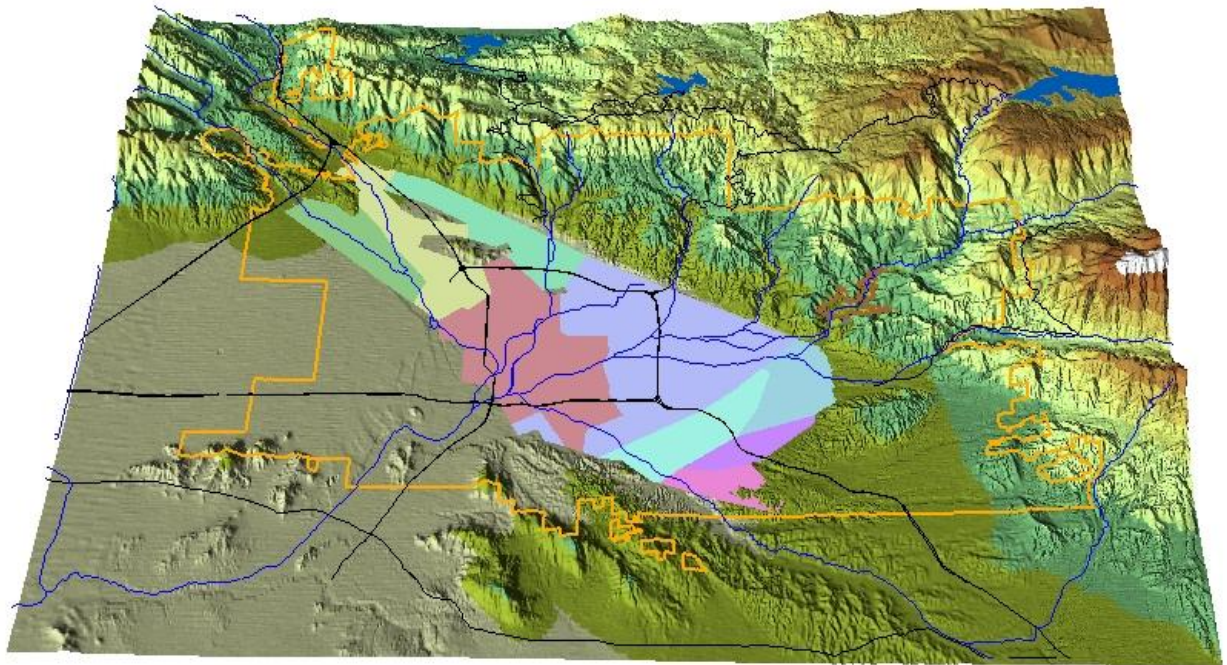


# **Change in Groundwater Storage for the San Bernardino Basin Area Calendar Years 1934 to 2009**



**March 2010**



# **Change in Groundwater Storage for the San Bernardino Basin Area Calendar Years 1934 to 2009**

## **EXECUTIVE SUMMARY AND APPENDIX**



**March 2010**

San Bernardino Valley Municipal Water District


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Manager of Engineering and Planning

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GIS Coordinator

## **ACKNOWLEDGMENT**

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Many public and private water agencies and various individuals have cooperated with the San Bernardino Valley Municipal Water District in furnishing the essential information upon which the Change in Storage Calculation is based.



# Change in Groundwater Storage For the San Bernardino Basin Area 1934 – 2009

## EXECUTIVE SUMMARY AND APPENDIX

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| Annual Change in Storage              |             |
| Tabular change in storage data        |             |
| Hydrographs                           |             |
| Tabular well depth data               |             |
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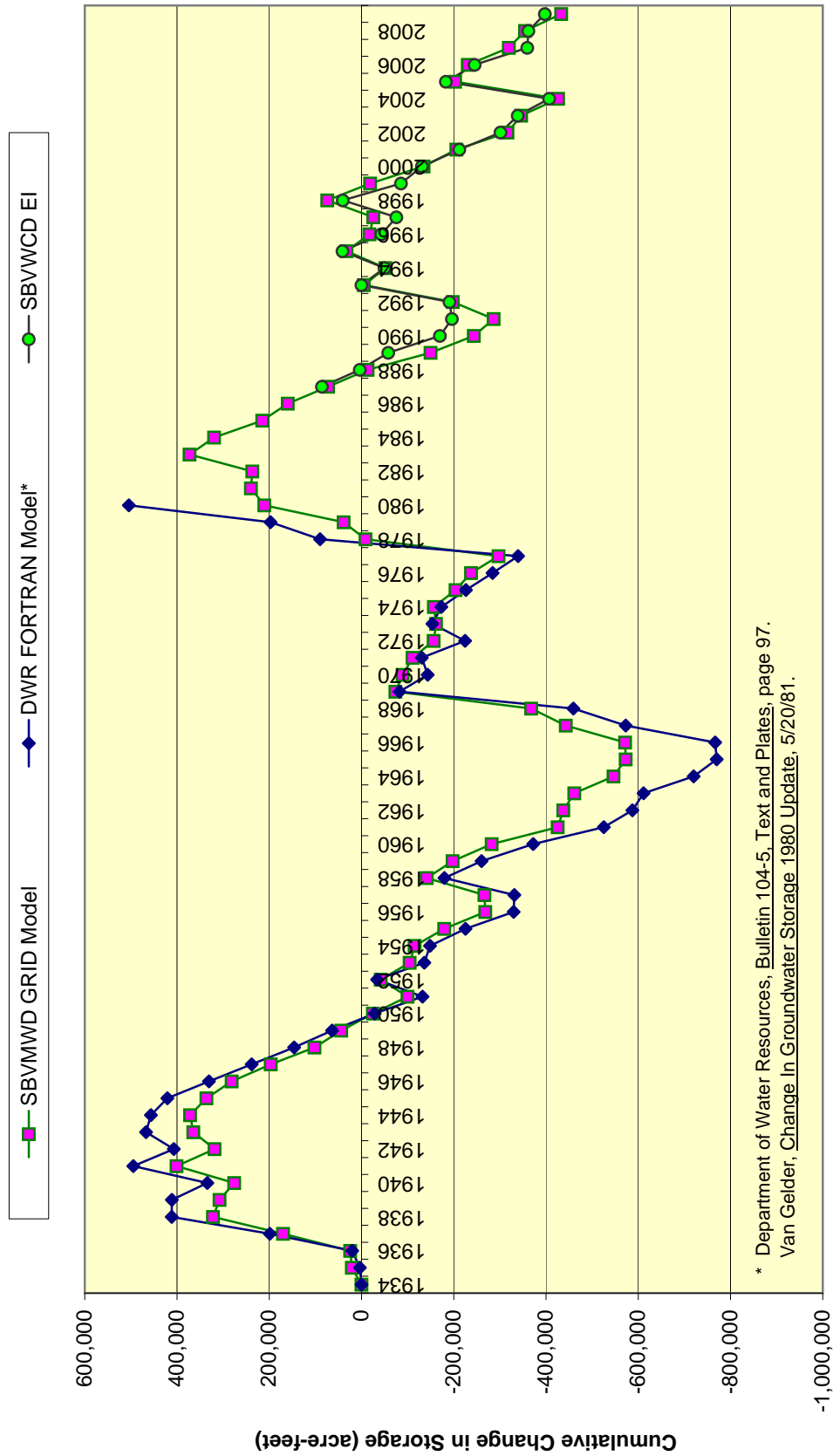
## EXECUTIVE SUMMARY

The San Bernardino Valley Municipal Water District (SBVMWD) has been calculating the change in groundwater storage for the San Bernardino Basin Area (SBBA) since 1970. The first calculation was completed for the years 1934 – 1960 by the State of California Department of Water Resources (DWR) and the results were summarized in Bulletin 104-5, Meeting Water Demands in the Bunker Hill-San Timoteo Area, Geology, Hydrology, and Operation-Economics Studies, Text and Plates (Olson, pp. 90 – 92). The DWR change in storage values were calculated using the Specific Yield Method (Olson, pp. 85 – 98) and a mathematical model developed by TRW, Incorporated, Redondo Beach, California (TRW). In 1980, SBVMWD updated the change in storage calculation to include the years 1961 – 1980 (Van Gelder). In the early 1990's, SBVMWD created a new change in storage model (SBVMWD Model) using software developed by Environmental Systems Research Institute (ESRI), Redlands, California (For an explanation of how the model works see **Appendix: SBVMWD Change in Storage Model**). Results from the SBVMWD Model are presented to the SBVMWD Board of Directors and may be released in a report format.

Like the earlier DWR model, the SBVMWD Model calculates the change in groundwater storage (volume) for the SBBA using the Specific Yield Method. In addition to the DWR and SBVMWD models, the San Bernardino Valley Water Conservation District (SBVWCD) and the U.S. Geological Survey (USGS) have created models for computing the change in storage for the SBBA. Although all four models use slightly different data sets and calculate the change in storage using different computer methods, their calculated values and results track remarkably well (Figures 1.1 and 1.2).

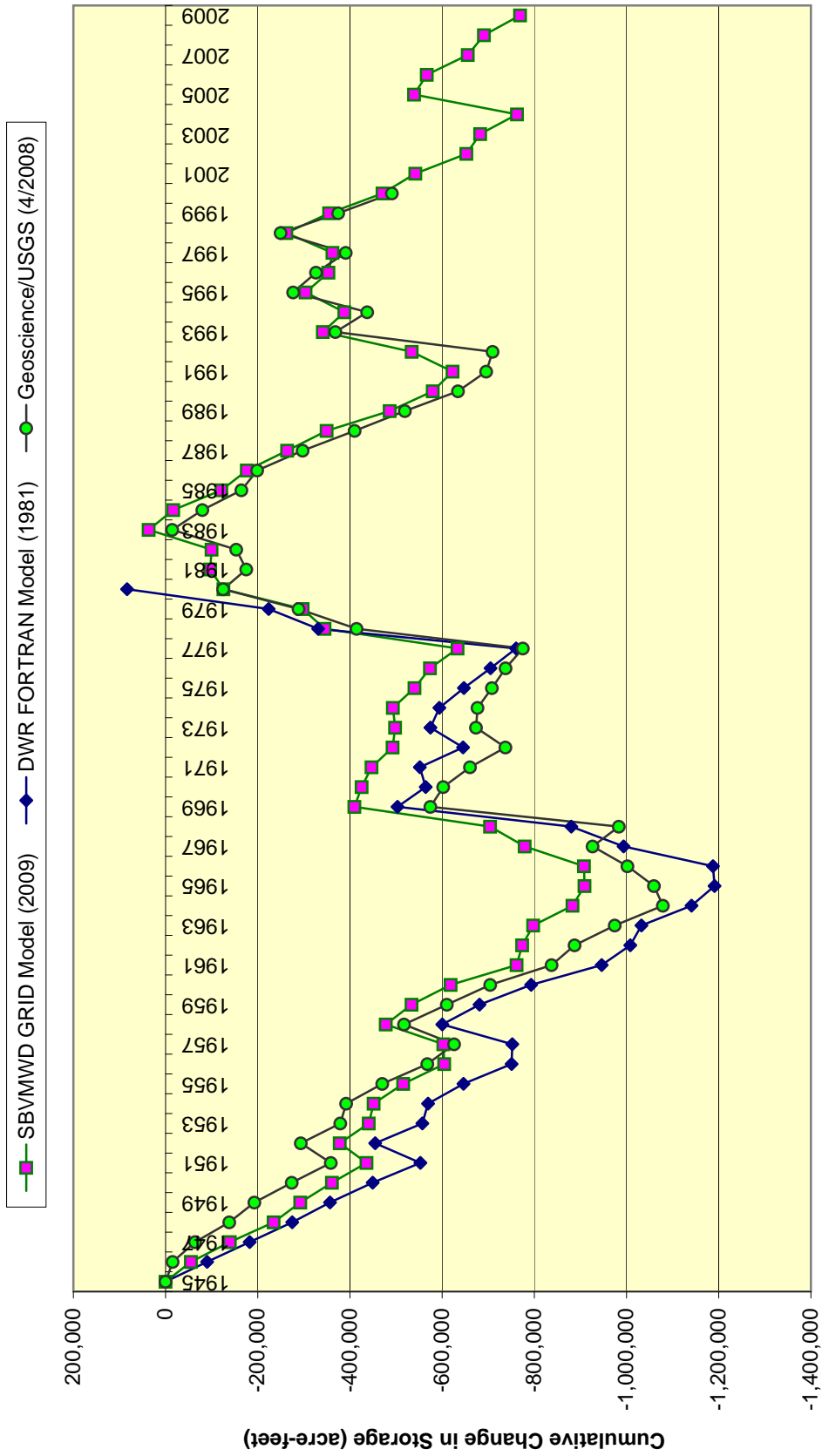
The cumulative change in groundwater storage (CCIS) is a measure of the volume of water lost or gained in the SBBA as compared to the base year of 1934. The year 1934 was selected as the base year to correspond with the first year of the DWR base period, 1934-35 through 1959-60 (Motokane, pp. 123 – 129). The annual change in storage (ACIS) is simply a measure of the volume of water lost or gained in the basin during a year. This report presents the results from the SBVMWD Model for calendar years 1934 to 2009.

Figure 1.1. Comparison of DWR FORTRAN Model, SBWCD EI and SBVMWD GRID Model Results



\* Department of Water Resources, Bulletin 104-5, Text and Plates, page 97. Van Gelder, Change In Groundwater Storage 1980 Update, 5/20/81.

Figure 1.2. Comparison of DWR FORTRAN Model, USGS MODFLOW Model and SBVMWD GRID Model Results



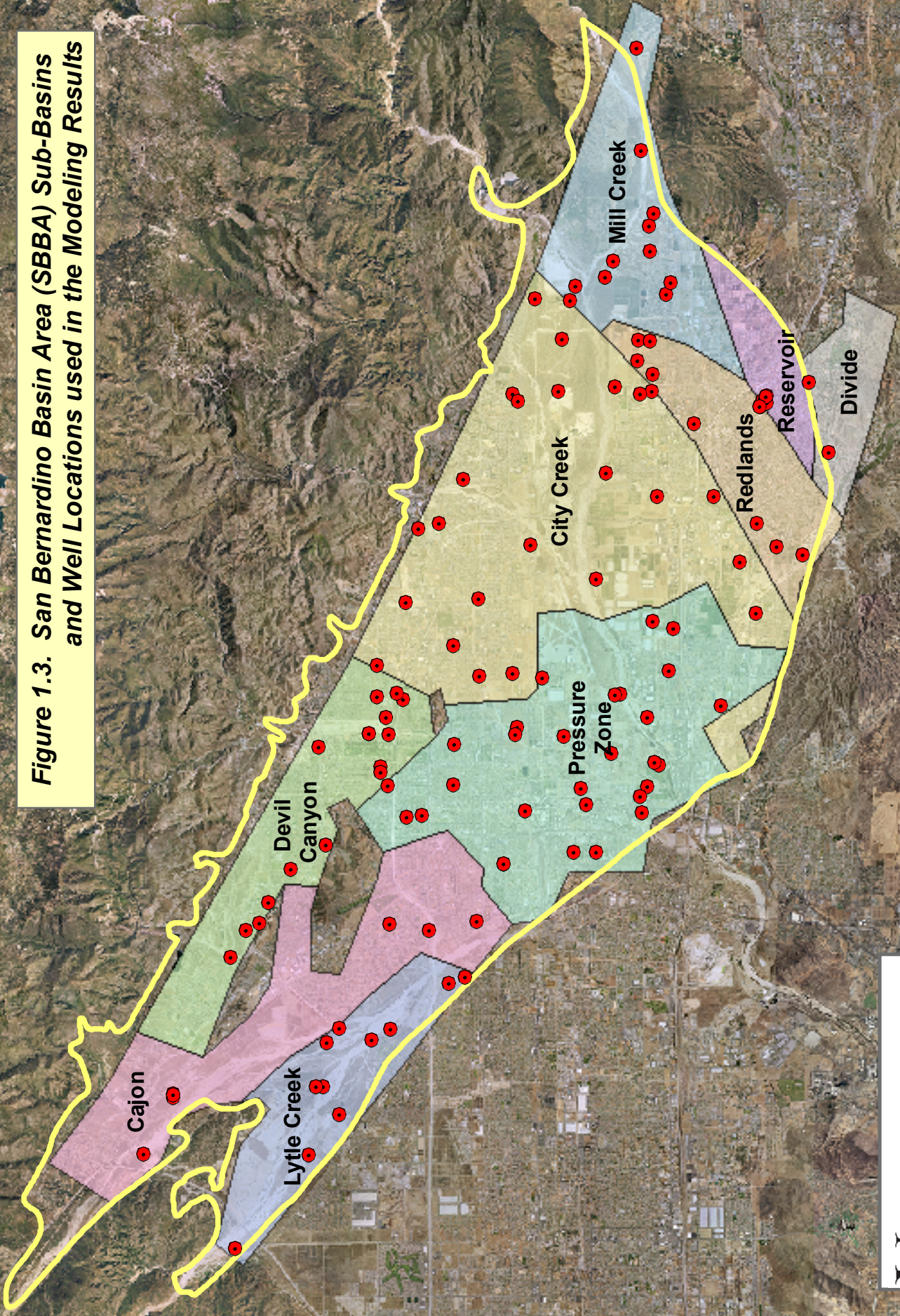


The SBVMWD Model uses the calendar year instead of the water year (October through September) to correspond with the United States Geological Survey MODFLOW groundwater model, which is dependent upon local pumping records kept by calendar year.

The annual change in storage for calendar year 2009 was calculated to be approximately -78,400 acre-feet. Table 1.1 summarizes the distribution of the 2009 annual and cumulative change in storage among the various sub-basins (Figure 1.3), as defined in Bulletin 104-5 (DWR, Plate 14, Basin Groundwater Storage Data). For 2009, the west end of the SBBA (Devil Canyon, Cajon, and Lytle Creek sub-basins) accounted for approximately 83% of the total decrease in annual change in storage for the San Bernardino Basin Area. This large decrease is likely attributed to the increase in well production and reduction of natural recharge due to below average precipitation over the past few years.

The cumulative change in storage for calendar year 2009 was calculated to be approximately -433,000 acre-feet which is a 22% decrease from the previous year. Review of Figure 1.1 and 1.2 shows that the cumulative change in storage had been declining since 1998. Then, a gain in 2005 single-handedly “erased” the decline in storage over the past several years returning the basin to 2001 levels. However, since 2005, water levels have again been trending downward.

**Figure 1.3. San Bernardino Basin Area (SBBA) Sub-Basins and Well Locations used in the Modeling Results**



A north arrow pointing upwards and a scale bar showing 0, 0.5, 1, and 2 miles. The scale bar is a horizontal line with tick marks at each interval.

Table 1.1 also provides a “basin index” for each sub-basin. The basin index is simply the average, annual water level change for the sub-basin for the given year. For example, a basin index of -5.0 indicates that the average water level for the named sub-basin decreased 5.0 feet for the given year. For 2009, the Lytle Creek sub-basin saw the largest change in water levels as it decreased 35 feet. The average change in water levels for the SBBA was a decrease of 10 feet.

**Table 1.1. Annual and cumulative change in storage for 2009 by sub-basin.**

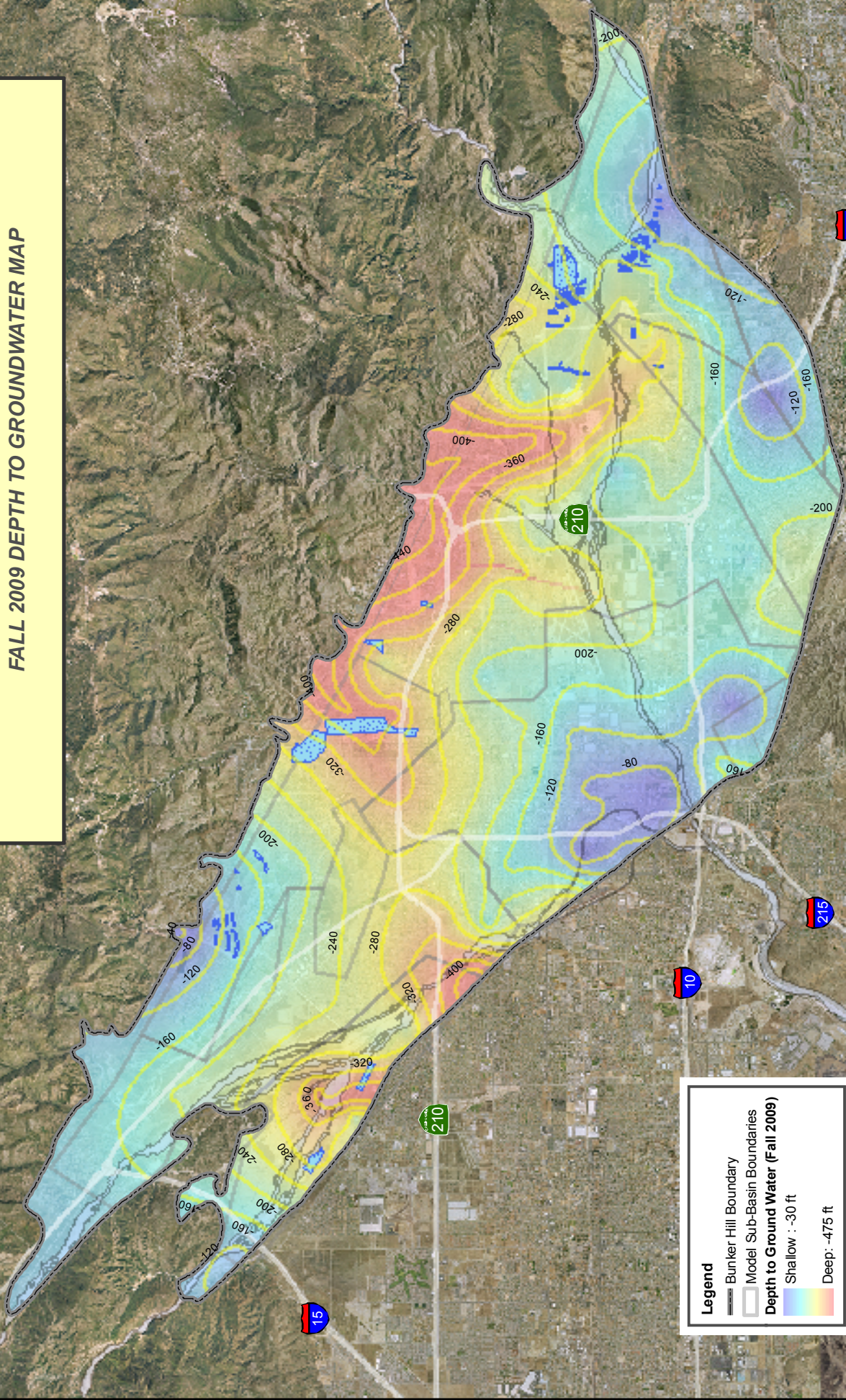
|   | Sub-basin     | Wells used |               | 2009 Annual    | 2009 Cumulative   | Basin |
|---|---------------|------------|---------------|----------------|-------------------|-------|
|   |               | in 2009    | Area          | Change in      | Change in Storage | Index |
|   |               | Model      | (acres)       | Storage        |                   | (ft)  |
| 1 | Cajon         | 4          | 9,833         | -25,204        | -74,687           | -13   |
| 2 | Devil Canyon  | 12         | 7,105         | -27,693        | -54,301           | -3    |
| 3 | Lytle Creek   | 10         | 5,899         | -28,620        | -40,796           | -35   |
| 4 | Pressure Zone | 19         | 15,965        | -11,169        | -124,861          | -7    |
| 5 | City Creek    | 17         | 21,284        | 18,017         | -175,528          | -2    |
| 6 | Redlands      | 6          | 5,113         | -3,331         | -4,406            | -14   |
| 7 | Mill Creek    | 10         | 7,299         | 856            | 25,048            | -7    |
| 8 | Reservoir     | 6          | 2,177         | -652           | 7,785             | -5    |
| 9 | Divide        | 2          | 2,634         | -621           | 8,734             | -4    |
|   |               | <b>86</b>  | <b>77,309</b> | <b>-78,417</b> | <b>-433,012</b>   |       |

The District and the primary water purveyors in the SBBA provided fall 2009 water level data for the model. The static depth to groundwater data used for the change in storage report were contoured and plotted in Figure 1.4 the “Fall 2009 Depth to Groundwater Map”. This 2009 depth to groundwater data was then subtracted from the historic low water levels to determine any areas where there may be new historic lows. Figure 1.5 shows the results of this comparison; areas in red indicate new historic lows.

Liquefaction potential can be measured based upon water levels. The threat of liquefaction is reduced for water levels lower than 50 feet below ground surface (SCEC Report, March 1999, page 7). Figure 1.4 shows that fall 2009 water levels are below this threshold.

Since the release of last year's April 2008 report, SBVMWD has made no changes to the model or wells modeled as indicated in Appendix, page A2.

**Figure 1.4. CHANGE IN STORAGE REPORT 1934-2009**  
**FALL 2009 DEPTH TO GROUNDWATER MAP**



**Legend**

- Bunker Hill Boundary
- Model Sub-Basin Boundaries

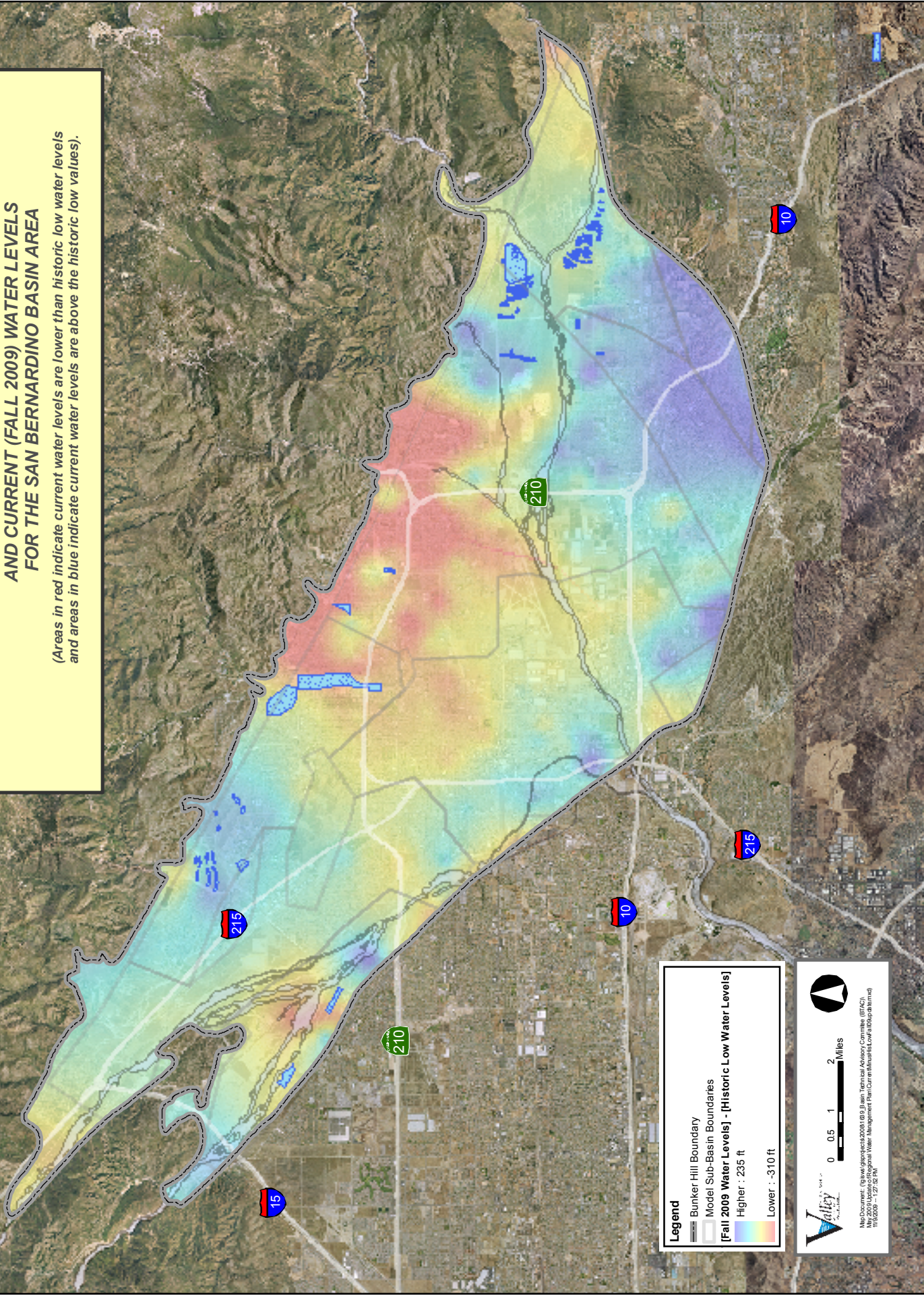
**Depth to Ground Water (Fall 2009)**

Shallow : -30 ft  
 Deep: -475 ft

Map Document: \Y:\2009\639\_Basin\_Technical\_Advisory\_Committee (BTAC)\May 2009\_Update\_of\_Regional\_Water\_Management\_Plan \GIS\DT\Wmap\Fall09update.mxd 4/12/2010 -- 4:12:46 PM

**Figure 1.5. CHANGE IN STORAGE REPORT 1934-2009**  
**COMPARISON OF HISTORIC LOW WATER LEVELS**  
**AND CURRENT (FALL 2009) WATER LEVELS**  
**FOR THE SAN BERNARDINO BASIN AREA**

(Areas in red indicate current water levels are lower than historic low water levels and areas in blue indicate current water levels are above the historic low values).



**Legend**

- Bunker Hill Boundary
- Model Sub-Basin Boundaries
- [Fall 2009 Water Levels] - [Historic Low Water Levels]**
- Higher : 235 ft
- Lower : -310 ft

**Valley**  
PROFESSIONAL ENGINEERS

No. 21000 - (16) Low Water Levels 08.13.09 - Technical Advisory Committee (TAC) -  
 Nov. 2009 - 11/27/09 - 11/27/09 - 11/27/09 - 11/27/09

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<http://www.ce.washington.edu/~liquefaction/html/what/what1.html>

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# APPENDIX

Change in Groundwater Storage for the San Bernardino Basin Area  
1934 - 2009



**Data Changes in the SBVMWD Change in Storage Model  
Since April 2009 Report**

**Cajon Sub-Basin and Wells:  
No Changes.**

**Devil Canyon Sub-Basin and Wells:  
No Changes.**

**Lytle Creek Sub-Basin and Wells:  
No Changes.**

**Pressure Zone Sub-Basin and Wells:  
No Changes.**

**City Creek Sub-Basin and Wells:  
No Changes.**

**Redlands Sub-Basin and Wells:  
No Changes.**

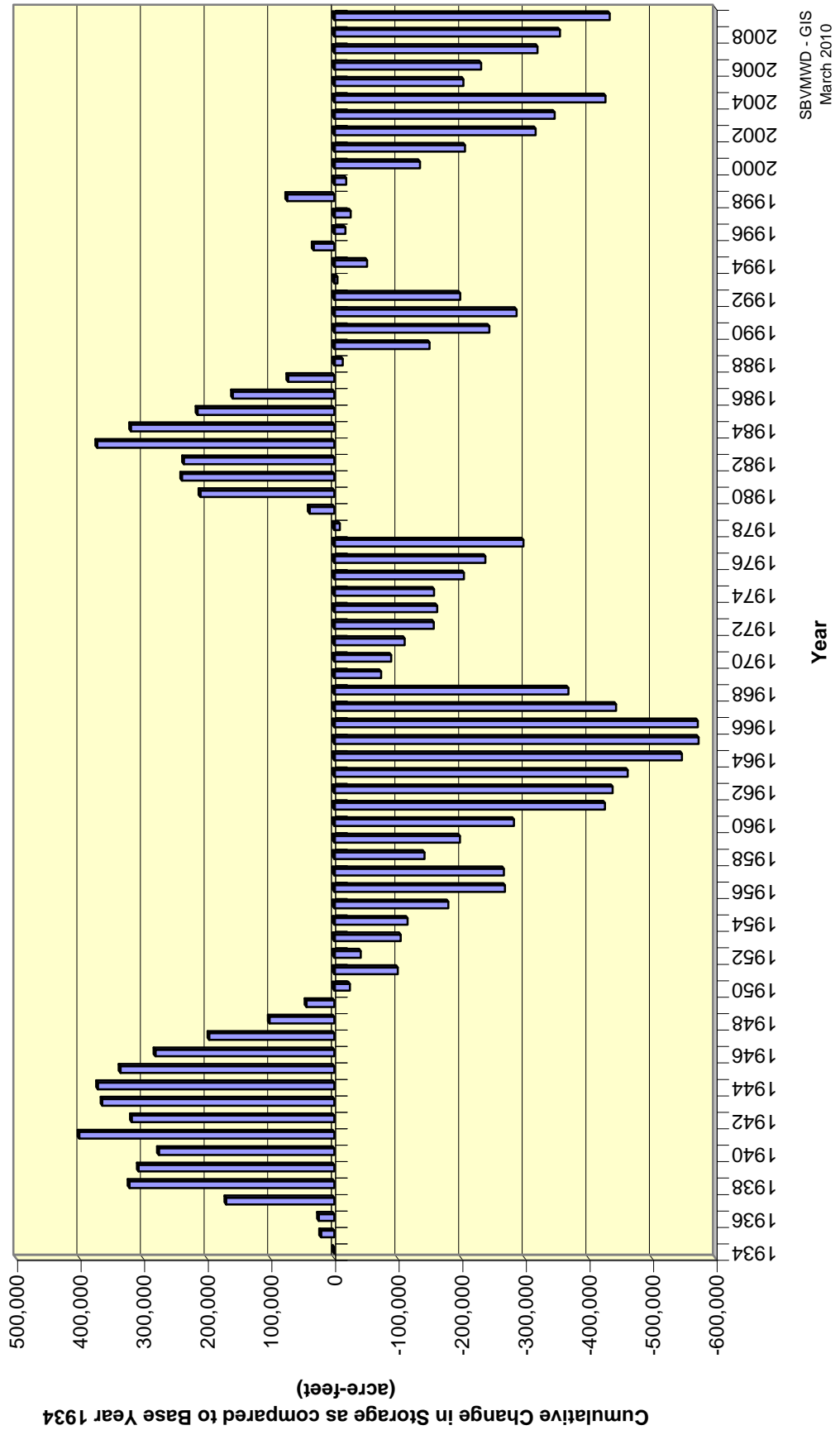
**Mill Creek Sub-Basin and Wells:  
No Changes.**

**Reservoir Sub-Basin and Wells:  
No Changes.**

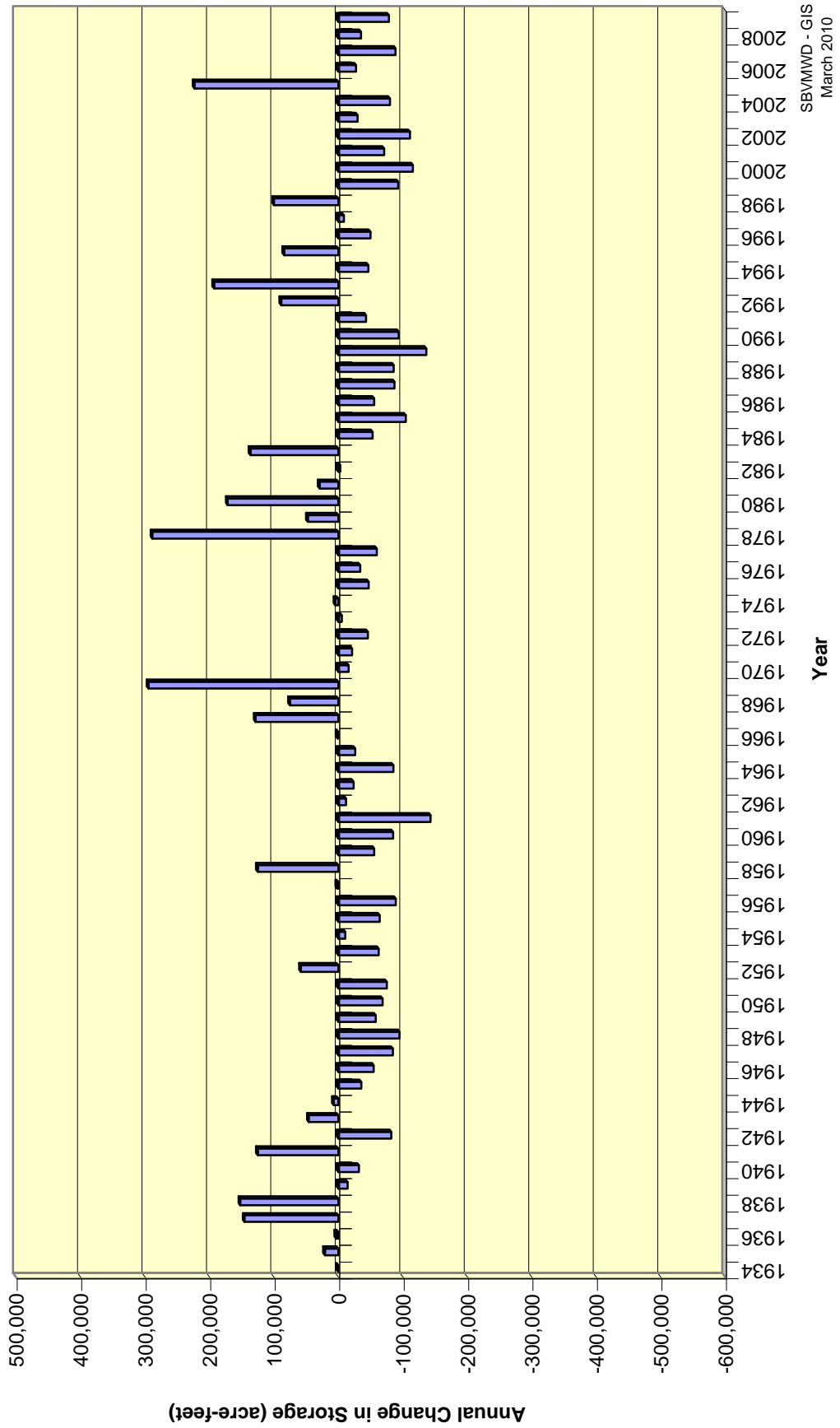
**Divide Sub-Basin and Wells:  
No Changes.**

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Cumulative Change in Storage for the San Bernardino Basin Area



Annual Change in Storage for the San Bernardino Basin Area



**San Bernardino Valley Municipal Water District**  
Change In Storage for the San Bernardino Basin Area 1934 - 2009

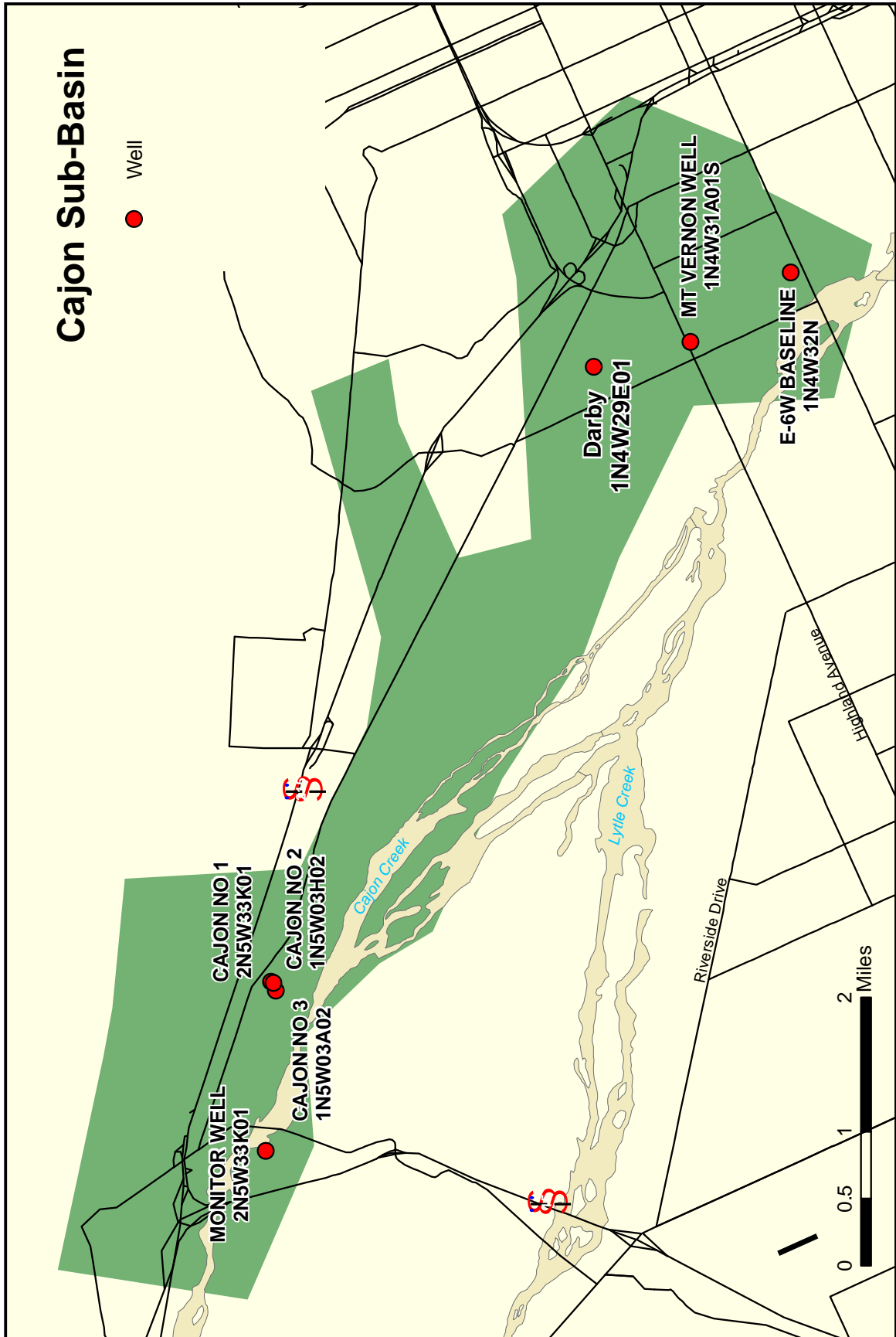
| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1934        | n/a                            | n/a  | 0   |
| 1935        | 6                              | 20,870   | 20,870  |
| 1936        | 2                              | 3,523  | 24,393  |
| 1937        | 23                             | 145,589  | 169,982   |
| 1938        | 22                             | 152,096  | 322,078   |
| 1939        | 3                              | -14,377  | 307,701   |
| 1940        | -5                             | -31,859  | 275,842   |
| 1941        | 17                             | 125,012  | 400,854   |
| 1942        | -11                            | -82,317  | 318,537   |
| 1943        | 7                              | 46,073   | 364,610   |
| 1944        | 0                              | 7,091  | 371,701   |
| 1945        | -5                             | -35,507  | 336,194   |
| 1946        | -9                             | -54,920  | 281,274   |
| 1947        | -12                            | -84,528  | 196,746   |
| 1948        | -16                            | -94,909  | 101,837   |
| 1949        | -9                             | -58,045  | 43,792  |
| 1950        | -14                            | -68,538  | -24,746   |
| 1951        | -12                            | -75,214  | -99,960   |
| 1952        | 11                             | 58,167   | -41,793   |
| 1953        | -7                             | -62,735  | -104,528  |
| 1954        | 1                              | -10,727  | -115,255  |
| 1955        | -11                            | -64,100  | -179,355  |
| 1956        | -14                            | -89,030  | -268,385  |
| 1957        | 0                              | 1,777  | -266,608  |
| 1958        | 20                             | 124,903  | -141,705  |
| 1959        | -8                             | -55,773  | -197,478  |
| 1960        | -13                            | -84,913  | -282,391  |
| 1961        | -18                            | -143,069   | -425,460  |
| 1962        | 4                              | -12,103  | -437,563  |
| 1963        | -6                             | -23,803  | -461,366  |
| 1964        | -12                            | -85,205  | -546,571  |
| 1965        | 0                              | -26,059  | -572,630  |
| 1966        | 4                              | 1,190  | -571,440  |
| 1967        | 19                             | 128,403  | -443,037  |
| 1968        | 9                              | 75,169   | -367,868  |
| 1969        | 39                             | 294,367  | -73,501   |
| 1970        | 2                              | -15,864  | -89,365   |
| 1971        | -4                             | -21,340  | -110,705  |
| 1972        | -7                             | -45,689  | -156,394  |
| 1973        | 1                              | -5,303   | -161,697  |
| 1974        | 1                              | 4,776  | -156,921  |
| 1975        | -5                             | -46,965  | -203,886  |
| 1976        | -6                             | -33,740  | -237,626  |
| 1977        | -9                             | -59,633  | -297,259  |

**San Bernardino Valley Municipal Water District**  
Change In Storage for the San Bernardino Basin Area 1934 - 2009

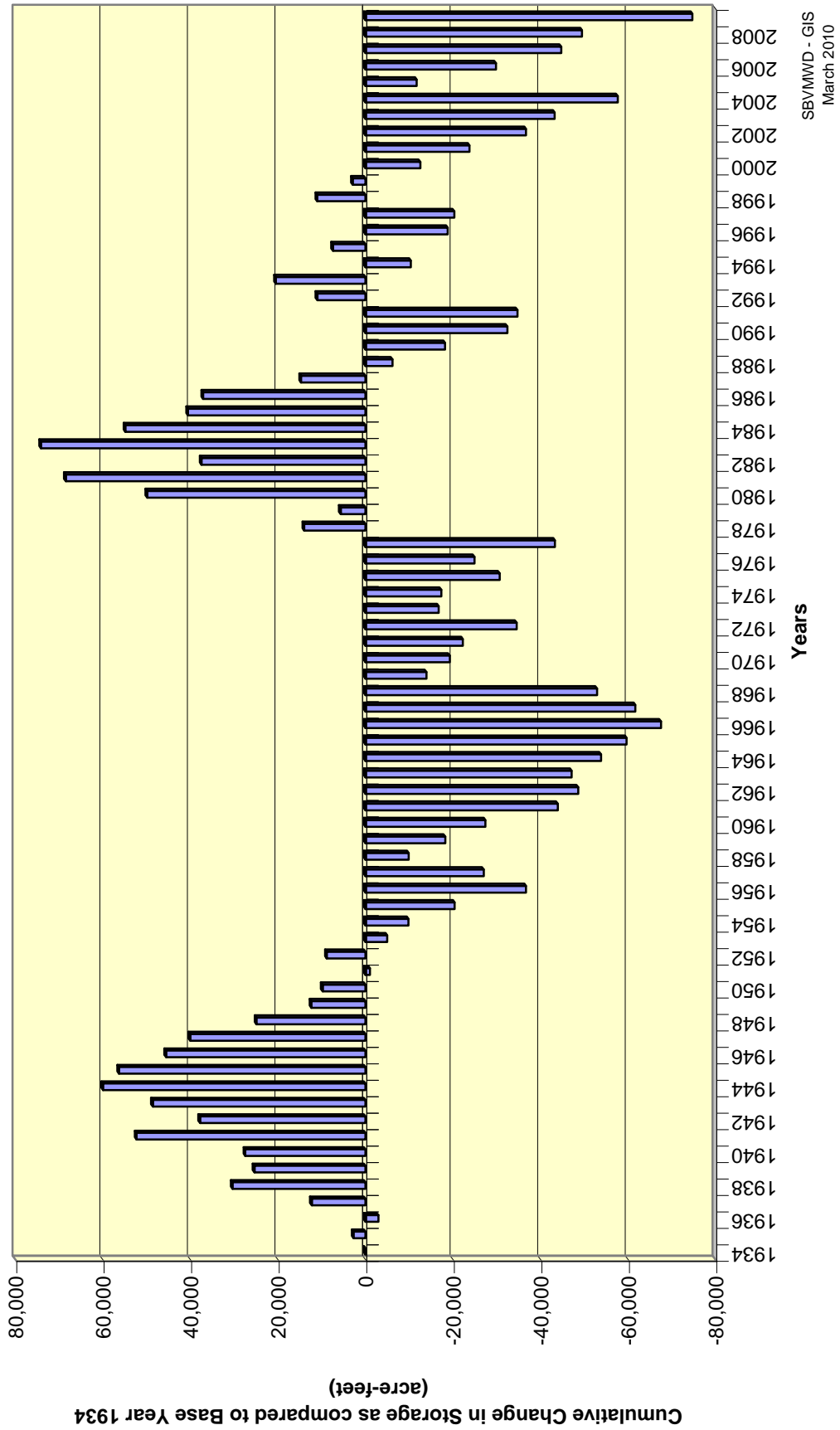
| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1978        | 38                             | 288,634  | -8,625  |
| 1979        | 5                              | 47,368   | 38,743  |
| 1980        | 21                             | 171,822  | 210,565   |
| 1981        | 2                              | 28,937   | 239,502   |
| 1982        | 1                              | -3,042   | 236,460   |
| 1983        | 16                             | 136,343  | 372,803   |
| 1984        | -7                             | -53,164  | 319,639   |
| 1985        | -13                            | -104,413   | 215,226   |
| 1986        | -8                             | -55,577  | 159,649   |
| 1987        | -12                            | -87,184  | 72,465  |
| 1988        | -12                            | -85,879  | -13,414   |
| 1989        | -16                            | -136,477   | -149,891  |
| 1990        | -13                            | -93,632  | -243,523  |
| 1991        | 0                              | -42,951  | -286,474  |
| 1992        | 11                             | 88,692   | -197,782  |
| 1993        | 30                             | 192,725  | -5,057  |
| 1994        | -6                             | -46,564  | -51,621   |
| 1995        | 13                             | 84,107   | 32,486  |
| 1996        | -3                             | -49,809  | -17,323   |
| 1997        | -1                             | -8,523   | -25,846   |
| 1998        | 4                              | 99,929   | 74,083  |
| 1999        | -11                            | -92,868  | -18,785   |
| 2000        | -15                            | -115,824   | -134,609  |
| 2001        | -9                             | -71,048  | -205,657  |
| 2002        | -14                            | -110,929   | -316,586  |
| 2003        | -6                             | -29,706  | -346,292  |
| 2004        | -8                             | -80,017  | -426,309  |
| 2005        | 33                             | 223,178  | -203,131  |
| 2006        | -3                             | -27,539  | -230,670  |
| 2007        | -16                            | -88,767  | -319,437  |
| 2008        | -2                             | -35,158  | -354,595  |
| 2009        | -10                            | -78,417  | -433,012  |

