Appendix C
Well Pumping

1.0 Purpose

The South Platte Decision Support System (SPDSS) alluvial groundwater flow model includes the key groundwater inflows and outflows that occur within and affect the study area. A primary outflow is from well pumping. The purpose of this appendix is to document the sources of data, describe the data processing methods, and present the well pumping used as model inputs to represent agricultural and municipal and industrial (M&I) pumping in the SPDSS alluvial groundwater flow model. The estimated fluxes documented in this appendix include the following:

1. *Alluvial agricultural well pumping*
2. *Alluvial municipal and industrial well pumping*

These fluxes are simulated in the model in MODFLOW's Well package. There are additional components included as fluxes in the MODFLOW well file; they include the following and are discussed in other appendices as noted:

- Lateral boundary inflows (Appendix D)
- Alluvial underflow (Appendix D)
- Augmentation wells (Appendix M)
- Bedrock flows (Appendix D)

The study period for the SPDSS alluvial groundwater model is 1950 through 2006. Three simulation periods were utilized within this study period: a steady-state period representing average conditions for 1991-1994, a monthly transient calibration period representing conditions from 1999-2005, and a model validation using monthly inputs for the full study period. The following sections describe the data sources, data processing, and model input for each category of well pumping for each of these three model simulation periods.

2.0 Agricultural Pumping

Agricultural pumping is one of the key sources of groundwater outflow in the alluvial groundwater flow model. Agricultural pumping estimates were based on potential crop consumptive use and available surface water, since no direct measurements of well production were available.

2.1 Data Sources

Agricultural pumping rates and timing were developed and discussed in SPDSS "*Historic Crop Consumptive Use Analysis*"(SPDSS 2010), with additional processing through *StateDGI* to associate individual wells with irrigated parcels. *StateDGI* is a tool

developed as part of the Colorado Decisions Support System (CDSS), which is used to associate land use, crop type, irrigation structure, and associate wells with parcels for each cell in the model. Agriculture well pumping was estimated based on consumptive use within *StatePP* due to the lack of actual pumping data.

The methodology used for developing the agricultural pumping estimates where groundwater is the sole water source is based on the consumptive use demand for crops and an estimated irrigation efficiency. Irrigation efficiency is estimated at 80 percent for sprinkler irrigation and 60 percent for flood irrigation. The pumping estimates were limited to decreed pumping rates.

For lands that get both surface and groundwater, consumptive use demand and associated losses are first met through surface water diversion, with the remainder of the demand made up through pumping of irrigation wells, with the wells limited by their decreed rate. For cases where lands have wells with decreed rates higher than physically feasible for pumping were truncated to a maximum rate of 2,000 gallons per minute (gpm). A number of wells had decreed rates well above the quantity that was physically possible to pump, either through adjudicating these wells as alternate points of diversion for surface rights, or from very old decrees that did not consider actual pumping rates. For example, Well WDID205053 showed a total decreed rate of 4,437 gpm. Additional detail on the consumptive use methodology can be found in the SPDSS report *Historic Crop Consumptive Use Analysis* (SPDSS 2010).

2.2 Data Processing

StatePP is a pre-processing tool that was used to create input files for MODFLOW pumping files for steady-state and transient simulations. *StatePP* was first developed for the Rio Grande Decisions Support System (RGDSS 2004) to facilitate the data centered development of MODFLOW pumping files using data from *StateCU* and *StateDGI* to determine agricultural pumping rates and locations.

In *StatePP,* agricultural pumping is estimated based on the crop consumptive use demand that is not met by surface water diversions. The total consumptive use crop demand is estimated for lands served by each structure within *StateCU*. *StateCU* compares the available surface water diverted for the structure, after accounting for canal loss and irrigation efficiency to determine if the crop demand has been met. The estimated crop demand that is not met by surface water or precipitation is assumed to be supplied by groundwater, for irrigated lands that have wells available. A more detailed description of the consumptive use analysis and files created in *StateCU* is explained in the SPDSS report *Historic Crop Consumptive Use Analysis* (SPDSS 2010).

StatePP uses data from *StateDGI* to allocate the pumping within a structure to individual wells, up to the decreed maximum permitted volume. *StateDGI* uses the geographic information system (GIS) database to determine individual parcels within a structure that are served by wells; or in the case where specific records are not available, geographic proximity to the structure area is used to select wells that are pumped to

meet the demand. The total groundwater demand for a structure is then allocated to wells based on the decreed yield (truncated to 2,000 gpm if necessary) and the proportion of time the well is available. The total pumping for each model cell containing a well is summed and a properly formatted MODFLOW well package file is produced.

As part of the SPDSS, the recent well pumping curtailment in 2005 and 2006 was considered in the agricultural pumping inputs to the model. A detailed description on how the pumping limitations were factored into agricultural pumping via the consumptive use analysis can be found in Appendix O of the *Historic Crop Consumptive Use Analysis*.

A detailed description of *StatePP* functionality and usage instructions are provided in the *StatePP* manuals (RGDSS 2004).

2.3 Model Input

The following sections present the well inputs for the steady-state, transient calibration, and model validation time periods that were used as a starting point in the modeling stages and may be revised during model calibration. Agricultural pumping is input into the model as specified flux values using the Well package of MODFLOW.

2.3.1 Steady-State Period

The steady-state model period represents average annual conditions for 1991 through 1994. The basis for selecting this period is due to a relatively stable hydrology with consistent pumping in the alluvial aquifer. In addition to the stable hydrology, the 1991 through 1994 period was chosen due to the availability of water level data, streamflows, and diversion records for calibration. The rationale for selecting this time period for steady state period is described in more detail in the *SPDSS Phase 4 Task 48.2 Development of Calibration Targets and Criteria Technical Memorandum* (SPDSS 2008).

The steady-state agricultural pumping data set used the annual average pumping rate at each well that was active at any time during the 1991-1994 period. The average annual pumping rates were used since agricultural pumping varies greatly over the year and do not pump during winter months. The total average annual agricultural pumping for the steady-state simulation period is shown in Table C-1.

Table C-1 Average Annual Agricultural Pumping, 1991-1994 (AFY)

Model Input	Rate (AFY)
Agricultural Pumping	432,838

2.3.2 Transient Calibration Period

The transient model calibration period represents monthly conditions for the period 1999 through 2005. The basis for selecting this period is described in the *SPDSS Phase 4 Task 48.2 Development of Calibration Targets and Criteria Technical Memorandum*. Briefly the period from 1999 to 2005 represents a period where there is a range of hydrologic

conditions, variability in well pumping and sufficient observed data necessary for transient model calibration. The goal of transient model calibration is to verify the model is able to simulate observed responses to changing conditions within an acceptable level of accuracy.

The transient calibration period model inputs consist of estimates of monthly agricultural pumping for the 84 stress periods from January 1999 through December 2005. The agricultural pumping was estimated using the demand based method described above using *StatePP*. The model-wide monthly values are shown in Figure C-1. Pumping rates for agricultural wells range from zero during the non-growing season winter months, generally from November through March, and reach peak values in July of each year. The highest monthly value, 223,000 acre-feet (AF), occurred during July 2002. Groundwater pumping for irrigation declined during 2005, reflecting the shutdown of wells without sufficient water rights as shown in Figure C-2. The average annual value is 498,000 AF.

2.3.3 Model Validation Period

The model validation period represents monthly conditions for the full study period of 1950 through 2006.

The model validation period model inputs consist of monthly values of agricultural pumping for the 684 stress periods from January 1950 through December 2006, estimated using the demand approach in *StatePP*. The annual agricultural pumping values for this time period are shown in Figure C-2 and listed in Table C-2 (included at the end of text). Annual values range from 176,000 AF in 1951 to 714,000 AF in 2002, with an average annual value for this period of 438,000 AF. There were 15 years in which agricultural wells pumped more than 500,000 AF, with the changes from one year to the next of over 100,000 AF being common. Other years of high pumping include 1963, 1964, 1977, and 2000.

Average monthly agricultural pumping values for the model validation period are shown in Figure C-3 and listed in Table C-3. July has the highest value of average monthly pumping, at 127,000 AF, followed by August, June, and September.

Table C-3 Average Monthly Agricultural Pumping, 1950-2006 (AF/month)

Time Period	Average Rate (AF/month)
January	0
February	0
March	16
April	4,461
May	29,161
June	77,483
July	126,652
August	119,215
September	67,426
October	13,089
November	99
December	0

3.0 Municipal and Industrial Pumping

Municipal and industrial (M&I) pumping is included in the SPDSS groundwater model to represent groundwater usage by municipal, industrial, and commercial entities. M&I pumping in the SPDSS study area is input into the model as specified flux values using the MODFLOW Well package.

3.1 Data Sources

M&I pumping information used as input to the alluvial groundwater model is taken largely from results presented in the SPDSS Task 41.3 Technical Memorandum (TM) (SPDSS 2006). As reported in this TM, M&I users that pump alluvial groundwater in the study area were identified from a query of the HydroBase water rights database based on the 'use type' code and linking this to a GIS shapefile of Division 1 decreed wells. Only wells that pump more than 50 gpm or M&I entities that have a total permitted pumping rate of at least 1,000 gpm were considered. This resulted in 50 M&I entities, shown below, each of whom were contacted to obtain pumping data.

