VENTURA PUBLIC WORKS

CITY Of SAN BUENAVENTURA
PUBIC WORKS/UTILITES/WASTEWATER

ANNUAL REPORT OF ANALYSIS 2001

Cover: Photo of a Bobcat and a Rabbit resting was taken near the Wildife Ponds by Mr. Don Williamson, an avid birdwatcher.

ANNUAL REPORT OF ANALYSIS

CITY OF SAN BUENAVENTURA

VENTURA WATER RECLAMATION FACILITY

2001

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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 105,000 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, 12 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 during 2001 include comminution, grit removal, primary sedimentation, primary flow equalization, activated sludge secondary biological treatment, tertiary effluent filtration and Chlorination.

During 2001 the ongoing Upgrade construction completed the rehabilitation of the activated sludge system, the main secondary treatment process. Operation of the trickling filter as a roughing filter ahead of the activated sludge process was ceased and full operation of the activated sludge system had been restored.

In 2001 process solids were treated by anaerobic digestion, dewatered and applied to agricultural land at River Island Farm near Wasco, California.

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 9.1 MGD, this provides approximately 4 days of detention.

Wastewater facilities include pump stations and pipelines for water reclamation. In 2001 the daily average volume of treated effluent reclaimed was 844,443 gallons. The maximum daily reuse volume measured in 2001 was 2,281,000 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 conservation program and represents a reduction in demand on the freshwater supply each year of approximately 325 million gallons.

Reclaimed water for irrigation and for discharge to the Santa Clara Tidal Prism is withdrawn from the end of the wildlife pond system. Irrigation water supply is delivered by two pump stations into 3 distribution lines.

Residence in these ponds provides substantial dissipation of Chlorine residual and a corresponding reduction in the cost of dechlorination chemicals needed to meet the requirement for complete Chlorine neutralization prior to discharge to the tidal prism. Chlorine dissipation also reduces the risk of landscape damage from high Chlorine concentrations in water supplied for irrigation.

Additionally the reservoir capacity of the wildlife ponds serves as a safeguard against use of effluent of unacceptable quality for irrigation of park land, where significant public health risk may occur. The pond detention time allows completion of analysis necessary to assure the safety of the irrigation supply before that water would reach the point of irrigation withdrawal.

When necessary, irrigation use from the ponds can be discontinued before inadequately treated effluent reaches the irrigation intake. When ponds operate in series, and all ponds are in operation, the safety margin is 4 days.

NPDES permit CA0053651, issued by the Los Angeles Regional Water Quality Control Board as Order 00 -144 regulates discharge of treated effluent to the Santa Clara Tidal Prism.

Reuse of effluent for irrigation is regulated by Los Angeles Regional Water Quality Control Board Order 87-45.

II. PROCESS PERFORMANCE AND COMPLIANCE WITH DISCHARGE REQUIREMENTS

On 14 days during 2001 the effluent total coliform failed to meet compliance exceeding the 7-day coliform median of 2.2 MPN.

On 11 days during 2001 the turbidity of the filtered effluent failed to meet compliance exceeding the daily limit of 2.0 NTU.

On 9 days during 2001 the turbidity of the filtered effluent failed to meet compliance of the 5.0 NTU more than 5% for a 24-hour period.

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
1999	1348	285	388	0.7	0.72
2000	1474	286	423	0.8	0.58
2001	1370	241	435	0.7	0.63

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
1999	249	116	43	21
2000	287	130	48	23
2001	265	115	48	20

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 2001.

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 2900 sampler programmed to collect samples at non-uniform time intervals proportional to the flow to the Roughing Filter 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 a Sigma Model 900 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. Chlorophyll A, Phosphorous and the 17 Dioxin Congeners. 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. A Residual Chlorine Analyzer also continuously monitors the flow from the station.

RECEIVING WATER SAMPLE STATIONS

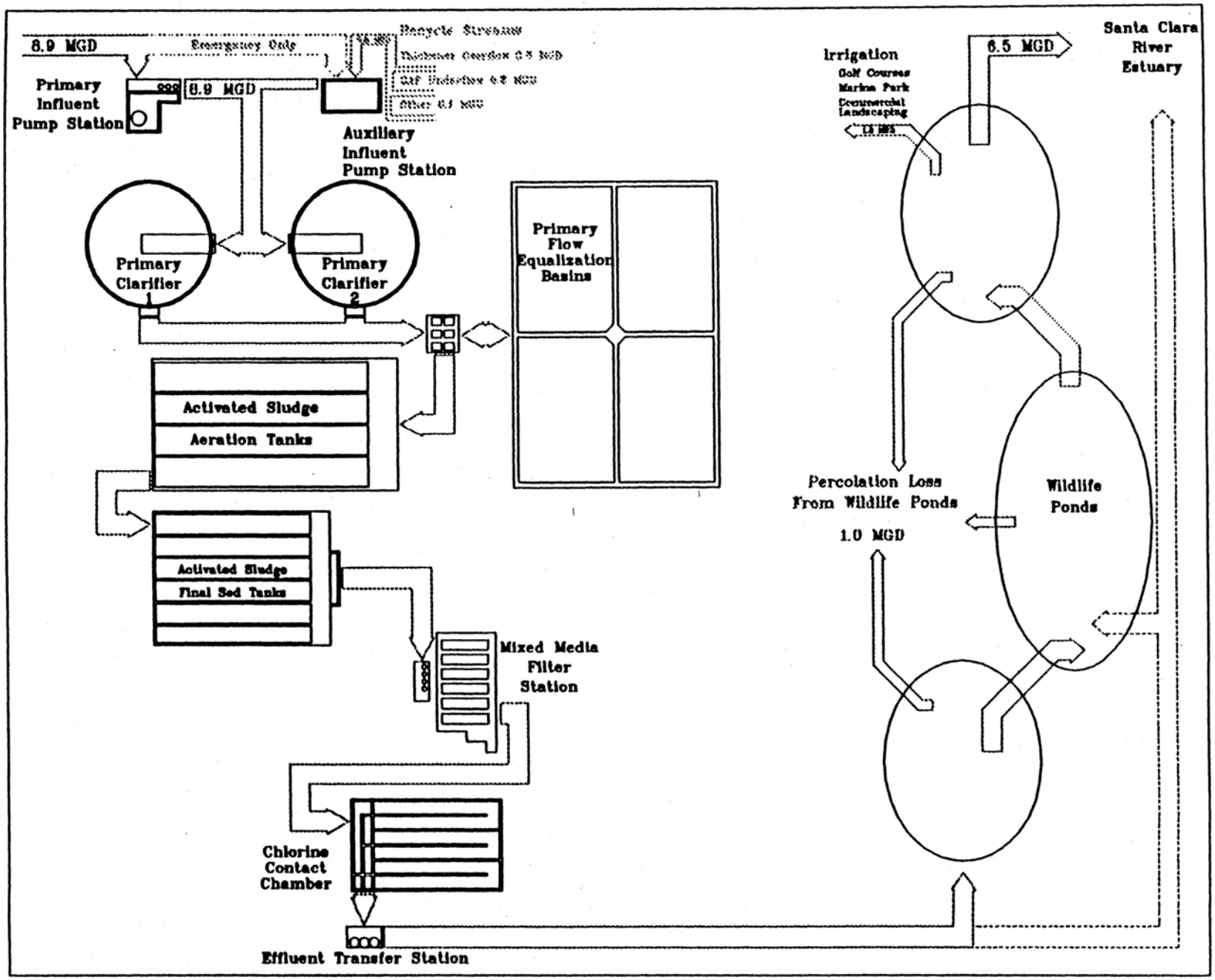
Five sample stations, designated R1 through R4 and L5 within the Santa Clara Tidal Prism are specified by the Los Angeles Regional Water Quality Control Board in the facility NPDES permit. The City monitored this additional station voluntarily until 1995 when the renewed NPDES permit made it a required monitoring station.

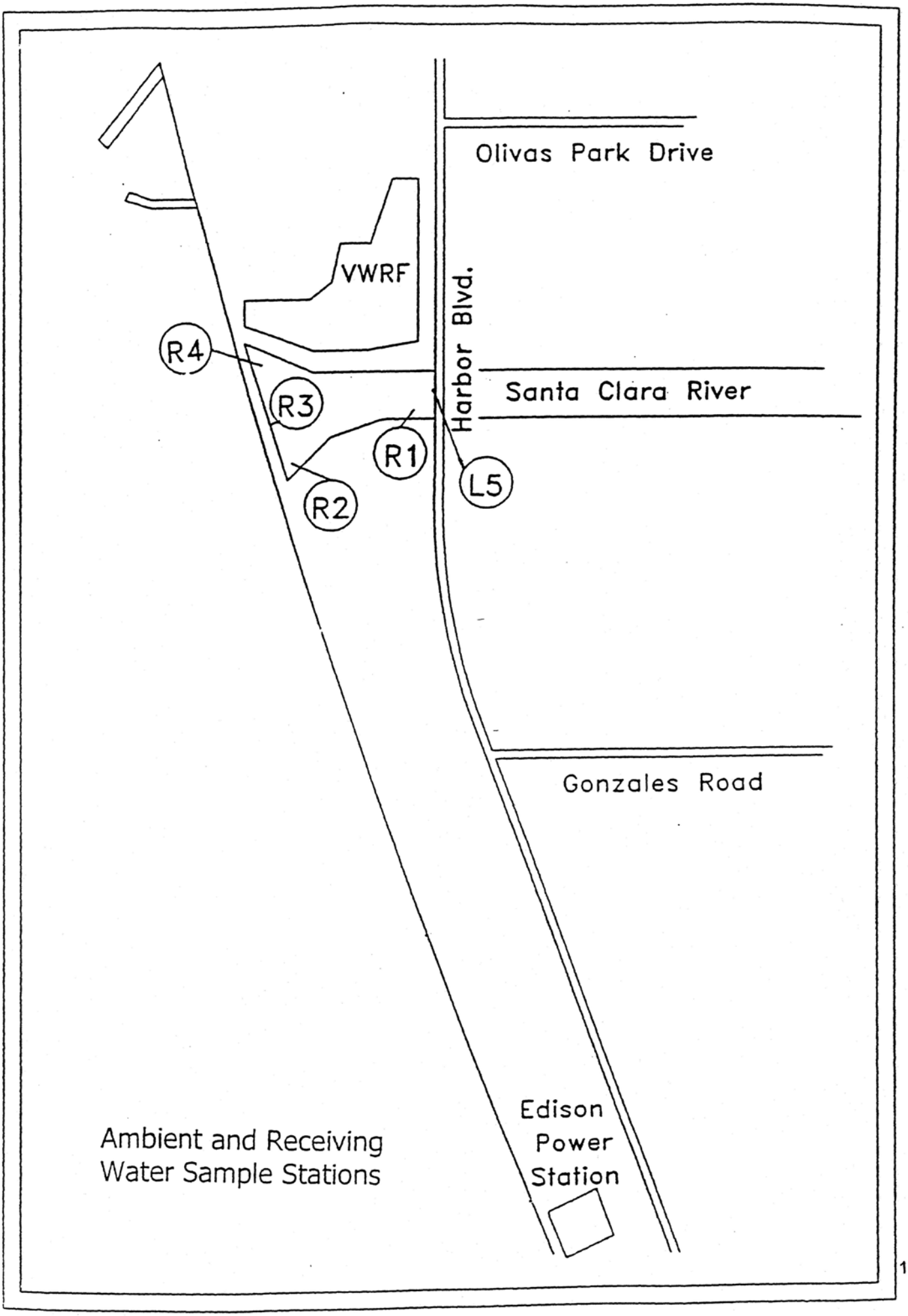
Water quality Observations, Temperature, Salinity, Chlorine Residual and Dissolved Oxygen are measurements are made at each of these sites.

Grab samples from these locations are taken weekly and analyzed for Total Coliform, Fecal Coliform and Total Hardness. Other required monthly analyses for the receiving water stations R1 through R4 and L5 are Total Phosphorous, Nitrogen Compounds, and Chlorophyll A.
Priority Pollutants are performed on sample stations R1, R3 and L5 quarterly.

Grab samples from station R1, on the flowing stream as it enters the Tidal Prism, and R3, on the west shoreline near the point of discharge and L5 on the flowing stream as it exits the Tidal Prism from the Ventura Water Reclamation Facility are analyzed for Chronic Toxicity. Samples are taken monthly for three months during the winter and analyzed using the same three species protocol applied to the discharge. Chronic Toxicity is performed once during the summer on the most sensitive test species for each station.

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


8.9 MGD
Emergency Only
Recycle Streams
Primary Influent Pump Station
8.9 MGD
Auxiliary Influent Pump Station
Primary Clarifier 1
Primary Clarifier 2
Primary Flow Equalization Basins
Activated Sludge
Aeration Tanks
Activated Sludge
Final Sed Tanks
Mixed Media Filter Station
Chlorine Contact Chamber
Effluent Transfer Station
Irrigation
Golf Courses
Marina Park
Commercial Landscaping
6.5 MGD
Santa Clara River Estuary
Percolation Loss From Wildlife Ponds
1.0 MGD
Wildlife Ponds



Ambient and Receiving
Water Sample Stations

Ventura Water Reclamation Facility

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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	9.28	7.31	206	248	524	27.9	52.1
February	9.59	7.48	206	253	505	26.0	34.9
March	10.78	7.47	234	250	487	22.7	34.8
April	9.61	7.41	246	275	552	22.4	37.6
May	9.15	7.27	227	264	566	25.2	28.9
June	9.14	7.21	230	278	581	26.4	45.7
July	9.09	7.33	225	269	561	26.6	44.1
August	9.13	7.35	239	279	581	24.7	40.1
September	9.06	7.31	220	287	532	26.2	
October	8.98	7.35	214	254	518	24.9	28.8
November	9.08	7.15	228	307	586	24.9	44.1
December	8.85	7.46	219	243	485	27.5	50.6
Average	9.31	7.34	225	267	542	25.7	40.4
Maximum	18.60	8.23	415	460	925	30.6	52.1
Minimum	7.87	6.80	80	155	294	15.3	28.8
Total	3380.34						

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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 *	0.156	<0.001	<0.002	0.035	<0.0002	<0.004	0.02900	<0.001	0.0370	0.166
February	3.255	<0.005	<0.002	0.103	<0.0010	<0.0010	<0.010	0.0082	0.1626	
May	0.718	0.0013	<0.0003	0.093	<0.00002	<0.00013	<0.00038	0.0016	0.1782	0.150
August *	1.200	<0.001	<0.002	0.082	<0.0002	<0.004	0.01200	<0.001	0.1207	0.181
August	1.561	0.002	<0.0003	0.114	<0.0002	<0.0001	0.00440	0.0019	0.1710	
November	1.024	0.005	0.001	0.147	<0.0002	<0.0001	0.00150	<0.0007	0.1988	0.159
Average	1.319			0.096				0.002	0.1447	0.164
Maximum	3.255			0.147				0.008	0.1988	0.181
Minimum	0.156			0.035				0.000	0.037	0.150

*Analyzed by American Scientific Laboratories, Los Angeles, CA

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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*	<0.005	<0.0002	<0.001	0.0260	<0.002	<0.0002	<0.001	<0.100	<0.004	0.0430
February	0.0051	<0.001	0.0285	<0.010	<0.005	<0.002	<0.001		0.0184	0.2330
May	0.0038	0.0004	0.0088	0.0214	<0.00049	<0.00021	<0.0001		0.018	0.218
August*	<0.005	<0.0002	0.0140	<0.010	<0.002	<0.0002	<0.001	<0.100	<0.004	0.1940
August	0.0066	0.0002	0.0151	0.0127	0.001	<0.0002	<0.0001		0.013	0.1807
November	0.0016	0.0010	0.0163	0.0090	<0.0005	0.0110	<0.0001		0.0236	0.1461
Average	0.003	0.000	0.014	0.012	0.000	0.002	<0.001		0.012	0.169
Maximum	0.007	0.001	0.029	0.026	0.001	0.011			0.024	0.233
Minimum			0.009							0.043

*Analyzed by American Scientific Laboratories, Los Angeles, CA

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Influent Pump Station

Month	Acetone	Chloroform	1,4 Dichlorobenzene	Ethylbenzene
February *	0.0542	0.0037	<0.0005	0.0012
August *	0.1690	0.0049	0.0010	<0.00034

Month	Tetrachloroethylene	Toluene	1,1,1-Trichloroethane	Xylenes
February *	0.03150	<0.0002	<0.00003	0.0083
August *	<0.00003	<0.0002	<0.00003	<0.0005

*Analyzed by American Scientific Laboratories, Los Angeles, CA

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	7.32	88.1	169	349	7.4	32.0	52.4
February	7.56	89.1	169	337	8.6	33.1	42.8
March	7.61	83.6	148	284	6.2	25.1	40.4
April	7.54	89.7	169	310	6.2	26.9	39.7
May	7.46	80.8	176	341	6.0	27.6	36.1
June	7.39	69.2	184	353	5.7	25.4	44.7
July	7.48	73.1	155	300	6.0	28.5	23.7
August	7.56	103.5	156	325	6.1	35.7	45.0
September	7.35	86.1	183	392	18.5	27.4	38.3
October	7.41	75.6	152	333	8.9	28.8	33.7
November	7.34	80.3	213	410	3.7	25.3	36.0
December	7.54	87.2	155	336	12.0	27.5	23.6
Average	7.46	83.7	169	339	7.9	28.8	38.0
Maximum	7.93	470.0	282	590	18.5	42.6	52.4
Minimum	7.05	49.8	96	192	3.7	18.5	23.6

Ventura Water Reclamation Facility

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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	8.67	10.83	18.3	41.7	0	7.53	2.03	5.25	6.5
February	8.94	9.94	21.4	38.1	<0.05	7.92	1.40	5.31	10.6
March	10.07	13.69	23.7	42.7	<0.05	9.36	1.44	4.75	3.3
April	8.89	12.96	45.5	44.9	<0.05	9.86	1.58	4.55	4.2
May	8.74	10.12	21.3	42.6	<0.05	6.18	3.90	4.68	2.6
June	8.76	10.18	21.1	40.7	<0.05	8.10	<0.40	2.11	4.2
July	8.89	43.92	56.8	77.8	<0.05	6.70	3.65	4.18	4.2
August	8.76	20.48	31.8	51.7	<0.05	4.58	2.90	8.96	5.9
September	8.90	12.91	23.7	52.2	0.350	3.28	6.43	6.13	6.2
October	10.01	19.32	39.5	64.2	<0.05	5.23	6.88	2.09	4.2
November	9.77	15.06	19.1	44.5	<0.05	10.52	1.50	1.63	4.4
December	9.49	15.71	18.0	43.3	0.100	12.10	0.63	0.59	5.4
Average	9.16	16.22	28.3	48.7	0.08	7.33	3.04	4.32	5.4
Maximum	12.46	299.40	270.0	412.4	0.350	13.80	8.80	18.70	10.6
Minimum	7.65	4.30	4.4	26.9	<0.05	1.40	<0.40	0.47	2.6

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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	6.73	1.04	70	1357	2177	1.9	128	25.7	<0.1
February	6.90	1.62	117	1382	2140	2.2	155	26.3	<0.1
March	6.97	2.42	219	1509	2293	2.0	176	25.4	<0.1
April	6.76	1.96	129	1460	2237	2.2	146	29.1	<0.1
May	6.74	1.56	99	1293	2020	2.2	141	27.5	<0.1
June	6.65	1.36	84	1244	1941	1.8	107	26.7	<0.1
July	6.76	1.95	127	1276	2005	2.1	132	28.2	<0.1
August	6.89	2.17	137	1346	2111	2.7	174	30.8	<0.1
September	6.71	1.95	125	1385	2173	1.7	104	32.3	<0.1
October	6.66	2.78	184	1398	2167	2.2	141	30.2	<0.1
November	6.98	1.36	98	1415	2197	1.2	86	25.2	<0.1
December	7.06	1.00	65	1388	2179	1.4	93	22.3	<0.1
Annual Average	6.82	1.75	121	1370	2136	2.0	133	27.5	<0.1
Maximum	7.60	10.88	896	1676	2440	11.4	765	53.2	-0.1
Minimum	5.89	0.14	9	980	1541	<0.3	<19	17.7	<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	Chlorophyll A* ug/l
January	1.0	0	0.8	10.5	<0.4	6.4	4.1	1.2
February	0.7	0	1.0	10.2	<0.4	4.2	8.2	1.0
March	0.6	0	1.2	12.8	<0.4	3.8	2.2	<0.5
April	1.5	0	0.9	12.6	<0.4	3.2	2.0	<0.5
May	1.2	0	1.2	10.7	<0.4	4.4	1.2	<0.5
June	1.5	0	1.0	11.2	<0.4	2.4	3.0	<0.5
July	2.0	0	1.4	10.7	<0.4	4.2	1.9	3.7
August	2.6	0	1.4	9.2	<0.4	7.7	3.2	3.3
September	0.9	0	1.4	10.8	<0.4	3.6	1.9	<2.0
October	0.5	0	1.9	13.8	<0.4	1.4	2.9	2.1
November	1.3	0	1.2	11.3	<0.4	1.1	6.5	<2.0
December	1.3	0	0.6	13.0	<0.4	0.7	3.4	<2.0
Annual Average	1.3	0	1.2	11.3	<0.4	3.7	3.4	0.4
Maximum	4.9	0	8.7	16.5	2	16.5	8.2	3.7
Minimum	<0.1	<7	0.4	5.0	<0.4	0.3	1.2	<2.0
Limitations of Permit CA0053651								
Maximum	15.0	1750	2.0					
7 Day Average								
30 Day Average	10.0	1170						

*Analyzed by Aquatic Bioassy Consulting Laboratories, Ventura, CA

Ventura Water Reclamation Facility

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Effluent Transfer Station

Month	MBAS mg/l	Chloride mg/l	Sulfate mg/l	Phosphate mg/l	Total Phosphorus mg/l	Fluoride mg/l	Boron mg/l
January	<0.05	254	356	1.60	1.69	0.99	0.82
February	<0.05	235	427	1.55	1.80	0.65	0.86
March	<0.05	255	516	0.79	0.64	0.62	0.83
April	<0.05	255	508	0.97	1.02	0.62	0.85
May	<0.05	280	400	0.05	0.16	0.61	0.76
June	<0.05	256	378	0.04	0.22	0.64	0.74
July	<0.05	158	404	0.58	0.85	0.54	0.67
August	<0.05	124	416	2.36	3.29	0.55	0.72
September	0	161	444	0.33	0.50	0.54	0.60
October	0	181	411	0.12	0.10	0.63	0.56
November	0	356	478	0.63	1.49	0.60	0.01
December	0	356	516	2.59	4.28	0.59	0.68
Annual Average	0.05	241	435	0.98	1.37	0.63	0.68
Maximum	0.17	394	543	2.59	4.28	0.99	0.86
Minimum	<0.05	102	318	0.04	0.10	0.54	0.01

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2001

Effluent Transfer Station

Month	Sodium mg/l	Calcium mg/l	Magnesium mg/l	Potassium mg/l
January	234	99	41.0	24.1
February	272	112	42.2	22.9
March	290	139	50.1	21.3
April	281	120	44.9	22.6
May	277	121	43.4	21.9
June	247	104	38.6	22.1
July	254	106	39.0	20.7
August	233	108	38.4	21.6
September	274	102	41.7	20.8
October	283	112	36.9	20.5
November	293	124	41.1	2.1
December	243	132	43.6	20.5
Annual Average	265	115	41.7	20.1
Maximum	293	139	50.1	24.1
Minimum	233	99	36.9	2.1

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2001

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	11.5	10.8	12.2	11.0
February	9.9	9.3	10.7	8.8
March	10.2	9.1	10.8	9.6
April	8.4	7.5	9.2	8.5
May	11.6	9.8	9.2	10.0
June	10.3	7.9	7.5	8.2
July	11.9	9.6	9.4	9.3
August	10.9	9.2	10.0	9.7
September	7.6	6.1	8.4	6.3
October	10.4	9.5	9.1	9.3
November	9.8	8.5	8.9	8.9
December	9.3	10.6	10.1	8.2
Annual Average	10.2	8.8	9.6	9.0
Maximum	31.5	32.6	27.0	32.6
Minimum	2.0	1.3	4.0	0.5

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2001

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										<0.0025
February	0.029	0.2219	<0.005	<0.002	0.029	<0.001	<0.001	<0.010	<0.0007	0.004
February *		0.1170	<0.001	<0.002	0.021	<0.0002	<0.004	0.027	<0.001	<0.006
March										0.005
April										0.005
May	0.010	0.3328	0.002	<0.0003	0.048	<0.00002	<0.0001	<0.0004	0.005	0.014
June										0.022
July										0.035
August	0.052	0.2385	0.002	0.0003	0.035	<0.00002	<0.0001	<0.0004	<0.0007	0.066
August *		0.1010	<0.001	<0.002	0.025	<0.0002	<0.004	<0.007	<0.0010	<0.006
September										0.007
October										0.017
November	0.006	0.1409	0.003	0.0019	0.047	<0.00002	<0.0001	<0.0004	<0.0007	0.010
December										0.035
Annual Average	0.024	0.192	<0.001	0.0004	0.0340				0.0008	0.016
Maximum	0.052	0.3328		0.0019	0.0475				0.0049	0.066
Minimum									<0.0007	<0.001
Limitations of Permit CA0053651										
Maximum	0.012			0.0760			0.016			0.098
7 Day Average										
30 Day Average								0.050		

*Analyzed by American Scientific Laboratories, Los Angeles, CA

Ventura Water Reclamation Facility

Annual Report 2001

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	<0.005			<0.010						0.092
February *	<0.005	<0.00020	0.0120	0.025	<.002	<0.0002	<0.001	<0.100	<0.004	0.040
February	<0.005	<0.001	0.0218	<0.010	<0.005	<0.002	<0.001		<0.004	0.065
March	<0.005			<0.010						<0.05
April	0.002			0.004						0.035
May	<0.0011	0.0002	0.0122	<0.0012	<0.0005	<0.0002	<0.0001		0.015	0.030
June	0.006			0.004						<0.0042
July	<0.005			<0.005						0.116
August*	<0.005	<0.0002	0.0100	<0.010	<0.002	<0.0002	<0.001	<0.100	<0.004	0.045
August	0.003	0.0002	0.0103	0.003	0.0023	<0.0002	<0.0001		0.011	0.060
September	<0.0011			<0.0012						<0.0042
October	<0.0011			0.002						0.022
November	<0.0011	0.0005	0.0188	0.004	<0.0005	0.0008	<0.0001		0.022	0.037
December	0.008			0.025						0.210
Annual Average	0.001	0.000	0.0142	0.005	0.00	0.000	<0.001	<0.100	0.0080	0.054
Maximum	0.008	0.0005	0.0218	0.025	0.0023	0.0008			0.022	0.210
Minimum	<0.005	<0.0002	0.010							<0.050
Limitations of Permit CA0053651										
Maximum	0.077	0.003		0.271		0.0270	2			1
7 Day Average										
30 Day Average										

*Analyzed by American Scientific Laboratories, Los Angeles, CA

Ventura Water Reclamation Facility

Annual Report 2001

Effluent Transfer Station

Month	Iron mg/l	Manganese mg/l
January	<0.1	<0.03
February	<0.1	<0.03
March	<0.1	<0.03
April	<0.1	<0.03
May	<0.1	0.190
June	<0.1	<0.03
July	<0.1	<0.03
August	<0.1	0.070
September	<0.1	0.040
October	<0.1	<0.03
November	<0.1	<0.03
December	<0.1	<0.03
Annual Average	<0.1	
Maximum	0.200	1
Minimum	<0.1	<0.03

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2001

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	<0.000030	<0.000040	<0.000030	<0.000070	<0.000020	<0.0004		
February *	<0.000004	<0.000003	<0.000006	<0.000009	<0.000004	<0.000065	0.0660	0.0025
May	<0.000003	<0.000006	<0.000004	<0.000014	<0.000007	<0.0004	<0.0001	<0.0002
August	<0.000003	<0.000006	<0.000004	<0.000011	<0.000007	<0.0004		
August *	<0.000004	<0.000003	<0.000006	<0.000009	<0.000004	<0.000065	0.0168	0.0064
November	<0.000003	<0.000006	<0.000004	<0.000011	<0.000007	<0.0004	0.0467	0.0038
Annual Average							0.0324	0.0032
Maximum							0.0660	0.0064
Minimum								
Limitations of Permit CA0053651								
Maximum	0.00130				0.0002		0.070	
7 Day Average								
30 Day Average								

*Analyzed by American Scientific Laboratories, Los Angeles, CA

Ventura Water Reclamation Facility

Annual Report 2001

Effluent Transfer Station

Month	Chloroform mg/l	Carbon Tetrachloride	Chlorobenzene	Dibromochloromethane	1,4-Dichlorobenzene
February *	0.1130	<0.00012	<0.0002	0.0289	<0.0005
May *	<0.00005	<0.00012	<0.0002	<0.00009	<0.0005
August *	0.0141	<0.00012	<0.0002	0.0104	<0.0005
November **	0.0405	<0.0005	<0.0005	0.0302	<0.0005
Annual Average	0.0419	<0.00012	<0.0002	0.0174	<0.0005
Maximum	0.1130			0.0302	<0.0010
Minimum				<0.0009	<0.0005

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

*Analyzed by American Scientific Laboratories, Los Angeles, CA
** Analyzed by FGL Environmental, Santa Paula, CA

Ventura Water Reclamation Facility

Annual Report 2001

Effluent Transfer Station

Month	Pentachlorophenol mg/l	bis (2-Ethylhexyl)phthalate
February *	<0.0036	<0.0025
May *	<0.0036	<0.0025
August *	<0.0036	<0.0025
November **	<0.050	<0.0100
Annual Average		
Maximum		
Minimum		
Limitations of Permit CA0053651		
Maximum	0.0130	0.0059
7 Day Average		
30 Day Average	0.0079	

*Analyzed by American Scientific Laboratories, Los Angeles, CA
** Analyzed by FGL Environmental, Santa Paula, CA

Ventura Water Reclamation Facility

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Irrigation Reuse Flows

Month	Olivas Pump Station Flow MGD	Marina Park Flow MGD	Buena Pump Station Flow MGD	Total Irrigation Flow MGD
January	0.2358	0.5016	0.1289	0.8663
February	0.1843	0.2313	0.0720	0.4876
March	0.2586	0.0050	0.1363	0.3998
April	0.5789	0.0252	0.3780	0.9821
May	0.6568	0.0463	0.4204	1.1234
June	0.9403	0.0631	0.5588	1.5622
July	0.9027	0.0601	0.5554	1.5182
August	0.8814	0.0659	0.4984	1.4457
September	0.6784	0.0458	0.3996	1.1238
October	0.5312	0.0385	0.2862	0.8559
November	0.1219	0.0142	0.0639	0.2000
December	0.2238	0.0057	0.1184	0.3479
Annual Average	0.5317	0.0909	0.3184	0.8955
Maximum	1.5600	1.3930	0.9920	2.2810
Minimum				

ermit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2001

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	7.93	<0.1	16.75	100.00%		
February	8.67	<0.1	17.21			
March	10.12	<0.1	20.16			
April	7.88	<0.1	20.66			
May	7.65	<0.1	23.29			
June	7.43	<0.1	25.11			
July	7.52	<0.1	24.15			
August	7.57	<0.1	23.81			
September	7.70	<0.1	24.03			
October	7.85	<0.1	22.51			
November	8.58	<0.1	20.32		1.00	1.00
December	7.96	<0.1	17.08		1.00	1.00
Annual Average	8.07	<0.1	21.28	100.00%	1.00	1.00
Maximum	18.54		26.50			
Minimum	5.88		15.40			
ermit 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	1.00
March	1.00	1.00	
April	1.00	1.00	
May	1.00	1.00	
June	1.00	1.00	
July	1.00	1.00	
August	1.00	1.00	
September	1.00	1.00	
October	1.00	1.00	
November	1.00	1.00	1.00
December	1.00	1.00	1.79
Annual Average	1.00	1.00	1.20
Maximum	1.00	1.00	1.79
Minimum	1.00	1.00	1.00

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2001

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					
February					
March					
April					
May					
June					
July					
August					
September					
October	1.00	1.00			
November	1.79	1.79	1.00	1.00	1.00
December	10.00	10.00	3.13	3.13	5.56
Annual Average	4.26	4.26	2.07	2.07	3.28
Maximum	10.00	>10	3.13	3.13	5.56
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 2001