# Cajon Sub-Basin

● Well

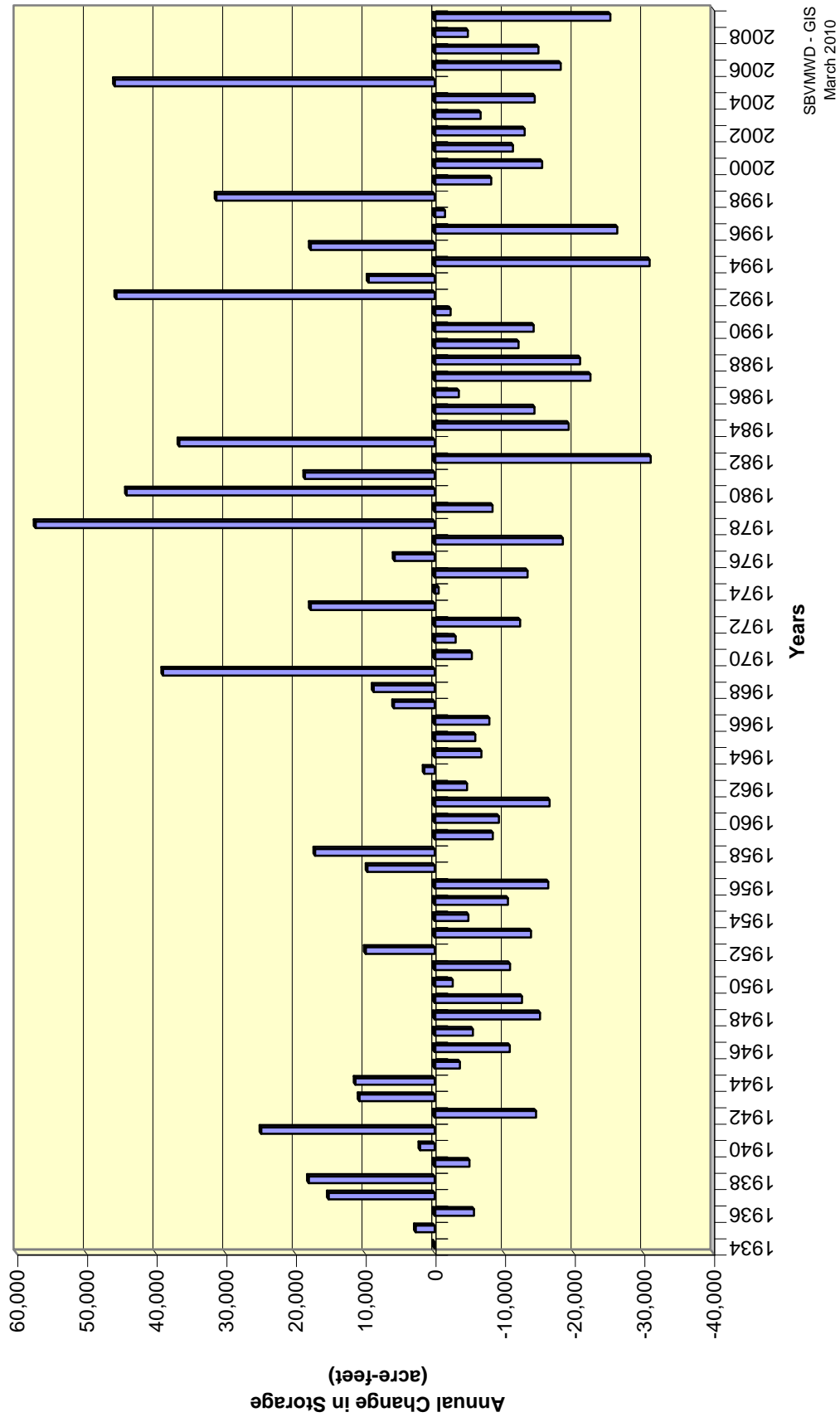


Cumulative Change in Storage for the Cajon Sub-Basin





Annual Change in Storage for the Cajon Sub-Basin



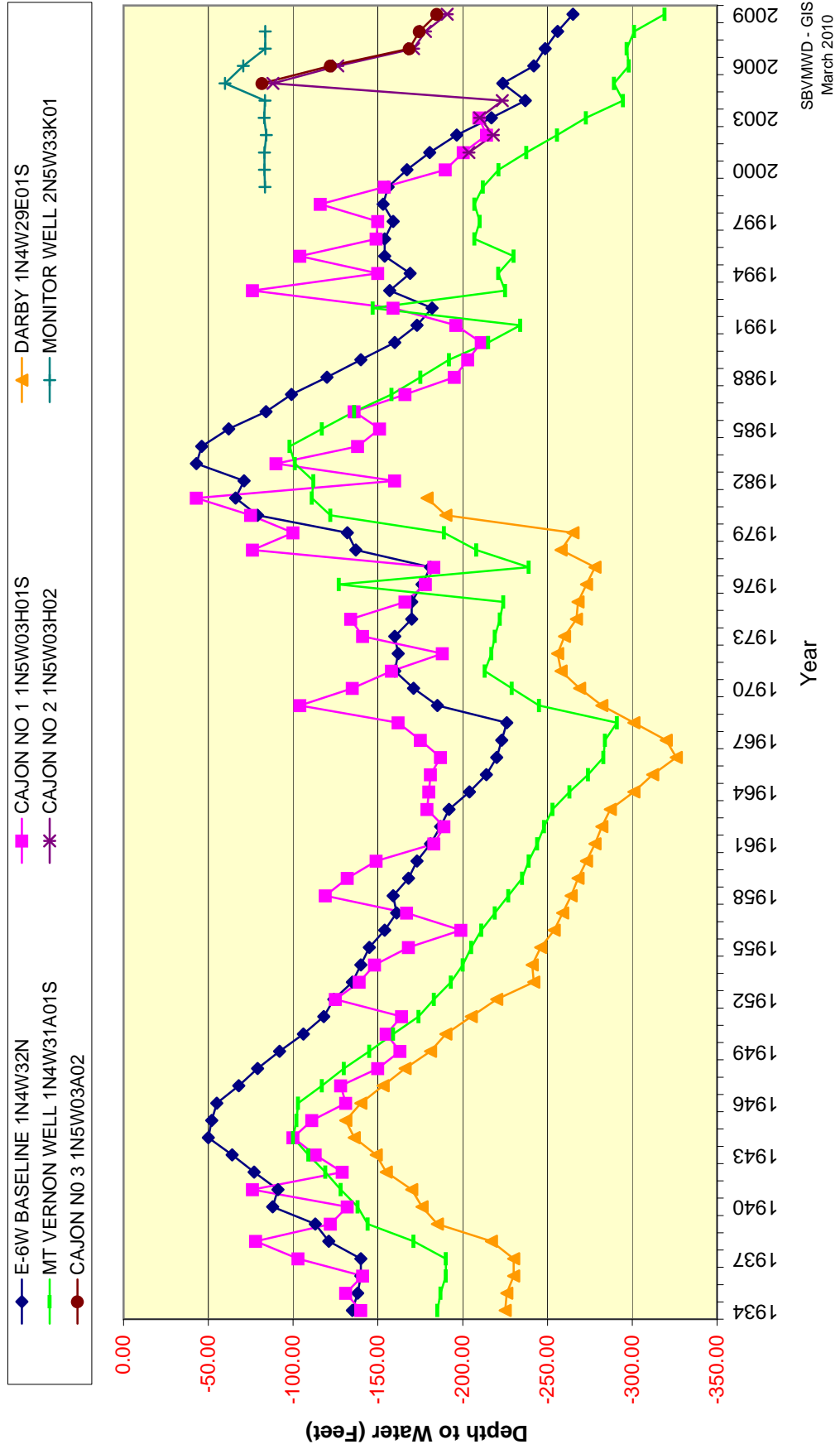
**San Bernardino Valley Municipal Water District**  
Change In Storage for the Cajon Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1934        | 0                              | n/a  | 0   |
| 1935        | 1                              | 2,727  | 2,727   |
| 1936        | -5                             | -5,653   | -2,926  |
| 1937        | 10                             | 15,215   | 12,289  |
| 1938        | 19                             | 18,080   | 30,369  |
| 1939        | 6                              | -5,005   | 25,364  |
| 1940        | 8                              | 2,091  | 27,455  |
| 1941        | 17                             | 24,881   | 52,336  |
| 1942        | -4                             | -14,541  | 37,795  |
| 1943        | 11                             | 10,803   | 48,598  |
| 1944        | 12                             | 11,376   | 59,974  |
| 1945        | -3                             | -3,632   | 56,342  |
| 1946        | -8                             | -10,790  | 45,552  |
| 1947        | -9                             | -5,498   | 40,054  |
| 1948        | -15                            | -15,133  | 24,921  |
| 1949        | -14                            | -12,542  | 12,379  |
| 1950        | -7                             | -2,595   | 9,784   |
| 1951        | -13                            | -10,817  | -1,033  |
| 1952        | 2                              | 9,903  | 8,870   |
| 1953        | -14                            | -13,833  | -4,963  |
| 1954        | -5                             | -4,860   | -9,823  |
| 1955        | -9                             | -10,534  | -20,357   |
| 1956        | -14                            | -16,316  | -36,673   |
| 1957        | 3                              | 9,655  | -27,018   |
| 1958        | 9                              | 17,153   | -9,865  |
| 1959        | -9                             | -8,349   | -18,214   |
| 1960        | -8                             | -9,204   | -27,418   |
| 1961        | -13                            | -16,502  | -43,920   |
| 1962        | -5                             | -4,666   | -48,586   |
| 1963        | -1                             | 1,479  | -47,107   |
| 1964        | -9                             | -6,714   | -53,821   |
| 1965        | -8                             | -5,836   | -59,657   |
| 1966        | -9                             | -7,858   | -67,515   |
| 1967        | 4                              | 5,840  | -61,675   |
| 1968        | 6                              | 8,771  | -52,904   |
| 1969        | 41                             | 38,982   | -13,922   |
| 1970        | 3                              | -5,336   | -19,258   |
| 1971        | 4                              | -3,004   | -22,262   |
| 1972        | -9                             | -12,262  | -34,524   |
| 1973        | 11                             | 17,783   | -16,741   |
| 1974        | -3                             | -579   | -17,320   |
| 1975        | -9                             | -13,326  | -30,646   |
| 1976        | 19                             | 5,760  | -24,886   |
| 1977        | -32                            | -18,387  | -43,273   |

**San Bernardino Valley Municipal Water District**  
Change In Storage for the Cajon Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1978        | 51                             | 57,276   | 14,003  |
| 1979        | -2                             | -8,324   | 5,679   |
| 1980        | 55                             | 44,197   | 49,876  |
| 1981        | 17                             | 18,611   | 68,487  |
| 1982        | -41                            | -31,017  | 37,470  |
| 1983        | 36                             | 36,661   | 74,131  |
| 1984        | -16                            | -19,249  | 54,882  |
| 1985        | -16                            | -14,328  | 40,554  |
| 1986        | -9                             | -3,458   | 37,096  |
| 1987        | -22                            | -22,350  | 14,746  |
| 1988        | -22                            | -20,895  | -6,149  |
| 1989        | -15                            | -12,038  | -18,187   |
| 1990        | -17                            | -14,210  | -32,397   |
| 1991        | -6                             | -2,305   | -34,702   |
| 1992        | 38                             | 45,699   | 10,997  |
| 1993        | 10                             | 9,487  | 20,484  |
| 1994        | -27                            | -30,849  | -10,365   |
| 1995        | 17                             | 17,786   | 7,421   |
| 1996        | -7                             | -26,213  | -18,792   |
| 1997        | -3                             | -1,497   | -20,289   |
| 1998        | 14                             | 31,321   | 11,032  |
| 1999        | -15                            | -8,134   | 2,898   |
| 2000        | -14                            | -15,417  | -12,519   |
| 2001        | -10                            | -11,244  | -23,763   |
| 2002        | -13                            | -12,902  | -36,665   |
| 2003        | -5                             | -6,578   | -43,243   |
| 2004        | -14                            | -14,377  | -57,620   |
| 2005        | 44                             | 45,908   | -11,712   |
| 2006        | -23                            | -18,090  | -29,802   |
| 2007        | -22                            | -14,901  | -44,703   |
| 2008        | -5                             | -4,780   | -49,483   |
| 2009        | -13                            | -25,204  | -74,687   |

Hydrographs for the Cajon Sub-Basin Wells



**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CAJON SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)               |                                    |                               |  |                                       |   |                                       |
|------|------------------------------------|------------------------------------|-------------------------------|--|---------------------------------------|---|---------------------------------------|
|      | E-6W BASELINE<br>1N4W32N<br>Source | CAJON NO 1<br>1N5W03H01S<br>Source | DARBY<br>1N4W29E01S<br>Source | MT VERNON WELL<br>1N4W31A01S<br>Source | CAJON NO 2<br>1N5W03H02<br>Substitute | MONITOR WELL<br>2N5W33K01<br>Added Source | CAJON NO 3<br>1N5W03A02<br>Substitute |
| 1934 | -135.00                            | -140.00                            | -225.00                       | -185.00                                |                                       |   |                                       |
| 1935 | -138.00                            | -131.00                            | -226.00                       | -187.00                                |                                       |   |                                       |
| 1936 | -140.00                            | -141.00                            | -230.00                       | -190.00                                |                                       |   |                                       |
| 1937 | -140.00                            | -103.00                            | -230.00                       | -190.00                                |                                       |   |                                       |
| 1938 | -121.00                            | -78.00                             | -217.00                       | -171.00                                |                                       |   |                                       |
| 1939 | -113.00                            | -122.00                            | -185.00                       | -144.00                                |                                       |   |                                       |
| 1940 | -88.00                             | -132.00                            | -176.00                       | -138.00                                |                                       |   |                                       |
| 1941 | -91.00                             | -76.00                             | -170.00                       | -128.00                                |                                       |   |                                       |
| 1942 | -77.00                             | -129.00                            | -155.00                       | -119.00                                |                                       |   |                                       |
| 1943 | -64.00                             | -113.00                            | -149.00                       | -109.00                                |                                       |   |                                       |
| 1944 | -50.00                             | -100.00                            | -136.00                       | -100.00                                |                                       |   |                                       |
| 1945 | -52.00                             | -111.00                            | -131.00                       | -102.00                                |                                       |   |                                       |
| 1946 | -55.00                             | -131.00                            | -140.00                       | -103.00                                |                                       |   |                                       |
| 1947 | -68.00                             | -128.00                            | -153.00                       | -117.00                                |                                       |   |                                       |
| 1948 | -79.00                             | -150.00                            | -166.00                       | -130.00                                |                                       |   |                                       |
| 1949 | -92.00                             | -163.00                            | -181.00                       | -145.00                                |                                       |   |                                       |
| 1950 | -106.00                            | -155.00                            | -190.00                       | -159.00                                |                                       |   |                                       |
| 1951 | -118.00                            | -164.00                            | -205.00                       | -174.00                                |                                       |   |                                       |
| 1952 | -124.00                            | -125.00                            | -220.00                       | -183.00                                |                                       |   |                                       |
| 1953 | -135.00                            | -139.00                            | -242.00                       | -193.00                                |                                       |   |                                       |
| 1954 | -140.00                            | -148.00                            | -241.00                       | -200.00                                |                                       |   |                                       |
| 1955 | -145.00                            | -168.00                            | -246.00                       | -205.00                                |                                       |   |                                       |
| 1956 | -154.00                            | -199.00                            | -254.00                       | -211.00                                |                                       |   |                                       |
| 1957 | -161.00                            | -167.00                            | -259.00                       | -219.00                                |                                       |   |                                       |
| 1958 | -159.00                            | -119.00                            | -264.00                       | -227.00                                |                                       |   |                                       |
| 1959 | -168.00                            | -132.00                            | -268.00                       | -235.00                                |                                       |   |                                       |
| 1960 | -173.00                            | -149.00                            | -273.00                       | -239.00                                |                                       |   |                                       |
| 1961 | -181.00                            | -183.00                            | -278.00                       | -244.00                                |                                       |   |                                       |
| 1962 | -187.00                            | -189.00                            | -282.00                       | -248.00                                |                                       |   |                                       |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CAJON SUB-BASIN**

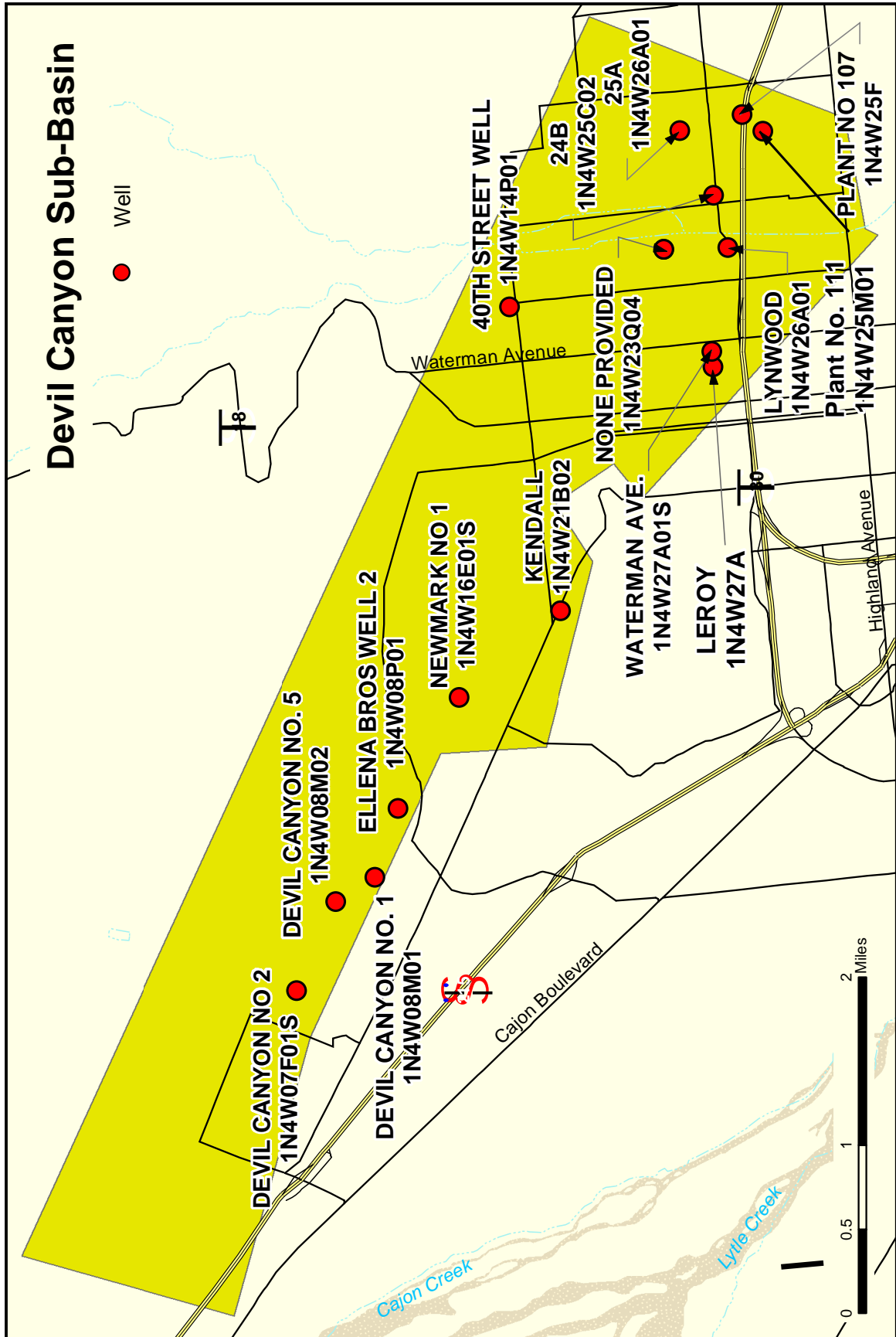
Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)               |                                    |                               |  |                                       |   |                                       |
|------|------------------------------------|------------------------------------|-------------------------------|--|---------------------------------------|---|---------------------------------------|
|      | E-6W BASELINE<br>1N4W32N<br>Source | CAJON NO 1<br>1N5W03H01S<br>Source | DARBY<br>1N4W29E01S<br>Source | MT VERNON WELL<br>1N4W31A01S<br>Source | CAJON NO 2<br>1N5W03H02<br>Substitute | MONITOR WELL<br>2N5W33K01<br>Added Source | CAJON NO 3<br>1N5W03A02<br>Substitute |
| 1963 | -192.00                            | -179.00                            | -287.00                       | -253.00                                |                                       |   |                                       |
| 1964 | -204.00                            | -180.00                            | -301.00                       | -263.00                                |                                       |   |                                       |
| 1965 | -214.00                            | -181.00                            | -312.00                       | -274.00                                |                                       |   |                                       |
| 1966 | -220.00                            | -187.00                            | -326.00                       | -283.00                                |                                       |   |                                       |
| 1967 | -223.00                            | -175.00                            | -320.00                       | -284.00                                |                                       |   |                                       |
| 1968 | -226.00                            | -162.00                            | -301.00                       | -291.00                                |                                       |   |                                       |
| 1969 | -185.00                            | -104.00                            | -282.00                       | -245.00                                |                                       |   |                                       |
| 1970 | -171.00                            | -135.00                            | -269.00                       | -229.00                                |                                       |   |                                       |
| 1971 | -160.00                            | -158.00                            | -258.00                       | -213.00                                |                                       |   |                                       |
| 1972 | -162.00                            | -188.00                            | -256.00                       | -217.00                                |                                       |   |                                       |
| 1973 | -160.00                            | -141.00                            | -260.00                       | -219.00                                |                                       |   |                                       |
| 1974 | -170.00                            | -134.00                            | -267.00                       | -222.00                                |                                       |   |                                       |
| 1975 | -170.00                            | -166.00                            | -268.00                       | -224.00                                |                                       |   |                                       |
| 1976 | -176.00                            | -178.00                            | -273.00                       | -127.00                                |                                       |   |                                       |
| 1977 | -181.00                            | -183.00                            | -278.00                       | -239.00                                |                                       |   |                                       |
| 1978 | -137.00                            | -76.00                             | -258.00                       | -208.00                                |                                       |   |                                       |
| 1979 | -132.00                            | -100.00                            | -265.00                       | -189.00                                |                                       |   |                                       |
| 1980 | -79.00                             | -75.00                             | -190.00                       | -122.00                                |                                       |   |                                       |
| 1981 | -66.00                             | -43.00                             | -179.00                       | -111.00                                |                                       |   |                                       |
| 1982 | -71.00                             | -160.00                            |                               | -112.00                                |                                       |   |                                       |
| 1983 | -43.00                             | -90.00                             |                               | -101.00                                |                                       |   |                                       |
| 1984 | -46.00                             | -138.00                            |                               | -98.00                                 |                                       |   |                                       |
| 1985 | -62.00                             | -151.00                            |                               | -117.00                                |                                       |   |                                       |
| 1986 | -84.00                             | -136.00                            |                               | -136.00                                |                                       |   |                                       |
| 1987 | -99.00                             | -166.00                            |                               | -158.00                                |                                       |   |                                       |
| 1988 | -120.00                            | -195.00                            |                               | -175.00                                |                                       |   |                                       |
| 1989 | -140.00                            | -203.00                            |                               | -192.00                                |                                       |   |                                       |
| 1990 | -160.00                            | -211.00                            |                               | -215.00                                |                                       |   |                                       |
| 1991 | -173.00                            | -196.00                            |                               | -234.00                                |                                       |   |                                       |

**San Bernardino Valley Municipal Water District**  
Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CAJON SUB-BASIN**

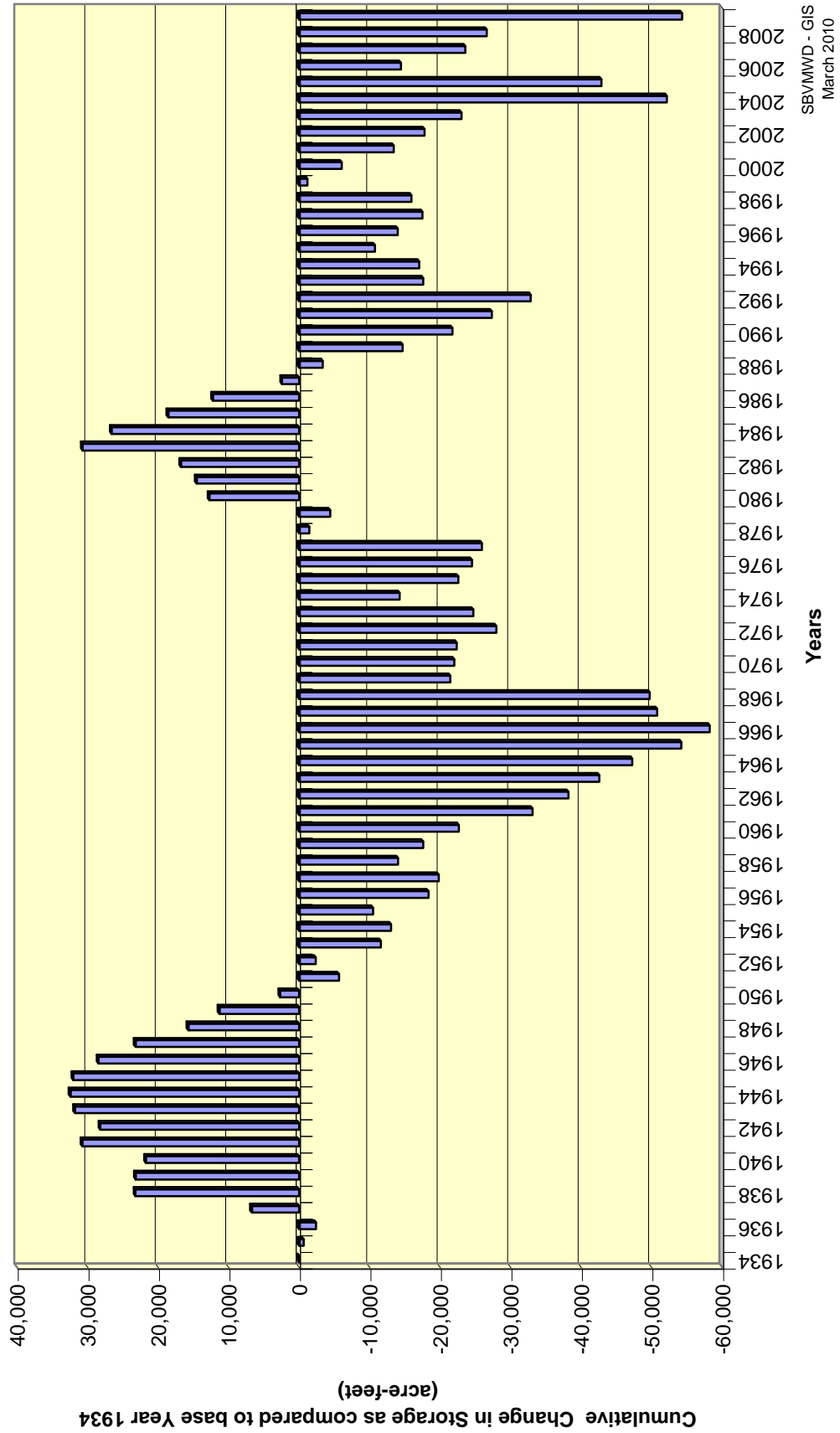
Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)               |                                    |                               |  |                                       |   |                                       |
|------|------------------------------------|------------------------------------|-------------------------------|--|---------------------------------------|---|---------------------------------------|
|      | E-6W BASELINE<br>1N4W32N<br>Source | CAJON NO 1<br>1N5W03H01S<br>Source | DARBY<br>1N4W29E01S<br>Source | MT VERNON WELL<br>1N4W31A01S<br>Source | CAJON NO 2<br>1N5W03H02<br>Substitute | MONITOR WELL<br>2N5W33K01<br>Added Source | CAJON NO 3<br>1N5W03A02<br>Substitute |
| 1992 | -182.00                            | -159.00                            |                               | -147.00                                |                                       |   |                                       |
| 1993 | -157.00                            | -76.00                             |                               | -225.00                                |                                       |   |                                       |
| 1994 | -169.00                            | -150.00                            |                               | -221.00                                |                                       |   |                                       |
| 1995 | -154.00                            | -104.00                            |                               | -230.00                                |                                       |   |                                       |
| 1996 | -154.00                            | -149.00                            |                               | -207.00                                |                                       |   |                                       |
| 1997 | -159.00                            | -150.00                            |                               | -210.00                                |                                       |   |                                       |
| 1998 | -153.00                            | -116.00                            |                               | -207.00                                |                                       |   |                                       |
| 1999 | -156.00                            | -153.80                            |                               | -211.90                                |                                       | -83.33                                    |                                       |
| 2000 | -167.10                            | -189.70                            |                               | -221.20                                |                                       | -83.07                                    |                                       |
| 2001 | -180.60                            | -200.40                            |                               | -237.50                                | -203.60                               | -83.12                                    |                                       |
| 2002 | -196.50                            | -214.10                            |                               | -255.70                                | -218.10                               | -84.24                                    |                                       |
| 2003 | -217.00                            | -209.60                            |                               | -272.70                                | -210.00                               | -83.00                                    |                                       |
| 2004 | -237.00                            |                                    |                               | -294.60                                | -223.30                               | -83.45                                    |                                       |
| 2005 | -223.60                            |                                    |                               | -289.30                                | -88.10                                | -59.84                                    | -81.70                                |
| 2006 | -242.00                            |                                    |                               | -298.00                                | -126.29                               | -70.63                                    | -122.00                               |
| 2007 | -248.64                            |                                    |                               | -296.78                                | -171.00                               | -83.48                                    | -168.50                               |
| 2008 | -256.00                            |                                    |                               | -301.16                                | -178.00                               | -83.48                                    | -174.38                               |
| 2009 | -265.00                            |                                    |                               | -319.00                                | -190.90                               |   | -184.80                               |

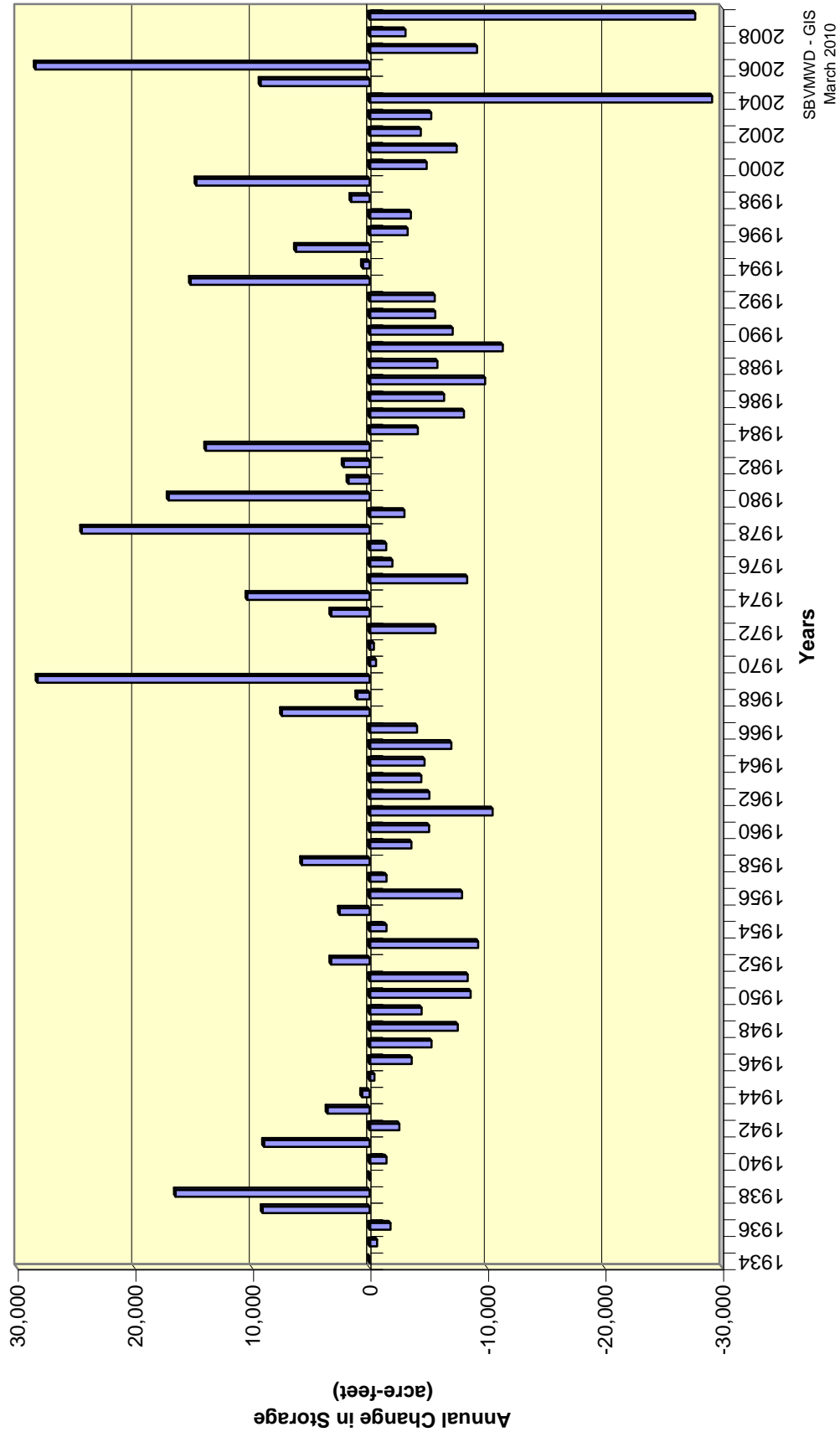




### Cumulative Change in Storage for the Devil Canyon Sub-Basin



### Annual Change in Storage for the Devil Canyon Sub-Basin



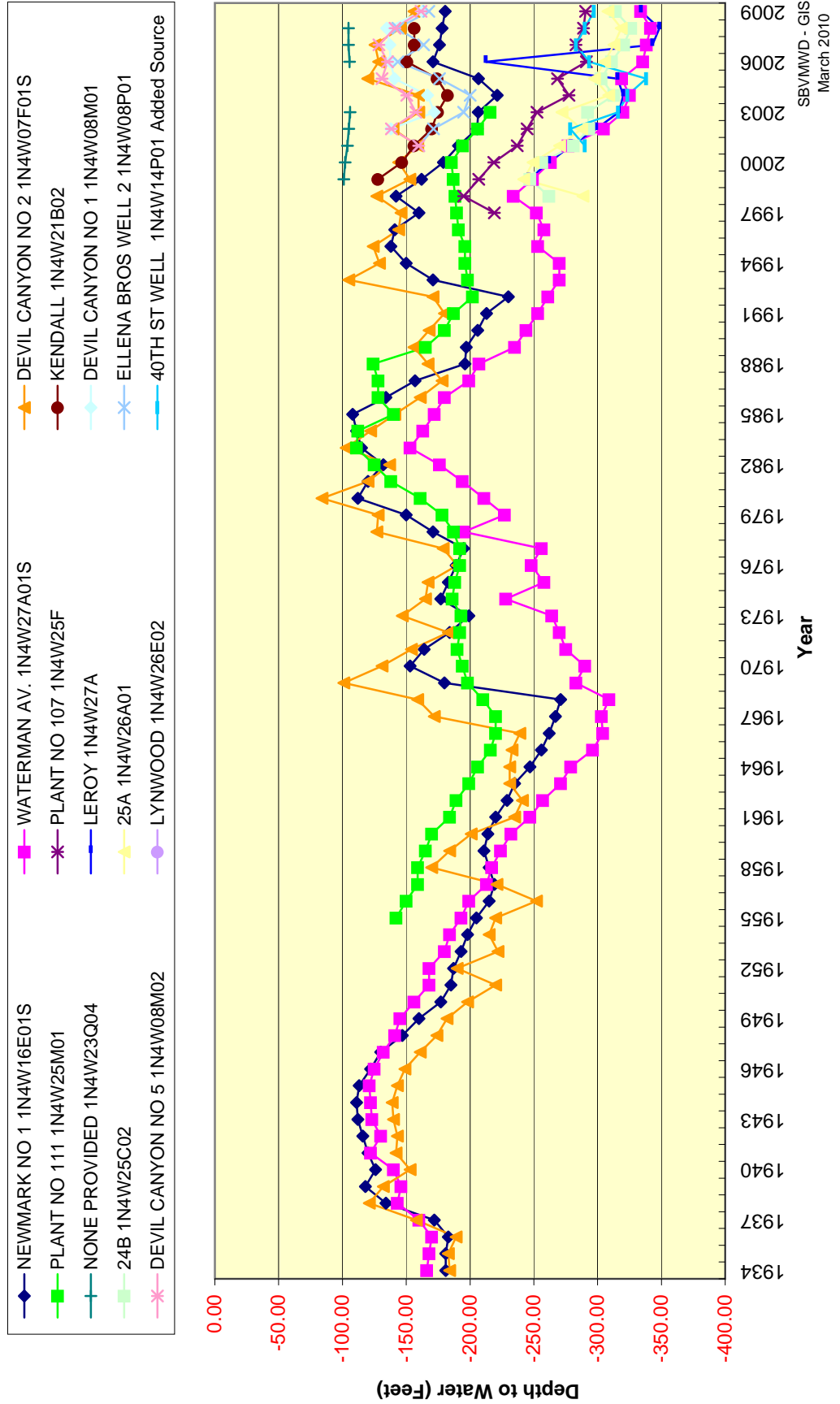
**San Bernardino Valley Municipal Water District**  
Change In Storage for the Devil Canyon Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1934        | 0                              | n/a  | 0   |
| 1935        | 0                              | -635   | -635  |
| 1936        | -3                             | -1,769   | -2,404  |
| 1937        | 17                             | 9,114  | 6,710   |
| 1938        | 31                             | 16,514   | 23,224  |
| 1939        | 1                              | -45  | 23,179  |
| 1940        | -8                             | -1,440   | 21,739  |
| 1941        | 12                             | 8,997  | 30,736  |
| 1942        | -2                             | -2,536   | 28,200  |
| 1943        | 5                              | 3,596  | 31,796  |
| 1944        | 1                              | 646  | 32,442  |
| 1945        | -2                             | -399   | 32,043  |
| 1946        | -6                             | -3,572   | 28,471  |
| 1947        | -9                             | -5,269   | 23,202  |
| 1948        | -13                            | -7,490   | 15,712  |
| 1949        | -8                             | -4,409   | 11,303  |
| 1950        | -15                            | -8,602   | 2,701   |
| 1951        | -14                            | -8,346   | -5,645  |
| 1952        | 9                              | 3,277  | -2,368  |
| 1953        | -17                            | -9,239   | -11,607   |
| 1954        | -1                             | -1,422   | -13,029   |
| 1955        | -7                             | 2,555  | -10,474   |
| 1956        | -14                            | -7,872   | -18,346   |
| 1957        | 1                              | -1,442   | -19,788   |
| 1958        | 13                             | 5,764  | -14,024   |
| 1959        | -6                             | -3,562   | -17,586   |
| 1960        | -8                             | -5,048   | -22,634   |
| 1961        | -17                            | -10,460  | -33,094   |
| 1962        | -8                             | -5,093   | -38,187   |
| 1963        | -5                             | -4,393   | -42,580   |
| 1964        | -7                             | -4,666   | -47,246   |
| 1965        | -10                            | -6,959   | -54,205   |
| 1966        | -6                             | -4,037   | -58,242   |
| 1967        | 16                             | 7,468  | -50,774   |
| 1968        | 3                              | 1,062  | -49,712   |
| 1969        | 47                             | 28,267   | -21,445   |
| 1970        | -2                             | -542   | -21,987   |
| 1971        | -4                             | -364   | -22,351   |
| 1972        | -12                            | -5,604   | -27,955   |
| 1973        | 7                              | 3,270  | -24,685   |
| 1974        | 12                             | 10,425   | -14,260   |
| 1975        | -10                            | -8,298   | -22,558   |
| 1976        | -6                             | -1,945   | -24,503   |
| 1977        | -1                             | -1,418   | -25,921   |

**San Bernardino Valley Municipal Water District**  
Change In Storage for the Devil Canyon Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1978        | 36                             | 24,493   | -1,428  |
| 1979        | -1                             | -2,963   | -4,391  |
| 1980        | 29                             | 17,117   | 12,726  |
| 1981        | -1                             | 1,812  | 14,538  |
| 1982        | 1                              | 2,224  | 16,762  |
| 1983        | 22                             | 13,938   | 30,700  |
| 1984        | -7                             | -4,102   | 26,598  |
| 1985        | -13                            | -8,029   | 18,569  |
| 1986        | -11                            | -6,328   | 12,241  |
| 1987        | -15                            | -9,819   | 2,422   |
| 1988        | -8                             | -5,764   | -3,342  |
| 1989        | -15                            | -11,326  | -14,668   |
| 1990        | -11                            | -7,063   | -21,731   |
| 1991        | -9                             | -5,576   | -27,307   |
| 1992        | -8                             | -5,528   | -32,835   |
| 1993        | 30                             | 15,236   | -17,599   |
| 1994        | 0                              | 579  | -17,020   |
| 1995        | 9                              | 6,283  | -10,737   |
| 1996        | -6                             | -3,236   | -13,973   |
| 1997        | -3                             | -3,519   | -17,492   |
| 1998        | 16                             | 1,572  | -15,920   |
| 1999        | -14                            | 14,749   | -1,171  |
| 2000        | -9                             | -4,853   | -6,024  |
| 2001        | -14                            | -7,407   | -13,431   |
| 2002        | -7                             | -4,345   | -17,776   |
| 2003        | -13                            | -5,237   | -23,013   |
| 2004        | 8                              | -29,138  | -52,151   |
| 2005        | 13                             | 9,289  | -42,862   |
| 2006        | 13                             | 28,432   | -14,430   |
| 2007        | -12                            | -9,131   | -23,561   |
| 2008        | -3                             | -3,047   | -26,608   |
| 2009        | -3                             | -27,693  | -54,301   |

### Hydrograph for the Devil Canyon Sub-Basin Wells



**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**DEVIL CANYON SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                 |                                      |   |                                     |                                       |                                      |  |
|------|--------------------------------------|--------------------------------------|---|-------------------------------------|---------------------------------------|--------------------------------------|--|
|      | NEWMARK NO 1<br>1N4W16E01S<br>Source | WATERMAN AV.<br>1N4W27A01S<br>Source | DEVIL CANYON NO 2<br>1N4W07F01S<br>Source | PLANT NO 111<br>1N4W25M01<br>Source | PLANT NO 107<br>1N4W25F<br>Substitute | KENDALL<br>1N4W21B02<br>Added Source | NONE PROVIDED<br>1N4W23Q04<br>Added Source |
| 1934 | -181.00                              | -166.00                              | -184.00                                   |                                     |                                       |                                      |  |
| 1935 | -181.00                              | -168.00                              | -183.00                                   |                                     |                                       |                                      |  |
| 1936 | -183.00                              | -170.00                              | -189.00                                   |                                     |                                       |                                      |  |
| 1937 | -172.00                              | -160.00                              | -158.00                                   |                                     |                                       |                                      |  |
| 1938 | -134.00                              | -143.00                              | -121.00                                   |                                     |                                       |                                      |  |
| 1939 | -118.00                              | -146.00                              | -132.00                                   |                                     |                                       |                                      |  |
| 1940 | -126.00                              | -140.00                              | -153.00                                   |                                     |                                       |                                      |  |
| 1941 | -120.00                              | -122.00                              | -142.00                                   |                                     |                                       |                                      |  |
| 1942 | -116.00                              | -130.00                              | -143.00                                   |                                     |                                       |                                      |  |
| 1943 | -112.00                              | -123.00                              | -140.00                                   |                                     |                                       |                                      |  |
| 1944 | -111.00                              | -122.00                              | -139.00                                   |                                     |                                       |                                      |  |
| 1945 | -113.00                              | -121.00                              | -143.00                                   |                                     |                                       |                                      |  |
| 1946 | -122.00                              | -125.00                              | -149.00                                   |                                     |                                       |                                      |  |
| 1947 | -130.00                              | -132.00                              | -161.00                                   |                                     |                                       |                                      |  |
| 1948 | -147.00                              | -141.00                              | -174.00                                   |                                     |                                       |                                      |  |
| 1949 | -160.00                              | -145.00                              | -182.00                                   |                                     |                                       |                                      |  |
| 1950 | -177.00                              | -156.00                              | -198.00                                   |                                     |                                       |                                      |  |
| 1951 | -185.00                              | -168.00                              | -220.00                                   |                                     |                                       |                                      |  |
| 1952 | -187.00                              | -168.00                              | -190.00                                   |                                     |                                       |                                      |  |
| 1953 | -193.00                              | -180.00                              | -222.00                                   |                                     |                                       |                                      |  |
| 1954 | -198.00                              | -184.00                              | -215.00                                   |                                     |                                       |                                      |  |
| 1955 | -205.00                              | -193.00                              | -220.00                                   | -142.00                             |                                       |                                      |  |
| 1956 | -215.00                              | -199.00                              | -252.00                                   | -150.00                             |                                       |                                      |  |
| 1957 | -219.00                              | -213.00                              | -221.00                                   | -159.00                             |                                       |                                      |  |
| 1958 | -215.00                              | -217.00                              | -170.00                                   | -159.00                             |                                       |                                      |  |
| 1959 | -211.00                              | -224.00                              | -184.00                                   | -165.00                             |                                       |                                      |  |
| 1960 | -214.00                              | -232.00                              | -201.00                                   | -170.00                             |                                       |                                      |  |
| 1961 | -220.00                              | -247.00                              | -235.00                                   | -184.00                             |                                       |                                      |  |
| 1962 | -229.00                              | -257.00                              | -241.00                                   | -189.00                             |                                       |                                      |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**DEVIL CANYON SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                 |                                      |   |                                     |                                       |                                      |  |
|------|--------------------------------------|--------------------------------------|---|-------------------------------------|---------------------------------------|--------------------------------------|--|
|      | NEWMARK NO 1<br>1N4W16E01S<br>Source | WATERMAN AV.<br>1N4W27A01S<br>Source | DEVIL CANYON NO 2<br>1N4W07F01S<br>Source | PLANT NO 111<br>1N4W25M01<br>Source | PLANT NO 107<br>1N4W25F<br>Substitute | KENDALL<br>1N4W21B02<br>Added Source | NONE PROVIDED<br>1N4W23Q04<br>Added Source |
| 1963 | -235.00                              | -271.00                              | -231.00                                   | -199.00                             |                                       |                                      |  |
| 1964 | -247.00                              | -279.00                              | -231.00                                   | -206.00                             |                                       |                                      |  |
| 1965 | -256.00                              | -296.00                              | -233.00                                   | -216.00                             |                                       |                                      |  |
| 1966 | -262.00                              | -304.00                              | -239.00                                   | -220.00                             |                                       |                                      |  |
| 1967 | -267.00                              | -303.00                              | -172.00                                   | -220.00                             |                                       |                                      |  |
| 1968 | -271.00                              | -309.00                              | -159.00                                   | -210.00                             |                                       |                                      |  |
| 1969 | -180.00                              | -283.00                              | -101.00                                   | -198.00                             |                                       |                                      |  |
| 1970 | -153.00                              | -290.00                              | -131.00                                   | -194.00                             |                                       |                                      |  |
| 1971 | -164.00                              | -275.00                              | -154.00                                   | -190.00                             |                                       |                                      |  |
| 1972 | -184.00                              | -270.00                              | -183.00                                   | -192.00                             |                                       |                                      |  |
| 1973 | -199.00                              | -264.00                              | -147.00                                   | -193.00                             |                                       |                                      |  |
| 1974 | -177.00                              | -228.00                              | -165.00                                   | -186.00                             |                                       |                                      |  |
| 1975 | -183.00                              | -258.00                              | -167.00                                   | -188.00                             |                                       |                                      |  |
| 1976 | -189.00                              | -248.00                              | -190.00                                   | -192.00                             |                                       |                                      |  |
| 1977 | -195.00                              | -256.00                              | -179.00                                   | -192.00                             |                                       |                                      |  |
| 1978 | -171.00                              | -195.00                              | -127.00                                   | -187.00                             |                                       |                                      |  |
| 1979 | -150.00                              | -227.00                              | -128.00                                   | -178.00                             |                                       |                                      |  |
| 1980 | -112.00                              | -211.00                              | -84.00                                    | -161.00                             |                                       |                                      |  |
| 1981 | -120.00                              | -194.00                              | -120.00                                   | -138.00                             |                                       |                                      |  |
| 1982 | -132.00                              | -176.00                              | -137.00                                   | -125.00                             |                                       |                                      |  |
| 1983 | -115.00                              | -153.00                              | -103.00                                   | -111.00                             |                                       |                                      |  |
| 1984 | -111.00                              | -163.00                              | -122.00                                   | -112.00                             |                                       |                                      |  |
| 1985 | -108.00                              | -172.00                              | -141.00                                   | -140.00                             |                                       |                                      |  |
| 1986 | -134.00                              | -180.00                              | -161.00                                   | -128.00                             |                                       |                                      |  |
| 1987 | -157.00                              | -199.00                              | -178.00                                   | -128.00                             |                                       |                                      |  |
| 1988 | -196.00                              | -207.00                              | -167.00                                   | -124.00                             |                                       |                                      |  |
| 1989 | -197.00                              | -235.00                              | -156.00                                   | -165.00                             |                                       |                                      |  |
| 1990 | -206.00                              | -244.00                              | -168.00                                   | -180.00                             |                                       |                                      |  |
| 1991 | -213.00                              | -253.00                              | -180.00                                   | -187.00                             |                                       |                                      |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**DEVIL CANYON SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                 |                                      |   |                                     |                                       |                                      |  |  |
|------|--------------------------------------|--------------------------------------|---|-------------------------------------|---------------------------------------|--------------------------------------|--|--|
|      | NEWMARK NO 1<br>1N4W16E01S<br>Source | WATERMAN AV.<br>1N4W27A01S<br>Source | DEVIL CANYON NO 2<br>1N4W07F01S<br>Source | PLANT NO 111<br>1N4W25M01<br>Source | PLANT NO 107<br>1N4W25F<br>Substitute | KENDALL<br>1N4W21B02<br>Added Source | NONE PROVIDED<br>1N4W23Q04<br>Added Source |  |
| 1992 | -230.00                              | -261.00                              | -171.00                                   | -202.00                             |                                       |                                      |  |  |
| 1993 | -171.00                              | -270.00                              | -105.00                                   | -198.00                             |                                       |                                      |  |  |
| 1994 | -150.00                              | -270.00                              | -129.00                                   | -196.00                             |                                       |                                      |  |  |
| 1995 | -138.00                              | -253.00                              | -124.00                                   | -196.00                             |                                       |                                      |  |  |
| 1996 | -141.00                              | -258.00                              | -144.00                                   | -191.00                             |                                       |                                      |  |  |
| 1997 | -160.00                              | -252.00                              | -146.00                                   | -189.60                             | -219.00                               |                                      |  |  |
| 1998 | -142.00                              | -234.00                              | -127.00                                   | -188.30                             | -195.00                               |                                      |  |  |
| 1999 | -162.00                              | -249.00                              | -152.90                                   | -186.90                             | -206.80                               | -127.70                              | -101.04                                    |  |
| 2000 | -179.10                              | -263.00                              | -144.00                                   | -185.50                             | -218.60                               | -146.46                              | -102.14                                    |  |
| 2001 | -191.00                              | -277.00                              | -158.90                                   | -194.10                             | -237.00                               | -156.15                              | -103.87                                    |  |
| 2002 | -205.60                              | -304.60                              | -139.60                                   | -206.00                             | -244.70                               | -169.92                              | -104.92                                    |  |
| 2003 | -206.40                              | -320.00                              | -159.70                                   | -215.80                             | -252.40                               | -174.55                              | -105.98                                    |  |
| 2004 | -221.30                              | -325.00                              | -159.50                                   |                                     | -277.50                               | -182.43                              |  |  |
| 2005 | -206.60                              | -318.90                              | -119.80                                   |                                     | -268.50                               | -174.24                              |  |  |
| 2006 | -171.00                              | -335.50                              | -128.41                                   |                                     | -291.20                               | -150.57                              | -105.52                                    |  |
| 2007 | -176.00                              | -338.30                              | -125.52                                   |                                     | -283.00                               | -156.37                              | -104.80                                    |  |
| 2008 | -178.00                              | -341.50                              | -145.27                                   |                                     | -289.00                               | -156.37                              | -104.80                                    |  |
| 2009 | -180.50                              | -333.80                              | -156.00                                   |                                     | -290.50                               |                                      |  |  |



