San Joaquin County
Flood Control and Water Conservation District

Groundwater Report
Fall 2013

San Joaquin County
Flood Control and Water Conservation District

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Copies of the Fall 2013 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

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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
Fall 2013 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 2013. The Camp Pardee station has data available from 1949 to 2013.

Annual Rainfall Distribution

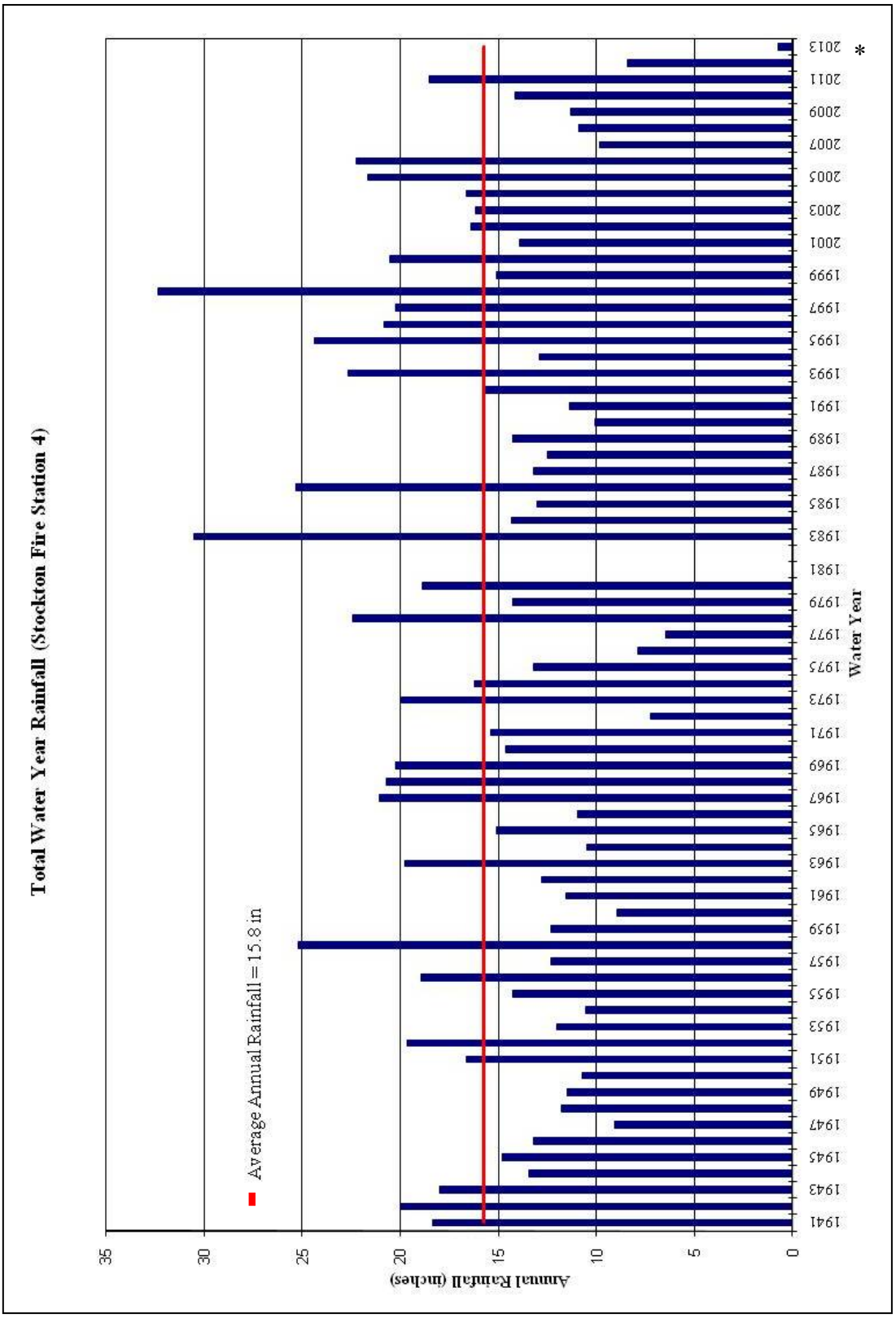

Figure 1-1: Total Annual Rainfall (Stockton Fire Station 4)

* Some data for 2012-2013 Water Year is missing. Total in graph does not reflect actual precipitation

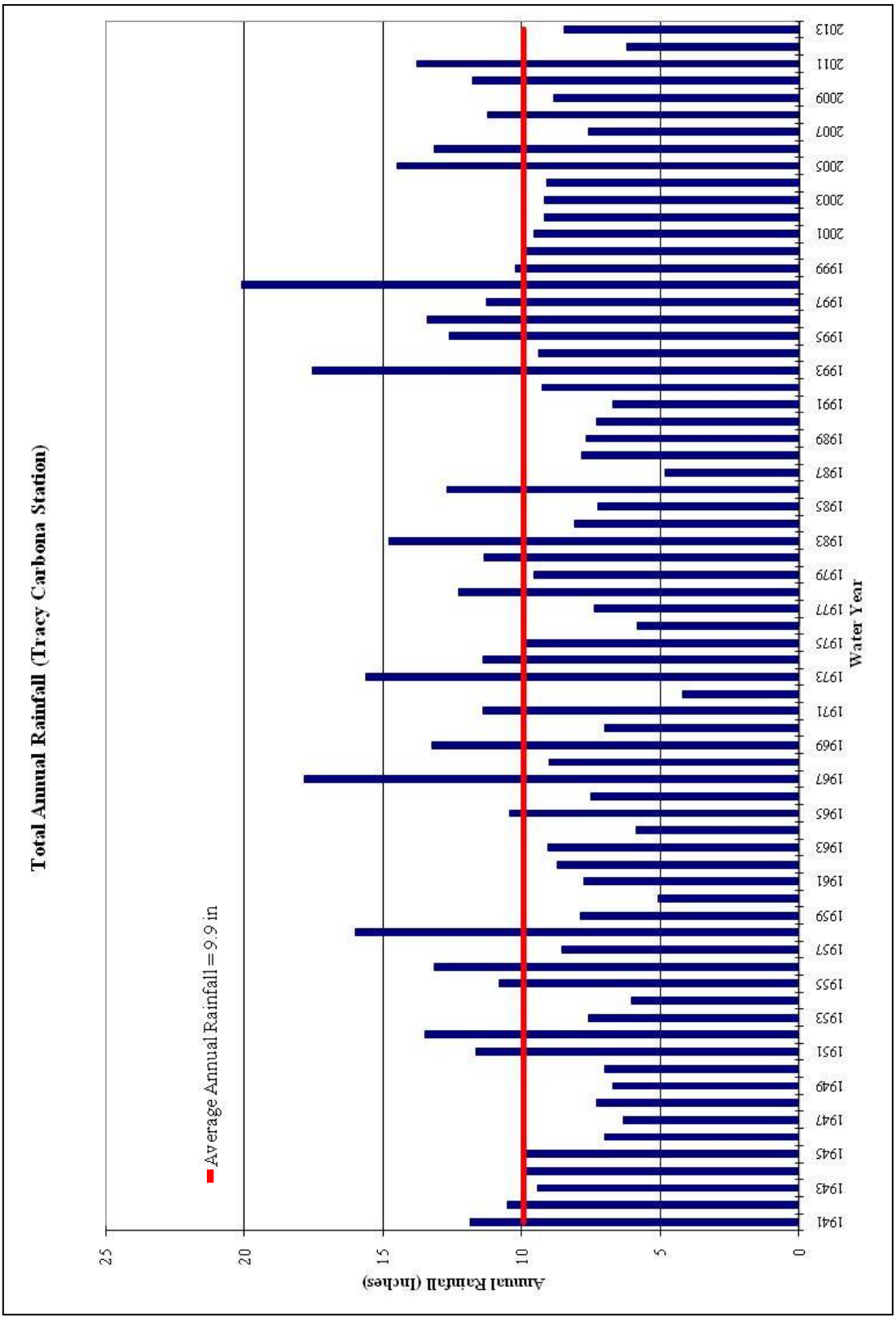

Figure 1-2: Total Annual Rainfall (Tracy Carbona Station)

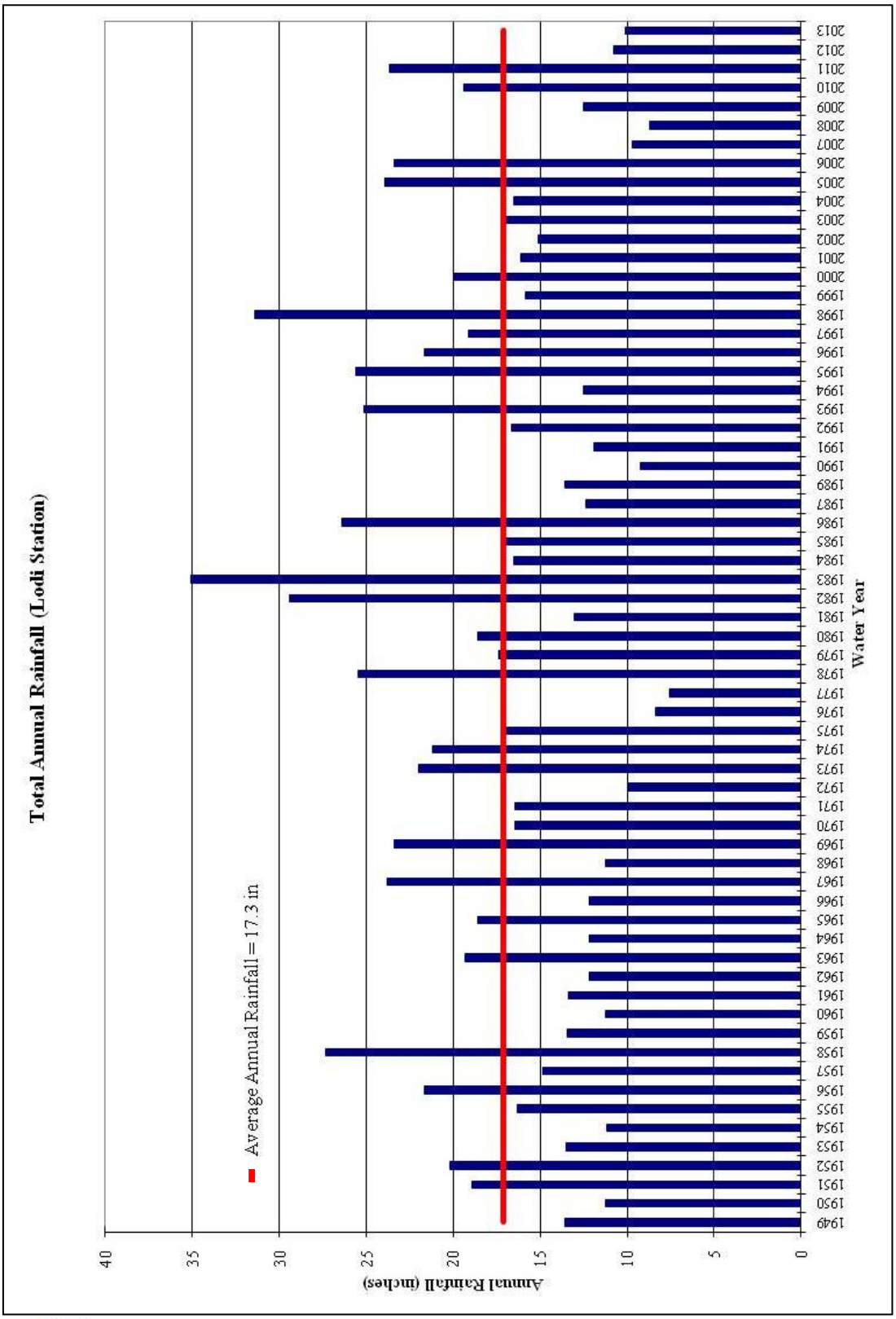

Figure 1-3: Total Annual Rainfall (Lodi Station)

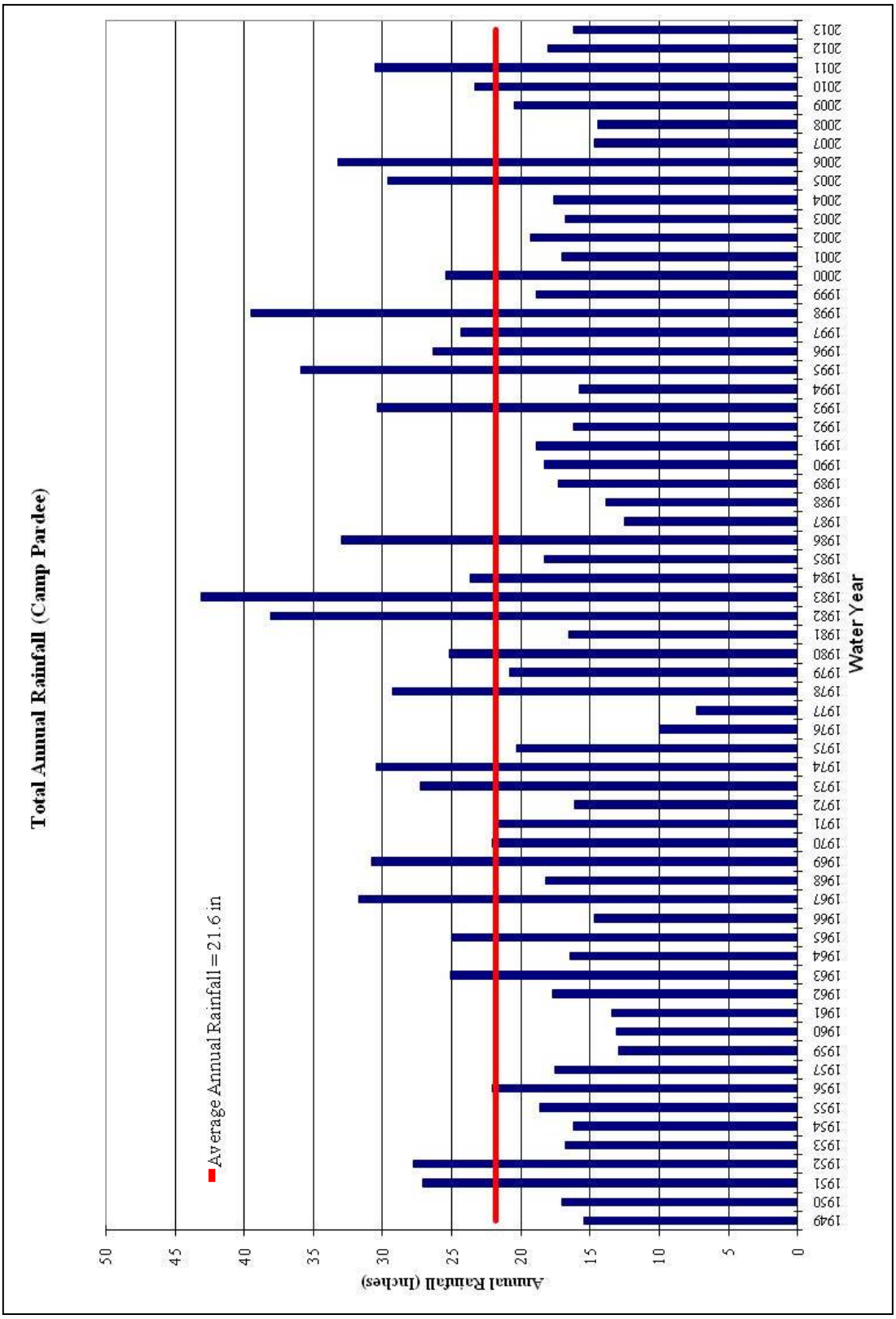

Figure 1-4: Total Annual Rainfall (Camp Pardee)

Monthly Rainfall Distribution

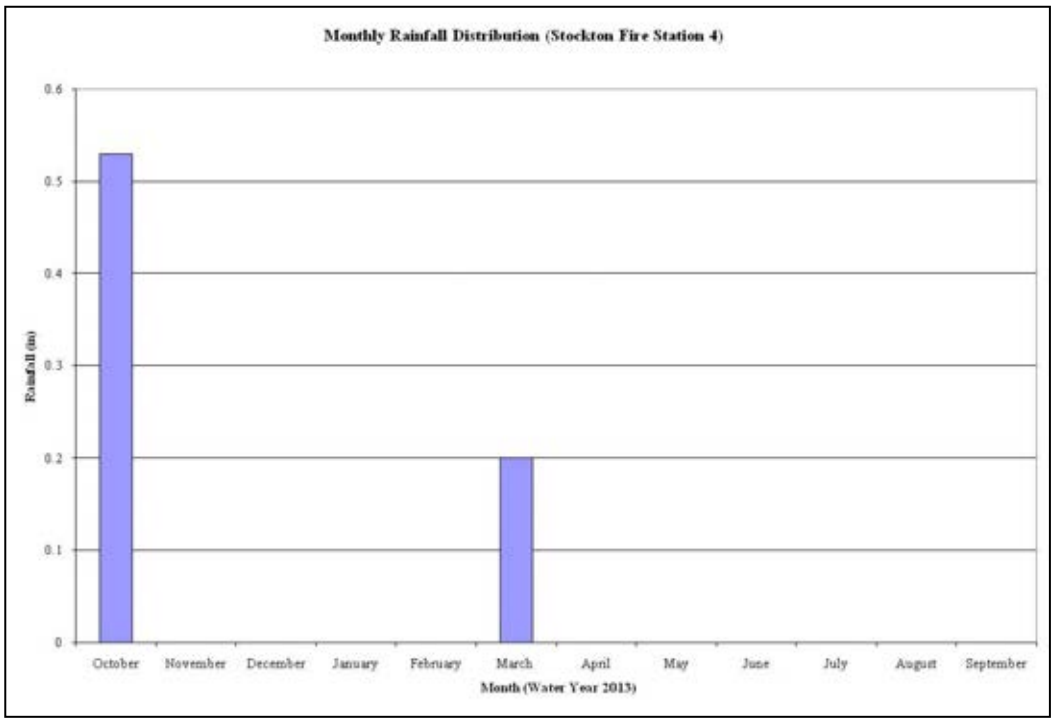

Figure 1-5: Monthly Rainfall Distribution (Stockton Fire Station 4)

* Some data for 2012-2013 Water Year is missing. Total in graph does not reflect actual precipitation totals.

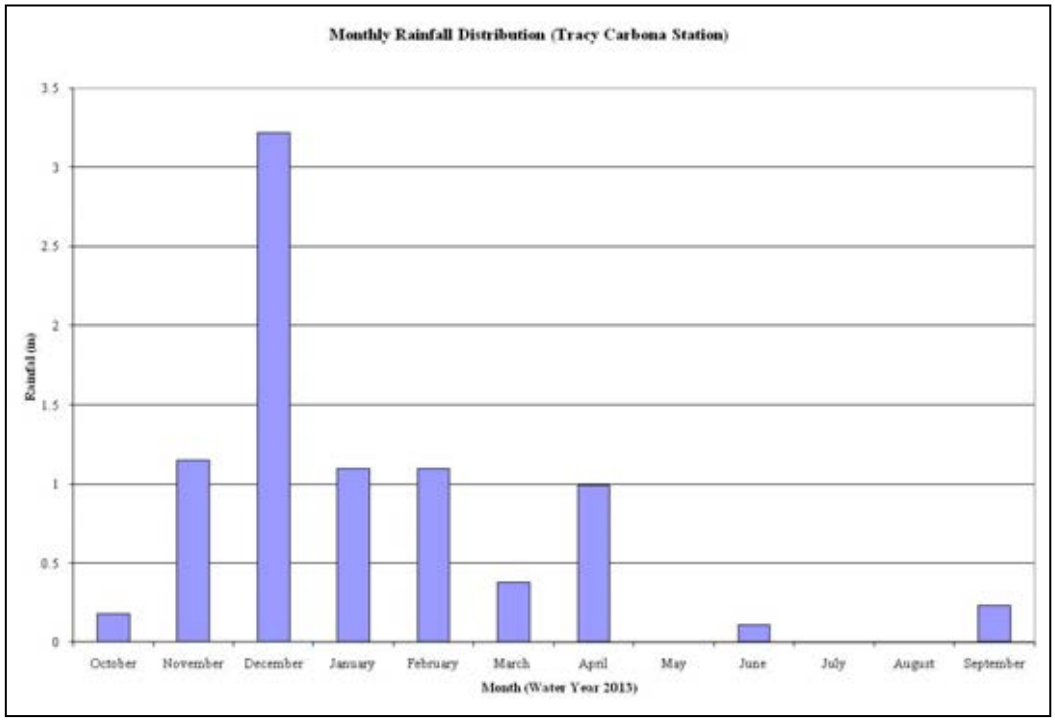

Figure 1-6: Monthly Rainfall Distribution (Tracy Carbona Station)

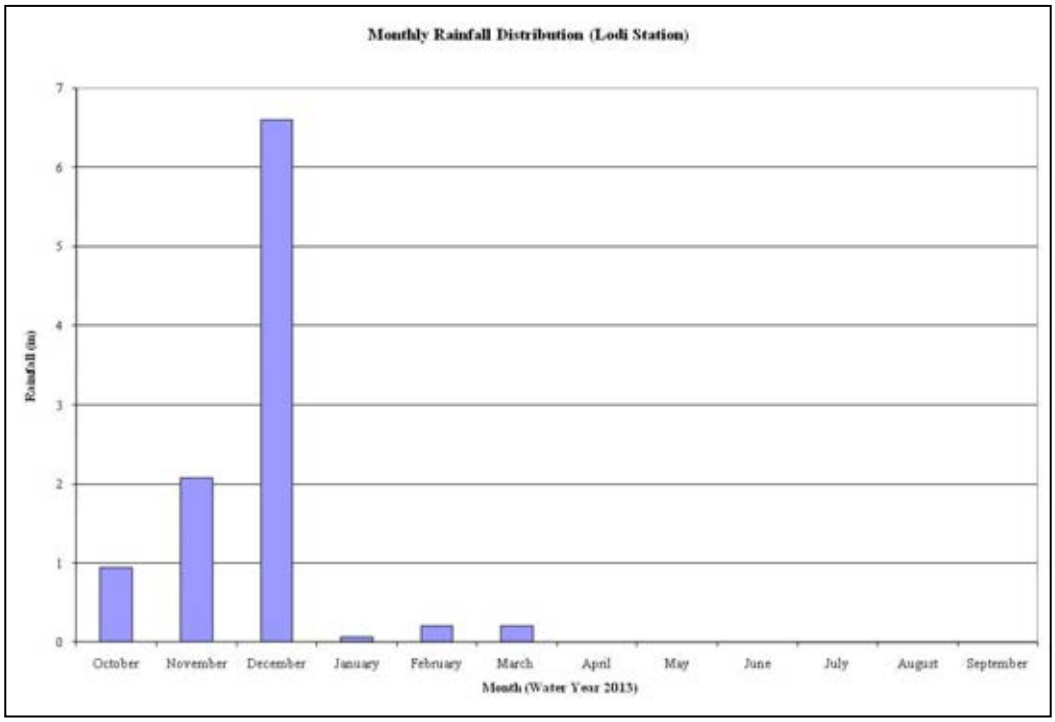

Figure 1-7: Monthly Rainfall Distribution (Lodi Station)

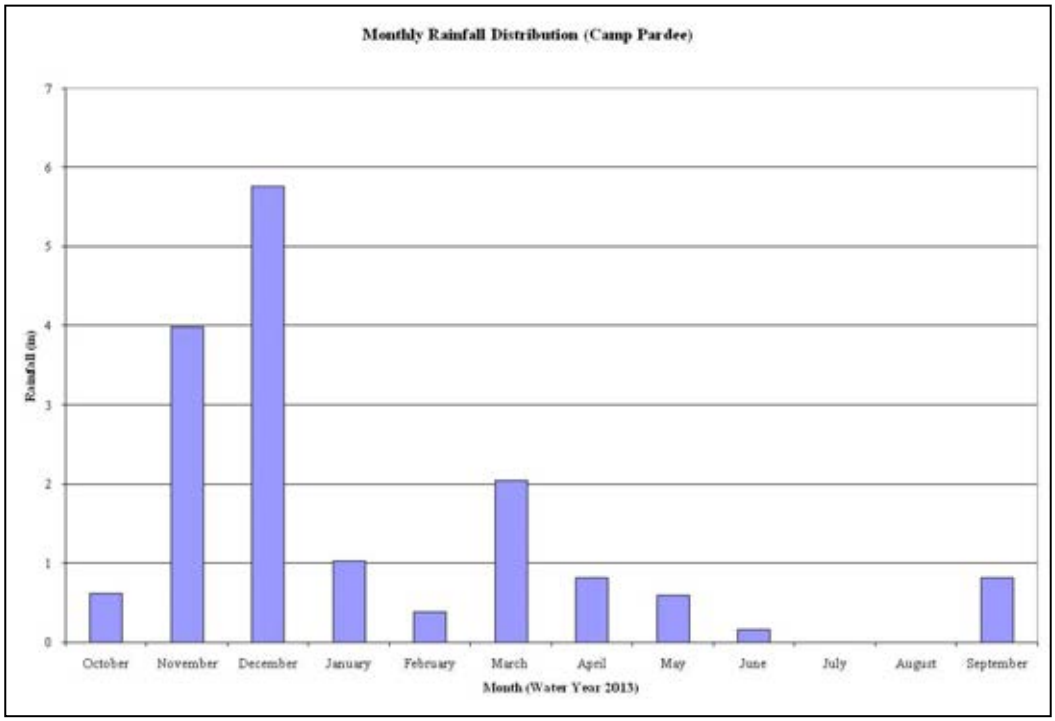

Figure 1-8: Monthly Rainfall Distribution (Camp Pardee)

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Section 2 – Groundwater Quality Monitoring

Summary of Groundwater Quality Results

The information contained in the Fall 2013 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 2012.

North Stockton – Five wells were tested for Cl^-, EC and TDS in North Stockton. Three of the wells increased in Cl^- concentrations from the previous measurements in the fall of 2012. Three of the wells increased in EC and TDS concentrations, and one well had no change in EC and TDS concentrations from the analysis in the fall 2012.

County Hospital Area - 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 2012.

Lathrop – Three wells were sampled in Lathrop. All of the wells have increases in Cl^- concentrations. Two of the wells have higher concentrations of EC and TDS from the analysis in the fall 2012.

