City of San Buenaventura
Public Works/Utilities/Wastewater Division

Annual Report of Analysis 1998

Cover: Ventura Water Reclamation Facility Wildlife Ponds

ANNUAL REPORT OF ANALYSIS

CITY OF SAN BUENAVENTURA

VENTURA WATER RECLAMATION FACILITY

1998

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DISCUSSION

I. INTRODUCTION: THE CITY OF SAN BUENAVENTURA

The City of San Buenaventura provides wastewater collection and treatment for the City, for McGrath State Beach Park, for the community of Cabrillo Village and for the North Coast Communities (Ventura County Service Area 29). These areas include a population of approximately 101,000 people.

THE SANITATION DIVISION:

Wastewater collection and treatment facilities are operated by the Sanitation Division, which along with the Water Division comprises Utilities Division of the Public Works Department. Facilities include 375 miles of sewer mains, 14 lift stations and the Ventura Water Renovation Facility, a tertiary treatment plant.

The Ventura Water Renovation Facility, at 1400 Spinnaker Drive, is located on the north bank of and discharges treated effluent to the Santa Clara River Estuary.

Processes employed at the treatment facility include comminution, grit removal, primary sedimentation, activated sludge and trickling filter secondary biological treatment, tertiary effluent filtration and Chlorination.

Process solids are treated by anaerobic digestion, dewatered and applied to agricultural land or when weather conditions prevent land application, are transported to landfill at Simi Valley or Chiquita Canyon.

Following disinfection, effluent enters a system of Wildlife Ponds with a combined capacity of 34 million gallons. At the current average daily outfall flow rate of 8.4 MGD, this provides approximately 4 days of detention.

Wastewater facilities include pump stations and pipelines for water reclamation. In 1998 the daily average volume of treated effluent reclaimed was 707,000 gallons. The maximum daily reuse volume measured in 1998 was 2,335,000 gallons per day.

The effluent reuse system provides effluent for irrigation of golf course, park and similar landscape areas. This reuse is an integral part of the city water

according to specification has been done to prevent this from occurring in the future.

In October 16, 1998 a sample taken at 8:00 PM was found to have a Total Coliform MPN of 240/100ml and on October 21, 1998 a sample taken at 11:00 AM was found to have a Total Coliform MPN of 26/100ml. Both of these disinfection failures coincided with high Turbidity levels in filtered effluent.

Five times during 1998 the turbidity of the filtered effluent exceeded Turbidity standards.

On September 1, 1998 and on September 3, 1998 effluent turbidity exceeded 5.0 NTU for more than 5% of the day. The cause of these exceedences is unknown.

On October 16, 1998 and again on October 21, 1998 filtered effluent Turbidity exceeded a daily average of 2.0 NTU. October 31,1998 filtered effluent Turbidity exceeded 5.0 NTU more than 5% of the day when the tertiary filtration system was overloaded by loss of solids from the activated sludge secondary treatment process. This solids loss from the secondary process was caused by process upset after an extended bypass of the primary treatment tanks due to plant construction.

On December 31,1998 filtered effluent Turbidity exceeded a daily average of 2.0 NTU. The cause of this failure is unknown.

III. IRRIGATION EFFLUENT QUALITY

A summary of principle effluent mineral constituent concentrations is presented below.

Year	Avg TDS	Avg Chloride	Avg Sulfate	Avg Boron	Avg Fluoride
1972	1950	487	421	1.5	1.04
1973	1740	440	399	1.4	0.96
1974	1547	422	358	1.5	1.11
1975	1454	374	369	1.1	0.61
1976	1474	366	398	1.4	0.65
1977	1479	372	383	1.2	0.64
1978	1525	358	409	1.0	0.80
1979	1527	359	481	1.1	0.89
1980	1451	342	463	1.2	0.73
1981	1330	312	424	0.9	0.88
1982	1452	334	443	0.8	0.80
1983	1367	308	435	0.7	0.81
1984	1398	312	454	0.7	0.80
1985	1380	313	393	0.8	0.78
1986	1411	309	415	0.8	0.62
1987	1309	317	371	0.8	0.63
1988	1457	333	412	0.8	0.58
1989	1424	324	418	0.7	0.59
1990	1561	328	444	0.9	0.67
1991	1583	334	418	0.9	0.56
1992	1569	333	456	0.7	0.55
1993	1493	315	446	0.7	0.67
1994	1403	304	416	0.7	0.71
1995	1508	293	460	0.8	0.66
1996	1425	295	425	0.7	0.52
1997	1310	279	366	0.7	0.41
1998	1387	263	405	0.6	0.71

Year	Avg Na	Avg Ca	Avg Mg	Avg K
1975	354	112	45	17
1976	331	118	36	15
1977	320	109	40	15
1978	325	110	40	17
1979	308	117	45	14
1980	295	120	43	15
1981	278	117	41	18
1982	280	136	46	17
1983	275	125	43	13
1984	257	130	42	20
1985	249	126	42	16
1986	269	132	44	19
1987	240	117	39	19
1988	274	123	44	17
1989	274	117	43	17
1990	307	126	46	18
1991	308	130	46	20
1992	283	140	46	18
1993	295	138	46	18
1994	289	131	44	19
1995	286	145	38	16
1996	273	130	42	20
1997	249	115	40	19
1998	261	124	43	19

LOCATION OF SAMPLE POINTS FOR MONITORING AND REPORTING PROGRAMS

The liquid fraction flow path for both discharge to the Santa Clara Tidal Prism and treated effluent reused for landscape irrigation was as shown in the schematic plant flow diagram which follows. This has been the treatment plant operating mode throughout all of 1998.

The total wastewater flow is treated and disinfected through the system as shown without regard to the ultimate discharge.

The following describes sample locations designated and the purposes for which each is used.

LOCATION 1 - INFLUENT PUMP STATION

This location receives all raw wastewater flow to the treatment plant unless failure of pumping systems occurs. If such failure occurs, or should storm flows exceed the capacity of this primary station, all or part of the influent flow will be diverted to a standby facility which has no provision for sampling or flow measurement. Such events are infrequent and duplication of influent sampling programs is not warranted.

The sampler used here is an ECOA model E dip sampler controlled by a PLC using the signal from the influent flow meters.

The sampler is located downstream of comminution equipment and upstream of grit removal and the entry point for recirculation from the Activated Sludge process.

Sampling is performed here for compliance monitoring and for process control. Analyses for pH, 5-day BOD, COD, Suspended Solids, Nitrogen Compounds and Priority Pollutants are performed on samples collected at this station.

LOCATION 2 - PRIMARY EFFLUENT

Through this location passes all effluent from the Primary Clarifier. This sample station can be bypassed and raw sewage delivered directly to the Activated Sludge System if routine maintenance or emergency requires it.

The sampler used here is an ISCO Model 2700 sampler programmed to collect samples at non-uniform time intervals proportional to the flow to the Activated Sludge System.

Sampling is performed here for process control.

Analyses for 5-day BOD, COD, Suspended Solids, Settleable Solids, MBAS and Nitrogen Compounds are performed on samples collected at this station.

LOCATION 3 - ACTIVATED SLUDGE PROCESS EFFLUENT

This location is at the end of the 36 inch line from the Activated Sludge Final Sedimentation Tanks and before the Mixed Media Filter Station Surge Ponds. Effluent from the Trickling Filter secondary process does not ordinarily pass through this sample point.

The sampler used here is an ISCO Model 2700 sampler programmed to collect samples at non-uniform time intervals proportional to the flow to the Activated Sludge System.

Sampling is performed here for process control.

Analyses for pH, 5-day BOD, COD, Suspended Solids, Settleable Solids, MBAS and Nitrogen Compounds are performed on samples collected at this station. The stream from the Activated Sludge System is also continuously monitored by a process turbidimeter.

LOCATION 4 - EFFLUENT TRANSFER STATION

This location follows Filtration and Disinfection and from here treated effluent is pumped to the Wildlife Ponds. All treated effluent passes through this station.

The sampler used here is an ISCO Model 2700 sampler programmed to collect samples at non-uniform time intervals proportional to the flow leaving the Mixed Media Filter Station.

Sampling is performed here for compliance monitoring and for process control. Analyses for pH, 5-day BOD, COD, Suspended Solids, Grease and Oil, Nitrogen Compounds, Phosphate, MBAS, Phenols, Chloride, Sulfate, Boron, Fluoride, Sodium, Potassium, Calcium, Magnesium and Priority Pollutants are performed on samples collected at this station. The flow from the Filtration and Disinfection processes is also continuously monitored here by a process turbidimeter.

Grab samples for bacteriological examination are collected three times daily, at 7:00 AM, 11:00 AM and 8:00 PM, just ahead of this sample station from the outlet end of the first contact chamber in use.

LOCATION 5 - OUTFALL METERING STRUCTURE

This sample location follows the Wildlife Pond System and the point of addition of Sulfur Dioxide used for Chlorine Residual neutralization and is immediately ahead of the point of discharge to the Santa Clara River Tidal Prism. All effluent reaching the Tidal Prism must pass through this Station.

Sampling is performed here for compliance monitoring and for process control.

Grab samples for Temperature and Composite samples used for Acute Toxicity and Chronic Toxicity are collected here. The flow from the station is also continuously monitored by a Residual Chlorine Analyzer.

RECEIVING WATER SAMPLE STATIONS

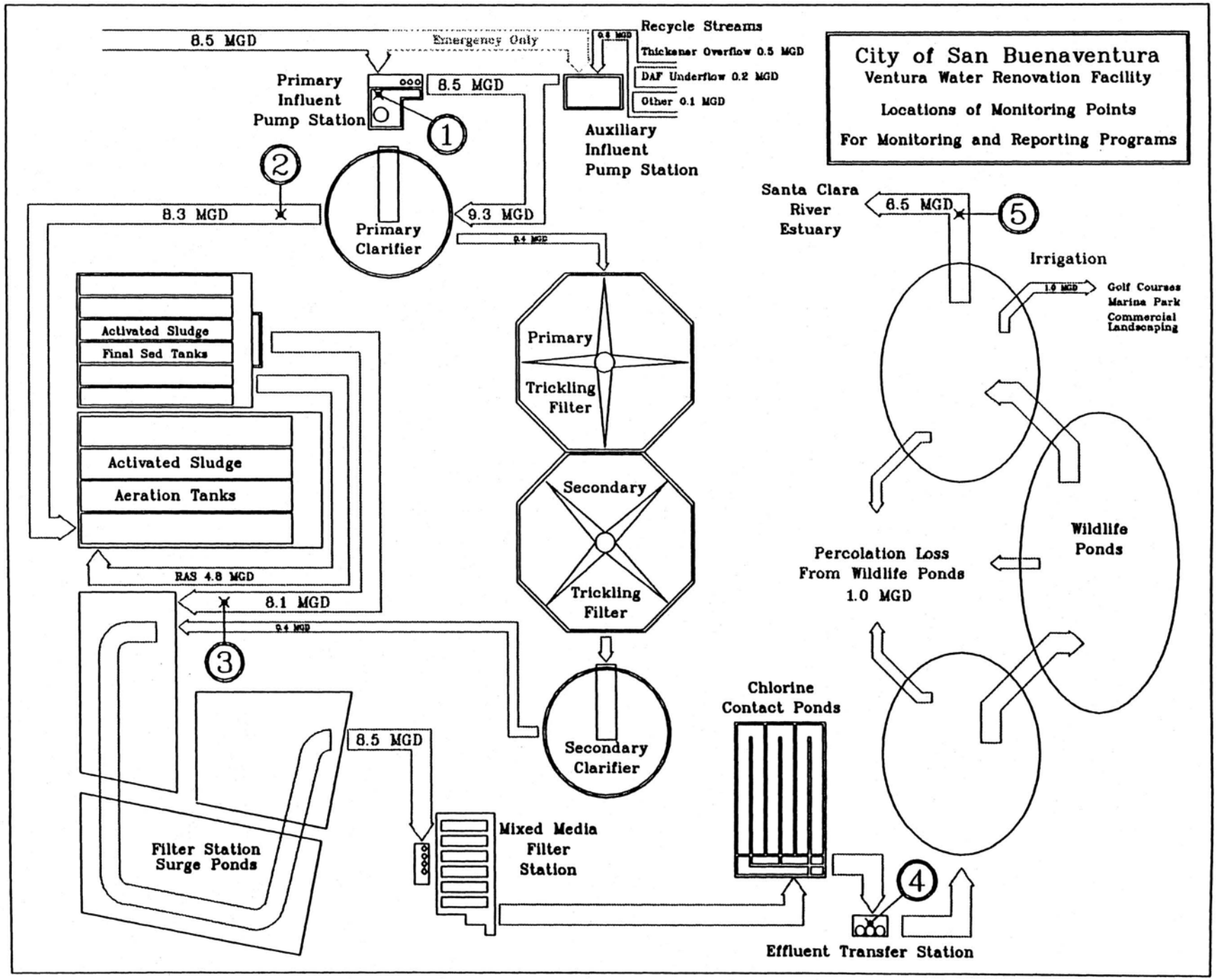
Ten sample stations, designated R1 through R4 within the Santa Clara Tidal Prism and R5 through R9 along the Pacific Ocean shore are specified by the Los Angeles Regional Water Quality Control Board in the facility NPDES permit. An additional sample station, designated L5, is located on the Santa Clara River approximately 1 mile east of the Harbor Boulevard Bridge. This additional station was monitored by the City voluntarily until 1995 when the renewed NPDES permit made it a required monitoring station.

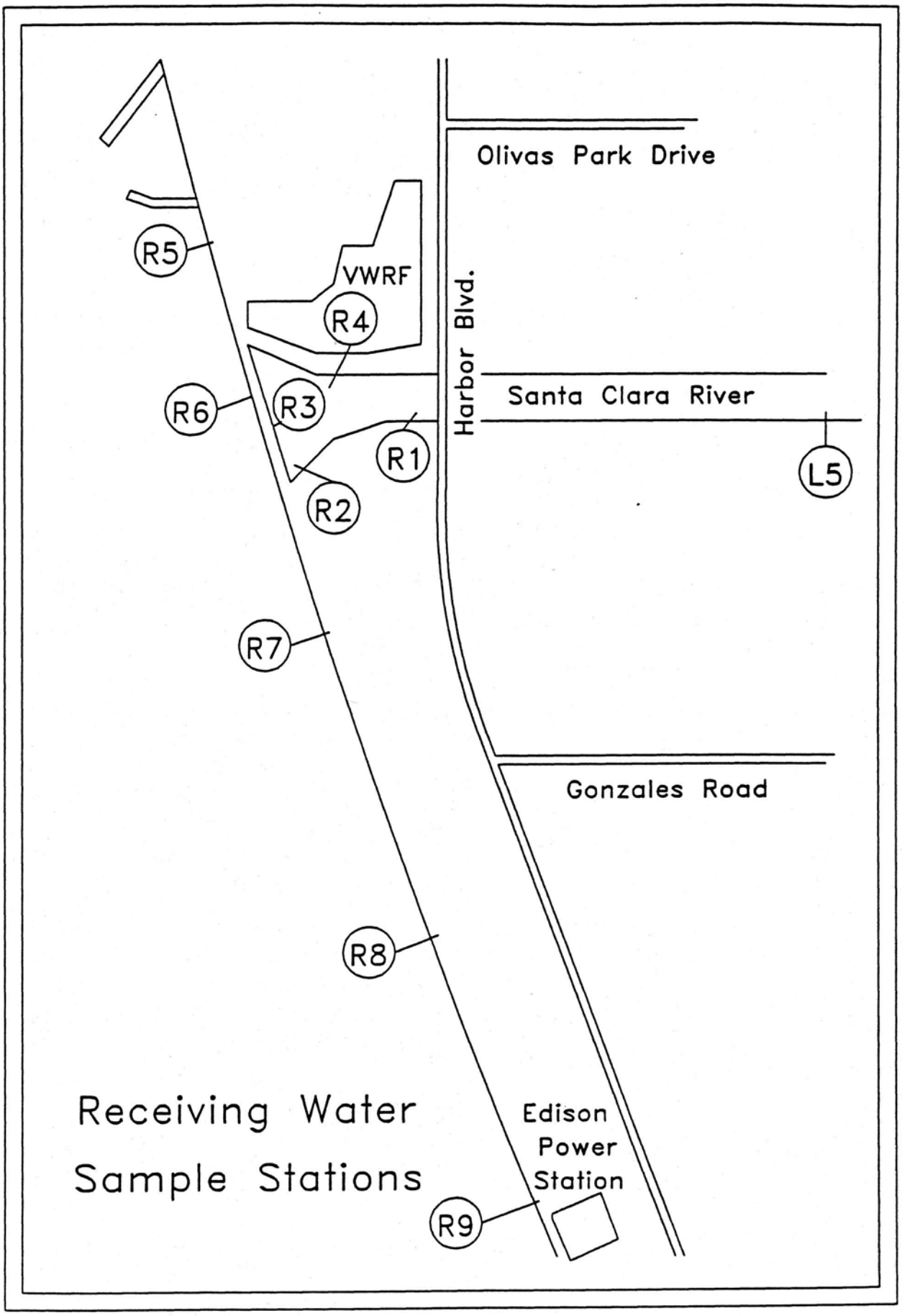
Water quality observations and temperature measurements are made at each of these sites.

Grab samples from these locations are taken weekly and analyzed for Total Coliform and, for stations within the Tidal Prism, for Residual Chlorine.

Grab samples from station R1, on the flowing stream as it enters the Tidal Prism, and R2, on the South shore of the Tidal Prism opposite the discharge from the Ventura Water Reclamation Facility, are also taken monthly for three months during the winter and analyzed Chronic Toxicity using the same three species protocol applied to the discharge.

A map showing these sample locations follows the schematic plant flow diagram.


City of San Buenaventura
Ventura Water Renovation Facility
Locations of Monitoring Points
For Monitoring and Reporting Programs
8.5 MGD
Emergency Only
Recycle Streams
0.8 MGD
Thickener Overflow 0.5 MGD
DAF Underflow 0.2 MGD
Other 0.1 MGD
Primary Influent Pump Station
8.5 MGD
1
Auxiliary Influent Pump Station
2
8.3 MGD
Primary Clarifier
9.3 MGD
0.4 MGD
Santa Clara River Estuary
6.5 MGD
5
Irrigation
1.0 MGD
Golf Courses
Marina Park
Commercial Landscaping
Activated Sludge
Final Sed Tanks
Primary
Trickling Filter
Activated Sludge
Aeration Tanks
Secondary
Trickling Filter
Wildlife Ponds
Percolation Loss From Wildlife Ponds 1.0 MGD
RAS 4.8 MGD
8.1 MGD
0.4 MGD
3
Secondary Clarifier
Chlorine Contact Ponds
8.5 MGD
Mixed Media Filter Station
Filter Station Surge Ponds
4
Effluent Transfer Station


Olivas Park Drive
VWRF
R5
R4
R6
R3
R1
R2
Harbor Blvd.
Santa Clara River
L5
R7
Gonzales Road
R8
Receiving Water
Sample Stations
Edison
Power
Station
R9

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Influent Pump Station

Month	Average Flow MGD	pH Units	Suspended Solids mg/l	BOD mg/l	COD mg/l	Ammonia Nitrogen mg/l	Total Kjeldahl Nitrogen mg/l
January	8.86	7.35	224	263	481	22.3	39.0
February	12.70	7.46	208	197	368	13.8	23.4
March	10.32	7.51	227	259	441	17.3	33.5
April	9.70	7.47	211	254	478	18.3	26.9
May	9.51	7.40	247	284	485	19.4	37.1
June	9.24	7.37	243	288	517	19.6	31.7
July	8.91	7.31	233	288	472	18.3	
August	8.83	7.26	237	264	510	20.7	34.8
September	9.28	7.20	233	266	518	21.3	32.3
October	9.08	7.25	228	279	491	22.0	31.8
November	8.86	7.31	213	255	503	20.4	36.7
December	8.62	7.36	220	230	520	22.4	52.1
Average	9.47	7.35	227	261	482	19.9	34.3
Maximum	16.90	7.80	505	490	954	25.6	52.1
Minimum	2.40	6.87	22	130	241	13.5	23.4
Total	37760.83						

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Influent Pump Station

Month	Aluminum mg/l	Antimony mg/l	Arsenic mg/l	Barium mg/l	Beryllium mg/l	Cadmium mg/l	Chromium mg/l	Cobalt mg/l	Copper mg/l	Iron mg/l
February	0.007	<0.001	<0.003	0.006	<0.0004	<0.0002	0.004	0.001	0.003	0.400
February	0.037	<0.001	<0.002	<0.100	<0.0004	<0.0002	0.002	0.001	0.074	
May	0.662	<0.001	<0.002	<0.100	<0.0004	<0.0004	0.010	0.002	0.160	0.800
August	1.100	<0.001	<0.002	0.074	<0.0004	<0.0002	0.010	0.001	0.181	0.600
August	1.067	0.004	<0.002	<0.096	0.001	0.001	0.006	0.006	0.170	
November	1.180	0.003	<0.002	0.095	<0.0001	<0.0006	<0.005	0.007	0.147	1.100
Average	0.675	<0.001	<0.002	0.029	<0.0004	<0.004	0.005	0.003	0.122	0.725
Maximum	1.180	0.004		0.095	0.001	0.001	0.010	0.007	0.181	1.100
Minimum	0.007	<0.001		<0.096	<0.0001	<0.002	<0.005	0.001	0.003	0.400

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Influent Pump Station

Month	Lead mg/l	Mercury mg/l	Molybdenum mg/l	Nickel mg/l	Selenium mg/l	Silver mg/l	Thallium mg/l	Tin mg/l	Vanadium mg/l	Zinc mg/l
February	<0.100	0.0040	0.008	0.004	<0.001	0.0080	<0.001		0.027	0.004
February	<0.003	<0.0008	<0.007	0.008	0.007	<0.005	<0.001	<0.100	0.007	0.222
May	0.005	0.0009	0.012	0.009	<0.003	0.0068	<0.001		0.009	0.166
August	0.009	0.0010	0.013	0.021	0.004	0.0090	<0.001		0.008	0.138
August	<0.003	<0.0008	0.034	0.013	<0.007	<0.007	<0.001	0.132	<0.004	0.189
November	<0.005	<0.001	0.016	<0.010	0.005	<0.006	<0.001		0.006	0.042
Average	0.002	0.001	0.014	0.009	0.003	0.004	<0.001	0.066	0.009	0.127
Maximum	0.009	0.004	0.034	0.021	0.007	0.009		0.132	0.027	0.222
Minimum	<0.003	<0.0008	<0.007	<0.010	<0.001	<0.005		<0.100	<0.004	0.004

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Influent Pump Station

Month	Acetone	Chloroform	1,4 Dichlorobenzene	Ethylbenzene
February	0.363	<0.00005	<0.0005	<0.00034
August	0.124	0.0041	<0.0005	<0.00034

Month	Tetrachloroethylene	Toluene	1,1,1-Trichloroethane	Xylenes
February	<0.00012	<0.0002	<0.00003	<0.0005
August	<0.00012	<0.0002	<0.00003	<0.0005

Ventura Water Reclamation Facility

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Primary Clarifier Effluent Splitter Box

Month	pH Units	Suspended Solids mg/l	BOD mg/l	COD mg/l	MBAS mg/l	Ammonia Nitrogen mg/l	Total Kjeldahl Nitrogen mg/l
January	7.47	100.6	181	331	6.7	26.5	31.3
February	7.51	103.0	151	270	2.7	25.3	33.0
March	7.60	119.5	185	327	5.0	23.1	39.1
April	7.56	114.3	191	345	4.1	25.3	32.7
May	7.41	156.9	218	377	7.6	26.7	42.7
June	7.35	107.1	215	372	7.1	26.6	39.7
July	7.37	84.2	171	320	10.9	25.3	30.8
August	7.15	79.9	193	339	7.4	24.7	32.0
September	7.39	81.2	186	321	5.5	24.8	30.8
October	7.47	92.2	192	335	5.8	23.6	31.9
November	7.50	93.2	178	336	6.4	23.8	36.0
December	7.48	92.7	178	324	4.9	27.5	52.0
Average	7.44	102.5	187	334	6.2	24.9	35.5
Maximum	8.50	982.0	300	516	10.9	35.8	52.0
Minimum	6.90	1.2	100	177	2.7	14.8	26.9

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Mixed Media Filter Station Influent

Month	Average Flow MGD	Suspended Solids mg/l	BOD mg/l	COD mg/l	MBAS mg/l	Nitrate Nitrogen mg/l	Nitrite Nitrogen mg/l	Ammonia Nitrogen mg/l	Total Kjeldahl Nitrogen mg/l
January	9.21	6.36	18.5	34.5	0.15	8.58	3.38	7.78	13.2
February	13.49	7.41	18.5	45.8	<0.05	12.20	1.08	2.88	5.1
March	10.85	8.93	20.1	30.5	<0.05	9.80	1.00	5.75	5.9
April	10.05	4.80	16.5	25.4	<0.05	10.12	0.96	6.06	5.8
May	9.79	5.29	17.9	25.0	<0.05	8.58	1.00	7.08	10.4
June	9.83	8.05	14.5	40.0	<0.05	7.80	<0.40	6.67	
July	9.15	6.60	11.1	28.5	<0.05	9.18	0.88	3.88	2.1
August	9.66	9.76	14.3	30.5	<0.05	11.23	0.82	3.53	7.6
September	9.88	22.39	21.9	44.8	-0.05	10.00	1.22	4.22	3.0
October	9.75	32.67	37.4	51.5	-0.05	10.50	1.20	4.75	8.0
November	9.09	24.22	41.3	45.5	0.22	9.50	1.93	6.80	15.0
December	8.50	7.33	11.0	31.4	0.15	9.88	1.63	7.98	5.2
Average	9.91	12.12	20.3	36.1	0.12	9.74	1.34	5.54	7.3
Maximum	18.50	140.00	150.0	330.0	1.4	15.10	6.10	12.20	15.0
Minimum	0.50	2.80	3.9	0.8	<0.05	5.40	<0.40	0.99	2.1

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Effluent Transfer Station

Month	pH Units	Suspended Solids mg/l	lb/day	TDS mg/l	Specific Cond uMHO	BOD mg/l	lb/day	COD mg/l	Settleable Solids ml/l
January	6.68	1.52	112	1208	1849	2.5	185	25.0	<0.1
February	6.84	1.91	239	1308	1858	3.0	389	25.4	<0.1
March	6.83	1.47	117	1423	2106	2.3	186	23.5	<0.1
April	6.89	1.48	107	1502	2209	2.5	185	21.6	<0.1
May	6.84	1.56	108	1499	2230	2.3	160	20.6	<0.1
June	6.81	1.85	118	1477	2167	2.6	169	20.9	<0.1
July	6.74	1.52	92	1376	1998	2.6	154	21.7	<0.1
August	6.77	1.40	87	1333	1936	2.6	159	20.8	<0.1
September	6.95	1.47	93	1315	1932	2.8	177	133.5	<0.1
October	6.87	1.89	114	1401	1990	2.4	141	23.7	<0.1
November	6.86	2.01	124	1456	2054	2.6	158	24.2	<0.1
December	6.78	1.47	91	1348	1965	2.6	154	35.7	<0.1
Annual Average	6.82	1.62	116	1387	2024	2.6	184	33.3	<0.1
Maximum	7.20	7.50	482	1960	2380	8.6	1039	2401.0	-0.1
Minimum	6.20	0.80	46	1040	1490	<0.3	<19	11.7	<0.1
Limitations of Permit CA0053651									
Maximum		45.00	5250			45	5250		0.3
7 Day Average		40.00	4670			30	3500		
30 Day Average		15.00	1751			20	2340		0.1

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Effluent Transfer Station

Month	Grease and Oil mg/l	lb/day	Continuous Turbidity NTU	Nitrate Nitrogen mg/l	Nitrite Nitrogen mg/l	Ammonia Nitrogen mg/l	Total Kjeldahl Nitrogen mg/l
January	2.4	178	0.7	11.2	<0.4	6.1	11.4
February	1.6	217	0.9	12.9	<0.4	1.7	2.3
March	2.3	177	0.8	11.3	<0.4	3.5	2.3
April	1.4	102	0.7	11.0	<0.4	3.8	2.5
May	1.2	82	0.7	9.5	<0.4	4.9	8.1
June	0.9	63	0.8	9.7	<0.4	3.6	4.0
July	1.1	64	0.8	11.6	<0.4	1.9	2.3
August	1.0	64	0.9	13.1	<0.4	1.6	4.1
September	0.6	36	0.9	12.9	<0.4	3.2	3.7
October	0.4	24	1.0	13.6	<0.4	3.5	6.0
November	0.1	9	0.7	11.4	<0.4	5.3	12.4
December	0.3	15	0.9	12.0	<0.4	5.2	5.1
Annual Average	1.1	85	0.8	11.6	<0.4	3.7	5.3
Maximum	4.2	350	3.1	18.4	1.4	10.1	12.4
Minimum	<0.1	<7	0.4	7.2	<0.4	-0.1	2.2
Limitations of Permit CA0053651							
Maximum	15.0	1750	2.0				
7 Day Average							
30 Day Average	10.0	1170					

Ventura Water Reclamation Facility

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Effluent Transfer Station

Month	MBAS mg/l	Chloride mg/l	Sulfate mg/l	Phosphate mg/l	Boron mg/l	Fluoride mg/l
January	<0.05	257	296	7	0.68	0.58
February	<0.05	220	459	5.6	0.66	0.57
March	<0.05	244	453	6.2	0.64	0.61
April	<0.05	255	470	7.2	0.84	<0.10
May	<0.05	278	460	4.4	0.85	<0.10
June	<0.05	279	468	4.7	0.81	0.59
July	<0.05	260	401	6.6	0.21	0.69
August	<0.05	265	363	8	0.74	0.63
September	-0.05	244	340	7.4	0.75	0.60
October	-0.05	261	357	11	0.77	0.80
November	0.17	290	419	6.4	0.74	0.68
December	0.12	331	403	1.3	0.84	0.60
Annual Average	0.19	263	405	6.3	0.71	0.63
Maximum	1.70	490	572	11	0.85	0.80
Minimum	<0.05	180	236	1.3	0.21	<0.10

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 1998

Effluent Transfer Station

Month	Sodium mg/l	Calcium mg/l	Magnesium mg/l	Potassium mg/l
January	244	108	37.9	17.8
February	216	118	47.0	13.2
March	280	133	52.6	15.5
April	286	151	52.4	17.6
May	276	148	51.2	18.9
June	272	138	49.3	20.2
July	248	119	35.6	21.0
August	258	115	42.5	23.2
September	254	117	43.1	22.1
October	244	120	40.7	20.2
November	269	89.2	20.0	21.1
December	279	136	45.3	13.8
Annual Average	261	124	43.1	18.7
Maximum	286	151	52.6	23.2
Minimum	216	89.2	20.0	13.2

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 1998

Effluent Transfer Station

Month	0700 Bay 1 Chlorine Residual mg/l	1100 Bay 1 Chlorine Residual mg/l	2000 Bay 1 Chlorine Residual mg/l	1100 ETS Chlorine Residual mg/l
January	10.8	10.8	11.9	10.0
February	13.2	12.3	13.7	11.6
March	10.7	13.0	14.6	10.1
April	11.5	13.5	14.7	10.5
May	11.6	12.0	13.6	8.6
June	10.8	12.5	13.4	9.0
July	10.7	12.7	12.3	7.7
August	11.4	11.5	11.1	8.8
September	12.4	10.3	12.5	8.4
October	11.8	12.0	11.3	9.8
November	13.3	13.7	13.5	10.5
December	17.5	10.2	12.3	11.7
Annual Average	12.1	12.0	12.9	9.7
Maximum	32.0	34.5	29.5	29.6
Minimum	1.0	2.1	5.4	0.6

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 1998

Effluent Transfer Station

Month	Cyanide mg/l	Aluminum mg/l	Antimony mg/l	Arsenic mg/l	Barium mg/l	Beryllium mg/l	Cadmium mg/l	Chromium mg/l	Cobalt mg/l	Copper mg/l
January										<0.001
February	0.004	0.054	<0.001	<0.003	0.035	<0.0004	<0.0002	<0.0005	<0.0007	0.008
February		<0.0372	<0.001	<0.002	<0.100	<0.0004	<0.0002	<0.0016	<0.0008	0.013
March										0.012
April										0.016
May	<0.004	0.011	<0.001	0.002	<0.096	<0.0004	<0.0002	0.003	0.001	0.022
June										0.019
July										0.009
August	<0.004	0.079	<0.001	<0.002	<0.030	<0.0004	<0.0002	<0.0005	<0.0007	<0.001
August		0.064	0.002	<0.002	<0.096	<0.0004	<0.0002	0.007	0.005	0.008
September										0.015
October										0.015
November	<0.004	0.261	0.003	<0.002	0.035	<0.0001	<0.0006	<0.005	0.009	0.019
December										<0.001
Annual Average	<0.004	0.037	<0.001	<0.002	<0.065	<0.0004	<0.0002	0.002	0.0025	0.011
Maximum	0.004	0.261	0.003	0.002	0.035			0.007	0.009	0.022
Minimum	<0.004	<0.0372	<0.001	<0.002	<0.030			<0.005	<0.0007	<0.001
Limitations of Permit CA0053651										
Maximum	0.012			0.076			0.016			0.098
7 Day Average										
30 Day Average								0.050		

Ventura Water Reclamation Facility

Annual Report 1998

Effluent Transfer Station

Month	Lead mg/l	Mercury mg/l	Molybdenum mg/l	Nickel mg/l	Selenium mg/l	Silver mg/l	Thallium mg/l	Tin mg/l	Vanadium mg/l	Zinc mg/l
January	<0.100			0.015						0.070
February	<0.100	<0.0008	<0.001	0.040	<0.009	<0.0001	<0.001		<0.005	0.022
February	<0.003	<0.0002	<0.0037	0.006	<0.009	<0.008	<0.001	<0.100	<0.007	0.045
March	<0.100			0.010						0.012
April	<0.050			0.007						0.063
May	<0.003	<0.0008	0.013	0.008	<0.003	<0.0007	<0.001		0.006	0.045
June	<0.025			0.009						0.037
July	<0.025			0.039						0.083
August	<0.003	<0.0008	<0.001	0.022	<0.003	<0.0002	<0.001		<0.005	0.047
August	<0.003	<0.0008	0.034	0.009	<0.003	0.0014	<0.001	<0.100	<0.007	0.037
September	<0.003			0.005						0.027
October	<0.003			<0.002						0.011
November	<0.005	<0.001	0.013	<0.010	0.003	<0.006	<0.001		0.006	0.042
December	<0.003			<0.002						<0.050
Annual Average	<0.036	<0.0008	0.017	0.012	<0.003	<0.001	<0.001		0.0020	0.039
Maximum			0.034	0.040	0.003	0.0014			0.006	0.083
Minimum			<0.001	<0.002	<0.003	<0.0001			<0.005	<0.050
Limitations of Permit CA0053651										
Maximum	0.077	0.003		0.271		0.027	1.765			1.181
7 Day Average										
30 Day Average										

Ventura Water Reclamation Facility

Annual Report 1998

Effluent Transfer Station

Month	Iron mg/l	Manganese mg/l
January	<0.1	0.09
February	<0.1	<0.03
March	<0.1	<0.03
April	<0.1	0.19
May	<0.1	<0.03
June	<0.1	0.04
July	<0.1	0.04
August	<0.1	0.04
September	<0.1	<0.03
October	<0.1	<0.03
November	<0.1	0.17
December	<0.1	0.10
Annual Average	<0.1	0.06
Maximum	0.1	0.19
Minimum	<0.1	<0.03

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 1998

Effluent Transfer Station

Month	Aldrin mg/l	alpha-BHC mg/l	beta-BHC mg/l	delta-BHC mg/l	Lindane mg/l	PCBs mg/l	Bromodichloromethane mg/l	Bromoform mg/l
February	<0.000004	<0.000003	<0.000006	<0.000009	<0.000004	<0.000065	0.089	0.0086
February	<0.00001	<0.000014	<0.000034	<0.000015	<0.000029	<0.0001		
May	<0.00001	<0.000014	<0.000034	<0.000015	<0.000029	<0.0001	0.0086	0.0051
August	<0.000004	<0.000003	<0.000006	<0.000009	<0.000004	<0.000065	0.078	0.0002
August	<0.00001	<0.000014	<0.000034	<0.000015	<0.000029	<0.0001		
November	<0.00001	<0.000014	<0.000034	<0.000015	<0.000029	<0.0001	0.0079	0.0029
Annual Average	<0.00001	<0.000014	<0.000034	<0.000015	<0.000029	<0.0001	0.045875	0.0042
Maximum							0.089	0.0086
Minimum							0.0079	0.0002
Limitations of Permit CA0053651								
Maximum	0.00130				0.00016		0.070	
7 Day Average								
30 Day Average								

Ventura Water Reclamation Facility

Annual Report 1998

Effluent Transfer Station

Month	Chloroform mg/l	Carbon tetrachloride	Chlorobenzene	Dibromochloromethane	1,4-Dichlorobenzene
February	0.0796	<0.00012	<0.0002	0.0558	<0.0005
August	0.138	<0.00012	<0.0002	0.028	<0.0005
Annual Average	0.1088	<0.00012	<0.0002	0.0419	<0.0005
Maximum	0.138			0.0558	
Minimum	0.0796			0.028	<0.0005
Limitations of Permit CA0053651					
Maximum					
7 Day Average					
30 Day Average					

Month	Pentachlorophenol mg/l	bis (2-Ethylhexyl)phthalate
February	<0.0036	<0.0025
August	<0.0036	<0.0025
Annual Average	<0.0036	<0.0025
Maximum		
Minimum		
Limitations of Permit CA0053651		
Maximum	0.013	0.0059
7 Day Average		
30 Day Average	0.0079	

Ventura Water Reclamation Facility

Annual Report 1998

Irrigation Reuse Flows

Month	Olivas Pump Station Flow MGD	Marina Park Flow MGD	Buena Pump Station Flow MGD	Total Irrigation Flow MGD
January	0.0742	0.0010	0.0424	0.1175
February	0.0519	0.0002	0.0002	0.0504
March	0.1161	0.0006	0.1510	0.2678
April	0.3167	0.0089	0.2000	0.5256
May	0.4419	0.0000	0.3132	0.7551
June	0.7933	0.0000	0.4618	1.2552
July	0.8516	0.0000	0.4489	1.3005
August	0.7903	0.0000	0.4213	1.2116
September	0.5200	0.0000	0.2749	0.7949
October	0.7000	0.0000	0.3696	1.0696
November	0.5033	0.0000	0.1793	0.6827
December	0.2710	0.0000	0.1416	0.4080
Annual Average	0.4560	0.0010	0.2531	0.7074
Maximum	2.1000	0.0255	1.3690	2.3350
Minimum				

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 1998

Outfall Junction Structure

Month	Flow MGD	Max Contin Chlorine Residual mg/l	1100 Grab Temp Degrees C	Bioassay Acute Toxicity Survival %	Bioassay Chronic Ceriodaphnia Survival TU	Bioassay Chronic Ceriodaphnia Reproduction TU
January	8.89	<0.1	18.22	97.10%	1.00	1.00
February	15.05	<0.1	17.79	97.00%	1.00	* *
March	9.48	<0.1	20.37	93.80%	1.00	*
April	8.70	<0.1	20.91			
May	8.37	<0.1	23.52			
June	7.67	<0.1	24.76			
July	7.24	<0.1	25.72			
August	7.44	<0.1	26.02			
September	7.60	<0.1	25.27			
October	7.22	<0.1	22.55			
November	7.35	<0.1	19.73			
December	7.40	<0.1	16.60	100.0%	1.00	1.00
Annual Average	8.49	<0.1	21.81	95.97%	1.00	1.00
Maximum	21.00		27.60			
Minimum	4.80		13.40			

Limitations of Permit CA0053651

Maximum	70
7 Day Average	
30 Day Average	90

Ventura Water Reclamation Facility

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Outfall Junction Structure

Month	Bioassay Chronic Fathead Larvae Survival TU	Bioassay Chronic Fathead Larvae Growth TU	Bioassay Chronic Selenastrum Growth TU
January	1.00	1.00	1.00
February	*	1.00	1.00
March	1.00	1.00	**
April			*
May			1.00
June			1.00
July			1.00
August			1.00
September			1.00
October			1.00
November			1.00
December	1.00	1.00	1.00
Annual Average	1.00	1.00	1.00
Maximum	1.00	1.00	1.00
Minimum	1.00	1.00	1.00

*TUc not determinable. Organsim response in undiluted sample was not significantly reduced from laboratory control water.

**Reproduction in the 100% Effluent is not significantly different from repoduction in lab control water.

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 1998

Tidal Prism Receiving Water Stations

Month	R1 Bioassay Chronic Ceriodaphnia Survival TU	R1 Bioassay Chronic Ceriodaphnia Reproduction TU	R1 Bioassay Chronic Fathead Larvae Survival TU	R1 Bioassay Chronic Fathead Larvae Growth TU	R1 Bioassay Chronic Selenastrum Growth TU
January	8.00	16.00	4.00	4.00	4.00
February	1.00	16.00	1.00	1.00	1.00
March	2.00	16.00	1.00	1.00	1.00
April					
May					
June					
July					
August					
September					
October					
November					
December	1.00	1.00	1.00	1.00	1.00
Annual Average	3.67	16.00	2.00	2.00	2.00
Maximum	8.00	16.00	4.00	4.00	4.00
Minimum	1.00	1.00	1.00	1.00	1.00

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 1998

Tidal Prism Receiving Water Stations

Month	R2 Bioassay Chronic Ceriodaphnia Survival TU	R2 Bioassay Chronic Ceriodaphnia Reproduction TU	R2 Bioassay Chronic Fathead Larvae Survival TU	R2 Bioassay Chronic Fathead Larvae Growth TU	R2 Bioassay Chronic Selenastrum Growth TU
January	16.00	16.00	4.00	4.00	4.00
February	1.00	16.00	1.00	1.00	1.00
March	1.00	16.00	1.00	1.00	1.00
April					
May					
June					
July					
August					
September					
October					
November					
December	1.00	1.00	1.00	1.00	1.00
Annual Average	6.00	16.00	2.00	2.00	2.00
Maximum	16.00	16.00	4.00	4.00	4.00
Minimum	1.00	1.00	1.00	1.00	1.00

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 1998

Tidal Prism Receiving Water Stations

Month	R1 Air Temp Degrees C	R2 Air Temp Degrees C	R3 Air Temp Degrees C	R4 Air Temp Degrees C	L5 Air Temp Degrees C	R1 Water Temp Degrees C	R2 Water Temp Degrees C	R3 Water Temp Degrees C	R4 Water Temp Degrees C	L5 Water Temp Degrees C
January	17.1	17.1	17.1	17.2	17.5	14.3	14.4	14.1	14.5	14.9
February	19.1	18.9	18.9	18.9	19.3	13.5	13.4	13.4	13.5	13.9
March	22.7	22.7	22.5	22.7	23.4	16.0	16.3	16.0	16.3	16.8
April	21.3	21.3	21.2	21.2	22.8	16.1	16.0	15.9	16.1	16.7
May	20.7	19.8	20.3	20.8	21.7	17.3	17.3	16.8	17.1	18.1
June	19.7	19.2	18.1	20.6	19.5	18.4	20.0	20.6	24.3	18.8
July	19.7	20.4	20.3	20.8	21.5	21.5	21.7	21.6	23.9	22.2
August	19.7	20.8	19.9	20.5	21.6	20.9	22.3	21.6	21.9	22.6
September	21.0	21.0	20.9	21.3	21.4	19.8	20.4	20.5	21.6	21.1
October	21.1	21.4	20.6	21.2	20.7	15.9	15.9	16.8	19.0	13.6
November	16.7	18.0	18.4	18.8	16.0	14.2	13.7	14.2	17.3	13.2
December	13.6	13.7	12.1	12.0	13.0	10.6	10.5	10.4	13.1	11.2
Annual Average	19.3	19.5	19.2	19.6	19.9	16.6	16.8	16.8	18.3	17.0
Maximum	30.0	30.0	30.0	30.0	30.0	24.3	25.6	24.0	25.9	24.3
Minimum	9.5	9.7	6.4	6.2	7.9	7.1	7.9	6.3	6.4	7.0

Ventura Water Reclamation Facility

Annual Report 1998

Tidal Prism Receiving Water Stations

Month	R1 Chlorine Residual mg/l	R2 Chlorine Residual mg/l	R3 Chlorine Residual mg/l	R4 Chlorine Residual mg/l	L5 Chlorine Residual mg/l
January	<0.1	<0.1	<0.1	<0.1	<0.1
February	<0.1	<0.1	<0.1	<0.1	<0.1
March	<0.1	<0.1	<0.1	<0.1	<0.1
April	<0.1	<0.1	<0.1	<0.1	<0.1
May	<0.1	<0.1	<0.1	<0.1	<0.1
June	<0.1	<0.1	<0.1	<0.1	<0.1
July	<0.1	<0.1	<0.1	<0.1	<0.1
August	<0.1	<0.1	<0.1	<0.1	<0.1
September	<0.1	<0.1	<0.1	<0.1	<0.1
October	<0.1	<0.1	<0.1	<0.1	<0.1
November	<0.1	<0.1	<0.1	<0.1	<0.1
December	<0.1	<0.1	<0.1	<0.1	<0.1
Annual Average	<0.1	<0.1	<0.1	<0.1	<0.1
Maximum					
Minimum					

Ventura Water Reclamation Facility

Annual Report 1998

Pacific Ocean Receiving Water Stations

Month	R5 Air Temp Degrees C	R6 Air Temp Degrees C	R7 Air Temp Degrees C	R8 Air Temp Degrees C	R9 Air Temp Degrees C	R5 Water Temp Degrees C	R6 Water Temp Degrees C	R7 Water Temp Degrees C	R8 Water Temp Degrees C	R9 Water Temp Degrees C
January	17.2	17.2	17.2	17.2	17.2	14.1	14.2	14.2	14.5	14.7
February	19.0	19.0	19.1	19.2	19.1	13.2	13.1	13.2	13.3	13.4
March	22.5	22.5	22.5	22.7	22.6	15.3	15.5	15.8	15.9	16.1
April	21.1	21.3	21.4	21.6	21.5	15.4	15.3	15.3	15.5	15.8
May	20.4	19.7	20.8	21.1	20.2	16.3	16.6	16.4	16.9	17.3
June	17.1	19.4	18.3	18.5	18.4	16.6	20.7	16.5	16.8	22.6
July	19.9	19.8	19.4	19.6	20.0	19.4	20.5	19.6	19.4	20.6
August	19.3	19.9	20.3	20.9	21.0	18.0	19.0	19.3	20.2	21.1
September	20.5	21.1	21.3	21.3	21.3	19.9	20.0	19.7	19.7	19.9
October	19.6	20.7	21.6	22.1	22.2	15.8	16.4	17.8	18.2	18.2
November	19.3	18.7	18.2	17.2	17.5	15.3	15.0	15.5	15.8	16.0
December	12.2	12.2	13.6	13.7	14.1	12.7	11.9	12.4	12.8	13.1
Annual Average	19.0	19.2	19.4	19.5	19.6	16.1	16.5	16.3	16.6	17.4
Maximum	30.0	30.0	30.0	30.0	30.0	21.8	23.4	21.3	23.4	25.2
Minimum	4.5	6.5	8.3	8.0	8.5	11.2	10.0	9.9	9.5	10.0

Ventura Water Reclamation Facility

Annual Report 1998

Solids Streams

Total Metal in mg/Kg Dry Weight

Dissolved Air Flotation System (Waste Activated Sludge)

Month	Cadmium mg/Kg	Chromium mg/Kg	Copper mg/Kg	Lead mg/Kg	Nickel mg/Kg	Silver mg/Kg	Zinc mg/Kg
February	2.1	25.2	535	25.4	19.7	0.9	506
May	3.6	32.6	764	30.6	12.6	1.3	463
August	2.5	17.9	666	23.0	121.4	1.6	839
November	2.3	6.7	739	24.7	13.1	0.9	381
Average	2.6	20.6	676.0	25.9	41.7	1.2	547.2

Gravity Thickener (Primary Sludge)

Month	Cadmium mg/Kg	Chromium mg/Kg	Copper mg/Kg	Lead mg/Kg	Nickel mg/Kg	Silver mg/Kg	Zinc mg/Kg
February	1.7	21.5	251	23.9	22.5	1.0	423
May	2.8	26.6	414	23.7	15.3	1.0	451
August	2.0	17.6	375	25.6	33.9	1.9	418
November	2.6	14.0	548	40.0	20.2	1.3	690
Average	2.3	19.9	397.2	28.3	23.0	1.3	495.7

Ventura Water Reclamation Facility

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Solids Streams

Total Metal in mg/Kg Dry Weight

Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium
18-Feb-98	FILTER PRESS 1 RUN 1						3.4	46.4
18-Feb-98	FILTER PRESS 1 RUN 2						3.5	47.6
18-Feb-98	FILTER PRESS 2 RUN 1						3.5	46.9
18-Feb-98	FILTER PRESS 2 RUN 2						3.5	47.6
25-Feb-98	FILTER PRESS 1 RUN 1	11161	<2.5	<2.5	373	<2.5	<2.5	110.0
24-Apr-98	FILTER PRESS 1 RUN 1	10394	<2.5	<2.5	401	<2.5	<2.5	49.3
06-May-98	FILTER PRESS 1 RUN 1						5.5	51.4
06-May-98	FILTER PRESS 1 RUN 2						5.4	54.0
06-May-98	FILTER PRESS 2 RUN 1						5.5	49.5
06-May-98	FILTER PRESS 2 RUN 2						5.2	51.3
03-Jun-98	FILTER PRESS 1 RUN 1	9607.8	<2.5	<2.5	377.9	<2.5	2.5	19
05-Aug-98	FILTER PRESS 1 RUN 1						5.6	43.7
05-Aug-98	FILTER PRESS 1 RUN 2						6.2	41.0
05-Aug-98	FILTER PRESS 2 RUN 1						6.6	47.1
05-Aug-98	FILTER PRESS 2 RUN 2						6.5	47.7
19-Aug-98	FILTER PRESS 2 RUN 1	9185	<2.7	<2.7	449	<2.7	<2.7	53.8
14-Oct-98	FILTER PRESS 2 RUN 1	8636	<2.3	<2.3	393.2	<2.3	2.59	29.95
04-Nov-98	FILTER PRESS 1 RUN 1						5.7	33.9
04-Nov-98	FILTER PRESS 1 RUN 2						4.7	33.5
04-Nov-98	FILTER PRESS 2 RUN 1						4.8	33.8
04-Nov-98	FILTER PRESS 2 RUN 2						4.7	32.3
04-Nov-98	FILTER PRESS 1 RUN 1	7885	<1.8	<1.8	349	<1.8	<1.8	26.7
Average		9478	<2.8	<2.8	391	<2.8	3.9	45
Maximum		11161			449		7	110
Minimum		7885	<2.3	<2.3	349	1.8	<2.7	19

Ventura Water Reclamation Facility

Annual Report 1998

Solids Streams

Total Metal in mg/Kg Dry Weight

Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Cobalt	Copper	Lead	Mercury	Molybdenu	Nickel	Selenium
18-Feb-98	FILTER PRESS 1 RUN 1		782	50.0			87.6	
18-Feb-98	FILTER PRESS 1 RUN 2		771	49.0			76.3	
18-Feb-98	FILTER PRESS 2 RUN 1		788	51.0			78.2	
18-Feb-98	FILTER PRESS 2 RUN 2		856	51.0			79.2	
25-Feb-98	FILTER PRESS 1 RUN 1	7.8	692	29.7	<1.0	11.7	10.1	10.4
24-Apr-98	FILTER PRESS 1 RUN 1	7.9	803	26.8	<1.0	11.4	40.6	29.1
06-May-98	FILTER PRESS 1 RUN 1		933	26.8			29.0	
06-May-98	FILTER PRESS 1 RUN 2		970	47.0			30.2	
06-May-98	FILTER PRESS 2 RUN 1		961	48.0			30.5	
06-May-98	FILTER PRESS 2 RUN 2		919	48.2			36.9	
03-Jun-98	FILTER PRESS 1 RUN 1	7.9	931	29.2	11.7	12.8	35.8	35.6
05-Aug-98	FILTER PRESS 1 RUN 1		831	41.5			80.4	
05-Aug-98	FILTER PRESS 1 RUN 2		849	26.1			88.5	
05-Aug-98	FILTER PRESS 2 RUN 1		914	35.5			91.6	
05-Aug-98	FILTER PRESS 2 RUN 2		928	37.7			91.2	
19-Aug-98	FILTER PRESS 2 RUN 1	9.8	951	29.6	4.5	25.4	98.4	30.3
14-Oct-98	FILTER PRESS 2 RUN 1	58.2	823	35.3	<0.91	18.4	36.3	25.3
04-Nov-98	FILTER PRESS 1 RUN 1		863	50.8			32.5	
04-Nov-98	FILTER PRESS 1 RUN 2		884	42.2			31.4	
04-Nov-98	FILTER PRESS 2 RUN 1		900	46.5			32.0	
04-Nov-98	FILTER PRESS 2 RUN 2		873	43.6			29.1	
04-Nov-98	FILTER PRESS 1 RUN 1	13.1	763	36.2	<1.0	18.0	32.5	27.2
Average		17.4	863.0	40.1	2.7	16.3	53.6	26.3
Maximum		58.2	970.0	51.0	11.7	25.4	98.4	35.6
Minimum		7.8	692.0	26.1	<0.91	11.4	10.1	10.4

Ventura Water Reclamation Facility

Annual Report 1998

Solids Streams

Total Metal in mg/Kg Dry Weight

Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Silver	Thallium	Tin	Vanadium	Zinc
18-Feb-98	FILTER PRESS 1 RUN 1	1.7				810
18-Feb-98	FILTER PRESS 1 RUN 2	2.3				779
18-Feb-98	FILTER PRESS 2 RUN 1	2.1				781
18-Feb-98	FILTER PRESS 2 RUN 2	0.1				817
25-Feb-98	FILTER PRESS 1 RUN 1	27.1	2.7	105.4	8.8	656
24-Apr-98	FILTER PRESS 1 RUN 1	40.8	11.1	2.5	6.2	813
06-May-98	FILTER PRESS 1 RUN 1	1.6				982
06-May-98	FILTER PRESS 1 RUN 2	2.3				1037
06-May-98	FILTER PRESS 2 RUN 1	2.4				1032
06-May-98	FILTER PRESS 2 RUN 2	2.5				991
03-Jun-98	FILTER PRESS 1 RUN 1	38.9	3.3	<2.5	4.3	838
05-Aug-98	FILTER PRESS 1 RUN 1	2.3				785
05-Aug-98	FILTER PRESS 1 RUN 2	1.7				834
05-Aug-98	FILTER PRESS 2 RUN 1	7.5				876
05-Aug-98	FILTER PRESS 2 RUN 2	3.6				903
19-Aug-98	FILTER PRESS 2 RUN 1	40.7	<2.7	4.9	8.4	679
14-Oct-98	FILTER PRESS 2 RUN 1	35.6	25.1	22.7	7.5	741
04-Nov-98	FILTER PRESS 1 RUN 1	1.6				712
04-Nov-98	FILTER PRESS 1 RUN 2	1.7				703
04-Nov-98	FILTER PRESS 2 RUN 1	1.6				685
04-Nov-98	FILTER PRESS 2 RUN 2	1.4				685
04-Nov-98	FILTER PRESS 1 RUN 1	39.1	16.2	20.0	9.1	685
Average		11.8	9.7	25.9	7.4	810
Maximum		40.8	25.1	105.4	9.1	1037
Minimum		0.1	<2.7	<2.5	4.3	656

Ventura Water Reclamation Facility

Annual Report 1998

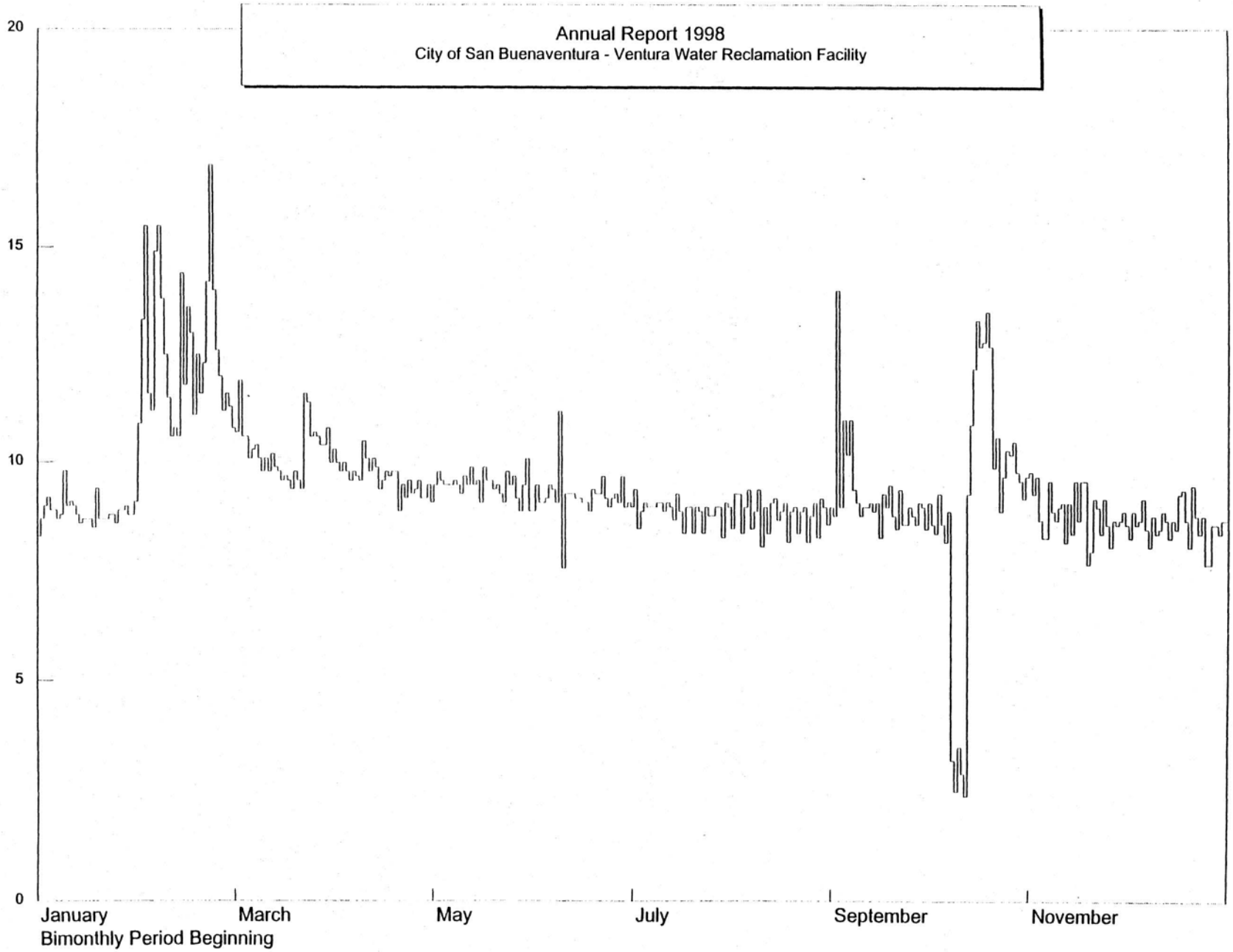
Solids Streams

Total Compound in mg/Kg Dry Weight

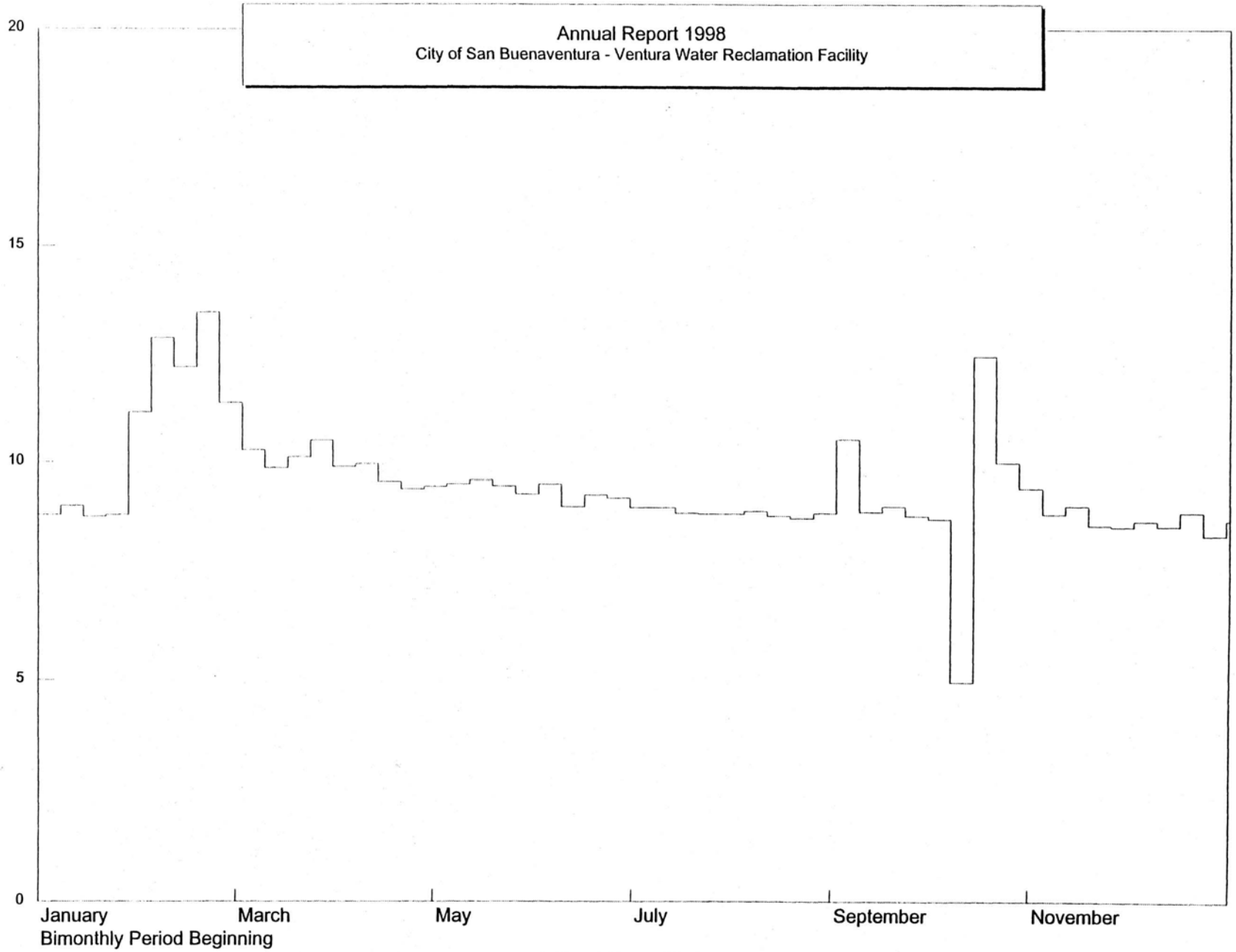
Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Acetone	Chloromethane	1,4-Dichlorobenzene	Toluene
25-Feb-98	FILTER PRESS 1 RUN 1	<0.22	<0.22	<0.05	<0.05
24-Apr-98	FILTER PRESS 1 RUN 1				
19-Aug-98	FILTER PRESS 2 RUN 1	6.96	<0.27	<0.05	2.30
04-Nov-98	FILTER PRESS 1 RUN 1				

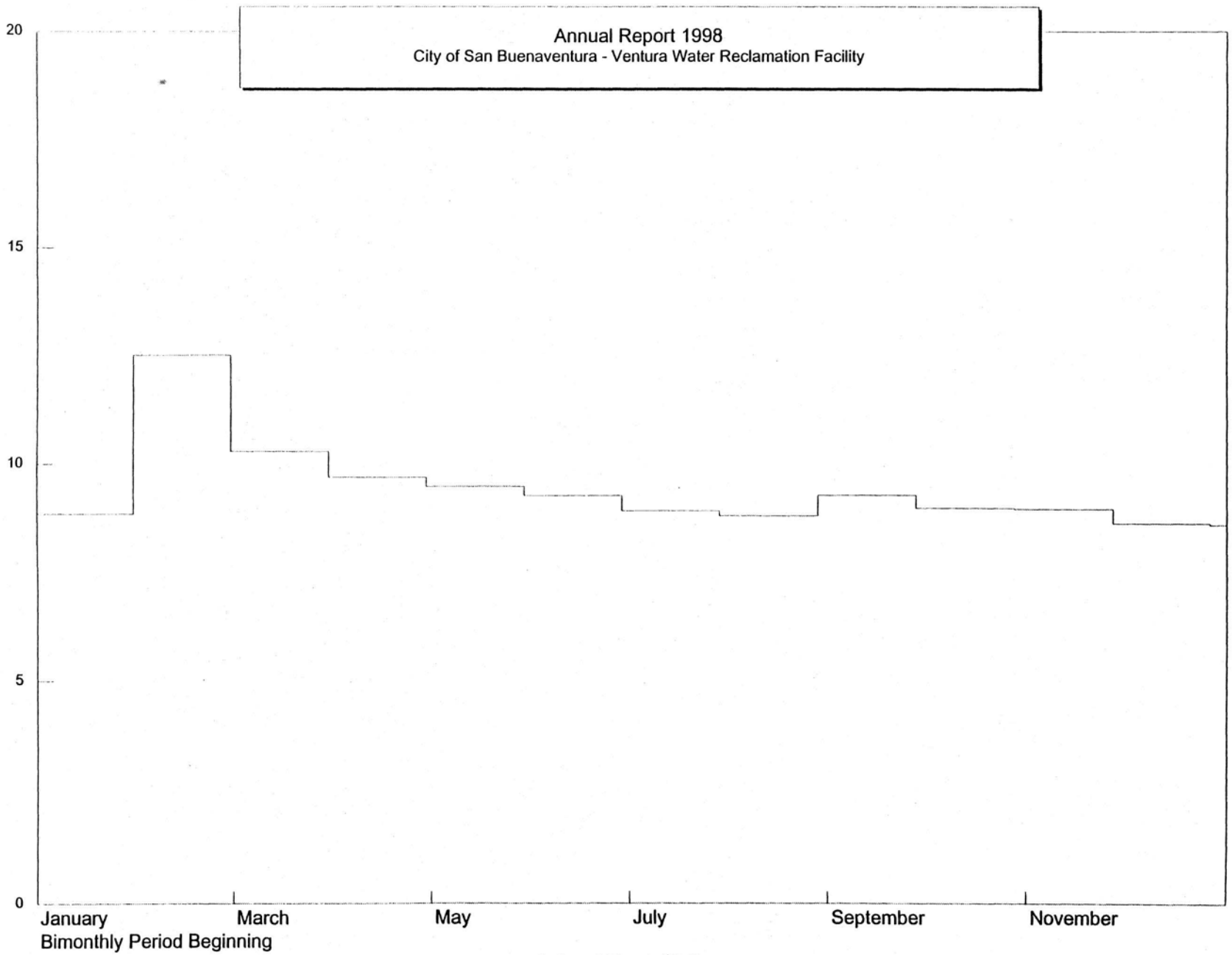
Date	Sample	Xylenes	Bis (2-Ethylhexyl)phthalate	TOX
25-Feb-98	FILTER PRESS 1 RUN 1	<0.09	<1.47	<22
24-Apr-98	FILTER PRESS 1 RUN 1			<25
03-Jun-98	FILTER PRESS 1 RUN 1	1.9	14.7	<25
19-Aug-98	FILTER PRESS 2 RUN 1			<27
14-Oct-98	FILTER PRESS 2 RUN 1			<23
04-Nov-98	FILTER PRESS 1 RUN 1			<18



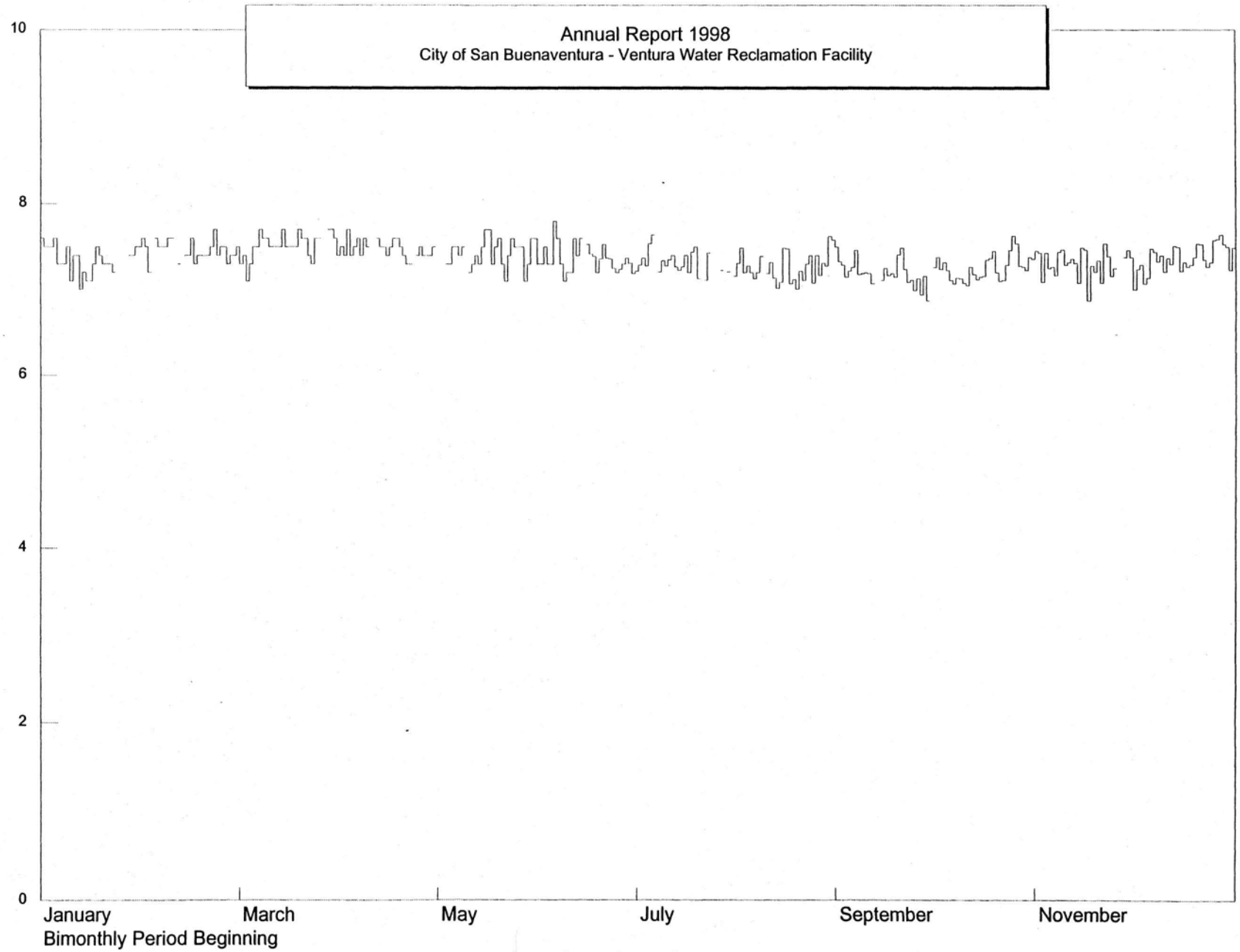
Influent Pump Station
Daily Influent Raw Sewage Flow



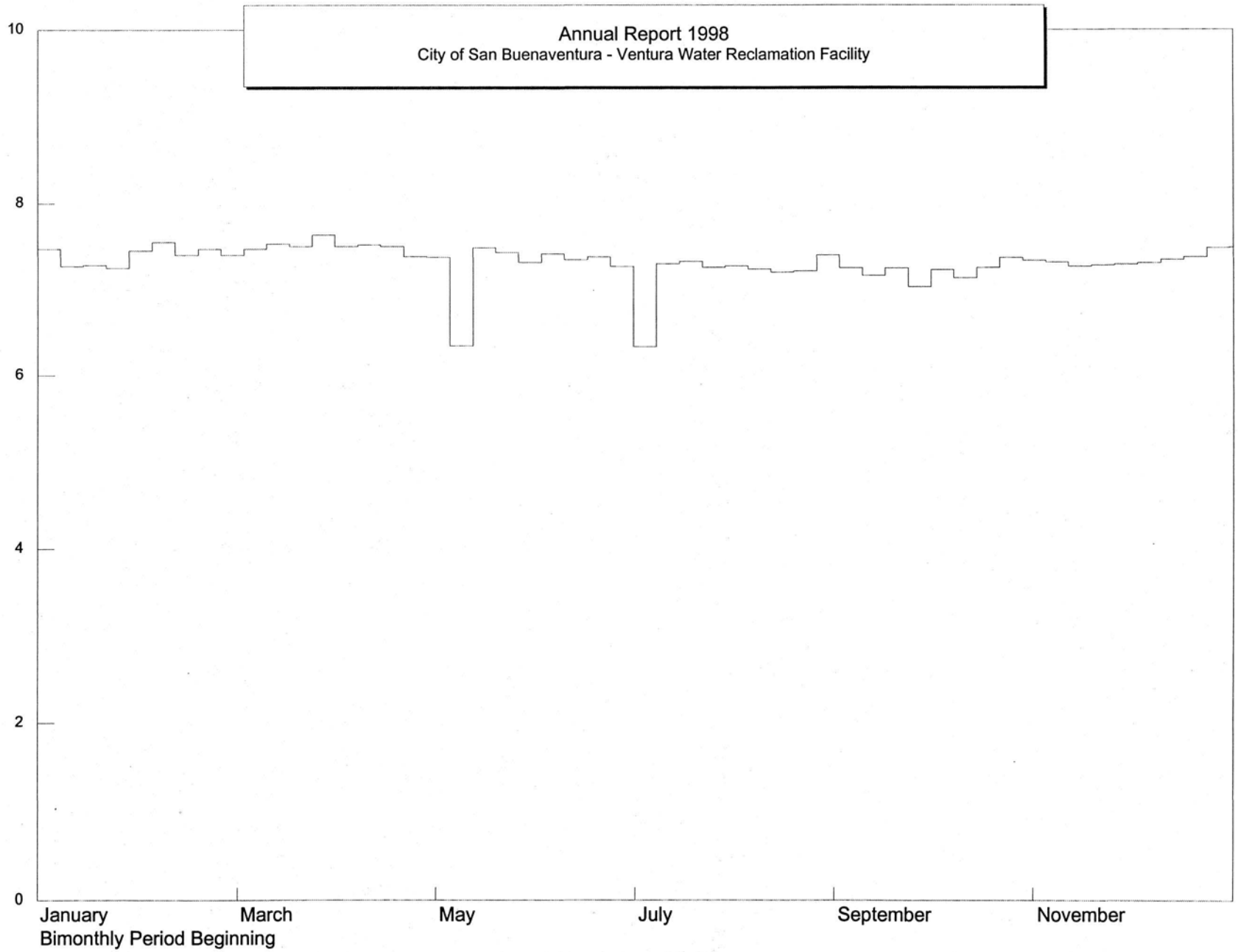
Influent Pump Station
Influent Raw Sewage 7 Day Average Flow