Tidal Prism Receiving Water Stations

Month	R3 Bioassay Chronic Ceriodaphnia Survival TU	R3 Bioassay Chronic Ceriodaphnia Reproduction TU	R3 Bioassay Chronic Fathead Larvae Survival TU	R3 Bioassay Chronic Fathead Larvae Growth TU	R3 Bioassay Chronic Selenastrum Growth TU
January					
February					
March					
April					
May					
June					
July					
August					
September					
October	1.00	1.00			
November	1.79	1.79	1.00	1.00	1.00
December	10.00	>10	3.13	3.13	3.13
Annual Average	4.26	4.26	2.07	2.07	2.07
Maximum	10.00	>10	3.13	3.13	3.13
Minimum			1.00	1.00	1.00

Limitations of Permit CA0053651

Maximum
7 Day Average
30 Day Average

Ventura Water Reclamation Facility

Annual Report 2001

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	14.6	13.7	14.0	14.0	16.5	12.1	14.6	13.8	14.2	9.5
February	12.7	12.3	11.4	12.8	15.0	11.1	12.2	11.7	13.2	10.7
March	15.8	14.7	14.5	19.0	15.0	14.2	14.5	14.4	19.6	14.8
April	16.3	15.3	14.5	14.7	14.8	16.0	15.5	14.9	19.1	15.1
May	19.2	16.7	16.6	19.0	17.9	18.7	19.1	18.4	22.8	19.2
June	19.7	20.3	20.8	21.4	19.7	22.1	22.5	21.1	25.8	20.9
July	19.3	19.1	17.8	18.2	20.0	21.7	19.5	20.2	23.1	21.3
August	18.7	18.5	17.4	19.0	19.3	21.6	18.9	18.0	23.4	22.4
September	20.3	21.2	21.1	22.1	20.4	21.9	22.1	22.0	22.7	22.5
October	17.5	17.2	17.0	16.7	16.8	19.8	19.7	19.6	20.0	19.7
November	17.5	18.1	16.8	16.9	16.9	16.4	16.7	16.7	17.0	16.1
December	14.7	15.4	14.5	14.2	15.8	11.7	12.5	12.7	13.1	12.8
Annual Average	17.2	16.9	16.3	17.3	17.4	17.2	17.4	17.0	19.5	17.2
Maximum	24.6	24.9	24.5	25.0	25.7	25.2	25.4	25.0	28.0	25.5
Minimum	8.5	7.5	7.2	7.6	11.6	8.2	8.1	8.0	8.1	8.1

Ventura Water Reclamation Facility

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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	R1 Chlorophyll A* ug/l	R2 Chlorophyll A* ug/l	R3 Chlorophyll A* ug/l	R4 Chlorophyll A* ug/l	L5 Chlorophyll A* ug/l
January	<0.1	<0.1	<0.1	<0.1	<0.1	1.0	5.8	5.4	5.1	5.7
February	<0.1	<0.1	<0.1	<0.1	<0.1	2.0	1.9	5.2	3.6	9.3
March	<0.1	<0.1	<0.1	<0.1	<0.1	3.0	0.6	<0.5	13.0	3.6
April	<0.1	<0.1	<0.1	<0.1	<0.1	4.0	1.8	3.2	<0.5	12.0
May	<0.1	<0.1	<0.1	<0.1	<0.1	5.0	13.0	8.8	3.4	38.0
June	<0.1	<0.1	<0.1	<0.1	<0.1	6.0	13.0	<0.5	<0.5	5.6
July	<0.1	<0.1	<0.1	<0.1	<0.1		0.0	13.0	8.5	24.0
August	<0.1	<0.1	<0.1	<0.1	<0.1	8.0	47.0	32.0	6.8	15.0
September	<0.1	<0.1	<0.1	<0.1	<0.1	9.0	<2	2.5	<2	2.3
October	<0.1	<0.1	<0.1	<0.1	<0.1	10.0	36.0	48.0	34.0	42.0
November	<0.1	<0.1	<0.1	<0.1	<0.1	11.0	4.0	6.0	2.2	2.7
December	<0.1	<0.1	<0.1	<0.1	<0.1	12.0	310.0	<2	250.0	48.0
Annual Average	<0.1	<0.1	<0.1	<0.1	<0.1	Avg	39.4	10.3	27.2	17.4
Maximum						Max	310.0	48.0	250.0	48.0
Minimum						<2	< .5	<.5	0.0	<2

* Analyzed by Aquatic Bioassay Consulting Laboratories, Ventura, CA

Ventura Water Reclamation Facility

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Pacific Ocean Receiving Water Stations

Month	R1 Dissovlved Oxygen Mg/L	R2 Dissolved Oxygen Mg/L	R3 Dissolved Osygen Mg/L	R4 Dissolved Oxygen Mg/L	L5 Dissolved Oxygen Mg/L	R1 Salinity PPT	R2 Salinity PPT	R3 Salinity PPT	R4 Salinity PPT	L5 Salinity PPT
January	9.9	7.7	8.2	7.1	8.9	8.2	17.0	15.4	11.2	1.9
February	9.1	10.1	5.9	8.3	5.5	5.9	6.5	7.7	4.7	0.6
March	9.3	8.6	1.0	7.9	7.2	1.0	0.7	2.1	1.2	0.7
April	10.7	7.2	0.7	7.0	8.6	0.7	4.1	2.0	1.1	0.8
May	8.2	5.6	0.8	10.7	7.8	0.8	5.4	11.5	1.0	0.9
June	8.3	5.7	4.3	8.9	8.5	4.3	2.6	11.2	1.2	2.6
July	10.0	8.1	3.7	10.6	8.7	3.7	12.2	15.7	2.5	1.2
August	13.4	7.1	2.4	7.8	8.9	2.4	17.6	20.7	2.6	2.7
September	3.5	8.7	4.7	7.7	10.0	4.7	3.7	3.6	4.3	3.6
October	3.4	6.9	2.1	7.3	6.6	2.1	1.8	2.5	2.0	1.6
November	5.9	6.8	1.0	6.2	5.8	1.0	4.4	4.7	1.3	1.1
December	10.3	9.2	14.8	9.6	9.4	14.8	16.3	23.4	9.4	13.8
Annual Average	8.5	7.6	4.0	8.3	7.9	4.0	7.9	10.2	3.5	2.6
Maximum	20.0	15.9	26.8	17.8	13.0	26.8	30.9	33.0	19.7	19.6
Minimum	0.6	0.2	-0.1	3.7	1.3	-0.1	0.3	0.2	0.2	0.1

Ventura Water Reclamation Facility

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Pacific Ocean Receiving Water Stations

Month	R1 Total Phosphorus mg/l	R2 Total Phosphorus mg/l	R3 Total Phosphorus mg/l	R4 Total Phosphorus mg/l	L5 Total Phosphorus mg/l	R1 Total Hardness mg/l	R2 Total Hardness mg/l	R3 Total Hardness mg/l	R4 Total Hardness mg/l	L5 Total Hardness mg/l
January	0.18	0.88	0.17	<0.1	0.25	2685	3621	2720	2656	1157
February	0.07	0.06	0.07	0.74	0.19	694	1488	1059	1454	650
March	0.01	0.12	<0.1	0.13	0.07	1092	544	789	632	571
April	0.25	0.07	0.08	0.32	0.09	1124	710	733	617	677
May	0.27	0.08	0.09	0.28	0.06	858	1082	2300	600	802
June	0.01	0.01	0.03	-0.01	0.45	1388	1278	2908	830	980
July		0.12	0.16	0.58	0.07	1143	2388	3440	1153	1115
August	0.11	0.58	0.11	1.78	0.22	1732	4039	5662	1296	1002
September	0.22	0.20	0.43	0.30	0.30	1245	3300	2400	1335	1243
October	0.43	0.62	9.25	34.00	0.36	908	1725	1700	890	910
November	0.58	0.62	0.66	0.60	0.78	900	1075	1175	655	775
December	0.29	0.37	0.16	0.64	0.19	3145	5050	5800	1950	2488
Annual Average	0.22	0.31	0.93	3.28	0.25	1396	2225	2620	1180	1027
Maximum	0.58	0.88	9.25	34.00	0.78	4900	8400	8600	5743	4230
Minimum	0.01	0.01	<0.1	<0.1	0.06	328	344	400	472	110

Ventura Water Reclamation Facility

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Pacific Ocean Receiving Water Stations

Month	R1 Nitrate Nitrogen mg/l	R2 Nitrate Nitrogen mg/l	R3 Nitrate Nitrogen mg/l	R4 Nitrate Nitrogen mg/l	L5 Nitrate Nitrogen mg/l	R1 Nitrite Nitrogen mg/l	R2 Nitrite Nitrogen mg/l	R3 Nitrite Nitrogen mg/l	R4 Nitrite Nitrogen mg/l	L5 Nitrite Nitrogen mg/l
January	1.40	1.40	1.20	1.20	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
February	3.10	2.60	3.00	4.80	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
March	11.30	2.00	1.70	0.80	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
April	20.10	1.50	1.70	11.00	1.30	0.7	<0.4	<0.4	<0.4	<0.4
May	8.70	3.30	3.80	9.80	2.10	<0.4	<0.4	<0.4	<0.4	<0.4
June	5.30	2.80	<0.4	10.80	1.80	<0.4	<0.4	<0.4	<0.4	<0.4
July		0.90	1.30	12.00	2.90		<0.4	<0.4	<0.4	<0.4
August	-0.40	5.20	<0.4	11.30	4.40	<0.4	<0.4	<0.4	<0.4	<0.4
September	5.20	6.80	6.30	6.60	5.20	<0.4	<0.4	<0.4	<0.4	<0.4
October	6.10	7.10	5.90	5.90	3.70	<0.4	<0.4	<0.4	<0.4	<0.4
November	5.80	5.60	5.60	5.80	5.80	<0.4	<0.4	<0.4	<0.4	<0.4
December	2.80	<0.4	-0.40	9.60	2.90	<0.4	<0.4	<0.4	<0.4	<0.4
Annual Average	6.31	3.23	2.44	7.47	2.41	<0.3	<0.4	<0.4	<0.2	<0.4
Maximum	20.10	7.10	6.30	12.00	5.80	0.7	<0.4	<0.4	0.6	<0.4
Minimum	<0.4	<0.4	<0.4	0.80	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Ventura Water Reclamation Facility

Annual Report 2001

Pacific Ocean Receiving Water Stations

Month	R1 Ammonia Nitrogen mg/l	R2 Ammonia Nitrogen mg/l	R3 Ammonia Nitrogen mg/l	R4 Ammonia Nitrogen mg/l	L5 Ammonia Nitrogen mg/l	R1 Tot Kjeldahl Nitrogen mg/l	R2 Tot Kjeldahl Nitrogen mg/l	R3 Tot Kjeldahl Nitrogen mg/l	R4 Tot Kjeldahl Nitrogen mg/l	L5 Tot Kjeldahl Nitrogen mg/l
January	1.08	0.68	0.62	0.88	0.77	1.19	1.24	1.10	1.27	2.28
February	0.95	0.50	0.67	2.35	0.57	1.27	0.55	0.31	3.22	0.87
March	0.40	0.30	0.30	0.20	0.30	0.60	0.60	0.30	2.60	2.20
April	0.78	0.38	0.64	2.12	0.55	0.73	0.41	0.58	2.89	0.95
May	0.24	0.33	0.34	0.81	0.23	0.27	0.45	0.83	4.42	1.73
June	0.60	0.69	0.44	0.82	0.74	0.89	0.87	0.87	1.77	1.01
July		0.51	0.49	1.04	0.47	0.00	0.91	0.98	1.46	1.50
August	0.71	0.64	0.71	1.13	0.63	1.71	1.48	1.71	1.94	1.89
September	0.61	0.30	0.11	0.11	0.11	9.30	8.50	0.57	2.40	1.90
October	0.97	0.68	0.45	0.48	0.49	7.94	2.37	2.25	1.78	0.86
November	1.20	0.62	0.70	0.60	0.55	5.50	25.60	10.10	30.30	6.03
December	0.92	0.73	0.35	0.70	0.59	1.84	0.94	1.07	5.48	0.89
Annual Average	0.77	0.53	0.49	0.94	0.50	2.84	3.66	1.72	4.96	1.84
Maximum	1.20	0.73	0.71	2.35	0.77	9.30	25.60	10.10	30.30	6.03
Minimum	0.24	0.30	0.11	0.11	0.11	0.27	0.41	0.30	1.27	0.86

Ventura Water Reclamation Facility

Annual Report 2001

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							
May	2.1	7.5	691	18.2	11.1	0.7	298
August	3.1	8.9	757	22.1	13.3	0.8	306
November	2.3	8.0	542	23.3	21.8	1.0	322
Average	2.5	8.1	663.3	21.2	15.4	0.8	308.7

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	1.8	16.8	343	21.8	17.6	1.1	377
May	2.1	12.9	397	16.2	15.4	0.8	434
August	2.6	16.5	434	26.7	22.6	1.1	448
November	2.0	15.4	375	21.1	17.2	1.1	390
Average		15.4	387.4	21.4	18.2	1.0	412.1

Ventura Water Reclamation Facility

Annual Report 2001

Solids Streams

Total Metal in mg/Kg Dry Weight

Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium
07-Feb-01	FILTER PRESS 1 RUN 1						4.3	22.5
07-Feb-01	FILTER PRESS 1 RUN 2						4.3	21.8
07-Feb-01	FILTER PRESS 2 RUN 1						4.2	21.5
07-Feb-01	FILTER PRESS 2 RUN 2						4.0	22.5
14-Feb-01	FILTER PRESS 1 RUN 1 *	10796	<2.5	<2.5	432	<2.5	<2.5	38.8
09-May-01	FILTER PRESS 2 RUN 2 *	10673	<2.4	<2.4	572	<2.4	<2.4	33.1
09-May-01	FILTER PRESS 1 RUN 1						3.9	27.6
09-May-01	FILTER PRESS 1 RUN 2						3.9	28.6
09-May-01	FILTER PRESS 2 RUN 1						3.8	27.6
09-May-01	FILTER PRESS 2 RUN 2						3.7	28.4
01-Aug-01	FILTER PRESS 1 RUN 1						4.4	21.8
01-Aug-01	FILTER PRESS 1 RUN 2						4.2	21.6
01-Aug-01	FILTER PRESS 2 RUN 1						4.0	23.3
01-Aug-01	FILTER PRESS 2 RUN 2						4.1	21.8
08-Aug-01	FILTER PRESS 2 RUN 1 *	5641	<1.6	<1.6	192	<1.6	<1.6	13.2
07-Nov-01	FILTER PRESS 1 RUN 3						4.0	21.6
07-Nov-01	FILTER PRESS 1 RUN 4						4.0	20.8
07-Nov-01	FILTER PRESS 2 RUN 3						4.1	20.8
07-Nov-01	FILTER PRESS 2 RUN 4						3.9	21.0
07-Nov-01	FILTER PRESS 2 RUN 1**	14694	<3.4	3	503	<2.0	<2.0	39.5
Average		10451	<2.8	<2.8	425	<2.8	3.2	25
Maximum		14694			572		4	40
Minimum		5641	<2.3	<2.3	192	1.8	<2.7	13

*Analyzed by American Scientific Laboratories, Los Angeles, CA

** Analyzed by FGL Environmental, Santa Paula, CA

Ventura Water Reclamation Facility

Annual Report 2001

Solids Streams

Total Metal in mg/Kg Dry Weight

Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium
07-Feb-01	FILTER PRESS 1 RUN 1		937	47.1			25.7	
07-Feb-01	FILTER PRESS 1 RUN 2		946	47.7			25.8	
07-Feb-01	FILTER PRESS 2 RUN 1		945	49.6			26.8	
07-Feb-01	FILTER PRESS 2 RUN 2		932	46.1			26.6	
14-Feb-01	FILTER PRESS 1 RUN 1 *	6.7	1109	24.0	3.0	21.8	29.9	15.2
09-May-01	FILTER PRESS 2 RUN 2 *	7.7	1043	16.3	<0.96	21.3	37.3	13.5
09-May-01	FILTER PRESS 1 RUN 1		954	40.2			31.3	
09-May-01	FILTER PRESS 1 RUN 2		955	37.4			31.2	
09-May-01	FILTER PRESS 2 RUN 1		966	38.4			30.7	
09-May-01	FILTER PRESS 2 RUN 2		910	37.0			31.3	
01-Aug-01	FILTER PRESS 1 RUN 1		1020	44.4			25.7	
01-Aug-01	FILTER PRESS 1 RUN 2		1007	42.6			25.6	
01-Aug-01	FILTER PRESS 2 RUN 1		1009	42.9			26.2	
01-Aug-01	FILTER PRESS 2 RUN 2		1074	42.1			25.5	
08-Aug-01	FILTER PRESS 2 RUN 1*	3.5	574	10.4	<0.64	13	13.9	7.3
07-Nov-01	FILTER PRESS 1 RUN 3		934	47.1			28.9	
07-Nov-01	FILTER PRESS 1 RUN 4		937	45.9			29.5	
07-Nov-01	FILTER PRESS 2 RUN 3		951	47.2			30.3	
07-Nov-01	FILTER PRESS 2 RUN 4		920	48.1			32.0	
07-Nov-01	FILTER PRESS 2 RUN 1 **	7.5	1422	44.9	3.4	34.7	32.0	11.6
Average		6.4	977.3	40.0	1.6	22.6	28.3	11.9
Maximum		7.7	1422.0	49.6	3.4	34.7	37.3	15.2
Minimum		3.5	574.0	10.4	<0.91	<2.7	13.9	7.3

*Analyzed by American Scientific Laboratories, Los Angeles, CA
** Analyzed by FGL Environmental, Santa Paula, CA

Ventura Water Reclamation Facility

Annual Report 2001

Solids Streams

Total Metal in mg/Kg Dry Weight

Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Silver	Thallium	Tin	Vanadium	Zinc
07-Feb-01	FILTER PRESS 1 RUN 1	5.1				713
07-Feb-01	FILTER PRESS 1 RUN 2	3.4				723
07-Feb-01	FILTER PRESS 2 RUN 1	5.0				721
07-Feb-01	FILTER PRESS 2 RUN 2	5.1				692
14-Feb-01	FILTER PRESS 1 RUN 1 *	33.8	<2.5	53	2.7	751
09-May-01	FILTER PRESS 2 RUN 2 *	37.5	<2.4	<24.0	2.9	976
09-May-01	FILTER PRESS 1 RUN 1	1.8				693
09-May-01	FILTER PRESS 1 RUN 2	1.9				723
09-May-01	FILTER PRESS 2 RUN 1	1.5				680
09-May-01	FILTER PRESS 2 RUN 2	1.5				708
01-Aug-01	FILTER PRESS 1 RUN 1	2.0				773
01-Aug-01	FILTER PRESS 1 RUN 2	2.6				724
01-Aug-01	FILTER PRESS 2 RUN 1	2.4				733
01-Aug-01	FILTER PRESS 2 RUN 2	2.7				785
08-Aug-01	FILTER PRESS 2 RUN 1*	21.9	27	<16.0	1.8	391
07-Nov-01	FILTER PRESS 1 RUN 3	2.6				709
07-Nov-01	FILTER PRESS 1 RUN 4	2.6				713
07-Nov-01	FILTER PRESS 2 RUN 3	3.3				715
07-Nov-01	FILTER PRESS 2 RUN 4	2.8				689
07-Nov-01	FILTER PRESS 2 RUN 1**	57.8	<3.4	48	15.6	1054
Average		9.8	6.8	25.2	5.7	733
Maximum		57.8	27.3	53.2	15.6	1054
Minimum		1.5	<2.7	<2.5	1.8	391

*Analyzed by American Scientific Laboratories, Los Angeles, CA

** Analyzed by FGL Environmental, Santa Paula, CA

Ventura Water Reclamation Facility

Annual Report 2001

Solids Streams

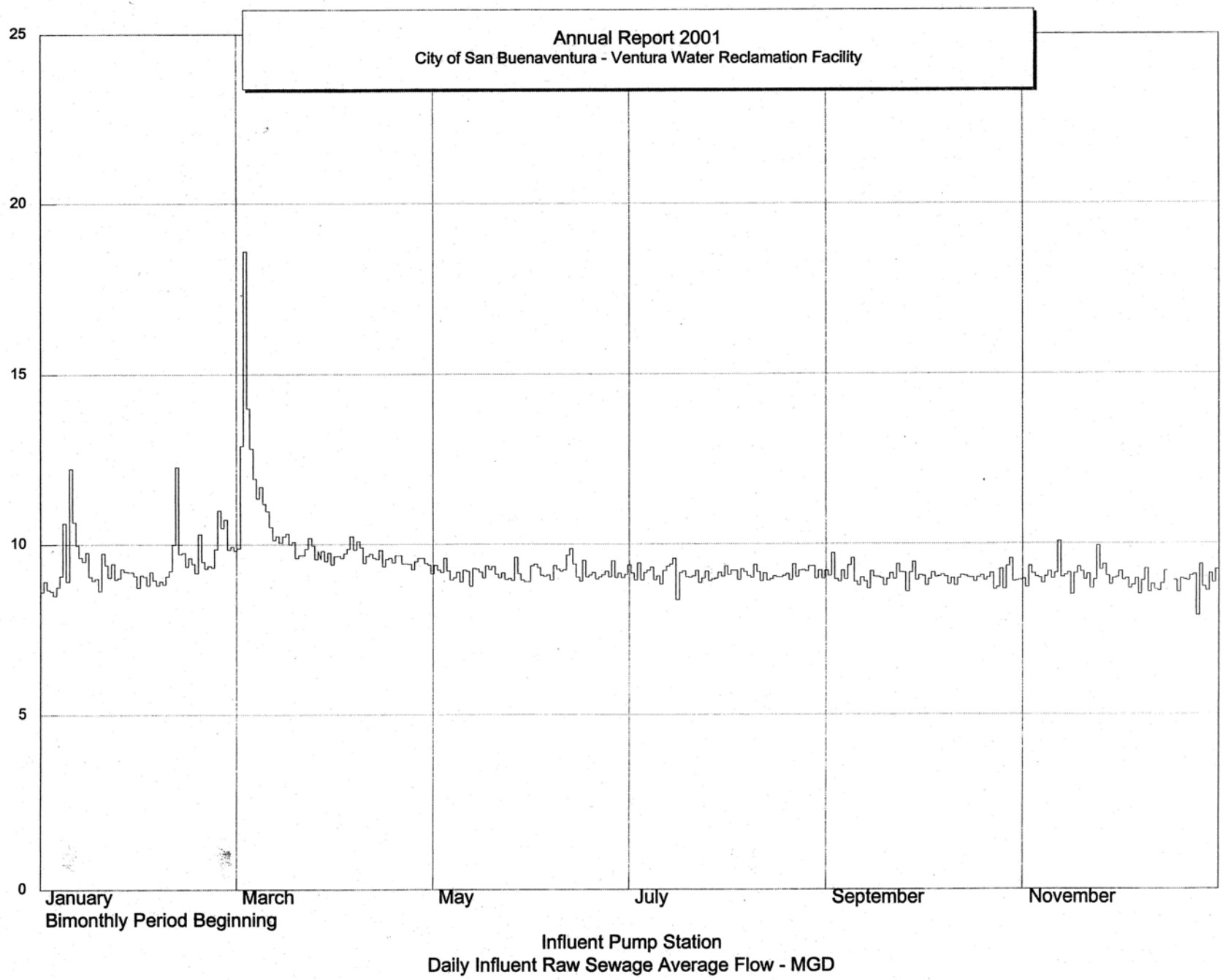
Total Compound in mg/Kg Dry Weight

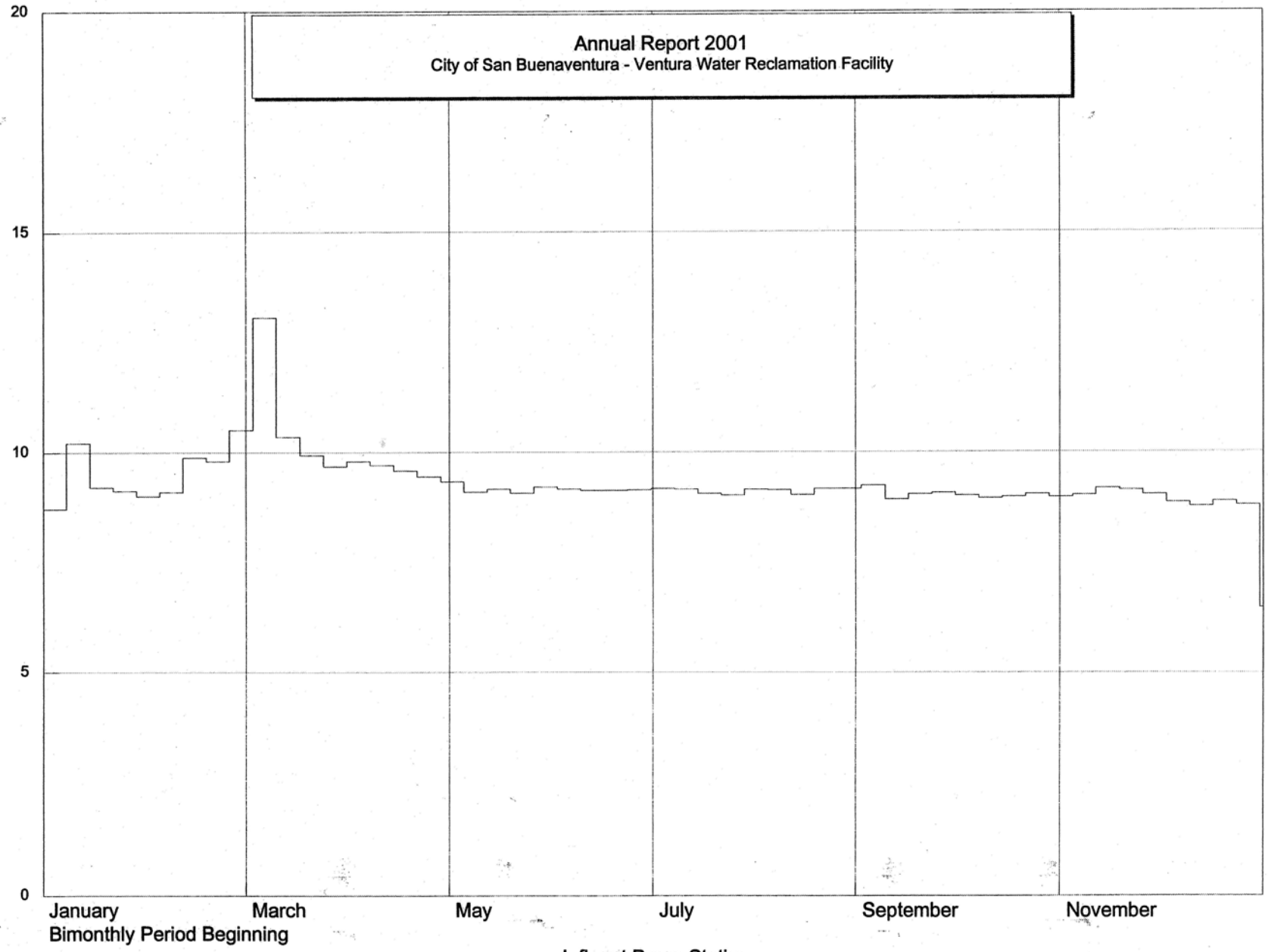
Filter Press Product (Dewatered Digested Sludge)

Date	Sample	Acetone	Chloromethane	1,4-Dichlorobenzene	Toluene
14-Feb-01	FILTER PRESS 1 RUN 1 *	<24.9	<24.9	<4.9	<0.41
09-May-01	FILTER PRESS 2 RUN 2 *	<24.0	<14.4	<4.8	<.96
09-Aug-01	FILTER PRESS 2 RUN 1 *	<8.0	<8.0	<1.6	<0.54
07-Nov-01	FILTER PRESS 2 RUN 1**	<17.0	<1.7	<1.7	<1.70

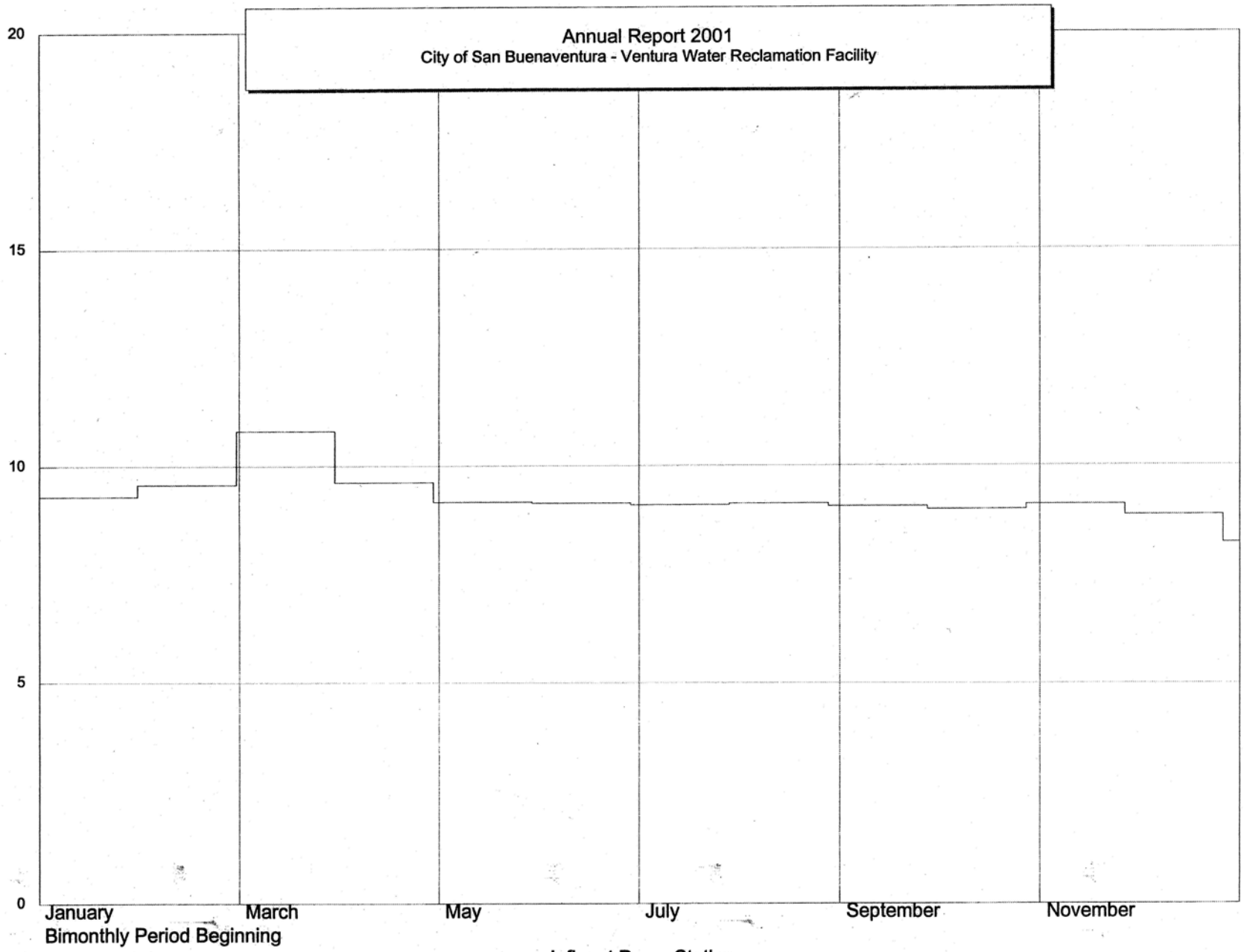
Date	Sample	Xylenes	Bis (2-Ethylhexyl)phthalate	TOX
14-Feb-01	FILTER PRESS 1 RUN 1 *	37	68.7	75
09-May-01	FILTER PRESS 2 RUN 2 *	14	40	149
08-Aug-01	FILTER PRESS 2 RUN 1 *	24	37	<16.0
07-Nov-01	FILTER PRESS 2 RUN 1**	<1.7	810	ND

*Analyzed by American Scientific Laboratories, Los Angeles, CA
** Analyzed by FGL Environmental, Santa Paula, CA