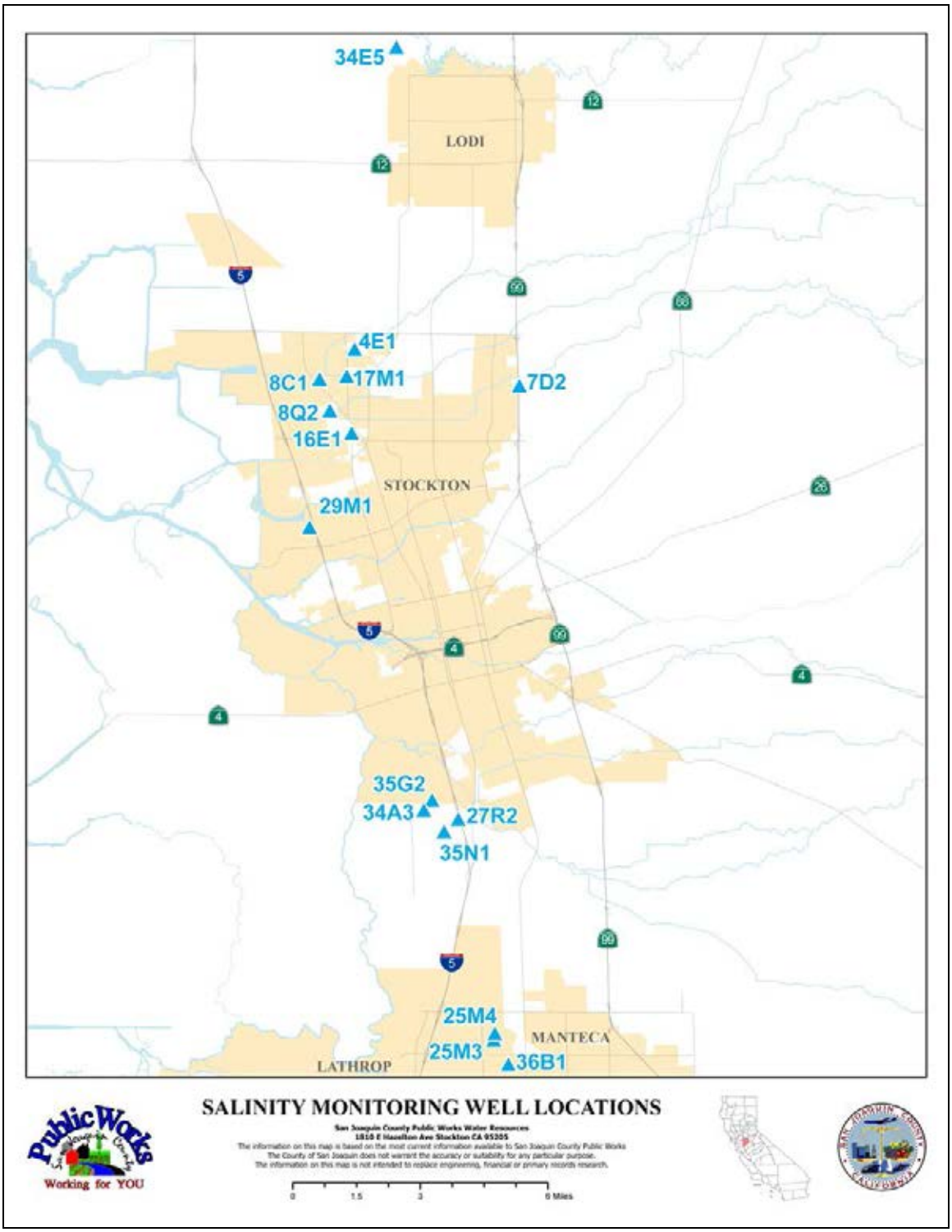

Figure 2-1: Salinity Monitoring Well Locations

Table 2-1: Groundwater Quality Mineral Analysis Fall 2013

Well	Chloride ppm	EC mmho	TDS* ppm
27R2	-	-	-
34A3	-	-	-
35G2	-	-	-
35N1	440	1.52	972
25M3	81	0.67	428
25M4	29	0.49	312
36B1	21	0.58	373
4E1	33	0.64	412
8C1	25	0.71	456
8Q2	-	-	-
16E1	-	-	-
17M1	18	0.29	188
29M1	97	0.89	570
7D2	10	0.41	262
34E5	21	0.98	627