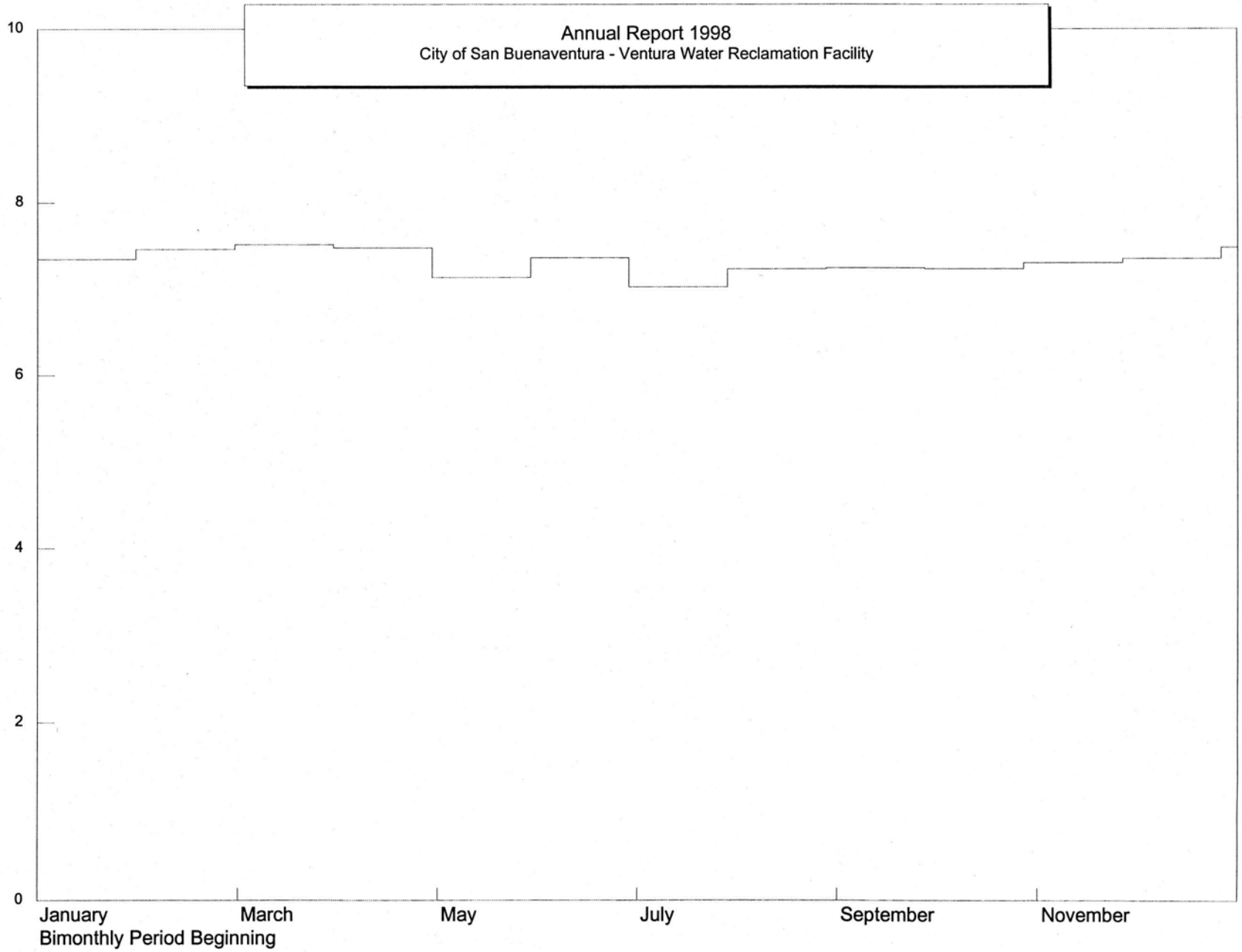
Influent Pump Station
Influent Raw Sewage 30 Day Average Flow



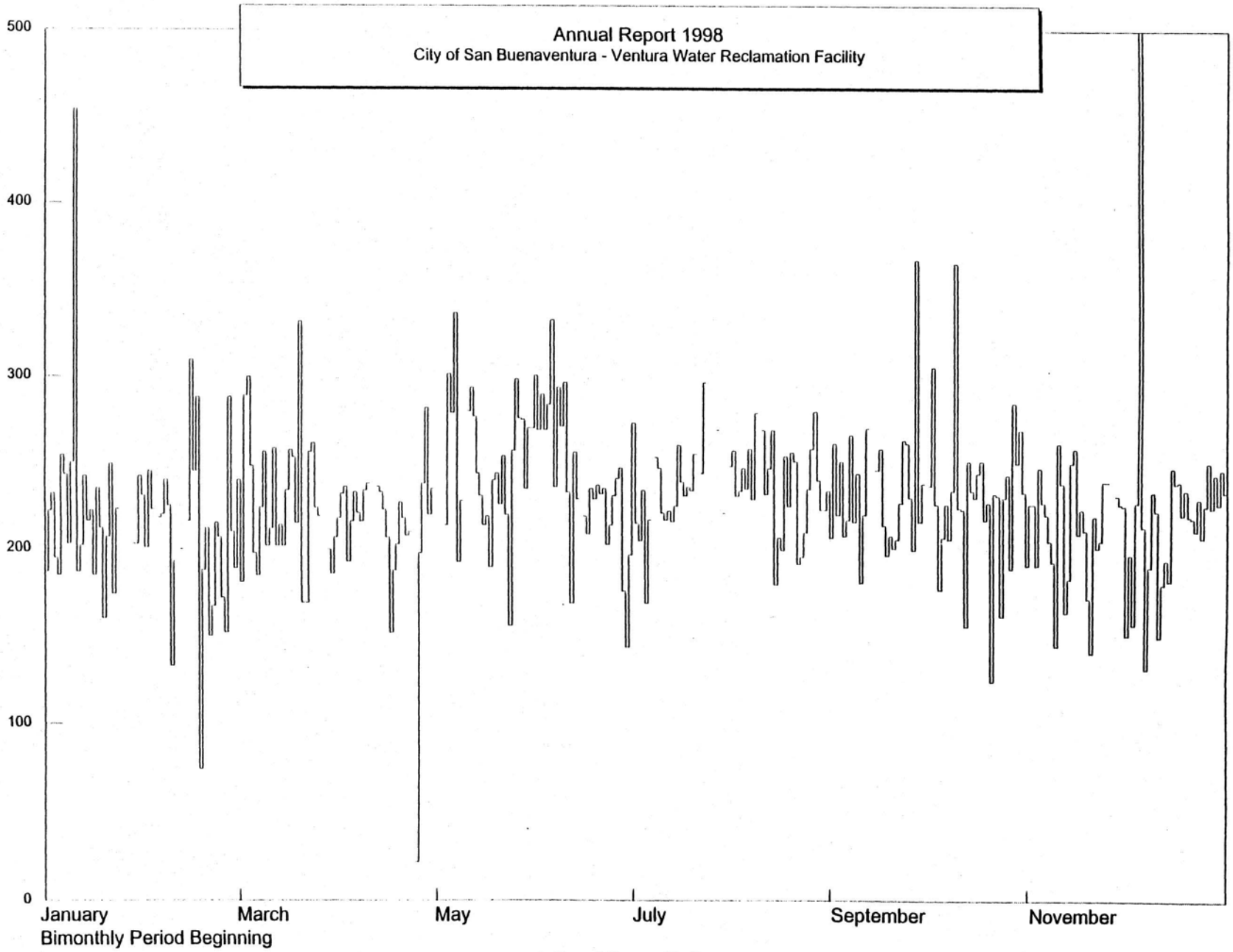
Influent Pump Station
Influent Raw Sewage pH - pH Units



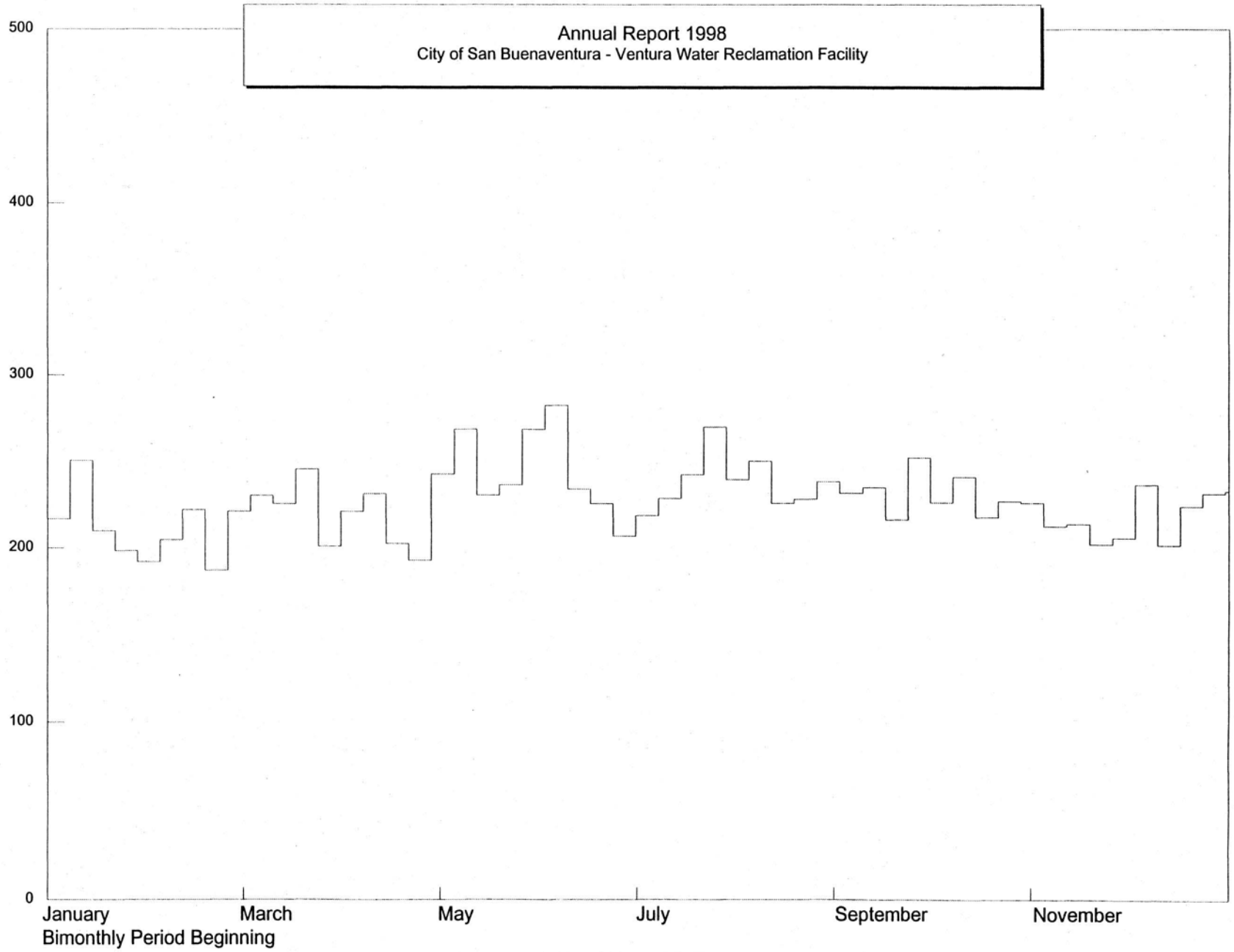
Influent Pump Station
Influent Raw Sewage 7 Day Average pH - pH Units



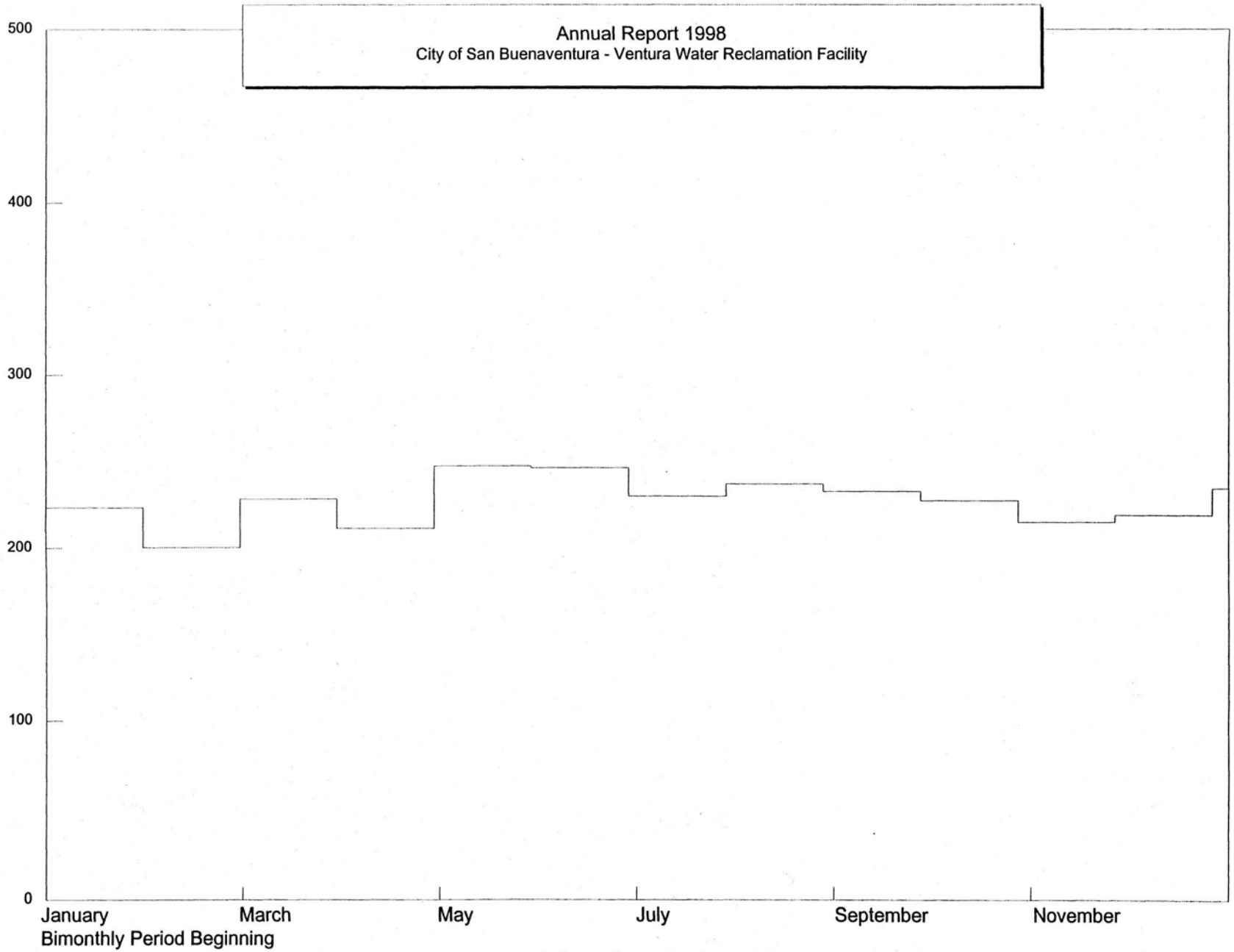
Influent Pump Station
Influent Raw Sewage 30 Day Average pH - pH Units



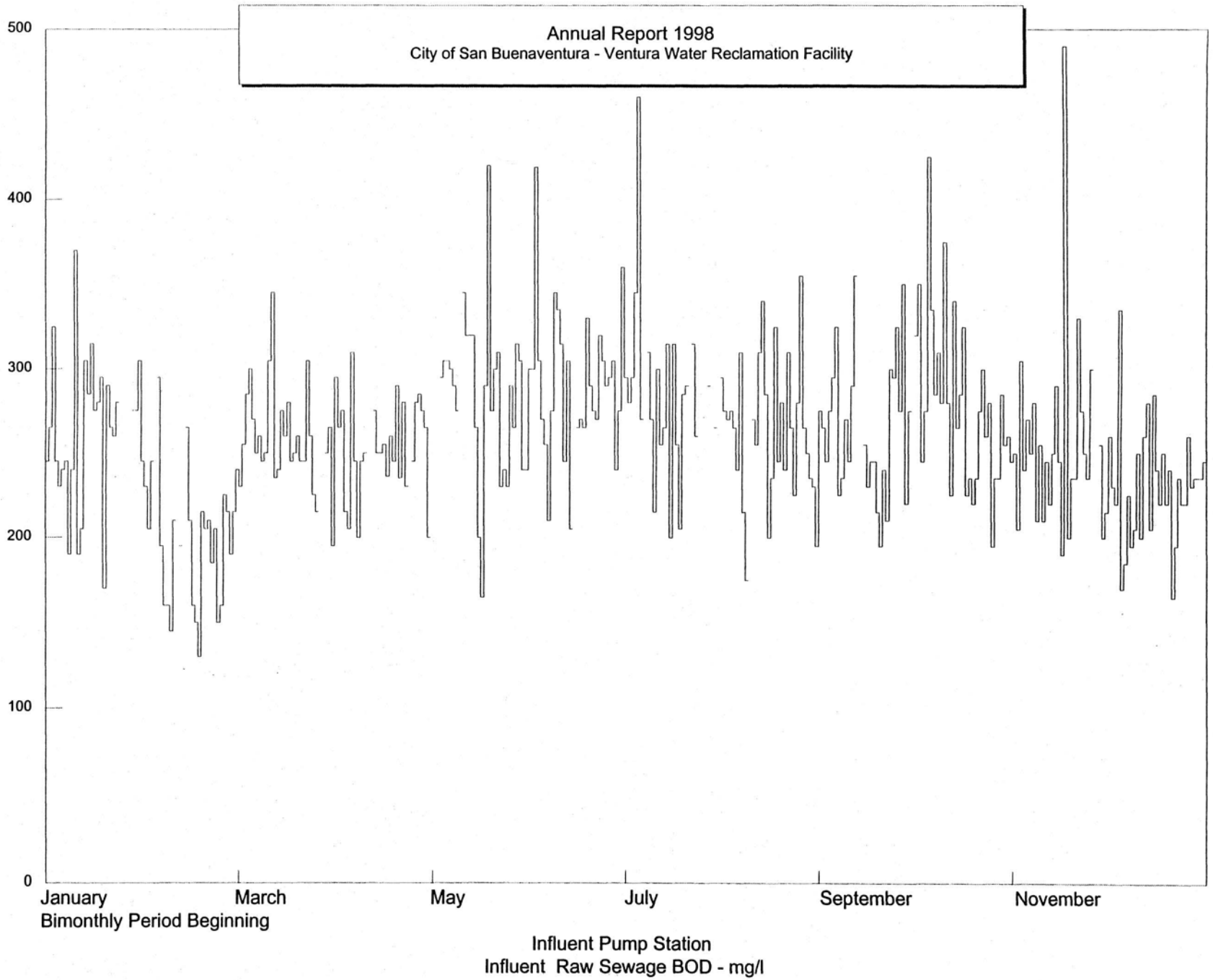
Influent Pump Station
Influent Raw Sewage Suspended Solids - mg/l

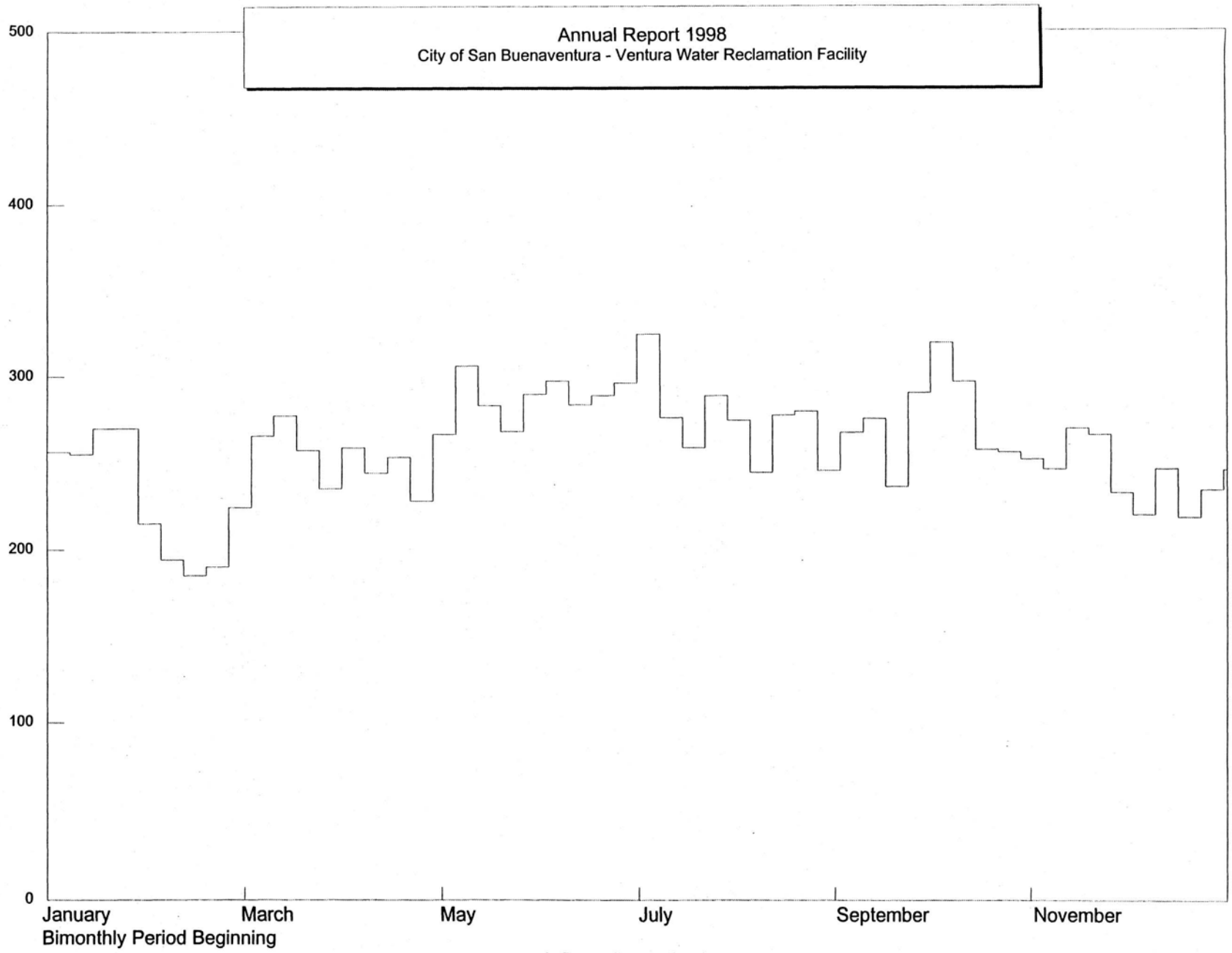


Influent Pump Station
Influent Raw Sewage 7 Day Average Suspended Solids - mg/l

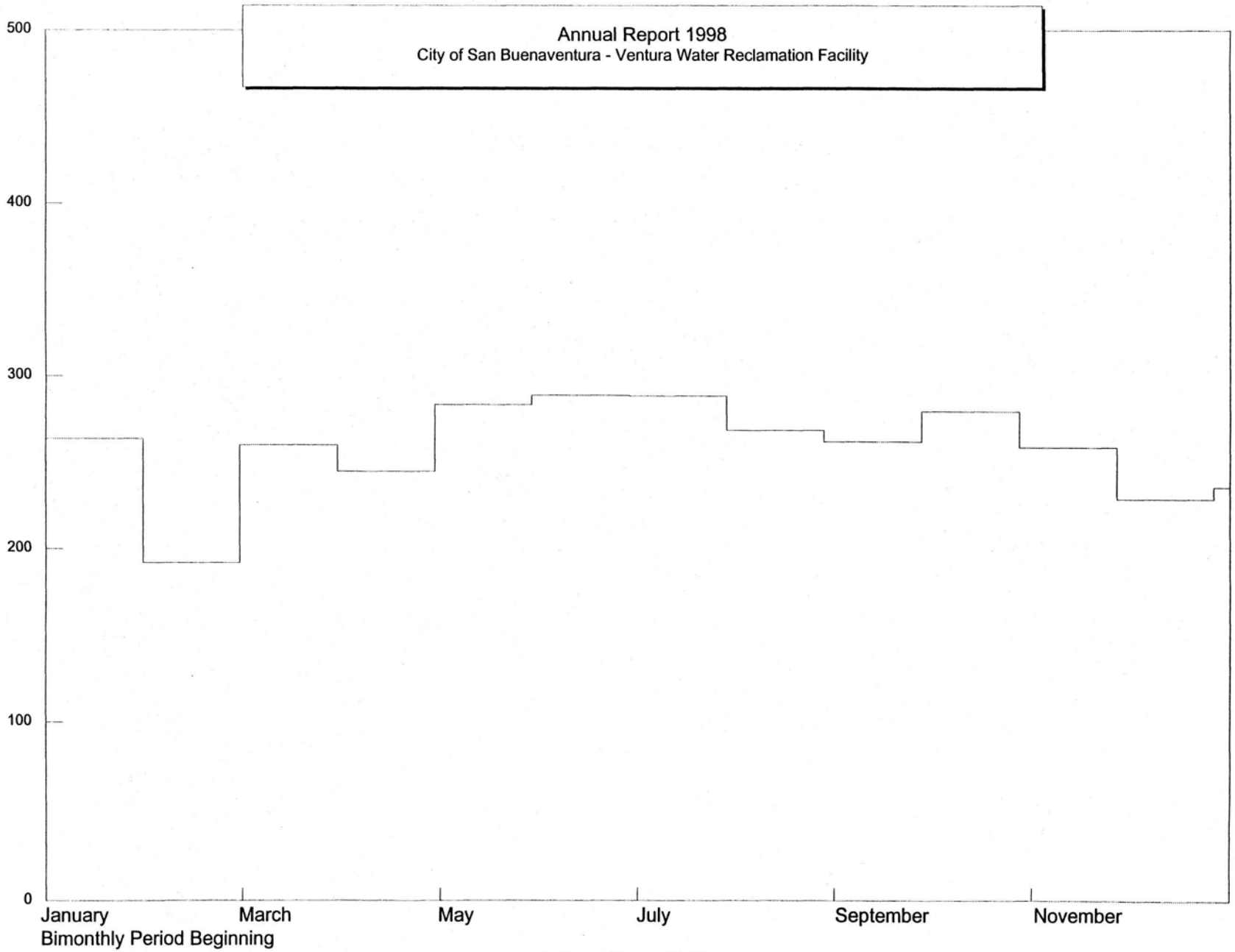


Influent Pump Station
Influent Raw Sewage 30 Day Average Suspended Solids - mg/l

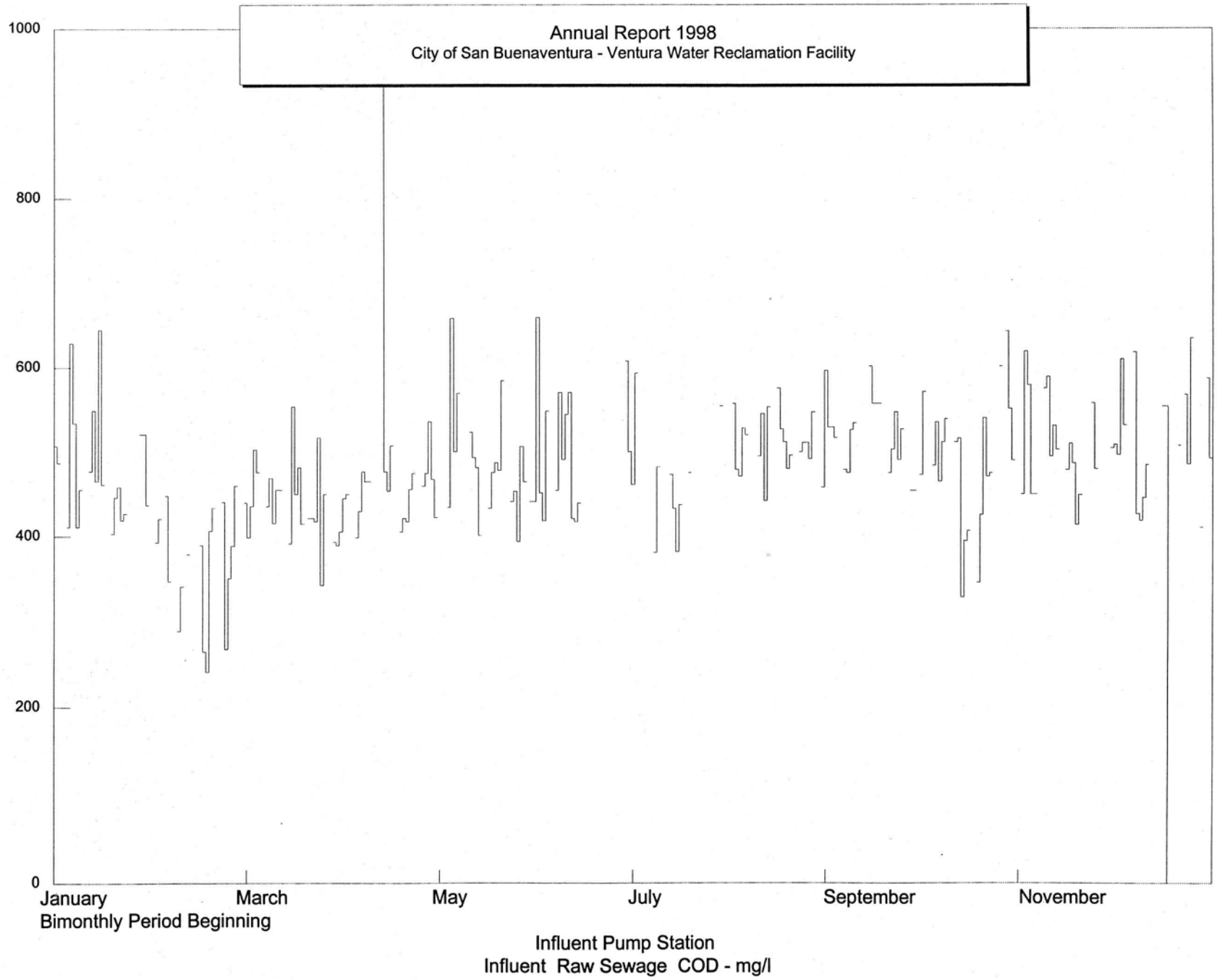

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
500
400
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Influent Pump Station
Influent Raw Sewage BOD - mg/l

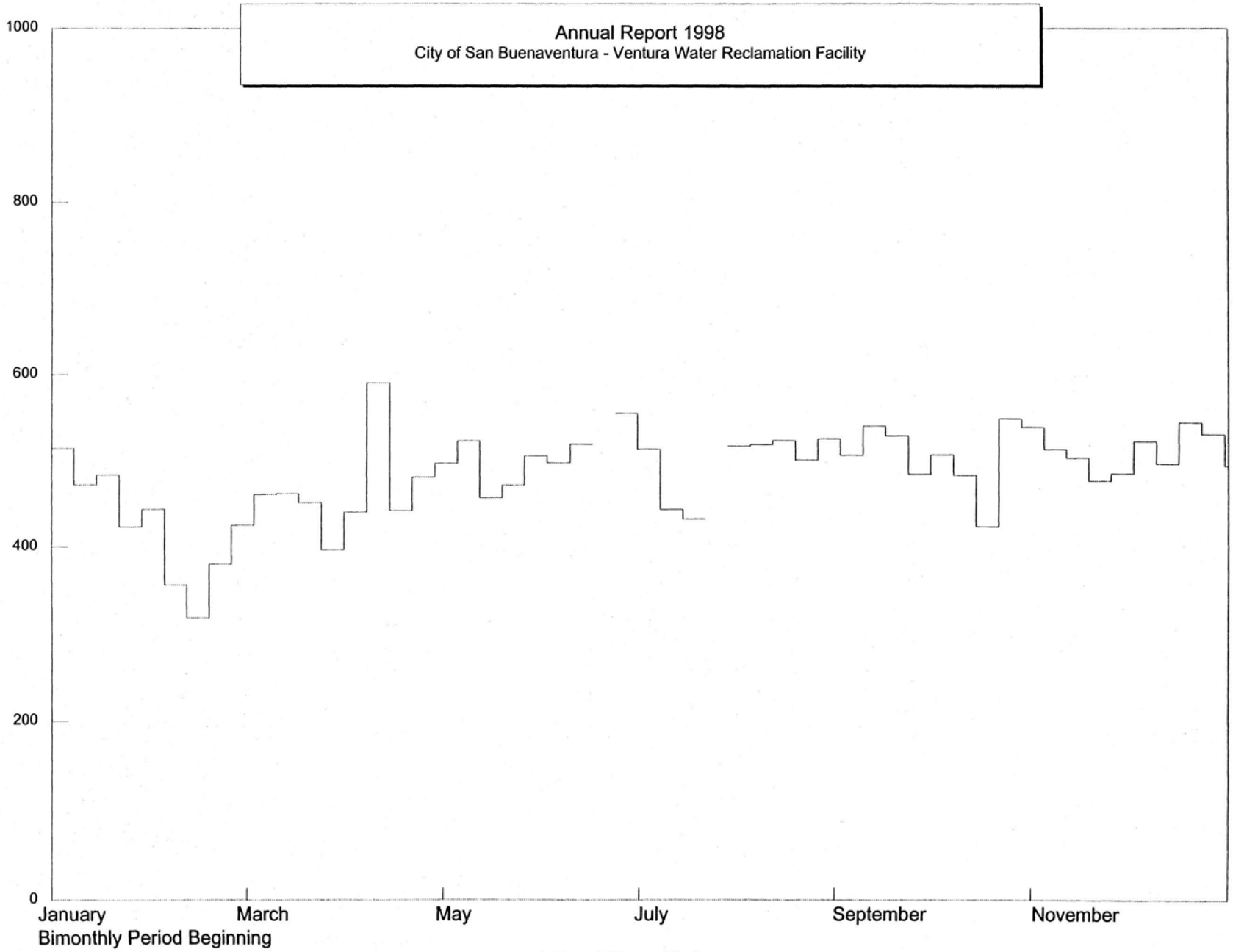


Influent Pump Station
Influent Raw Sewage 7 Day Average BOD - mg/l

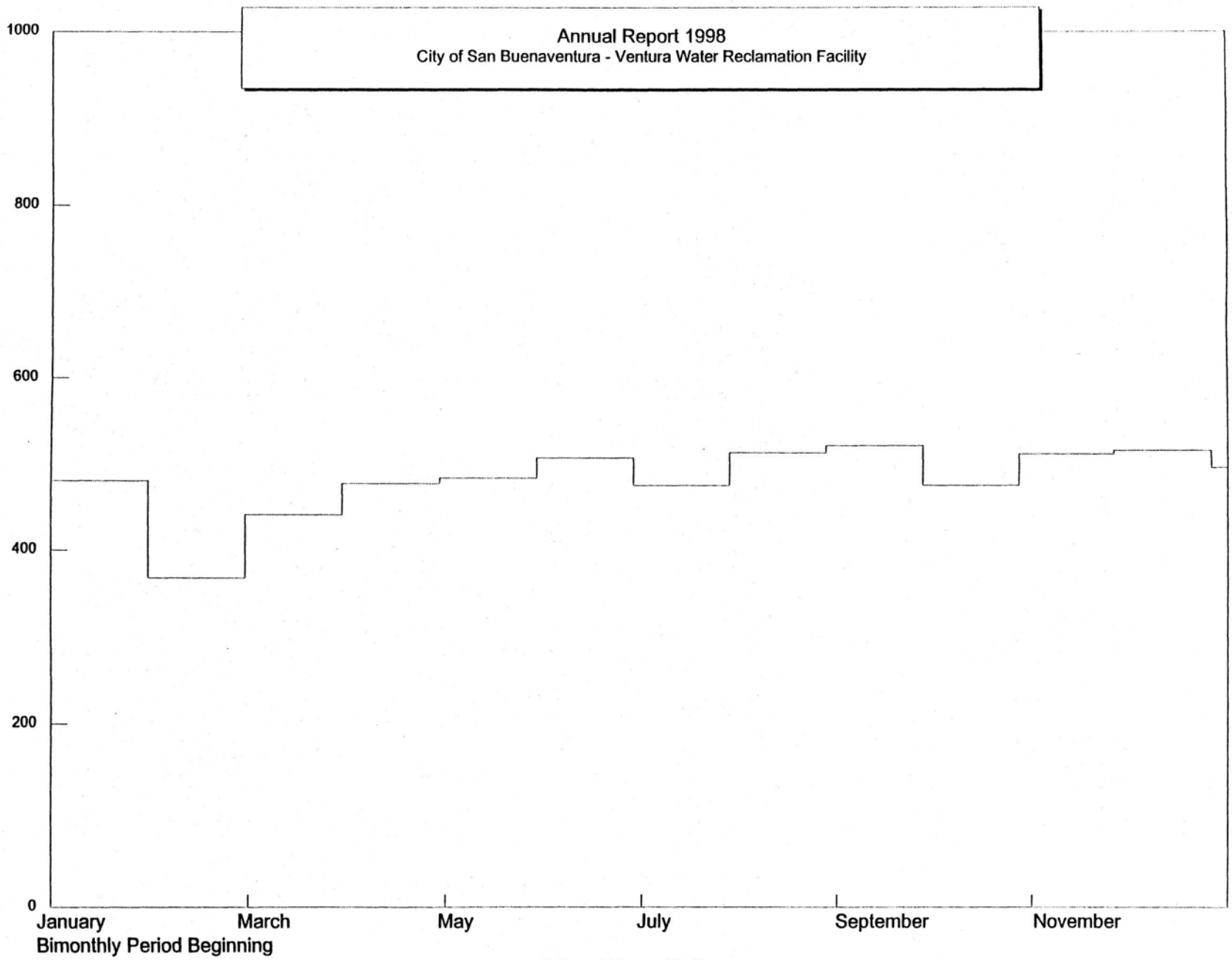


Influent Pump Station
Influent Raw Sewage 30 Day Average BOD - mg/l

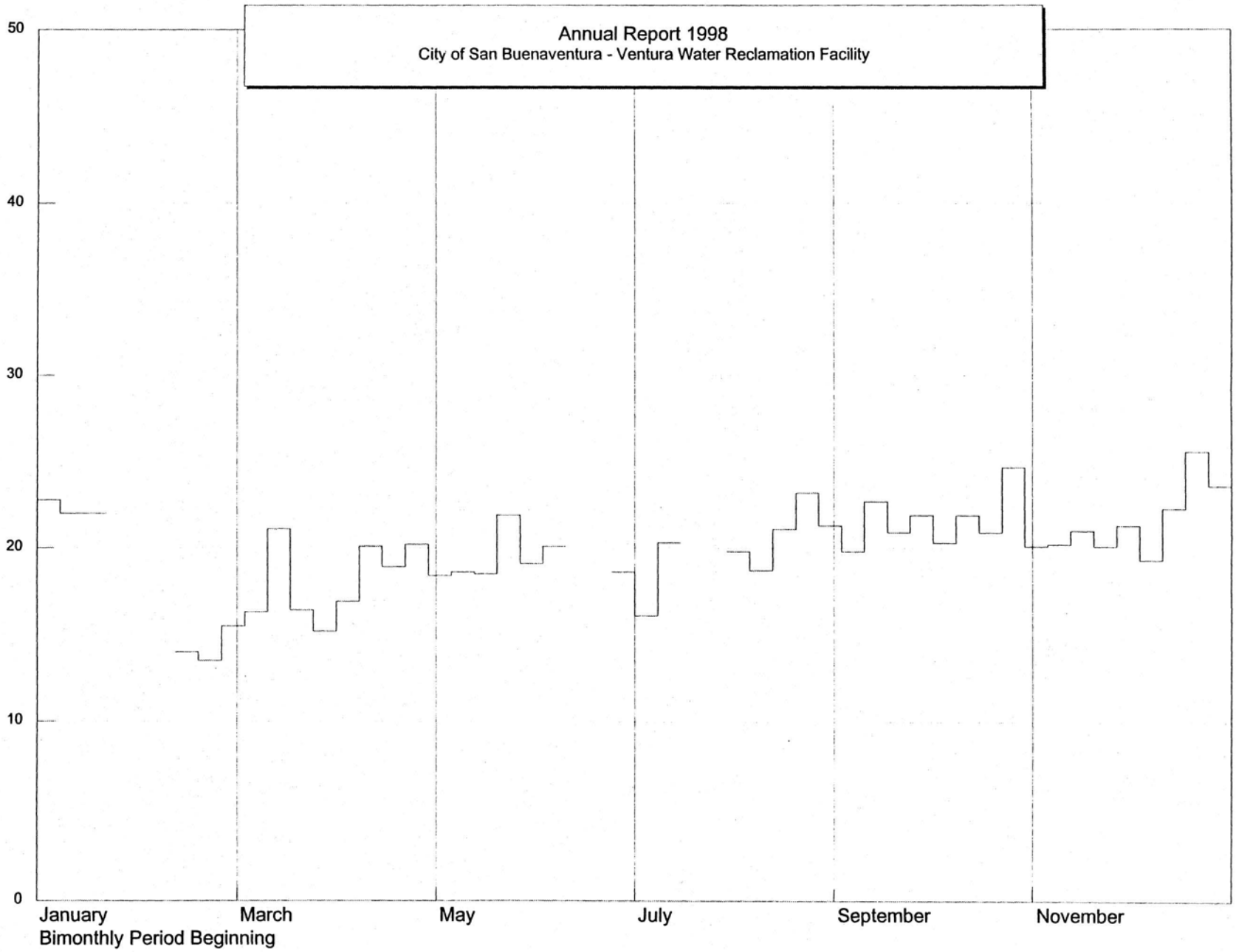

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
1000
800
600
400
200
0
January
March
May
July
September
November
Bimonthly Period Beginning
Influent Pump Station
Influent Raw Sewage COD - mg/l



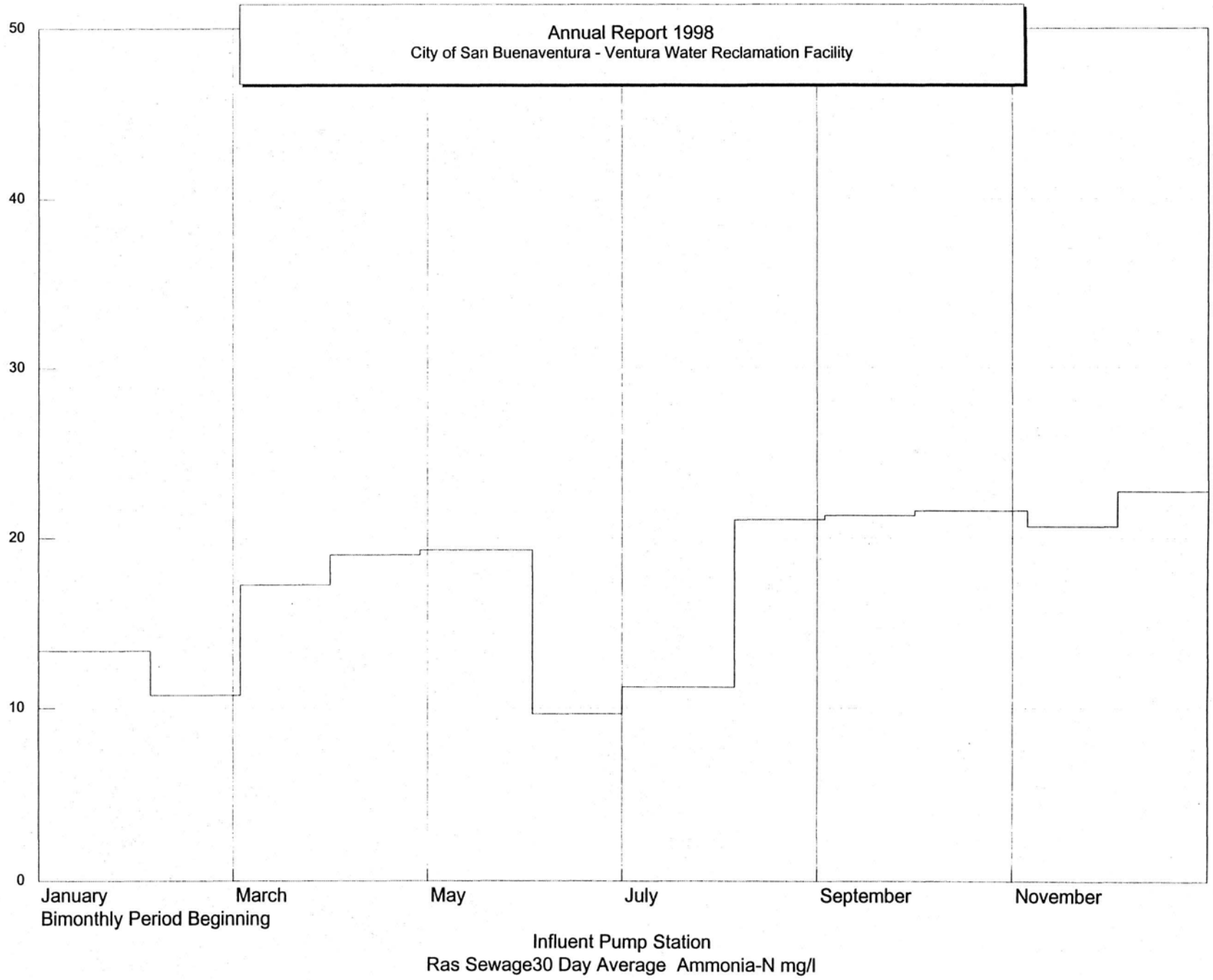
Influent Pump Station
Influent Raw Sewage 7 Day Average COD - mg/l

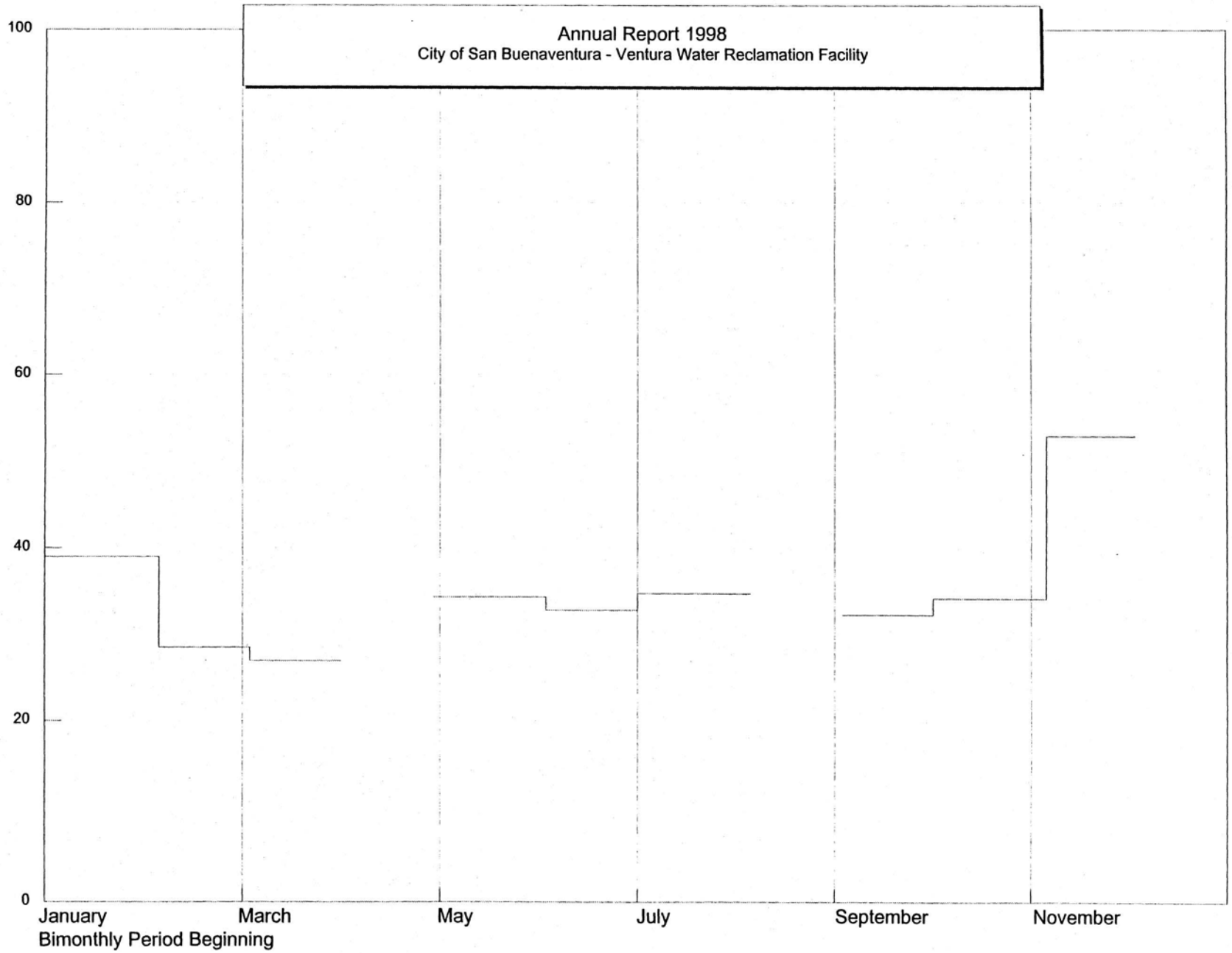


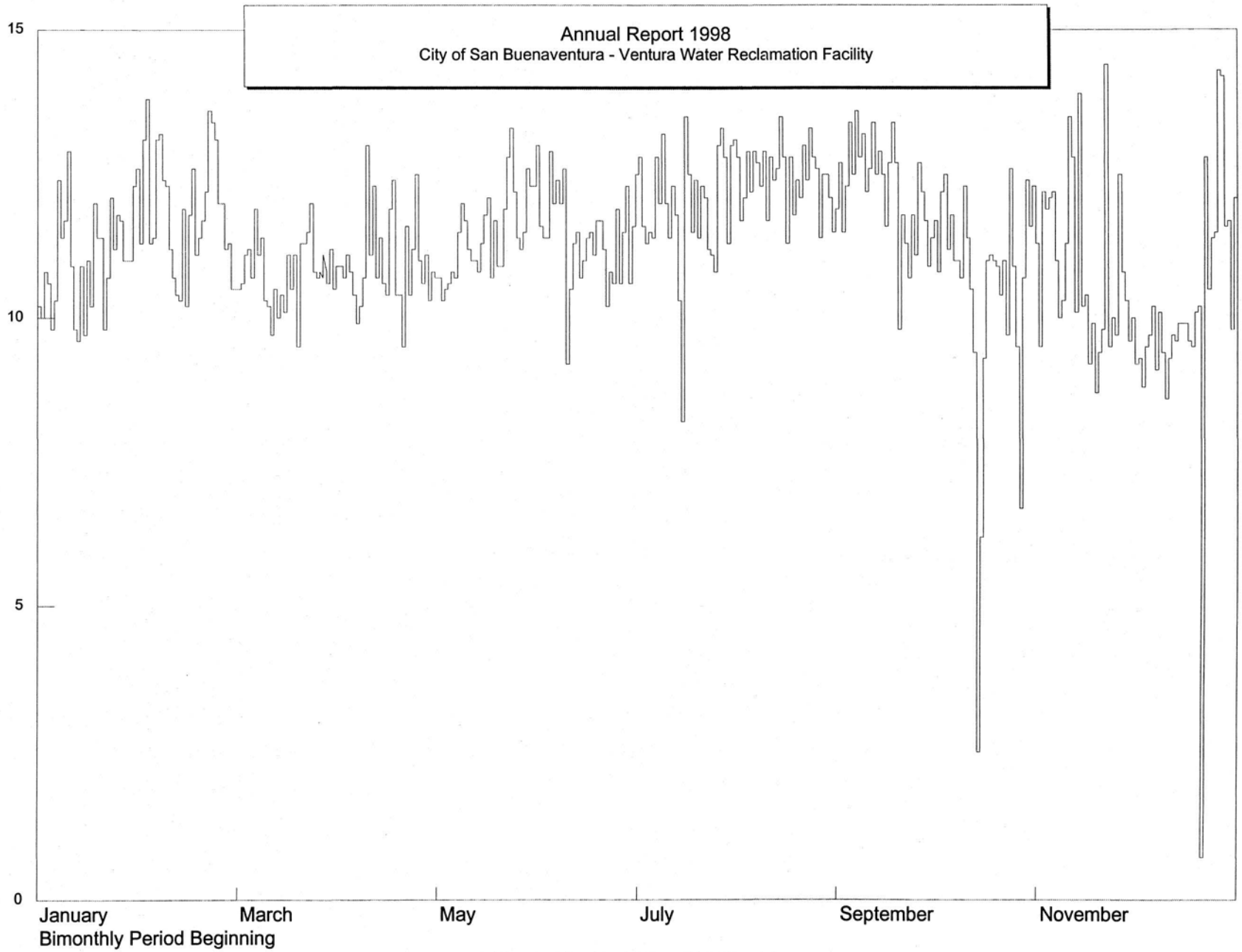
Influent Pump Station
Influent Raw Sewage 30 Day Average COD - mg/l



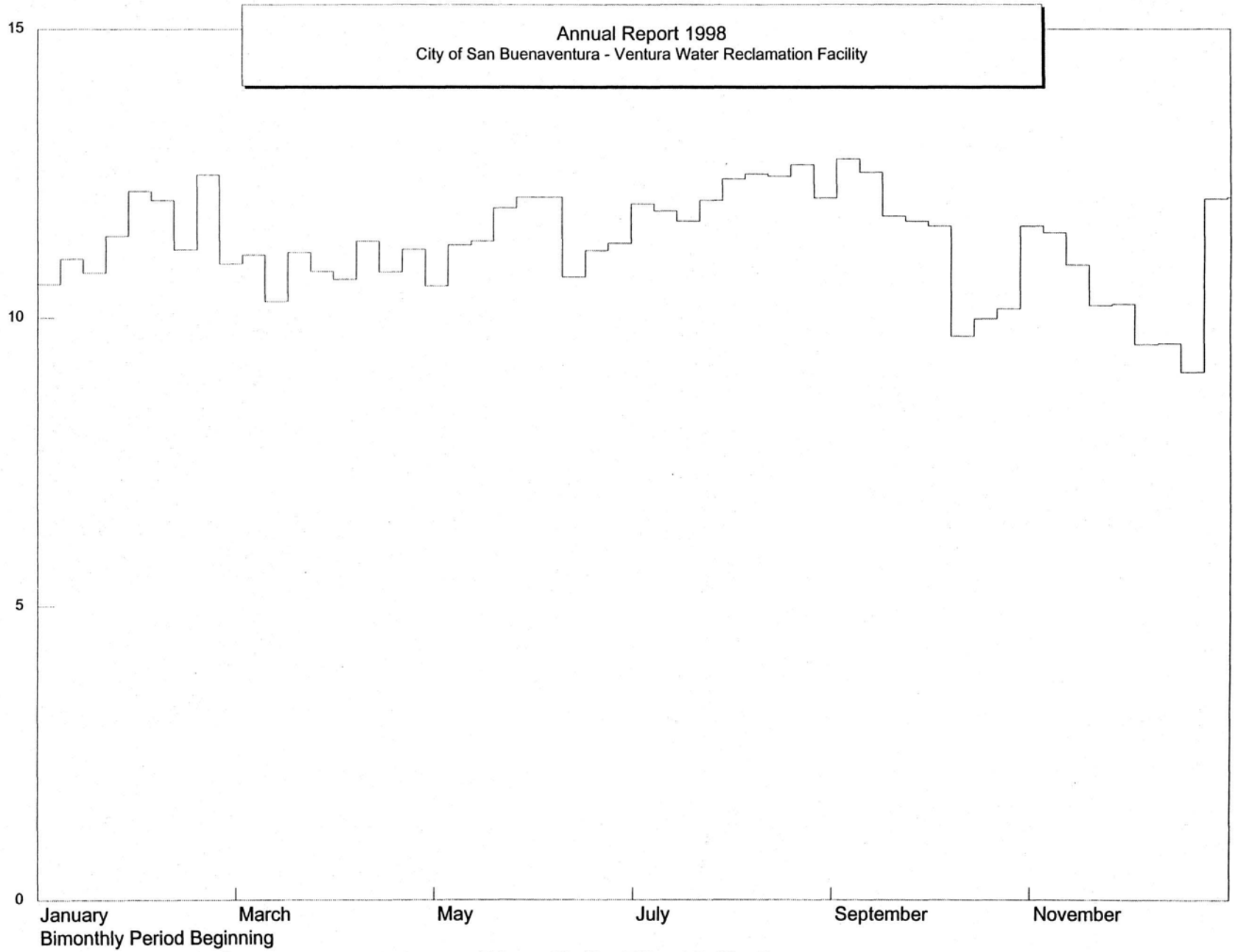
Influent Pump Station
Ras Sewage Weekly Ammonia-N mg/l


Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
50
40
30
20
10
0
January
March
May
July
September
November
Bimonthly Period Beginning
Influent Pump Station
Ras Sewage30 Day Average Ammonia-N mg/l

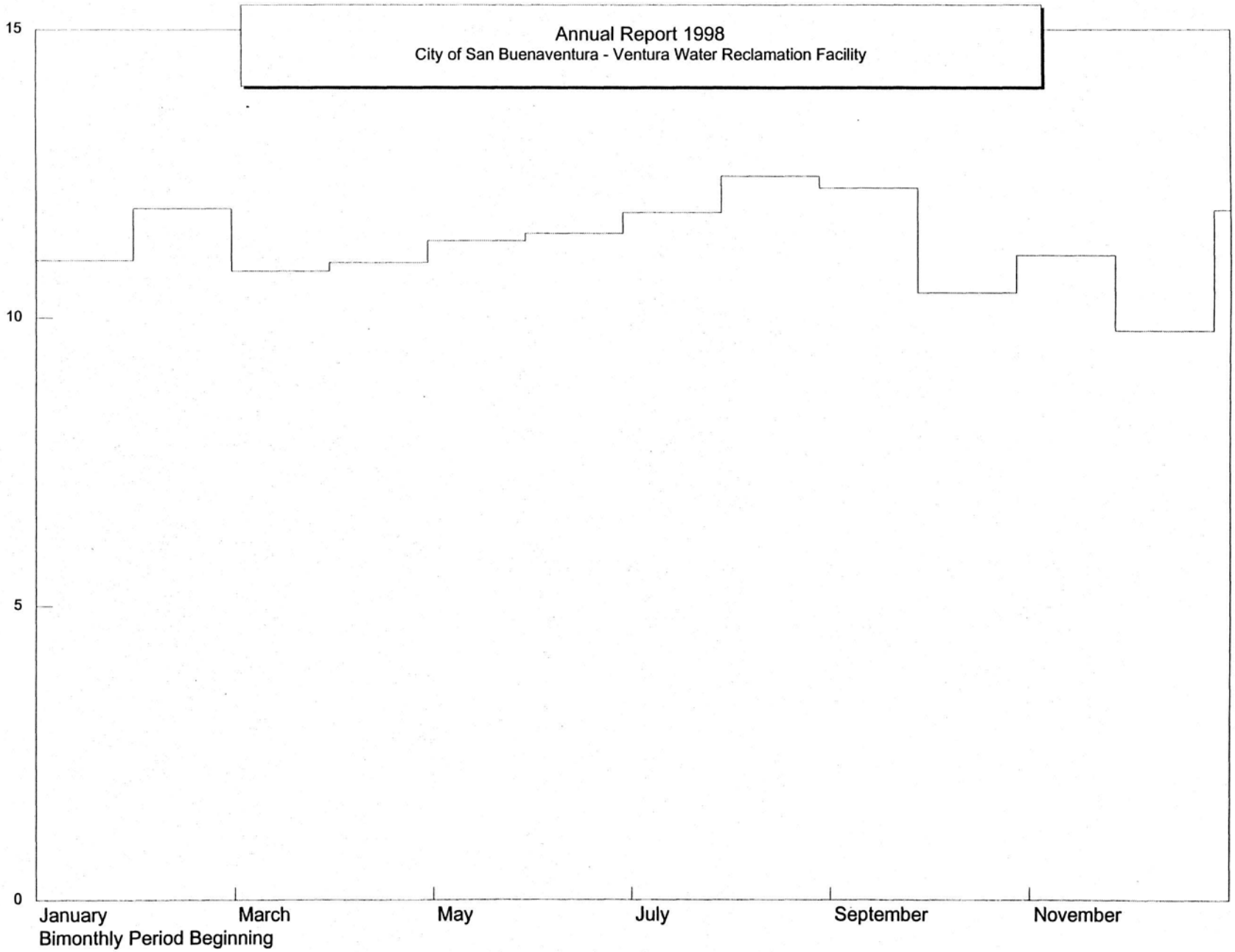

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
100
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
Influent Pump Station
Monthly Raw Sewage TKN - mg/l



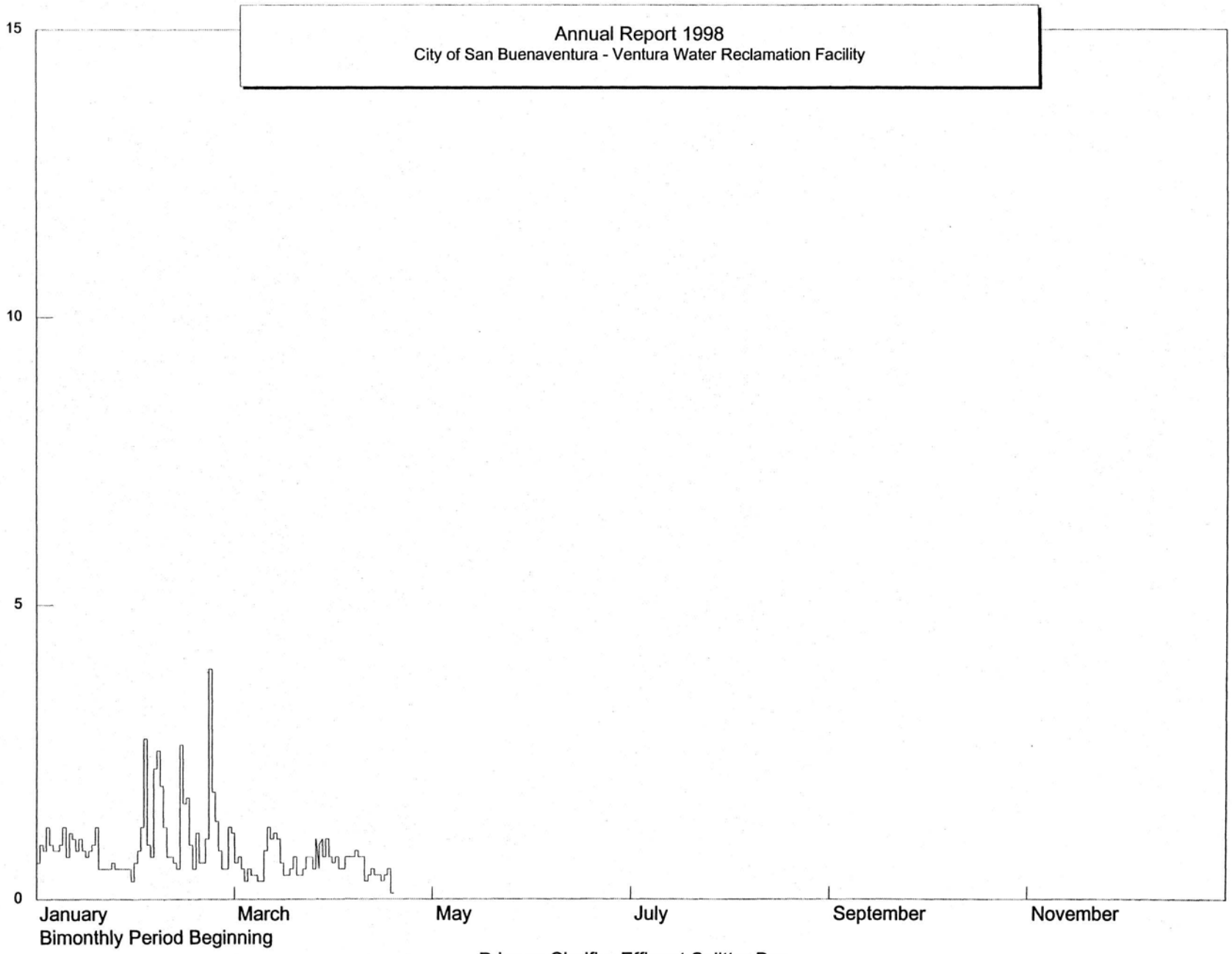
Primary Clarifier Effluent Splitter Box
Primary Effluent to Activated Sludge - MGD



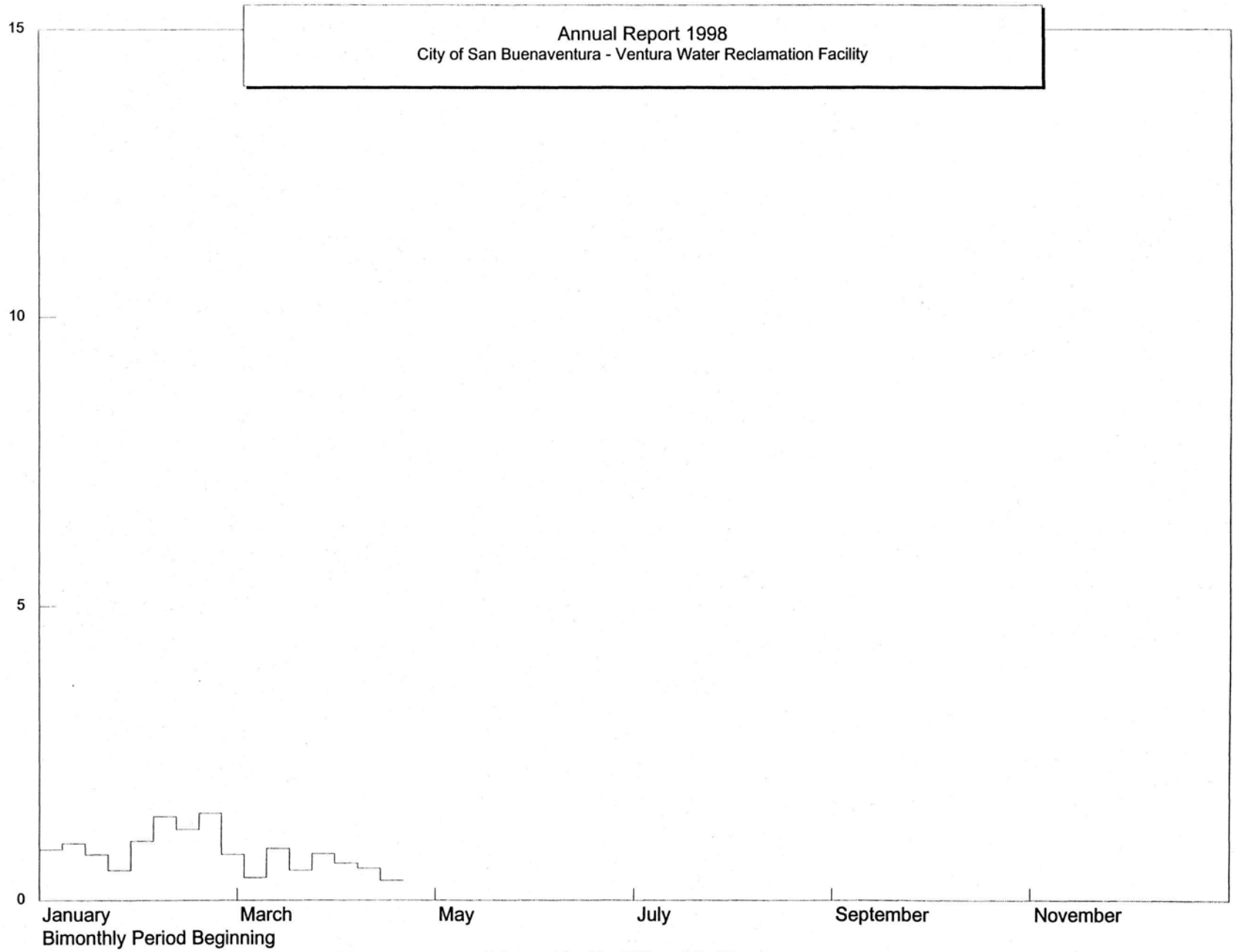
Primary Clarifier Effluent Splitter Box
7 Day Average Primary Effluent to Activated Sludge - MGD



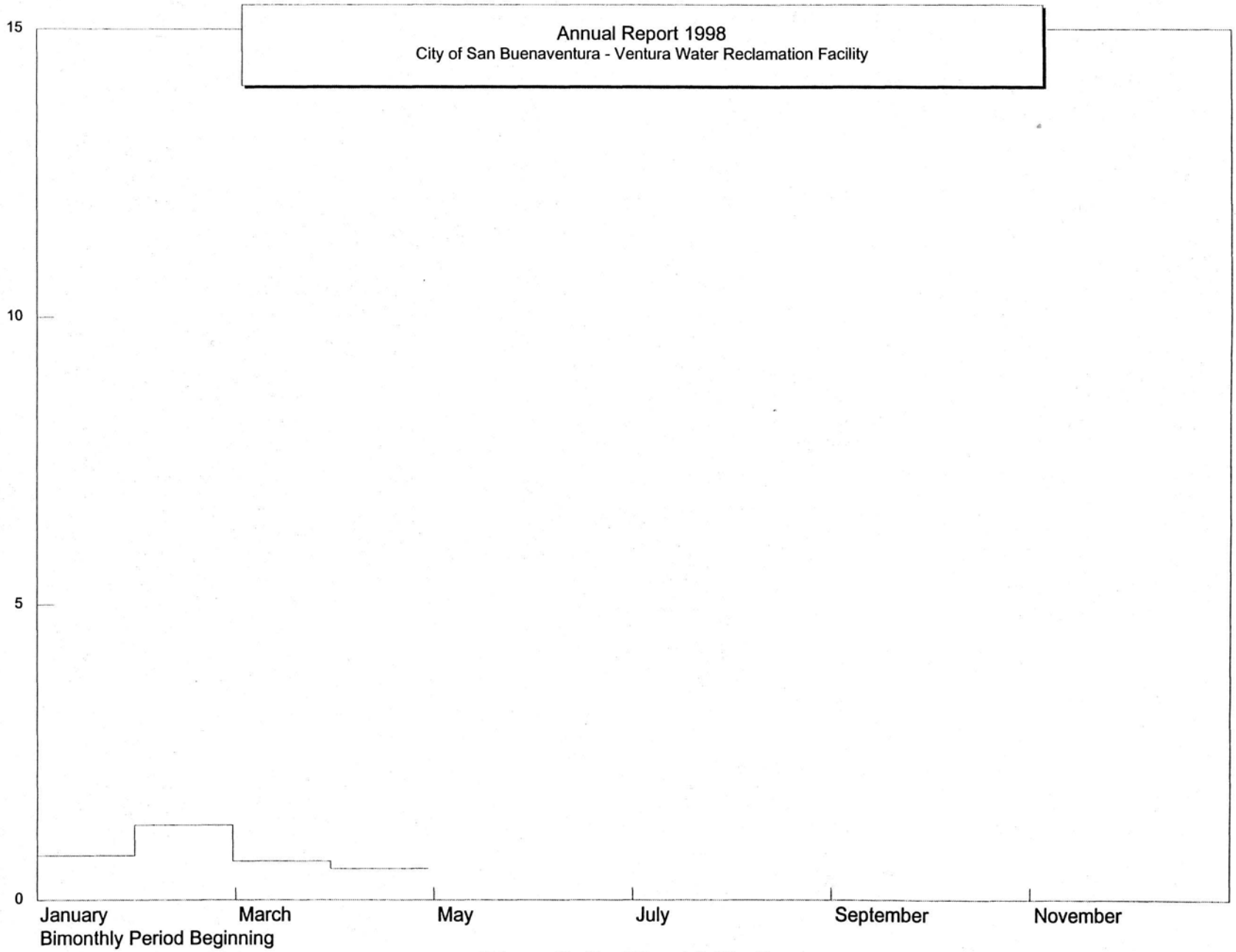
Primary Clarifier Effluent Splitter Box
30 Day Average Primary Effluent to Activated Sludge - MGD



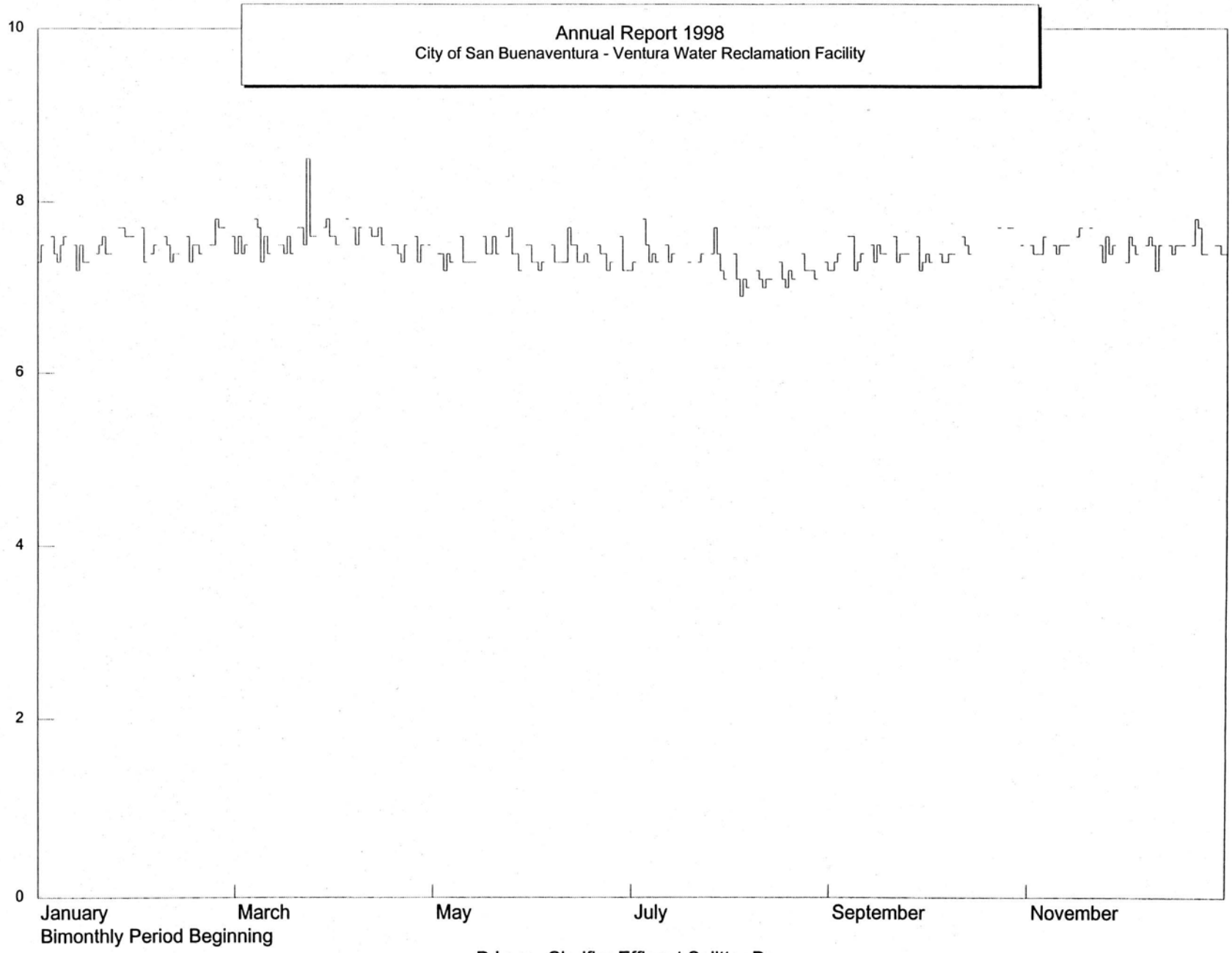
Primary Clarifier Effluent Splitter Box
Primary Effluent to Trickling Filters - MGD