**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**DEVIL CANYON SUB-BASIN**

\*Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft).            |  |                                |                                |   |  |   |
|------|---------------------------------|--|--------------------------------|--------------------------------|---|--|---|
|      | LERROY<br>1N4W27A<br>Substitute | DEVIL CANYON NO 1<br>1N4W08M01<br>Added Source | 24B<br>1N4W25C02<br>Substitute | 25A<br>1N4W26A01<br>Substitute | ELLENA BROS WELL 2<br>1N4W08P01<br>Added Source | DEVIL CANYON NO 5<br>1N4W08M02<br>Added Source | 40TH ST WELL<br>1N4W14P01<br>Added Source |
| 1934 |                                 |  |                                |                                |   |  |   |
| 1935 |                                 |  |                                |                                |   |  |   |
| 1936 |                                 |  |                                |                                |   |  |   |
| 1937 |                                 |  |                                |                                |   |  |   |
| 1938 |                                 |  |                                |                                |   |  |   |
| 1939 |                                 |  |                                |                                |   |  |   |
| 1940 |                                 |  |                                |                                |   |  |   |
| 1941 |                                 |  |                                |                                |   |  |   |
| 1942 |                                 |  |                                |                                |   |  |   |
| 1943 |                                 |  |                                |                                |   |  |   |
| 1944 |                                 |  |                                |                                |   |  |   |
| 1945 |                                 |  |                                |                                |   |  |   |
| 1946 |                                 |  |                                |                                |   |  |   |
| 1947 |                                 |  |                                |                                |   |  |   |
| 1948 |                                 |  |                                |                                |   |  |   |
| 1949 |                                 |  |                                |                                |   |  |   |
| 1950 |                                 |  |                                |                                |   |  |   |
| 1951 |                                 |  |                                |                                |   |  |   |
| 1952 |                                 |  |                                |                                |   |  |   |
| 1953 |                                 |  |                                |                                |   |  |   |
| 1954 |                                 |  |                                |                                |   |  |   |
| 1955 |                                 |  |                                |                                |   |  |   |
| 1956 |                                 |  |                                |                                |   |  |   |
| 1957 |                                 |  |                                |                                |   |  |   |
| 1958 |                                 |  |                                |                                |   |  |   |
| 1959 |                                 |  |                                |                                |   |  |   |
| 1960 |                                 |  |                                |                                |   |  |   |
| 1961 |                                 |  |                                |                                |   |  |   |
| 1962 |                                 |  |                                |                                |   |  |   |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**DEVIL CANYON SUB-BASIN**

\*Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)            |  |                                |                                |   |  |   |
|------|---------------------------------|--|--------------------------------|--------------------------------|---|--|---|
|      | LERROY<br>1N4W27A<br>Substitute | DEVIL CANYON NO 1<br>1N4W08M01<br>Added Source | 24B<br>1N4W25C02<br>Substitute | 25A<br>1N4W26A01<br>Substitute | ELLENA BROS WELL 2<br>1N4W08P01<br>Added Source | DEVIL CANYON NO 5<br>1N4W08M02<br>Added Source | 40TH ST WELL<br>1N4W14P01<br>Added Source |
| 1963 |                                 |  |                                |                                |   |  |   |
| 1964 |                                 |  |                                |                                |   |  |   |
| 1965 |                                 |  |                                |                                |   |  |   |
| 1966 |                                 |  |                                |                                |   |  |   |
| 1967 |                                 |  |                                |                                |   |  |   |
| 1968 |                                 |  |                                |                                |   |  |   |
| 1969 |                                 |  |                                |                                |   |  |   |
| 1970 |                                 |  |                                |                                |   |  |   |
| 1971 |                                 |  |                                |                                |   |  |   |
| 1972 |                                 |  |                                |                                |   |  |   |
| 1973 |                                 |  |                                |                                |   |  |   |
| 1974 |                                 |  |                                |                                |   |  |   |
| 1975 |                                 |  |                                |                                |   |  |   |
| 1976 |                                 |  |                                |                                |   |  |   |
| 1977 |                                 |  |                                |                                |   |  |   |
| 1978 |                                 |  |                                |                                |   |  |   |
| 1979 |                                 |  |                                |                                |   |  |   |
| 1980 |                                 |  |                                |                                |   |  |   |
| 1981 |                                 |  |                                |                                |   |  |   |
| 1982 |                                 |  |                                |                                |   |  |   |
| 1983 |                                 |  |                                |                                |   |  |   |
| 1984 |                                 |  |                                |                                |   |  |   |
| 1985 |                                 |  |                                |                                |   |  |   |
| 1986 |                                 |  |                                |                                |   |  |   |
| 1987 |                                 |  |                                |                                |   |  |   |
| 1988 |                                 |  |                                |                                |   |  |   |
| 1989 |                                 |  |                                |                                |   |  |   |
| 1990 |                                 |  |                                |                                |   |  |   |
| 1991 |                                 |  |                                |                                |   |  |   |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**DEVIL CANYON SUB-BASIN**

\*Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft).            |  |                                |                                |   |  |   |  |
|------|---------------------------------|--|--------------------------------|--------------------------------|---|--|---|--|
|      | LERROY<br>1N4W27A<br>Substitute | DEVIL CANYON NO 1<br>1N4W08M01<br>Added Source | 24B<br>1N4W25C02<br>Substitute | 25A<br>1N4W26A01<br>Substitute | ELLENA BROS WELL 2<br>1N4W08P01<br>Added Source | DEVIL CANYON NO 5<br>1N4W08M02<br>Added Source | 40TH ST WELL<br>1N4W14P01<br>Added Source |  |
| 1992 |                                 |  |                                |                                |   |  |   |  |
| 1993 |                                 |  |                                |                                |   |  |   |  |
| 1994 |                                 |  |                                |                                |   |  |   |  |
| 1995 |                                 |  |                                |                                |   |  |   |  |
| 1996 |                                 |  |                                |                                |   |  |   |  |
| 1997 |                                 |  |                                |                                |   |  |   |  |
| 1998 |                                 |  | -261.90                        | -288.60                        |   |  |   |  |
| 1999 | -245.70                         |  | -246.90                        | -242.00                        |   |  |   |  |
| 2000 | -262.10                         |  | -256.30                        | -249.40                        |   |  |   |  |
| 2001 | -279.00                         |  | -281.00                        | -270.30                        | -159.70   | -159.70  | -290.00                                   |  |
| 2002 | -299.00                         | -137.90  | -293.20                        | -287.50                        | -171.40   | -138.40  | -278.50                                   |  |
| 2003 | -316.70                         | -172.00  | -292.30                        | -272.00                        | -195.00   | -157.60  | -316.00                                   |  |
| 2004 | -320.10                         | -166.60  | -312.70                        | -308.80                        | -200.10   | -150.40  | -323.40                                   |  |
| 2005 | -315.60                         | -140.90  | -302.80                        | -297.60                        | -176.00   | -131.00  | -338.10                                   |  |
| 2006 | -212.25                         | -137.55  | -310.90                        | -305.50                        | -143.37   | -135.35  | -293.35                                   |  |
| 2007 | -343.00                         | -137.15  | -320.50                        | -312.80                        | -163.62   | -128.54  | -283.03                                   |  |
| 2008 | -348.40                         | -134.70  | -326.00                        | -318.40                        | -143.51   | -141.16  | -290.00                                   |  |
| 2009 | -334.00                         | -162.50  | -314.00                        | -308.00                        | -167.80   | -161.50  | -297.00                                   |  |

**San Bernardino Valley Municipal Water District**  
**Change in Storage for the San Bernardino Basin Area 1934 - 2009**  
 DEVIL CANYON SUB-BASIN

'Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft)                |  |  |  |  |
|------|------------------------------------|--|--|--|--|
|      | LYNWOOD<br>1N4W26E02<br>Substitute |  |  |  |  |
| 1934 |                                    |  |  |  |  |
| 1935 |                                    |  |  |  |  |
| 1936 |                                    |  |  |  |  |
| 1937 |                                    |  |  |  |  |
| 1938 |                                    |  |  |  |  |
| 1939 |                                    |  |  |  |  |
| 1940 |                                    |  |  |  |  |
| 1941 |                                    |  |  |  |  |
| 1942 |                                    |  |  |  |  |
| 1943 |                                    |  |  |  |  |
| 1944 |                                    |  |  |  |  |
| 1945 |                                    |  |  |  |  |
| 1946 |                                    |  |  |  |  |
| 1947 |                                    |  |  |  |  |
| 1948 |                                    |  |  |  |  |
| 1949 |                                    |  |  |  |  |
| 1950 |                                    |  |  |  |  |
| 1951 |                                    |  |  |  |  |
| 1952 |                                    |  |  |  |  |
| 1953 |                                    |  |  |  |  |
| 1954 |                                    |  |  |  |  |
| 1955 |                                    |  |  |  |  |
| 1956 |                                    |  |  |  |  |
| 1957 |                                    |  |  |  |  |
| 1958 |                                    |  |  |  |  |
| 1959 |                                    |  |  |  |  |
| 1960 |                                    |  |  |  |  |
| 1961 |                                    |  |  |  |  |
| 1962 |                                    |  |  |  |  |

**San Bernardino Valley Municipal Water District**  
**Change in Storage for the San Bernardino Basin Area 1934 - 2009**  
 DEVIL CANYON SUB-BASIN

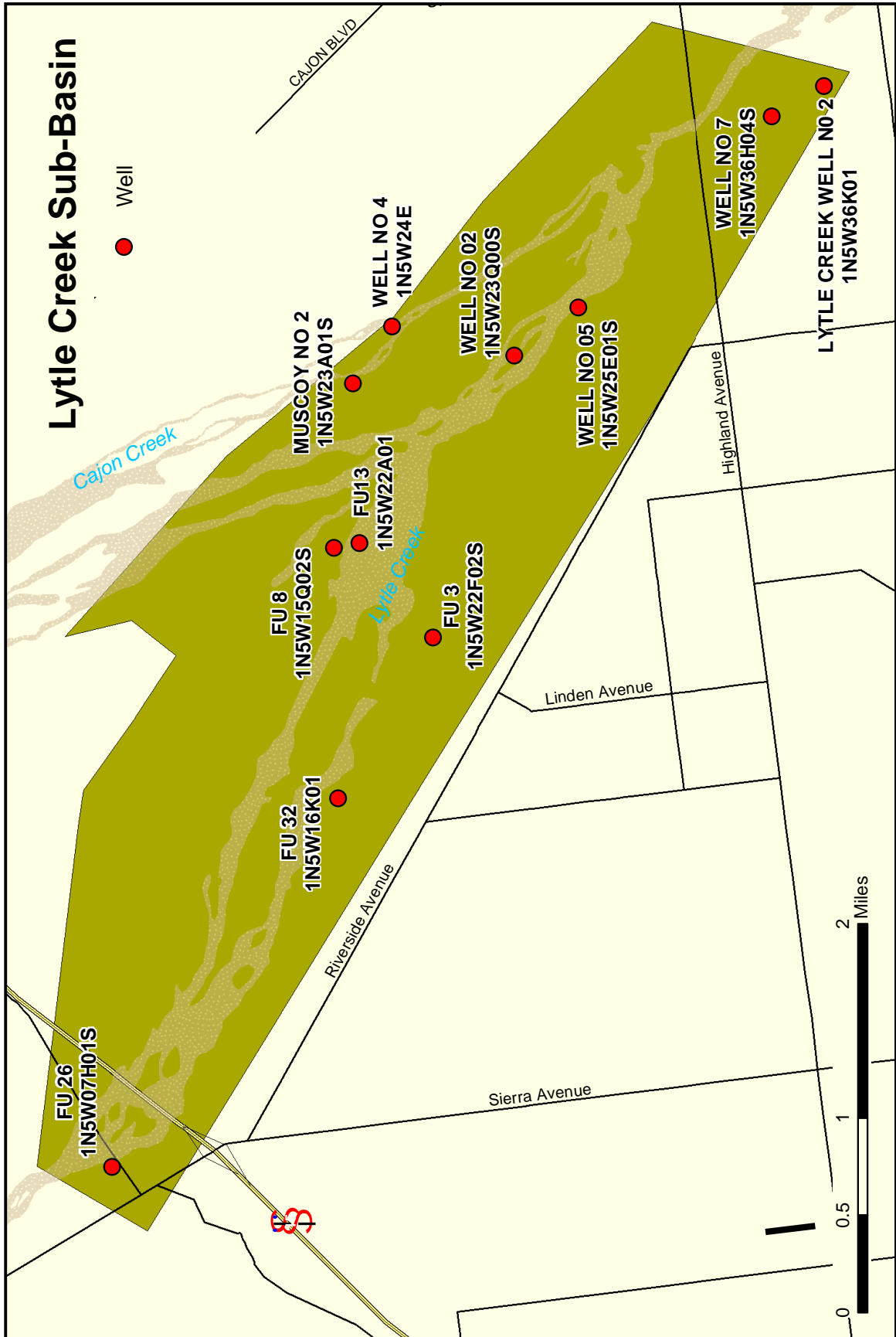
'Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | LYNWOOD<br>1N4W26E02<br>Substitute | Depth to Water (ft) |  |  |  |  |
|------|------------------------------------|---------------------|--|--|--|--|
|      |                                    |                     |  |  |  |  |
| 1963 |                                    |                     |  |  |  |  |
| 1964 |                                    |                     |  |  |  |  |
| 1965 |                                    |                     |  |  |  |  |
| 1966 |                                    |                     |  |  |  |  |
| 1967 |                                    |                     |  |  |  |  |
| 1968 |                                    |                     |  |  |  |  |
| 1969 |                                    |                     |  |  |  |  |
| 1970 |                                    |                     |  |  |  |  |
| 1971 |                                    |                     |  |  |  |  |
| 1972 |                                    |                     |  |  |  |  |
| 1973 |                                    |                     |  |  |  |  |
| 1974 |                                    |                     |  |  |  |  |
| 1975 |                                    |                     |  |  |  |  |
| 1976 |                                    |                     |  |  |  |  |
| 1977 |                                    |                     |  |  |  |  |
| 1978 |                                    |                     |  |  |  |  |
| 1979 |                                    |                     |  |  |  |  |
| 1980 |                                    |                     |  |  |  |  |
| 1981 |                                    |                     |  |  |  |  |
| 1982 |                                    |                     |  |  |  |  |
| 1983 |                                    |                     |  |  |  |  |
| 1984 |                                    |                     |  |  |  |  |
| 1985 |                                    |                     |  |  |  |  |
| 1986 |                                    |                     |  |  |  |  |
| 1987 |                                    |                     |  |  |  |  |
| 1988 |                                    |                     |  |  |  |  |
| 1989 |                                    |                     |  |  |  |  |
| 1990 |                                    |                     |  |  |  |  |
| 1991 |                                    |                     |  |  |  |  |

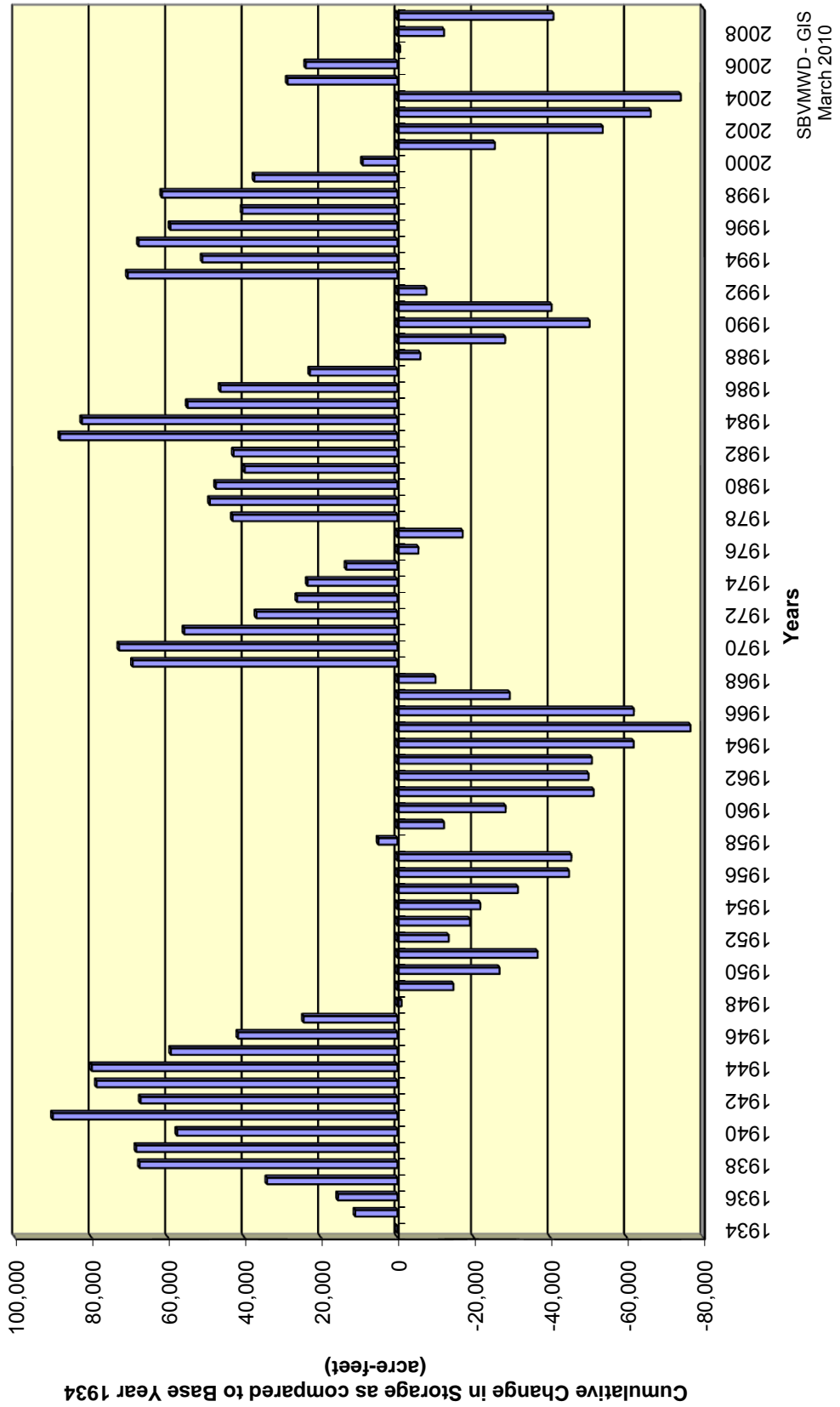
**San Bernardino Valley Municipal Water District**  
**Change in Storage for the San Bernardino Basin Area 1934 - 2009**  
 DEVIL CANYON SUB-BASIN

'Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

|             |   | <b>Depth to Water (ft)</b> |  |  |  |  |
|-------------|---|----------------------------|--|--|--|--|
| <b>Year</b> | <b>LYNWOOD<br/>1N4W26E02<br/>Substitute</b> |                            |  |  |  |  |
| 1992        |   |                            |  |  |  |  |
| 1993        |   |                            |  |  |  |  |
| 1994        |   |                            |  |  |  |  |
| 1995        |   |                            |  |  |  |  |
| 1996        |   |                            |  |  |  |  |
| 1997        |   |                            |  |  |  |  |
| 1998        |   |                            |  |  |  |  |
| 1999        |   |                            |  |  |  |  |
| 2000        |   |                            |  |  |  |  |
| 2001        |   |                            |  |  |  |  |
| 2002        |   |                            |  |  |  |  |
| 2003        |   |                            |  |  |  |  |
| 2004        |   |                            |  |  |  |  |
| 2005        | -300.00                                     |                            |  |  |  |  |
| 2006        | -312.24                                     |                            |  |  |  |  |
| 2007        | -324.00                                     |                            |  |  |  |  |
| 2008        | -327.30                                     |                            |  |  |  |  |
| 2009        | -318.90                                     |                            |  |  |  |  |

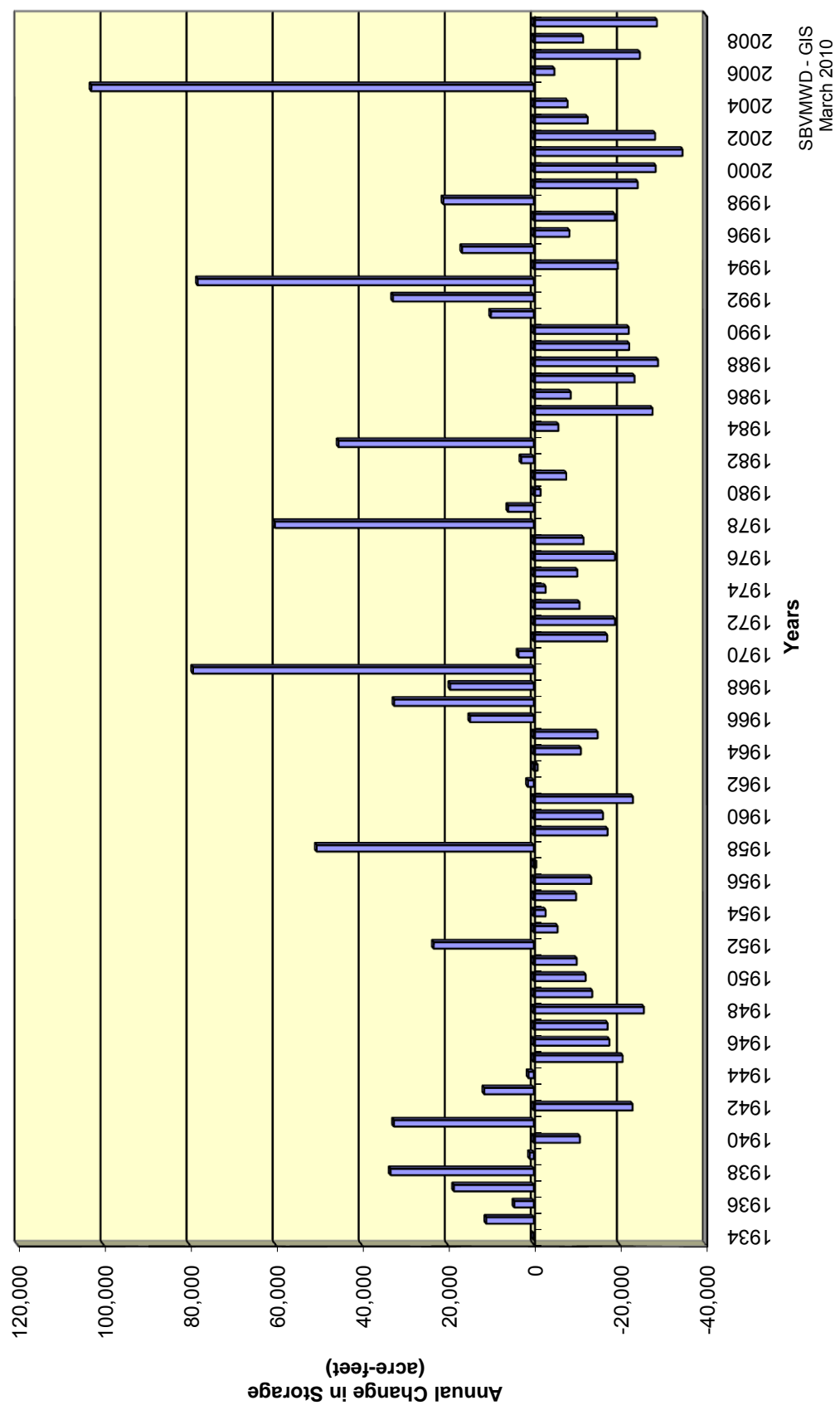


Cumulative Change in Storage for the Lytle Creek Sub-Basin





Annual Change in Storage for the Lytle Creek Sub-Basin



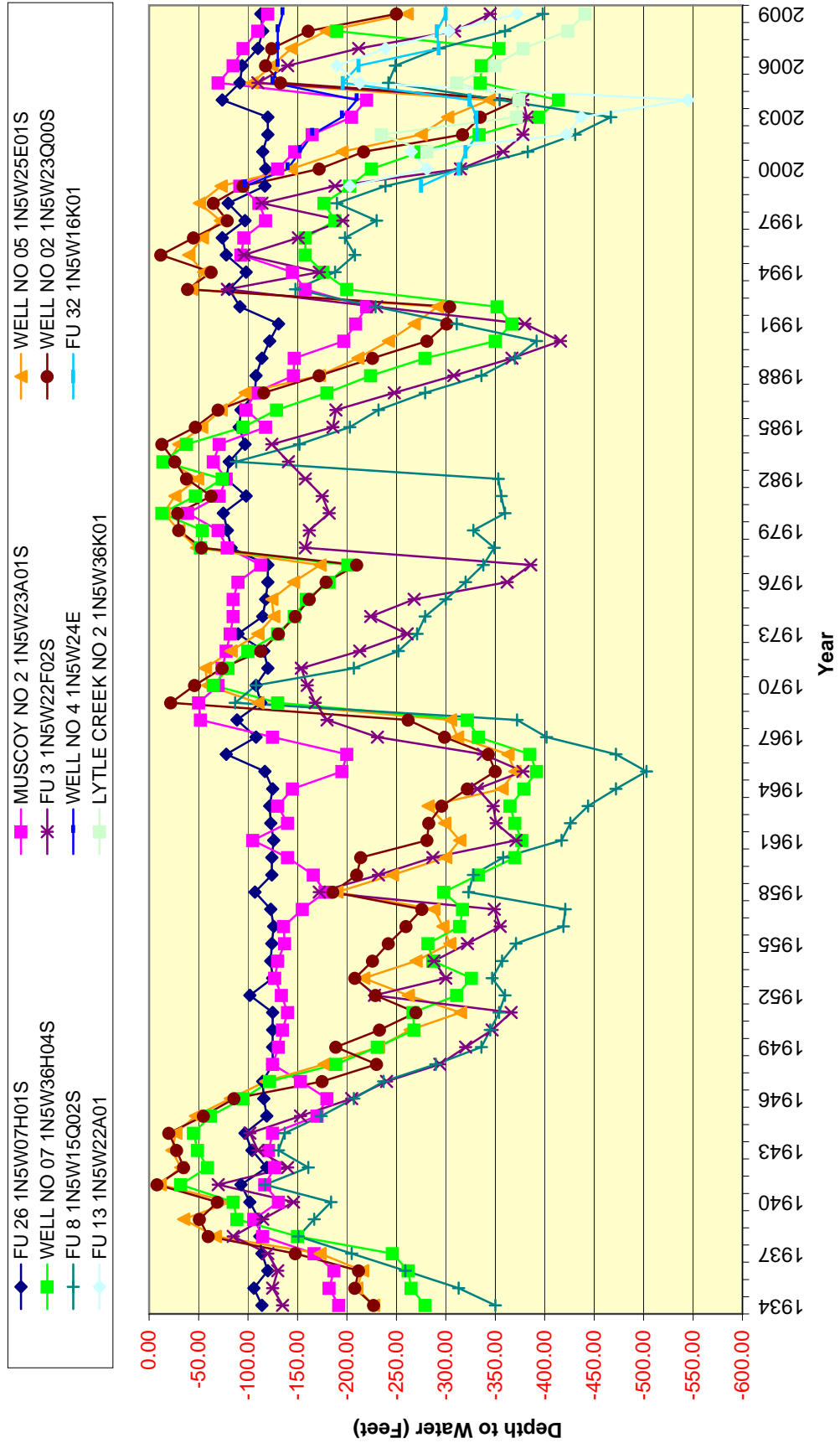
**San Bernardino Valley Municipal Water District**  
Change In Storage for the Lytle Creek Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1934        | 0                              | n/a  | 0   |
| 1935        | 16                             | 11,039   | 11,039  |
| 1936        | 3                              | 4,524  | 15,563  |
| 1937        | 30                             | 18,561   | 34,124  |
| 1938        | 62                             | 33,297   | 67,421  |
| 1939        | 9                              | 926  | 68,347  |
| 1940        | -18                            | -10,717  | 57,630  |
| 1941        | 50                             | 32,509   | 90,139  |
| 1942        | -32                            | -22,956  | 67,183  |
| 1943        | 15                             | 11,515   | 78,698  |
| 1944        | 2                              | 1,224  | 79,922  |
| 1945        | -32                            | -20,656  | 59,266  |
| 1946        | -27                            | -17,567  | 41,699  |
| 1947        | -27                            | -17,153  | 24,546  |
| 1948        | -39                            | -25,594  | -1,048  |
| 1949        | -19                            | -13,579  | -14,627   |
| 1950        | -22                            | -12,057  | -26,684   |
| 1951        | -17                            | -9,964   | -36,648   |
| 1952        | 30                             | 23,256   | -13,392   |
| 1953        | -3                             | -5,523   | -18,915   |
| 1954        | -4                             | -2,738   | -21,653   |
| 1955        | -14                            | -9,853   | -31,506   |
| 1956        | -18                            | -13,361  | -44,867   |
| 1957        | -3                             | -596   | -45,463   |
| 1958        | 68                             | 50,451   | 4,988   |
| 1959        | -26                            | -17,150  | -12,162   |
| 1960        | -22                            | -16,108  | -28,270   |
| 1961        | -28                            | -23,046  | -51,316   |
| 1962        | 0                              | 1,366  | -49,950   |
| 1963        | 1                              | -885   | -50,835   |
| 1964        | -21                            | -10,938  | -61,773   |
| 1965        | -25                            | -14,831  | -76,604   |
| 1966        | 18                             | 14,805   | -61,799   |
| 1967        | 53                             | 32,429   | -29,370   |
| 1968        | 33                             | 19,431   | -9,939  |
| 1969        | 129                            | 79,194   | 69,255  |
| 1970        | 9                              | 3,552  | 72,807  |
| 1971        | -21                            | -17,053  | 55,754  |
| 1972        | -27                            | -18,851  | 36,903  |
| 1973        | -17                            | -10,643  | 26,260  |
| 1974        | -7                             | -2,741   | 23,519  |
| 1975        | -13                            | -10,131  | 13,388  |
| 1976        | -26                            | -18,859  | -5,471  |
| 1977        | -20                            | -11,573  | -17,044   |

**San Bernardino Valley Municipal Water District**  
Change In Storage for the Lytle Creek Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1978        | 103                            | 60,162   | 43,118  |
| 1979        | 10                             | 5,964  | 49,082  |
| 1980        | 6                              | -1,588   | 47,494  |
| 1981        | -18                            | -7,544   | 39,950  |
| 1982        | 1                              | 2,912  | 42,862  |
| 1983        | 56                             | 45,372   | 88,234  |
| 1984        | -13                            | -5,730   | 82,504  |
| 1985        | -38                            | -27,599  | 54,905  |
| 1986        | -13                            | -8,602   | 46,303  |
| 1987        | -36                            | -23,422  | 22,881  |
| 1988        | -47                            | -28,867  | -5,986  |
| 1989        | -35                            | -22,178  | -28,164   |
| 1990        | -41                            | -22,083  | -50,247   |
| 1991        | 5                              | 9,959  | -40,288   |
| 1992        | 35                             | 32,721   | -7,567  |
| 1993        | 139                            | 78,106   | 70,539  |
| 1994        | -21                            | -19,516  | 51,023  |
| 1995        | 30                             | 16,655   | 67,678  |
| 1996        | -13                            | -8,288   | 59,390  |
| 1997        | -29                            | -18,815  | 40,575  |
| 1998        | 27                             | 21,005   | 61,580  |
| 1999        | -31                            | -24,144  | 37,436  |
| 2000        | -57                            | -28,334  | 9,102   |
| 2001        | -27                            | -34,576  | -25,474   |
| 2002        | -42                            | -28,205  | -53,679   |
| 2003        | -33                            | -12,542  | -66,221   |
| 2004        | -18                            | -7,866   | -74,087   |
| 2005        | 153                            | 102,835  | 28,748  |
| 2006        | -9                             | -4,791   | 23,957  |
| 2007        | -31                            | -24,651  | -694  |
| 2008        | -18                            | -11,482  | -12,176   |
| 2009        | -35                            | -28,620  | -40,796   |

### Hydrograph for the Lytle Creek Sub-Basin Wells



**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**LYTLE CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)          |                                     |                                    |                                    |                              |                                    |                              |  |
|------|-------------------------------|-------------------------------------|------------------------------------|------------------------------------|------------------------------|------------------------------------|------------------------------|--|
|      | FU 26<br>1N5W07H01S<br>Source | MUSCOY NO 2<br>1N5W23A01S<br>Source | WELL NO 05<br>1N5W25E01S<br>Source | WELL NO 07<br>1N5W36H04S<br>Source | FU 3<br>1N5W22F02S<br>Source | WELL NO 02<br>1N5W23Q00S<br>Source | FU 8<br>1N5W15Q02S<br>Source |  |
| 1934 | -114.00                       | -192.00                             | -227.00                            | -279.00                            | -135.00                      | -227.00                            | -350.00                      |  |
| 1935 | -106.00                       | -182.00                             | -210.00                            | -265.00                            | -125.00                      | -208.00                            | -313.00                      |  |
| 1936 | -120.00                       | -187.00                             | -216.00                            | -262.00                            | -130.00                      | -212.00                            | -259.00                      |  |
| 1937 | -114.00                       | -167.00                             | -173.00                            | -246.00                            | -120.00                      | -148.00                            | -205.00                      |  |
| 1938 | -112.00                       | -115.00                             | -67.00                             | -150.00                            | -85.00                       | -60.00                             | -151.00                      |  |
| 1939 | -111.00                       | -106.00                             | -35.00                             | -89.00                             | -115.00                      | -51.00                             | -167.00                      |  |
| 1940 | -102.00                       | -131.00                             | -82.00                             | -85.00                             | -146.00                      | -69.00                             | -184.00                      |  |
| 1941 | -93.00                        | -117.00                             | -11.00                             | -32.00                             | -70.00                       | -8.00                              | -117.00                      |  |
| 1942 | -119.00                       | -127.00                             | -32.00                             | -59.00                             | -140.00                      | -35.00                             | -161.00                      |  |
| 1943 | -104.00                       | -121.00                             | -23.00                             | -49.00                             | -110.00                      | -28.00                             | -131.00                      |  |
| 1944 | -97.00                        | -125.00                             | -27.00                             | -45.00                             | -102.00                      | -20.00                             | -137.00                      |  |
| 1945 | -119.00                       | -170.00                             | -47.00                             | -62.00                             | -153.00                      | -55.00                             | -174.00                      |  |
| 1946 | -116.00                       | -180.00                             | -82.00                             | -95.00                             | -205.00                      | -86.00                             | -207.00                      |  |
| 1947 | -115.00                       | -153.00                             | -118.00                            | -122.00                            | -240.00                      | -175.00                            | -237.00                      |  |
| 1948 | -125.00                       | -125.00                             | -177.00                            | -189.00                            | -294.00                      | -230.00                            | -290.00                      |  |
| 1949 | -125.00                       | -131.00                             | -232.00                            | -231.00                            | -320.00                      | -189.00                            | -336.00                      |  |
| 1950 | -125.00                       | -135.00                             | -264.00                            | -268.00                            | -347.00                      | -233.00                            | -345.00                      |  |
| 1951 | -125.00                       | -140.00                             | -315.00                            | -267.00                            | -366.00                      | -270.00                            | -354.00                      |  |
| 1952 | -102.00                       | -134.00                             | -262.00                            | -311.00                            | -228.00                      | -229.00                            | -360.00                      |  |
| 1953 | -125.00                       | -127.00                             | -217.00                            | -326.00                            | -300.00                      | -208.00                            | -347.00                      |  |
| 1954 | -123.00                       | -130.00                             | -270.00                            | -287.00                            | -288.00                      | -226.00                            | -357.00                      |  |
| 1955 | -124.00                       | -137.00                             | -304.00                            | -282.00                            | -322.00                      | -242.00                            | -371.00                      |  |
| 1956 | -126.00                       | -136.00                             | -297.00                            | -314.00                            | -355.00                      | -260.00                            | -419.00                      |  |
| 1957 | -123.00                       | -155.00                             | -288.00                            | -317.00                            | -349.00                      | -276.00                            | -421.00                      |  |
| 1958 | -107.00                       | -178.00                             | -190.00                            | -298.00                            | -172.00                      | -186.00                            | -323.00                      |  |
| 1959 | -124.00                       | -166.00                             | -246.00                            | -333.00                            | -232.00                      | -210.00                            | -328.00                      |  |
| 1960 | -124.00                       | -140.00                             | -300.00                            | -370.00                            | -287.00                      | -214.00                            | -358.00                      |  |
| 1961 | -126.00                       | -105.00                             | -314.00                            | -377.00                            | -371.00                      | -281.00                            | -417.00                      |  |
| 1962 | -123.00                       | -140.00                             | -299.00                            | -370.00                            | -351.00                      | -283.00                            | -426.00                      |  |
| 1963 | -122.00                       | -130.00                             | -282.00                            | -365.00                            | -348.00                      | -296.00                            | -444.00                      |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**LYTLE CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)          |                                     |                                    |                                    |                              |                                    |                              |  |
|------|-------------------------------|-------------------------------------|------------------------------------|------------------------------------|------------------------------|------------------------------------|------------------------------|--|
|      | FU 26<br>1N5W07H01S<br>Source | MUSCOY NO 2<br>1N5W23A01S<br>Source | WELL NO 05<br>1N5W25E01S<br>Source | WELL NO 07<br>1N5W36H04S<br>Source | FU 3<br>1N5W22F02S<br>Source | WELL NO 02<br>1N5W23Q00S<br>Source | FU 8<br>1N5W15Q02S<br>Source |  |
| 1964 | -125.00                       | -145.00                             | -357.00                            | -379.00                            | -332.00                      | -322.00                            | -472.00                      |  |
| 1965 | -117.00                       | -195.00                             | -370.00                            | -392.00                            | -378.00                      | -350.00                            | -503.00                      |  |
| 1966 | -78.00                        | -200.00                             | -363.00                            | -385.00                            | -338.00                      | -343.00                            | -472.00                      |  |
| 1967 | -108.00                       | -125.00                             | -312.00                            | -333.00                            | -231.00                      | -299.00                            | -402.00                      |  |
| 1968 | -89.00                        | -52.00                              | -305.00                            | -322.00                            | -180.00                      | -262.00                            | -372.00                      |  |
| 1969 | -113.00                       | -50.00                              | -110.00                            | -130.00                            | -168.00                      | -22.00                             | -87.00                       |  |
| 1970 | -108.00                       | -70.00                              | -59.00                             | -65.00                             | -160.00                      | -46.00                             | -108.00                      |  |
| 1971 | -120.00                       | -74.00                              | -57.00                             | -80.00                             | -154.00                      | -74.00                             | -207.00                      |  |
| 1972 | -116.00                       | -78.00                              | -83.00                             | -100.00                            | -213.00                      | -113.00                            | -252.00                      |  |
| 1973 | -90.00                        | -82.00                              | -110.00                            | -130.00                            | -261.00                      | -131.00                            | -271.00                      |  |
| 1974 | -115.00                       | -85.00                              | -126.00                            | -147.00                            | -224.00                      | -148.00                            | -279.00                      |  |
| 1975 | -118.00                       | -85.00                              | -124.00                            | -159.00                            | -268.00                      | -162.00                            | -300.00                      |  |
| 1976 | -120.00                       | -90.00                              | -146.00                            | -182.00                            | -362.00                      | -179.00                            | -320.00                      |  |
| 1977 | -120.00                       | -113.00                             | -173.00                            | -201.00                            | -386.00                      | -210.00                            | -338.00                      |  |
| 1978 | -83.00                        | -79.00                              | -48.00                             | -52.00                             | -158.00                      | -53.00                             | -349.00                      |  |
| 1979 | -79.00                        | -70.00                              | -30.00                             | -54.00                             | -162.00                      | -30.00                             | -328.00                      |  |
| 1980 | -75.00                        | -39.00                              | -15.00                             | -13.00                             | -182.00                      | -29.00                             | -360.00                      |  |
| 1981 | -98.00                        | -71.00                              | -26.00                             | -47.00                             | -175.00                      | -63.00                             | -356.00                      |  |
| 1982 | -78.00                        | -78.00                              | -49.00                             | -74.00                             | -158.00                      | -38.00                             | -353.00                      |  |
| 1983 | -81.00                        | -65.00                              | -20.00                             | -14.00                             | -141.00                      | -26.00                             | -88.00                       |  |
| 1984 | -97.00                        | -71.00                              | -30.00                             | -38.00                             | -124.00                      | -13.00                             | -152.00                      |  |
| 1985 | -91.00                        | -118.00                             | -53.00                             | -95.00                             | -186.00                      | -47.00                             | -203.00                      |  |
| 1986 | -93.00                        | -98.00                              | -73.00                             | -129.00                            | -189.00                      | -70.00                             | -232.00                      |  |
| 1987 | -107.00                       | -107.00                             | -97.00                             | -180.00                            | -248.00                      | -116.00                            | -279.00                      |  |
| 1988 | -108.00                       | -146.00                             | -172.00                            | -224.00                            | -308.00                      | -172.00                            | -336.00                      |  |
| 1989 | -114.00                       | -147.00                             | -211.00                            | -279.00                            | -367.00                      | -226.00                            | -370.00                      |  |
| 1990 | -122.00                       | -197.00                             | -242.00                            | -350.00                            | -416.00                      | -281.00                            | -392.00                      |  |
| 1991 | -131.00                       | -209.00                             | -268.00                            | -367.00                            | -380.00                      | -301.00                            | -311.00                      |  |
| 1992 | -92.00                        | -220.00                             | -292.00                            | -352.00                            | -230.00                      | -304.00                            | -229.00                      |  |
| 1993 | -81.00                        | -158.00                             | -43.00                             | -200.00                            | -79.00                       | -39.00                             | -148.00                      |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**LYTLE CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)          |                                     |                                    |                                    |                              |                                    |                              |  |
|------|-------------------------------|-------------------------------------|------------------------------------|------------------------------------|------------------------------|------------------------------------|------------------------------|--|
|      | FU 26<br>1N5W07H01S<br>Source | MUSCOY NO 2<br>1N5W23A01S<br>Source | WELL NO 05<br>1N5W25E01S<br>Source | WELL NO 07<br>1N5W36H04S<br>Source | FU 3<br>1N5W22F02S<br>Source | WELL NO 02<br>1N5W23Q00S<br>Source | FU 8<br>1N5W15Q02S<br>Source |  |
| 1994 | -98.00                        | -145.00                             | -55.00                             | -176.00                            | -172.00                      | -63.00                             | -188.00                      |  |
| 1995 | -78.00                        | -93.00                              | -40.00                             | -158.00                            | -96.00                       | -12.00                             | -208.00                      |  |
| 1996 | -74.00                        | -96.00                              | -54.00                             | -158.00                            | -151.00                      | -45.00                             | -198.00                      |  |
| 1997 | -97.00                        | -118.00                             | -72.00                             | -188.00                            | -196.00                      | -79.00                             | -230.00                      |  |
| 1998 | -80.00                        | -111.00                             | -51.00                             | -177.00                            | -114.00                      | -65.00                             | -190.00                      |  |
| 1999 | -117.00                       | -92.00                              | -73.00                             | -203.00                            | -188.00                      | -95.00                             | -239.00                      |  |
| 2000 | -118.00                       | -130.00                             | -144.00                            | -225.00                            | -315.00                      | -172.00                            | -316.00                      |  |
| 2001 | -115.00                       | -147.50                             | -195.00                            | -275.00                            | -358.00                      | -217.00                            | -383.00                      |  |
| 2002 | -120.00                       | -165.00                             | -275.00                            | -334.00                            | -378.00                      | -317.00                            | -431.00                      |  |
| 2003 | -120.00                       | -205.00                             | -302.00                            | -394.00                            | -382.00                      | -335.00                            | -467.00                      |  |
| 2004 | -74.00                        | -220.00                             | -344.00                            | -414.00                            | -378.00                      | -373.00                            | -354.50                      |  |
| 2005 | -92.00                        | -70.00                              | -104.00                            | -335.00                            | -110.00                      | -133.00                            | -242.00                      |  |
| 2006 | -94.00                        | -85.00                              | -124.00                            | -336.00                            | -140.00                      | -118.00                            | -249.00                      |  |
| 2007 | -110.00                       | -95.00                              | -144.00                            | -354.00                            | -212.00                      | -124.00                            | -293.00                      |  |
| 2008 | -115.00                       | -110.00                             | -179.00                            | -190.00                            | -309.00                      | -161.00                            | -360.00                      |  |
| 2009 | -113.00                       | -120.00                             | -261.00                            |                                    | -345.00                      | -250.00                            | -398.00                      |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**LYTLE CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft)                  |                                  |                                  |   |
|------|--------------------------------------|----------------------------------|----------------------------------|---|
|      | WELL NO 4<br>1N5W24E<br>Added Source | FU 32<br>1N5W16K01<br>Substitute | FU 13<br>1N5W22A01<br>Substitute | LYTLE CREEK NO 2<br>1N5W36K01<br>Added Source |
| 1934 |                                      |                                  |                                  |   |
| 1935 |                                      |                                  |                                  |   |
| 1936 |                                      |                                  |                                  |   |
| 1937 |                                      |                                  |                                  |   |
| 1938 |                                      |                                  |                                  |   |
| 1939 |                                      |                                  |                                  |   |
| 1940 |                                      |                                  |                                  |   |
| 1941 |                                      |                                  |                                  |   |
| 1942 |                                      |                                  |                                  |   |
| 1943 |                                      |                                  |                                  |   |
| 1944 |                                      |                                  |                                  |   |
| 1945 |                                      |                                  |                                  |   |
| 1946 |                                      |                                  |                                  |   |
| 1947 |                                      |                                  |                                  |   |
| 1948 |                                      |                                  |                                  |   |
| 1949 |                                      |                                  |                                  |   |
| 1950 |                                      |                                  |                                  |   |
| 1951 |                                      |                                  |                                  |   |
| 1952 |                                      |                                  |                                  |   |
| 1953 |                                      |                                  |                                  |   |
| 1954 |                                      |                                  |                                  |   |
| 1955 |                                      |                                  |                                  |   |
| 1956 |                                      |                                  |                                  |   |
| 1957 |                                      |                                  |                                  |   |
| 1958 |                                      |                                  |                                  |   |
| 1959 |                                      |                                  |                                  |   |
| 1960 |                                      |                                  |                                  |   |
| 1961 |                                      |                                  |                                  |   |
| 1962 |                                      |                                  |                                  |   |
| 1963 |                                      |                                  |                                  |   |



