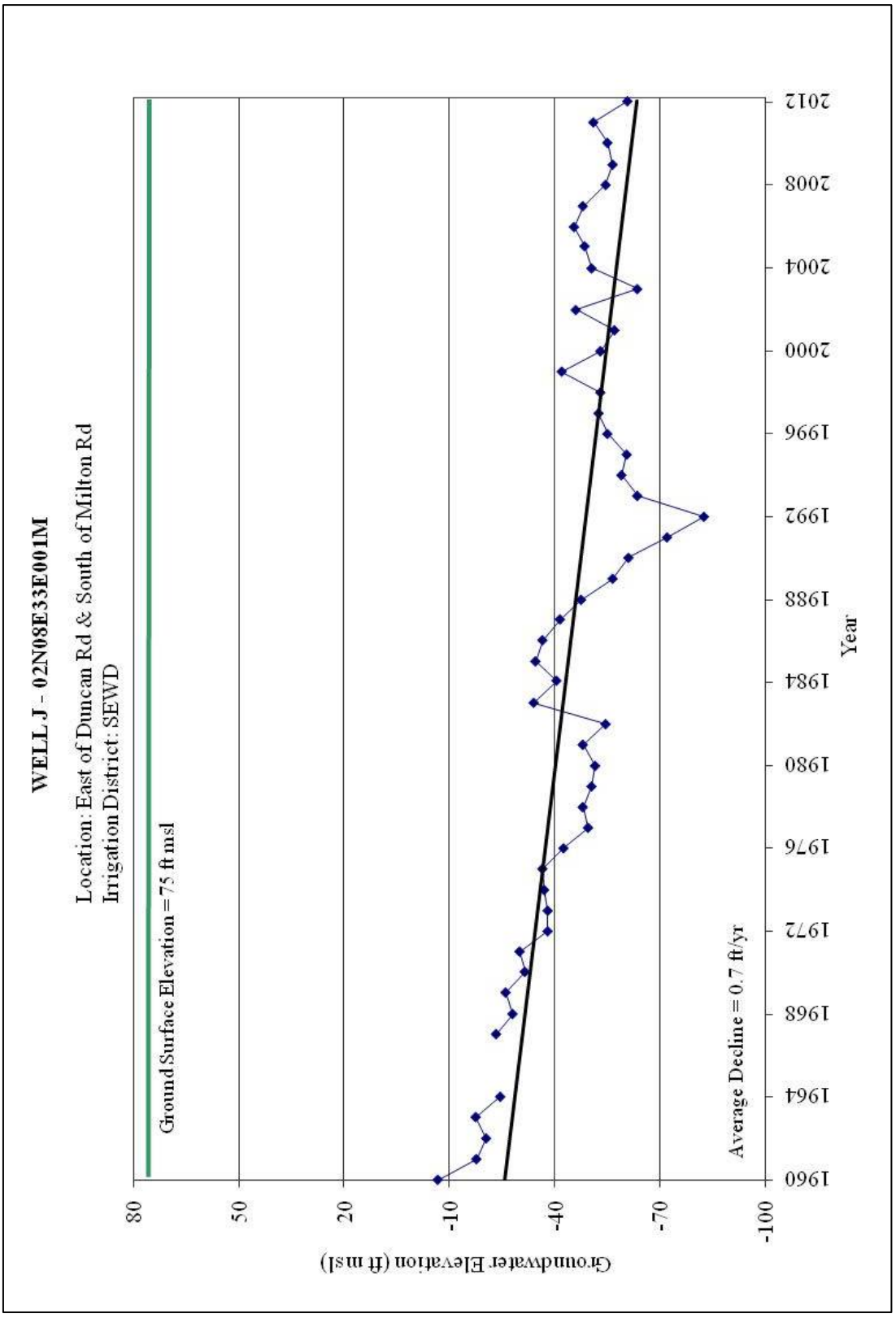


Figure 3-11: Fall Hydrograph Well J

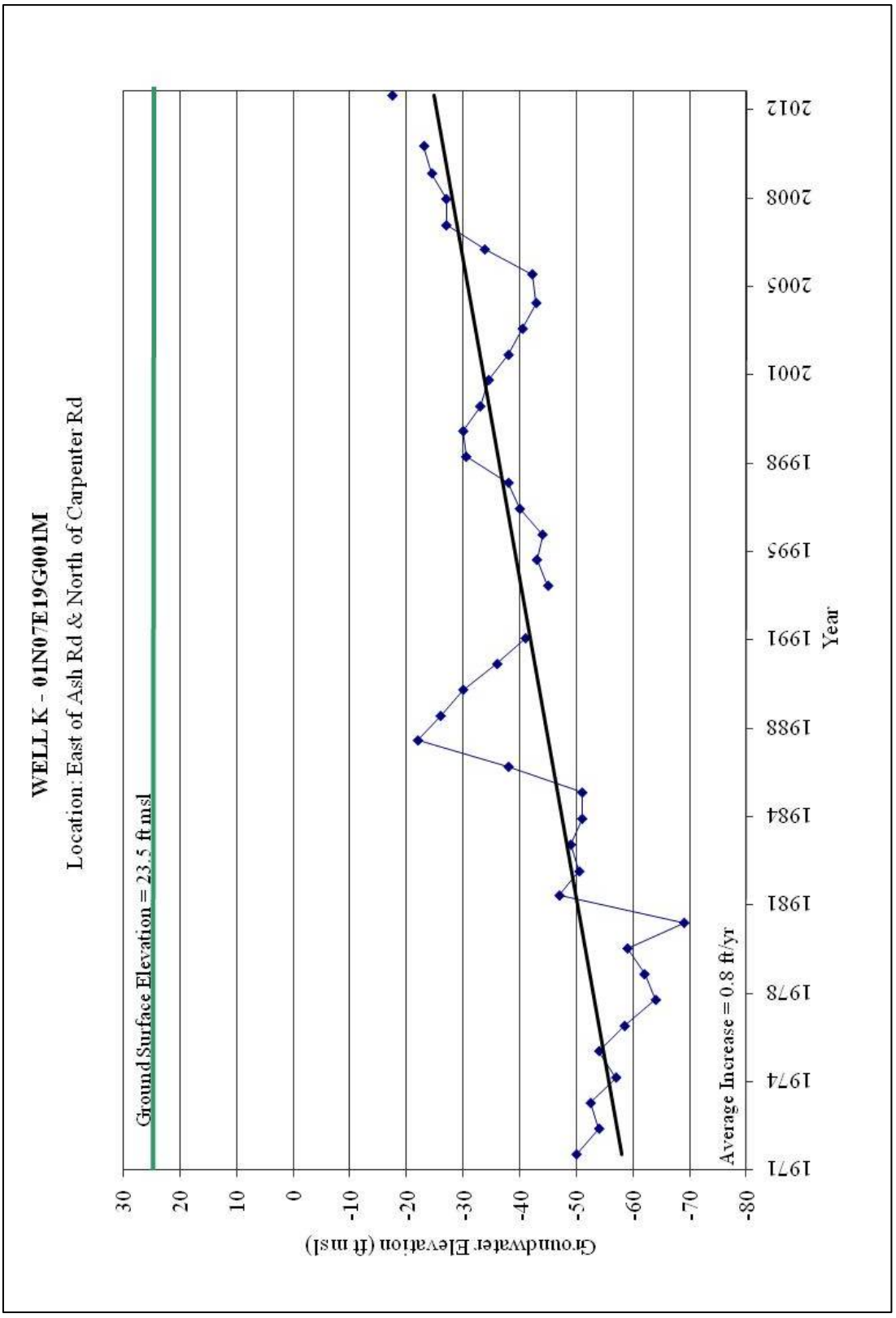


Figure 3-12: Fall Hydrograph Well K

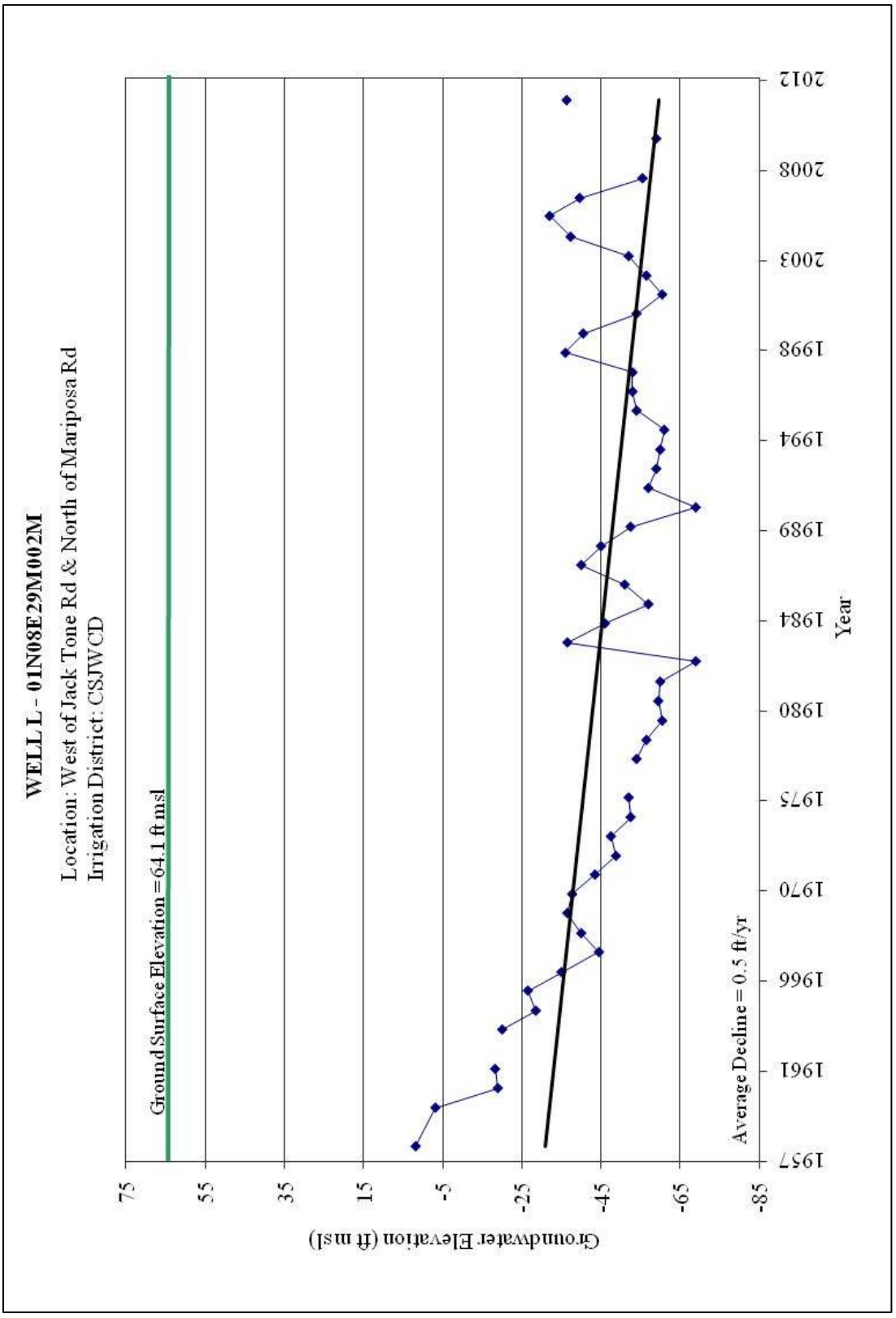


Figure 3-13: Fall Hydrograph Well L

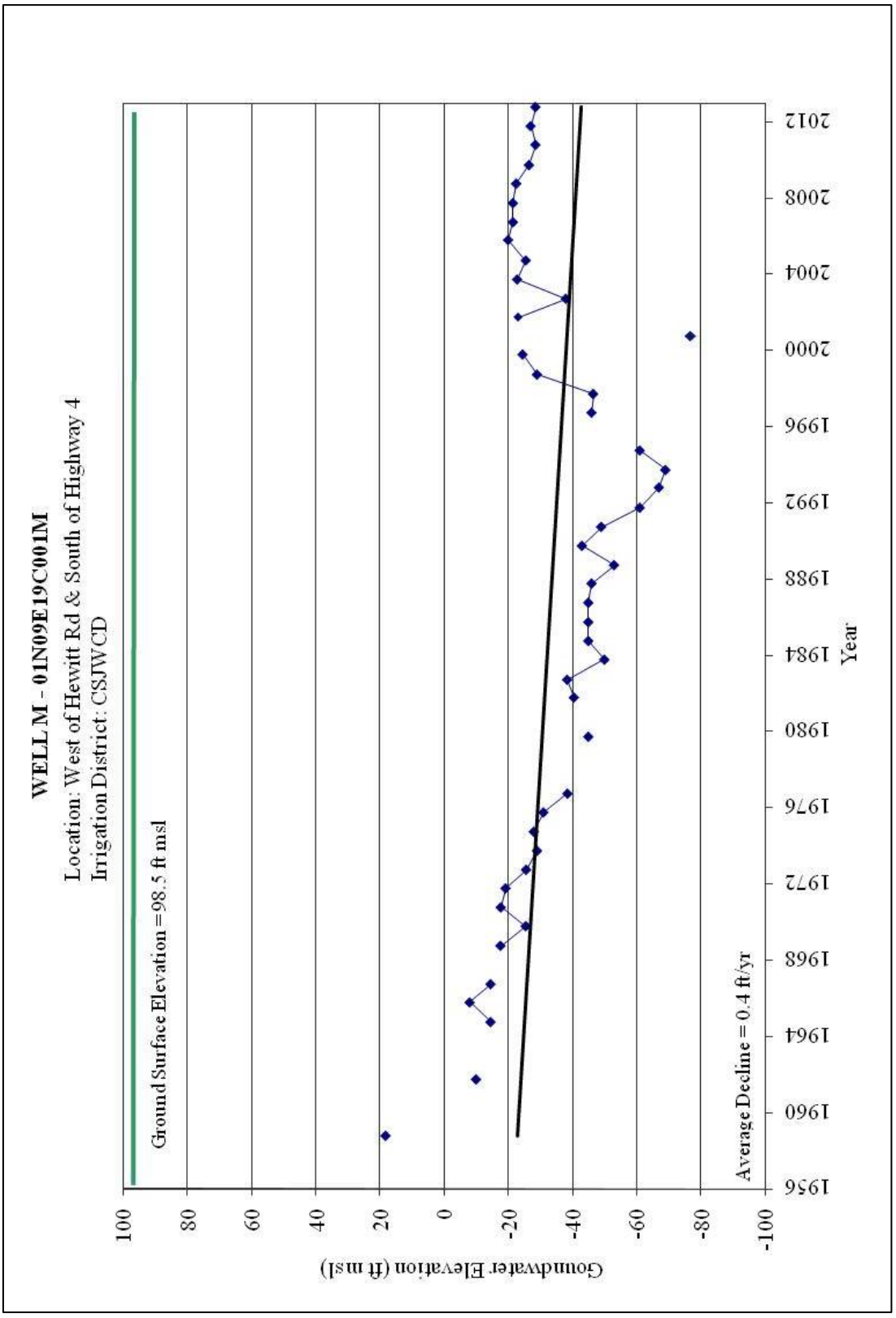