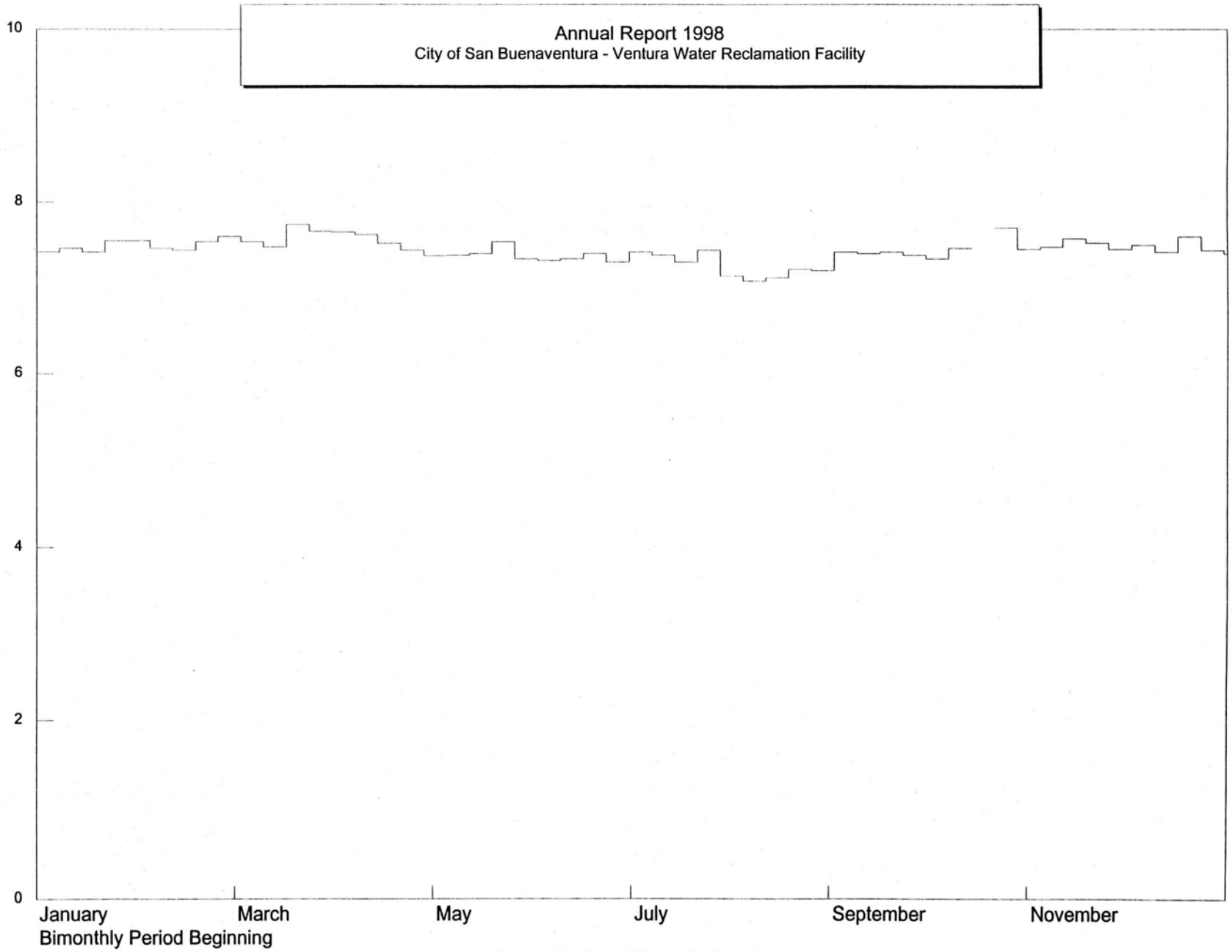
Primary Clarifier Effluent Splitter Box
7 Day Average Primary Effluent to Trickling Filters - MGD



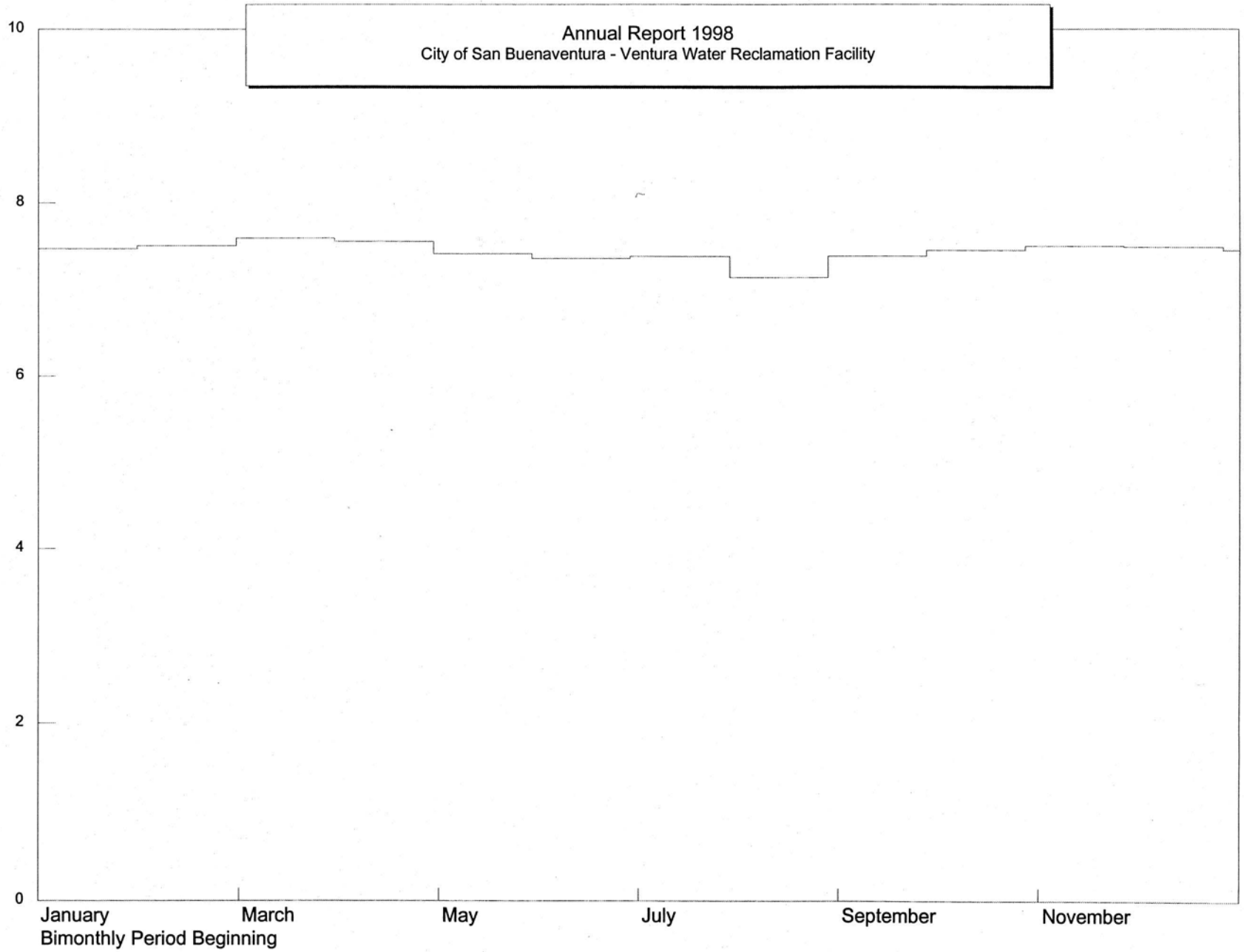
Primary Clarifier Effluent Splitter Box
30 Day Average Primary Effluent to Trickling Filters - MGD



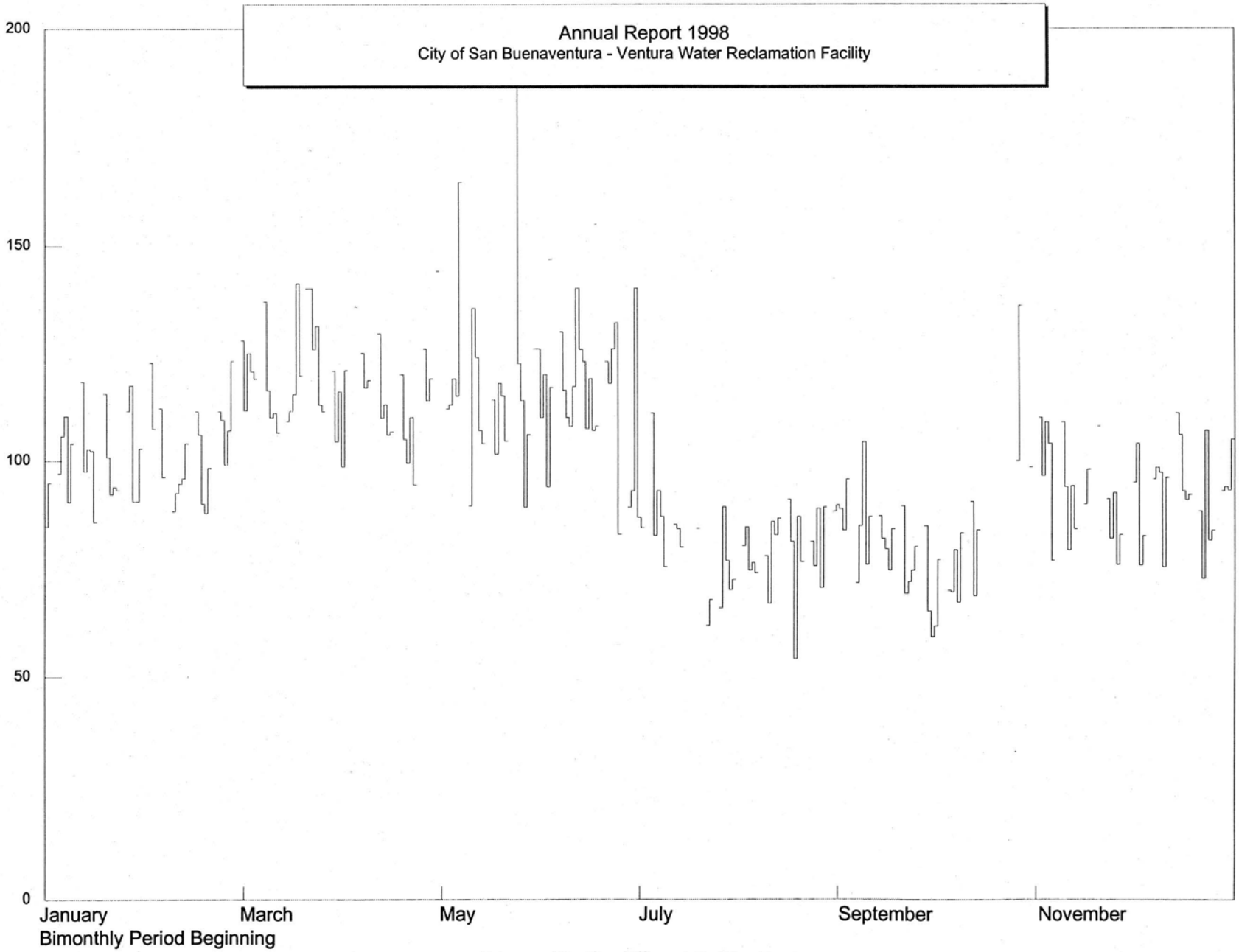
Primary Clarifier Effluent Splitter Box
Primary Effluent pH - pH Units



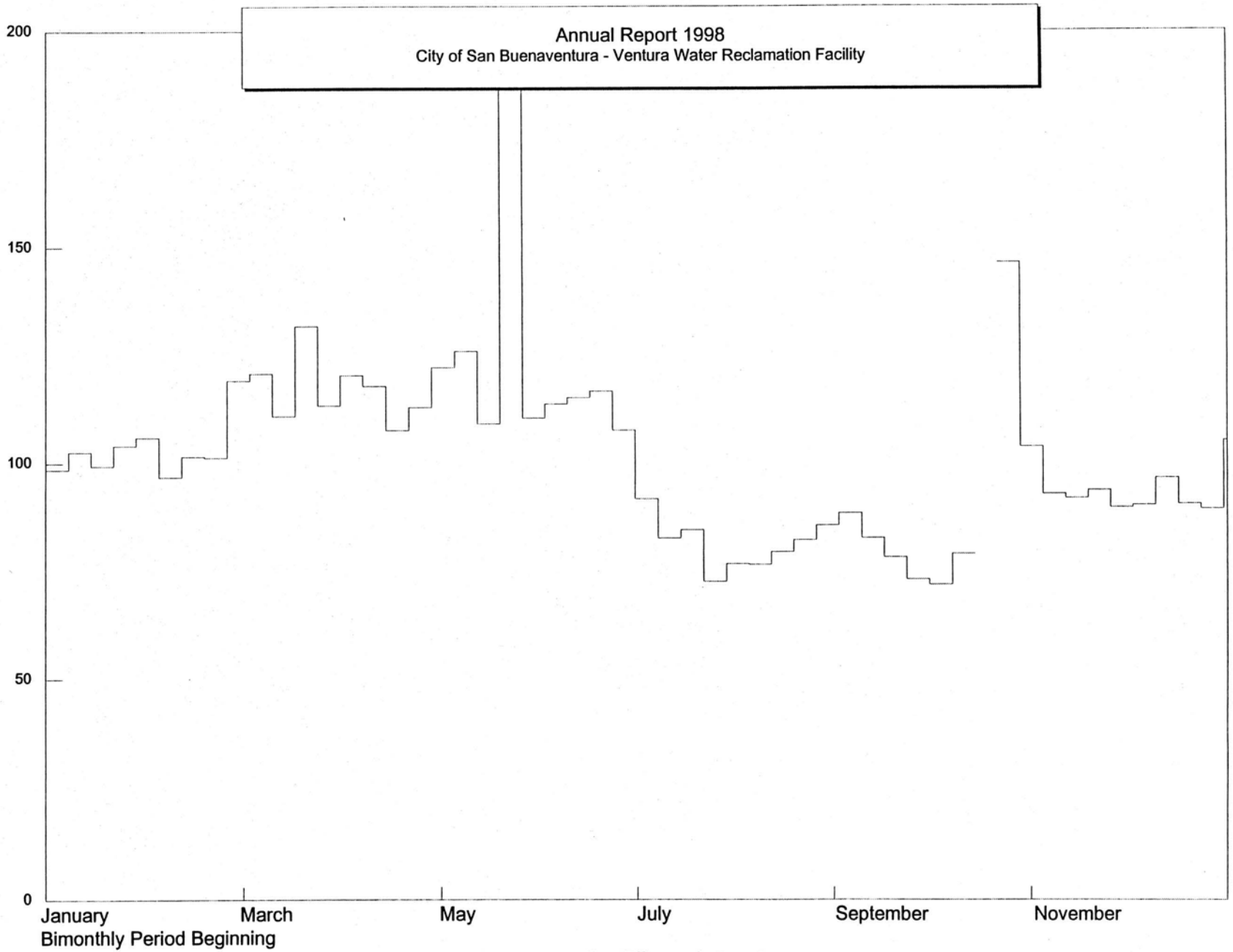
Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average pH - pH Units



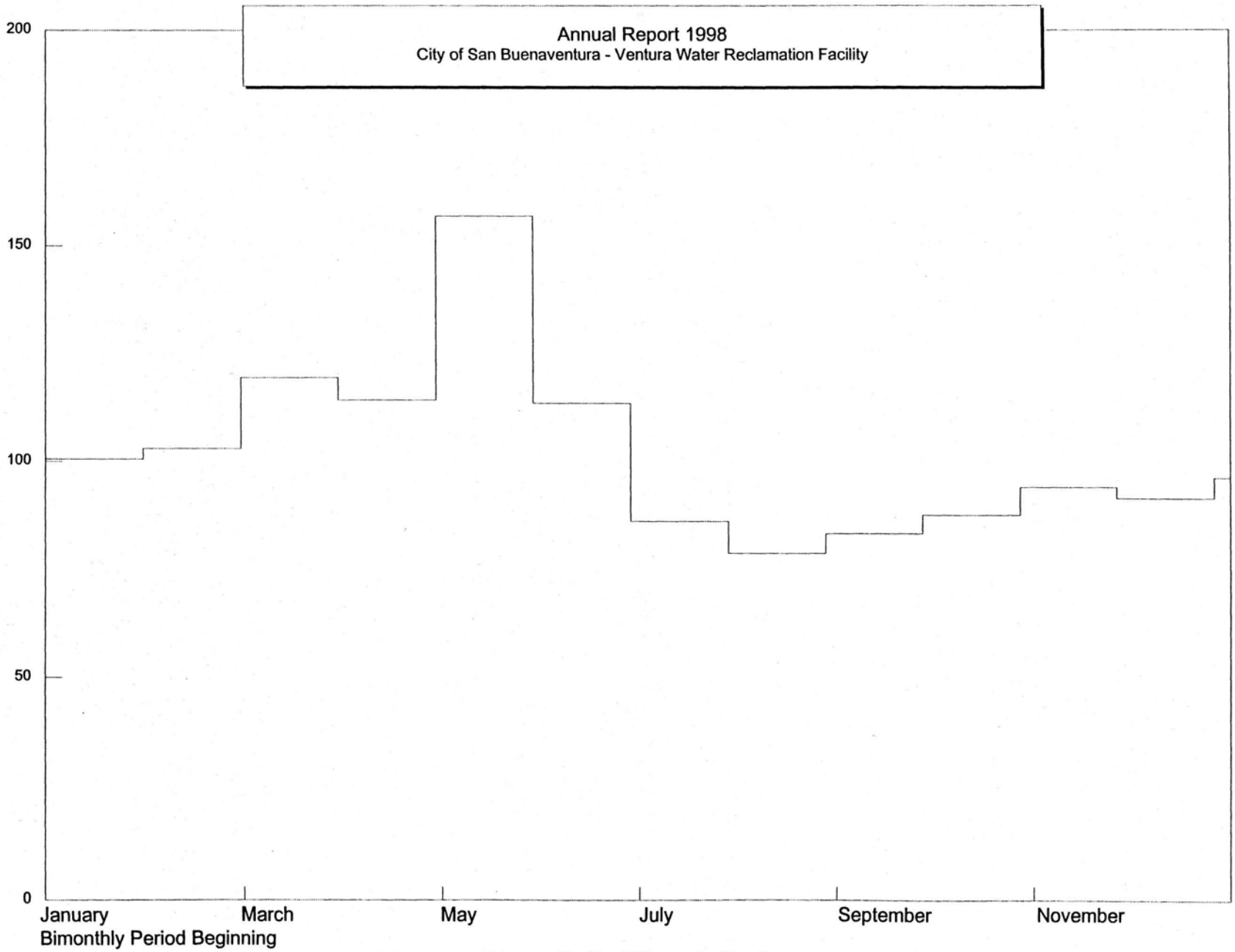
Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average pH - pH Units



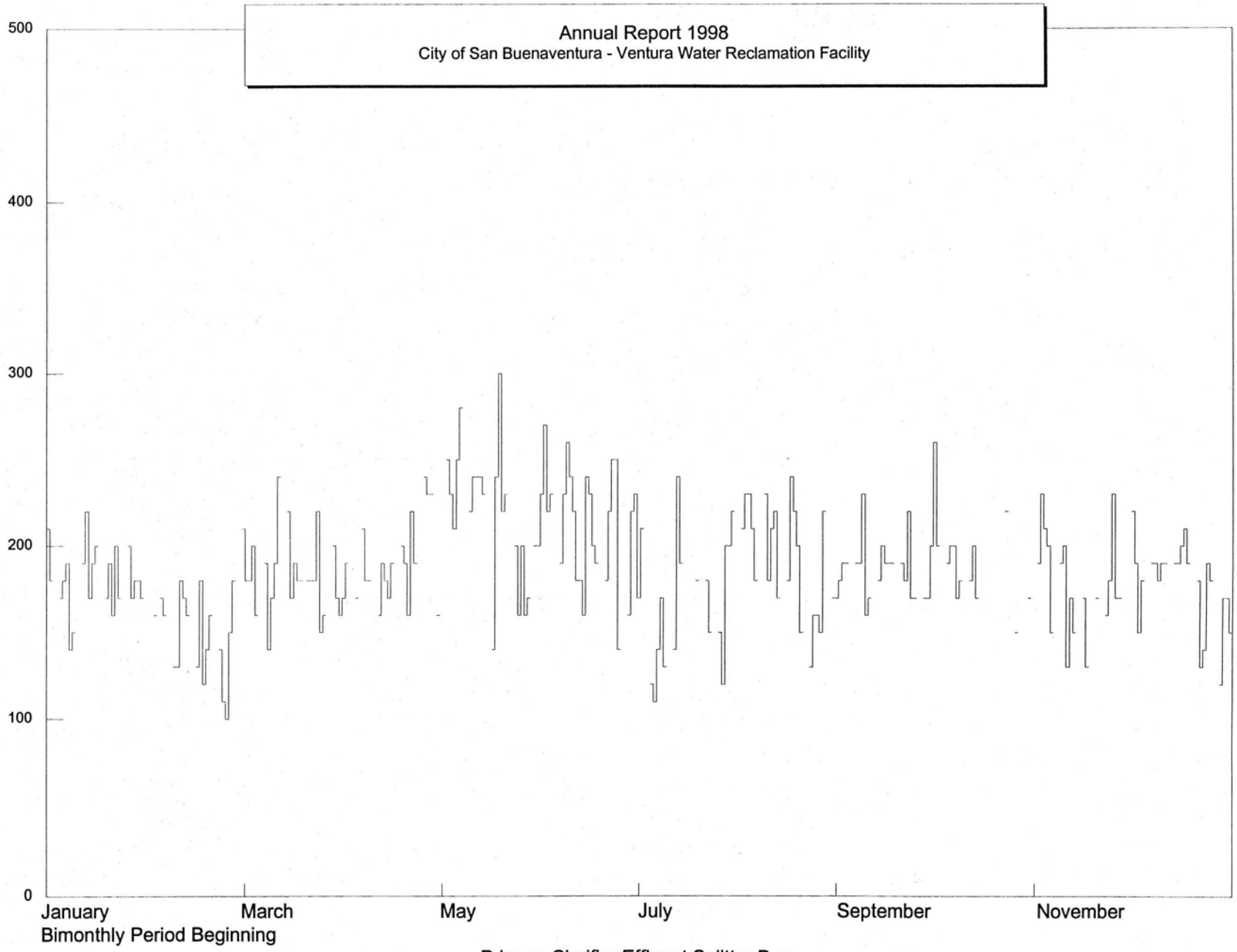
Primary Clarifier Effluent Splitter Box
Primary Effluent Suspended Solids - mg/l

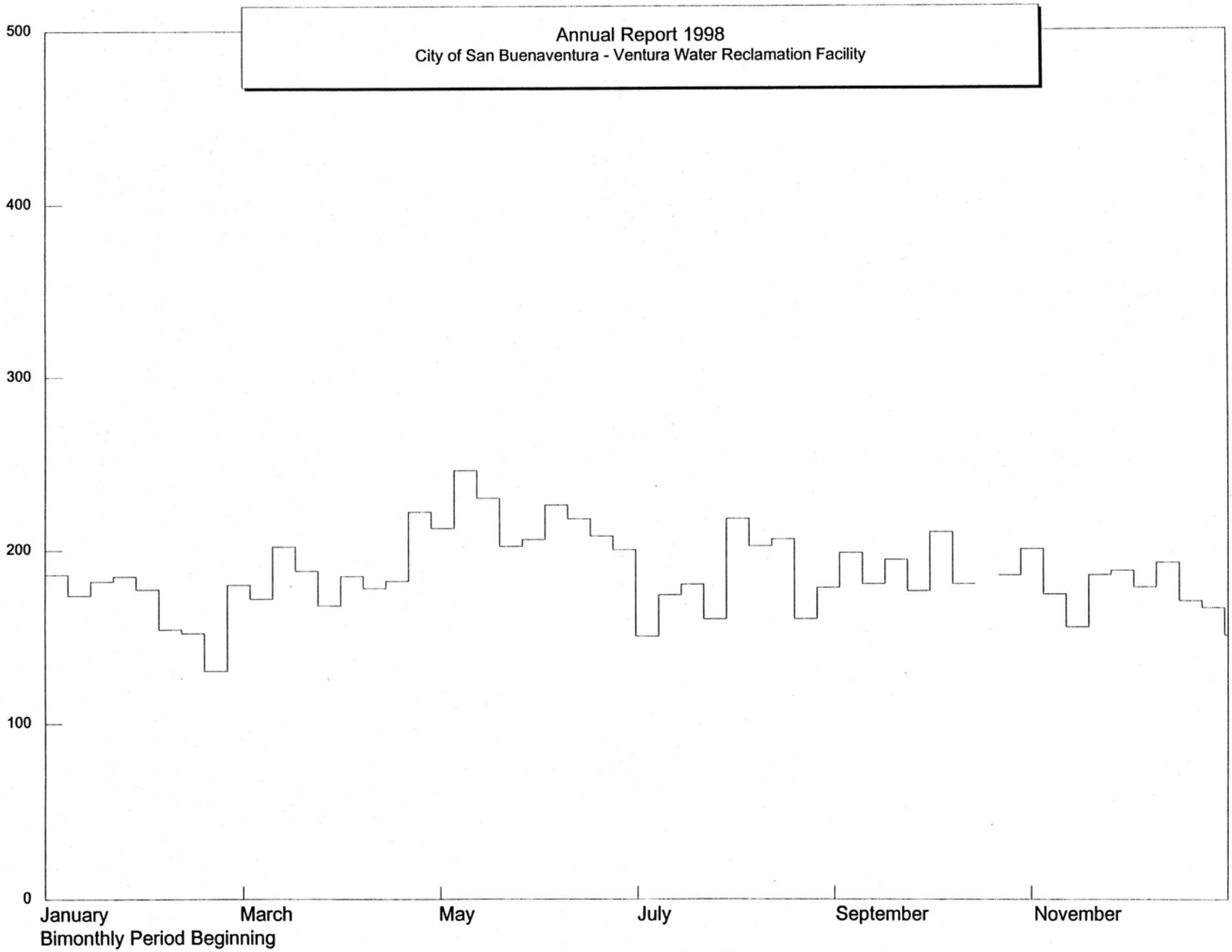


Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average Suspended Solids - mg/l

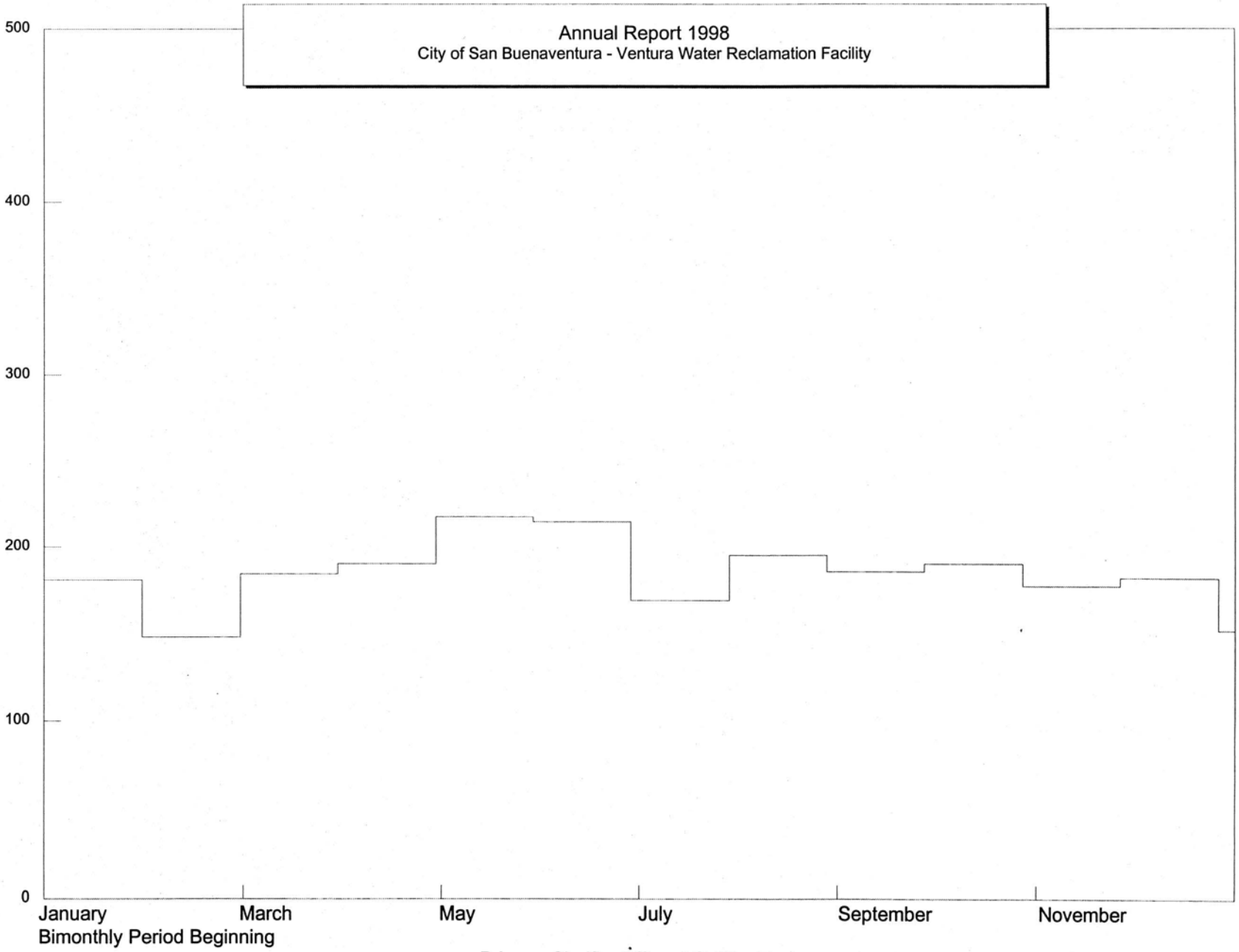


Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average Suspended Solids - mg/l

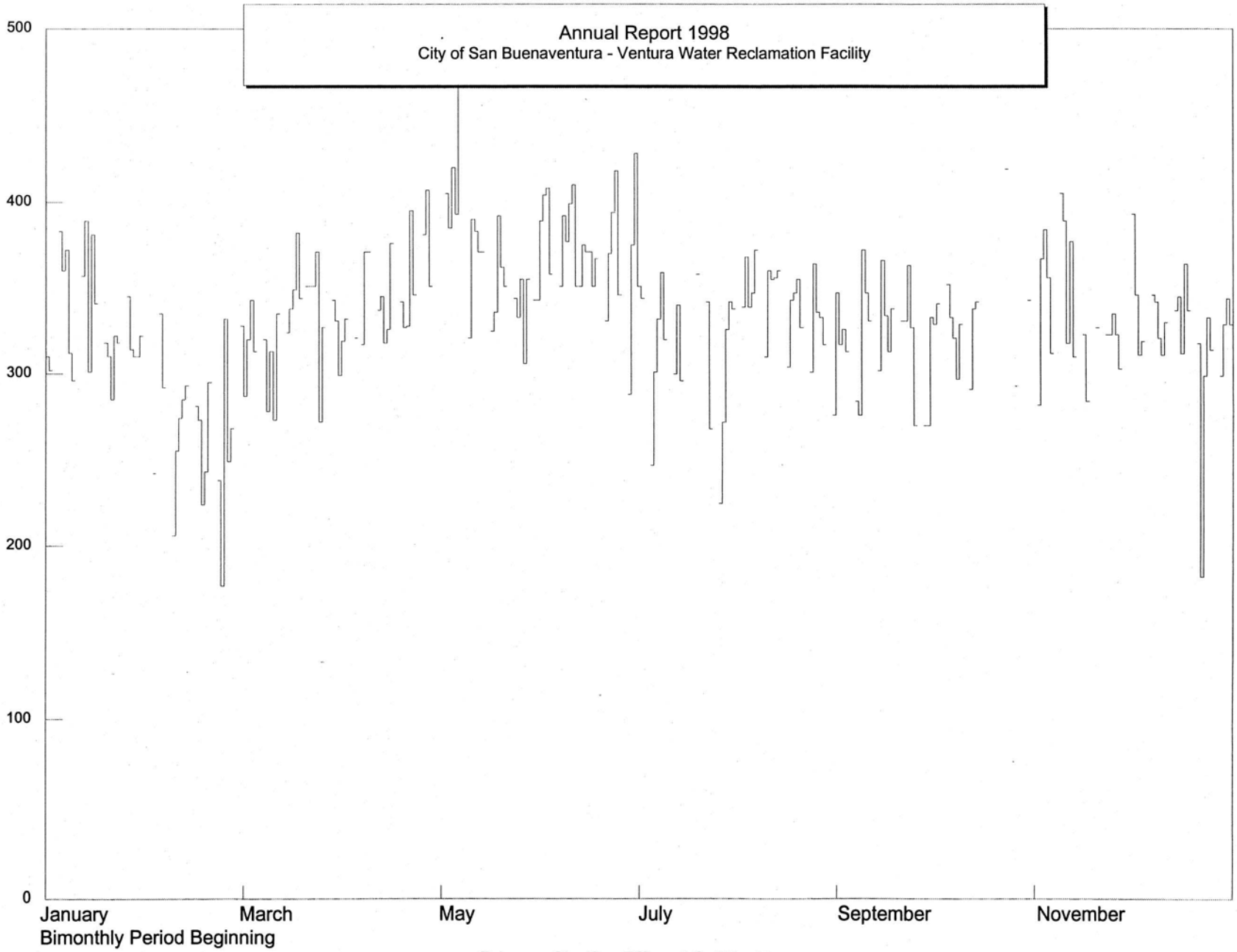

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
500
400
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Primary Clarifier Effluent Splitter Box
Primary Effluent BOD - mg/l



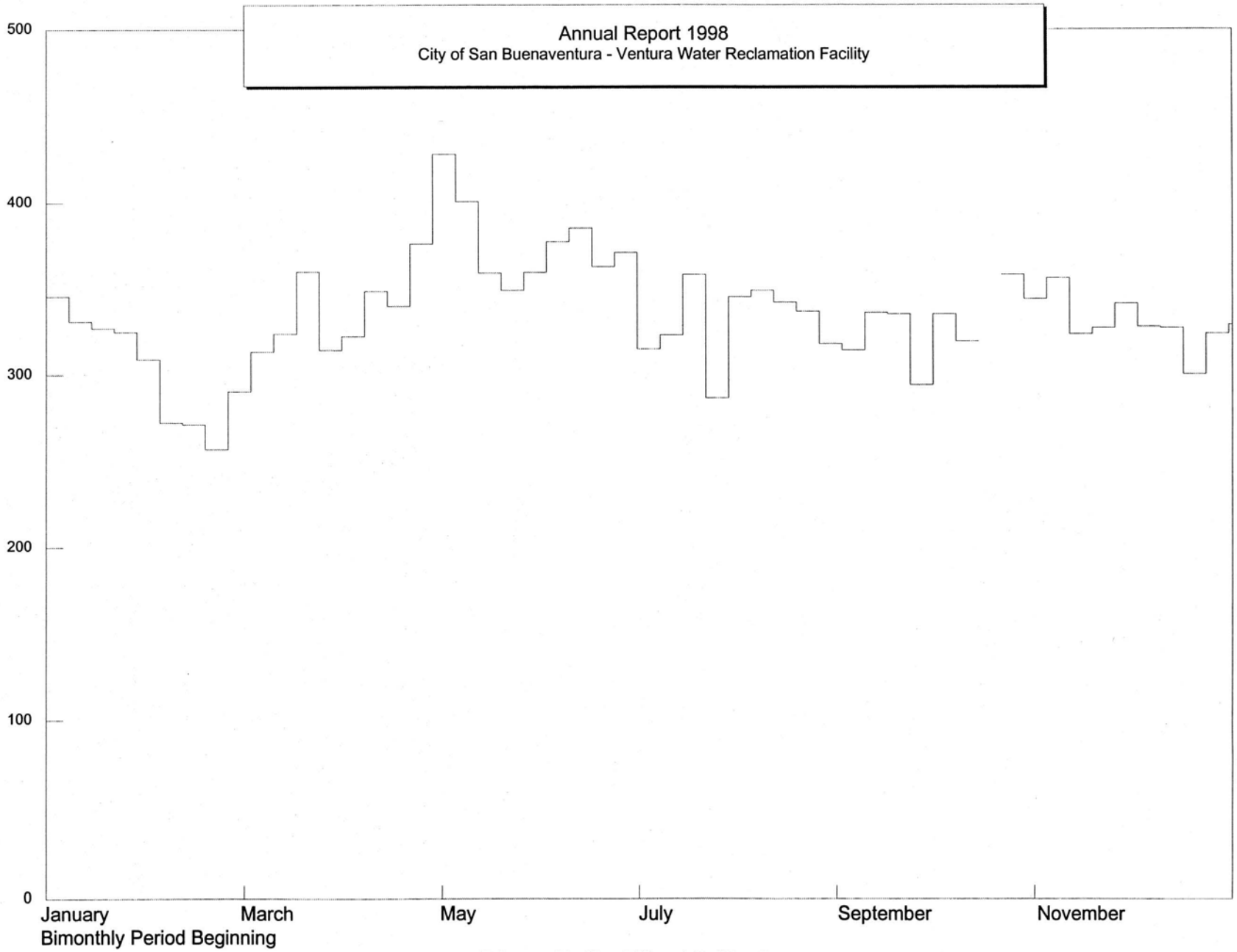
Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average BOD - mg/l



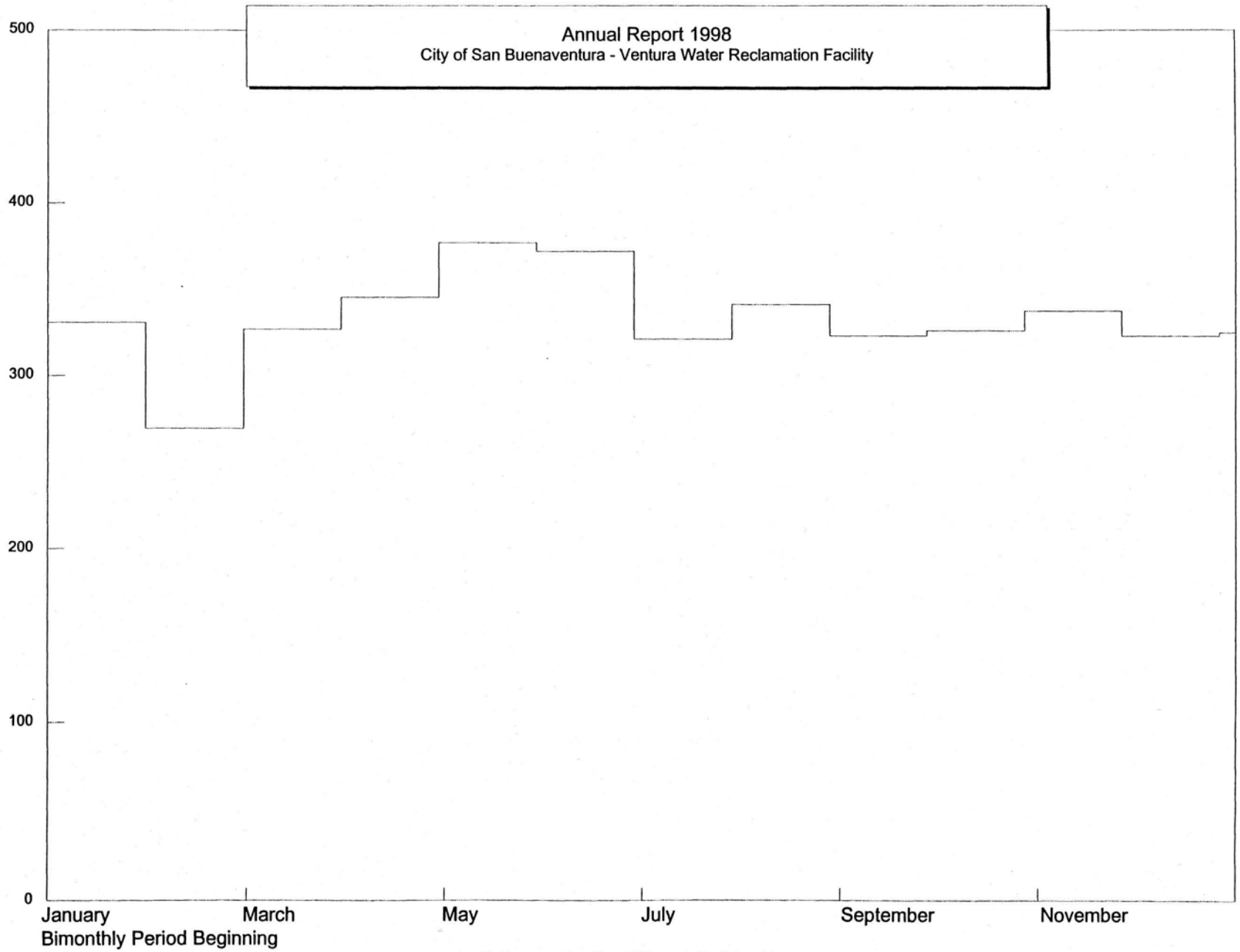
Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Averge BOD - mg/l



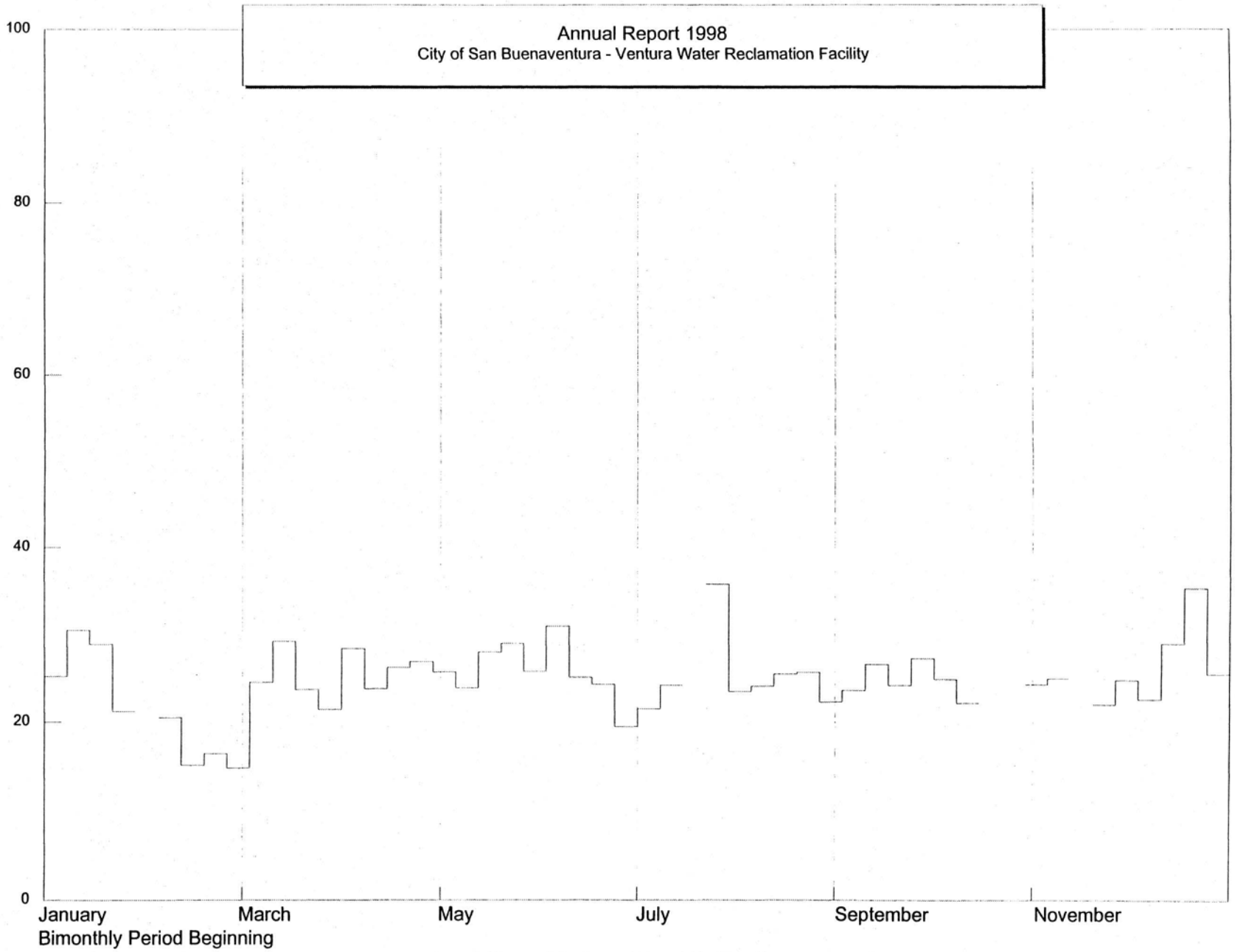
Primary Clarifier Effluent Splitter Box
Primary Effluent COD - mg/l



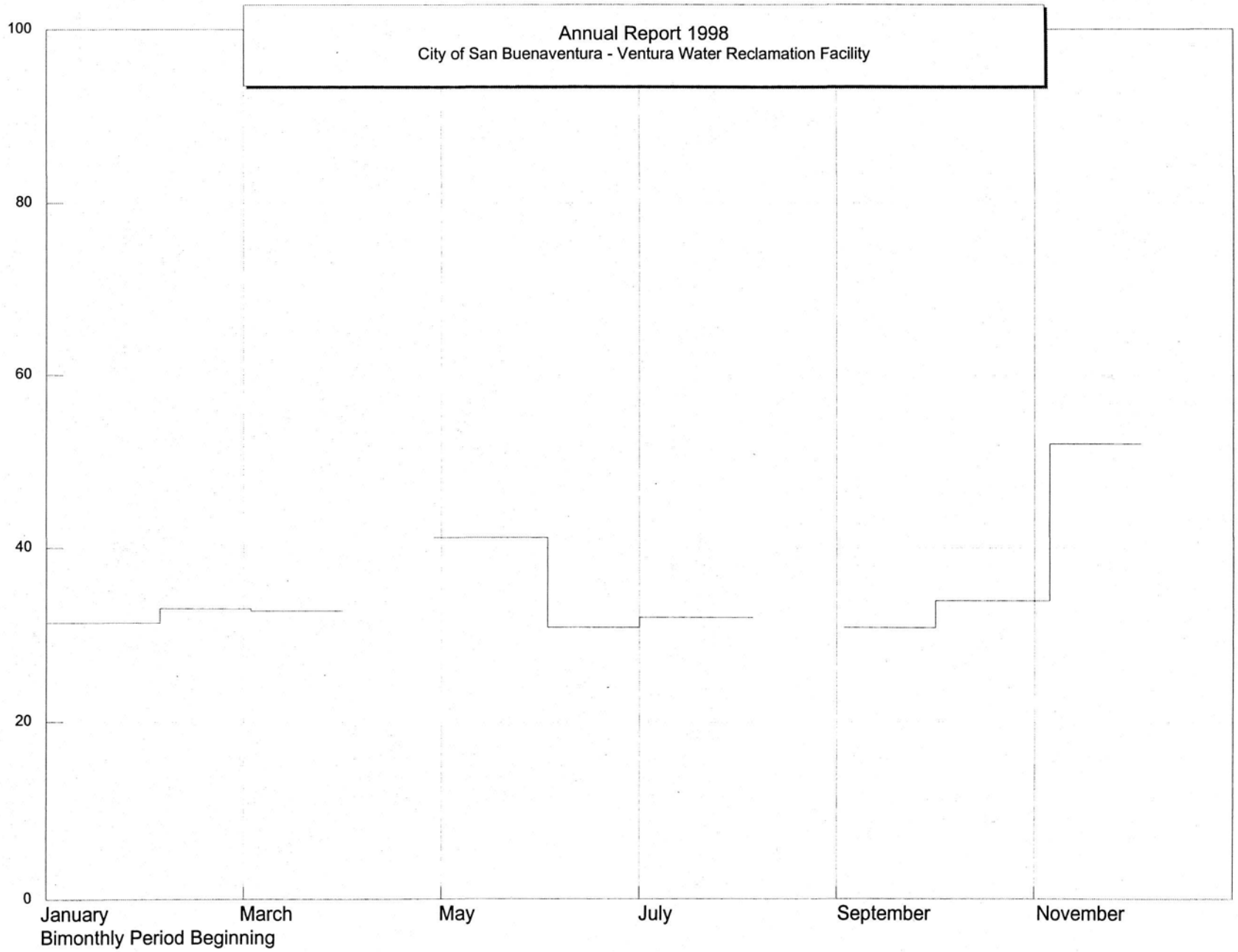
Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average COD - mg/l



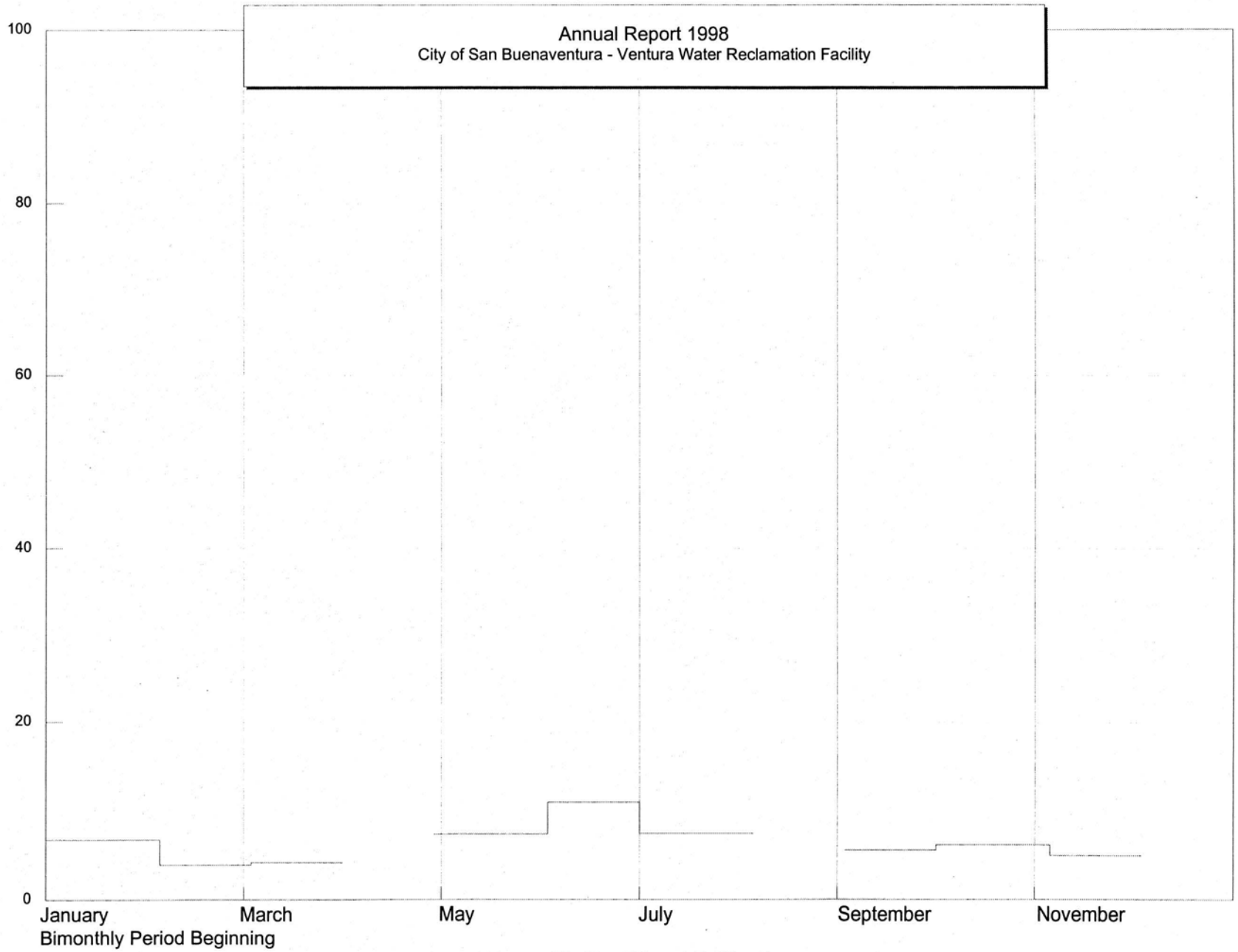
Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average COD - mg/l



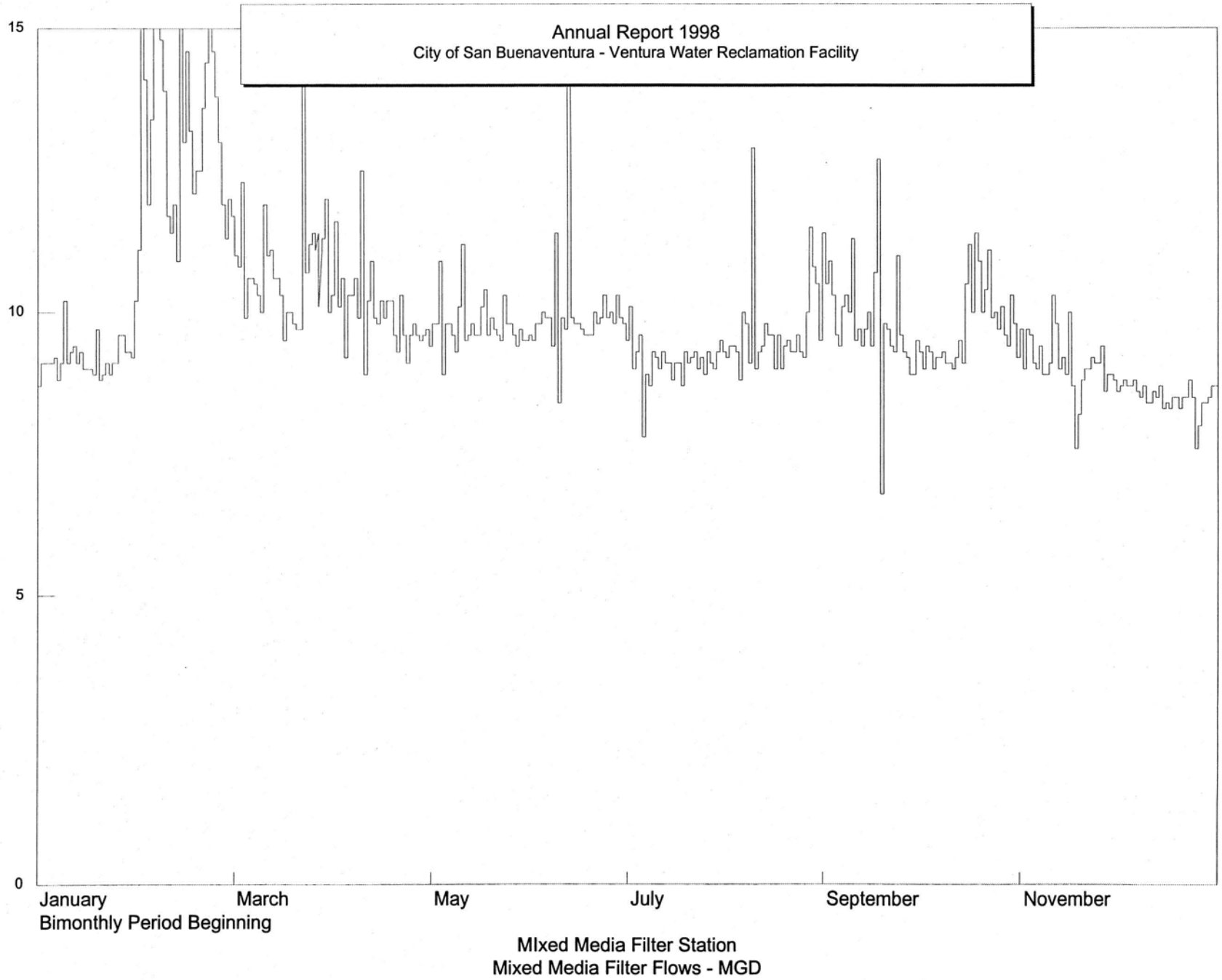
Primary Clarifier Effluent Splitter Box
Primary Effluent Weekly Ammonia-N mg/l

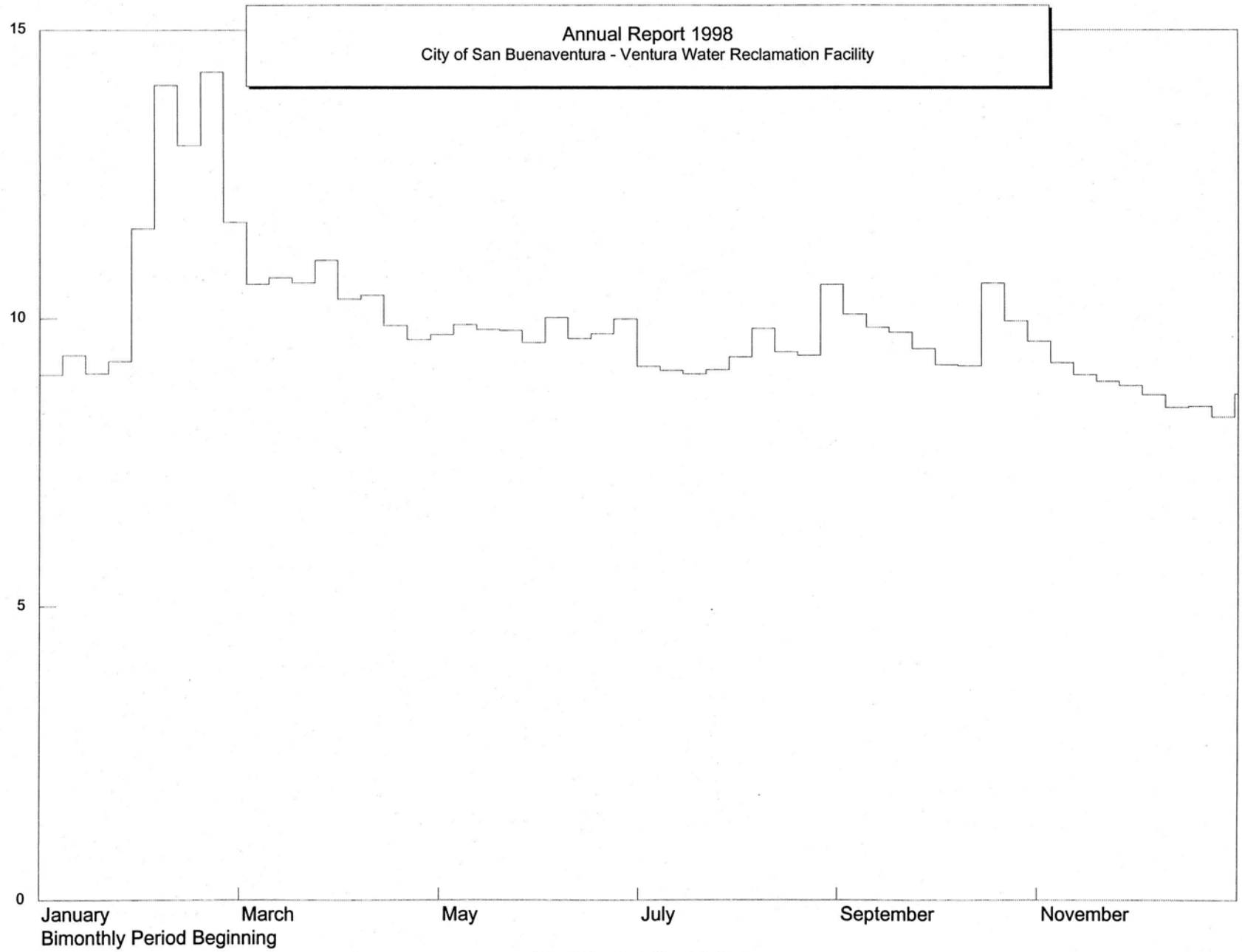


Primary Clarifier Effluent Splitter
Primary Effluent Monthly TKN - mg/l

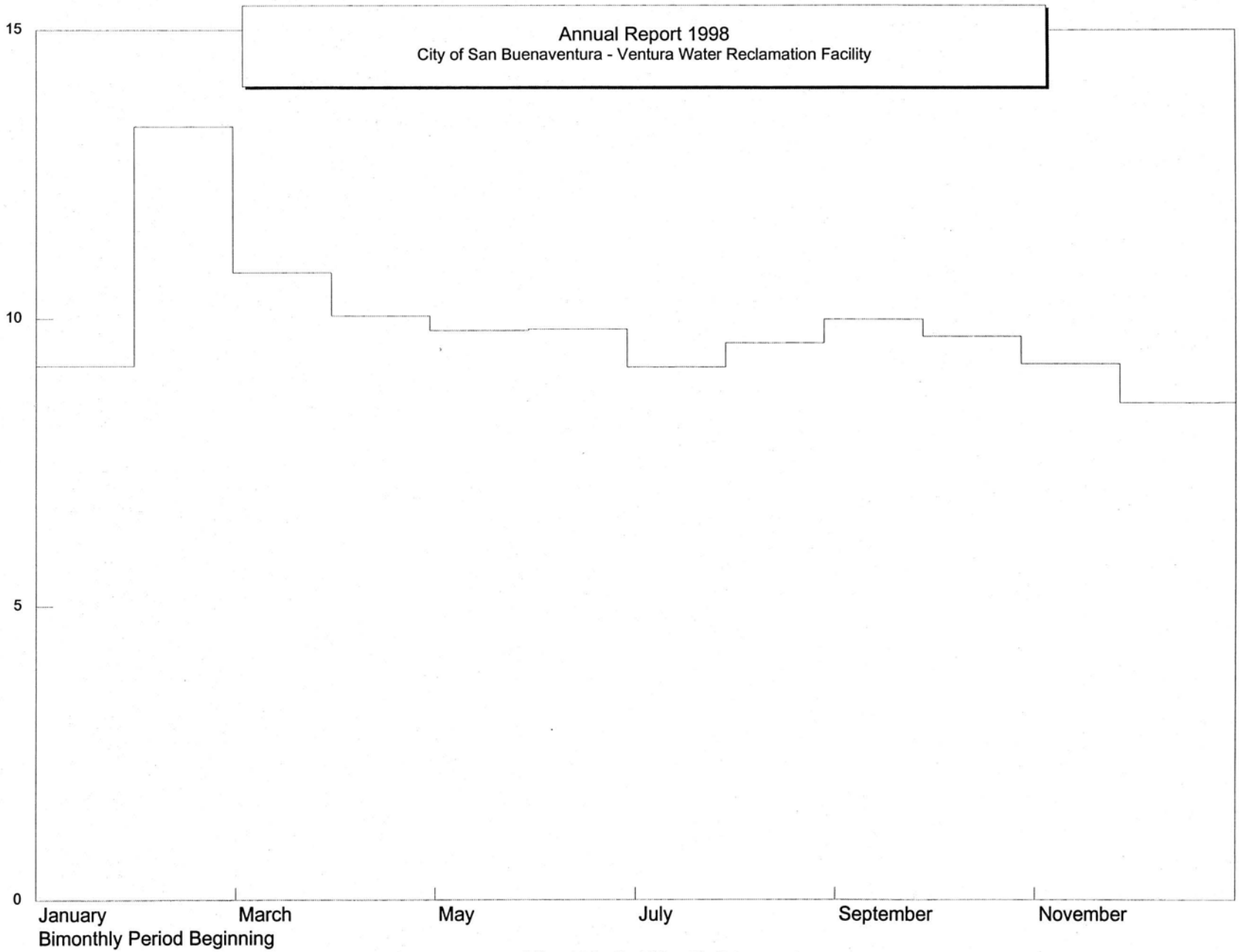


Primary Clarifier Effluent Splitter Box
Primary Effluent Monthly MBAS - mg/l

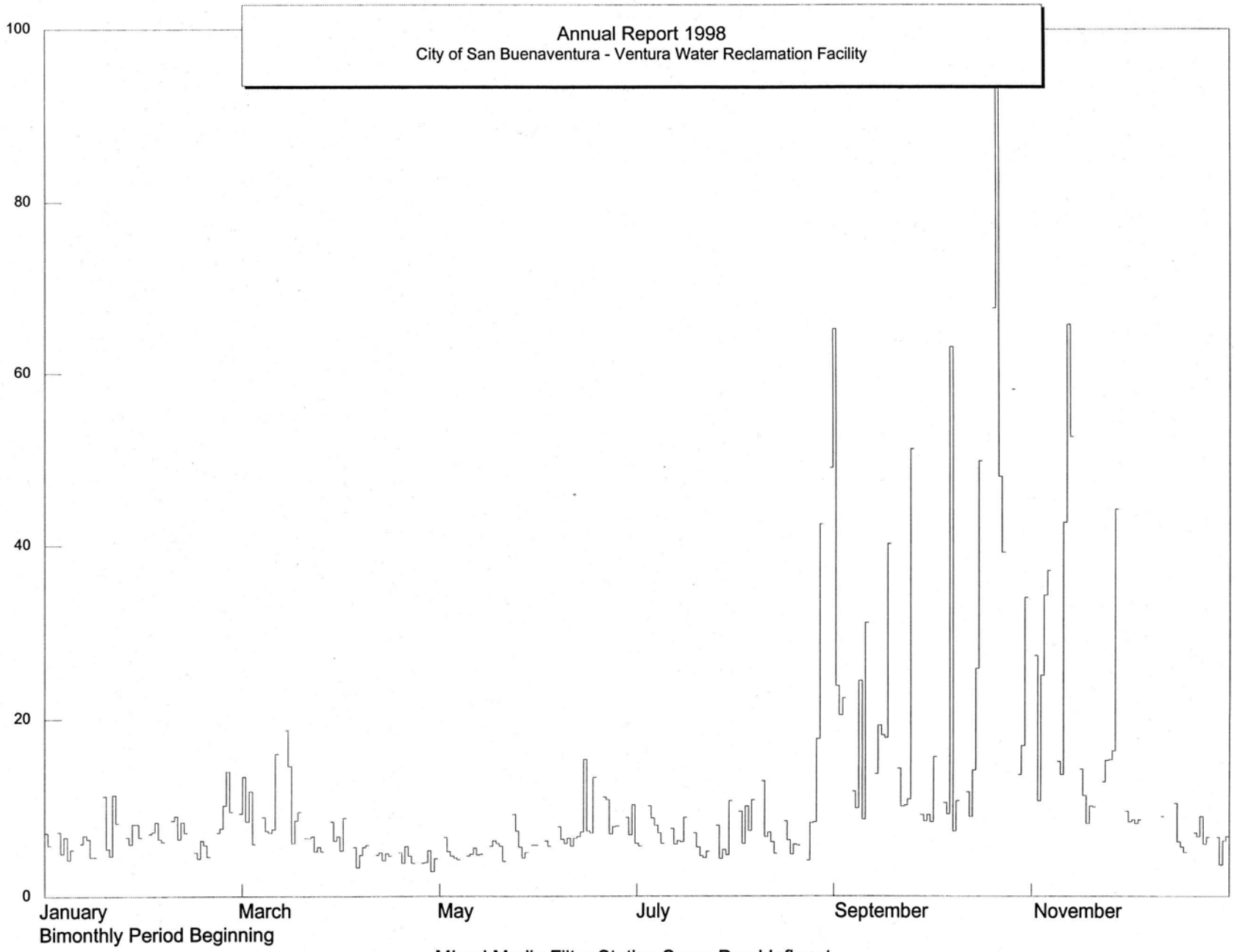

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
MIxed Media Filter Station
Mixed Media Filter Flows - MGD



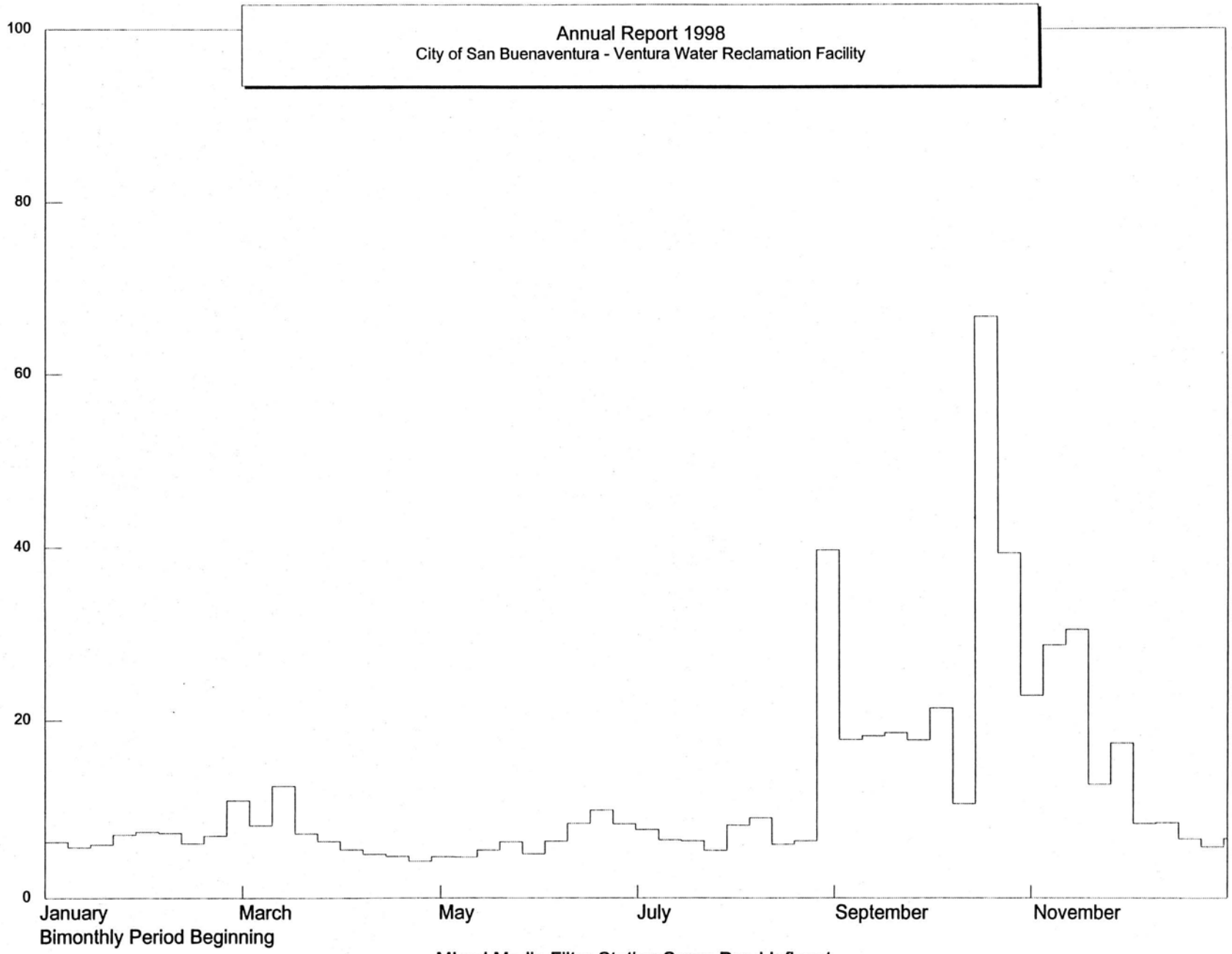
MIxed Media Filter Station
7 Day Average Mixed Media Filter Flows - MGD