- Ft. Morgan
- Public Service (also listed as Xcel Corp)
- Ft. Lupton
- Brighton
- Aurora
- Monfort Finance Co Inc (now Five Rivers Ranch)
- Thornton
- Englewood
- South Adams County Water & Sanitation District Sterling
- Cherry Creek Gallery
- Golden Eagle Ranch (also listed as R. McAtee)
- Great Western Sugar Co
- Monfort Packing Co. (now Swift & Co.)
- Brush
- Greeley
- Piney Creek (ECCV Wellfield)
- Sterling E W
- Sterling Colorado Beef CO/ Cargill (now Trinidad Bean Co.)
- Julesburg
- LaSalle
- Klausner, James T.
- Packaging Corporation of America/ Republic Paperboard
- SUNCOR / Conoco Phillips Commerce City Refinery
- Carey, E K
- Parker Water & Sanitation District (also listed as Williamson Well)
- Wiggins
- Reddy Ice (Formerly City Ice)
- Grand Mesa Eggs, Inc (listed as Dekalb Wells)

- Cherry Creek Country Club (formerly Holland Marcus/Los Verdes Golf Club)
- Centennial Water & Sanitation District (also listed as Cent. Turf Club)
- Lauck/Knievel D.A. & M. A.
- Platteville
- Walker Well 4-2498-F/Beauprez R.L. JR. & T. M.
- Cushman Bros./Cushman S.E. & D.W.
- Log Lane Village
- Colorado State Land Board
- K&B Packing/High Plains A & M, LLC
- Kersey
- Ovid
- Morgan County Quality Water Co.
- Krueger Martin (Lower Platte & Beaver)
- Hibbs W. D.
- Mathews/Emerald Sod Farms Ltd/TESODCO
- Valencia Wells
- Lousberg G.W. 1-13083
- Sedgwick
- Hillrose
- N. Colorado Water Association
- Merino

Pumping data supplied by the municipal or industrial entity was used explicitly when available. However, relatively little historical pumping data were provided. Of the entities contacted, 19 provided varying degrees of historical pumping data. For periods and/or entities in which pumping data were not available, the following procedures were used to estimate monthly pumping rates, as summarized from the Task 41.3 TM (SPDSS 2006).

For municipal water providers, pumping rates were estimated based on population data and per capita demand. Population data were available on a decadal basis from the U.S. Census Bureau and were interpolated to obtain annual population estimates. Per capita demands for a given municipal provider were used when available, or were obtained from basin-wide estimates reported in the Colorado Statewide Water Supply Initiative (SWSI) Report (Colorado Water Conservation Board [CWCB] 2004). Monthly pumping from a given provider was based on patterns present in the data provided, or from monthly data from nearby and similar-sized municipal providers. Pumping from individual wells was apportioned based on the data received, on the decreed rates of individual wells, or assigned uniformly if information did not exist for specific wells. The pumping rates for Aurora needed to be reduced by a factor of three to remain within the capacity of the aquifer. The Task 41.3 TM provides more details on the process used to estimate monthly pumping for each municipal entity.

For industrial wells, available data were used to develop regression equations to extrapolate pumping rates (limited by decreed rates) to times of missing records.

Starting dates were taken from well permit dates. In most cases the industrial well pumping rates had to be estimated and were set initially to be their decreed rates. In many cases, this decreed rate was unreasonable for the aquifer conditions, so actual operating periods likely for the industries were considered, and the rates were reduced to 25 percent of the decreed rate. Two of these entities—Klausner and Swift—needed pumping rates to be reduced by a factor of three to remain within the capacity of the aquifer.

Other modifications included the following: Great Western Sugar and Monfort Finance provided updated pumping rates in late 2008 as part of water rights augmentation plans; and the pumping from Swift was distributed to five wells instead of one to spread out the pumping impact. The Task 41.3 TM provides more details on the process used to estimate monthly pumping for each industrial entity.

3.2 Data Processing

The M&I pumping rates are specified as a direct input to *StatePP* where they are merged into the MODFLOW Well package file with agricultural pumping.

3.3 Model Input

The following sections present the M&I pumping estimates for the steady-state, transient calibration, and model validation time periods implemented in the model.

3.3.1 Steady-State Period

The steady-state model period represents average annual conditions for 1991 through 1994. The basis for selecting this period is described in the *SPDSS Phase 4 Task 48.2 Technical Memorandum, Development of Calibration Targets and Criteria* (SPDSS 2008).

The steady-state model input consists of the average annual M&I pumping values for 1991 through 1994 for each M&I well pumped during this period. The total modeled M&I well pumping for the steady-state period is shown in Table C-4.

Table C-4 Average Annual M&I Pumping, 1991-1994 (AFY)

Model Input	Rate (AFY)
M&I Pumping	49,600

3.3.2 Transient Calibration Period

The transient model calibration period represents monthly conditions for the period 1999 through 2005. The basis for selecting this period is described in the *SPDSS Phase 4 Task 48.2 Technical Memorandum, Development of Calibration Targets and Criteria* (SPDSS 2008).

The transient calibration period model inputs consist of monthly values that simulate M&I pumping for the 84 stress periods from January 1999 through December 2005. The monthly values are shown in Figure C-4. Pumping amounts are at their lowest, approximately 3,000 AF, in the November through March time period, and reach peak

values of over 6,000 AF in July of each year. Both winter-season and summer-season rates showed a slight increase from 1999 through 2002 and then declined in 2003-2004 before returning to previous rates in 2005. The highest monthly value, 6,200 AF, occurred during July 2005. The average monthly value during this period is 4,100 AF and the average annual value is 45,080 AF.

3.3.3 Model Validation Period

The model validation period represents monthly conditions for the full study period of 1950 through 2006.

The model validation period model inputs consist of monthly values that simulate M&I pumping for the 684 stress periods from January 1950 through December 2006. The annual M&I pumping values for this time period are shown in Figure C-5. Annual values range from 21,000 AF in 1951 to 54,000 AF in 2002, with an average annual value for this period of 46,400 AF. Annual M&I pumping amounts increased steadily from 1950 through 1980 to approximately 50,000 AF, declined almost 10 percent in 1981, and remained at relatively constant rates into the early 1990s, and then had larger annual variability through 2005.

Average monthly M&I pumping values for the model validation period are shown in Figure C-6 and listed in Table C-5. The highest average monthly pumping amount occurs in July, at 6,200 AF, followed by August, June, and September. November and December have the lowest average monthly pumping amounts, at approximately 2,650 AF.

Table C-5 Average Monthly M&I Pumping, 1950-2006 (AF/month)

Month	Average Rate (AF/month)
January	2,679
February	2,643
March	2,976
April	3,572
May	4,355
June	5,076
July	6,193
August	5,486
September	4,553
October	3,538
November	2,675
December	2,622

4.0 References

CWCB, 2004. *Colorado Statewide Water Supply Initiative Report* (SWSI). Prepared for the Colorado Water Conservation Board by CDM.

RGDSS, 2004. Rio Grande Decision Support System – *Phase 4 Groundwater Model Documentation – Appendix J StatePP Documentation Final (Version 2)*. Prepared for the Colorado Water Conservation Board and Colorado Division of Water Resources by HRS Water Consultants.

SPDSS, 2010. *Historic Crop Consumptive Use Analysis -- South Platte Decision Support System*. Prepared for the Colorado Water Conservation Board and Colorado Division of Water Resources by Leonard Rice Engineers.

SPDSS, 2008. *SPDSS Phase 4 Task 48.2 Technical Memorandum, Development of Calibration Targets and Criteria.* Prepared for the Colorado Water Conservation Board and Colorado Division of Water Resources by CDM. July.

SPDSS, 2006. SPDSS Phase 3 Task 41.3 Technical Memorandum, Estimation of Municipal and Industrial Pumping in the South Platte Alluvium Region. Prepared for the Colorado Water Conservation Board and Colorado Division of Water Resources by CDM.