Figure 3-14: Fall Hydrograph Well M

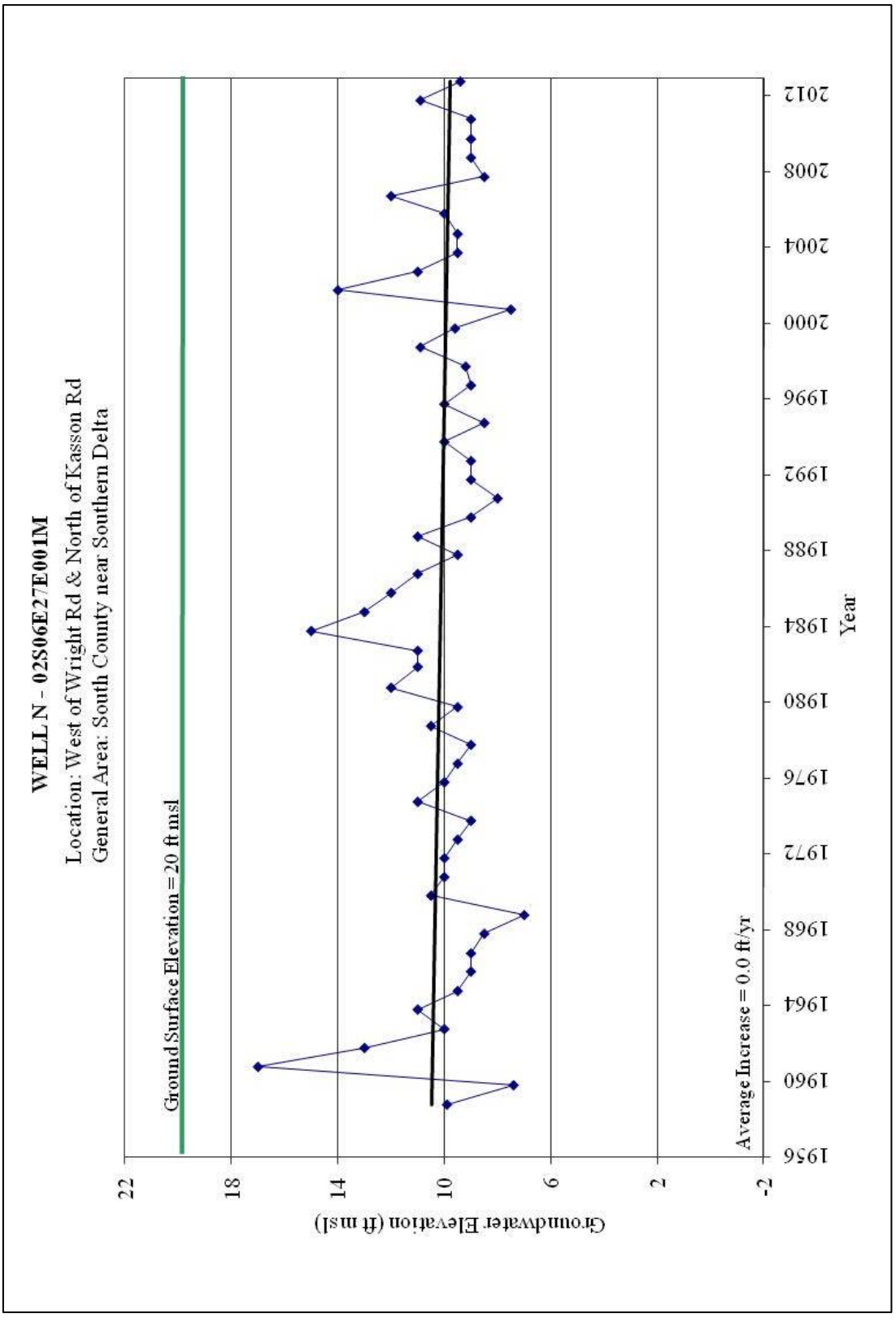


Figure 3-15: Fall Hydrograph Well N

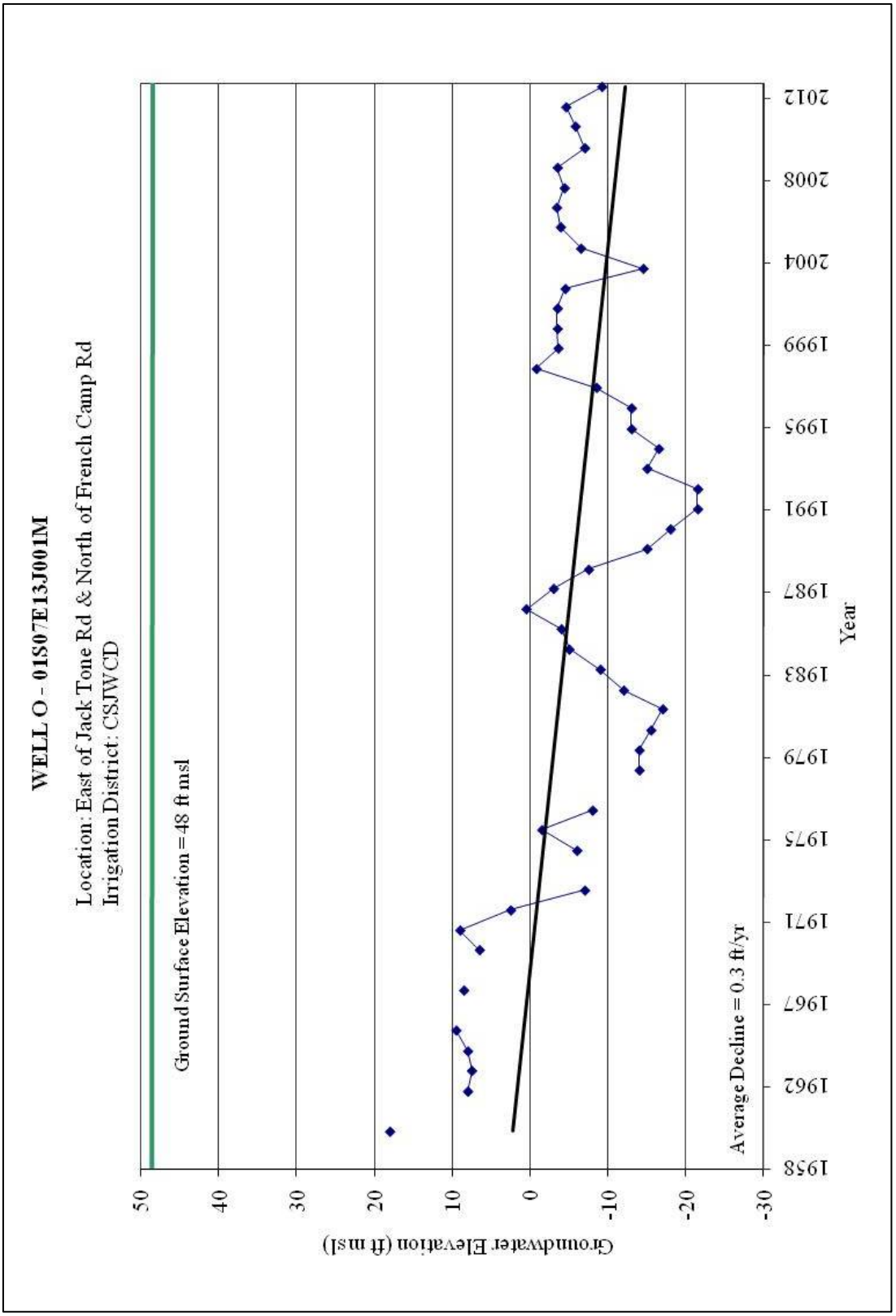


Figure 3-16: Fall Hydrograph Well O

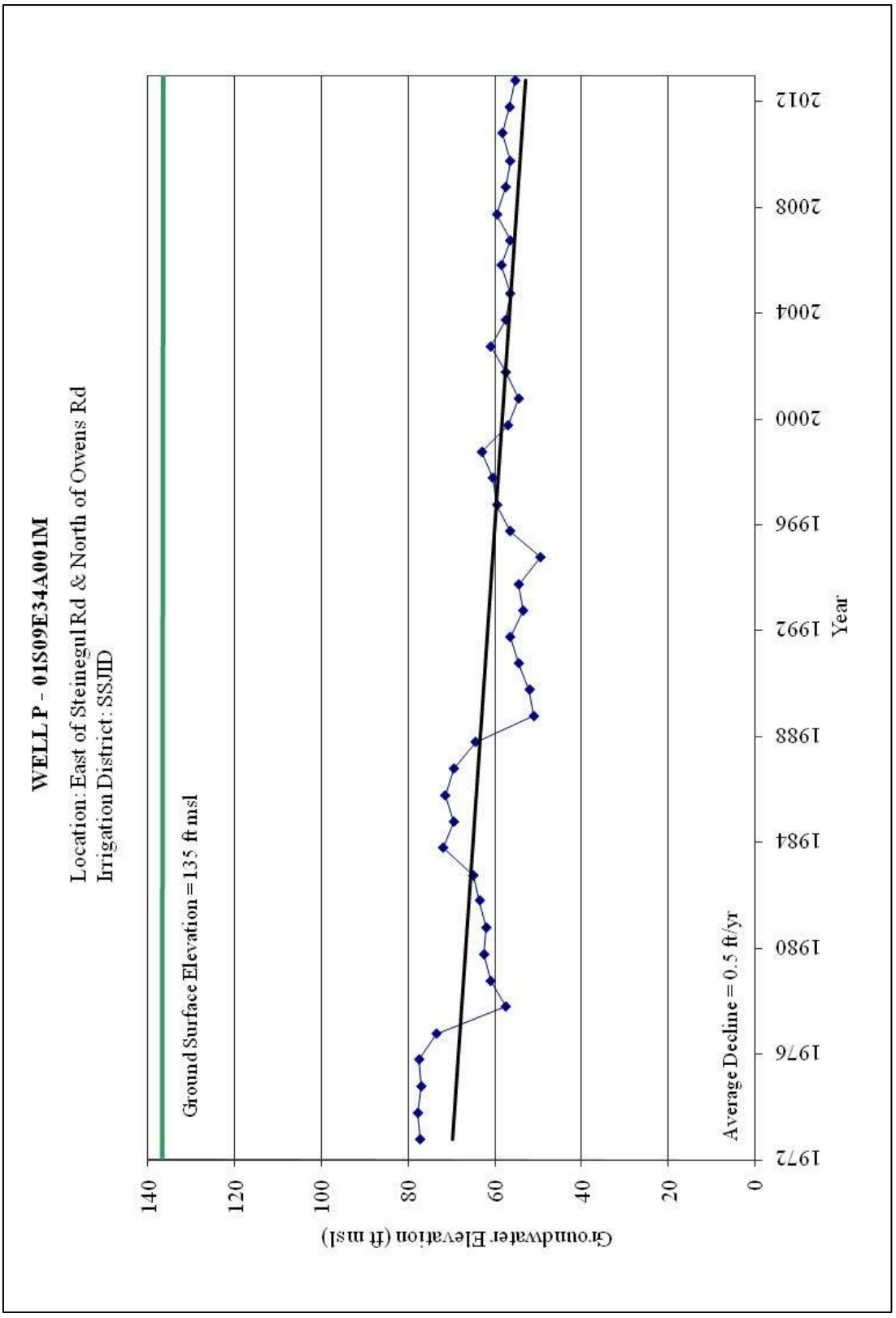


Figure 3-17: Fall Hydrograph Well P