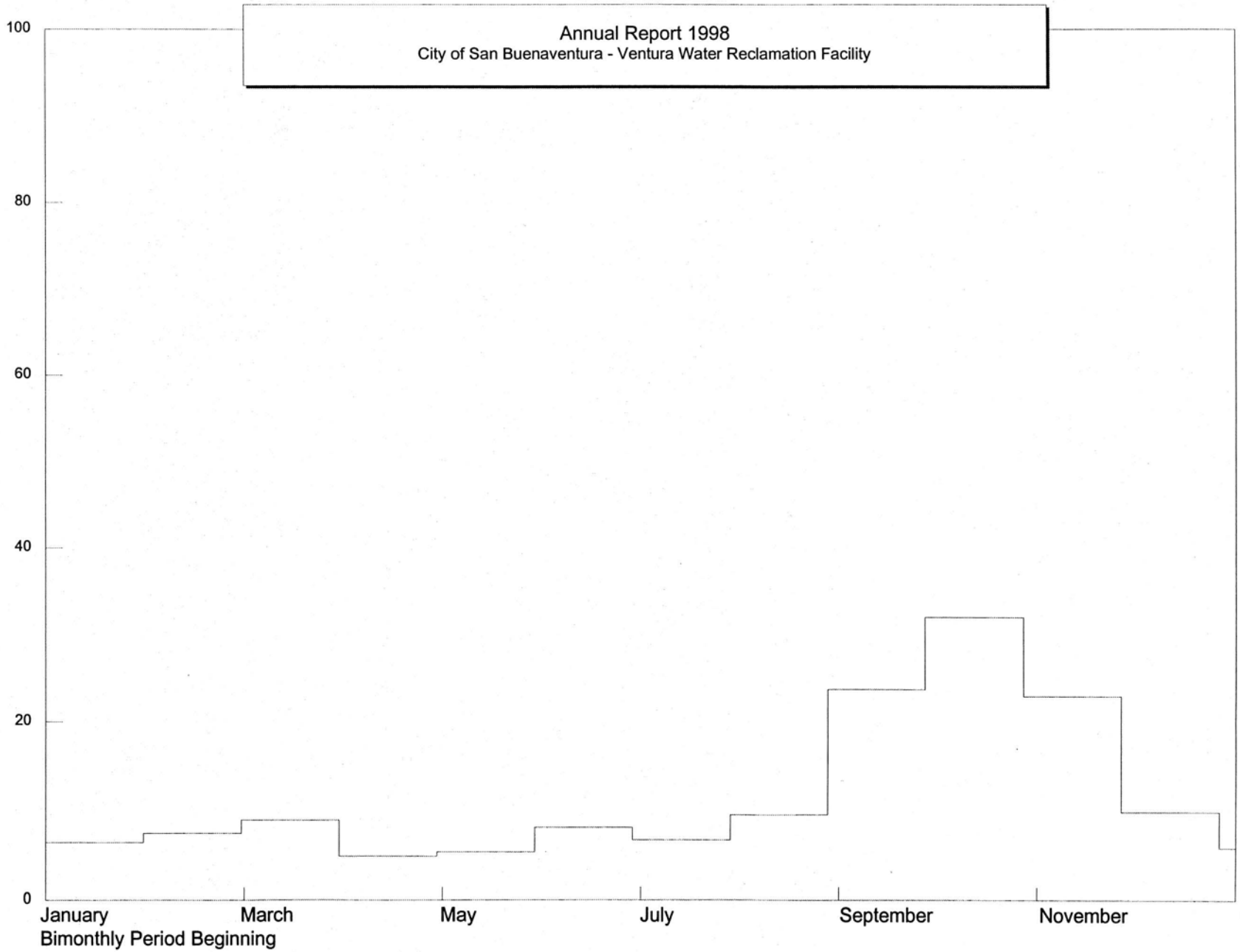
MIxed Media Filter Station
30 Day Average Mixed Media Filter Flows - MGD



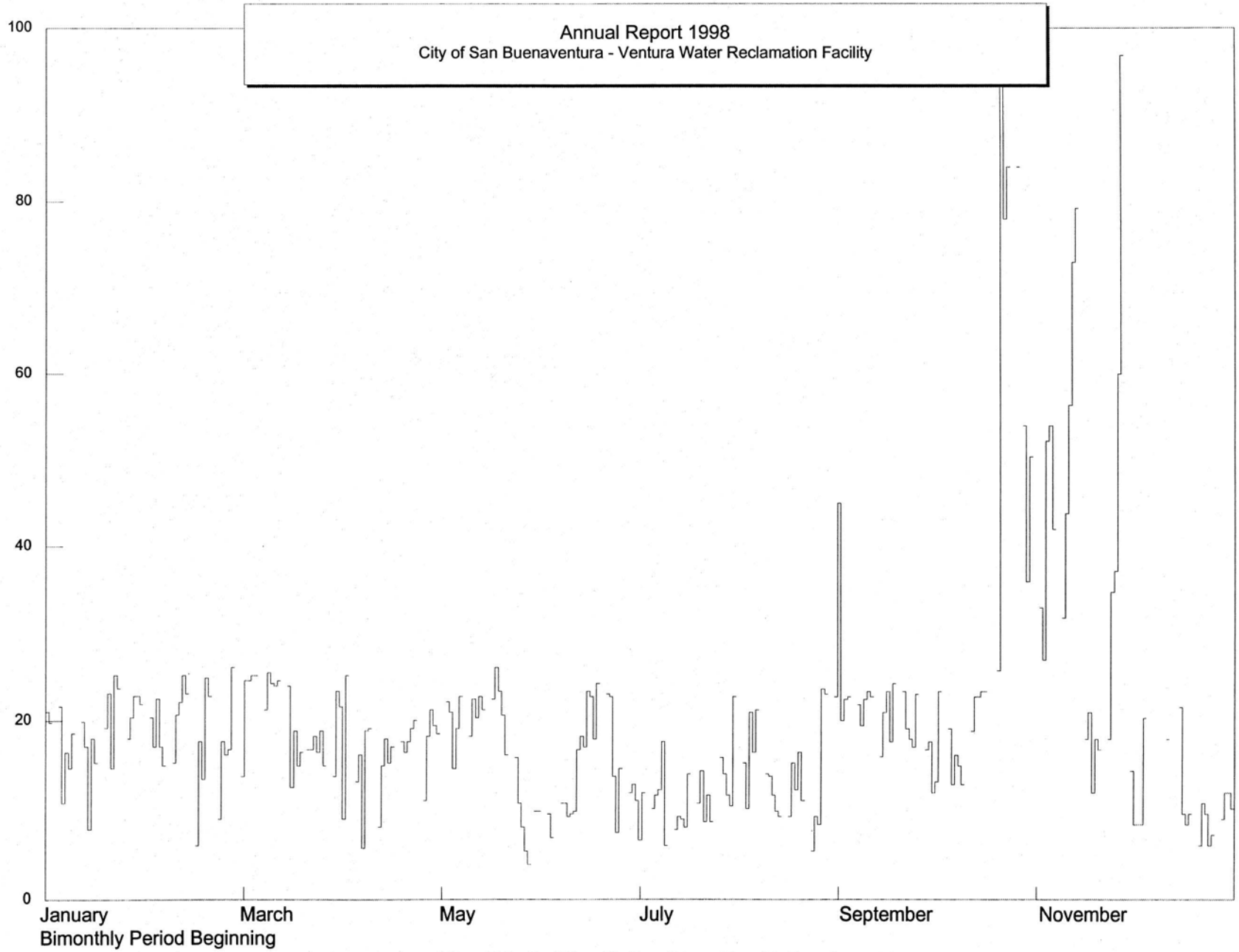
MIxed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Suspended Solids - mg/l



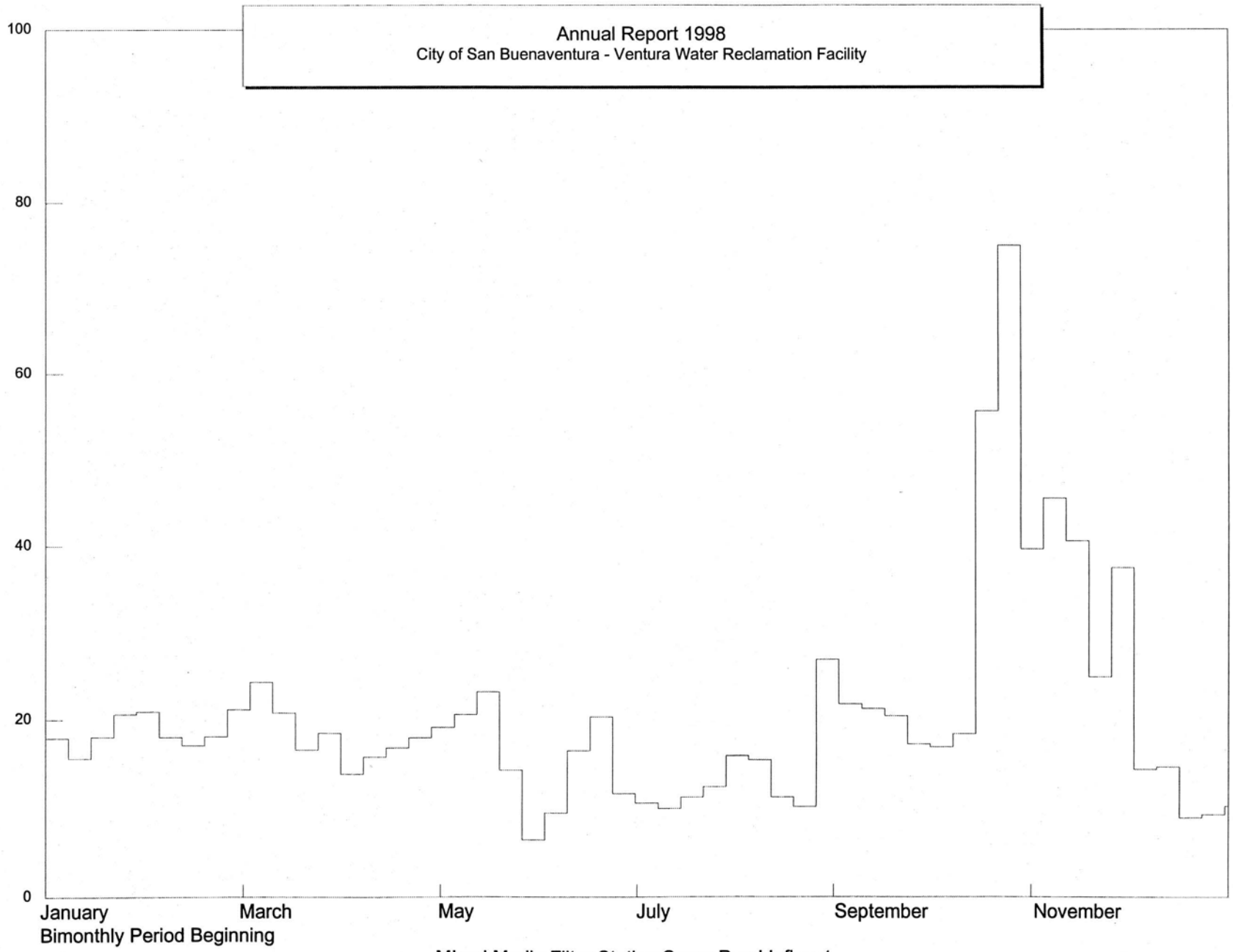
MIxed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 7 Day Average Suspended Solids - mg/l



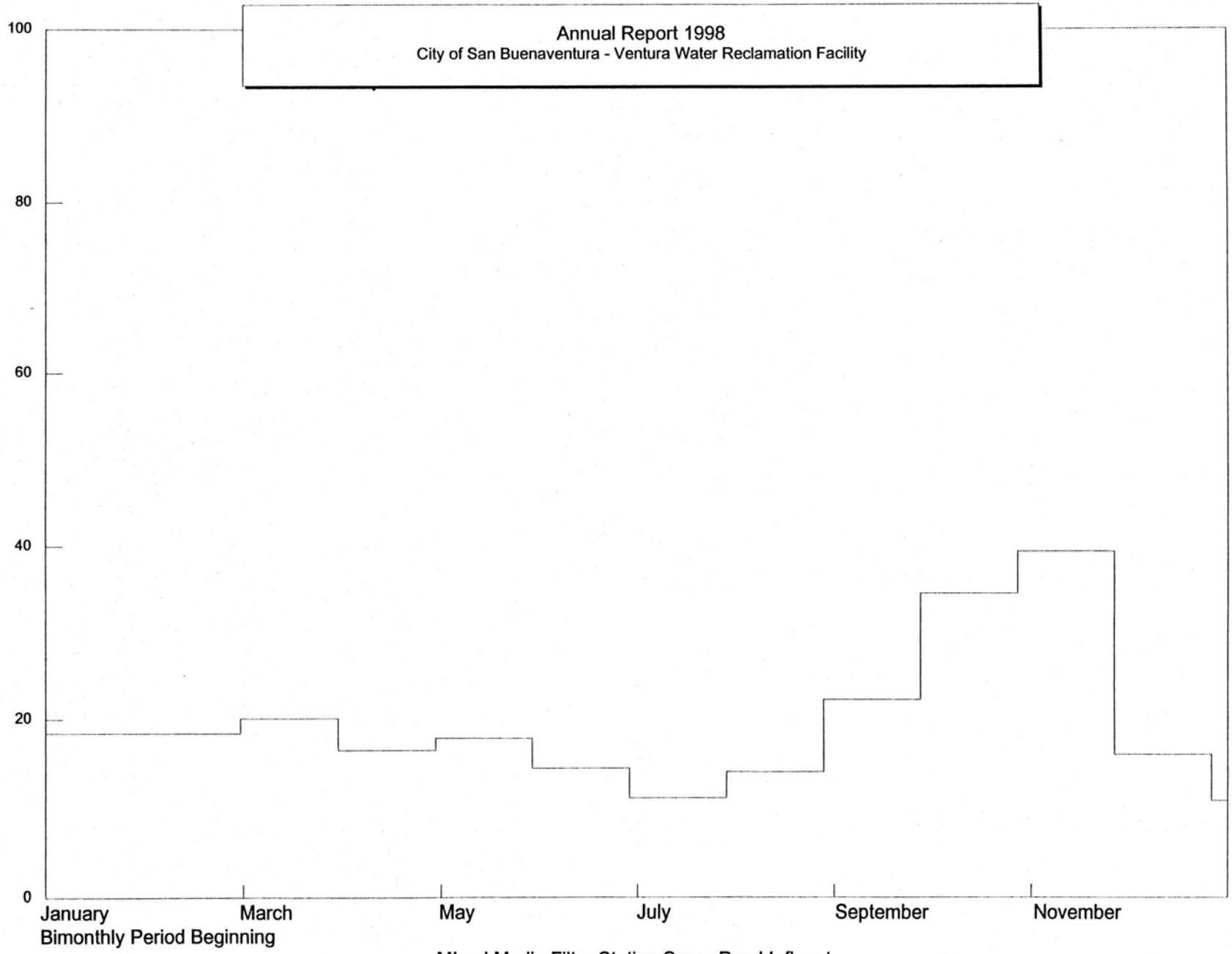
MIxed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average Suspended Solids - mg/l



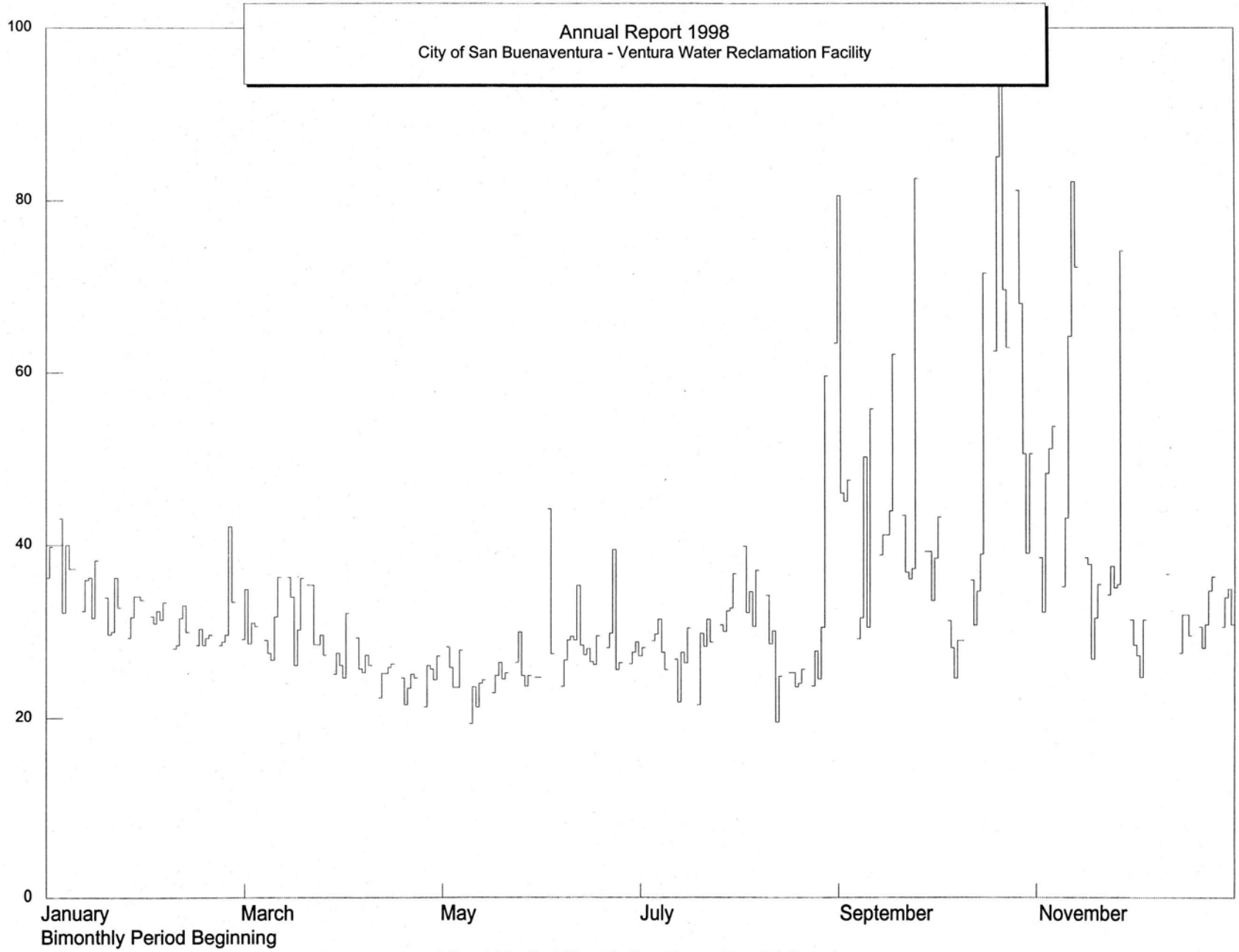
MIxed Media Filter Station Surge Pond Influent
Activated Sludge Effluent BOD - mg/l

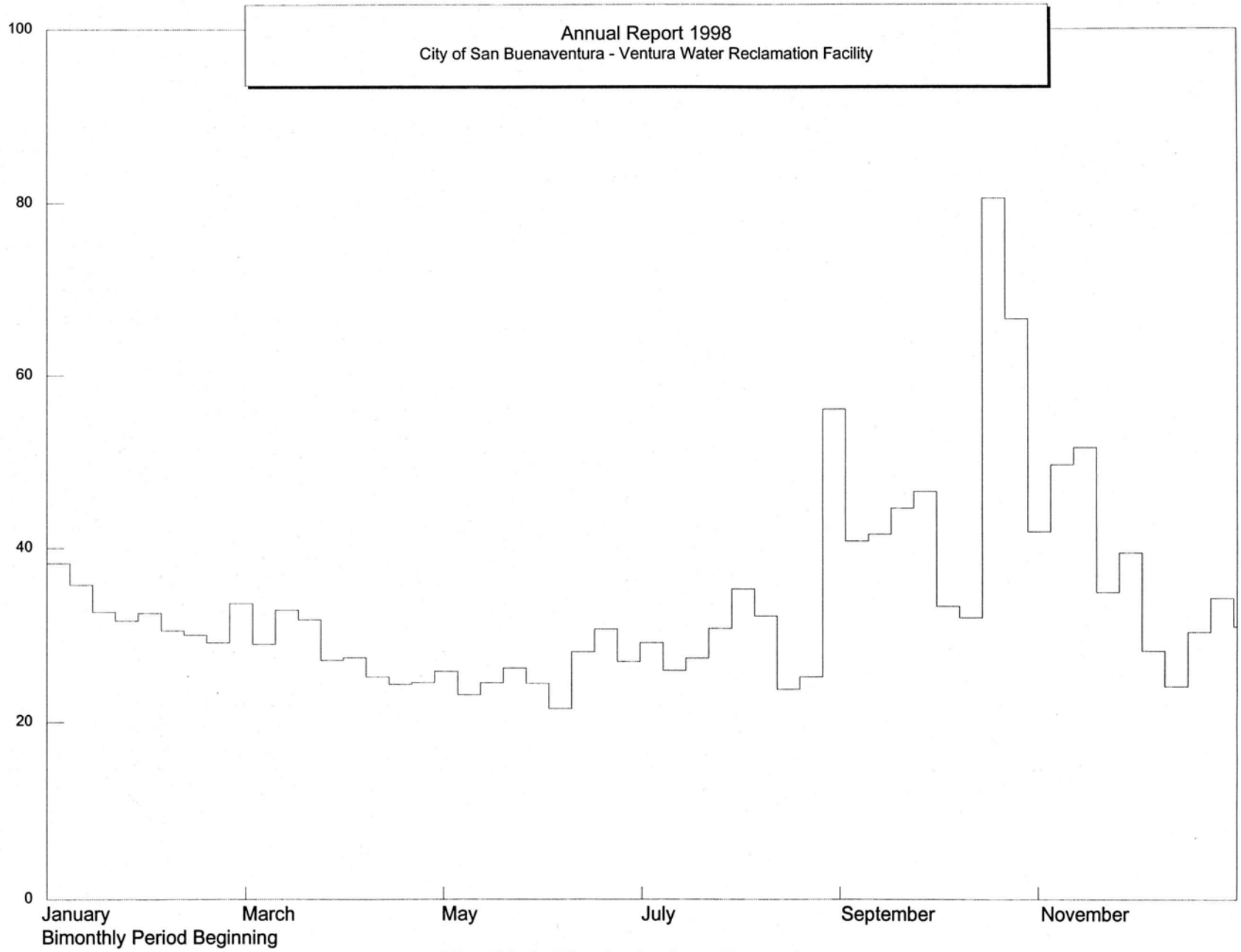


MIxed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 7 Day Average BOD - mg/l

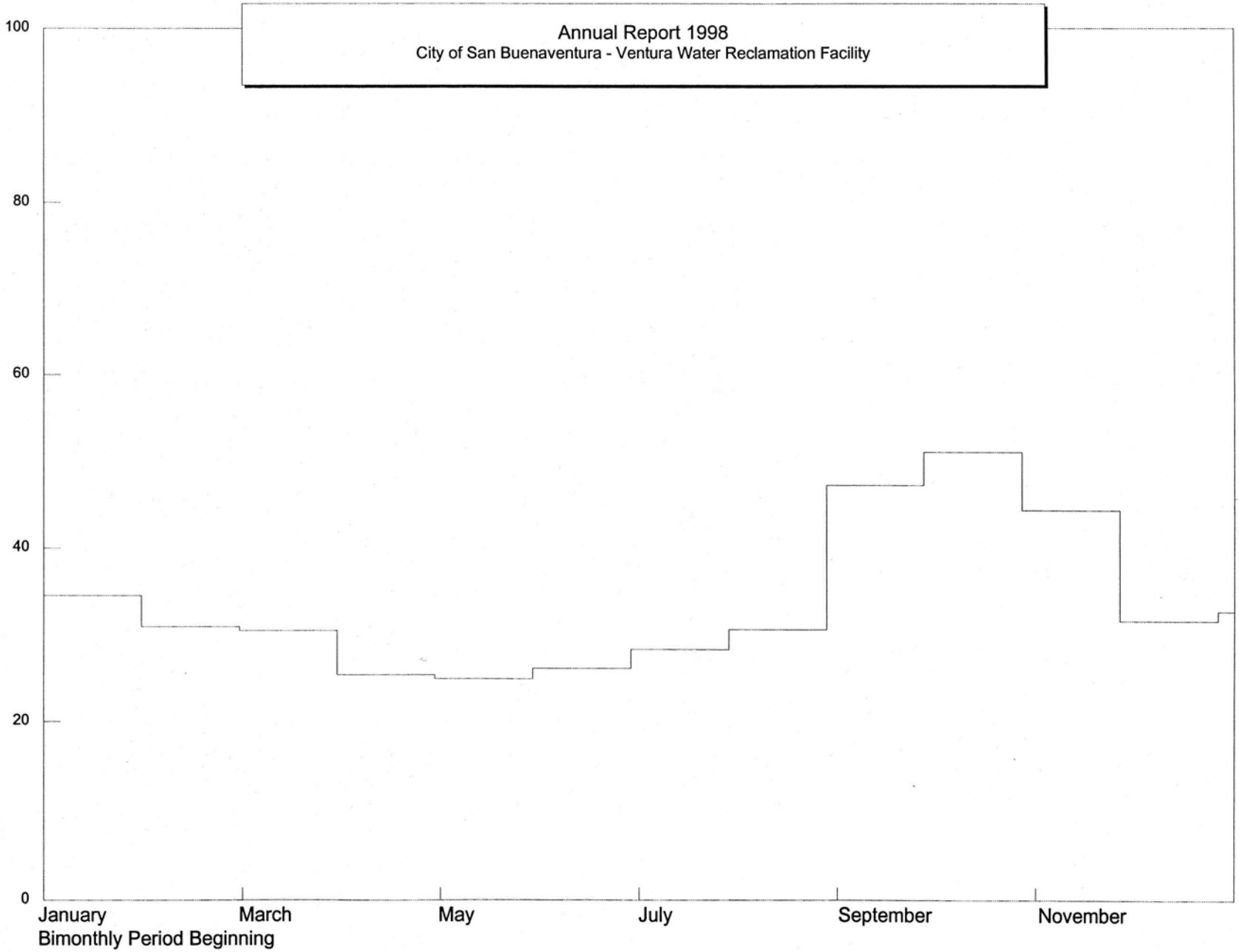


MIxed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average BOD - mg/l

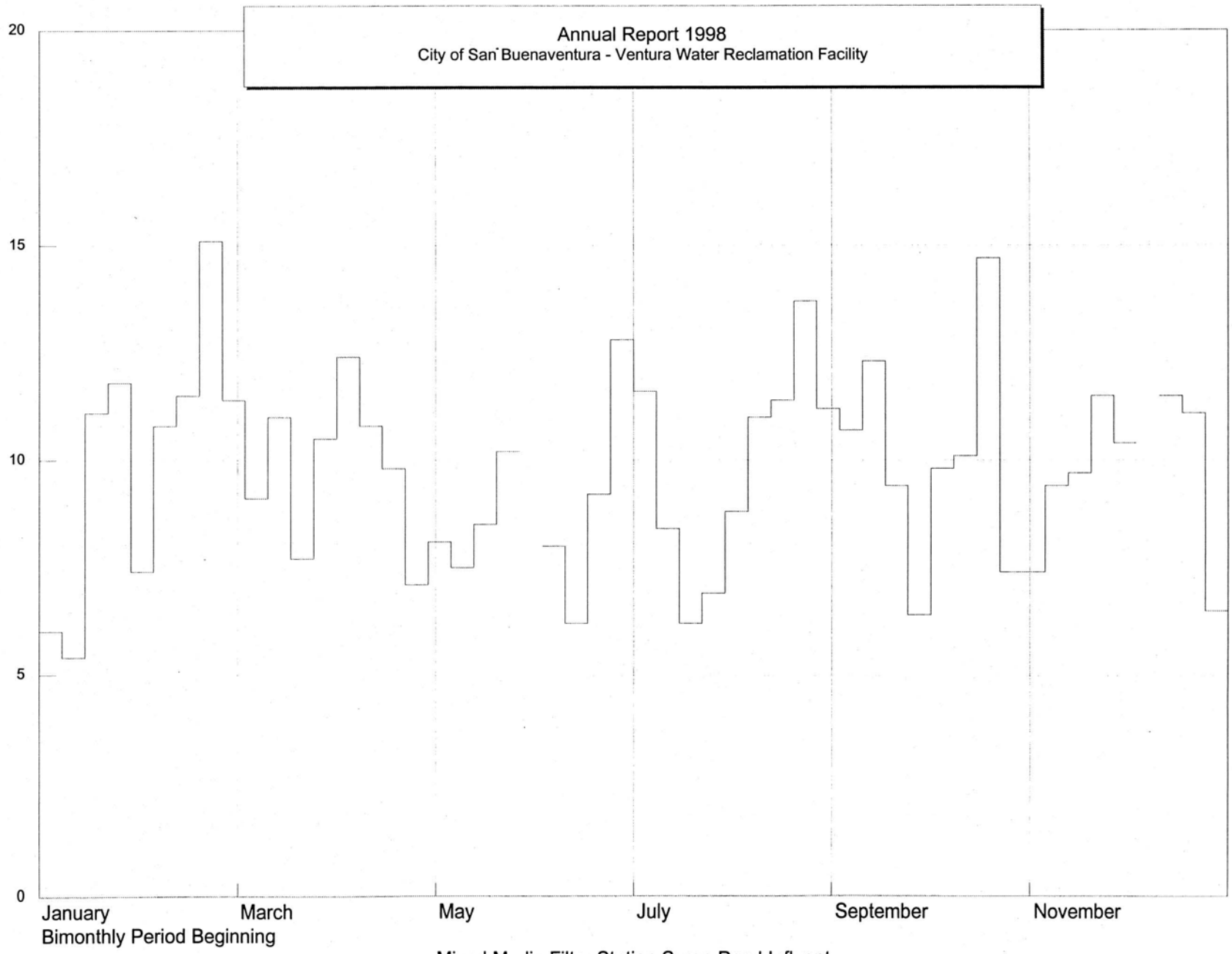

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
100
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
MIxed Media Filter Station Surge Pond Influent
Activated Sludge Effluent COD - mg/l



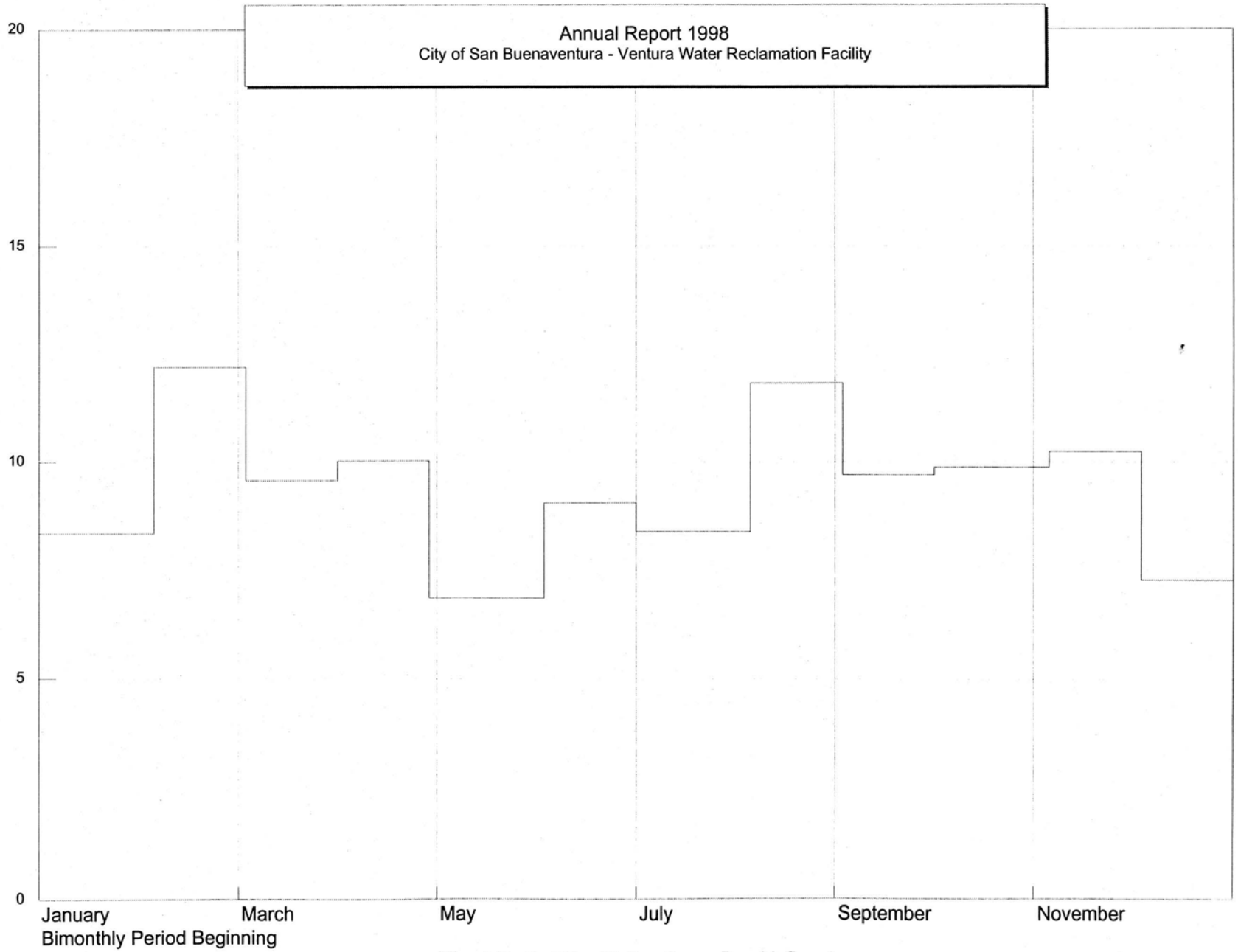
MIxed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 7 Day Average COD - mg/l



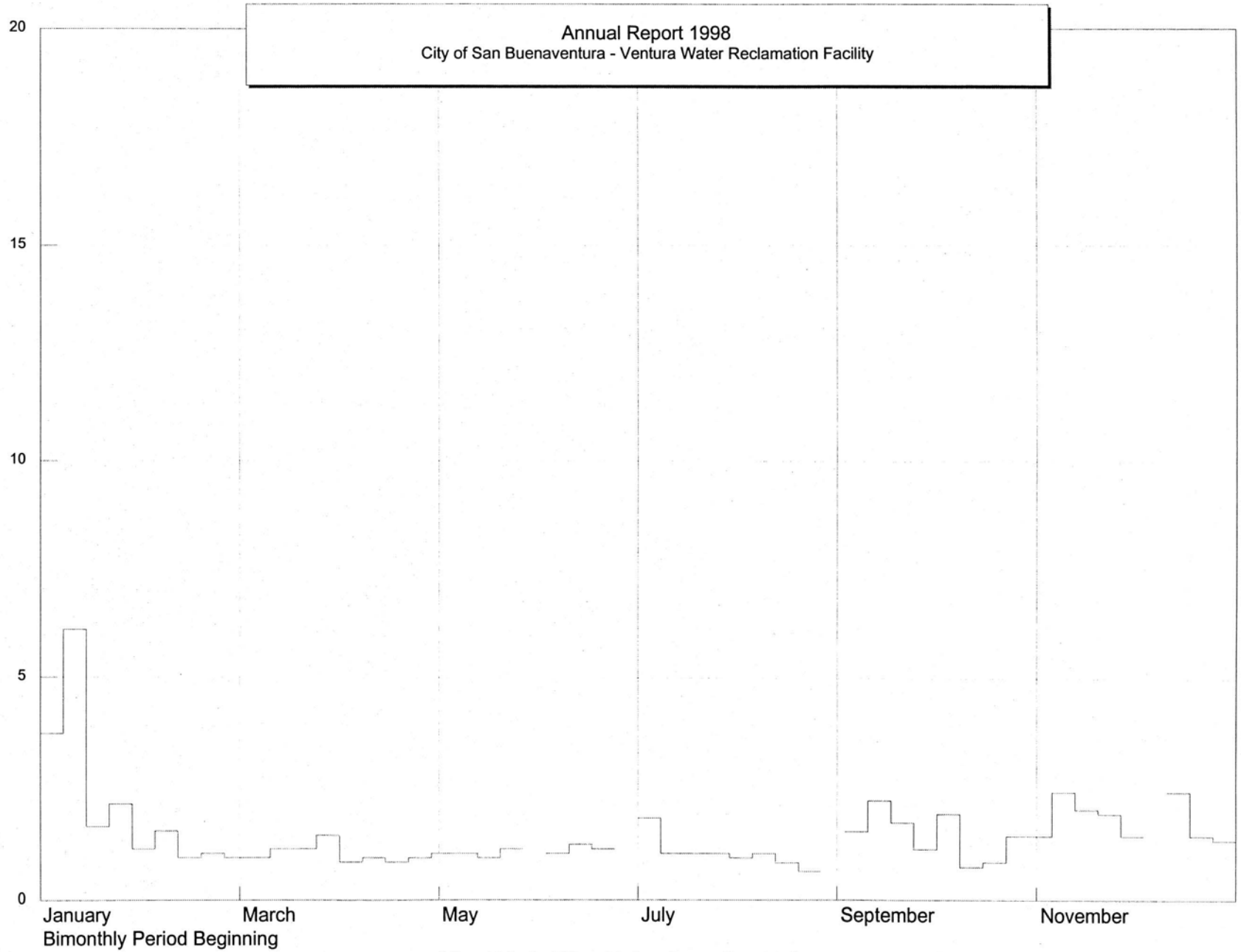
MIxed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average COD - mg/l



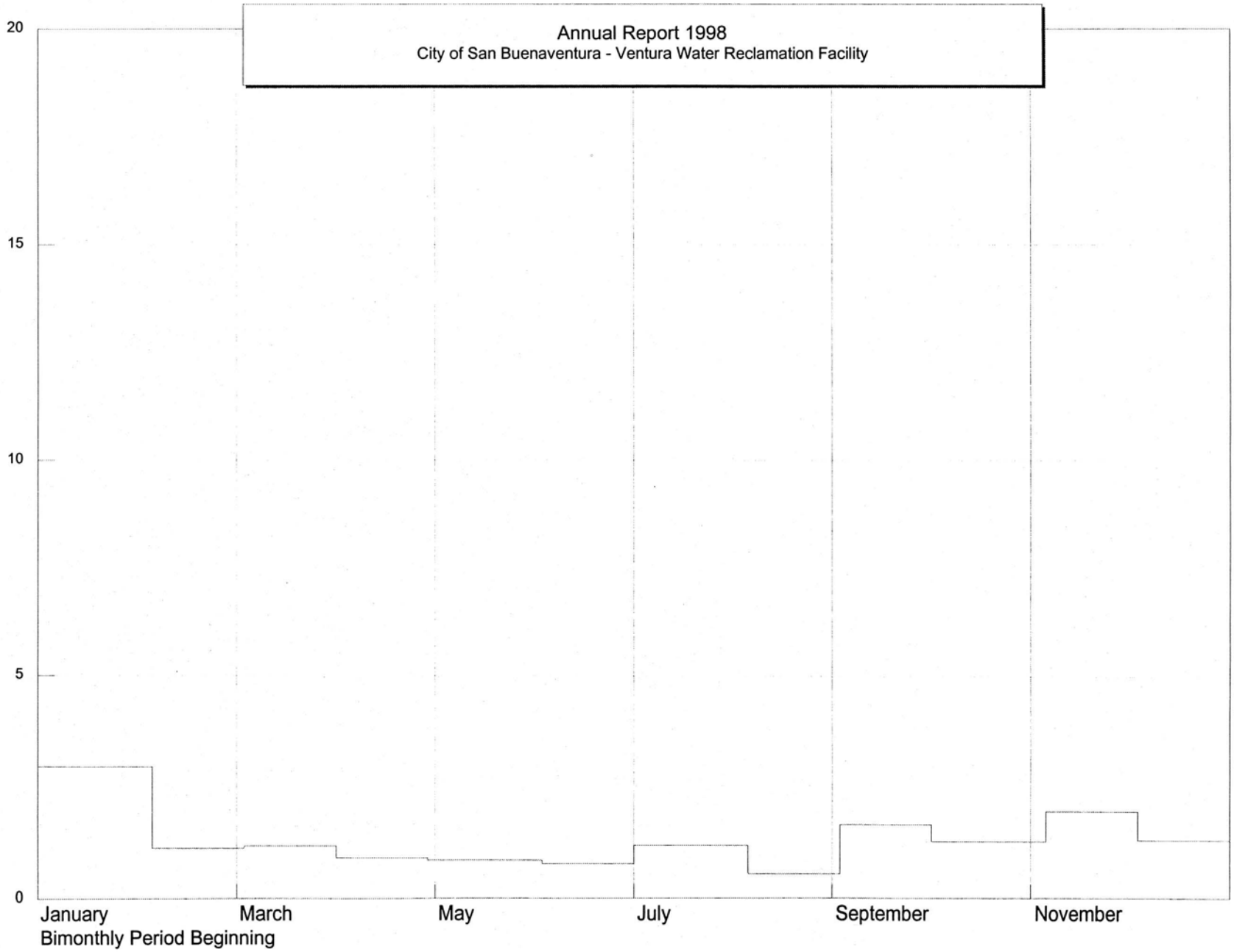
Mixed Media Filter Station Surge Pond Influent
Weekly Activated Sludge Effluent Nitrate-N mg/l



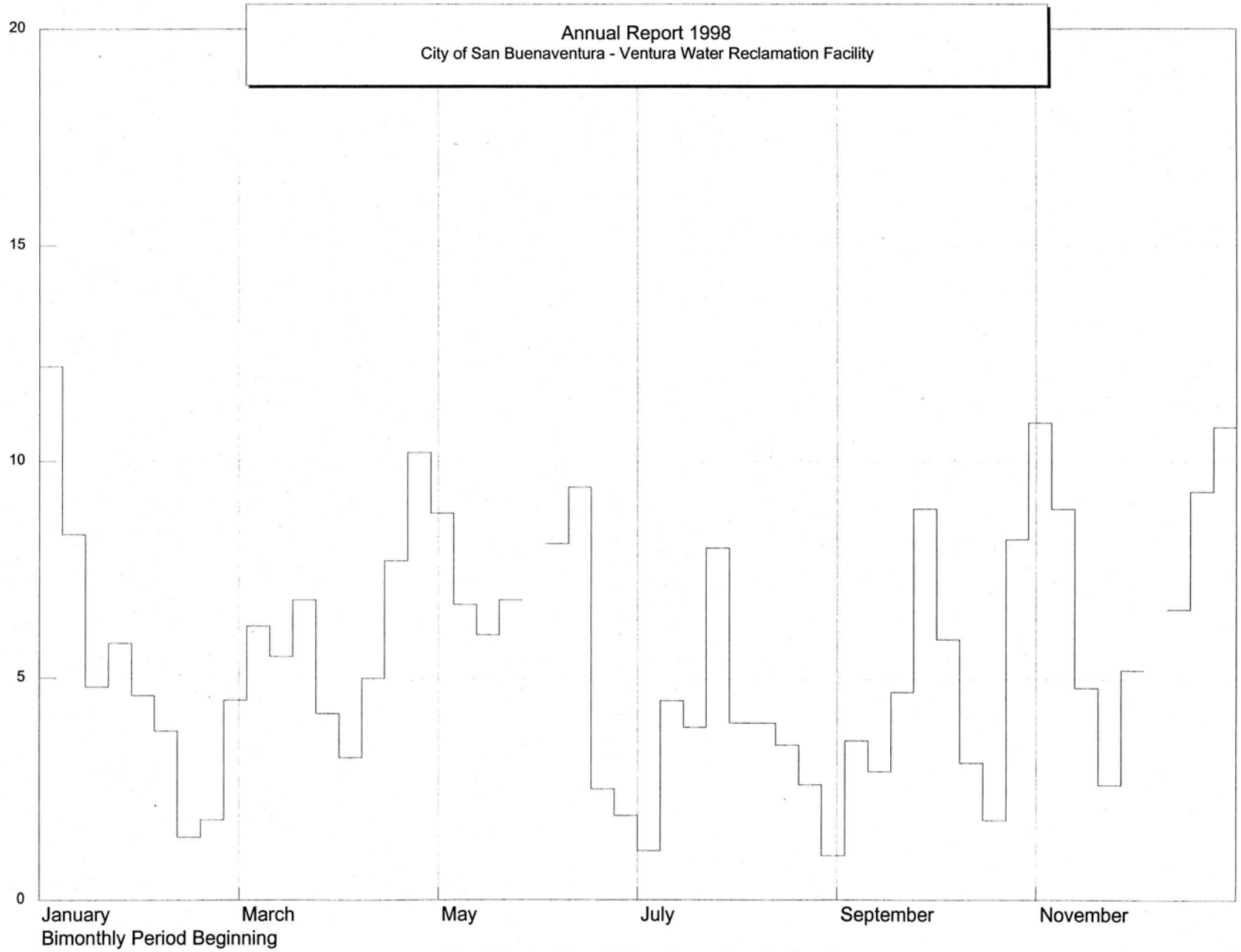
Mixed Media Filter Station Surge Pond Influent
30 Day Average Activated Sludge Effluent Nitrate-N mg/l



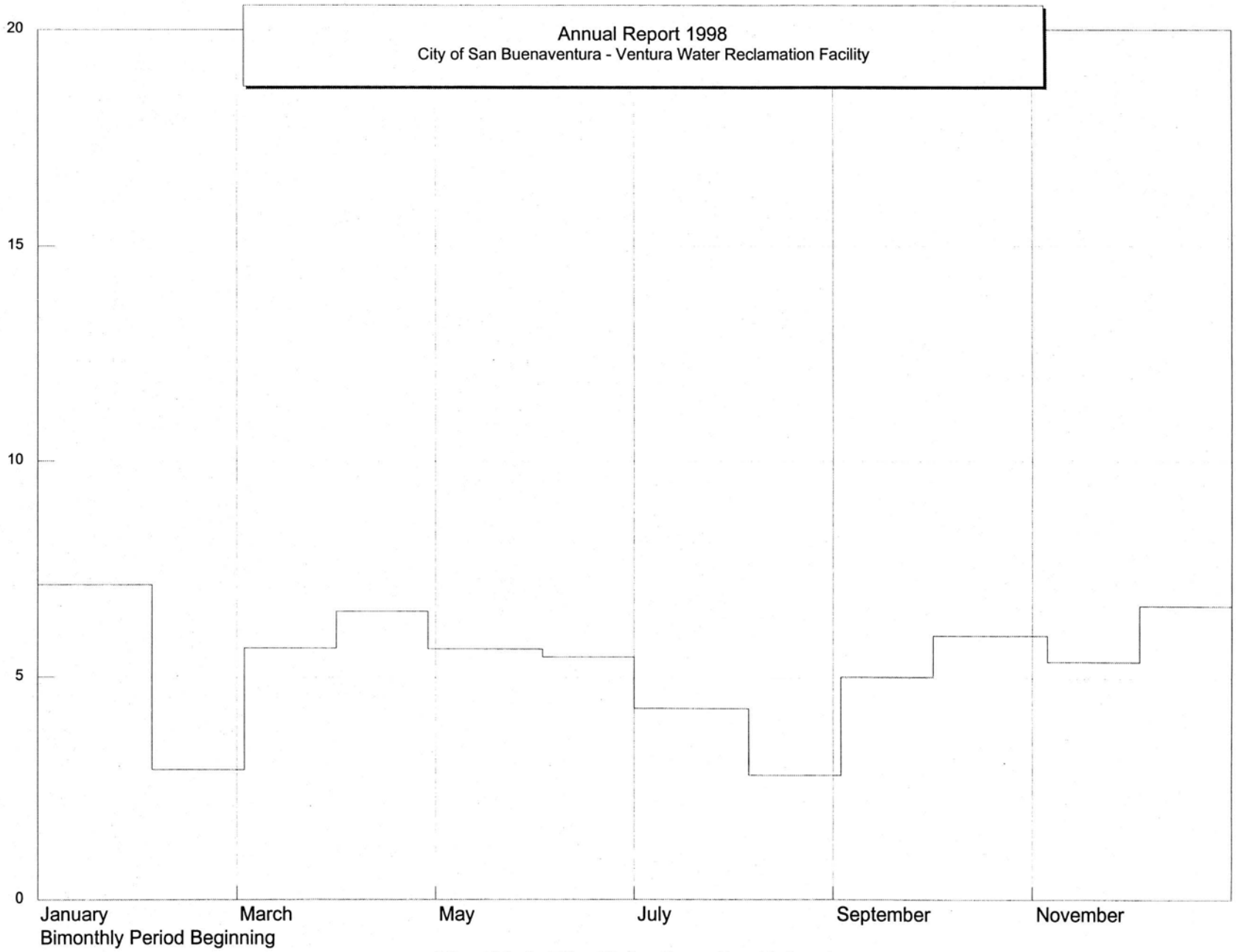
Mixed Media Filter Station Surge Pond Influent
Weekly Activated Sludge Effluent Nitrite-N mg/l



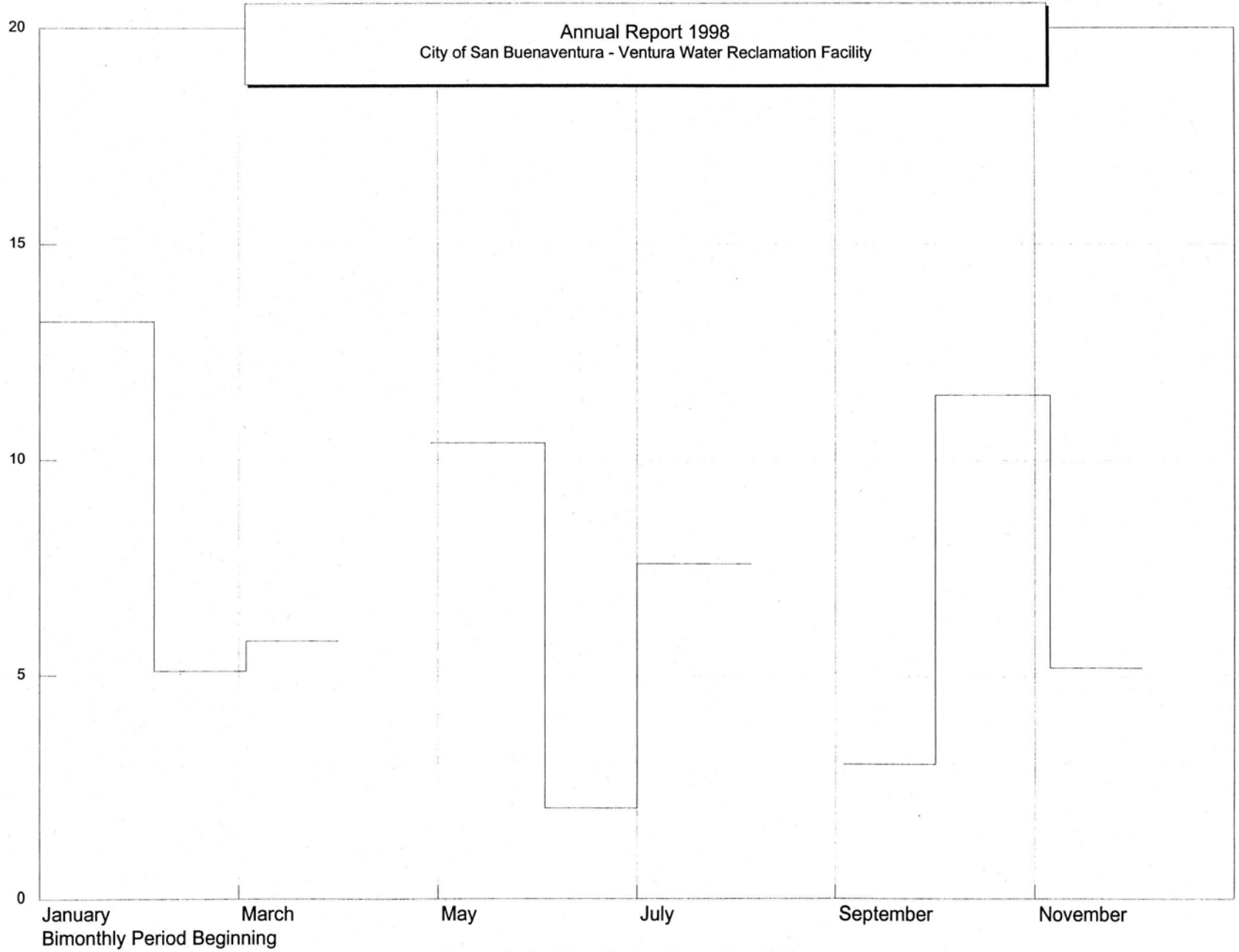
Mixed Media Filter Station Surge Pond Influent
30 Day Average Activated Sludge Effluent Nitrite-N mg/l



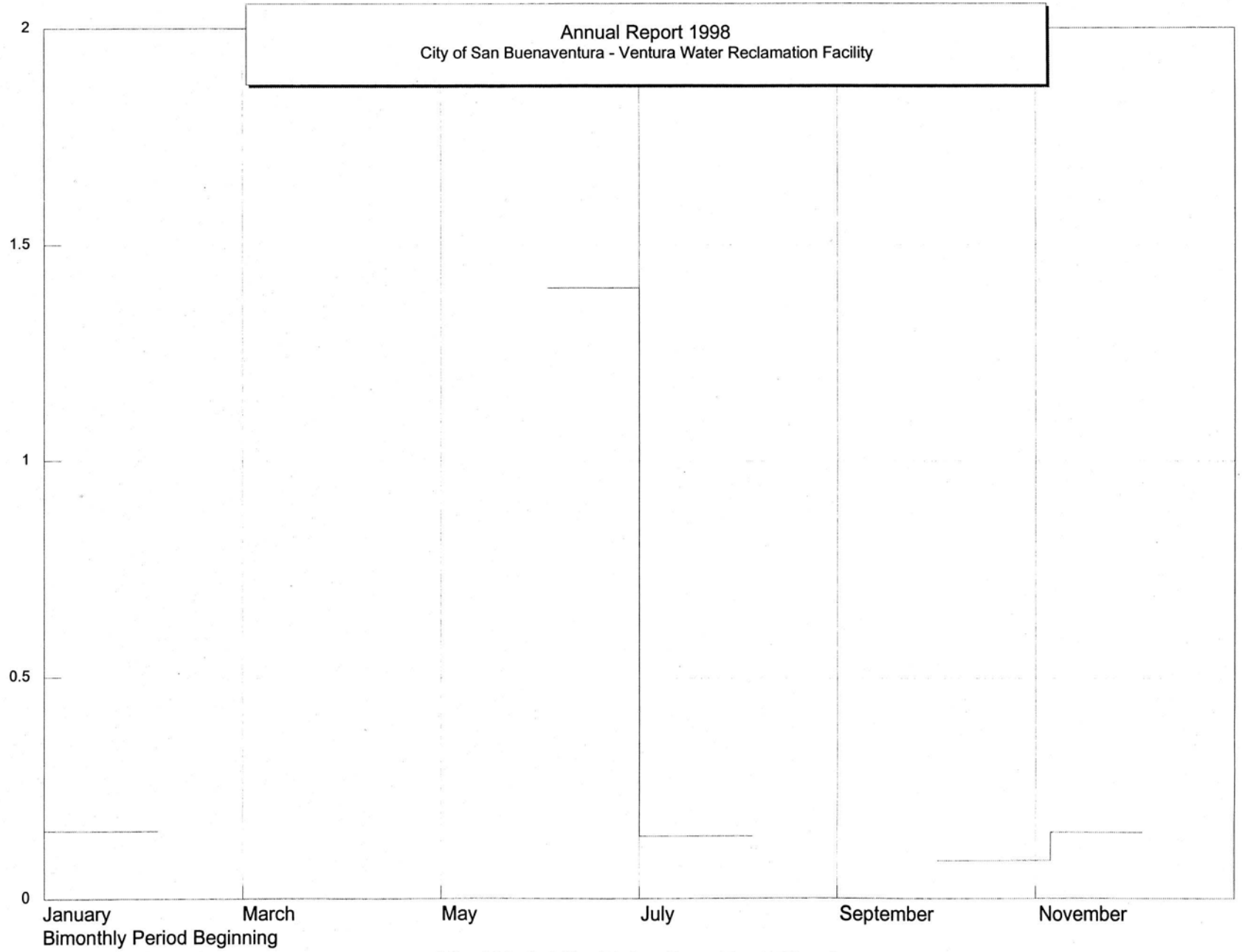
Mixed Media Filter Station Surge Pond Influent
Weekly Activated Sludge Effluent Ammonia-N mg/l



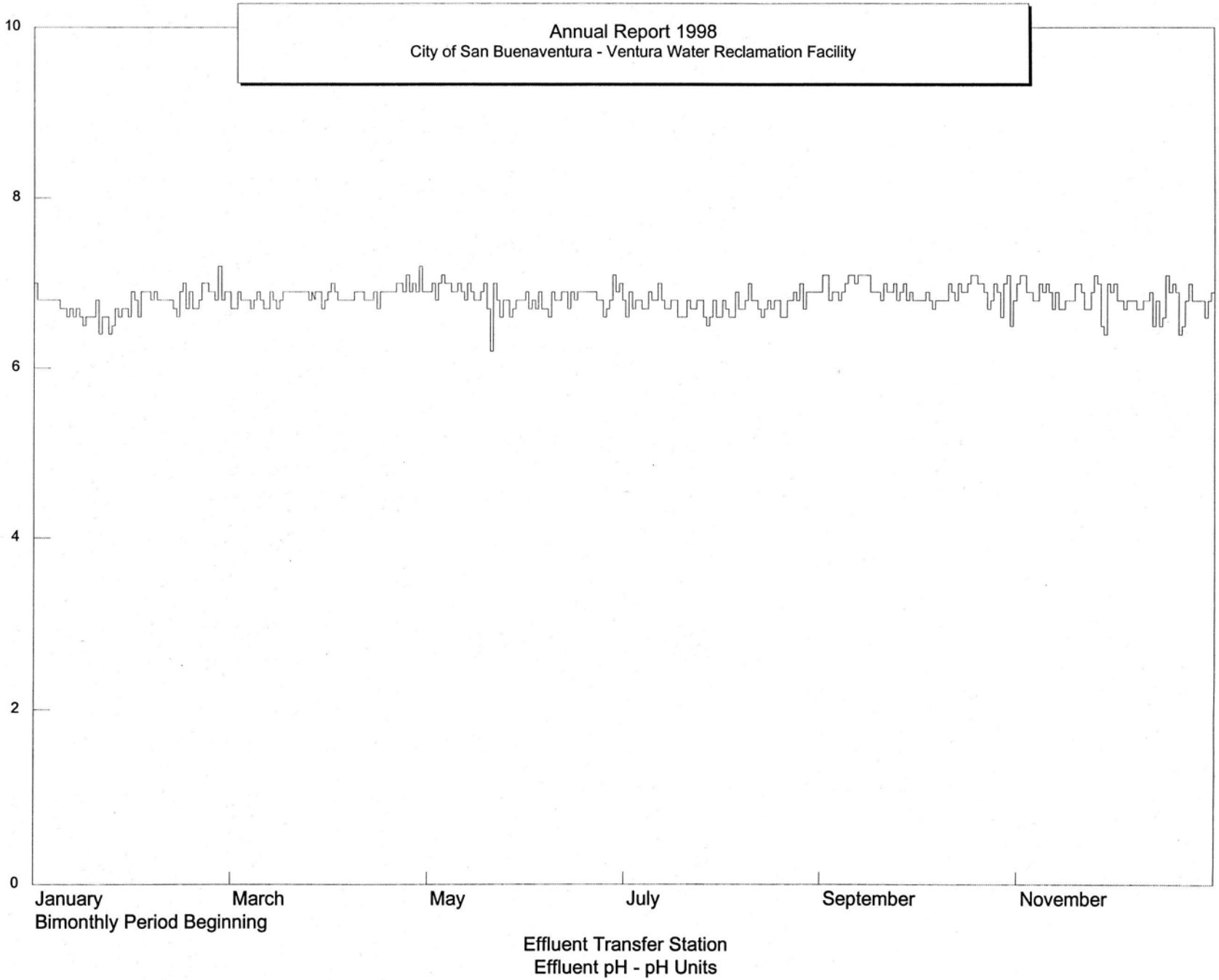
Mixed Media Filter Station Surge Pond Influent
30 Day Average Activated Sludge Effluent Ammonia-N mg/l

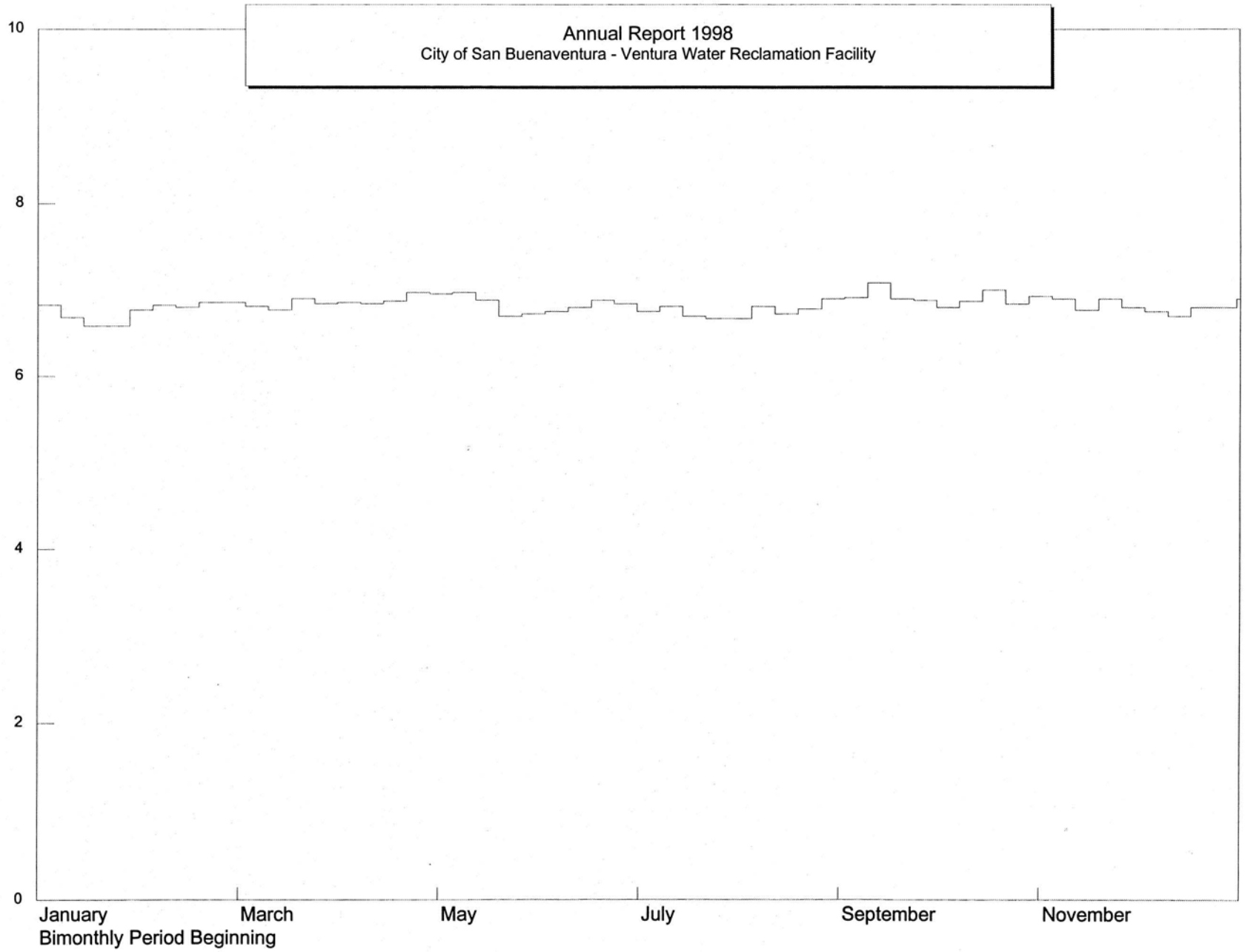


Mixed Media Filter Station Surge Pond Effluent
Activated Sludge Effluent Monthly TKN - mg/l

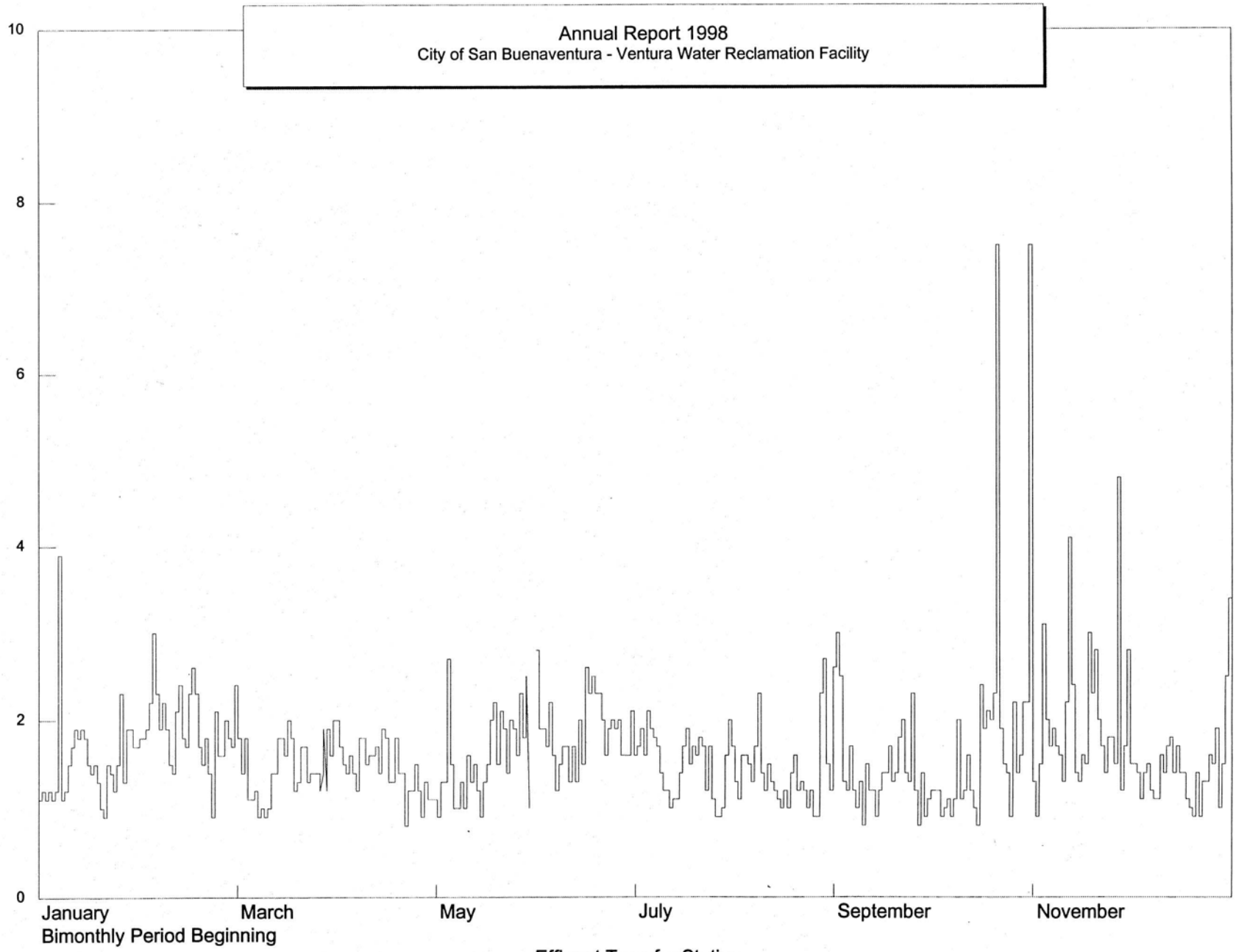


Mixed Media Filter Station Surge Pond Effluent
Activated Sludge Effluent Monthly MBAS - mg/l

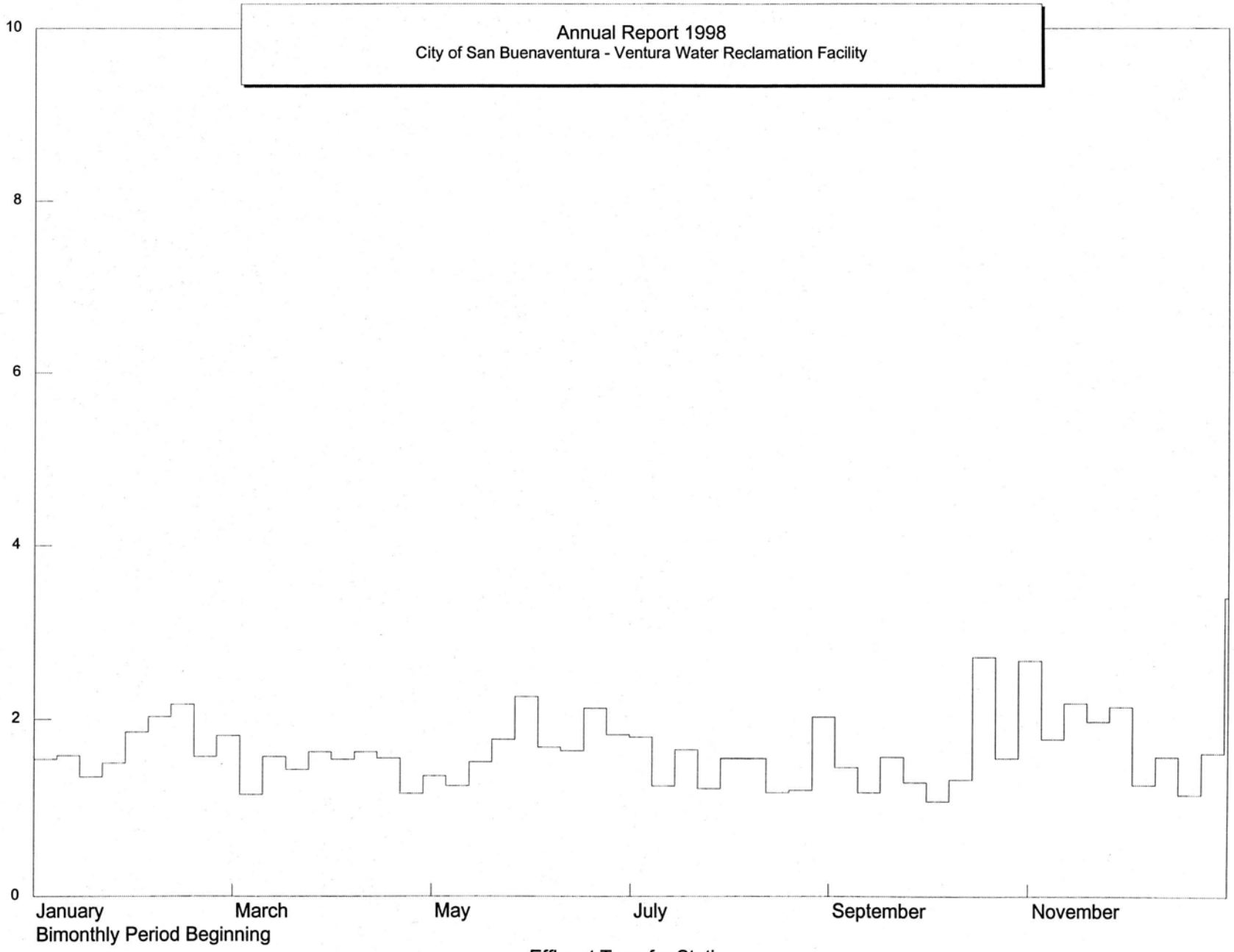

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
6
4
2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent pH - pH Units



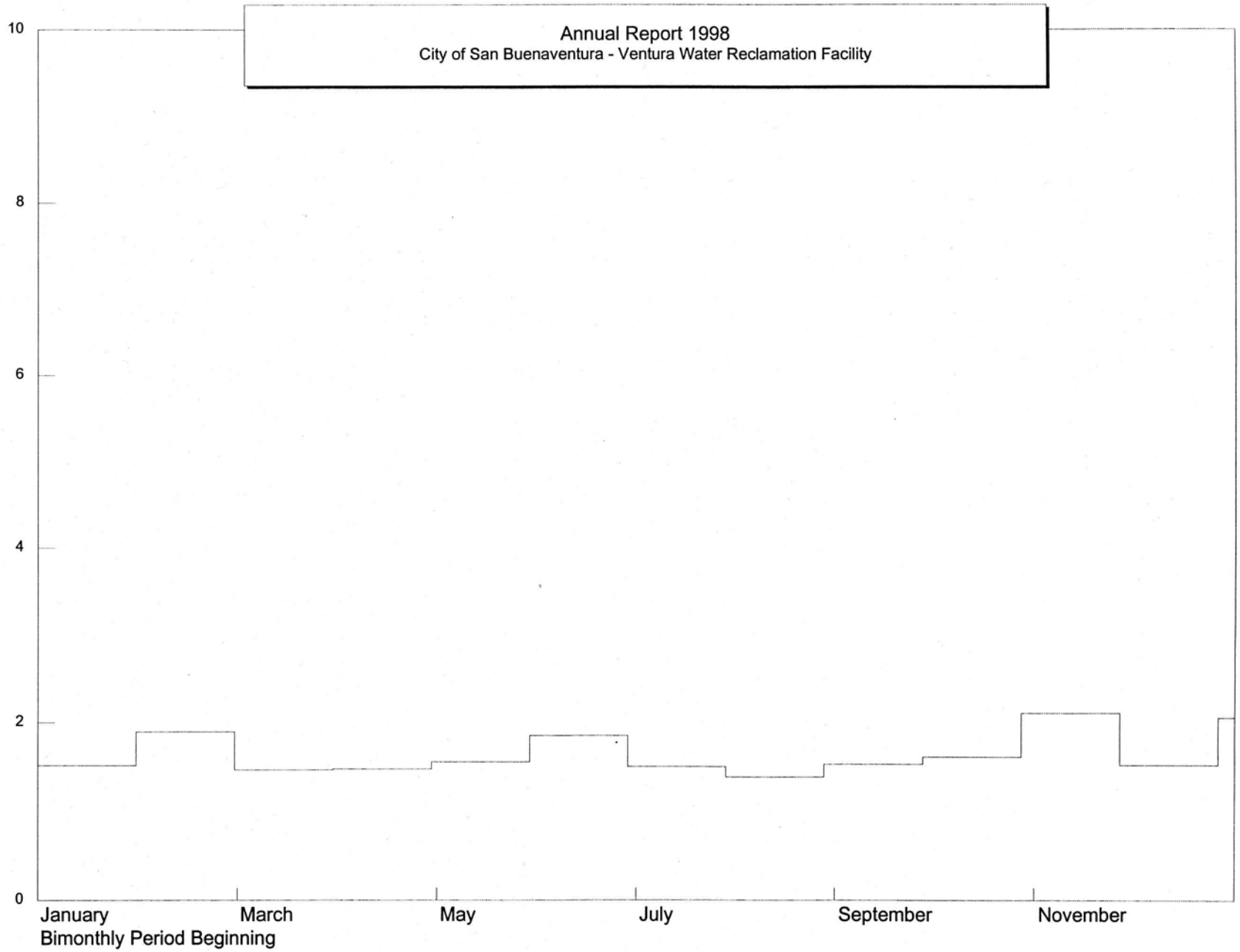
Effluent Transfer Station
Effluent 7 Day Average pH - pH Units