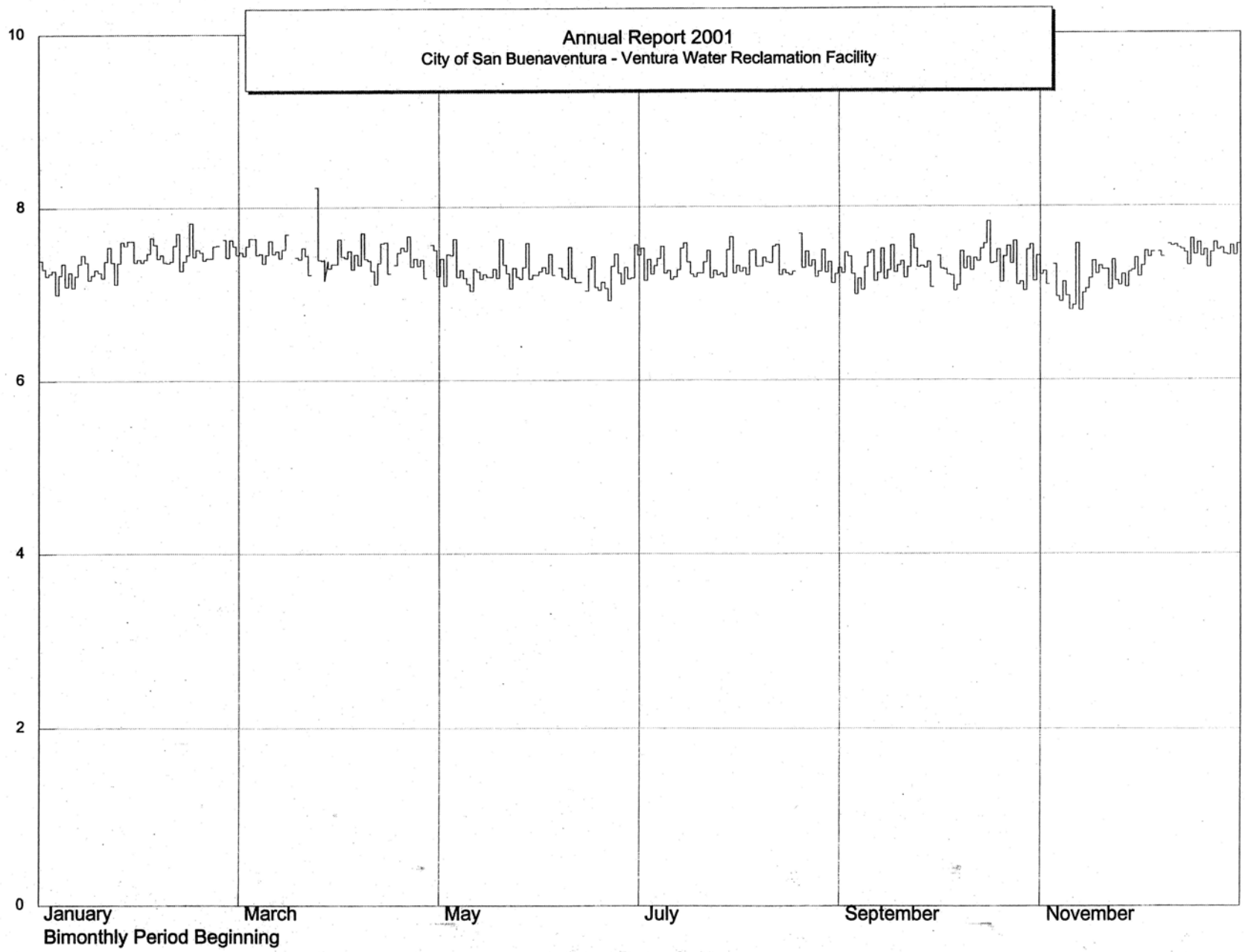

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
25
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Influent Pump Station
Daily Influent Raw Sewage Average Flow - MGD



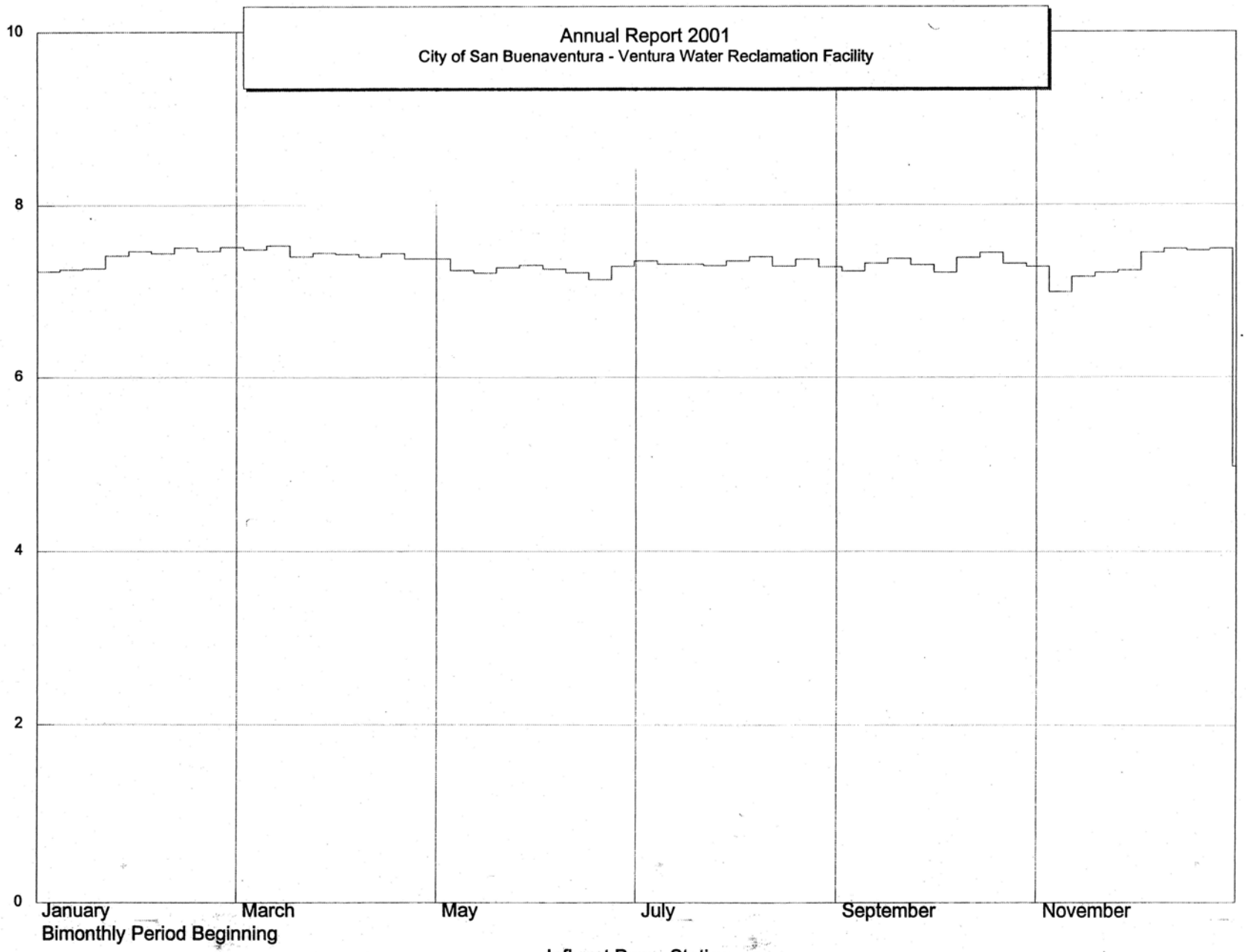
Influent Pump Station
Daily Influent Raw Sewage 7 Day Flow - MGD



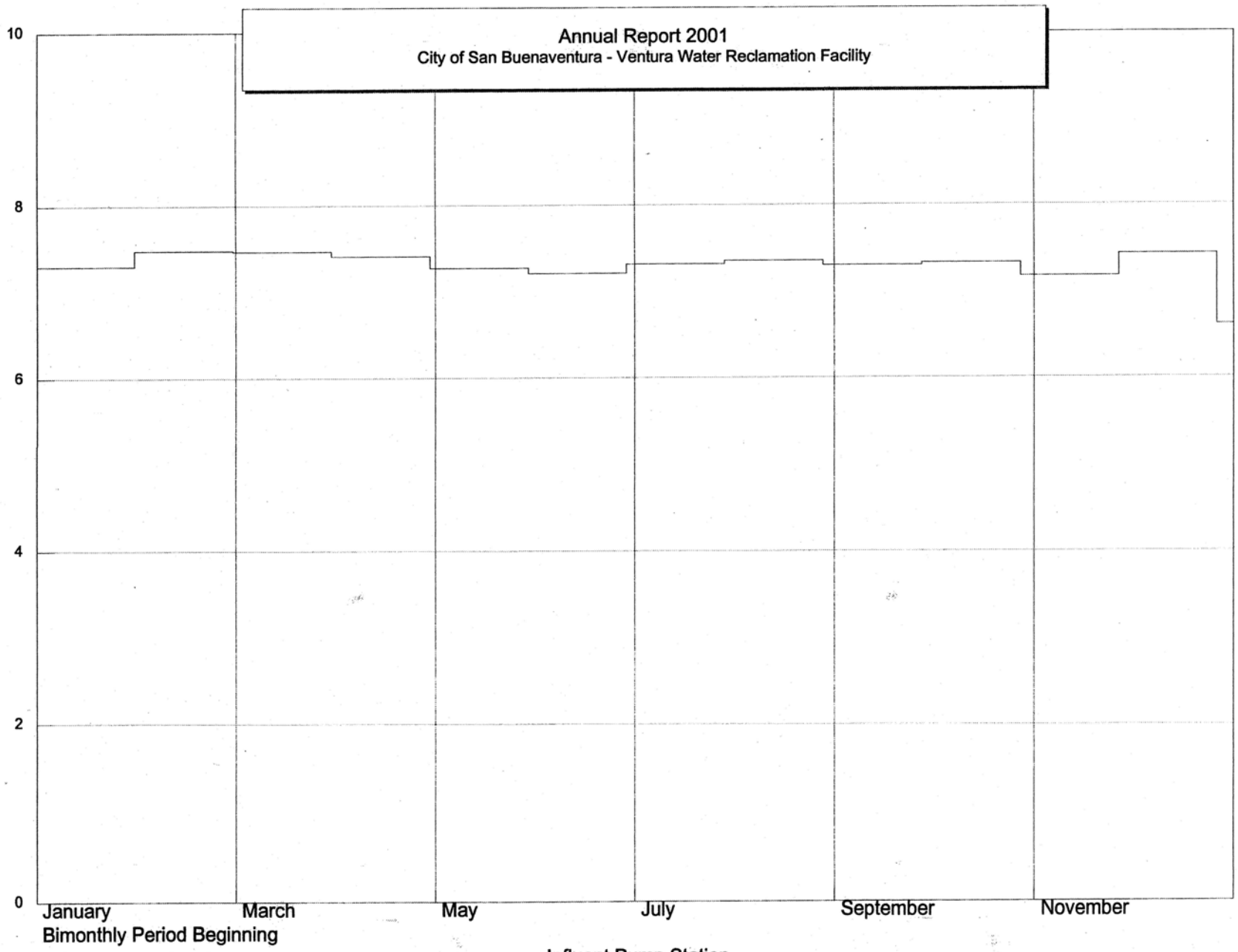
Influent Pump Station
Daily Influent Raw Sewage 30 Day Flow - MGD



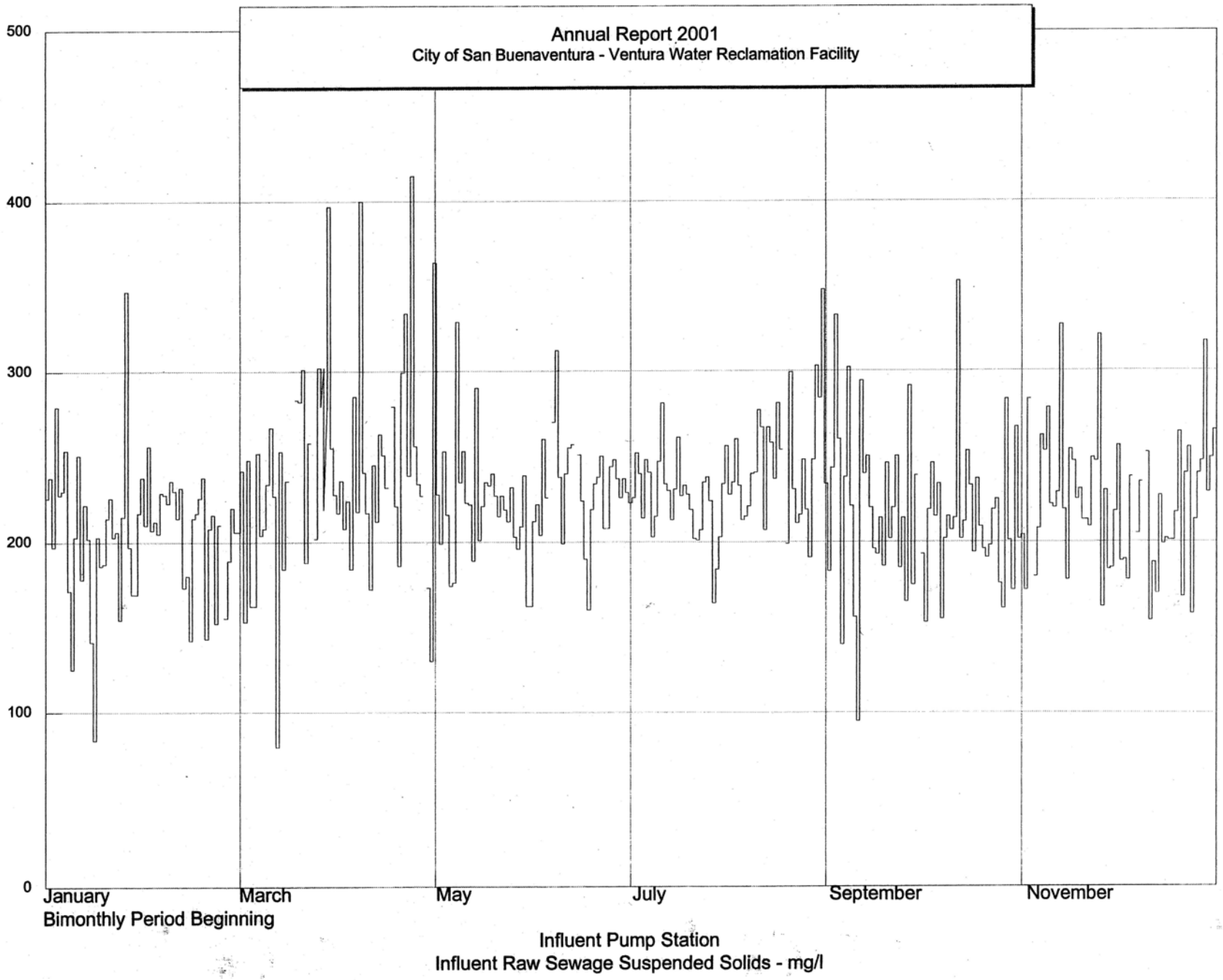
Influent Pump Station
Influent Raw Sewage pH - pH Units

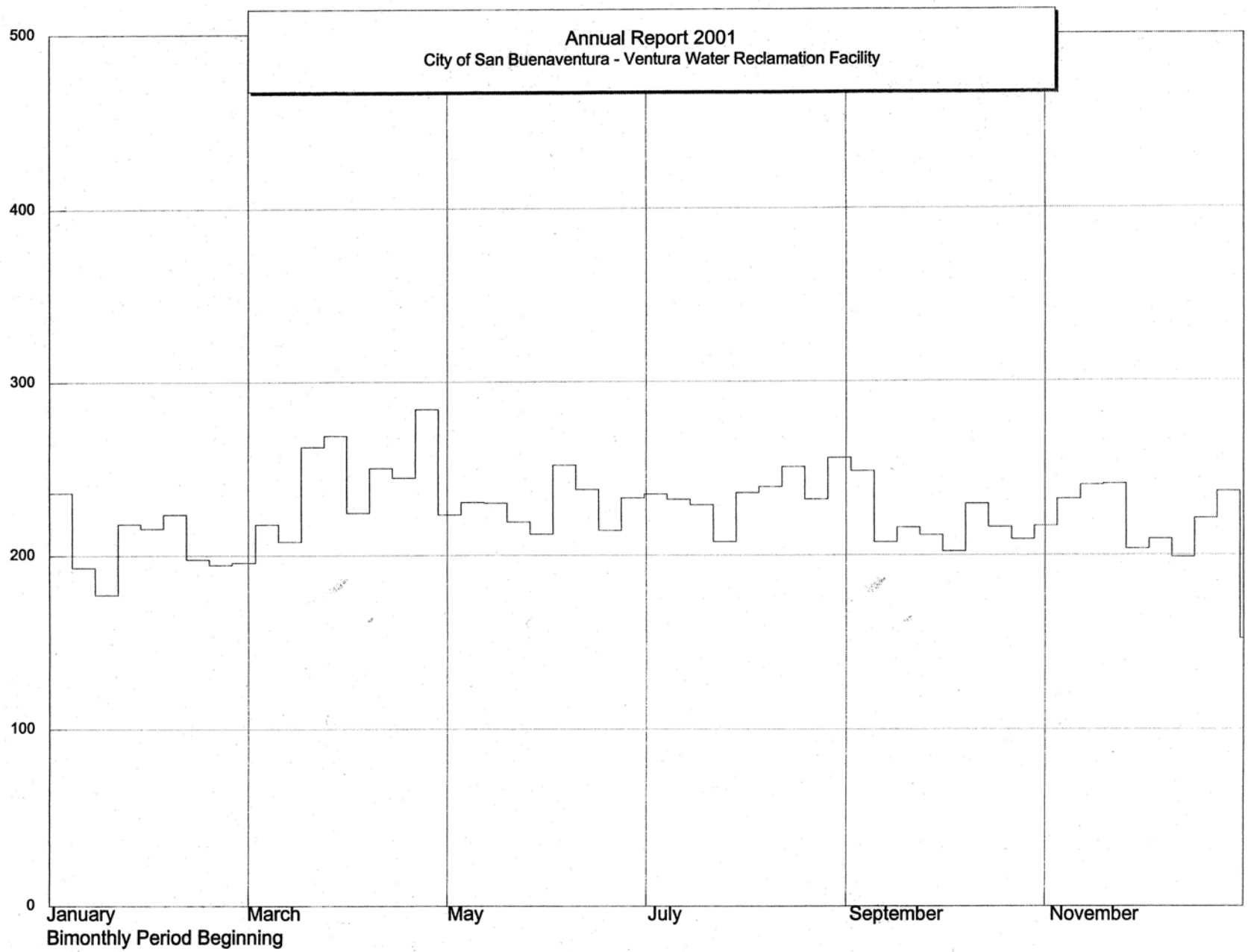


Influent Pump Station
Influent Raw Sewage 7 Day Average pH - pH Units

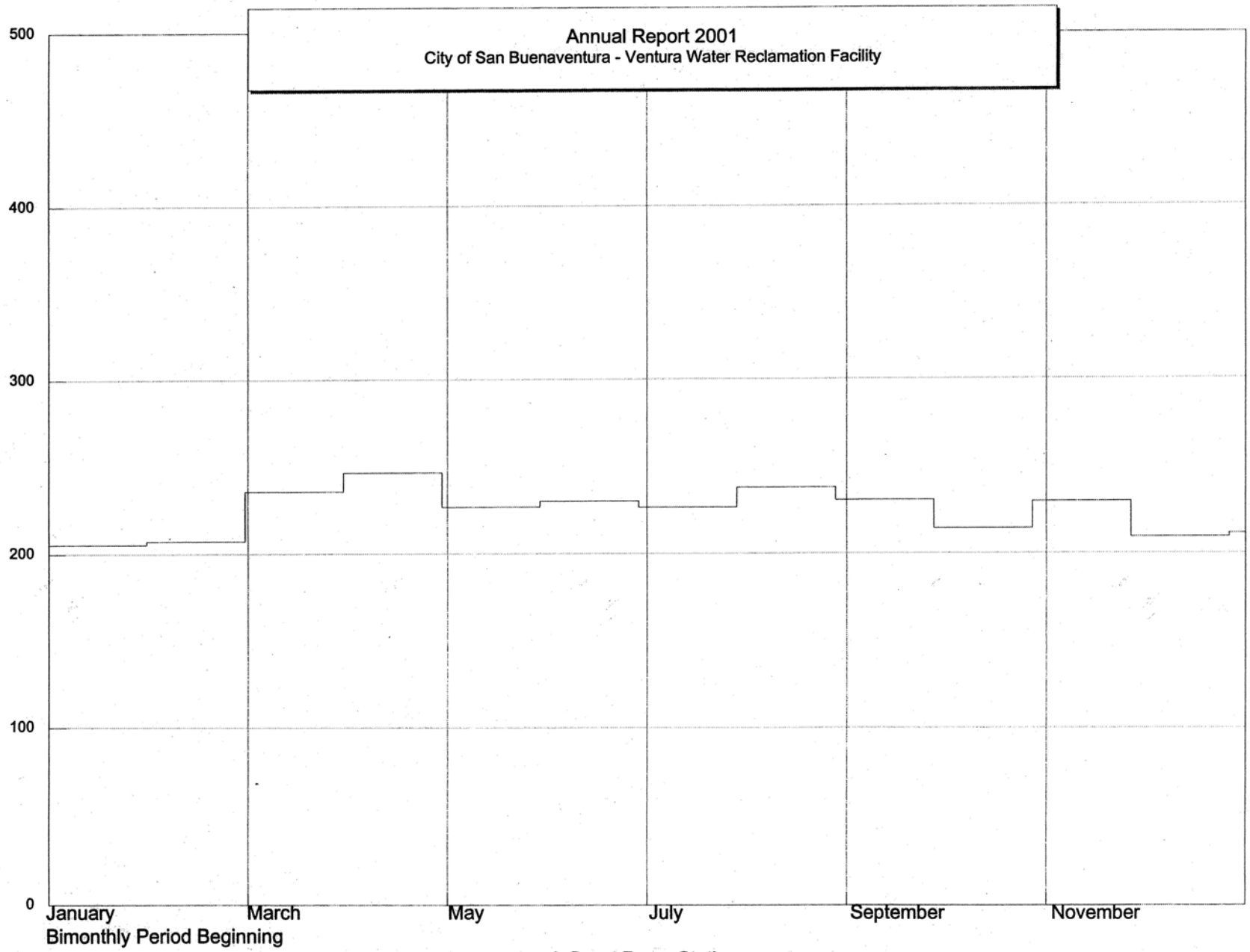


Influent Pump Station
Influent Raw Sewage 30 Day Average pH - pH Units

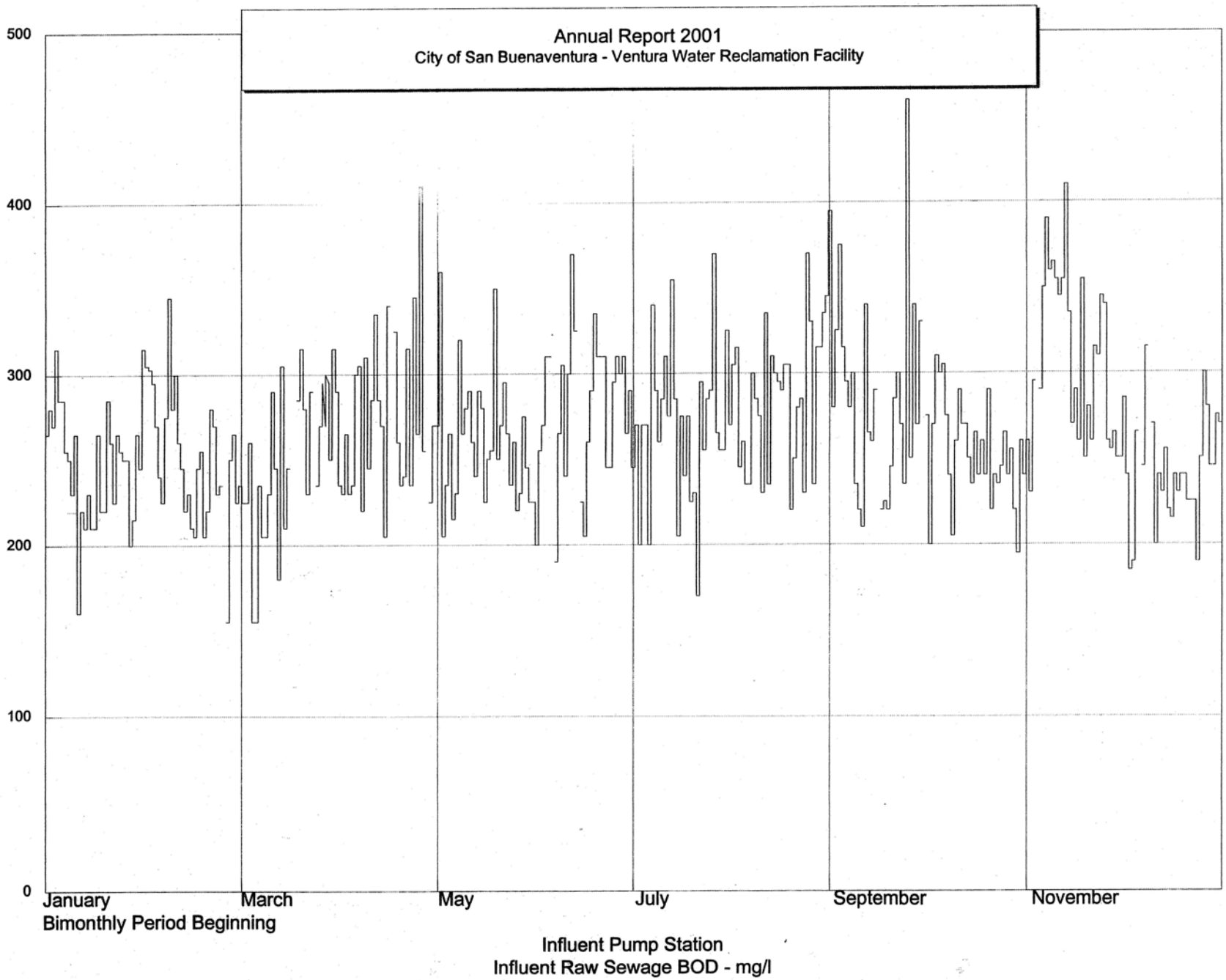

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
500
400
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Influent Pump Station
Influent Raw Sewage Suspended Solids - mg/l

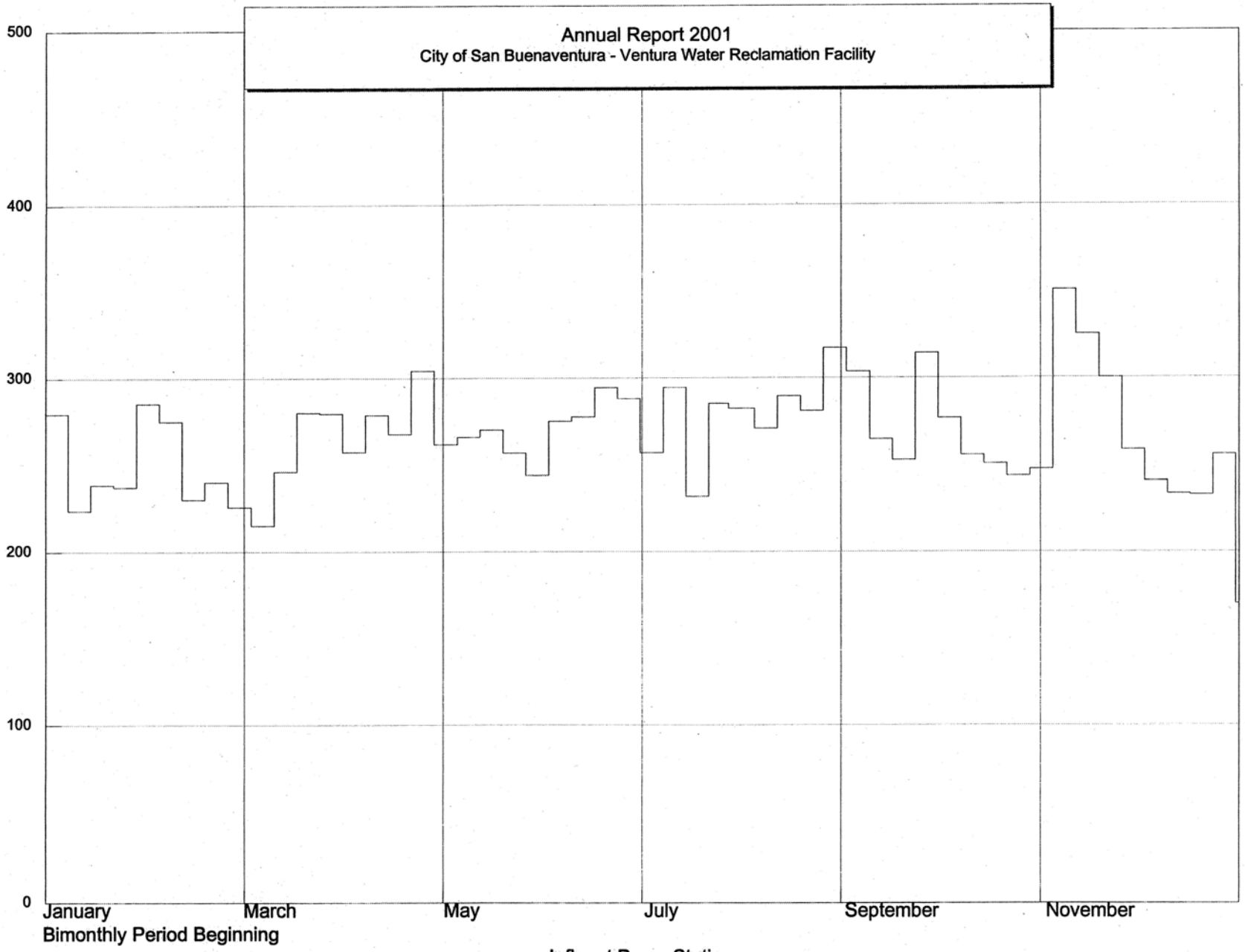


Influent Pump Station
Influent Raw Sewage 7 Day Average Suspended Solids - mg/l

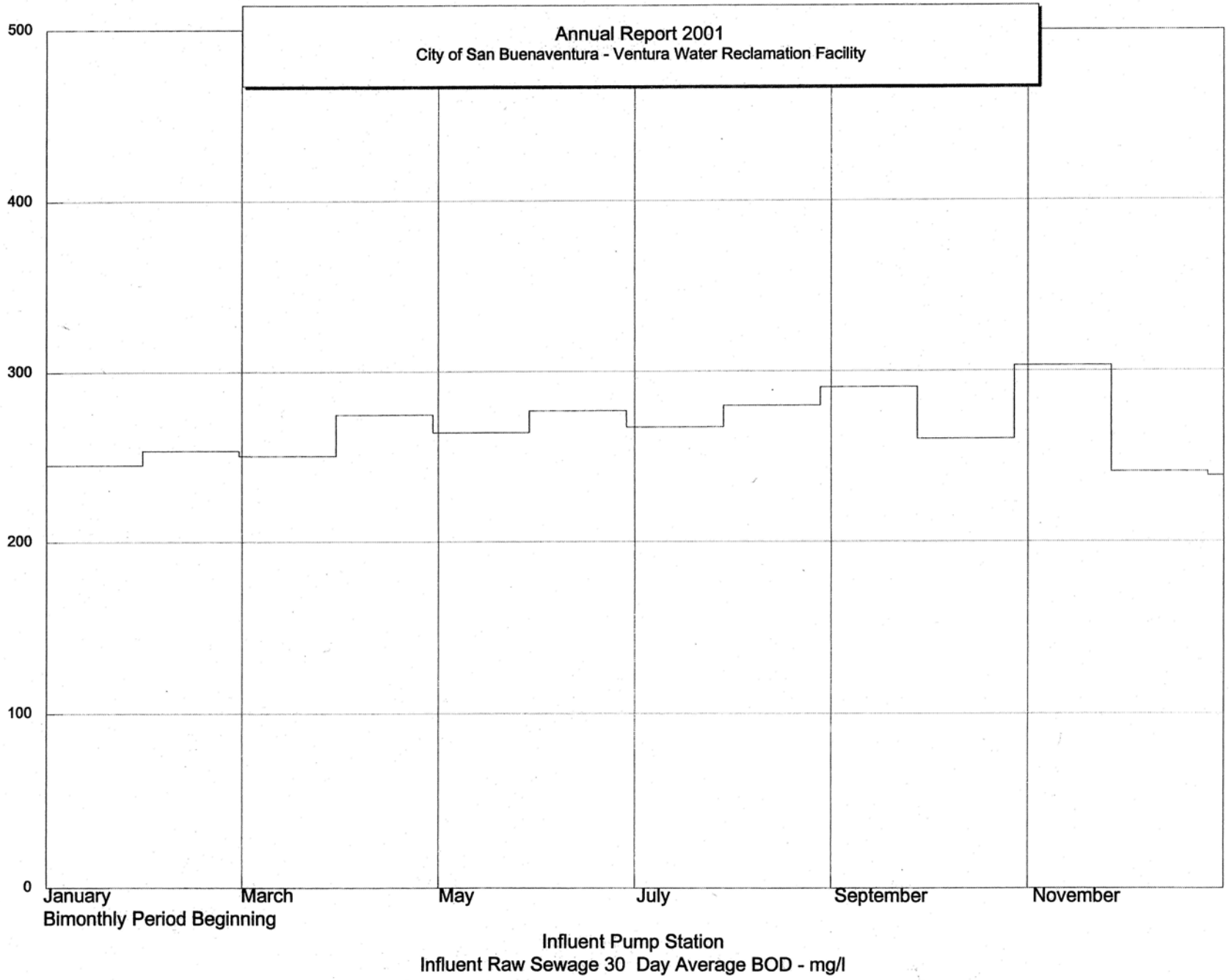


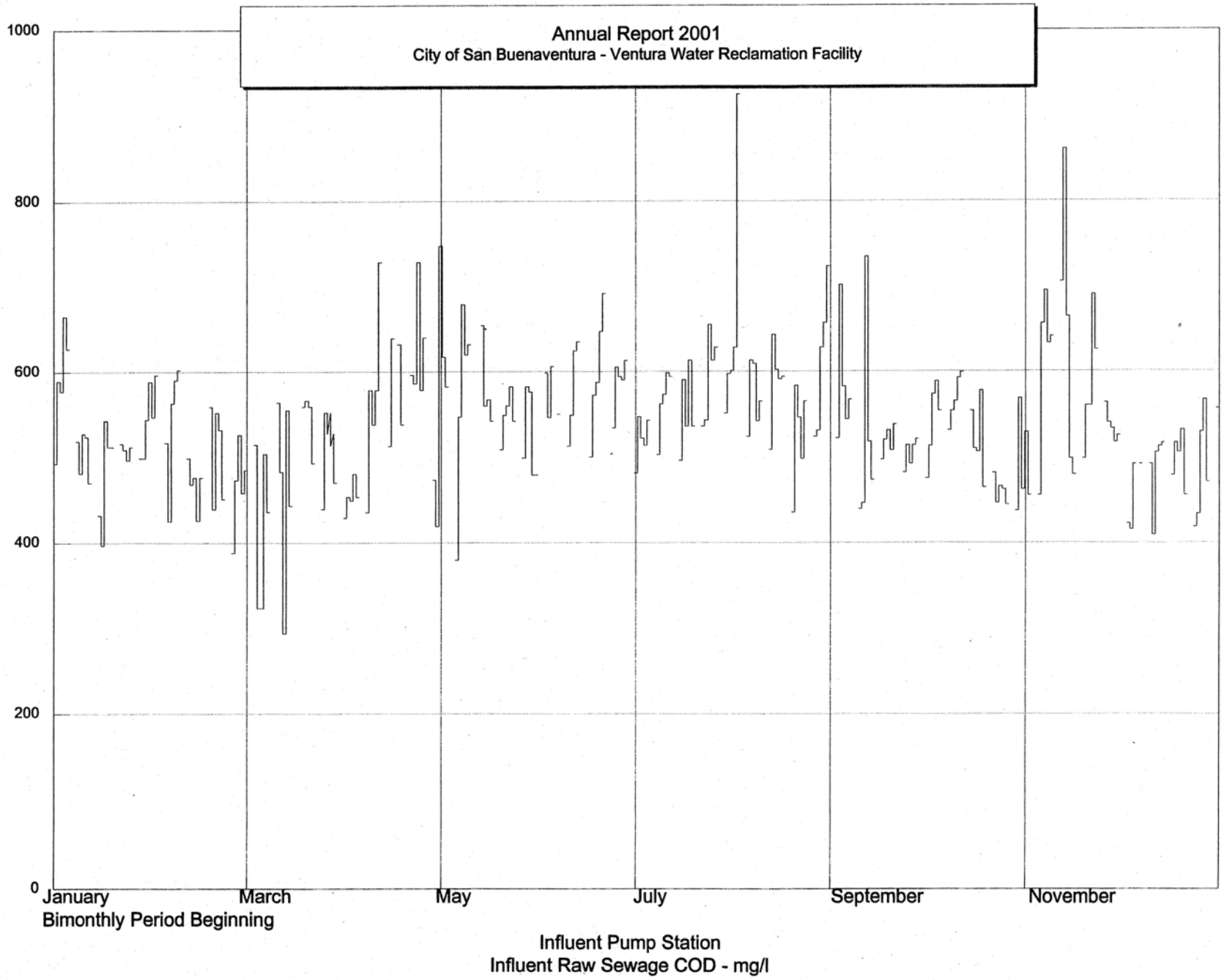
Influent Pump Station
Influent Raw Sewage 30 Day Average Suspended Solids - mg/l