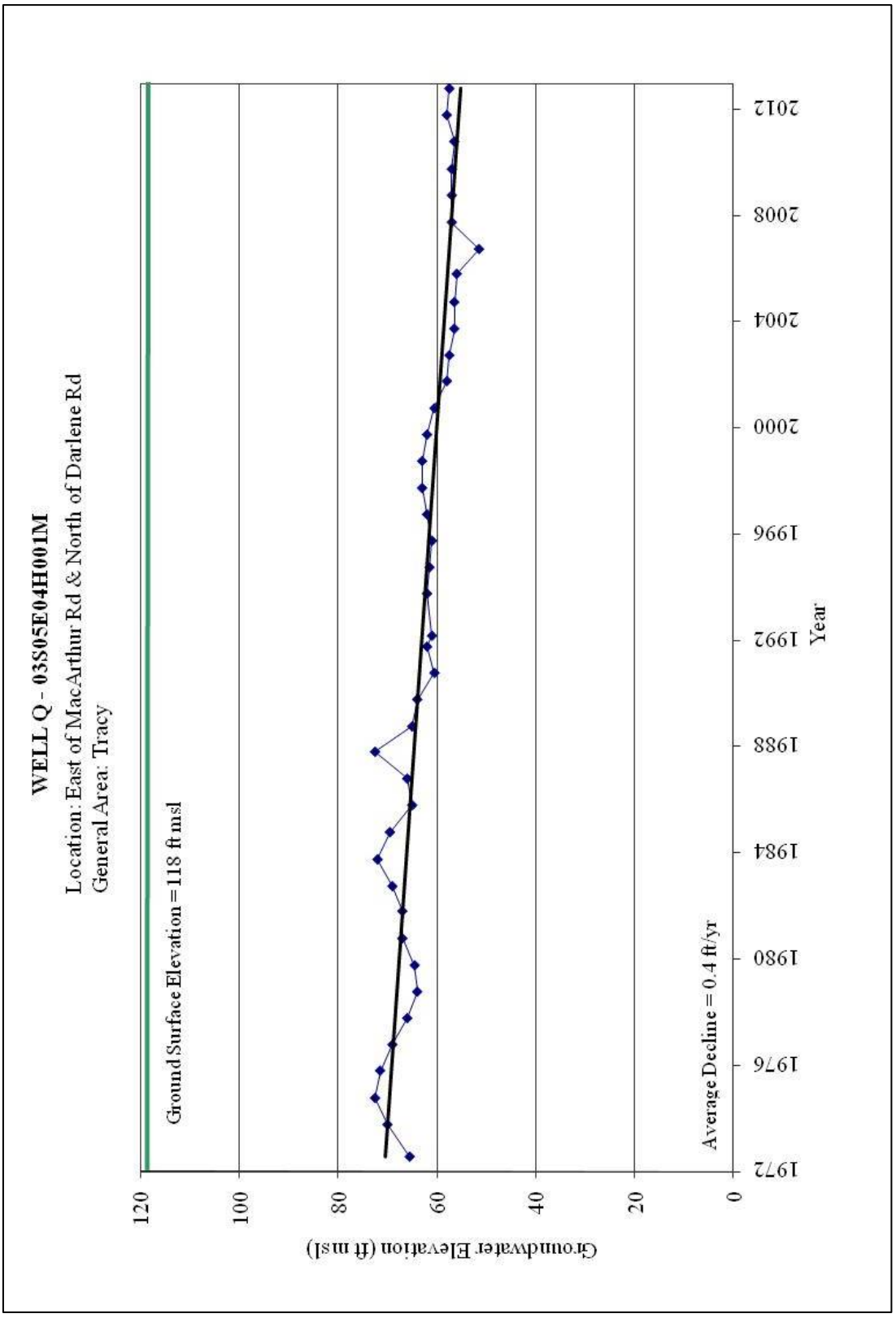


Figure 3-18: Fall Hydrograph Well Q

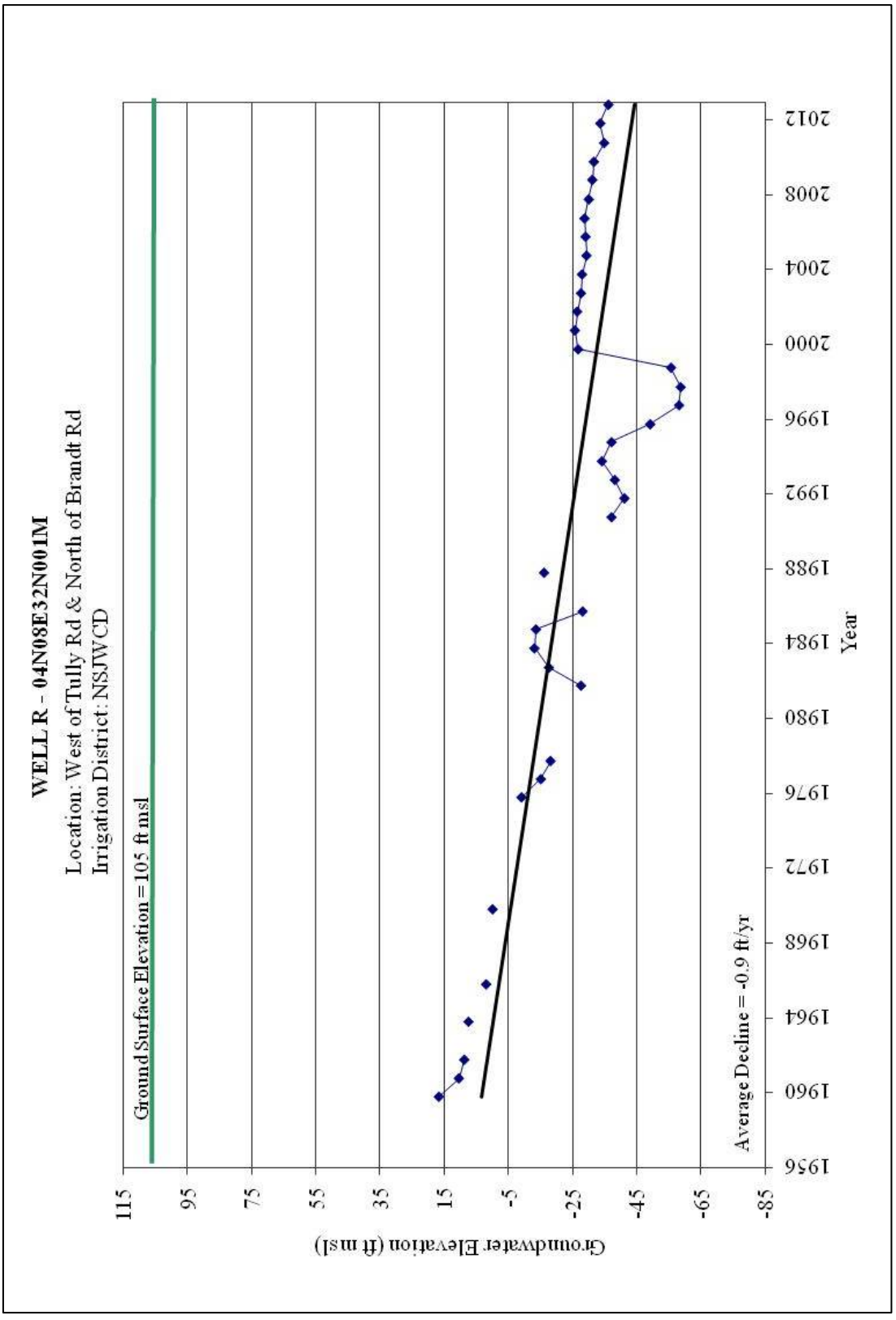


Figure 3-19: Fall Hydrograph Well R

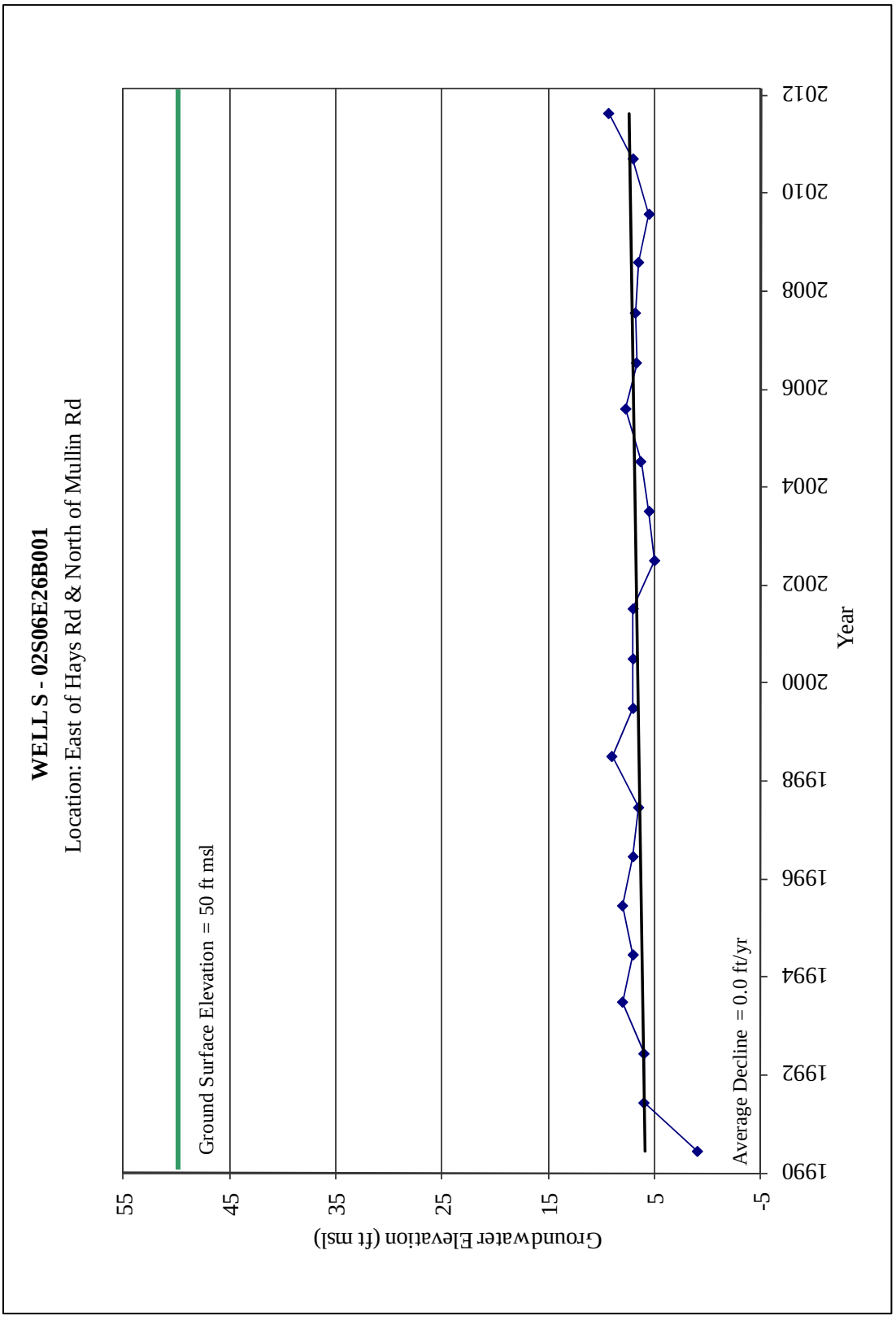


Figure 3-20: Fall Hydrograph Well S

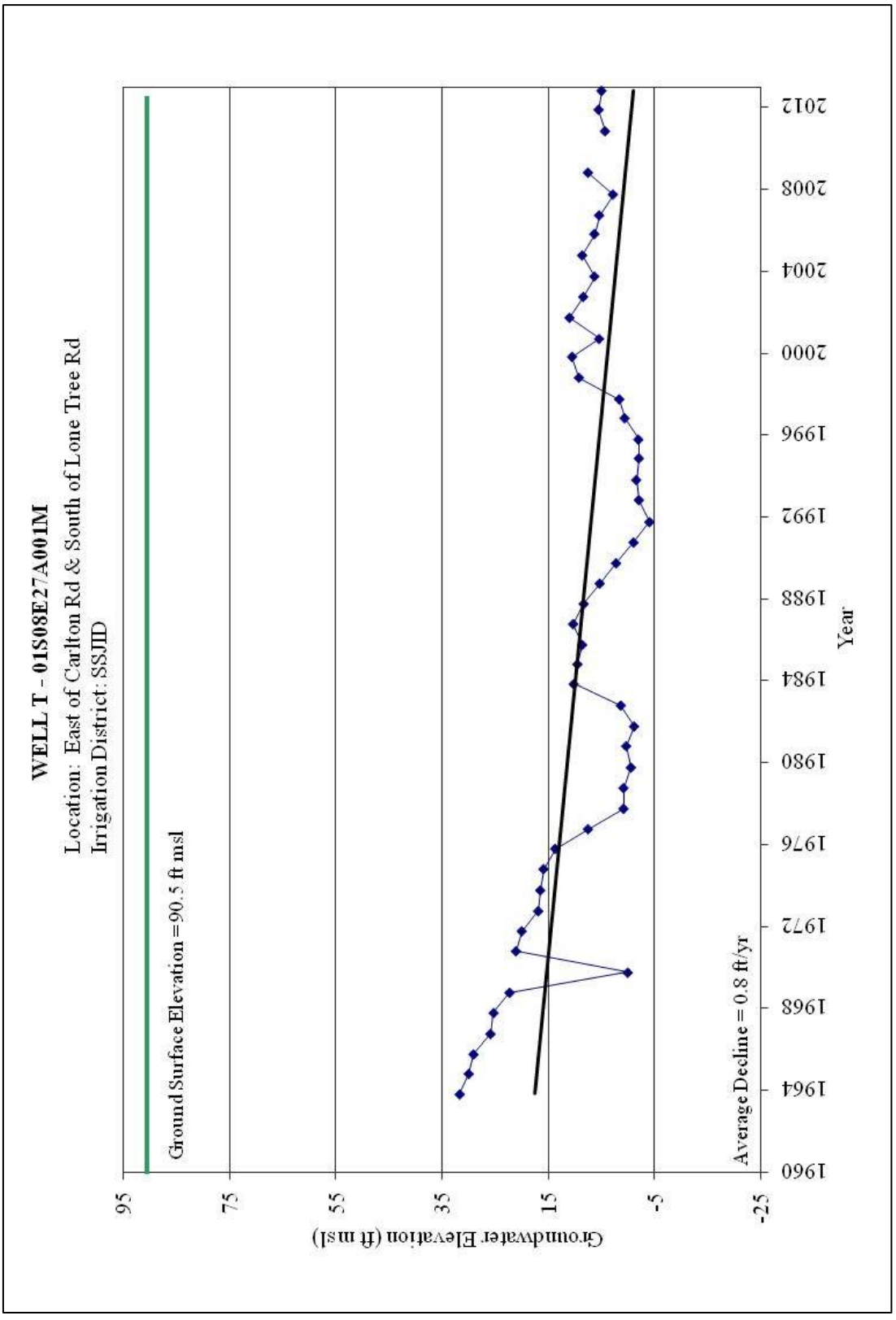