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

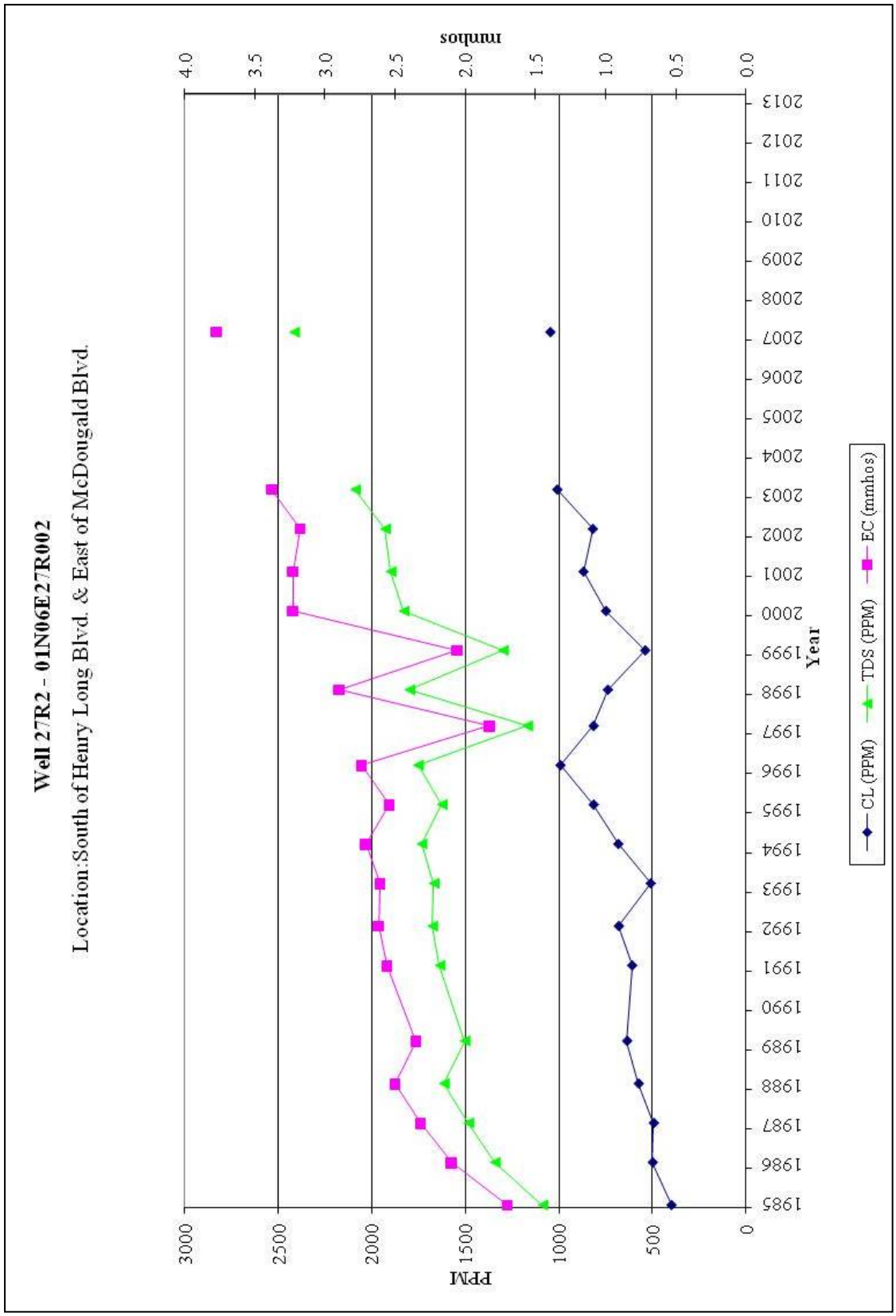

Figure 2-2: Quality Comparison Graph Well 27R2

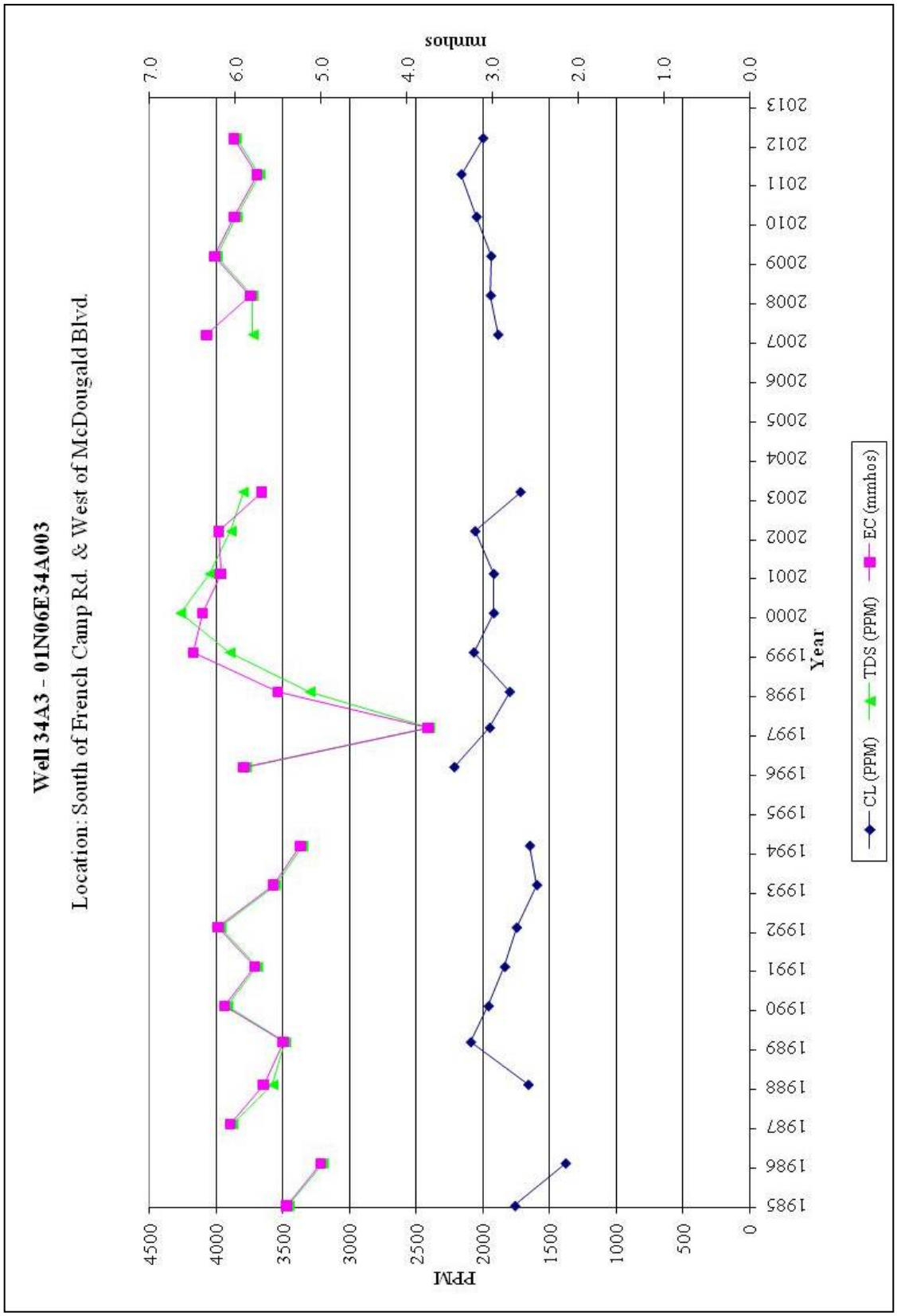

Figure 2-3: Quality Comparison Graph Well 34A3

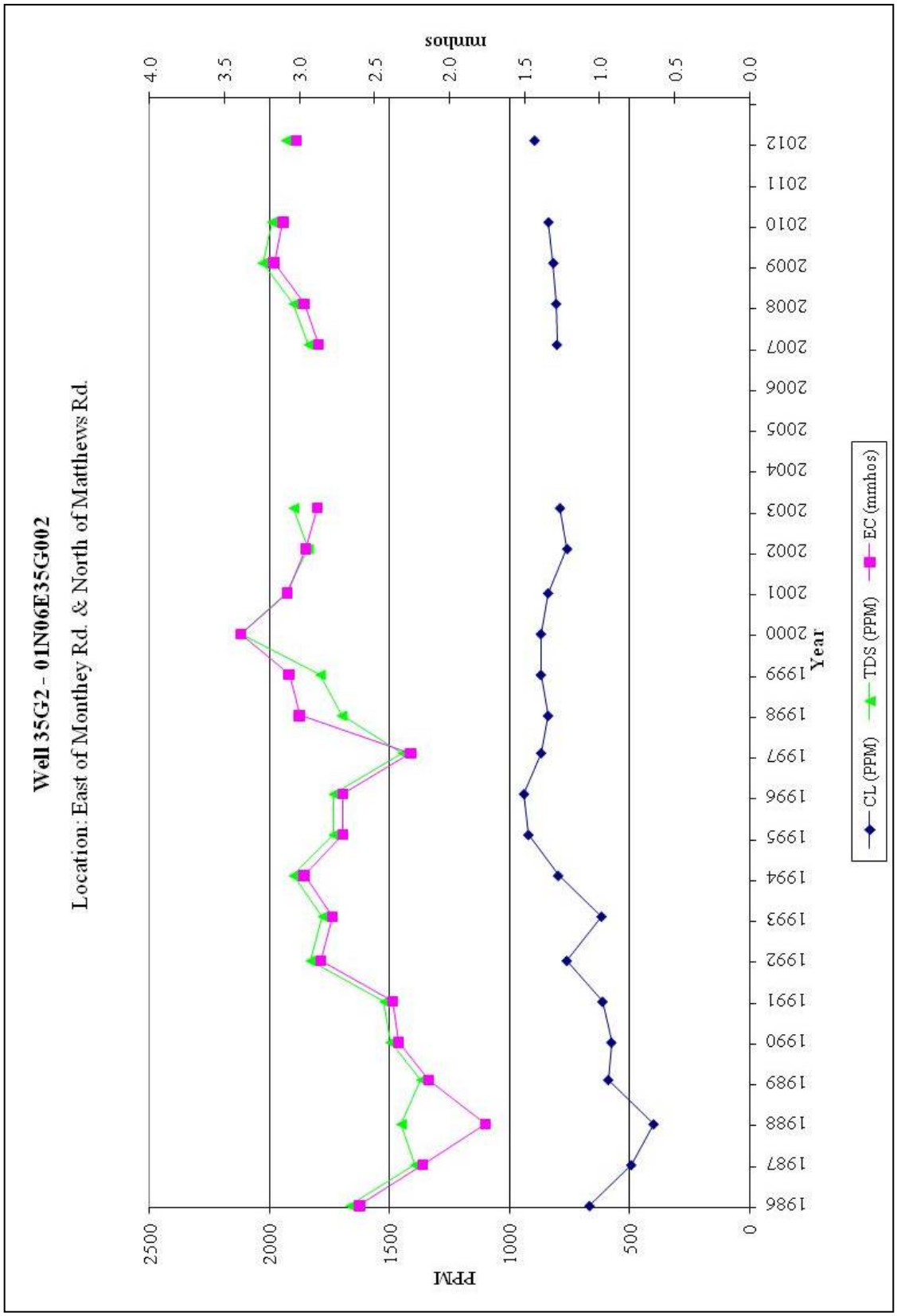

Figure 2-4: Quality Comparison Graph Well 35G2

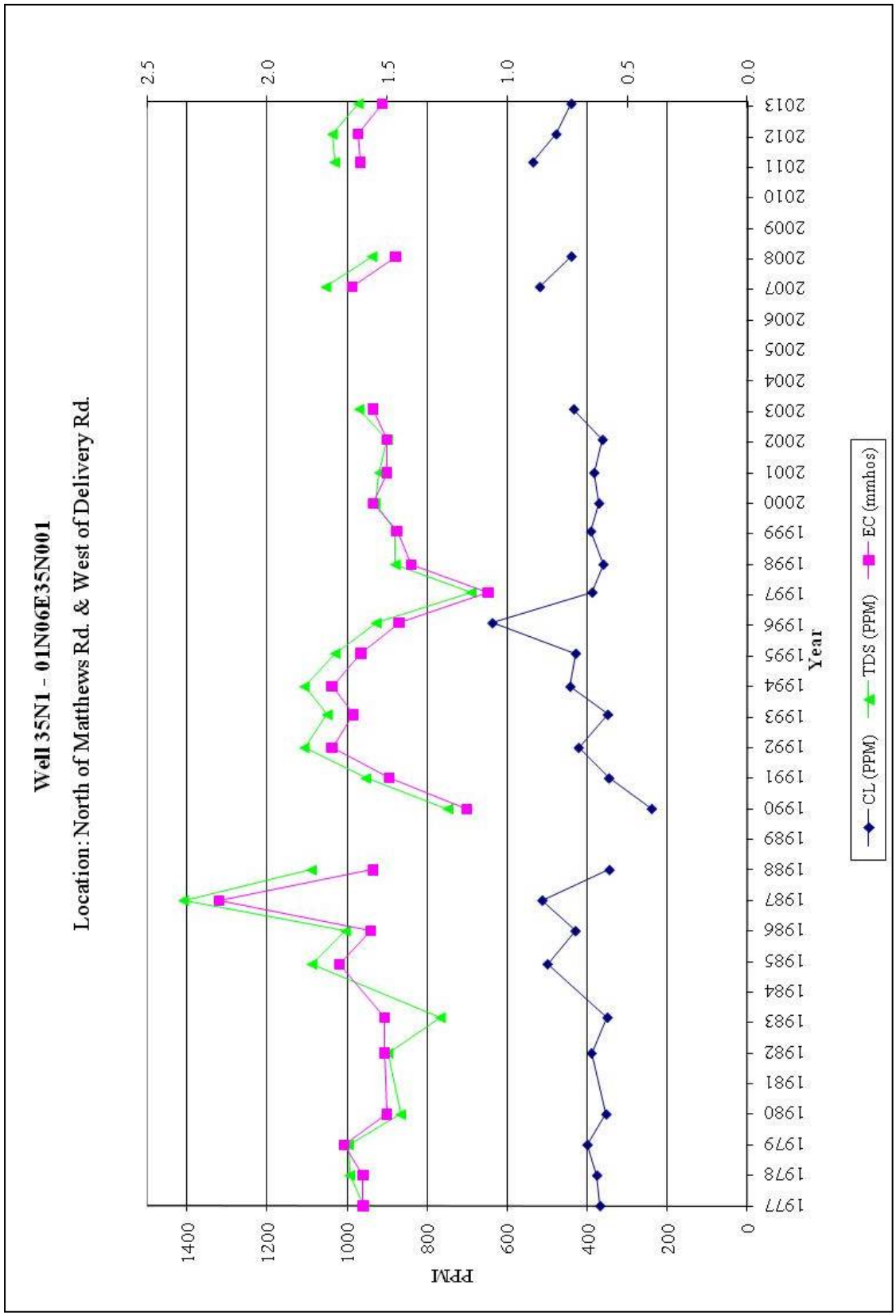

Figure 2-5: Quality Comparison Graph Well 35N1

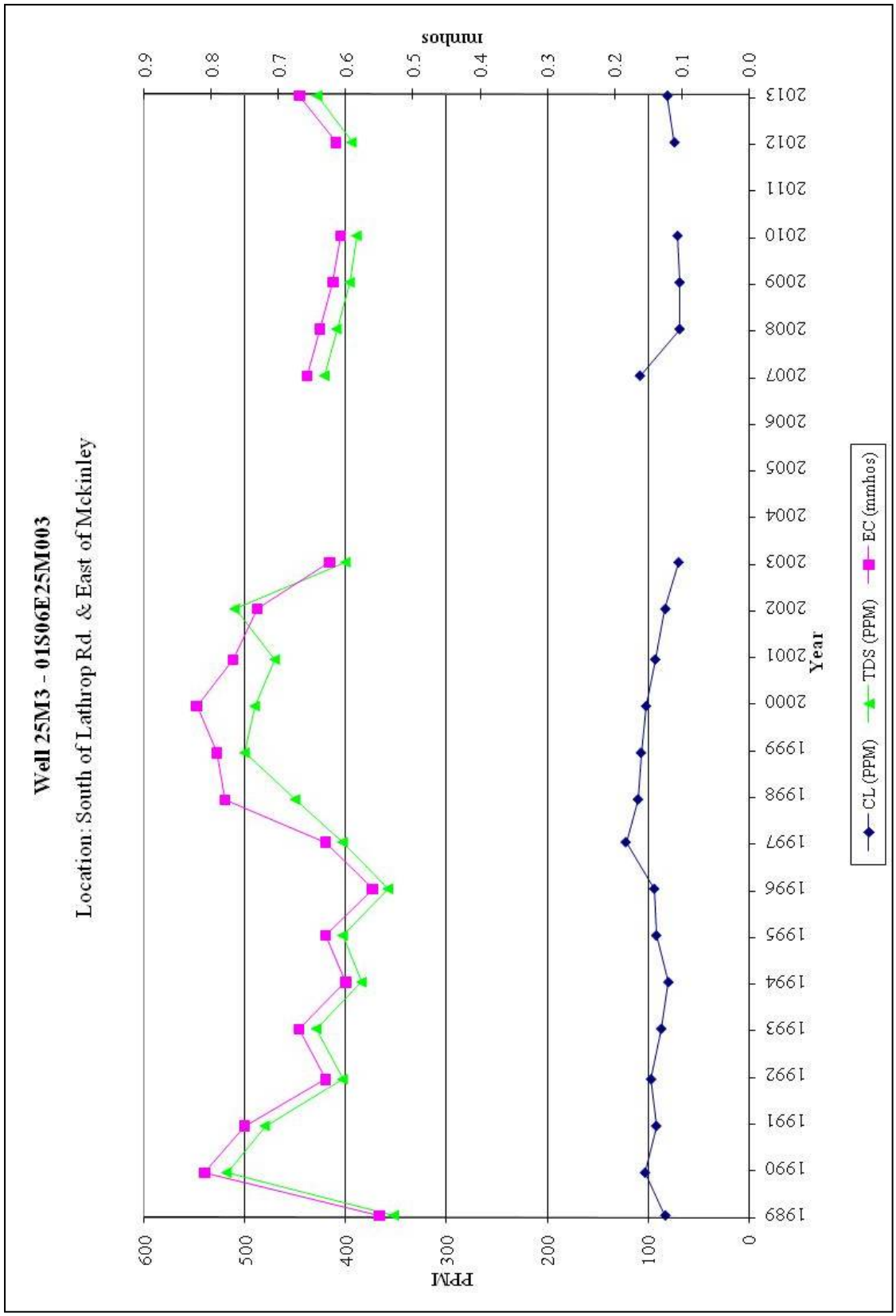

Figure 2-6: Quality Comparison Graph Well 25M3

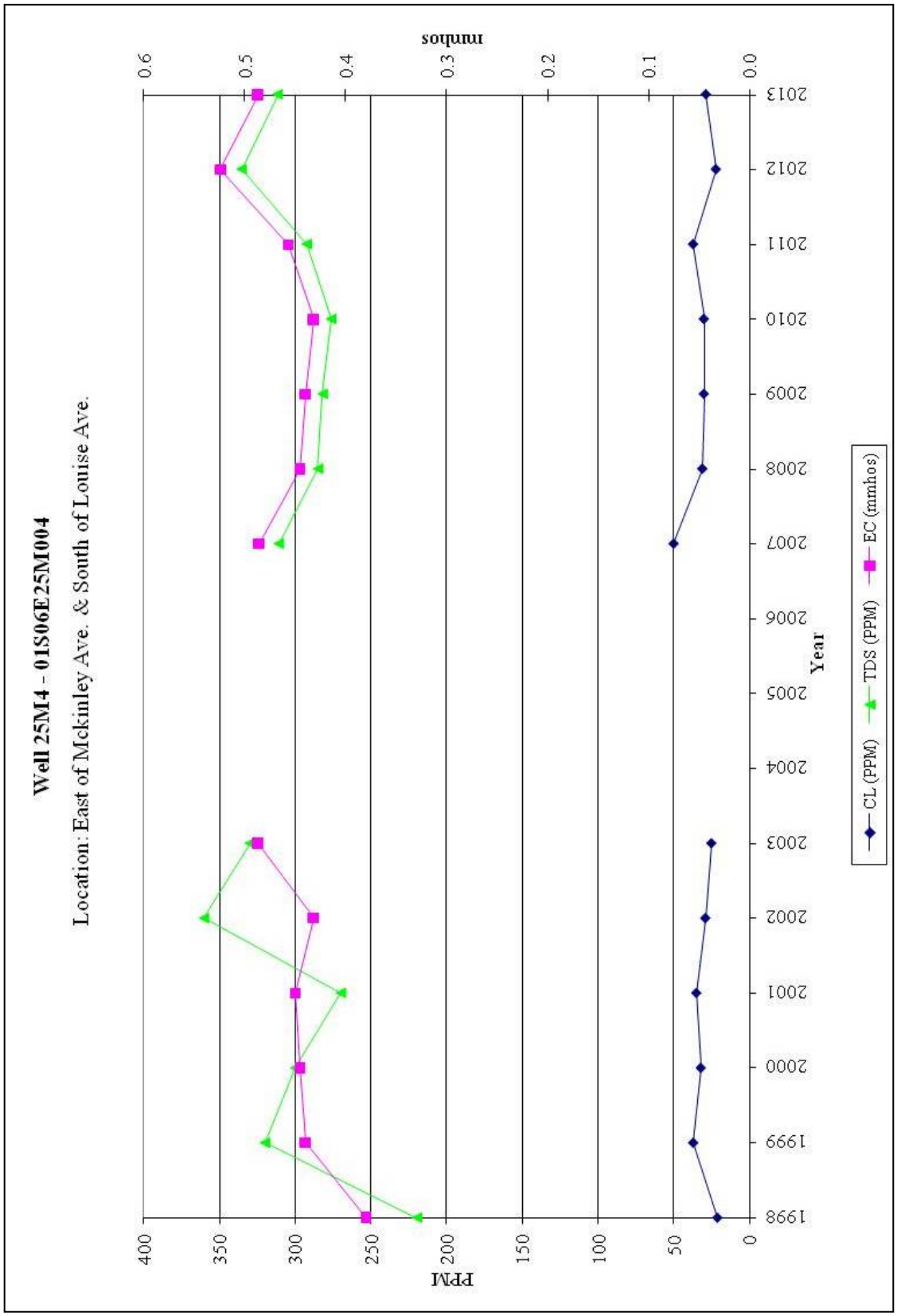

Figure 2-7: Quality Comparison Graph Well 25M4

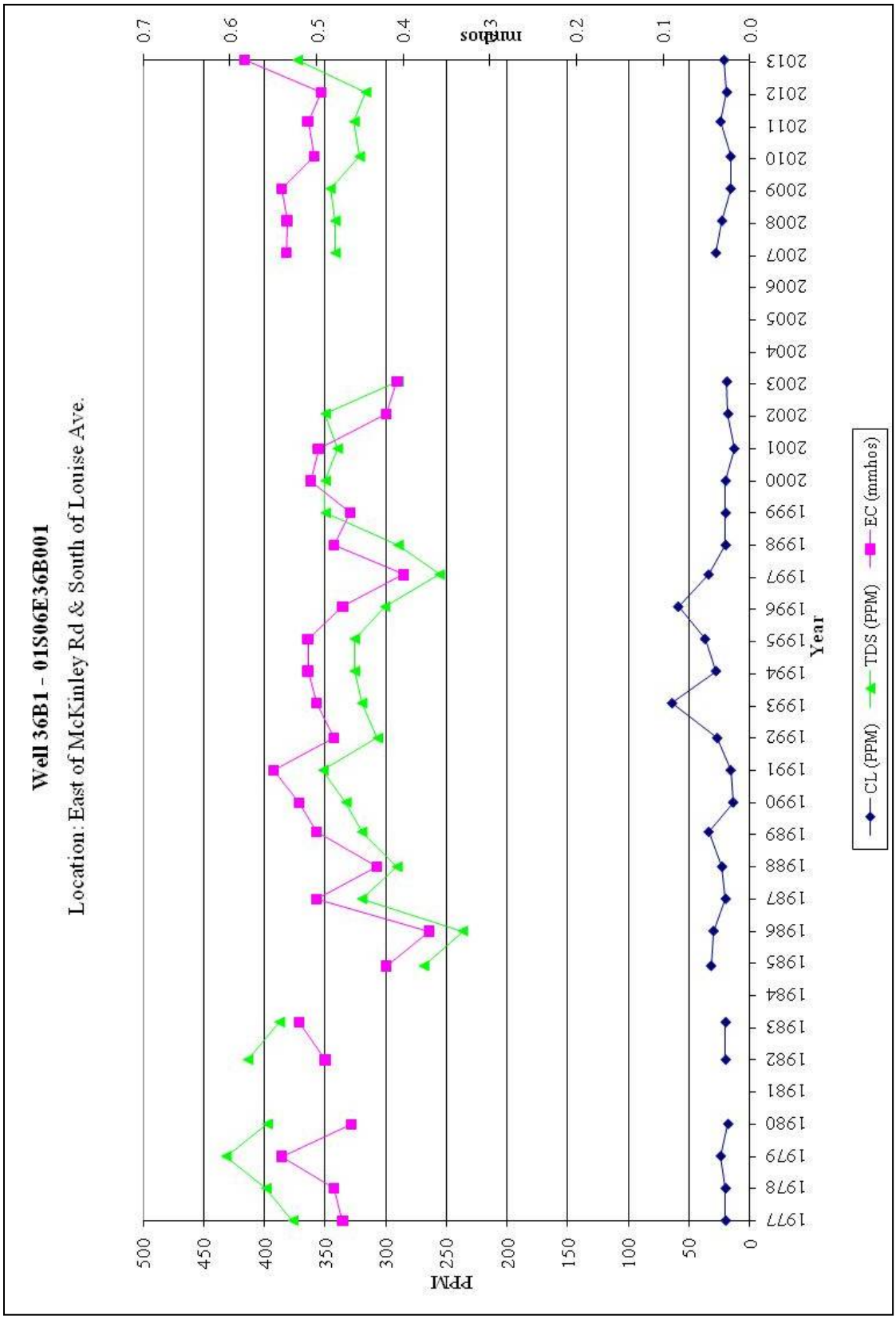

Figure 2-8: Quality Comparison Graph Well 36B1

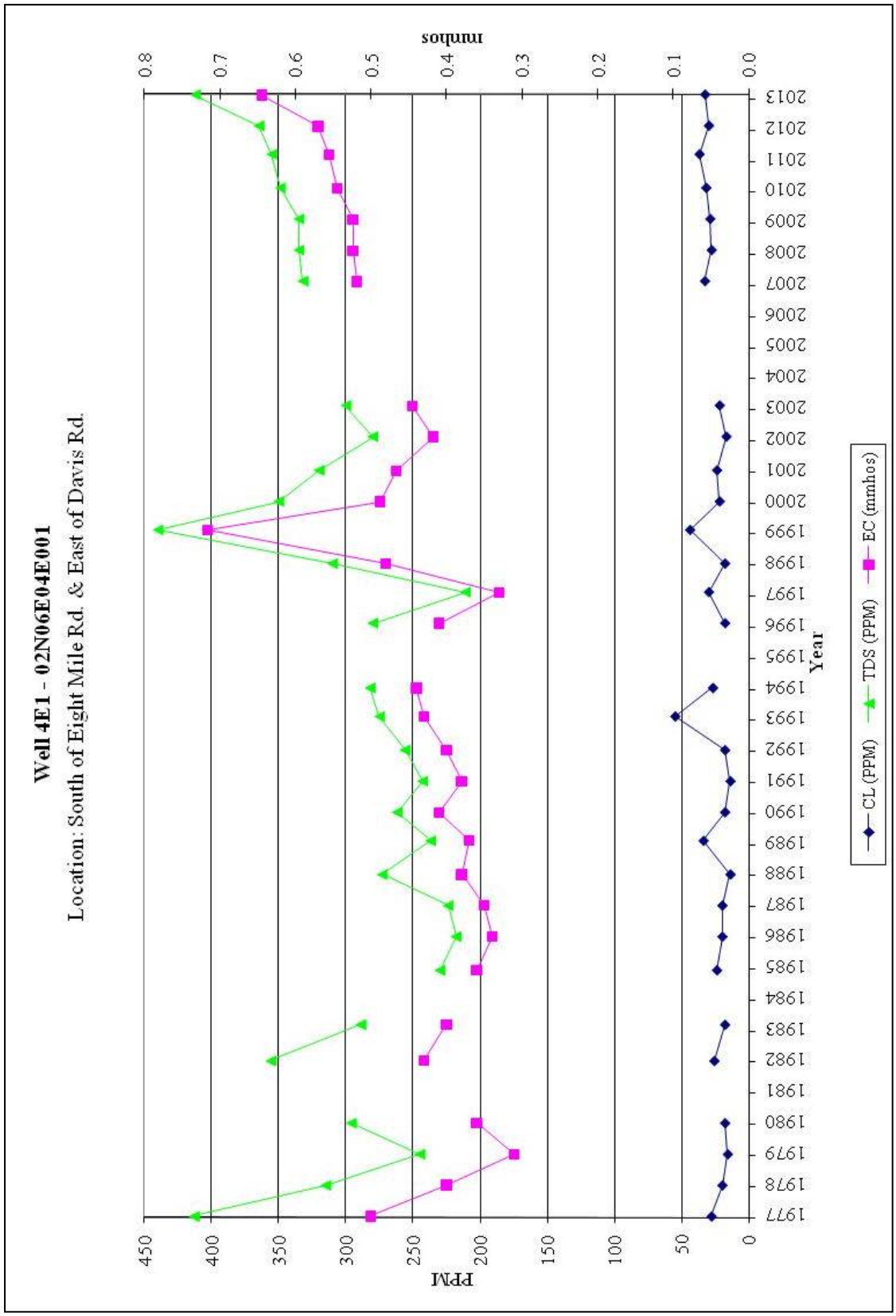

Figure 2-9: Quality Comparison Graph Well 4E1

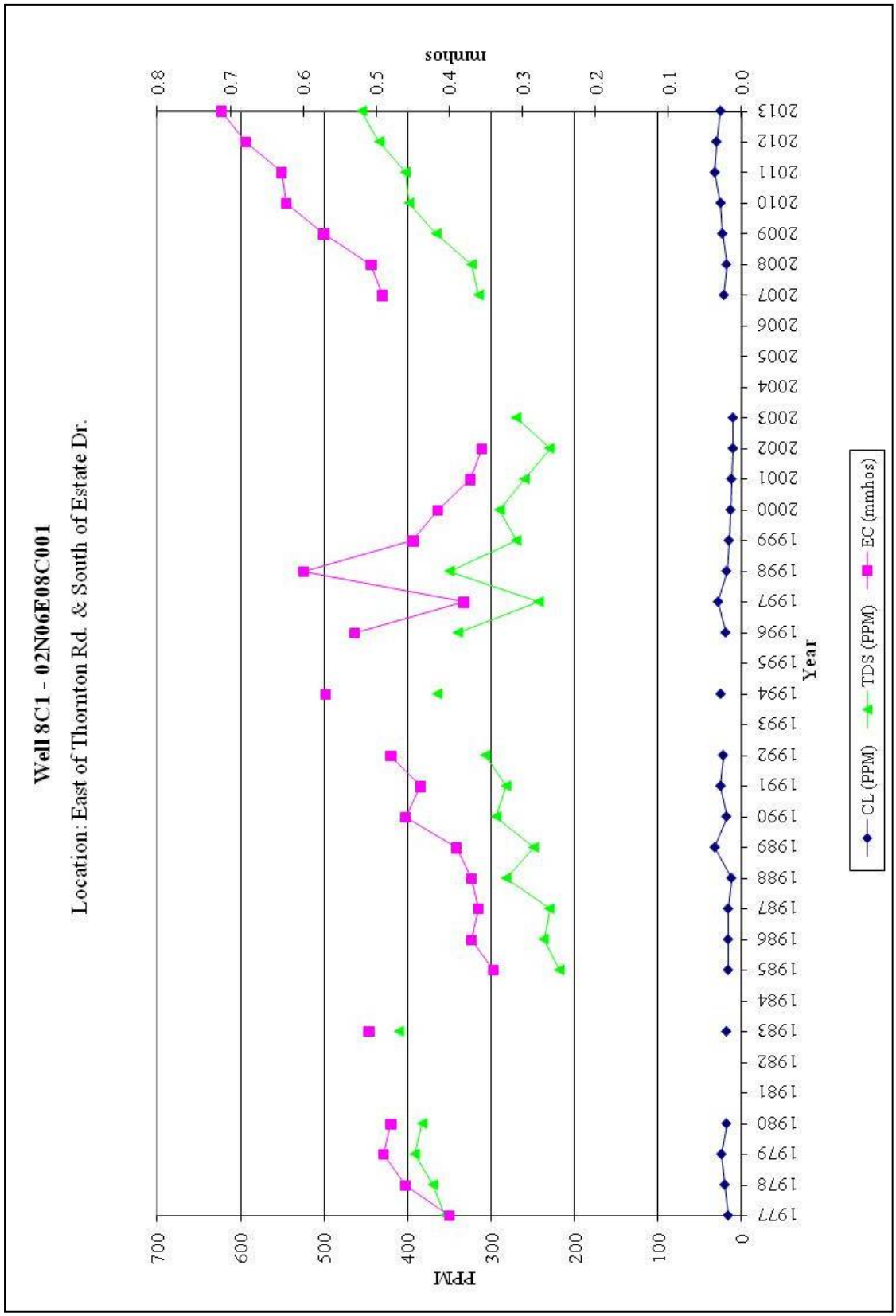

Figure 2-10: Quality Comparison Graph Well 8C1

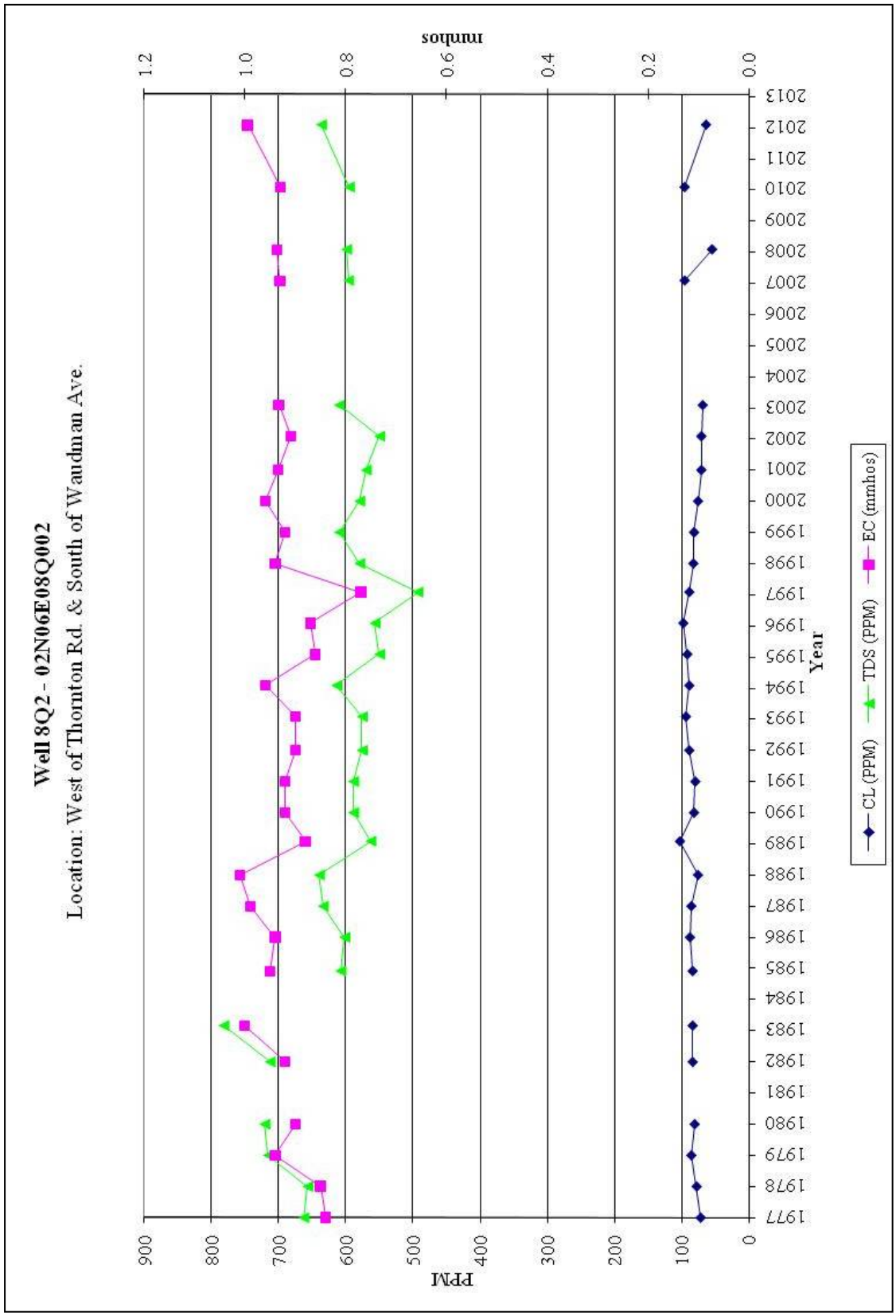

Figure 2-11: Quality Comparison Graph Well 8Q2

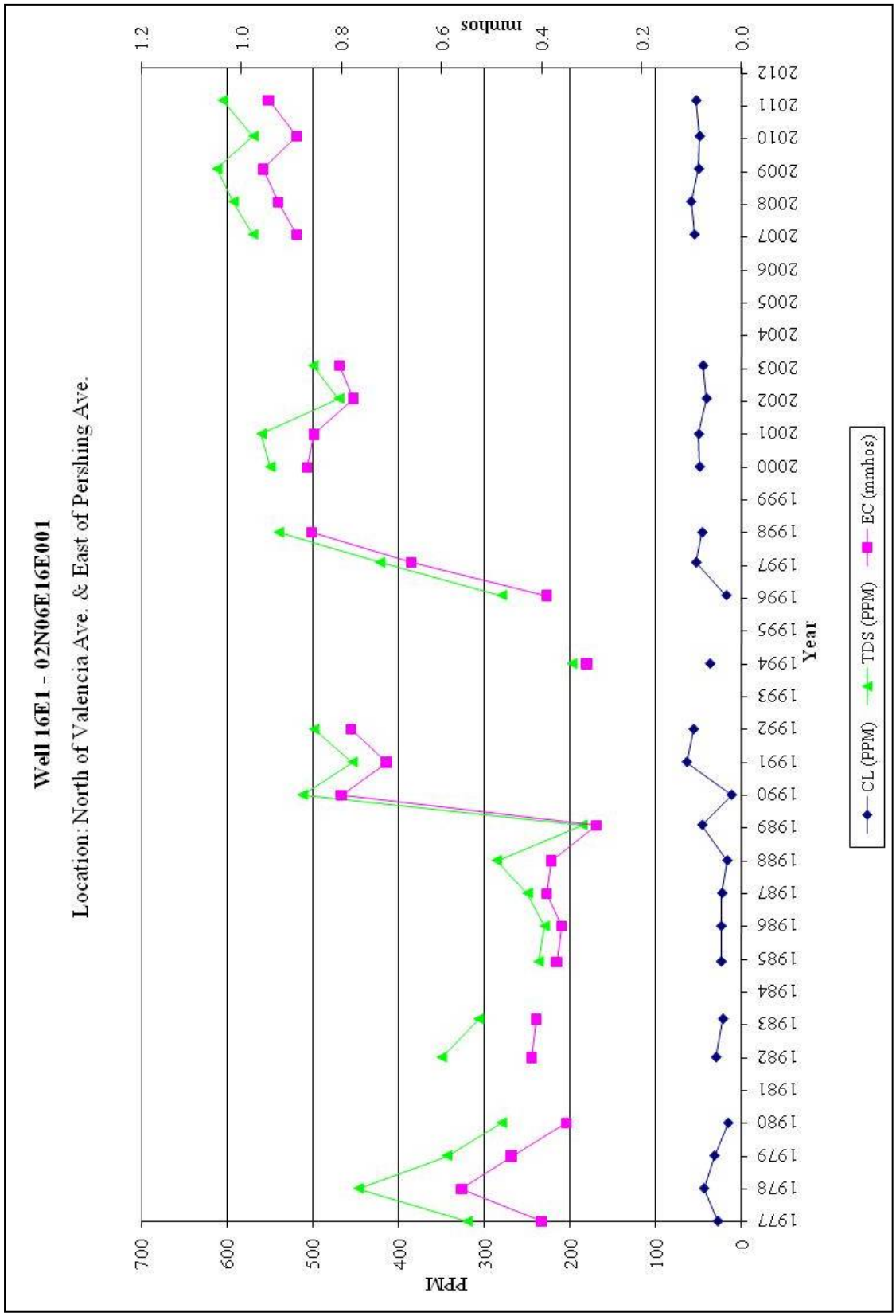

Figure 2-12: Quality Comparison Graph Well 16E1

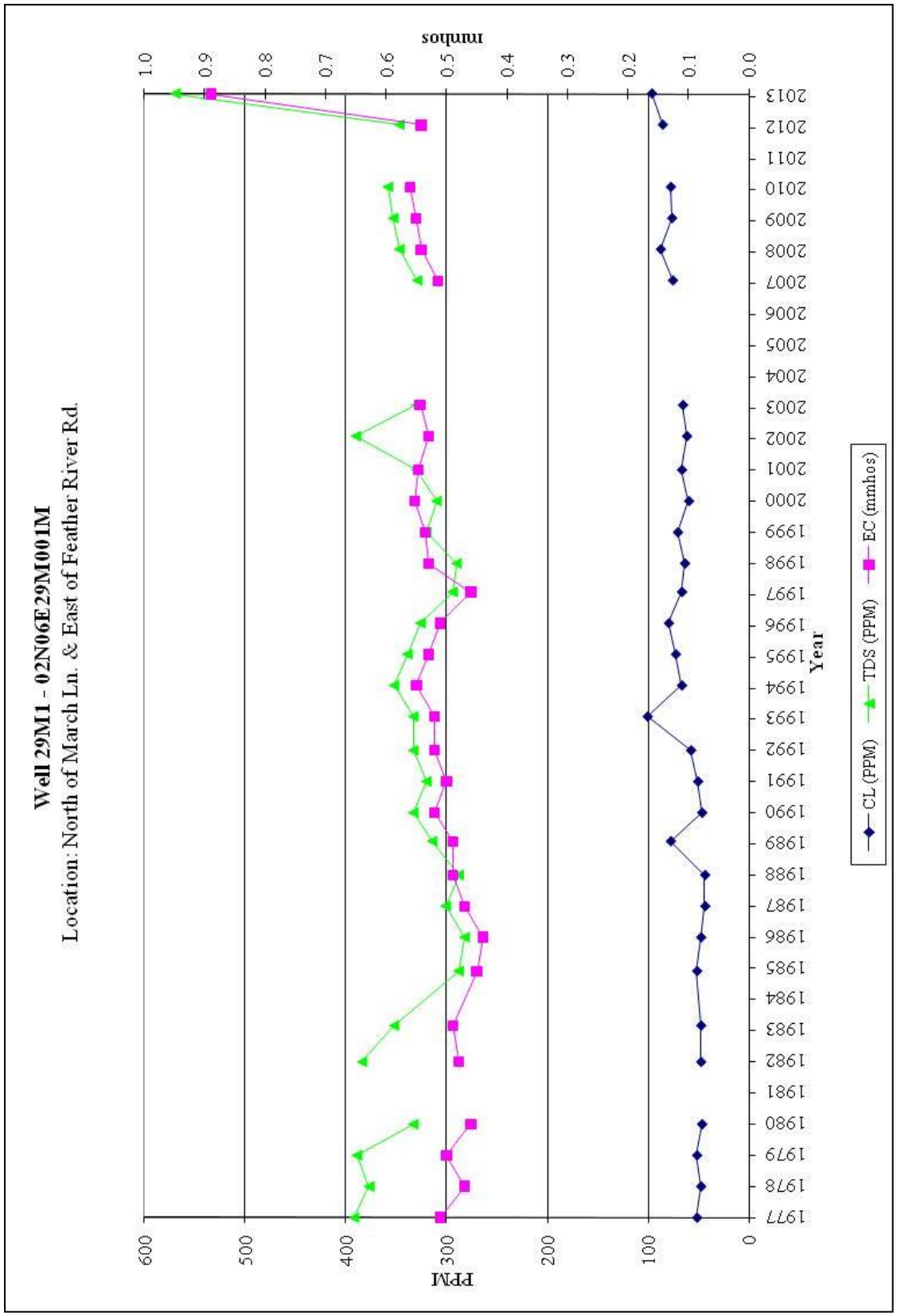

Figure 2-13: Quality Comparison Graph Well 29M1

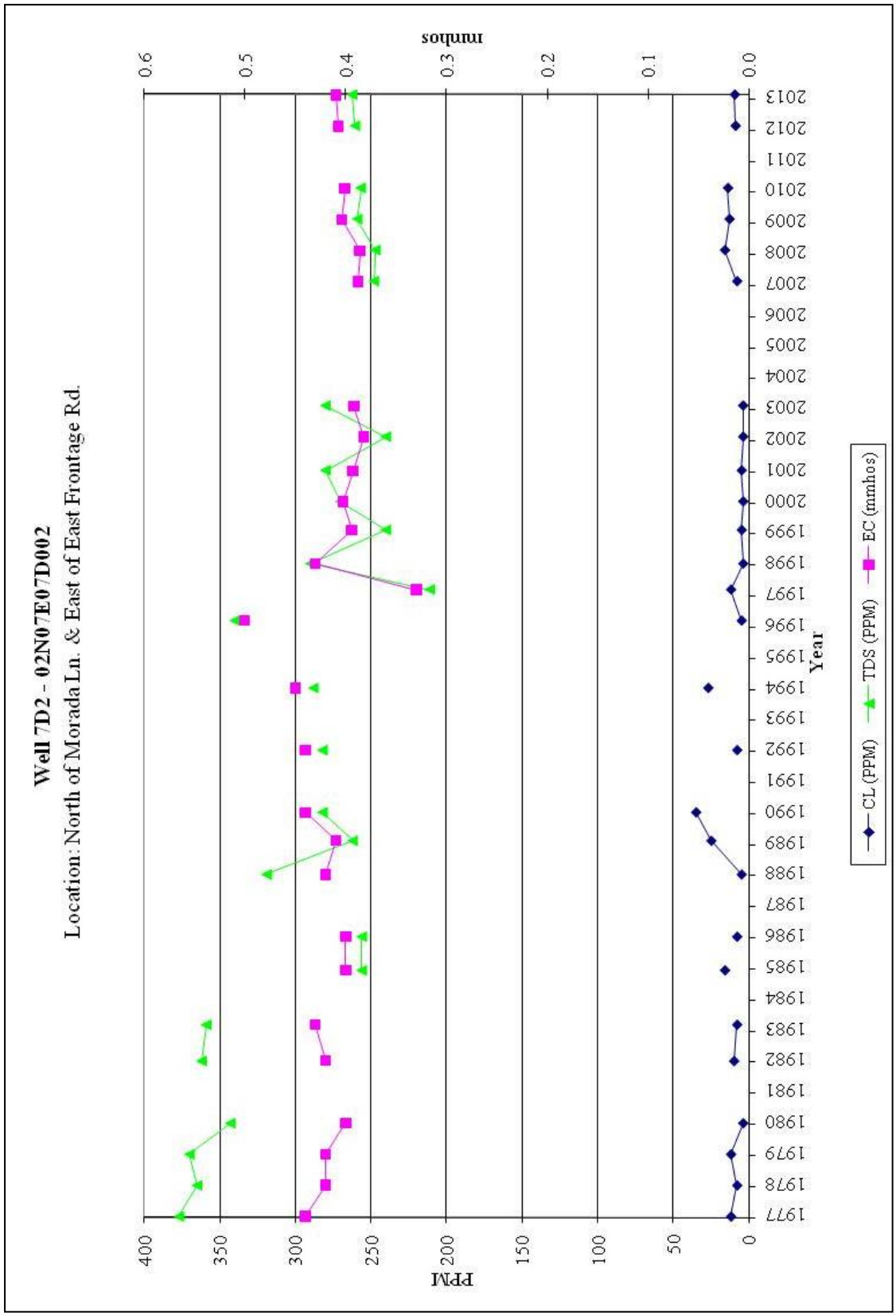

Figure 2-14: Quality Comparison Graph Well 7D2

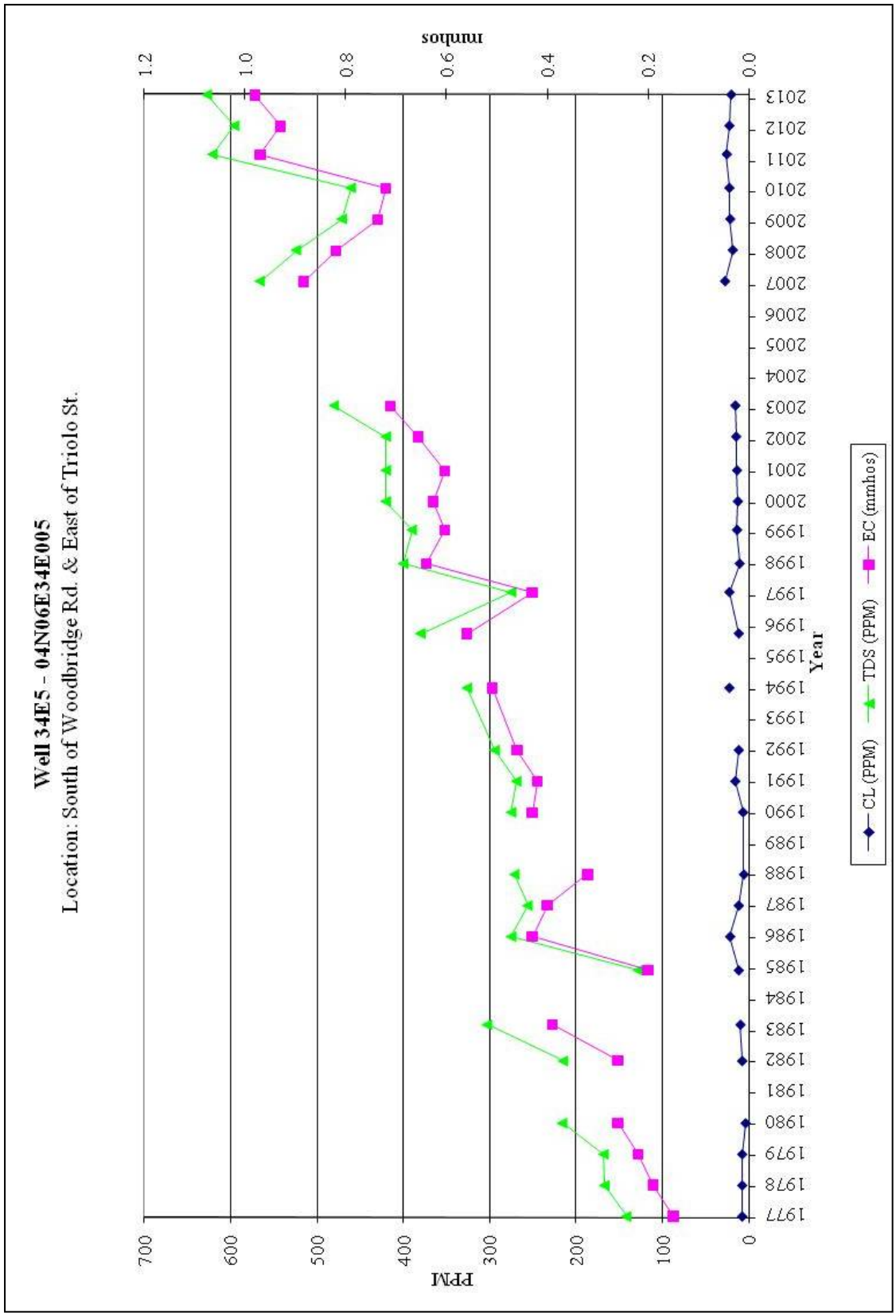

Figure 2-15: Quality Comparison Graph Well 34E5

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Section 3 – Groundwater Elevation Monitoring

Summary of Groundwater Elevations

The information contained in the Fall 2013 Groundwater Report is summarized as follows:

GROUNDWATER LEVELS

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

North San Joaquin Water Conservation District (NSJWCD) – One-hundred three wells were compared in NSJWCD. Forty-eight wells decreased in groundwater levels. Fifty-five wells increased in groundwater levels..

Oakdale Irrigation District (OID) – Three wells were compared in the OID area. All three wells shows decrease in groundwater levels.

Stockton East Water District (SEWD) – Eighty-one wells were compared in SEWD. Sixty-eight wells decreased in groundwater levels. Twelve wells show increases in groundwater levels. One well had no change in groundwater level.

South San Joaquin Irrigation District (SSJID) – Thirty-eight wells were compared in the SSJID area. Thirty-two wells declined in groundwater elevation. Six show increases in groundwater levels.

Southwest County Areas – Twenty-one wells measured across the Southwest County. Sixteen wells descended in groundwater levels. Three wells increased in groundwater level. Two wells had no change in groundwater level.

Woodbridge Irrigation District (WID) – Thirty-three wells were compared in the WID. Nineteen wells decreased in groundwater levels. Thirteen well shows increase in groundwater level. One well had no change in groundwater elevation.

Table 3-1 Comparison of CSJWCD Water Levels

StateWellID	Fall 2013	Fall 2012	Change
01N07E11L001	-37.0	----	----
01N07E11M001	-37.3	-40.7	3.4
01N07E13J002	----	-46.5	----
01N07E14J002	-44.6	-36.6	-8.0
01N07E14L001	-40.7	-39.1	-1.6
01N07E15M002	----	----	----
01N07E24A001	----	----	----
01N07E24R001	-51.0	-53.5	2.5
01N07E26H003	-36.0	-34.4	-1.6
01N07E32A001	-21.4	-14.6	-6.8
01N08E02B001	-45.5	-42.9	-2.6
01N08E02J001	----	-40.5	----
01N08E07M001	-59.1	----	----
01N08E09L001	-52.9	-50.7	-2.2
01N08E11L001	-48.2	-44.8	-3.4
01N08E13J001	-34.8	-30.9	-3.9
01N08E15J001	-42.8	-38.9	-3.9
01N08E16G001	-45.9	-42.6	-3.3
01N08E16H002	-45.4	-41.2	-4.2
01N08E16P001	-44.3	-41.5	-2.8
01N08E18A002	-50.0	-43.5	-6.5
01N08E22J001	-44.4	-39.9	-4.5
01N08E26A002	-33.2	-28.7	-4.5
01N08E27R002	-37.3	-33.3	-4.0
01N08E28K001	-38.2	-36.6	-1.6
01N08E29M002	----	----	----
01N08E35F001	-31.9	-27.4	-4.5
01N08E35R002	-27.0	-25.5	-1.5
01N08E36F001	-25.2	-21.4	-3.8
01N09E01C001	14.4	15.0	-0.6
01N09E05J001	-14.5	-12.5	-2.0
01N09E06N001	-36.8	-34.7	-2.1
01N09E13D001	----	15.6	----
01N09E15B002	-4.1	-2.1	-2.0
01N09E17D001	-28.8	-24.9	-3.9
01N09E17M001	-28.8	-25.1	-3.7
01N09E19C001	-32.2	-28.5	-3.7
01N09E21J001	-4.9	----	----

StateWellID	Fall 2013	Fall 2012	Change
01N09E22G002	----	-1.9	----
01N09E26A001	10.8	13.2	-2.4
01N09E29R001	-12.5	-10.0	-2.5
01N09E30C005	-21.0	-17.2	-3.8
01N09E31J001	-11.0	-8.1	-2.9
01N09E35K001	5.4	14.3	-8.9
01S07E01J001	-28.4	-26.3	-2.1
01S07E02J001	-31.0	-29.6	-1.4
01S07E10A001	-17.5	-15.1	-2.4
01S07E12H001	----	----	----
01S07E13J001	----	-9.2	----
01S08E04R001	-28.8	-28.3	-0.5
01S08E05A001	-35.4	-29.4	-6.0
01S08E05R001	----	-28.7	----
01S08E06D001	-28.5	-27.3	-1.2
01S08E09Q001	-20.7	-17.9	-2.8
01S08E11F001	-21.7	-17.6	-4.1
01S08E12B001	-15.8	-11.2	-4.6
01S08E14B001	-10.9	-1.2	-9.7
01S08E15A001	-31.9	-28.0	-3.9
01S08E15P001	----	----	----
01S08E20B001	-11.7	-7.3	-4.4
01S08E23A001	----	-5.0	----
01S08E27A001	2.6	5.0	-2.4
01S09E02R001	24.6	28.1	-3.5
01S09E05H002	----	1.5	----
01S09E07A001	-7.8	-3.5	-4.3
01S09E07N001	-4.5	0.2	-4.7
01S09E09R001	7.8	13.3	-5.5
01S09E11J002	31.5	34.8	-3.3
01S09E18R003	4.1	8.7	-4.6
01S09E19Q002	12.3	15.5	-3.2

Total Number of Wells	**70**
Total Number of Comparable Wells	**54**
Number of Wells with Decrease	**52**
Number of Wells with Increase	**2**
Number of Wells with No Change	**0**
Range of Change	**-9.7 to 3.4**
Average Change	**-3.4**

Table 3-2 Comparison of NSJWCD Water Levels

StateWellID	Fall 2013	Fall 2012	Change
03N06E04C001	-2.3	-2.7	0.4
03N06E23A003	-30.1	----	----
03N06E24M003	-35.5	-32.6	-2.9
03N06E25C001	-38.2	-41.0	2.9
03N06E25H015	----	----	----
03N06E25R005	-44.6	-40.9	-3.7
03N06E36N001	----	----	----
03N07E02G003	-30.5	-28.3	-2.2
03N07E03R001	-30.8	-25.8	-5.0
03N07E05D005	19.9	16.4	3.5
03N07E08B012	-22.1	-24.2	2.2
03N07E08E002	-30.8	-27.0	-3.8
03N07E09C001	-30.8	-25.7	-5.1
03N07E09C003	-25.4	----	----
03N07E09P002	-34.6	-36.6	2.0
03N07E10L004	-35.3	-36.0	0.7
03N07E12P001	-45.7	-44.2	-1.5
03N07E15C004	-43.3	-36.0	-7.3
03N07E17A006	-34.2	-35.9	1.7
03N07E17D003	-28.7	----	----
03N07E17D004	-31.1	-30.9	-0.2
03N07E17K002	-42.2	-39.5	-2.7
03N07E18D012	-32.4	-30.5	-1.9
03N07E18M002	-34.0	-38.6	4.6
03N07E19J004	----	-46.5	----
03N07E19Q012	-43.8	-43.8	0.0
03N07E20C012	-41.0	-41.8	0.8
03N07E21L003	-48.3	-49.0	0.7
03N07E22C011	-45.0	-47.5	2.5
03N07E23C002	----	----	----
03N07E23K011	-47.7	-48.0	0.3
03N07E25G001	----	-54.1	----
03N07E26G012	-49.2	-49.6	0.4
03N07E32Q012	----	----	----
03N07E33G002	-42.8	-44.3	1.5
03N08E04Q001	-41.2	-40.5	-0.7
03N08E05K011	----	-38.9	----
03N08E07D002	-44.1	-42.0	-2.1

StateWellID	Fall 2013	Fall 2012	Change
03N08E07J001	----	-36.8	----
03N08E17B001	-46.9	-47.2	0.3
03N08E17Q011	-50.6	----	----
03N08E19C001	----	-46.4	----
03N08E19M003	-51.5	-52.1	0.6
03N08E22A001	-51.8	-53.3	1.5
03N09E05D001	----	----	----
04N06E02R011	----	-26.5	----
04N06E03A012	-14.5	-7.4	-7.1
04N06E05Q001	-15.8	-13.0	-2.8
04N06E06N012	----	5.9	----
04N06E12C004	-35.3	-31.5	-3.8
04N06E12N002	-35.0	-27.3	-7.7
04N06E15B002	-16.0	-15.2	-0.8
04N06E16A011	-11.6	----	----
04N06E16C001	-4.0	-5.7	1.7
04N06E16K011	-0.7	4.9	-5.6
04N06E23D004	-27.1	-34.4	7.3
04N06E23K00	-14.0	-8.0	-6.0
04N06E24D012	-19.8	-20.2	0.4
04N06E24F001	-25.0	-20.0	-5.0
04N06E25B001	-13.5	-16.1	2.6
04N06E25R001	-6.0	-5.0	-1.0
04N06E27B012	----	----	----
04N06E27D002	11.9	13.2	-1.3
04N06E27Q012	14.5	11.4	3.1
04N06E35D011	17.2	14.2	3.0
04N06E36J012	5.4	----	----
04N07E01B011	----	----	----
04N07E02R001	-42.5	-44.0	1.5
04N07E04B012	-46.5	-49.5	3.1
04N07E04Q012	-45.9	-41.8	-4.1
04N07E07A001	----	----	----
04N07E07H011	-41.8	-41.4	-0.4
04N07E11D012	-45.3	----	----
04N07E12E001	-52.5	-46.5	-6.0
04N07E12G012	----	----	----
04N07E14P011	-35.4	----	----
04N07E15B012	----	----	----
04N07E16D001	-43.8	-41.5	-2.3
04N07E17J013	----	----	----
04N07E17N001	-29.3	-32.3	3.0