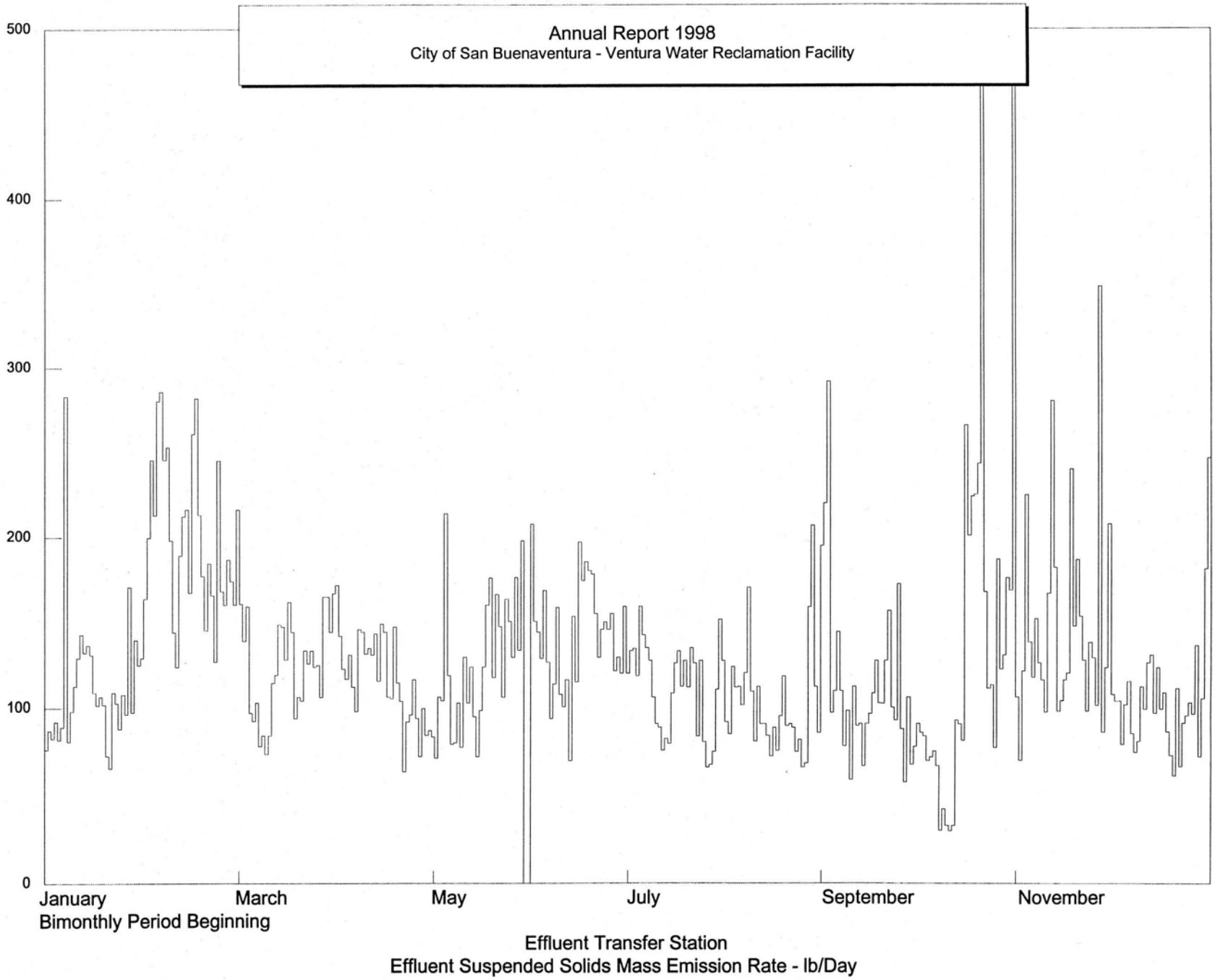
Effluent Transfer Station
Effluent Suspended Solids - mg/l

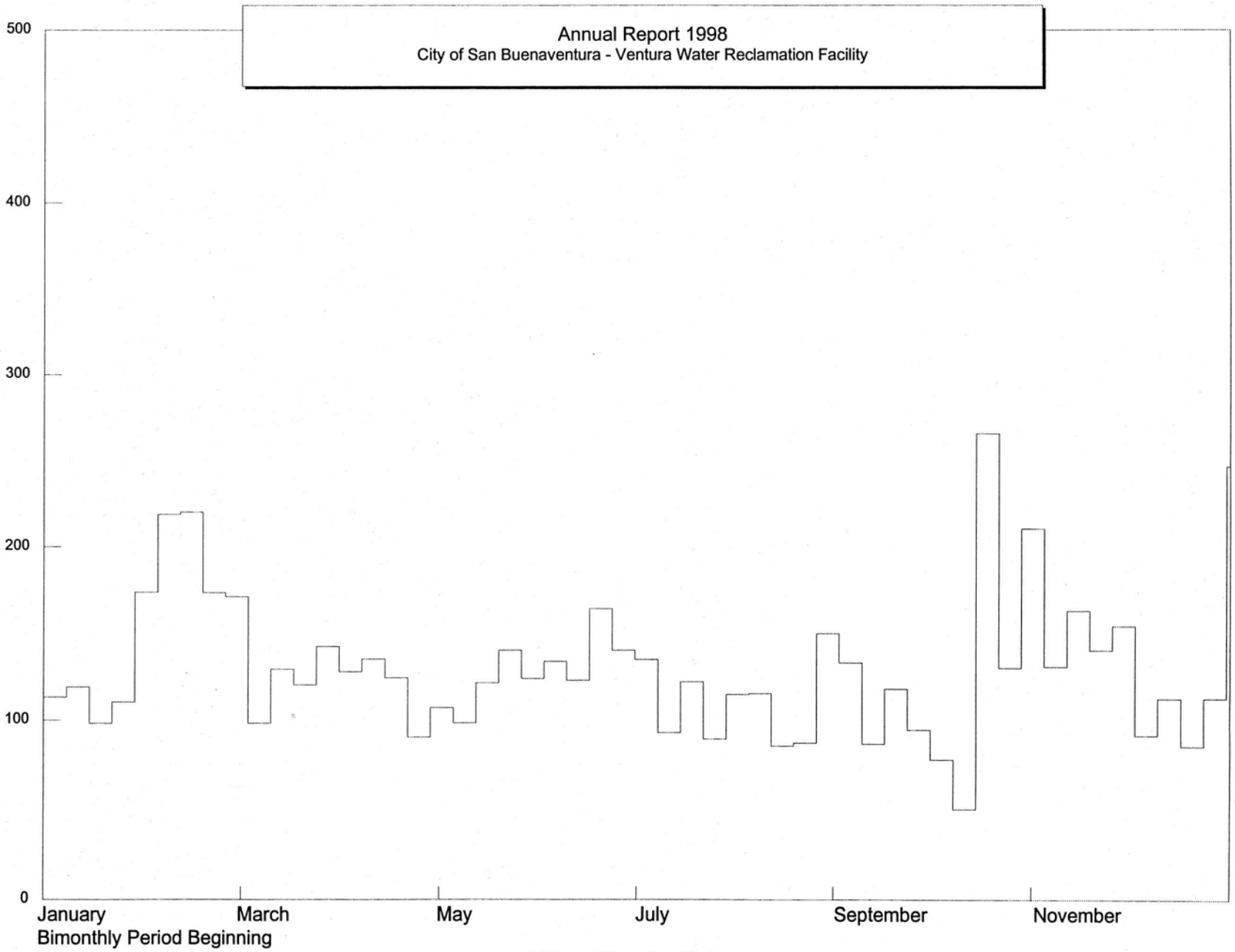


Effluent Transfer Station
Effluent 7 Day Average Suspended Solids - mg/l

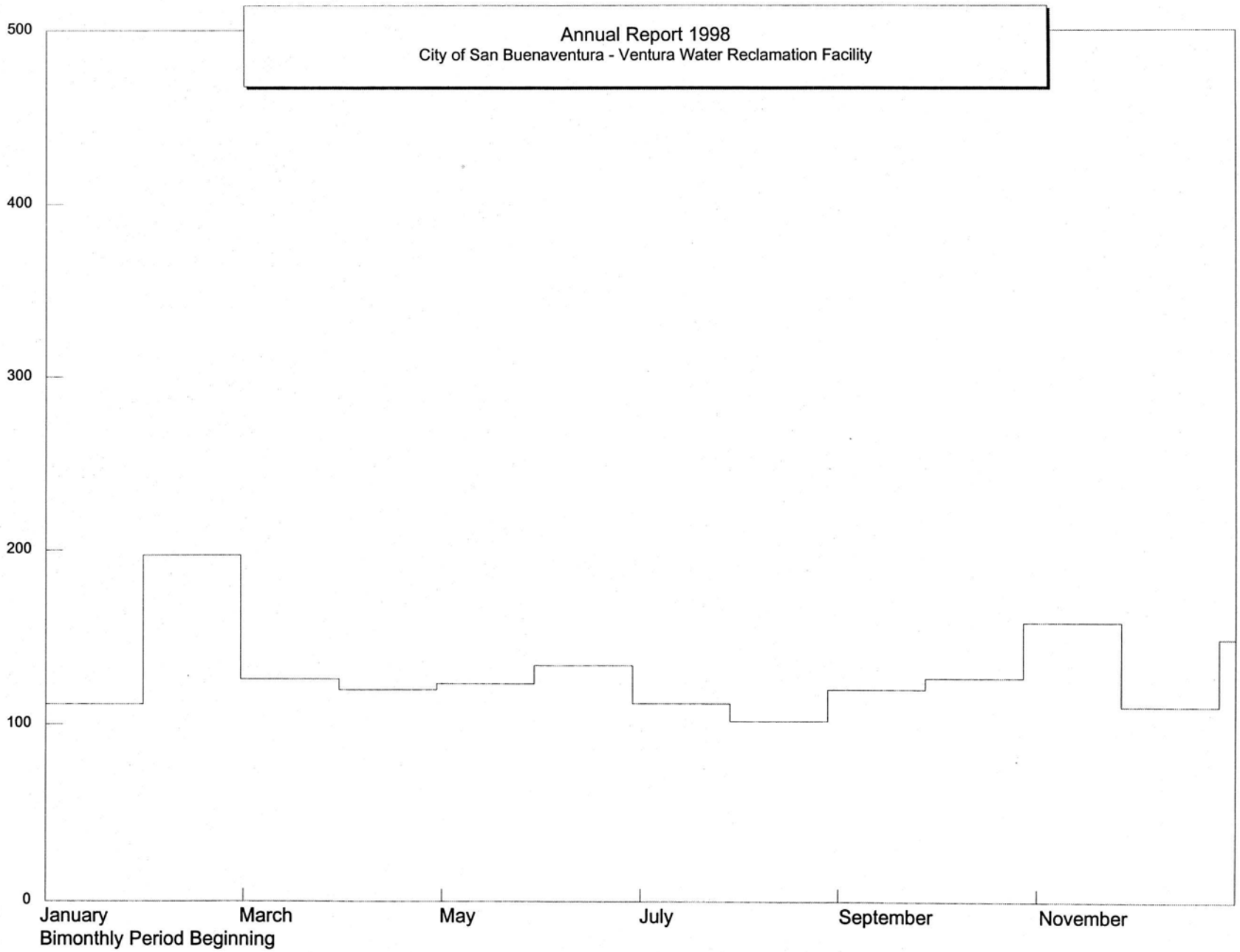


Effluent Transfer Station
Effluent 30 Day Average Suspended Solids - mg/l

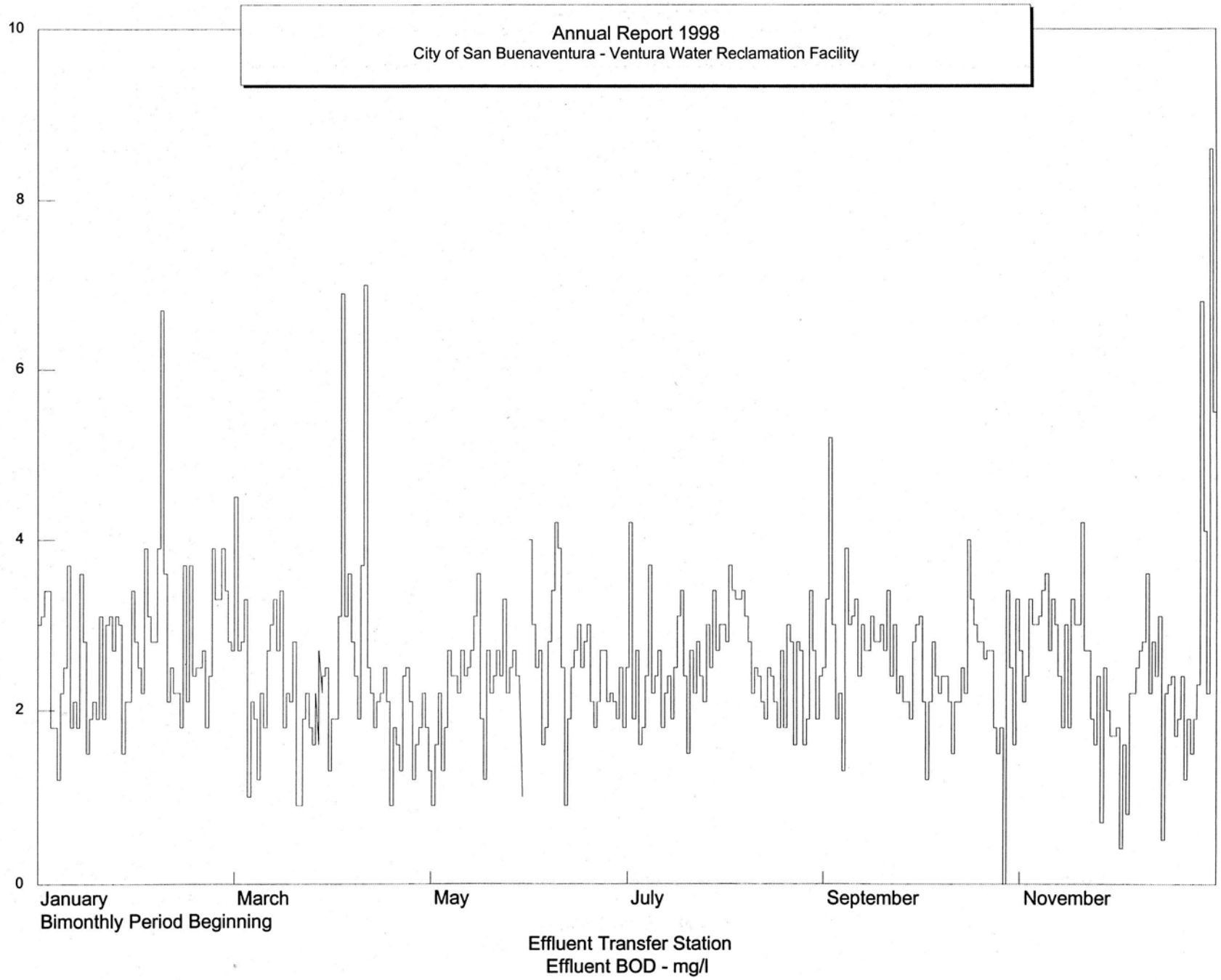

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
500
400
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Suspended Solids Mass Emission Rate - lb/Day

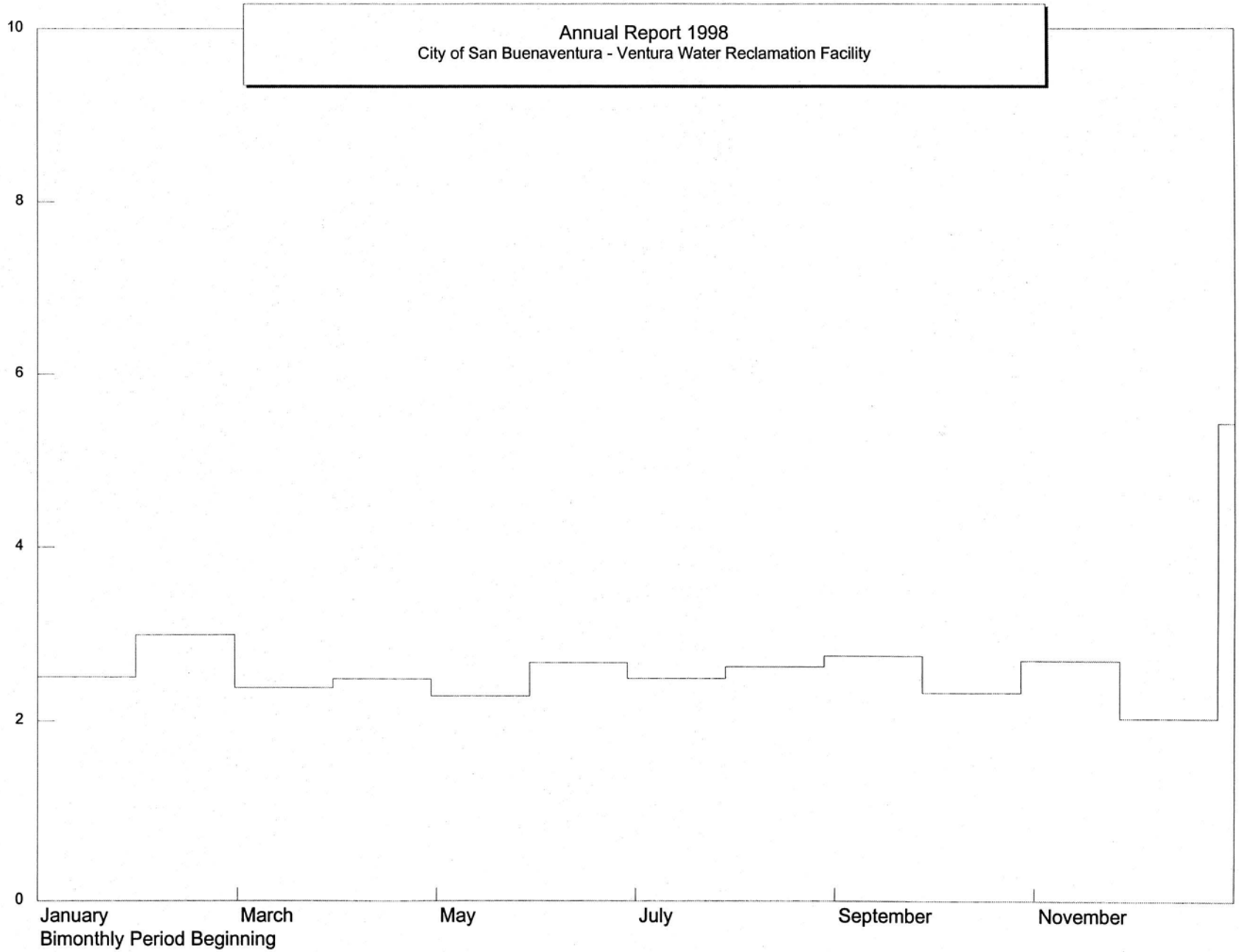


Effluent Transfer Station
Effluent 7 Day AverageSuspended Solids Mass Emission Rate - lb/Day

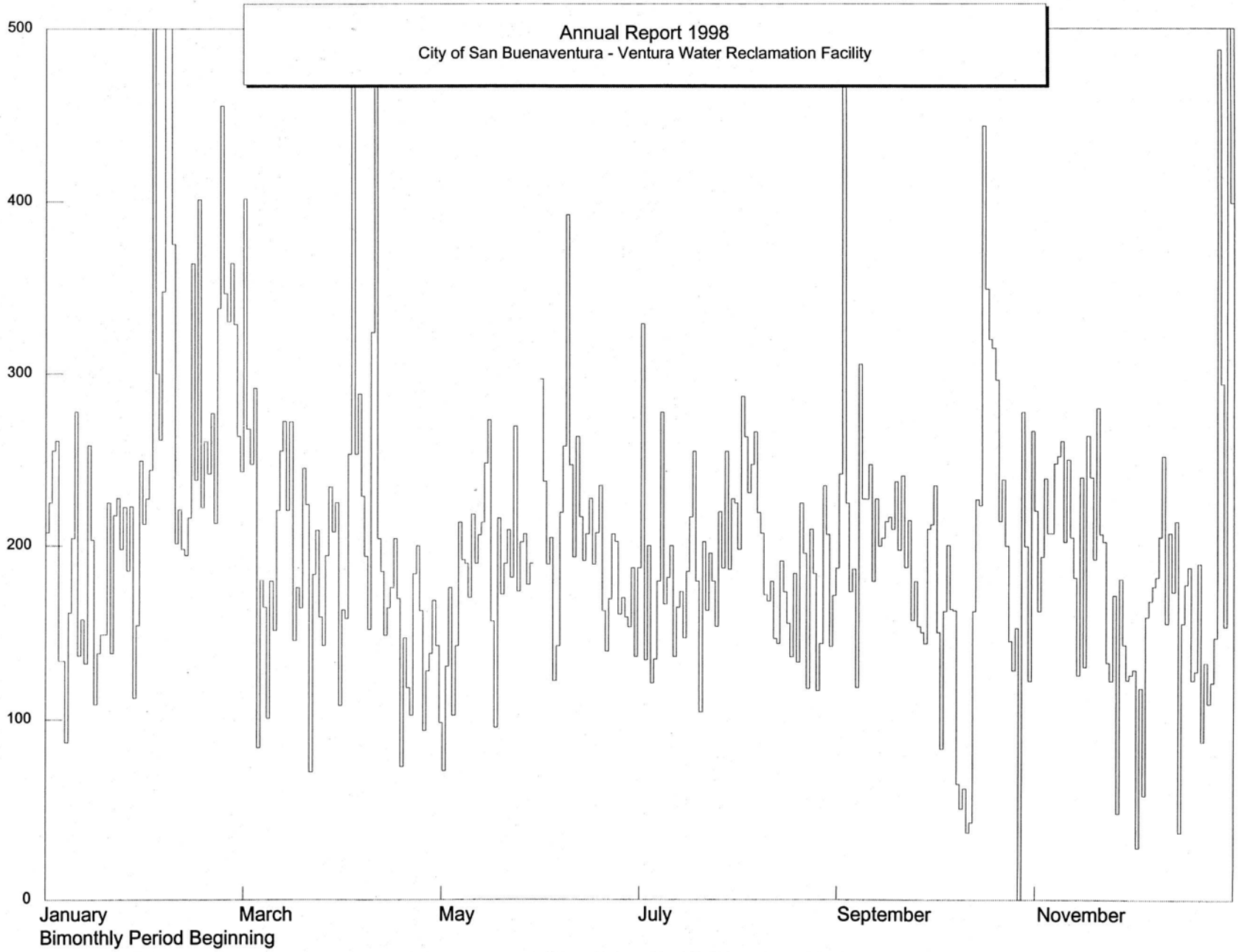


Effluent Transfer Station
Effluent 30 Day AverageSuspended Solids Mass Emission Rate - lb/Day

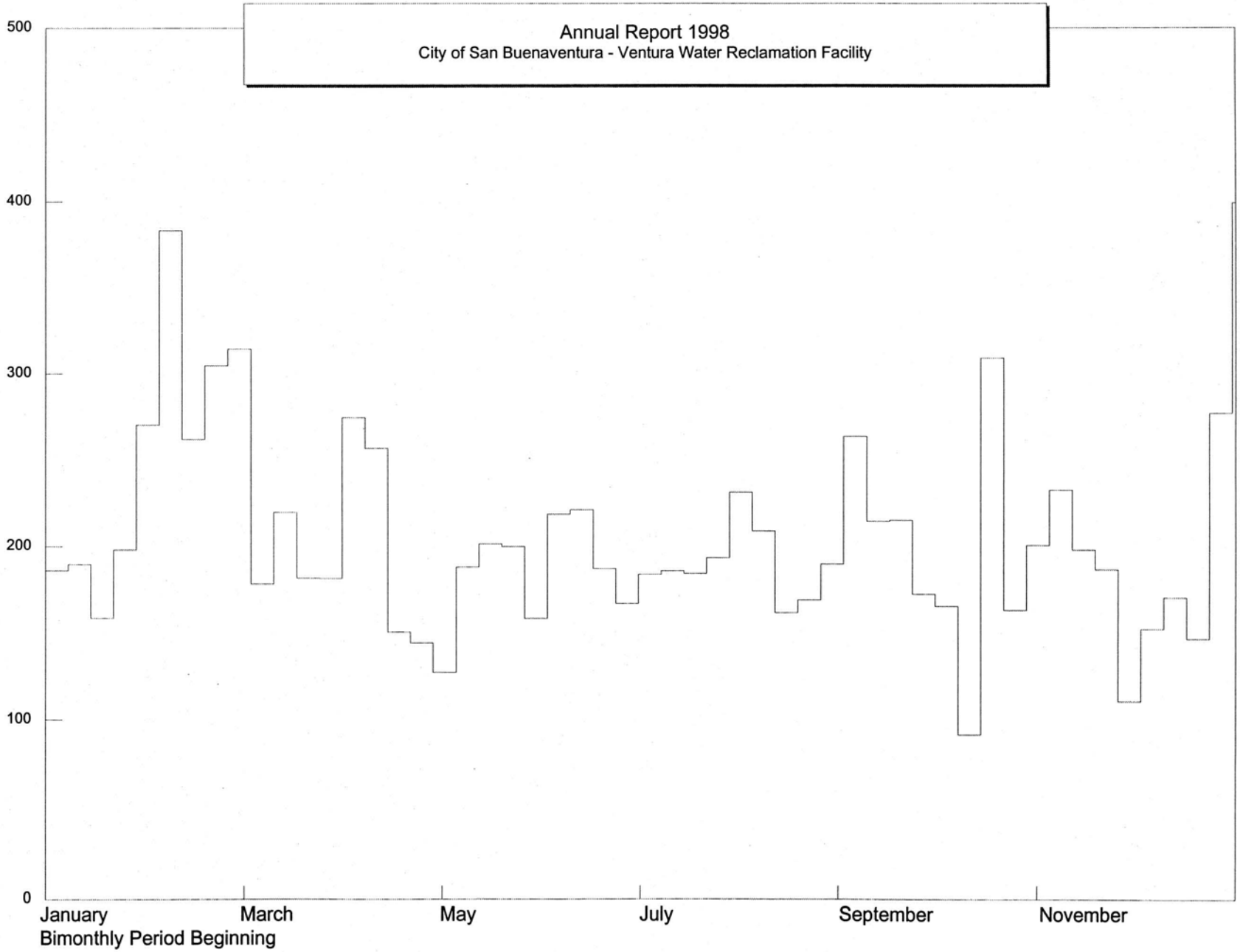

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
6
4
2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent BOD - mg/l



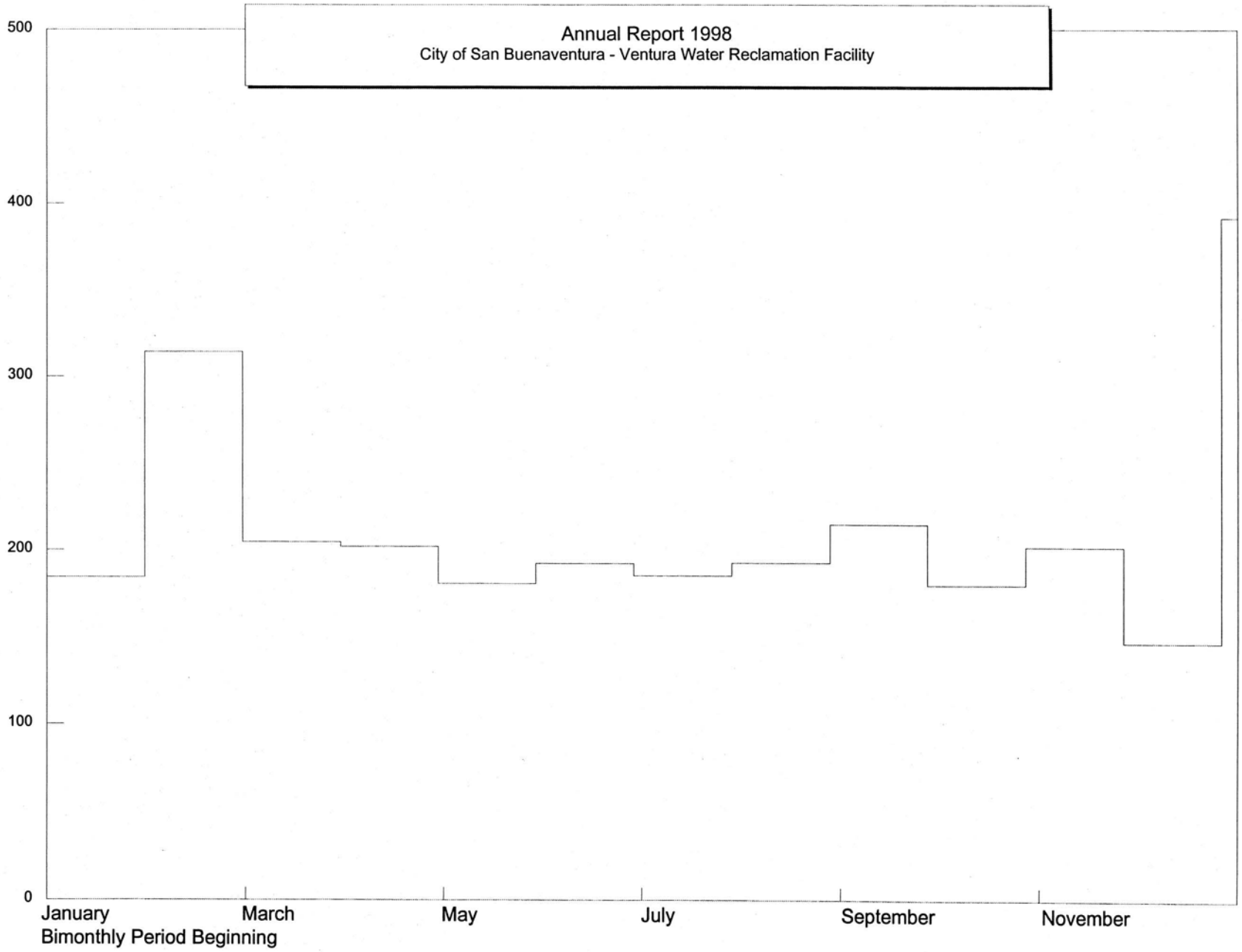
Effluent Transfer Station
Effluent 30 Day Average BOD - mg/l



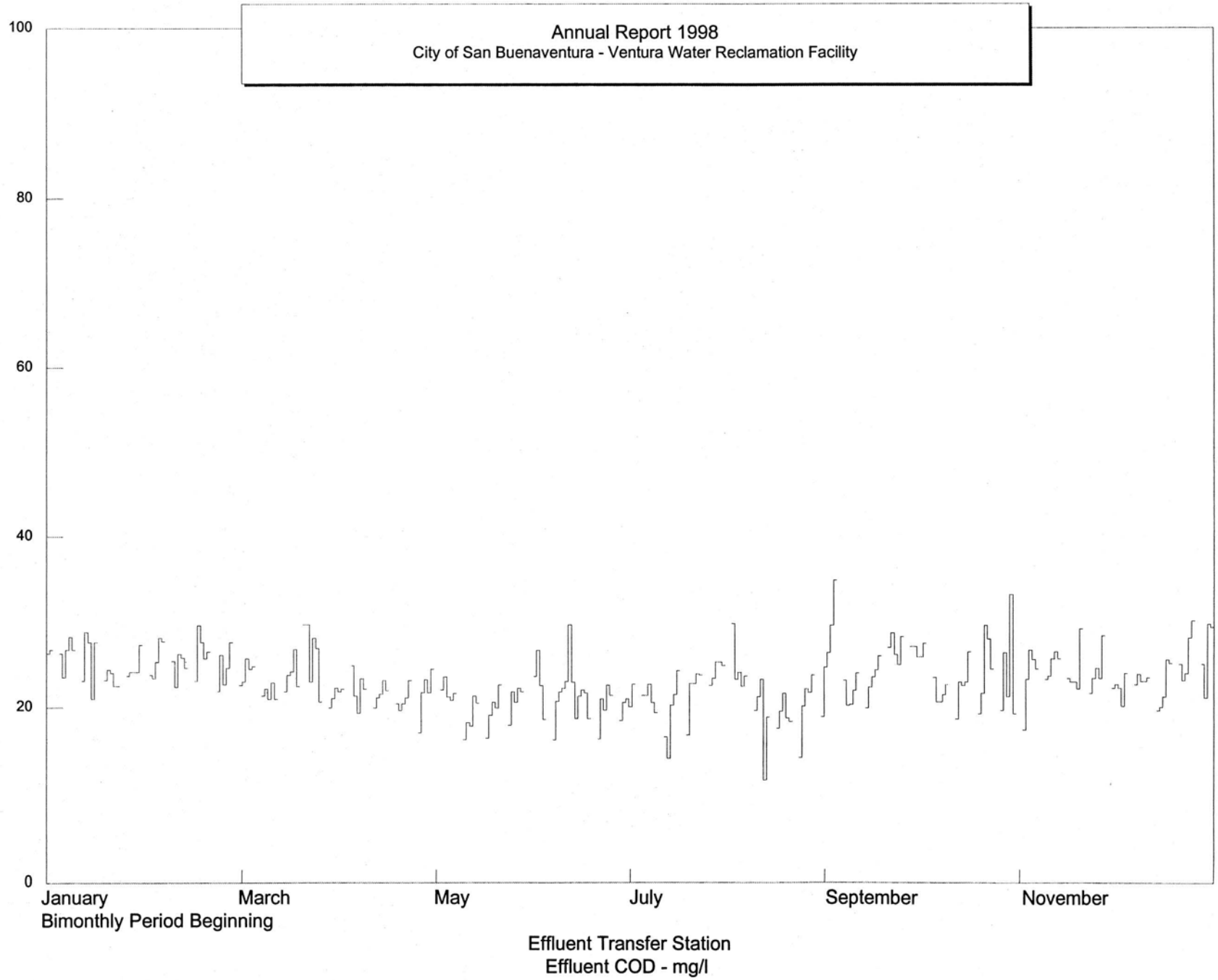
Effluent Transfer Station
Effluent BOD Mass Emission Rate - mg/l

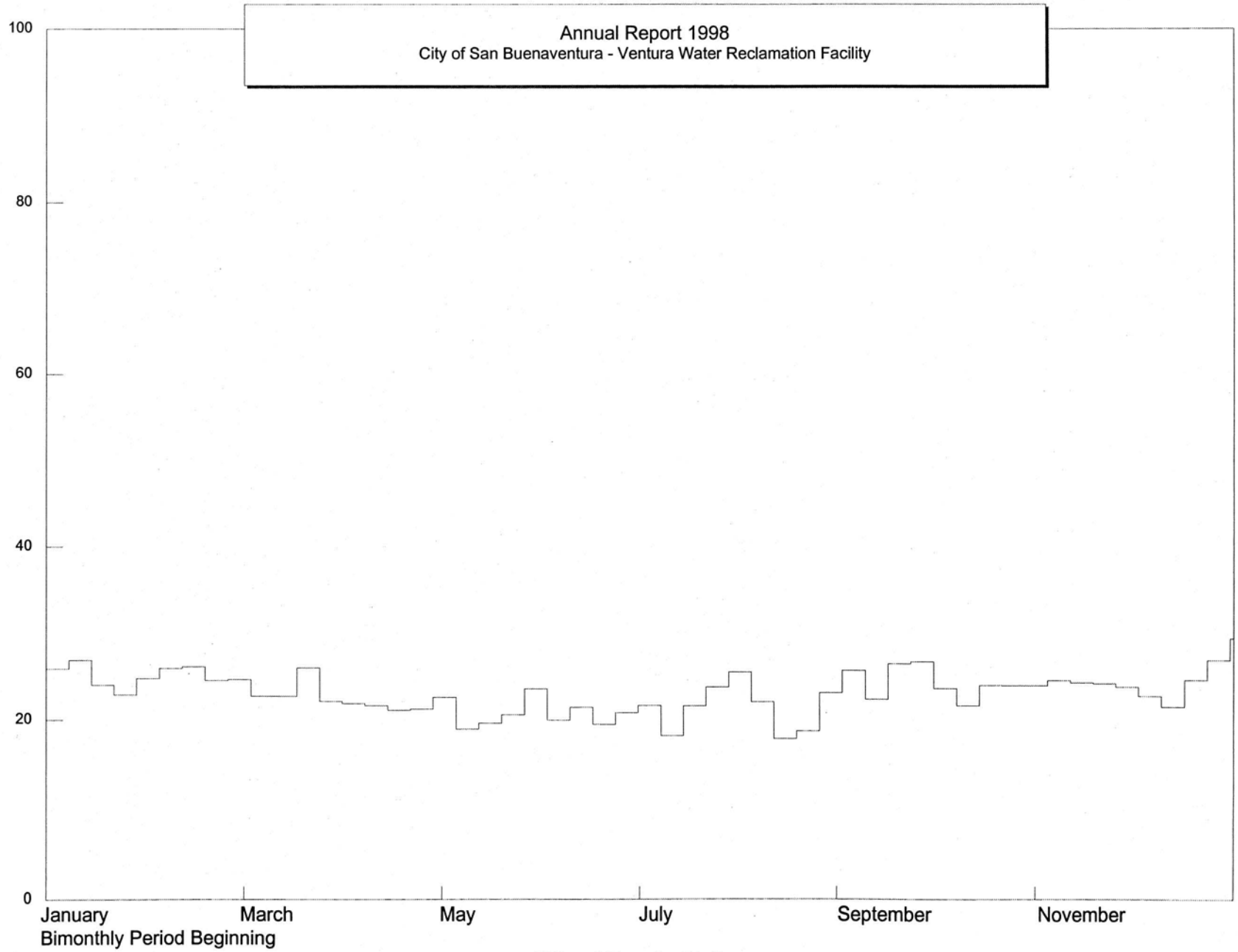


Effluent Transfer Station
Effluent 7 Day Average BOD Mass Emission Rate - mg/l

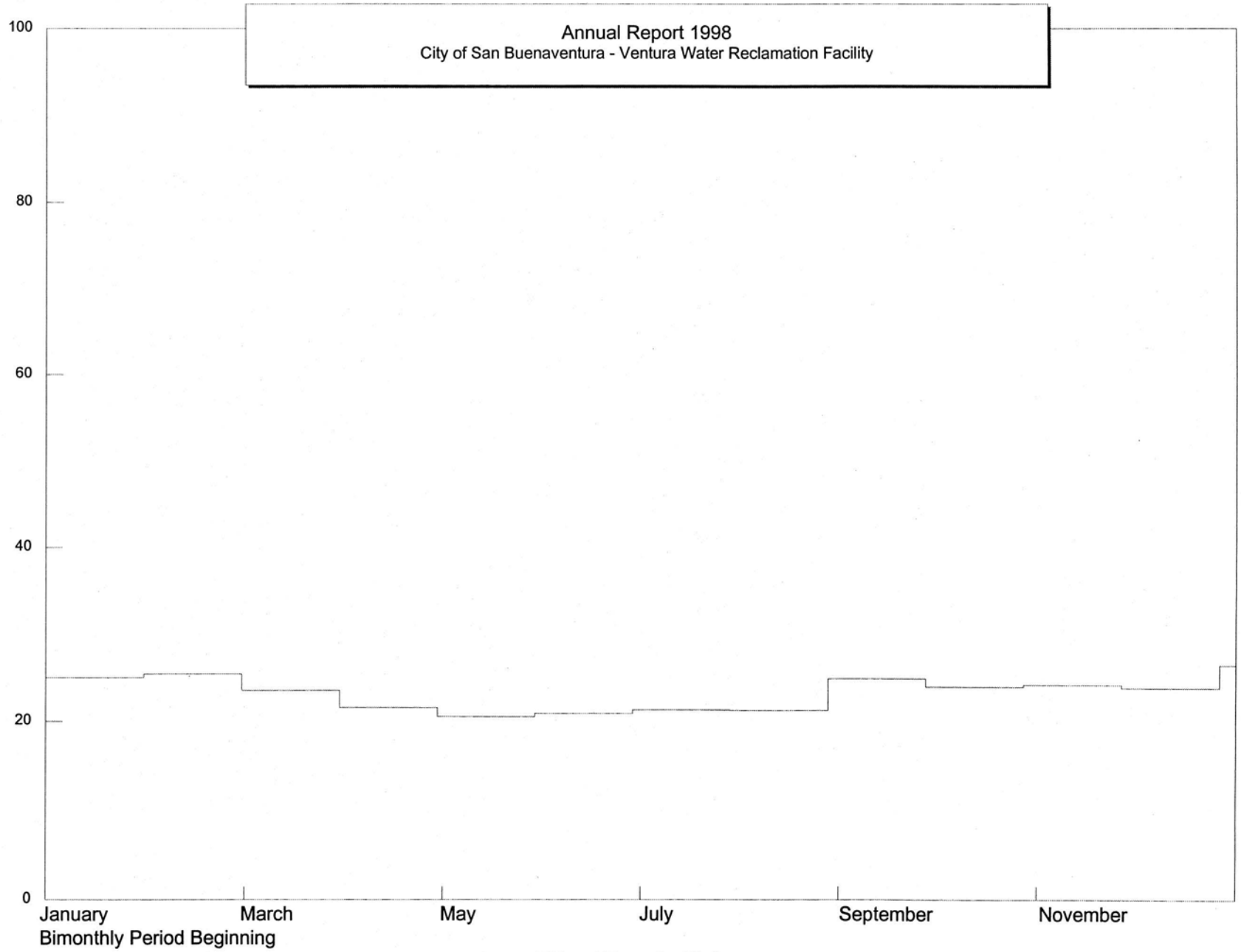


Effluent Transfer Station
Effluent 30 Day Average BOD Mass Emission Rate - mg/l

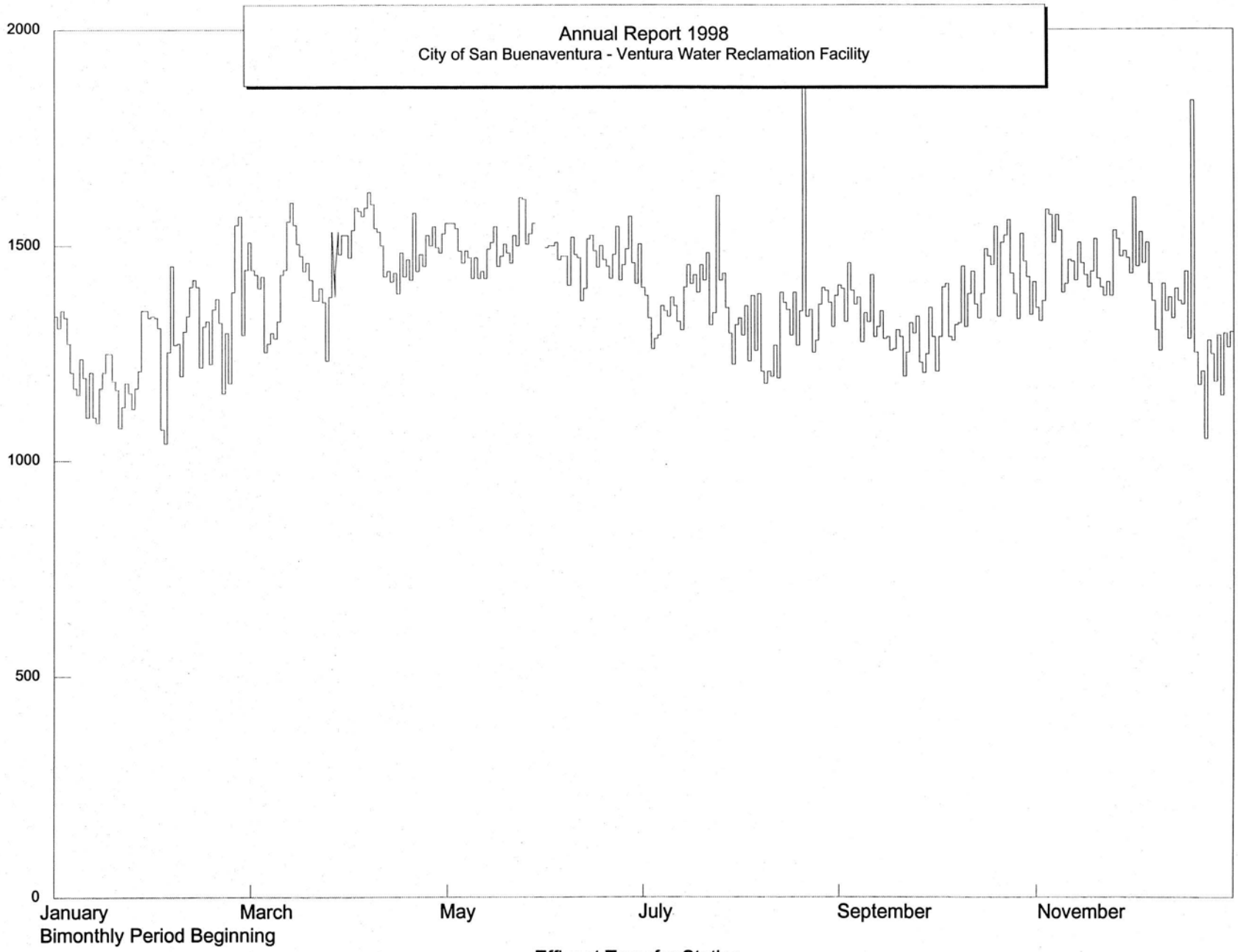

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
100
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent COD - mg/l



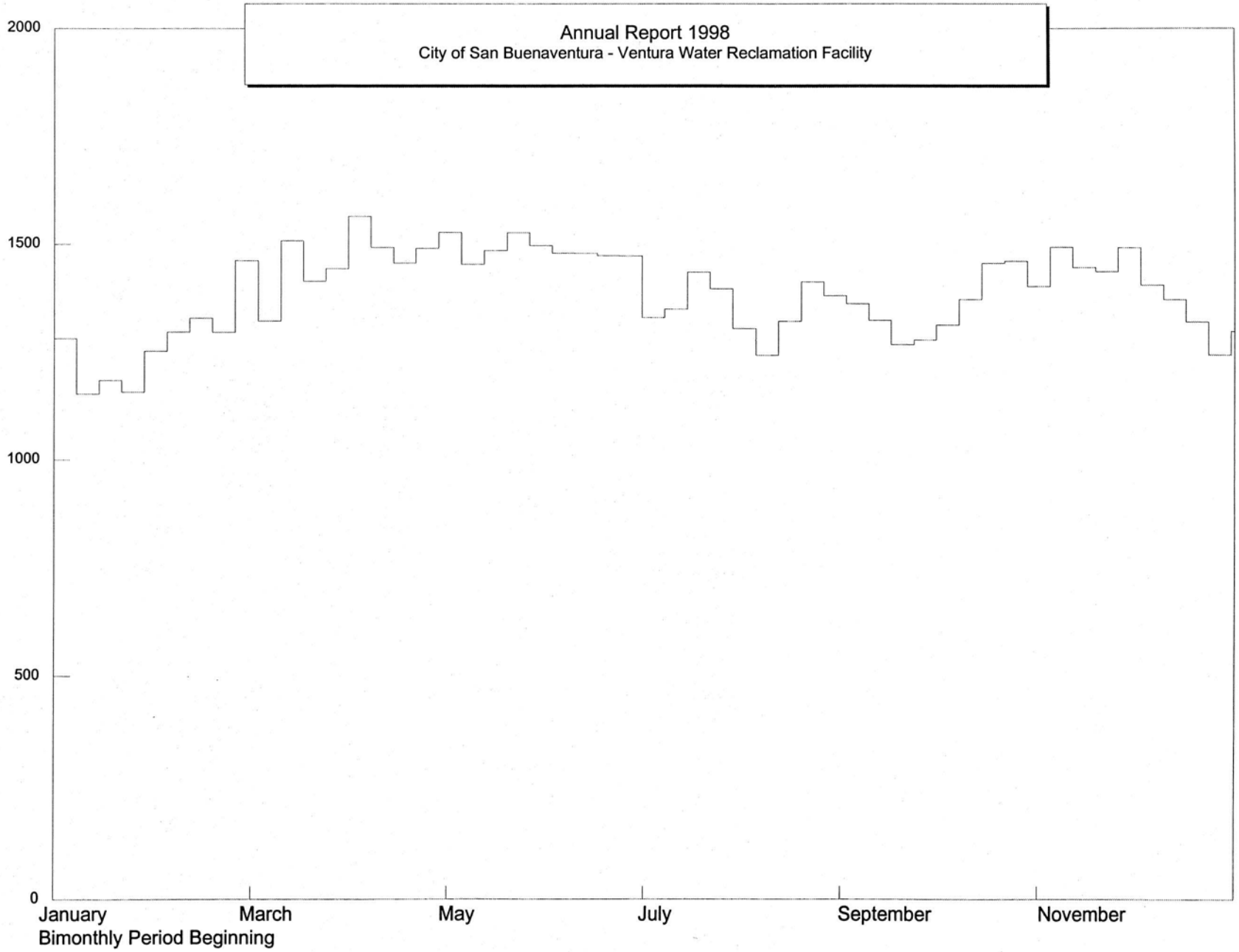
Effluent Transfer Station
Effluent 7 Day Average COD - mg/l



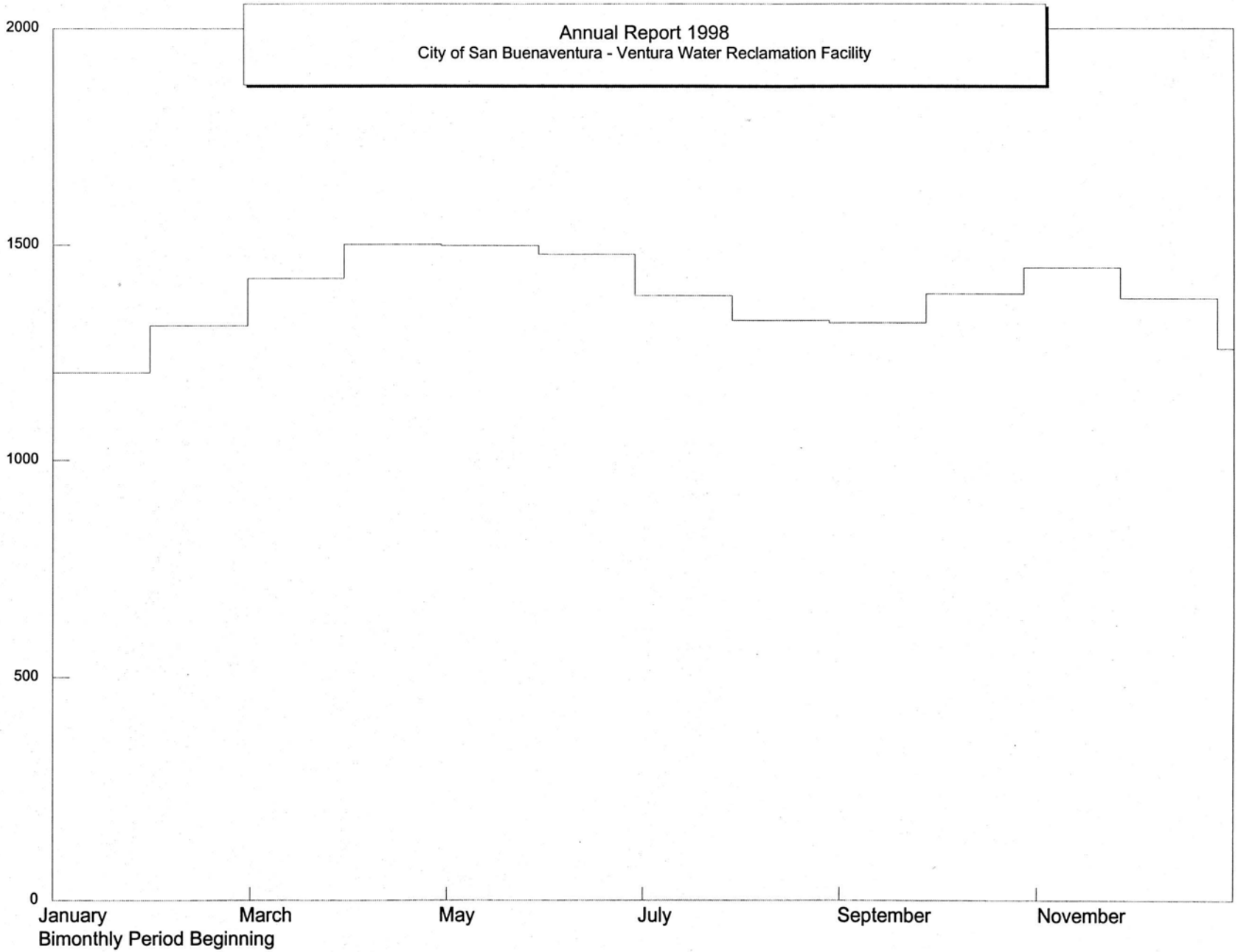
Effluent Transfer Station
Effluent 30 Day Average COD - mg/l



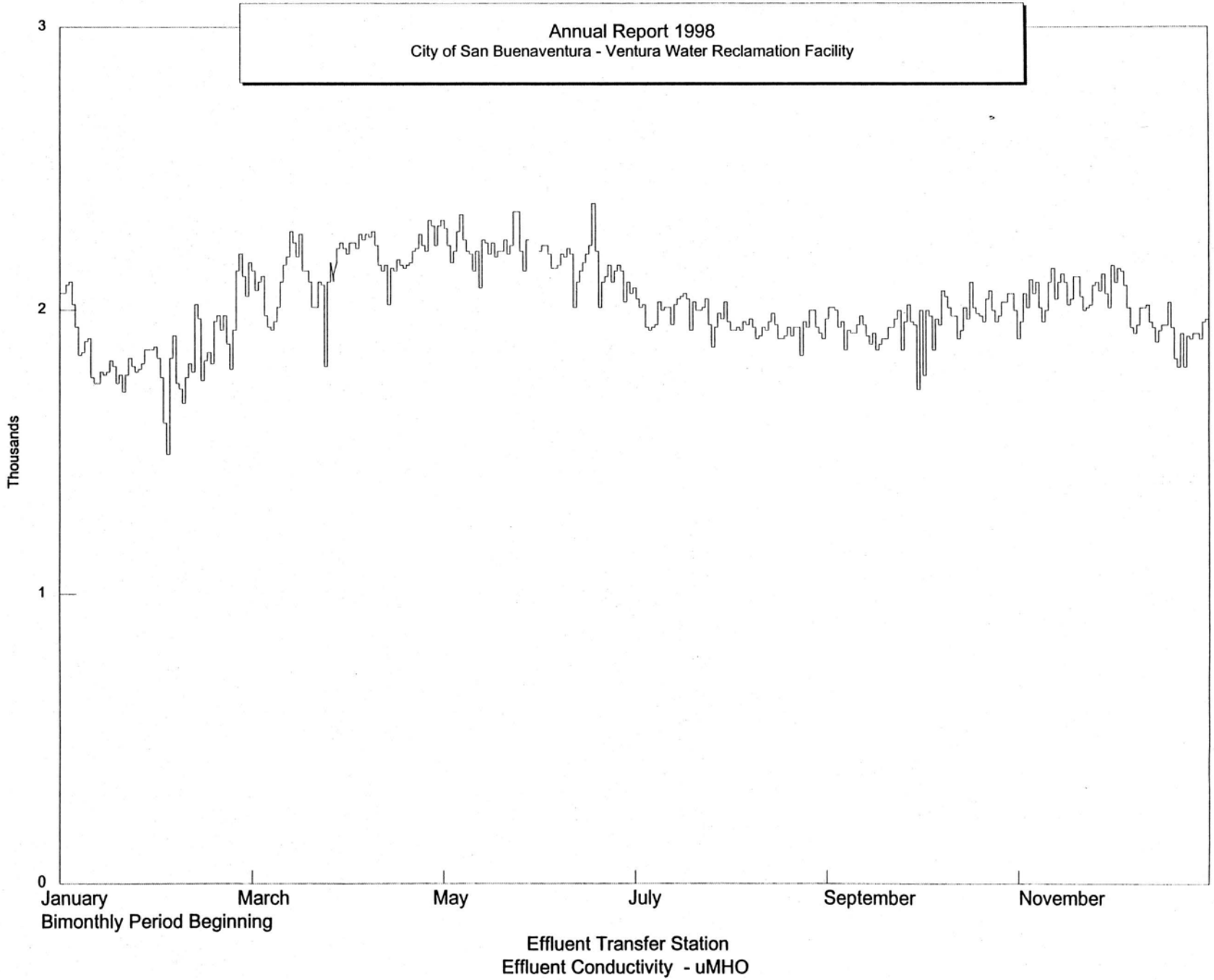
Effluent Transfer Station
Effluent Total Dissolved Solids - mg/l

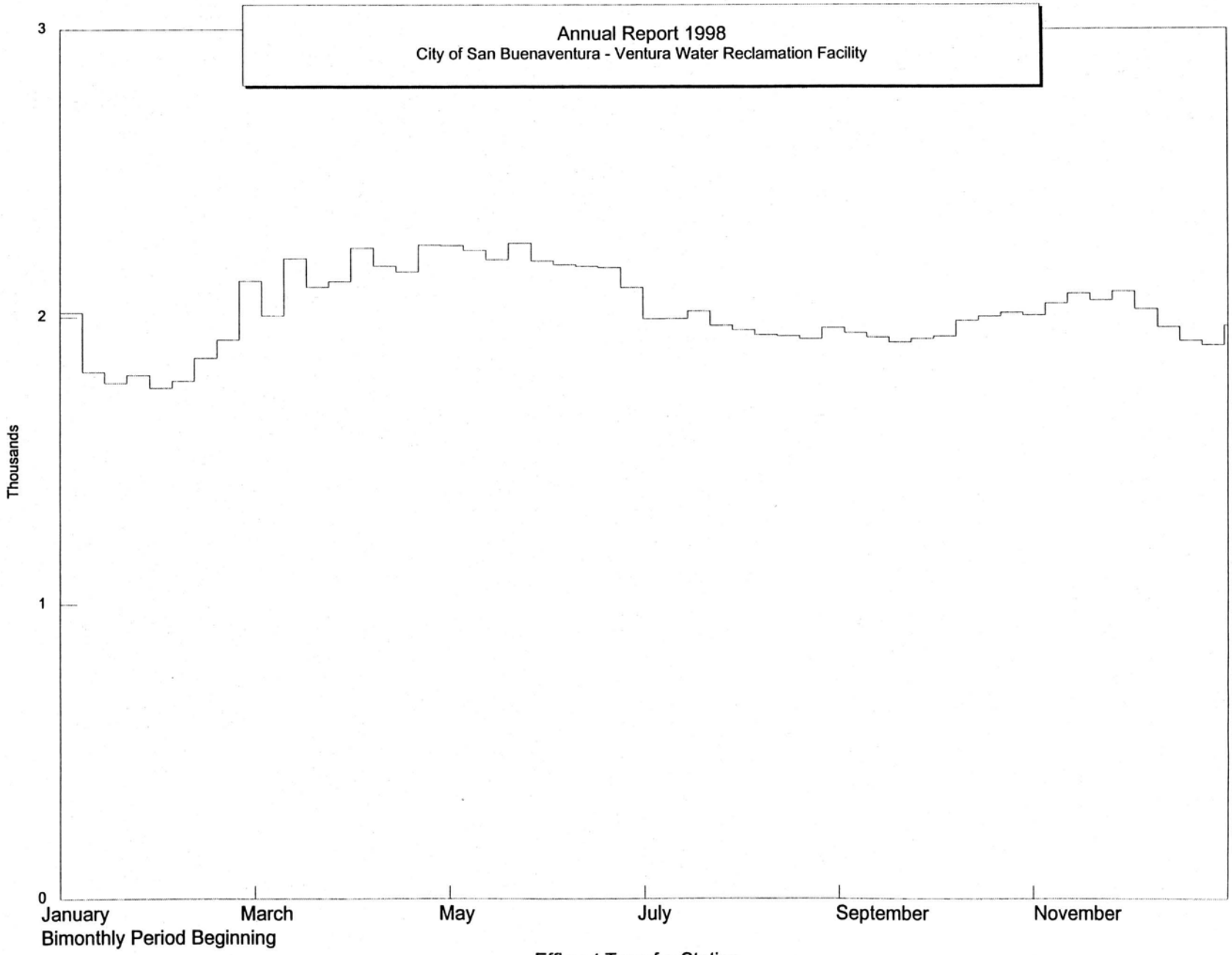


Effluent Transfer Station
Effluent 7 Day Average Total Dissolved Solids - mg/l

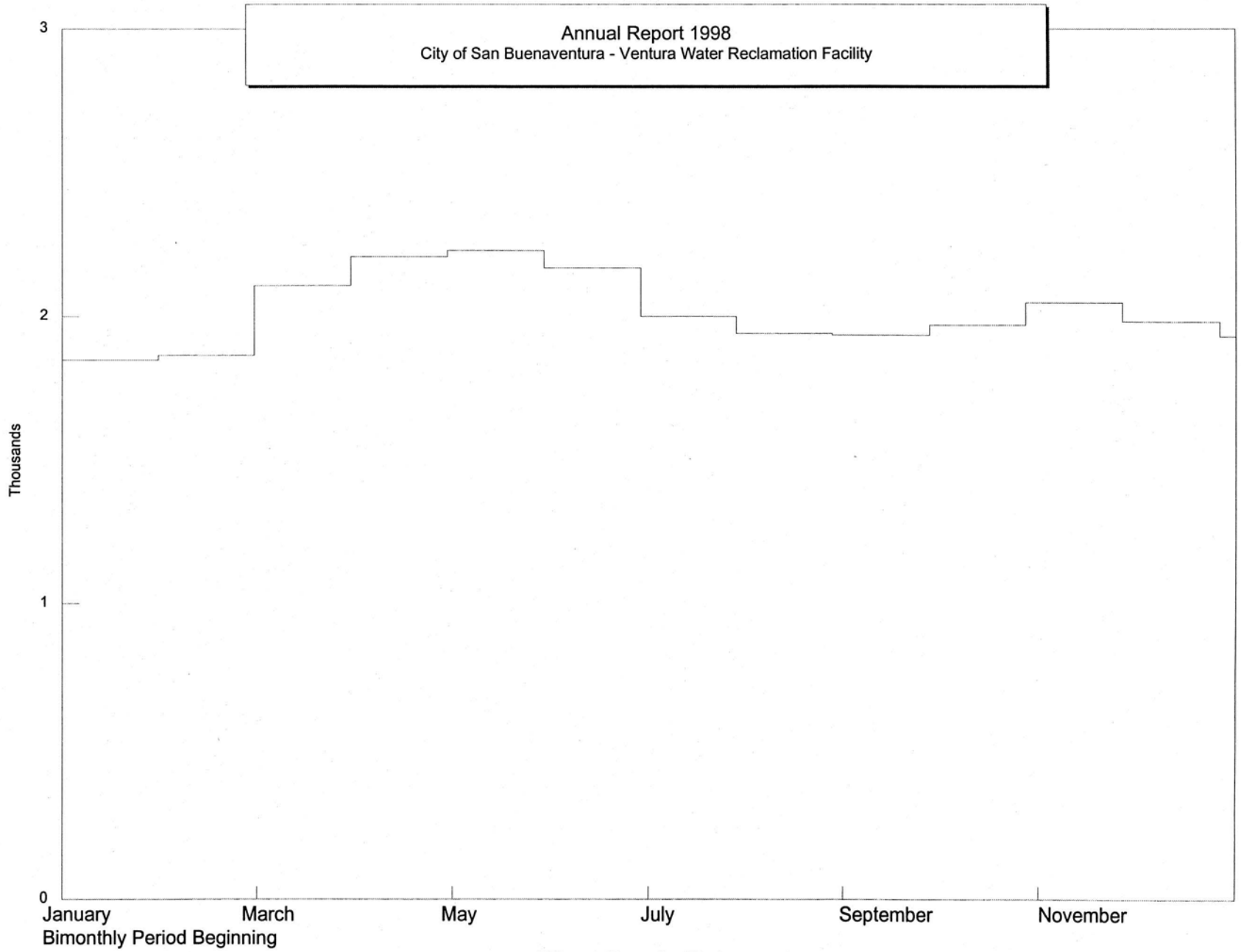


Effluent Transfer Station
Effluent 30 Day Average Total Dissolved Solids - mg/l

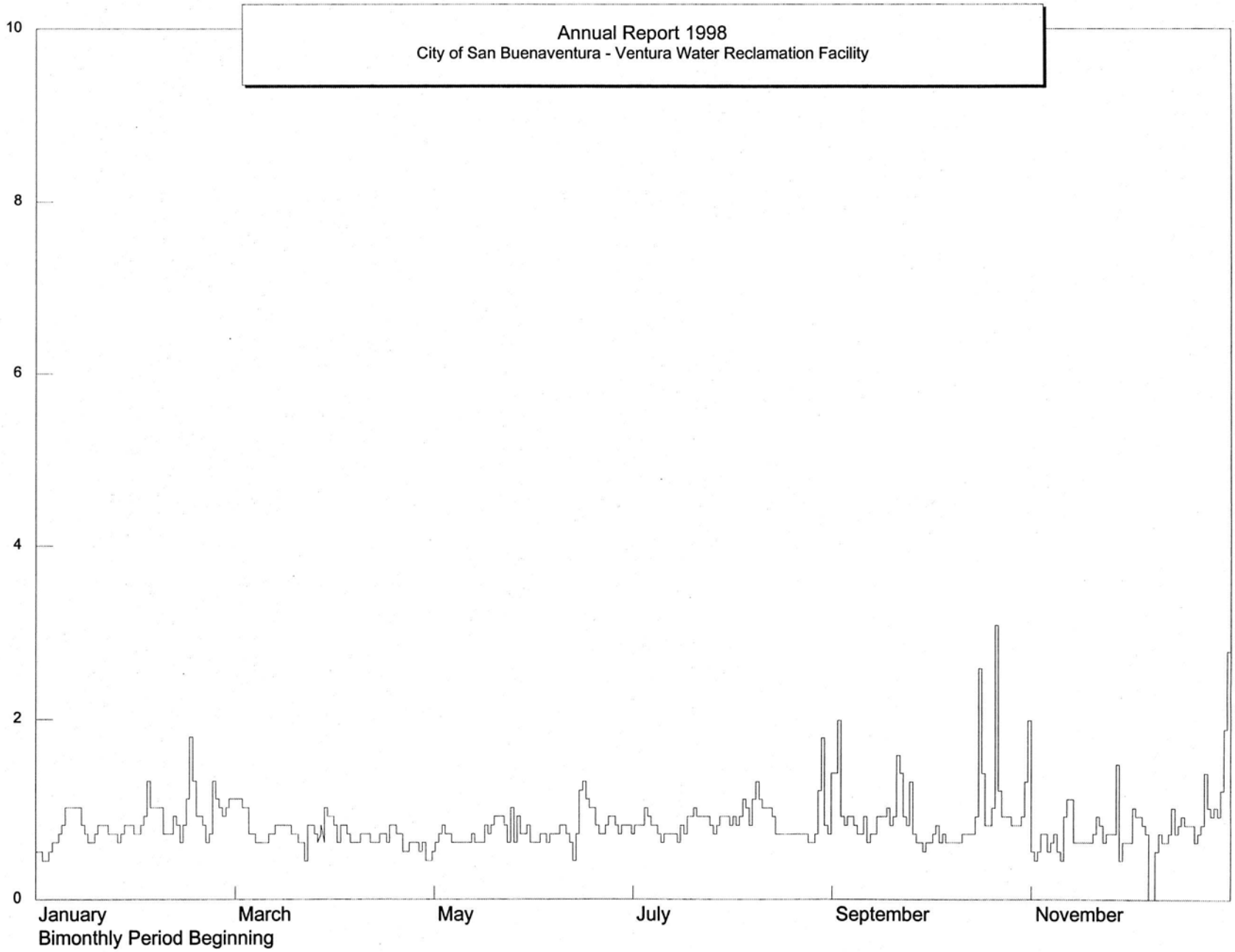

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
3
2
1
0
Thousands
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Conductivity - uMHO



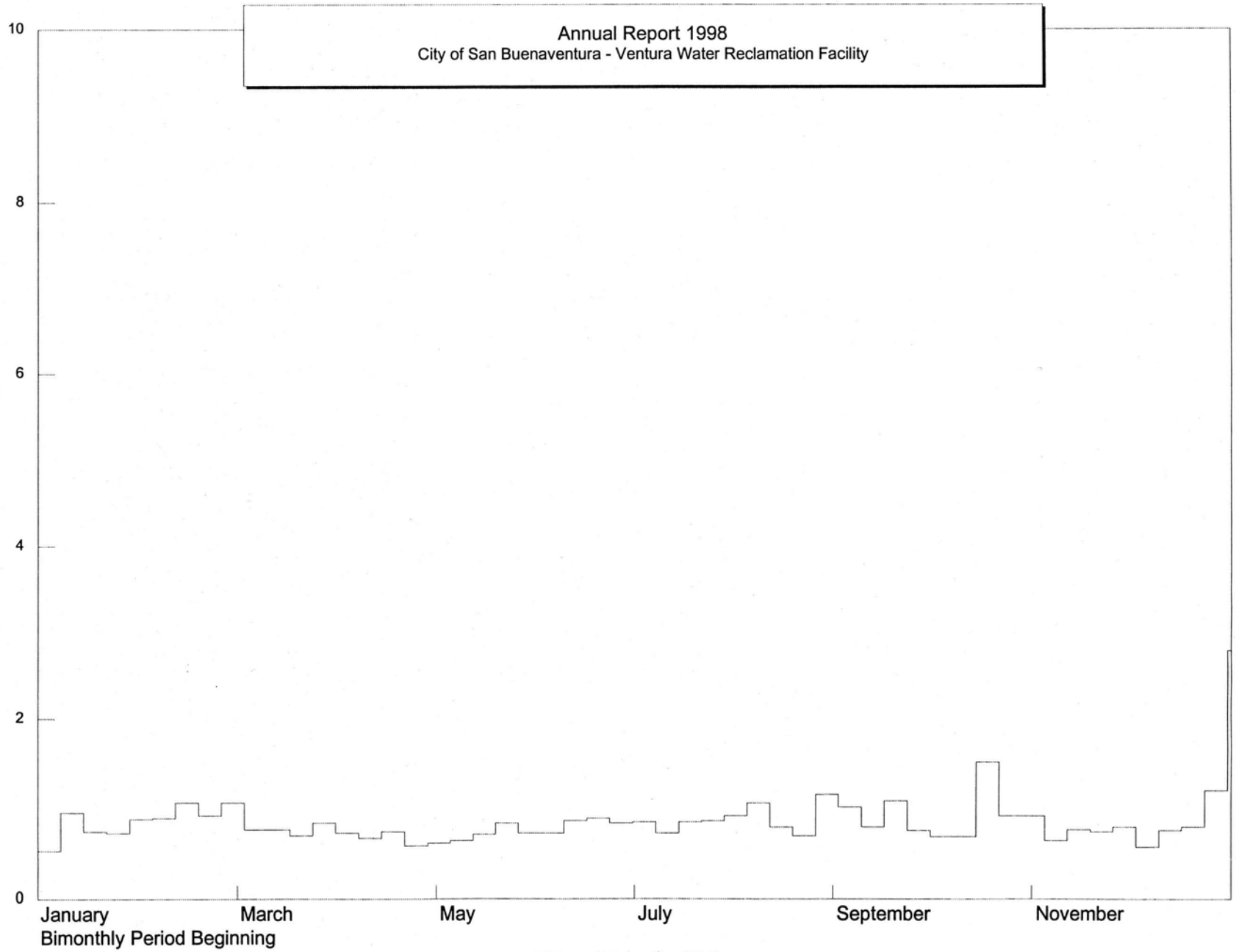
Effluent Transfer Station
Effluent 7 Day Average Conductivity - uMHO



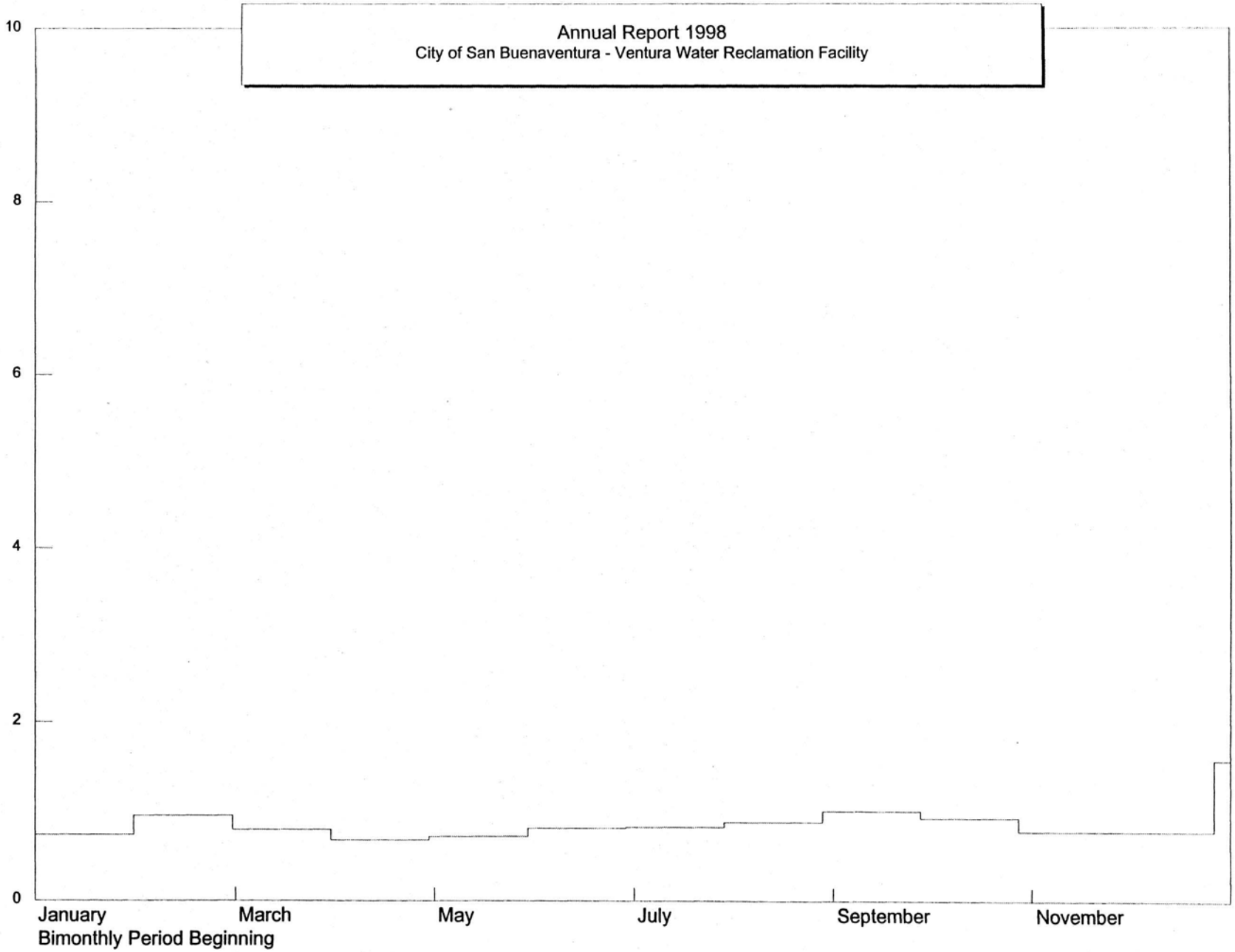
Effluent Transfer Station
Effluent 30 Day Average Conductivity - uMHO