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
1	1/1/1950	-980.5	0.0
2	2/1/1950	-889.9	0.0
3	3/1/1950	-1109.2	0.0
4	4/1/1950	-1483.5	-225.0
5	5/1/1950	-2018.2	-9381.7
6	6/1/1950	-2431.6	-35330.2
7	7/1/1950	-2916.6	-49474.3
8	8/1/1950	-2744.7	-81244.1
9	9/1/1950	-2135.2	-59182.0
10	10/1/1950	-1741.9	-13297.2
11	11/1/1950	-1173.7	-132.2
12	12/1/1950	-1375.0	0.0
13	1/1/1951	-1516.2	0.0
14	2/1/1951	-1414.3	0.0
15	3/1/1951	-1596.9	0.0
16	4/1/1951	-1992.1	-1.0
17	5/1/1951	-2581.1	-10398.1
18	6/1/1951	-2924.3	-24469.9
19	7/1/1951	-3579.4	-61701.4
20	8/1/1951	-3316.9	-46403.1
21	9/1/1951	-2578.6	-28868.8
22	10/1/1951	-2103.8	-4053.4
23	11/1/1951	-1475.1	0.0
24	12/1/1951	-1437.5	0.0
25	1/1/1952	-1557.4	0.0
26	2/1/1952	-1512.0	0.0
27	3/1/1952	-1653.8	0.0
28	4/1/1952	-2076.4	-33.1
29	5/1/1952	-2688.7	-6146.9
30	6/1/1952	-3055.1	-58122.4
31	7/1/1952	-3757.2	-89607.9
32	8/1/1952	-3476.2	-87907.6
33	9/1/1952	-2685.1	-66012.8
34	10/1/1952	-2176.3	-7120.8
35	11/1/1952	-1509.3	0.0
36	12/1/1952	-1463.9	0.0
37	1/1/1953	-1601.6	0.0
38	2/1/1953	-1508.6	0.0
39	3/1/1953	-1712.9	0.0
40	4/1/1953	-2134.5	0.0
41	5/1/1953	-2761.7	-2808.9
42	6/1/1953	-3129.8	-39692.4

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
43	7/1/1953	-3907.6	-69950.0
44	8/1/1953	-3611.2	-85077.0
45	9/1/1953	-2787.5	-87337.1
46	10/1/1953	-2244.9	-14759.8
47	11/1/1953	-1553.8	-160.5
48	12/1/1953	-1507.1	0.0
49	1/1/1954	-1629.3	0.0
50	2/1/1954	-1540.8	0.0
51	3/1/1954	-1755.4	0.0
52	4/1/1954	-2178.7	-13048.7
53	5/1/1954	-2822.6	-29630.8
54	6/1/1954	-3194.5	-83896.0
55	7/1/1954	-4060.9	-155572.5
56	8/1/1954	-3797.8	-135832.0
57	9/1/1954	-2956.7	-95870.5
58	10/1/1954	-2402.0	-14833.5
59	11/1/1954	-1706.9	-150.3
60	12/1/1954	-1658.2	0.0
61	1/1/1955	-1786.3	0.0
62	2/1/1955	-1788.7	0.0
63	3/1/1955	-2122.9	0.0
64	4/1/1955	-2649.4	-4005.5
65	5/1/1955	-3313.2	-30773.6
66	6/1/1955	-3867.5	-48589.2
67	7/1/1955	-4731.2	-166303.6
68	8/1/1955	-4340.0	-147344.4
69	9/1/1955	-3448.5	-61976.9
70	10/1/1955	-2618.9	-13826.1
71	11/1/1955	-1853.8	-1.0
72	12/1/1955	-1804.5	0.0
73	1/1/1956	-1945.6	0.0
74	2/1/1956	-1999.9	0.0
75	3/1/1956	-2237.7	0.0
76	4/1/1956	-2774.1	-140.6
77	5/1/1956	-3487.0	-30569.7
78	6/1/1956	-4032.6	-99542.3
79	7/1/1956	-4929.4	-100906.0
80	8/1/1956	-4467.4	-112376.9
81	9/1/1956	-3558.6	-103614.4
82	10/1/1956	-2699.5	-22369.8
83	11/1/1956	-1929.0	-3.9
84	12/1/1956	-1886.0	0.0

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
85	1/1/1957	-2014.9	0.0
86	2/1/1957	-2004.0	0.0
87	3/1/1957	-2320.9	0.0
88	4/1/1957	-2934.5	-5.0
89	5/1/1957	-3645.8	-253.8
90	6/1/1957	-4190.5	-40623.3
91	7/1/1957	-5062.4	-93969.6
92	8/1/1957	-4606.4	-91886.5
93	9/1/1957	-3706.4	-57360.5
94	10/1/1957	-2832.0	-9901.3
95	11/1/1957	-2081.8	0.0
96	12/1/1957	-2031.4	0.0
97	1/1/1958	-2183.2	0.0
98	2/1/1958	-2206.2	0.0
99	3/1/1958	-2535.3	0.0
100	4/1/1958	-3047.5	0.0
101	5/1/1958	-3777.2	-16924.3
102	6/1/1958	-4313.8	-61578.2
103	7/1/1958	-5230.6	-80281.7
104	8/1/1958	-4766.4	-128350.7
105	9/1/1958	-3836.9	-61211.9
106	10/1/1958	-2936.1	-13199.0
107	11/1/1958	-2166.4	-37.8
108	12/1/1958	-2120.6	0.0
109	1/1/1959	-2312.1	0.0
110	2/1/1959	-2302.0	0.0
111	3/1/1959	-2675.9	0.0
112	4/1/1959	-3215.2	0.0
113	5/1/1959	-3973.0	-3810.1
114	6/1/1959	-4575.3	-80190.0
115	7/1/1959	-5501.0	-137746.1
116	8/1/1959	-5003.8	-148053.5
117	9/1/1959	-4037.2	-61937.5
118	10/1/1959	-3083.6	-4712.3
119	11/1/1959	-2296.6	0.0
120	12/1/1959	-2231.2	0.0
121	1/1/1960	-2379.5	0.0
122	2/1/1960	-2505.5	0.0
123	3/1/1960	-2777.4	0.0
124	4/1/1960	-3372.4	-2318.7
125	5/1/1960	-4153.7	-21257.0
126	6/1/1960	-4763.1	-77386.5

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
127	7/1/1960	-5694.9	-115051.3
128	8/1/1960	-5188.8	-165055.6
129	9/1/1960	-4200.8	-94999.3
130	10/1/1960	-3226.8	-13279.5
131	11/1/1960	-2431.6	-50.2
132	12/1/1960	-2363.6	0.0
133	1/1/1961	-2472.3	0.0
134	2/1/1961	-2481.3	0.0
135	3/1/1961	-2837.2	0.0
136	4/1/1961	-3382.2	0.0
137	5/1/1961	-4163.5	-5416.1
138	6/1/1961	-4772.0	-60342.0
139	7/1/1961	-5705.0	-85033.3
140	8/1/1961	-5201.3	-107502.1
141	9/1/1961	-4213.2	-24952.8
142	10/1/1961	-3239.4	-9143.4
143	11/1/1961	-2444.7	0.0
144	12/1/1961	-2377.4	0.0
145	1/1/1962	-2498.1	0.0
146	2/1/1962	-2485.7	0.0
147	3/1/1962	-2839.5	0.0
148	4/1/1962	-3389.7	-4631.7
149	5/1/1962	-4173.3	-28839.6
150	6/1/1962	-4793.2	-43095.1
151	7/1/1962	-5729.2	-103154.0
152	8/1/1962	-5222.4	-124068.2
153	9/1/1962	-4230.7	-44594.7
154	10/1/1962	-3248.6	-15345.1
155	11/1/1962	-2452.2	-342.6
156	12/1/1962	-2383.4	0.0
157	1/1/1963	-2493.5	0.0
158	2/1/1963	-2479.7	0.0
159	3/1/1963	-2830.7	0.0
160	4/1/1963	-3381.0	-8269.3
161	5/1/1963	-4164.8	-67538.2
162	6/1/1963	-4783.7	-91126.0
163	7/1/1963	-5732.6	-198891.6
164	8/1/1963	-5228.3	-106440.9
165	9/1/1963	-4236.5	-51872.2
166	10/1/1963	-3254.5	-34339.6
167	11/1/1963	-2458.6	-875.1
168	12/1/1963	-2390.6	0.0

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
169	1/1/1964	-2502.9	0.0
170	2/1/1964	-2625.0	0.0
171	3/1/1964	-2933.9	0.0
172	4/1/1964	-3475.0	-686.5
173	5/1/1964	-4244.1	-30961.0
174	6/1/1964	-4970.8	-74024.1
175	7/1/1964	-5868.5	-208661.5
176	8/1/1964	-5285.4	-168629.4
177	9/1/1964	-4292.1	-96273.4
178	10/1/1964	-3270.7	-16768.5
179	11/1/1964	-2454.9	-24.6
180	12/1/1964	-2387.7	0.0
181	1/1/1965	-2519.5	0.0
182	2/1/1965	-2612.6	0.0
183	3/1/1965	-3082.5	0.0
184	4/1/1965	-3647.5	-4122.2
185	5/1/1965	-4412.1	-26678.4
186	6/1/1965	-5366.7	-28467.6
187	7/1/1965	-6218.1	-97481.3
188	8/1/1965	-5525.0	-122591.9
189	9/1/1965	-4513.9	-23820.7
190	10/1/1965	-3388.8	-13784.7
191	11/1/1965	-2543.7	-1084.4
192	12/1/1965	-2477.6	0.0
193	1/1/1966	-2593.9	0.0
194	2/1/1966	-2684.8	0.0
195	3/1/1966	-3152.5	0.0
196	4/1/1966	-3717.9	-309.4
197	5/1/1966	-4482.6	-56622.7
198	6/1/1966	-5368.8	-75158.3
199	7/1/1966	-6221.5	-199605.9
200	8/1/1966	-5530.7	-133008.1
201	9/1/1966	-4519.7	-64788.9
202	10/1/1966	-3394.4	-11088.6
203	11/1/1966	-2538.4	-56.5
204	12/1/1966	-2473.5	0.0
205	1/1/1967	-2677.2	0.0
206	2/1/1967	-2798.3	0.0
207	3/1/1967	-3311.0	-39.2
208	4/1/1967	-3903.8	-7191.5
209	5/1/1967	-4667.9	-11258.9
210	6/1/1967	-5736.9	-21802.6