StateWellID	Fall 2013	Fall 2012	Change
04N07E19K001	-26.1	-22.6	-3.5
04N07E19R011	-23.0	-24.7	1.7
04N07E20H003	-98.5	-100.5	2.0
04N07E21F001	-32.6	-29.3	-3.3
04N07E23J012	-34.3	-31.2	-3.1
04N07E24N002	----	-31.4	----
04N07E25G015	-28.0	-26.9	-1.1
04N07E27C002	-29.5	-23.0	-6.5
04N07E28J002	-24.7	-20.7	-4.0
04N07E28P011	6.0	5.3	0.7
04N07E29H001	----	-22.1	----
04N07E29N012	-9.5	-12.3	2.8
04N07E31Q031	17.1	----	----
04N07E32F011	2.9	1.6	1.3
04N07E33H001	23.4	25.0	-1.6
04N07E34K011	-14.6	-16.9	2.3
04N07E35C002	-18.9	----	----
04N07E35E013	-19.8	-20.7	0.9
04N07E36L001	-29.8	-26.5	-3.3
04N08E01K001	50.2	49.0	1.2
04N08E02E011	-7.2	----	----
04N08E04P014	----	-27.5	----
04N08E06C002	-38.9	-33.3	-5.6
04N08E06N002	-44.5	-40.2	-4.3
04N08E11M012	-6.3	-6.8	0.5
04N08E12A011	73.3	69.4	3.9
04N08E12B011	51.1	50.1	1.0
04N08E12N001	21.9	22.6	-0.7
04N08E14K001	-8.8	-7.6	-1.2
04N08E15D011	-20.0	-16.5	-3.5
04N08E15J011	-13.5	-13.9	0.4
04N08E17A001	----	-24.8	----
04N08E17J001	-32.1	-28.0	-4.1
04N08E21M001	-35.7	-33.6	-2.1
04N08E22C015	-20.9	-20.6	-0.3
04N08E26A012	-8.3	-11.1	2.8
04N08E27J011	-19.0	-20.6	1.6
04N08E28E001	----	-31.7	----
04N08E32N001	-40.2	-36.1	-4.1
04N08E34Q011	-33.1	-34.2	1.1
04N09E06L011	107.4	110.6	-3.2

StateWellID	Fall 2013	Fall 2012	Change
04N09E07D012	81.7	77.9	3.8
04N09E07E011	90.9	89.2	1.7
04N09E16Q002	164.6	163.8	0.8
04N09E17E001	138.2	137.3	0.9
04N09E18A011	184.5	----	----
04N09E18D002	50.9	49.4	1.5
04N09E18N011	16.3	19.0	-2.7
04N09E20M001	118.1	111.3	6.8
04N09E21A001	217.4	----	----
04N09E28C002	187.1	185.9	1.2
04N09E31M001	-17.6	----	----
05N06E36R001	----	----	----
05N07E31J001	----	----	----
05N07E31Q001	----	----	----
05N07E34G001	-53.3	-47.1	-6.2
05N07E34Q001	-52.6	-49.9	-2.7
05N08E24Q011	54.3	51.7	2.6
05N08E25P011	53.2	50.0	3.2
05N08E35K012	3.4	0.8	2.6
05N09E30C011	161.4	159.6	1.8
05N09E30M011	145.3	143.7	1.6
05N09E31L011	125.3	123.6	1.7

Total Number of Wells	**142**
Total Number of Comparable Wells	**103**
Number of Wells with Decrease	**48**
Number of Wells with Increase	**55**
Number of Wells with No Change	**0**
Range of Change	**-7.7 to 7.3**
Average Change	**-0.5**

Table 3-3 Comparison of OID Water Levels

StateWellID	Fall 2013	Fall 2012	Change
01S09E14K001	38.3	43.3	-5.0
01S09E21J002	35.1	38.2	-3.1
01S09E23N001	----	48.6	----
01S09E24R001	63.5	66.6	-3.1
01S09E28M002	----	37.2	----

Total Number of Wells	**5**
Total Number of Comparable Wells	**3**
Number of Wells with Decrease	**3**
Number of Wells with Increase	**0**
Number of Wells with No Change	**0**
Range of Change	**-5.0 to -3.1**
Average Change	**-3.7**

Table 3-4 Comparison of SEWD Water Levels

StateWellID	Fall 2013	Fall 2012	Change
01N06E02C001	-27.2	----	----
01N06E03K001	-8.5	-7.5	-1.0
01N06E04J002	----	----	----
01N06E05H001	-7.0	-7.1	0.1
01N06E05M004	----	----	----
01N06E23J001	----	----	----
01N06E27R002	-6.4	-7.0	0.6
01N07E01A002	----	----	----
01N07E01M002	-53.5	-50.2	-3.3
01N07E02G001	-45.3	-43.0	-2.3
01N07E03L001	----	----	----
01N07E03M001	----	-5.0	----
01N07E04R001	-21.8	-14.0	-7.8
01N07E08B001	----	-26.0	----
01N07E09E004	-26.2	-24.0	-2.2
01N07E09H001	-31.9	-26.5	-5.4
01N07E09Q003	-32.4	-30.0	-2.4
01N07E10D001	-28.4	-22.0	-6.4
01N07E10G001	-37.6	----	----
01N07E19G001	----	-17.5	----
01N07E20G001	-21.0	-21.2	0.2
01N07E21R001	-26.9	----	----
01N08E03P001	----	-49.5	----

StateWellID	Fall 2013	Fall 2012	Change
01N08E04E001	-57.0	-56.0	-1.0
01N09E05B001	----	-17.6	----
01S06E01C002	-5.4	-5.9	0.5
01S06E02D004	----	-5.6	----
01S06E02G002	-5.6	-5.6	0.0
01S06E10G001	-5.3	-8.6	3.3
01S06E11E001	-3.8	-4.6	0.8
01S07E06M002	-4.7	-4.8	0.1
01S07E08J002	-6.1	-3.2	-2.9
02N06E01A001	----	----	----
02N06E03A003	-32.9	-31.8	-1.1
02N06E06C002	-13.0	-14.1	1.1
02N06E11L001	----	----	----
02N06E12H001	-44.4	-39.7	-4.7
02N06E13R002	-38.0	----	----
02N06E24F001	-33.5	-30.5	-3.0
02N06E24J002	----	-31.4	----
02N06E24J003	-34.0	-31.2	-2.8
02N06E32G001	-9.5	----	----
02N07E03D001	-55.8	-51.0	-4.8
02N07E08D001	-55.2	-51.2	-4.0
02N07E08K003	-64.2	-58.1	-6.1
02N07E08R002	-51.0	-57.2	6.2
02N07E10F002	-61.8	-55.5	-6.3
02N07E11F001	-59.5	-54.5	-5.0
02N07E11R002	-64.7	-58.0	-6.7
02N07E12A003	-57.4	-54.1	-3.3
02N07E15C001	-68.2	-62.3	-5.9
02N07E16F002	-64.4	-58.3	-6.1
02N07E16L001	-63.3	-57.3	-6.0
02N07E20N002	-44.0	-40.0	-4.0
02N07E21A002	-67.6	-62.4	-5.2
02N07E21K002	-60.4	-54.5	-5.9
02N07E21N001	----	----	----
02N07E23B001	-72.5	-65.0	-7.5
02N07E24B001	-65.2	-59.1	-6.1
02N07E24Q001	-67.3	-62.0	-5.3
02N07E26H003	-67.6	-61.5	-6.1
02N07E26N001	-61.2	-57.7	-3.5
02N07E28K002	-64.0	-59.5	-4.5
02N07E28N004	-47.6	-43.5	-4.1
02N07E28P001	----	----	----

StateWellID	Fall 2013	Fall 2012	Change
02N07E29B001	-49.8	-50.5	0.7
02N07E29M002	-40.9	-36.0	-4.9
02N07E30E001	-35.1	-31.8	-3.3
02N07E30H001	-37.8	-34.5	-3.3
02N07E31M001	-24.8	-20.8	-4.0
02N07E32J002	-36.8	-29.5	-7.3
02N07E32M002	-31.2	-26.0	-5.2
02N07E32R001	-31.0	-25.6	-5.4
02N07E33L001	-39.0	-33.0	-6.0
02N07E34R001	-36.6	-31.0	-5.6
02N07E35L001	----	----	----
02N07E36H001	-65.5	-62.2	-3.3
02N07E36P002	-53.4	-52.2	-1.2
02N08E03G002	-54.2	-49.4	-4.8
02N08E04C001	-58.9	-54.0	-4.9
02N08E05C001	----	-56.5	----
02N08E08N001	-63.2	-58.3	-4.9
02N08E09G002	-63.1	-58.0	-5.1
02N08E10H002	-54.1	-49.7	-4.4
02N08E12C002	----	----	----
02N08E13K001	----	-39.6	----
02N08E14C001	-53.0	-50.5	-2.5
02N08E15M002	-59.7	-54.5	-5.2
02N08E16D001	-62.1	-56.9	-5.2
02N08E18C001	----	-62.2	----
02N08E20F001	-66.7	-60.8	-5.9
02N08E24J001	----	-63.6	----
02N08E24P001	-44.2	-40.8	-3.4
02N08E28H002	-54.6	-50.1	-4.5
02N08E32L002	-63.4	-59.3	-4.1
02N08E33E001	-61.1	-57.6	-3.5
02N09E03A001	57.8	59.4	-1.6
02N09E04H001	47.8	50.1	-2.3
02N09E05H001	-7.2	-6.0	-1.2
02N09E05N001	----	-19.0	----
02N09E08N001	----	-28.6	----
02N09E09D001	-10.8	-14.8	4.0
02N09E18Q001	-43.4	-40.0	-3.4
02N09E22D001	----	-2.4	----
02N09E28N001	-12.3	-11.3	-1.0
03N06E35P002	-31.0	-30.5	-0.5
03N07E28K012	-50.2	----	----

StateWellID	Fall 2013	Fall 2012	Change
03N07E35C002	-58.0	-51.7	-6.3
03N07E35L001	-59.0	-52.5	-6.5
03N07E36J001	-60.2	-52.3	-7.9
03N08E27R001	----	-48.6	----
03N08E32P001	-58.3	-59.5	1.2
03N09E25R001	78.9	83.6	-4.7
03N09E36G001	----	181.2	----

Total Number of Wells	**113**
Total Number of Comparable Wells	**81**
Number of Wells with Decrease	**68**
Number of Wells with Increase	**12**
Number of Wells with No Change	**1**
Range of Change	**-7.9 to 6.2**
Average Change	**-3.4**

Table 3-5 Comparison of SSJID Water Levels

StateWellID	Fall 2013	Fall 2012	Change
01S07E09Q001	-1.8	0.2	-2.0
01S07E14M001	-0.4	1.0	-1.4
01S07E14P003	-2.3	-1.8	-0.5
01S07E15F002	-6.6	-1.9	-4.7
01S07E17N002	----	----	----
01S07E18L001	4.3	5.8	-1.5
01S07E21G001	14.7	14.5	0.2
01S07E25E001	7.5	5.5	2.0
01S07E25R001	13.8	14.6	-0.8
01S07E26G001	9.0	5.0	4.0
01S07E27K001	10.9	10.0	0.9
01S07E28D001	----	----	----
01S07E30R001	8.2	----	----
01S07E36D001	19.1	21.5	-2.4
01S08E19R001	-4.7	-0.7	-4.0
01S08E25Q001	----	21.6	----
01S08E29K001	1.3	5.0	-3.7
01S08E30C002	3.3	4.5	-1.2
01S08E34Q001	15.4	18.7	-3.3
01S08E35R002	26.0	27.8	-1.8
01S09E29M002	28.4	30.1	-1.7
01S09E33J002	52.5	54.3	-1.8

StateWellID	Fall 2013	Fall 2012	Change
01S09E33P001	48.0	49.9	-1.9
01S09E34A001	53.3	55.3	-2.0
02S07E07D002	9.2	9.4	-0.2
02S07E07Q001	----	24.3	----
02S07E08R001	26.8	27.5	-0.7
02S07E10B002	----	26.2	----
02S07E11N002	34.6	34.4	0.2
02S07E12G001	----	----	----
02S07E12R001	22.6	25.4	-2.8
02S07E12R002	28.4	30.7	-2.3
02S07E19H001	20.5	21.0	-0.5
02S07E20R002	23.8	----	----
02S07E22N002	----	27.3	----
02S07E24R002	----	37.6	----
02S07E26B001	29.5	30.2	-0.7
02S08E04M001	11.5	26.0	-14.5
02S08E06J001	19.4	19.6	-0.2
02S08E07R001	31.2	31.9	-0.7
02S08E08A001	22.5	22.4	0.1
02S08E08E001	21.7	24.7	-3.0
02S08E09J001	32.9	35.1	-2.2
02S08E12D001	37.9	39.7	-1.8
02S08E14E001	42.3	45.1	-2.8
02S09E03K001	----	58.8	----
02S09E07D001	36.3	39.9	-3.6
02S09E11K001	74.7	75.2	-0.5
02S09E12R001	70.1	71.9	-1.8
02S09E19B002	57.7	----	----

Total Number of Wells	**49**
Total Number of Comparable Wells	**38**
Number of Wells with Decrease	**32**
Number of Wells with Increase	**6**
Number of Wells with No Change	**0**
Range of Change	**-14.5 to 4.0**
Average Change	**-1.7**

Table 3-6 Comparison of South West County Area Water LevelsWater Levels

StateWellID	Fall 2013	Fall 2012	Change
01S05E31R002	0.6	0.6	0.0
01S06E04J001	-1.0	-1.7	0.7
01S06E12P001	-2.5	-1.2	-1.3
01S06E14F001	-1.6	-1.6	0.0
01S06E15F001	1.3	1.6	-0.3
01S06E23C003	3.8	4.4	-0.6
01S06E26K001	1.7	2.2	-0.5
02S04E15R001	56.5	56.0	0.5
02S05E08B001	-2.3	-5.4	3.1
02S05E13N001	14.1	14.6	-0.5
02S06E10K001	2.5	3.0	-0.5
02S06E11J001	11.4	18.4	-7.0
02S06E25J001	15.8	15.8	0.0
02S06E26B001	----	----	----
02S06E27E001	8.4	9.4	-1.0
02S06E31N001	52.5	53.5	-1.0
02S07E31N001	12.5	14.5	-2.0
03S05E04H001	56.9	57.5	-0.6
03S06E03F002	14.5	15.5	-1.0
03S06E23C001	2.3	9.5	-7.2
03S06E27N001	72.5	75.8	-3.3
03S07E05J001	23.8	25.0	-1.2
03S07E06Q001	18.2	19.0	-0.8
MW-1A	7.8	15.1	-7.3
MW-1B	6.2	18.5	-12.3
MW-1C	7.6	20.8	-13.2
MW-2A	2.4	8.8	-6.4
MW-2B	-1.3	13.4	-14.7
MW-2C	-2.9	16.4	-19.3
MW-3A	-2.3	3.7	-6.0
MW-3B	-4.2	10.9	-15.1
MW-3C	-8.1	9.3	-17.5
MW-4A	2.3	15.7	-13.3
MW-4B	0.6	16.1	-15.5
MW-4C	-0.2	16.6	-16.7
MW-5A	10.6	28.1	-17.5
MW-5B	6.5	20.5	-14.0
MW-5C	2.1	14.4	-12.3
MW-6A	5.9	14.7	-8.8

StateWellID	Fall 2013	Fall 2012	Change
MW-6B	5.8	16.7	-10.9
MW-6C	2.0	12.6	-10.6

Total Number of Wells	**39**
Total Number of Comparable Wells	**21**
Number of Wells with Decrease	**16**
Number of Wells with Increase	**3**
Number of Wells with No Change	**2**
Range of Change	**-7.2 to 3.1**
Average Change	**-1.2**

Table 3-7 Comparison of WID Water Levels

StateWellID	Fall 2013	Fall 2012	Change
03N05E13L001	----	-11.0	----
03N05E14C001	-5.1	-4.3	-0.8
03N05E24L001	-5.6	-4.7	-0.9
03N06E04P012	-9.0	-12.5	3.5
03N06E05C002	-4.1	-7.5	3.5
03N06E05N003	-13.5	-12.0	-1.5
03N06E07D013	-7.0	-9.1	2.1
03N06E07H003	-16.5	-15.9	-0.6
03N06E09N011	----	----	----
03N06E10D001	-5.4	----	----
03N06E15C004	-20.8	-23.3	2.5
03N06E17A004	-27.2	-24.2	-3.0
03N06E18M003	-17.0	-15.8	-1.2
03N06E20D002	-21.0	-20.5	-0.5
03N06E26P002	-33.3	-31.7	-1.6
03N06E27E001	-36.2	-32.2	-4.0
03N06E29C001	-32.3	-28.3	-4.0
03N06E30R001	-26.6	-25.4	-1.2
03N06E32R001	-26.4	-24.5	-1.9
04N05E03D003	----	----	----
04N05E09D001	----	----	----
04N05E10K001	-5.2	-6.0	0.8
04N05E13C012	-4.4	-7.0	2.6
04N05E13H001	-8.3	-6.0	-2.3
04N05E13R004	-7.6	-6.5	-1.1
04N05E14B002	-5.9	-5.9	0.0
04N05E14P001	0.0	-1.5	1.5
04N05E22H001	-8.8	----	----

StateWellID	Fall 2013	Fall 2012	Change
04N05E24J004	-3.1	-1.6	-1.5
04N05E26F001	1.3	0.7	0.6
04N05E36C004	1.3	-2.4	3.7
04N05E36H003	-0.4	0.0	-0.4
04N06E17G004	-3.8	-3.0	-0.8
04N06E18R012	-3.1	-5.2	2.1
04N06E19F001	-0.3	-1.4	1.1
04N06E19R012	1.0	0.3	0.7
04N06E21D001	----	5.6	----
04N06E29A001	----	----	----
04N06E29N002	-4.6	-3.0	-1.6
04N06E30E001	-1.5	0.7	-2.2
04N06E34J002	20.6	20.4	0.2
05N05E28L003	-4.5	----	----
05N05E32M001	----	----	----

Total Number of Wells	**42**
Total Number of Comparable Wells	**33**
Number of Wells with Decrease	**19**
Number of Wells with Increase	**13**
Number of Wells with No Change	**1**
Range of Change	**-4.0 to 3.7**
Average Change	**-0.2**