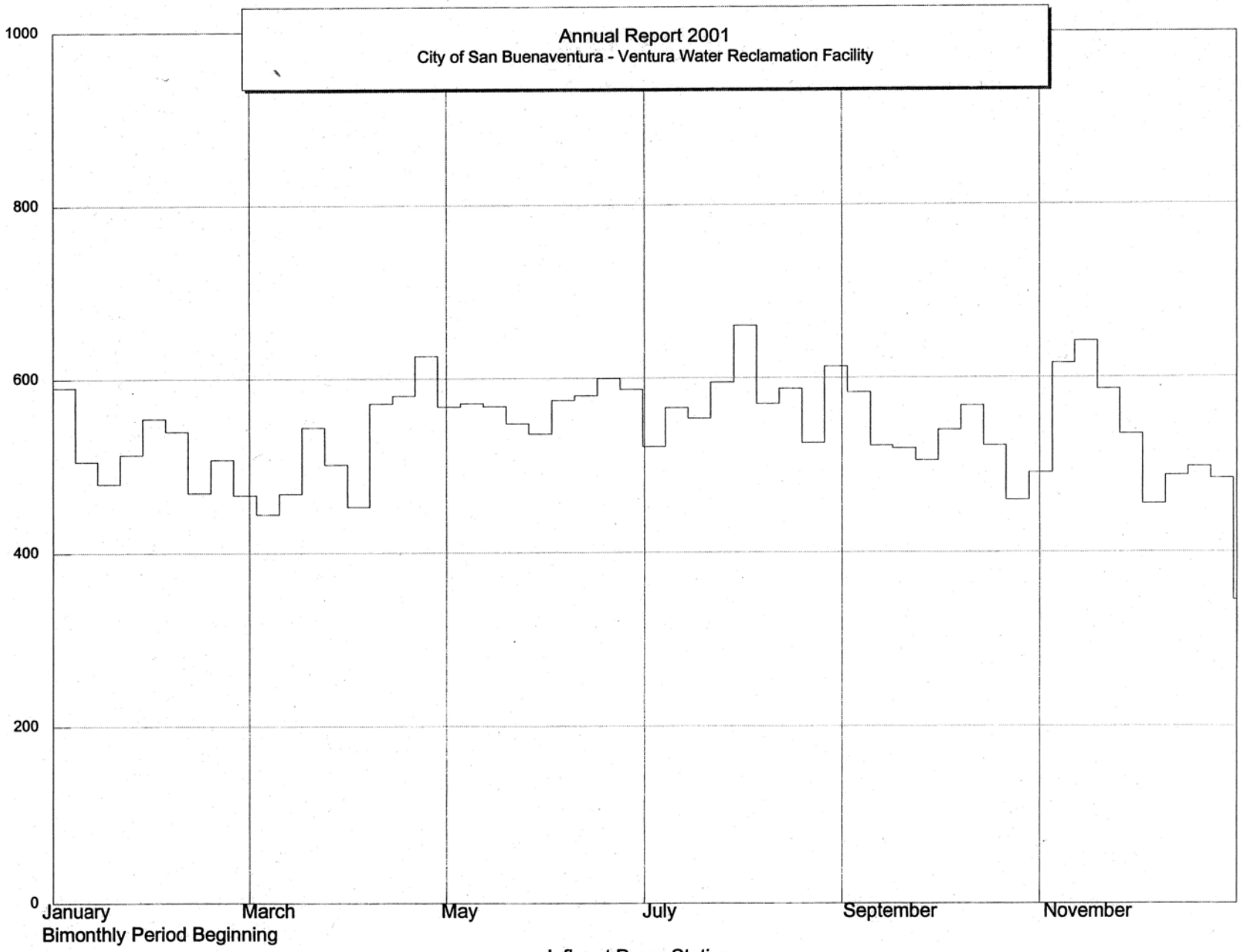

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
500
400
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Influent Pump Station
Influent Raw Sewage BOD - mg/l



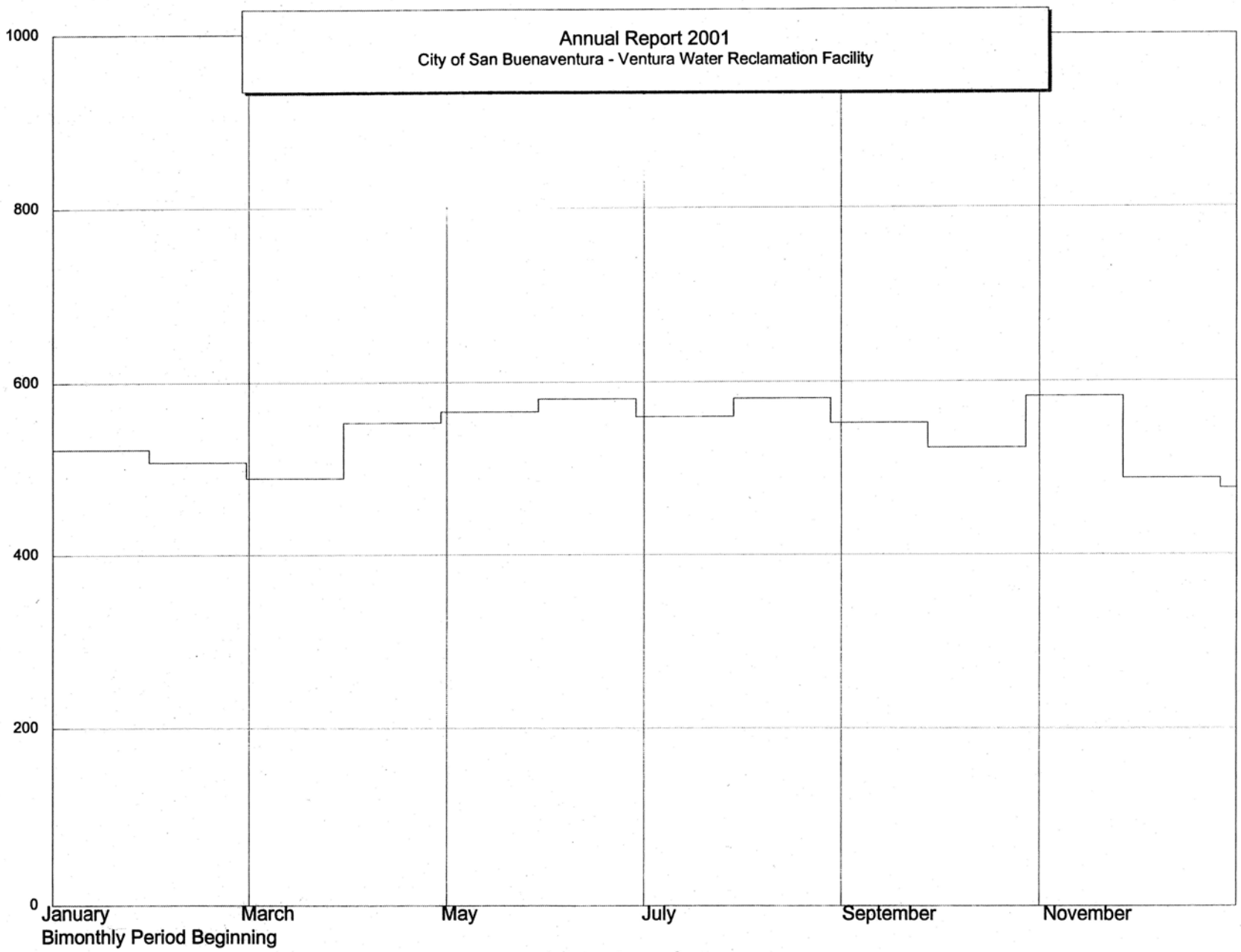
Influent Pump Station
Influent Raw Sewage 7 Day Average BOD - mg/l


Annual Report 2001
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 30 Day Average BOD - mg/l

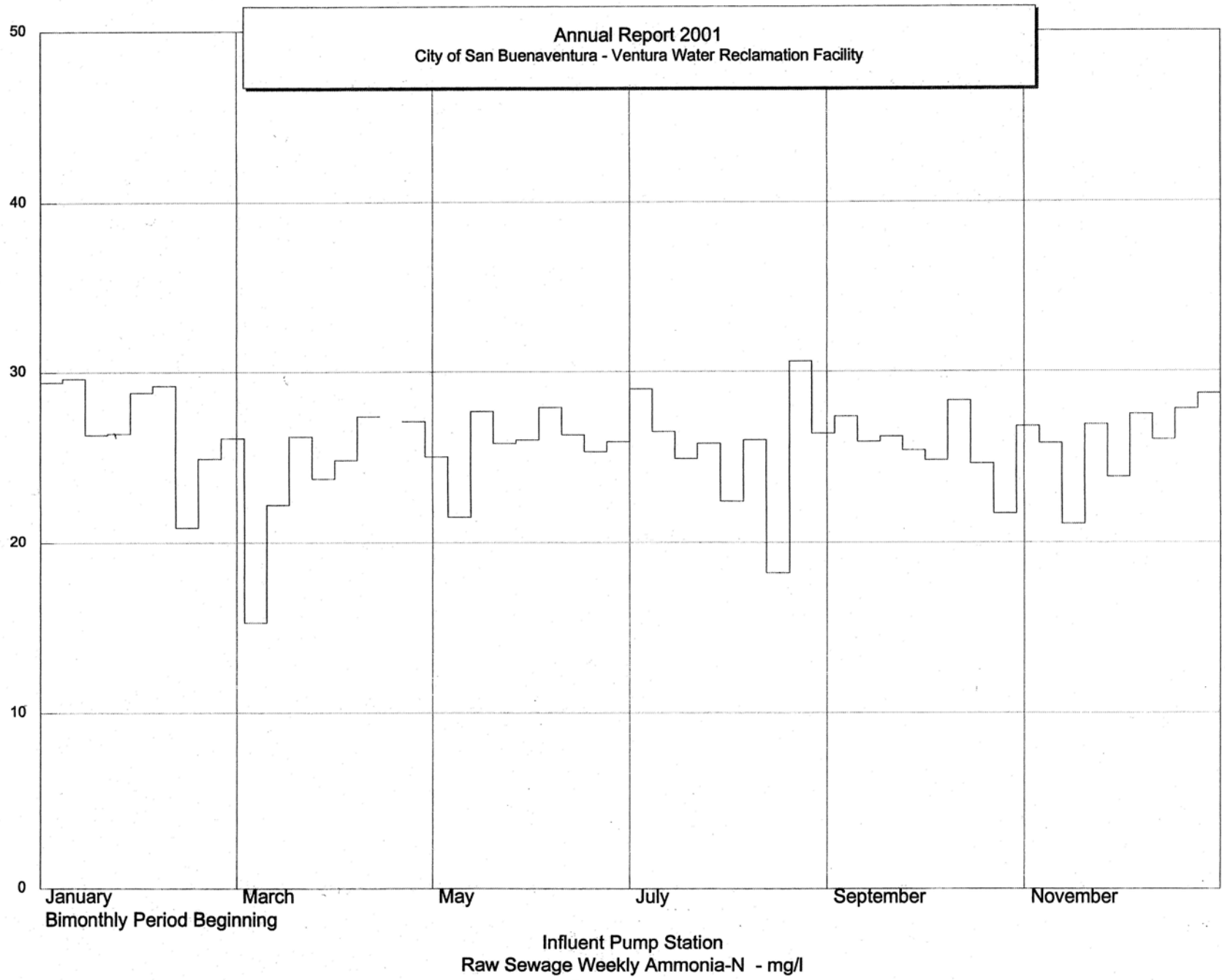

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
1000
800
600
400
200
0
January
March
May
July
September
November
Bimonthly Period Beginning
Influent Pump Station
Influent Raw Sewage COD - mg/l

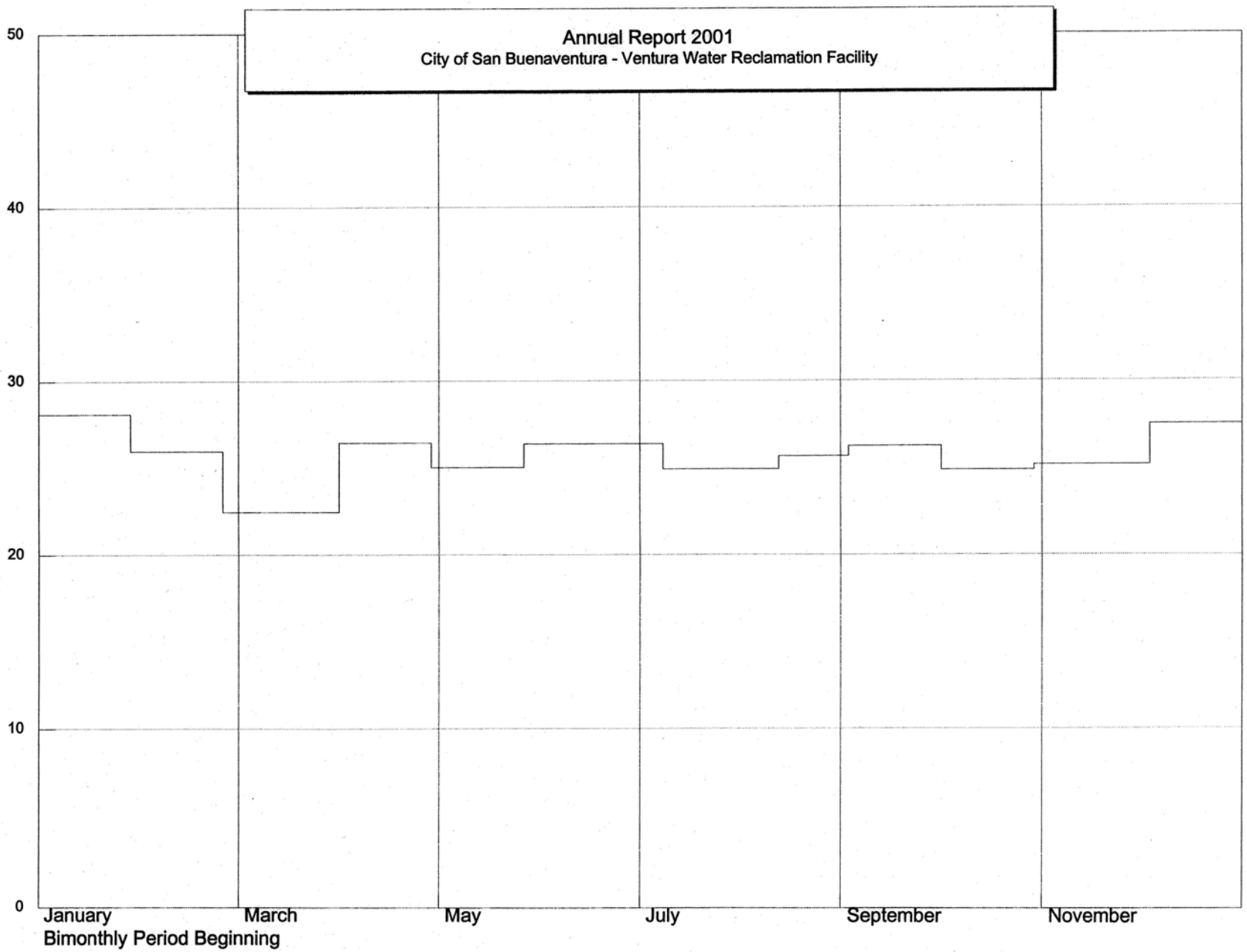


Influent Pump Station
Influent Raw Sewage 7 Day Average COD - mg/l

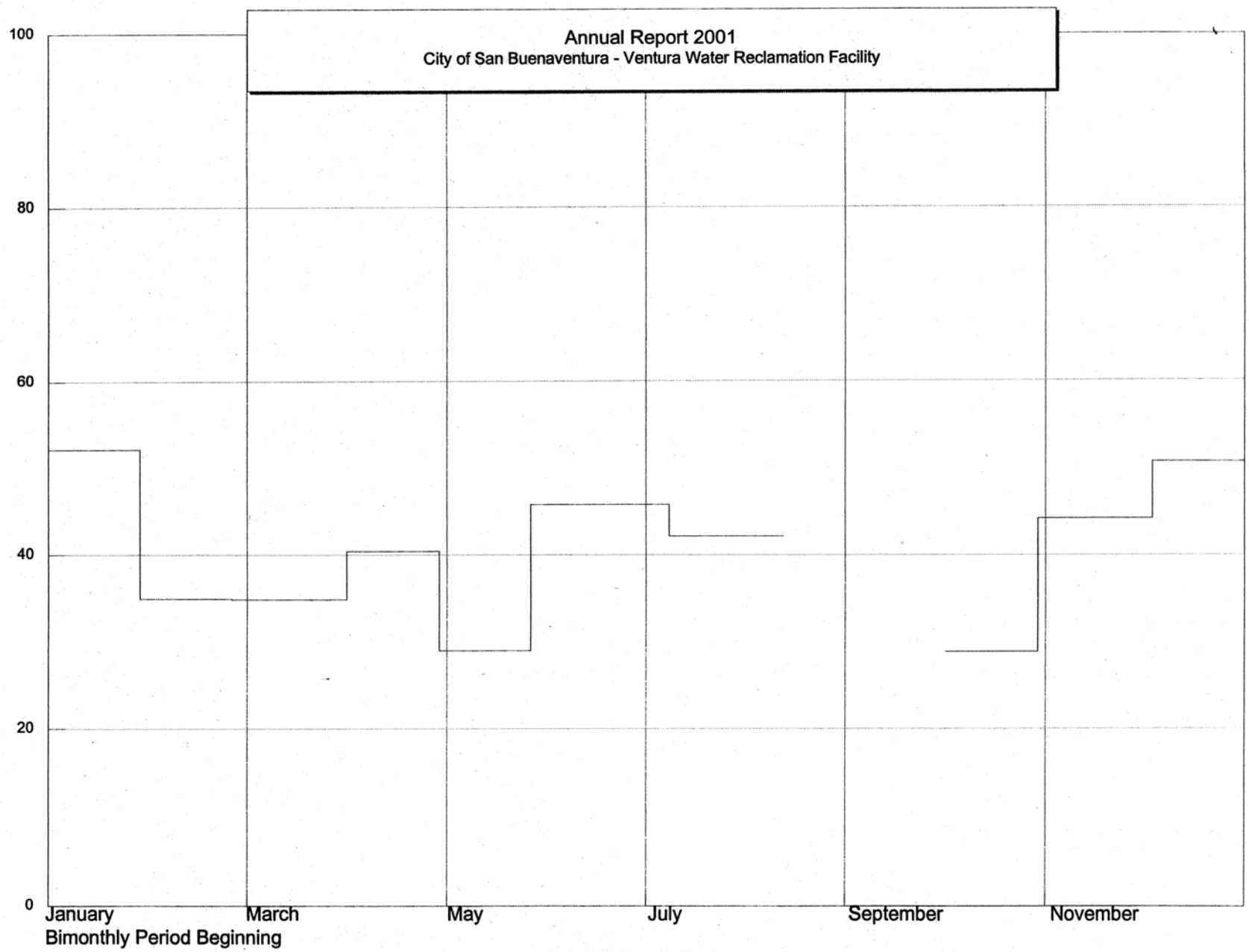


Influent Pump Station
Influent Raw Sewage 30 Day Average COD - mg/l

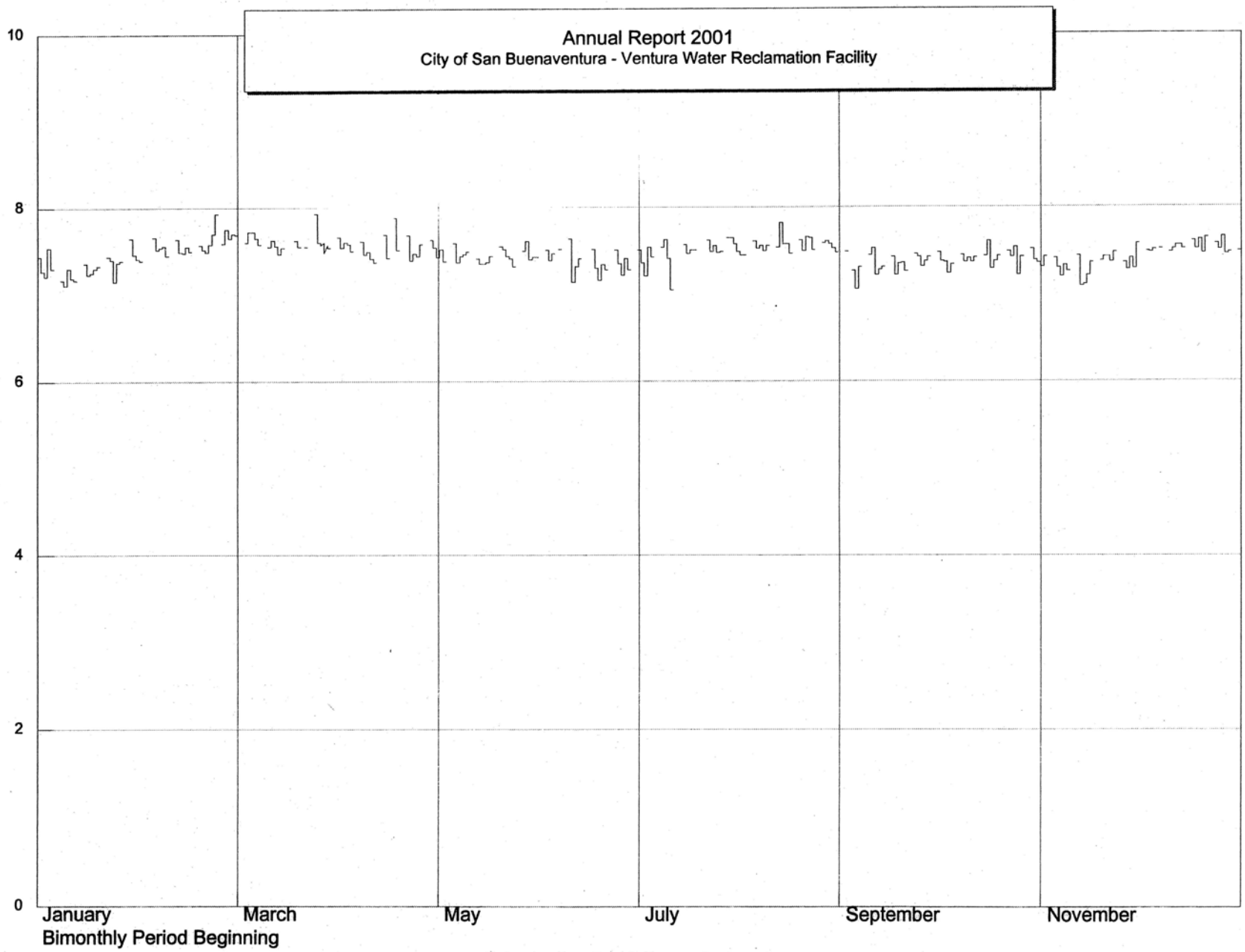

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
50
40
30
20
10
0
January
March
May
July
September
November
Bimonthly Period Beginning
Influent Pump Station
Raw Sewage Weekly Ammonia-N - mg/l



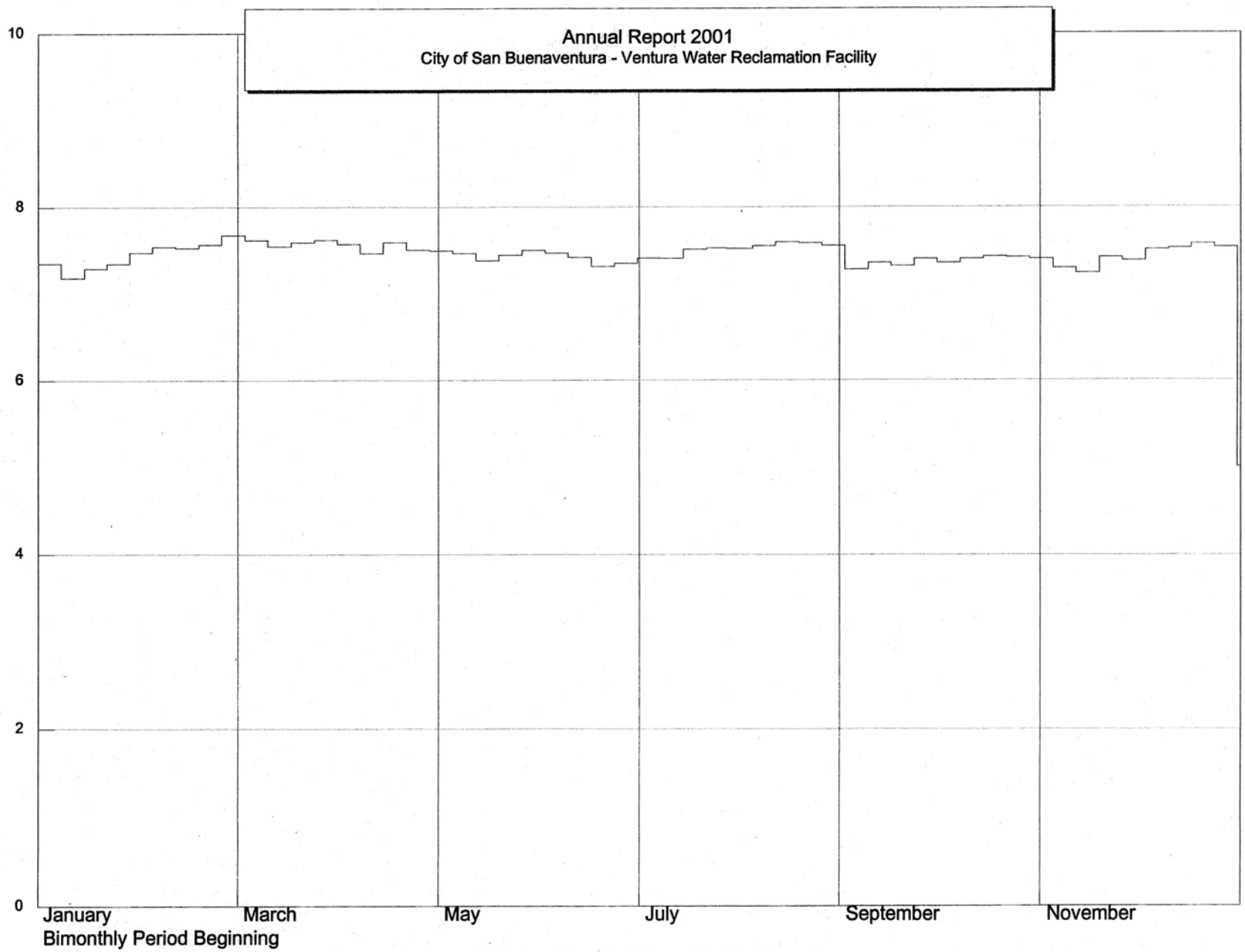
Influent Pump Station
Raw Sewage 30 Day Average Ammonia-N - mg/l