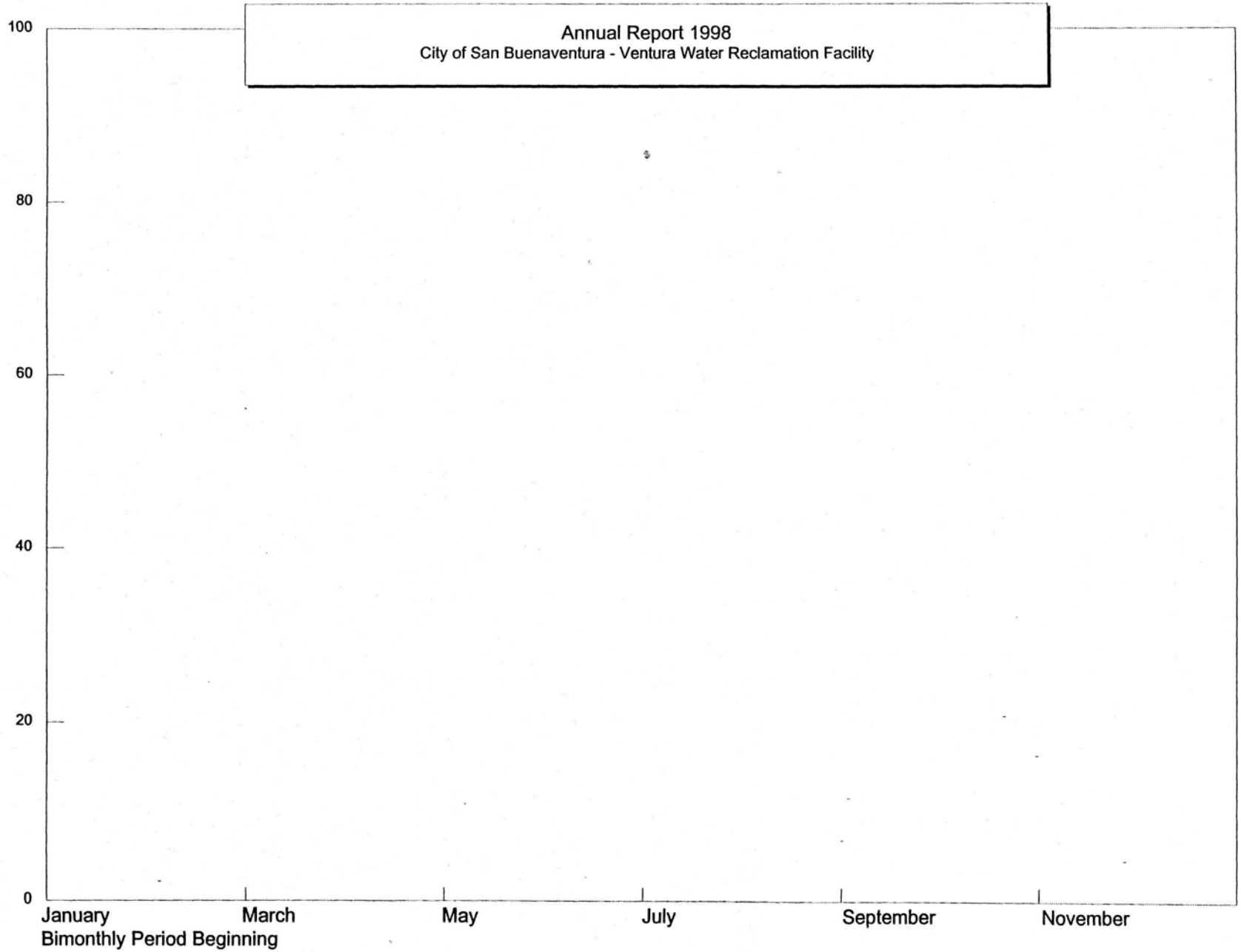
Effluent Transfer Station
Effluent Daily Average Turbidity - NTU



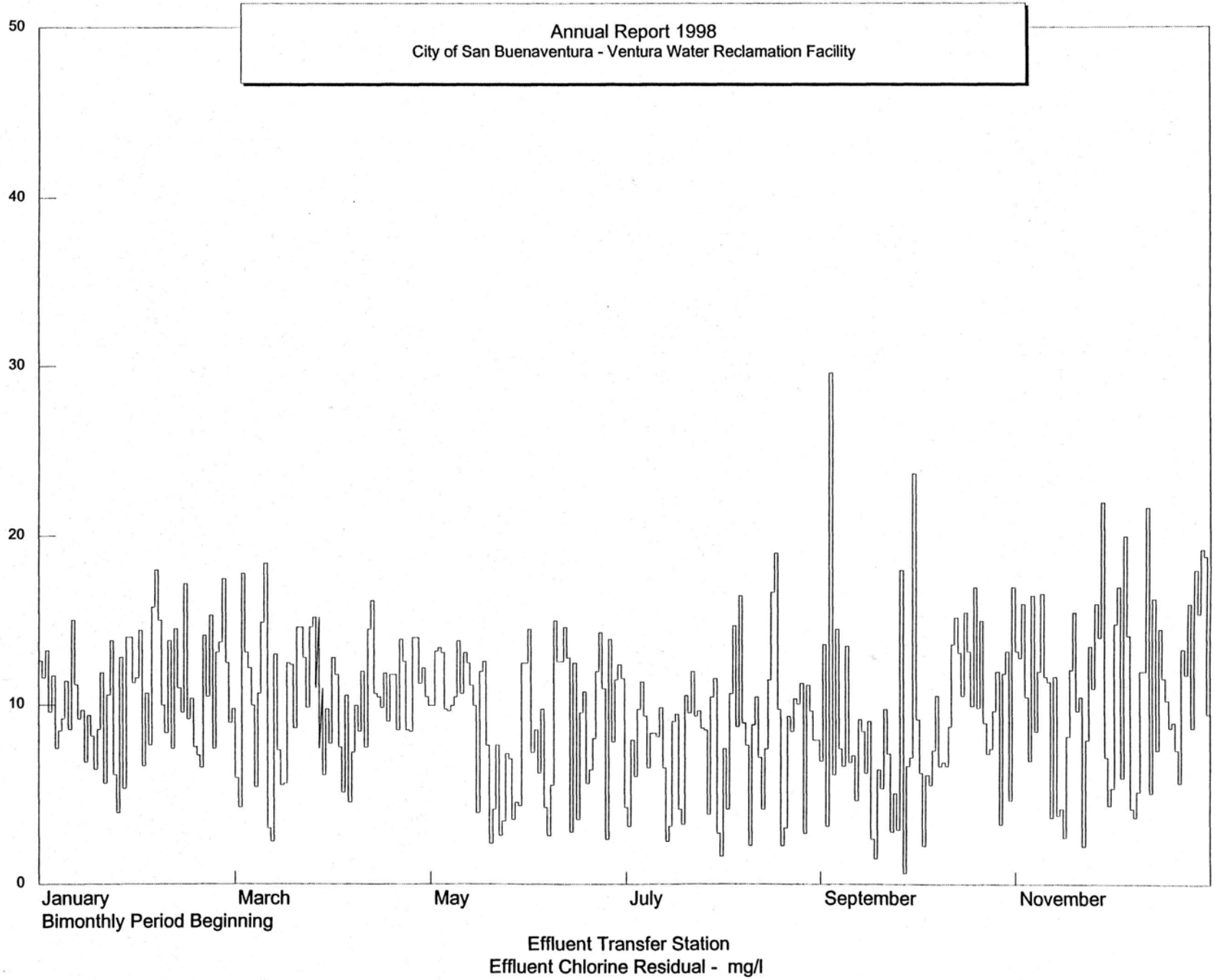
Effluent Transfer Station
Effluent 7 Day Average Turbidity - NTU

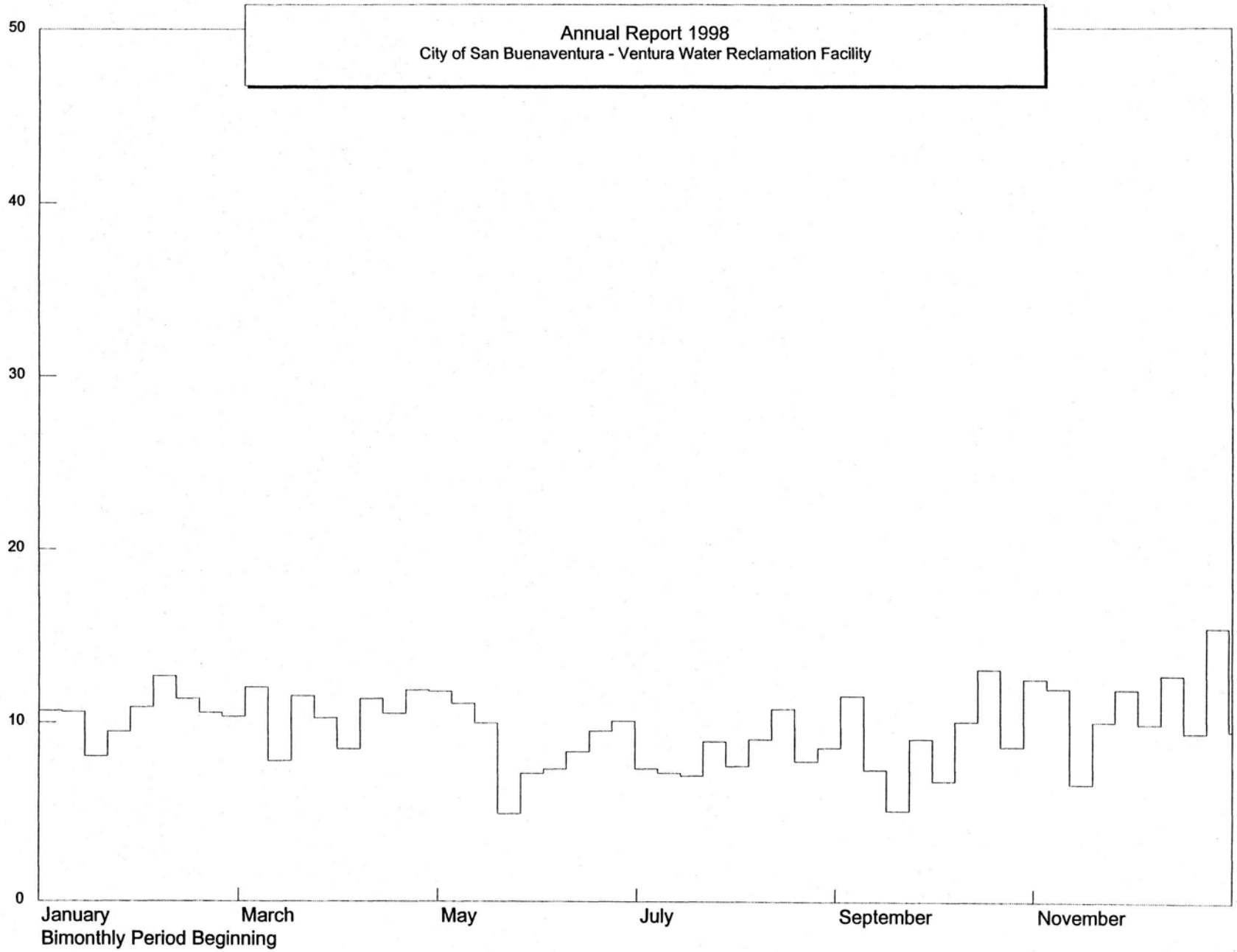


Effluent Transfer Station
Effluent 30 Day Average Turbidity - NTU

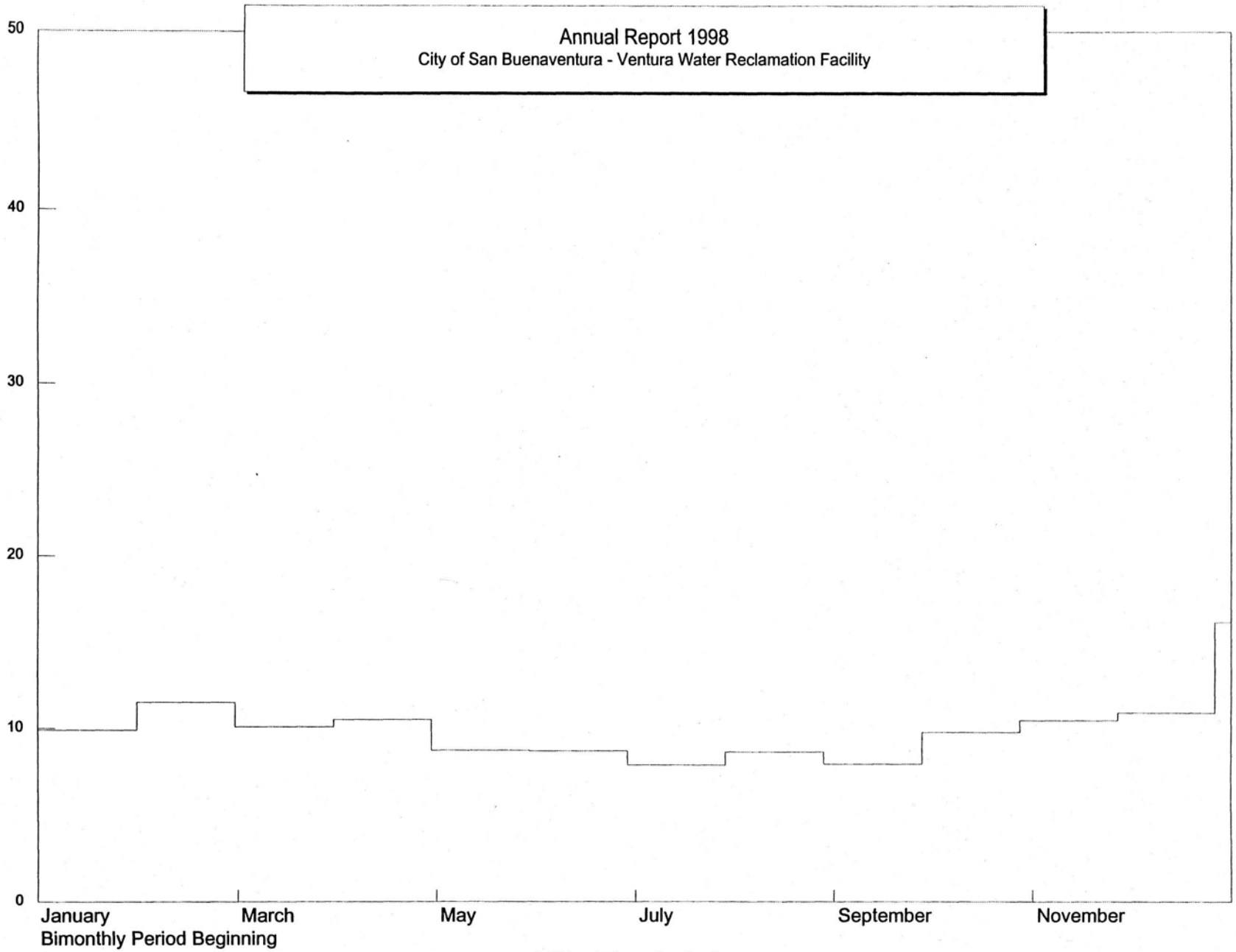


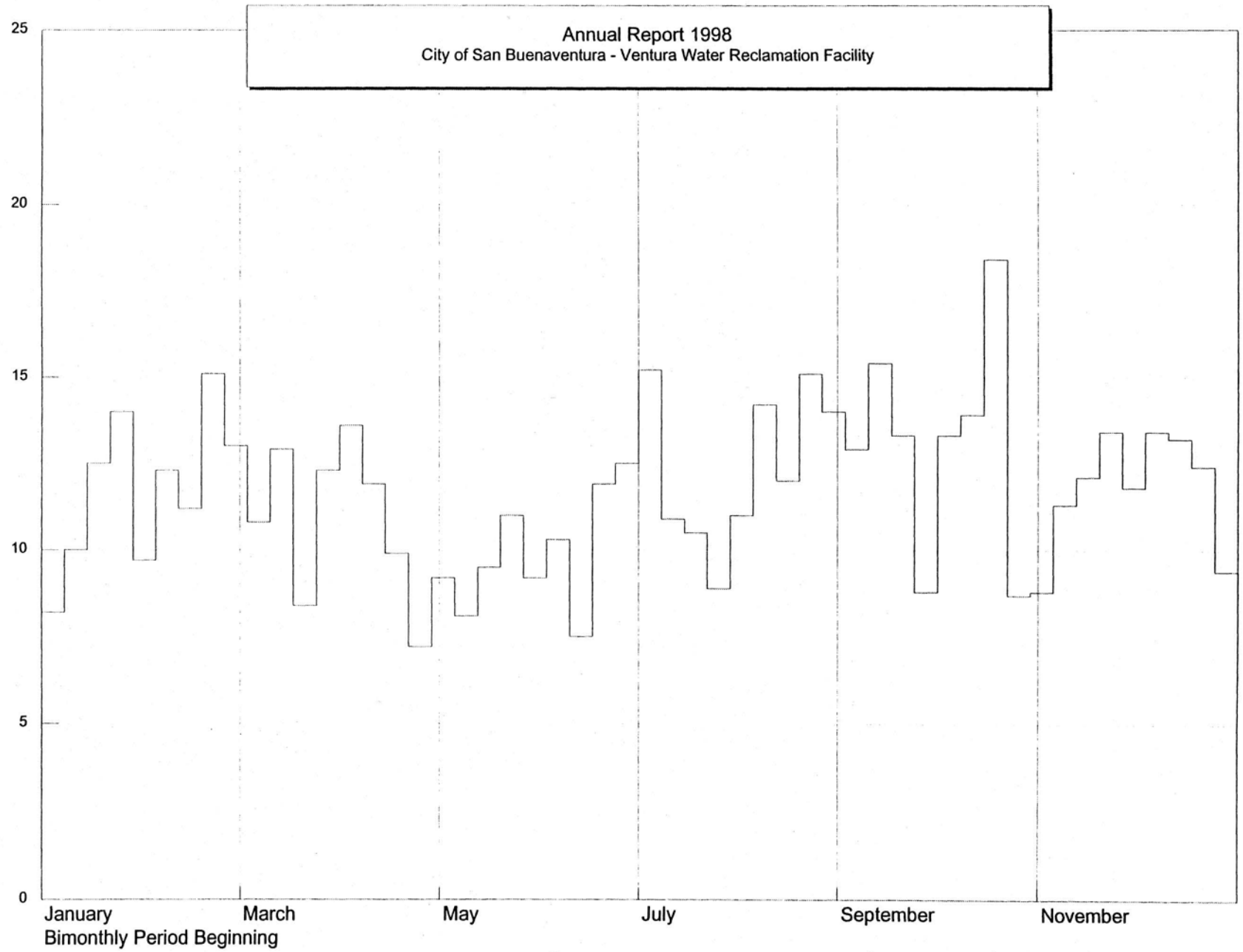
Effluent Transfer Station
Effluent Turbidity Exceeding 5 NTU - %


Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
50
40
30
20
10
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Chlorine Residual - mg/l

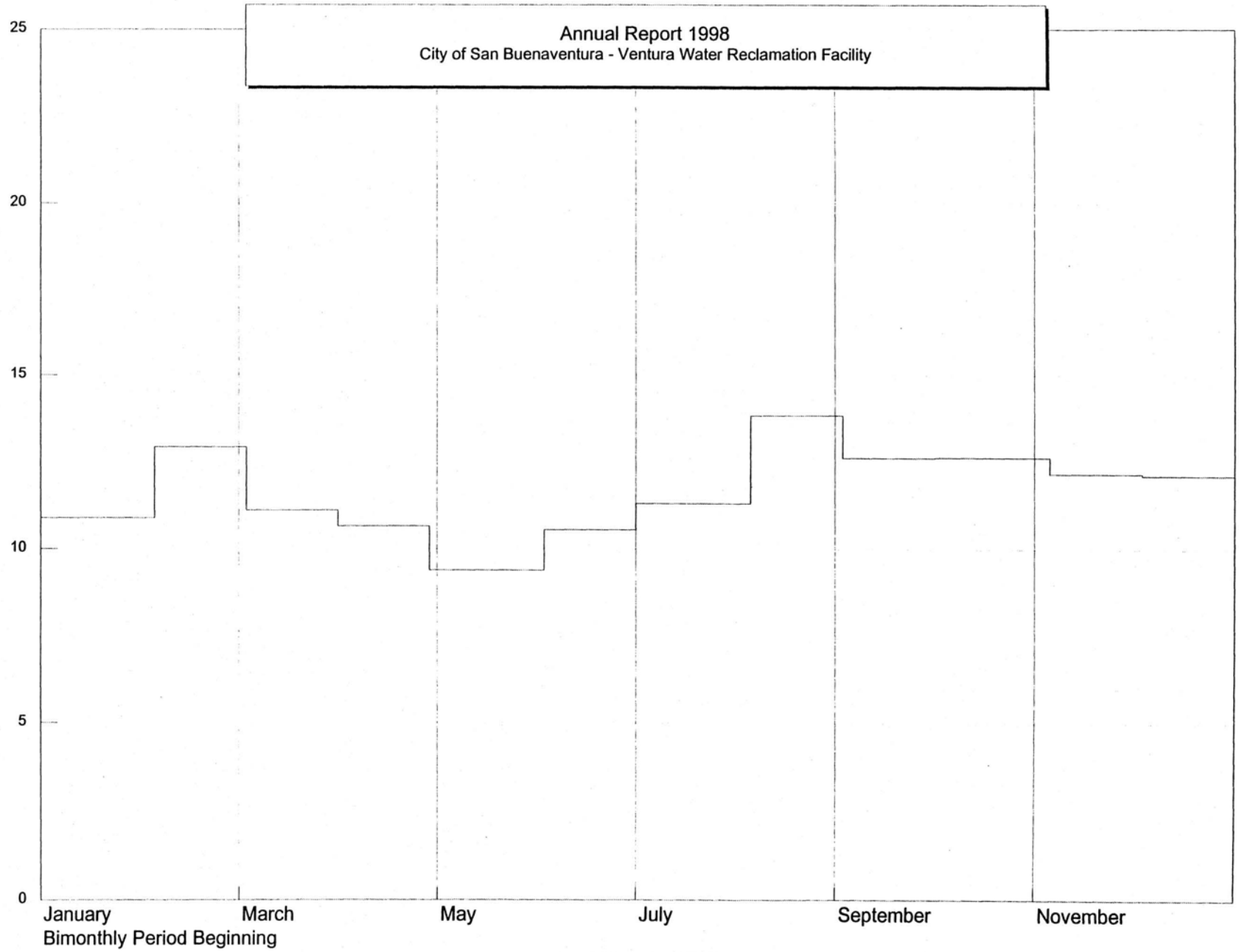


Effluent Transfer Station
Effluent 7 Day Average Chlorine Residual - mg/l

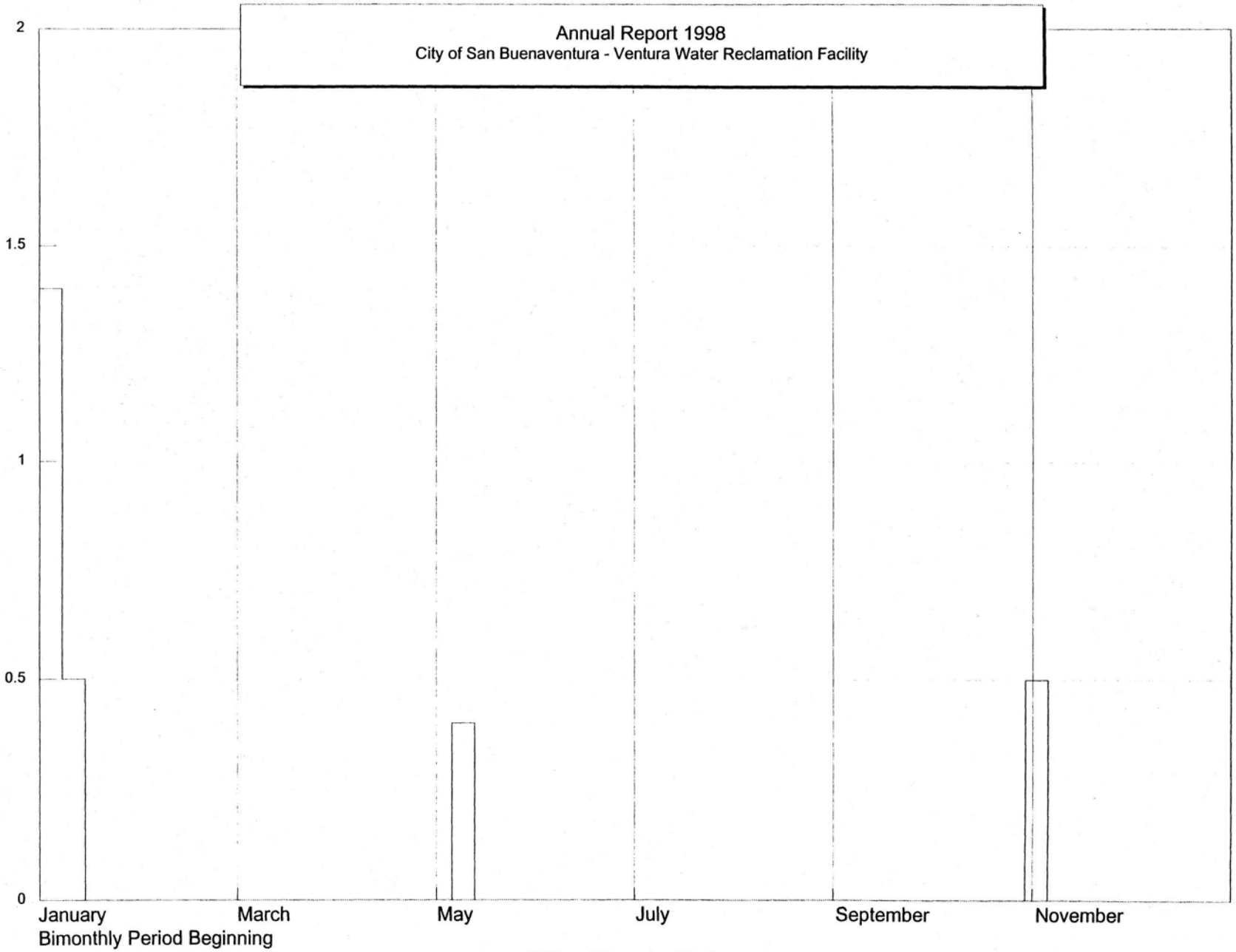

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
50
40
30
20
10
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent 30 Day Average Chlorine Residual - mg/l



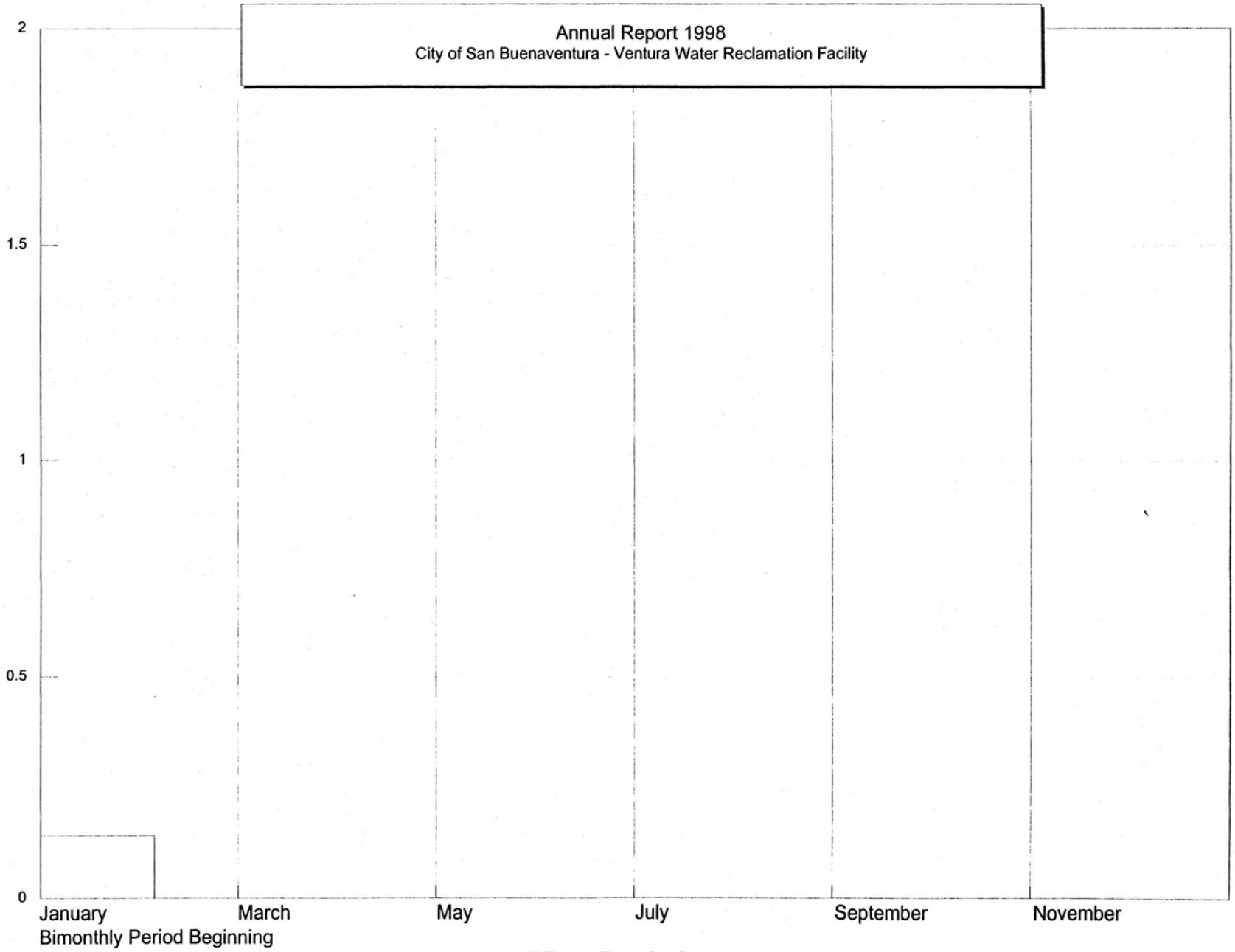
Effluent Transfer Station
Weekly Effluent Nitrate-N mg/l



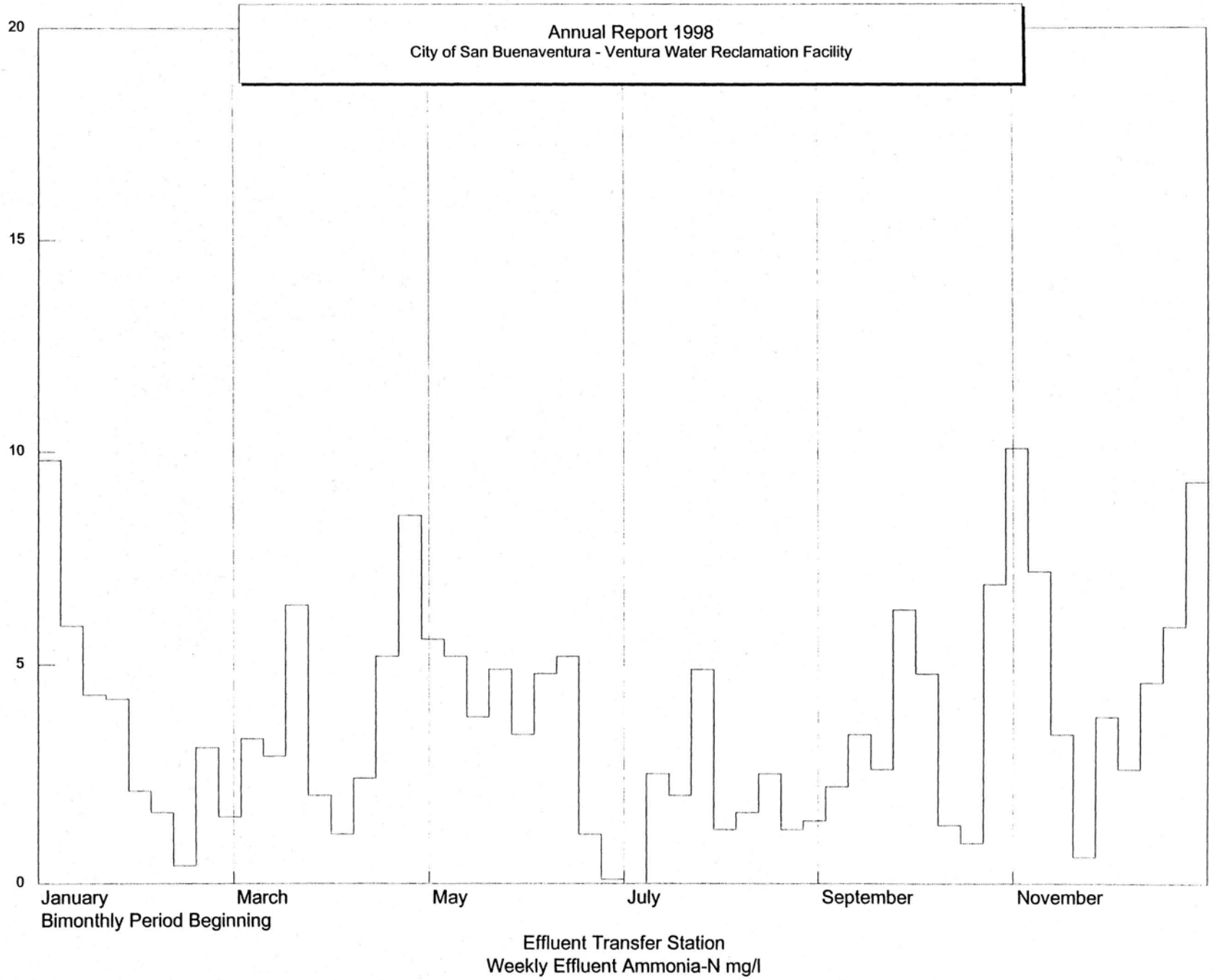
Effluent Transfer Station
30 Day Average Effluent Nitrate-N mg/l

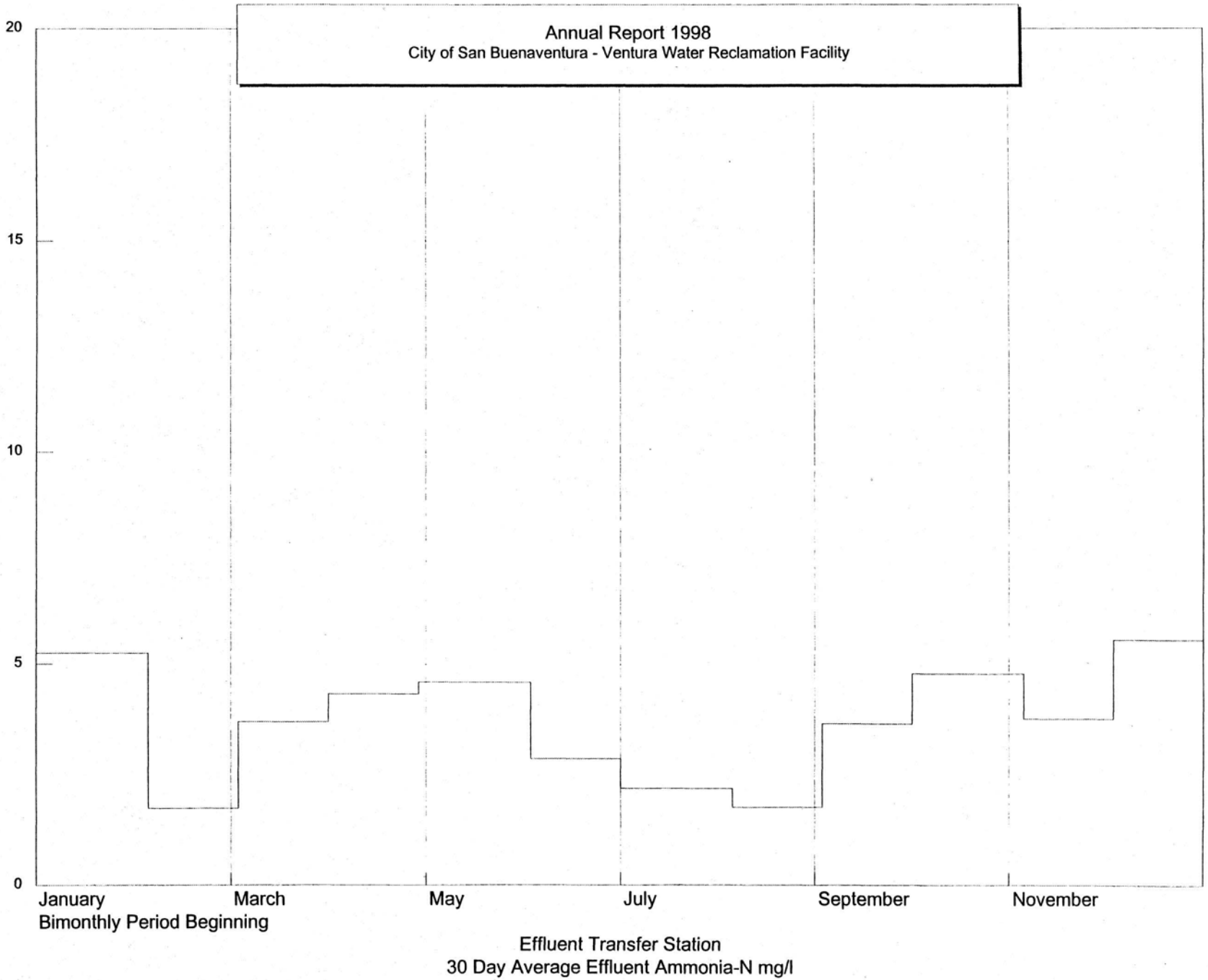


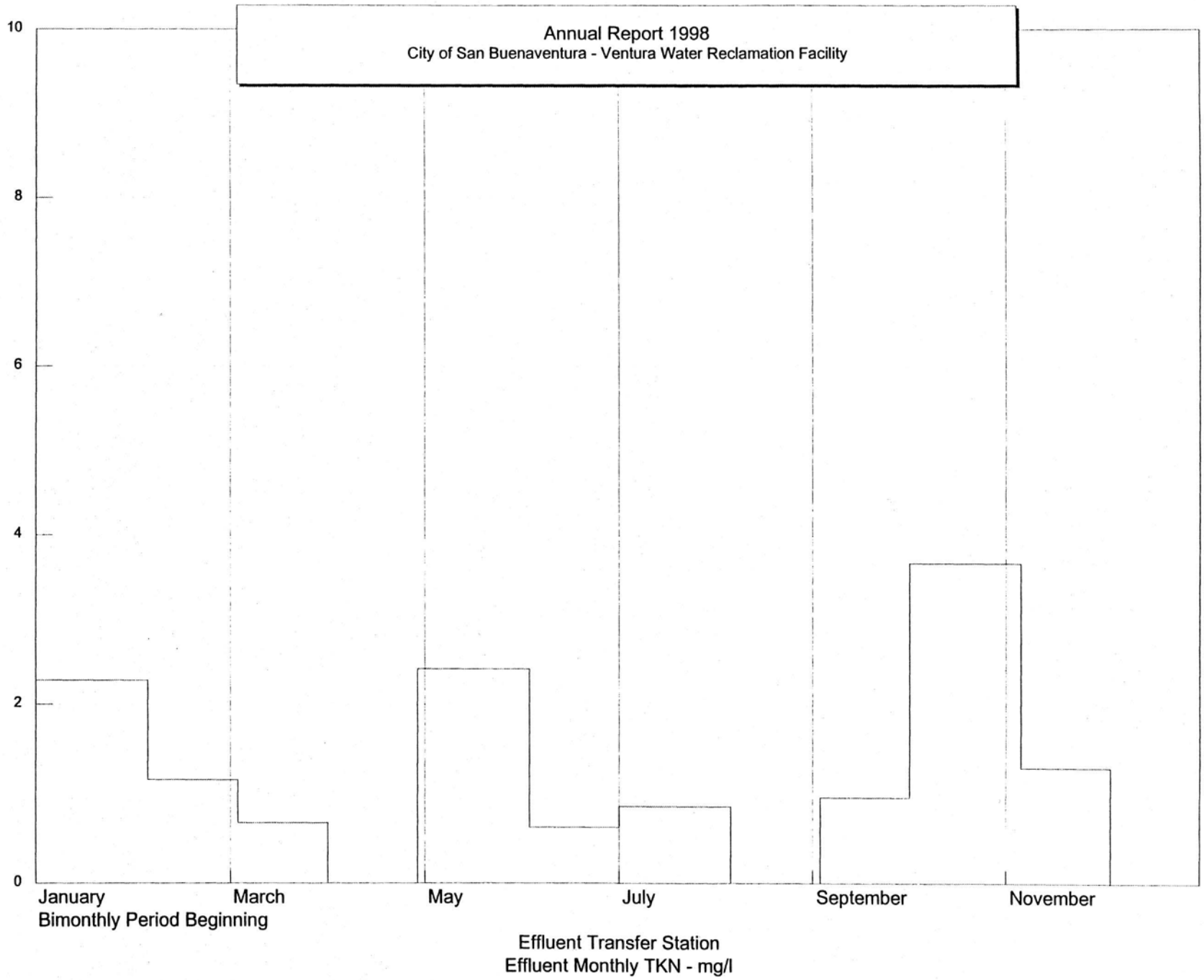
Effluent Transfer Station
Weekly Effluent Nitrite-N - mg/l

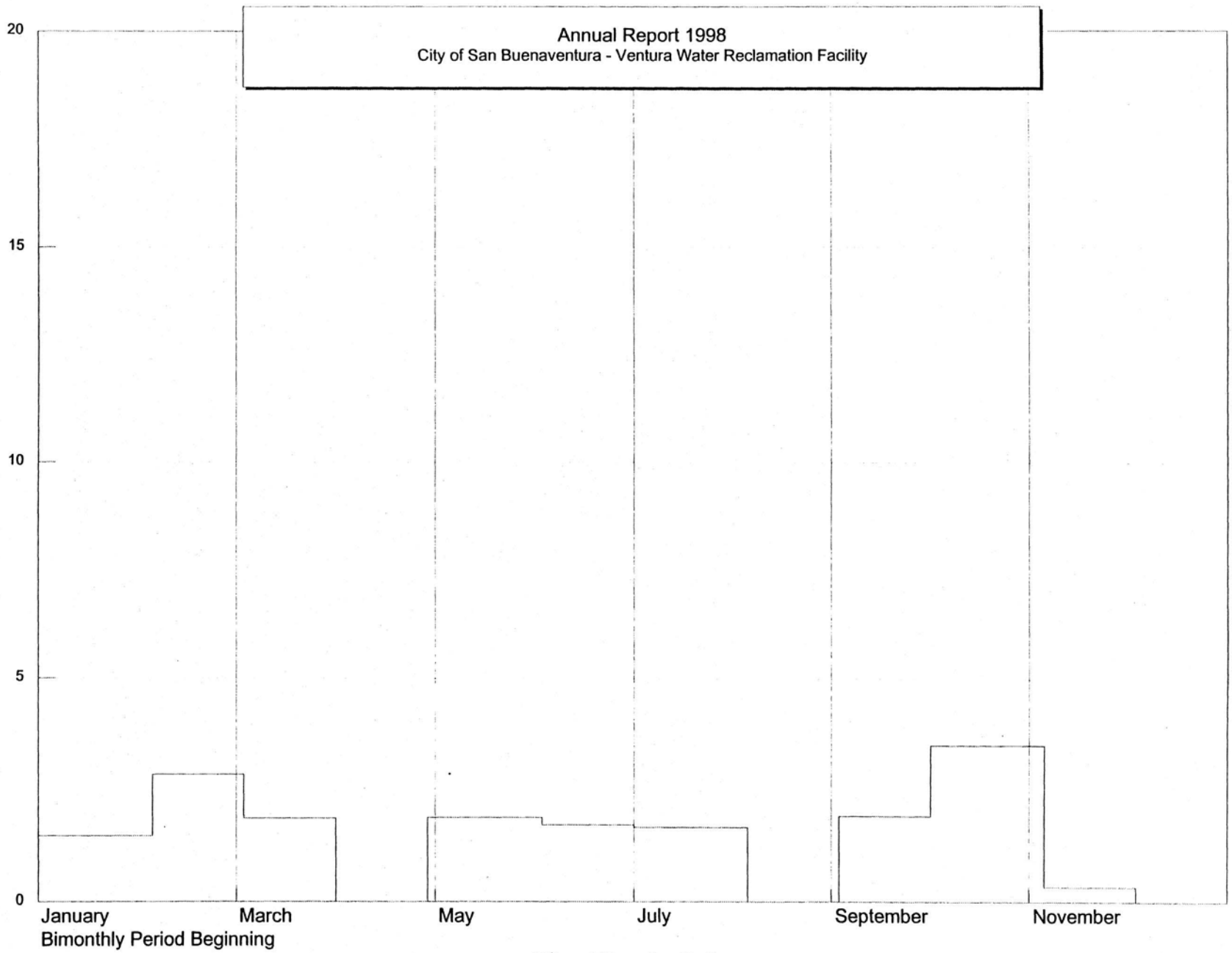


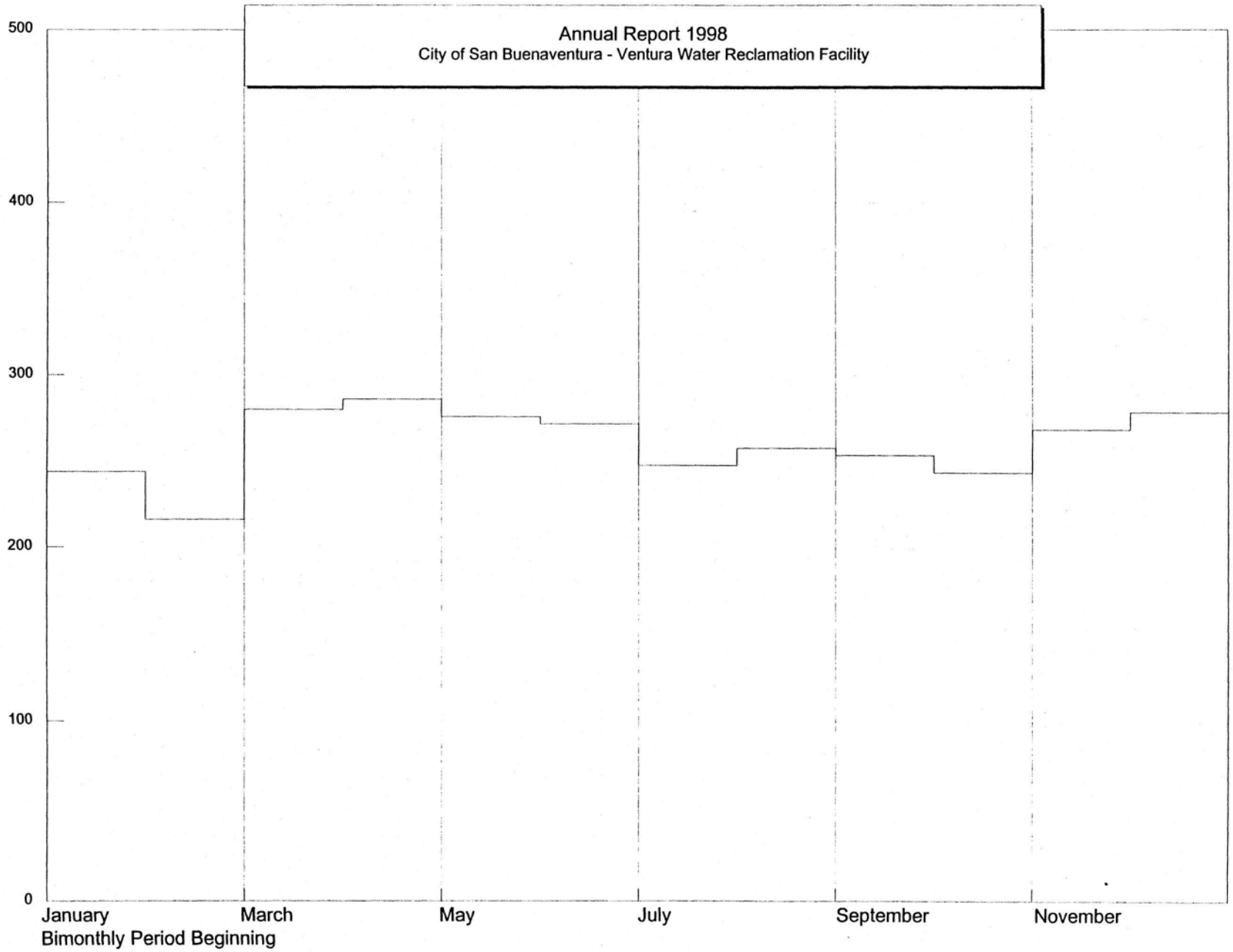
Effluent Transfer Station
30 Day Average Effluent Nitrite-N - mg/l

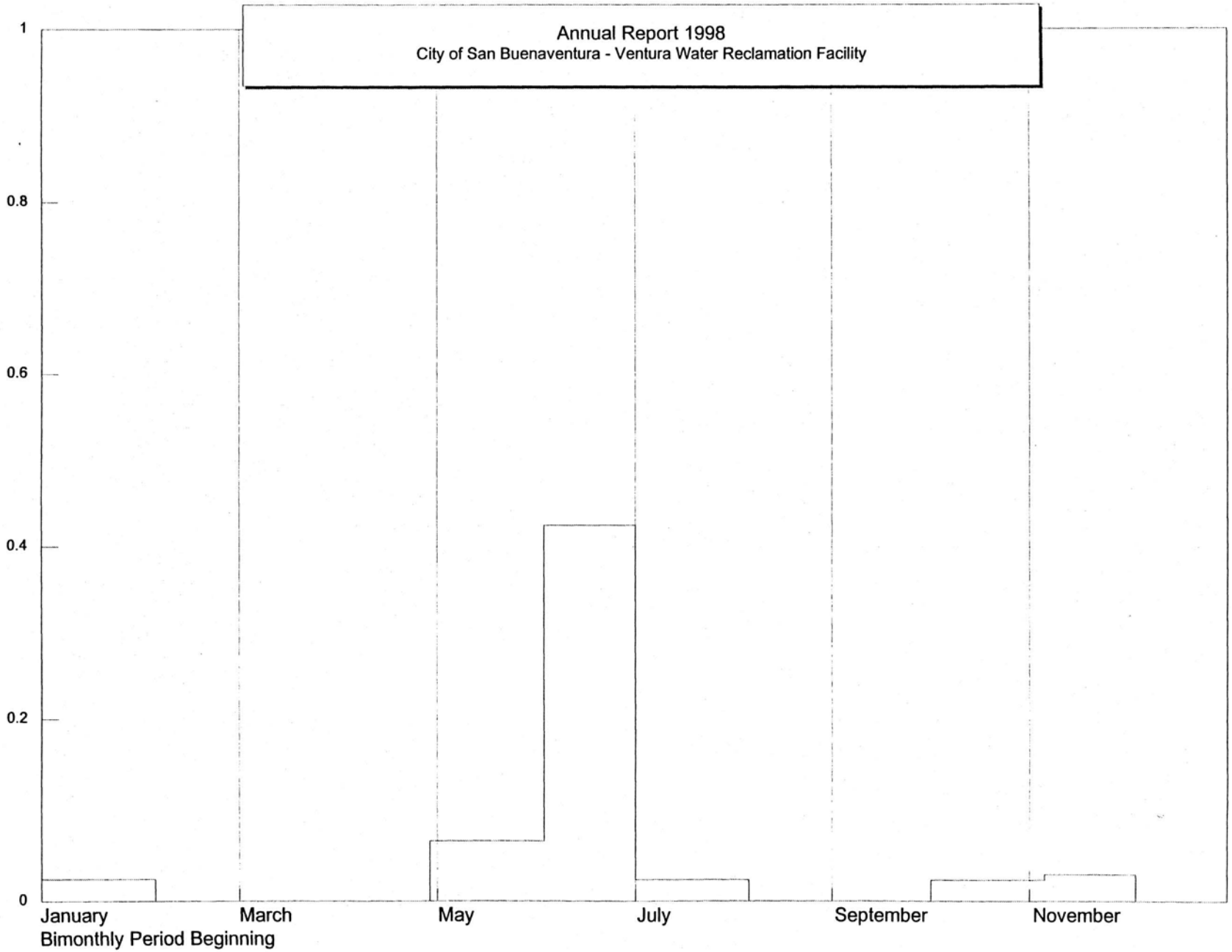

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Weekly Effluent Ammonia-N mg/l

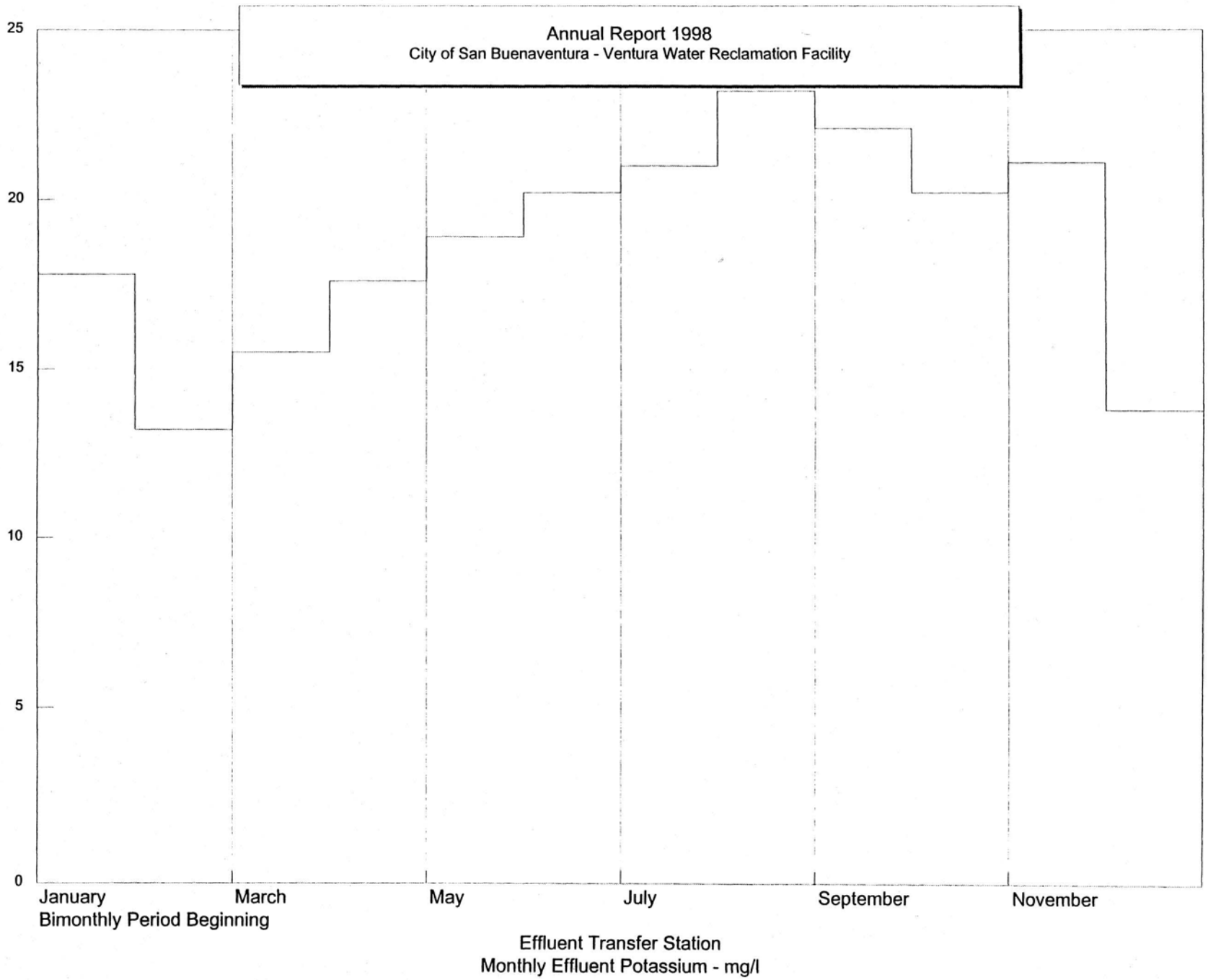

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
30 Day Average Effluent Ammonia-N mg/l

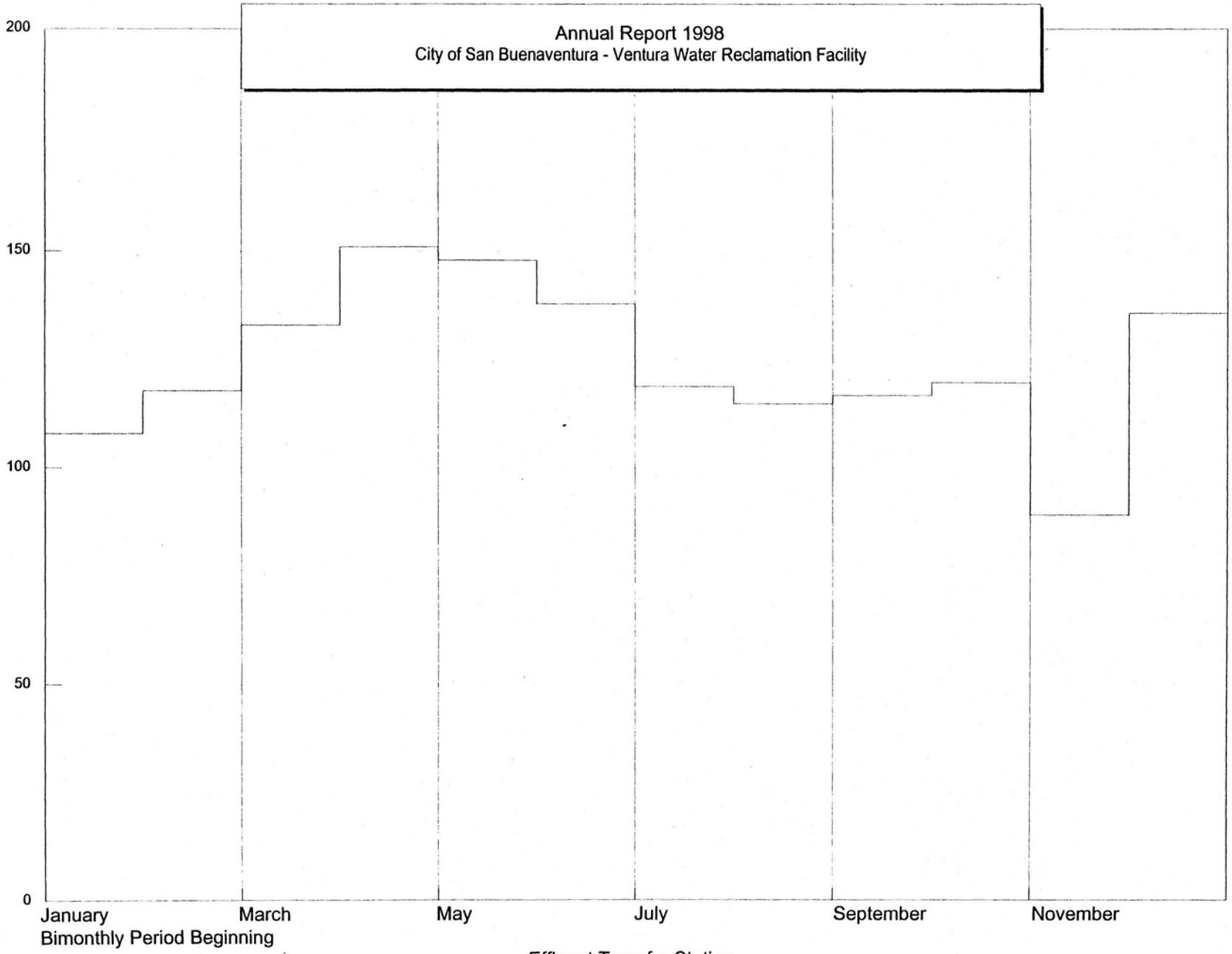

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
6
4
2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly TKN - mg/l


Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly Phosphate - mg/l

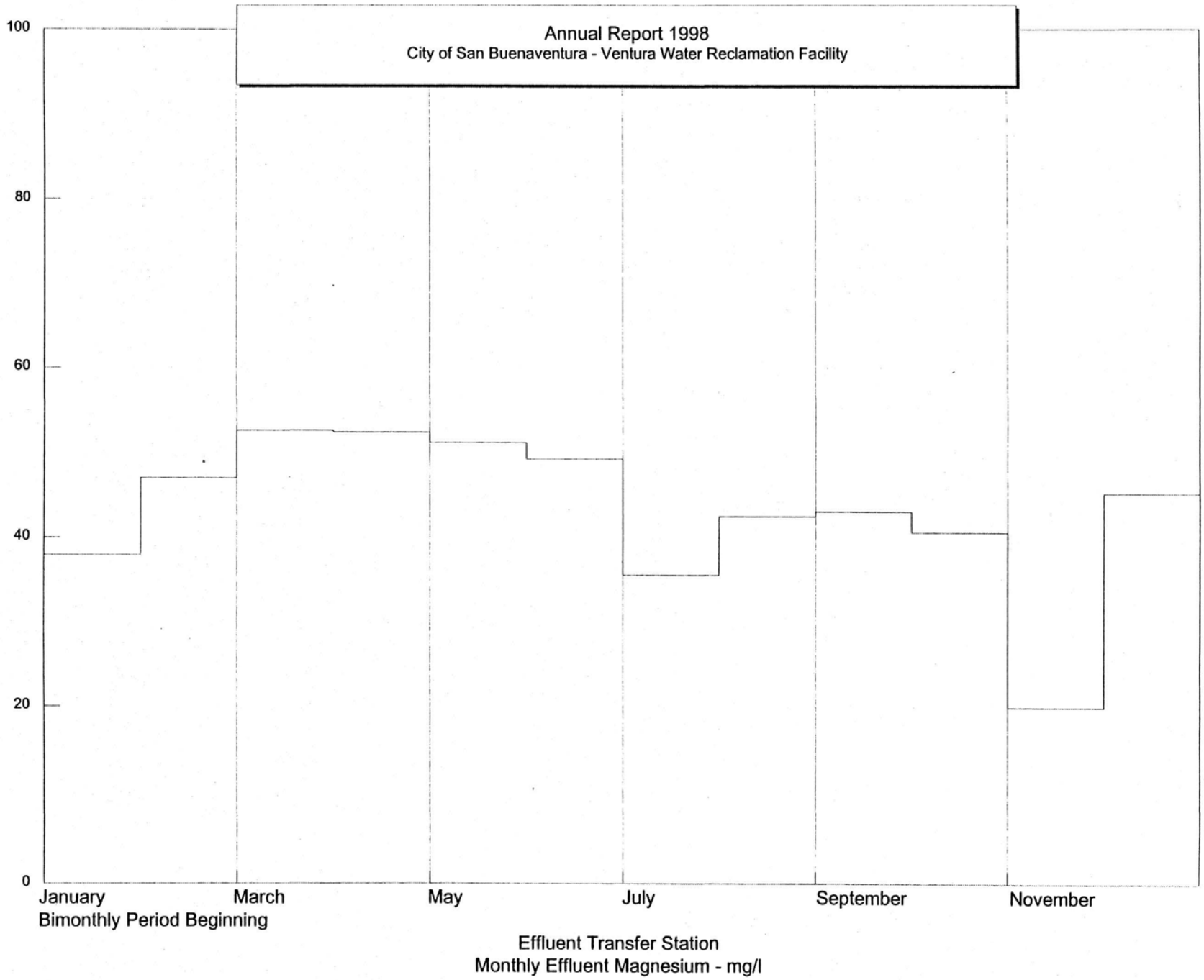

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
500
400
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Monthly Effluent Sodium - mg/l

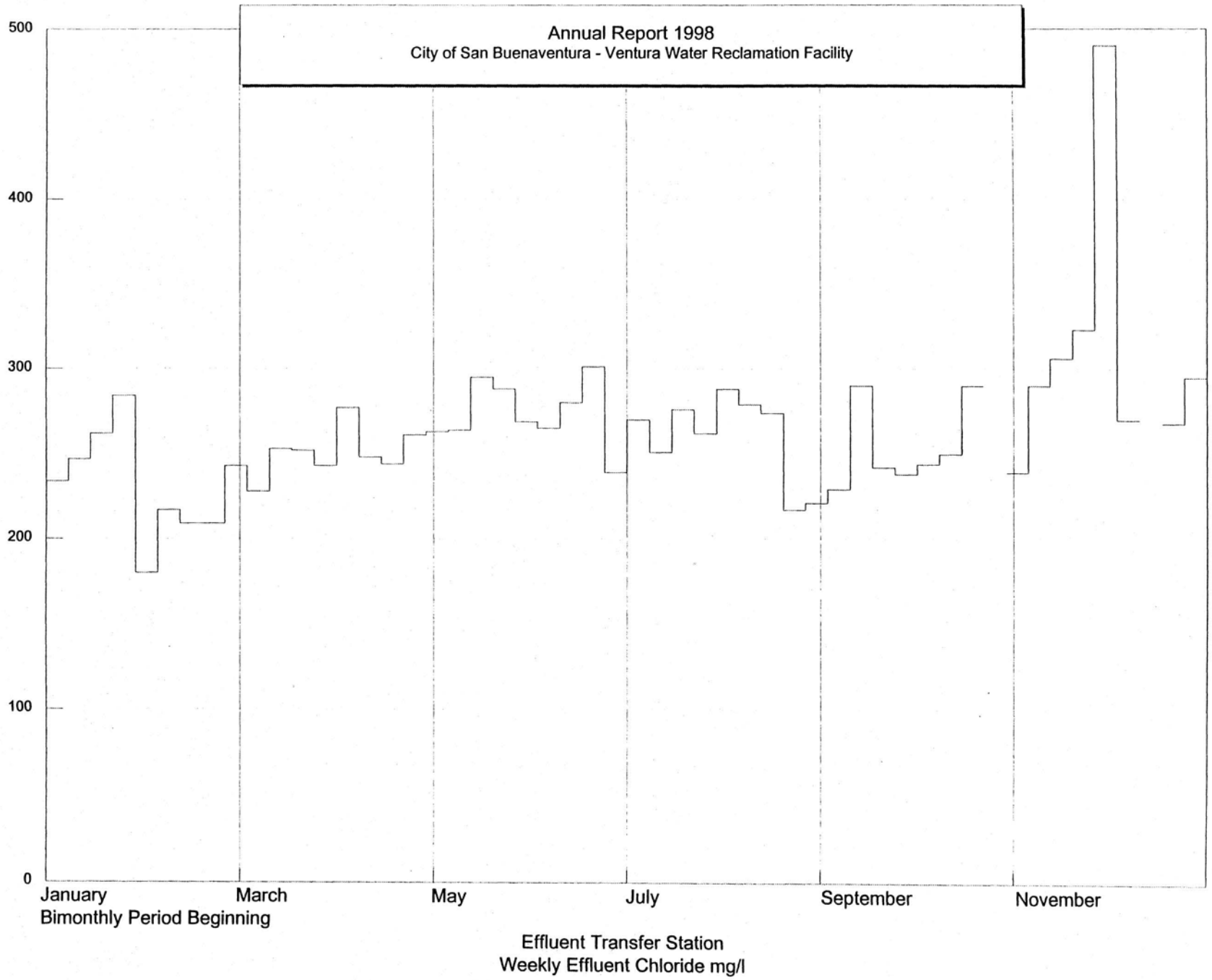

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
1
0.8
0.6
0.4
0.2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly MBAS - mg/l

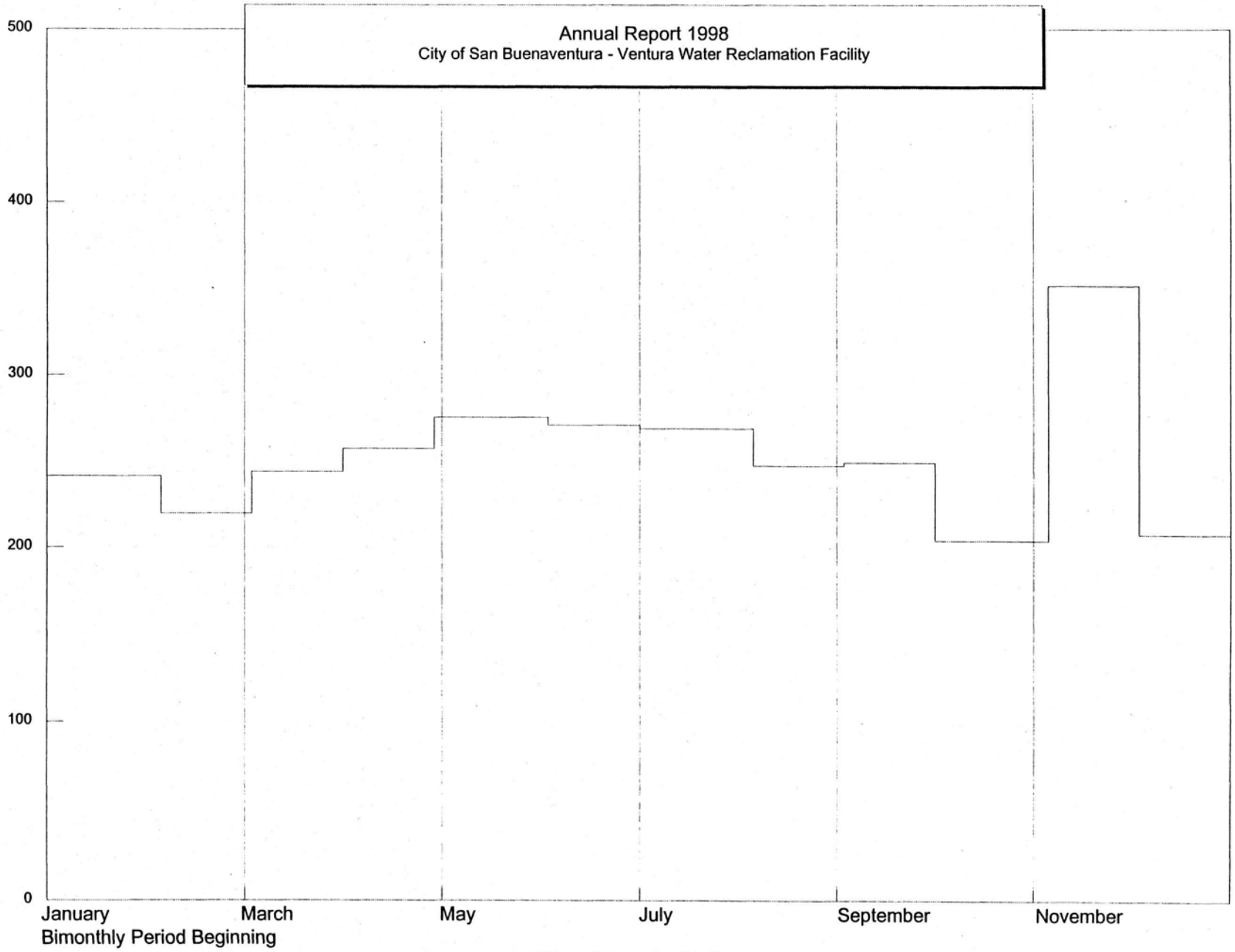

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
25
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Monthly Effluent Potassium - mg/l



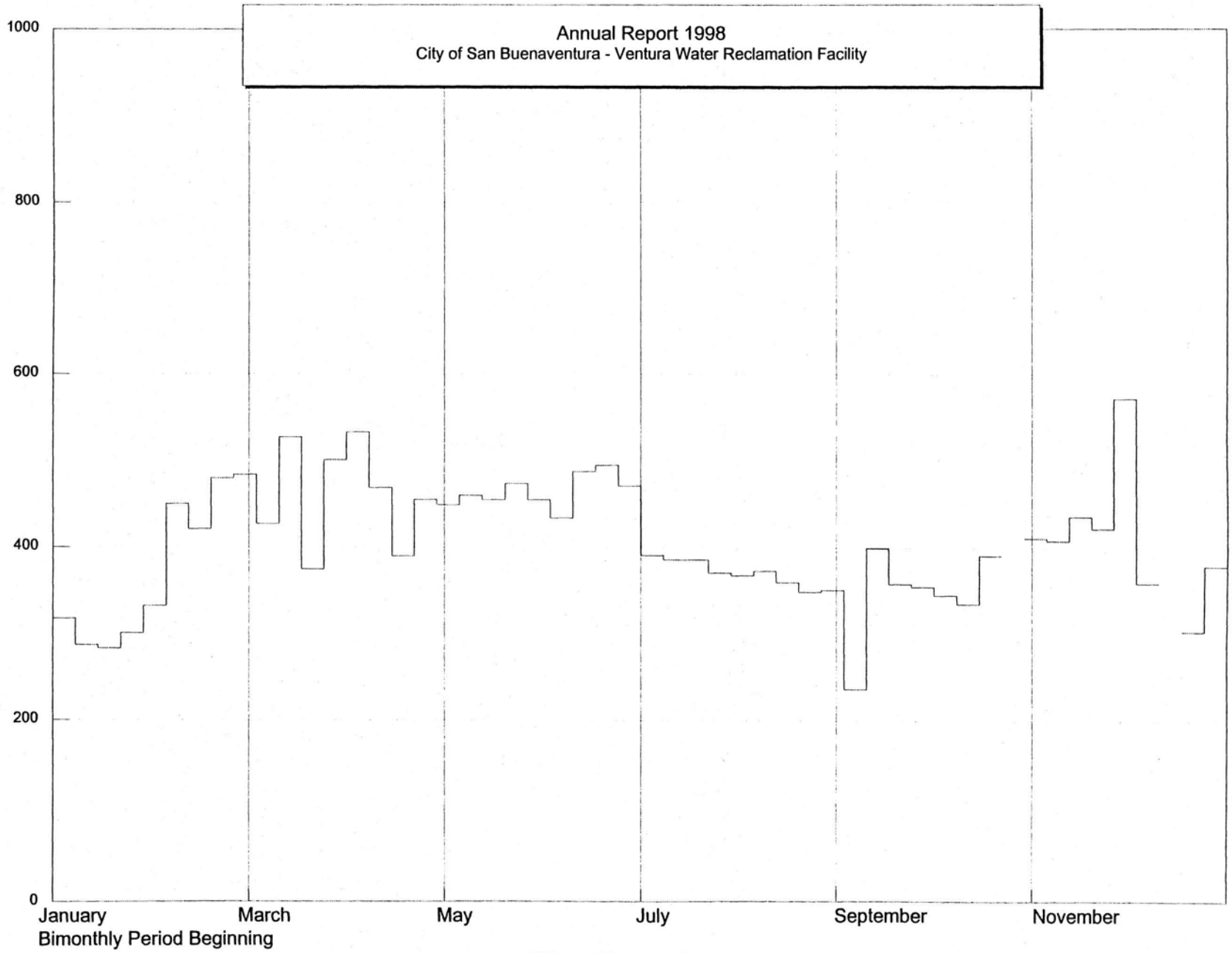
Effluent Transfer Station
Monthly Effluent Calcium - mg/l