HYDROGRAPHS

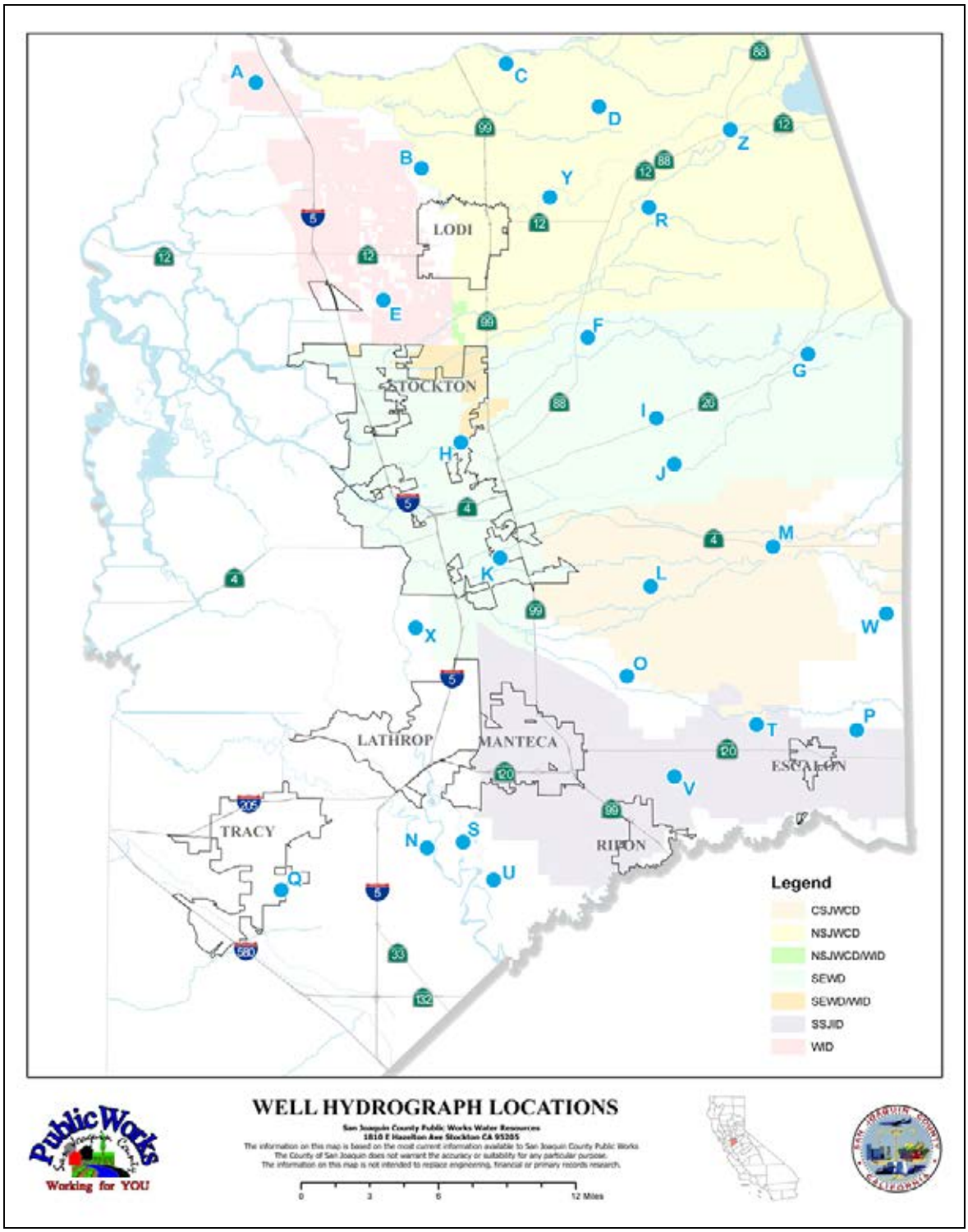

Figure 3-1: Well Hydrograph Locations

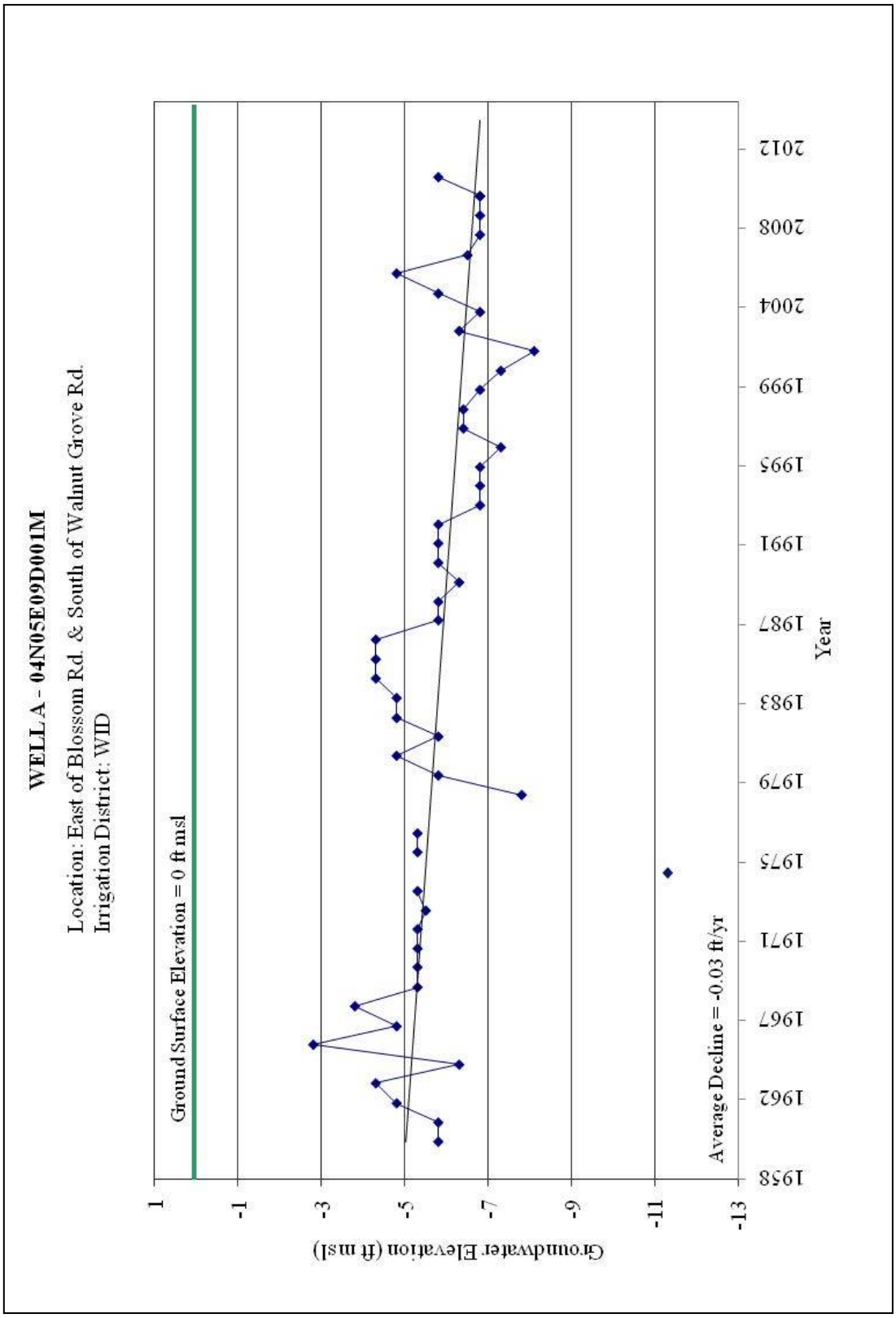

Figure 3-2: Fall Hydrograph Well A

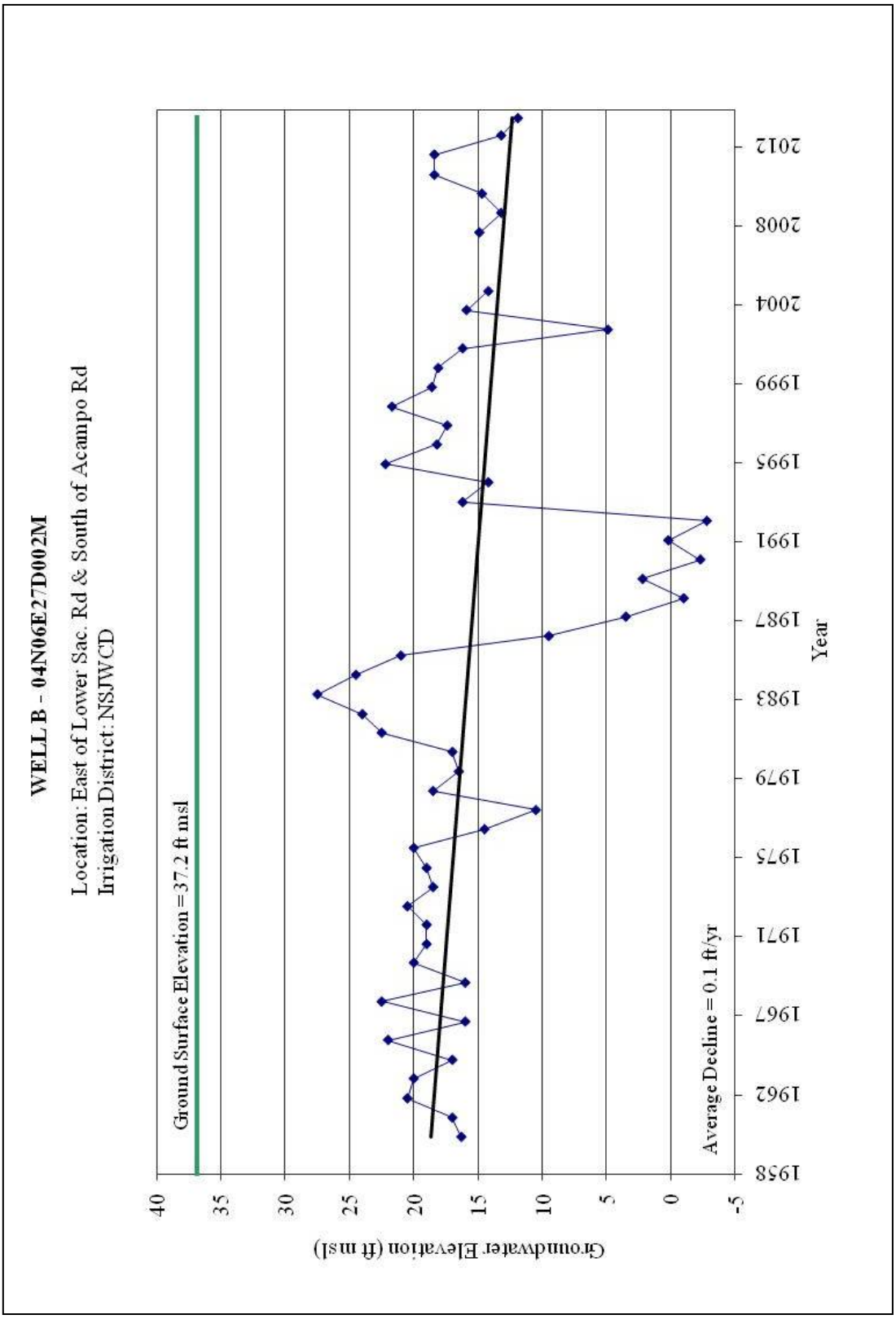

Figure 3-3: Fall Hydrograph Well B

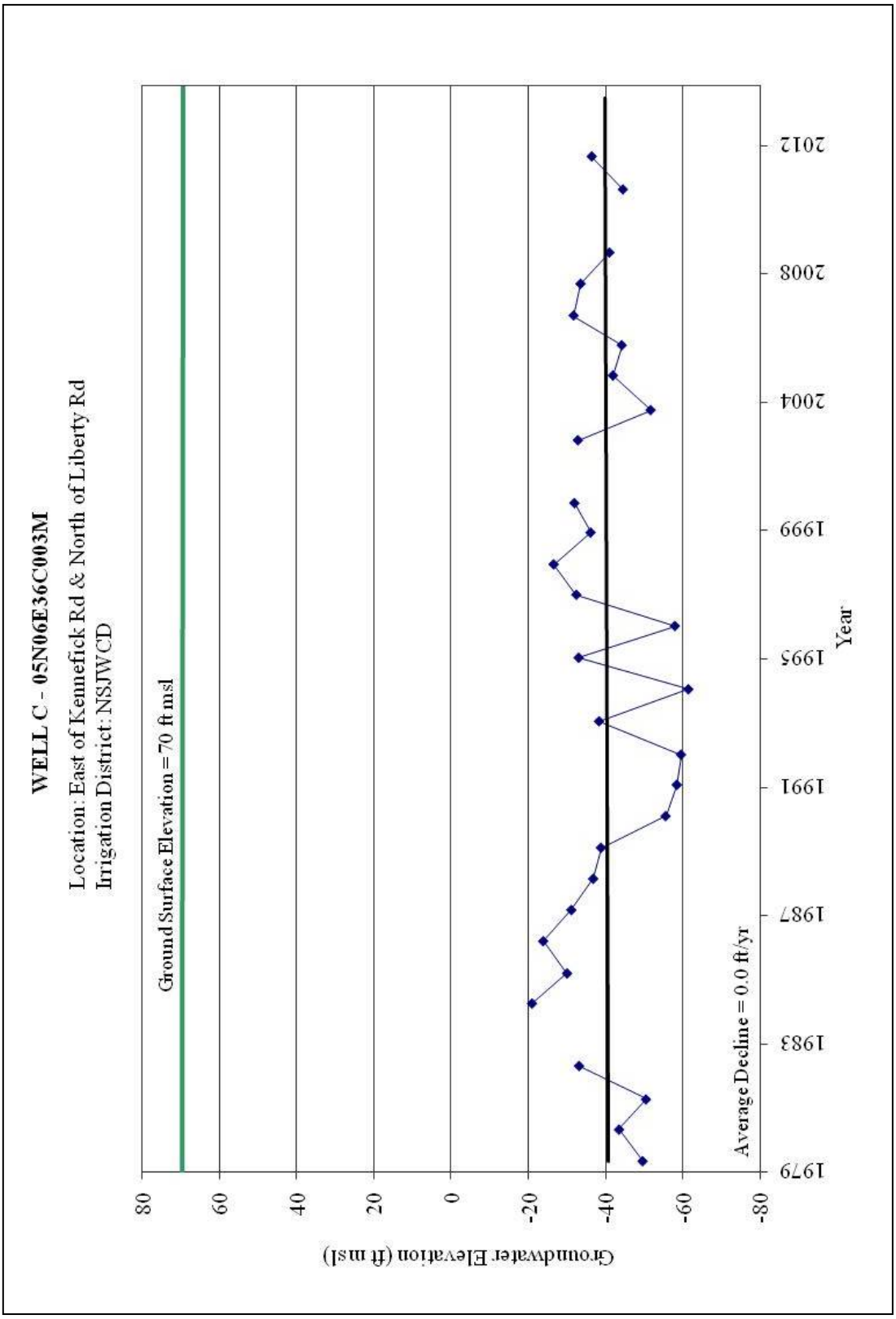

Figure 3-4: Fall Hydrograph Well C

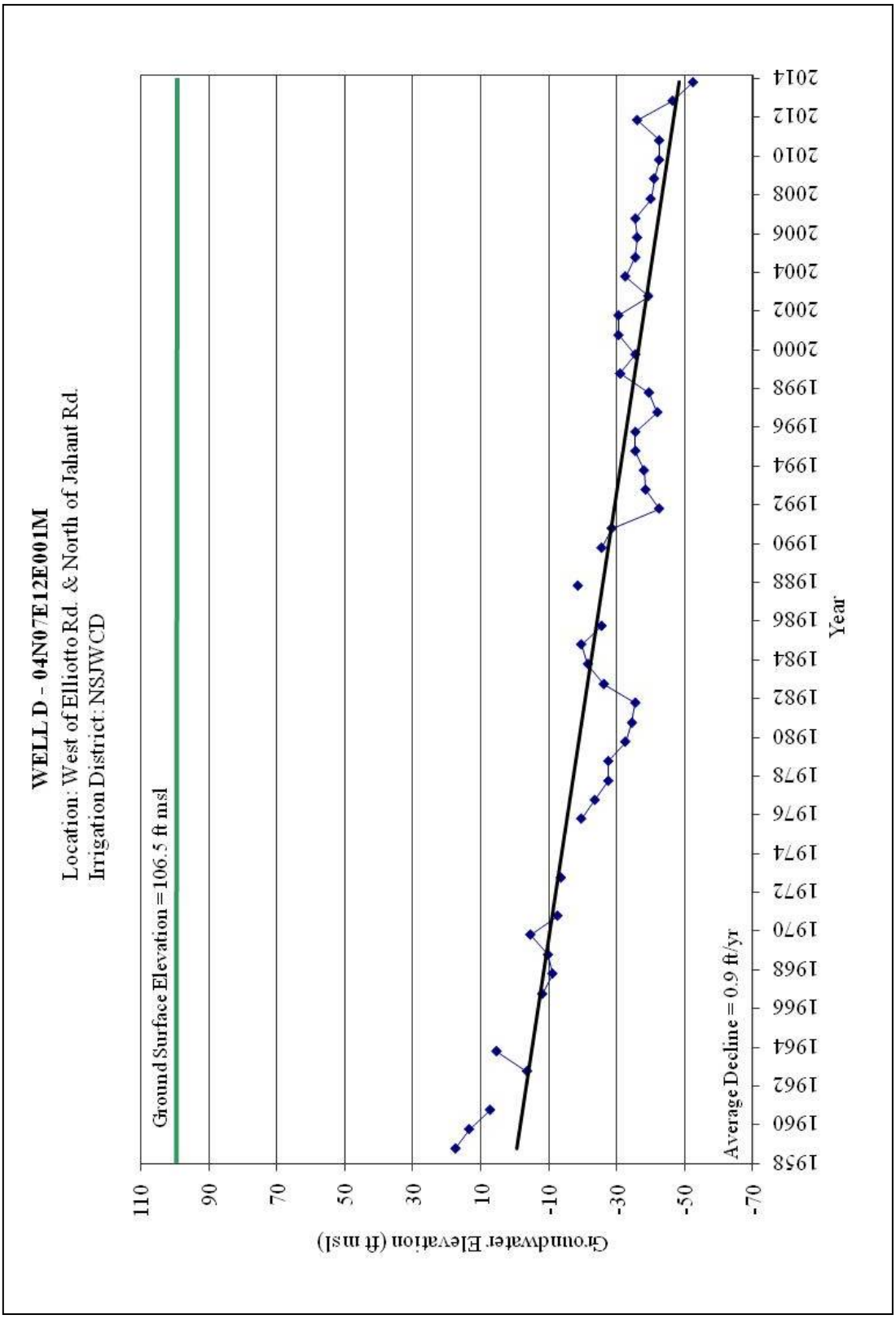

Figure 3-5: Fall Hydrograph Well D

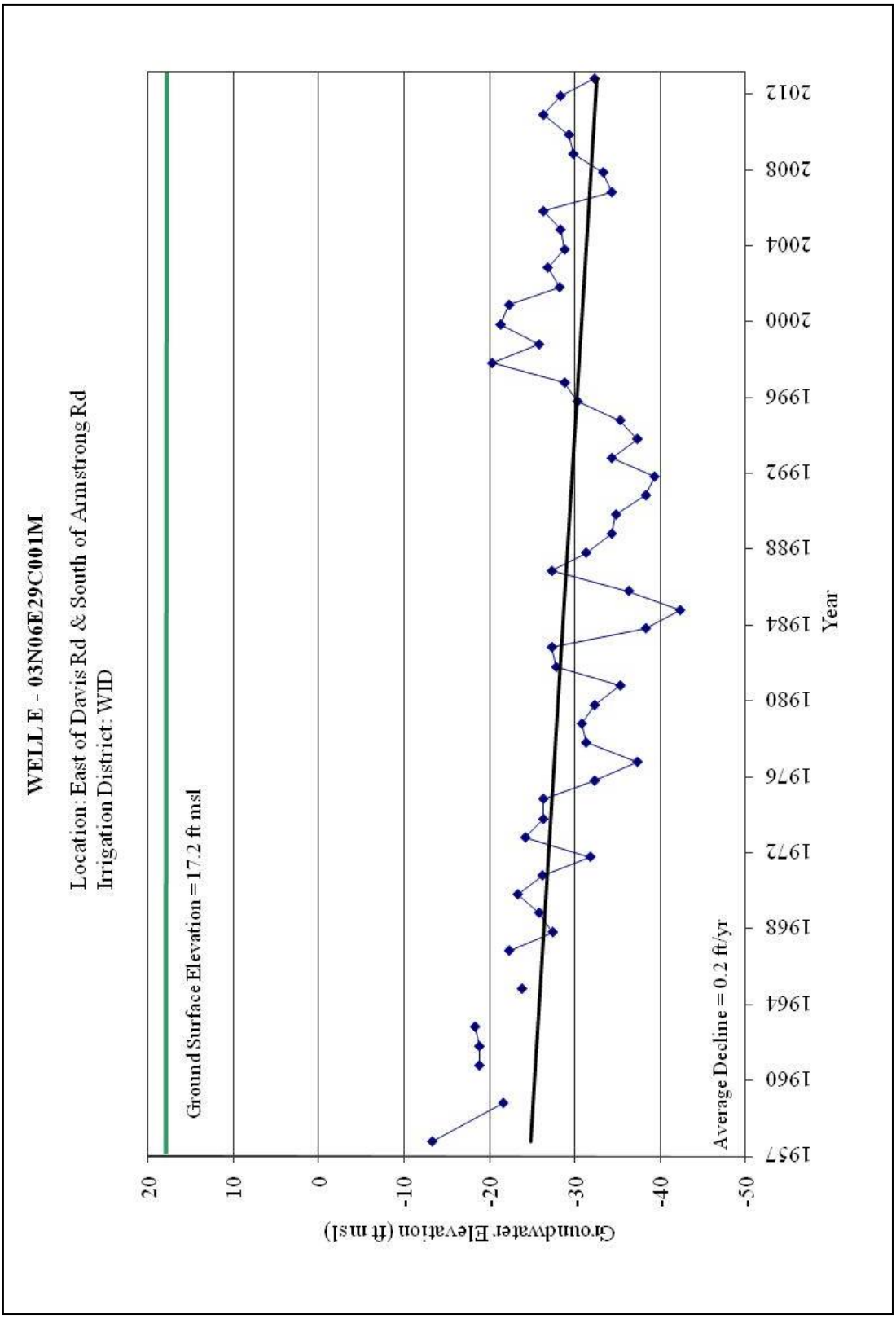

Figure 3-6: Fall Hydrograph Well E

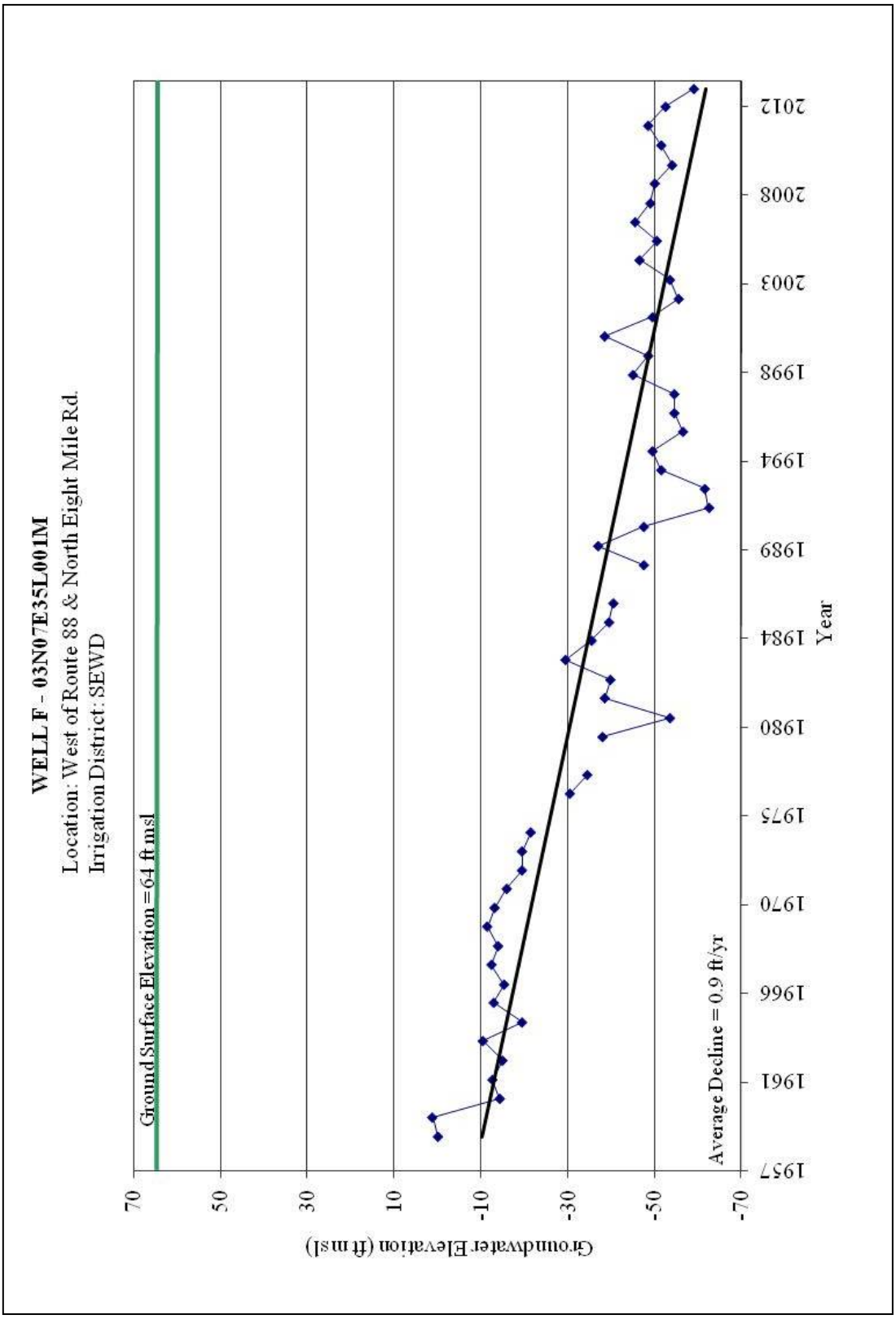

Figure 3-7: Fall Hydrograph Well F

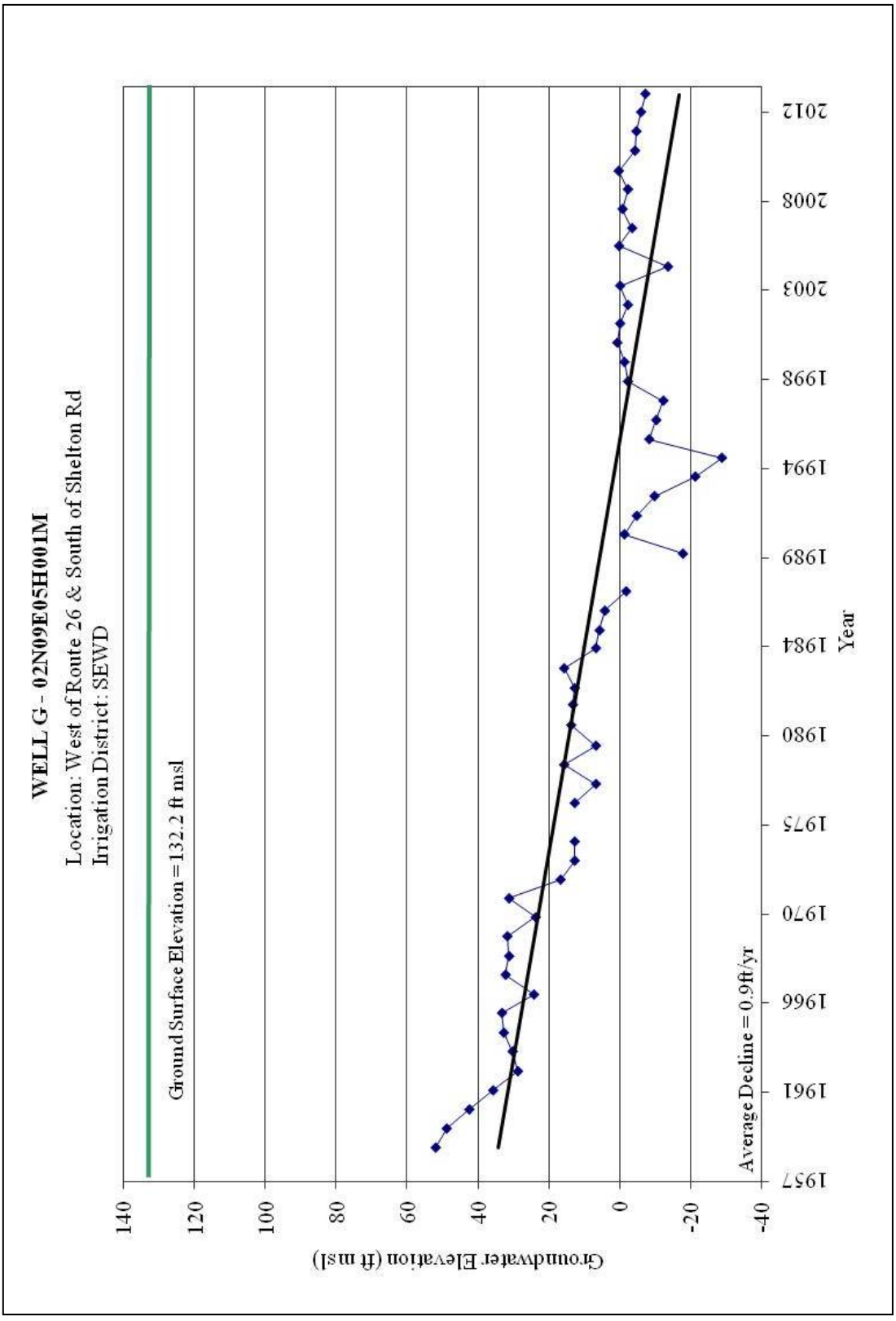

Figure 3-8: Fall Hydrograph Well G

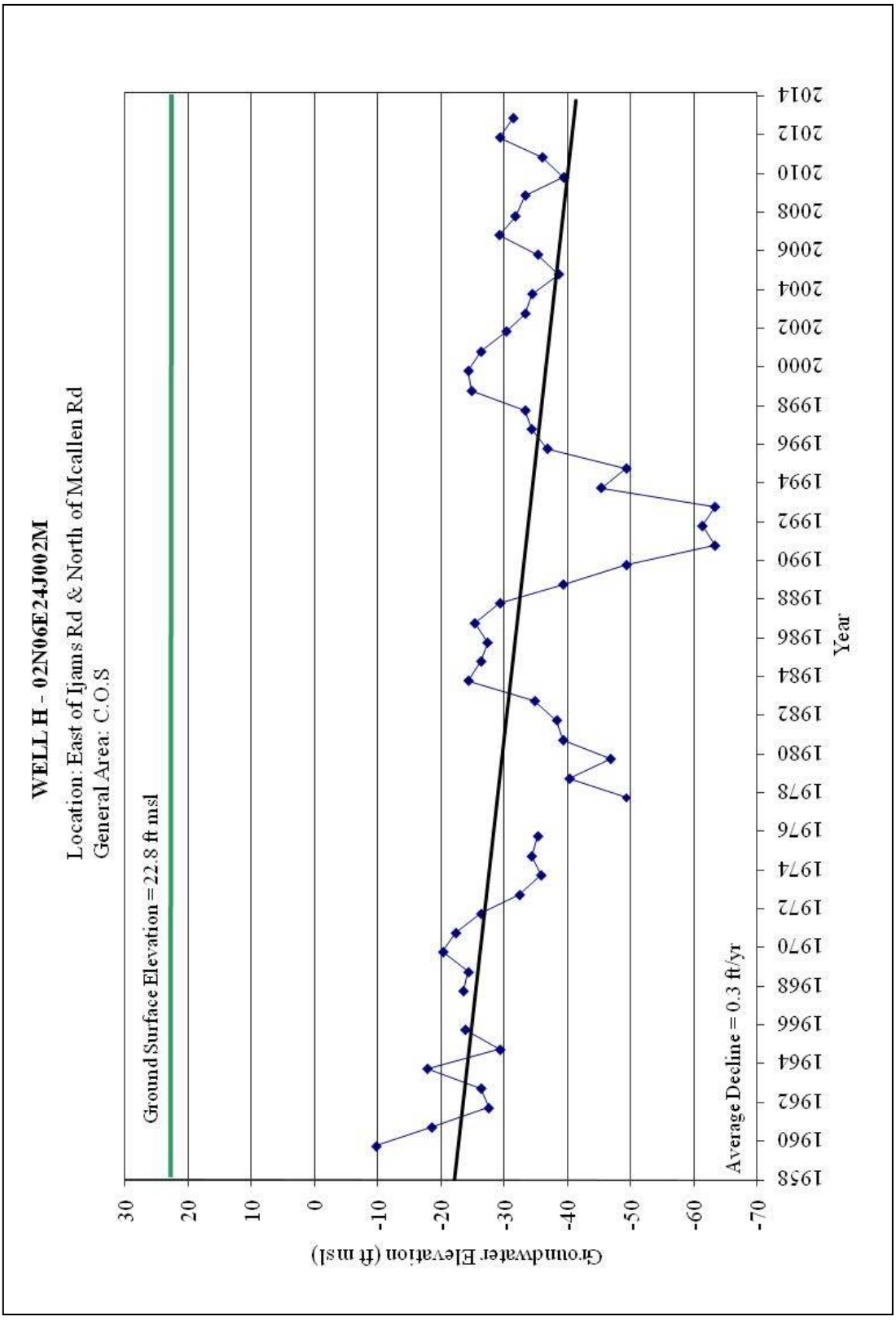

Figure 3-9: Fall Hydrograph Well H

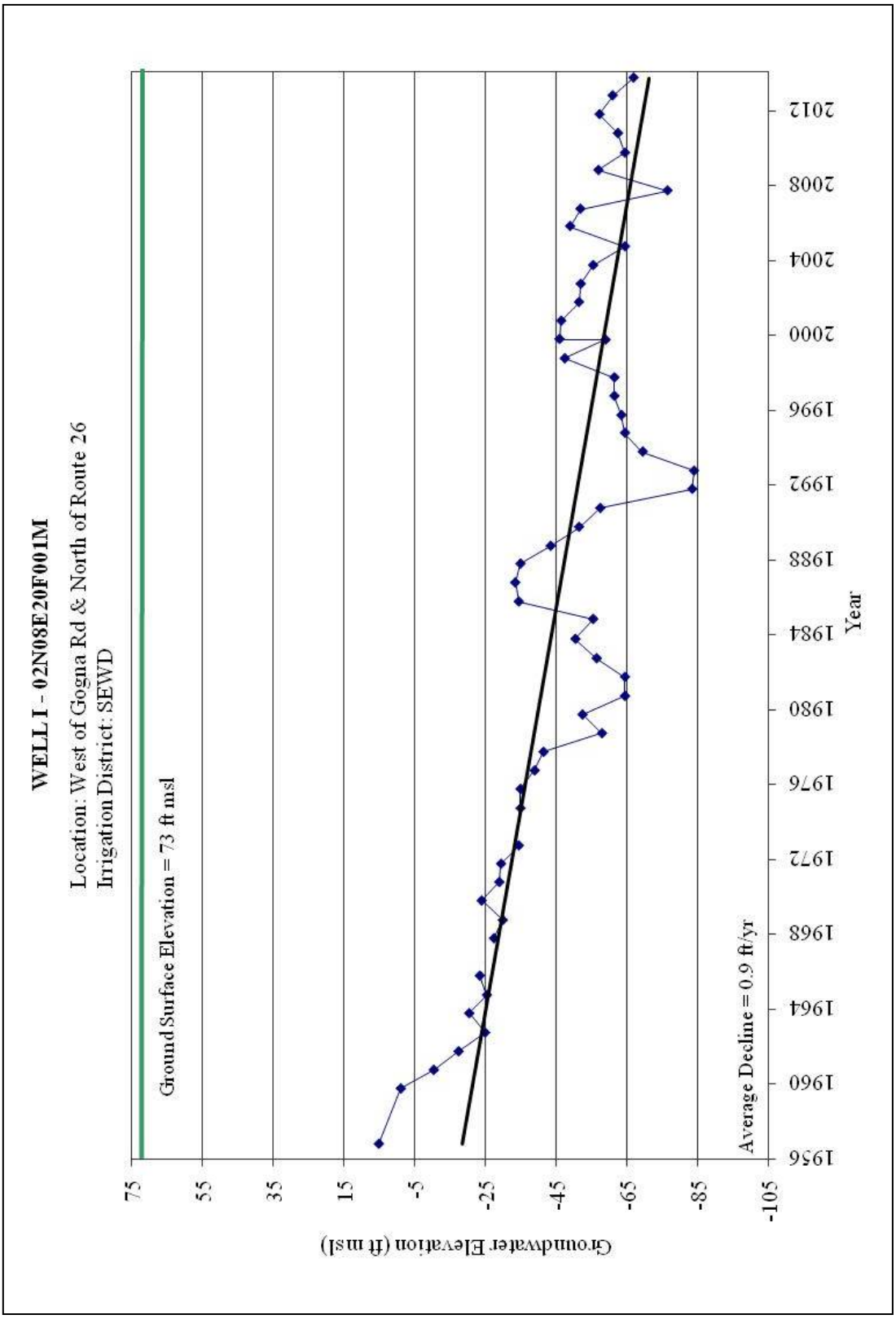