Figure 3-21: Fall Hydrograph Well T

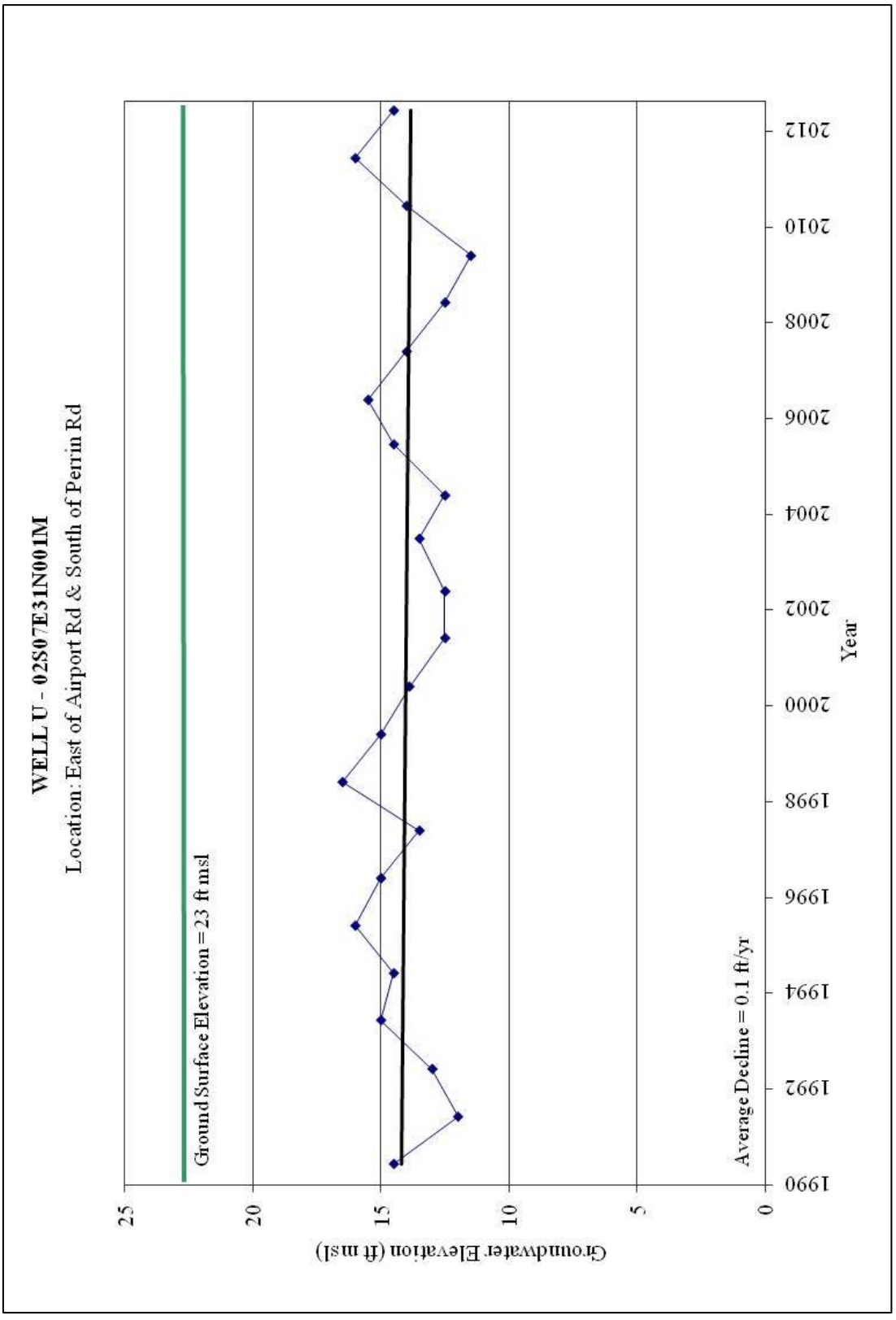


Figure 3-22: Fall Hydrograph Well U

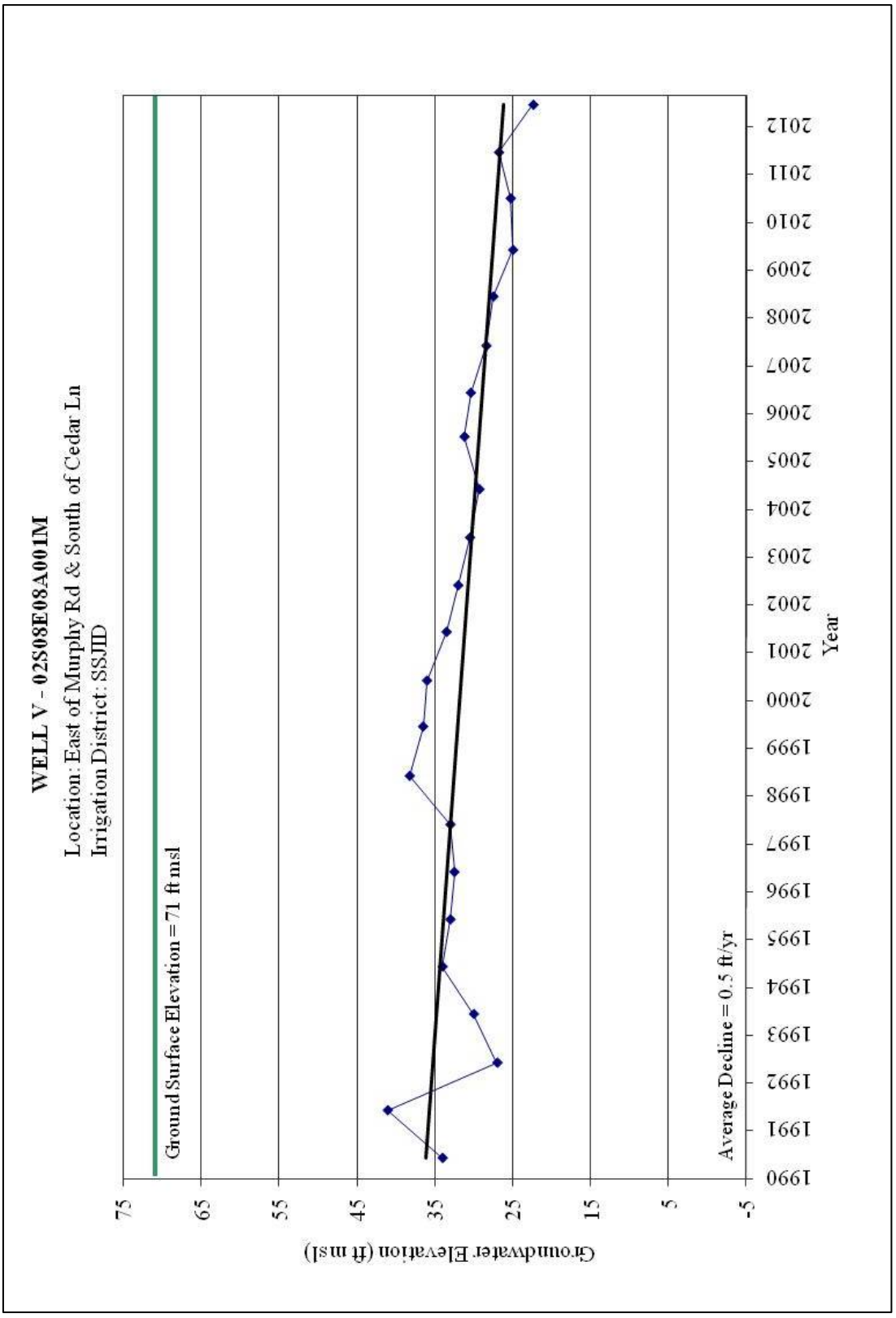


Figure 3-23: Fall Hydrograph Well V

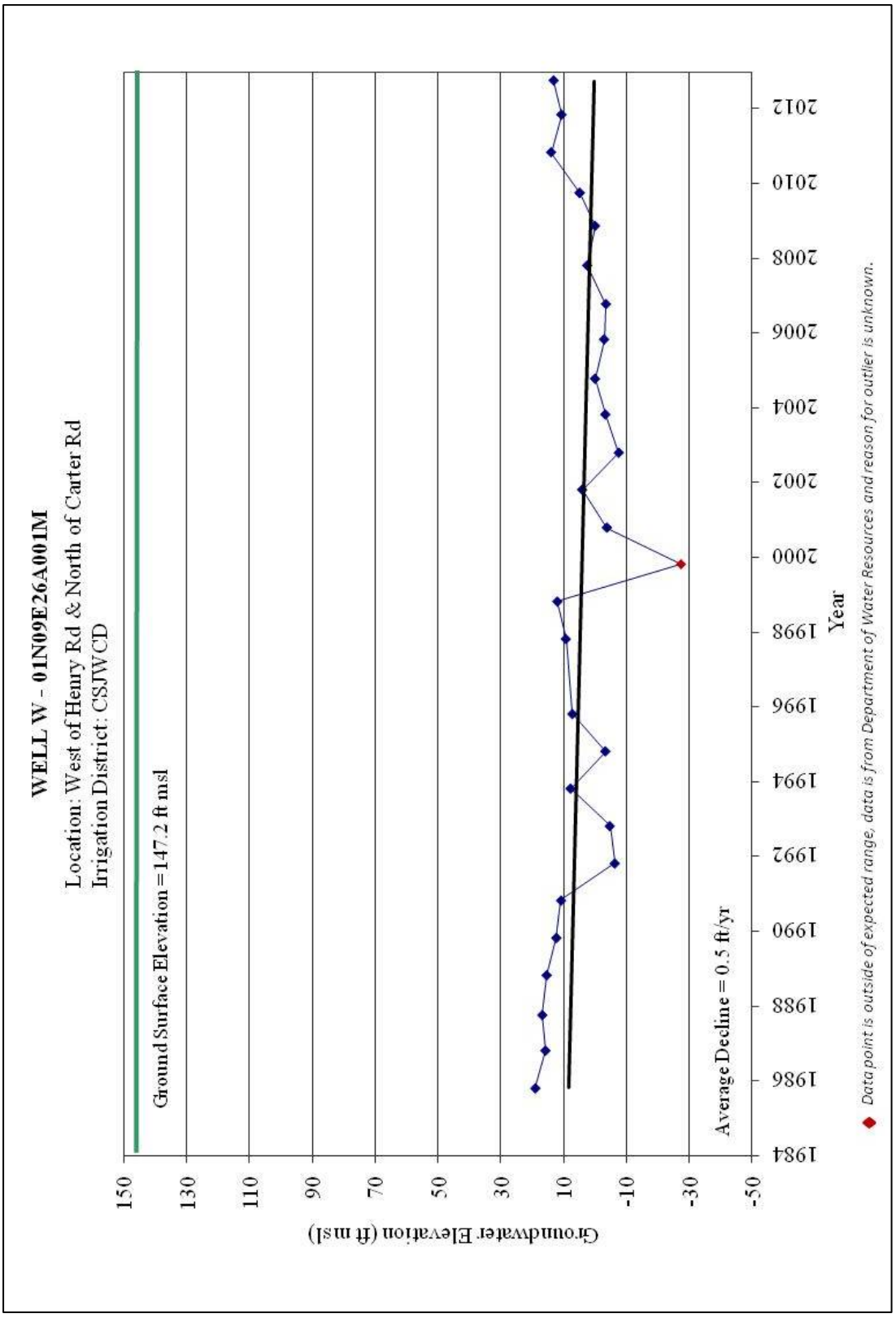


Figure 3-24: Fall Hydrograph Well W

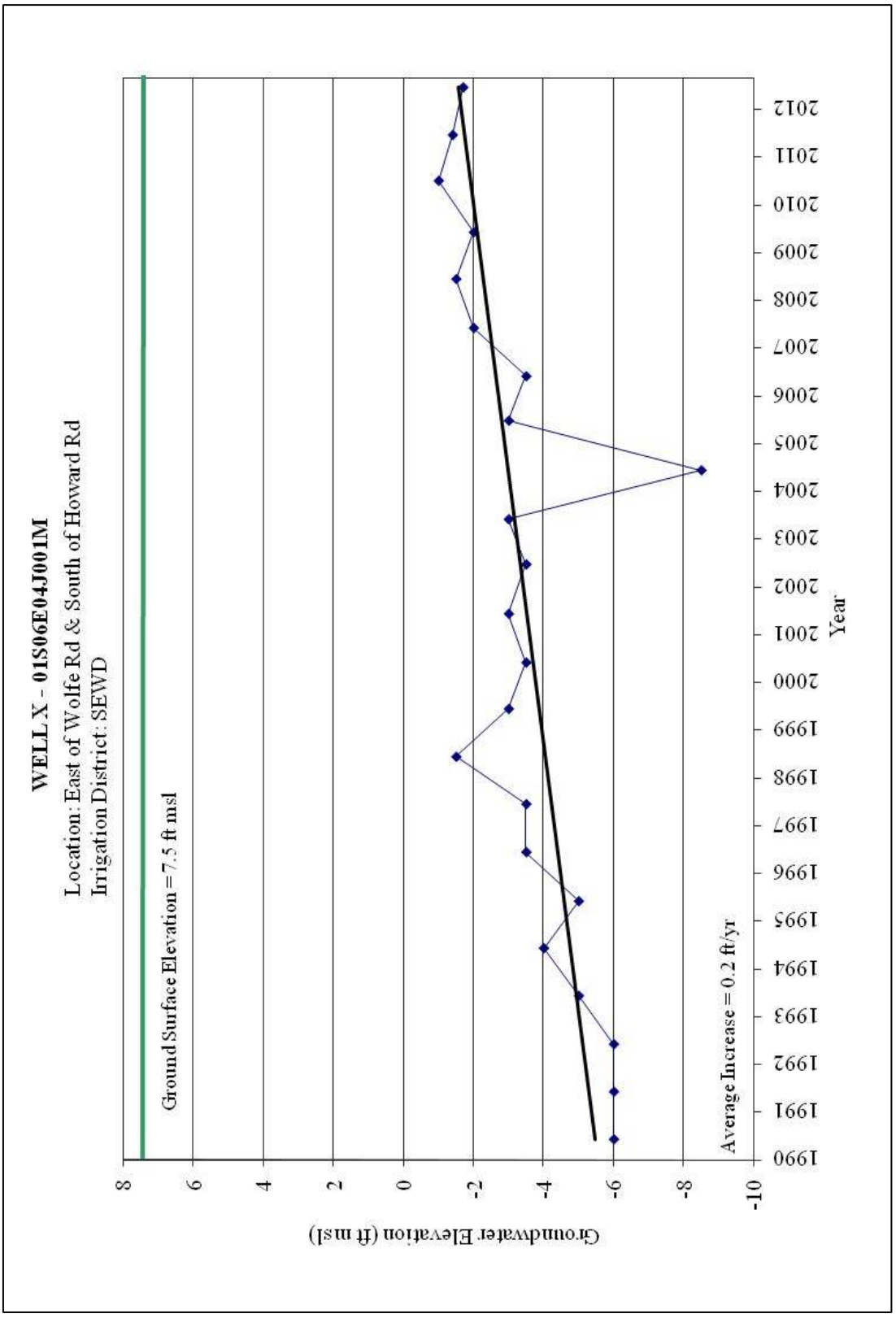