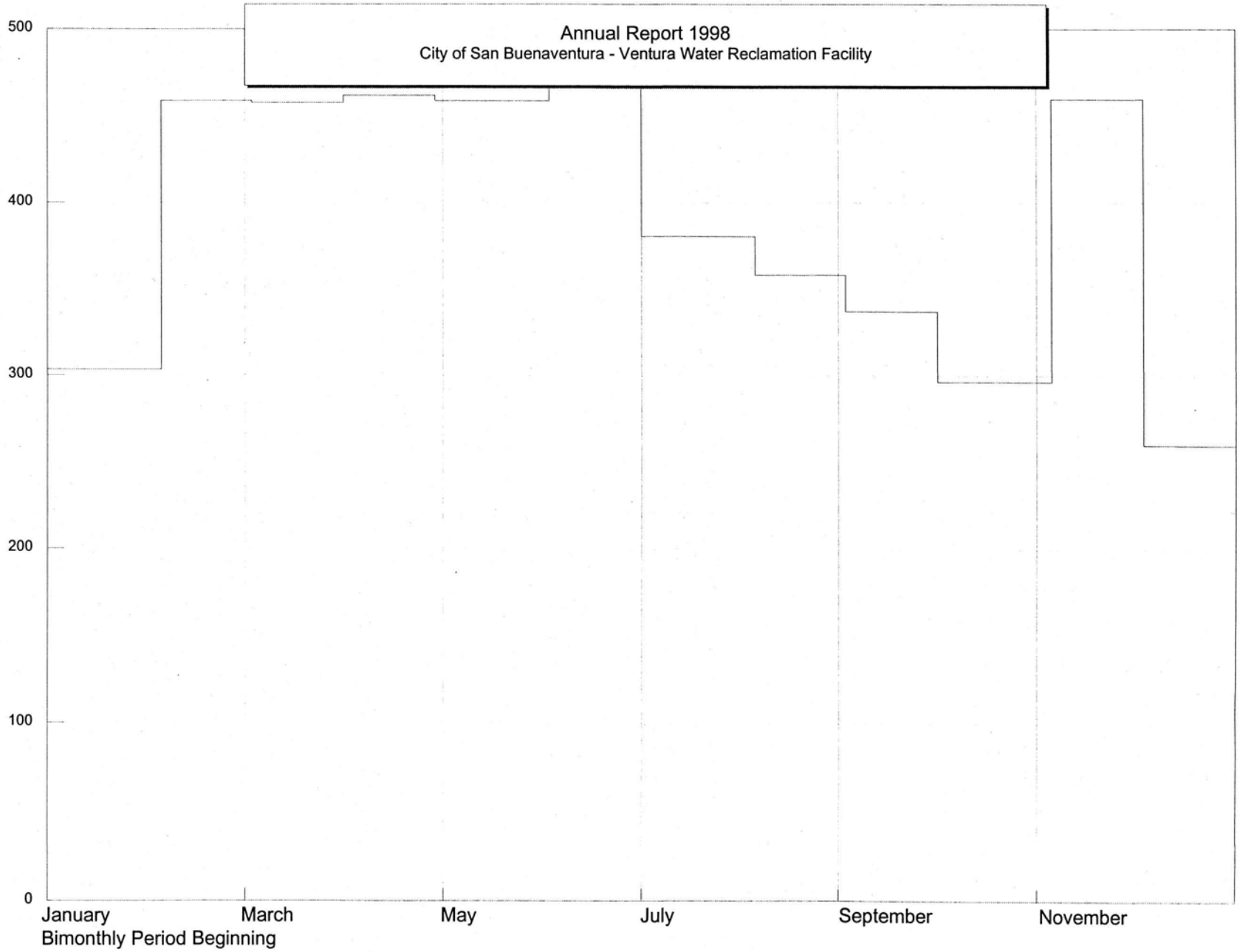

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
100
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Monthly Effluent Magnesium - mg/l


Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
500
400
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Weekly Effluent Chloride mg/l

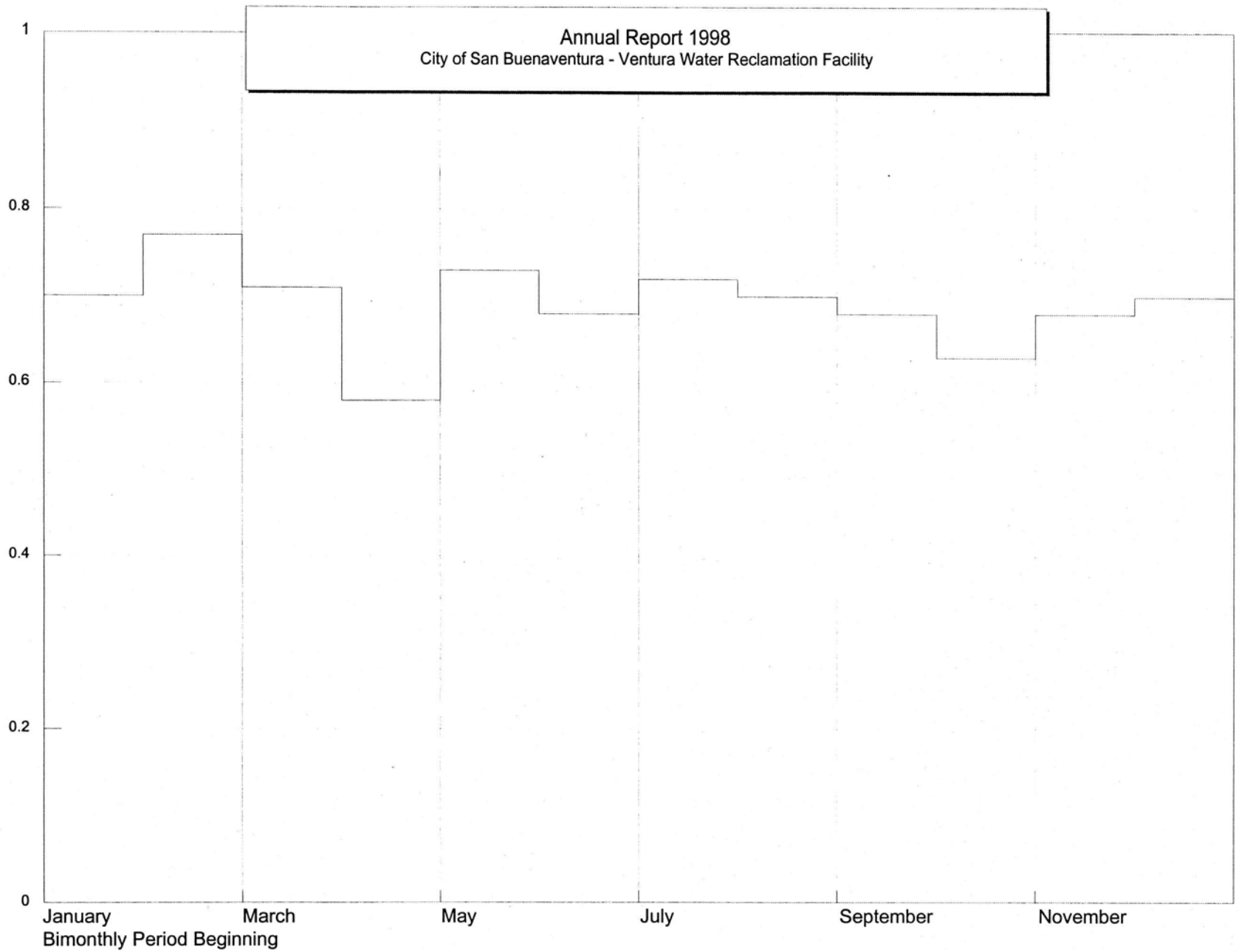


Effluent Transfer Station
30 Day Average Effluent Chloride mg/l

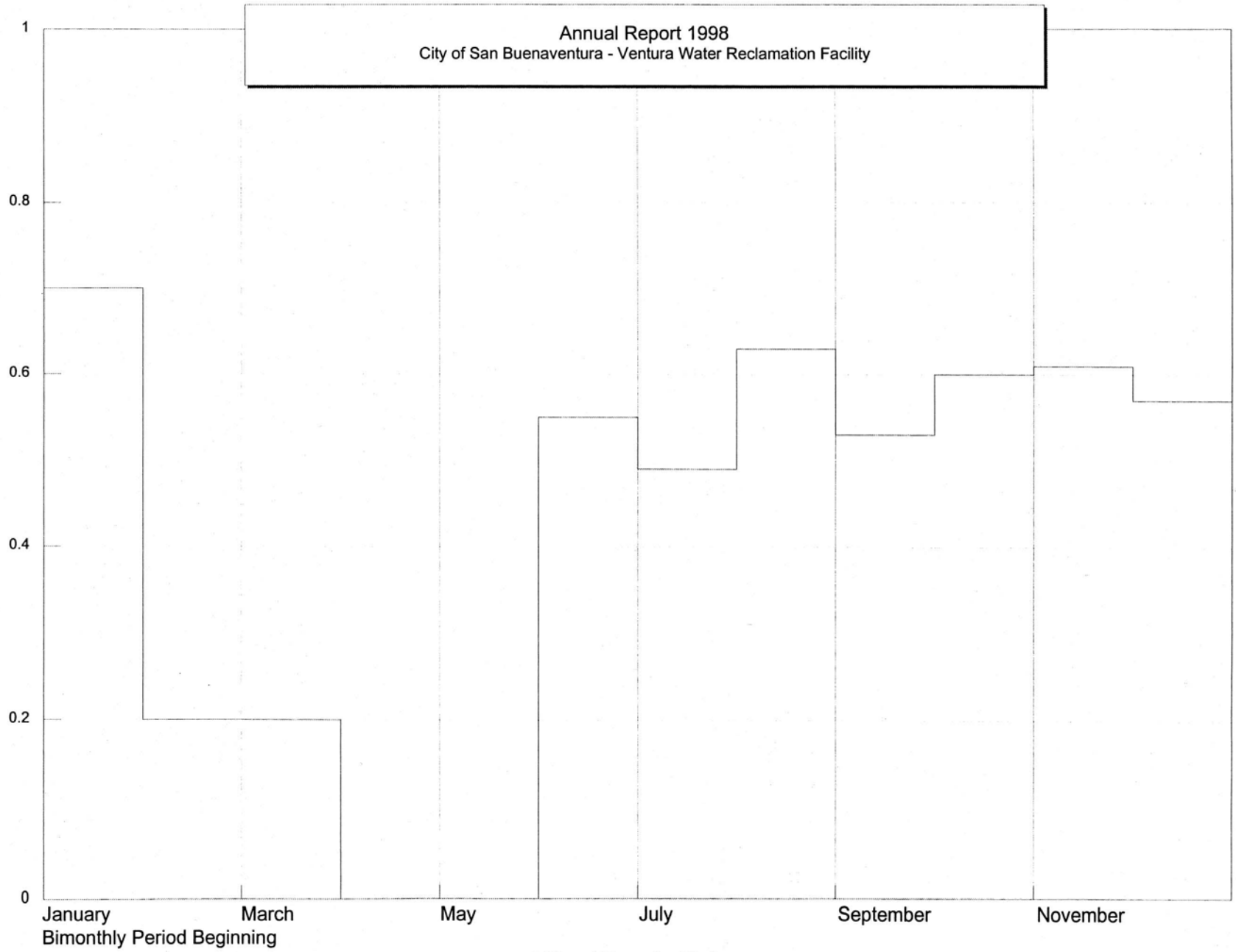

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
1000
800
600
400
200
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Weekly Effluent Sulfate mg/l

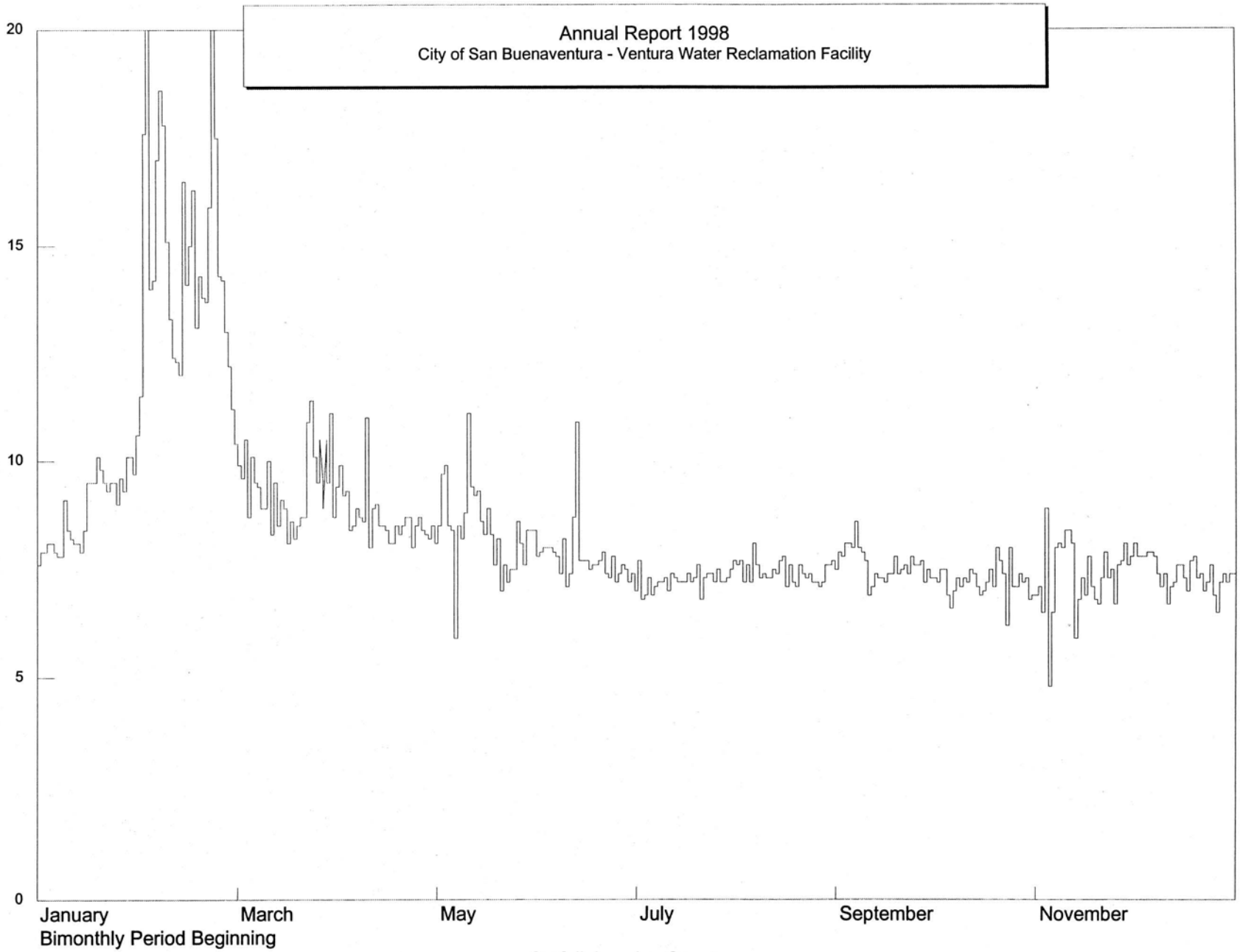


Effluent Transfer Station
30 Day Average Effluent Sulfate mg/l

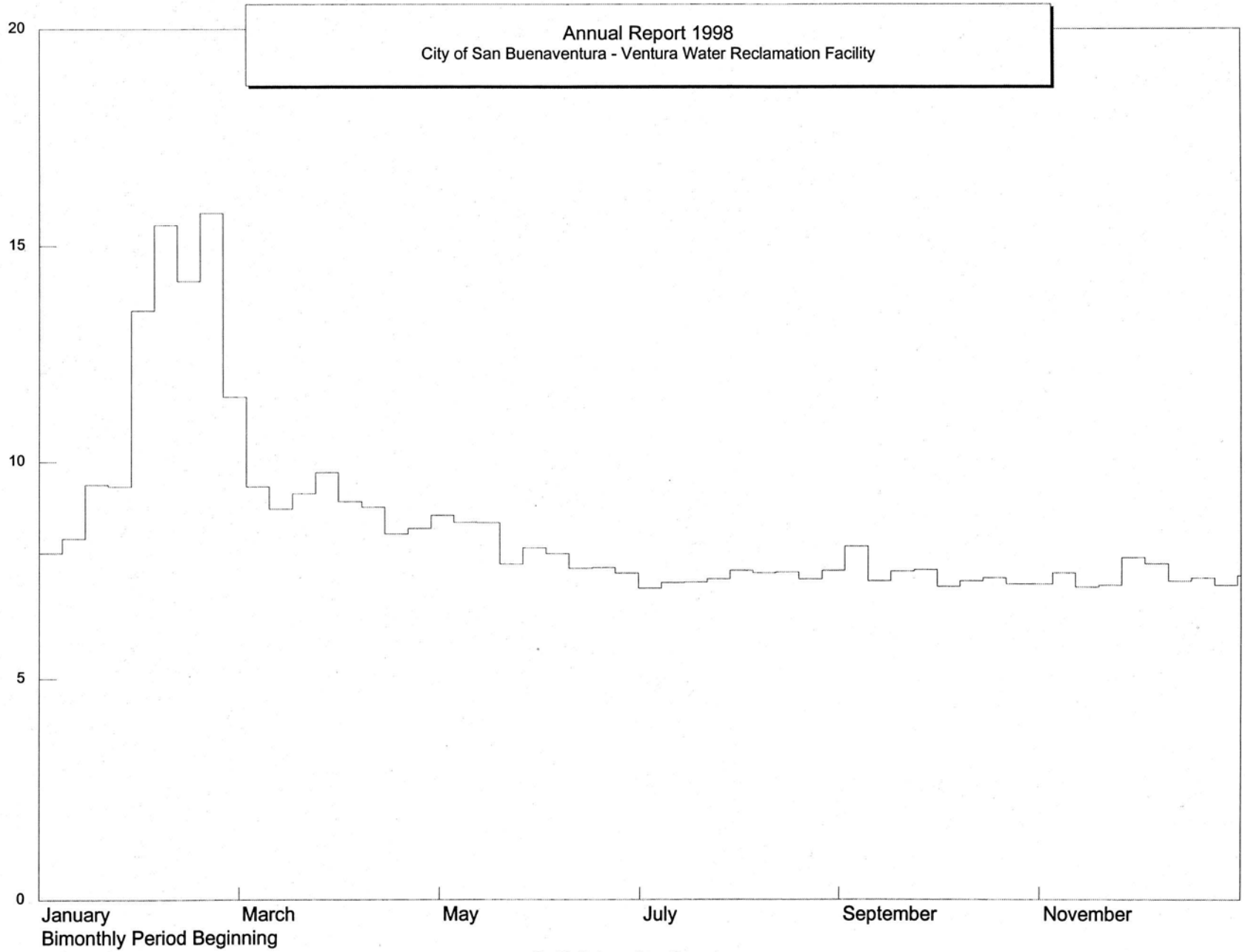


Effluent Transfer Station
Monthly Effluent Boron - mg/l

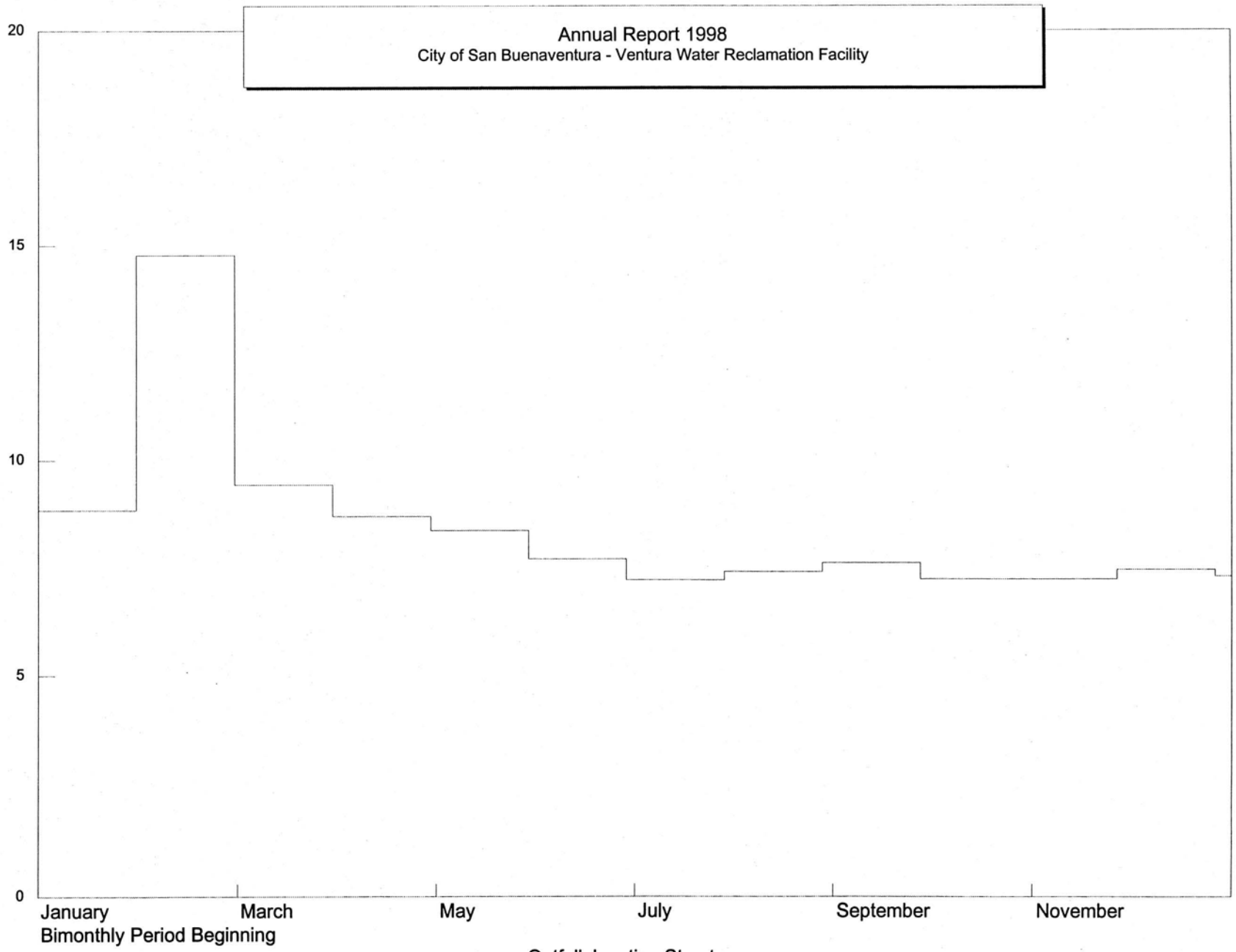

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
1
0.8
0.6
0.4
0.2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Monthly Effluent Fluoride - mg/l



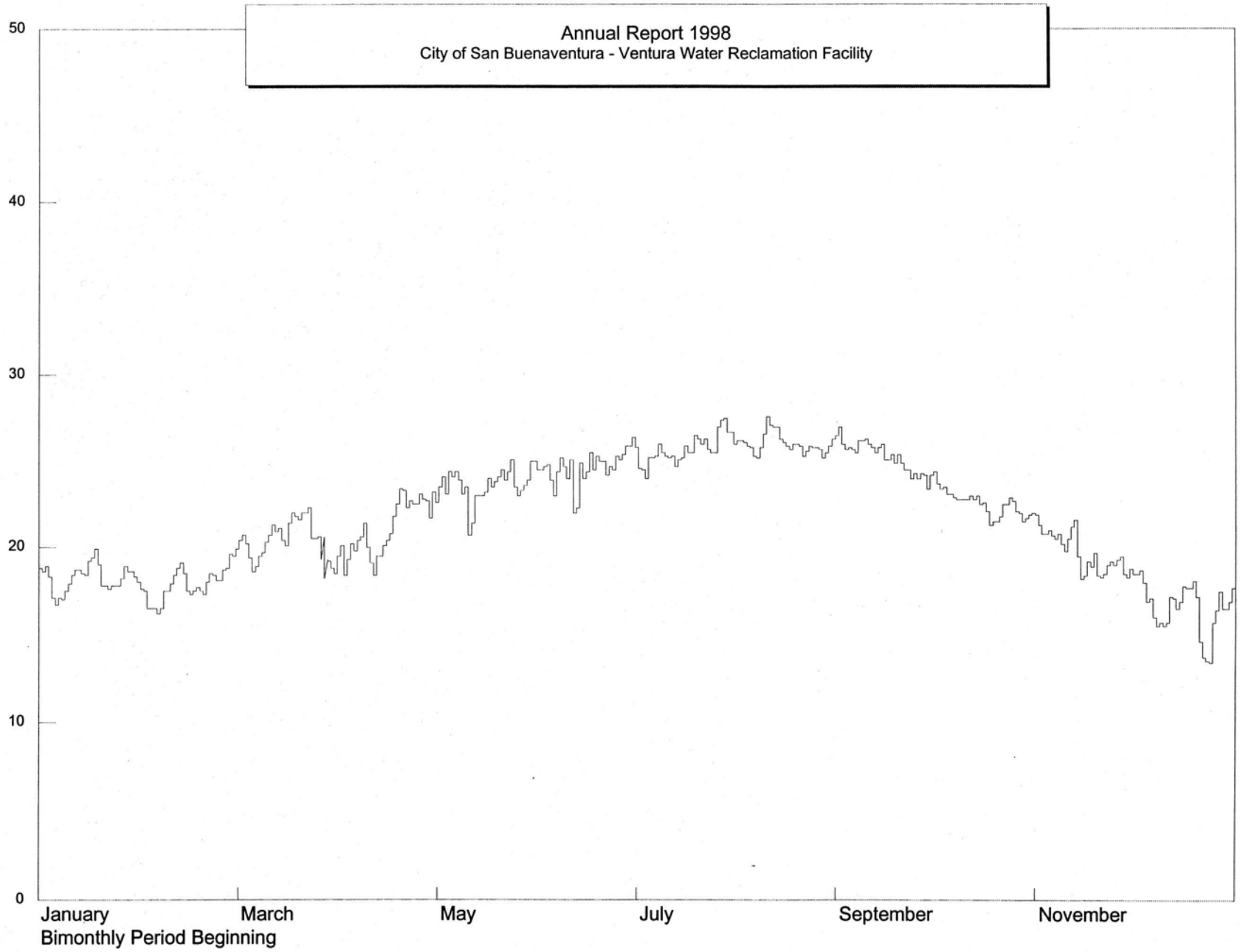
Outfall Junction Structure
Effluent Discharge to the Santa Clara Tidal Prism - MGD



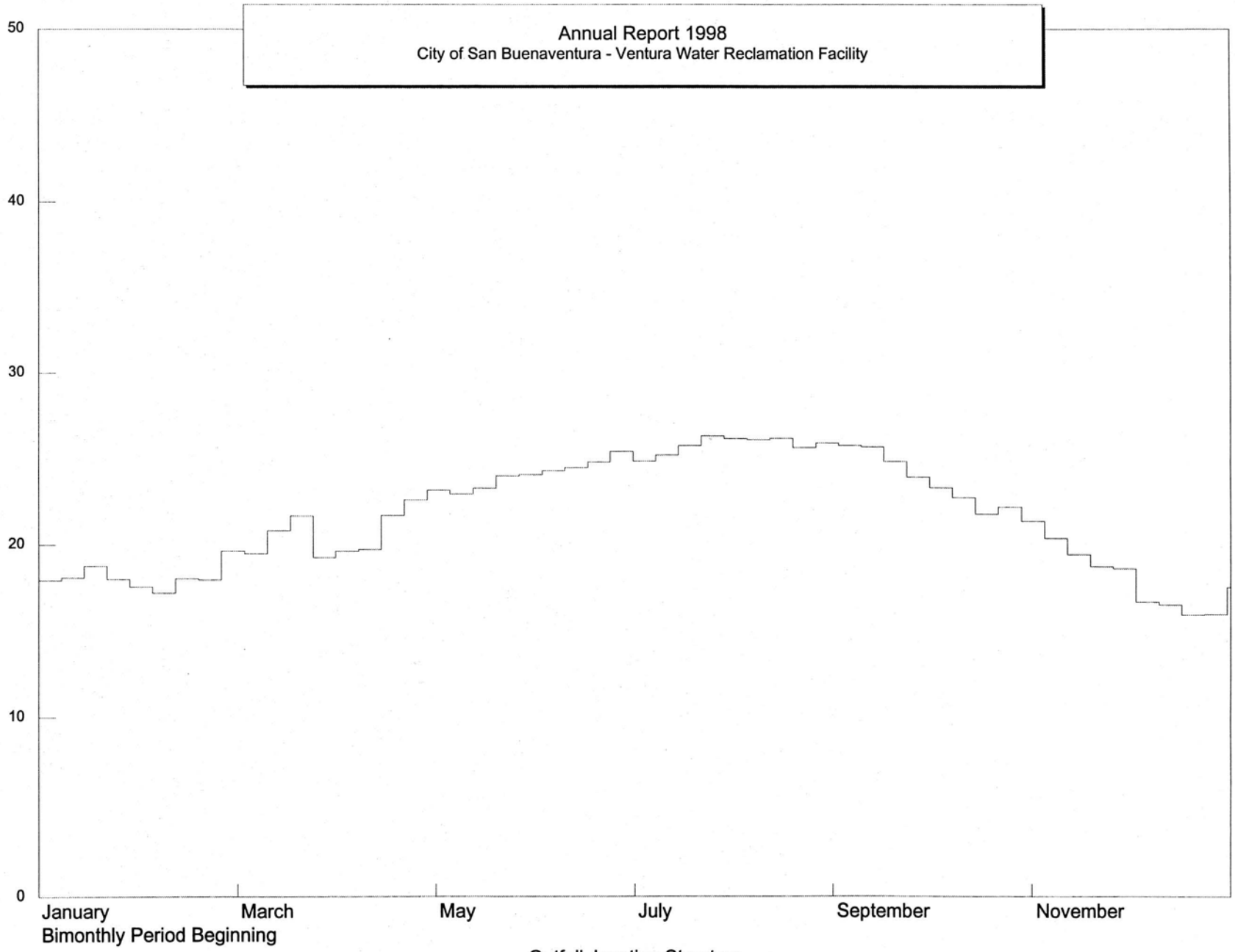
Outfall Junction Structure
7 Day Average Effluent Discharge to the Santa Clara Tidal Prism - MGD



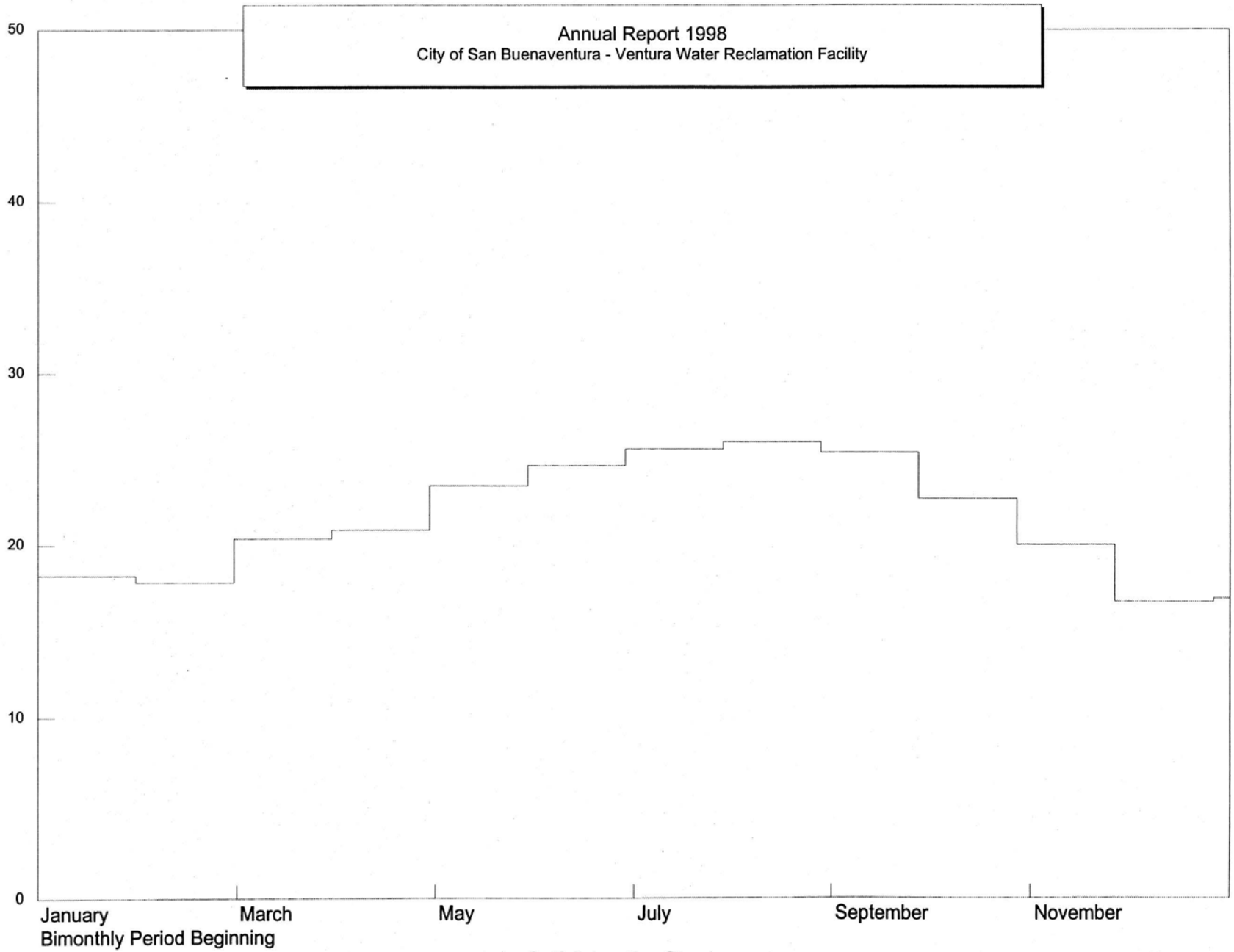
Outfall Junction Structure
30 Day Average Effluent Discharge to the Santa Clara Tidal Prism - MGD



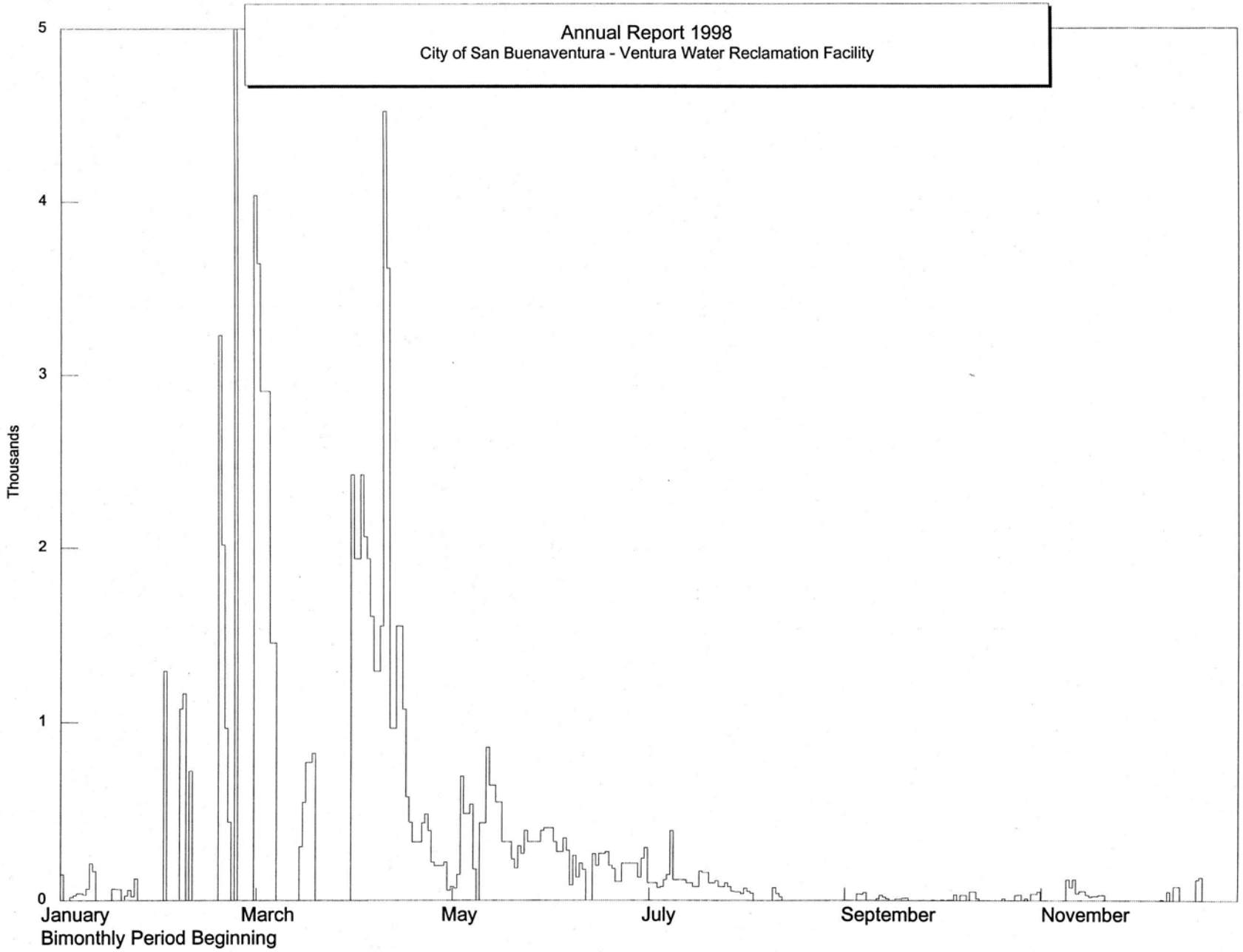
Outfall Junction Structure
Effluent Temperature at 11:00 AM - Degrees C



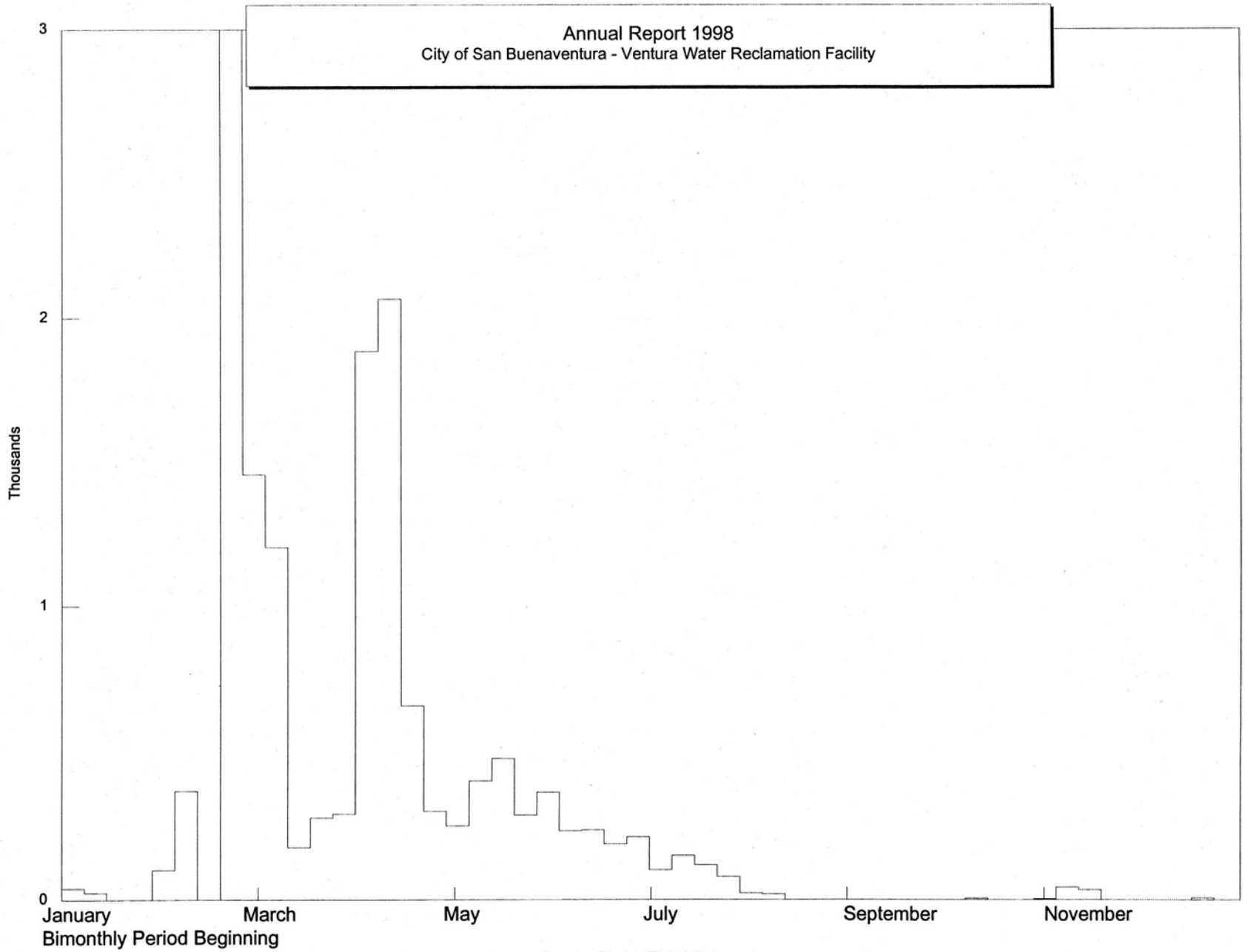
Outfall Junction Structure
Effluent 7 Day Averge Temperature at 11:00 AM - Degrees C



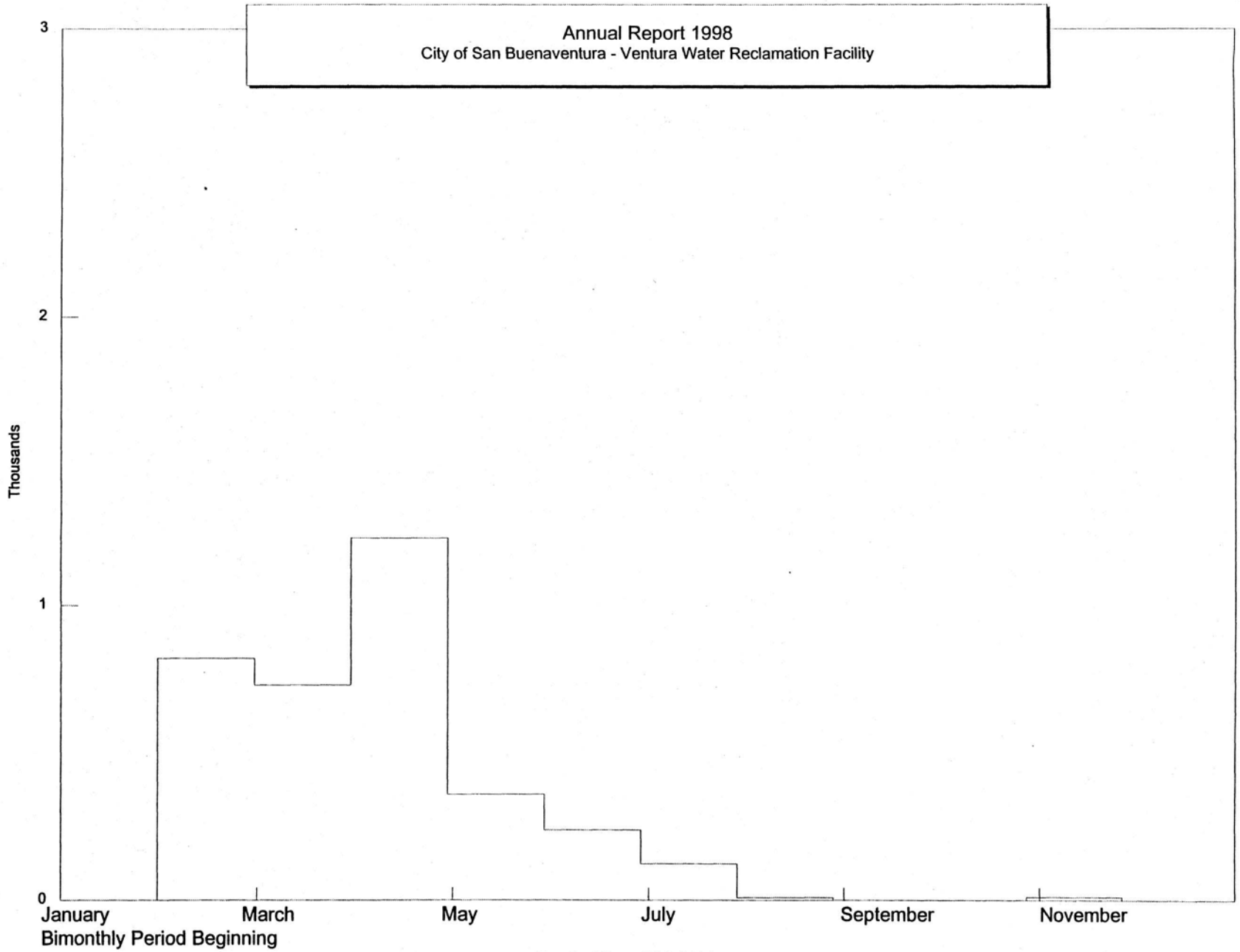
Outfall Junction Structure
Effluent 30 Day Averge Temperature at 11:00 AM - Degrees C



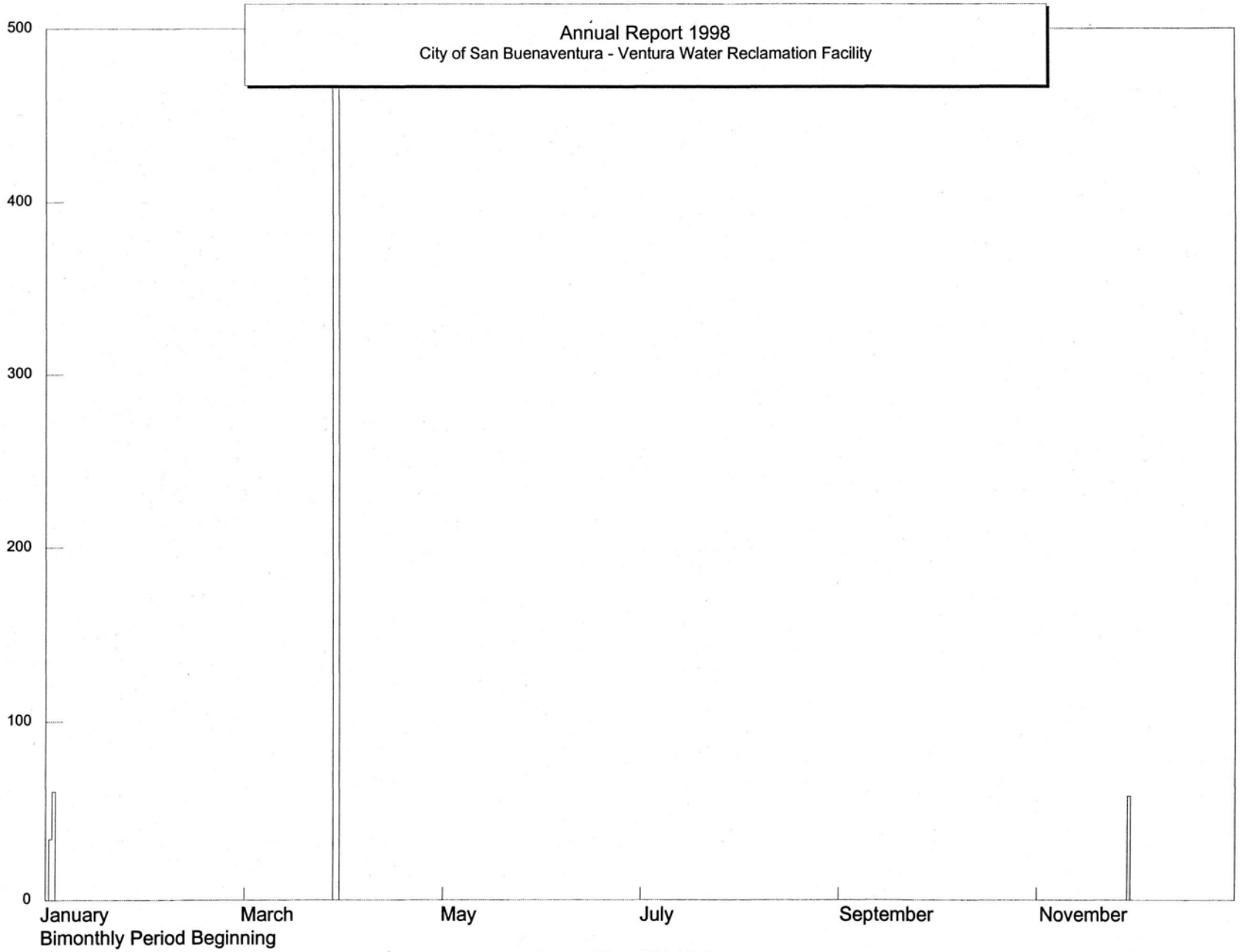
Santa Clara Tidal Prism
Estimated Discharge to the Pacific Ocean - MGD



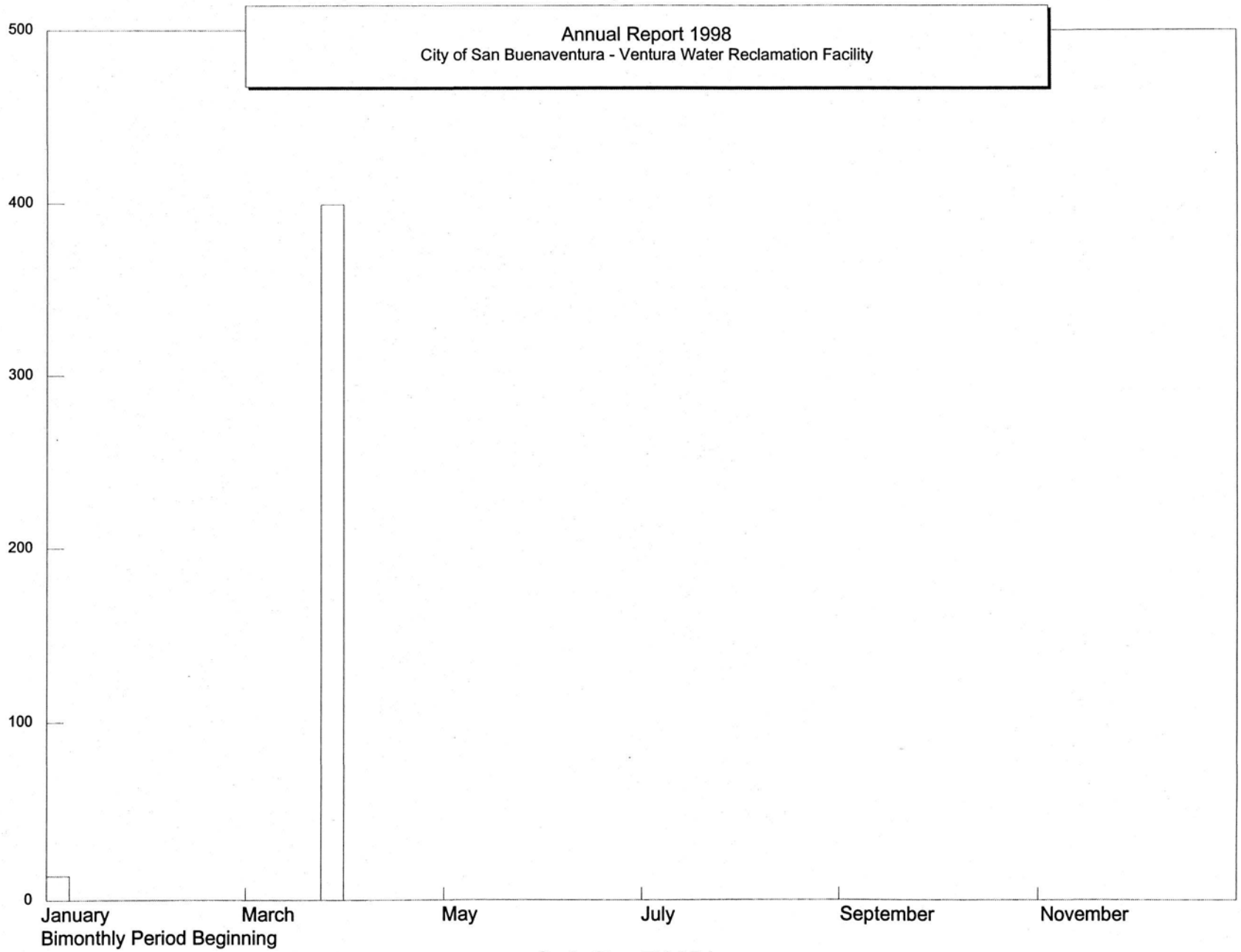
Santa Clara Tidal Prism
Estimated 7 Day Average Discharge to the Pacific Ocean - MGD



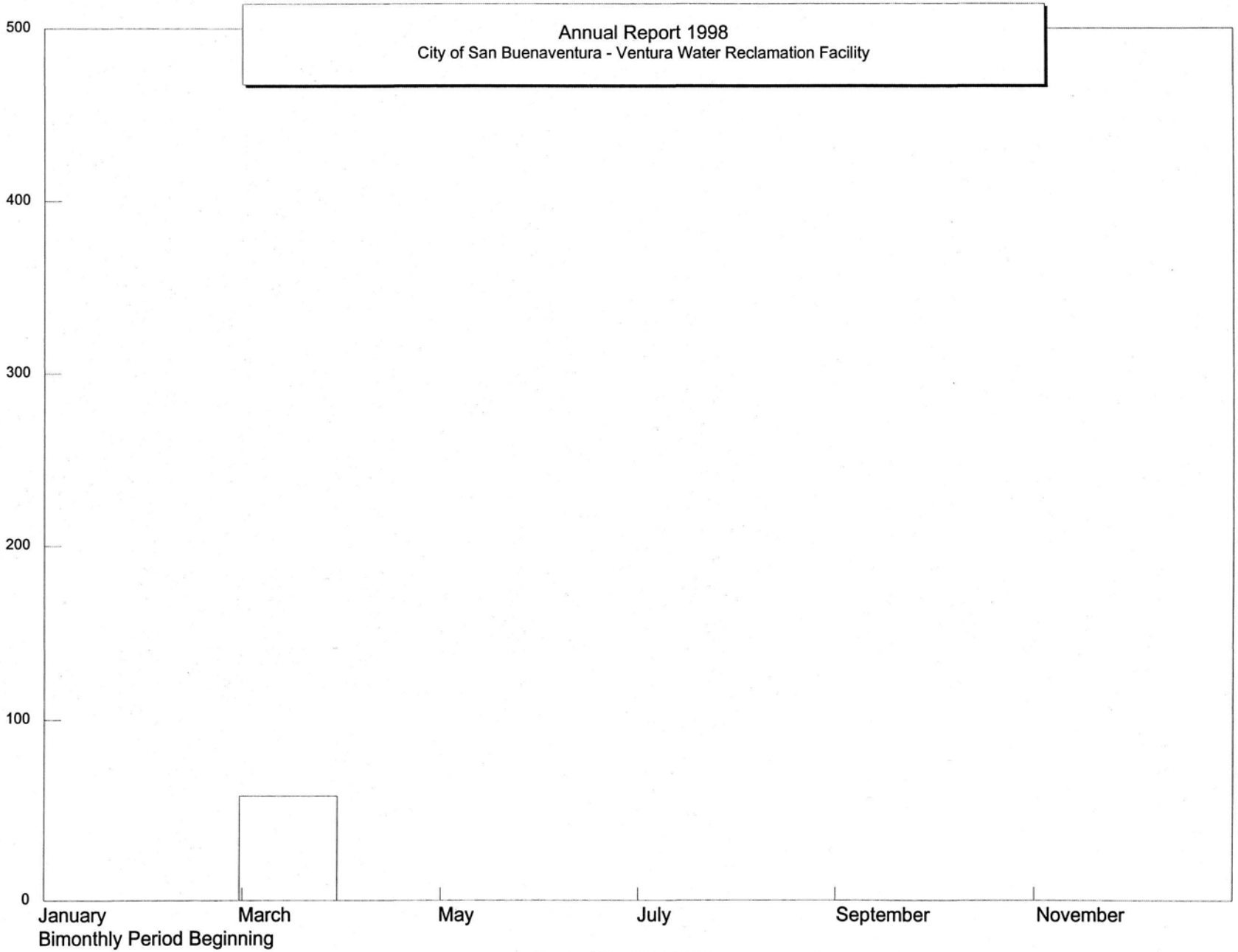
Santa Clara Tidal Prism
Estimated 30 Day Average Discharge to the Pacific Ocean - MGD



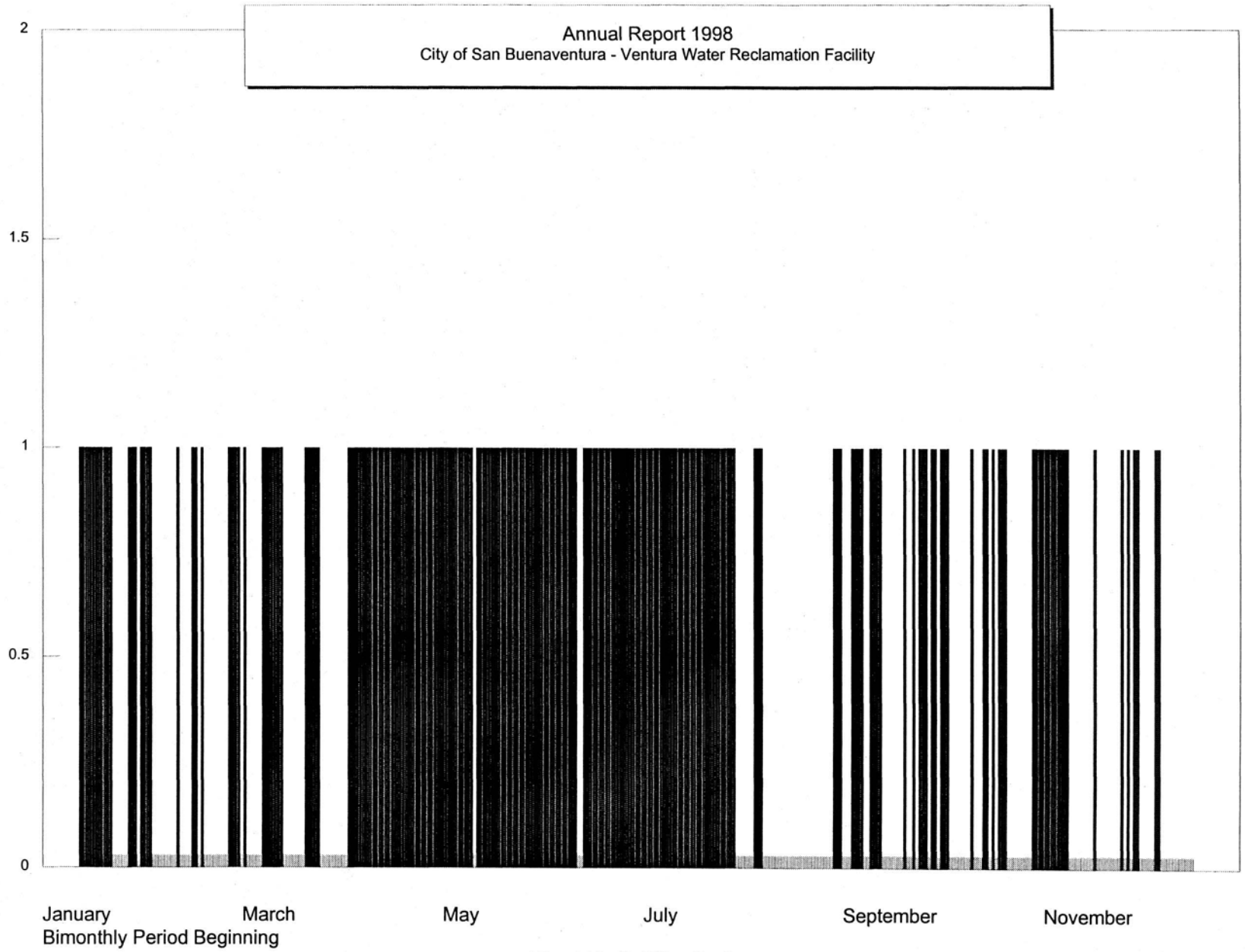
Santa Clara Tidal Prism
Estimated Influx to the Pacific Ocean - MGD



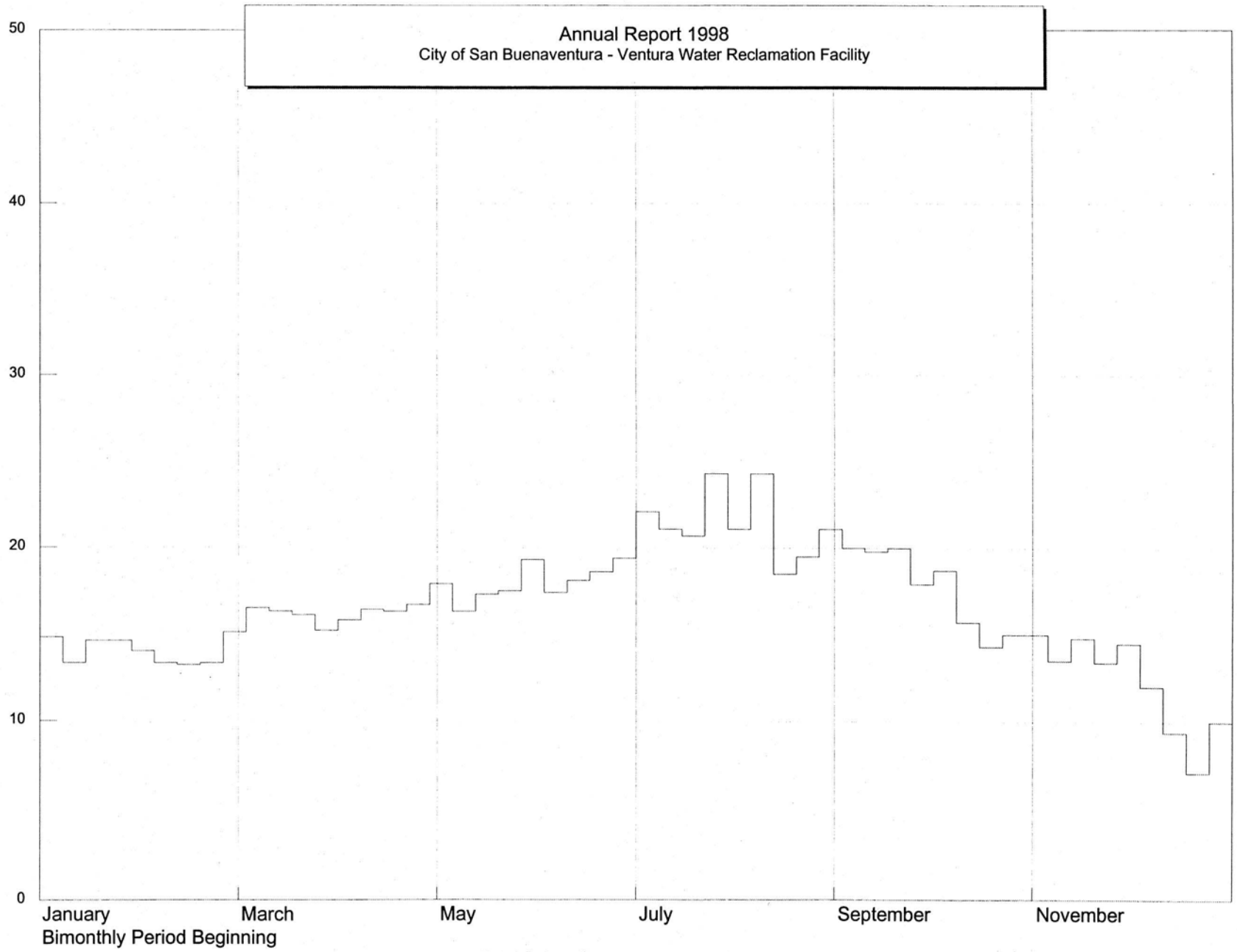
Santa Clara Tidal Prism
Estimated 7 Day Average Influx to the Pacific Ocean - MGD



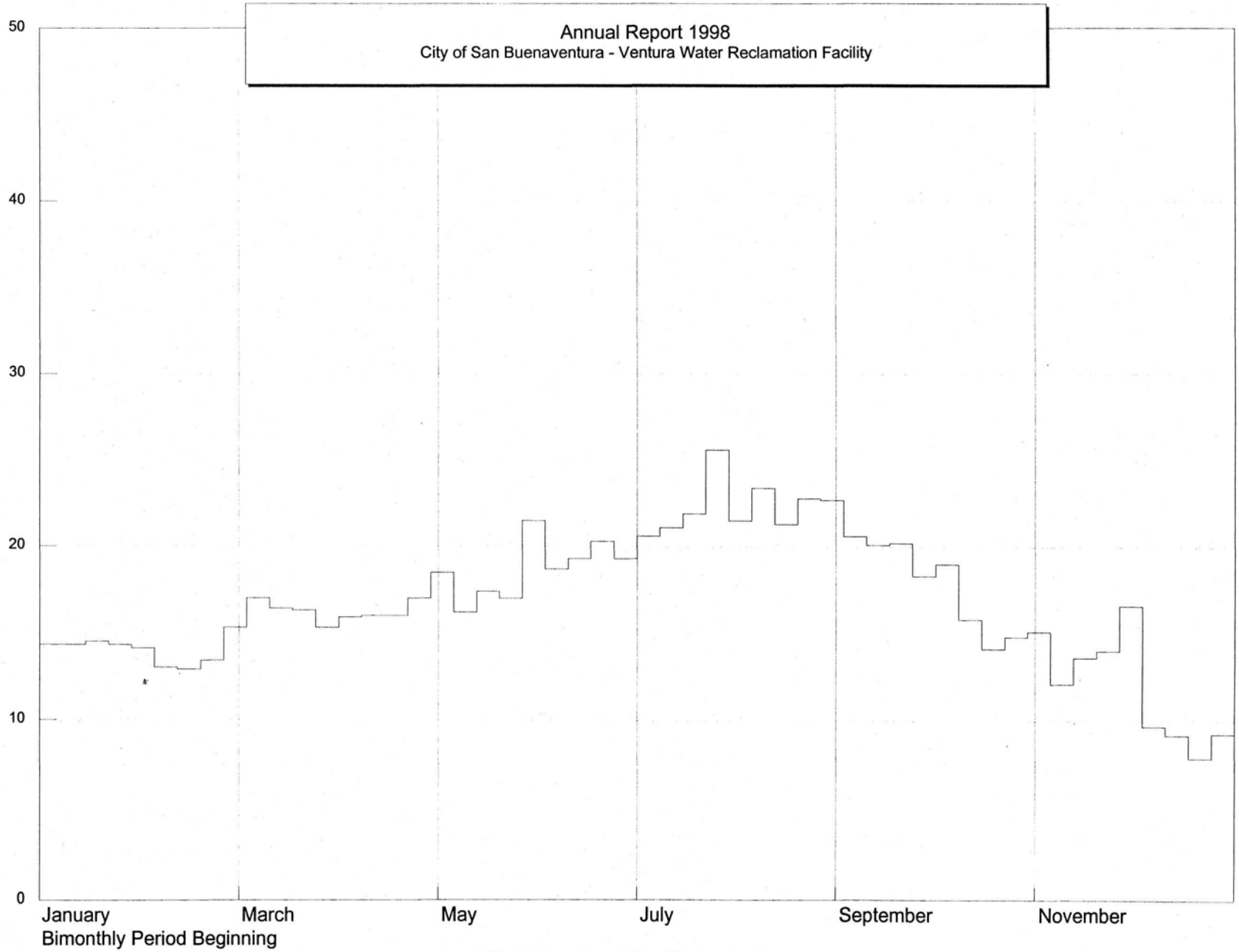
Santa Clara Tidal Prism
Estimated 30 Day Average Influx to the Pacific Ocean - MGD



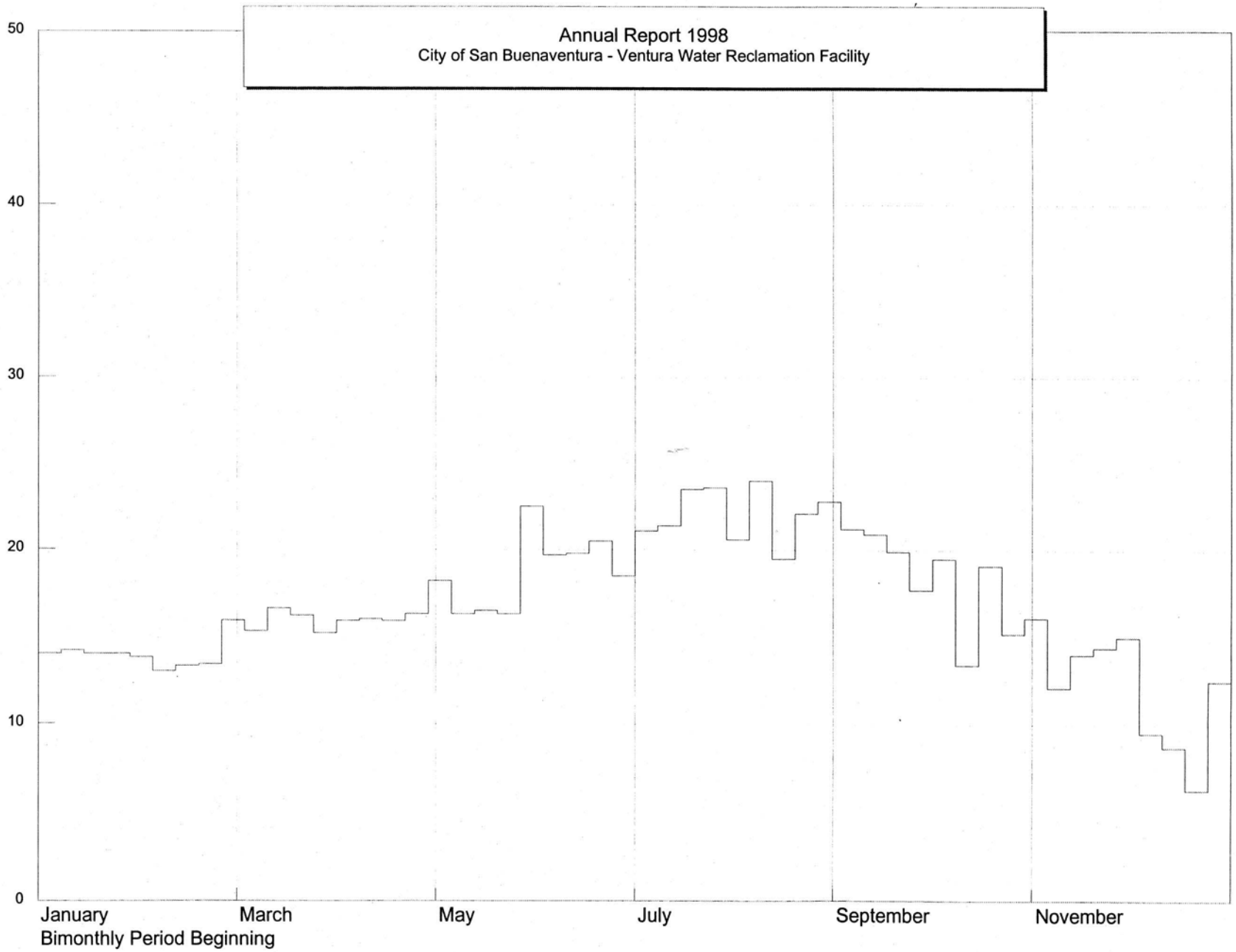
MIxed Media Filter Station
Observed Exchange Between the Tidal Prism and Ocean



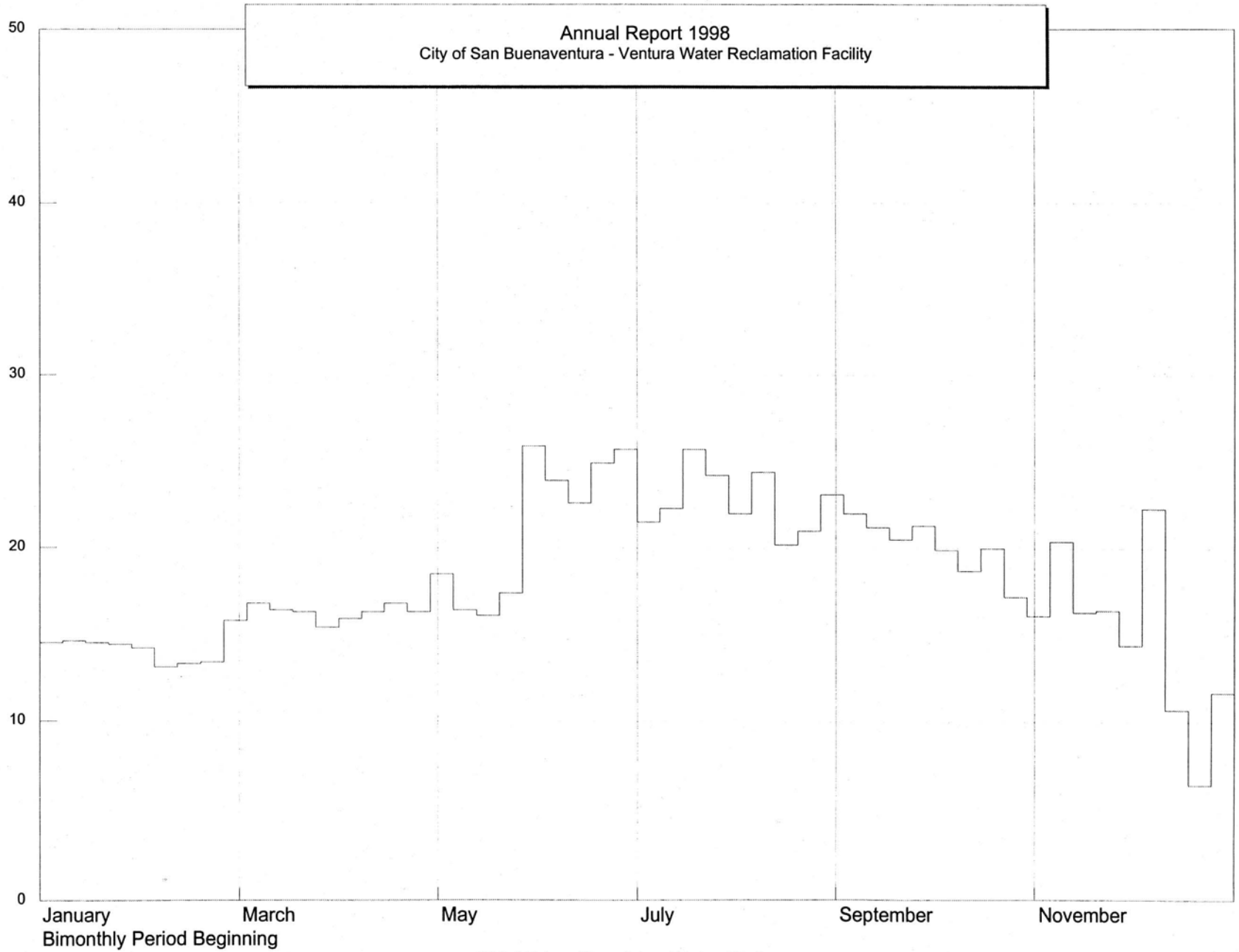
Tidal Prism Receiving Water Stations
R1 Weekly Temperature - Degrees C