**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**LYTLE CREEK SUB-BASIN**

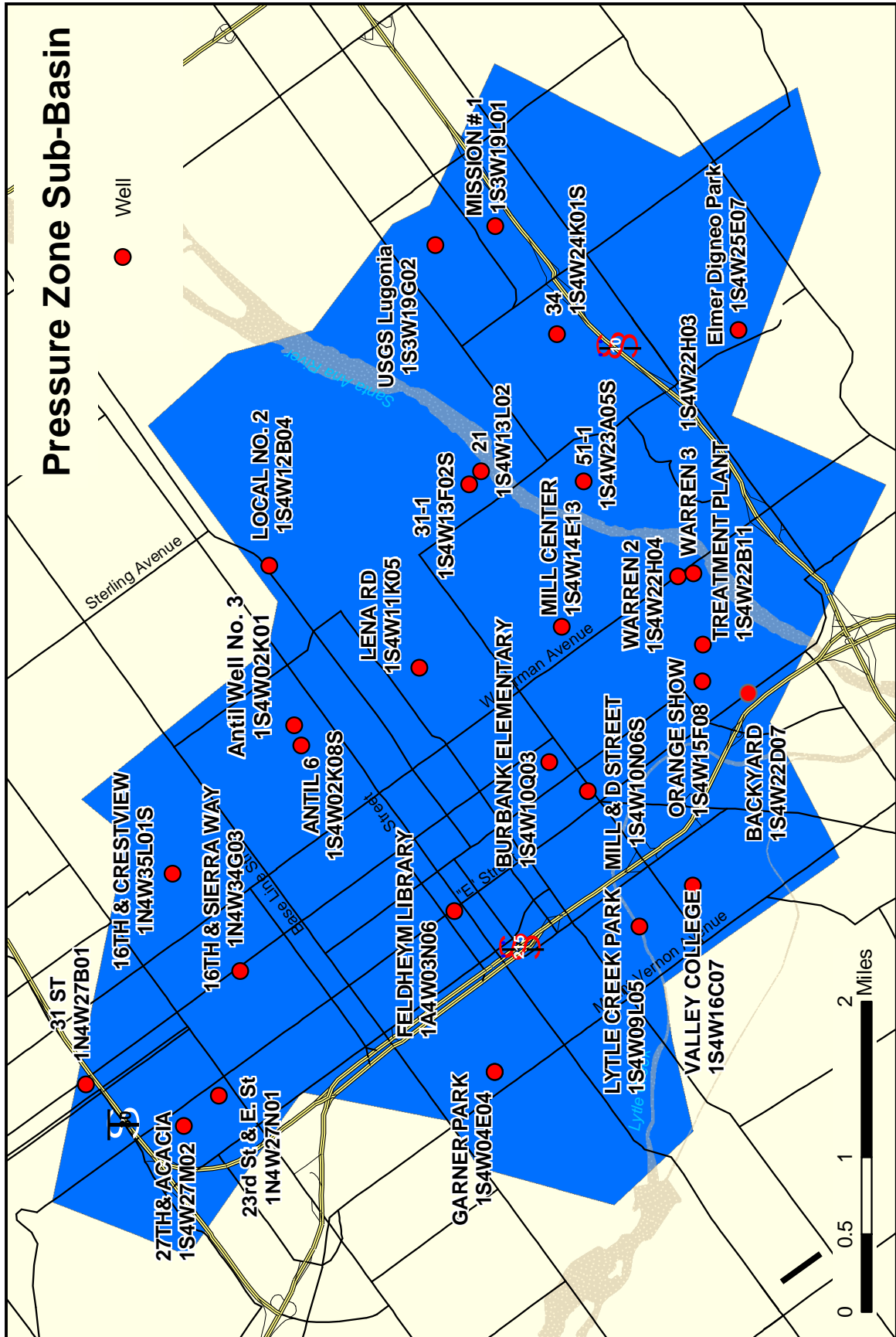
Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft)                  |                                  |                                  |   |  |
|------|--------------------------------------|----------------------------------|----------------------------------|---|--|
|      | WELL NO 4<br>1N5W24E<br>Added Source | FU 32<br>1N5W16K01<br>Substitute | FU 13<br>1N5W22A01<br>Substitute | LYTLE CREEK NO 2<br>1N5W36K01<br>Added Source |  |
| 1964 |                                      |                                  |                                  |   |  |
| 1965 |                                      |                                  |                                  |   |  |
| 1966 |                                      |                                  |                                  |   |  |
| 1967 |                                      |                                  |                                  |   |  |
| 1968 |                                      |                                  |                                  |   |  |
| 1969 |                                      |                                  |                                  |   |  |
| 1970 |                                      |                                  |                                  |   |  |
| 1971 |                                      |                                  |                                  |   |  |
| 1972 |                                      |                                  |                                  |   |  |
| 1973 |                                      |                                  |                                  |   |  |
| 1974 |                                      |                                  |                                  |   |  |
| 1975 |                                      |                                  |                                  |   |  |
| 1976 |                                      |                                  |                                  |   |  |
| 1977 |                                      |                                  |                                  |   |  |
| 1978 |                                      |                                  |                                  |   |  |
| 1979 |                                      |                                  |                                  |   |  |
| 1980 |                                      |                                  |                                  |   |  |
| 1981 |                                      |                                  |                                  |   |  |
| 1982 |                                      |                                  |                                  |   |  |
| 1983 |                                      |                                  |                                  |   |  |
| 1984 |                                      |                                  |                                  |   |  |
| 1985 |                                      |                                  |                                  |   |  |
| 1986 |                                      |                                  |                                  |   |  |
| 1987 |                                      |                                  |                                  |   |  |
| 1988 |                                      |                                  |                                  |   |  |
| 1989 |                                      |                                  |                                  |   |  |
| 1990 |                                      |                                  |                                  |   |  |
| 1991 |                                      |                                  |                                  |   |  |
| 1992 |                                      |                                  |                                  |   |  |
| 1993 |                                      |                                  |                                  |   |  |

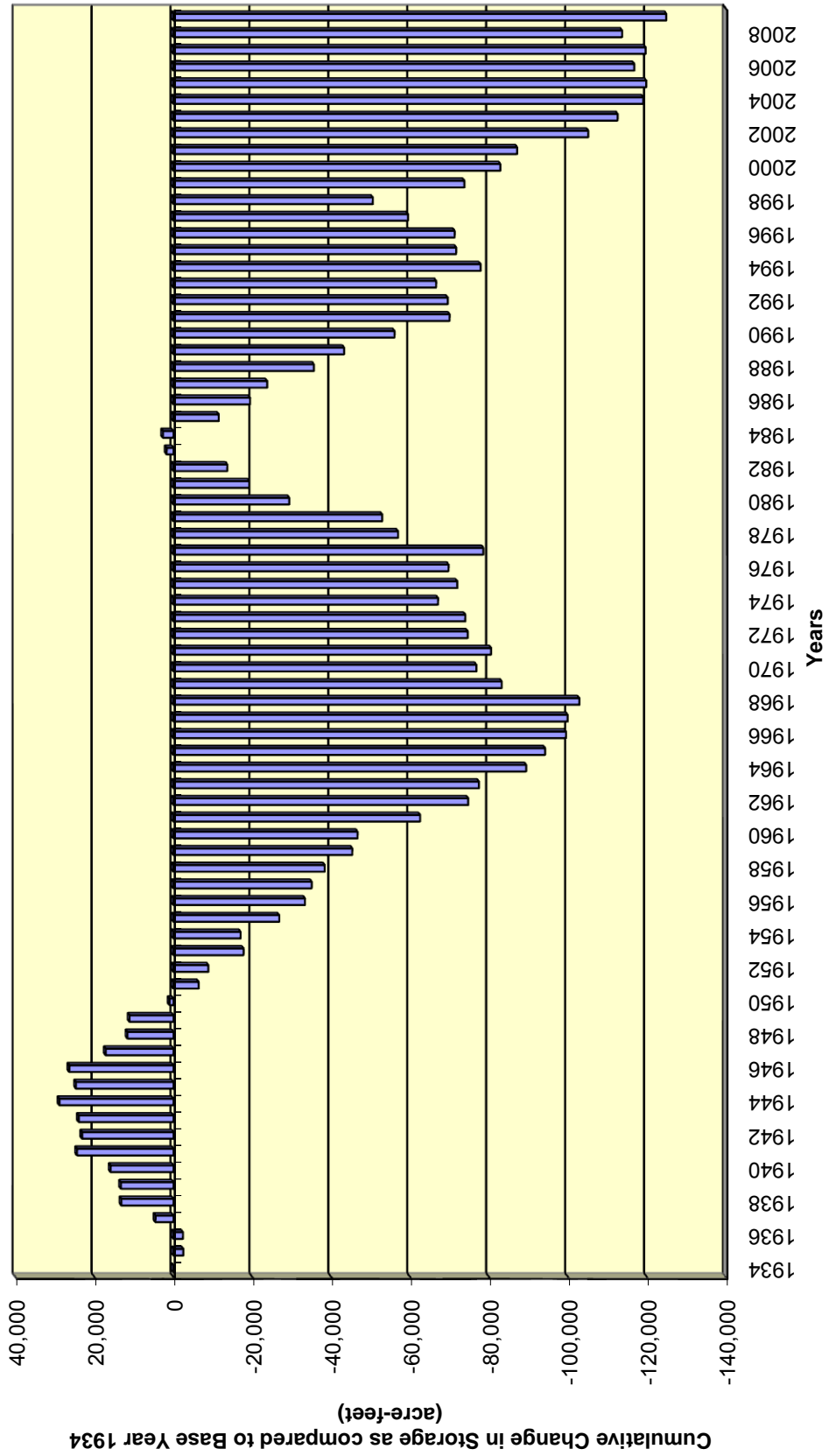
**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**LYTLE CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft)                  |                                  |                                  |   |
|------|--------------------------------------|----------------------------------|----------------------------------|---|
|      | WELL NO 4<br>1N5W24E<br>Added Source | FU 32<br>1N5W16K01<br>Substitute | FU 13<br>1N5W22A01<br>Substitute | LYTLE CREEK NO 2<br>1N5W36K01<br>Added Source |
| 1994 |                                      |                                  |                                  |   |
| 1995 |                                      |                                  |                                  |   |
| 1996 |                                      |                                  |                                  |   |
| 1997 |                                      |                                  |                                  |   |
| 1998 |                                      |                                  |                                  |   |
| 1999 | -97.00                               | -275.00                          | -203.00                          |   |
| 2000 | -140.00                              | -313.00                          | -281.00                          |   |
| 2001 | -152.50                              | -320.00                          | -265.00                          | -281.00                                       |
| 2002 | -165.00                              | -332.00                          | -422.00                          | -234.90                                       |
| 2003 | -195.00                              | -331.00                          | -437.00                          | -371.60                                       |
| 2004 | -210.00                              | -324.00                          | -545.00                          | -374.00                                       |
| 2005 | -125.00                              | -196.00                          | -213.00                          | -311.00                                       |
| 2006 | -130.00                              | -212.00                          | -190.00                          | -349.90                                       |
| 2007 | -130.00                              | -293.00                          | -239.00                          | -378.39                                       |
| 2008 | -130.00                              | -291.00                          | -303.00                          | -423.50                                       |
| 2009 | -135.00                              | -300.00                          | -372.00                          | -440.80                                       |

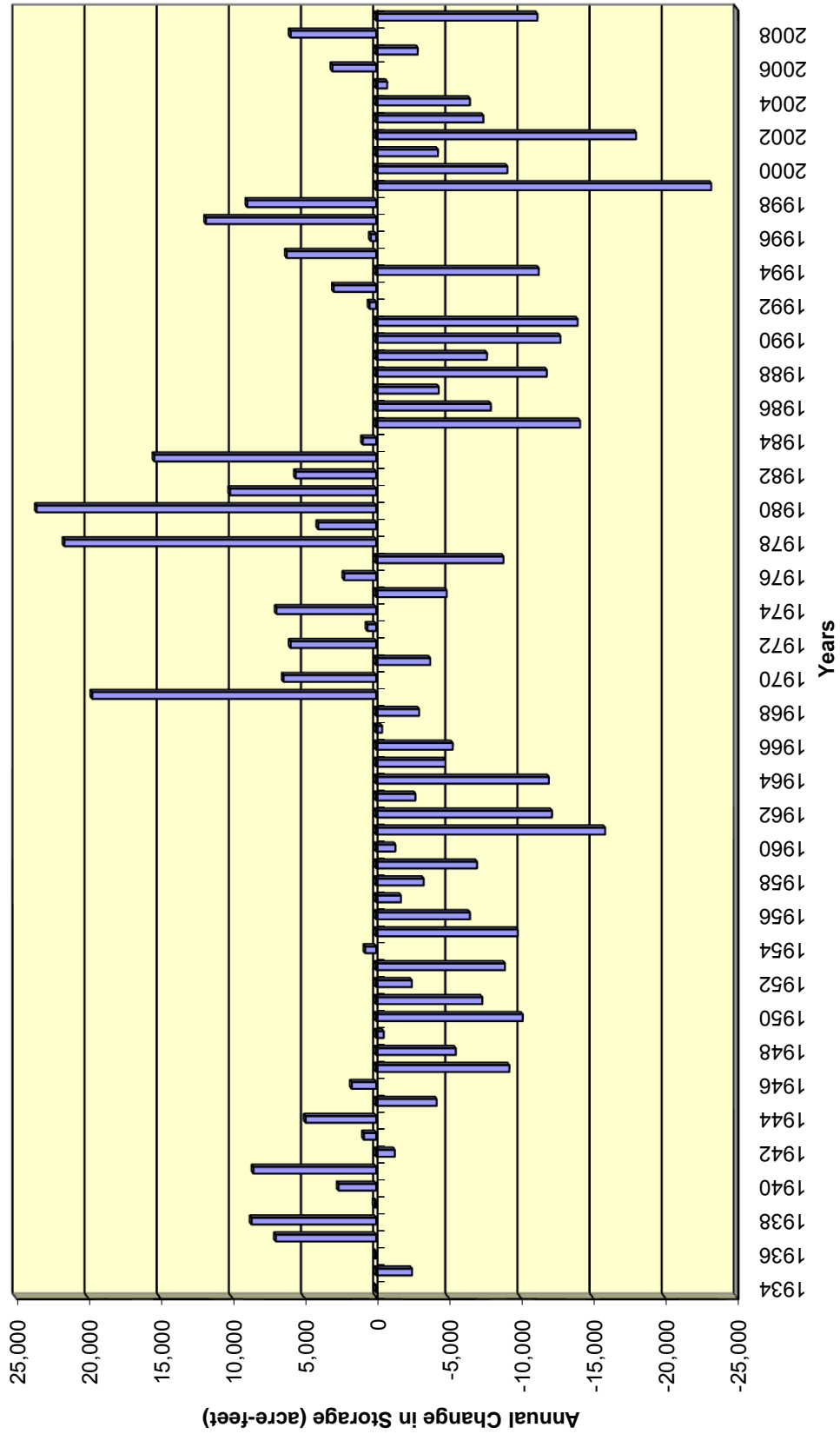


**Cumulative Change in Storage for the Pressure Zone Sub-Basin**



SBVMWD - GIS  
March 2010

Annual Change in Storage for the Pressure Zone Sub-Basin



SBVMWD - GIS  
March 2010

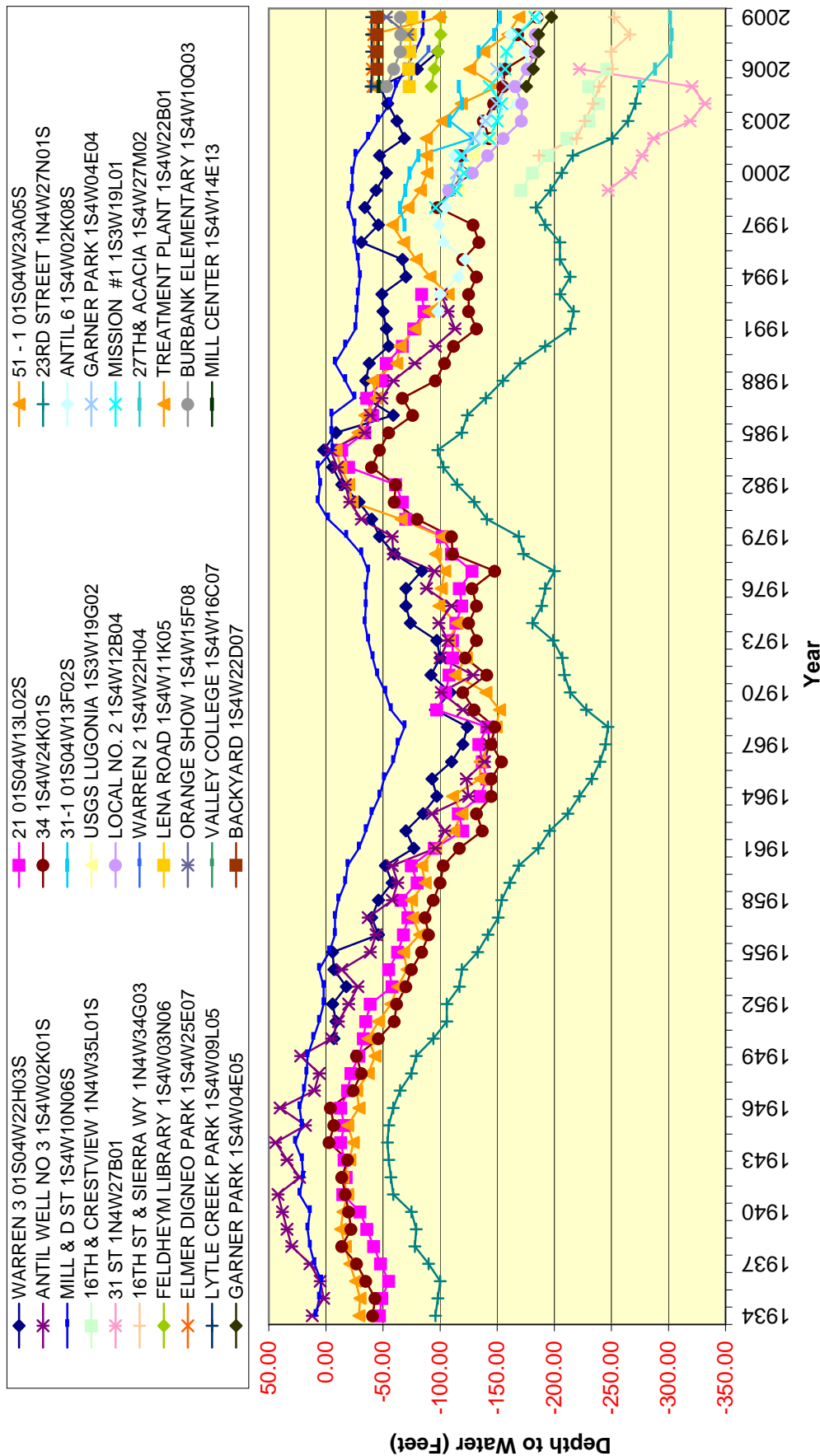
**San Bernardino Valley Municipal Water District**  
Change In Storage for the Pressure Zone Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1934        | 0                              | n/a  | 0   |
| 1935        | -3                             | -2,484   | -2,484  |
| 1936        | 1                              | 89   | -2,395  |
| 1937        | 8                              | 6,961  | 4,566   |
| 1938        | 9                              | 8,638  | 13,204  |
| 1939        | 1                              | 121  | 13,325  |
| 1940        | 2                              | 2,610  | 15,935  |
| 1941        | 7                              | 8,507  | 24,442  |
| 1942        | -3                             | -1,289   | 23,153  |
| 1943        | 1                              | 853  | 24,006  |
| 1944        | 6                              | 4,893  | 28,899  |
| 1945        | -6                             | -4,190   | 24,709  |
| 1946        | 3                              | 1,694  | 26,403  |
| 1947        | -11                            | -9,229   | 17,174  |
| 1948        | -6                             | -5,514   | 11,660  |
| 1949        | 0                              | -519   | 11,141  |
| 1950        | -11                            | -10,156  | 985   |
| 1951        | -7                             | -7,354   | -6,369  |
| 1952        | -4                             | -2,467   | -8,836  |
| 1953        | -9                             | -8,921   | -17,757   |
| 1954        | 2                              | 763  | -16,994   |
| 1955        | -9                             | -9,810   | -26,804   |
| 1956        | -12                            | -6,500   | -33,304   |
| 1957        | 1                              | -1,713   | -35,017   |
| 1958        | -5                             | -3,289   | -38,306   |
| 1959        | -9                             | -6,988   | -45,294   |
| 1960        | 1                              | -1,334   | -46,628   |
| 1961        | -19                            | -15,866  | -62,494   |
| 1962        | -11                            | -12,182  | -74,676   |
| 1963        | -3                             | -2,718   | -77,394   |
| 1964        | -12                            | -11,963  | -89,357   |
| 1965        | -6                             | -4,795   | -94,152   |
| 1966        | -8                             | -5,307   | -99,459   |
| 1967        | -3                             | -412   | -99,871   |
| 1968        | -4                             | -2,972   | -102,843  |
| 1969        | 20                             | 19,683   | -83,160   |
| 1970        | 6                              | 6,418  | -76,742   |
| 1971        | 1                              | -3,741   | -80,483   |
| 1972        | 5                              | 5,932  | -74,551   |
| 1973        | 2                              | 612  | -73,939   |
| 1974        | 7                              | 6,910  | -67,029   |
| 1975        | -2                             | -4,883   | -71,912   |
| 1976        | 3                              | 2,218  | -69,694   |
| 1977        | -9                             | -8,818   | -78,512   |

**San Bernardino Valley Municipal Water District**  
Change In Storage for the Pressure Zone Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1978        | 22                             | 21,610   | -56,902   |
| 1979        | 5                              | 4,020  | -52,882   |
| 1980        | 25                             | 23,540   | -29,342   |
| 1981        | 15                             | 10,127   | -19,215   |
| 1982        | 6                              | 5,581  | -13,634   |
| 1983        | 14                             | 15,379   | 1,745   |
| 1984        | 1                              | 930  | 2,675   |
| 1985        | -15                            | -14,130  | -11,455   |
| 1986        | -13                            | -7,945   | -19,400   |
| 1987        | -3                             | -4,335   | -23,735   |
| 1988        | -8                             | -11,820  | -35,555   |
| 1989        | -9                             | -7,680   | -43,235   |
| 1990        | -13                            | -12,770  | -56,005   |
| 1991        | -13                            | -13,955  | -69,960   |
| 1992        | -1                             | 463  | -69,497   |
| 1993        | 0                              | 2,947  | -66,550   |
| 1994        | -7                             | -11,268  | -77,818   |
| 1995        | 5                              | 6,202  | -71,616   |
| 1996        | 9                              | 376  | -71,240   |
| 1997        | 3                              | 11,802   | -59,438   |
| 1998        | 6                              | 8,938  | -50,500   |
| 1999        | -8                             | -23,219  | -73,719   |
| 2000        | -10                            | -9,093   | -82,812   |
| 2001        | -5                             | -4,280   | -87,092   |
| 2002        | -19                            | -18,009  | -105,101  |
| 2003        | -8                             | -7,427   | -112,528  |
| 2004        | -9                             | -6,495   | -119,023  |
| 2005        | -1                             | -762   | -119,785  |
| 2006        | 5                              | 3,037  | -116,748  |
| 2007        | -6                             | -2,876   | -119,624  |
| 2008        | 2                              | 5,932  | -113,692  |
| 2009        | -7                             | -11,169  | -124,861  |

### Hydrographs for the Pressure Zone Sub-Basin





**San Bernardino Valley Municipal Water District**  
Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**PRESSURE ZONE SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)               |                              |                                  |   |                            |                                     |                                     |                                |  |  |
|------|------------------------------------|------------------------------|----------------------------------|---|----------------------------|-------------------------------------|-------------------------------------|--------------------------------|--|--|
|      | WARREN 3<br>01S04W22H03S<br>Source | 21<br>01S04W13L02S<br>Source | 51 - 1<br>01S04W23A05S<br>Source | ANTIL WELL NO 3<br>1S4W02K01S<br>Source | 34<br>1S4W24K01S<br>Source | 23RD STREET<br>1N4W27N01S<br>Source | MILL & D ST<br>1S4W10N06S<br>Source | 31-1<br>01S04W13F02S<br>Source |  |  |
| 1934 | -47.00                             | -49.00                       | -29.00                           | 12.00                                   | -41.00                     | -96.00                              | 9.00                                |                                |  |  |
| 1935 |                                    | -49.00                       | -30.00                           | 2.00                                    | -43.00                     | -98.00                              | 6.00                                |                                |  |  |
| 1936 |                                    | -55.00                       | -26.00                           | 5.00                                    | -35.00                     | -100.00                             | 4.00                                |                                |  |  |
| 1937 |                                    | -48.00                       | -21.00                           | 14.00                                   | -27.00                     | -90.00                              | 10.00                               |                                |  |  |
| 1938 |                                    | -42.00                       | -17.00                           | 30.00                                   | -14.00                     | -78.00                              | 14.00                               |                                |  |  |
| 1939 |                                    | -36.00                       | -13.00                           | 34.00                                   | -22.00                     | -79.00                              | 16.00                               |                                |  |  |
| 1940 |                                    | -30.00                       | -15.00                           | 38.00                                   | -20.00                     | -75.00                              | 14.00                               |                                |  |  |
| 1941 |                                    | -15.00                       | -19.00                           | 42.00                                   | -17.00                     | -59.00                              | 23.00                               |                                |  |  |
| 1942 |                                    | -18.00                       | -15.00                           | 23.00                                   | -14.00                     | -57.00                              | 20.00                               |                                |  |  |
| 1943 |                                    | -16.00                       | -21.00                           | 34.00                                   | -19.00                     | -55.00                              | 21.00                               |                                |  |  |
| 1944 |                                    | -13.00                       | -24.00                           | 44.00                                   | -3.00                      | -54.00                              | 27.00                               |                                |  |  |
| 1945 |                                    | -16.00                       | -19.00                           | 18.00                                   | -7.00                      | -55.00                              | 21.00                               |                                |  |  |
| 1946 |                                    | -13.00                       | -29.00                           | 40.00                                   | -4.00                      | -59.00                              | 23.00                               |                                |  |  |
| 1947 |                                    | -19.00                       | -27.00                           | 10.00                                   | -24.00                     | -65.00                              | 19.00                               |                                |  |  |
| 1948 |                                    | -22.00                       | -37.00                           | 6.00                                    | -31.00                     | -75.00                              | 17.00                               |                                |  |  |
| 1949 |                                    | -29.00                       | -43.00                           | 22.00                                   | -27.00                     | -79.00                              | 16.00                               |                                |  |  |
| 1950 | -7.00                              | -33.00                       | -37.00                           | -5.00                                   | -46.00                     | -94.00                              | 11.00                               |                                |  |  |
| 1951 | -9.00                              | -35.00                       | -46.00                           | -11.00                                  | -60.00                     | -106.00                             | 6.00                                |                                |  |  |
| 1952 | -6.00                              | -39.00                       | -57.00                           | -20.00                                  | -62.00                     | -106.00                             | 2.00                                |                                |  |  |
| 1953 | -18.00                             | -58.00                       | -63.00                           | -28.00                                  | -70.00                     | -117.00                             | 2.00                                |                                |  |  |
| 1954 | -7.00                              | -55.00                       | -71.00                           | -14.00                                  | -75.00                     | -119.00                             | 6.00                                |                                |  |  |
| 1955 | -6.00                              | -63.00                       | -68.00                           | -39.00                                  | -84.00                     | -133.00                             | -3.00                               |                                |  |  |
| 1956 | -46.00                             | -68.00                       | -82.00                           | -44.00                                  | -90.00                     | -142.00                             | -8.00                               |                                |  |  |
| 1957 | -40.00                             | -72.00                       | -76.00                           | -37.00                                  | -87.00                     | -151.00                             | -8.00                               |                                |  |  |
| 1958 | -46.00                             | -66.00                       | -75.00                           | -58.00                                  | -94.00                     | -154.00                             | -11.00                              |                                |  |  |
| 1959 | -58.00                             | -80.00                       | -87.00                           | -63.00                                  | -100.00                    | -161.00                             | -17.00                              |                                |  |  |
| 1960 | -52.00                             | -75.00                       | -84.00                           | -58.00                                  | -103.00                    | -169.00                             | -19.00                              |                                |  |  |
| 1961 | -77.00                             | -95.00                       | -96.00                           | -96.00                                  | -117.00                    | -186.00                             | -29.00                              |                                |  |  |
| 1962 | -70.00                             | -120.00                      | -112.00                          | -104.00                                 | -137.00                    | -196.00                             | -35.00                              |                                |  |  |
| 1963 | -85.00                             | -116.00                      | -119.00                          | -93.00                                  | -132.00                    | -212.00                             | -40.00                              |                                |  |  |
| 1964 | -97.00                             | -135.00                      | -111.00                          | -125.00                                 | -145.00                    | -222.00                             | -47.00                              |                                |  |  |
| 1965 | -93.00                             | -141.00                      | -135.00                          | -123.00                                 | -145.00                    | -233.00                             | -51.00                              |                                |  |  |
| 1966 | -110.00                            | -137.00                      | -135.00                          | -139.00                                 | -154.00                    | -240.00                             | -59.00                              |                                |  |  |
| 1967 | -120.00                            | -134.00                      | -143.00                          | -143.00                                 | -145.00                    | -245.00                             | -63.00                              |                                |  |  |
| 1968 | -124.00                            | -141.00                      | -149.00                          | -142.00                                 | -148.00                    | -247.00                             | -69.00                              |                                |  |  |
| 1969 | -96.00                             | -97.00                       | -152.00                          | -120.00                                 | -130.00                    | -228.00                             | -57.00                              |                                |  |  |
| 1970 | -109.00                            | -105.00                      | -140.00                          | -101.00                                 | -120.00                    | -214.00                             | -52.00                              |                                |  |  |
| 1971 | -92.00                             | -108.00                      | -113.00                          | -129.00                                 | -141.00                    | -209.00                             | -45.00                              |                                |  |  |
| 1972 | -100.00                            | -111.00                      | -123.00                          | -100.00                                 | -122.00                    | -207.00                             | -41.00                              |                                |  |  |

**San Bernardino Valley Municipal Water District**  
Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**PRESSURE ZONE SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)               |                              |                                  |   |                            |                                     |                                     |                                |  |  |
|------|------------------------------------|------------------------------|----------------------------------|---|----------------------------|-------------------------------------|-------------------------------------|--------------------------------|--|--|
|      | WARREN 3<br>01S04W22H03S<br>Source | 21<br>01S04W13L02S<br>Source | 51 - 1<br>01S04W23A05S<br>Source | ANTIL WELL NO 3<br>1S4W02K01S<br>Source | 34<br>1S4W24K01S<br>Source | 23RD STREET<br>1N4W27N01S<br>Source | MILL & D ST<br>1S4W10N06S<br>Source | 31-1<br>01S04W13F02S<br>Source |  |  |
| 1973 | -97.00                             | -111.00                      | -108.00                          | -107.00                                 | -132.00                    | -199.00                             | -37.00                              |                                |  |  |
| 1974 | -74.00                             | -114.00                      | -115.00                          | -99.00                                  | -125.00                    | -181.00                             | -34.00                              |                                |  |  |
| 1975 | -70.00                             | -119.00                      | -99.00                           | -110.00                                 | -132.00                    | -189.00                             | -35.00                              |                                |  |  |
| 1976 | -70.00                             | -117.00                      | -101.00                          | -88.00                                  | -128.00                    | -192.00                             | -35.00                              |                                |  |  |
| 1977 | -84.00                             | -128.00                      | -104.00                          | -95.00                                  | -148.00                    | -200.00                             | -37.00                              |                                |  |  |
| 1978 | -60.00                             | -110.00                      | -96.00                           | -59.00                                  | -111.00                    | -173.00                             | -31.00                              |                                |  |  |
| 1979 | -47.00                             | -102.00                      | -101.00                          | -58.00                                  | -110.00                    | -169.00                             | -18.00                              |                                |  |  |
| 1980 | -40.00                             | -70.00                       | -66.00                           | -31.00                                  | -80.00                     | -141.00                             | -2.00                               |                                |  |  |
| 1981 | -29.00                             | -67.00                       | -23.00                           | -21.00                                  | -60.00                     | -130.00                             | 7.00                                |                                |  |  |
| 1982 | -14.00                             | -61.00                       | -20.00                           | -17.00                                  | -61.00                     | -115.00                             | 5.00                                |                                |  |  |
| 1983 | -6.00                              | -20.00                       | -13.00                           | -10.00                                  | -40.00                     | -103.00                             | 7.00                                |                                |  |  |
| 1984 | 2.00                               | -14.00                       | -9.00                            | -4.00                                   | -47.00                     | -98.00                              | -6.00                               |                                |  |  |
| 1985 | -9.00                              | -34.00                       | -28.00                           | -34.00                                  | -55.00                     | -119.00                             | -5.00                               |                                |  |  |
| 1986 | -59.00                             | -41.00                       | -34.00                           | -39.00                                  | -76.00                     | -124.00                             | -5.00                               |                                |  |  |
| 1987 | -35.00                             | -36.00                       | -44.00                           | -49.00                                  | -67.00                     | -140.00                             | -25.00                              |                                |  |  |
| 1988 | -35.00                             | -50.00                       | -41.00                           | -59.00                                  | -96.00                     | -155.00                             | -17.00                              |                                |  |  |
| 1989 | -38.00                             | -53.00                       | -62.00                           | -78.00                                  | -104.00                    | -170.00                             | -8.00                               |                                |  |  |
| 1990 | -55.00                             | -67.00                       | -65.00                           | -96.00                                  | -112.00                    | -192.00                             | -17.00                              |                                |  |  |
| 1991 | -53.00                             | -77.00                       | -78.00                           | -113.00                                 | -132.00                    | -214.00                             | -26.00                              |                                |  |  |
| 1992 | -50.00                             | -86.00                       | -90.00                           | -107.00                                 | -125.00                    | -217.00                             | -27.00                              |                                |  |  |
| 1993 | -49.00                             | -84.00                       | -107.00                          | -101.00                                 | -125.00                    | -205.00                             | -28.00                              |                                |  |  |
| 1994 | -70.00                             |                              | -91.00                           |   | -132.00                    | -214.00                             | -30.00                              |                                |  |  |
| 1995 | -67.00                             |                              | -79.00                           |   | -120.00                    | -205.00                             | -28.00                              |                                |  |  |
| 1996 | -31.00                             |                              | -68.00                           |   | -134.00                    | -205.00                             | -25.00                              |                                |  |  |
| 1997 | -46.00                             |                              | -58.00                           |   | -129.00                    | -192.00                             | -25.00                              | -69.00                         |  |  |
| 1998 | -34.00                             |                              | -72.00                           |   | -98.00                     | -184.00                             | -20.00                              | -65.00                         |  |  |
| 1999 | -44.00                             |                              | -82.90                           |   | -109.00                    | -196.60                             | -23.00                              | -69.70                         |  |  |
| 2000 | -53.00                             |                              | -88.50                           |   | -120.00                    | -206.50                             | -23.30                              | -73.30                         |  |  |
| 2001 | -47.00                             |                              | -88.15                           |   | -118.00                    | -216.30                             | -25.90                              | -81.20                         |  |  |
| 2002 | -68.80                             |                              | -87.80                           |   | -143.00                    | -251.00                             | -37.00                              | -128.10                        |  |  |
| 2003 | -62.20                             |                              | -102.00                          |   | -138.00                    | -264.60                             | -45.60                              | -108.50                        |  |  |
| 2004 | -54.10                             |                              | -118.70                          |   | -147.00                    | -271.00                             | -55.90                              | -119.30                        |  |  |
| 2005 | -47.10                             |                              | -150.50                          |   | -155.00                    | -274.20                             | -61.40                              | -116.60                        |  |  |
| 2006 | -80.00                             |                              | -126.00                          |   | -157.00                    |                                     | -69.44                              |                                |  |  |
| 2007 | -98.00                             |                              | -138.20                          |   | -182.00                    |                                     | -78.12                              | -133.80                        |  |  |
| 2008 |                                    |                              | -159.30                          |   | -168.00                    |                                     | -84.90                              | -147.50                        |  |  |
| 2009 |                                    |                              | -169.00                          |   | -185.00                    |                                     | -85.50                              | -152.50                        |  |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**PRESSURE ZONE SUB-BASIN (Continued)**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)            |  |   |  |                                    |  |                                       |  |  |  |
|------|---------------------------------|--|---|--|------------------------------------|--|---------------------------------------|--|--|--|
|      | ANTIL 6<br>1SAW02K08S<br>Source | 16TH & CRESTVIEW<br>1N4W35L01S<br>Substitute | USGS LUGONIA<br>1S3W19G02<br>Added Source | GARNER PARK<br>1S4W04E04<br>Added Source | 31 ST<br>1N4W27B01<br>Added Source | LOCAL NO. 2<br>1SAW12B04<br>Added Source | MISSION #1<br>1S3W19L01<br>Substitute | 16TH ST & SIERRA WY<br>1N4W34G03<br>Substitute |  |  |
| 1934 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1935 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1936 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1937 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1938 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1939 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1940 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1941 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1942 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1943 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1944 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1945 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1946 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1947 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1948 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1949 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1950 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1951 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1952 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1953 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1954 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1955 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1956 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1957 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1958 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1959 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1960 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1961 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1962 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1963 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1964 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1965 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1966 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1967 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1968 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1969 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1970 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1971 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1972 |                                 |  |   |  |                                    |  |                                       |  |  |  |

**San Bernardino Valley Municipal Water District**  
Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**PRESSURE ZONE SUB-BASIN (Continued)**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)            |  |   |  |                                    |  |                                       |  |  |  |
|------|---------------------------------|--|---|--|------------------------------------|--|---------------------------------------|--|--|--|
|      | ANTIL 6<br>1SAW02K08S<br>Source | 16TH & CRESTVIEW<br>1N4W35L01S<br>Substitute | USGS LUGONIA<br>1S3W19G02<br>Added Source | GARNER PARK<br>1S4W04E04<br>Added Source | 31 ST<br>1N4W27B01<br>Added Source | LOCAL NO. 2<br>1SAW12B04<br>Added Source | MISSION #1<br>1S3W19L01<br>Substitute | 16TH ST & SIERRA WY<br>1N4W34G03<br>Substitute |  |  |
| 1973 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1974 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1975 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1976 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1977 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1978 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1979 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1980 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1981 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1982 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1983 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1984 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1985 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1986 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1987 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1988 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1989 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1990 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1991 |                                 |  |   |  |                                    |  |                                       |  |  |  |
| 1992 | -98.00                          |  |   |  |                                    |  |                                       |  |  |  |
| 1993 | -100.00                         |  |   |  |                                    |  |                                       |  |  |  |
| 1994 | -116.00                         |  |   |  |                                    |  |                                       |  |  |  |
| 1995 | -122.00                         |  |   |  |                                    |  |                                       |  |  |  |
| 1996 | -103.00                         |  |   |  |                                    |  |                                       |  |  |  |
| 1997 | -99.00                          |  |   |  |                                    |  |                                       |  |  |  |
| 1998 | -105.00                         |  |   |  |                                    |  |                                       |  |  |  |
| 1999 | -107.00                         | -170.78                                      | -115.50                                   | -108.22                                  | -247.33                            | -107.72                                  | -96.00                                |  |  |  |
| 2000 | -119.80                         | -181.04                                      | -122.42                                   | -114.13                                  | -266.75                            | -128.30                                  | -114.00                               |  |  |  |
| 2001 | -112.30                         | -194.60                                      | -128.95                                   | -119.97                                  | -277.08                            | -141.60                                  | -118.00                               |  |  |  |
| 2002 | -135.60                         | -211.16                                      | -142.54                                   | -129.91                                  | -287.00                            | -155.31                                  | -143.00                               |  |  |  |
| 2003 | -140.00                         | -230.62                                      |   | -139.79                                  | -319.11                            | -171.23                                  | -150.00                               |  |  |  |
| 2004 | -167.70                         | -238.57                                      |   | -149.29                                  | -331.90                            | -171.63                                  | -154.00                               |  |  |  |
| 2005 | -168.80                         | -230.24                                      |   | -159.10                                  | -320.60                            | -166.22                                  | -143.00                               |  |  |  |
| 2006 | -175.03                         | -246.38                                      |   | -149.44                                  | -222.00                            | -176.58                                  | -157.00                               |  |  |  |
| 2007 | -176.00                         |  |   |  |                                    | -183.58                                  | -158.00                               |  |  |  |
| 2008 | -161.80                         |  |   |  |                                    | -183.58                                  | -169.00                               |  |  |  |
| 2009 | -185.00                         |  |   |  |                                    |  | -183.00                               |  |  |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
 PRESSURE ZONE SUB-BASIN (Continued)

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                |  |   |  |  |  |  |   |
|------|-------------------------------------|--|---|--|--|--|--|---|
|      | WARREN 2<br>1S4W22H04<br>Substitute | 27TH & ACACIA<br>1S4W27M02<br>Substitute | FELDHEYM LIBRARY<br>1S4W03N06<br>Added Source | LENA ROAD<br>1SAW11K05<br>Added Source | TREATMENT PLANT<br>1S4W22B01<br>Added Source | ELMER DIGNEO PARK<br>1S4W25E07<br>Added Source | ORANGE SHOW<br>1S4W15F08<br>Added Source | BURBANK ELEMENTARY<br>1SAW10Q03<br>Added Source |
| 1934 |                                     |  |   |  |  |  |  |   |
| 1935 |                                     |  |   |  |  |  |  |   |
| 1936 |                                     |  |   |  |  |  |  |   |
| 1937 |                                     |  |   |  |  |  |  |   |
| 1938 |                                     |  |   |  |  |  |  |   |
| 1939 |                                     |  |   |  |  |  |  |   |
| 1940 |                                     |  |   |  |  |  |  |   |
| 1941 |                                     |  |   |  |  |  |  |   |
| 1942 |                                     |  |   |  |  |  |  |   |
| 1943 |                                     |  |   |  |  |  |  |   |
| 1944 |                                     |  |   |  |  |  |  |   |
| 1945 |                                     |  |   |  |  |  |  |   |
| 1946 |                                     |  |   |  |  |  |  |   |
| 1947 |                                     |  |   |  |  |  |  |   |
| 1948 |                                     |  |   |  |  |  |  |   |
| 1949 |                                     |  |   |  |  |  |  |   |
| 1950 |                                     |  |   |  |  |  |  |   |
| 1951 |                                     |  |   |  |  |  |  |   |
| 1952 |                                     |  |   |  |  |  |  |   |
| 1953 |                                     |  |   |  |  |  |  |   |
| 1954 |                                     |  |   |  |  |  |  |   |
| 1955 |                                     |  |   |  |  |  |  |   |
| 1956 |                                     |  |   |  |  |  |  |   |
| 1957 |                                     |  |   |  |  |  |  |   |
| 1958 |                                     |  |   |  |  |  |  |   |
| 1959 |                                     |  |   |  |  |  |  |   |
| 1960 |                                     |  |   |  |  |  |  |   |
| 1961 |                                     |  |   |  |  |  |  |   |
| 1962 |                                     |  |   |  |  |  |  |   |
| 1963 |                                     |  |   |  |  |  |  |   |
| 1964 |                                     |  |   |  |  |  |  |   |
| 1965 |                                     |  |   |  |  |  |  |   |
| 1966 |                                     |  |   |  |  |  |  |   |
| 1967 |                                     |  |   |  |  |  |  |   |
| 1968 |                                     |  |   |  |  |  |  |   |
| 1969 |                                     |  |   |  |  |  |  |   |
| 1970 |                                     |  |   |  |  |  |  |   |
| 1971 |                                     |  |   |  |  |  |  |   |
| 1972 |                                     |  |   |  |  |  |  |   |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
 PRESSURE ZONE SUB-BASIN (Continued)

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                |  |   |  |  |  |  |   |
|------|-------------------------------------|--|---|--|--|--|--|---|
|      | WARREN 2<br>1S4W22H04<br>Substitute | 27TH & ACACIA<br>1S4W27M02<br>Substitute | FELDHEYM LIBRARY<br>1S4W03N06<br>Added Source | LENA ROAD<br>1SAW11K05<br>Added Source | TREATMENT PLANT<br>1S4W22B01<br>Added Source | ELMER DIGNEO PARK<br>1S4W25E07<br>Added Source | ORANGE SHOW<br>1S4W15F08<br>Added Source | BURBANK ELEMENTARY<br>1SAW10Q03<br>Added Source |
| 1973 |                                     |  |   |  |  |  |  |   |
| 1974 |                                     |  |   |  |  |  |  |   |
| 1975 |                                     |  |   |  |  |  |  |   |
| 1976 |                                     |  |   |  |  |  |  |   |
| 1977 |                                     |  |   |  |  |  |  |   |
| 1978 |                                     |  |   |  |  |  |  |   |
| 1979 |                                     |  |   |  |  |  |  |   |
| 1980 |                                     |  |   |  |  |  |  |   |
| 1981 |                                     |  |   |  |  |  |  |   |
| 1982 |                                     |  |   |  |  |  |  |   |
| 1983 |                                     |  |   |  |  |  |  |   |
| 1984 |                                     |  |   |  |  |  |  |   |
| 1985 |                                     |  |   |  |  |  |  |   |
| 1986 |                                     |  |   |  |  |  |  |   |
| 1987 |                                     |  |   |  |  |  |  |   |
| 1988 |                                     |  |   |  |  |  |  |   |
| 1989 |                                     |  |   |  |  |  |  |   |
| 1990 |                                     |  |   |  |  |  |  |   |
| 1991 |                                     |  |   |  |  |  |  |   |
| 1992 |                                     |  |   |  |  |  |  |   |
| 1993 |                                     |  |   |  |  |  |  |   |
| 1994 |                                     |  |   |  |  |  |  |   |
| 1995 |                                     |  |   |  |  |  |  |   |
| 1996 |                                     |  |   |  |  |  |  |   |
| 1997 |                                     |  |   |  |  |  |  |   |
| 1998 |                                     |  |   |  |  |  |  |   |
| 1999 |                                     |  |   |  |  |  |  |   |
| 2000 |                                     |  |   |  |  |  |  |   |
| 2001 |                                     |  |   |  |  |  |  |   |
| 2002 |                                     |  |   |  |  |  |  |   |
| 2003 |                                     |  |   |  |  |  |  |   |
| 2004 |                                     |  |   |  |  |  |  |   |
| 2005 | -74.40                              | -274.70                                  | -92.20  | -73.12                                 | -40.47                                       | -41.20   | -43.35                                   | -53.29  |
| 2006 | -75.50                              | -288.34                                  | -95.08  | -72.58                                 | -40.63                                       | -40.71   |  | -59.39  |
| 2007 | -90.00                              | -302.00                                  | -98.30  | -73.78                                 | -43.39                                       | -42.20   |  | -65.30  |
| 2008 |                                     | -302.80                                  | -100.53                                       | -73.98                                 | -40.44                                       | -41.82   | -71.76                                   | -65.61  |
| 2009 |                                     | -301.50                                  | -100.67                                       | -75.29                                 | -99.23                                       | -43.32   | -53.00                                   | -65.43  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
 PRESSURE ZONE SUB-BASIN (Continued)