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
211	7/1/1967	-6563.3	-89066.0
212	8/1/1967	-5768.1	-120169.3
213	9/1/1967	-4729.9	-98095.8
214	10/1/1967	-3513.3	-22240.2
215	11/1/1967	-2626.3	-23.7
216	12/1/1967	-2544.9	0.0
217	1/1/1968	-2673.2	0.0
218	2/1/1968	-2892.3	0.0
219	3/1/1968	-3302.6	0.0
220	4/1/1968	-3895.8	-55.0
221	5/1/1968	-4660.3	-9375.1
222	6/1/1968	-5729.0	-87322.1
223	7/1/1968	-6557.3	-135189.4
224	8/1/1968	-5763.6	-104462.9
225	9/1/1968	-4724.9	-110404.3
226	10/1/1968	-3507.8	-23027.3
227	11/1/1968	-2620.8	-36.6
228	12/1/1968	-2540.4	0.0
229	1/1/1969	-2668.5	0.0
230	2/1/1969	-2786.4	0.0
231	3/1/1969	-3293.7	0.0
232	4/1/1969	-3887.0	-9775.8
233	5/1/1969	-4651.7	-24701.8
234	6/1/1969	-5741.8	-70496.5
235	7/1/1969	-6571.3	-148101.5
236	8/1/1969	-5780.1	-166684.0
237	9/1/1969	-4741.3	-65757.7
238	10/1/1969	-3524.3	-1487.7
239	11/1/1969	-2638.0	0.0
240	12/1/1969	-2558.2	0.0
241	1/1/1970	-2763.6	0.0
242	2/1/1970	-2867.1	0.0
243	3/1/1970	-3406.7	0.0
244	4/1/1970	-4000.5	-100.0
245	5/1/1970	-4802.7	-44477.1
246	6/1/1970	-5860.1	-64600.3
247	7/1/1970	-6876.2	-154572.9
248	8/1/1970	-5936.3	-163012.5
249	9/1/1970	-4847.6	-59043.4
250	10/1/1970	-3638.0	-8253.5
251	11/1/1970	-2754.2	0.0
252	12/1/1970	-2670.0	0.0

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
253	1/1/1971	-2788.3	0.0
254	2/1/1971	-2869.8	0.0
255	3/1/1971	-3380.3	0.0
256	4/1/1971	-4059.7	-16.0
257	5/1/1971	-4876.2	-17866.6
258	6/1/1971	-5997.2	-98290.1
259	7/1/1971	-6926.0	-157846.8
260	8/1/1971	-5996.2	-172567.2
261	9/1/1971	-4873.3	-35969.4
262	10/1/1971	-3713.2	-8413.2
263	11/1/1971	-2801.5	0.0
264	12/1/1971	-2711.7	0.0
265	1/1/1972	-2817.2	0.0
266	2/1/1972	-3004.9	0.0
267	3/1/1972	-3474.0	-212.4
268	4/1/1972	-4099.0	-10826.2
269	5/1/1972	-4849.1	-41276.0
270	6/1/1972	-5923.9	-81964.7
271	7/1/1972	-6925.5	-149083.6
272	8/1/1972	-5952.0	-113316.8
273	9/1/1972	-4934.9	-88935.5
274	10/1/1972	-3806.9	-18559.8
275	11/1/1972	-2822.6	0.0
276	12/1/1972	-2739.2	0.0
277	1/1/1973	-2832.9	0.0
278	2/1/1973	-2921.8	0.0
279	3/1/1973	-3447.3	0.0
280	4/1/1973	-4014.1	-4.8
281	5/1/1973	-4706.8	-970.5
282	6/1/1973	-6006.4	-69771.6
283	7/1/1973	-6901.2	-115887.2
284	8/1/1973	-6010.9	-161354.6
285	9/1/1973	-4905.6	-40568.1
286	10/1/1973	-3769.3	-27018.8
287	11/1/1973	-2829.1	-37.0
288	12/1/1973	-2738.1	0.0
289	1/1/1974	-2847.4	0.0
290	2/1/1974	-2924.5	0.0
291	3/1/1974	-3475.3	0.0
292	4/1/1974	-4105.1	-936.3
293	5/1/1974	-4983.6	-58882.9
294	6/1/1974	-6073.8	-85151.3

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
295	7/1/1974	-7060.6	-157923.6
296	8/1/1974	-6021.9	-140015.5
297	9/1/1974	-4959.0	-64319.3
298	10/1/1974	-3803.4	-19276.9
299	11/1/1974	-2829.7	-71.1
300	12/1/1974	-2738.9	0.0
301	1/1/1975	-2857.3	0.0
302	2/1/1975	-2942.2	0.0
303	3/1/1975	-3434.5	0.0
304	4/1/1975	-4058.2	-56.7
305	5/1/1975	-4731.0	-4831.1
306	6/1/1975	-5859.8	-67926.9
307	7/1/1975	-6841.0	-122852.9
308	8/1/1975	-5862.3	-134765.1
309	9/1/1975	-4884.5	-77638.6
310	10/1/1975	-3789.6	-16374.5
311	11/1/1975	-2845.3	0.0
312	12/1/1975	-2769.4	0.0
313	1/1/1976	-2878.4	0.0
314	2/1/1976	-3075.3	0.0
315	3/1/1976	-3515.3	0.0
316	4/1/1976	-4230.9	-672.9
317	5/1/1976	-4953.8	-21344.5
318	6/1/1976	-6209.8	-93573.1
319	7/1/1976	-7256.8	-162487.9
320	8/1/1976	-6155.8	-143573.9
321	9/1/1976	-5081.4	-76457.8
322	10/1/1976	-3883.3	-12412.7
323	11/1/1976	-2878.0	0.0
324	12/1/1976	-2793.0	0.0
325	1/1/1977	-2903.5	0.0
326	2/1/1977	-2990.5	0.0
327	3/1/1977	-3537.7	0.0
328	4/1/1977	-4180.3	-4674.4
329	5/1/1977	-5014.8	-51335.5
330	6/1/1977	-6142.9	-135740.9
331	7/1/1977	-7112.0	-170671.2
332	8/1/1977	-6032.6	-142083.9
333	9/1/1977	-5132.5	-93095.2
334	10/1/1977	-3894.3	-16984.6
335	11/1/1977	-2884.5	-73.6
336	12/1/1977	-2792.9	0.0

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
337	1/1/1978	-2900.9	0.0
338	2/1/1978	-2947.4	0.0
339	3/1/1978	-3450.1	-1.0
340	4/1/1978	-4188.2	-8034.2
341	5/1/1978	-4977.3	-19367.5
342	6/1/1978	-6298.4	-75821.6
343	7/1/1978	-7354.4	-165169.6
344	8/1/1978	-6328.1	-126143.0
345	9/1/1978	-5311.4	-109976.2
346	10/1/1978	-3997.3	-10641.6
347	11/1/1978	-2901.2	-4.6
348	12/1/1978	-2804.6	0.0
349	1/1/1979	-2916.1	0.0
350	2/1/1979	-3008.3	0.0
351	3/1/1979	-3558.4	0.0
352	4/1/1979	-4247.2	-485.0
353	5/1/1979	-4981.0	-10942.1
354	6/1/1979	-6265.1	-50100.8
355	7/1/1979	-7416.6	-119427.5
356	8/1/1979	-6168.1	-73874.6
357	9/1/1979	-5281.5	-119028.1
358	10/1/1979	-3983.7	-19557.7
359	11/1/1979	-2920.2	0.0
360	12/1/1979	-2806.6	0.0
361	1/1/1980	-2939.2	0.0
362	2/1/1980	-3116.9	0.0
363	3/1/1980	-3558.9	0.0
364	4/1/1980	-4206.3	0.0
365	5/1/1980	-4900.8	-3568.7
366	6/1/1980	-6366.1	-96317.1
367	7/1/1980	-7403.4	-133732.1
368	8/1/1980	-6298.8	-127103.8
369	9/1/1980	-5231.7	-101805.5
370	10/1/1980	-3982.3	-18734.8
371	11/1/1980	-2925.1	-46.3
372	12/1/1980	-2831.7	0.0
373	1/1/1981	-2955.8	0.0
374	2/1/1981	-2814.6	0.0
375	3/1/1981	-3120.6	-0.3
376	4/1/1981	-3853.1	-22925.4
377	5/1/1981	-4559.1	-21100.9
378	6/1/1981	-5402.6	-105479.4