Figure 3-25: Fall Hydrograph Well X

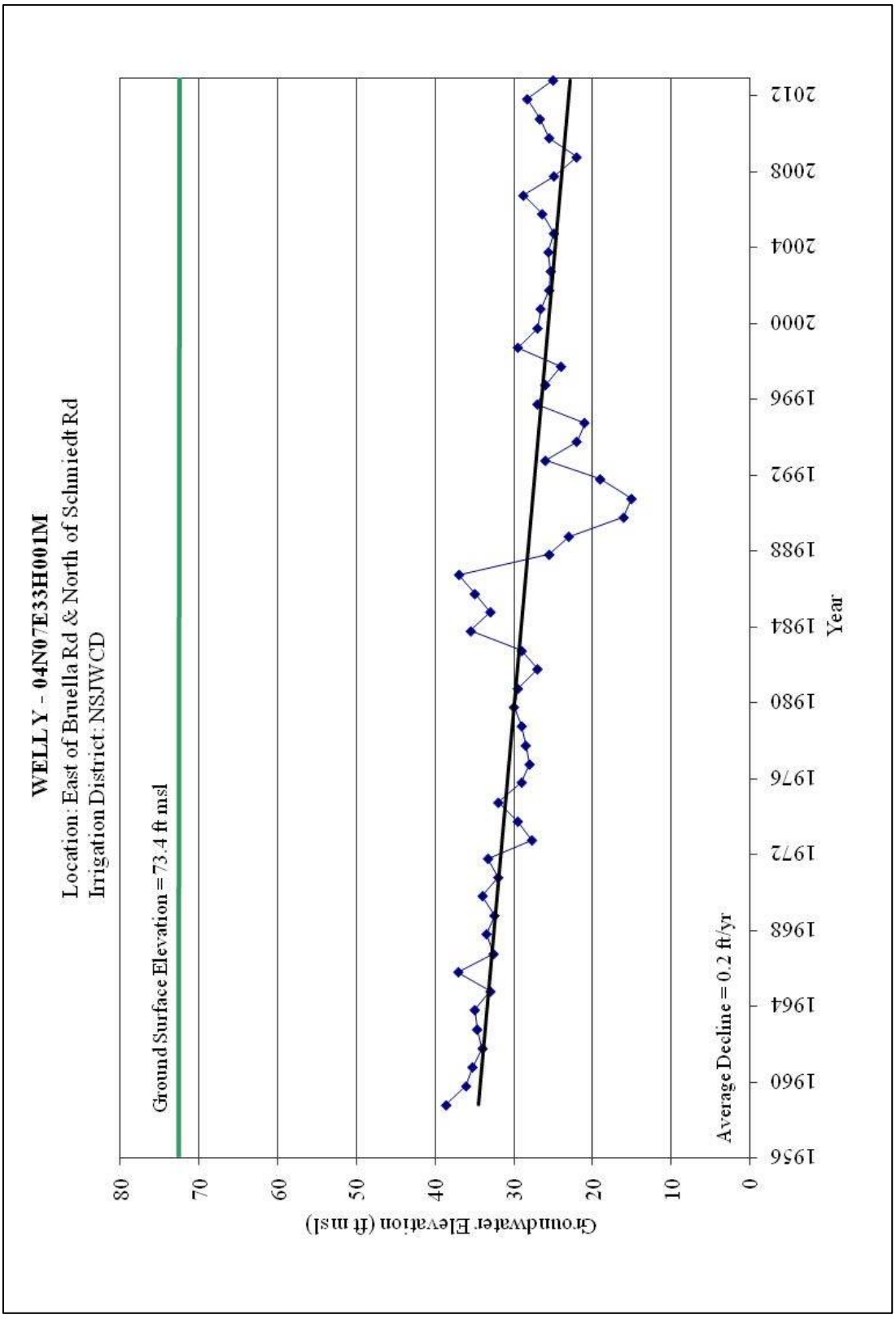


Figure 3-26: Fall Hydrograph Well Y

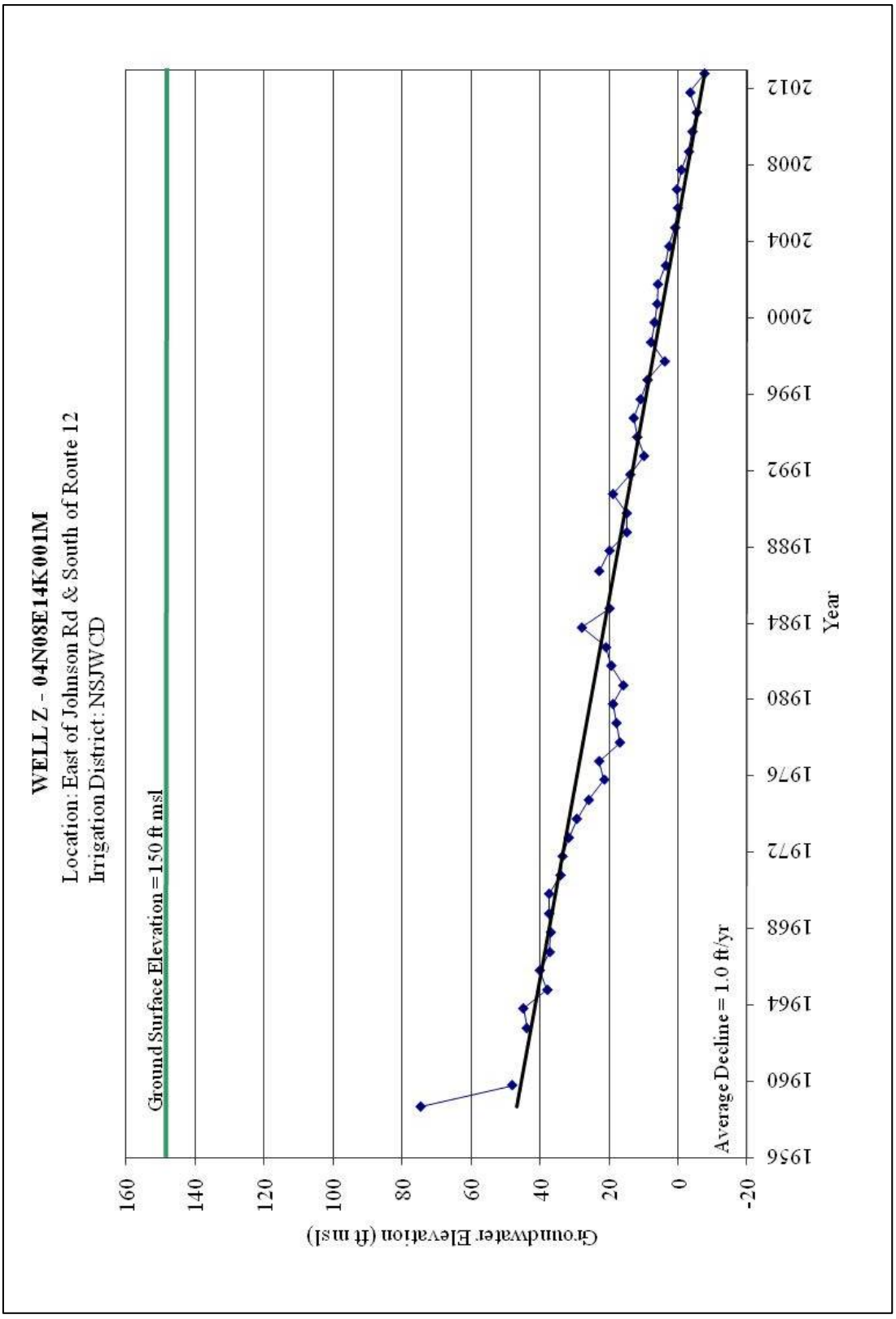


Figure 3-27: Fall Hydrograph Well Z

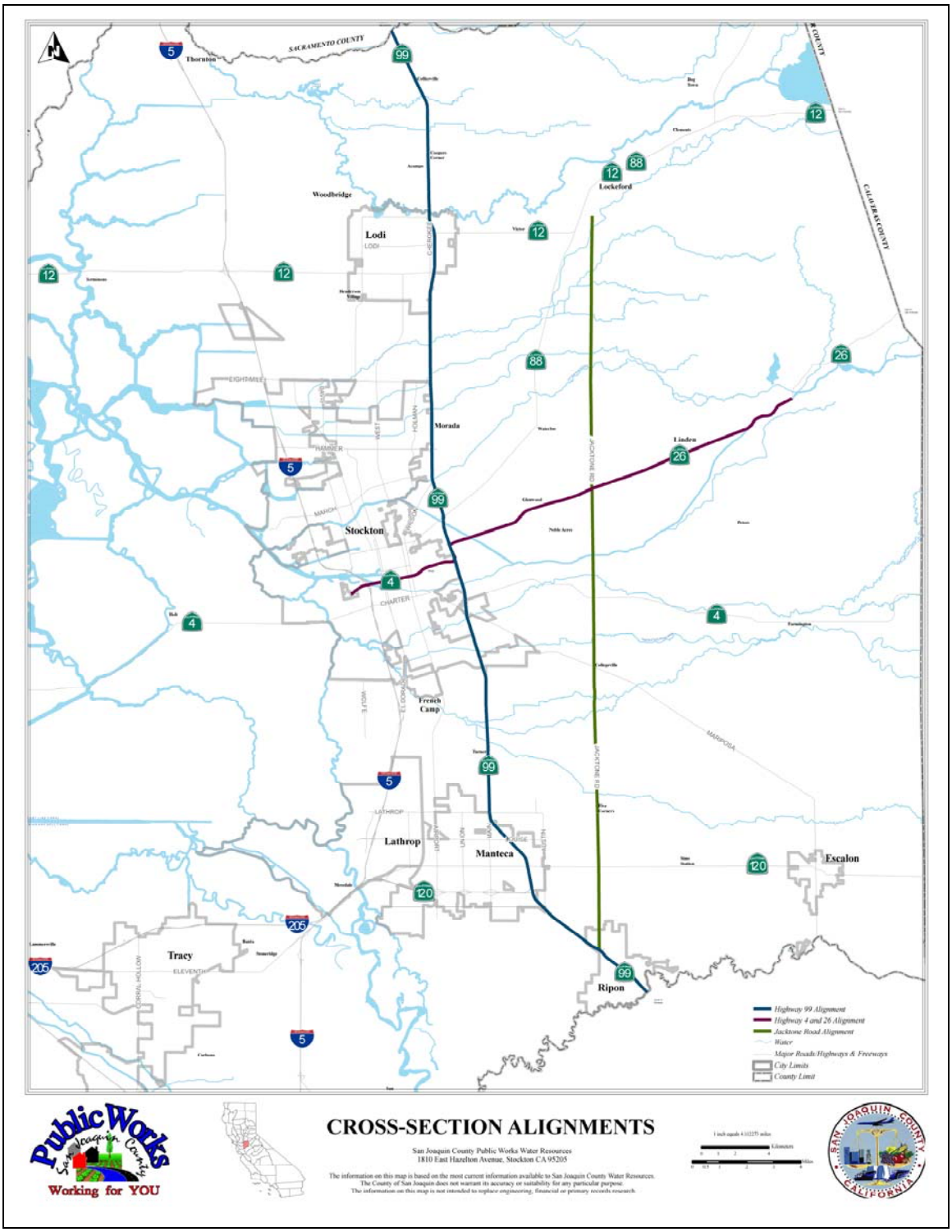


Figure 3-28: Cross Section Alignments