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

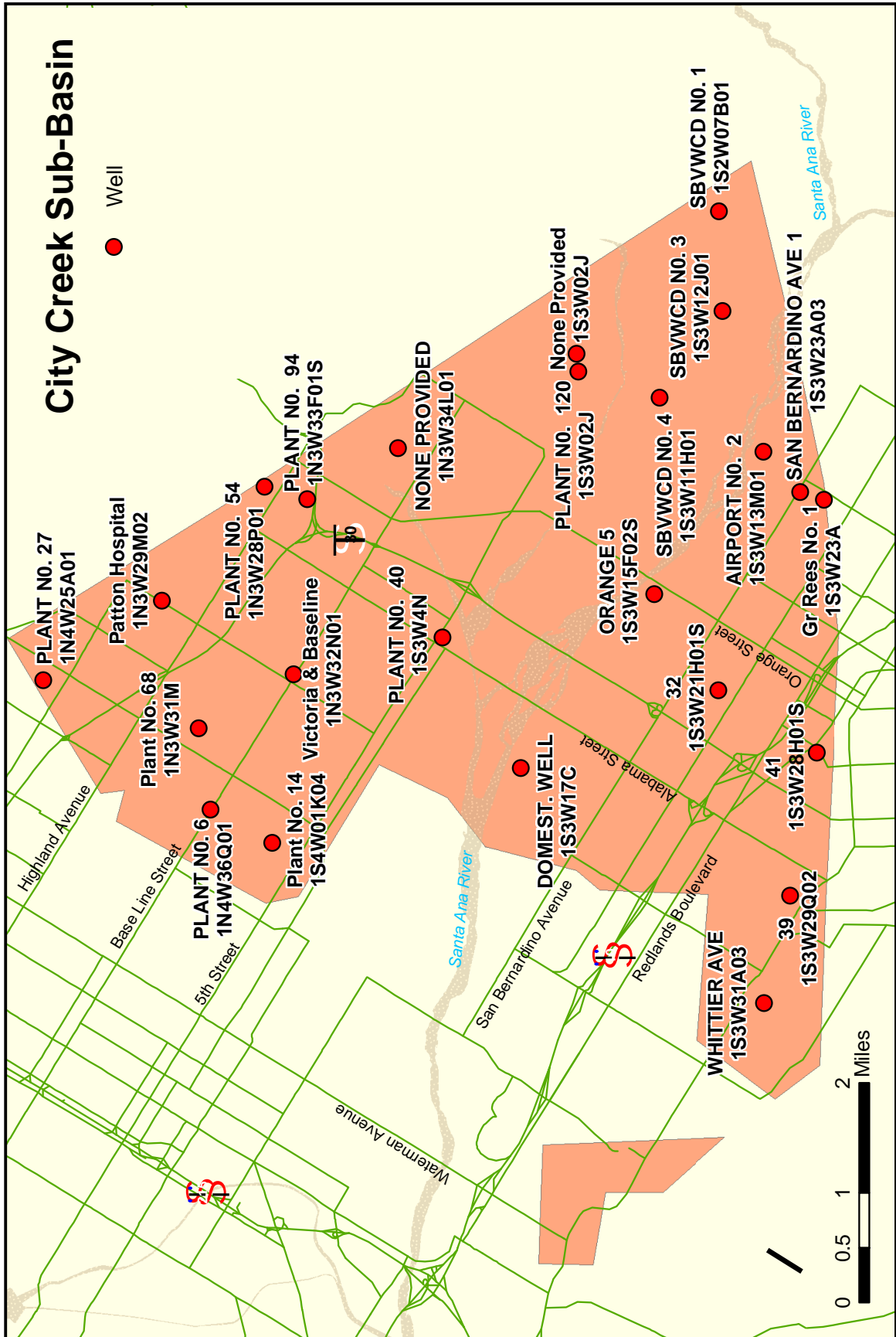
| Year | Depth to Water (ft.)                          |   |  |  |                                       |  |
|------|---|---|--|--|---------------------------------------|--|
|      | LYTLE CREEK PARK<br>1S4W09L05<br>Added Source | VALLEY COLLEGE<br>1S4W16C07<br>Added Source | MILL CENTER<br>1S4W14E13<br>Added Source | GARNER PARK<br>1S4W04E05<br>Added Source | BACKYARD<br>1S4W22D07<br>Added Source |  |
| 1934 |   |   |  |  |                                       |  |
| 1935 |   |   |  |  |                                       |  |
| 1936 |   |   |  |  |                                       |  |
| 1937 |   |   |  |  |                                       |  |
| 1938 |   |   |  |  |                                       |  |
| 1939 |   |   |  |  |                                       |  |
| 1940 |   |   |  |  |                                       |  |
| 1941 |   |   |  |  |                                       |  |
| 1942 |   |   |  |  |                                       |  |
| 1943 |   |   |  |  |                                       |  |
| 1944 |   |   |  |  |                                       |  |
| 1945 |   |   |  |  |                                       |  |
| 1946 |   |   |  |  |                                       |  |
| 1947 |   |   |  |  |                                       |  |
| 1948 |   |   |  |  |                                       |  |
| 1949 |   |   |  |  |                                       |  |
| 1950 |   |   |  |  |                                       |  |
| 1951 |   |   |  |  |                                       |  |
| 1952 |   |   |  |  |                                       |  |
| 1953 |   |   |  |  |                                       |  |
| 1954 |   |   |  |  |                                       |  |
| 1955 |   |   |  |  |                                       |  |
| 1956 |   |   |  |  |                                       |  |
| 1957 |   |   |  |  |                                       |  |
| 1958 |   |   |  |  |                                       |  |
| 1959 |   |   |  |  |                                       |  |
| 1960 |   |   |  |  |                                       |  |
| 1961 |   |   |  |  |                                       |  |
| 1962 |   |   |  |  |                                       |  |
| 1963 |   |   |  |  |                                       |  |
| 1964 |   |   |  |  |                                       |  |
| 1965 |   |   |  |  |                                       |  |
| 1966 |   |   |  |  |                                       |  |
| 1967 |   |   |  |  |                                       |  |
| 1968 |   |   |  |  |                                       |  |
| 1969 |   |   |  |  |                                       |  |
| 1970 |   |   |  |  |                                       |  |
| 1971 |   |   |  |  |                                       |  |
| 1972 |   |   |  |  |                                       |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
 PRESSURE ZONE SUB-BASIN (Continued)

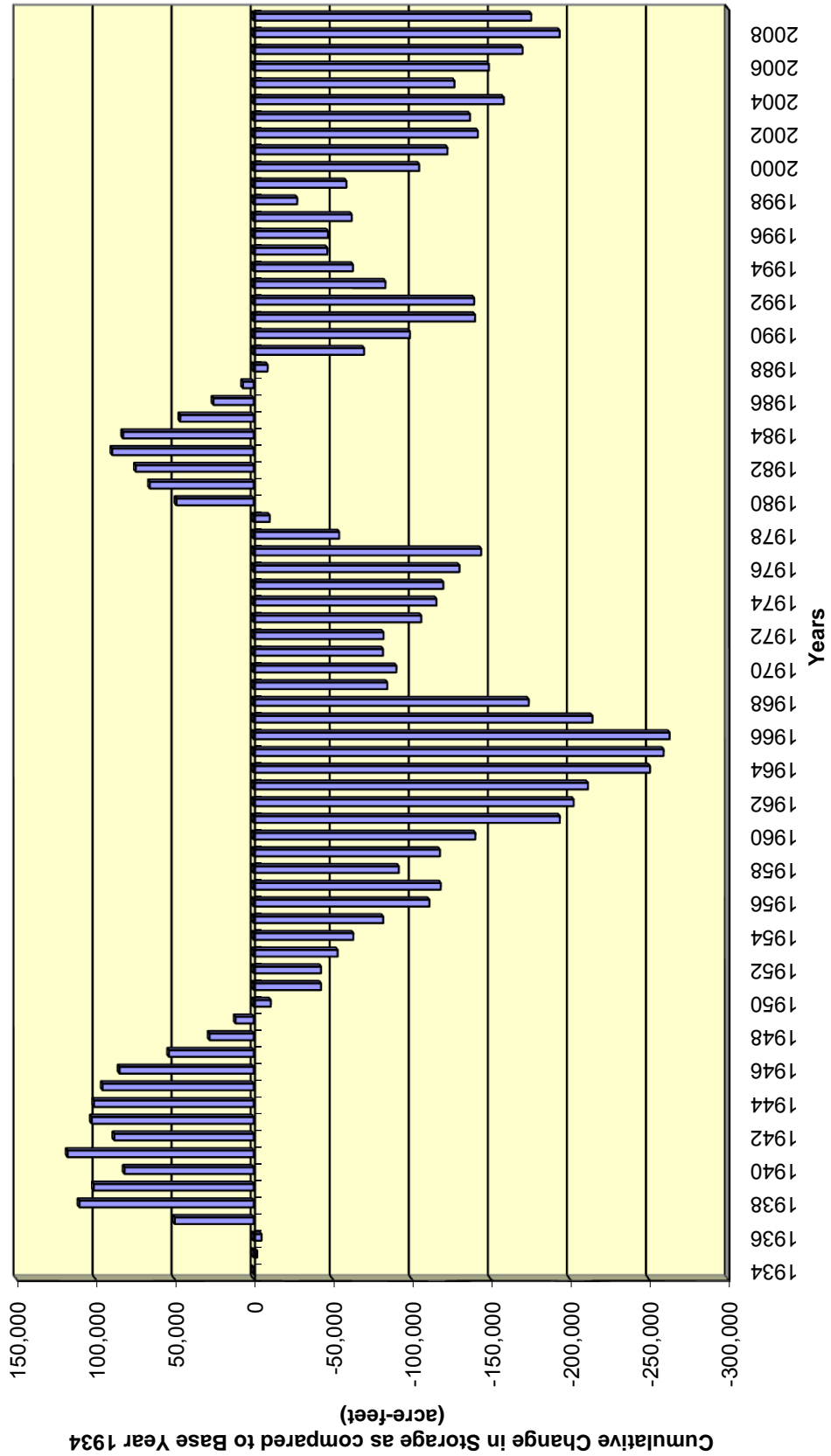
Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                          |   |  |  |                                       |
|------|---|---|--|--|---------------------------------------|
|      | LYTLE CREEK PARK<br>1S4W09L05<br>Added Source | VALLEY COLLEGE<br>1S4W16C07<br>Added Source | MILL CENTER<br>1S4W14E13<br>Added Source | GARNER PARK<br>1S4W04E05<br>Added Source | BACKYARD<br>1S4W22D07<br>Added Source |
| 1973 |   |   |  |  |                                       |
| 1974 |   |   |  |  |                                       |
| 1975 |   |   |  |  |                                       |
| 1976 |   |   |  |  |                                       |
| 1977 |   |   |  |  |                                       |
| 1978 |   |   |  |  |                                       |
| 1979 |   |   |  |  |                                       |
| 1980 |   |   |  |  |                                       |
| 1981 |   |   |  |  |                                       |
| 1982 |   |   |  |  |                                       |
| 1983 |   |   |  |  |                                       |
| 1984 |   |   |  |  |                                       |
| 1985 |   |   |  |  |                                       |
| 1986 |   |   |  |  |                                       |
| 1987 |   |   |  |  |                                       |
| 1988 |   |   |  |  |                                       |
| 1989 |   |   |  |  |                                       |
| 1990 |   |   |  |  |                                       |
| 1991 |   |   |  |  |                                       |
| 1992 |   |   |  |  |                                       |
| 1993 |   |   |  |  |                                       |
| 1994 |   |   |  |  |                                       |
| 1995 |   |   |  |  |                                       |
| 1996 |   |   |  |  |                                       |
| 1997 |   |   |  |  |                                       |
| 1998 |   |   |  |  |                                       |
| 1999 |   |   |  |  |                                       |
| 2000 |   |   |  |  |                                       |
| 2001 |   |   |  |  |                                       |
| 2002 |   |   |  |  |                                       |
| 2003 |   |   |  |  |                                       |
| 2004 |   |   |  |  |                                       |
| 2005 | -39.63  | -70.26                                      | -46.23                                   | -175.52                                  | -44.83                                |
| 2006 | -40.23  | -70.27                                      | -46.56                                   | -181.53                                  | -44.98                                |
| 2007 | -40.00  | -70.52                                      | -45.99                                   | -186.32                                  | -44.98                                |
| 2008 | -40.15  | -70.43                                      | -46.14                                   | -186.32                                  | -44.98                                |
| 2009 | -40.00  | -70.49                                      | -46.33                                   | -197.50                                  | -45.02                                |



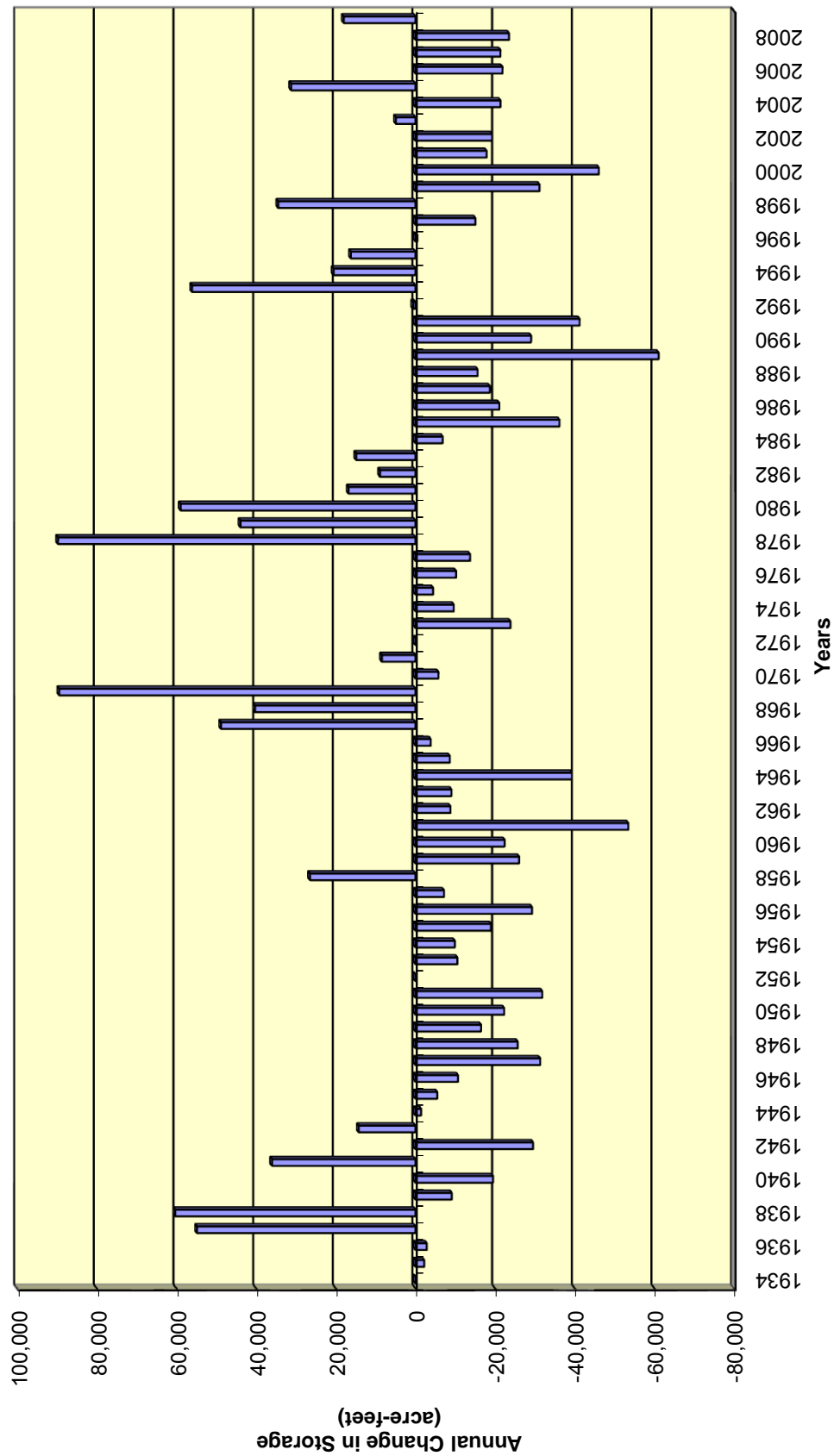


**Cumulative Change in Storage for the City Creek Sub-Basin**



SBVMWD - GIS  
March 2010

Annual Change in Storage for the City Creek Sub-Basin



SBVMWD - GIS  
March 2010

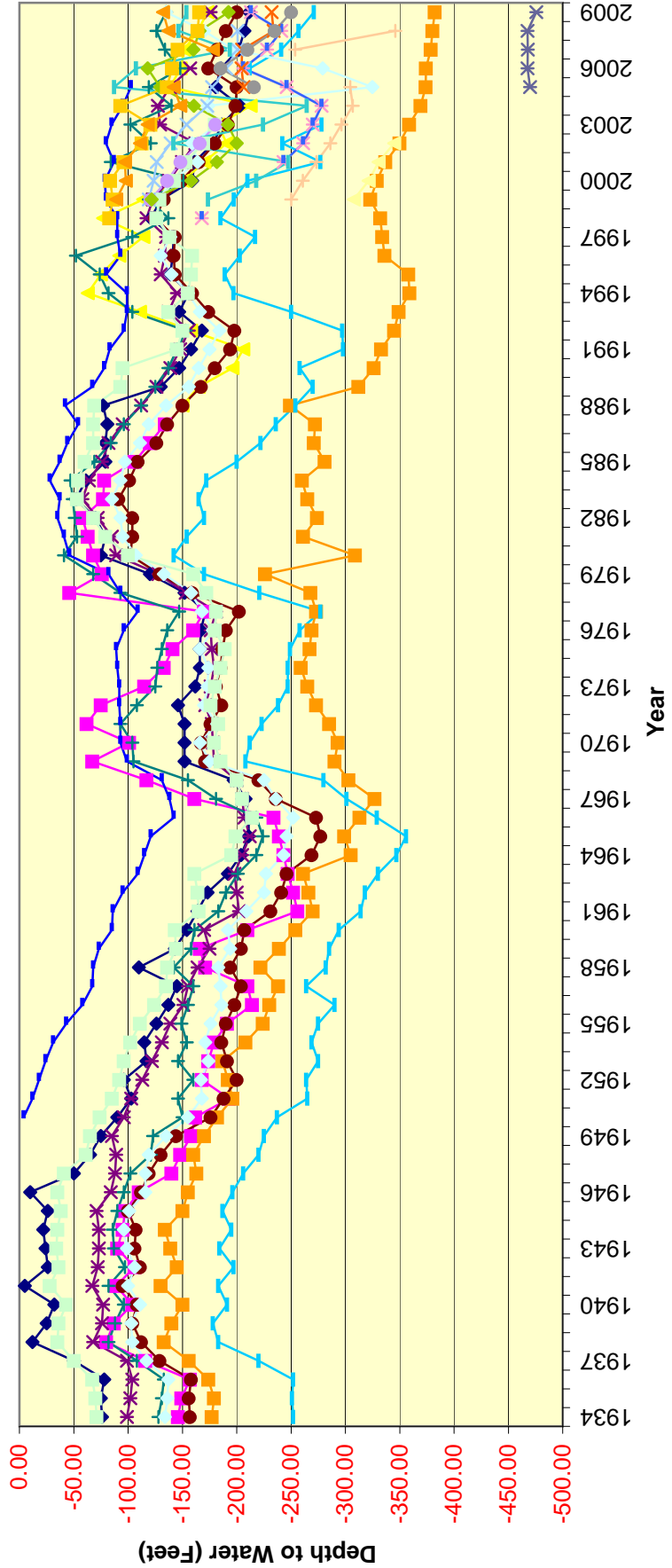
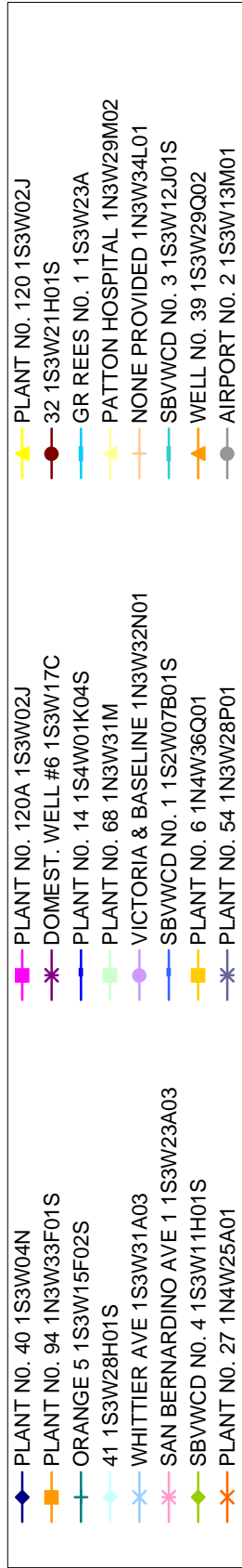
**San Bernardino Valley Municipal Water District**  
Change In Storage for the City Creek Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1934        | 0                              | n/a  | 0   |
| 1935        | -1                             | -2,179   | -2,179  |
| 1936        | -1                             | -2,802   | -4,981  |
| 1937        | 24                             | 54,853   | 49,872  |
| 1938        | 26                             | 60,340   | 110,212   |
| 1939        | -3                             | -9,101   | 101,111   |
| 1940        | -8                             | -19,467  | 81,644  |
| 1941        | 15                             | 36,016   | 117,660   |
| 1942        | -13                            | -29,496  | 88,164  |
| 1943        | 7                              | 14,244   | 102,408   |
| 1944        | -1                             | -1,406   | 101,002   |
| 1945        | -2                             | -5,458   | 95,544  |
| 1946        | -6                             | -10,667  | 84,877  |
| 1947        | -12                            | -31,299  | 53,578  |
| 1948        | -10                            | -25,663  | 27,915  |
| 1949        | -7                             | -16,455  | 11,460  |
| 1950        | -16                            | -22,241  | -10,781   |
| 1951        | -13                            | -31,812  | -42,593   |
| 1952        | -1                             | -21  | -42,614   |
| 1953        | -4                             | -10,500  | -53,114   |
| 1954        | -4                             | -9,873   | -62,987   |
| 1955        | -8                             | -18,914  | -81,901   |
| 1956        | -12                            | -29,231  | -111,132  |
| 1957        | -2                             | -7,142   | -118,274  |
| 1958        | 9                              | 26,490   | -91,784   |
| 1959        | -11                            | -26,023  | -117,807  |
| 1960        | -9                             | -22,382  | -140,189  |
| 1961        | -21                            | -53,413  | -193,602  |
| 1962        | -4                             | -8,760   | -202,362  |
| 1963        | -5                             | -9,015   | -211,377  |
| 1964        | -17                            | -39,262  | -250,639  |
| 1965        | -4                             | -8,605   | -259,244  |
| 1966        | -1                             | -3,808   | -263,052  |
| 1967        | 20                             | 48,813   | -214,239  |
| 1968        | 17                             | 40,290   | -173,949  |
| 1969        | 40                             | 89,460   | -84,489   |
| 1970        | -1                             | -5,746   | -90,235   |
| 1971        | 2                              | 8,443  | -81,792   |
| 1972        | -1                             | -318   | -82,110   |
| 1973        | -8                             | -23,831  | -105,941  |
| 1974        | -3                             | -9,592   | -115,533  |
| 1975        | -2                             | -4,410   | -119,943  |
| 1976        | -5                             | -10,186  | -130,129  |
| 1977        | -7                             | -13,696  | -143,825  |

**San Bernardino Valley Municipal Water District**  
Change In Storage for the City Creek Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1978        | 36                             | 89,758   | -54,067   |
| 1979        | 22                             | 43,951   | -10,116   |
| 1980        | 21                             | 58,966   | 48,850  |
| 1981        | 7                              | 16,804   | 65,654  |
| 1982        | 2                              | 8,897  | 74,551  |
| 1983        | 6                              | 14,890   | 89,441  |
| 1984        | -3                             | -6,823   | 82,618  |
| 1985        | -16                            | -36,130  | 46,488  |
| 1986        | -9                             | -21,038  | 25,450  |
| 1987        | -8                             | -18,659  | 6,791   |
| 1988        | -5                             | -15,578  | -8,787  |
| 1989        | -26                            | -61,028  | -69,815   |
| 1990        | -11                            | -29,017  | -98,832   |
| 1991        | -16                            | -41,190  | -140,022  |
| 1992        | -2                             | 616  | -139,406  |
| 1993        | 23                             | 56,087   | -83,319   |
| 1994        | 10                             | 20,573   | -62,746   |
| 1995        | 8                              | 16,221   | -46,525   |
| 1996        | 0                              | -453   | -46,978   |
| 1997        | -7                             | -15,021  | -61,999   |
| 1998        | 12                             | 34,478   | -27,521   |
| 1999        | -4                             | -31,118  | -58,639   |
| 2000        | -20                            | -46,018  | -104,657  |
| 2001        | -12                            | -17,857  | -122,514  |
| 2002        | 1                              | -19,242  | -141,756  |
| 2003        | -14                            | 4,923  | -136,833  |
| 2004        | -15                            | -21,327  | -158,160  |
| 2005        | 18                             | 31,225   | -126,935  |
| 2006        | 16                             | -21,828  | -148,763  |
| 2007        | -25                            | -21,308  | -170,071  |
| 2008        | 0                              | -23,474  | -193,545  |
| 2009        | -2                             | 18,017   | -175,528  |

### Hydrograph for City Creek Sub-Basin Wells



**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)              |                                     |  |                                      |                                      |                            |                                  |
|------|-----------------------------------|-------------------------------------|--|--------------------------------------|--------------------------------------|----------------------------|----------------------------------|
|      | PLANT NO. 40<br>1S3W04N<br>Source | PLANT NO. 120A<br>1S3W02J<br>Source | PLANT NO. 120<br>1S3W02J<br>Substitute | PLANT NO. 94<br>1N3W33F01S<br>Source | DOMEST. WELL #6<br>1S3W17C<br>Source | 32<br>1S3W21H01S<br>Source | ORANGE 5<br>1S3W15F02S<br>Source |
| 1934 | -76.00                            | -146.00                             |  | -177.00                              | -99.00                               | -157.00                    | -128.00                          |
| 1935 | -75.00                            | -149.00                             |  | -179.00                              | -102.00                              | -156.00                    | -131.00                          |
| 1936 | -78.00                            | -157.00                             |  | -174.00                              | -104.00                              | -158.00                    | -133.00                          |
| 1937 | -50.00                            | -116.00                             |  | -156.00                              | -99.00                               | -129.00                    | -108.00                          |
| 1938 | -12.00                            | -80.00                              |  | -133.00                              | -68.00                               | -112.00                    | -82.00                           |
| 1939 | -25.00                            | -87.00                              |  | -140.00                              | -76.00                               | -104.00                    | -88.00                           |
| 1940 | -32.00                            | -104.00                             |  | -150.00                              | -77.00                               | -108.00                    | -96.00                           |
| 1941 | -5.00                             | -89.00                              |  | -130.00                              | -67.00                               | -95.00                     | -82.00                           |
| 1942 | -26.00                            | -106.00                             |  | -145.00                              | -72.00                               | -111.00                    | -97.00                           |
| 1943 | -24.00                            | -90.00                              |  | -139.00                              | -73.00                               | -106.00                    | -87.00                           |
| 1944 | -22.00                            | -95.00                              |  | -134.00                              | -73.00                               | -107.00                    | -86.00                           |
| 1945 | -26.00                            | -97.00                              |  | -150.00                              | -71.00                               | -100.00                    | -90.00                           |
| 1946 | -10.00                            | -110.00                             |  | -155.00                              | -84.00                               | -112.00                    | -96.00                           |
| 1947 | -50.00                            | -140.00                             |  | -163.00                              | -88.00                               | -119.00                    | -102.00                          |
| 1948 | -65.00                            | -148.00                             |  | -160.00                              | -89.00                               | -130.00                    | -121.00                          |
| 1949 | -75.00                            | -158.00                             |  | -170.00                              | -85.00                               | -144.00                    | -123.00                          |
| 1950 | -90.00                            | -162.00                             |  | -182.00                              | -96.00                               | -176.00                    | -150.00                          |
| 1951 | -103.00                           | -193.00                             |  | -196.00                              | -103.00                              | -188.00                    | -146.00                          |
| 1952 | -96.00                            | -168.00                             |  | -192.00                              | -113.00                              | -200.00                    | -160.00                          |
| 1953 | -117.00                           | -174.00                             |  | -187.00                              | -122.00                              | -191.00                    | -146.00                          |
| 1954 | -115.00                           | -179.00                             |  | -208.00                              | -131.00                              | -186.00                    | -154.00                          |
| 1955 | -126.00                           | -191.00                             |  | -224.00                              | -139.00                              | -190.00                    | -149.00                          |
| 1956 | -137.00                           | -214.00                             |  | -230.00                              | -151.00                              | -198.00                    | -155.00                          |
| 1957 | -145.00                           | -210.00                             |  | -238.00                              | -155.00                              | -204.00                    | -160.00                          |
| 1958 | -110.00                           | -171.00                             |  | -222.00                              | -164.00                              | -194.00                    | -142.00                          |
| 1959 | -143.00                           | -166.00                             |  | -239.00                              | -175.00                              | -204.00                    | -158.00                          |
| 1960 | -154.00                           | -210.00                             |  | -254.00                              | -170.00                              | -207.00                    | -161.00                          |
| 1961 | -164.00                           | -256.00                             |  | -270.00                              | -202.00                              | -231.00                    | -183.00                          |
| 1962 | -173.00                           | -252.00                             |  | -266.00                              | -200.00                              | -241.00                    | -190.00                          |
| 1963 | -192.00                           | -247.00                             |  | -261.00                              | -198.00                              | -246.00                    | -201.00                          |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)              |                                     |  |                                      |                                      |                            |                                  |
|------|-----------------------------------|-------------------------------------|--|--------------------------------------|--------------------------------------|----------------------------|----------------------------------|
|      | PLANT NO. 40<br>1S3W04N<br>Source | PLANT NO. 120A<br>1S3W02J<br>Source | PLANT NO. 120<br>1S3W02J<br>Substitute | PLANT NO. 94<br>1N3W33F01S<br>Source | DOMEST. WELL #6<br>1S3W17C<br>Source | 32<br>1S3W21H01S<br>Source | ORANGE 5<br>1S3W15F02S<br>Source |
| 1964 | -204.00                           | -243.00                             |  | -305.00                              | -205.00                              | -269.00                    | -218.00                          |
| 1965 | -211.00                           | -239.00                             |  | -299.00                              | -212.00                              | -277.00                    | -224.00                          |
| 1966 | -211.00                           | -234.00                             |  | -313.00                              | -207.00                              | -273.00                    | -218.00                          |
| 1967 | -208.00                           | -161.00                             |  | -327.00                              | -205.00                              | -236.00                    | -181.00                          |
| 1968 | -197.00                           | -117.00                             |  | -303.00                              | -200.00                              | -220.00                    | -155.00                          |
| 1969 | -152.00                           | -67.00                              |  | -290.00                              | -179.00                              | -171.00                    | -105.00                          |
| 1970 | -152.00                           | -101.00                             |  | -293.00                              | -178.00                              | -167.00                    | -104.00                          |
| 1971 | -152.00                           | -62.00                              |  | -285.00                              | -177.00                              | -176.00                    | -93.00                           |
| 1972 | -146.00                           | -75.00                              |  | -273.00                              | -171.00                              | -186.00                    | -108.00                          |
| 1973 | -162.00                           | -115.00                             |  | -265.00                              | -176.00                              | -181.00                    | -125.00                          |
| 1974 | -166.00                           | -133.00                             |  | -259.00                              | -179.00                              | -185.00                    | -127.00                          |
| 1975 | -166.00                           | -141.00                             |  | -267.00                              | -177.00                              | -187.00                    | -131.00                          |
| 1976 | -167.00                           | -160.00                             |  | -269.00                              | -176.00                              | -190.00                    | -136.00                          |
| 1977 | -171.00                           | -170.00                             |  | -273.00                              | -181.00                              | -202.00                    | -147.00                          |
| 1978 | -152.00                           | -46.00                              |  | -268.00                              | -153.00                              | -159.00                    | -93.00                           |
| 1979 | -120.00                           | -76.00                              |  | -226.00                              | -128.00                              | -129.00                    | -68.00                           |
| 1980 | -75.00                            | -68.00                              |  | -309.00                              | -89.00                               | -102.00                    | -41.00                           |
| 1981 | -79.00                            | -63.00                              |  | -261.00                              | -85.00                               | -104.00                    | -53.00                           |
| 1982 | -70.00                            | -58.00                              |  | -274.00                              | -72.00                               | -104.00                    | -51.00                           |
| 1983 | -52.00                            | -77.00                              |  | -265.00                              | -58.00                               | -91.00                     | -49.00                           |
| 1984 | -61.00                            | -78.00                              |  | -260.00                              | -64.00                               | -101.00                    | -47.00                           |
| 1985 | -79.00                            | -106.00                             |  | -281.00                              | -76.00                               | -109.00                    | -69.00                           |
| 1986 | -79.00                            | -120.00                             |  | -271.00                              | -82.00                               | -126.00                    | -84.00                           |
| 1987 | -81.00                            | -134.00                             |  | -272.00                              | -95.00                               | -136.00                    | -96.00                           |
| 1988 | -77.00                            |                                     | -150.00                                | -249.00                              | -112.00                              | -150.00                    | -112.00                          |
| 1989 | -130.00                           |                                     | -165.00                                | -312.00                              | -126.00                              | -167.00                    | -125.00                          |
| 1990 | -147.00                           |                                     | -196.00                                | -326.00                              | -139.00                              | -180.00                    | -137.00                          |
| 1991 | -158.00                           |                                     | -206.00                                | -333.00                              | -148.00                              | -194.00                    | -145.00                          |
| 1992 | -168.00                           |                                     | -158.00                                | -345.00                              | -156.00                              | -198.00                    | -153.00                          |
| 1993 | -147.00                           |                                     | -111.00                                | -349.00                              | -137.00                              | -174.00                    | -104.00                          |



**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)              |                                     |  |                                      |                                      |                            |                                  |
|------|-----------------------------------|-------------------------------------|--|--------------------------------------|--------------------------------------|----------------------------|----------------------------------|
|      | PLANT NO. 40<br>1S3W04N<br>Source | PLANT NO. 120A<br>1S3W02J<br>Source | PLANT NO. 120<br>1S3W02J<br>Substitute | PLANT NO. 94<br>1N3W33F01S<br>Source | DOMEST. WELL #6<br>1S3W17C<br>Source | 32<br>1S3W21H01S<br>Source | ORANGE 5<br>1S3W15F02S<br>Source |
| 1994 | -156.00                           |                                     | -63.00                                 | -359.00                              | -145.00                              | -159.00                    | -82.00                           |
| 1995 | -139.00                           |                                     | -75.00                                 | -358.00                              | -130.00                              | -143.00                    | -74.00                           |
| 1996 | -141.00                           |                                     | -92.00                                 | -336.00                              | -134.00                              | -142.00                    | -52.00                           |
| 1997 | -142.00                           |                                     | -114.00                                | -334.00                              | -135.00                              | -143.00                    | -104.00                          |
| 1998 | -121.00                           |                                     | -77.00                                 | -332.00                              | -117.00                              | -125.00                    | -137.00                          |
| 1999 | -130.60                           |                                     | -113.85                                | -323.10                              | -122.60                              | -133.00                    | -119.00                          |
| 2000 | -159.00                           |                                     | -150.70                                | -329.10                              | -137.70                              | -149.00                    | -151.00                          |
| 2001 | -161.00                           |                                     | -170.30                                | -336.90                              | -149.60                              | -165.00                    | -84.00                           |
| 2002 | -178.50                           |                                     | -190.60                                | -349.90                              | -162.00                              | -180.00                    | -121.00                          |
| 2003 | -186.20                           |                                     | -183.00                                | -358.80                              | -129.50                              | -192.00                    | -102.00                          |
| 2004 | -203.00                           |                                     | -212.80                                | -369.30                              | -127.40                              | -199.00                    | -140.00                          |
| 2005 | -180.70                           |                                     | -138.70                                | -374.00                              | -138.60                              | -200.00                    | -119.00                          |
| 2006 | -185.30                           |                                     | -148.30                                | -374.10                              | -157.30                              | -174.00                    | -148.00                          |
| 2007 | -201.80                           |                                     | -151.80                                | -378.70                              |                                      | -182.00                    | -134.00                          |
| 2008 | -207.00                           |                                     | -164.20                                | -380.10                              |                                      | -190.00                    | -126.00                          |
| 2009 | -211.50                           |                                     | -173.20                                | -382.20                              | -176.00                              | -200.00                    | -135.00                          |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN (Continued)**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                 |                                    |                            |                                   |  |   |  |
|------|--------------------------------------|------------------------------------|----------------------------|-----------------------------------|--|---|--|
|      | PLANT NO. 14<br>1S4W01K04S<br>Source | GR REES NO. 1<br>1S3W23A<br>Source | 41<br>1S3W28H01S<br>Source | PLANT NO. 68<br>1N3W31M<br>Source | PATTON HOSPITAL<br>1N3W29M02<br>Added Source | WHITTIER AVE<br>1S3W31A03<br>Added Source |  |
| 1934 |                                      | -252.00                            | -134.00                    | -71.00                            |  |   |  |
| 1935 |                                      | -251.00                            | -136.00                    | -70.00                            |  |   |  |
| 1936 |                                      | -252.00                            | -137.00                    | -67.00                            |  |   |  |
| 1937 |                                      | -220.00                            | -117.00                    | -50.00                            |  |   |  |
| 1938 |                                      | -183.00                            | -104.00                    | -35.00                            |  |   |  |
| 1939 |                                      | -178.00                            | -103.00                    | -36.00                            |  |   |  |
| 1940 |                                      | -191.00                            | -111.00                    | -43.00                            |  |   |  |
| 1941 |                                      | -183.00                            | -100.00                    | -28.00                            |  |   |  |
| 1942 |                                      | -197.00                            | -106.00                    | -36.00                            |  |   |  |
| 1943 |                                      | -184.00                            | -99.00                     | -34.00                            |  |   |  |
| 1944 |                                      | -195.00                            | -96.00                     | -35.00                            |  |   |  |
| 1945 |                                      | -187.00                            | -101.00                    | -38.00                            |  |   |  |
| 1946 |                                      | -196.00                            | -116.00                    | -35.00                            |  |   |  |
| 1947 |                                      | -206.00                            | -116.00                    | -41.00                            |  |   |  |
| 1948 |                                      | -220.00                            | -119.00                    | -61.00                            |  |   |  |
| 1949 |                                      | -225.00                            | -135.00                    | -65.00                            |  |   |  |
| 1950 | -4.00                                | -237.00                            | -155.00                    | -74.00                            |  |   |  |
| 1951 | -12.00                               | -265.00                            | -168.00                    | -85.00                            |  |   |  |
| 1952 | -18.00                               | -264.00                            | -167.00                    | -92.00                            |  |   |  |
| 1953 | -24.00                               | -275.00                            | -174.00                    | -96.00                            |  |   |  |
| 1954 | -31.00                               | -269.00                            | -171.00                    | -102.00                           |  |   |  |
| 1955 | -43.00                               | -275.00                            | -176.00                    | -111.00                           |  |   |  |
| 1956 | -58.00                               | -290.00                            | -186.00                    | -124.00                           |  |   |  |
| 1957 | -67.00                               | -264.00                            | -185.00                    | -135.00                           |  |   |  |
| 1958 | -68.00                               | -282.00                            | -183.00                    | -136.00                           |  |   |  |
| 1959 | -73.00                               | -285.00                            | -194.00                    | -144.00                           |  |   |  |
| 1960 | -85.00                               | -294.00                            | -192.00                    | -143.00                           |  |   |  |
| 1961 | -86.00                               | -314.00                            | -209.00                    | -165.00                           |  |   |  |
| 1962 | -95.00                               | -318.00                            | -225.00                    | -164.00                           |  |   |  |
| 1963 | -109.00                              | -330.00                            | -227.00                    | -161.00                           |  |   |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN (Continued)**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                 |                                    |                            |                                   |  |   |
|------|--------------------------------------|------------------------------------|----------------------------|-----------------------------------|--|---|
|      | PLANT NO. 14<br>1S4W01K04S<br>Source | GR REES NO. 1<br>1S3W23A<br>Source | 41<br>1S3W28H01S<br>Source | PLANT NO. 68<br>1N3W31M<br>Source | PATTON HOSPITAL<br>1N3W29M02<br>Added Source | WHITTIER AVE<br>1S3W31A03<br>Added Source |
| 1964 | -115.00                              | -347.00                            | -243.00                    | -195.00                           |  |   |
| 1965 | -121.00                              | -356.00                            | -246.00                    | -199.00                           |  |   |
| 1966 | -142.00                              | -329.00                            | -252.00                    | -214.00                           |  |   |
| 1967 | -138.00                              | -301.00                            | -236.00                    | -205.00                           |  |   |
| 1968 | -131.00                              | -280.00                            | -225.00                    | -200.00                           |  |   |
| 1969 | -99.00                               | -208.00                            | -175.00                    | -185.00                           |  |   |
| 1970 | -93.00                               | -212.00                            | -166.00                    | -179.00                           |  |   |
| 1971 | -93.00                               | -223.00                            | -182.00                    | -183.00                           |  |   |
| 1972 | -92.00                               | -238.00                            | -170.00                    | -176.00                           |  |   |
| 1973 | -92.00                               | -247.00                            | -173.00                    | -180.00                           |  |   |
| 1974 | -90.00                               | -247.00                            | -174.00                    | -185.00                           |  |   |
| 1975 | -89.00                               | -249.00                            | -166.00                    | -189.00                           |  |   |
| 1976 | -96.00                               | -258.00                            | -178.00                    | -180.00                           |  |   |
| 1977 | -109.00                              | -277.00                            | -168.00                    | -181.00                           |  |   |
| 1978 | -93.00                               | -221.00                            | -158.00                    | -172.00                           |  |   |
| 1979 | -82.00                               | -170.00                            | -133.00                    | -160.00                           |  |   |
| 1980 | -46.00                               | -142.00                            | -107.00                    | -100.00                           |  |   |
| 1981 | -41.00                               | -154.00                            | -95.00                     | -79.00                            |  |   |
| 1982 | -35.00                               | -170.00                            | -93.00                     | -68.00                            |  |   |
| 1983 | -37.00                               | -165.00                            | -85.00                     | -53.00                            |  |   |
| 1984 | -28.00                               | -172.00                            | -93.00                     | -54.00                            |  |   |
| 1985 | -37.00                               | -200.00                            | -97.00                     | -60.00                            |  |   |
| 1986 | -44.00                               | -222.00                            | -111.00                    | -68.00                            |  |   |
| 1987 | -54.00                               | -236.00                            | -119.00                    | -68.00                            |  |   |
| 1988 | -42.00                               | -254.00                            | -135.00                    | -69.00                            |  |   |
| 1989 | -67.00                               | -270.00                            | -156.00                    | -93.00                            |  |   |
| 1990 | -78.00                               | -258.00                            | -165.00                    | -95.00                            |  |   |
| 1991 | -83.00                               | -298.00                            | -175.00                    | -145.00                           |  |   |
| 1992 | -96.00                               | -297.00                            | -184.00                    | -150.00                           |  |   |
| 1993 | -99.00                               | -250.00                            | -166.00                    | -137.00                           |  |   |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN (Continued)**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                 |                                    |                            |                                   |  |   |  |
|------|--------------------------------------|------------------------------------|----------------------------|-----------------------------------|--|---|--|
|      | PLANT NO. 14<br>1S4W01K04S<br>Source | GR REES NO. 1<br>1S3W23A<br>Source | 41<br>1S3W28H01S<br>Source | PLANT NO. 68<br>1N3W31M<br>Source | PATTON HOSPITAL<br>1N3W29M02<br>Added Source | WHITTIER AVE<br>1S3W31A03<br>Added Source |  |
| 1994 | -99.00                               | -197.00                            | -155.00                    | -155.00                           |  |   |  |
| 1995 | -80.00                               | -189.00                            | -140.00                    | -158.00                           |  |   |  |
| 1996 | -93.00                               | -203.00                            | -130.00                    | -159.00                           |  |   |  |
| 1997 | -90.00                               | -217.00                            | -139.00                    | -138.00                           |  |   |  |
| 1998 | -90.00                               | -185.00                            | -127.00                    | -126.00                           |  |   |  |
| 1999 | -79.70                               | -197.50                            | -128.00                    | -129.00                           | -307.74                                      | -119.06                                   |  |
| 2000 | -78.70                               | -210.00                            | -140.00                    | -142.60                           | -321.36                                      | -123.43                                   |  |
| 2001 | -86.90                               | -277.00                            | -164.00                    | -153.10                           | -330.50                                      | -126.43                                   |  |
| 2002 | -79.60                               | -242.00                            | -159.00                    | -169.20                           | -345.02                                      | -139.17                                   |  |
| 2003 | -84.80                               | -278.00                            | -182.00                    | -180.00                           |  | -153.66                                   |  |
| 2004 | -95.10                               |                                    | -174.00                    |                                   |  | -172.77                                   |  |
| 2005 | -102.60                              |                                    | -324.80                    |                                   |  | -177.27                                   |  |
| 2006 |                                      | -212.00                            | -279.00                    |                                   |  | -190.27                                   |  |
| 2007 |                                      | -241.00                            | -197.00                    |                                   |  | -200.88                                   |  |
| 2008 |                                      | -257.00                            | -170.00                    |                                   |  | -200.80                                   |  |
| 2009 |                                      | -271.00                            | -135.00                    |                                   |  |   |  |

San Bernardino Valley Municipal Water District  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN (Continued)**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (Feet)                            |  |   |  |
|------|--|--|---|--|
|      | VICTORIA & BASELINE<br>1N3W32N01<br>Added Source | NONE PROVIDED<br>1N3W34L01<br>Added Source | SAN BERNARDINO AVE 1<br>1S3W23A03<br>Substitute | SBVWCD NO. 1<br>1S2W07B01S<br>Added Source |
| 1934 |  |  |   | SBVWCD NO. 3<br>1S3W12J01S<br>Added Source |
| 1935 |  |  |   |  |
| 1936 |  |  |   |  |
| 1937 |  |  |   |  |
| 1938 |  |  |   |  |
| 1939 |  |  |   |  |
| 1940 |  |  |   |  |
| 1941 |  |  |   |  |
| 1942 |  |  |   |  |
| 1943 |  |  |   |  |
| 1944 |  |  |   |  |
| 1945 |  |  |   |  |
| 1946 |  |  |   |  |
| 1947 |  |  |   |  |
| 1948 |  |  |   |  |
| 1949 |  |  |   |  |
| 1950 |  |  |   |  |
| 1951 |  |  |   |  |
| 1952 |  |  |   |  |
| 1953 |  |  |   |  |
| 1954 |  |  |   |  |
| 1955 |  |  |   |  |
| 1956 |  |  |   |  |
| 1957 |  |  |   |  |
| 1958 |  |  |   |  |
| 1959 |  |  |   |  |
| 1960 |  |  |   |  |
| 1961 |  |  |   |  |
| 1962 |  |  |   |  |
| 1963 |  |  |   |  |

San Bernardino Valley Municipal Water District  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN (Continued)**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (Feet)                            |  |   |  |
|------|--|--|---|--|
|      | VICTORIA & BASELINE<br>1N3W32N01<br>Added Source | NONE PROVIDED<br>1N3W34L01<br>Added Source | SAN BERNARDINO AVE 1<br>1S3W23A03<br>Substitute | SBVWCD NO. 1<br>1S2W07B01S<br>Added Source |
| 1964 |  |  |   | SBVWCD NO. 3<br>1S3W12J01S<br>Added Source |
| 1965 |  |  |   |  |
| 1966 |  |  |   |  |
| 1967 |  |  |   |  |
| 1968 |  |  |   |  |
| 1969 |  |  |   |  |
| 1970 |  |  |   |  |
| 1971 |  |  |   |  |
| 1972 |  |  |   |  |
| 1973 |  |  |   |  |
| 1974 |  |  |   |  |
| 1975 |  |  |   |  |
| 1976 |  |  |   |  |
| 1977 |  |  |   |  |
| 1978 |  |  |   |  |
| 1979 |  |  |   |  |
| 1980 |  |  |   |  |
| 1981 |  |  |   |  |
| 1982 |  |  |   |  |
| 1983 |  |  |   |  |
| 1984 |  |  |   |  |
| 1985 |  |  |   |  |
| 1986 |  |  |   |  |
| 1987 |  |  |   |  |
| 1988 |  |  |   |  |
| 1989 |  |  |   |  |
| 1990 |  |  |   |  |
| 1991 |  |  |   |  |
| 1992 |  |  |   |  |
| 1993 |  |  |   |  |

San Bernardino Valley Municipal Water District  
Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN (Continued)**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (Feet)                            |  |   |  |
|------|--|--|---|--|
|      | VICTORIA & BASELINE<br>1N3W32N01<br>Added Source | NONE PROVIDED<br>1N3W34L01<br>Added Source | SAN BERNARDINO AVE 1<br>1S3W23A03<br>Substitute | SBVWCD NO. 1<br>1S2W07B01S<br>Added Source |
| 1994 |  |  |   |  |
| 1995 |  |  |   |  |
| 1996 |  |  |   |  |
| 1997 |  |  |   |  |
| 1998 |  |  | -168.00   |  |
| 1999 | -120.50  | -250.08                                    |   | -193.75                                    |
| 2000 | -136.00  | -260.87                                    |   | -276.13                                    |
| 2001 | -148.18  | -273.33                                    | -243.00   | -299.19                                    |
| 2002 | -166.07  | -286.28                                    | -261.00   | -179.75                                    |
| 2003 | -180.49  | -296.24                                    | -270.00   | -257.45                                    |
| 2004 |  | -306.88                                    | -278.00   | -297.00                                    |
| 2005 |  | -304.52                                    | -246.00   | -134.06                                    |
| 2006 |  |  | -206.00   | -159.69                                    |
| 2007 |  | -253.72                                    | -228.00   | -241.11                                    |
| 2008 |  | -345.90                                    | -241.00   | -227.00                                    |
| 2009 |  |  | -213.00   | -225.50                                    |
|      |  |  |   | SBVWCD NO. 3<br>1S3W12J01S<br>Added Source |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN (Continued)**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (Feet)                      |  |  |   |   |  |
|------|--|--|--|---|---|--|
|      | SBVWCD NO. 4<br>1S3W11H01S<br>Added Source | PLANT NO. 6<br>1N4W36Q01<br>Substitute | WELL NO. 39<br>1S3W29Q02<br>Added Source | PLANT NO. 27<br>1N4W25A01<br>Substitute | PLANT NO. 54<br>1N3W28P01<br>Substitute | AIRPORT NO. 2<br>1S3W13M01<br>Substitute |
| 1934 |  |  |  |   |   |  |
| 1935 |  |  |  |   |   |  |
| 1936 |  |  |  |   |   |  |
| 1937 |  |  |  |   |   |  |
| 1938 |  |  |  |   |   |  |
| 1939 |  |  |  |   |   |  |
| 1940 |  |  |  |   |   |  |
| 1941 |  |  |  |   |   |  |
| 1942 |  |  |  |   |   |  |
| 1943 |  |  |  |   |   |  |
| 1944 |  |  |  |   |   |  |
| 1945 |  |  |  |   |   |  |
| 1946 |  |  |  |   |   |  |
| 1947 |  |  |  |   |   |  |
| 1948 |  |  |  |   |   |  |
| 1949 |  |  |  |   |   |  |
| 1950 |  |  |  |   |   |  |
| 1951 |  |  |  |   |   |  |
| 1952 |  |  |  |   |   |  |
| 1953 |  |  |  |   |   |  |
| 1954 |  |  |  |   |   |  |
| 1955 |  |  |  |   |   |  |
| 1956 |  |  |  |   |   |  |
| 1957 |  |  |  |   |   |  |
| 1958 |  |  |  |   |   |  |
| 1959 |  |  |  |   |   |  |
| 1960 |  |  |  |   |   |  |
| 1961 |  |  |  |   |   |  |
| 1962 |  |  |  |   |   |  |
| 1963 |  |  |  |   |   |  |