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
379	7/1/1981	-6576.3	-113680.2
380	8/1/1981	-5911.7	-121967.5
381	9/1/1981	-4939.2	-94225.2
382	10/1/1981	-3846.1	-16486.4
383	11/1/1981	-2940.9	-518.1
384	12/1/1981	-2837.7	0.0
385	1/1/1982	-2917.0	0.0
386	2/1/1982	-2806.9	0.0
387	3/1/1982	-3157.0	0.0
388	4/1/1982	-4004.7	-3879.2
389	5/1/1982	-4646.9	-22774.0
390	6/1/1982	-5258.7	-43010.7
391	7/1/1982	-6598.3	-108052.1
392	8/1/1982	-5964.9	-117359.2
393	9/1/1982	-4828.0	-68616.8
394	10/1/1982	-3833.9	-10836.7
395	11/1/1982	-2955.8	0.0
396	12/1/1982	-2854.9	0.0
397	1/1/1983	-2921.6	0.0
398	2/1/1983	-2780.3	0.0
399	3/1/1983	-3092.1	0.0
400	4/1/1983	-3661.0	0.0
401	5/1/1983	-4472.2	-319.1
402	6/1/1983	-5091.1	-18305.8
403	7/1/1983	-6524.7	-121892.5
404	8/1/1983	-5961.1	-125491.2
405	9/1/1983	-5001.2	-82862.2
406	10/1/1983	-3912.4	-9262.6
407	11/1/1983	-2931.1	-8.3
408	12/1/1983	-2870.2	0.0
409	1/1/1984	-2946.1	0.0
410	2/1/1984	-2907.6	0.0
411	3/1/1984	-3108.4	0.0
412	4/1/1984	-3687.5	0.0
413	5/1/1984	-4767.7	-17373.1
414	6/1/1984	-5297.7	-84468.0
415	7/1/1984	-6605.6	-146274.7
416	8/1/1984	-5759.5	-106707.0
417	9/1/1984	-4913.0	-74802.1
418	10/1/1984	-3712.8	-2501.1
419	11/1/1984	-2848.5	0.0
420	12/1/1984	-2783.4	0.0

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
421	1/1/1985	-2859.1	0.0
422	2/1/1985	-2693.3	0.0
423	3/1/1985	-3054.5	0.0
424	4/1/1985	-3820.1	-9414.7
425	5/1/1985	-4591.2	-53449.8
426	6/1/1985	-5409.8	-93989.3
427	7/1/1985	-6511.5	-99915.4
428	8/1/1985	-6029.2	-140629.4
429	9/1/1985	-4788.0	-38141.3
430	10/1/1985	-3719.8	-4998.9
431	11/1/1985	-2887.8	0.0
432	12/1/1985	-2823.1	0.0
433	1/1/1986	-2915.9	0.0
434	2/1/1986	-2780.2	0.0
435	3/1/1986	-3217.6	-37.0
436	4/1/1986	-3788.1	-5171.0
437	5/1/1986	-4800.2	-34416.3
438	6/1/1986	-5398.2	-82606.5
439	7/1/1986	-6756.5	-130433.4
440	8/1/1986	-6095.6	-122326.3
441	9/1/1986	-4897.4	-69107.1
442	10/1/1986	-3806.4	-10579.7
443	11/1/1986	-2898.4	0.0
444	12/1/1986	-2841.1	0.0
445	1/1/1987	-2909.0	0.0
446	2/1/1987	-2775.3	0.0
447	3/1/1987	-3074.8	0.0
448	4/1/1987	-3817.4	-2708.2
449	5/1/1987	-4660.7	-18129.9
450	6/1/1987	-5466.2	-90666.8
451	7/1/1987	-7052.4	-147095.7
452	8/1/1987	-6039.3	-93320.4
453	9/1/1987	-4858.5	-58575.4
454	10/1/1987	-3912.3	-13062.9
455	11/1/1987	-2906.8	-5.9
456	12/1/1987	-2826.1	0.0
457	1/1/1988	-2893.4	0.0
458	2/1/1988	-2875.7	0.0
459	3/1/1988	-3057.5	0.0
460	4/1/1988	-3766.8	-586.6
461	5/1/1988	-4763.6	-16303.5
462	6/1/1988	-5502.7	-118447.1

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
463	7/1/1988	-7157.1	-145115.8
464	8/1/1988	-6081.5	-129086.1
465	9/1/1988	-4951.8	-60236.1
466	10/1/1988	-3986.2	-27520.0
467	11/1/1988	-2950.1	-212.1
468	12/1/1988	-2849.9	0.0
469	1/1/1989	-2929.8	0.0
470	2/1/1989	-2820.5	0.0
471	3/1/1989	-3120.9	0.0
472	4/1/1989	-3884.9	-10942.9
473	5/1/1989	-4647.6	-49462.9
474	6/1/1989	-5158.9	-61334.2
475	7/1/1989	-6761.1	-123009.9
476	8/1/1989	-5838.2	-98664.9
477	9/1/1989	-4862.9	-46340.5
478	10/1/1989	-3890.4	-16456.1
479	11/1/1989	-2905.7	-197.5
480	12/1/1989	-2838.6	0.0
481	1/1/1990	-2847.7	0.0
482	2/1/1990	-2687.1	0.0
483	3/1/1990	-2962.0	0.0
484	4/1/1990	-3577.2	-503.3
485	5/1/1990	-4651.6	-21919.2
486	6/1/1990	-4990.5	-122975.9
487	7/1/1990	-6188.5	-81593.3
488	8/1/1990	-5608.0	-92125.7
489	9/1/1990	-4799.2	-82544.4
490	10/1/1990	-3676.8	-13335.0
491	11/1/1990	-2836.4	-88.9
492	12/1/1990	-2812.3	0.0
493	1/1/1991	-2935.4	0.0
494	2/1/1991	-2754.8	0.0
495	3/1/1991	-3118.9	0.0
496	4/1/1991	-3772.4	-8509.1
497	5/1/1991	-4692.5	-45953.7
498	6/1/1991	-5286.9	-93115.3
499	7/1/1991	-6556.4	-102369.7
500	8/1/1991	-5908.6	-102607.9
501	9/1/1991	-4996.6	-60642.9
502	10/1/1991	-3931.9	-14021.3
503	11/1/1991	-3019.4	0.0
504	12/1/1991	-2879.5	0.0

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
505	1/1/1992	-2928.6	0.0
506	2/1/1992	-2896.7	0.0
507	3/1/1992	-3095.4	0.0
508	4/1/1992	-3805.0	-15907.3
509	5/1/1992	-4814.6	-71988.4
510	6/1/1992	-5155.6	-68985.5
511	7/1/1992	-6438.0	-102267.2
512	8/1/1992	-5790.9	-73283.4
513	9/1/1992	-4945.2	-57028.8
514	10/1/1992	-3895.5	-12842.8
515	11/1/1992	-2879.2	0.0
516	12/1/1992	-2839.7	0.0
517	1/1/1993	-3010.7	0.0
518	2/1/1993	-2941.2	0.0
519	3/1/1993	-3032.0	0.0
520	4/1/1993	-3847.5	-5.1
521	5/1/1993	-4874.6	-35212.2
522	6/1/1993	-5336.2	-69458.8
523	7/1/1993	-6661.3	-113611.4
524	8/1/1993	-5996.7	-91429.4
525	9/1/1993	-4908.7	-39549.9
526	10/1/1993	-4097.7	-3652.7
527	11/1/1993	-3064.6	0.0
528	12/1/1993	-2812.7	0.0
529	1/1/1994	-3008.7	0.0
530	2/1/1994	-2446.5	0.0
531	3/1/1994	-2582.9	0.0
532	4/1/1994	-3648.8	-1566.3
533	5/1/1994	-4240.0	-63463.2
534	6/1/1994	-4978.1	-128186.2
535	7/1/1994	-6555.9	-130328.3
536	8/1/1994	-5835.4	-141669.4
537	9/1/1994	-5247.1	-74867.3
538	10/1/1994	-4080.4	-8827.0
539	11/1/1994	-2951.6	0.0
540	12/1/1994	-2845.5	0.0
541	1/1/1995	-2957.6	0.0
542	2/1/1995	-2712.2	0.0
543	3/1/1995	-3011.1	0.0
544	4/1/1995	-3582.3	0.0
545	5/1/1995	-4498.9	-959.4
546	6/1/1995	-5319.0	-32891.3

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
547	7/1/1995	-6638.6	-123888.3
548	8/1/1995	-5938.8	-138893.6
549	9/1/1995	-4835.4	-42350.2
550	10/1/1995	-3655.0	-5554.5
551	11/1/1995	-2662.7	-75.3
552	12/1/1995	-2666.8	0.0
553	1/1/1996	-2983.4	0.0
554	2/1/1996	-2911.1	0.0
555	3/1/1996	-2832.8	0.0
556	4/1/1996	-3675.2	-3221.3
557	5/1/1996	-4515.7	-31341.8
558	6/1/1996	-5123.1	-97614.8
559	7/1/1996	-7020.6	-107334.1
560	8/1/1996	-5854.3	-101960.7
561	9/1/1996	-4716.6	-44032.9
562	10/1/1996	-3907.4	-10257.7
563	11/1/1996	-2877.7	-5.1
564	12/1/1996	-3138.5	0.0
565	1/1/1997	-2727.4	0.0
566	2/1/1997	-2678.1	0.0
567	3/1/1997	-3222.2	0.0
568	4/1/1997	-3380.2	-47.0
569	5/1/1997	-4352.7	-28457.5
570	6/1/1997	-4952.6	-75757.3
571	7/1/1997	-6323.0	-98876.3
572	8/1/1997	-5435.5	-87028.0
573	9/1/1997	-4598.7	-80181.6
574	10/1/1997	-3962.8	-9251.3
575	11/1/1997	-3063.5	0.0
576	12/1/1997	-2650.0	0.0
577	1/1/1998	-3282.5	0.0
578	2/1/1998	-3065.5	0.0
579	3/1/1998	-3391.6	0.0
580	4/1/1998	-3979.6	-830.2
581	5/1/1998	-4876.2	-48139.7
582	6/1/1998	-5561.8	-84966.5
583	7/1/1998	-6889.9	-83518.3
584	8/1/1998	-6174.4	-123640.3
585	9/1/1998	-5271.9	-81931.8
586	10/1/1998	-4036.0	-14832.9
587	11/1/1998	-3121.5	-168.9
588	12/1/1998	-3052.5	0.0