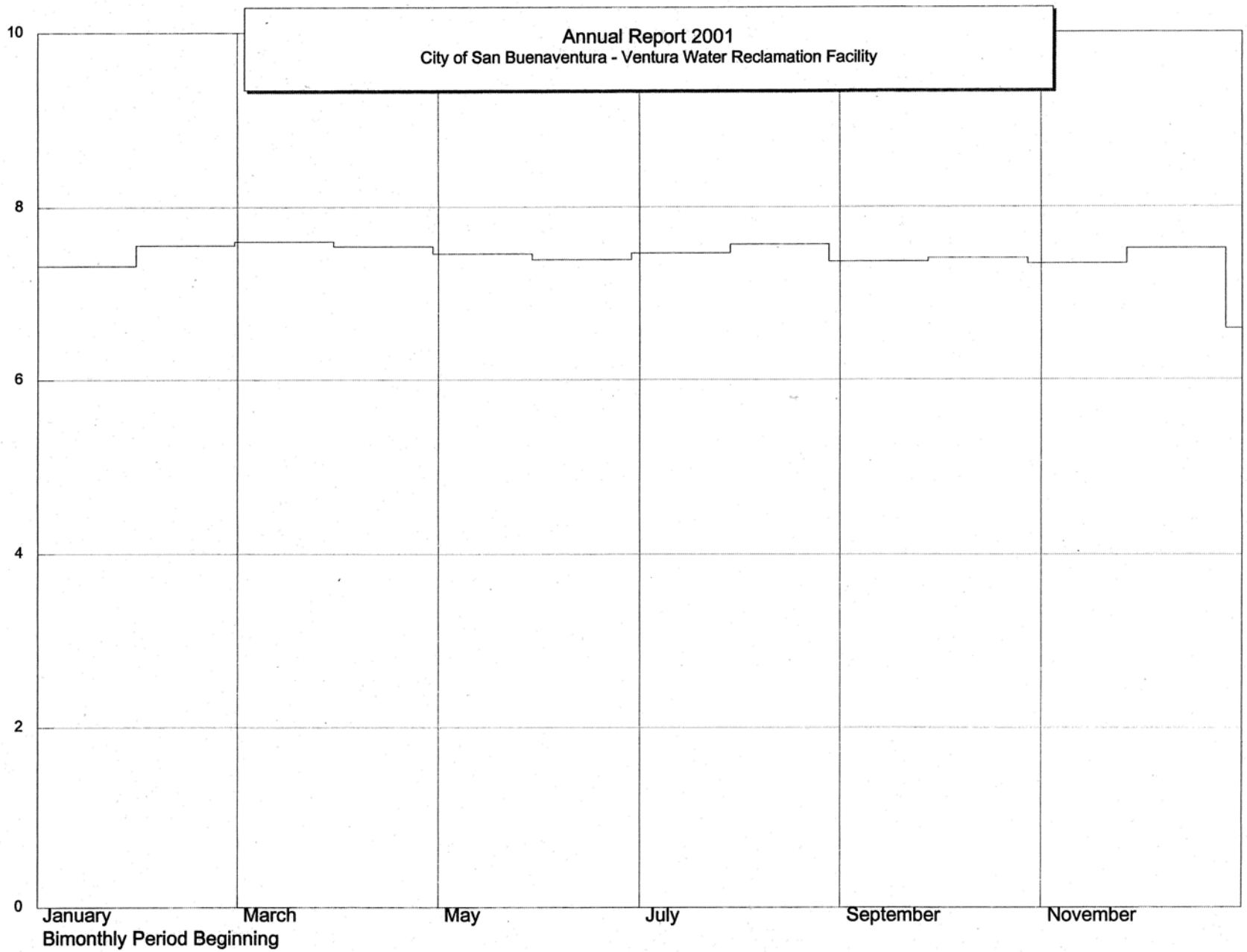
Influent Pump Station
Raw Sewage Monthly TKN - mg/l



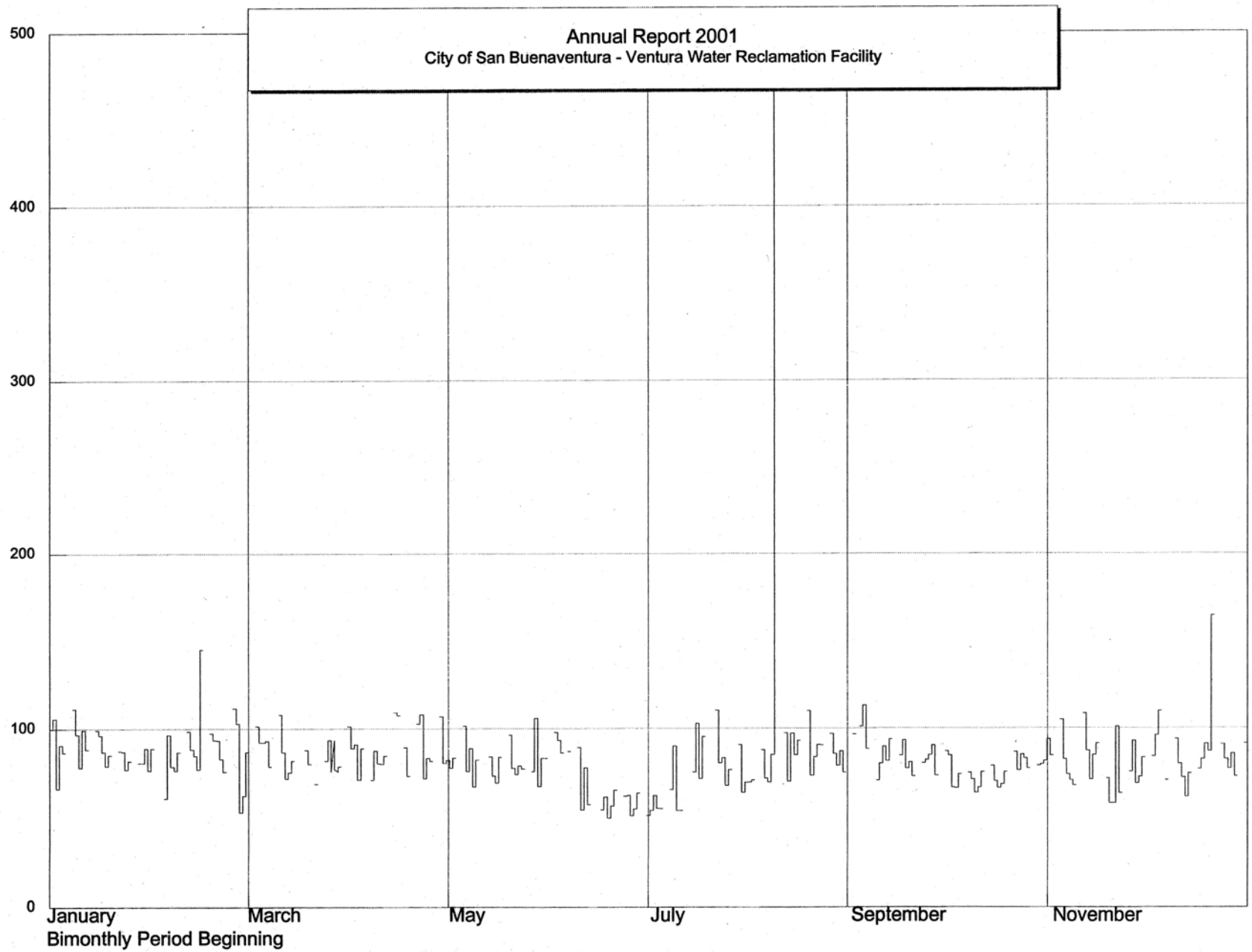
Primary Clarifier Effluent Splitter Box
Primary Effluent pH - pH Units



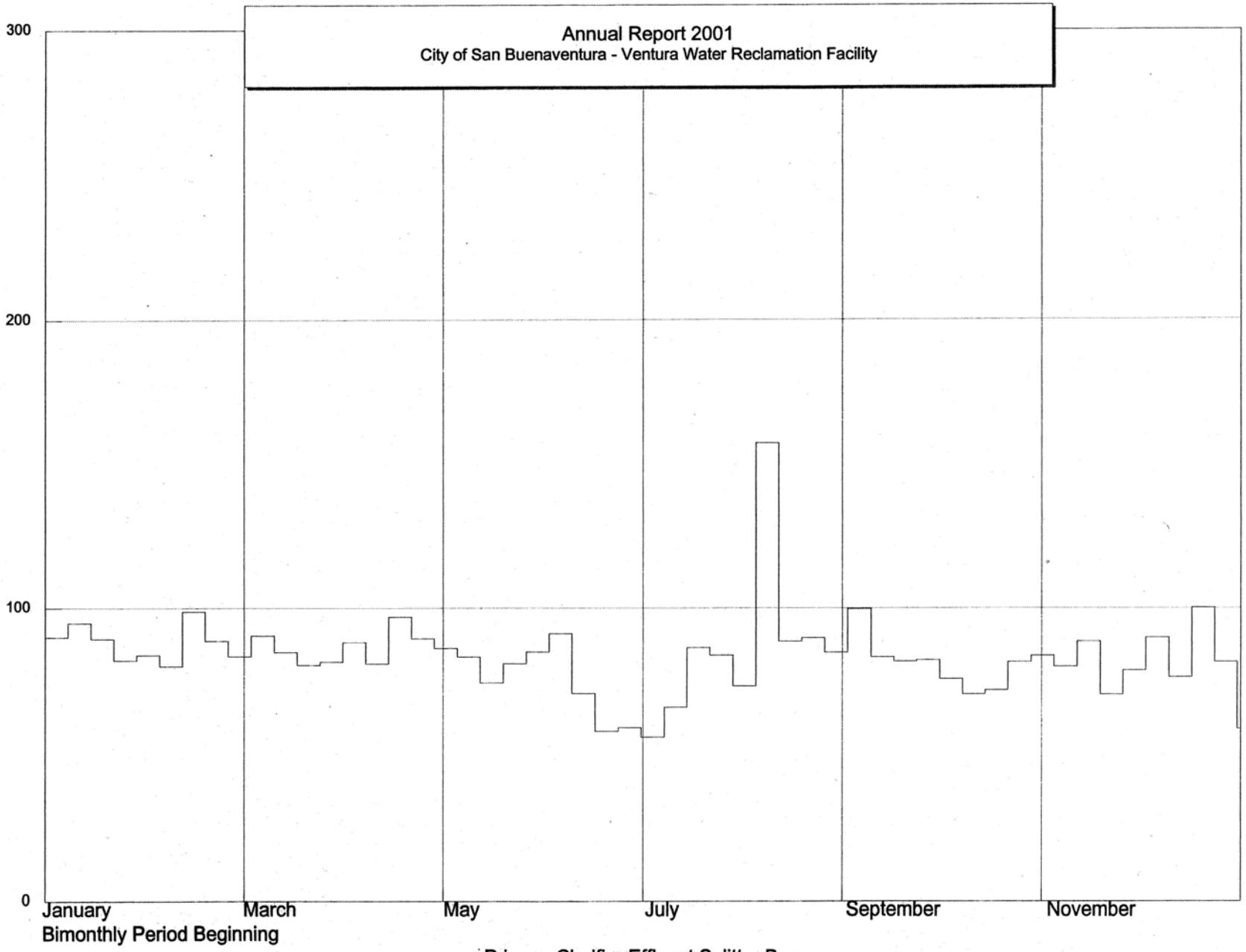
Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average pH - pH Units



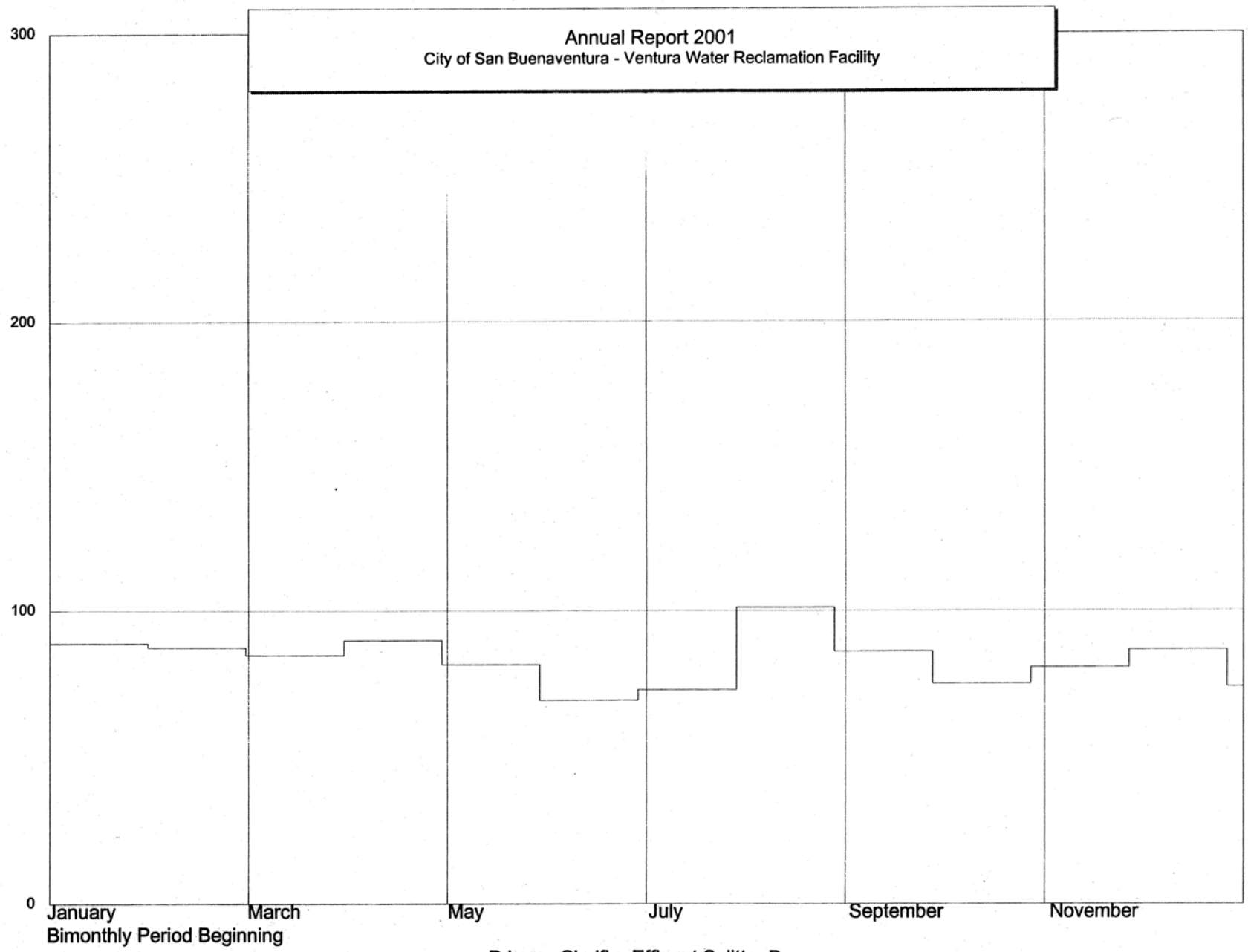
Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average pH - pH Units



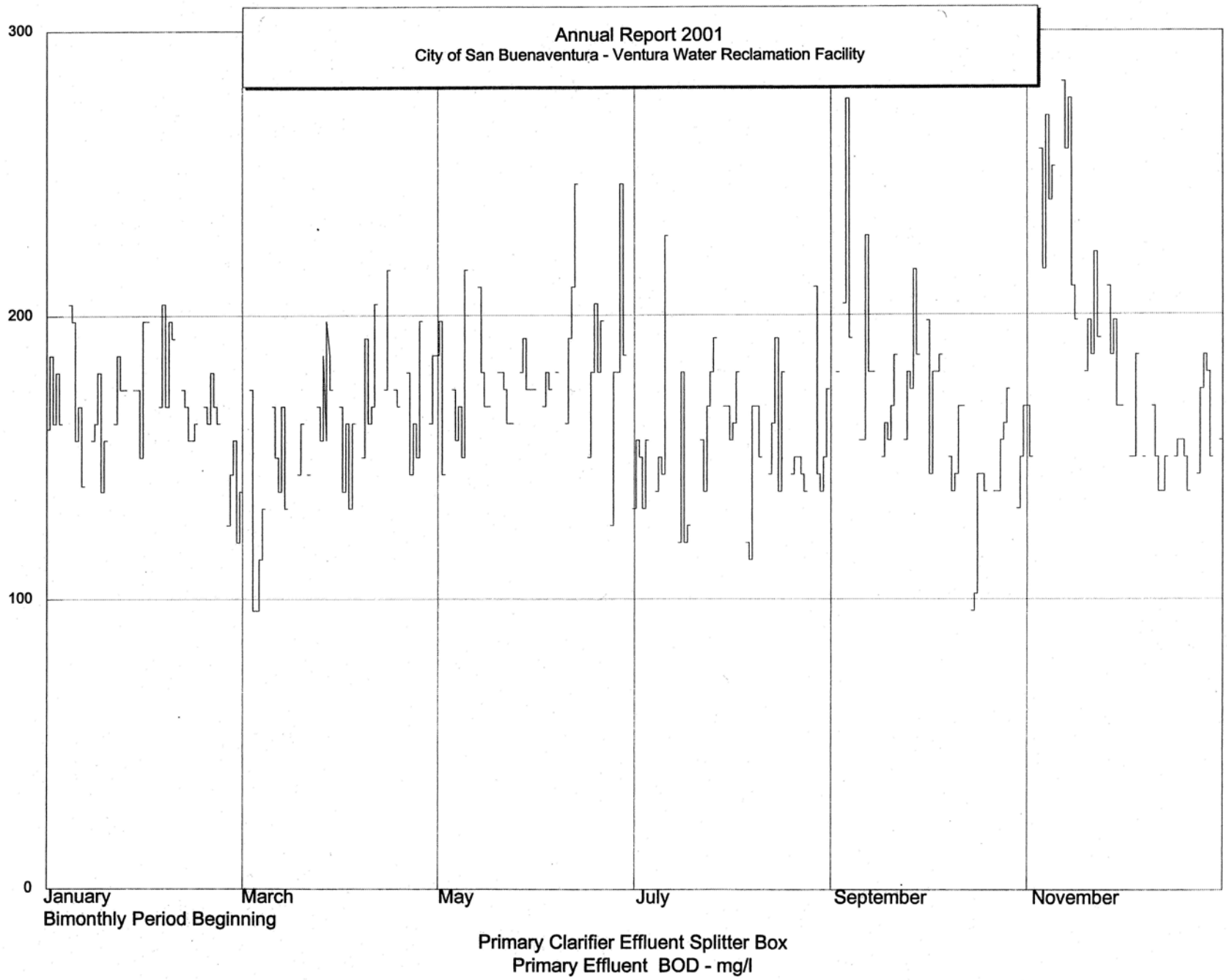
Primary Clarifier Effluent Splitter Box
Primary Effluent Suspended Solids - mg/l

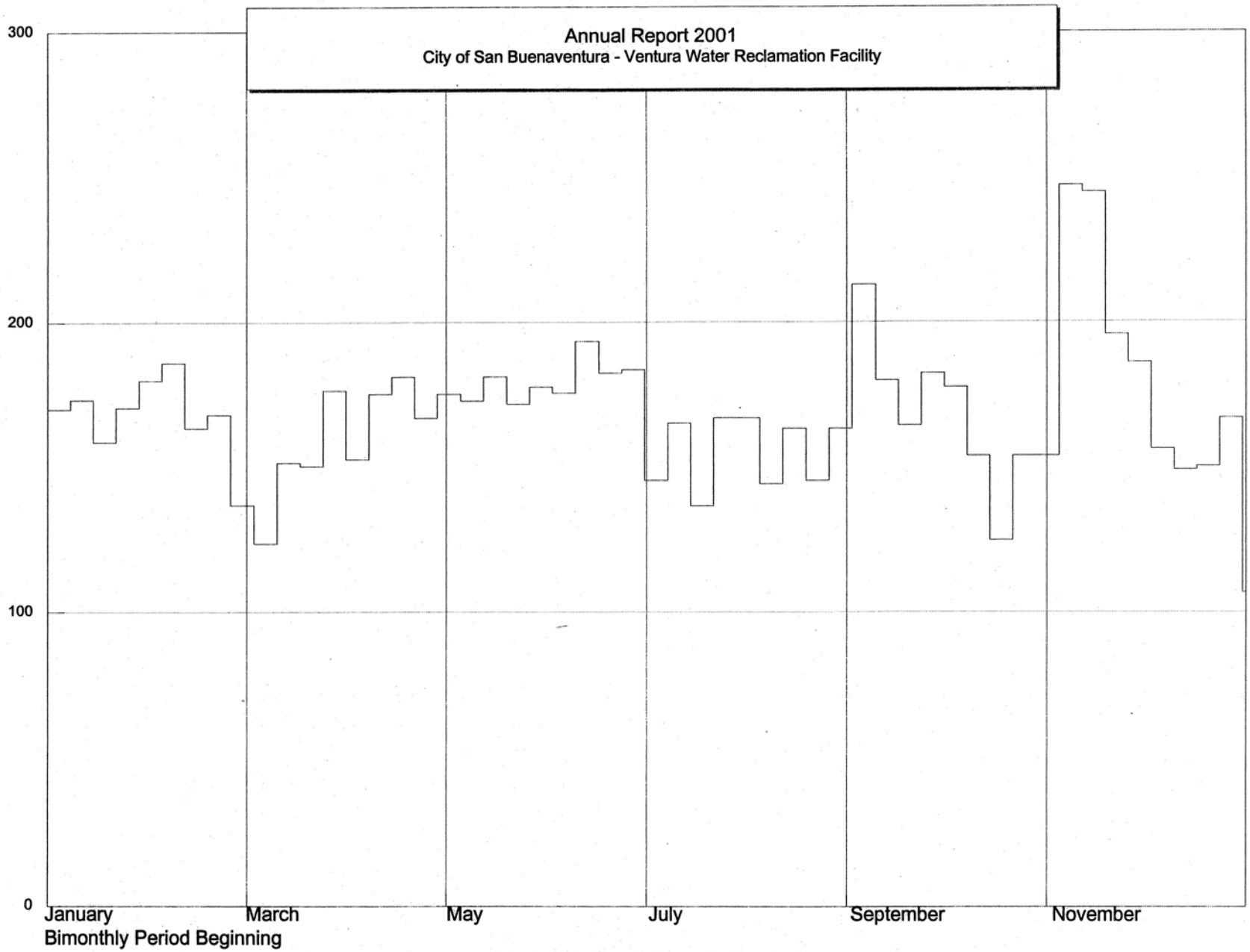


Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average Suspended Solids - mg/l

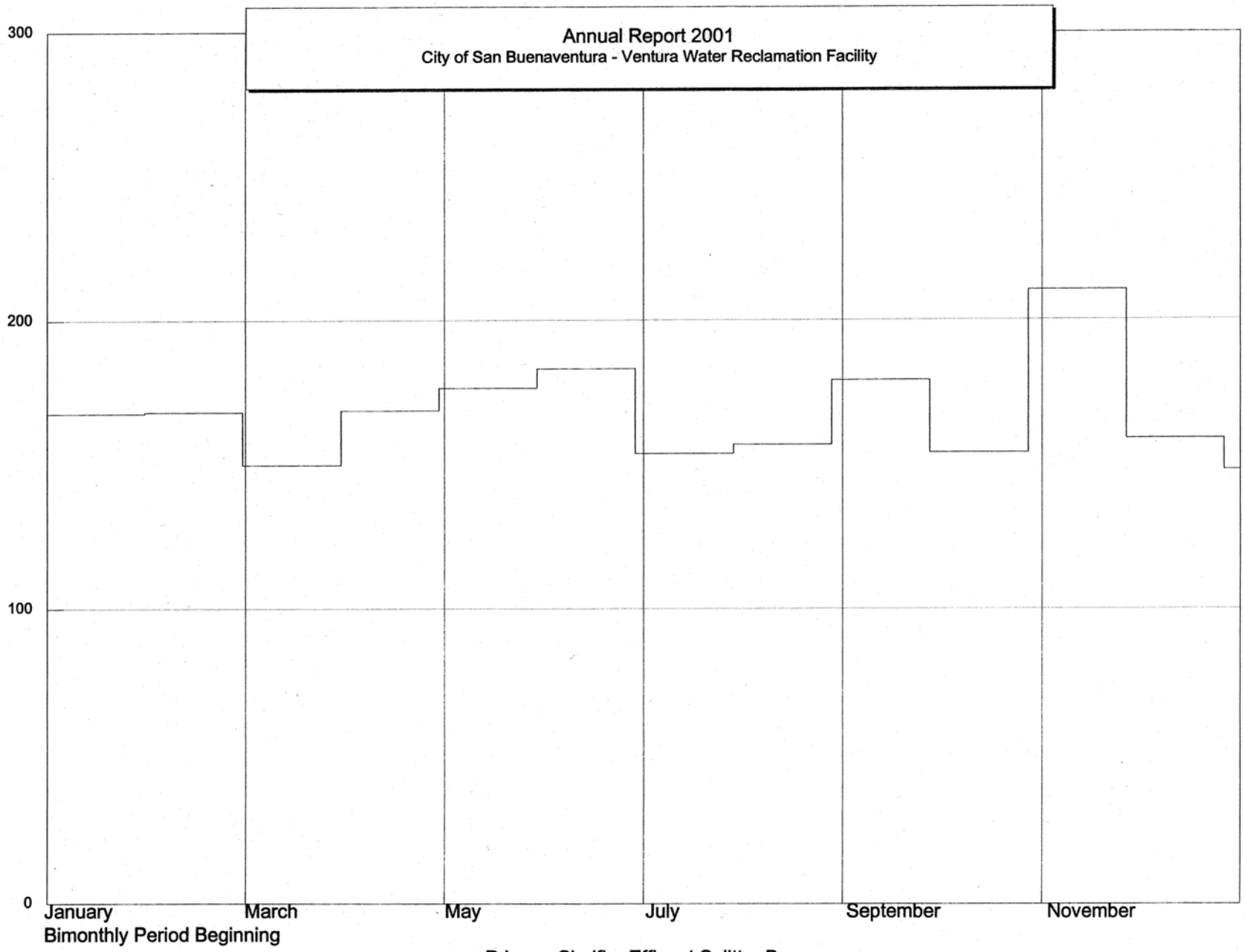


Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average Suspended Solids - mg/l

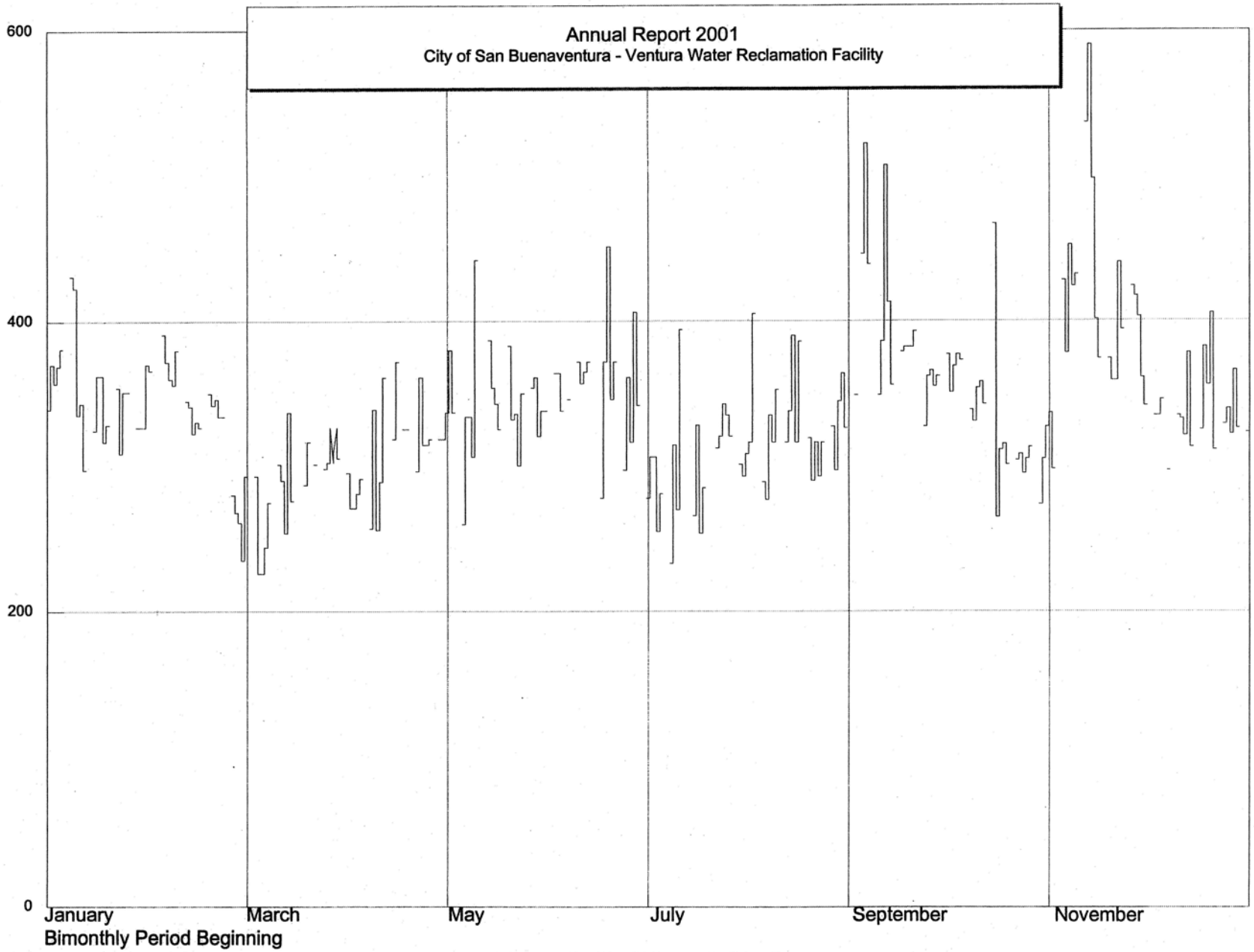

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Primary Clarifier Effluent Splitter Box
Primary Effluent BOD - mg/l



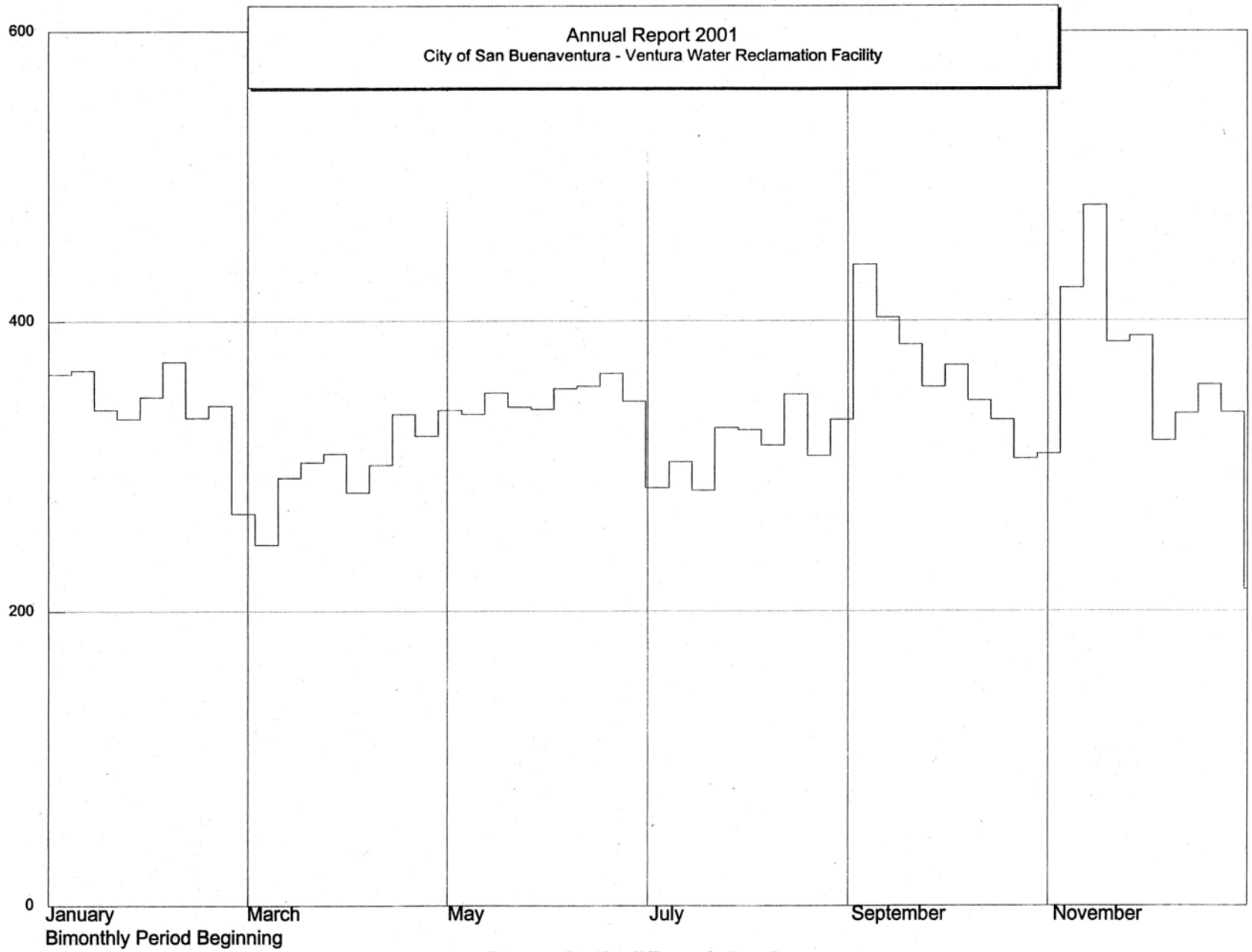
Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average BOD - mg/l