**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN (Continued)**

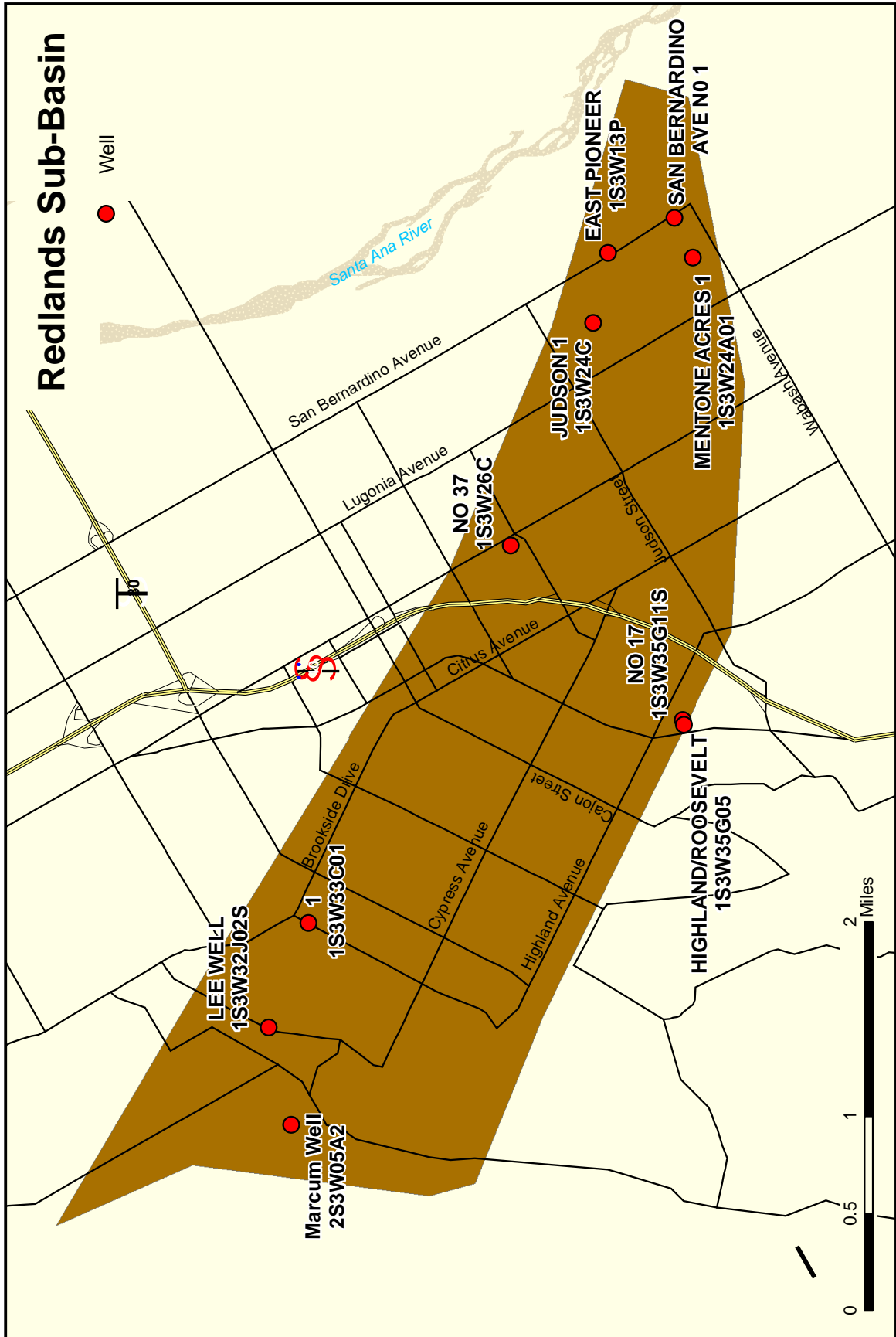
Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (Feet)                      |  |  |   |   |  |
|------|--|--|--|---|---|--|
|      | SBVWCD NO. 4<br>1S3W11H01S<br>Added Source | PLANT NO. 6<br>1N4W36Q01<br>Substitute | WELL NO. 39<br>1S3W29Q02<br>Added Source | PLANT NO. 27<br>1N4W25A01<br>Substitute | PLANT NO. 54<br>1N3W28P01<br>Substitute | AIRPORT NO. 2<br>1S3W13M01<br>Substitute |
| 1964 |  |  |  |   |   |  |
| 1965 |  |  |  |   |   |  |
| 1966 |  |  |  |   |   |  |
| 1967 |  |  |  |   |   |  |
| 1968 |  |  |  |   |   |  |
| 1969 |  |  |  |   |   |  |
| 1970 |  |  |  |   |   |  |
| 1971 |  |  |  |   |   |  |
| 1972 |  |  |  |   |   |  |
| 1973 |  |  |  |   |   |  |
| 1974 |  |  |  |   |   |  |
| 1975 |  |  |  |   |   |  |
| 1976 |  |  |  |   |   |  |
| 1977 |  |  |  |   |   |  |
| 1978 |  |  |  |   |   |  |
| 1979 |  |  |  |   |   |  |
| 1980 |  |  |  |   |   |  |
| 1981 |  |  |  |   |   |  |
| 1982 |  |  |  |   |   |  |
| 1983 |  |  |  |   |   |  |
| 1984 |  |  |  |   |   |  |
| 1985 |  |  |  |   |   |  |
| 1986 |  |  |  |   |   |  |
| 1987 |  |  |  |   |   |  |
| 1988 |  |  |  |   |   |  |
| 1989 |  |  |  |   |   |  |
| 1990 |  |  |  |   |   |  |
| 1991 |  |  |  |   |   |  |
| 1992 |  |  |  |   |   |  |
| 1993 |  |  |  |   |   |  |

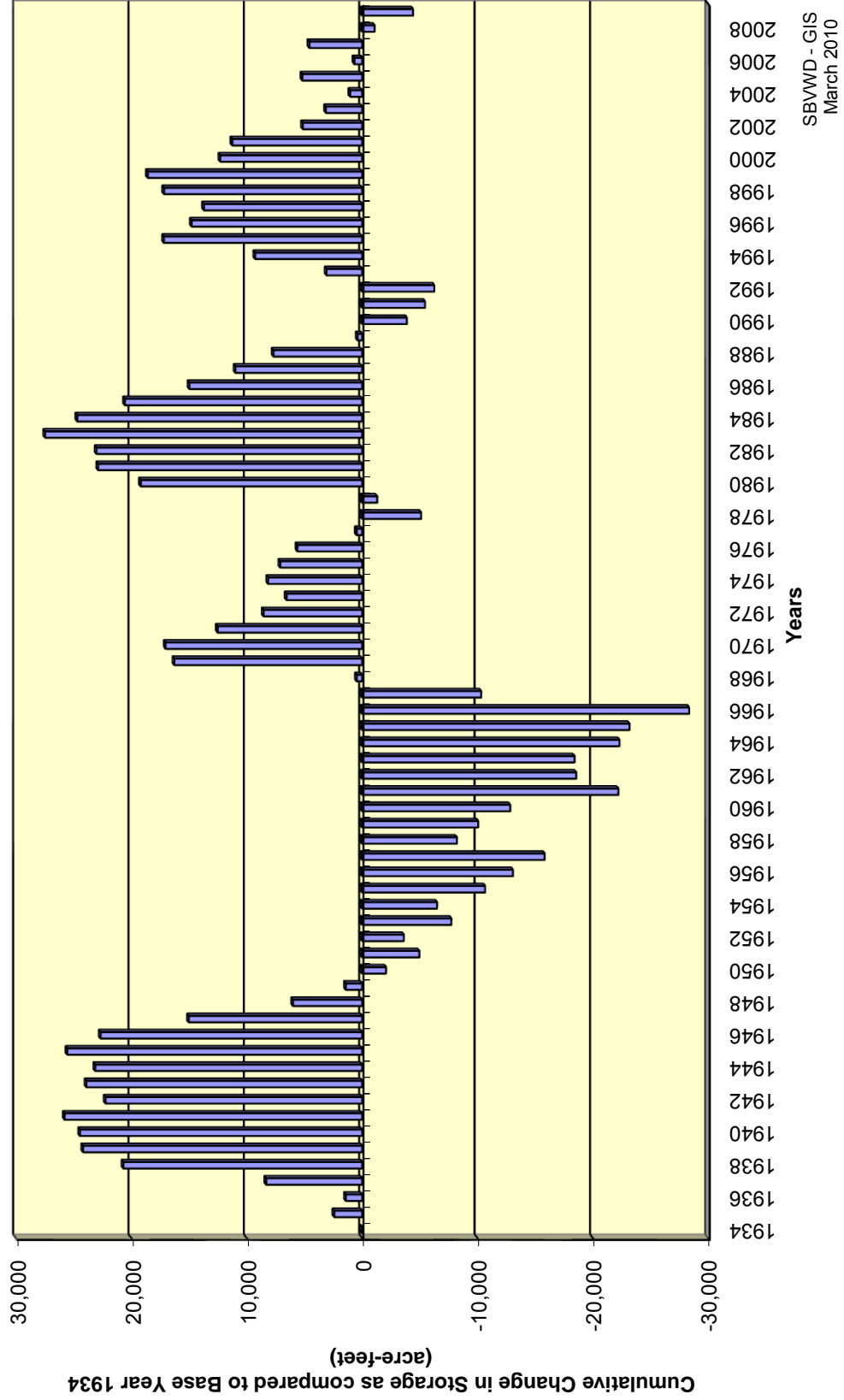
**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**CITY CREEK SUB-BASIN (Continued)**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

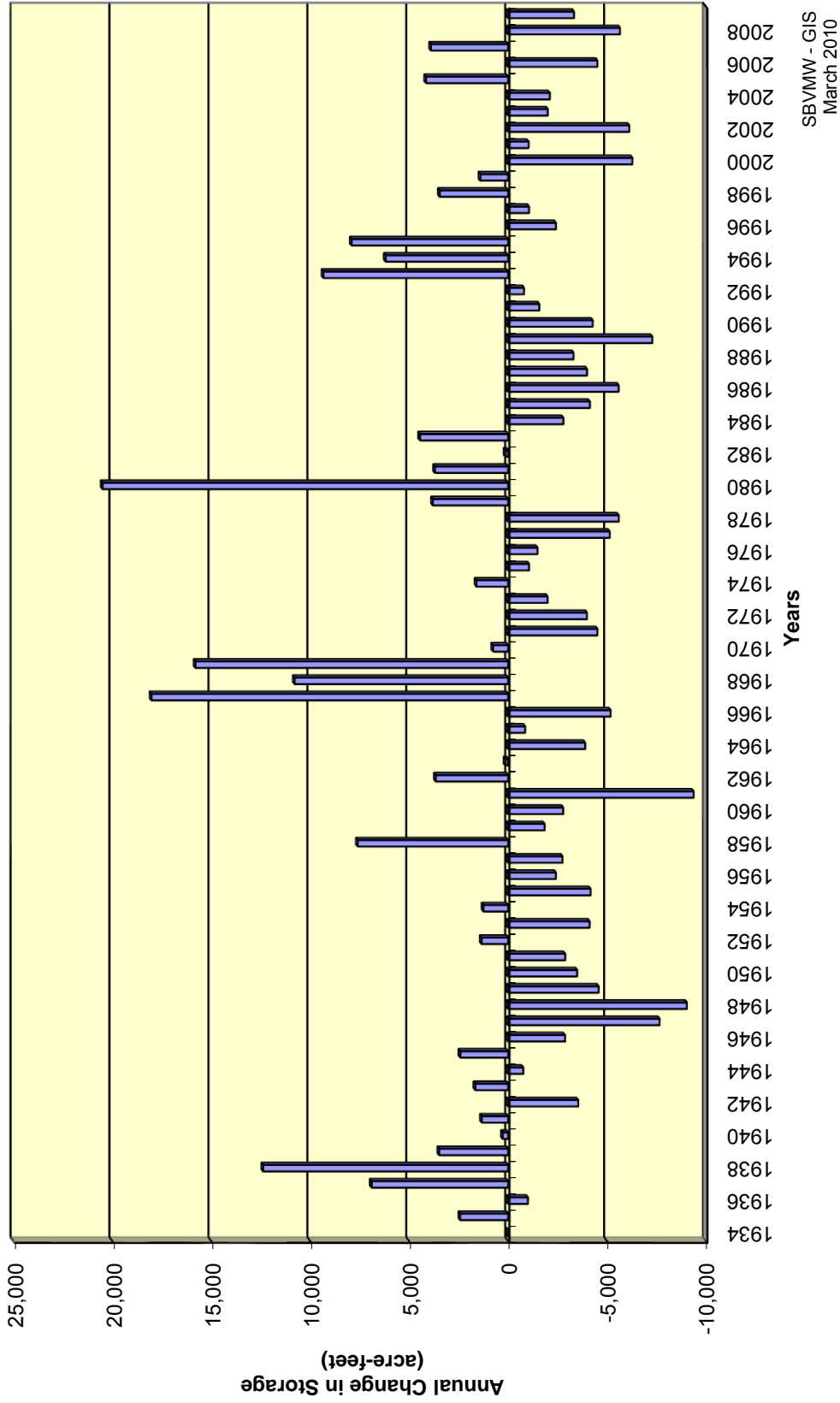
| Year | Depth to Water (Feet)                      |  |  |   |   |  |
|------|--|--|--|---|---|--|
|      | SBVWCD NO. 4<br>1S3W11H01S<br>Added Source | PLANT NO. 6<br>1N4W36Q01<br>Substitute | WELL NO. 39<br>1S3W29Q02<br>Added Source | PLANT NO. 27<br>1N4W25A01<br>Substitute | PLANT NO. 54<br>1N3W28P01<br>Substitute | AIRPORT NO. 2<br>1S3W13M01<br>Substitute |
| 1994 |  |  |  |   |   |  |
| 1995 |  |  |  |   |   |  |
| 1996 |  |  |  |   |   |  |
| 1997 |  |  |  |   |   |  |
| 1998 |  | -82.80                                 |  |   |   |  |
| 1999 | -121.60                                    | -85.80                                 | -89.00                                   |   |   |  |
| 2000 | -158.25                                    | -83.60                                 | -98.00                                   |   |   |  |
| 2001 | -181.70                                    | -95.70                                 | -97.00                                   |   |   |  |
| 2002 | -200.11                                    | -112.50                                | -111.00                                  |   |   |  |
| 2003 | -191.97                                    | -120.60                                | -118.00                                  |   |   |  |
| 2004 | -160.68                                    | -92.90                                 | -148.00                                  |   |   |  |
| 2005 | -129.40                                    | -135.80                                | -142.00                                  | -206.30                                 | -469.90                                 | -216.00                                  |
| 2006 | -118.06                                    | -140.50                                |  | -204.50                                 | -467.60                                 | -185.00                                  |
| 2007 | -160.03                                    | -145.80                                | -178.00                                  | -205.00                                 | -468.00                                 | -210.00                                  |
| 2008 | -165.69                                    | -163.90                                | -137.00                                  | -234.00                                 | -467.60                                 | -235.00                                  |
| 2009 | -192.50                                    | -165.50                                | -132.00                                  | -232.00                                 | -475.80                                 | -250.00                                  |



### Cumulative Change in Storage for the Redlands Sub-Basin



### Annual Change in Storage for the Redlands Sub-Basin



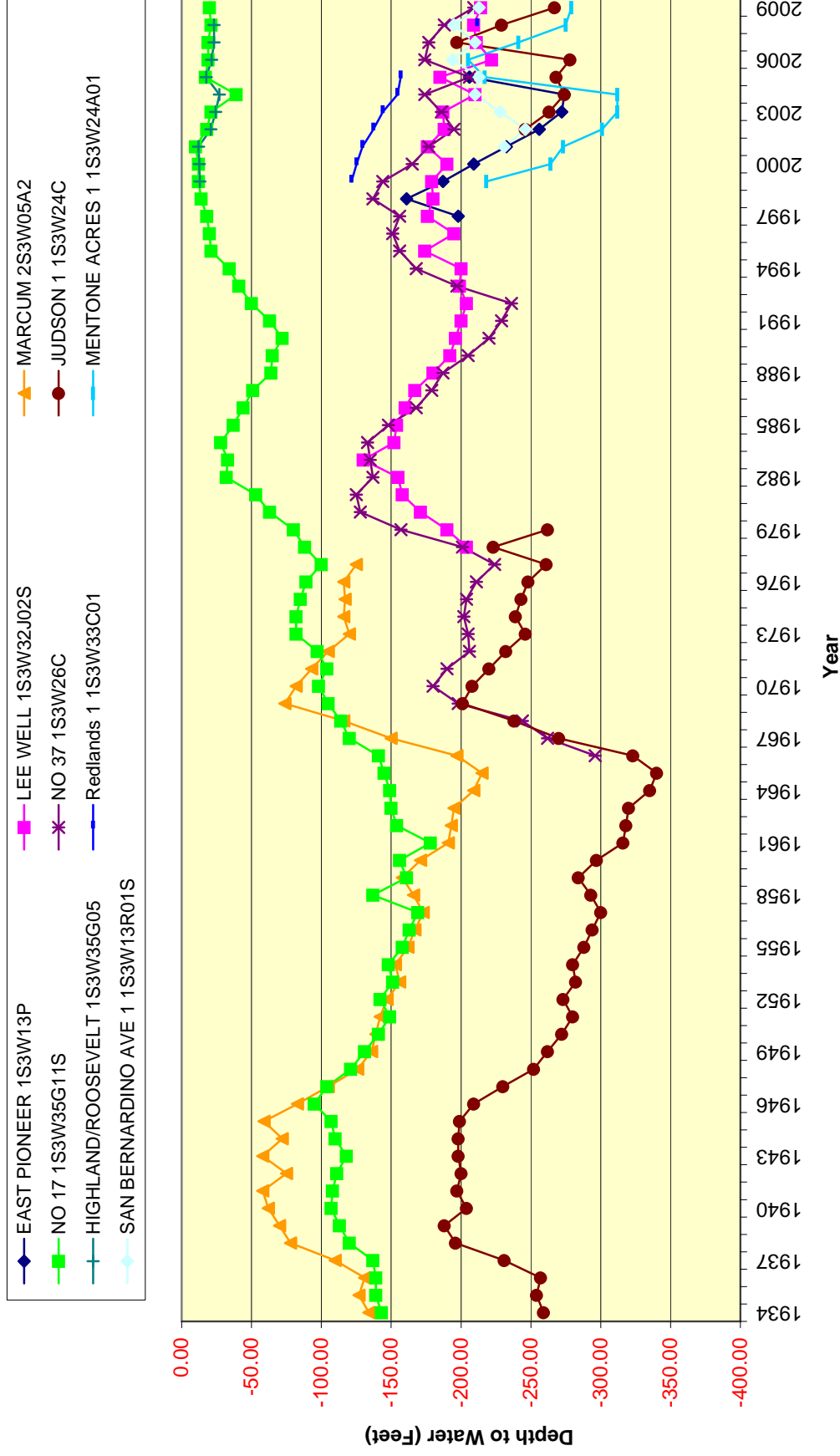
**San Bernardino Valley Municipal Water District**  
Change In Storage for the Redlands Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1934        | 0                              | n/a  | 0   |
| 1935        | 5                              | 2,422  | 2,422   |
| 1936        | -2                             | -1,000   | 1,422   |
| 1937        | 16                             | 6,898  | 8,320   |
| 1938        | 28                             | 12,380   | 20,700  |
| 1939        | 8                              | 3,484  | 24,184  |
| 1940        | -1                             | 272  | 24,456  |
| 1941        | 3                              | 1,330  | 25,786  |
| 1942        | -8                             | -3,543   | 22,243  |
| 1943        | 4                              | 1,658  | 23,901  |
| 1944        | -2                             | -764   | 23,137  |
| 1945        | 5                              | 2,417  | 25,554  |
| 1946        | -7                             | -2,877   | 22,677  |
| 1947        | -17                            | -7,651   | 15,026  |
| 1948        | -20                            | -9,030   | 5,996   |
| 1949        | -10                            | -4,575   | 1,421   |
| 1950        | -8                             | -3,489   | -2,068  |
| 1951        | -6                             | -2,885   | -4,953  |
| 1952        | 3                              | 1,342  | -3,611  |
| 1953        | -9                             | -4,118   | -7,729  |
| 1954        | 3                              | 1,246  | -6,483  |
| 1955        | -9                             | -4,166   | -10,649   |
| 1956        | -5                             | -2,414   | -13,063   |
| 1957        | -6                             | -2,745   | -15,808   |
| 1958        | 15                             | 7,599  | -8,209  |
| 1959        | -2                             | -1,842   | -10,051   |
| 1960        | -7                             | -2,781   | -12,832   |
| 1961        | -20                            | -9,375   | -22,207   |
| 1962        | 7                              | 3,658  | -18,549   |
| 1963        | 0                              | 140  | -18,409   |
| 1964        | -9                             | -3,892   | -22,301   |
| 1965        | -2                             | -860   | -23,161   |
| 1966        | 13                             | -5,177   | -28,338   |
| 1967        | 39                             | 18,026   | -10,312   |
| 1968        | 23                             | 10,790   | 478   |
| 1969        | 34                             | 15,801   | 16,279  |
| 1970        | 3                              | 759  | 17,038  |
| 1971        | -10                            | -4,512   | 12,526  |
| 1972        | -8                             | -3,981   | 8,545   |
| 1973        | -3                             | -1,990   | 6,555   |
| 1974        | 4                              | 1,601  | 8,156   |
| 1975        | -3                             | -1,055   | 7,101   |
| 1976        | -4                             | -1,485   | 5,616   |
| 1977        | -12                            | -5,133   | 483   |

**San Bernardino Valley Municipal Water District**  
Change In Storage for the Redlands Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1978        | 24                             | -5,591   | -5,108  |
| 1979        | 7                              | 3,805  | -1,303  |
| 1980        | 22                             | 20,494   | 19,191  |
| 1981        | 9                              | 3,700  | 22,891  |
| 1982        | 4                              | 140  | 23,031  |
| 1983        | 9                              | 4,455  | 27,486  |
| 1984        | -5                             | -2,791   | 24,695  |
| 1985        | -9                             | -4,131   | 20,564  |
| 1986        | -11                            | -5,586   | 14,978  |
| 1987        | -8                             | -3,988   | 10,990  |
| 1988        | -11                            | -3,303   | 7,687   |
| 1989        | -10                            | -7,285   | 402   |
| 1990        | -9                             | -4,273   | -3,871  |
| 1991        | -1                             | -1,576   | -5,447  |
| 1992        | 1                              | -802   | -6,249  |
| 1993        | 18                             | 9,337  | 3,088   |
| 1994        | 12                             | 6,189  | 9,277   |
| 1995        | 17                             | 7,913  | 17,190  |
| 1996        | -5                             | -2,416   | 14,774  |
| 1997        | 5                              | -1,057   | 13,717  |
| 1998        | 14                             | 3,457  | 17,174  |
| 1999        | -8                             | 1,407  | 18,581  |
| 2000        | -15                            | -6,279   | 12,302  |
| 2001        | -5                             | -1,040   | 11,262  |
| 2002        | -15                            | -6,120   | 5,142   |
| 2003        | -6                             | -2,001   | 3,141   |
| 2004        | -7                             | -2,104   | 1,037   |
| 2005        | 21                             | 4,150  | 5,187   |
| 2006        | 1                              | -4,510   | 677   |
| 2007        | 5                              | 3,900  | 4,577   |
| 2008        | -9                             | -5,652   | -1,075  |
| 2009        | -14                            | -3,331   | -4,406  |

### Hydrograph for the Redlands Sub-Basin





**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**REDLANDS SUB-BASIN**

Shaded cells with no values represent no depth available, shaded cells with values represent interpolated depths

| Year | Depth to Water (Feet)             |                                  |                              |                               |                            |                               |   |   |  |  |
|------|-----------------------------------|----------------------------------|------------------------------|-------------------------------|----------------------------|-------------------------------|---|---|--|--|
|      | EAST PIONEER<br>1S3W13P<br>Source | LEE WELL<br>1S3W32J02S<br>Source | MARCUM<br>2S3W05A2<br>Source | NO 17<br>1S3W35G11S<br>Source | NO 37<br>1S3W26C<br>Source | JUDSON 1<br>1S3W24C<br>Source | HIGHLAND/ROOSEVELT<br>1S3W35G05<br>Added Source | Redlands 1<br>1S3W33C01<br>Added Source |  |  |
| 1934 |                                   |                                  | -134.00                      | -143.00                       |                            | -259.00                       |   |   |  |  |
| 1935 |                                   |                                  | -127.00                      | -139.00                       |                            | -254.00                       |   |   |  |  |
| 1936 |                                   |                                  | -131.00                      | -139.00                       |                            | -257.00                       |   |   |  |  |
| 1937 |                                   |                                  | -110.00                      | -137.00                       |                            | -231.00                       |   |   |  |  |
| 1938 |                                   |                                  | -78.00                       | -120.00                       |                            | -196.00                       |   |   |  |  |
| 1939 |                                   |                                  | -70.00                       | -113.00                       |                            | -188.00                       |   |   |  |  |
| 1940 |                                   |                                  | -62.00                       | -107.00                       |                            | -204.00                       |   |   |  |  |
| 1941 |                                   |                                  | -58.00                       | -108.00                       |                            | -197.00                       |   |   |  |  |
| 1942 |                                   |                                  | -75.00                       | -111.00                       |                            | -200.00                       |   |   |  |  |
| 1943 |                                   |                                  | -58.00                       | -118.00                       |                            | -198.00                       |   |   |  |  |
| 1944 |                                   |                                  | -72.00                       | -110.00                       |                            | -198.00                       |   |   |  |  |
| 1945 |                                   |                                  | -59.00                       | -107.00                       |                            | -199.00                       |   |   |  |  |
| 1946 |                                   |                                  | -83.00                       | -95.00                        |                            | -209.00                       |   |   |  |  |
| 1947 |                                   |                                  | -105.00                      | -104.00                       |                            | -230.00                       |   |   |  |  |
| 1948 |                                   |                                  | -126.00                      | -121.00                       |                            | -252.00                       |   |   |  |  |
| 1949 |                                   |                                  | -136.00                      | -131.00                       |                            | -262.00                       |   |   |  |  |
| 1950 |                                   |                                  | -139.00                      | -141.00                       |                            | -272.00                       |   |   |  |  |
| 1951 |                                   |                                  | -142.00                      | -149.00                       |                            | -280.00                       |   |   |  |  |
| 1952 |                                   |                                  | -147.00                      | -142.00                       |                            | -273.00                       |   |   |  |  |
| 1953 |                                   |                                  | -156.00                      | -151.00                       |                            | -282.00                       |   |   |  |  |
| 1954 |                                   |                                  | -163.00                      | -148.00                       |                            | -280.00                       |   |   |  |  |
| 1955 |                                   |                                  | -162.00                      | -158.00                       |                            | -288.00                       |   |   |  |  |
| 1956 |                                   |                                  | -167.00                      | -163.00                       |                            | -294.00                       |   |   |  |  |
| 1957 |                                   |                                  | -173.00                      | -169.00                       |                            | -300.00                       |   |   |  |  |
| 1958 |                                   |                                  | -166.00                      | -137.00                       |                            | -293.00                       |   |   |  |  |
| 1959 |                                   |                                  | -158.00                      | -161.00                       |                            | -284.00                       |   |   |  |  |
| 1960 |                                   |                                  | -171.00                      | -156.00                       |                            | -297.00                       |   |   |  |  |
| 1961 |                                   |                                  | -191.00                      | -178.00                       |                            | -316.00                       |   |   |  |  |
| 1962 |                                   |                                  | -193.00                      | -154.00                       |                            | -318.00                       |   |   |  |  |
| 1963 |                                   |                                  | -195.00                      | -150.00                       |                            | -320.00                       |   |   |  |  |
| 1964 |                                   |                                  | -209.00                      | -149.00                       |                            | -335.00                       |   |   |  |  |
| 1965 |                                   |                                  | -215.00                      | -145.00                       |                            | -340.00                       |   |   |  |  |
| 1966 |                                   |                                  | -197.00                      | -141.00                       |                            | -323.00                       |   |   |  |  |
| 1967 |                                   |                                  | -150.00                      | -120.00                       |                            | -270.00                       |   |   |  |  |
| 1968 |                                   |                                  | -116.00                      | -114.00                       |                            | -238.00                       |   |   |  |  |
| 1969 |                                   |                                  | -74.00                       | -105.00                       |                            | -201.00                       |   |   |  |  |
| 1970 |                                   |                                  | -82.00                       | -98.00                        |                            | -208.00                       |   |   |  |  |
| 1971 |                                   |                                  | -93.00                       | -104.00                       |                            | -220.00                       |   |   |  |  |
| 1972 |                                   |                                  | -105.00                      | -97.00                        |                            | -232.00                       |   |   |  |  |
| 1973 |                                   |                                  | -120.00                      | -82.00                        |                            | -246.00                       |   |   |  |  |
| 1974 |                                   |                                  | -116.00                      | -82.00                        |                            | -239.00                       |   |   |  |  |
| 1975 |                                   |                                  | -117.00                      | -85.00                        |                            | -243.00                       |   |   |  |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**REDLANDS SUB-BASIN**

Shaded cells with no values represent no depth available, shaded cells with values represent interpolated depths

| Year | Depth to Water (Feet)             |                                  |                              |                               |                            |                               |   |   |  |  |
|------|-----------------------------------|----------------------------------|------------------------------|-------------------------------|----------------------------|-------------------------------|---|---|--|--|
|      | EAST PIONEER<br>1S3W13P<br>Source | LEE WELL<br>1S3W32J02S<br>Source | MARCUM<br>2S3W05A2<br>Source | NO 17<br>1S3W35G11S<br>Source | NO 37<br>1S3W26C<br>Source | JUDSON 1<br>1S3W24C<br>Source | HIGHLAND/ROOSEVELT<br>1S3W35G05<br>Added Source | Redlands 1<br>1S3W33C01<br>Added Source |  |  |
| 1976 |                                   |                                  | -116.00                      | -89.00                        | -211.00                    | -248.00                       |   |   |  |  |
| 1977 |                                   |                                  | -125.00                      | -100.00                       | -224.00                    | -261.00                       |   |   |  |  |
| 1978 |                                   | -204.00                          |                              | -88.00                        | -201.00                    | -223.00                       |   |   |  |  |
| 1979 |                                   | -190.00                          |                              | -80.00                        | -157.00                    | -262.00                       |   |   |  |  |
| 1980 |                                   | -171.00                          |                              | -63.00                        | -128.00                    |                               |   |   |  |  |
| 1981 |                                   | -158.00                          |                              | -53.00                        | -125.00                    |                               |   |   |  |  |
| 1982 |                                   | -155.00                          |                              | -32.00                        | -137.00                    |                               |   |   |  |  |
| 1983 |                                   | -130.00                          |                              | -33.00                        | -135.00                    |                               |   |   |  |  |
| 1984 |                                   | -152.00                          |                              | -28.00                        | -133.00                    |                               |   |   |  |  |
| 1985 |                                   | -154.00                          |                              | -37.00                        | -148.00                    |                               |   |   |  |  |
| 1986 |                                   | -160.00                          |                              | -44.00                        | -168.00                    |                               |   |   |  |  |
| 1987 |                                   | -167.00                          |                              | -51.00                        | -179.00                    |                               |   |   |  |  |
| 1988 |                                   | -180.00                          |                              | -64.00                        | -187.00                    |                               |   |   |  |  |
| 1989 |                                   | -192.00                          |                              | -65.00                        | -205.00                    |                               |   |   |  |  |
| 1990 |                                   | -196.00                          |                              | -72.00                        | -220.00                    |                               |   |   |  |  |
| 1991 |                                   | -200.00                          |                              | -63.00                        | -229.00                    |                               |   |   |  |  |
| 1992 |                                   | -204.00                          |                              | -50.00                        | -236.00                    |                               |   |   |  |  |
| 1993 |                                   | -199.00                          |                              | -41.00                        | -197.00                    |                               |   |   |  |  |
| 1994 |                                   | -200.00                          |                              | -34.00                        | -168.00                    |                               |   |   |  |  |
| 1995 |                                   | -174.00                          |                              | -21.00                        | -156.00                    |                               |   |   |  |  |
| 1996 |                                   | -195.00                          |                              | -20.00                        | -151.00                    |                               |   |   |  |  |
| 1997 | -198.00                           | -176.00                          |                              | -18.00                        | -156.00                    |                               |   |   |  |  |
| 1998 | -161.00                           | -180.00                          |                              | -14.00                        | -137.00                    |                               |   |   |  |  |
| 1999 | -187.00                           | -179.00                          |                              | -12.00                        | -144.00                    |                               |   |   |  |  |
| 2000 | -209.00                           | -190.00                          |                              | -12.00                        | -165.00                    |                               |   |   |  |  |
| 2001 | -232.50                           | -176.00                          |                              | -10.00                        | -177.00                    |                               |   |   |  |  |
| 2002 | -256.00                           | -188.00                          |                              | -18.00                        | -195.00                    | -246.00                       | -13.06  | -121.55                                 |  |  |
| 2003 | -272.00                           | -187.00                          |                              | -21.00                        | -186.00                    | -263.00                       | -12.64  | -125.32                                 |  |  |
| 2004 | -274.00                           | -210.00                          |                              | -39.00                        | -174.00                    | -274.00                       | -12.15  | -129.44                                 |  |  |
| 2005 | -206.00                           | -185.00                          |                              | -17.00                        | -206.00                    | -268.00                       | -20.88  | -137.20                                 |  |  |
| 2006 |                                   | -222.00                          |                              | -19.00                        | -174.00                    | -278.00                       | -24.30  | -143.96                                 |  |  |
| 2007 |                                   | -211.00                          |                              | -19.00                        | -177.00                    | -197.00                       | -26.92  | -154.45                                 |  |  |
| 2008 |                                   | -209.00                          |                              | -21.00                        | -188.00                    | -229.00                       | -17.70  | -156.85                                 |  |  |
| 2009 |                                   | -214.00                          |                              | -20.00                        | -209.00                    | -267.00                       | -21.42  |   |  |  |
|      |                                   |                                  |                              |                               |                            |                               | -23.13  | -211.49                                 |  |  |
|      |                                   |                                  |                              |                               |                            |                               | -23.13  |   |  |  |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**REDLANDS SUB-BASIN**

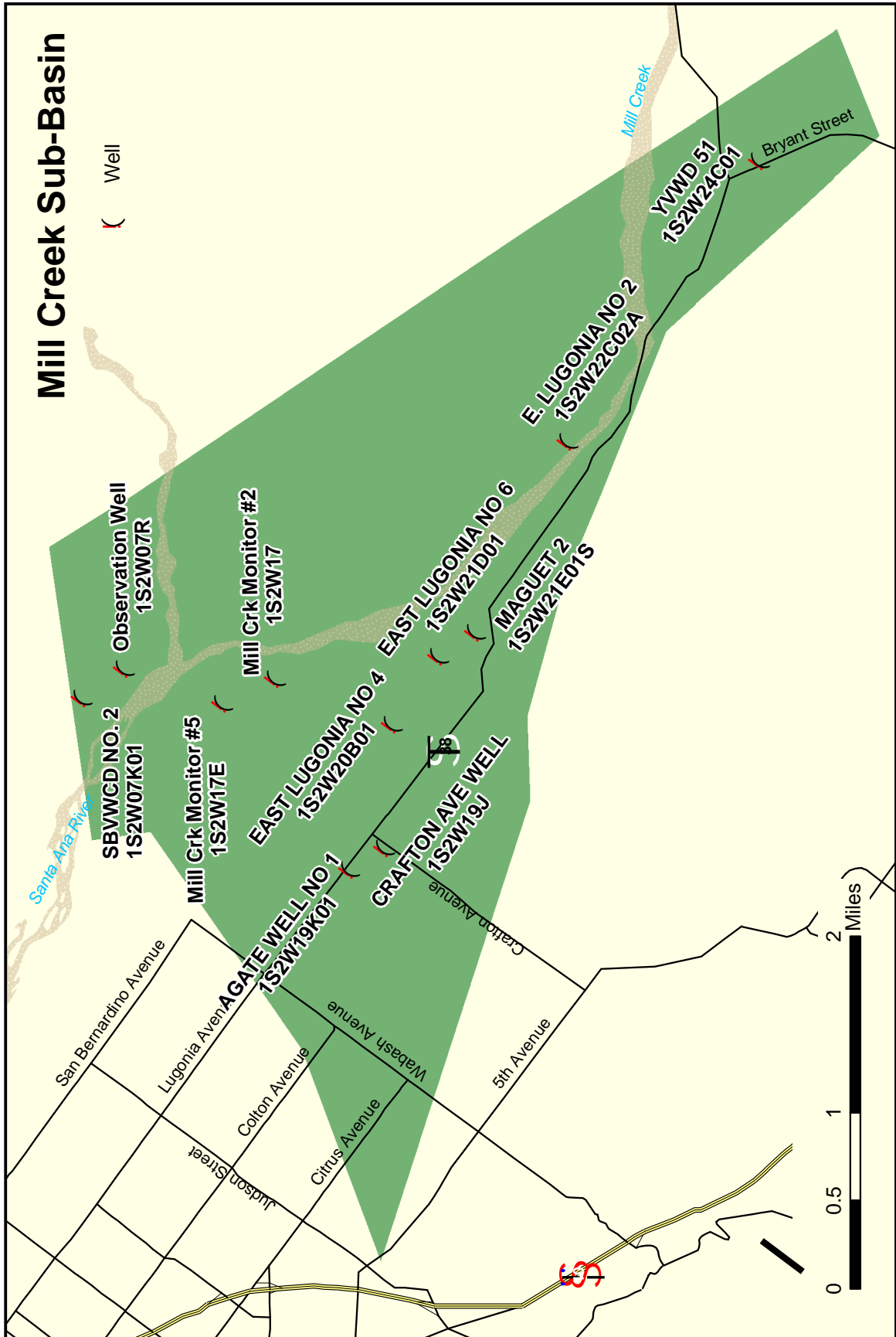
Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | MENTONE ACRES 1<br>1S3W24A01<br>Substitute | Depth to Water (Feet) | SAN BERNARDINO AVE 1<br>1S3W13R01S<br>Added Source |
|------|--|-----------------------|--|
| 1934 |  |                       |  |
| 1935 |  |                       |  |
| 1936 |  |                       |  |
| 1937 |  |                       |  |
| 1938 |  |                       |  |
| 1939 |  |                       |  |
| 1940 |  |                       |  |
| 1941 |  |                       |  |
| 1942 |  |                       |  |
| 1943 |  |                       |  |
| 1944 |  |                       |  |
| 1945 |  |                       |  |
| 1946 |  |                       |  |
| 1947 |  |                       |  |
| 1948 |  |                       |  |
| 1949 |  |                       |  |
| 1950 |  |                       |  |
| 1951 |  |                       |  |
| 1952 |  |                       |  |
| 1953 |  |                       |  |
| 1954 |  |                       |  |
| 1955 |  |                       |  |
| 1956 |  |                       |  |
| 1957 |  |                       |  |
| 1958 |  |                       |  |
| 1959 |  |                       |  |
| 1960 |  |                       |  |
| 1961 |  |                       |  |
| 1962 |  |                       |  |
| 1963 |  |                       |  |
| 1964 |  |                       |  |
| 1965 |  |                       |  |
| 1966 |  |                       |  |
| 1967 |  |                       |  |
| 1968 |  |                       |  |
| 1969 |  |                       |  |
| 1970 |  |                       |  |
| 1971 |  |                       |  |
| 1972 |  |                       |  |
| 1973 |  |                       |  |
| 1974 |  |                       |  |
| 1975 |  |                       |  |

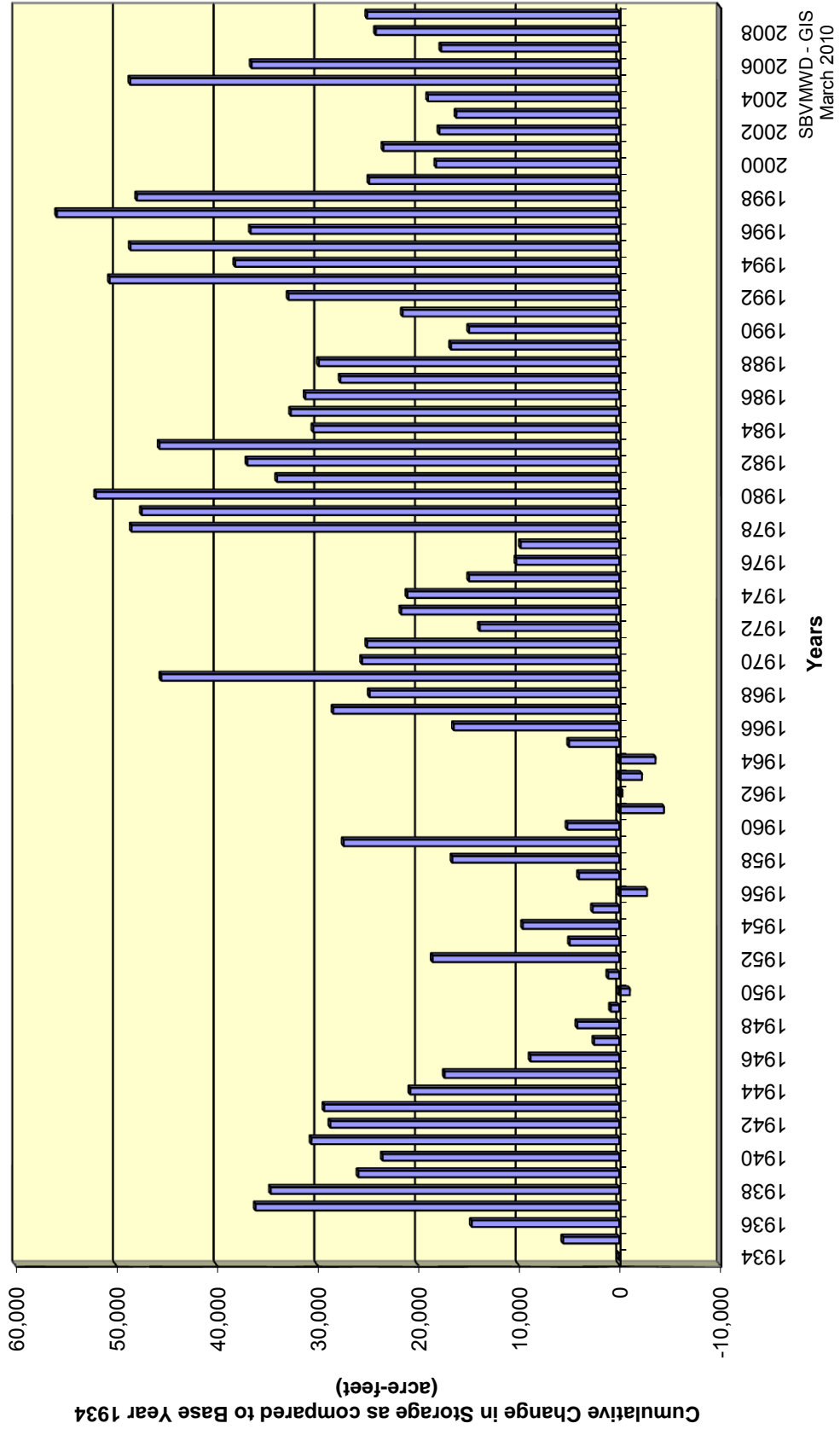
**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**REDLANDS SUB-BASIN**

Shaded cells with no values represent no depth available, shaded cells with values represent interpolated depths

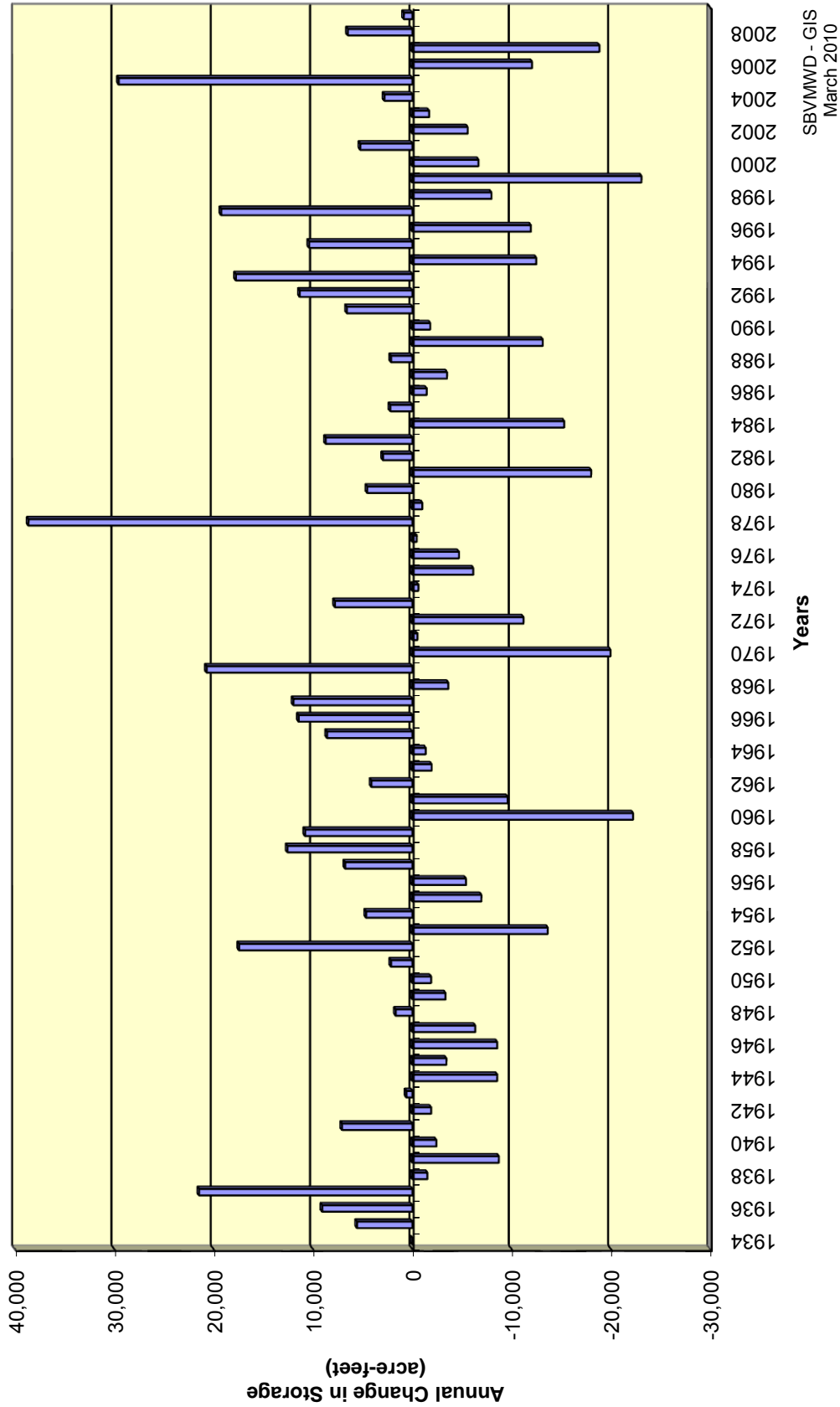
| Year | Depth to Water (Feet)                      |  |
|------|--|--|
|      | MENTONE ACRES 1<br>1S3W24A01<br>Substitute | SAN BERNARDINO AVE 1<br>1S3W13R01S<br>Added Source |
| 1976 |  |  |
| 1977 |  |  |
| 1978 |  |  |
| 1979 |  |  |
| 1980 |  |  |
| 1981 |  |  |
| 1982 |  |  |
| 1983 |  |  |
| 1984 |  |  |
| 1985 |  |  |
| 1986 |  |  |
| 1987 |  |  |
| 1988 |  |  |
| 1989 |  |  |
| 1990 |  |  |
| 1991 |  |  |
| 1992 |  |  |
| 1993 |  |  |
| 1994 |  |  |
| 1995 |  |  |
| 1996 |  |  |
| 1997 |  |  |
| 1998 |  |  |
| 1999 | -218.00                                    |  |
| 2000 | -264.00                                    |  |
| 2001 | -273.00                                    | -231.00  |
| 2002 | -301.00                                    | -246.00  |
| 2003 | -312.00                                    | -228.00  |
| 2004 | -312.00                                    | -210.00  |
| 2005 | -217.00                                    | -213.00  |
| 2006 | -205.00                                    | -194.00  |
| 2007 | -241.00                                    | -210.00  |
| 2008 | -275.00                                    | -195.00  |
| 2009 | -279.00                                    | -213.00  |