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
589	1/1/1999	-2761.7	0.0
590	2/1/1999	-2619.2	0.0
591	3/1/1999	-2951.3	0.0
592	4/1/1999	-3382.2	-524.4
593	5/1/1999	-4208.8	-32676.0
594	6/1/1999	-4822.6	-100294.2
595	7/1/1999	-6277.3	-134759.0
596	8/1/1999	-5450.4	-87366.2
597	9/1/1999	-4599.7	-48774.5
598	10/1/1999	-3588.1	-8139.5
599	11/1/1999	-2712.6	-624.1
600	12/1/1999	-2600.2	0.0
601	1/1/2000	-2875.1	0.0
602	2/1/2000	-2824.4	0.0
603	3/1/2000	-2974.0	-15.2
604	4/1/2000	-3623.3	-16878.6
605	5/1/2000	-4410.9	-65535.7
606	6/1/2000	-5034.9	-129989.0
607	7/1/2000	-6169.8	-176684.7
608	8/1/2000	-5779.0	-138147.2
609	9/1/2000	-4673.6	-55398.4
610	10/1/2000	-3739.2	-4800.2
611	11/1/2000	-3346.6	0.0
612	12/1/2000	-3309.2	0.0
613	1/1/2001	-3065.9	0.0
614	2/1/2001	-2864.1	0.0
615	3/1/2001	-3154.5	0.0
616	4/1/2001	-3618.6	-2660.0
617	5/1/2001	-4317.4	-28360.7
618	6/1/2001	-5114.9	-136256.8
619	7/1/2001	-6387.5	-114354.8
620	8/1/2001	-5939.0	-136839.2
621	9/1/2001	-5082.4	-76703.9
622	10/1/2001	-4277.1	-14574.4
623	11/1/2001	-3401.5	-97.1
624	12/1/2001	-3277.7	0.0
625	1/1/2002	-3208.0	0.0
626	2/1/2002	-3260.7	0.0
627	3/1/2002	-3540.2	0.0
628	4/1/2002	-4555.1	-18186.7
629	5/1/2002	-5200.7	-66842.1
630	6/1/2002	-5495.6	-145986.8

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
631	7/1/2002	-6548.9	-222905.2
632	8/1/2002	-5911.2	-166113.8
633	9/1/2002	-5280.6	-84026.2
634	10/1/2002	-4111.5	-9883.0
635	11/1/2002	-3415.9	0.0
636	12/1/2002	-3580.9	0.0
637	1/1/2003	-3442.2	0.0
638	2/1/2003	-3265.8	0.0
639	3/1/2003	-3452.0	0.0
640	4/1/2003	-3626.3	-15209.7
641	5/1/2003	-4049.9	-51826.0
642	6/1/2003	-4633.5	-76730.6
643	7/1/2003	-6054.4	-169640.9
644	8/1/2003	-5613.5	-124093.3
645	9/1/2003	-4732.8	-53889.7
646	10/1/2003	-4238.9	-17379.1
647	11/1/2003	-3339.3	-109.4
648	12/1/2003	-3457.6	0.0
649	1/1/2004	-3233.2	0.0
650	2/1/2004	-3136.4	0.0
651	3/1/2004	-3224.0	-589.1
652	4/1/2004	-3657.6	-16681.6
653	5/1/2004	-4353.8	-56409.1
654	6/1/2004	-4413.0	-71656.8
655	7/1/2004	-5521.0	-115539.6
656	8/1/2004	-5005.8	-93852.0
657	9/1/2004	-4411.1	-50314.0
658	10/1/2004	-3514.0	-20817.2
659	11/1/2004	-2752.2	-7.0
660	12/1/2004	-2968.2	0.0
661	1/1/2005	-3355.0	0.0
662	2/1/2005	-3058.8	0.0
663	3/1/2005	-3368.1	0.0
664	4/1/2005	-3823.0	-1110.1
665	5/1/2005	-4826.6	-27705.2
666	6/1/2005	-5186.5	-44030.9
667	7/1/2005	-6807.4	-108308.5
668	8/1/2005	-5698.0	-77364.3
669	9/1/2005	-5389.2	-61872.7
670	10/1/2005	-3843.1	-4788.8
671	11/1/2005	-3240.2	-314.4
672	12/1/2005	-3302.8	0.0

Table C-2 Monthly Well Pumping During Study Period			
		Acre-feet	
Stress Period	Date	Municipal and Industrial	Irrigation
673	1/1/2006	-3355.0	0.0
674	2/1/2006	-3058.8	0.0
675	3/1/2006	-3368.1	0.0
676	4/1/2006	-3823.0	-16201.5
677	5/1/2006	-4826.6	-53854.1
678	6/1/2006	-5186.5	-118805.2
679	7/1/2006	-6807.4	-102298.6
680	8/1/2006	-5698.0	-82404.0
681	9/1/2006	-5389.2	-30523.0
682	10/1/2006	-3843.1	-6625.2
683	11/1/2006	-3240.2	-8.9
684	12/1/2006	-3302.8	0.0

Figure C-1. Monthly Irrigation Pumping During Transient Calibration Period (1999-2005)

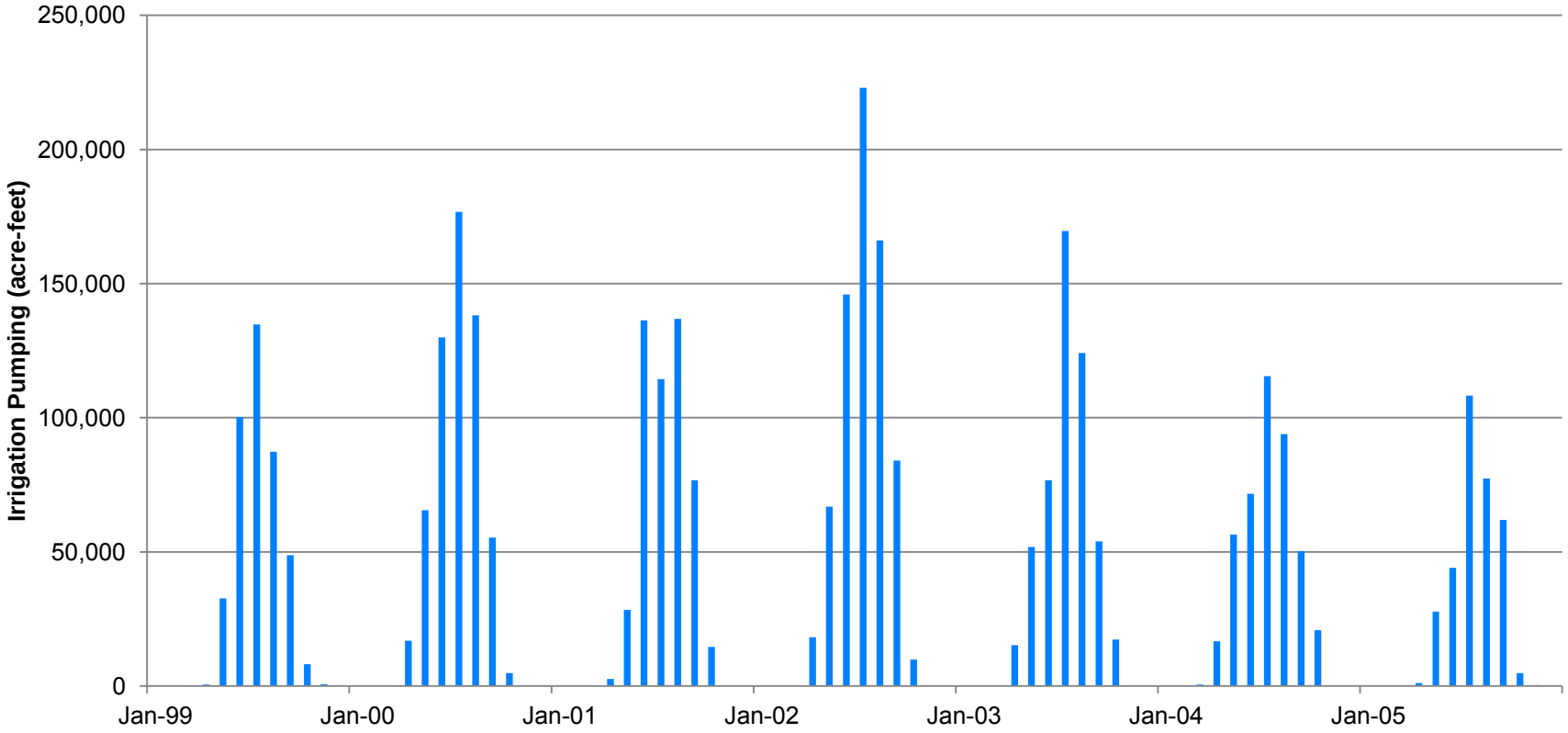

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Figure C-2. Annual Irrigation Pumping During Validation Period (1950 - 2006)