Figure 3-10: Fall Hydrograph Well I

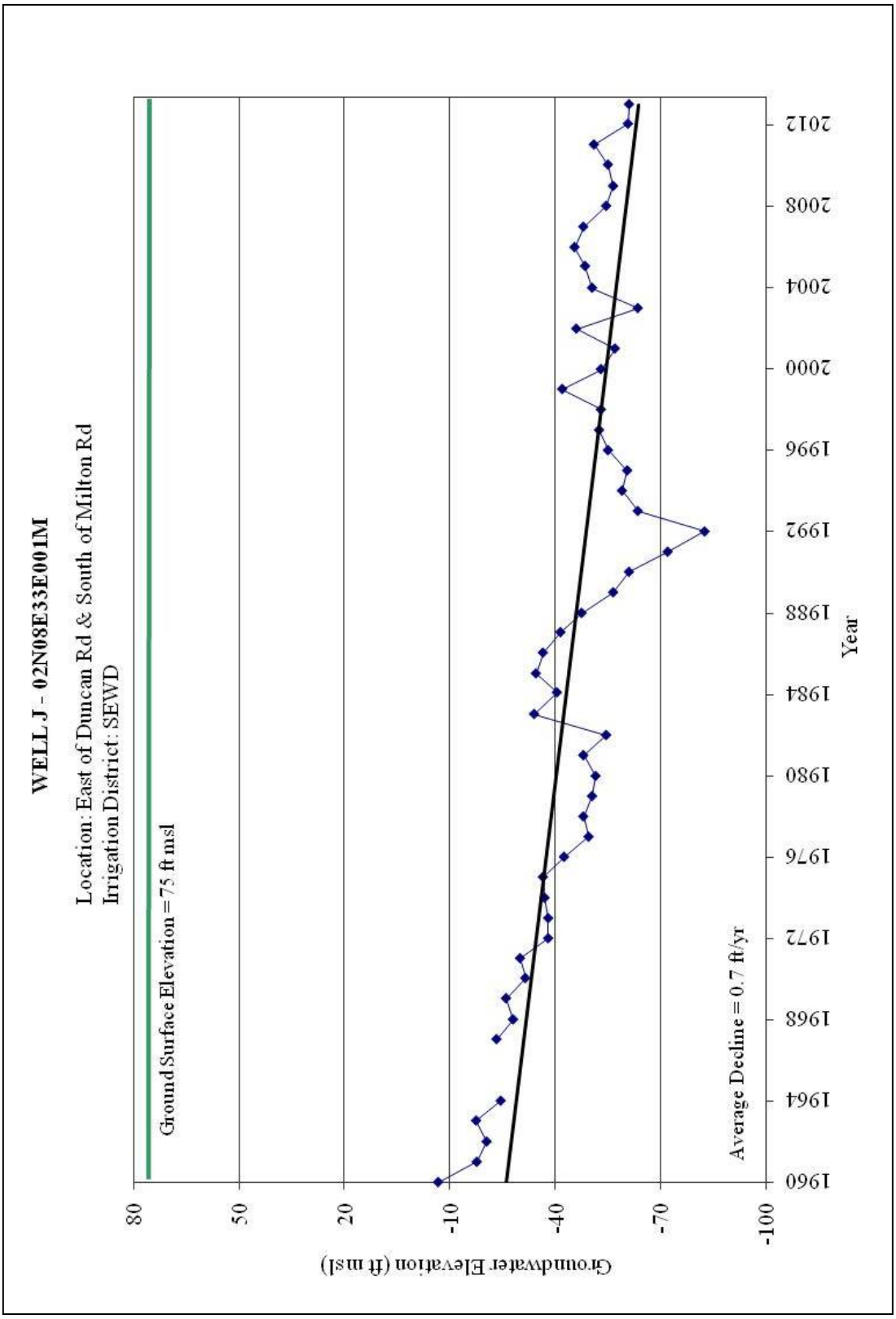

Figure 3-11: Fall Hydrograph Well J

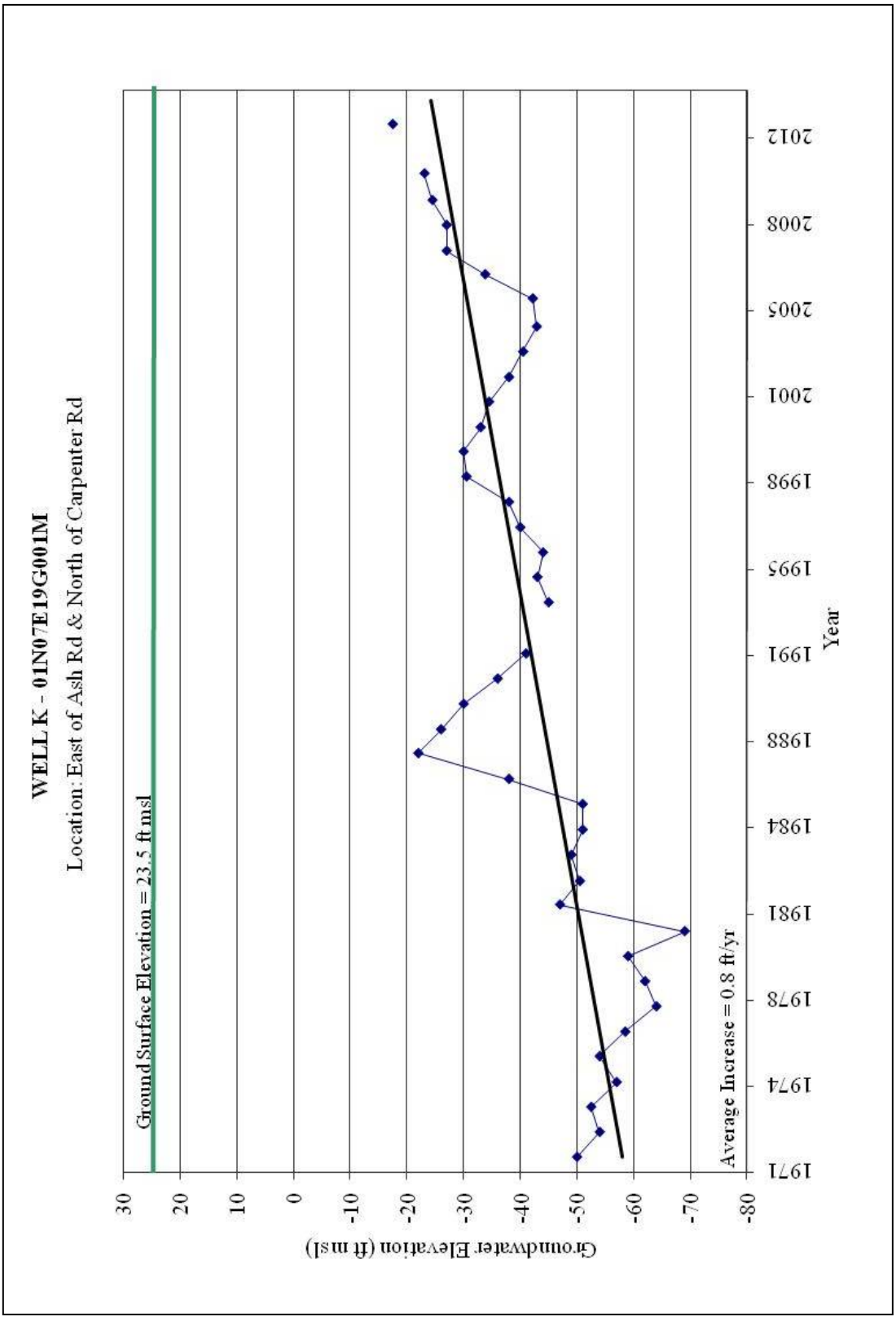

Figure 3-12: Fall Hydrograph Well K

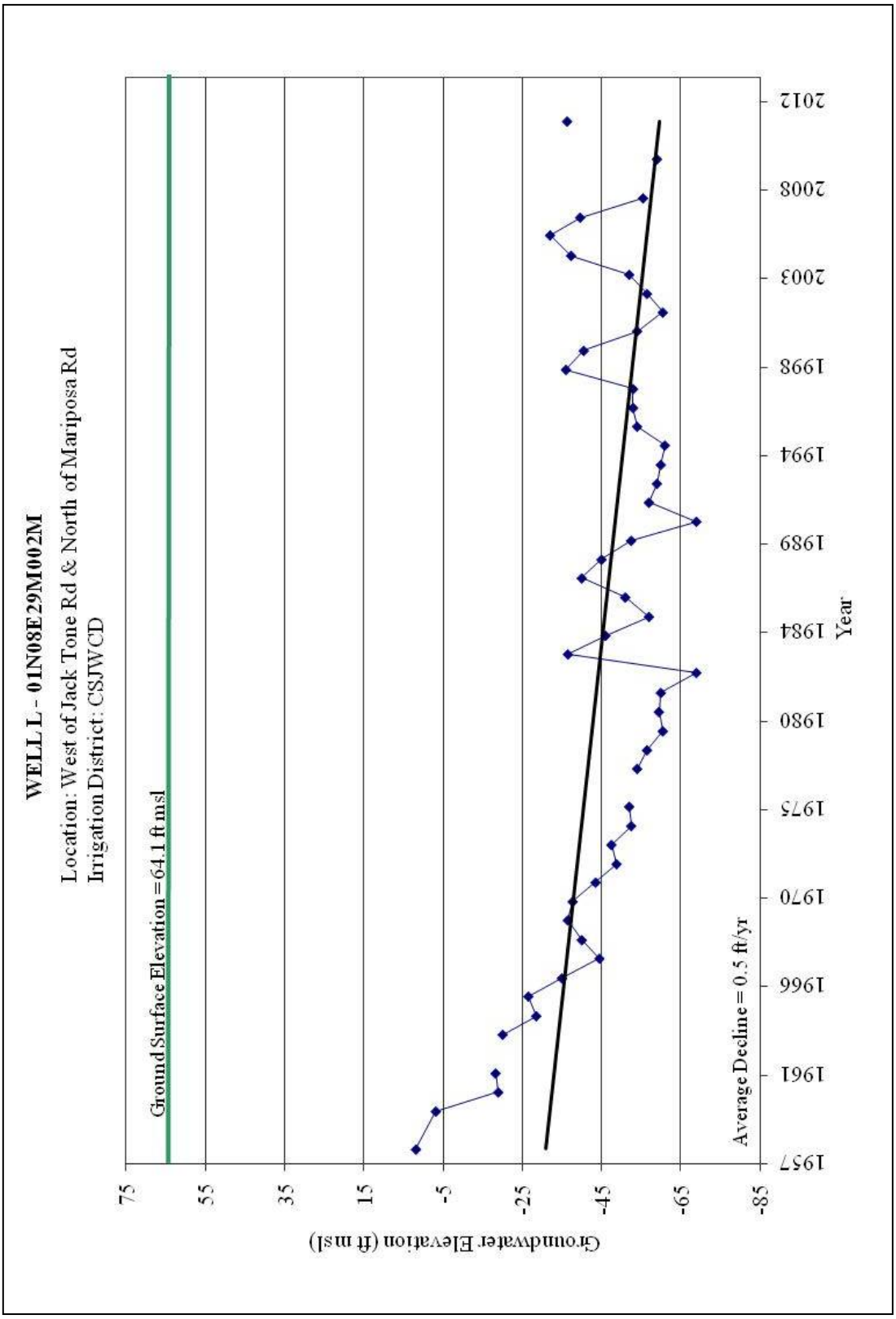

Figure 3-13: Fall Hydrograph Well L

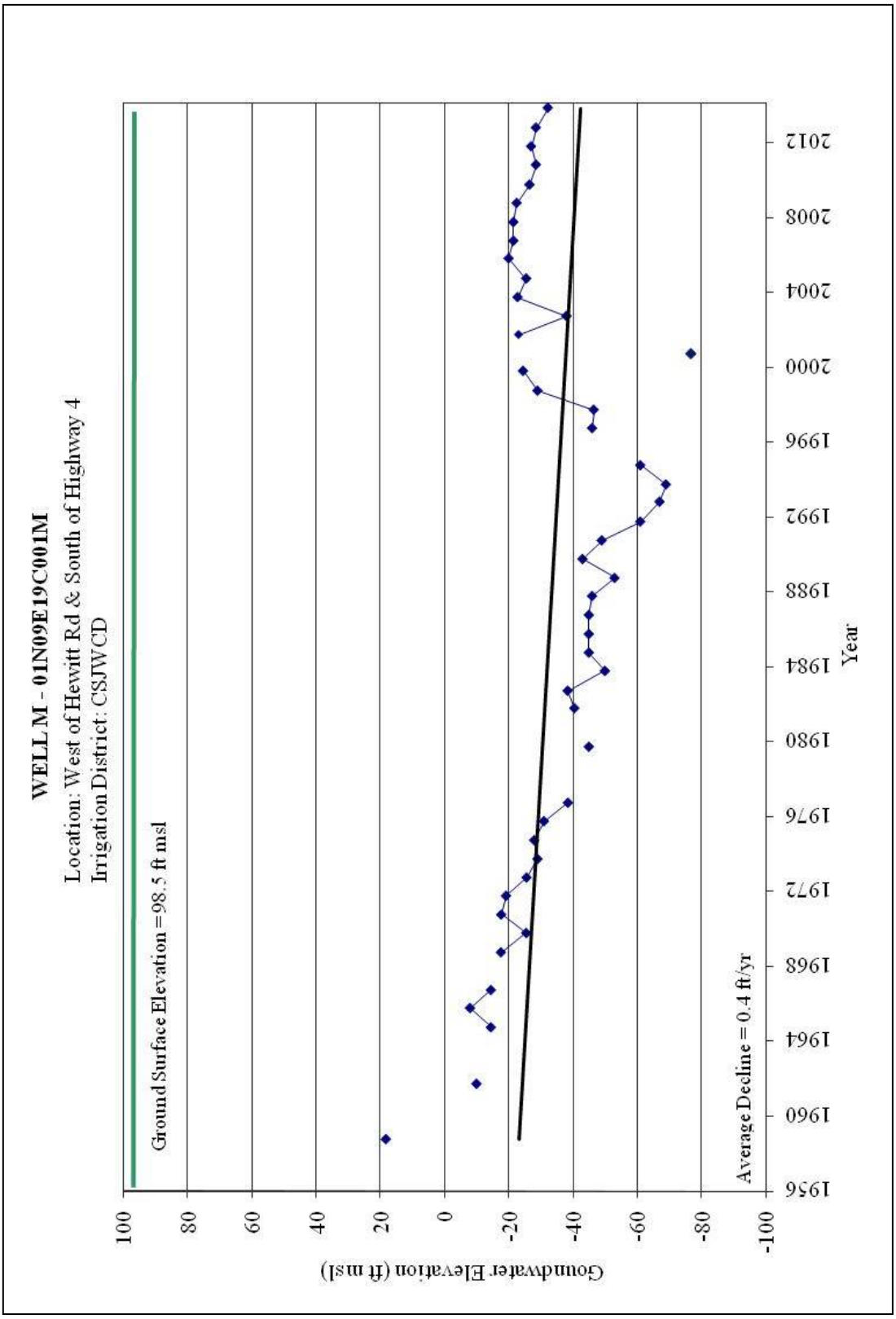

Figure 3-14: Fall Hydrograph Well M

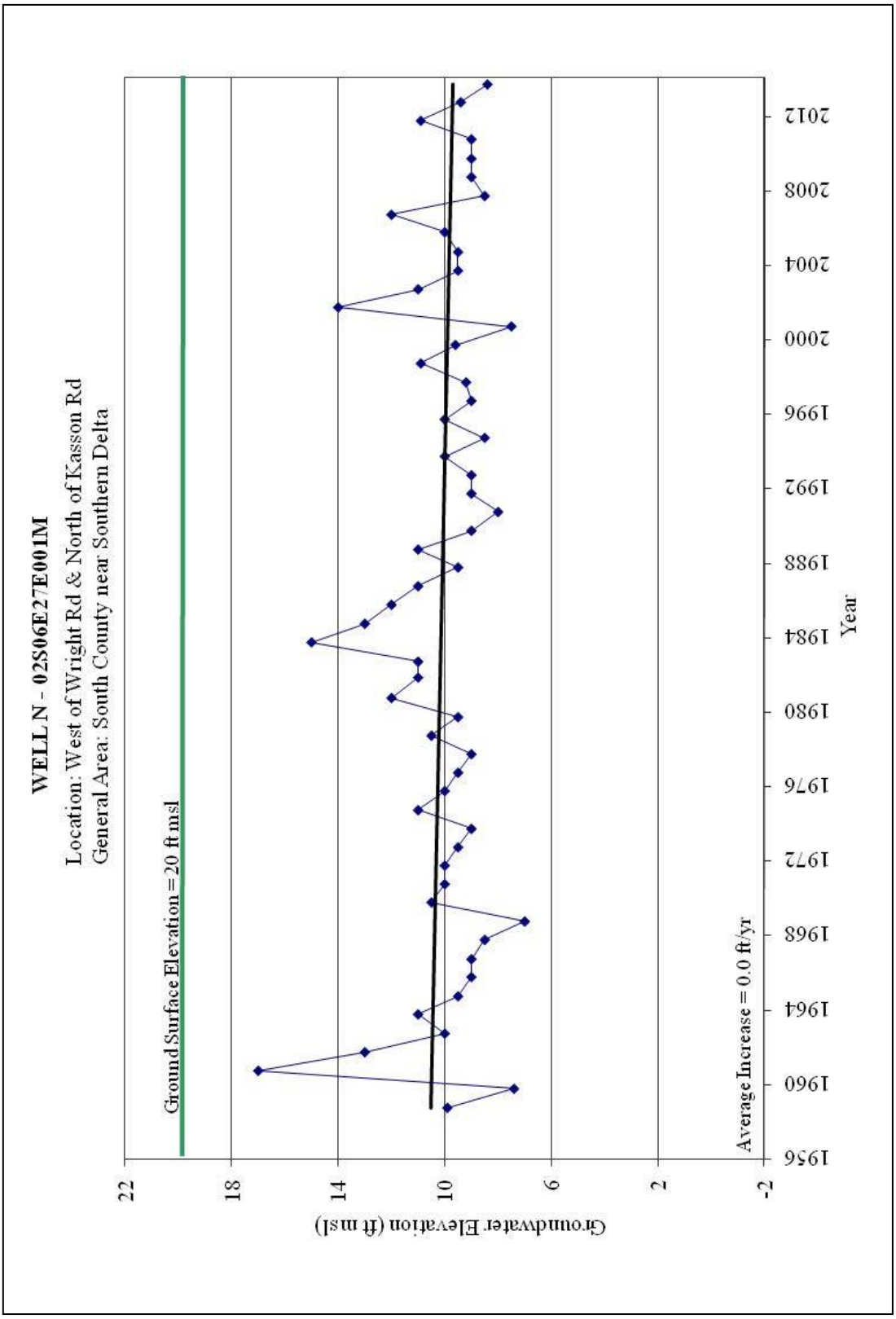

Figure 3-15: Fall Hydrograph Well N

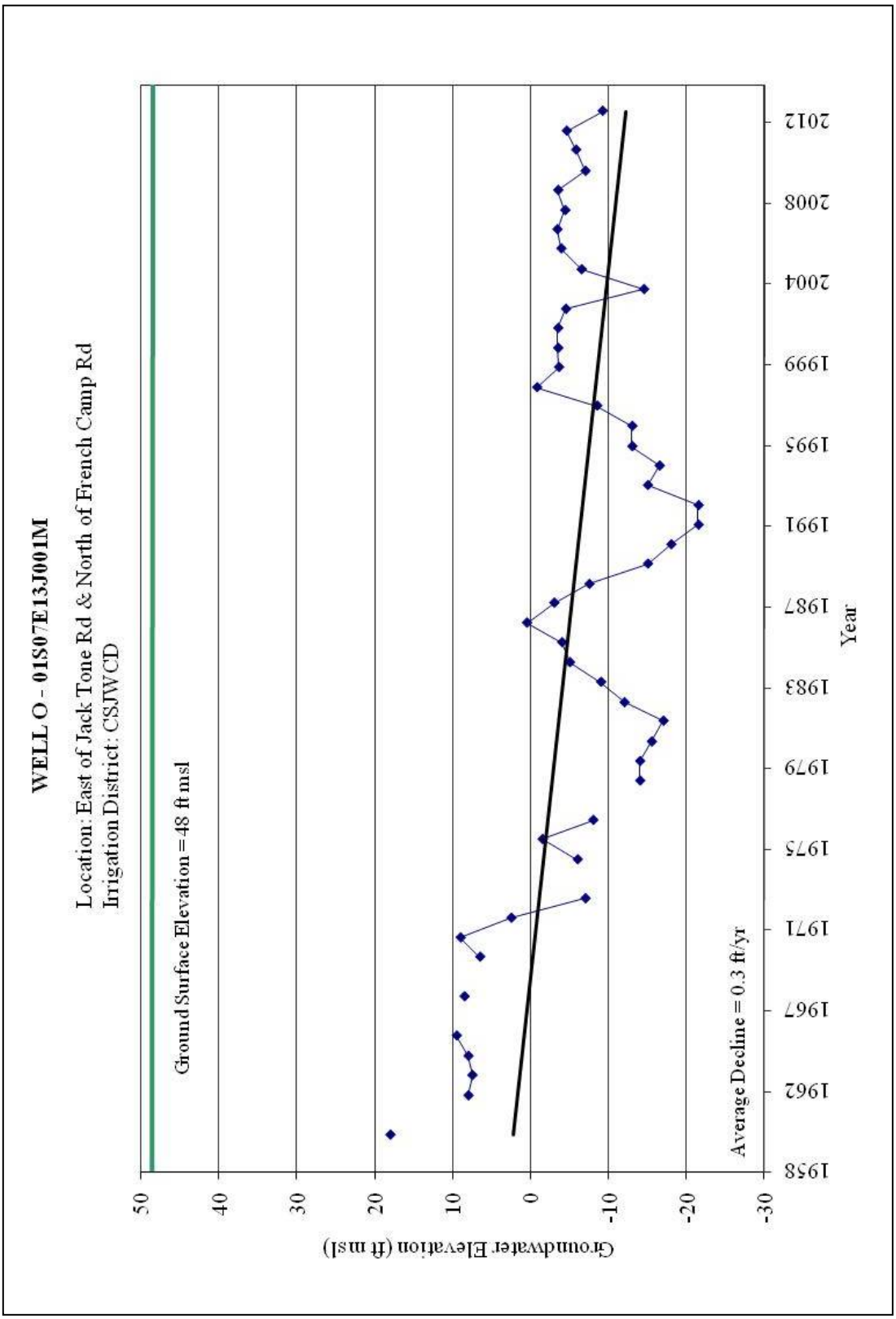

Figure 3-16: Fall Hydrograph Well O

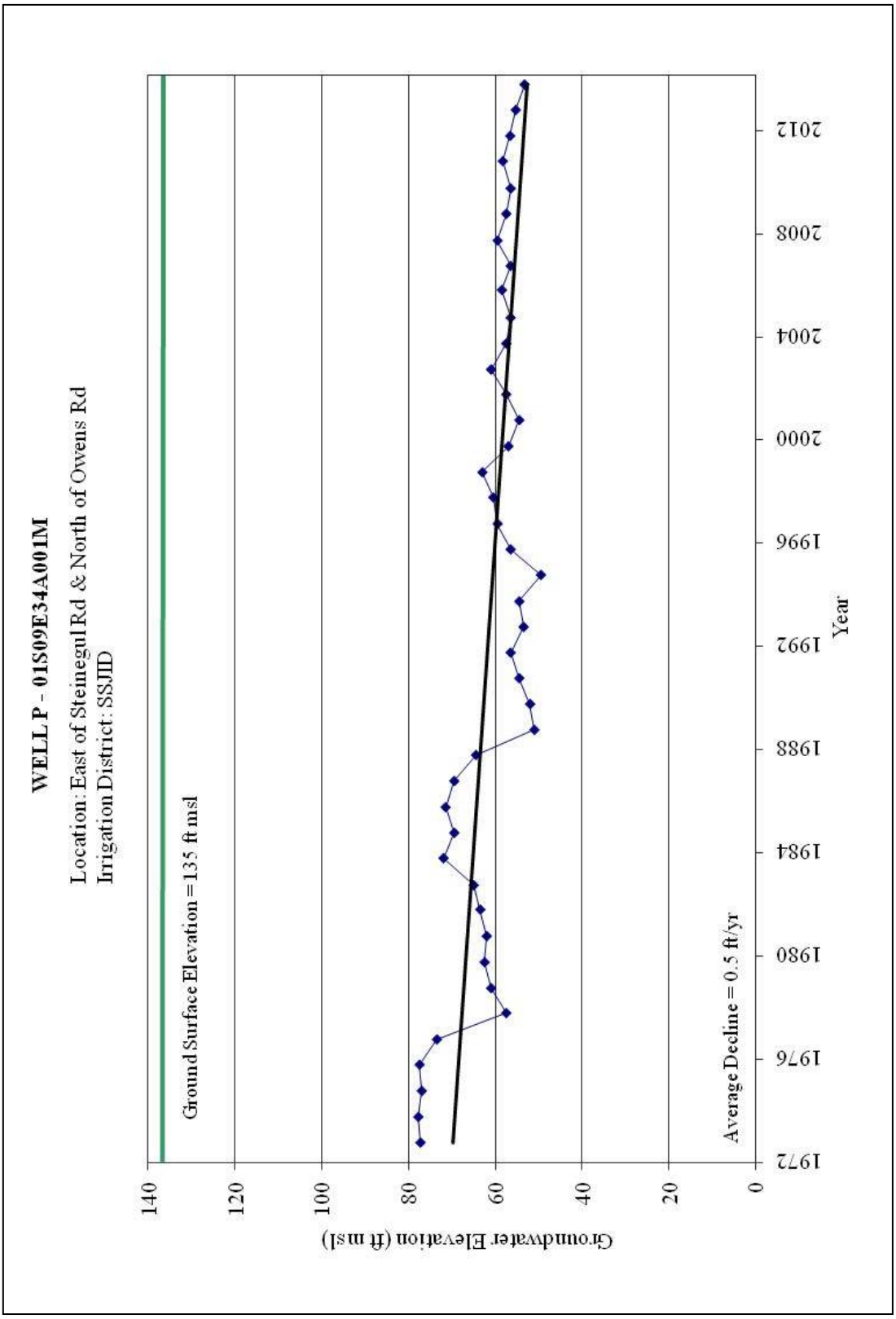

Figure 3-17: Fall Hydrograph Well P

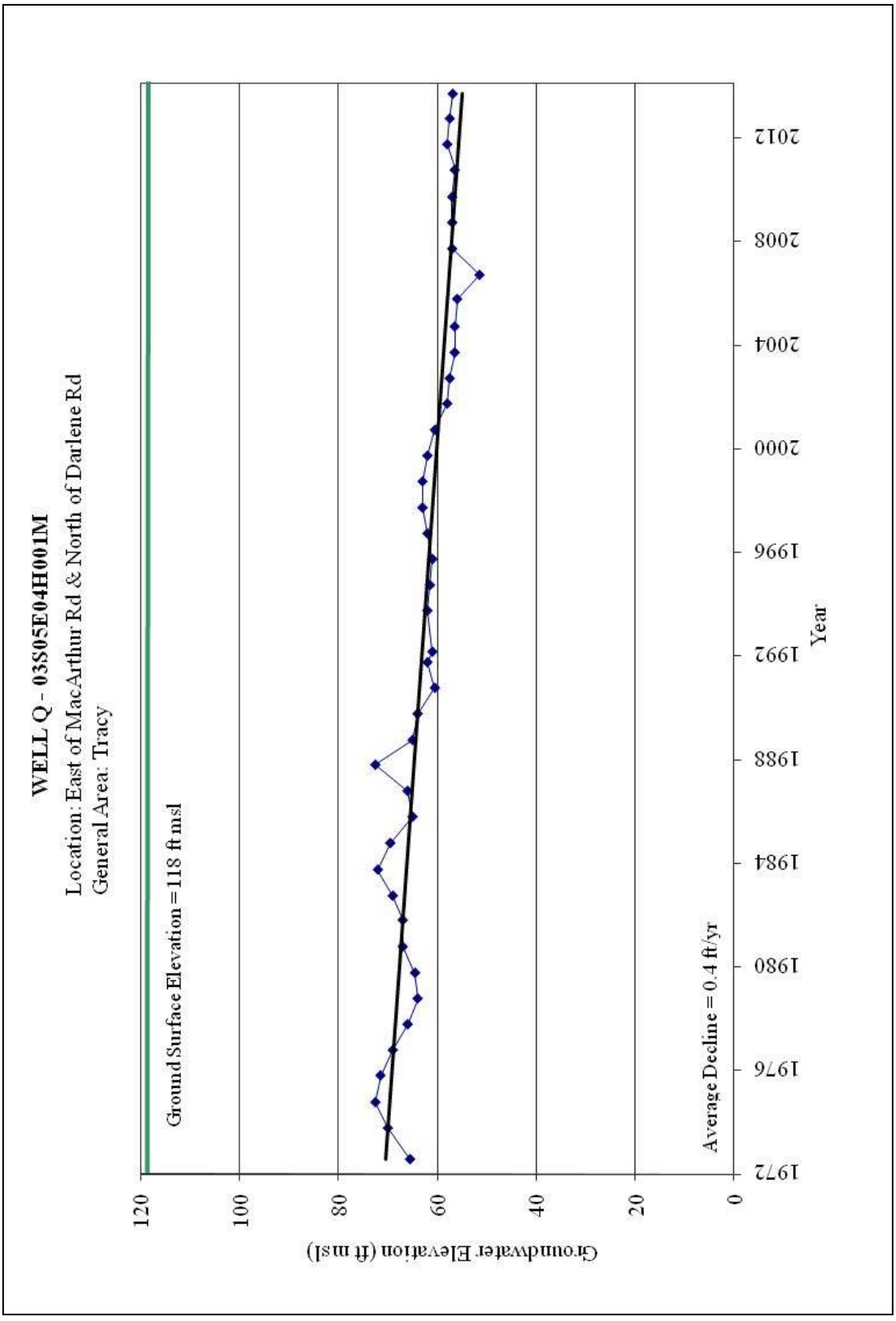

Figure 3-18: Fall Hydrograph Well Q

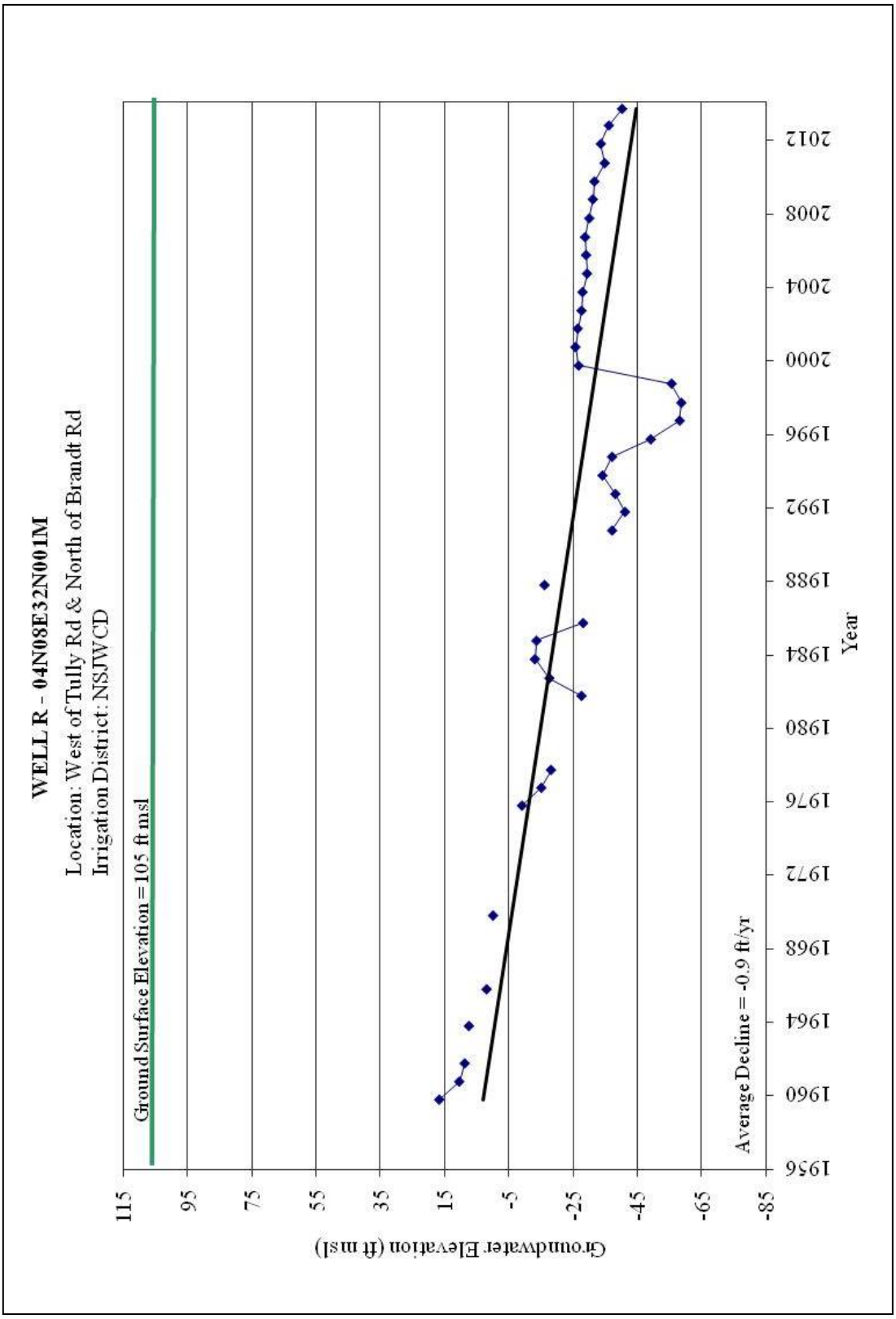

Figure 3-19: Fall Hydrograph Well R