### Cumulative Change in Storage for the Mill Creek Sub-Basin



Annual Change in Storage for the Mill Creek Sub-Basin



**San Bernardino Valley Municipal Water District**  
Change In Storage for the Mill Creek Sub-basin 1934 - 2009

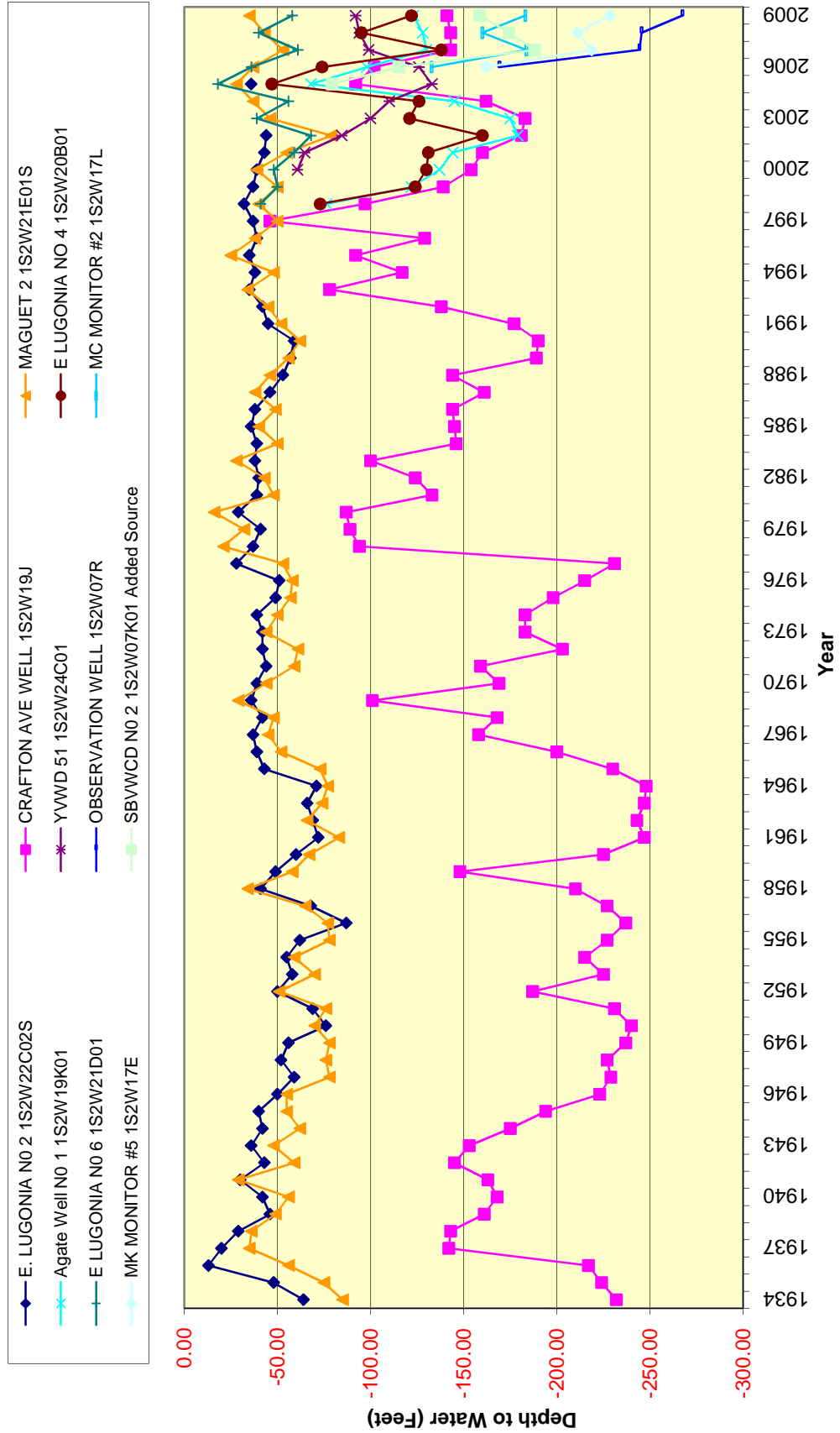
| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1934        | 0                              | n/a  | 0   |
| 1935        | 11                             | 5,575  | 5,575   |
| 1936        | 20                             | 9,081  | 14,656  |
| 1937        | 30                             | 21,472   | 36,128  |
| 1938        | -4                             | -1,506   | 34,622  |
| 1939        | -16                            | -8,705   | 25,917  |
| 1940        | -3                             | -2,412   | 23,505  |
| 1941        | 15                             | 7,081  | 30,586  |
| 1942        | -8                             | -1,883   | 28,703  |
| 1943        | 3                              | 608  | 29,311  |
| 1944        | -14                            | -8,542   | 20,769  |
| 1945        | -3                             | -3,421   | 17,348  |
| 1946        | -13                            | -8,531   | 8,817   |
| 1947        | -13                            | -6,322   | 2,495   |
| 1948        | 4                              | 1,677  | 4,172   |
| 1949        | -5                             | -3,332   | 840   |
| 1950        | -5                             | -1,890   | -1,050  |
| 1951        | 3                              | 2,151  | 1,101   |
| 1952        | 29                             | 17,447   | 18,548  |
| 1953        | -22                            | -13,629  | 4,919   |
| 1954        | 8                              | 4,664  | 9,583   |
| 1955        | -13                            | -6,947   | 2,636   |
| 1956        | -11                            | -5,394   | -2,758  |
| 1957        | 14                             | 6,767  | 4,009   |
| 1958        | 25                             | 12,574   | 16,583  |
| 1959        | 10                             | 10,797   | 27,380  |
| 1960        | -32                            | -22,220  | 5,160   |
| 1961        | -17                            | -9,592   | -4,432  |
| 1962        | 8                              | 4,121  | -311  |
| 1963        | -3                             | -1,939   | -2,250  |
| 1964        | -3                             | -1,344   | -3,594  |
| 1965        | 17                             | 8,585  | 4,991   |
| 1966        | 18                             | 11,449   | 16,440  |
| 1967        | 17                             | 11,973   | 28,413  |
| 1968        | -6                             | -3,615   | 24,798  |
| 1969        | 31                             | 20,705   | 45,503  |
| 1970        | -29                            | -19,947  | 25,556  |
| 1971        | -3                             | -507   | 25,049  |
| 1972        | -15                            | -11,184  | 13,865  |
| 1973        | 12                             | 7,794  | 21,659  |
| 1974        | -1                             | -605   | 21,054  |
| 1975        | -11                            | -6,130   | 14,924  |
| 1976        | -7                             | -4,694   | 10,230  |
| 1977        | 4                              | -440   | 9,790   |



**San Bernardino Valley Municipal Water District**  
Change In Storage for the Mill Creek Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1978        | 53                             | 38,652   | 48,442  |
| 1979        | -3                             | -1,001   | 47,441  |
| 1980        | 10                             | 4,546  | 51,987  |
| 1981        | -29                            | -17,993  | 33,994  |
| 1982        | 4                              | 2,958  | 36,952  |
| 1983        | 14                             | 8,723  | 45,675  |
| 1984        | -23                            | -15,284  | 30,391  |
| 1985        | 5                              | 2,232  | 32,623  |
| 1986        | -3                             | -1,445   | 31,178  |
| 1987        | -5                             | -3,482   | 27,696  |
| 1988        | 1                              | 2,148  | 29,844  |
| 1989        | -20                            | -13,125  | 16,719  |
| 1990        | -3                             | -1,796   | 14,923  |
| 1991        | 12                             | 6,593  | 21,516  |
| 1992        | 16                             | 11,338   | 32,854  |
| 1993        | 26                             | 17,767   | 50,621  |
| 1994        | -19                            | -12,468  | 38,153  |
| 1995        | 17                             | 10,390   | 48,543  |
| 1996        | -18                            | -11,923  | 36,620  |
| 1997        | 24                             | 19,248   | 55,868  |
| 1998        | -30                            | -7,957   | 47,911  |
| 1999        | -27                            | -23,059  | 24,852  |
| 2000        | -12                            | -6,656   | 18,196  |
| 2001        | -7                             | 5,243  | 23,439  |
| 2002        | -20                            | -5,565   | 17,874  |
| 2003        | 19                             | -1,681   | 16,193  |
| 2004        | 4                              | 2,811  | 19,004  |
| 2005        | 41                             | 29,567   | 48,571  |
| 2006        | -18                            | -12,042  | 36,529  |
| 2007        | -41                            | -18,835  | 17,694  |
| 2008        | 13                             | 6,498  | 24,192  |
| 2009        | -7                             | 856  | 25,048  |

### Hydrograph for the Mill Creek Sub-Basin Wells



**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**MILL CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                    |                                       |                                  |  |                                    |   |
|------|---|---------------------------------------|----------------------------------|--|------------------------------------|---|
|      | E. LUGONIA NO 2<br>1S2W22C02S<br>Source | CRAFTON AVE WELL<br>1S2W19J<br>Source | MAGUET 2<br>1S2W21E01S<br>Source | Agate Well NO 1<br>1S2W19K01<br>Added Source | YVWD 51<br>1S2W24C01<br>Substitute | E LUGONIA NO 4<br>1S2W20B01<br>Added Source |
| 1934 | -64.00                                  | -232.00                               | -85.00                           |  |                                    |   |
| 1935 | -48.00                                  | -224.00                               | -75.00                           |  |                                    |   |
| 1936 | -13.00                                  | -217.00                               | -56.00                           |  |                                    |   |
| 1937 | -20.00                                  | -142.00                               | -35.00                           |  |                                    |   |
| 1938 | -29.00                                  | -143.00                               | -36.00                           |  |                                    |   |
| 1939 | -46.00                                  | -161.00                               | -49.00                           |  |                                    |   |
| 1940 | -42.00                                  | -168.00                               | -56.00                           |  |                                    |   |
| 1941 | -30.00                                  | -163.00                               | -29.00                           |  |                                    |   |
| 1942 | -43.00                                  | -145.00                               | -59.00                           |  |                                    |   |
| 1943 | -36.00                                  | -153.00                               | -48.00                           |  |                                    |   |
| 1944 | -42.00                                  | -175.00                               | -62.00                           |  |                                    |   |
| 1945 | -40.00                                  | -194.00                               | -55.00                           |  |                                    |   |
| 1946 | -50.00                                  | -223.00                               | -55.00                           |  |                                    |   |
| 1947 | -59.00                                  | -229.00                               | -78.00                           |  |                                    |   |
| 1948 | -52.00                                  | -227.00                               | -76.00                           |  |                                    |   |
| 1949 | -56.00                                  | -237.00                               | -78.00                           |  |                                    |   |
| 1950 | -76.00                                  | -240.00                               | -70.00                           |  |                                    |   |
| 1951 | -69.00                                  | -231.00                               | -76.00                           |  |                                    |   |
| 1952 | -50.00                                  | -187.00                               | -51.00                           |  |                                    |   |
| 1953 | -58.00                                  | -225.00                               | -70.00                           |  |                                    |   |
| 1954 | -55.00                                  | -215.00                               | -59.00                           |  |                                    |   |
| 1955 | -62.00                                  | -227.00                               | -78.00                           |  |                                    |   |
| 1956 | -87.00                                  | -237.00                               | -77.00                           |  |                                    |   |
| 1957 | -68.00                                  | -227.00                               | -65.00                           |  |                                    |   |
| 1958 | -41.00                                  | -210.00                               | -34.00                           |  |                                    |   |
| 1959 | -49.00                                  | -148.00                               | -58.00                           |  |                                    |   |
| 1960 | -60.00                                  | -225.00                               | -67.00                           |  |                                    |   |
| 1961 | -72.00                                  | -247.00                               | -83.00                           |  |                                    |   |
| 1962 | -69.00                                  | -243.00                               | -66.00                           |  |                                    |   |
| 1963 | -66.00                                  | -247.00                               | -74.00                           |  |                                    |   |
| 1964 | -71.00                                  | -248.00                               | -77.00                           |  |                                    |   |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**MILL CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                    |                                       |                                  |  |                                    |   |
|------|---|---------------------------------------|----------------------------------|--|------------------------------------|---|
|      | E. LUGONIA NO 2<br>1S2W22C02S<br>Source | CRAFTON AVE WELL<br>1S2W19J<br>Source | MAGUET 2<br>1S2W21E01S<br>Source | Agate Well NO 1<br>1S2W19K01<br>Added Source | YVWD 51<br>1S2W24C01<br>Substitute | E LUGONIA NO 4<br>1S2W20B01<br>Added Source |
| 1965 | -43.00                                  | -230.00                               | -73.00                           |  |                                    |   |
| 1966 | -39.00                                  | -200.00                               | -52.00                           |  |                                    |   |
| 1967 | -37.00                                  | -158.00                               | -45.00                           |  |                                    |   |
| 1968 | -42.00                                  | -168.00                               | -48.00                           |  |                                    |   |
| 1969 | -36.00                                  | -101.00                               | -29.00                           |  |                                    |   |
| 1970 | -39.00                                  | -169.00                               | -44.00                           |  |                                    |   |
| 1971 | -44.00                                  | -159.00                               | -59.00                           |  |                                    |   |
| 1972 | -42.00                                  | -203.00                               | -61.00                           |  |                                    |   |
| 1973 | -42.00                                  | -183.00                               | -44.00                           |  |                                    |   |
| 1974 | -39.00                                  | -183.00                               | -50.00                           |  |                                    |   |
| 1975 | -49.00                                  | -198.00                               | -57.00                           |  |                                    |   |
| 1976 | -51.00                                  | -215.00                               | -58.00                           |  |                                    |   |
| 1977 | -28.00                                  | -231.00                               | -53.00                           |  |                                    |   |
| 1978 | -37.00                                  | -94.00                                | -21.00                           |  |                                    |   |
| 1979 | -41.00                                  | -89.00                                | -32.00                           |  |                                    |   |
| 1980 | -29.00                                  | -87.00                                | -16.00                           |  |                                    |   |
| 1981 | -39.00                                  | -133.00                               | -48.00                           |  |                                    |   |
| 1982 | -40.00                                  | -124.00                               | -43.00                           |  |                                    |   |
| 1983 | -38.00                                  | -100.00                               | -28.00                           |  |                                    |   |
| 1984 | -39.00                                  | -146.00                               | -50.00                           |  |                                    |   |
| 1985 | -36.00                                  | -145.00                               | -40.00                           |  |                                    |   |
| 1986 | -38.00                                  | -144.00                               | -49.00                           |  |                                    |   |
| 1987 | -46.00                                  | -161.00                               | -38.00                           |  |                                    |   |
| 1988 | -53.00                                  | -144.00                               | -46.00                           |  |                                    |   |
| 1989 | -57.00                                  | -189.00                               | -56.00                           |  |                                    |   |
| 1990 | -59.00                                  | -190.00                               | -62.00                           |  |                                    |   |
| 1991 | -45.00                                  | -177.00                               | -52.00                           |  |                                    |   |
| 1992 | -42.00                                  | -138.00                               | -45.00                           |  |                                    |   |
| 1993 | -35.00                                  | -78.00                                | -34.00                           |  |                                    |   |
| 1994 | -38.00                                  | -117.00                               | -48.00                           |  |                                    |   |
| 1995 | -35.00                                  | -92.00                                | -25.00                           |  |                                    |   |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**MILL CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                    |                                       |                                  |  |                                    |   |
|------|---|---------------------------------------|----------------------------------|--|------------------------------------|---|
|      | E. LUGONIA NO 2<br>1S2W22C02S<br>Source | CRAFTON AVE WELL<br>1S2W19J<br>Source | MAGUET 2<br>1S2W21E01S<br>Source | Agate Well NO 1<br>1S2W19K01<br>Added Source | YVWD 51<br>1S2W24C01<br>Substitute | E LUGONIA NO 4<br>1S2W20B01<br>Added Source |
| 1996 | -39.00                                  | -129.00                               | -38.00                           |  |                                    |   |
| 1997 | -37.00                                  | -46.00                                | -50.00                           |  |                                    |   |
| 1998 | -32.00                                  | -97.00                                | -40.00                           | -76.50                                       |                                    | -73.00                                      |
| 1999 | -37.00                                  | -139.00                               | -50.00                           | -122.00                                      |                                    | -124.00                                     |
| 2000 | -39.00                                  | -154.00                               | -39.00                           | -137.00                                      | -60.80                             | -130.00                                     |
| 2001 | -43.00                                  | -160.00                               | -55.00                           | -144.00                                      | -64.60                             | -131.00                                     |
| 2002 | -44.00                                  | -181.00                               | -79.00                           | -179.00                                      | -84.60                             | -160.00                                     |
| 2003 |   | -183.00                               | -46.00                           | -175.00                                      | -100.00                            | -121.00                                     |
| 2004 |   | -162.00                               | -37.00                           | -145.00                                      | -110.00                            | -126.00                                     |
| 2005 | -36.00                                  | -92.00                                | -28.00                           | -68.00                                       | -133.00                            | -47.00                                      |
| 2006 |   | -102.00                               | -37.00                           | -98.00                                       | -126.00                            | -74.00                                      |
| 2007 |   | -143.00                               | -53.00                           | -130.00                                      | -99.00                             | -138.00                                     |
| 2008 |   | -143.00                               | -43.00                           | -128.00                                      | -94.00                             | -95.00                                      |
| 2009 |   | -141.00                               | -35.00                           | -123.00                                      | -92.00                             | -122.00                                     |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**MILL CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                        |  |  |  |   |
|------|---|--|--|--|---|
|      | E LUGONIA NO 6<br>1S2W21D01<br>Added Source | SBVWCD NO 2<br>1S2W07K01<br>Added Source | MC MONITOR #2<br>1S2W17L<br>Added Source | MK MONITOR #5<br>1S2W17E<br>Added Source | OBSERVATION WELL<br>1S2W07R<br>Added Source |
| 1934 |   |  |  |  |   |
| 1935 |   |  |  |  |   |
| 1936 |   |  |  |  |   |
| 1937 |   |  |  |  |   |
| 1938 |   |  |  |  |   |
| 1939 |   |  |  |  |   |
| 1940 |   |  |  |  |   |
| 1941 |   |  |  |  |   |
| 1942 |   |  |  |  |   |
| 1943 |   |  |  |  |   |
| 1944 |   |  |  |  |   |
| 1945 |   |  |  |  |   |
| 1946 |   |  |  |  |   |
| 1947 |   |  |  |  |   |
| 1948 |   |  |  |  |   |
| 1949 |   |  |  |  |   |
| 1950 |   |  |  |  |   |
| 1951 |   |  |  |  |   |
| 1952 |   |  |  |  |   |
| 1953 |   |  |  |  |   |
| 1954 |   |  |  |  |   |
| 1955 |   |  |  |  |   |
| 1956 |   |  |  |  |   |
| 1957 |   |  |  |  |   |
| 1958 |   |  |  |  |   |
| 1959 |   |  |  |  |   |
| 1960 |   |  |  |  |   |
| 1961 |   |  |  |  |   |
| 1962 |   |  |  |  |   |
| 1963 |   |  |  |  |   |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**MILL CREEK SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

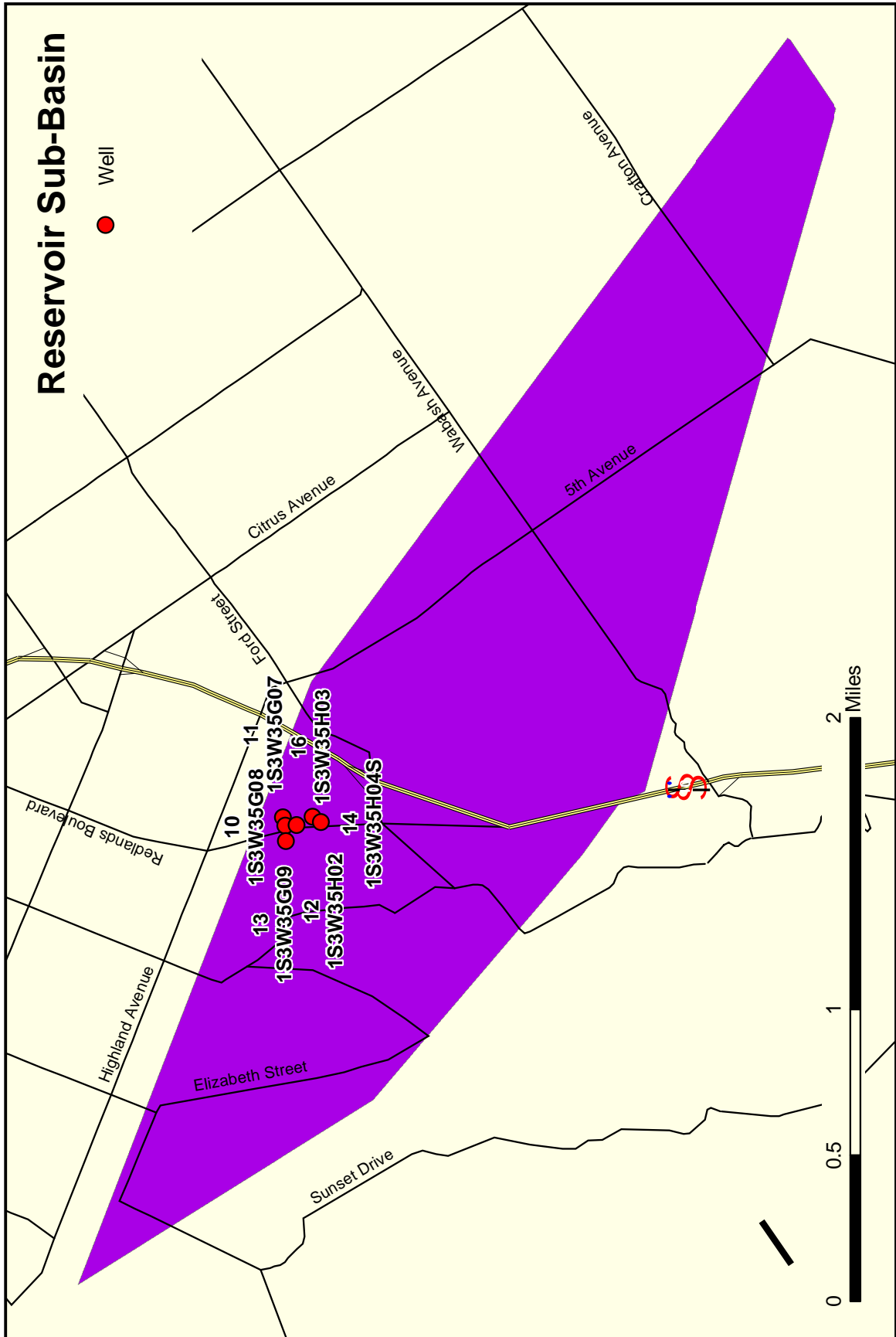
| Year | Depth to Water (ft.)                        |  |  |  |   |
|------|---|--|--|--|---|
|      | E LUGONIA NO 6<br>1S2W21D01<br>Added Source | SBVWCD NO 2<br>1S2W07K01<br>Added Source | MC MONITOR #2<br>1S2W17L<br>Added Source | MK MONITOR #5<br>1S2W17E<br>Added Source | OBSERVATION WELL<br>1S2W07R<br>Added Source |
| 1964 |   |  |  |  |   |
| 1965 |   |  |  |  |   |
| 1966 |   |  |  |  |   |
| 1967 |   |  |  |  |   |
| 1968 |   |  |  |  |   |
| 1969 |   |  |  |  |   |
| 1970 |   |  |  |  |   |
| 1971 |   |  |  |  |   |
| 1972 |   |  |  |  |   |
| 1973 |   |  |  |  |   |
| 1974 |   |  |  |  |   |
| 1975 |   |  |  |  |   |
| 1976 |   |  |  |  |   |
| 1977 |   |  |  |  |   |
| 1978 |   |  |  |  |   |
| 1979 |   |  |  |  |   |
| 1980 |   |  |  |  |   |
| 1981 |   |  |  |  |   |
| 1982 |   |  |  |  |   |
| 1983 |   |  |  |  |   |
| 1984 |   |  |  |  |   |
| 1985 |   |  |  |  |   |
| 1986 |   |  |  |  |   |
| 1987 |   |  |  |  |   |
| 1988 |   |  |  |  |   |
| 1989 |   |  |  |  |   |
| 1990 |   |  |  |  |   |
| 1991 |   |  |  |  |   |
| 1992 |   |  |  |  |   |
| 1993 |   |  |  |  |   |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**MILL CREEK SUB-BASIN**

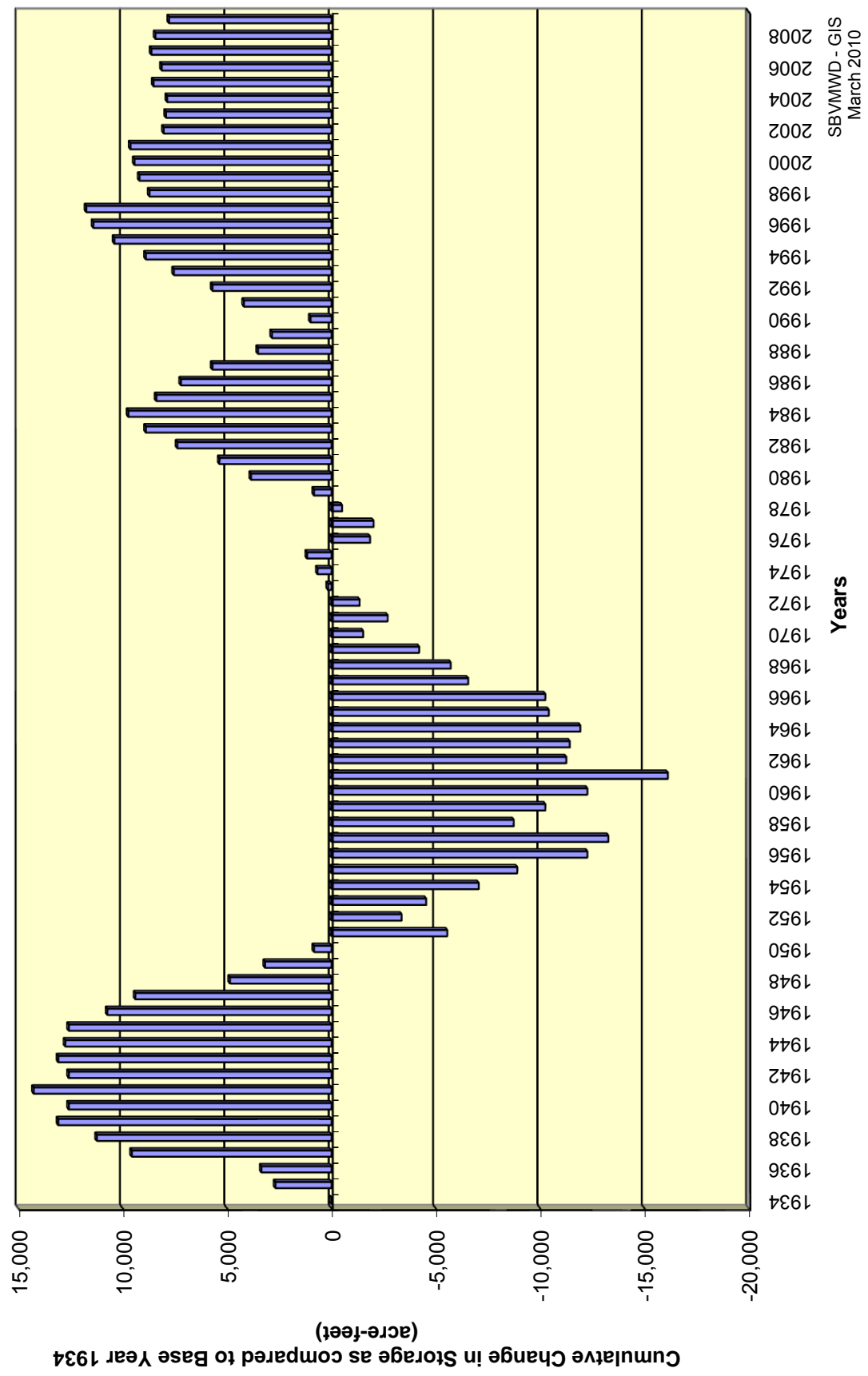
Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)                        |  |  |  |   |
|------|---|--|--|--|---|
|      | E LUGONIA NO 6<br>1S2W21D01<br>Added Source | SBVWCD NO 2<br>1S2W07K01<br>Added Source | MC MONITOR #2<br>1S2W17L<br>Added Source | MK MONITOR #5<br>1S2W17E<br>Added Source | OBSERVATION WELL<br>1S2W07R<br>Added Source |
| 1994 |   |  |  |  |   |
| 1995 |   |  |  |  |   |
| 1996 |   |  |  |  |   |
| 1997 |   |  |  |  |   |
| 1998 | -41.00                                      |  |  |  |   |
| 1999 | -50.00                                      |  |  |  |   |
| 2000 | -48.00                                      |  |  |  |   |
| 2001 | -59.00                                      |  |  |  |   |
| 2002 | -68.00                                      |  |  |  |   |
| 2003 | -39.00                                      |  |  |  |   |
| 2004 | -56.00                                      |  |  |  |   |
| 2005 | -18.00                                      | -79.40                                   |  |  |   |
| 2006 | -36.00                                      | -115.23                                  | -132.75                                  | -162.14                                  | -169.20                                     |
| 2007 | -61.00                                      | -188.20                                  | -183.64                                  | -218.66                                  | -244.40                                     |
| 2008 | -40.00                                      | -174.40                                  | -160.00                                  | -211.00                                  | -245.50                                     |
| 2009 | -58.00                                      | -158.60                                  | -183.10                                  | -228.50                                  | -267.40                                     |

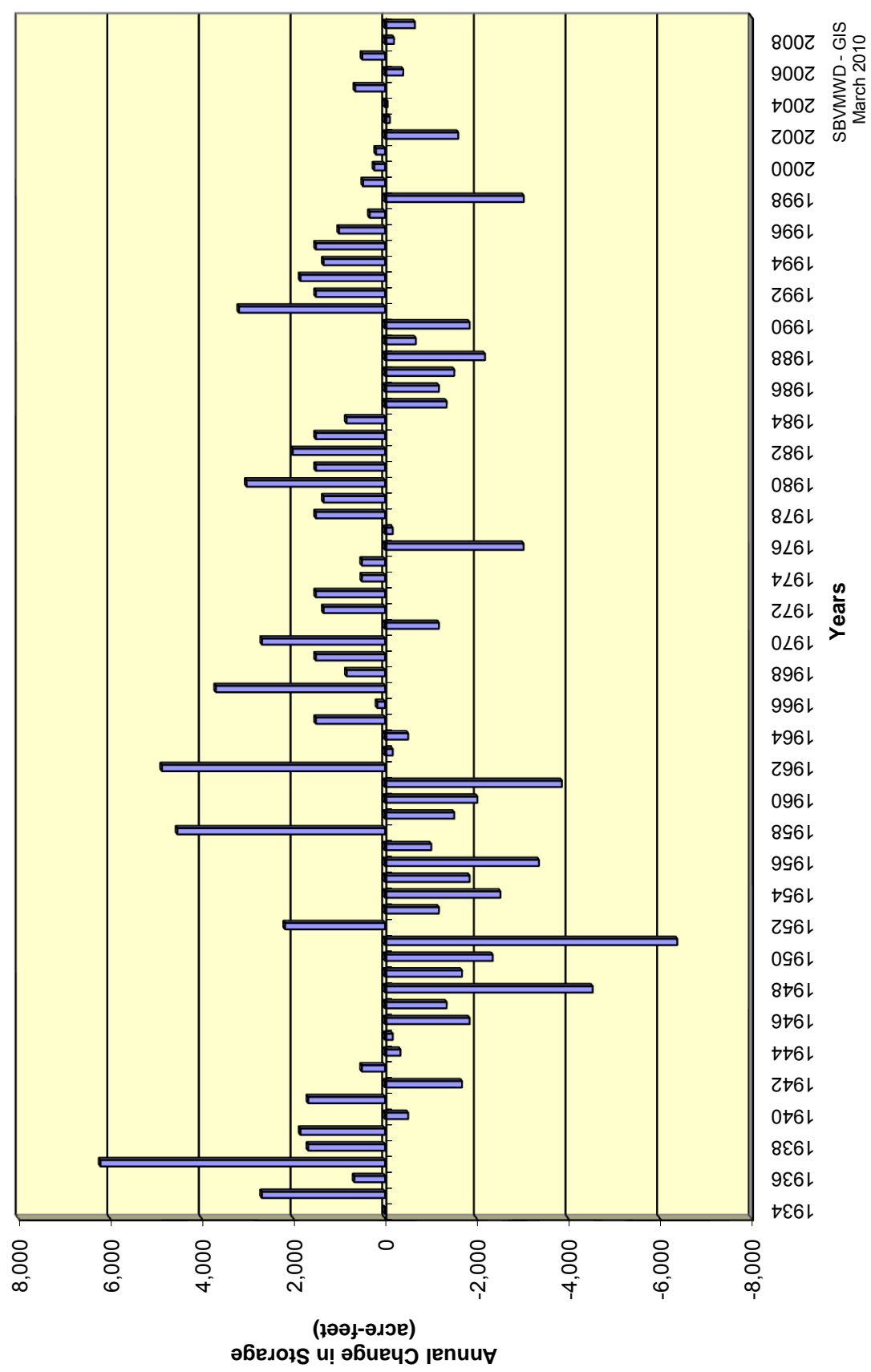




# Cumulative Change in Storage for the Reservoir Sub-Basin



# Annual Change in Storage for the Reservoir Sub-Basin



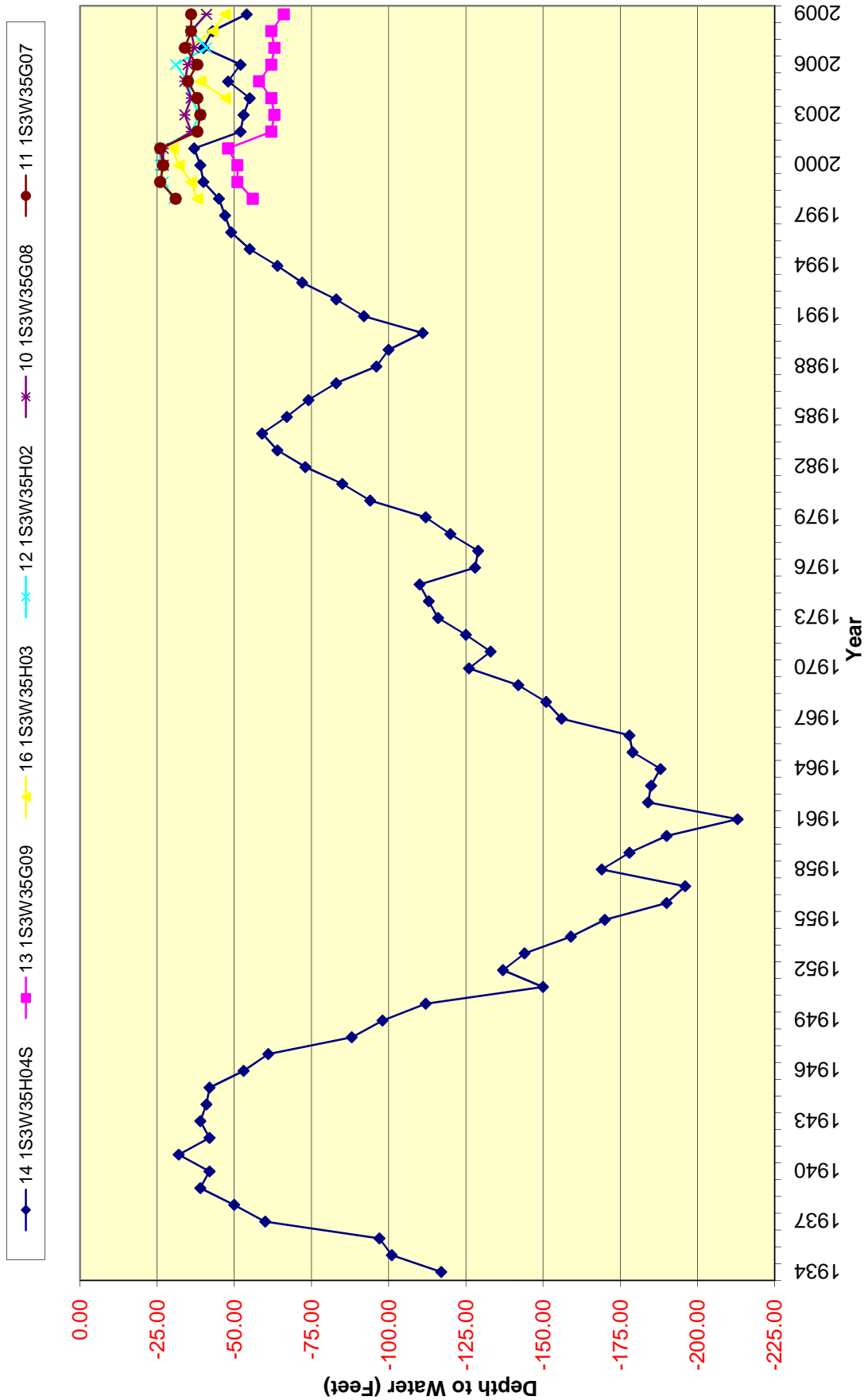
**San Bernardino Valley Municipal Water District**  
Change In Storage for the Reservoir Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1934        | 0                              | n/a  | 0   |
| 1935        | 16                             | 2,686  | 2,686   |
| 1936        | 4                              | 671  | 3,357   |
| 1937        | 37                             | 6,211  | 9,568   |
| 1938        | 10                             | 1,678  | 11,246  |
| 1939        | 11                             | 1,847  | 13,093  |
| 1940        | -3                             | -504   | 12,589  |
| 1941        | 10                             | 1,679  | 14,268  |
| 1942        | -10                            | -1,679   | 12,589  |
| 1943        | 3                              | 504  | 13,093  |
| 1944        | -2                             | -336   | 12,757  |
| 1945        | -1                             | -168   | 12,589  |
| 1946        | -11                            | -1,846   | 10,743  |
| 1947        | -8                             | -1,343   | 9,400   |
| 1948        | -27                            | -4,532   | 4,868   |
| 1949        | -10                            | -1,679   | 3,189   |
| 1950        | -14                            | -2,350   | 839   |
| 1951        | -38                            | -6,378   | -5,539  |
| 1952        | 13                             | 2,182  | -3,357  |
| 1953        | -7                             | -1,175   | -4,532  |
| 1954        | -15                            | -2,518   | -7,050  |
| 1955        | -11                            | -1,846   | -8,896  |
| 1956        | -20                            | -3,358   | -12,254   |
| 1957        | -6                             | -1,007   | -13,261   |
| 1958        | 27                             | 4,532  | -8,729  |
| 1959        | -9                             | -1,510   | -10,239   |
| 1960        | -12                            | -2,015   | -12,254   |
| 1961        | -23                            | -3,860   | -16,114   |
| 1962        | 29                             | 4,868  | -11,246   |
| 1963        | -1                             | -168   | -11,414   |
| 1964        | -3                             | -504   | -11,918   |
| 1965        | 9                              | 1,511  | -10,407   |
| 1966        | 1                              | 168  | -10,239   |
| 1967        | 22                             | 3,693  | -6,546  |
| 1968        | 5                              | 839  | -5,707  |
| 1969        | 9                              | 1,511  | -4,196  |
| 1970        | 16                             | 2,685  | -1,511  |
| 1971        | -7                             | -1,175   | -2,686  |
| 1972        | 8                              | 1,343  | -1,343  |
| 1973        | 9                              | 1,511  | 168   |
| 1974        | 3                              | 503  | 671   |
| 1975        | 3                              | 504  | 1,175   |
| 1976        | -18                            | -3,021   | -1,846  |
| 1977        | -1                             | -168   | -2,014  |

**San Bernardino Valley Municipal Water District**  
Change In Storage for the Reservoir Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1978        | 9                              | 1,510  | -504  |
| 1979        | 8                              | 1,343  | 839   |
| 1980        | 18                             | 3,022  | 3,861   |
| 1981        | 9                              | 1,510  | 5,371   |
| 1982        | 12                             | 2,015  | 7,386   |
| 1983        | 9                              | 1,510  | 8,896   |
| 1984        | 5                              | 840  | 9,736   |
| 1985        | -8                             | -1,343   | 8,393   |
| 1986        | -7                             | -1,175   | 7,218   |
| 1987        | -9                             | -1,511   | 5,707   |
| 1988        | -13                            | -2,182   | 3,525   |
| 1989        | -4                             | -671   | 2,854   |
| 1990        | -11                            | -1,847   | 1,007   |
| 1991        | 19                             | 3,189  | 4,196   |
| 1992        | 9                              | 1,511  | 5,707   |
| 1993        | 11                             | 1,847  | 7,554   |
| 1994        | 8                              | 1,342  | 8,896   |
| 1995        | 9                              | 1,511  | 10,407  |
| 1996        | 6                              | 1,007  | 11,414  |
| 1997        | 2                              | 336  | 11,750  |
| 1998        | -31                            | -3,027   | 8,723   |
| 1999        | 4                              | 481  | 9,204   |
| 2000        | -4                             | 236  | 9,440   |
| 2001        | 1                              | 197  | 9,637   |
| 2002        | -5                             | -1,598   | 8,039   |
| 2003        | -1                             | -106   | 7,933   |
| 2004        | -8                             | -54  | 7,879   |
| 2005        | 4                              | 652  | 8,531   |
| 2006        | -2                             | -396   | 8,135   |
| 2007        | 1                              | 497  | 8,632   |
| 2008        | -1                             | -195   | 8,437   |
| 2009        | -5                             | -652   | 7,785   |

### Hydrograph for the Reservoir Sub-Basin Wells



**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
 RESERVOIR SUB-BASIN

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)       |                                 |                                 |                                 |                                 |                                 |
|------|----------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
|      | 14<br>1S3W35H04S<br>Source | 13<br>1S3W35G09<br>Added Source | 16<br>1S3W35H03<br>Added Source | 12<br>1S3W35H02<br>Added Source | 10<br>1S3W35G08<br>Added Source | 11<br>1S3W35G07<br>Added Source |
| 1934 | -117.00                    |                                 |                                 |                                 |                                 |                                 |
| 1935 | -101.00                    |                                 |                                 |                                 |                                 |                                 |
| 1936 | -97.00                     |                                 |                                 |                                 |                                 |                                 |
| 1937 | -60.00                     |                                 |                                 |                                 |                                 |                                 |
| 1938 | -50.00                     |                                 |                                 |                                 |                                 |                                 |
| 1939 | -39.00                     |                                 |                                 |                                 |                                 |                                 |
| 1940 | -42.00                     |                                 |                                 |                                 |                                 |                                 |
| 1941 | -32.00                     |                                 |                                 |                                 |                                 |                                 |
| 1942 | -42.00                     |                                 |                                 |                                 |                                 |                                 |
| 1943 | -39.00                     |                                 |                                 |                                 |                                 |                                 |
| 1944 | -41.00                     |                                 |                                 |                                 |                                 |                                 |
| 1945 | -42.00                     |                                 |                                 |                                 |                                 |                                 |
| 1946 | -53.00                     |                                 |                                 |                                 |                                 |                                 |
| 1947 | -61.00                     |                                 |                                 |                                 |                                 |                                 |
| 1948 | -88.00                     |                                 |                                 |                                 |                                 |                                 |
| 1949 | -98.00                     |                                 |                                 |                                 |                                 |                                 |
| 1950 | -112.00                    |                                 |                                 |                                 |                                 |                                 |
| 1951 | -150.00                    |                                 |                                 |                                 |                                 |                                 |
| 1952 | -137.00                    |                                 |                                 |                                 |                                 |                                 |
| 1953 | -144.00                    |                                 |                                 |                                 |                                 |                                 |
| 1954 | -159.00                    |                                 |                                 |                                 |                                 |                                 |
| 1955 | -170.00                    |                                 |                                 |                                 |                                 |                                 |
| 1956 | -190.00                    |                                 |                                 |                                 |                                 |                                 |
| 1957 | -196.00                    |                                 |                                 |                                 |                                 |                                 |
| 1958 | -169.00                    |                                 |                                 |                                 |                                 |                                 |
| 1959 | -178.00                    |                                 |                                 |                                 |                                 |                                 |
| 1960 | -190.00                    |                                 |                                 |                                 |                                 |                                 |
| 1961 | -213.00                    |                                 |                                 |                                 |                                 |                                 |
| 1962 | -184.00                    |                                 |                                 |                                 |                                 |                                 |
| 1963 | -185.00                    |                                 |                                 |                                 |                                 |                                 |
| 1964 | -188.00                    |                                 |                                 |                                 |                                 |                                 |

**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
 RESERVOIR SUB-BASIN

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

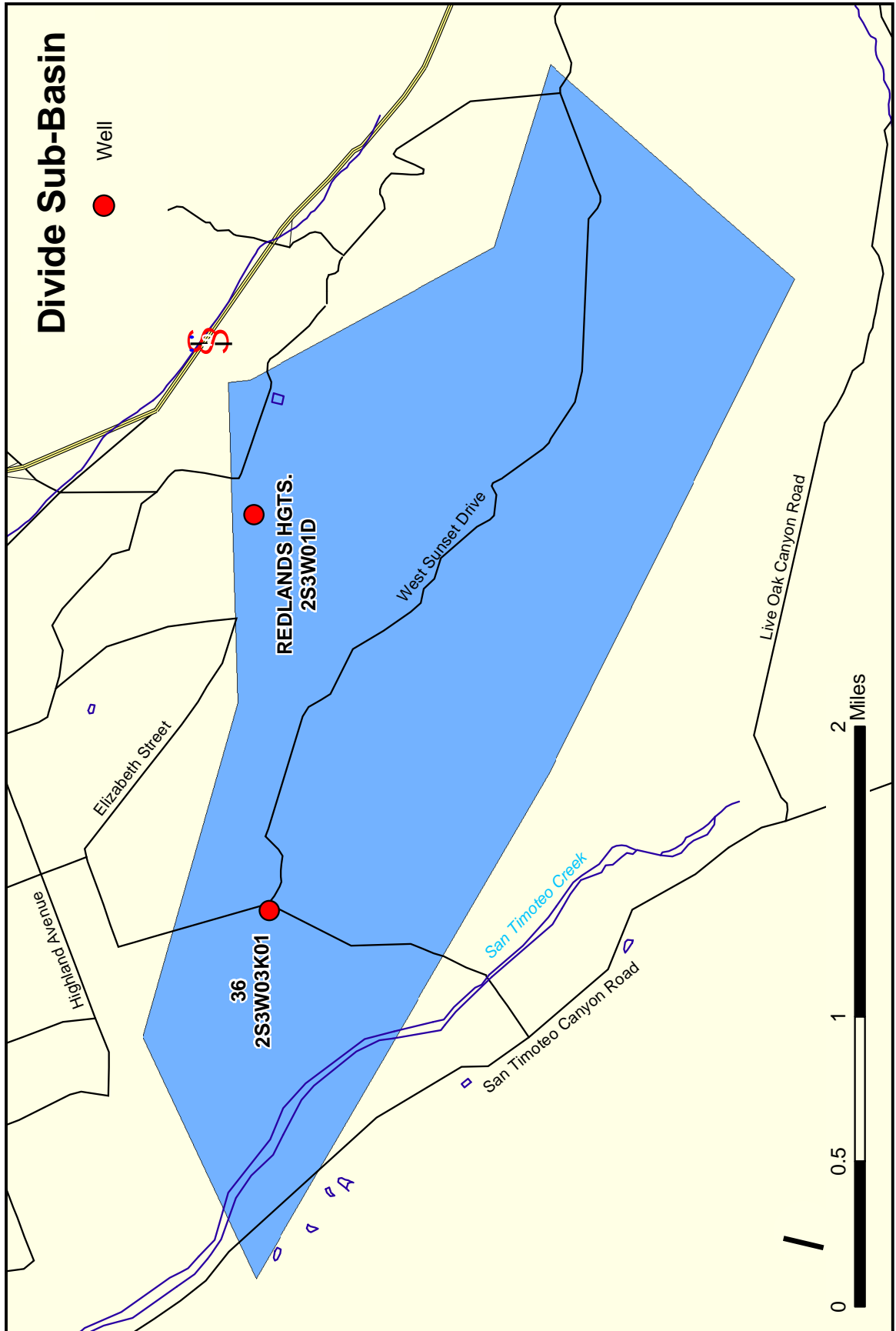
| Year | Depth to Water (ft.)       |                                 |                                 |                                 |                                 |                                 |
|------|----------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
|      | 14<br>1S3W35H04S<br>Source | 13<br>1S3W35G09<br>Added Source | 16<br>1S3W35H03<br>Added Source | 12<br>1S3W35H02<br>Added Source | 10<br>1S3W35G08<br>Added Source | 11<br>1S3W35G07<br>Added Source |
| 1965 | -179.00                    |                                 |                                 |                                 |                                 |                                 |
| 1966 | -178.00                    |                                 |                                 |                                 |                                 |                                 |
| 1967 | -156.00                    |                                 |                                 |                                 |                                 |                                 |
| 1968 | -151.00                    |                                 |                                 |                                 |                                 |                                 |
| 1969 | -142.00                    |                                 |                                 |                                 |                                 |                                 |
| 1970 | -126.00                    |                                 |                                 |                                 |                                 |                                 |
| 1971 | -133.00                    |                                 |                                 |                                 |                                 |                                 |
| 1972 | -125.00                    |                                 |                                 |                                 |                                 |                                 |
| 1973 | -116.00                    |                                 |                                 |                                 |                                 |                                 |
| 1974 | -113.00                    |                                 |                                 |                                 |                                 |                                 |
| 1975 | -110.00                    |                                 |                                 |                                 |                                 |                                 |
| 1976 | -128.00                    |                                 |                                 |                                 |                                 |                                 |
| 1977 | -129.00                    |                                 |                                 |                                 |                                 |                                 |
| 1978 | -120.00                    |                                 |                                 |                                 |                                 |                                 |
| 1979 | -112.00                    |                                 |                                 |                                 |                                 |                                 |
| 1980 | -94.00                     |                                 |                                 |                                 |                                 |                                 |
| 1981 | -85.00                     |                                 |                                 |                                 |                                 |                                 |
| 1982 | -73.00                     |                                 |                                 |                                 |                                 |                                 |
| 1983 | -64.00                     |                                 |                                 |                                 |                                 |                                 |
| 1984 | -59.00                     |                                 |                                 |                                 |                                 |                                 |
| 1985 | -67.00                     |                                 |                                 |                                 |                                 |                                 |
| 1986 | -74.00                     |                                 |                                 |                                 |                                 |                                 |
| 1987 | -83.00                     |                                 |                                 |                                 |                                 |                                 |
| 1988 | -96.00                     |                                 |                                 |                                 |                                 |                                 |
| 1989 | -100.00                    |                                 |                                 |                                 |                                 |                                 |
| 1990 | -111.00                    |                                 |                                 |                                 |                                 |                                 |
| 1991 | -92.00                     |                                 |                                 |                                 |                                 |                                 |
| 1992 | -83.00                     |                                 |                                 |                                 |                                 |                                 |
| 1993 | -72.00                     |                                 |                                 |                                 |                                 |                                 |
| 1994 | -64.00                     |                                 |                                 |                                 |                                 |                                 |
| 1995 | -55.00                     |                                 |                                 |                                 |                                 |                                 |