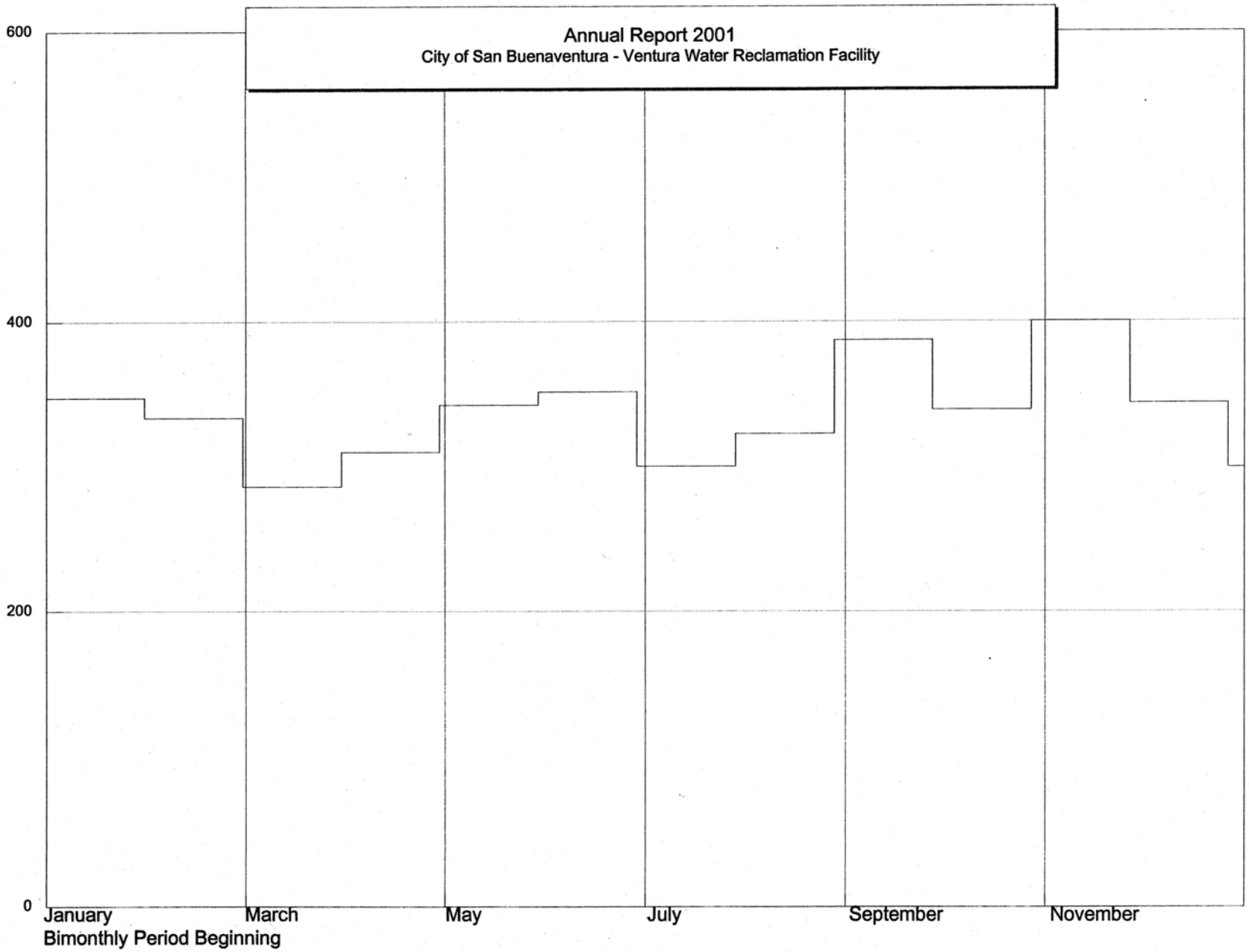
Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average BOD - mg/l



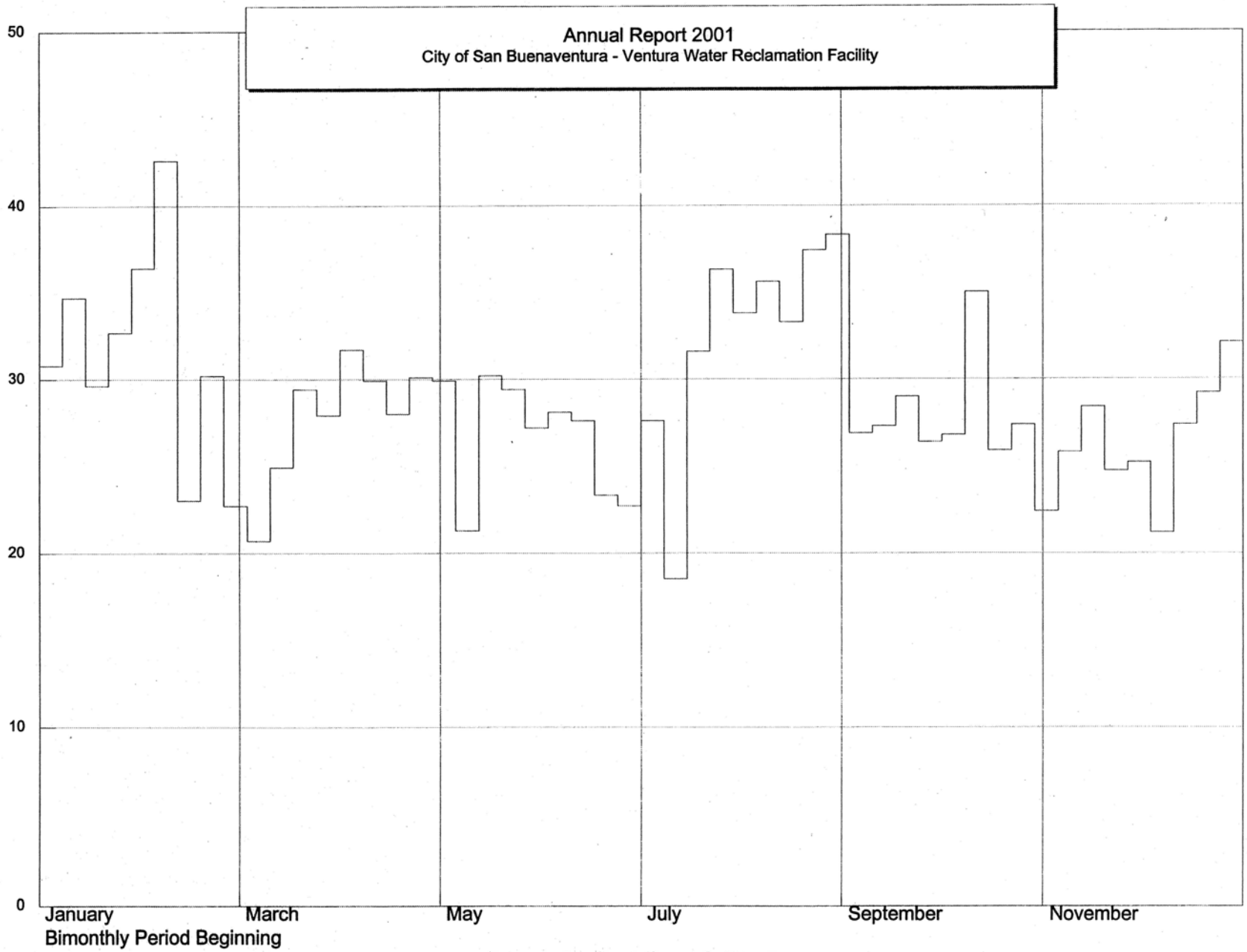
Primary Clarifier Effluent Splitter Box
Primary Effluent COD - mg/l



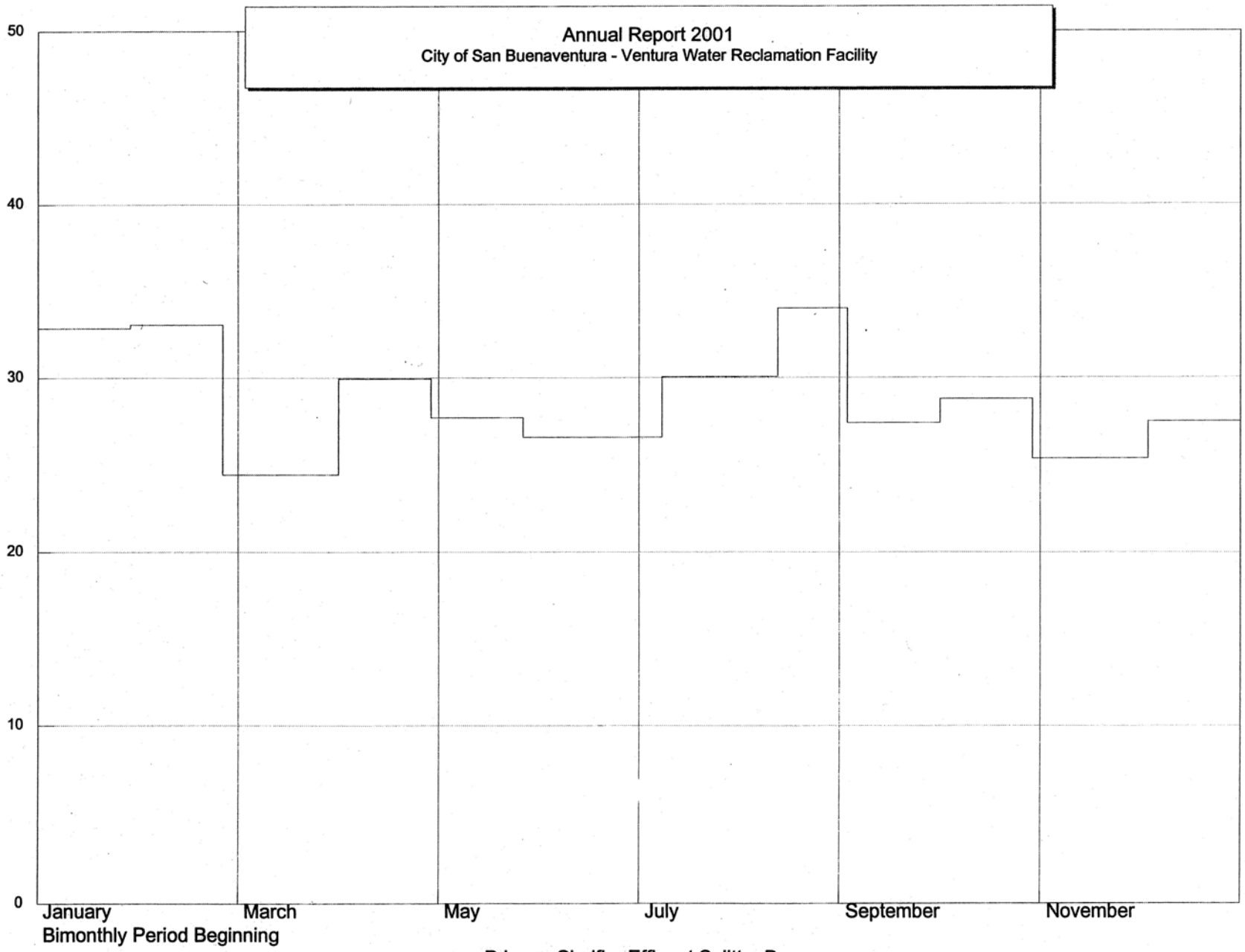
Primary Clarifier Effluent Splitter Box
Primary Effluent 7 Day Average COD - mg/l



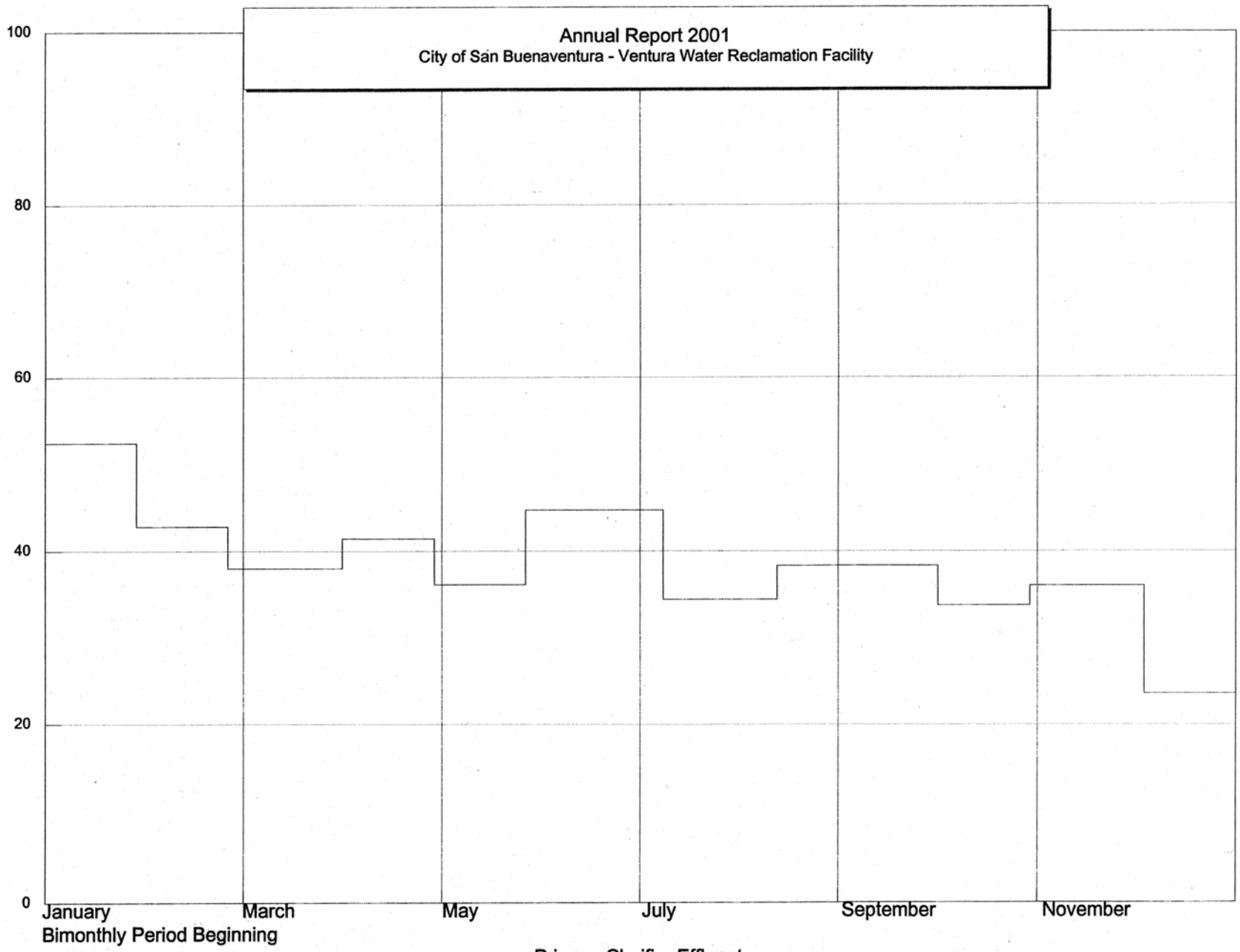
Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average COD - mg/l

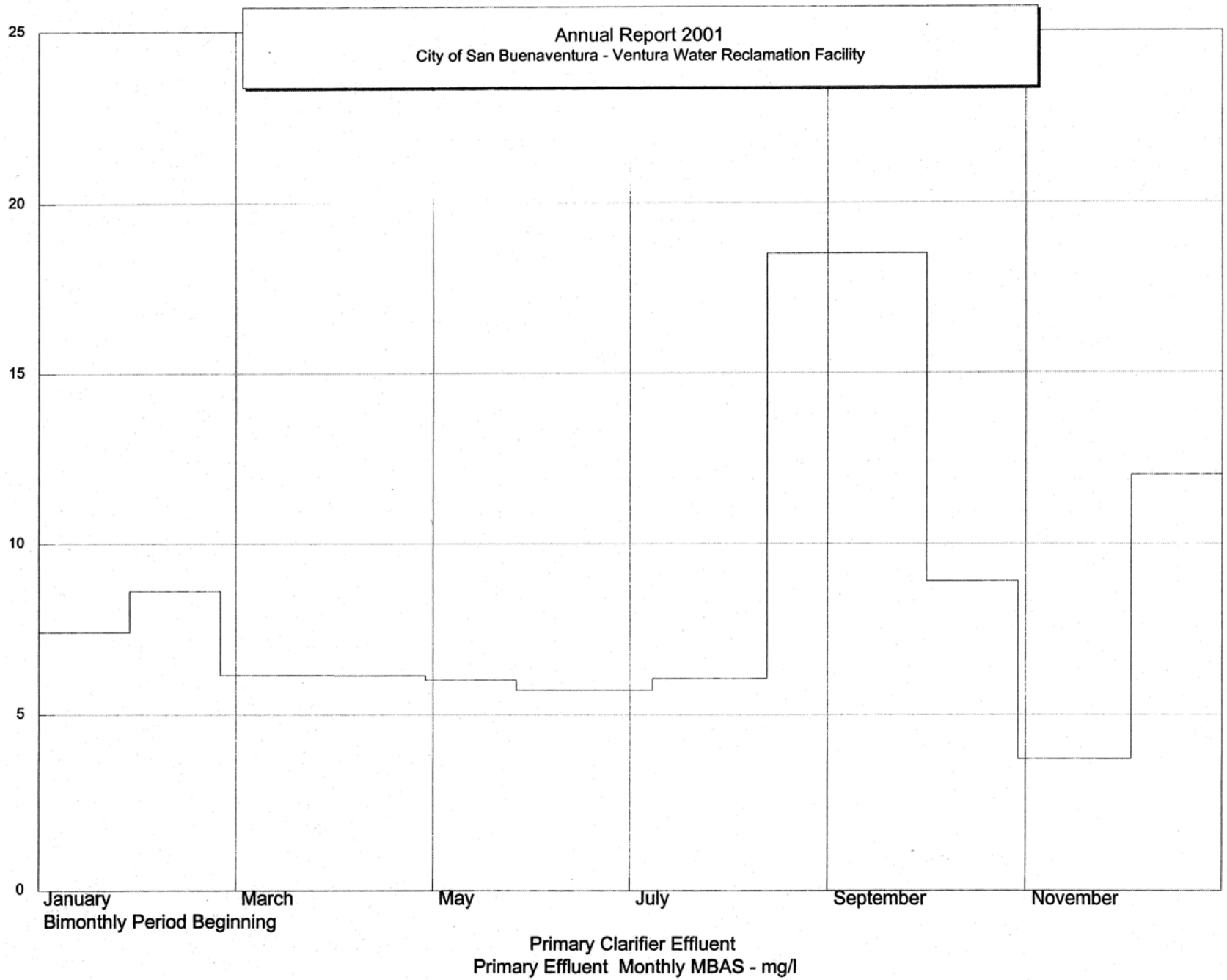


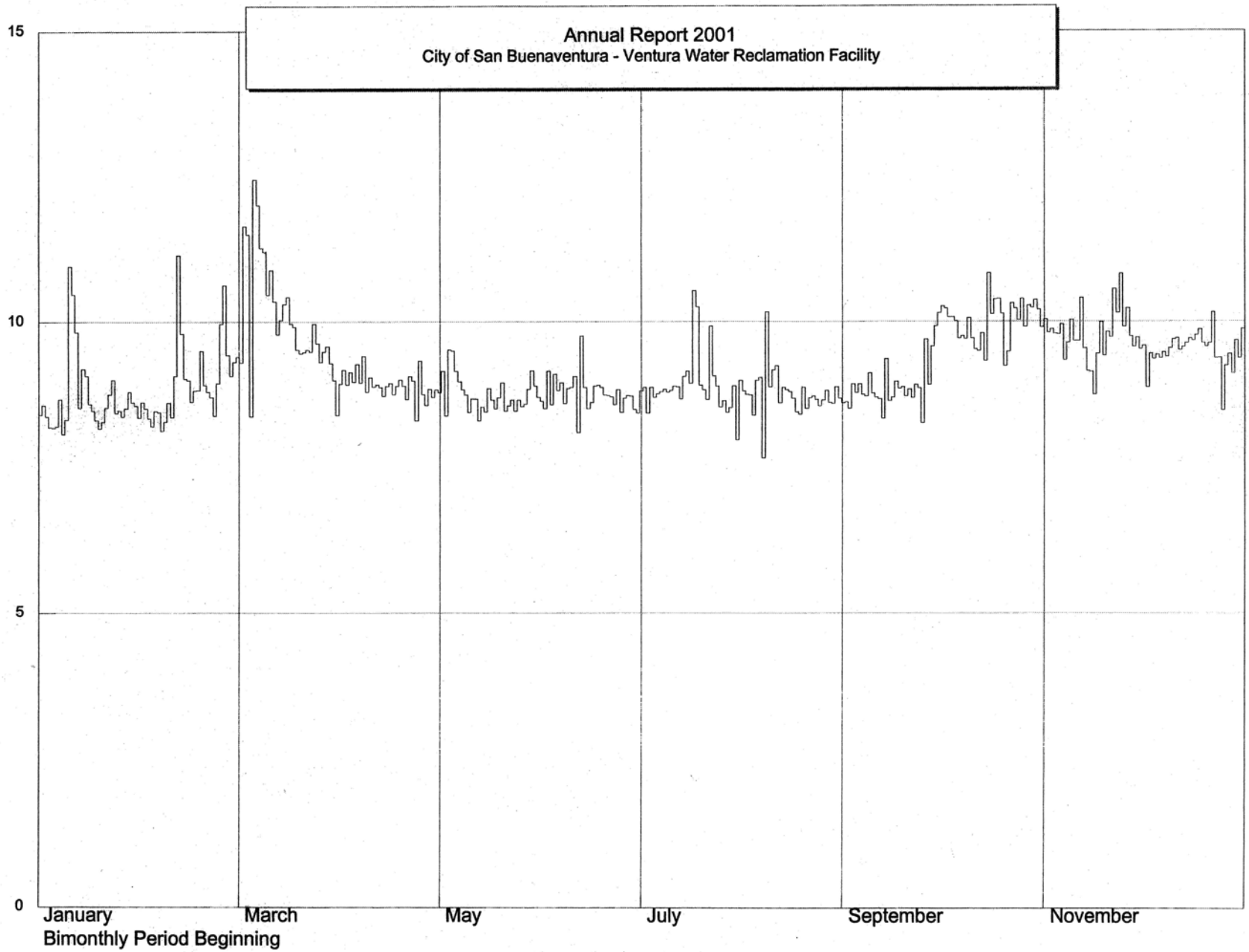
Primary Clarifier Effluent Splitter Box
Primary Effluent Weekly Ammonia-N - mg/l

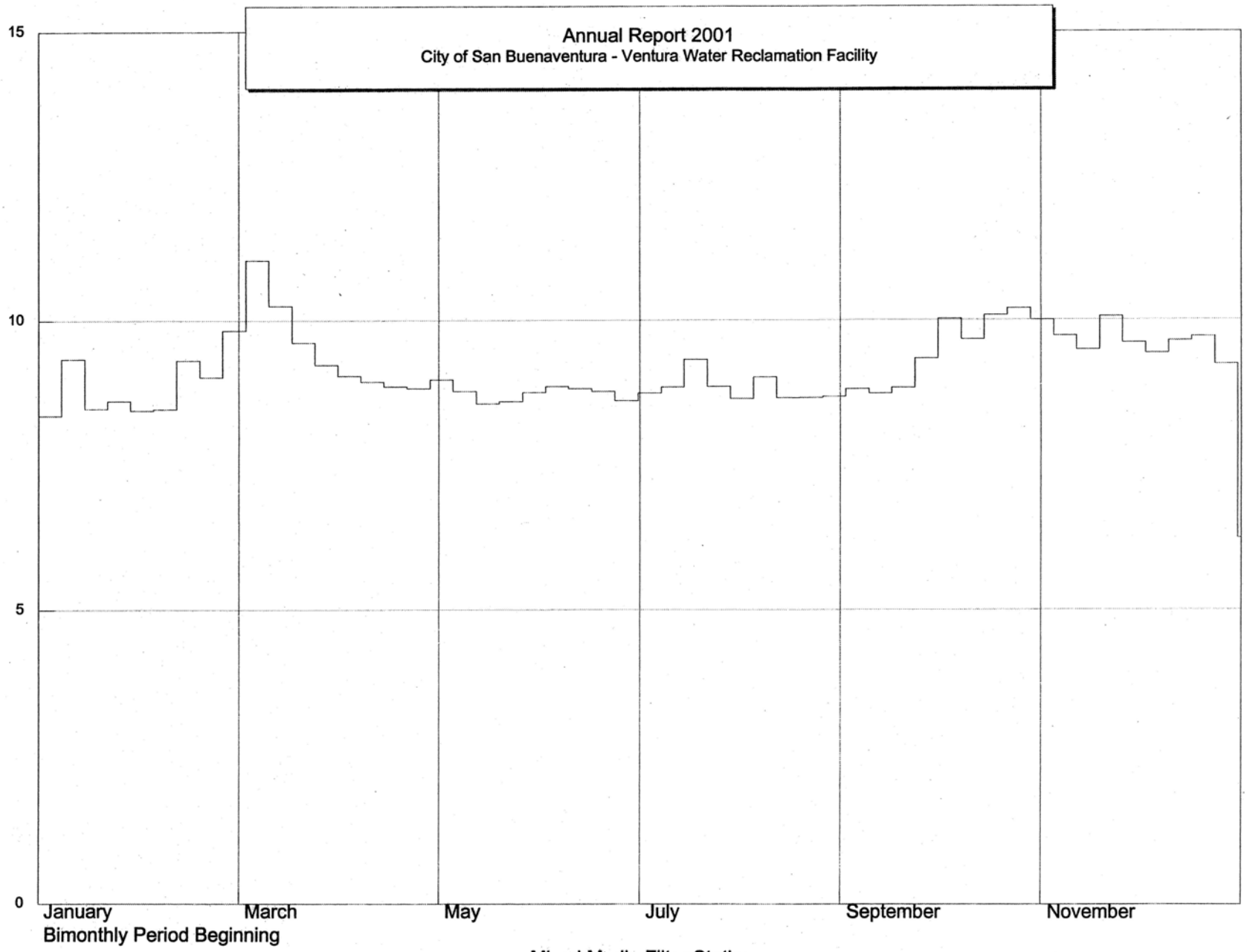


Primary Clarifier Effluent Splitter Box
Primary Effluent 30 Day Average Ammonia-N - mg/l

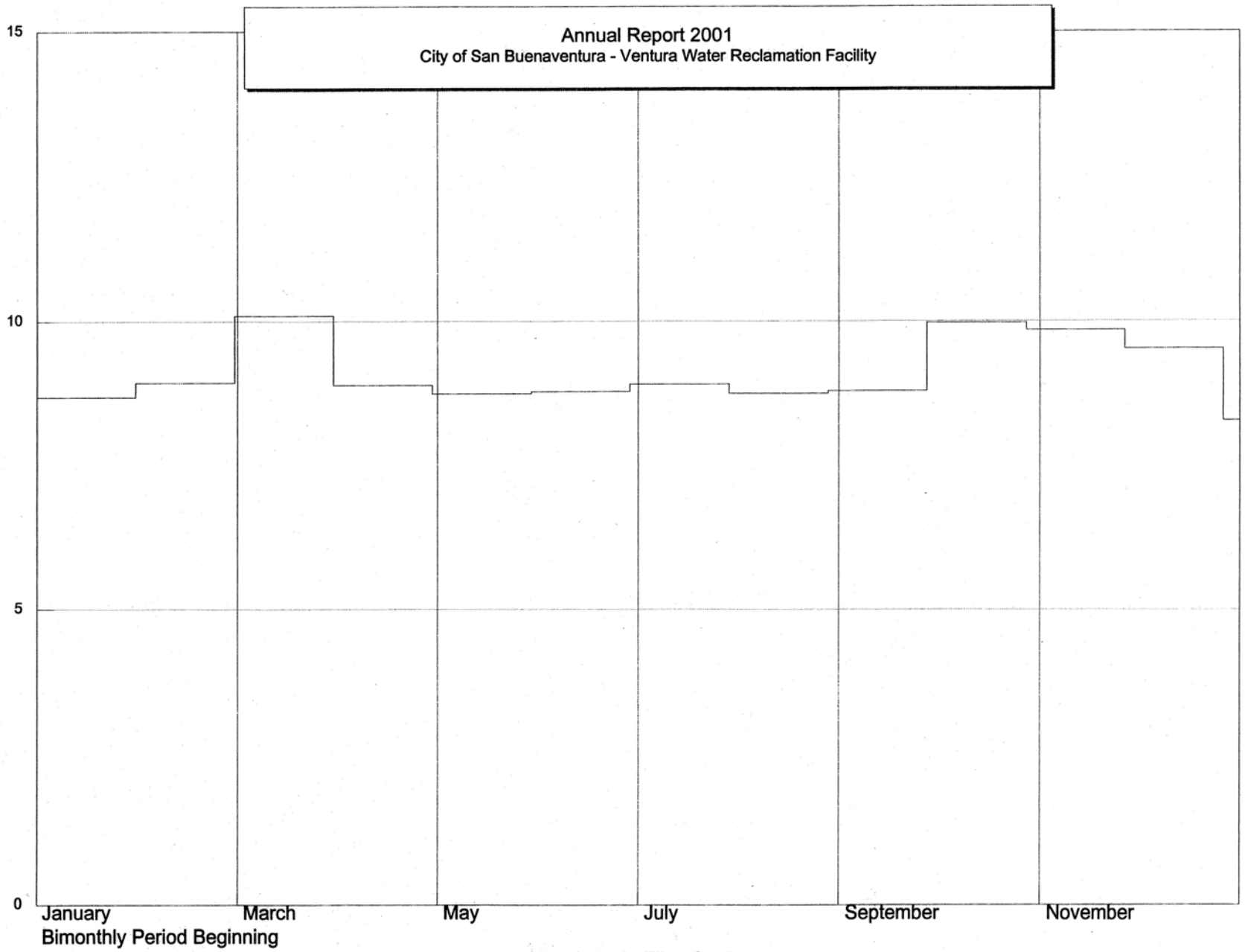

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
100
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
Primary Clarifier Effluent
Primary Effluent Monthly TKN - mg/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
25
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Primary Clarifier Effluent
Primary Effluent Monthly MBAS - mg/l

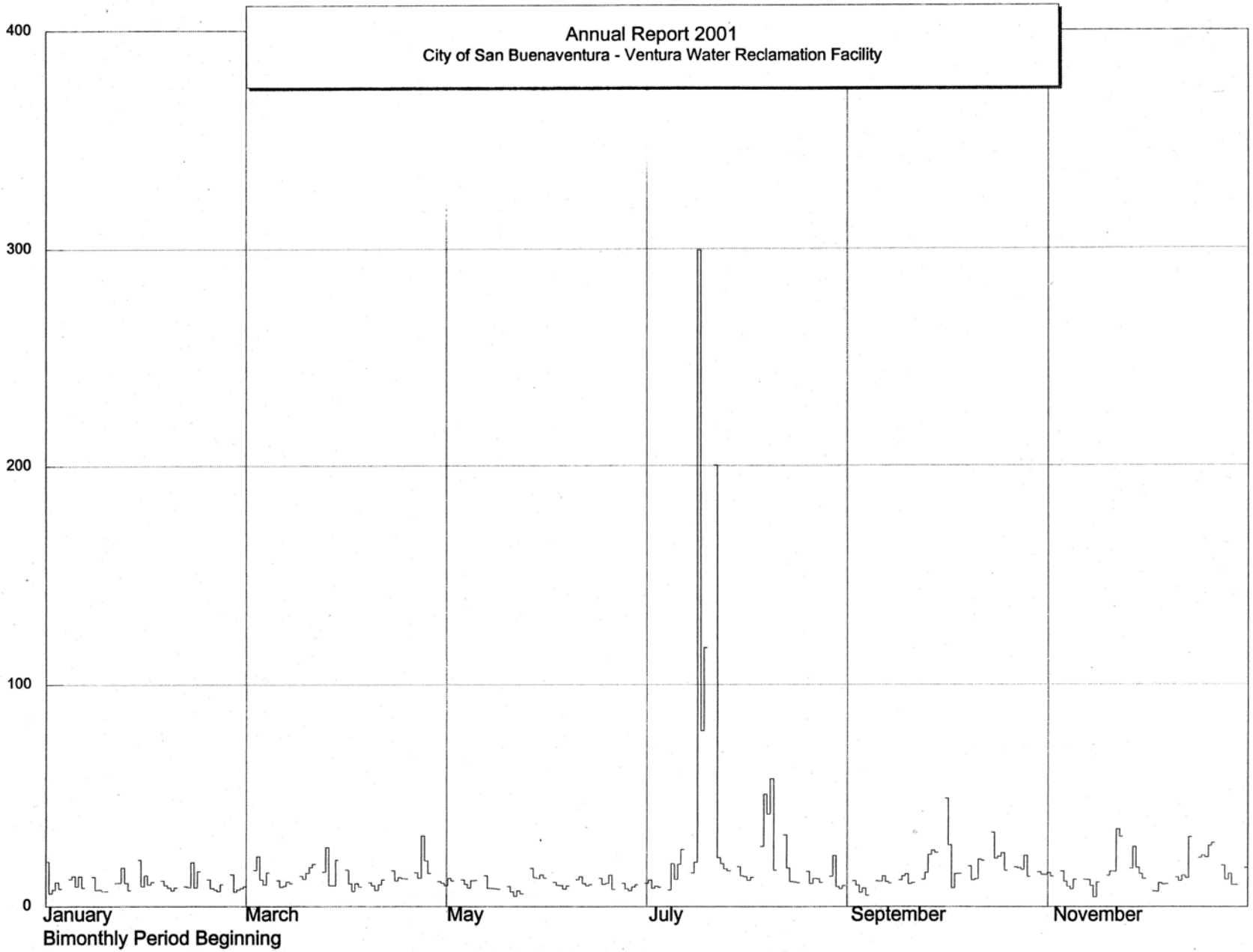

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Mixed Media Filter Station
Mixed Media Filter Flows - MGD