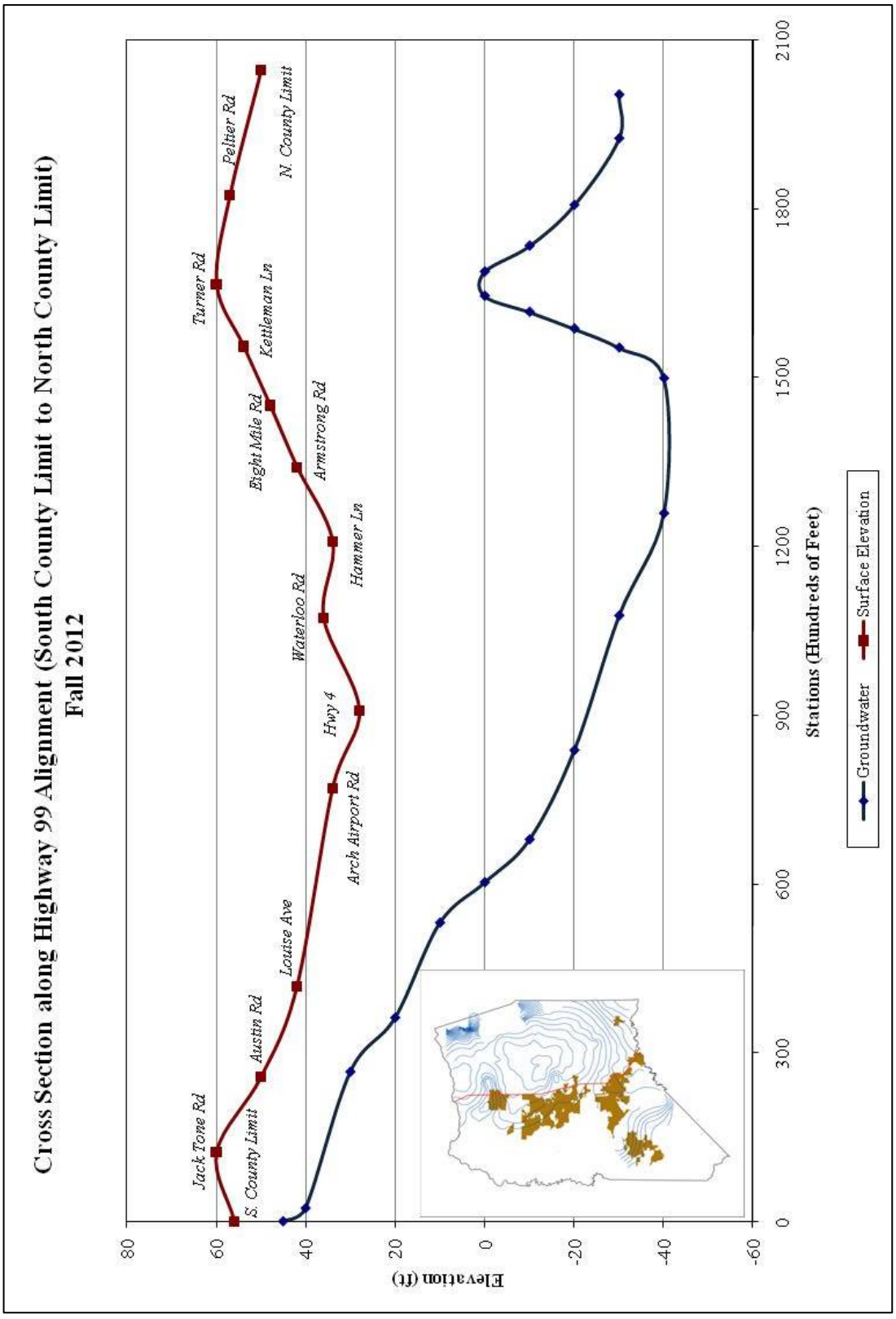


Figure 3-29: Highway 99 Cross Section Fall 2012

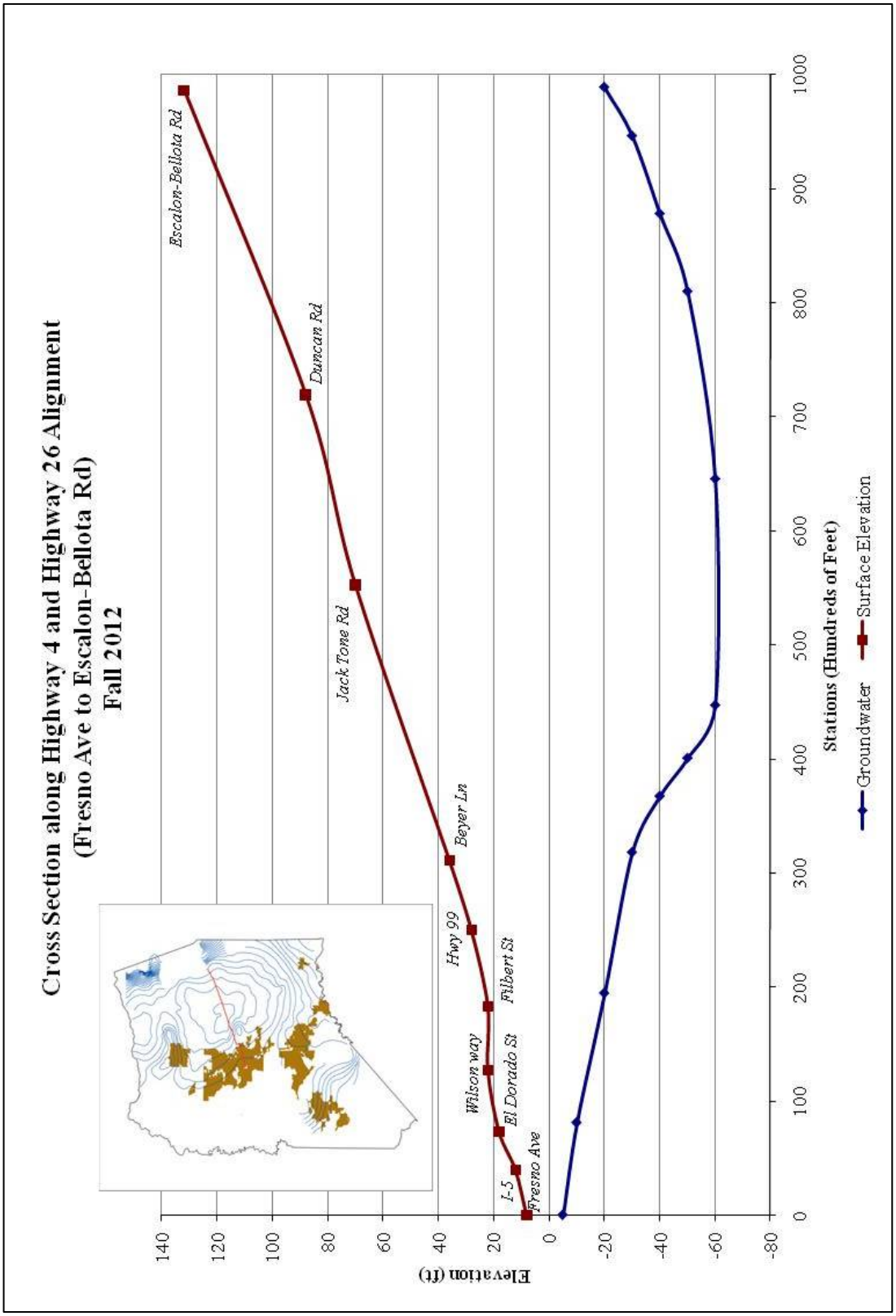


Figure 3-30: Highway 4 & Highway 26 Cross Section Fall 2012

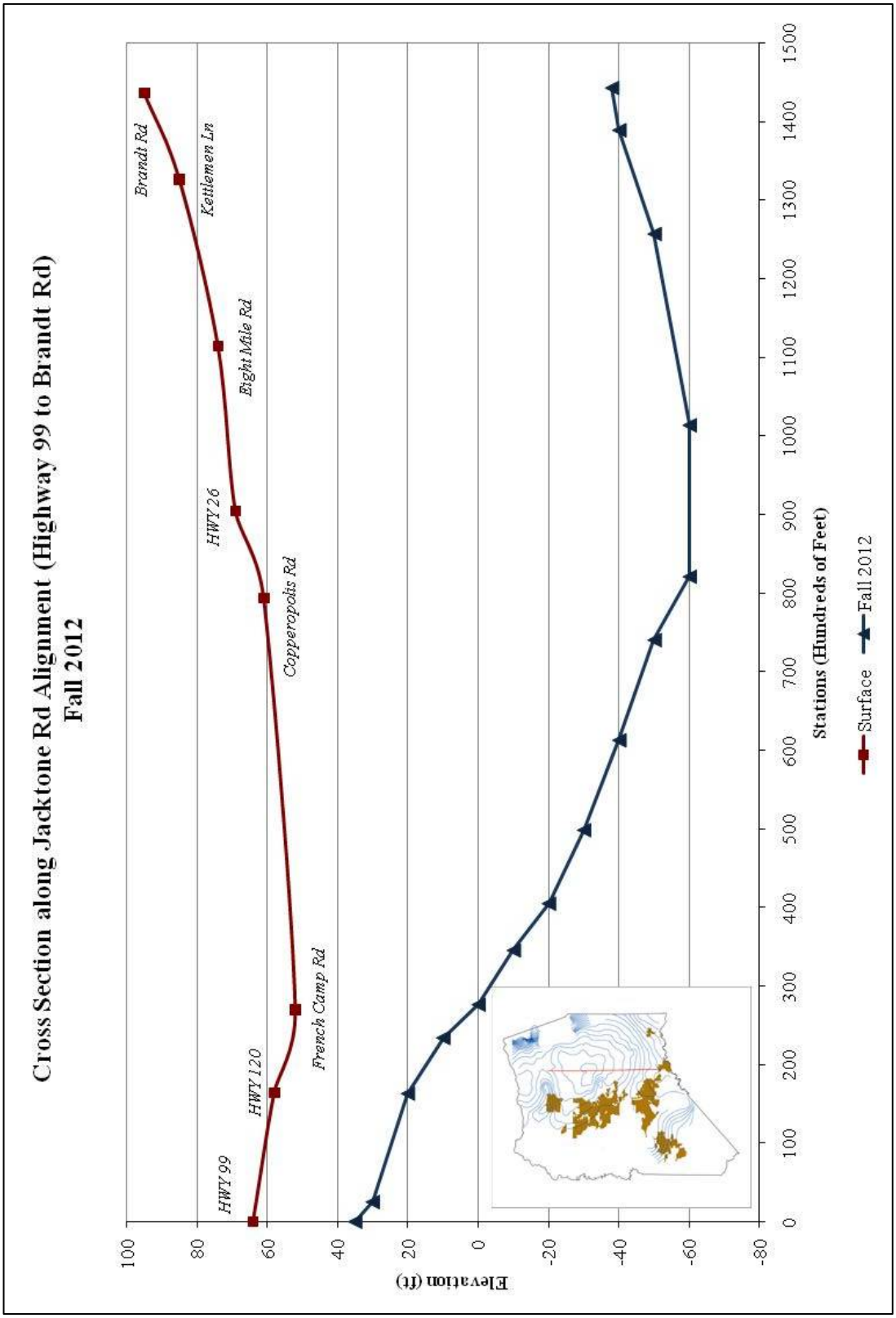


Figure 3-31: Jacktone Rd Cross Section Fall 2012