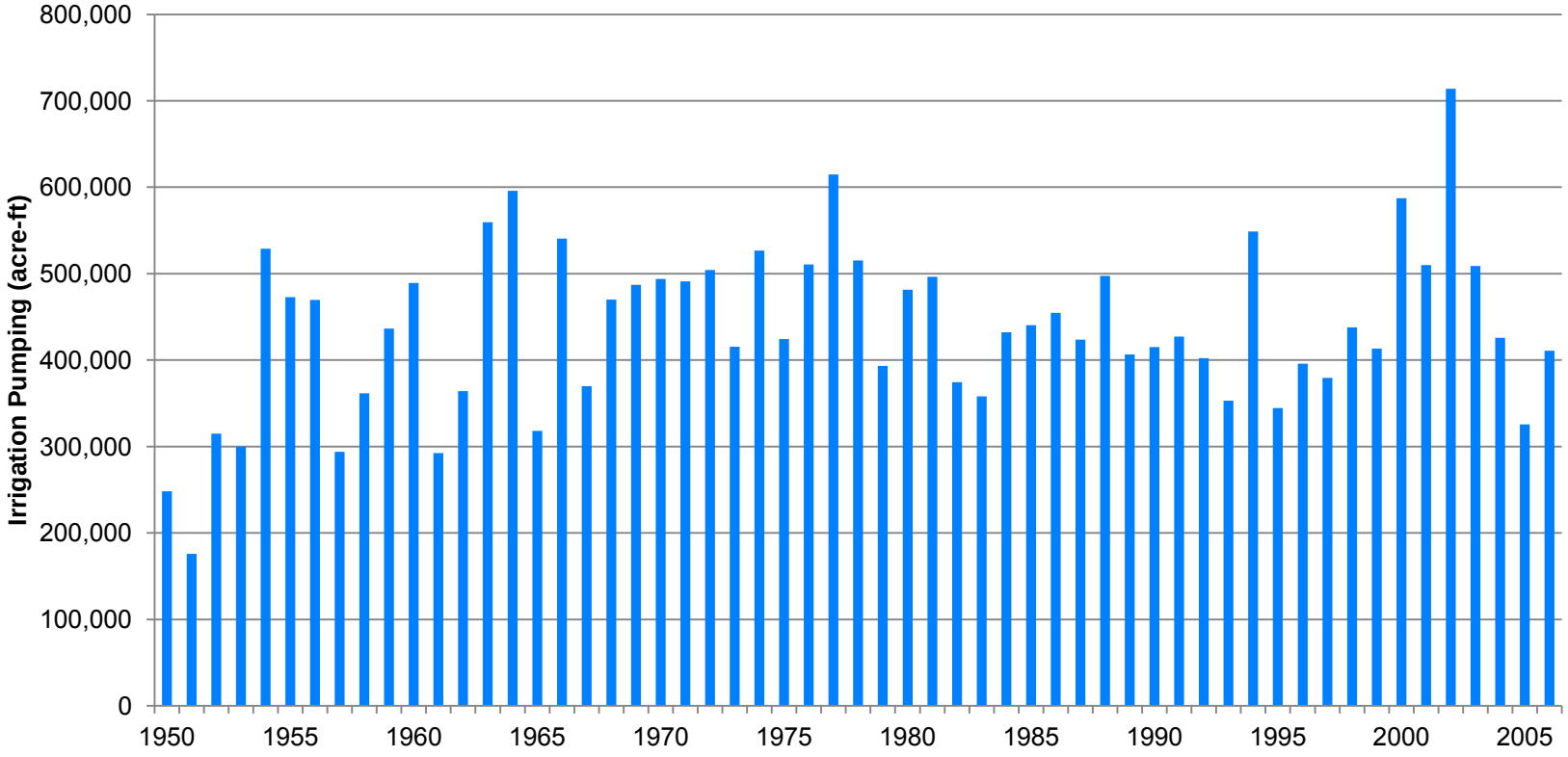

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Figure C-3. Average Monthly Irrigation Pumping During Validation Period (1950 - 2006)

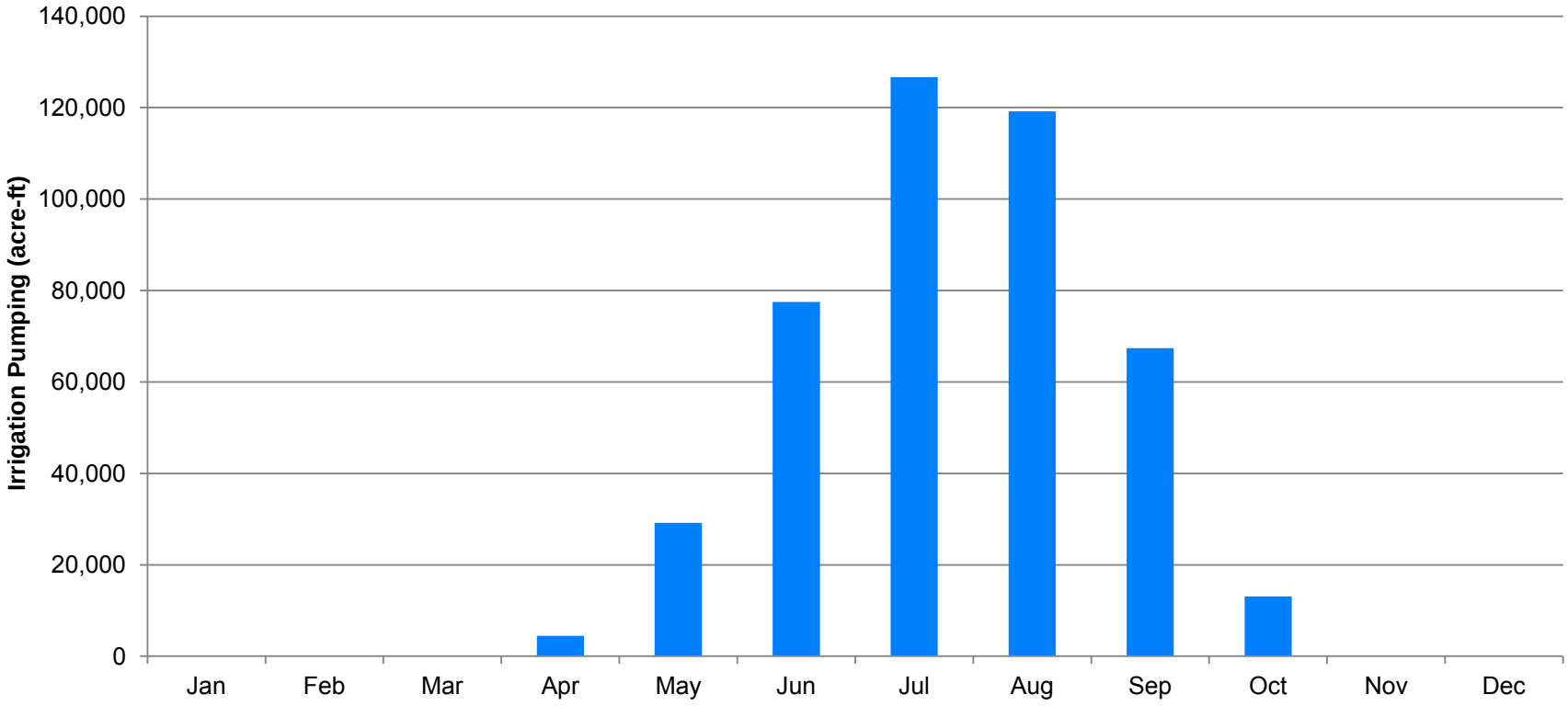

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Figure C-4. Monthly Municipal and Industrial Pumping During Transient Calibration Period (1999 - 2005)