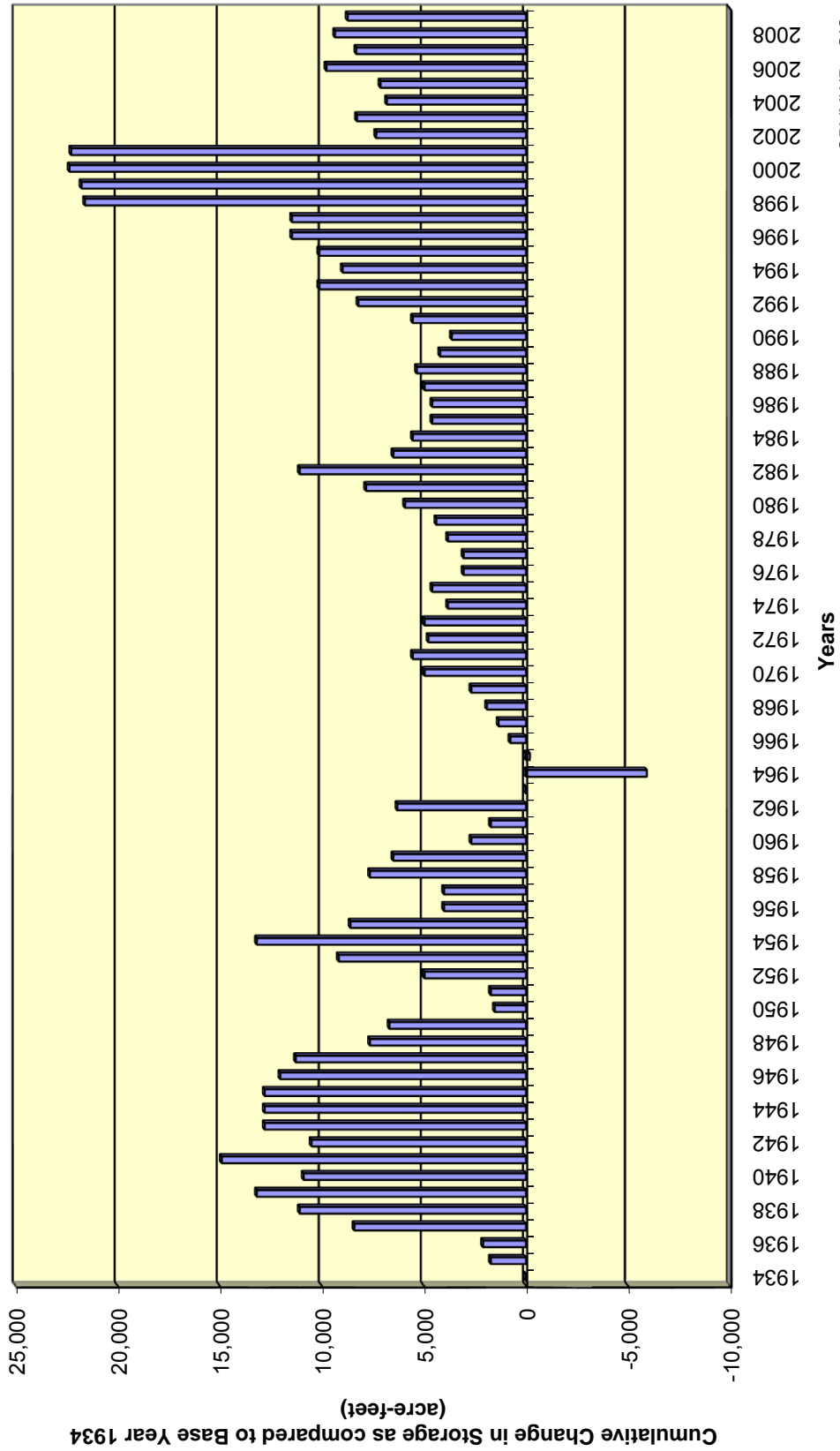
**San Bernardino Valley Municipal Water District**  
 Change in Storage for the San Bernardino Basin Area 1934 - 2009  
 RESERVOIR SUB-BASIN

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| Year | Depth to Water (ft.)       |                                 |                                 |                                 |                                 |                                 |  |
|------|----------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|--|
|      | 14<br>1S3W35H04S<br>Source | 13<br>1S3W35G09<br>Added Source | 16<br>1S3W35H03<br>Added Source | 12<br>1S3W35H02<br>Added Source | 10<br>1S3W35G08<br>Added Source | 11<br>1S3W35G07<br>Added Source |  |
| 1996 | -49.00                     |                                 |                                 |                                 |                                 |                                 |  |
| 1997 | -47.00                     |                                 |                                 |                                 |                                 |                                 |  |
| 1998 | -45.00                     | -56.00                          | -38.00                          | -30.50                          |                                 | -31.00                          |  |
| 1999 | -40.00                     | -51.00                          | -36.00                          | -27.00                          |                                 | -26.00                          |  |
| 2000 | -39.00                     | -51.00                          | -32.00                          | -26.00                          | -27.00                          | -27.00                          |  |
| 2001 | -37.00                     | -48.00                          | -30.00                          | -26.00                          | -27.00                          | -26.00                          |  |
| 2002 | -52.00                     | -62.00                          |                                 | -36.00                          | -36.00                          | -38.00                          |  |
| 2003 | -53.00                     | -63.00                          |                                 | -39.00                          | -34.00                          | -39.00                          |  |
| 2004 | -55.00                     | -62.00                          | -47.00                          | -36.00                          | -36.00                          | -38.00                          |  |
| 2005 | -48.00                     | -58.00                          | -39.00                          | -35.00                          | -34.00                          | -35.00                          |  |
| 2006 | -52.00                     | -62.00                          |                                 | -31.00                          | -35.00                          | -38.00                          |  |
| 2007 | -40.00                     | -63.00                          | -35.00                          | -41.00                          | -37.00                          | -34.00                          |  |
| 2008 | -43.00                     | -62.00                          | -43.00                          | -36.00                          | -36.00                          | -36.00                          |  |
| 2009 | -54.00                     | -66.00                          | -47.00                          | -41.00                          | -41.00                          | -36.00                          |  |

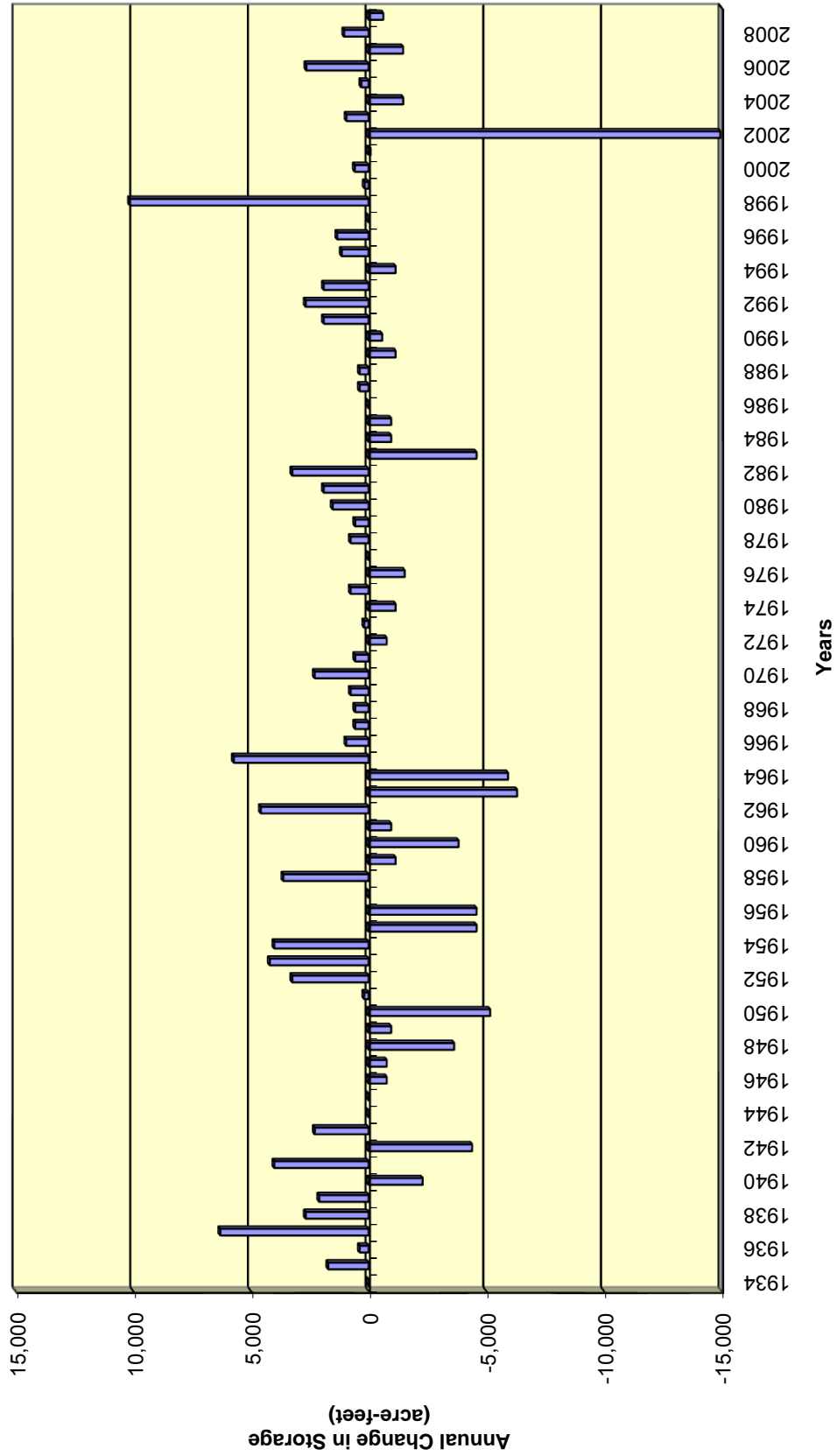


Cumulative Change in Storage for the Divide Sub-Basin



SBVMWD - GIS  
March 2010

### Annual Change in Storage for the Divide Sub-Basin



SBVMWD - GIS  
March 2010

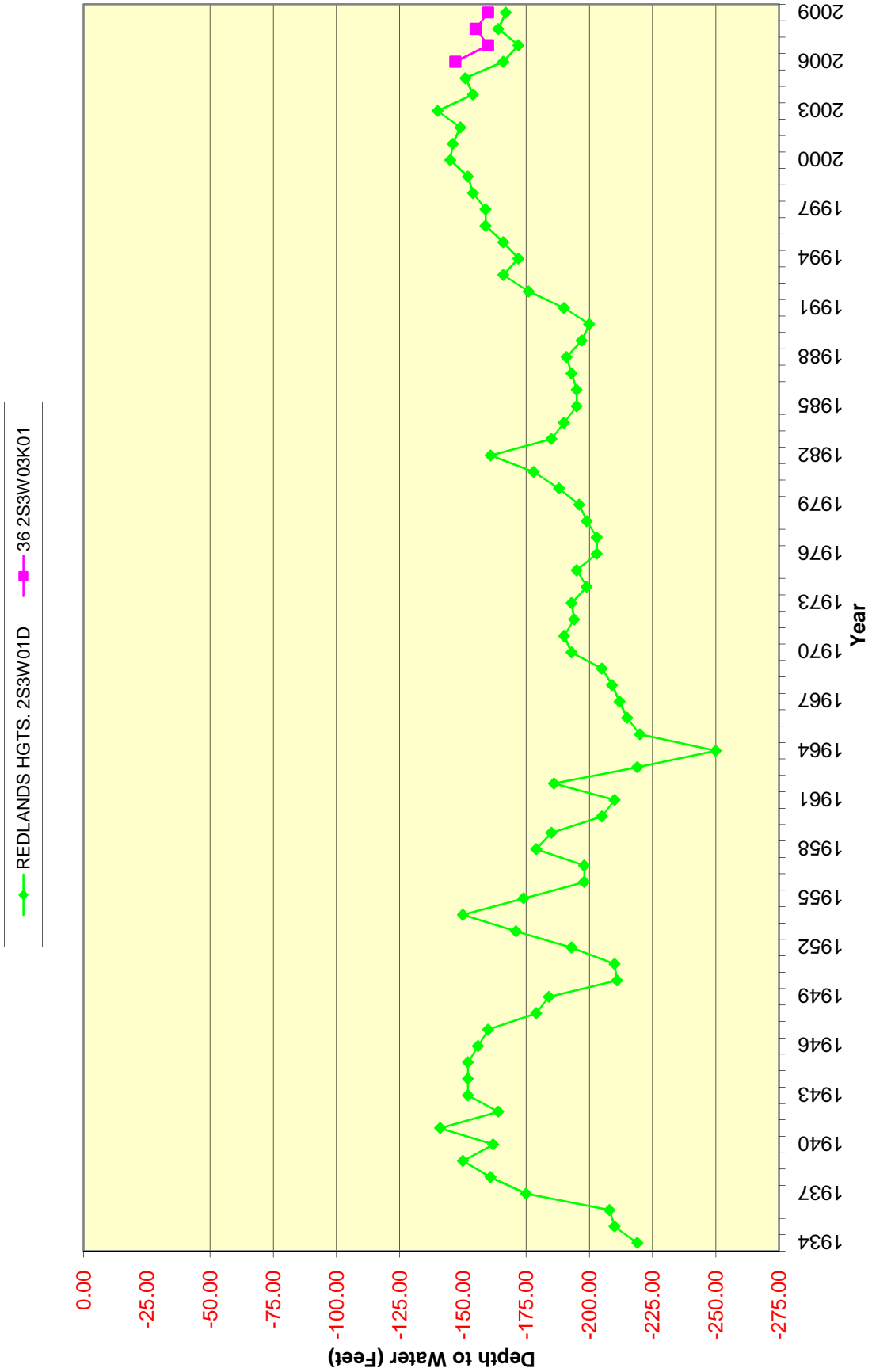
**San Bernardino Valley Municipal Water District**  
Change In Storage for the Divide Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1934        | 0                              | n/a  | 0   |
| 1935        | 9                              | 1,719  | 1,719   |
| 1936        | 2                              | 382  | 2,101   |
| 1937        | 33                             | 6,304  | 8,405   |
| 1938        | 14                             | 2,675  | 11,080  |
| 1939        | 11                             | 2,101  | 13,181  |
| 1940        | -12                            | -2,292   | 10,889  |
| 1941        | 21                             | 4,012  | 14,901  |
| 1942        | -23                            | -4,394   | 10,507  |
| 1943        | 12                             | 2,292  | 12,799  |
| 1944        | 0                              | 0  | 12,799  |
| 1945        | 0                              | 0  | 12,799  |
| 1946        | -4                             | -764   | 12,035  |
| 1947        | -4                             | -764   | 11,271  |
| 1948        | -19                            | -3,630   | 7,641   |
| 1949        | -5                             | -955   | 6,686   |
| 1950        | -27                            | -5,158   | 1,528   |
| 1951        | 1                              | 191  | 1,719   |
| 1952        | 17                             | 3,248  | 4,967   |
| 1953        | 22                             | 4,203  | 9,170   |
| 1954        | 21                             | 4,011  | 13,181  |
| 1955        | -24                            | -4,585   | 8,596   |
| 1956        | -24                            | -4,584   | 4,012   |
| 1957        | 0                              | 0  | 4,012   |
| 1958        | 19                             | 3,629  | 7,641   |
| 1959        | -6                             | -1,146   | 6,495   |
| 1960        | -20                            | -3,821   | 2,674   |
| 1961        | -5                             | -955   | 1,719   |
| 1962        | 24                             | 4,585  | 6,304   |
| 1963        | -33                            | -6,304   | 0   |
| 1964        | -31                            | -5,922   | -5,922  |
| 1965        | 30                             | 5,731  | -191  |
| 1966        | 5                              | 955  | 764   |
| 1967        | 3                              | 573  | 1,337   |
| 1968        | 3                              | 573  | 1,910   |
| 1969        | 4                              | 764  | 2,674   |
| 1970        | 12                             | 2,293  | 4,967   |
| 1971        | 3                              | 573  | 5,540   |
| 1972        | -4                             | -764   | 4,776   |
| 1973        | 1                              | 191  | 4,967   |
| 1974        | -6                             | -1,146   | 3,821   |
| 1975        | 4                              | 764  | 4,585   |
| 1976        | -8                             | -1,528   | 3,057   |
| 1977        | 0                              | 0  | 3,057   |

**San Bernardino Valley Municipal Water District**  
Change In Storage for the Divide Sub-basin 1934 - 2009

| (1)<br>Year | (2)<br>Basin<br>Index<br>(ft.) | (3)<br>Annual<br>Change in Groundwater<br>Storage<br>(acre-feet) | (4)<br>Cummulative<br>Change in Groundwater<br>Storage<br>(acre-feet) |
|-------------|--------------------------------|--|---|
| 1978        | 4                              | 764  | 3,821   |
| 1979        | 3                              | 573  | 4,394   |
| 1980        | 8                              | 1,528  | 5,922   |
| 1981        | 10                             | 1,910  | 7,832   |
| 1982        | 17                             | 3,248  | 11,080  |
| 1983        | -24                            | -4,585   | 6,495   |
| 1984        | -5                             | -955   | 5,540   |
| 1985        | -5                             | -955   | 4,585   |
| 1986        | 0                              | 0  | 4,585   |
| 1987        | 2                              | 382  | 4,967   |
| 1988        | 2                              | 382  | 5,349   |
| 1989        | -6                             | -1,146   | 4,203   |
| 1990        | -3                             | -573   | 3,630   |
| 1991        | 10                             | 1,910  | 5,540   |
| 1992        | 14                             | 2,674  | 8,214   |
| 1993        | 10                             | 1,911  | 10,125  |
| 1994        | -6                             | -1,146   | 8,979   |
| 1995        | 6                              | 1,146  | 10,125  |
| 1996        | 7                              | 1,337  | 11,462  |
| 1997        | 0                              | 0  | 11,462  |
| 1998        | 5                              | 10,142   | 21,604  |
| 1999        | 2                              | 169  | 21,773  |
| 2000        | 7                              | 590  | 22,363  |
| 2001        | -1                             | -84  | 22,279  |
| 2002        | -3                             | -14,943  | 7,336   |
| 2003        | 9                              | 943  | 8,279   |
| 2004        | -14                            | -1,467   | 6,812   |
| 2005        | 3                              | 314  | 7,126   |
| 2006        | -15                            | 2,649  | 9,775   |
| 2007        | -10                            | -1,462   | 8,313   |
| 2008        | 7                              | 1,042  | 9,355   |
| 2009        | -4                             | -621   | 8,734   |

### Hydrograph for the Divide Sub-Basin Wells



**San Bernardino Valley Municipal Water District**  
Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**DIVIDE SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| <b>Depth to Water (ft.)</b> |  |  |
|-----------------------------|--|--|
| <b>Year</b>                 | <b>REDLANDS HGTS.<br/>2S3W01D<br/>Source</b> | <b>36<br/>2S3W03K01<br/>Added Source</b> |
| 1934                        | -219.00                                      |  |
| 1935                        | -210.00                                      |  |
| 1936                        | -208.00                                      |  |
| 1937                        | -175.00                                      |  |
| 1938                        | -161.00                                      |  |
| 1939                        | -150.00                                      |  |
| 1940                        | -162.00                                      |  |
| 1941                        | -141.00                                      |  |
| 1942                        | -164.00                                      |  |
| 1943                        | -152.00                                      |  |
| 1944                        | -152.00                                      |  |
| 1945                        | -152.00                                      |  |
| 1946                        | -156.00                                      |  |
| 1947                        | -160.00                                      |  |
| 1948                        | -179.00                                      |  |
| 1949                        | -184.00                                      |  |
| 1950                        | -211.00                                      |  |
| 1951                        | -210.00                                      |  |
| 1952                        | -193.00                                      |  |
| 1953                        | -171.00                                      |  |
| 1954                        | -150.00                                      |  |
| 1955                        | -174.00                                      |  |
| 1956                        | -198.00                                      |  |
| 1957                        | -198.00                                      |  |
| 1958                        | -179.00                                      |  |
| 1959                        | -185.00                                      |  |
| 1960                        | -205.00                                      |  |
| 1961                        | -210.00                                      |  |
| 1962                        | -186.00                                      |  |
| 1963                        | -219.00                                      |  |
| 1964                        | -250.00                                      |  |
| 1965                        | -220.00                                      |  |
| 1966                        | -215.00                                      |  |
| 1967                        | -212.00                                      |  |
| 1968                        | -209.00                                      |  |
| 1969                        | -205.00                                      |  |
| 1970                        | -193.00                                      |  |
| 1971                        | -190.00                                      |  |
| 1972                        | -194.00                                      |  |
| 1973                        | -193.00                                      |  |
| 1974                        | -199.00                                      |  |
| 1975                        | -195.00                                      |  |



**San Bernardino Valley Municipal Water District**  
Change in Storage for the San Bernardino Basin Area 1934 - 2009  
**DIVIDE SUB-BASIN**

Shaded cells with no values represent no depth available; shaded cells with values represent interpolated depths

| <b>Depth to Water (ft.)</b> |  |  |
|-----------------------------|--|--|
| <b>Year</b>                 | <b>REDLANDS HGTS.<br/>2S3W01D<br/>Source</b> | <b>36<br/>2S3W03K01<br/>Added Source</b> |
| 1976                        | -203.00                                      |  |
| 1977                        | -203.00                                      |  |
| 1978                        | -199.00                                      |  |
| 1979                        | -196.00                                      |  |
| 1980                        | -188.00                                      |  |
| 1981                        | -178.00                                      |  |
| 1982                        | -161.00                                      |  |
| 1983                        | -185.00                                      |  |
| 1984                        | -190.00                                      |  |
| 1985                        | -195.00                                      |  |
| 1986                        | -195.00                                      |  |
| 1987                        | -193.00                                      |  |
| 1988                        | -191.00                                      |  |
| 1989                        | -197.00                                      |  |
| 1990                        | -200.00                                      |  |
| 1991                        | -190.00                                      |  |
| 1992                        | -176.00                                      |  |
| 1993                        | -166.00                                      |  |
| 1994                        | -172.00                                      |  |
| 1995                        | -166.00                                      |  |
| 1996                        | -159.00                                      |  |
| 1997                        | -159.00                                      |  |
| 1998                        | -154.00                                      |  |
| 1999                        | -152.00                                      |  |
| 2000                        | -145.00                                      |  |
| 2001                        | -146.00                                      |  |
| 2002                        | -149.00                                      |  |
| 2003                        | -140.00                                      |  |
| 2004                        | -154.00                                      |  |
| 2005                        | -151.00                                      |  |
| 2006                        | -166.00                                      | -147.00                                  |
| 2007                        | -172.00                                      | -160.00                                  |
| 2008                        | -164.00                                      | -155.00                                  |
| 2009                        | -167.00                                      | -160.00                                  |

## **APPENDIX: SBVMWD CHANGE IN STORAGE MODEL**

## List of Figures

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## **A. INTRODUCTION**

The San Bernardino Valley Municipal Water District was incorporated on February 17, 1954. The District is one of 29 contractors of the California State Water Project (SWP) and has the fifth largest annual entitlement to SWP water at 102,600 acre-feet. The District takes delivery of SWP water through the Devil Canyon Powerhouse on the East Branch of the California State Aqueduct.

The District serves a population of about 600,000 people within a 328 square mile area in the east San Bernardino Valley. Currently, there are over 33 miles of 12-inch to 78-inch diameter pipelines in the District's delivery system. The system includes 28 service connections to deliver both native and SWP water for direct delivery or groundwater recharge within the District's boundary. Groundwater recharge is conducted to lessen the impact of increasing well production from the various groundwater basins within the District's boundary and to help the District meet certain legal obligations.

One of the legal obligations imposed on the District is the responsibility for maintaining the "safe yield" of the San Bernardino Basin Area. The safe yield is a theoretical maximum amount of water that may be removed from the basin on an annual basis without degrading the usable water supply. For the San Bernardino Basin Area, this amount has been set by the Western-San Bernardino Watermaster at 232,100 acre-feet/yr (Watermaster, pg. 24).

One method of accounting for groundwater that enters or leaves the San Bernardino Basin Area is to estimate the change in groundwater volume, or storage, using a network of observation wells. The change in groundwater elevation for these observation wells along with the given soil characteristics can be used to approximate the change in groundwater storage.

## B. THE SBVMWD CHANGE IN STORAGE MODEL

### B.1 Background

The San Bernardino Valley Municipal Water District (SBVMWD) has been calculating the change in groundwater storage for the San Bernardino Basin area since 1970. The first calculation was completed for the years 1934 – 1960 by the State of California Department of Water Resources (DWR) and the results were summarized in Bulletin 104-5, Meeting Water Demands in the Bunker Hill-San Timoteo Area, Geology, Hydrology, and Operation-Economics Studies, Text and Plates (Olson, pp. 90 – 92). The DWR change in storage values were calculated using the Specific Yield Method (Olson, pp. 85 – 98) and a mathematical model developed by TRW, Incorporated, Redondo Beach, California (TRW). In 1980, SBVMWD updated the change in storage calculation to include the years 1961 – 1980 (Van Gelder). In the early 1990's, SBVMWD created a new change in storage model using GRID software developed by Environmental Systems Research Institute (ESRI), Redlands, California. GRID was selected because it allowed a finer model resolution and because it was able to interpolate surfaces or create contour maps from a spatial distribution of data points. The differences between the two models are summarized in Table B.1.1.

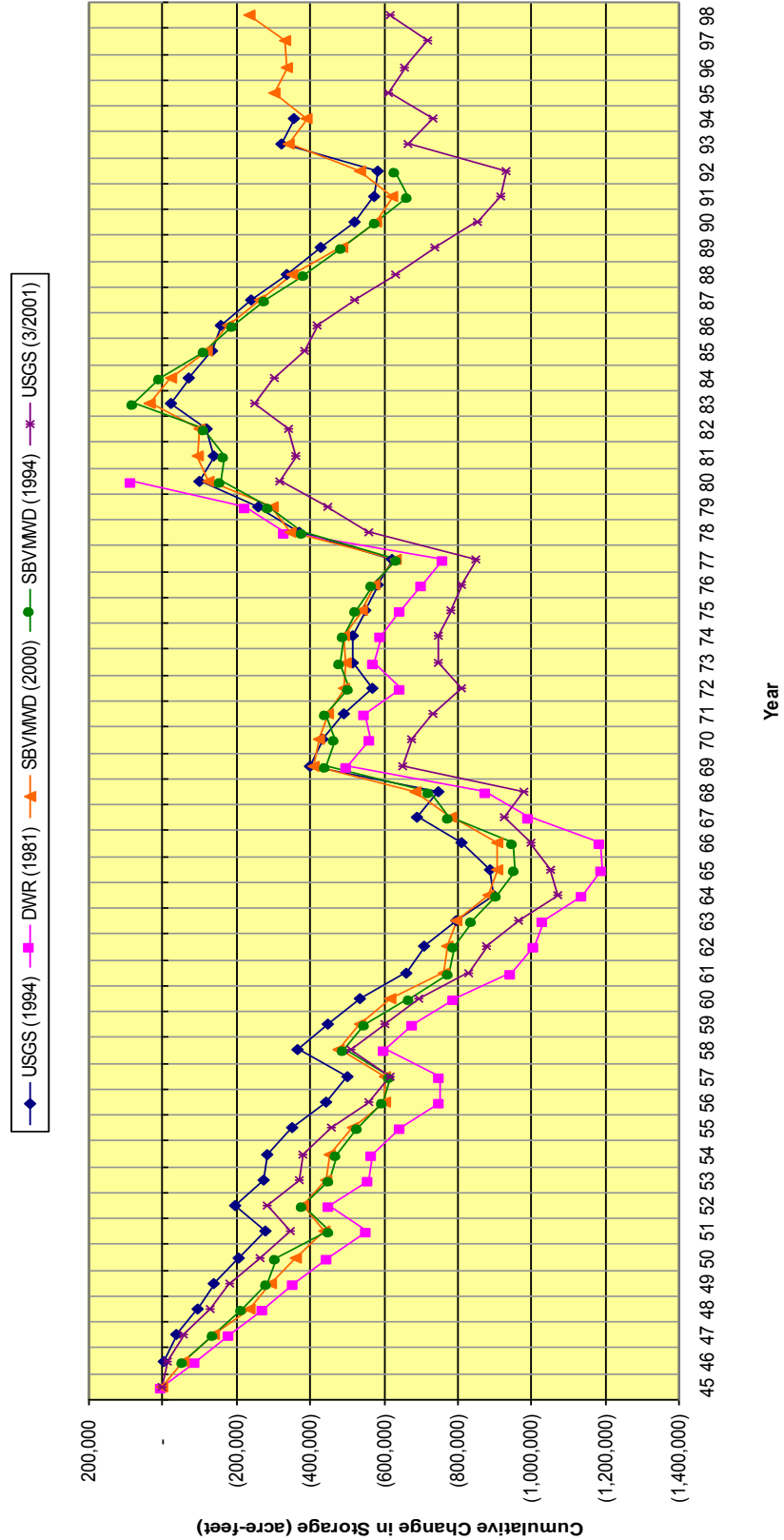
**Table B.1.1. Differences between DWR model and SBVMWD Model.**

| Item                         | DWR Model  | SBVMWD Model  |
|------------------------------|--|---|
| Method of Analysis           | Specific Yield Method  | Specific Yield Method   |
| Sub-basin boundaries         | DWR Bulletin No. 104-5   | DWR Bulletin No. 104-5  |
| Wells (quantity)             | 75   | See main report   |
| Water Levels                 | Constant across "nodes"  | Interpolated from given data                                      |
| Specific Yield               | DWR Bulletin No. 45  | DWR Bulletin No. 45   |
| Computer Software            | FORTRAN IV   | ESRI GRID® Software   |
| Model resolution (cell size) | 75 "nodes" (cells):<br>Smallest cell= 589 acres<br>Largest cell = 1,778<br>acres | 335,758 cells:<br>Uniform cell size: 100 ft.<br>square (.23 acre) |

Although the two models use different computer programs and a different quantity of wells (many of the wells used in the original study have since been abandoned) to calculate the

change in groundwater storage, the results obtained from the two models are similar (see Figure B.1.1). The difference in the results can be mostly attributed to the improved capabilities of the SBVMWD model.

Figure B.1.1. Comparison of DWR FORTRAN Model, USGS MODFLOW Model and SBVMWD GRID Model Results



Geologists divided the DWR model for the San Bernardino Basin Area into 75 polygons (see Table B.1.2), or “nodes”, using the Thiessen method of polygon construction. The nodes were drawn to surround an area where the soil characteristics, specific yield, and groundwater surface could be assumed constant. The change in storage was computed for each individual node using the Specific Yield Method. The sum of the change in storage for all of the nodes was the change in storage for the San Bernardino Basin area.

**Table B.1.2. Quantity of Thiessen Polygons (“Nodes”) for the Department of Water Resources Bulletin 104-5.**

| <b>Area No.</b> | <b>Designation</b> | <b>No. of Nodes</b> |
|-----------------|--------------------|---------------------|
| 1               | Cajon              | 8                   |
| 2               | Devil Canyon       | 4                   |
| 3               | Lytle Creek        | 10                  |
| 4               | Pressure Zone      | 16                  |
| 5               | City Creek         | 19                  |
| 6               | Redlands           | 5                   |
| 7               | Mill Creek         | 8                   |
| 8               | Reservoir          | 3                   |
| 9               | Divide             | 2                   |
| <b>TOTALS</b>   |                    | <b>75</b>           |

The surface area of the smallest node was 589 acres and the surface area of the largest node was 1,778 acres. The large node, or model cell size, provides one of the largest differences between the SBVMWD model and the DWR model. The SBVMWD model has been divided into a uniform, square cell size of 100 feet per side (0.23 acre). This smaller cell size of the SBVMWD model allows values to be more accurately assigned to each model cell based upon the given contour maps instead of assuming constant values across large areas like the DWR model. For example, each model uses storage coefficients from DWR’s Bulletin No. 45 (Eckis). The specific yield data from Bulletin No. 45 is presented on a contour map (Eckis, Plate E). The SBVMWD model is able to convert this contour map into a grid which contains a unique specific yield value for each

of its 335,758 model cells. In contrast, the DWR model must assume a single, constant specific yield across each of its 75 larger nodes. The larger number of model cells in the SBVMWD model allows it to use a more accurate representation of the specific yield contour map in the change in groundwater storage calculation.

In addition to providing a more accurate representation of the specific yield contour map, the SBVMWD model also provides a more accurate representation of the water levels within each sub-basin. The DWR model assumes a constant water level across each of its 75 nodes. This constant groundwater surface across each node causes the DWR model to produce a groundwater surface with a “stair step” appearance. The finer resolution and ability of the SBVMWD model to interpolate a groundwater surface within each sub-basin from the given well data. This produces a water level surface that is more representative of the true surface than the “stair step” surface generated by the DWR model.

In conclusion, the DWR model and SBVMWD model produce similar results. The difference between the two models is most likely due to the finer model resolution and the interpolation capabilities of the newer SBVMWD model.

## B.2 Method of Analysis

The San Bernardino Valley Municipal Water District (SBVMWD) Change in Storage (CIS) model calculates the cumulative change in storage (CCIS) using a spatial distribution of available wells and the Specific Yield Method, as put forth in the Department of Water Resources' Bulletin 104-5 (Olson, pg. 85). This method calculates the change in storage based upon an adaptation of the simple mathematical equation for calculating volume, (length \* width \* height).

$$\text{CCIS} = (h_{\text{present year}} - h_{\text{base year}})SA \quad \text{(Equation B.2.1)}$$

where,

CCIS = Cumulative change in storage, acre-feet

$(h_{\text{present year}} - h_{\text{base year}})$  = Change in saturated thickness, ft.

$h_{\text{present year}}$  = Depth to groundwater, present year

$h_{\text{base year}}$  = Depth to groundwater, base year (1934)

S = Specific Yield, dimensionless

A = Area, acres



In Equation B.2.1, “length \* width” is given by the surface area, A, of the basin and “height” is given by,  $(h_{\text{present year}} - h_{\text{base year}})$ , the change in saturated thickness. The specific yield simply adjusts the volume calculation to account for the fact that only the pore space in the soil is available for water storage. Figure B.2.1 illustrates the Specific Yield Method.

Given the cumulative change in storage values for a series of years, these cumulative values can be used to calculate the annual change in groundwater storage. The annual change in groundwater storage is simply the difference between a year’s cumulative change in storage and the previous year’s cumulative change in storage (Equation B.2.2).

$$\text{ACIS}_{\text{present year}} = \text{CCIS}_{\text{present year}} - \text{CCIS}_{\text{previous year}} \quad (\text{Equation B.2.2})$$

where,

ACIS = Annual Change in Storage for the present year, acre-feet

CCIS<sub>present year</sub> = Cumulative Change in Storage for the present year,  
acre-feet

CCIS<sub>previous year</sub> = Cumulative Change in Storage for the previous year,  
acre-feet

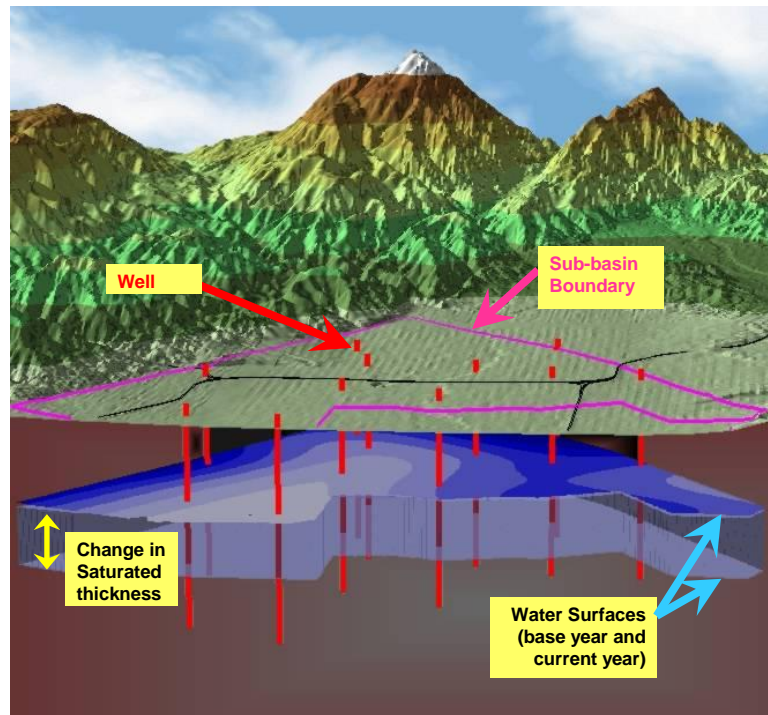


Figure B.2.1. Illustration of the Specific Yield Method for calculating the change in groundwater storage (Equation B.2.1).

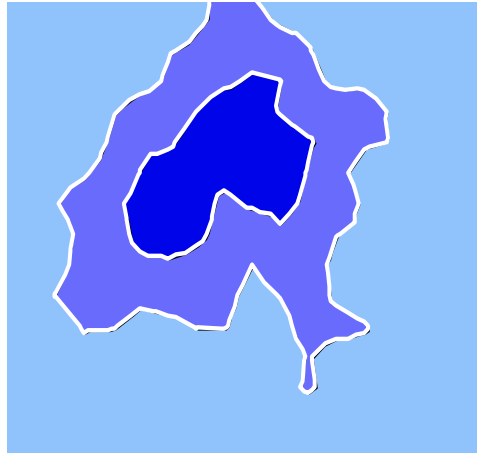
### **B.3 Technical Approach**

Each of the variables in the cumulative change in storage calculation (Equation B.2.1) varies depending upon the geographic position within the San Bernardino Basin Area and can be spatially represented by a contour map. The SBVMWD Change in Storage model was written in Environmental Systems Research Institute's (ESRI) GRID software because it allows contour maps to be converted into "grids" and used directly in the simple mathematical equation for the cumulative change in storage.

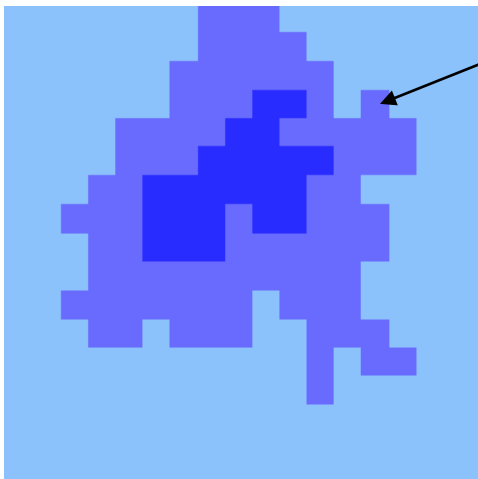
When a contour map is converted into a grid, the software essentially breaks the contour map down into smaller, user-defined pieces called cells. The GRID software stores a unique value within each grid cell depending upon its geographic location. For example, each cell in the depth to groundwater grid contains a unique value for the depth to groundwater based upon its geographic position in the grid. Figure B.3.1 illustrates the conversion of a contour map into a grid. The user has the flexibility to control the cell size. The smaller the cell size, the more representative of the actual contour map. However, there is a trade-off between cell size and processing speed. Since the software performs calculations on each individual grid cell, a finer grid requires more calculations and, therefore, takes longer to process. Thus, the challenge is to select the largest cell size possible without significantly impacting the results. The cell size for the SBVMWD CIS model is 100 feet square.

Once the contour maps have been converted to grids, these grids are used in Equation B.2.1. When the GRID software uses grids in any algebraic equation, the results are stored in a new grid. For example, when two grids are multiplied, the software essentially lays the two grids on top of one another and multiplies the values in each individual grid cell on a cell-by-cell basis. The results are stored in a new grid and are located in the same geographic cell location as the two values used in the calculation. The same logic applies to the cumulative change in storage calculation. The software generates the change in saturated thickness grid by subtracting one water level grid from the other. The change in saturated thickness grid (height) is then multiplied by the specific yield grid (unit less) and then multiplied by the cell size (area) which results in a grid containing the cumulative change in storage in each cell (see Figure B.3.2). The cumulative change in storage for the entire area is simply the summation of the individual cell values.

Contour Map



Corresponding "grid"



Typical grid cell

Figure B.3.1. Grid representation of a contour map.

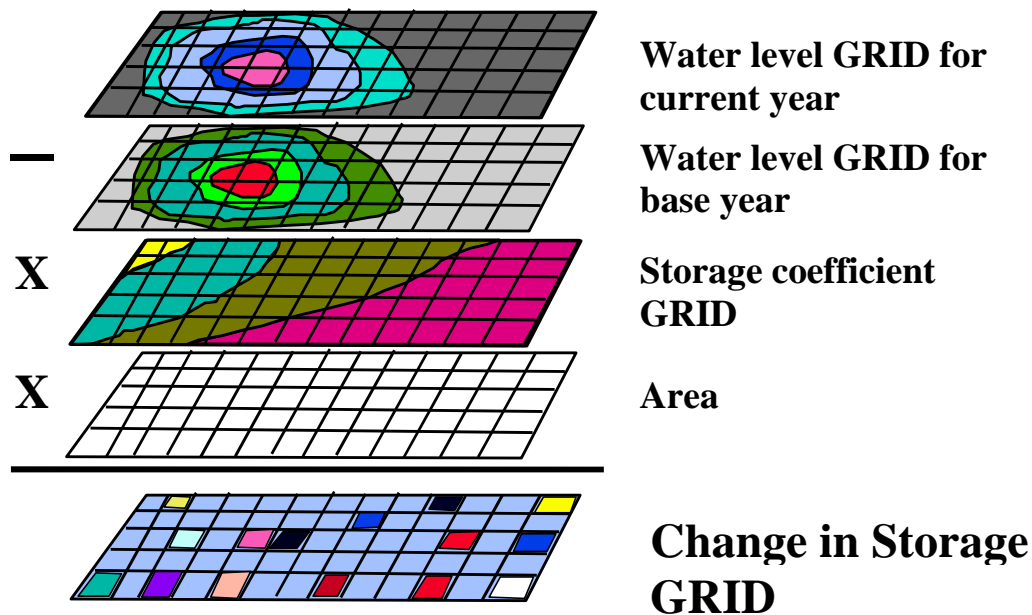


Figure B.3.2. Grid representation of Equation B.2.1.

The SBVMWD model uses the calendar year instead of the water year (October through September). Calendar years were chosen so that the SBVMWD model results would be coincident with the United States Geological Survey groundwater model results which are dependent upon local pumping records kept by calendar year.

#### B.4 Data

Sub-basin boundaries. The SBVMWD Change in Storage model used the same sub-basins identified in the Department of Water Resources (DWR) Bulletin 104-5 (DWR, Plate 14) (Basin Groundwater Storage Data). DWR Geologists divided the San Bernardino Basin area into nine sub-basins based upon the known hydrologic barriers (faults) in the valley.

Well Locations. Wherever possible, the change in storage model used the same wells used in Bulletin 104-5. However, many of the original wells have since been abandoned and are no longer available for measurement. Whenever one of the original wells was unavailable, an attempt was made to find a “replacement well” in the same vicinity. If a replacement well was not available in the same vicinity, an effort was made to find an additional well within the sub-basin that would improve the spatial distribution of

data points. In addition to geographic location, replacement wells were selected based upon the following criteria:

1. *Public ownership.* Because public water agencies tend to be more diligent at data collection, SBVMWD limited its selection of replacement wells to those owned by public water agencies.
2. *Similar hydrograph.* A hydrograph is a plot of the static water level over time. The hydrograph for each replacement well was compared to the hydrograph of the well it was replacing to ensure that the replacement well was measuring water levels from the same aquifer as the original well.

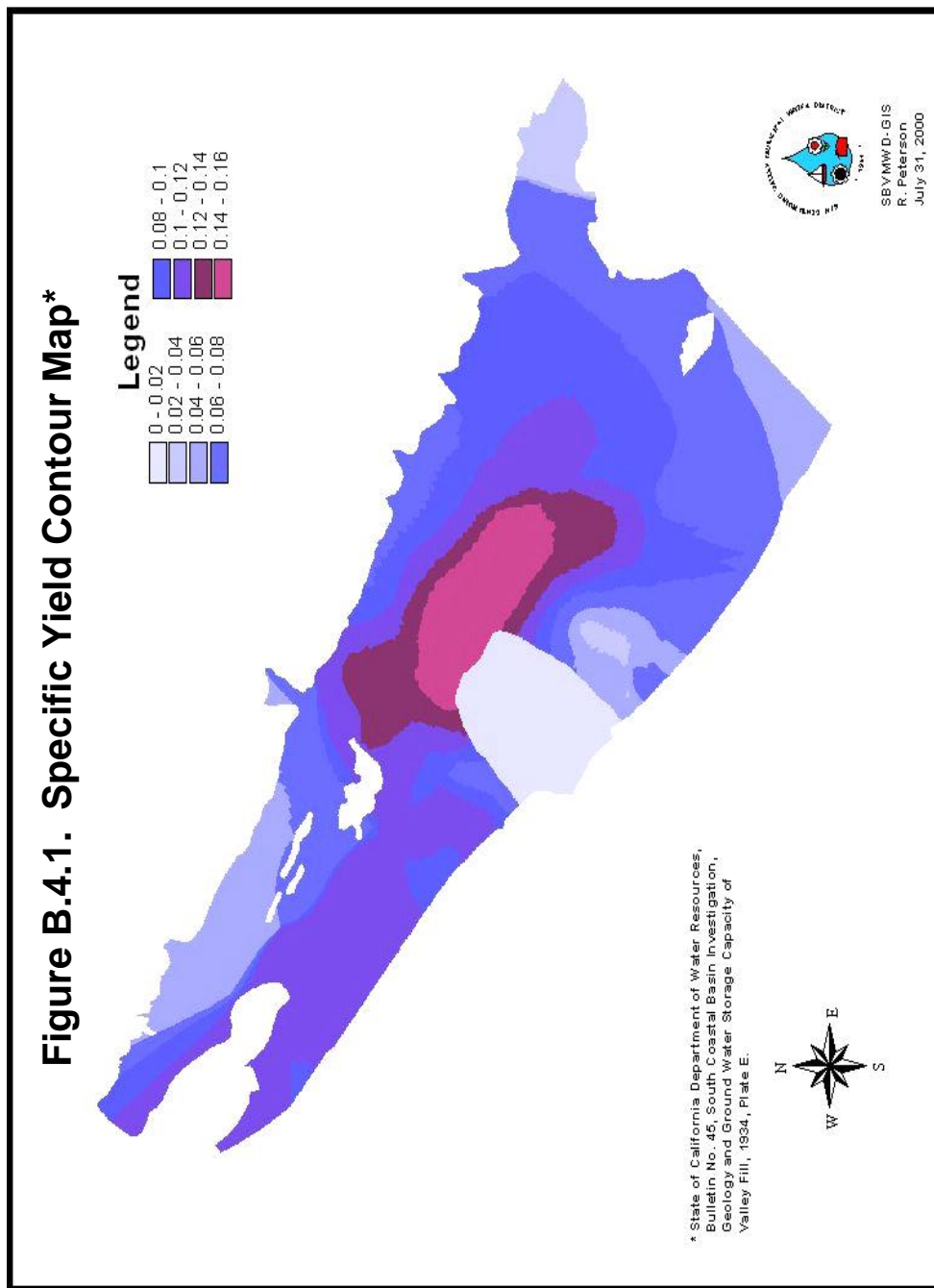
Static depth to water. Like the DWR model, the SBVMWD Change in Storage model uses the highest, annual fall (September - December) static (pump OFF) depth-to-water measurement for each well. The fall season was selected because it follows the summer months during which basin water levels are drawn down to their lowest levels due to the high demands. Fall is also chosen because the cooler fall weather causes pumping rates to dramatically decline and allows the water surface to recover to a level that is more representative of the static water surface.

Static water level data was obtained directly from the well owners and was verified to be static by reviewing the well's hydrograph. Large downward "spikes" in the data were investigated by comparing the depth of the spike to the estimated cone of depression. If the depth of the spike was similar to the cone of depression, that data point was assumed to be dynamic (pump ON) and the data point was eliminated from the analysis. When points were eliminated, or missing from the data, a straight-line interpolation was performed between the known points. Although there is some error associated with assigning points by straight-line interpolation, it was felt that omitting points from the overall interpolation of the water surface would cause a larger error in the analysis.

Before the depth to water data could be used in the Change in Storage model, it had to first be converted into a grid surface. The annual depth to water grids for each sub-basin were interpolated using the highest fall measurements and the Inverse Distance Weighted method of interpolation. Interpolation was intentionally performed separately

within each sub-basin to eliminate the potential problem of interpolating across sub-basin boundaries, which are groundwater barriers.

Specific Yields. The specific yield is “the ratio of the volume of water that will drain under the influence of gravity to the volume of saturated rock” (Heath, pp. 28-29). The specific yield values used for the study area were obtained from the Department of Water Resources report entitled South Coastal Basin Investigation Geology and Ground Water Storage Capacity of Valley Fill, Bulletin No. 45 (Eckis, Plate E) (see Figure B.4.1).



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