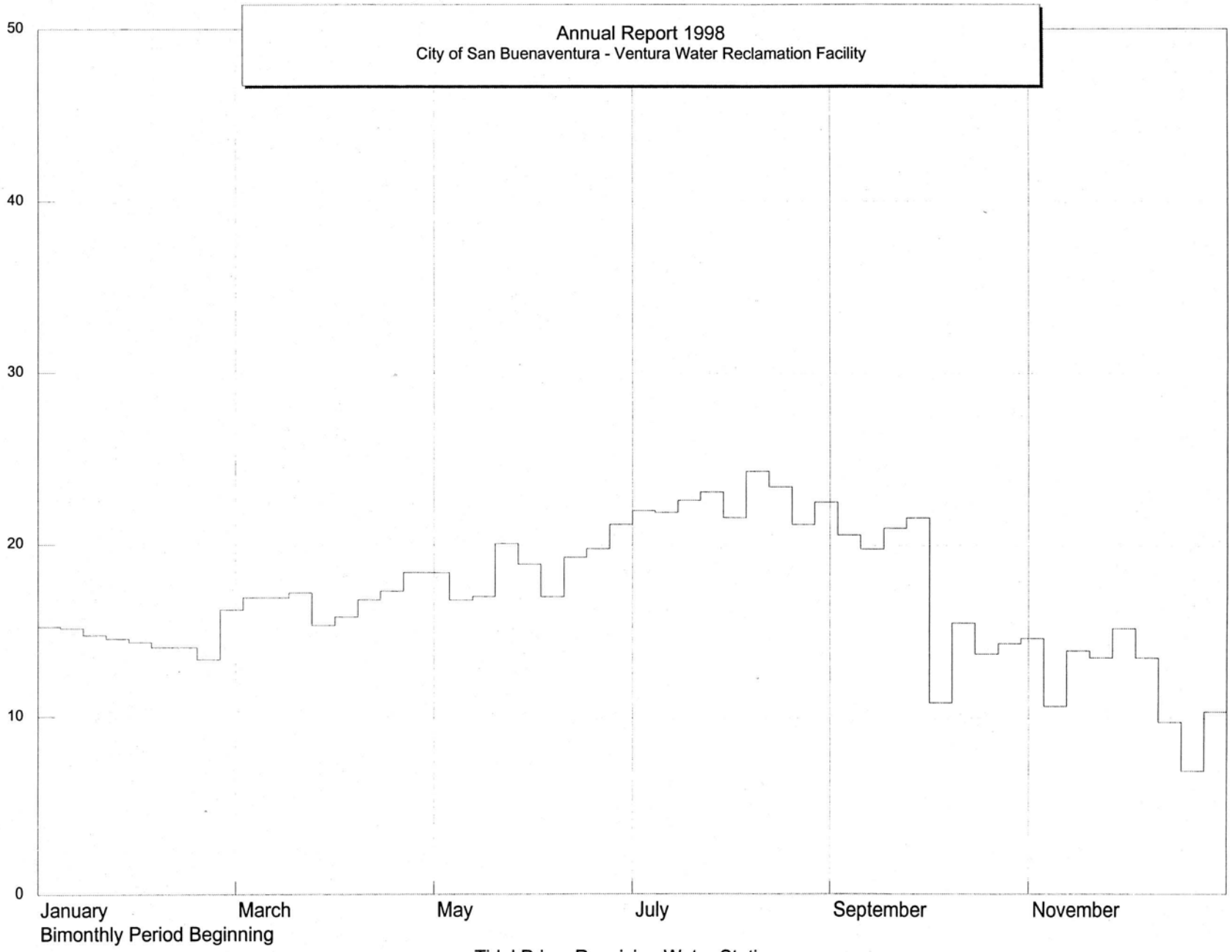
Tidal Prism Receiving Water Stations
R2 Weekly Temperature - Degrees C



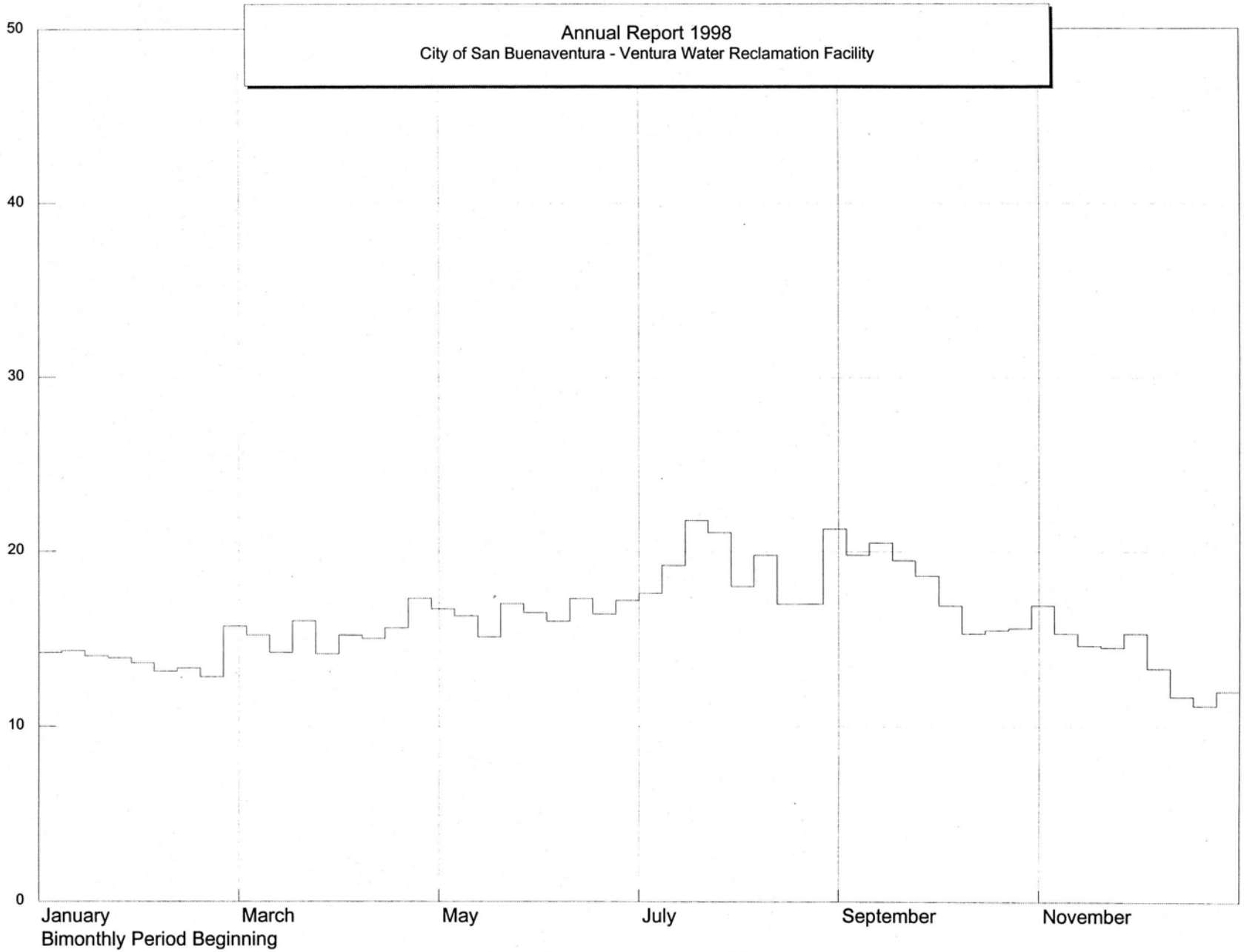
Tidal Prism Receiving Water Stations
R3 Weekly Temperature - Degrees C



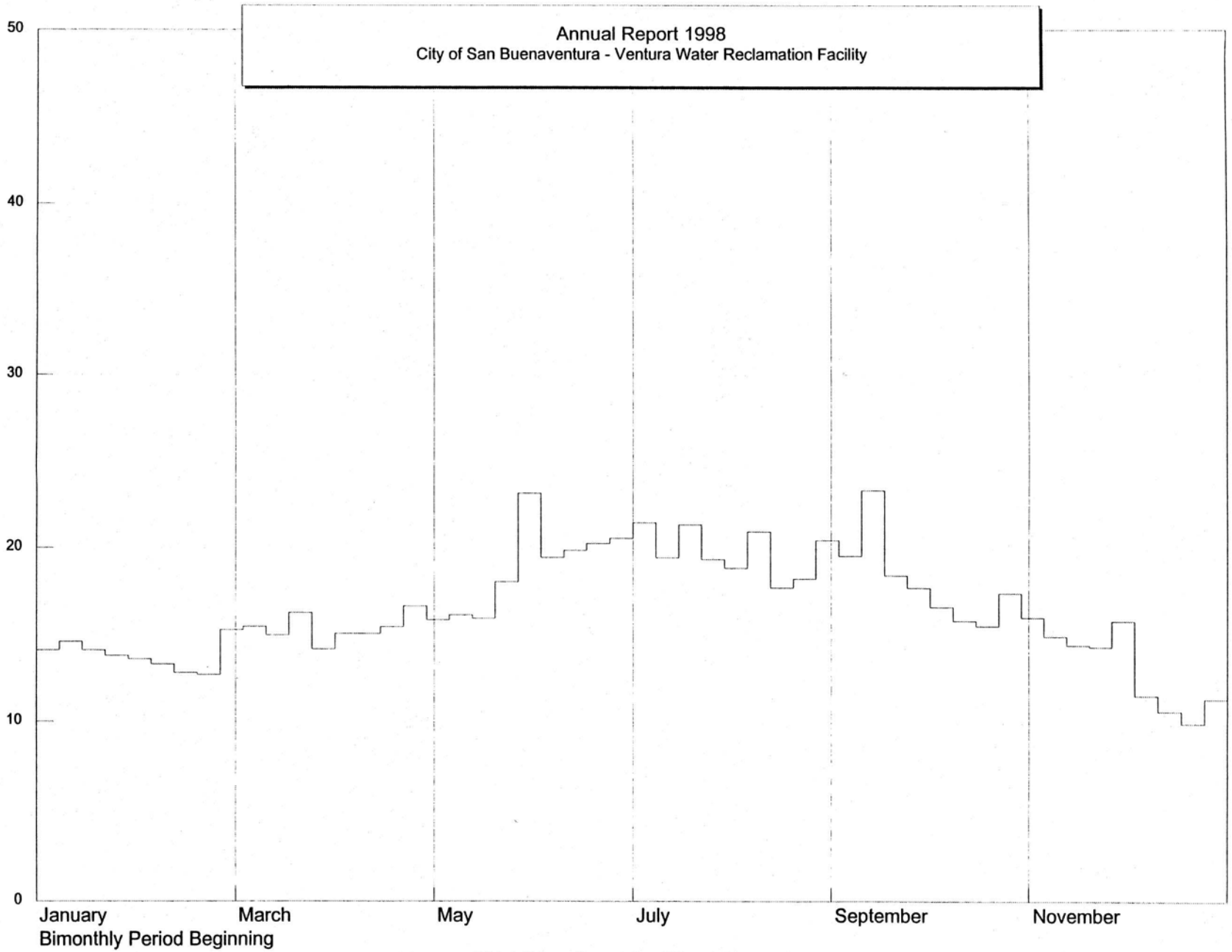
Tidal Prism Receiving Water Stations
R4 Weekly Temperature - Degrees C



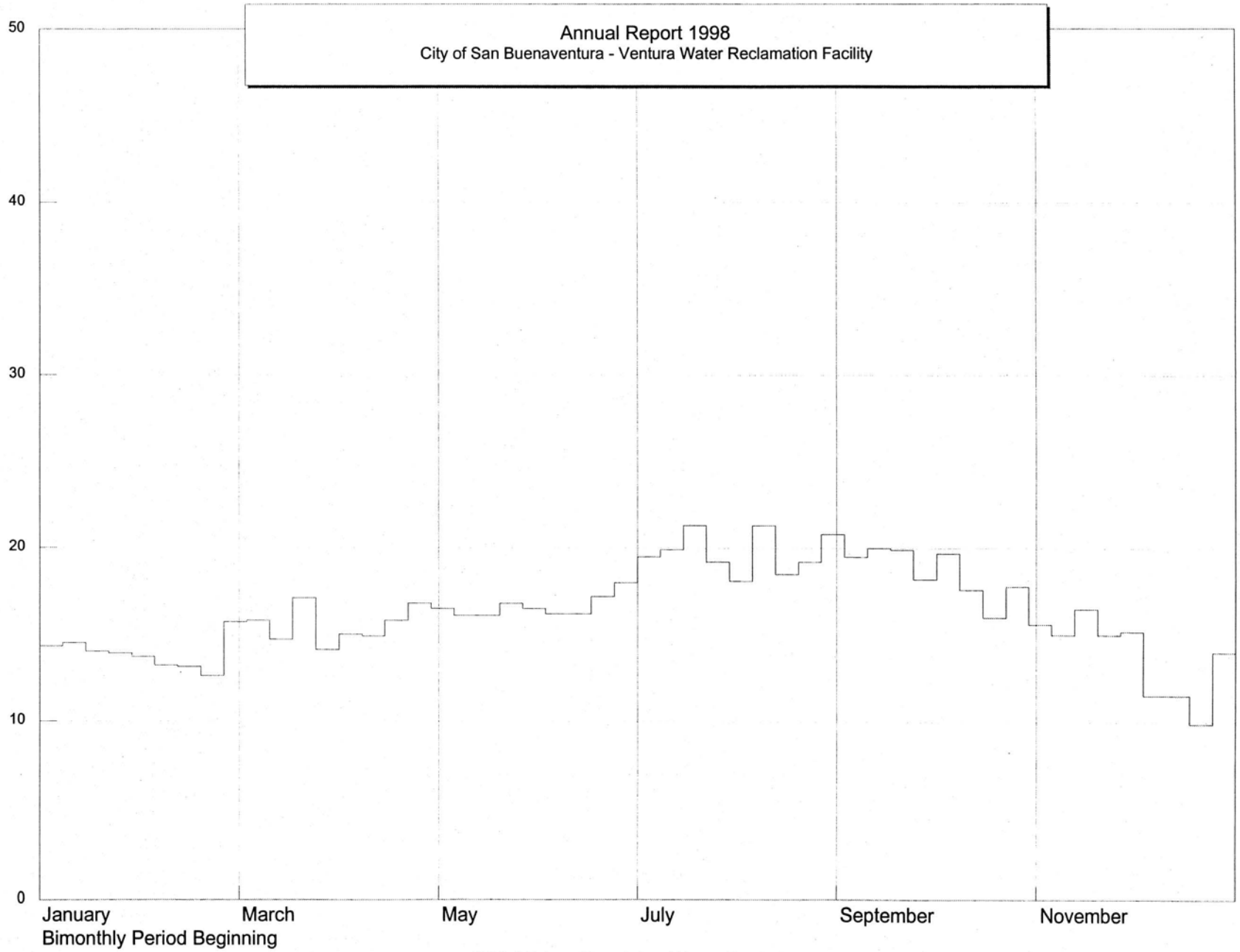
Tidal Prism Receiving Water Stations
L5 Weekly Temperature - Degrees C



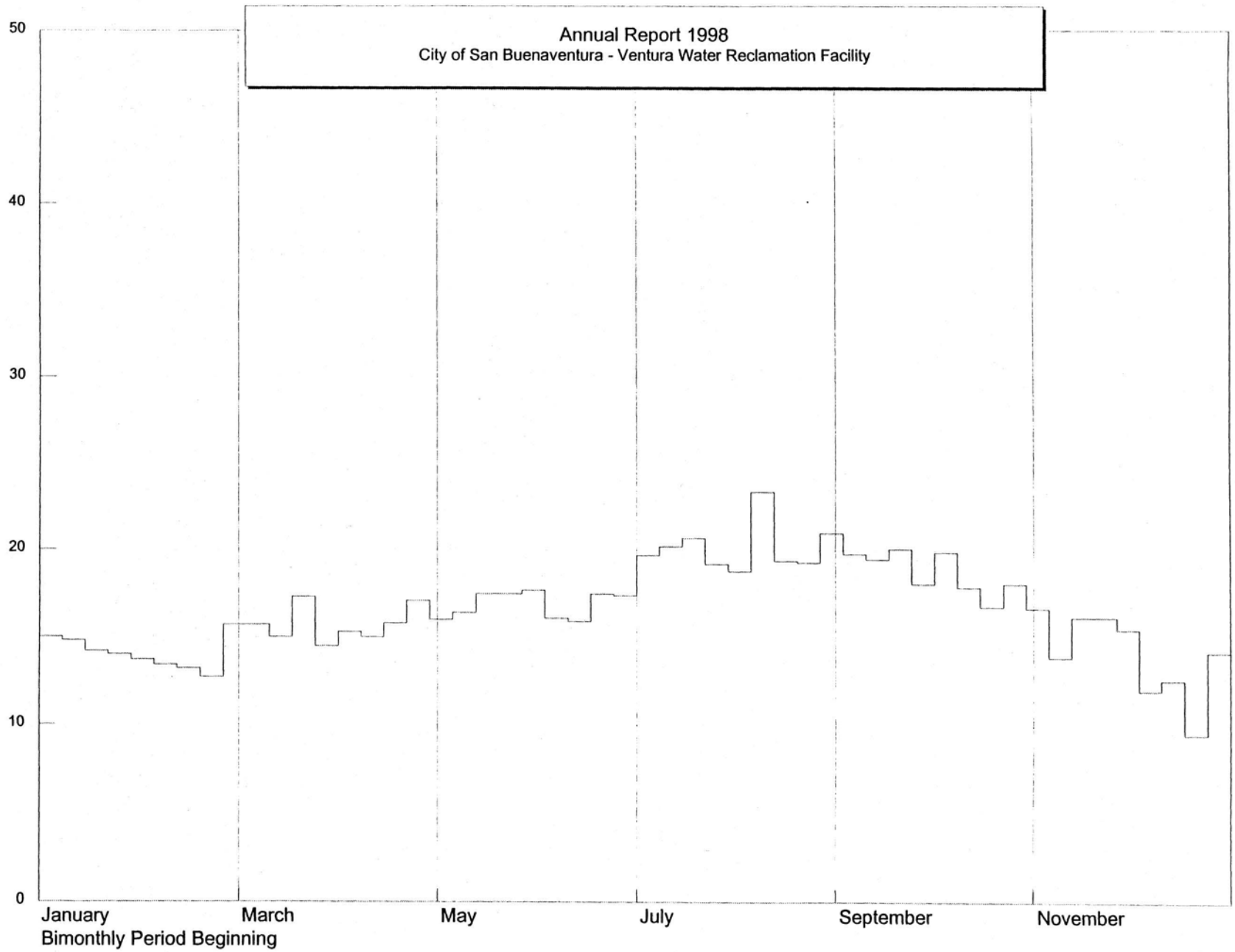
Tidal Prism Receiving Water Stations
R5 Weekly Temperature - Degrees C



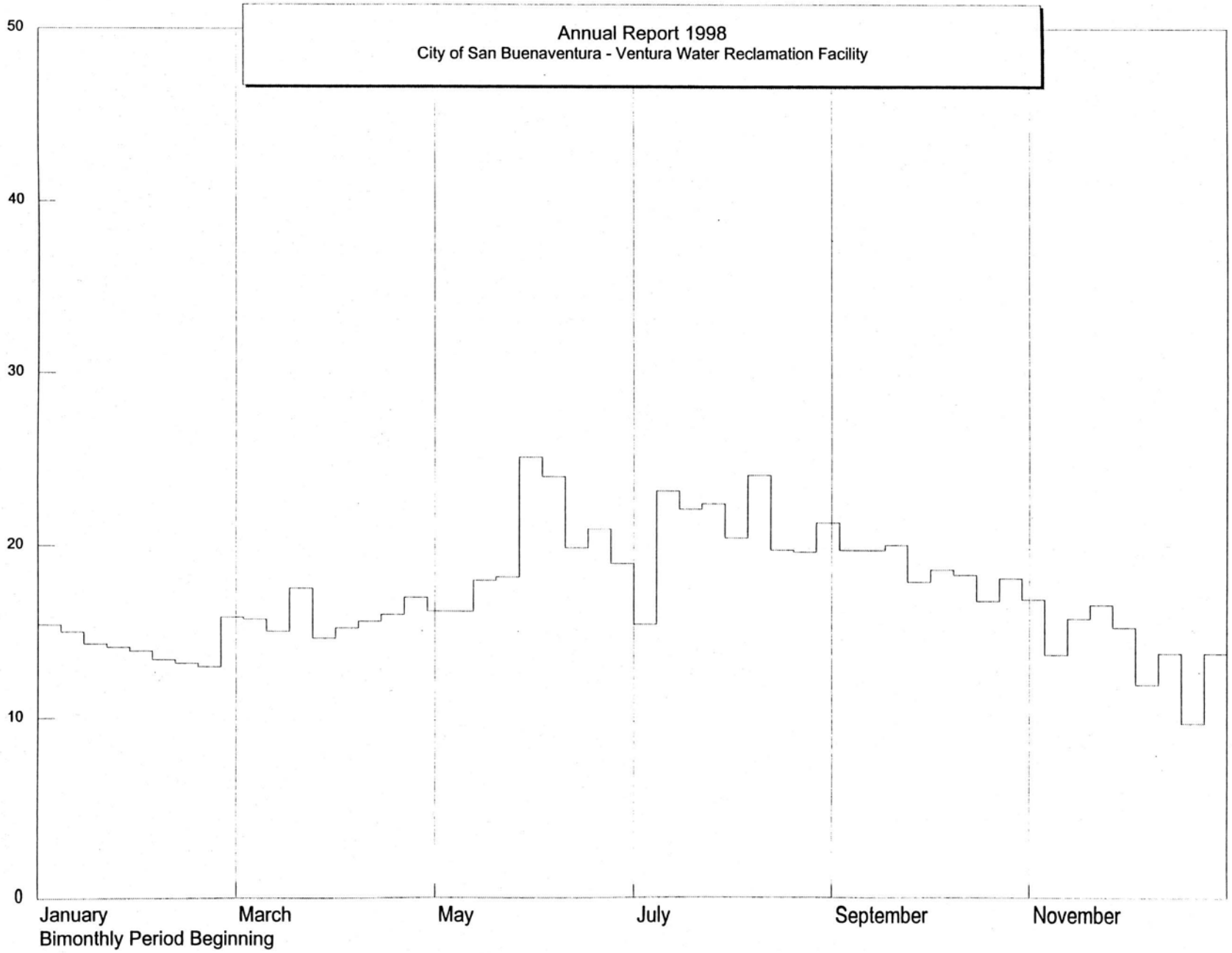
Tidal Prism Receiving Water Stations
R6 Weekly Temperature - Degrees C



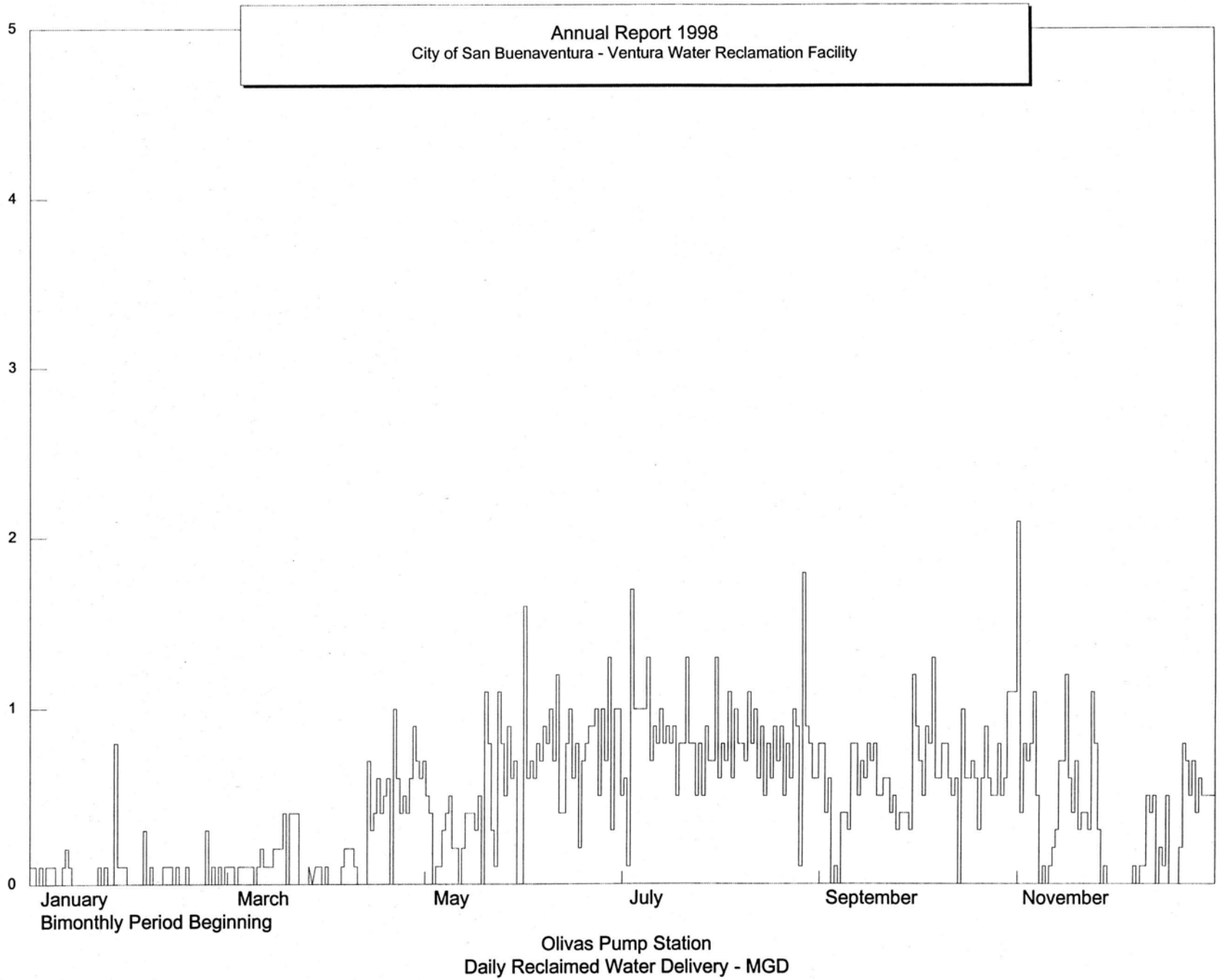
Tidal Prism Receiving Water Stations
R7 Weekly Temperature - Degrees C

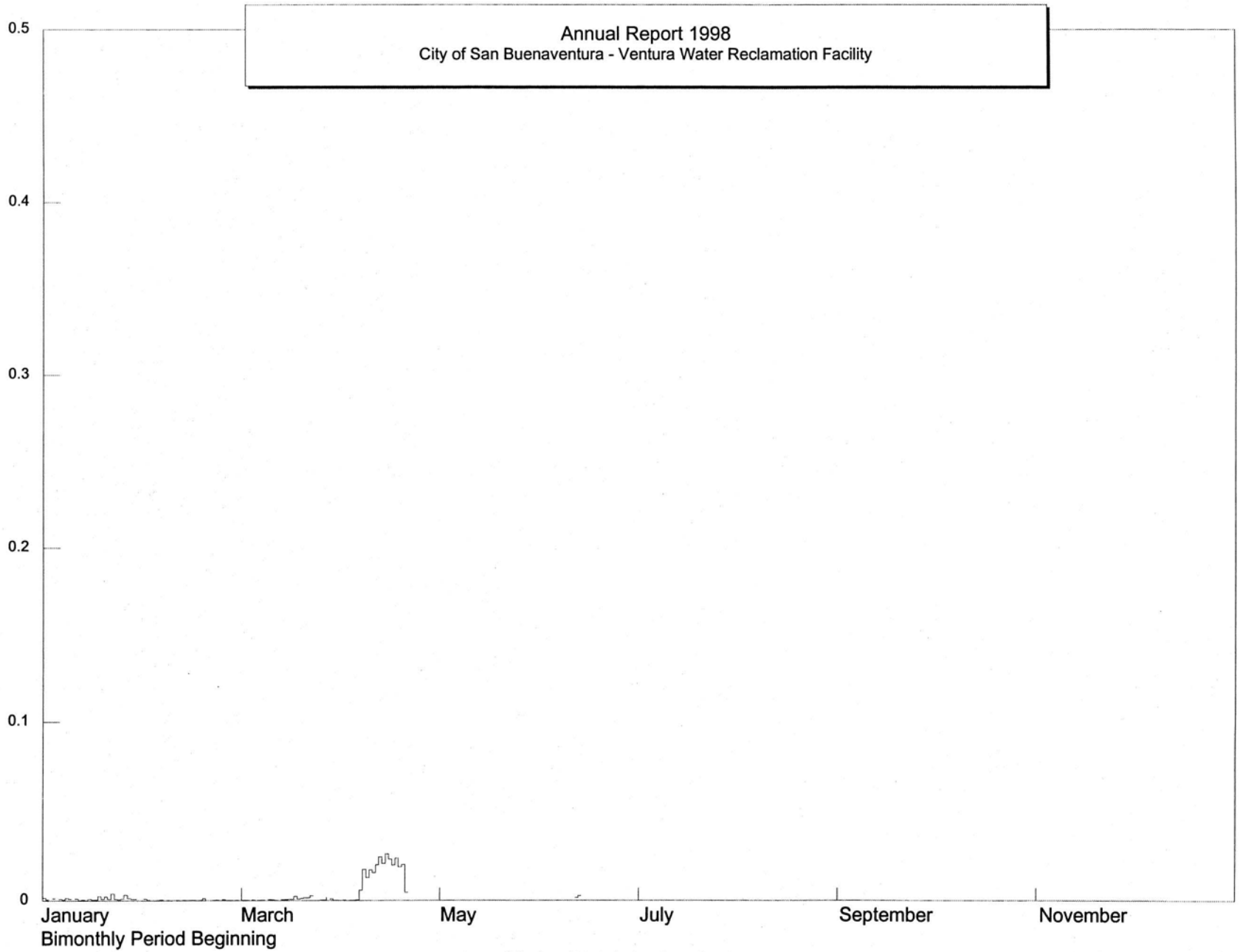


Tidal Prism Receiving Water Stations
R8 Weekly Temperature - Degrees C

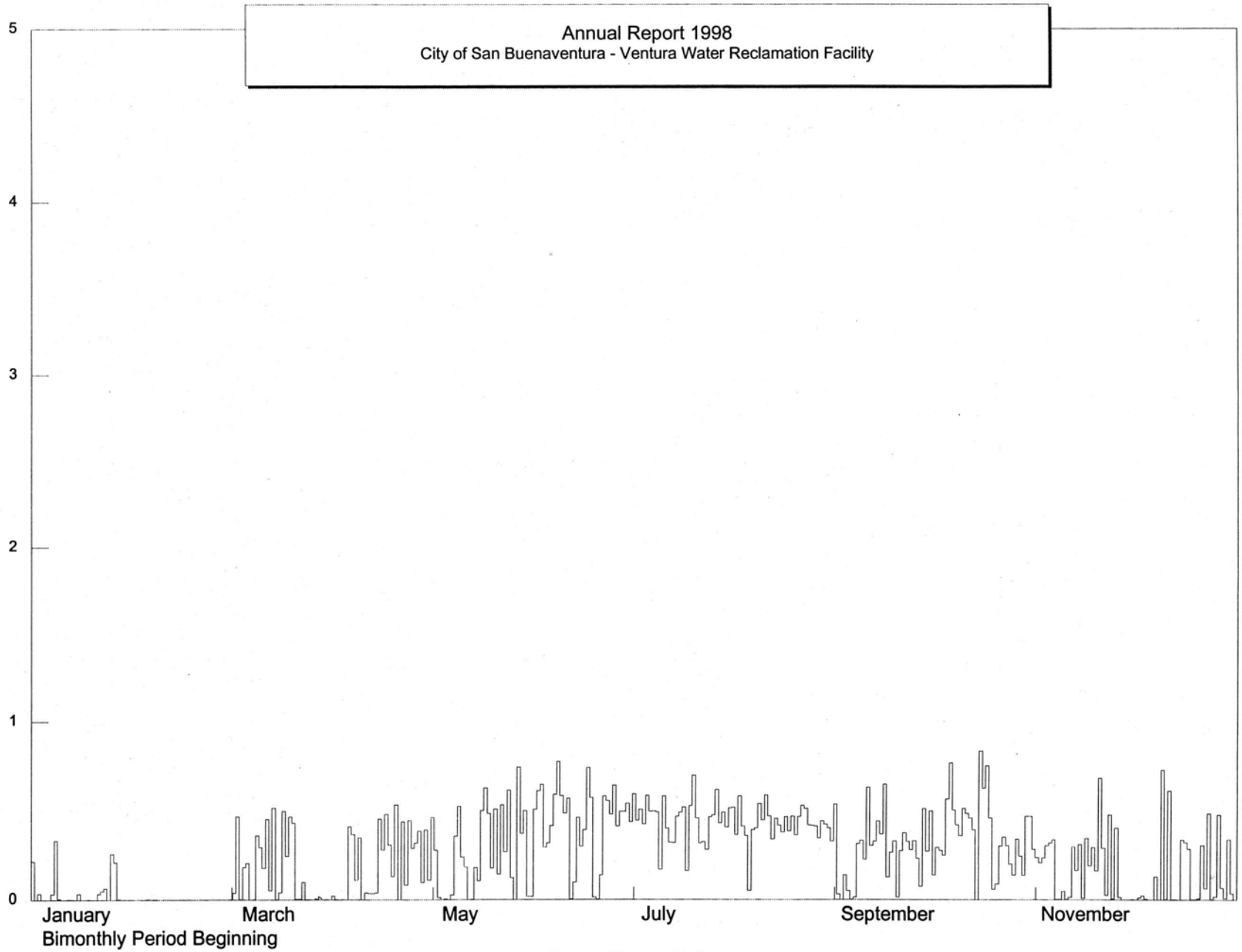


Tidal Prism Receiving Water Stations
R9 Weekly Temperature - Degrees C

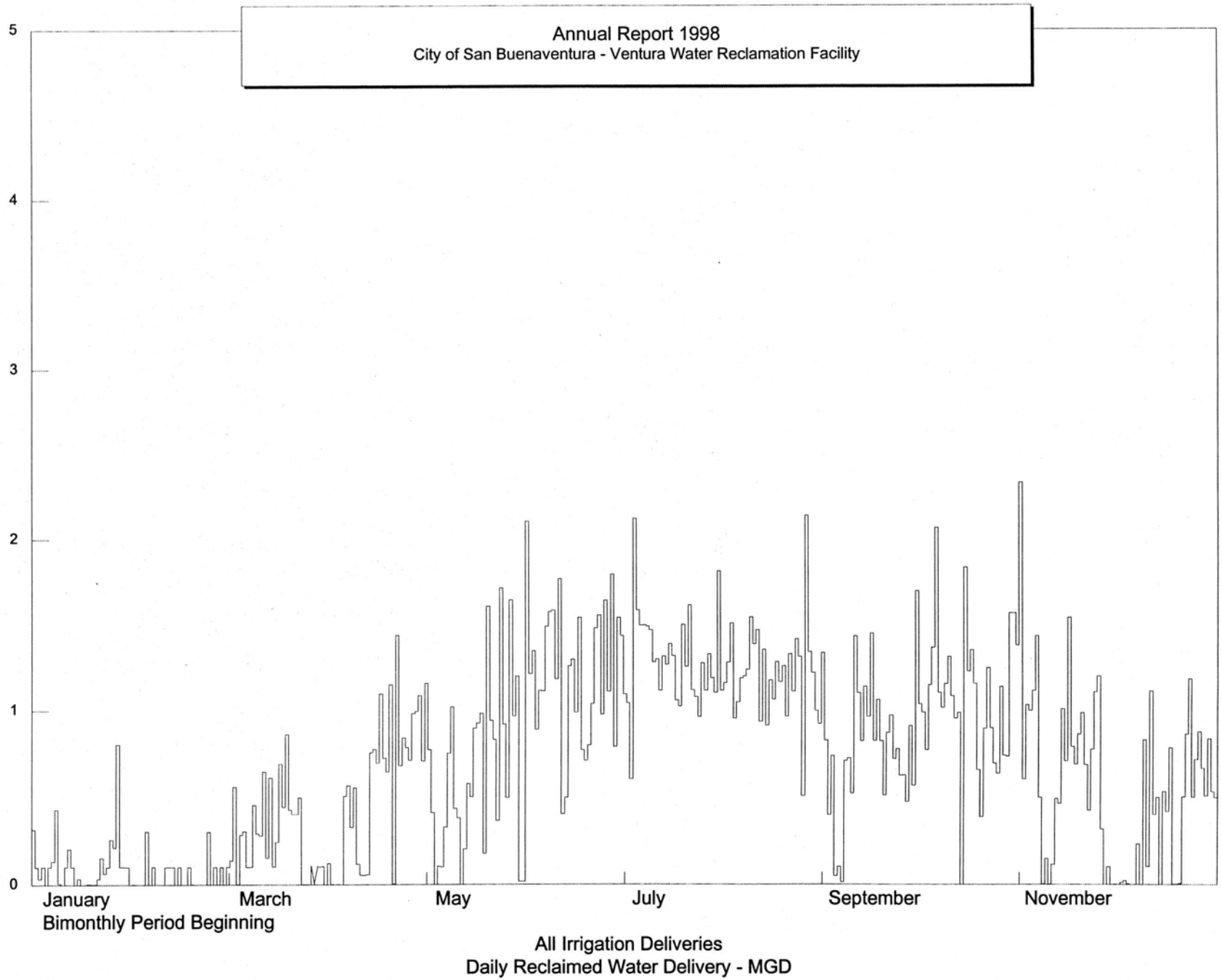

Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
5
4
3
2
1
0
January
March
May
July
September
November
Bimonthly Period Beginning
Olivas Pump Station
Daily Reclaimed Water Delivery - MGD

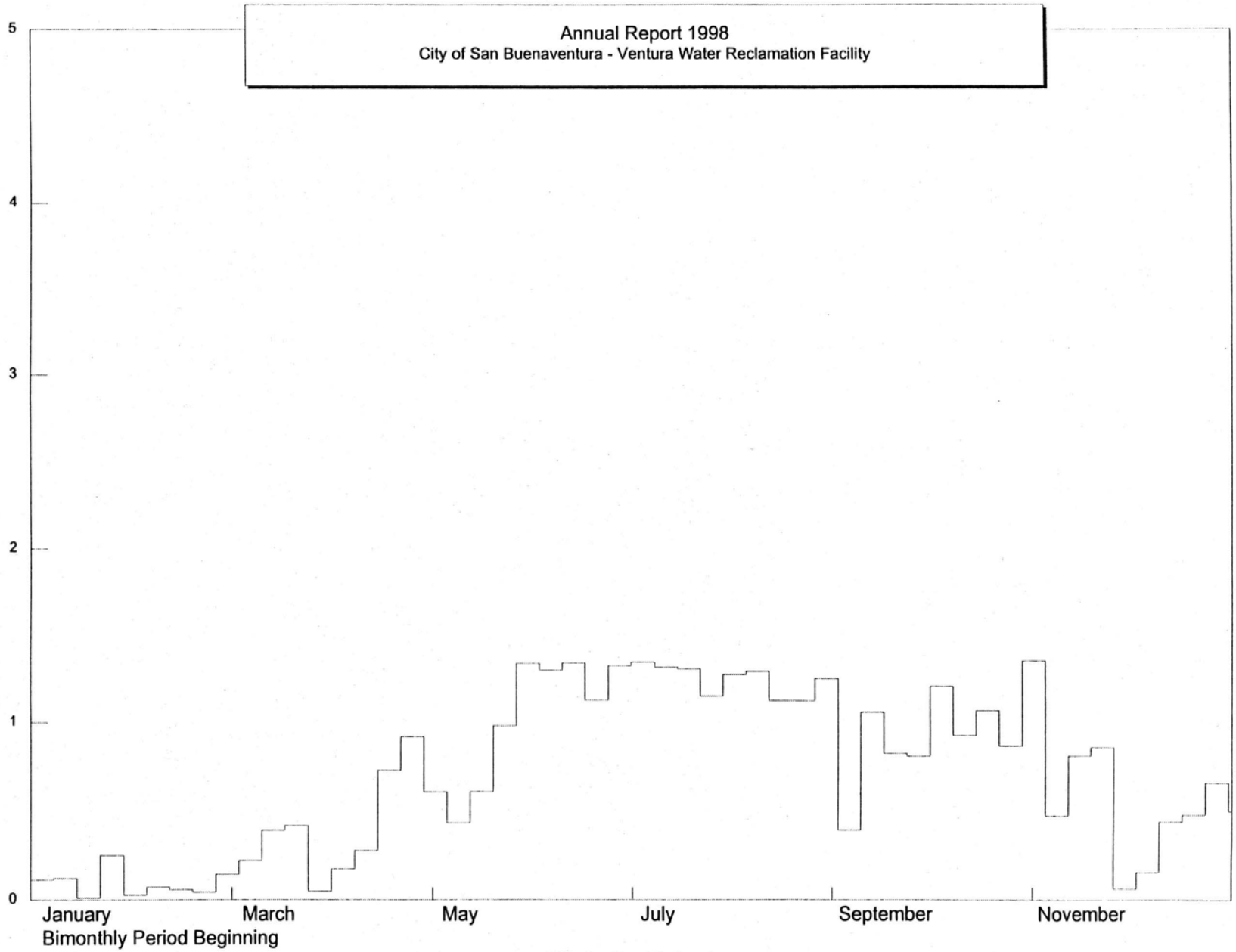


Marina Park Irrigation Systems
Daily Reclaimed Water Delivery - MGD

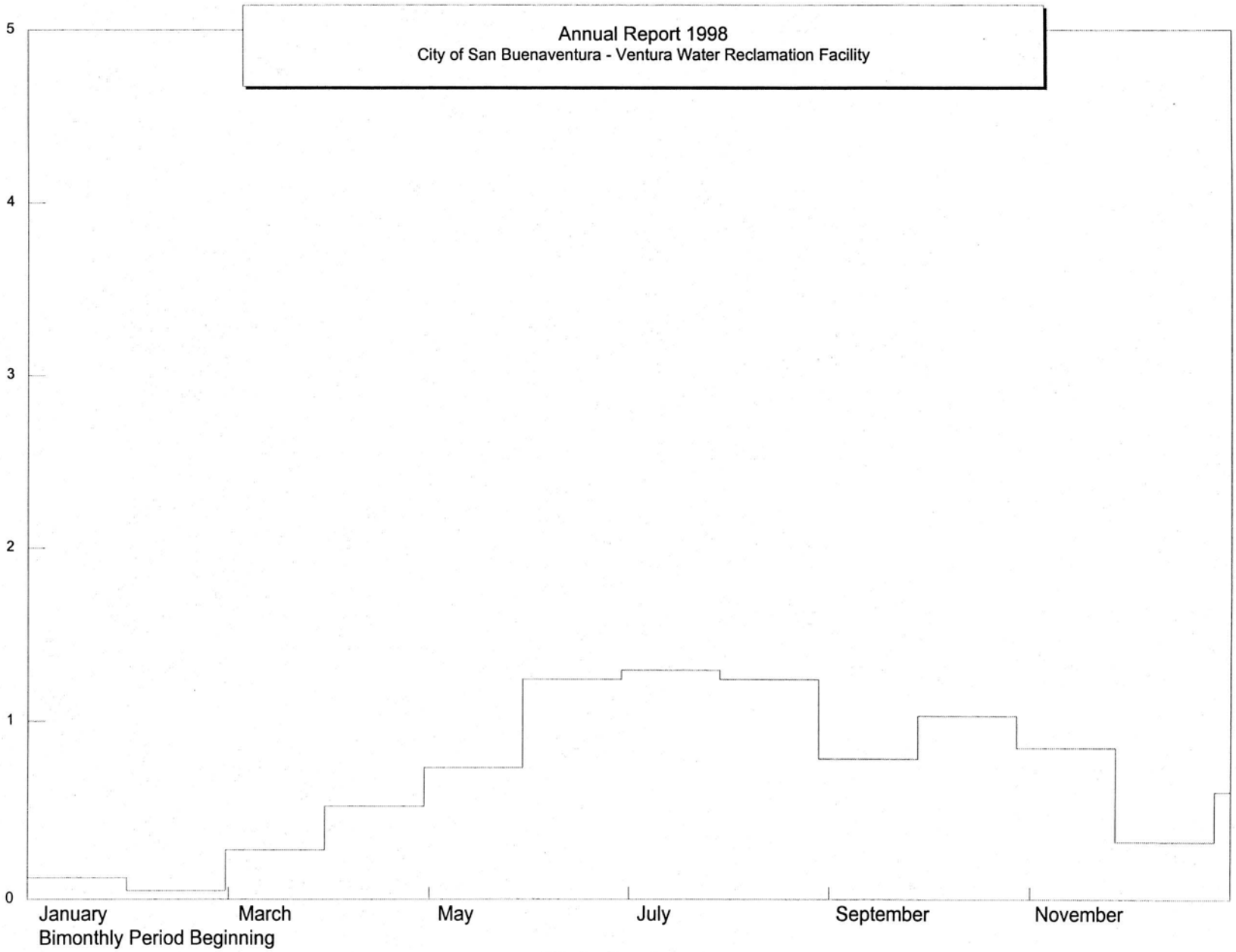


Buena Pump Station
Daily Reclaimed Water Delivery - MGD


Annual Report 1998
City of San Buenaventura - Ventura Water Reclamation Facility
5
4
3
2
1
0
January
March
May
July
September
November
Bimonthly Period Beginning
All Irrigation Deliveries
Daily Reclaimed Water Delivery - MGD



All Irrigation Deliveries
7 Day Average Reclaimed Water Delivery - MGD



All Irrigation Deliveries
30 Day Average Reclaimed Water Delivery - MGD

ANALYTICAL QUALITY ASSURANCE PROGRAM 1998

I. LABORATORY DUTIES AND OBJECTIVES

The City of San Buenaventura Sanitation Division Laboratory is responsible for all sampling and analysis for purposes of NPDES compliance monitoring related to the City operated wastewater treatment plant and for the City domestic water supply and water distribution system monitoring for SDWA compliance.

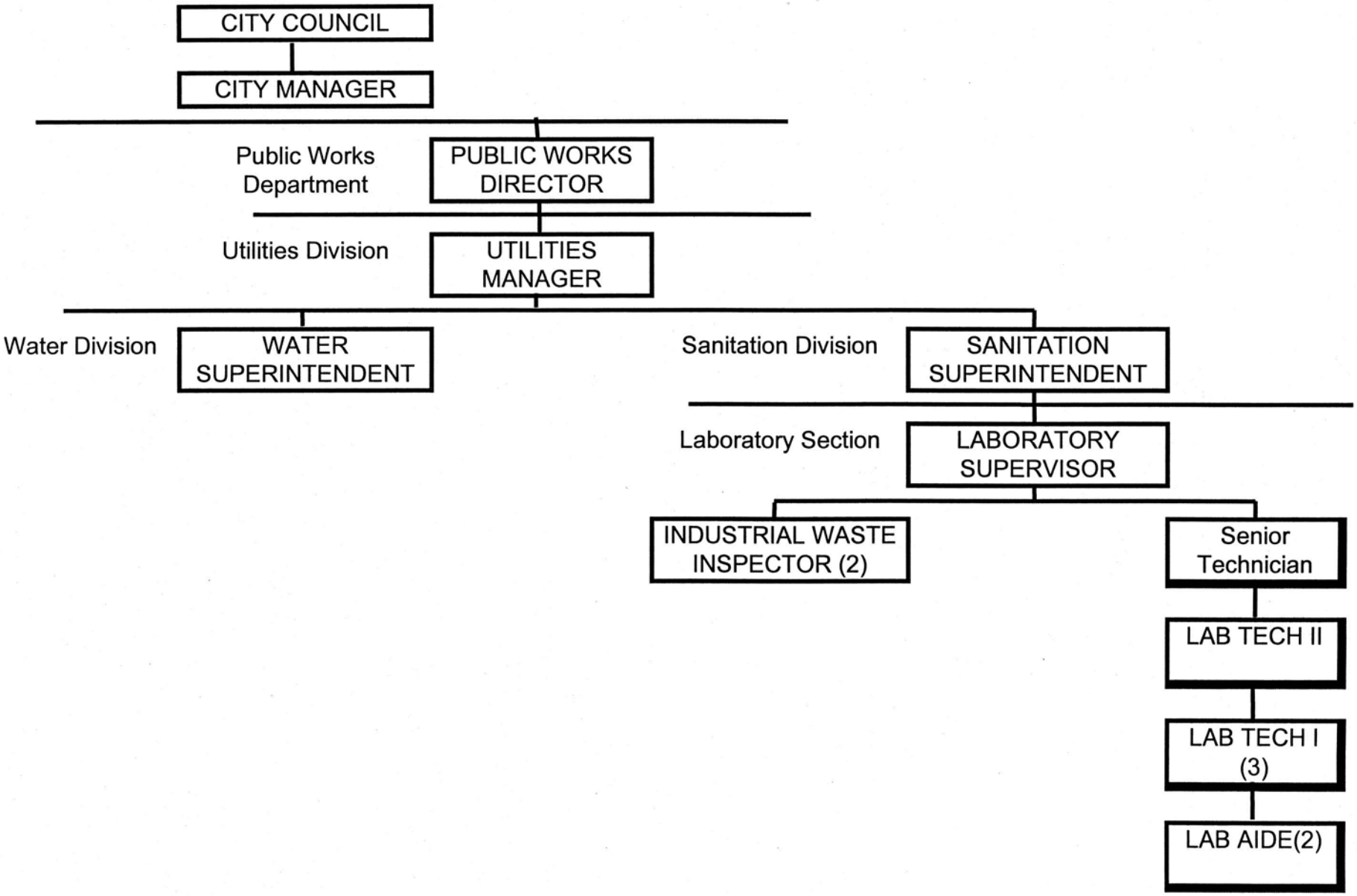
Current State of California Department of Health Services laboratory approval is attached.

All analyses for purposes of NPDES and SDWA reporting or for industrial waste monitoring conforms to the current requirements of 40 CFR Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants" or of 40 CFR Part 141, "National Interim Primary Drinking Water Regulations."

The purpose of this document is to outline the laboratory quality assurance procedures as they relate to compliance monitoring and to evaluate performance where statistically valid numbers of control results are available.

Laboratory Overview

A. Organization



B. Laboratory Personnel Qualifications and Experience

Laboratory Supervisor: **Florence Jay**

1979 to Present

Education

Bachelor of Sciences Fort Valley State College Major - Biology

Master of Sciences Iowa State University Major - Fisheries Biology

Experience

Lab Tech I City of San Buenaventura Water Division

Lab Tech II City of San Buenaventura Wastewater Division

Present Duties

Responsibility for the laboratory service including planning, budget and QA functions. Perform and supervise others in performing routine and sophisticated chemical, physical and biological analysis of water and waste.

Senior Technician: **VACANT**

Lab Tech II: **Michele G. Holmes**

1989 to Present

Education

Associate of Arts, Ventura College, Major - Natural Science

Experience

Laboratory Technician, BTC Laboratories, Ventura California

Laboratory Technician, SOCI Laboratory, Westlake, California

Laboratory Technician, City of Oxnard, Oxnard, California

Present Duties

Under supervision, perform routine chemical, physical and biological analysis of water and waste.

Lab Tech I: **George Beswick**

1972 to Present

Education

Waynesburg College Seton Hill College University of Pittsburg
Total 60 Units Major - General Education

Experience

Lab Technician University of Pittsburg School of Medicine

Present Duties

Under supervision, perform routine chemical, physical and biological analysis of water and waste.

Lab Tech I: **Dat Tien Le**

1975 to Present

Education

Bachelor of Science Saigon School of Pedagogy

Experience

Biology Instructor Petrus Ky High School Saigon, Vietnam

Present Duties

Under supervision, perform routine chemical, physical and biological analysis of water and waste.

Lab Tech I: **Lotfollah Momen-Safaii**

1992 to Present

Education

Bachelor of Sciences Southern Utah State College - Biology

Experience

Laboratory Technician, Ventura Regional Sanitary District

Present Duties

Under supervision, perform routine chemical, physical and biological analysis of water and waste.

C. Instrumentation and Equipment

The division laboratory owns and maintains the following equipment and instrumentation.

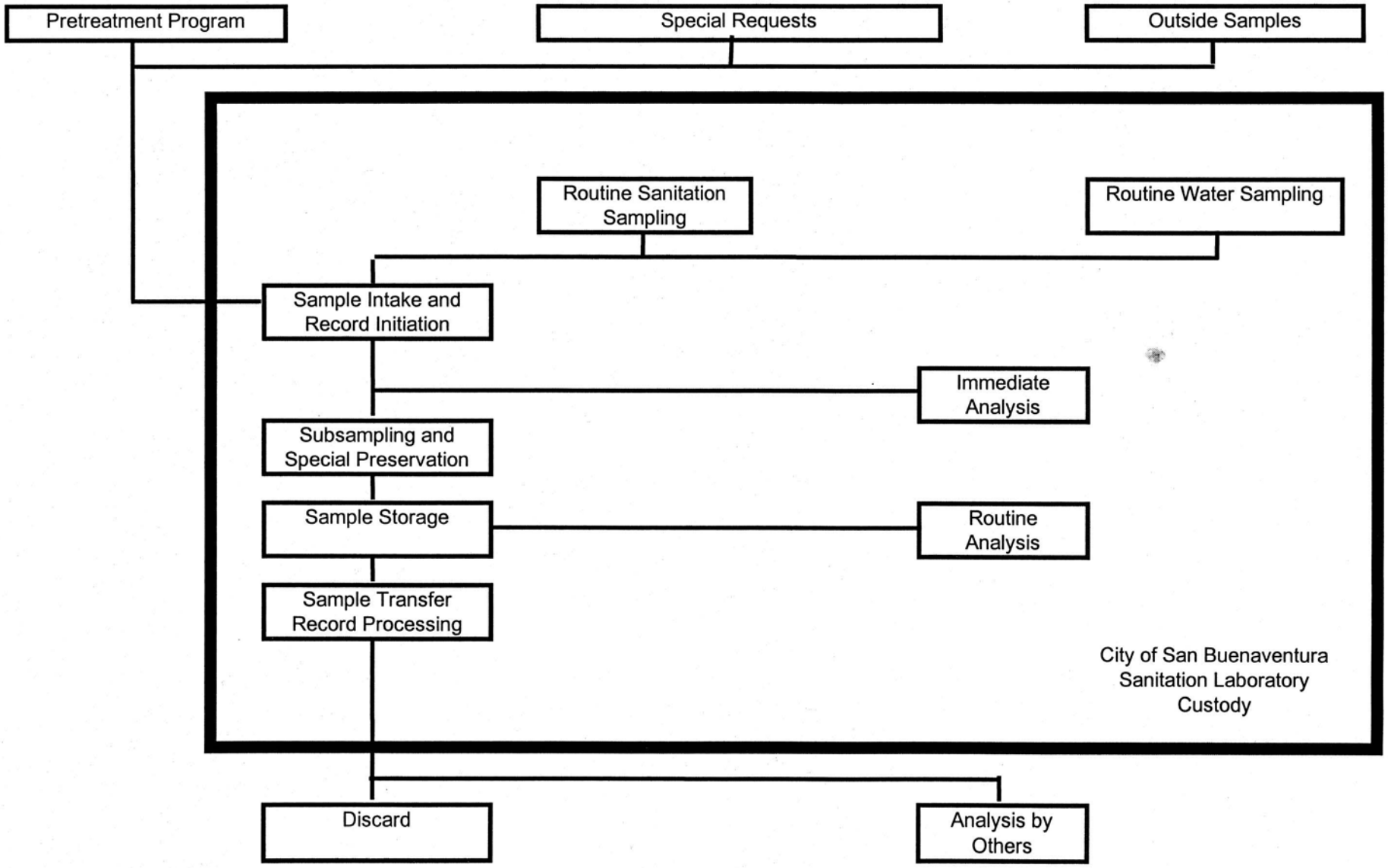
UNIT	MANUFACTURER/MODEL	MAINTENANCE
Water Still	Corning 3 Liter Megapure	Division
D. I. Water Supply	Culligan Commercial Units	Culligan
Forced Convection Oven	NAPCO Model 630	Division
Oven	Labline Model 3500	Division
Muffle Furnace	Thermoline Model FA-1730/Temcometer	Division
Incubator (Air)	Precision Model 30M	Division
Incubator (Water Bath)	Blue M Magniwhirl Model 1110A	Division
Incubator (BOD)	Freas Model 815	Division
Autoclave	Pharmetics Datacon II	Division
pH Meters	Orion Model 601	Division
	Orion Model 701	Division
	Cole-Parmer 5938-00 Portable	Division
Specific Ion System	Orion Model EA 940 Meter/Electrodes	Division
Conductivity Meter	Barnstead Model PM 70-CB	Division
D.O. Meters	Orion SL 9 Portable Probe	Division
	Orion Model 9708 Electrode	Division
Nepthelometers	Hach Model 2100A	Division
	Hach Ratio/XR	Division
Analytical Balances	Mettler Model AE 163	Division
	Mettler Model H20T	Division
Top-Loading Balances	Mettler Model PM2000	Division
	Mettler Model PM2000	Division
Microscopes	American Optical 40-1000X Phastar	Division
	American Optical .7-3X Stereo	Division
Spectrophotometers	HP 8453 UV-Visible Spectrophotometer	HP
	Bausch & Lomb Spectronic 20	Division
Spectrophotometer AA-AE	Varian Spectra220/Furnace Atomizer/ GTA110 Autosamplers	Varian
Ion Chromatograph	Waters/Millipore/Dionex ASRS-I Self Regenerating Supressor/Dionex CD20 conductivity Detector	Waters
Gas Chromatograph	HP 6890 GCSystem Series Autosampler; Micro ECDetector Flame Ionization Detector	HP
Purge/Trap system	HP 7695	HP
Dispenser/Diluter	Gilson 222	Division
Samplers	4 ISCO Model 2700	Division
	3 ISCO Model 2900	Division
	3 American Sigma 800SL	Division
	1 ECOA Model E	Division
Hewlett Packard	-- Hewlett Packard Co. Van Nuys, Ca.	
Varian	-- Varian Sugarland, Texax	
Division	-- Ventura Sanitation Division Personnel	

III. PROCEDURES, RECORDS AND REPORTS

A. Sampling

Procedures for sampling, sample preservation and transportation conform to the requirements of 40 CFR Part 136 and/or to 40 CFR Part 141 and ammendments.

The laboratory sample path is shown below.



Sample Identification

Sampling sites for routine Sanitation and Drinking Water monitoring are fixed and identified by name, number or acronym. This identification is used on location maps, in sample logs, on bench worksheets, on permanent records and on analysis reports.

Other Water or Sanitation samples, Industrial Waste samples and any non-routine sample received is assigned a unique Laboratory Identification Number. As above, this number is used in sample logs, bench worksheets, permanent records and on analysis reports.

Custody

Change of custody occurs when a sample enters or leaves the laboratory unit as defined by the double line of the sample path diagram on Page 7.

Custody documents vary with the sampling purpose, but all custody transfers identify the sample by name and/or Laboratory Identification Number, identify the sample collector and document date, time, location and circumstances of sample collection along with the history of sample transfers by person and/or organization.

B. Analysis Procedures

Bench procedures for routine analytical methods performed by the Laboratory are maintained in a loose-leaf notebook in the Laboratory work area. These are derived from approved standard procedures with analytical options for interference correction, sample volume etc. defined for the samples routinely examined. These procedures are reviewed periodically and revised to accommodate method and sample changes.

These detailed analytical procedures are numerous, lengthy and inappropriate for inclusion here. A summary listing of the references for procedures employed in routine analysis is given as part of the performance evaluation data tables which follow.

For unfamiliar and non-routine samples, the primary analytical procedures are followed for determining dilution, interference correction and all other method variables.

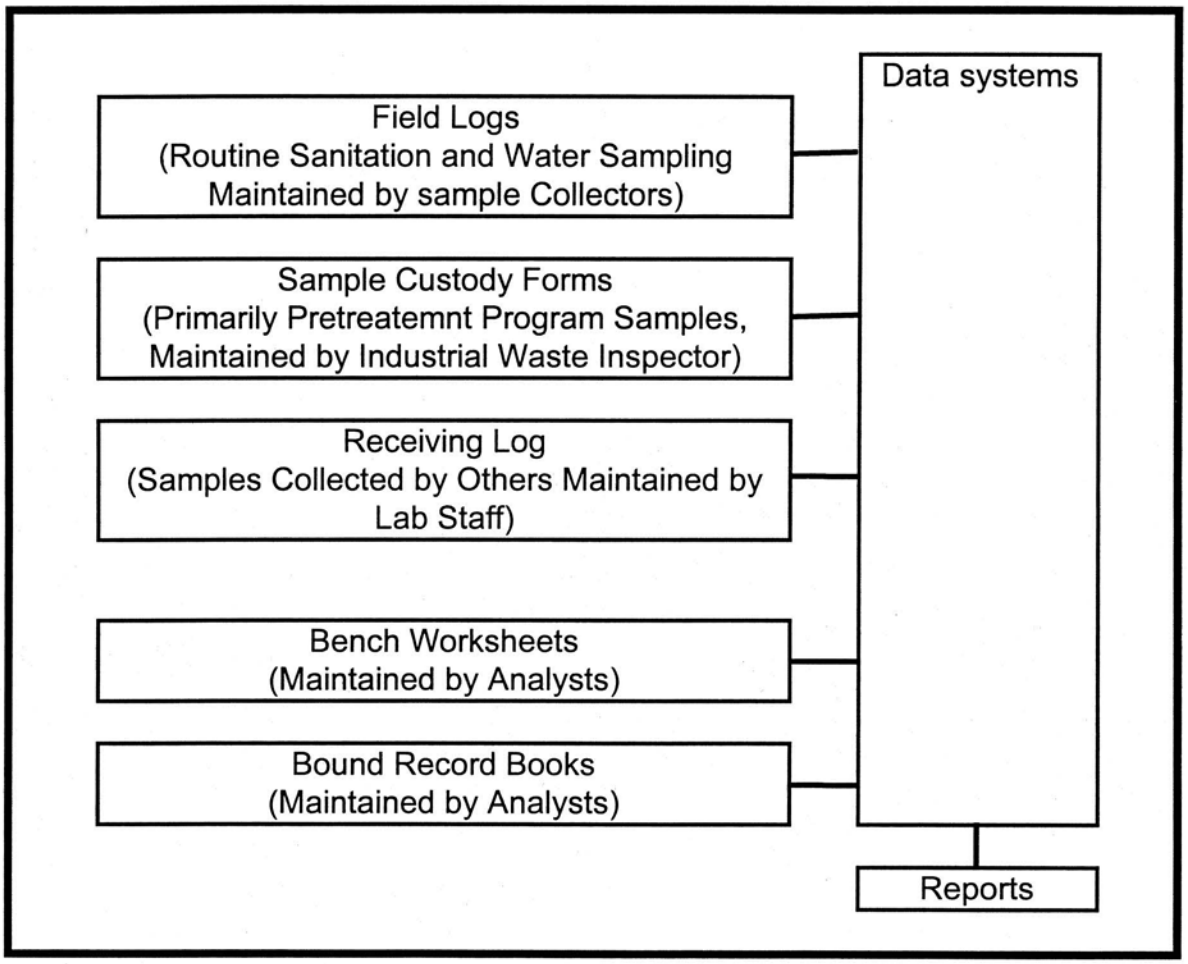
C. Records

Systematic procedures for record keeping and retention have been established in conformance with the requirements of compliance monitoring and good practice.

The following summarizes the purposes and retention criteria for each general type of written laboratory record.

Record	Function	Retention
Field Logs	Record of Field Measurements and Circumstances of Sampling	7 Years
Receiving Log	Record of Samples Received from Others	7 Years
Sample/Custody Form	Pretreatment Program Sampling	7 Years
Bench Logs	Worksheets for Data and Calculation	7 Years
Bound Record Books	Permenant Record of Analysis Results	7 Years
Reports	Transmittal of Information to Others	7 Years

Data flow from generation to reporting is shown below.



D. Reports

Report formats and content are generally specified by the agency requesting such reports. Reports of routine monitoring are provided by computer methods designed to meet these specifications.

All current procedures, records and reports are available at the laboratory for review and inspection. Records of analytical results are available from 1971 to date.

Sample Retention Requirements

Sample Source	Frequency	Subsample	Discard After:	Authorization by:
Drinking Water	Weekly	Turbidity, Iron Filters	Analysis Complete	Analysts
Drinking Water	Any	Bacti	Innoculation Complete	Analysts
Drinking Water	Monthly	Chemistry	Report Reviewed	Lab Supervisor
Drinking Water	Quarterly	THM	Report Reviewed	Lab Supervisor
Drinking Water	Annual	Metals, Organics	Report Reviewed	Lab Supervisor
Conjunctive Use	Any	All	Report Reviewed	Lab Supervisor
Surface and Ocean	Any	Bacti	Innoculation Complete	Analysts
Wastewater	Daily Grab	pH, Turbidity, Residual, Oil and Grease	Analysis Complete	Analysts
Wastewater	Daily Grab	Bacti	Innoculation Complete	Analysts
Wastewater	Daily Composit	pH, Solids, Oxygen Demands, Cond	Analysis Complete	Analysts
Wastewater	Weekly Composite	Nitrogen, Chloride	Analysis Complete	Analysts
Wastewater	Weekly Composite	MBAS	Analysis Complete	Analysts
Wastewater	Weekly Composite	Sulfate	Report Reviewed	Lab Supervisor
Wastewater	Monthly Composite	Phenols	Report Reviewed	Lab Supervisor
Wastewater	Monthly Composite	Minerals	Report Reviewed	Lab Supervisor
Wastewater	Monthly Composite	CN, PO4, Alk, B, F	Analysis Complete	Analysts
Wastewater	Monthly Grab	Bioassay	Test Setup	Analysts
Wastewater	Quarterly Composite	Metals	Report Reviewed	Lab Supervisor
Wastewater	Quarterly Composite	Pesticides	Report Reviewed	Lab Supervisor
Source Control	Any	All	Report Reviewed	IW Inspector
Special	Any	All	Report Reviewed	Lab Supervisor

IV. QUALITY ASSURANCE PROCEDURES AND DOCUMENTATION

A. General

The quality assurance procedures employed by the laboratory are intended to accomplish the following objectives:

1. Provide primary control over the accuracy reagents and standards employed in analysis.

2. Provide day-to-day control over the accuracy of measurements.

Specific actions designed to accomplish these goals in each area of laboratory measurement are discussed in the following.

B. Laboratory Equipment

Equipment subject to read-out drift for environmental, mechanical or electronic reasons is checked periodically for alignment. Other units, such as ovens or incubators are monitored for accuracy and consistency. Readings are taken or calibration procedures are performed and recorded at the frequency indicated below.

Unit	Calibration Procedure	Frequency
Ovens	Verify Temperature and Adjust as needed	Daily
Incubators	Verify Temperature and Adjust as needed	Daily
Furnace	Verify Temperature and Adjust as needed	Daily
pH Meters	Calibrate with Buffer Solutions	Prior to Use
D.O. Meters	Air Calibrate	Prior to Use
D.O. Meters	Check Against Winkler Titration	Weekly
Turbidimeters	Calibrate with Secondary Turbidity Standards	Prior to Use
Turbidimeters	Calibrate with Certified Standards	Prior to Use
Spectrophotometer	Verify Wavelength Accuracy with Holmium Oxide Filter	Quarterly
Autoclave	Verify Accuracy of Integral Recorder with Lag Thermometer	Weekly
Balances	Verify Accuracy with External Calibration Weights	Weekly

C. Chemical Analysis

Analysis reagents and standards are prepared from Primary standard materials, calibrated against Primary Standard materials, or purchased as certified purity and/or certified concentration standards.

These procedures are used to assure conformance to narrow concentration or purity limits when procedures require it, to determine when a reagent must be discarded and for purposes of determining calculation factors to avoid determinant errors in analysis results.

D. Day-to-day control of accuracy of results

Testing for chemical and physical composition is routinely conducted on a batch basis. Each sample batch is run with controls and acceptance of sample results as valid is based on the results of the control analysis.

Most such routine control samples are prepared in house for frequently performed analyses. For other procedures the Division Laboratory analyzes SPex Certiprep - EMSL or NIST traceable commercial reference samples.

In addition to these primary checks on the accuracy and precision of measurement, sample replicates and matrix spikes are carried through all procedures.

E. Corrective Actions

Some laboratory data reduction is automated, in many cases including instrument data generation. In automated applications, if a control, spike or sample duplicate evaluation fails to meet standard criteria for method performance, the analysis process is halted and/or sample results are withheld by the software system and analysis cannot continue until the cause of the failure is identified and acceptable results from the control materials are produced.

In procedures where automation is not employed, the analyst performs the same function: data is not reportable unless results from analysis of control, spike and sample duplicates run with the analysis batch are within acceptance standards.

F. Special considerations for Trace Organic Analyses

The Quality Assurance requirements for trace organic analysis are narrowly defined by the approved analytical procedures. These requirements are adhered to.

Standard materials used in Trace Organic Analysis are normally obtained from Supelco Incorporated. Bellefonte, PA. If appropriate materials are not available

from this source, they are obtained from manufacturers or from normal chemical supply sources.

Control materials employed in these analyses are also obtained from Supelco Incorporated. Bellefonte, PA.

As with all other measurements, acceptability of sample results is dependent on control analysis results being within acceptance limits.

G. Special Considerations for Toxicity Analysis

Instrument Calibration

Continuous temperature recorders for monitoring test solution temperatures are Taylor Instrument drum recorders with remote sensor probes. Recorders are calibrated against ASTM 90C glass thermometers by adjustment of the pen arm.

pH measurement is made with a Markson 6100 portable meter. Calibration is noted in section IV.B.

D.O. measurement is made with an Orion SL9 portable meter. Calibration is noted in section IV.B.

Reference materials are analyzed as noted below.

Analysis	Reference Material	Frequency of Reference Analysis
Acute Toxicity	Copper Sulfate	With Every Test Sample
Algae Growth Chronic Toxicity	Cadmium Chloride	With Every Test Sample
Ceriodaphnia Survival and Reproduction	Copper Sulfate	With Every Test Sample
Larval Fathead Minnow Survival and Growth	Copper Sulfate	With Every Test Sample

Other test acceptance criteria are noted below.

Analysis	Criterion
Acute Toxicity	Survival in Controls >> 90 %
Algae Growth Chronic Toxicity	Control cell counts >> 200,000/ml
Algae Growth Chronic Toxicity	Control Replicate Counts << 20% Different
Ceriodaphnia Survival and Reproduction	Survival in Controls >> 90 %
Ceriodaphnia Survival and Reproduction	Average Number of Offspring >>= 15
Larval Fathead Minnow Survival and Growth	Survival in Controls >> 90 %
Larval Fathead Minnow Survival and Growth	Control Average Dry Weight >> 0.250 mg

H. Bacteriological Analysis

Bacteriological analysis required by NPDES and SDWA monitoring is routinely performed by the multiple-tube fermentation procedure.

The Laboratory is equipped to perform MTF tests for Total Coliform, Fecal Coliform and Fecal Streptococci; Membrane Filter tests for Total and Fecal Coliform; and Heterotrophic Plate Count.

Quality assurance is directed primarily toward control of the MTF procedures. Other procedures above are utilized at irregular intervals and generally for other than compliance monitoring. Basic media and equipment quality control for these other procedures is conducted similar to that for MTF analysis described herein.

Total Coliform testing is routinely performed following the procedures of Section 9221B of "Standard Methods for the Examination of Water and Wastewater," 18th Edition. All Samples are carried through the Brilliant Green Bile confirmation step.

At least 5% of all samples testing positive in the confirmed coliform procedure are carried through the completed procedure.

Fecal Coliform testing is routinely performed following the procedures of Section 9221E of "Standard Methods for the Examination of Water and Wastewater," 18th Edition.

Fecal streptococcus testing is routinely performed following the procedures of Section 9230B of "Standard Methods for the Examination of Water and Wastewater," 18th Edition.

Control tests for water suitability and for inhibitory residues are performed annually following the procedures of Section 9020B(3)(a)(2) and 9020A(3)(c)(1)

of "Standard Methods for the Examination of Water and Wastewater," 18th Edition.

Commercial dehydrated media is used for all analysis. Media is tested for accurate response by innoculation of portions from each prepared batch with Escherichia coli (ATCC 25922), Staphloccus aureus (ATCC 25923) and Streptococcus faecalis (USEPA-EMSL Cincinnati 111054). Coliform test materials failing to give a positive response to Echerichia coli, a negative response to Staphlococcus aureus and no response upon incubation of un-inoculated media are discarded. Fecal strep test materials failing to give a positive response to Streptococcus faecalis, a negative response to Staphlococcus aureus and no response upon incubation of un-inoculated media are discarded.

Both media and equipment are prepared in weekly batches, and materials are tested for sterility using Tryptic Soy Broth before use and dated to assure they are used within acceptable holding periods or discarded.

ANNUAL REPORT OF ANALYSIS

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Executed on the 23rd day of April, 1999, at Ventura, CA.

Donald L. Davis
Wastewater Superintendent

Donald Burt

Donald Burt
Acting Operations Supervisor

Florence B. Jay

Florence B. Jay
Laboratory Supervisor