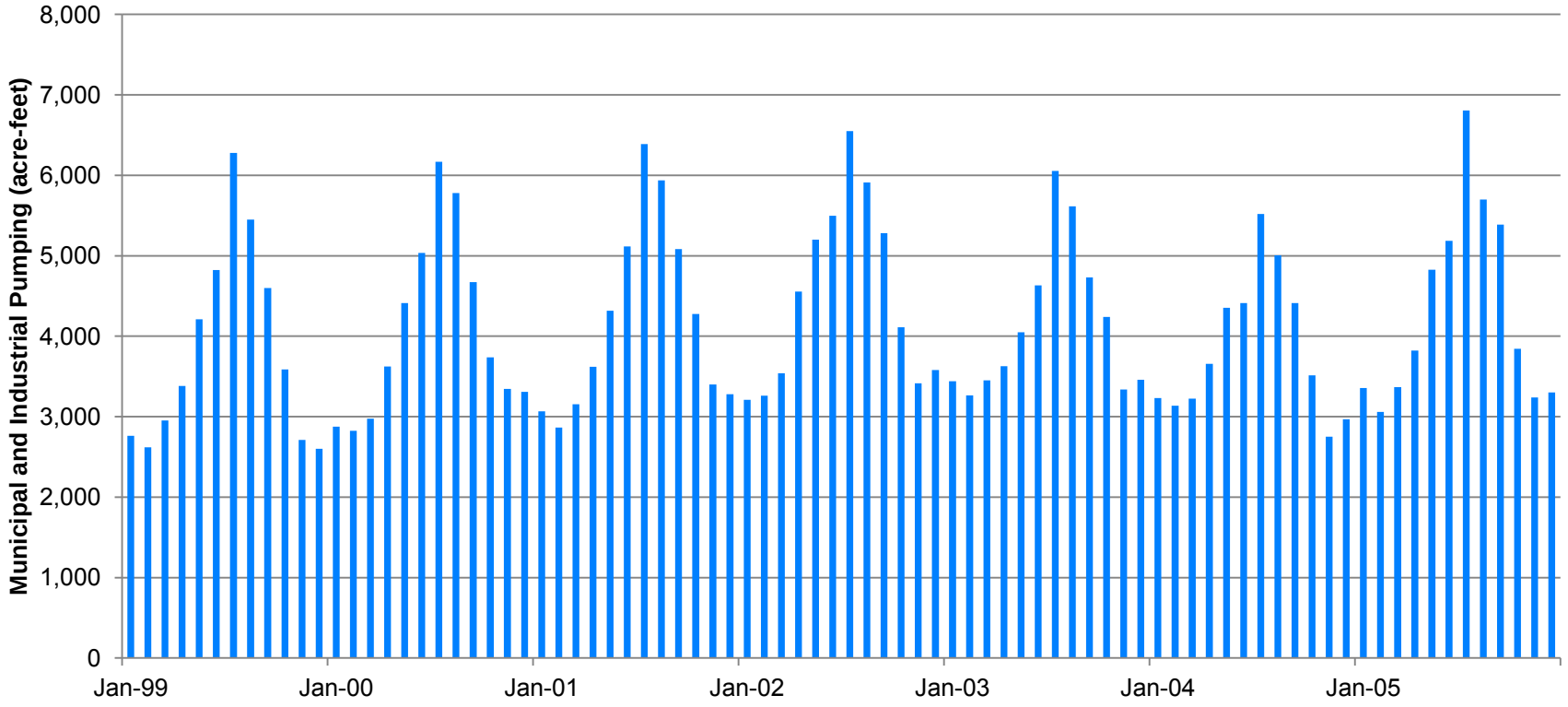

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Figure C-5. Annual Municipal and Industrial Pumping During Validation Period (1950 - 2006)

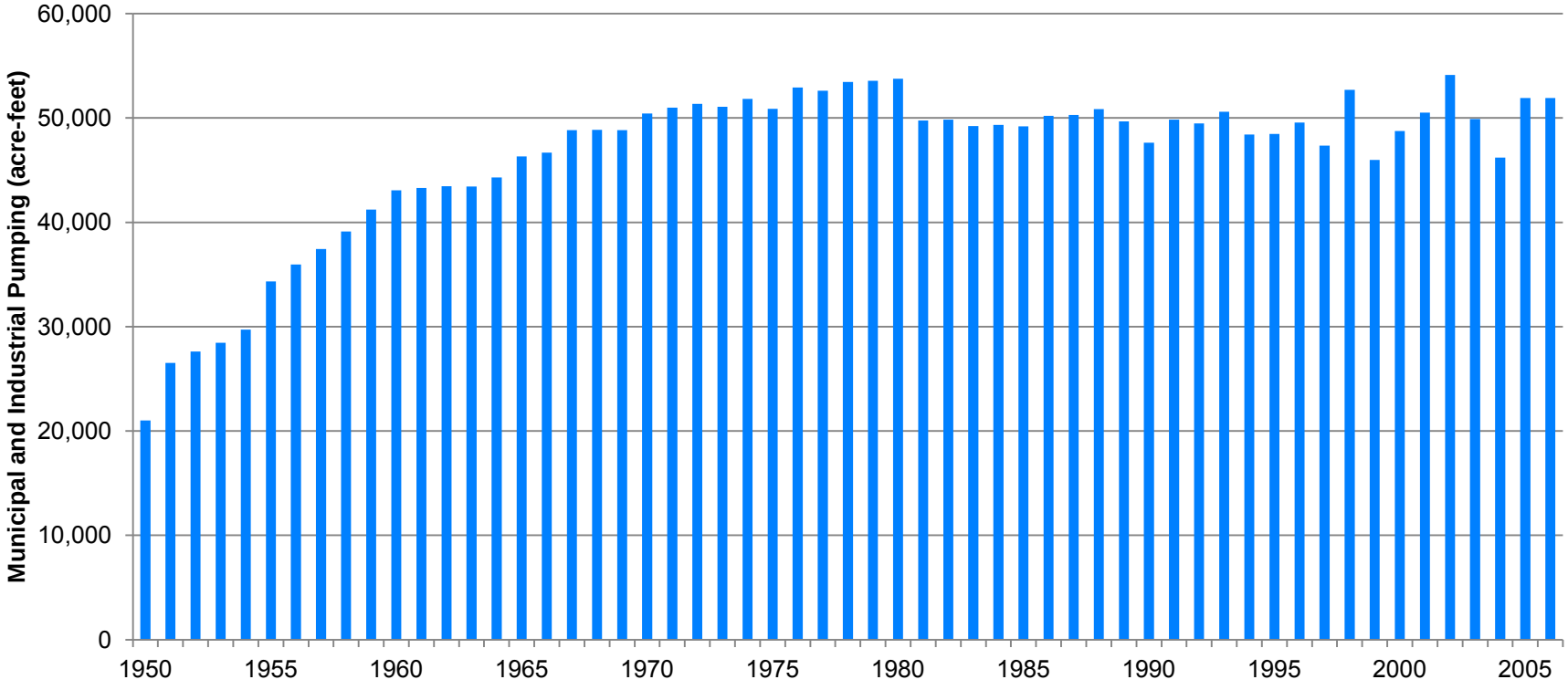

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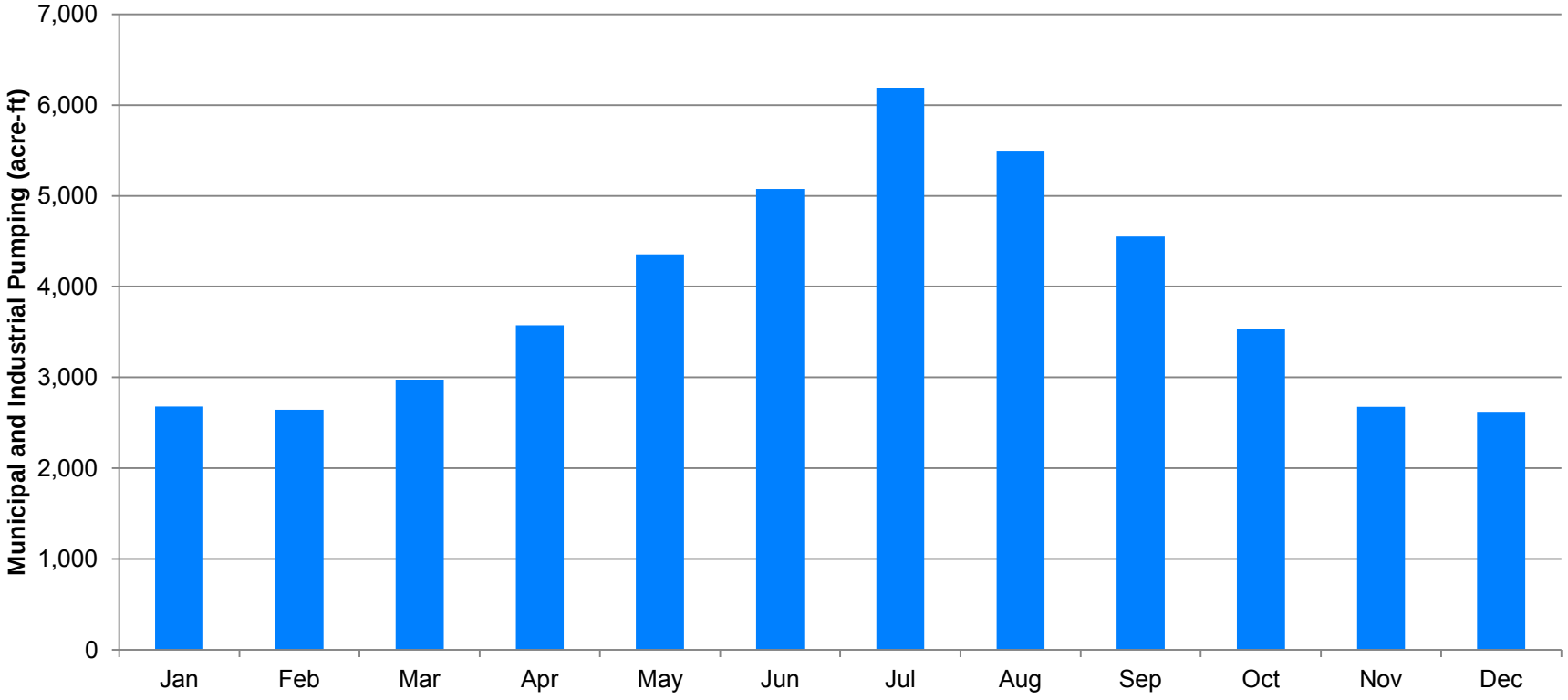
Figure C-6. Average Monthly Municipal and Industrial Pumping During Validation Period (1950 - 2006)



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