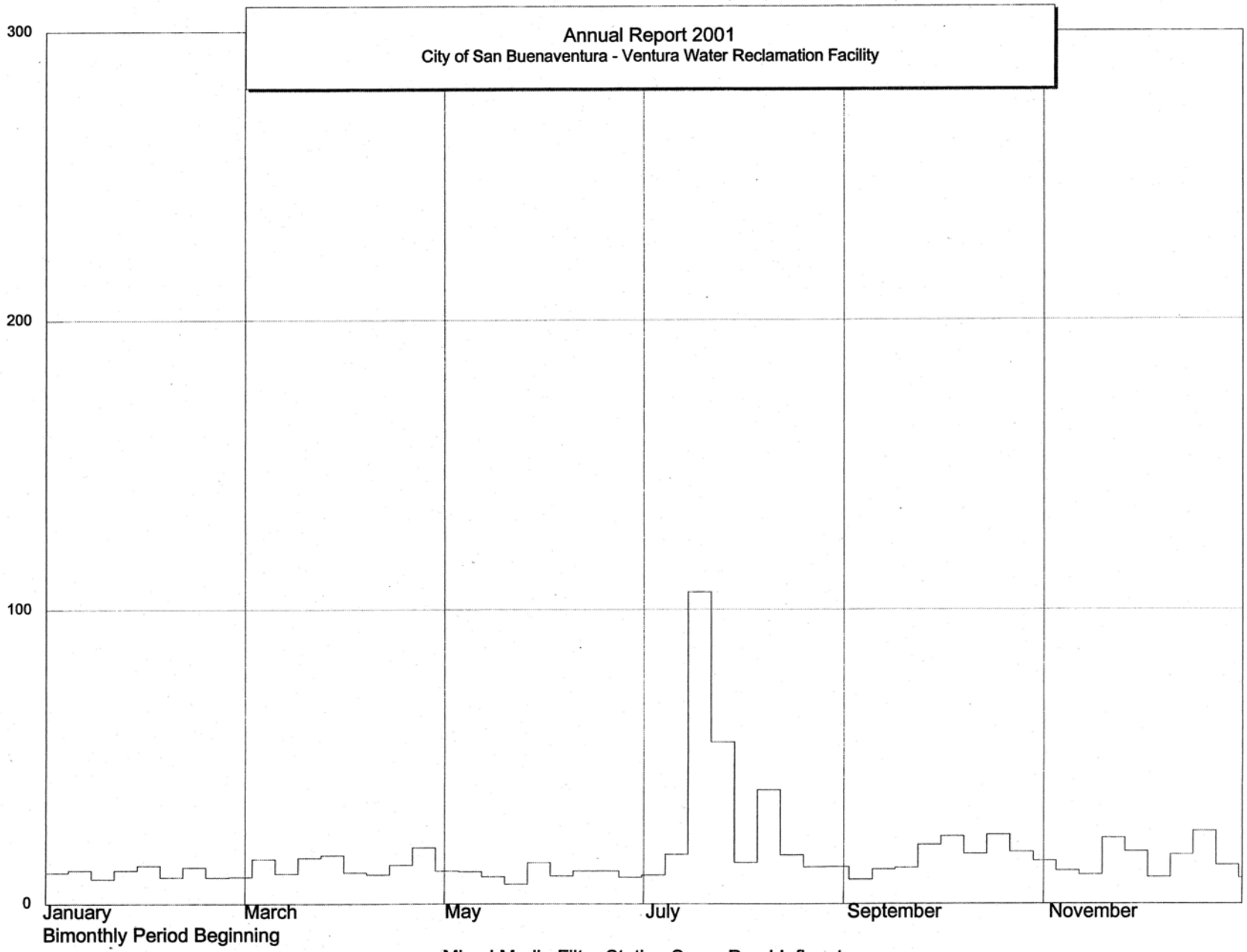
Mixed Media Filter Station
Mixed Media Filter 7 Day Average Flows - MGD



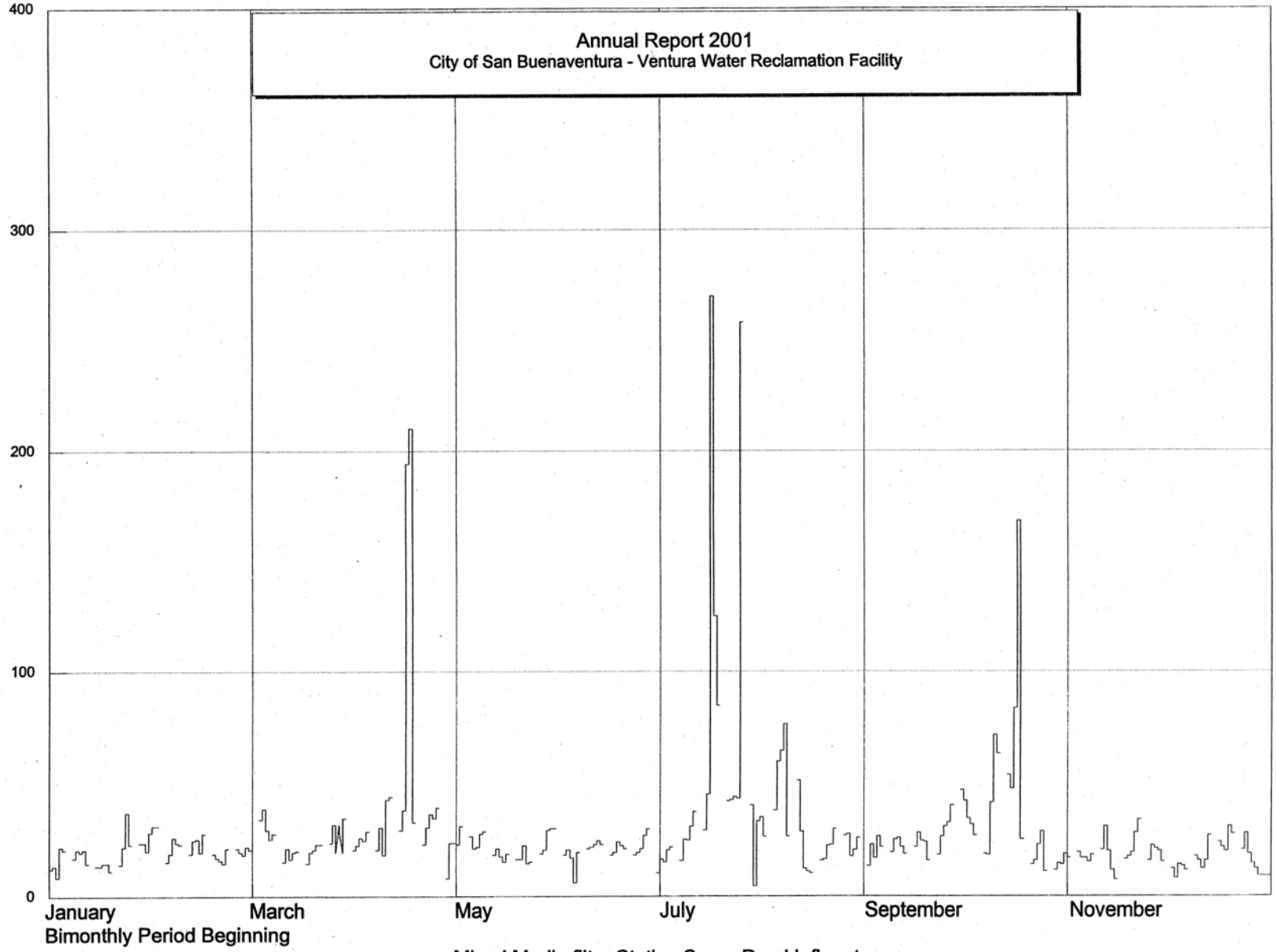
Mixed Media Filter Station
Mixed Media Filter 30 Day Average Flows - MGD



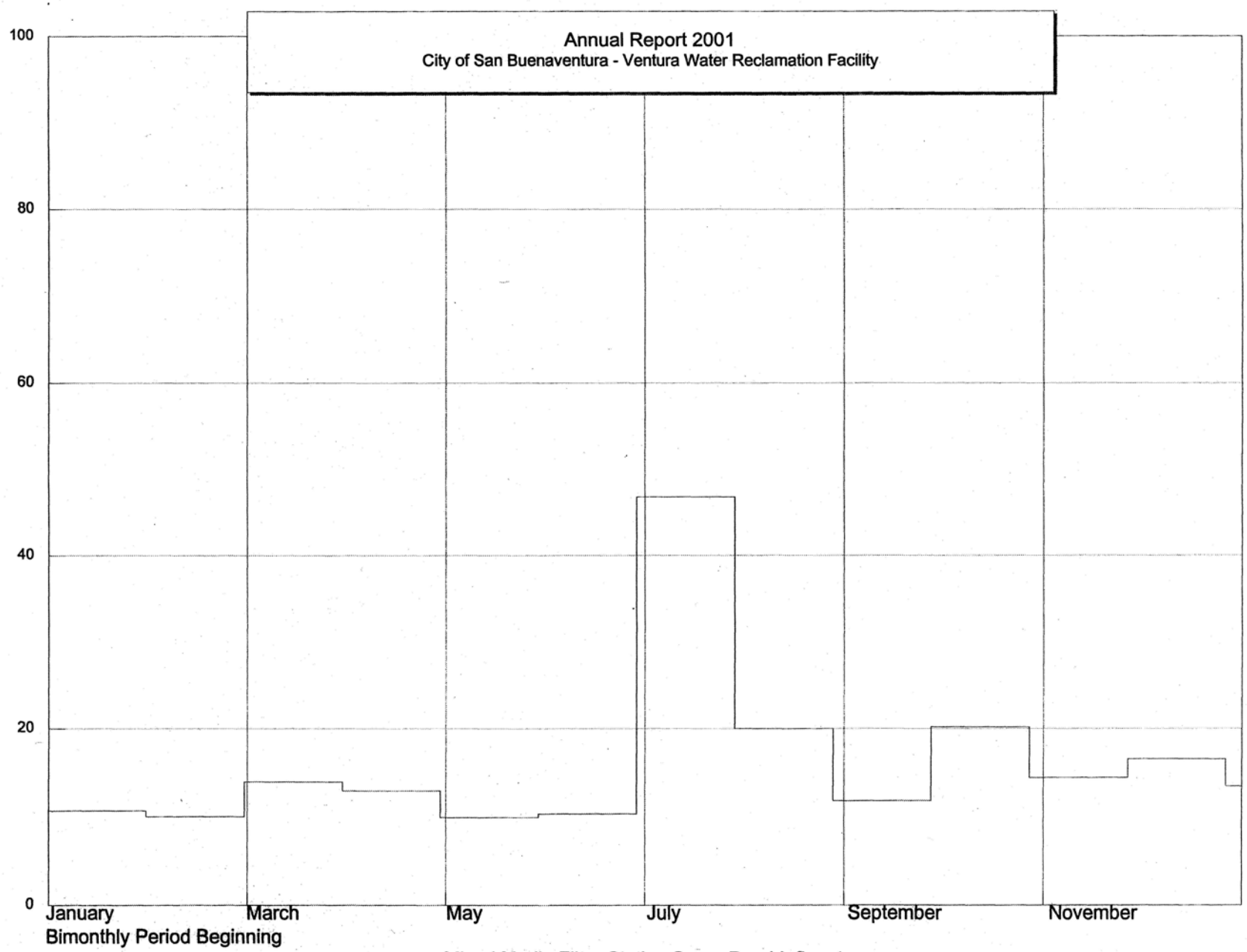
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Suspennded Solids - mg/l



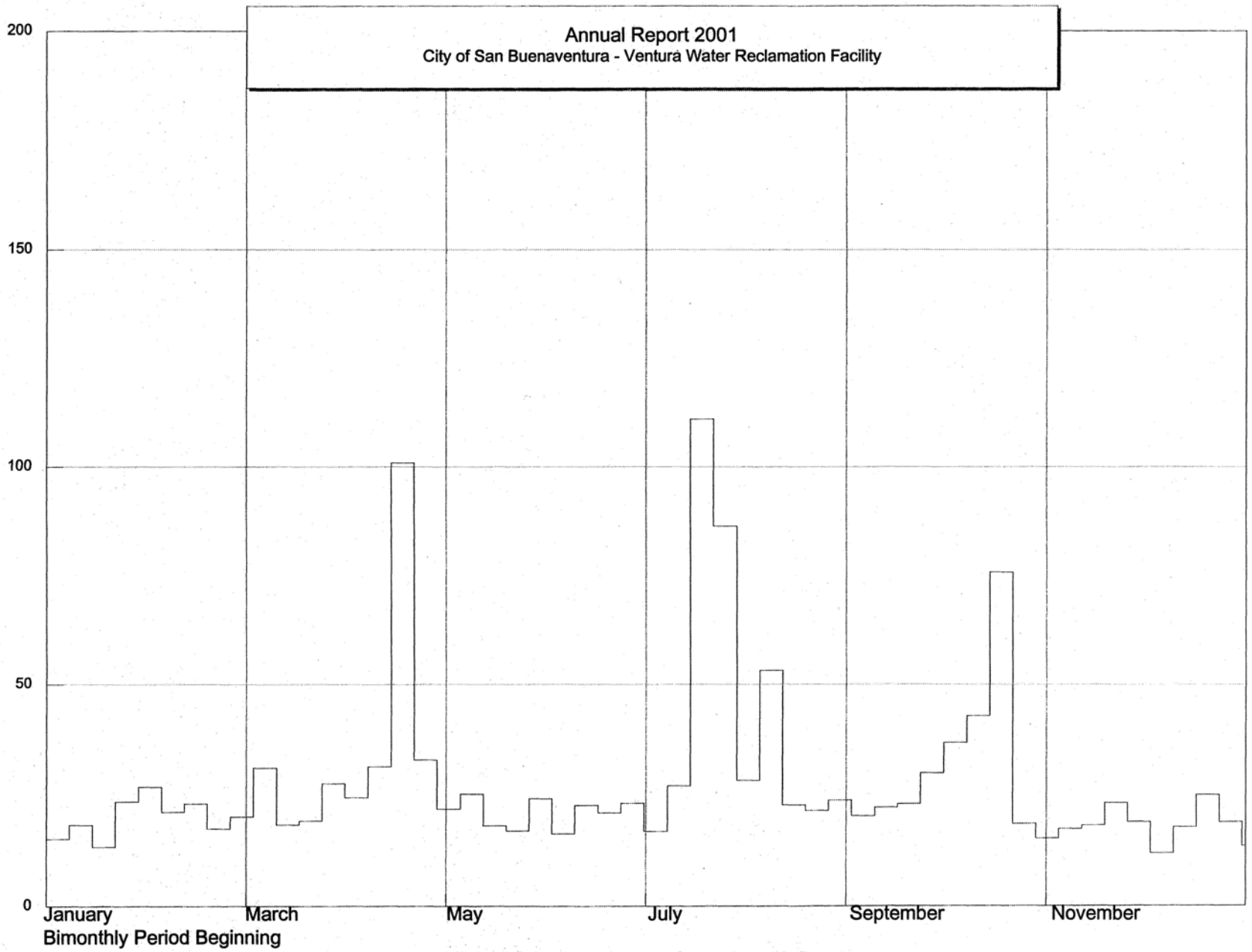
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 7 Day Averge Suspennded Solids - mg/l



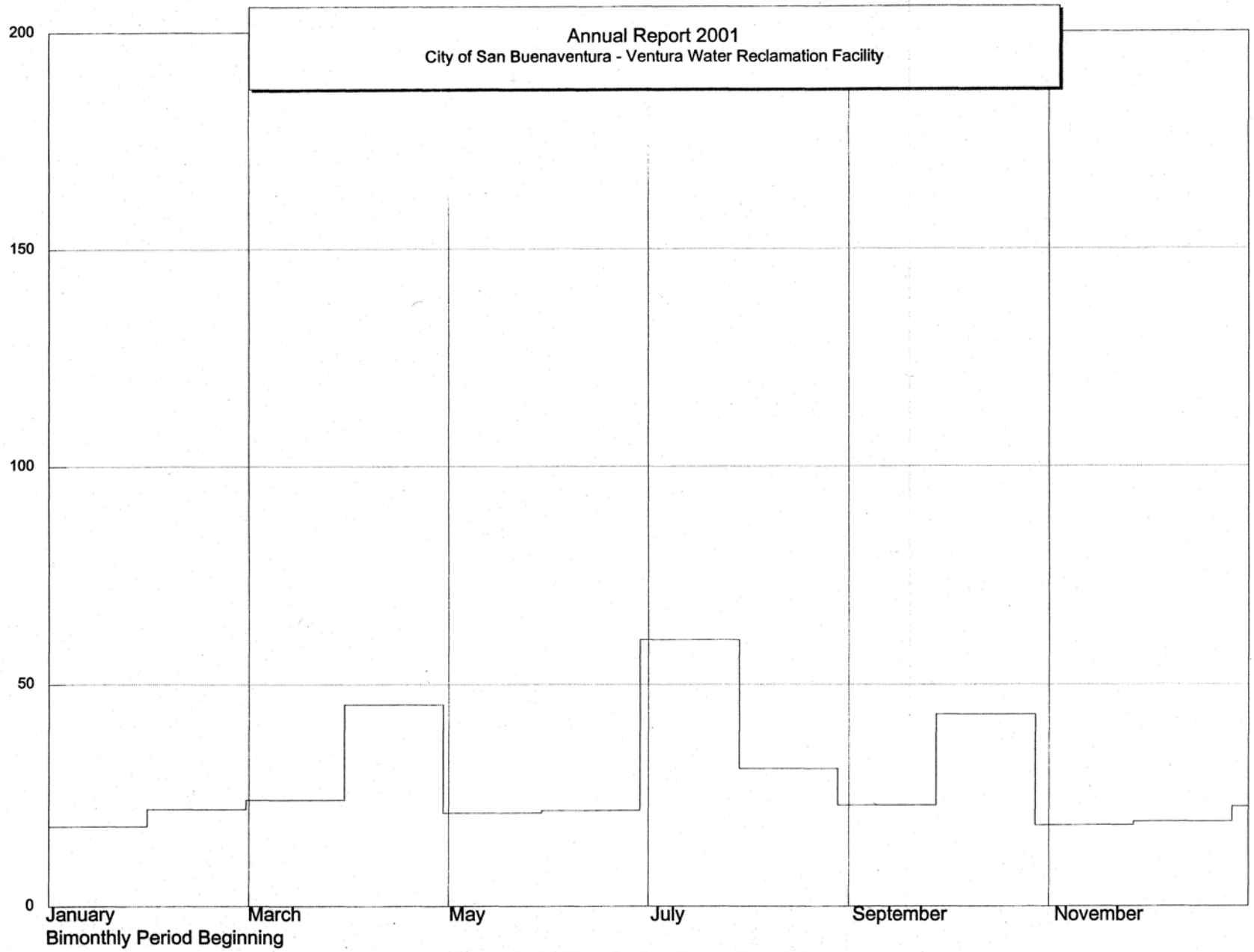
Mixed Media filter Station Surge Pond Influent
Activated Sludge Effluent BOD - mg/l



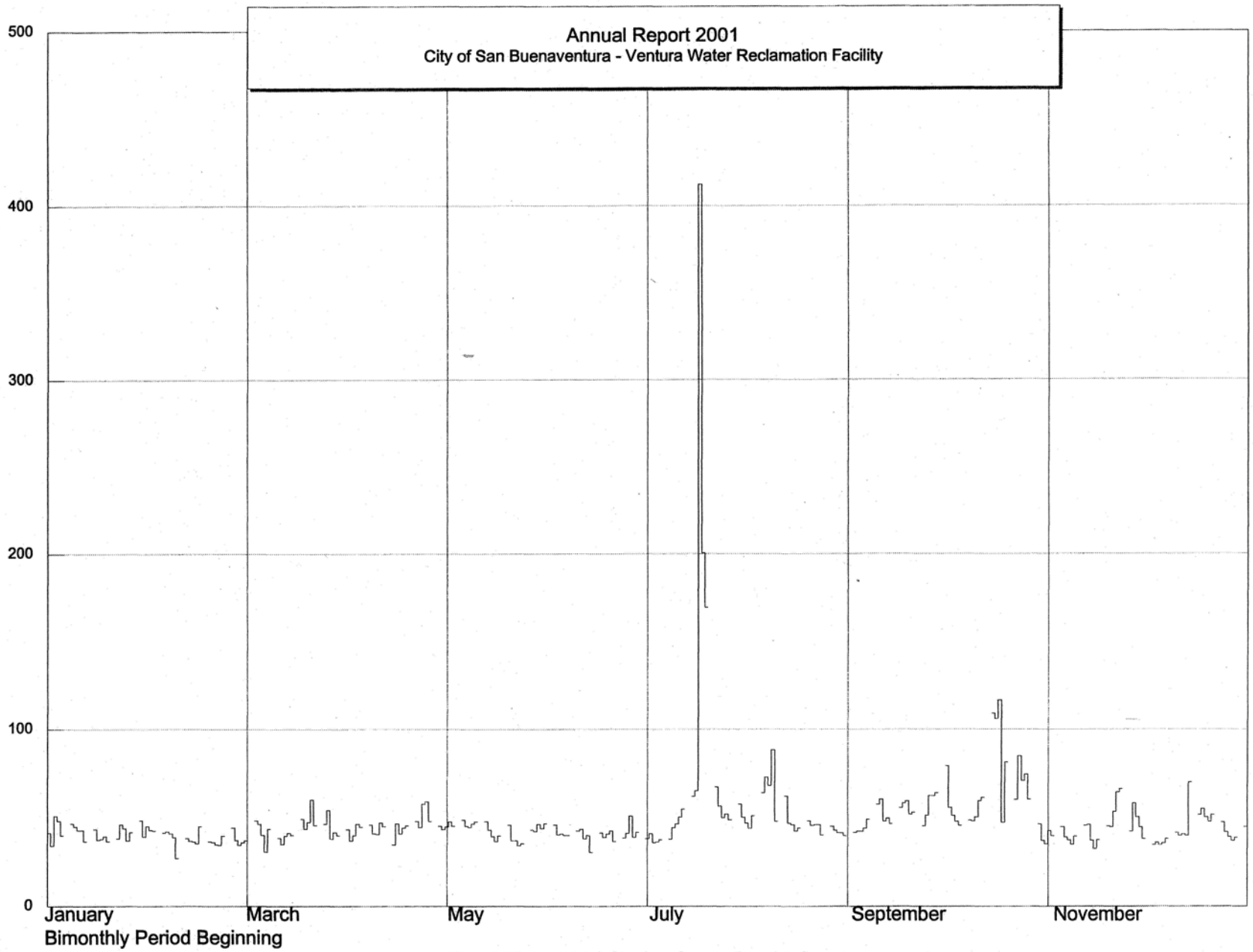
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Averge Suspennded Solids - mg/l



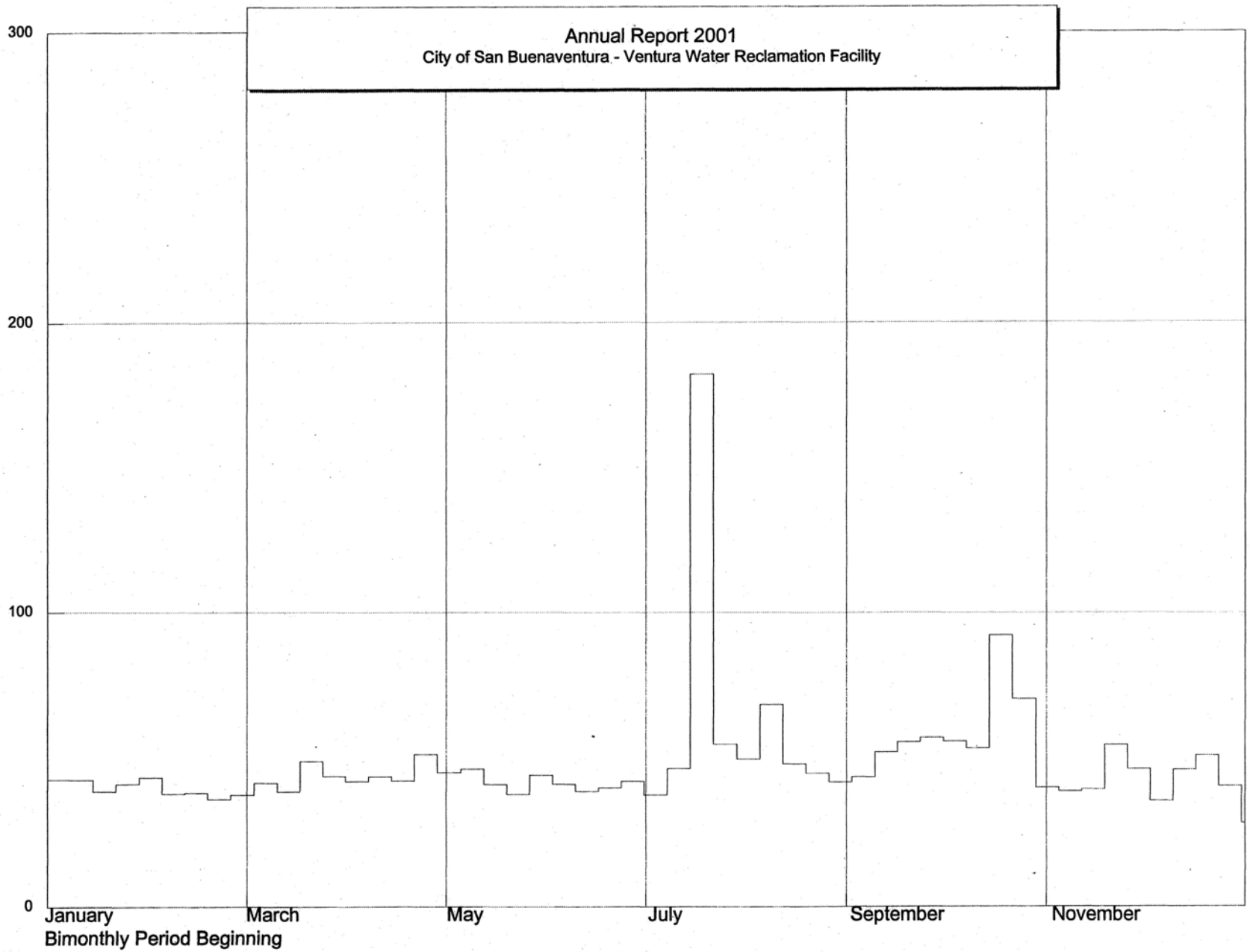
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 7 Day Average BOD - mg/l



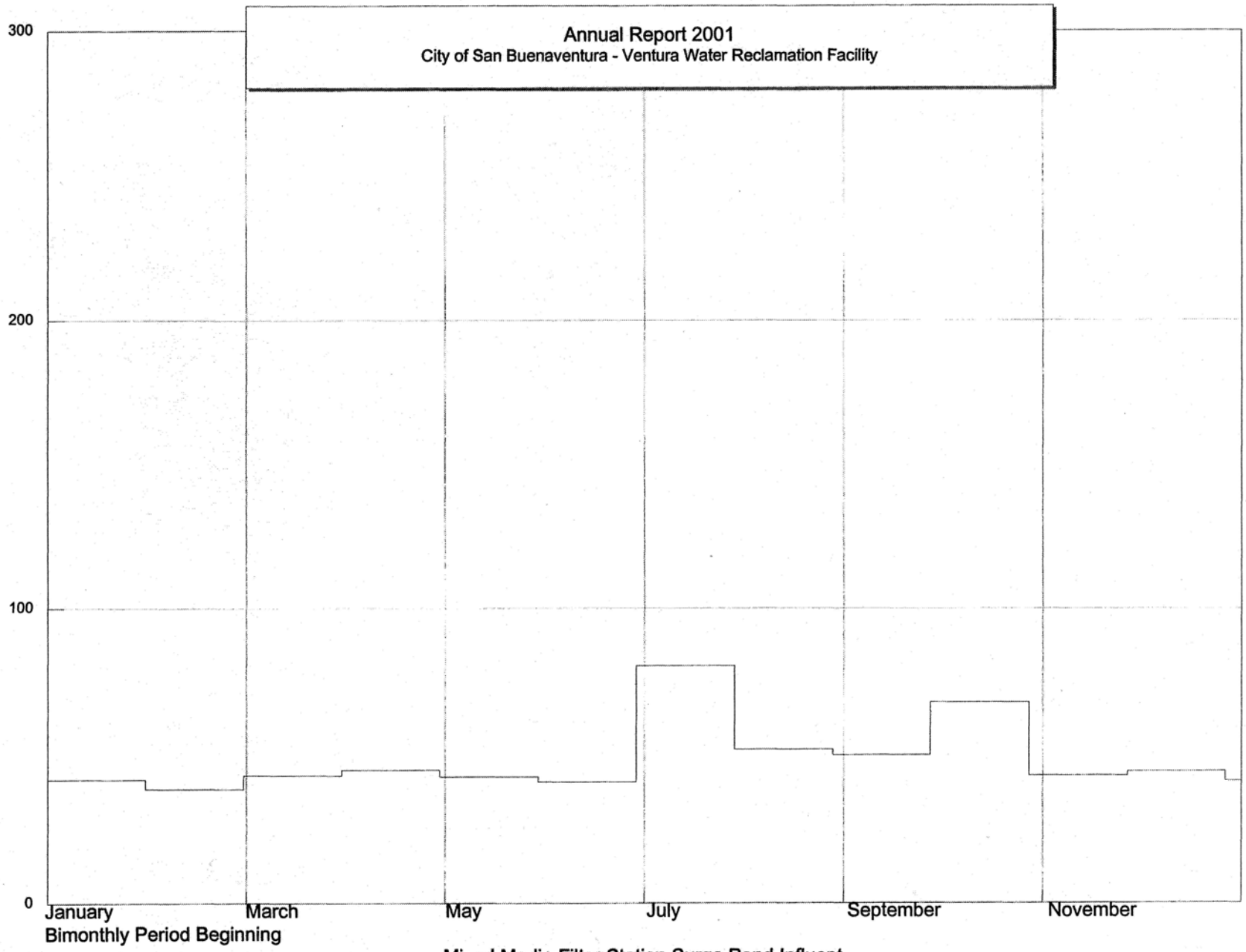
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average BOD - mg/l