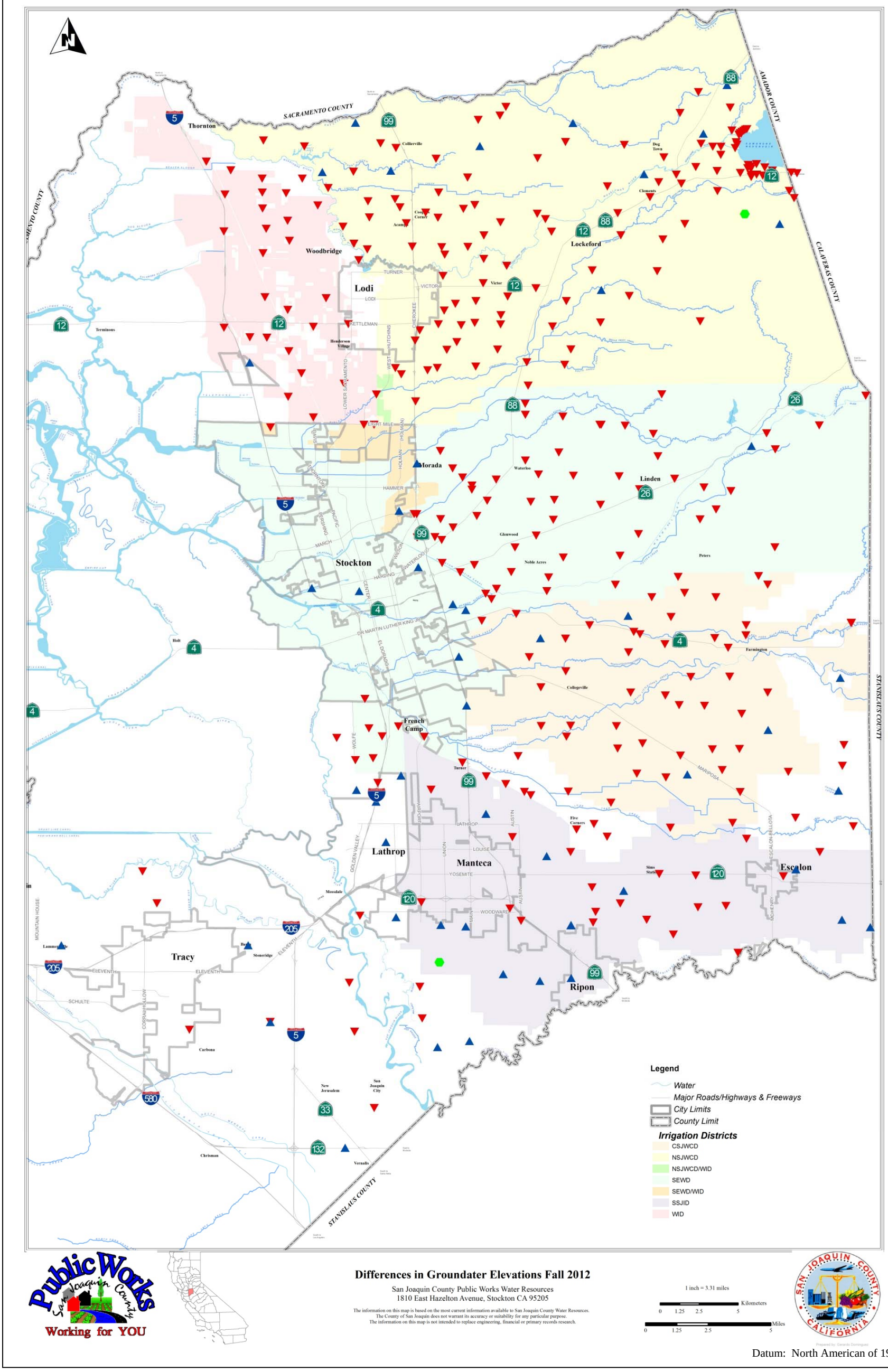


Figure 3-32: Differences in Groundwater Elevations Fall 2012

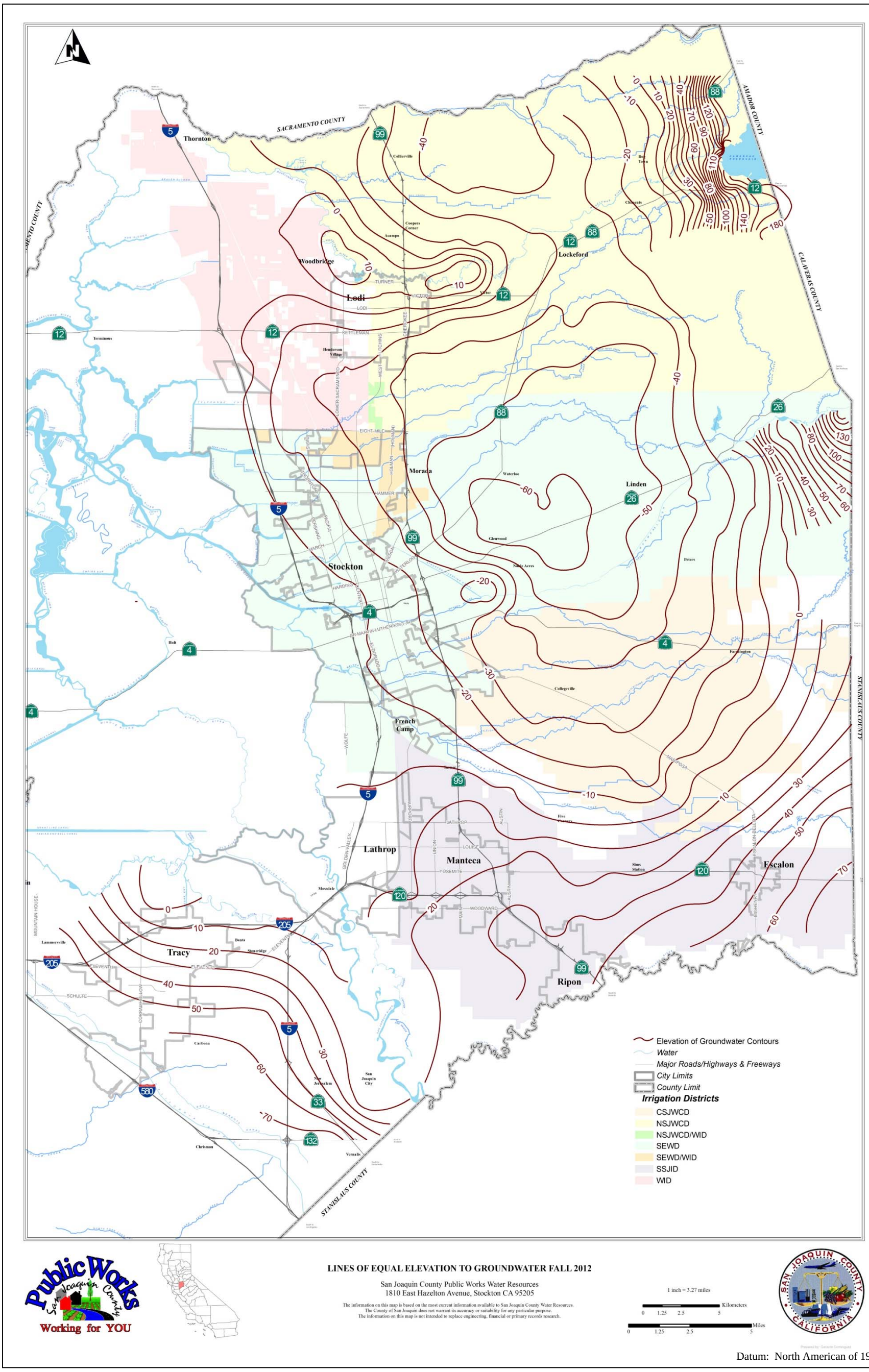


Figure 3-33: Lines of Equal Elevation of Groundwater Fall 2012

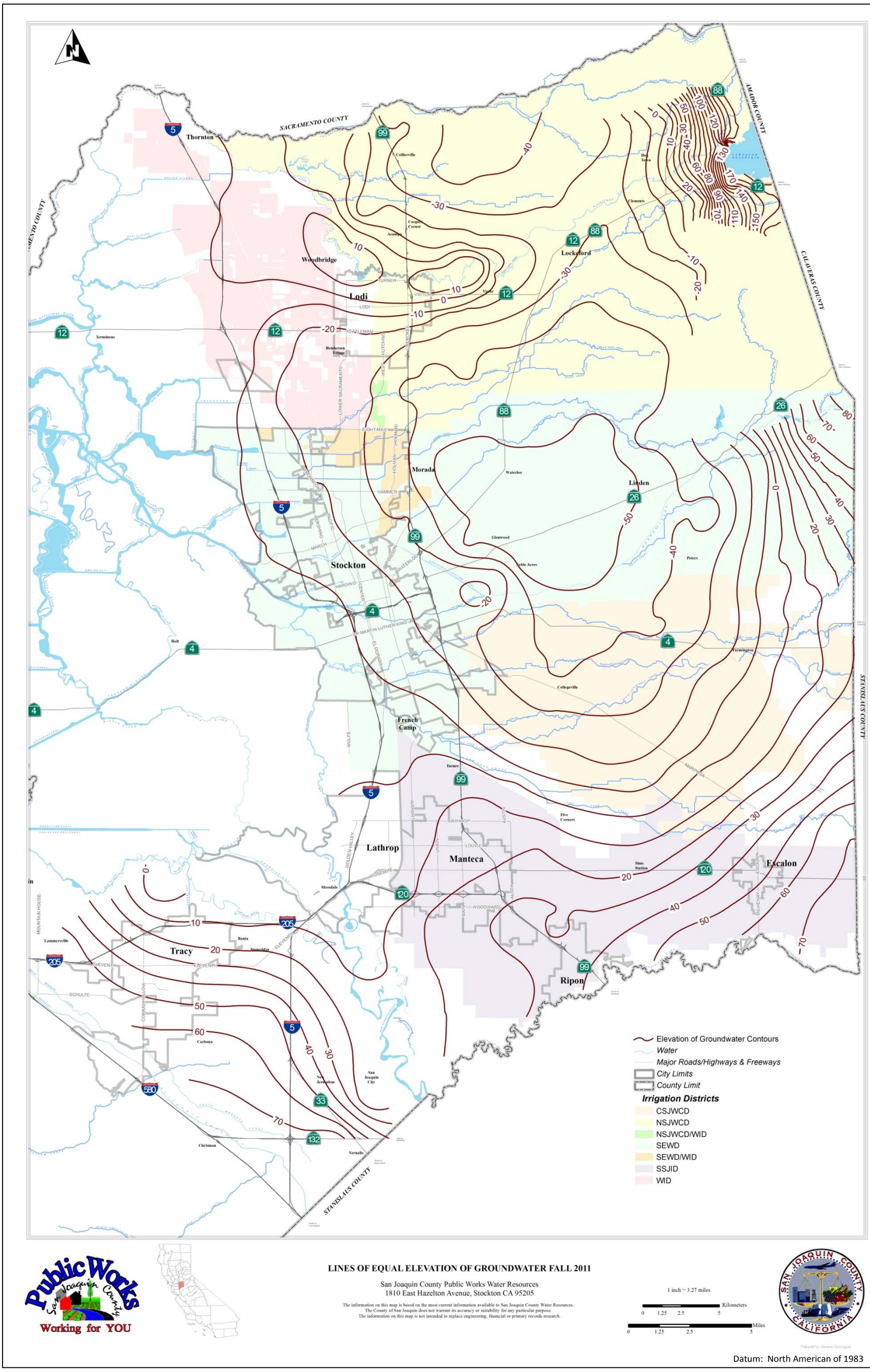