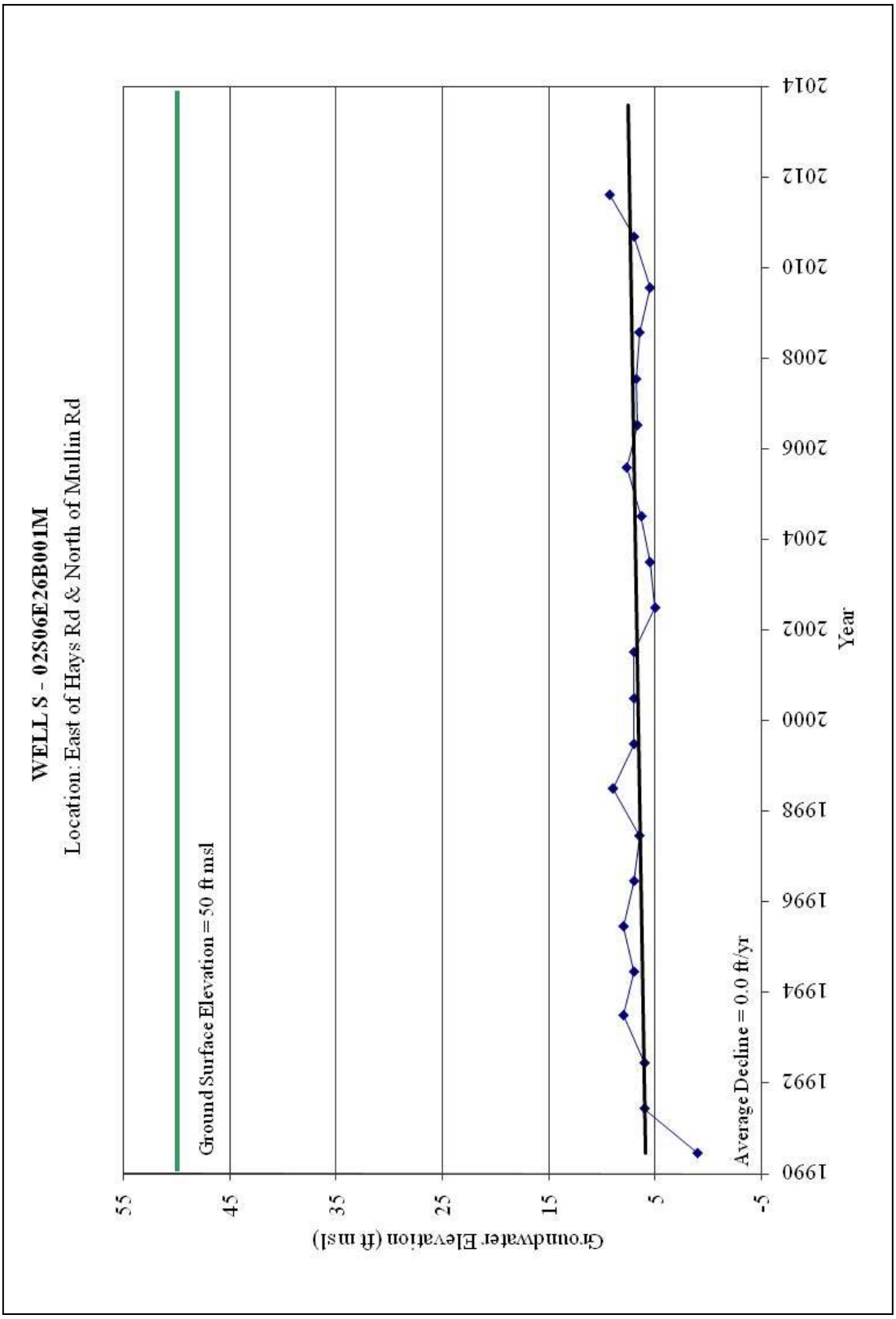

Figure 3-20: Fall Hydrograph Well S

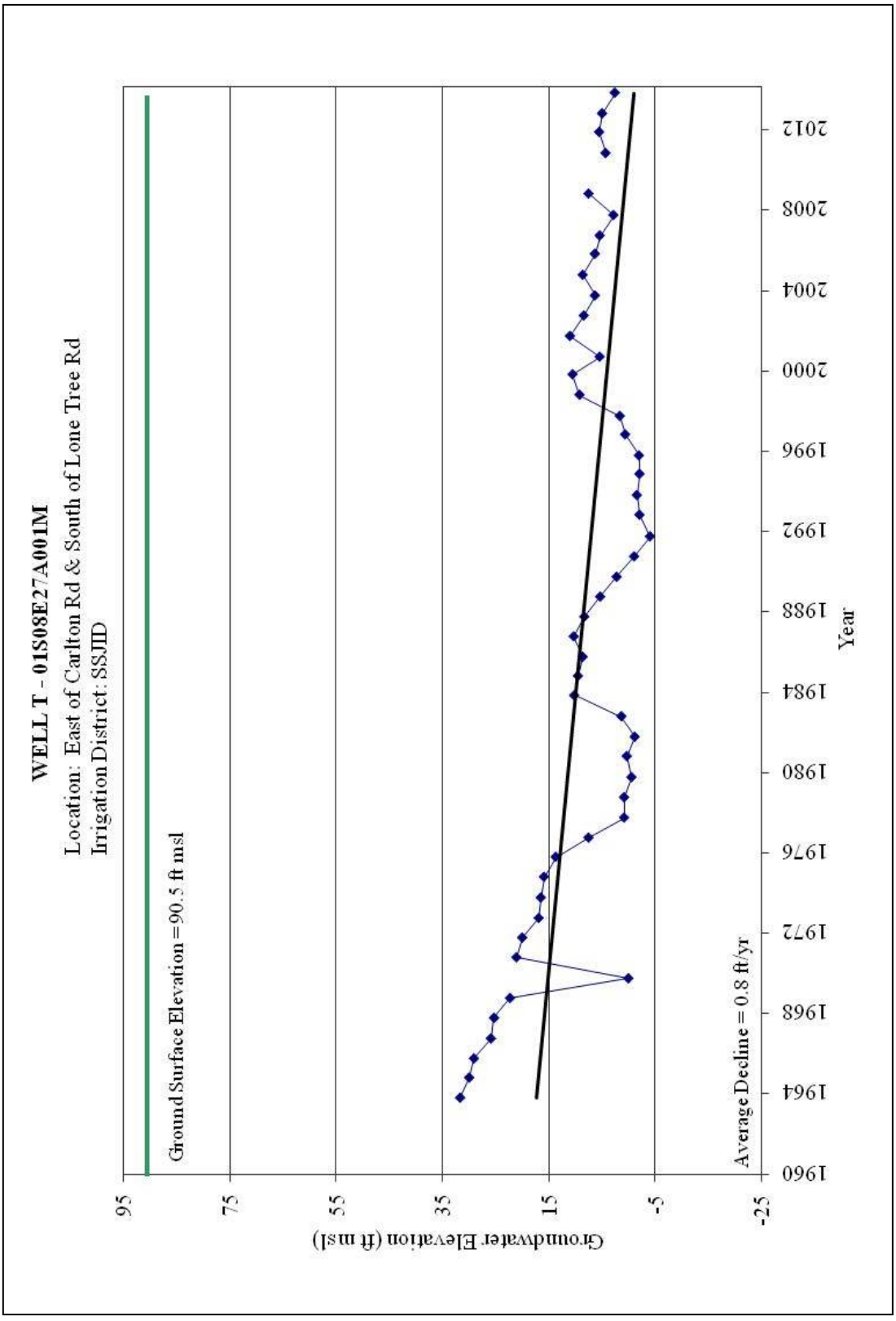

Figure 3-21: Fall Hydrograph Well T

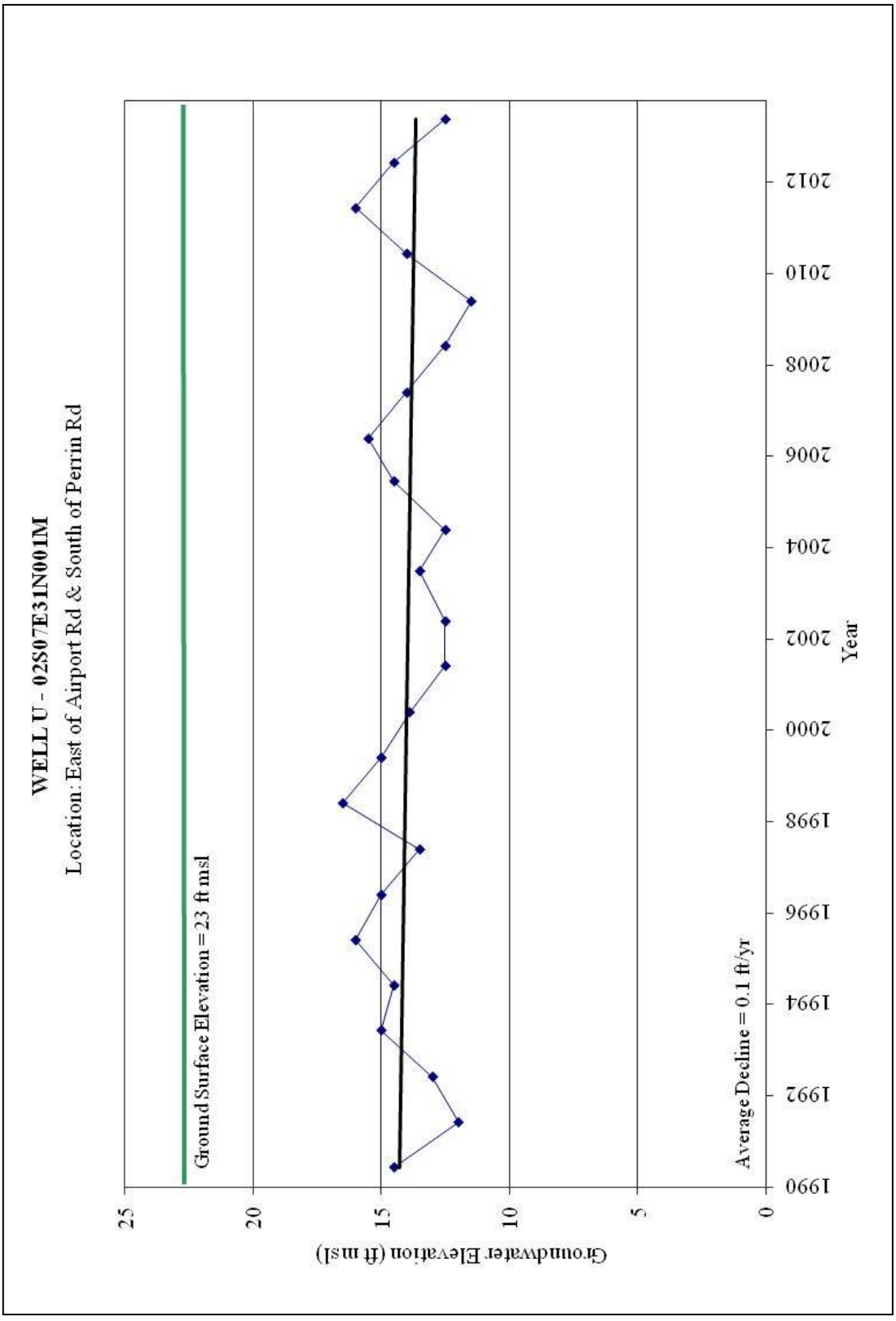

Figure 3-22: Fall Hydrograph Well U

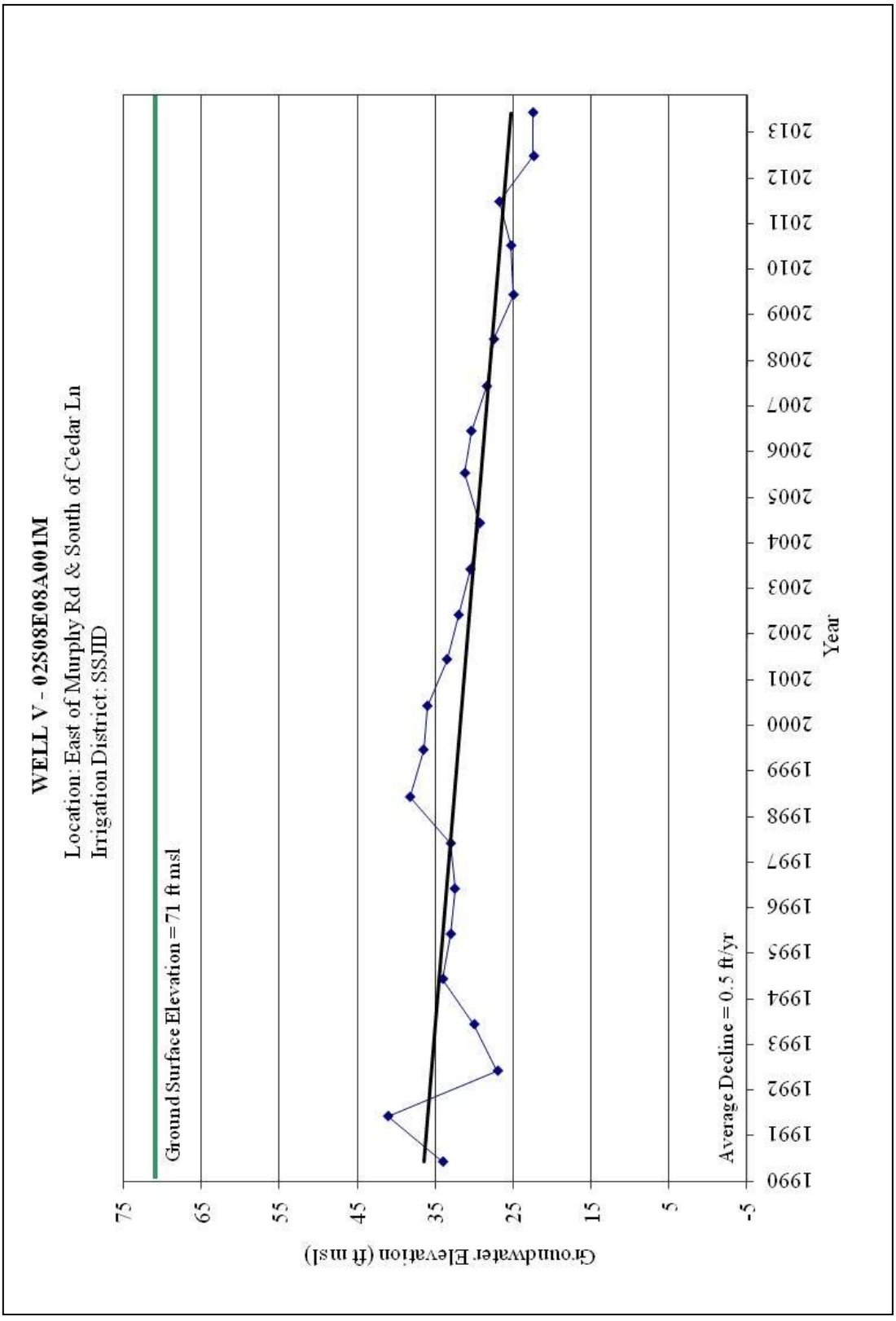

Figure 3-23: Fall Hydrograph Well V

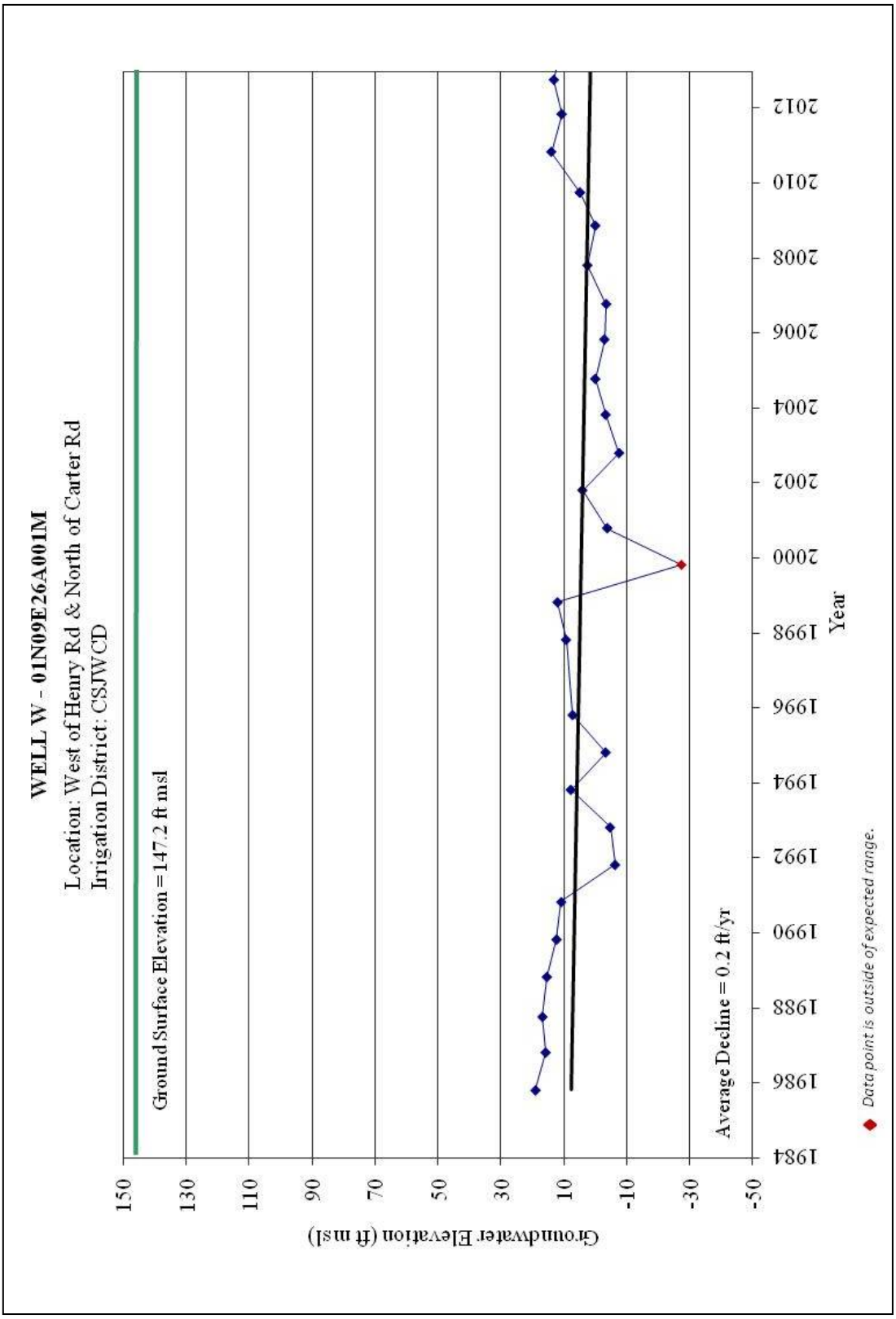

Figure 3-24: Fall Hydrograph Well W

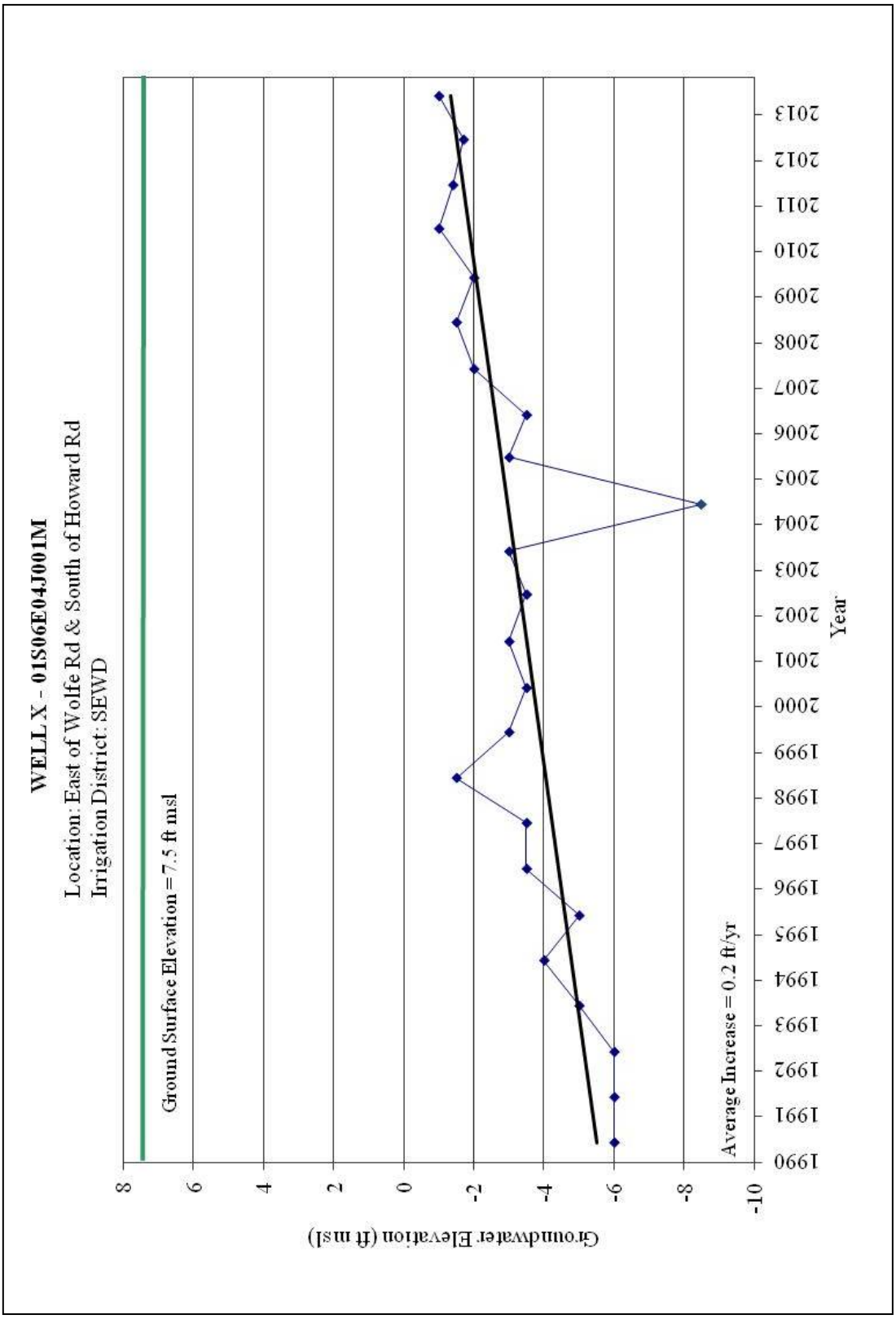

Figure 3-25: Fall Hydrograph Well X

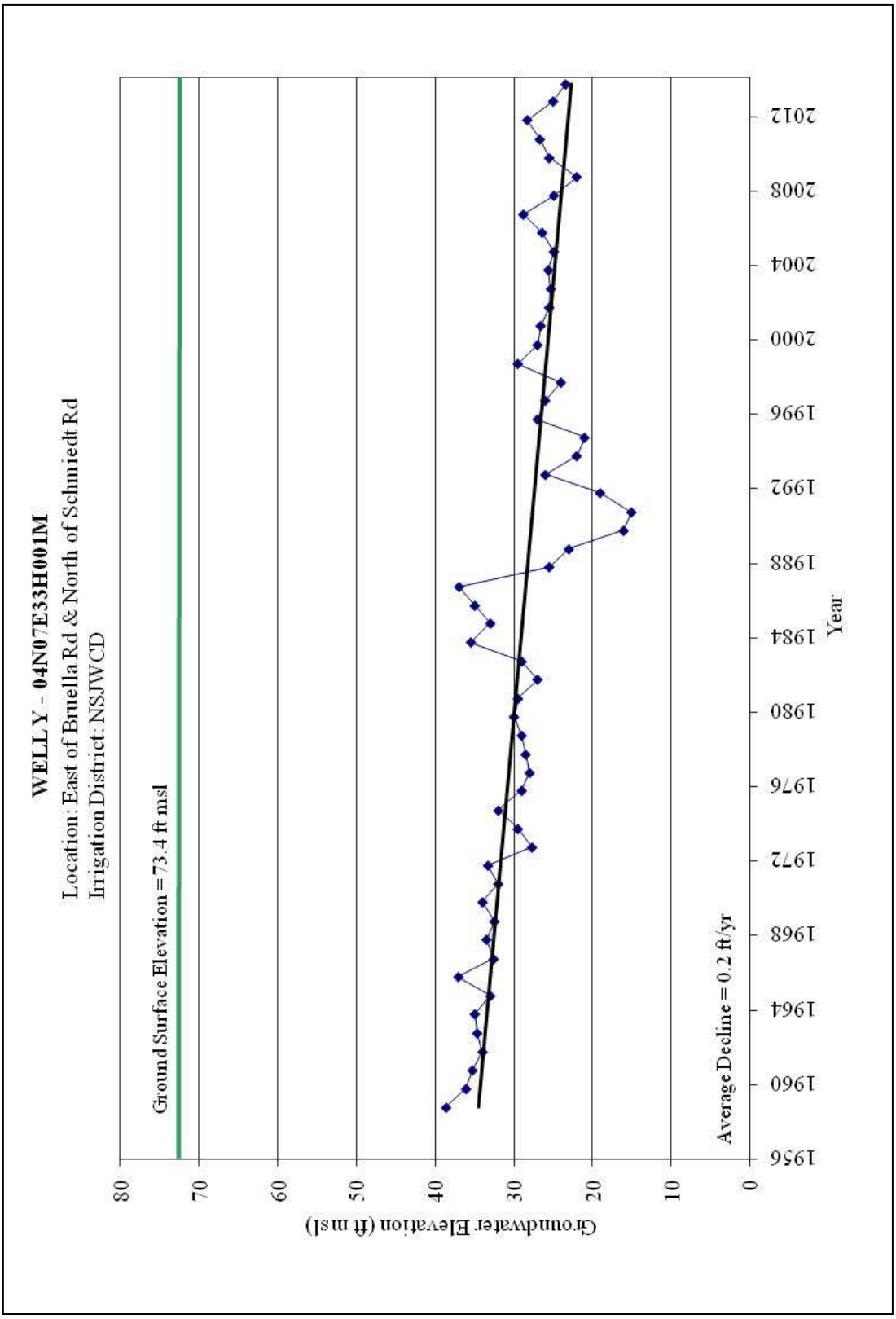

Figure 3-26: Fall Hydrograph Well Y

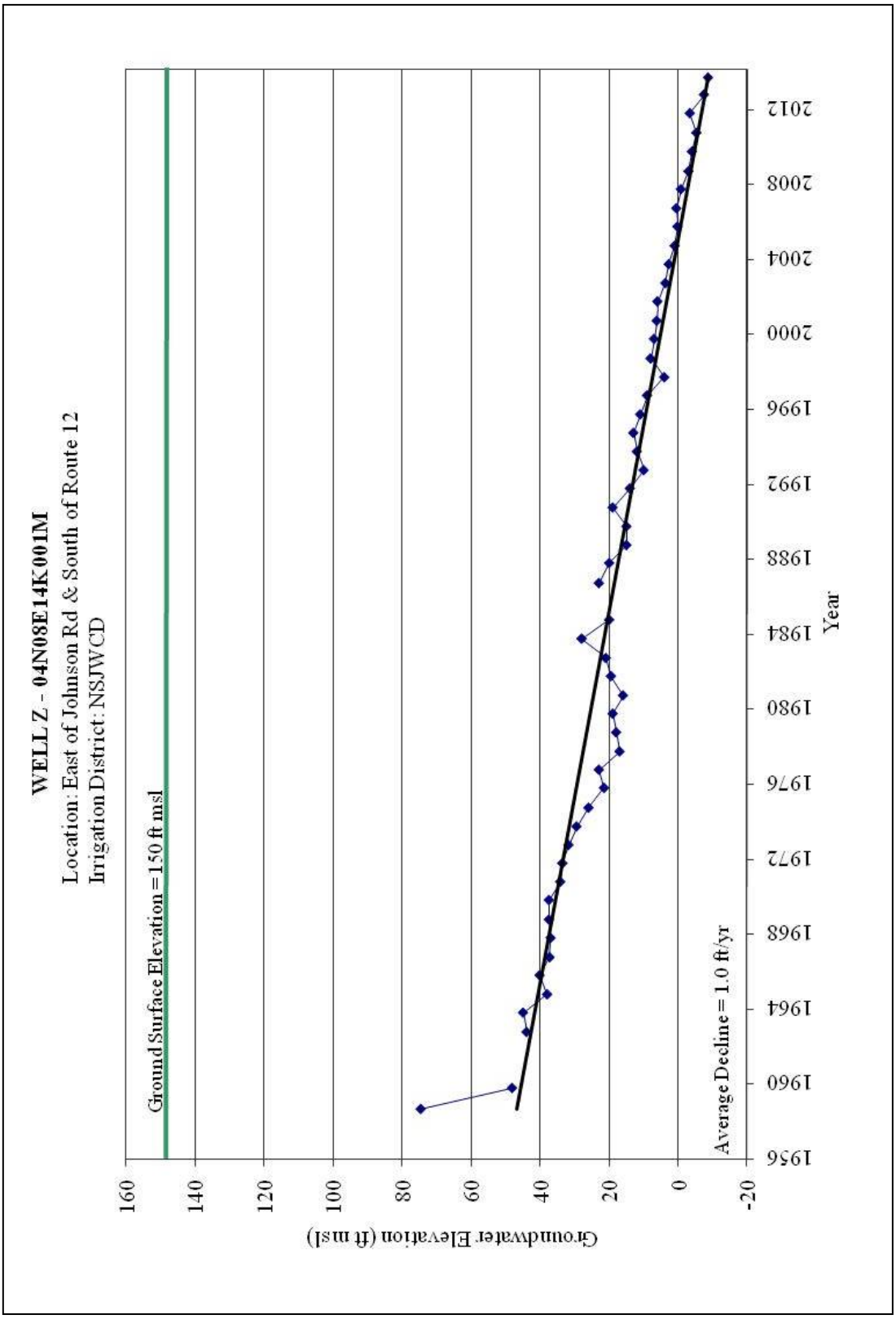

Figure 3-27: Fall Hydrograph Well Z

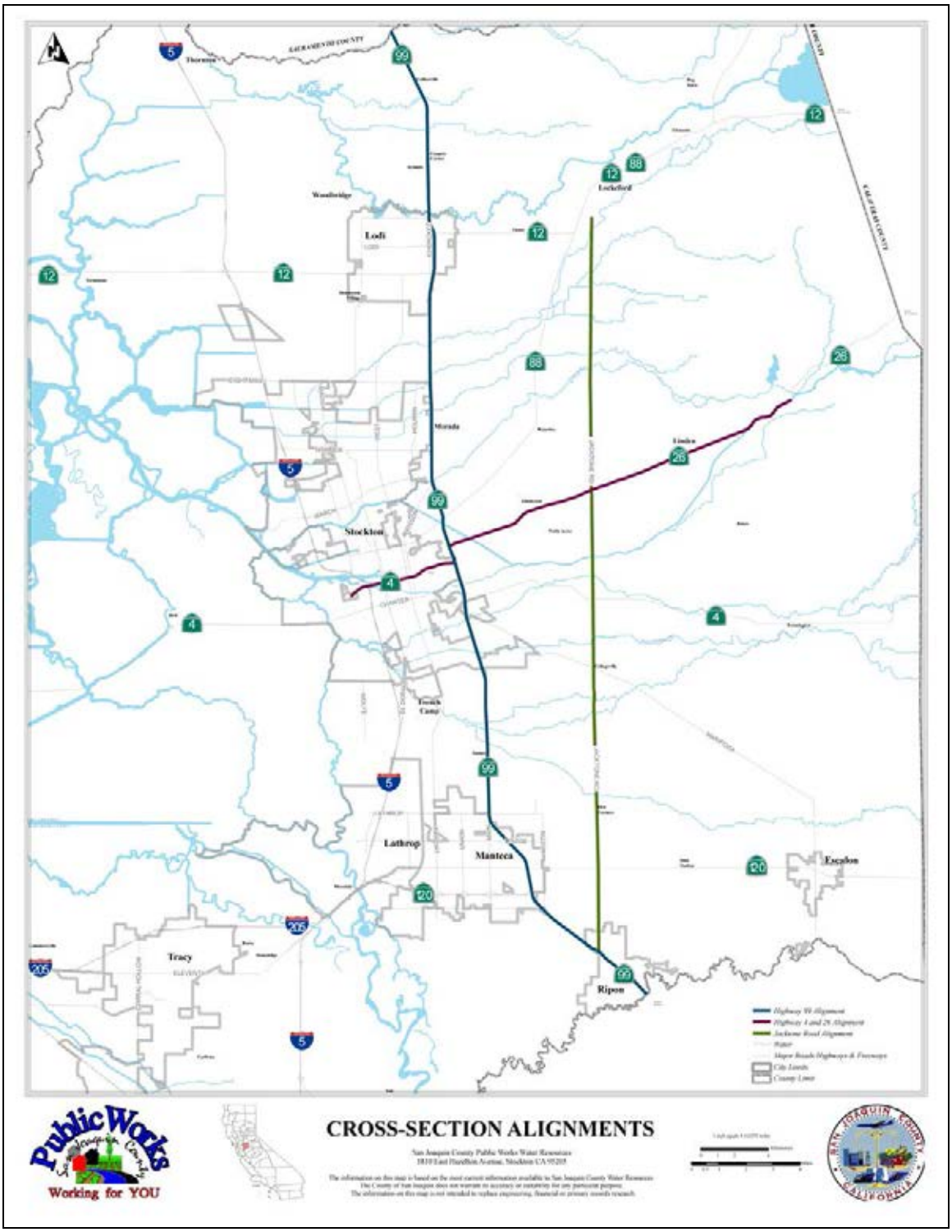

Figure 3-28: Cross Section Alignments

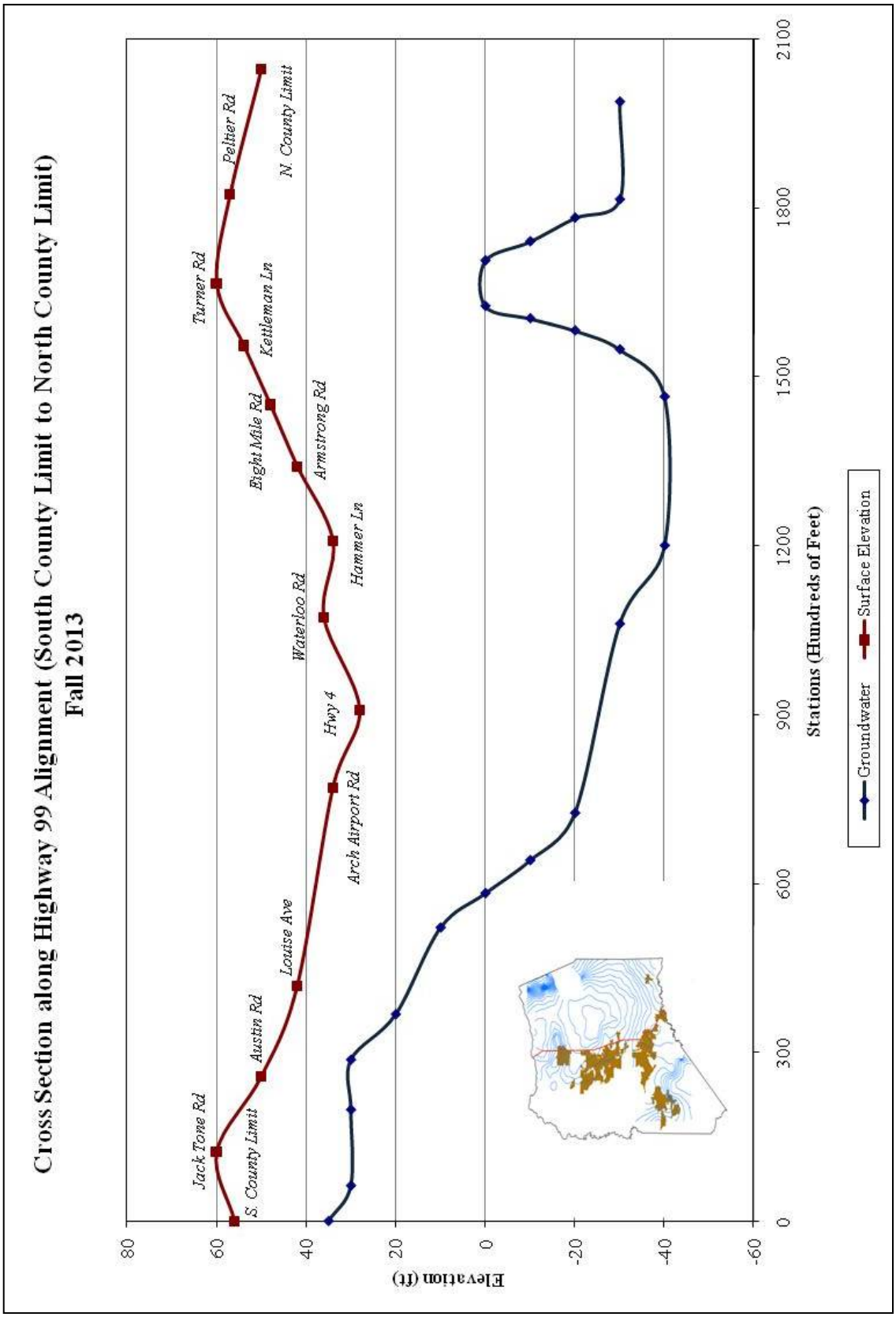