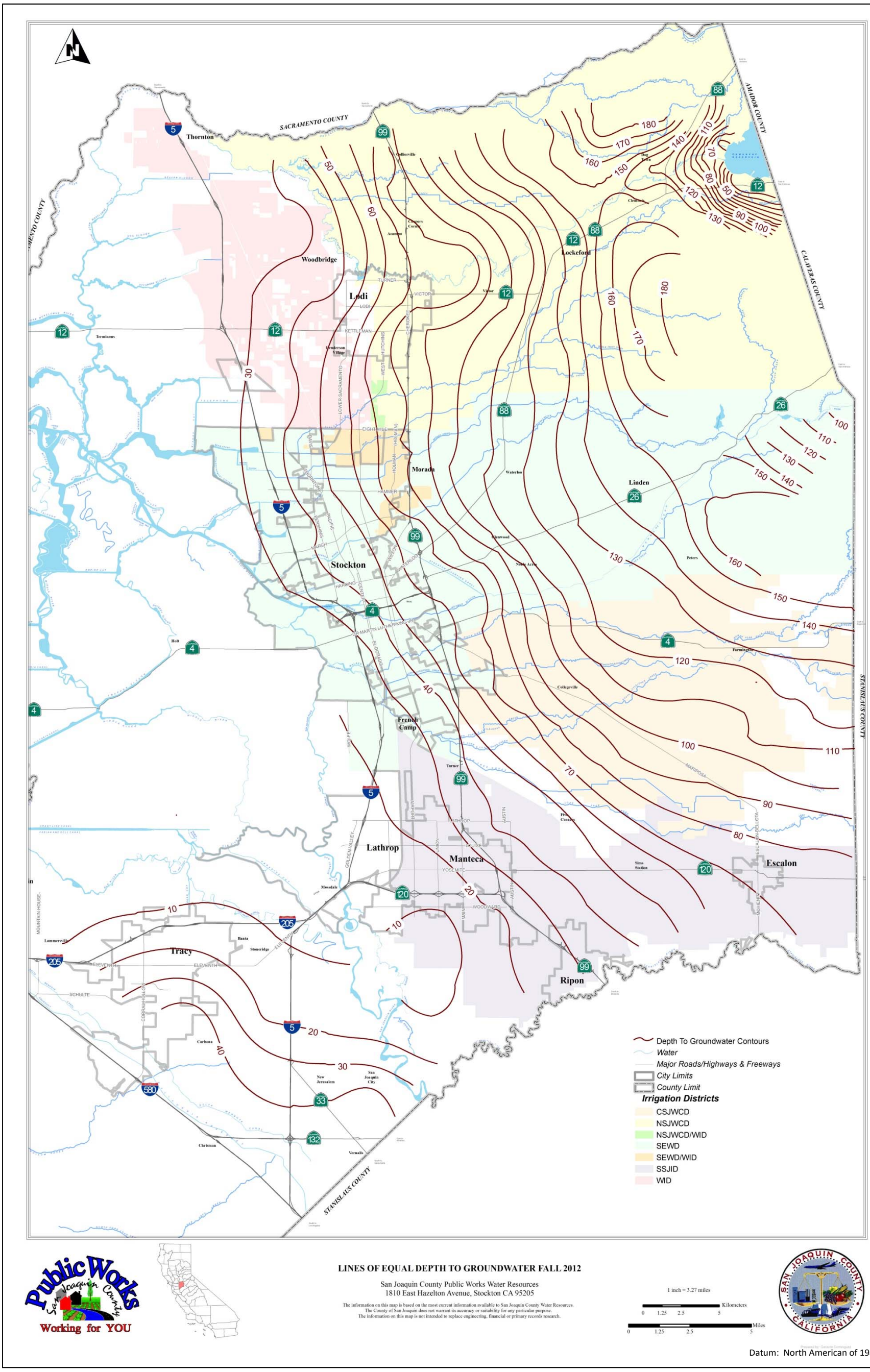


Figure 3-34: Lines of Equal Elevation of Groundwater Fall 2011



Datum: North American of 1983

Figure 3-35: Lines of Equal Depth to Groundwater Fall 2012

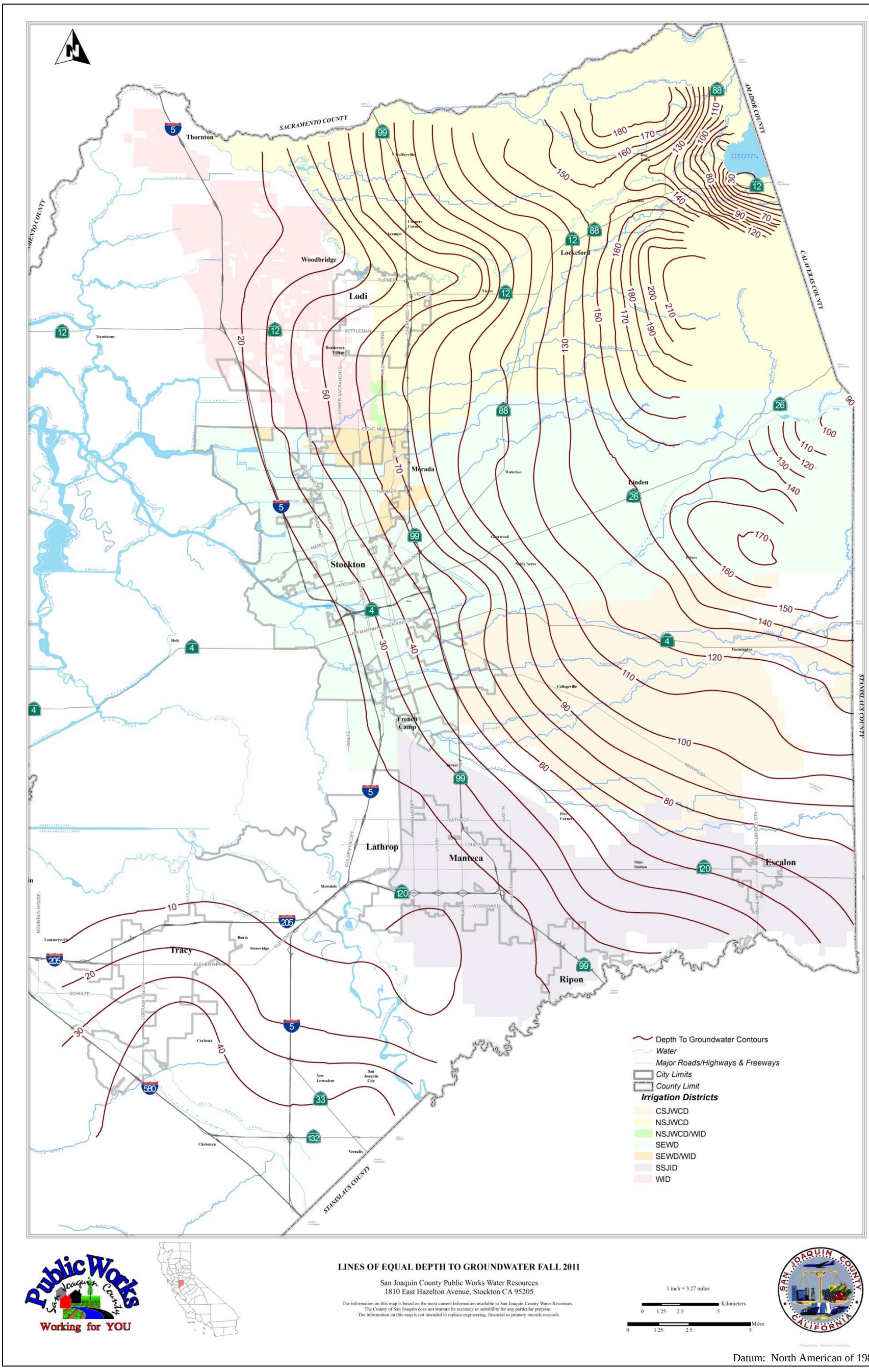


Figure 3-36: Lines of Equal Depth to Groundwater Fall 2011