Figure 3-29: Highway 99 Cross Section Fall 2013

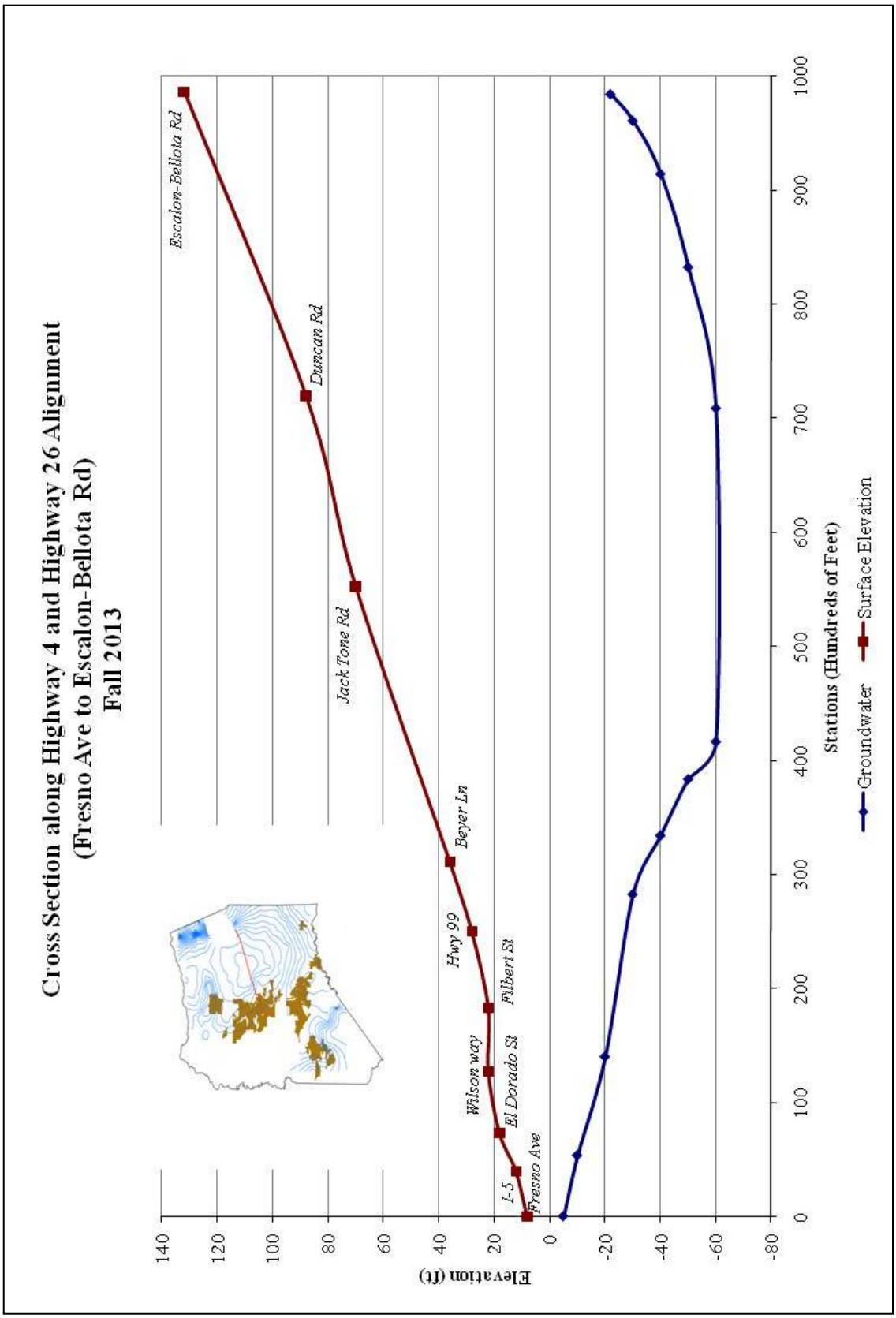

Figure 3-30: Highway 4 & Highway 26 Cross Section Fall 2013

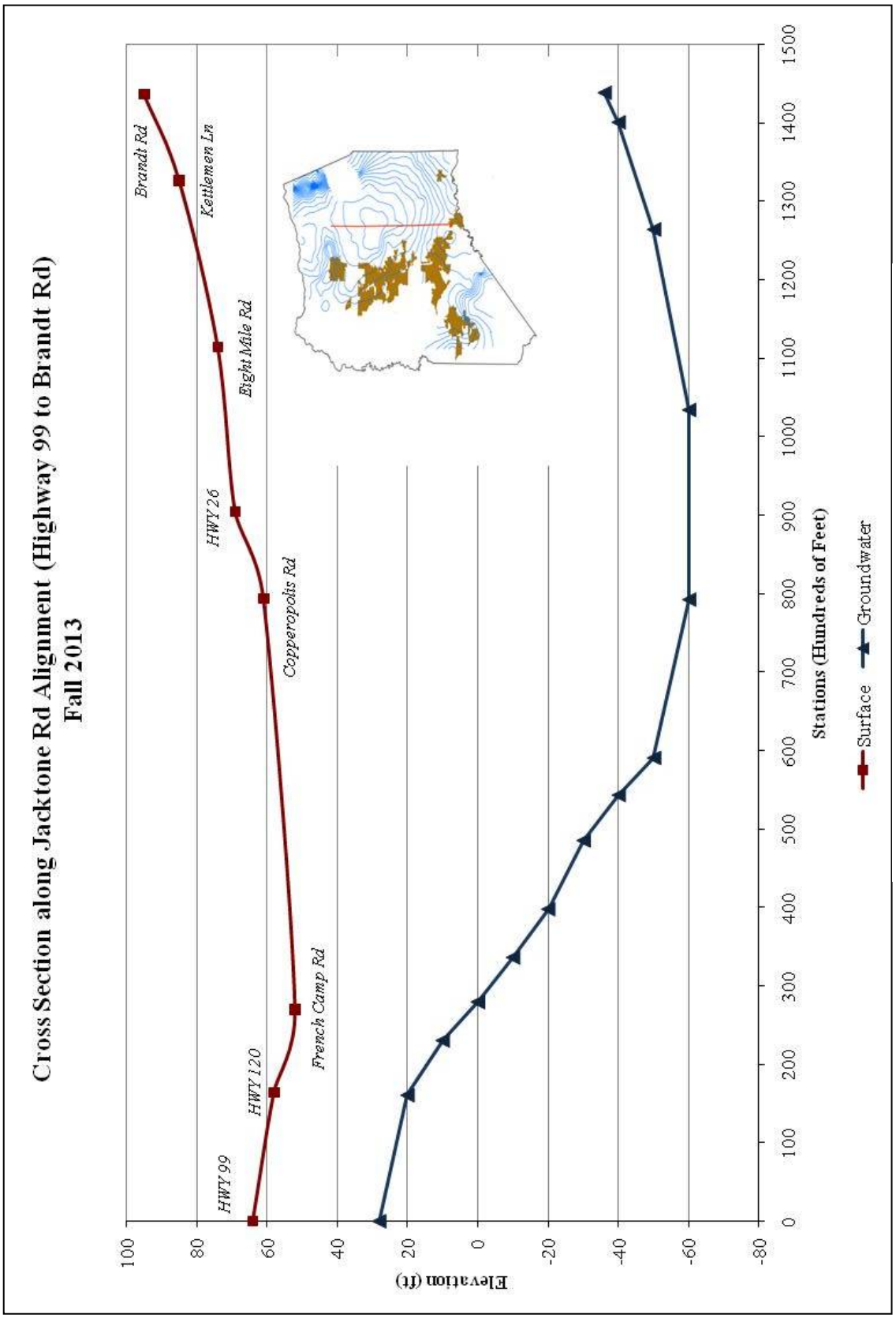

Figure 3-31: Jacktone Rd Cross Section Fall 2013

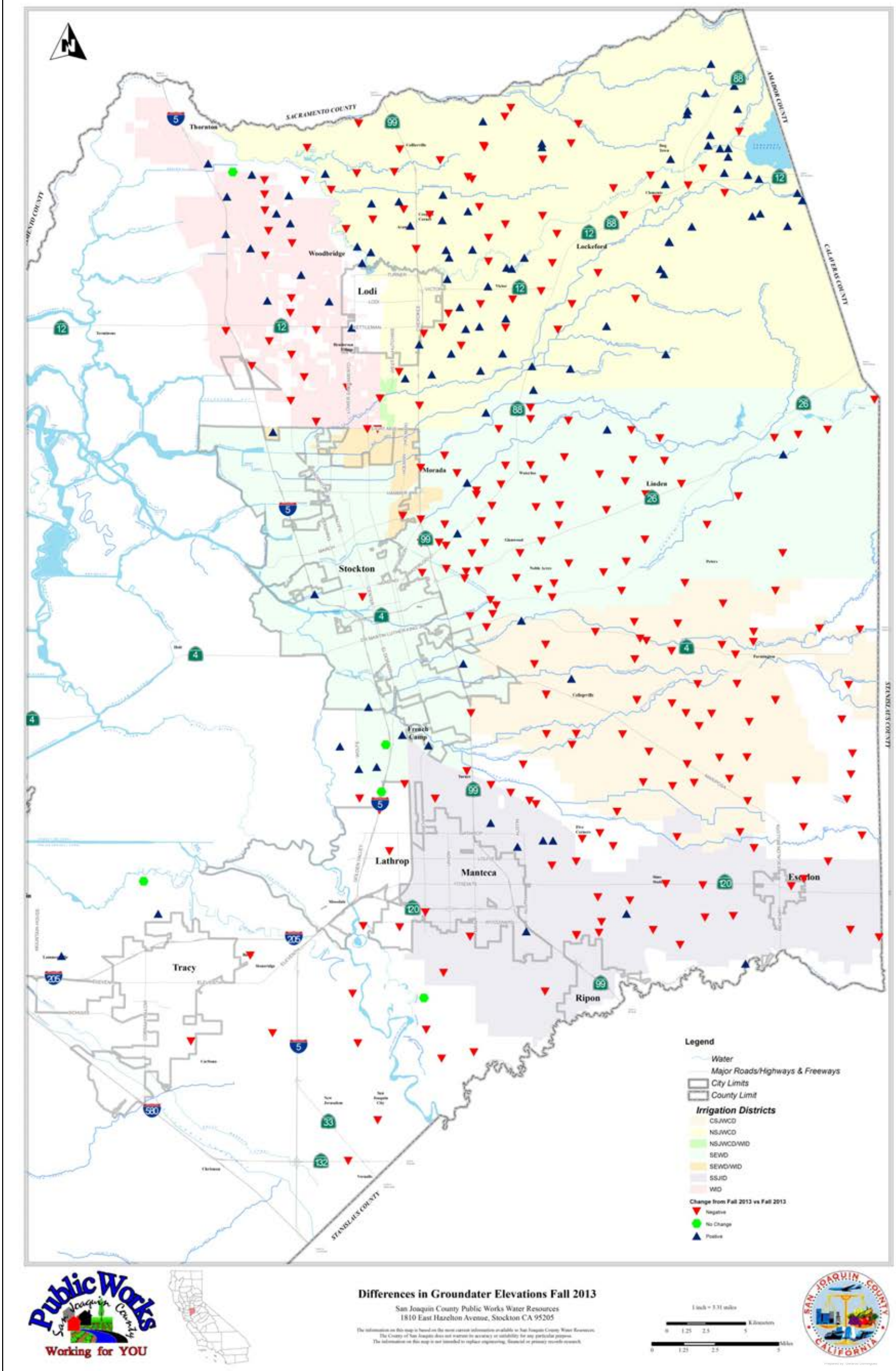

Figure 3-32: Differences in Groundwater Elevations Fall 2013

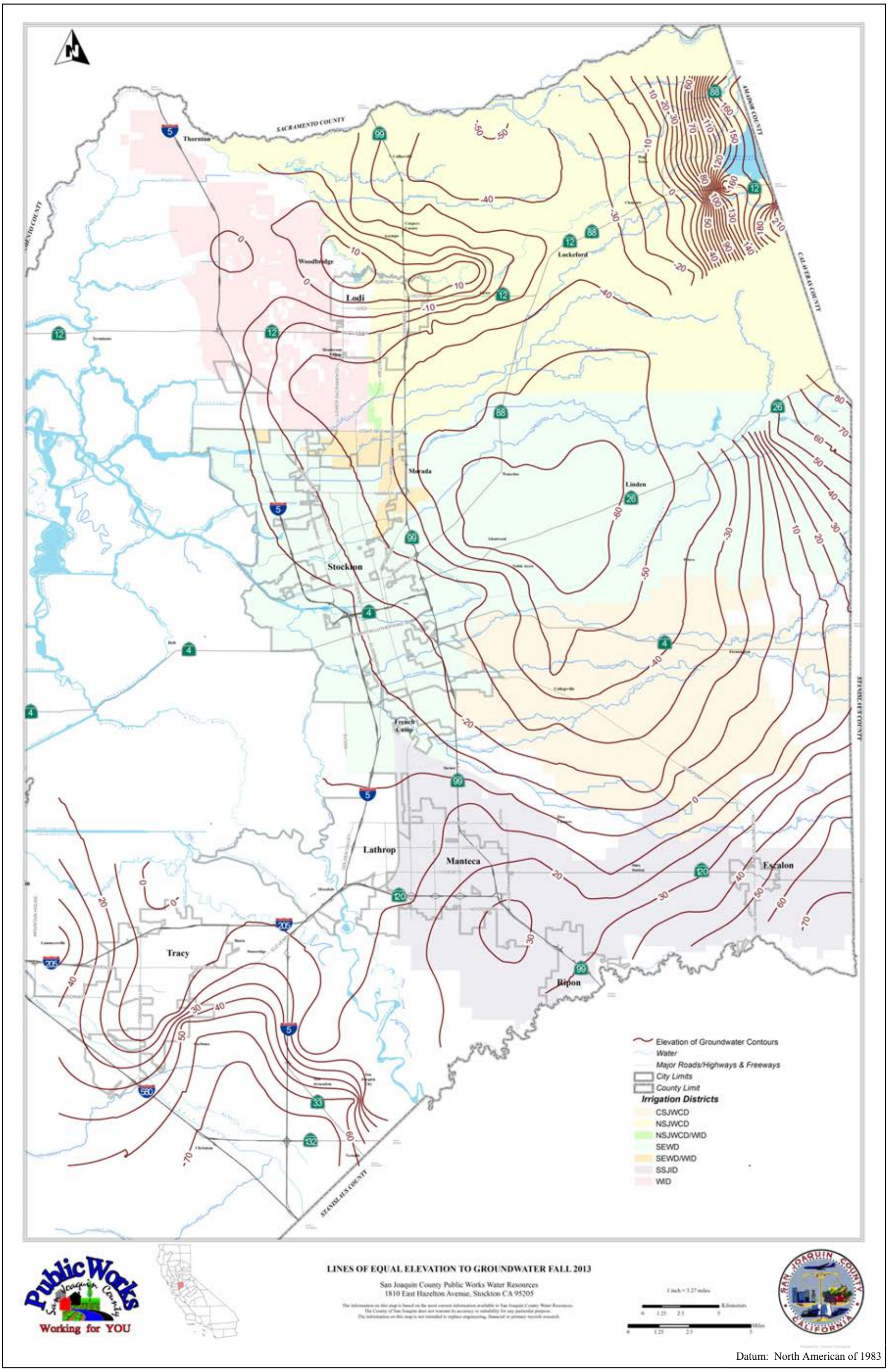

Figure 3-33: Lines of Equal Elevation of Groundwater Fall 2013

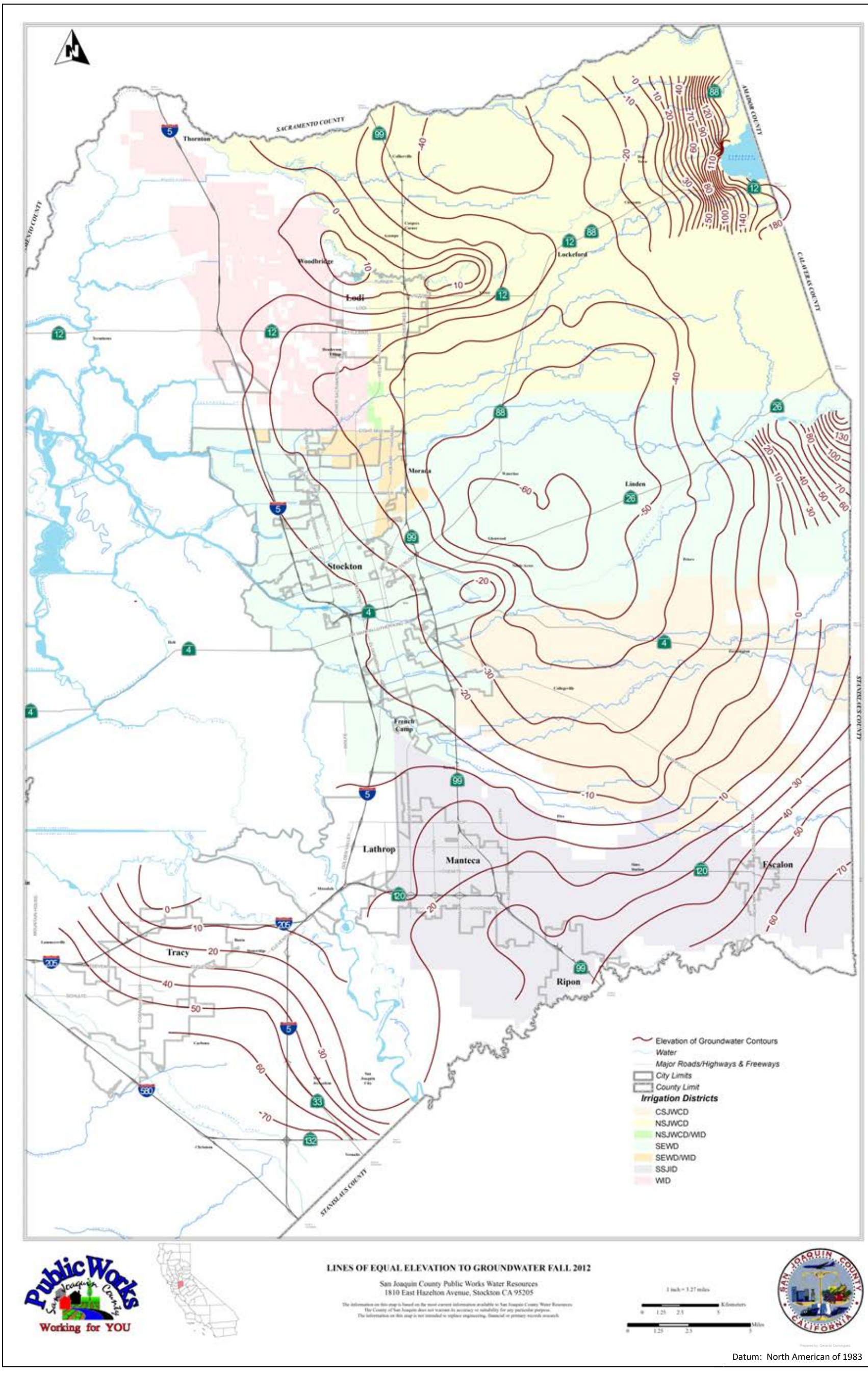

Figure 3-34: Lines of Equal Elevation of Groundwater Fall 2012

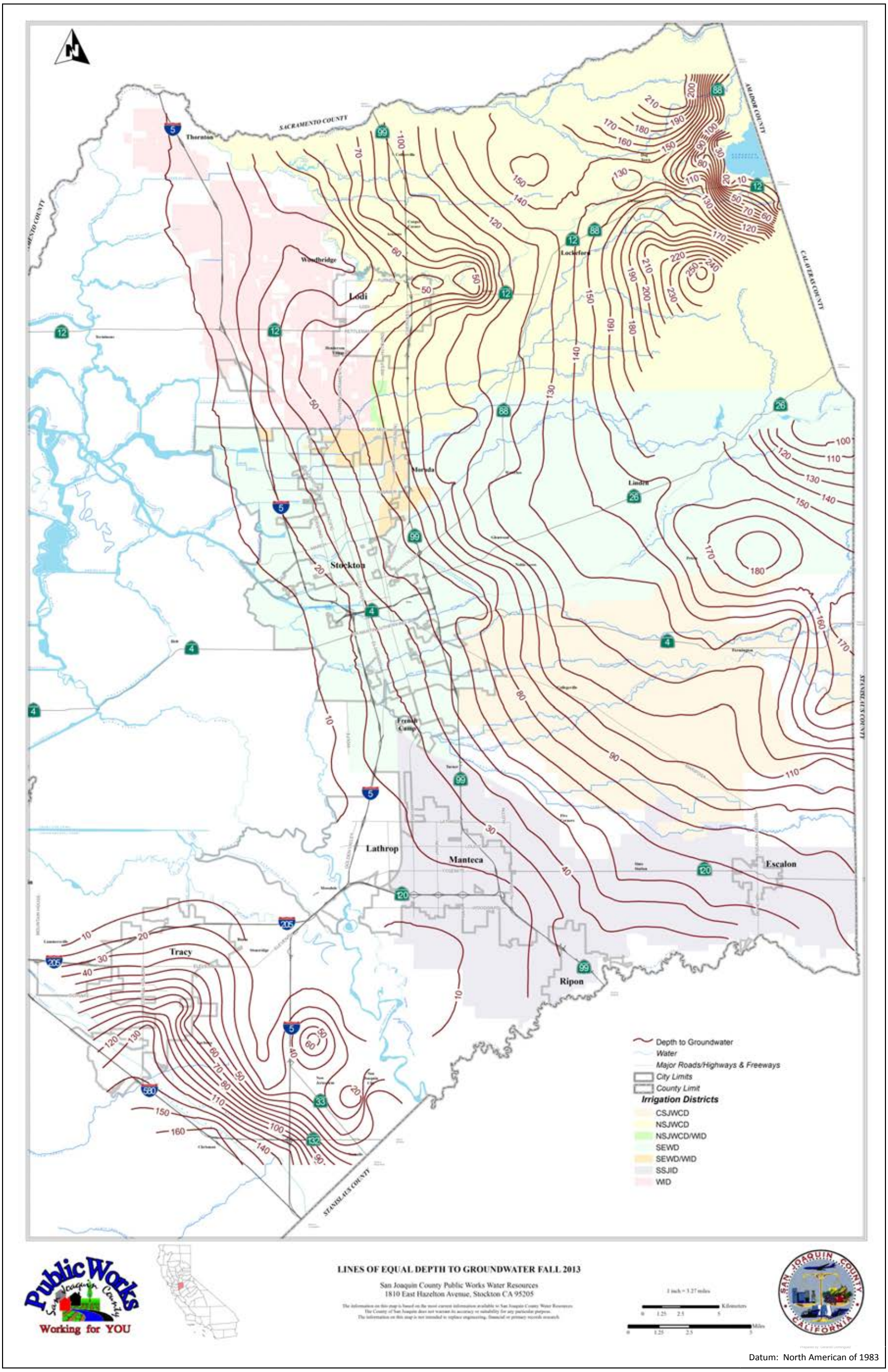

Figure 3-35: Lines of Equal Depth to Groundwater Fall 2013

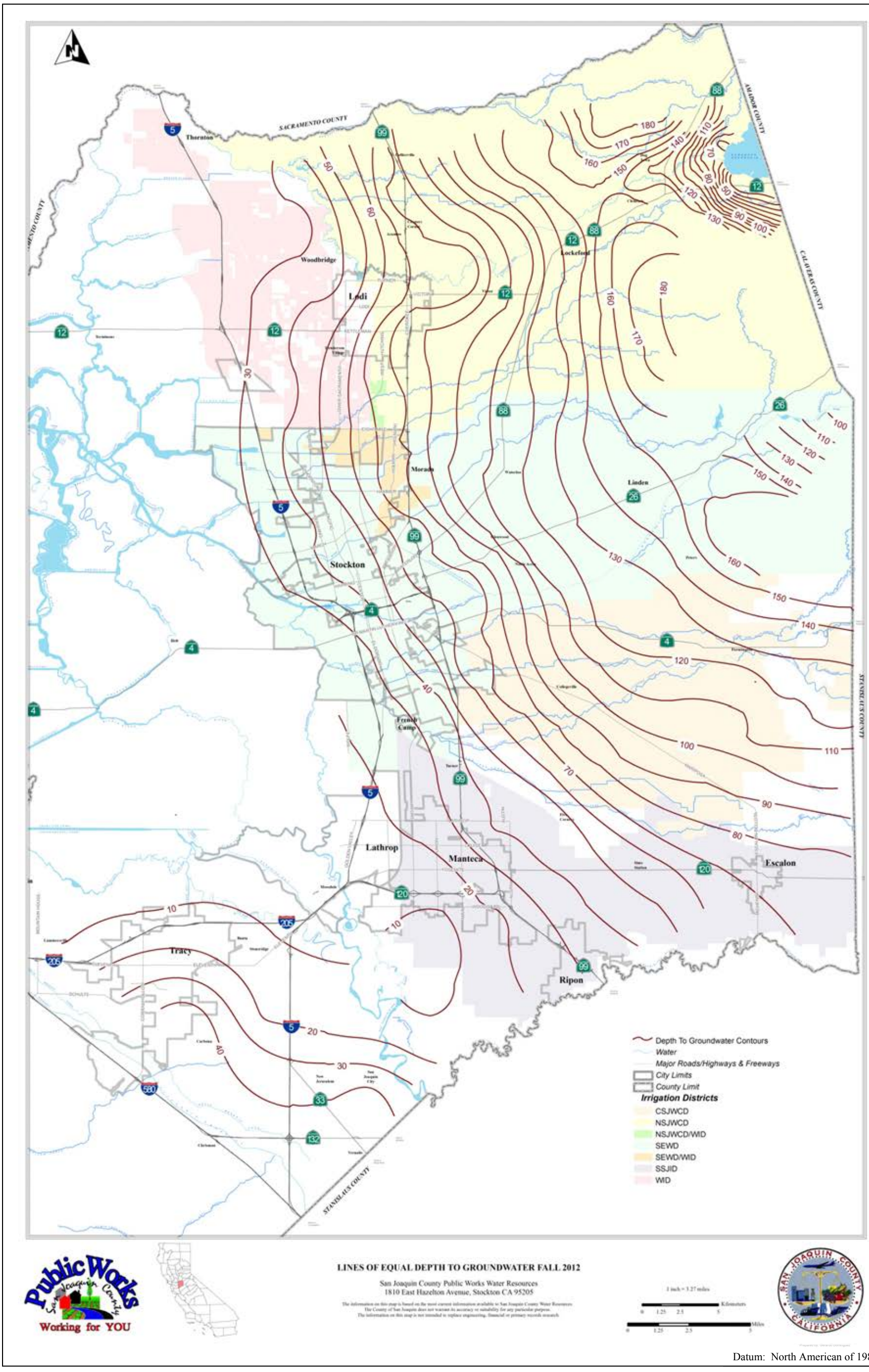

Figure 3-36: Lines of Equal Depth to Groundwater Fall 2012