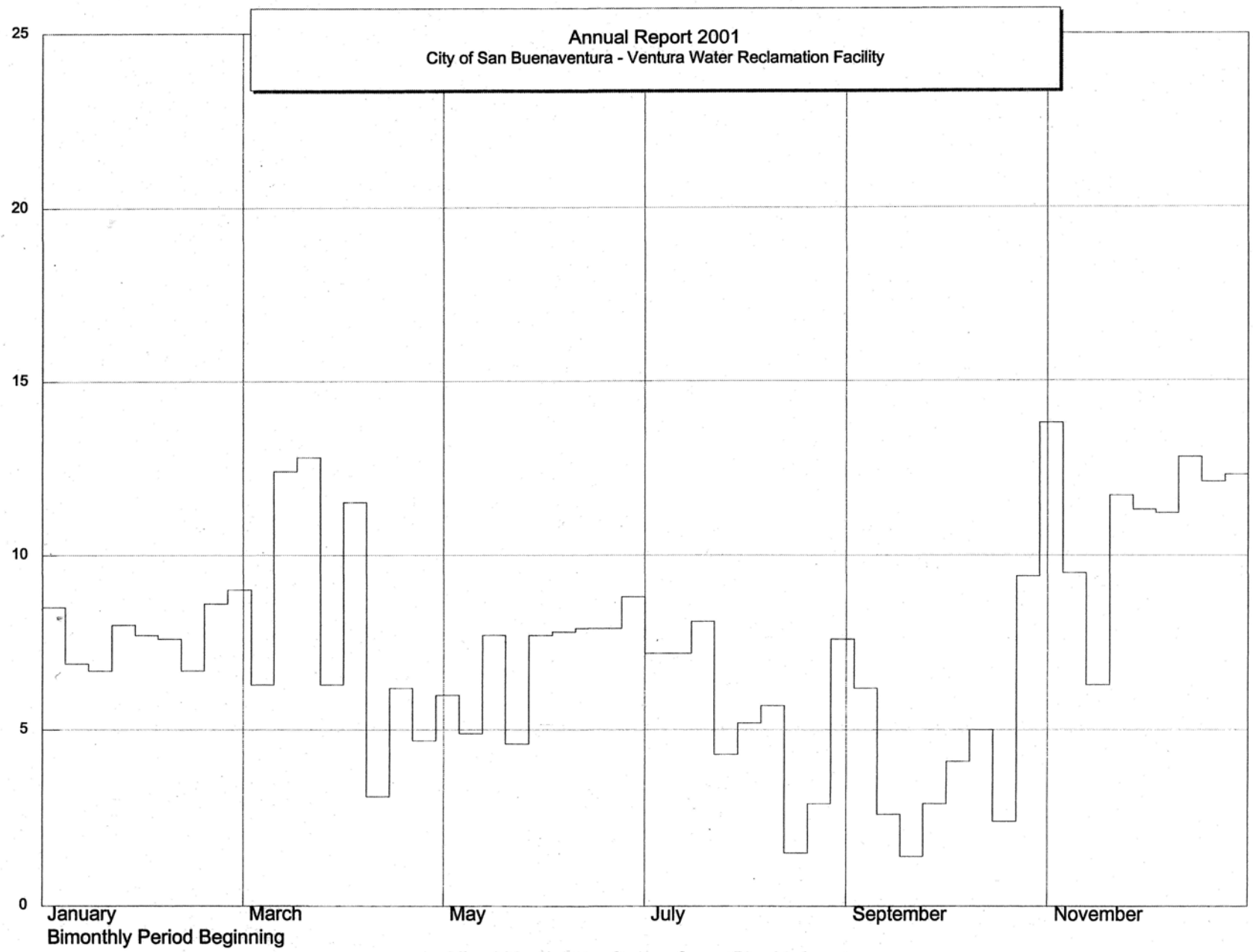
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent COD - mg/l



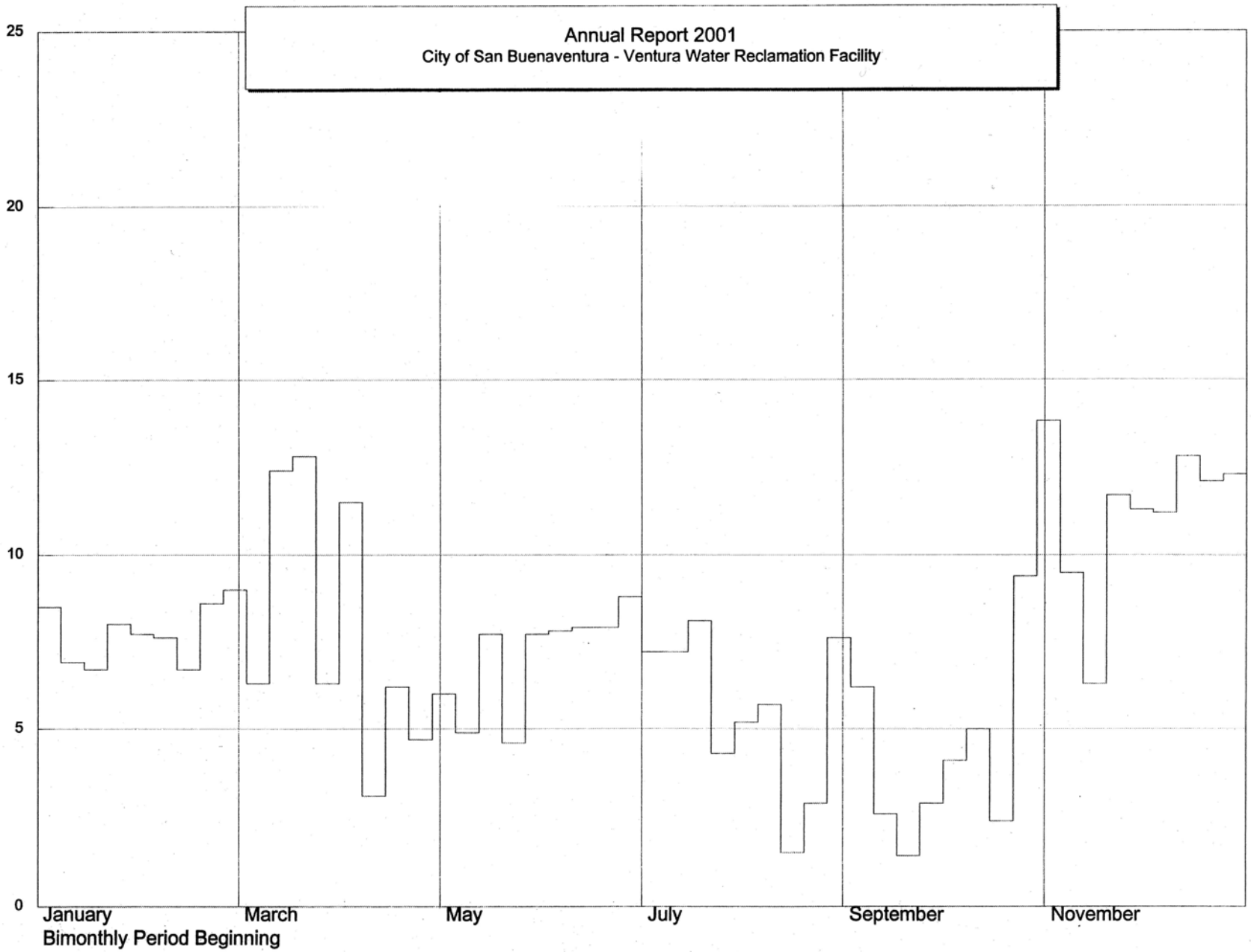
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 7 Day AverageCOD - mg/l



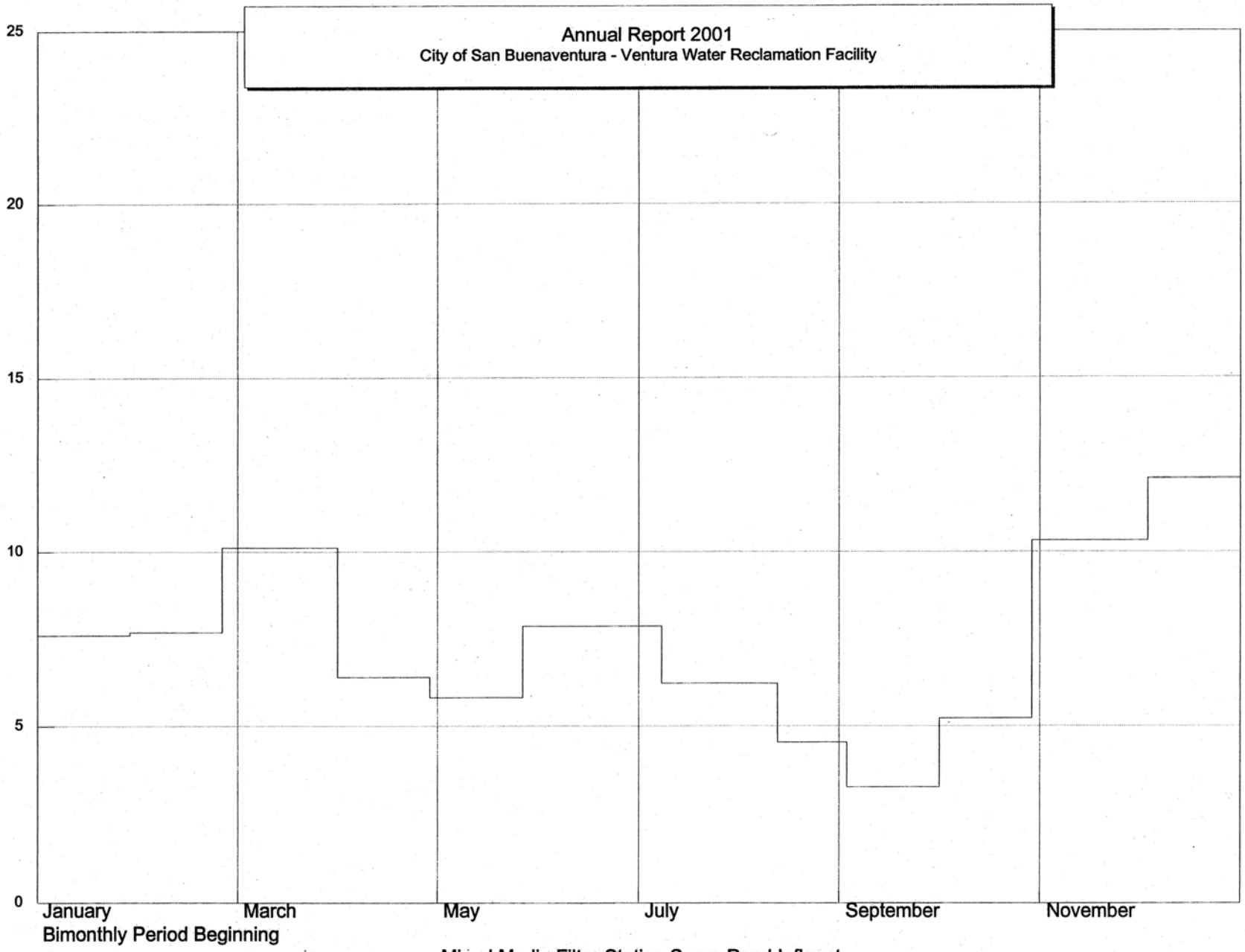
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average COD - mg/l



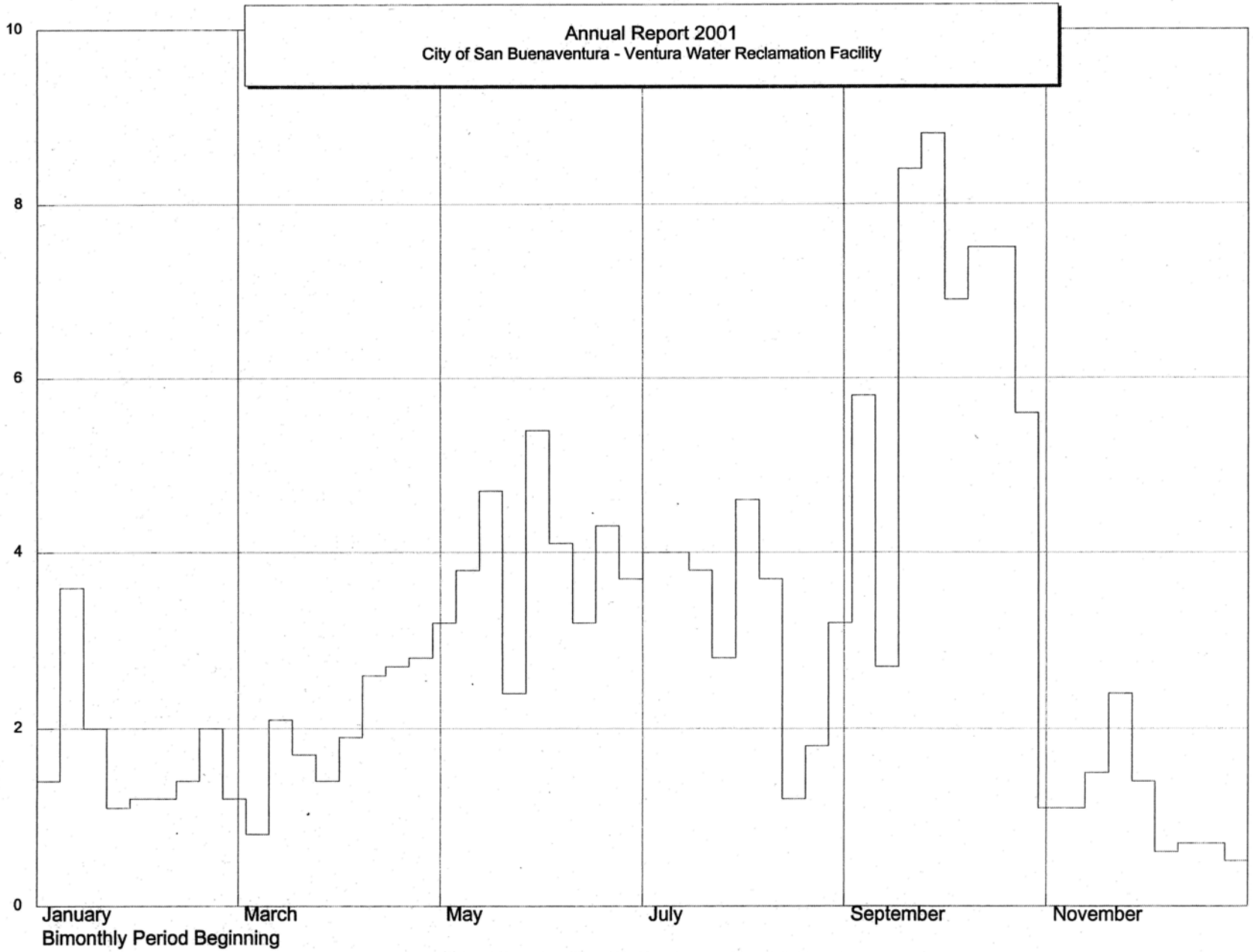
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Nitrate-N - mg/l



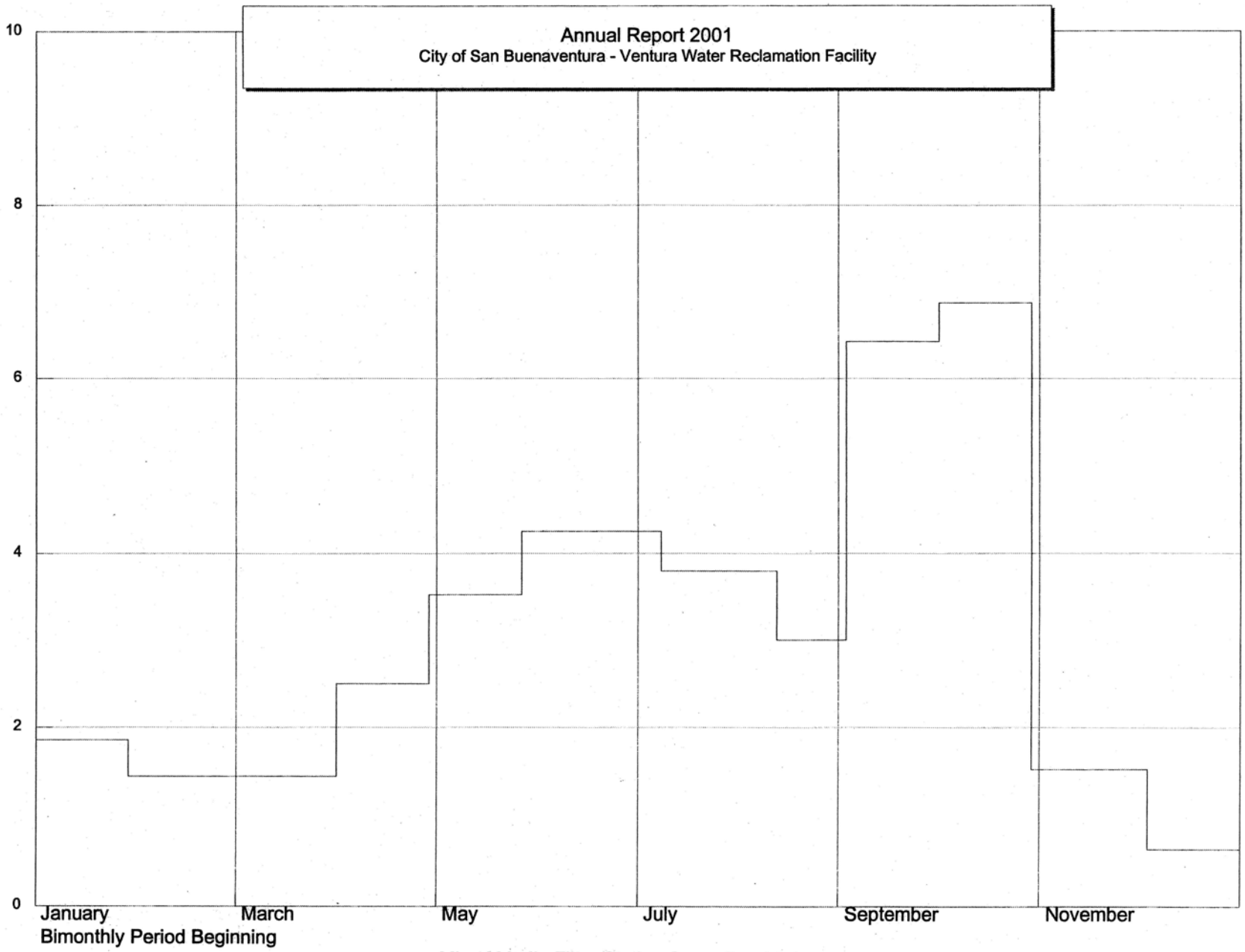
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Weekly Nitrate-N - mg/l



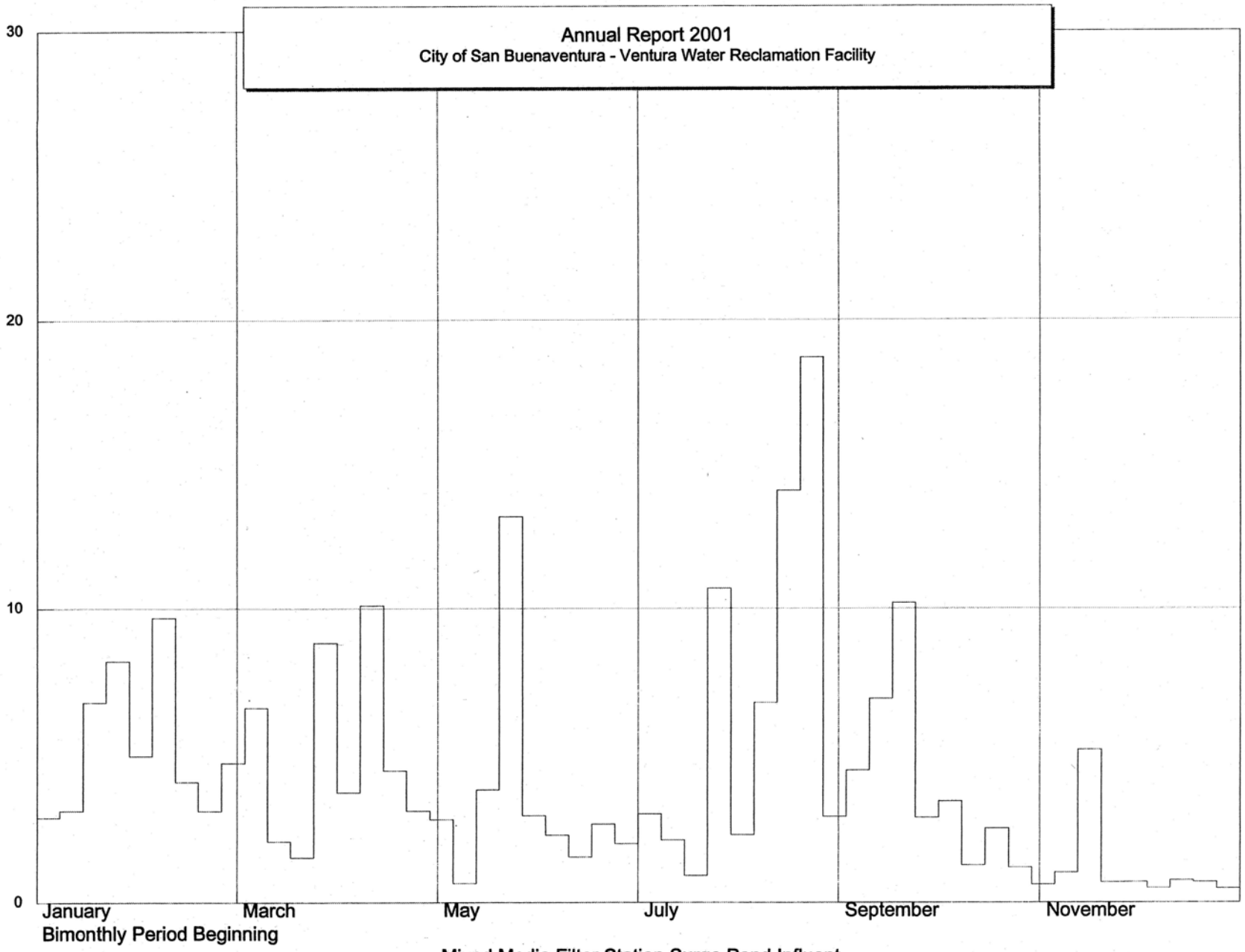
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average Nitrate-N - mg/l



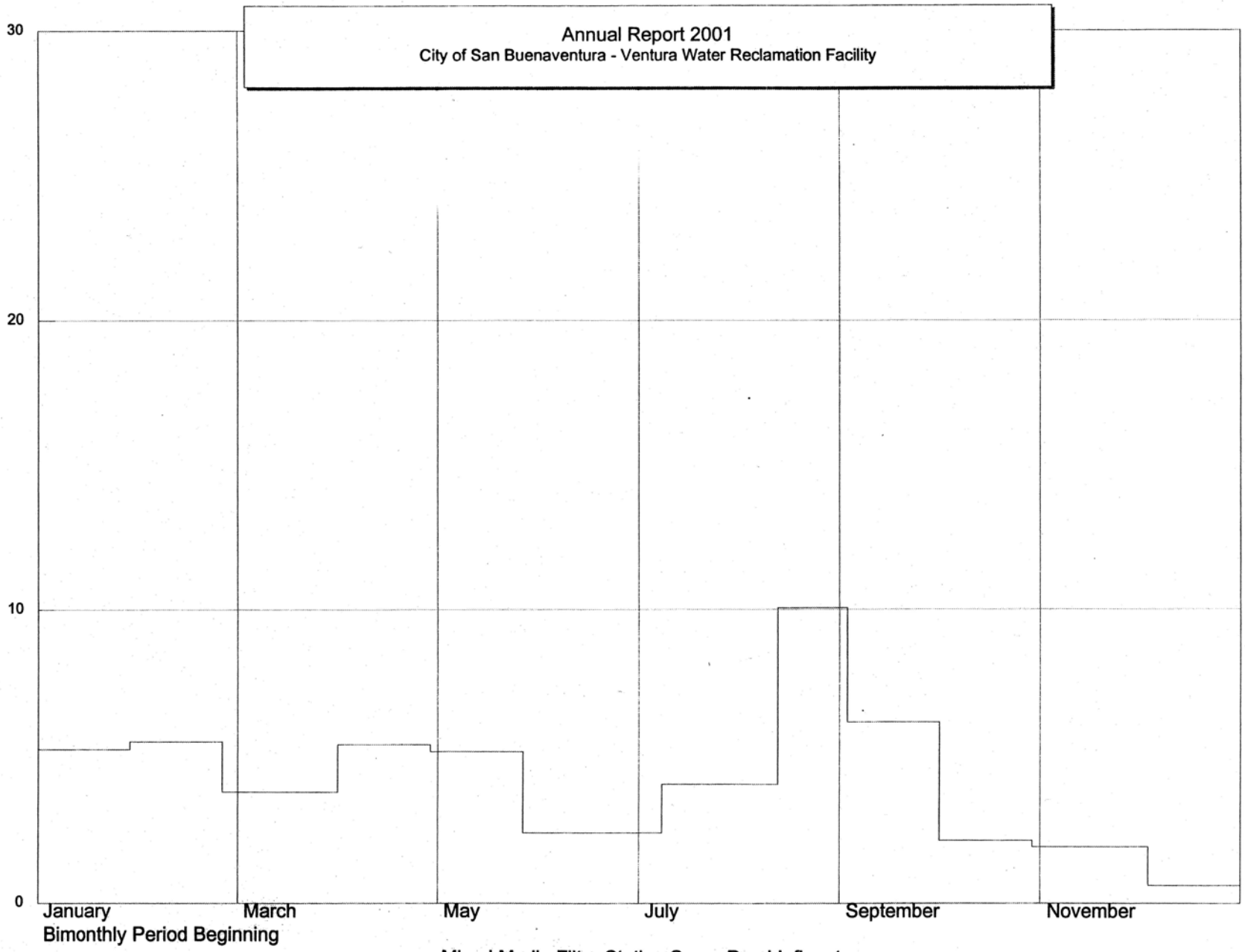
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Weekly Nitrite-N - mg/l



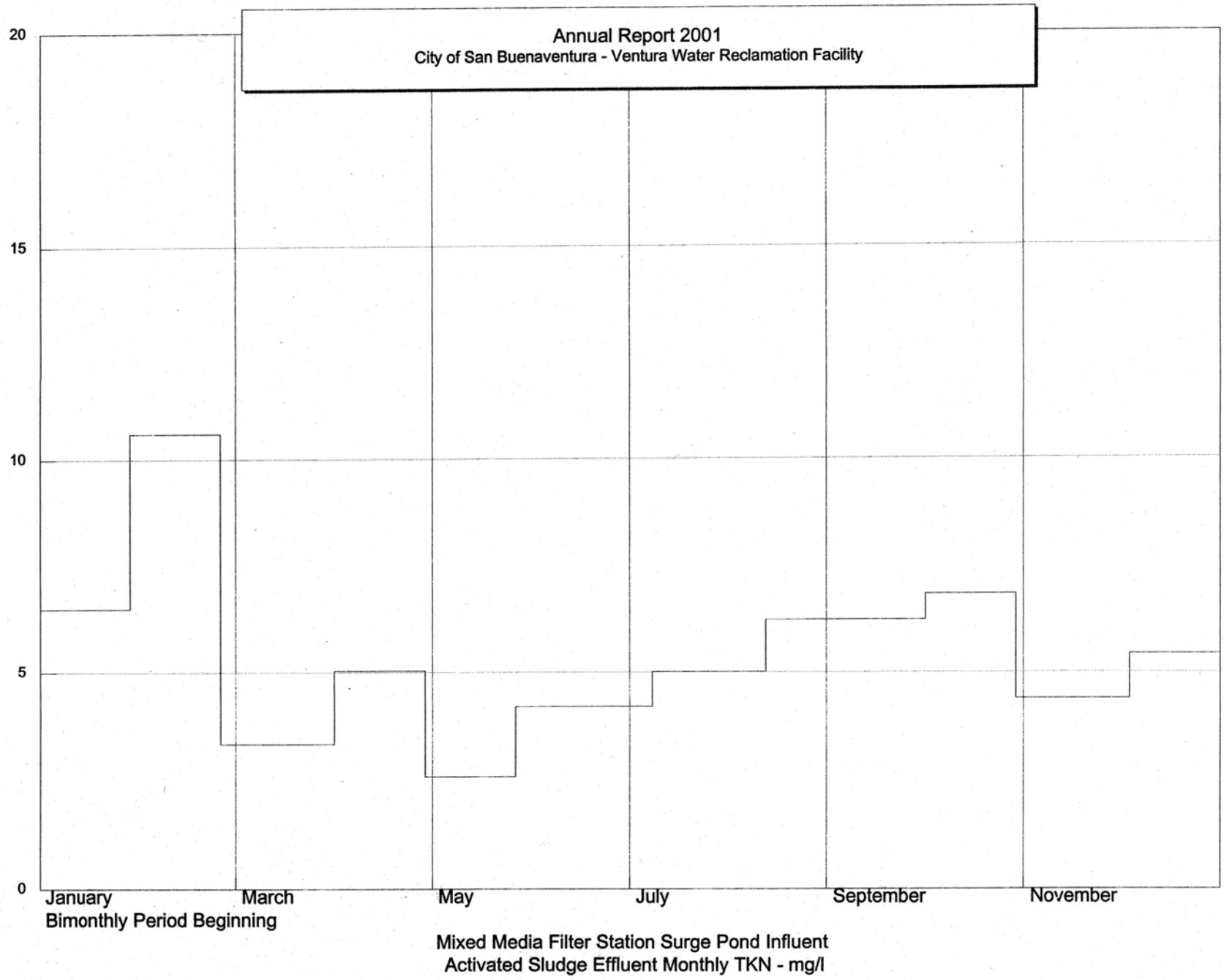
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average Nitrite-N - mg/l

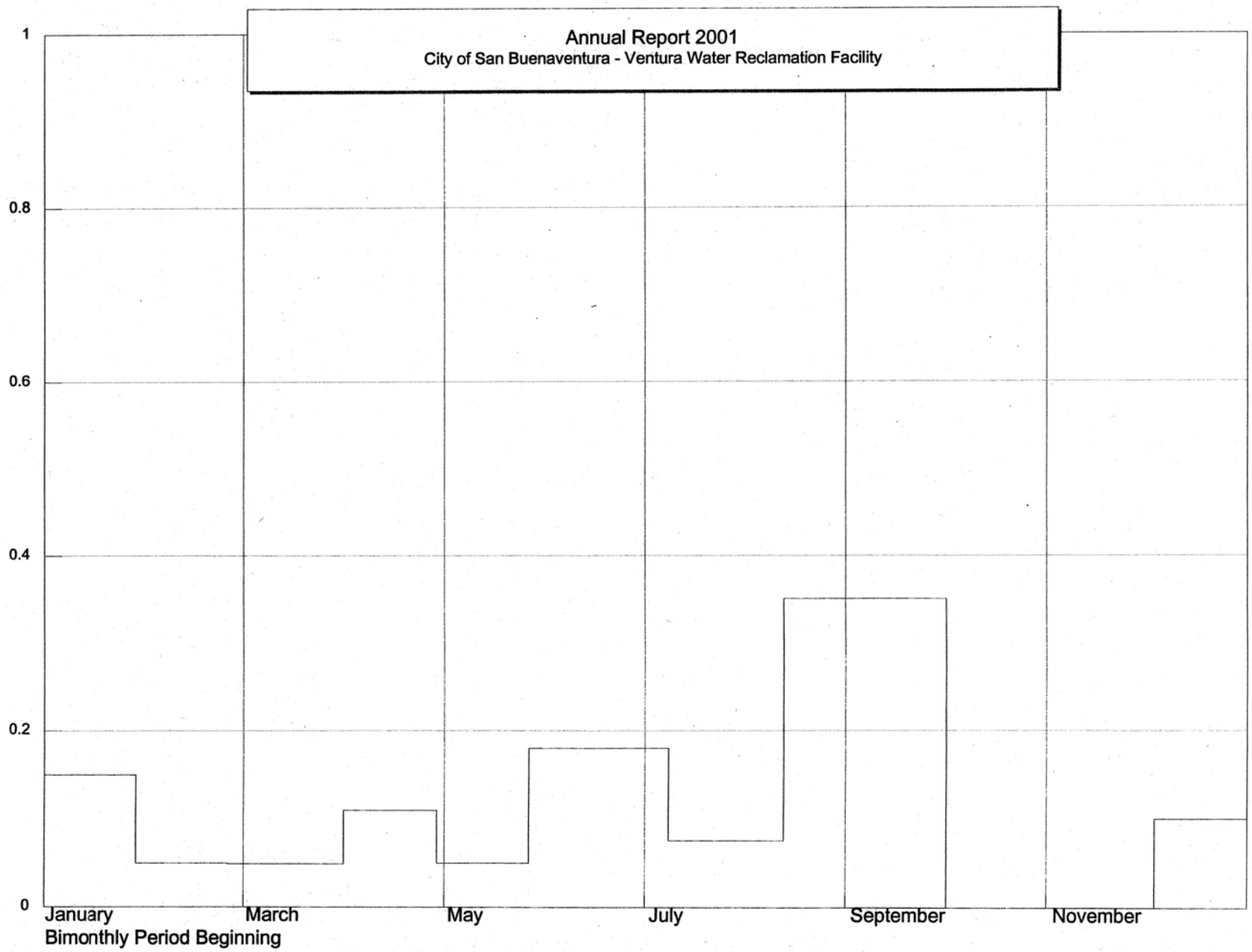


Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Weekly Ammonia-N - mg/l

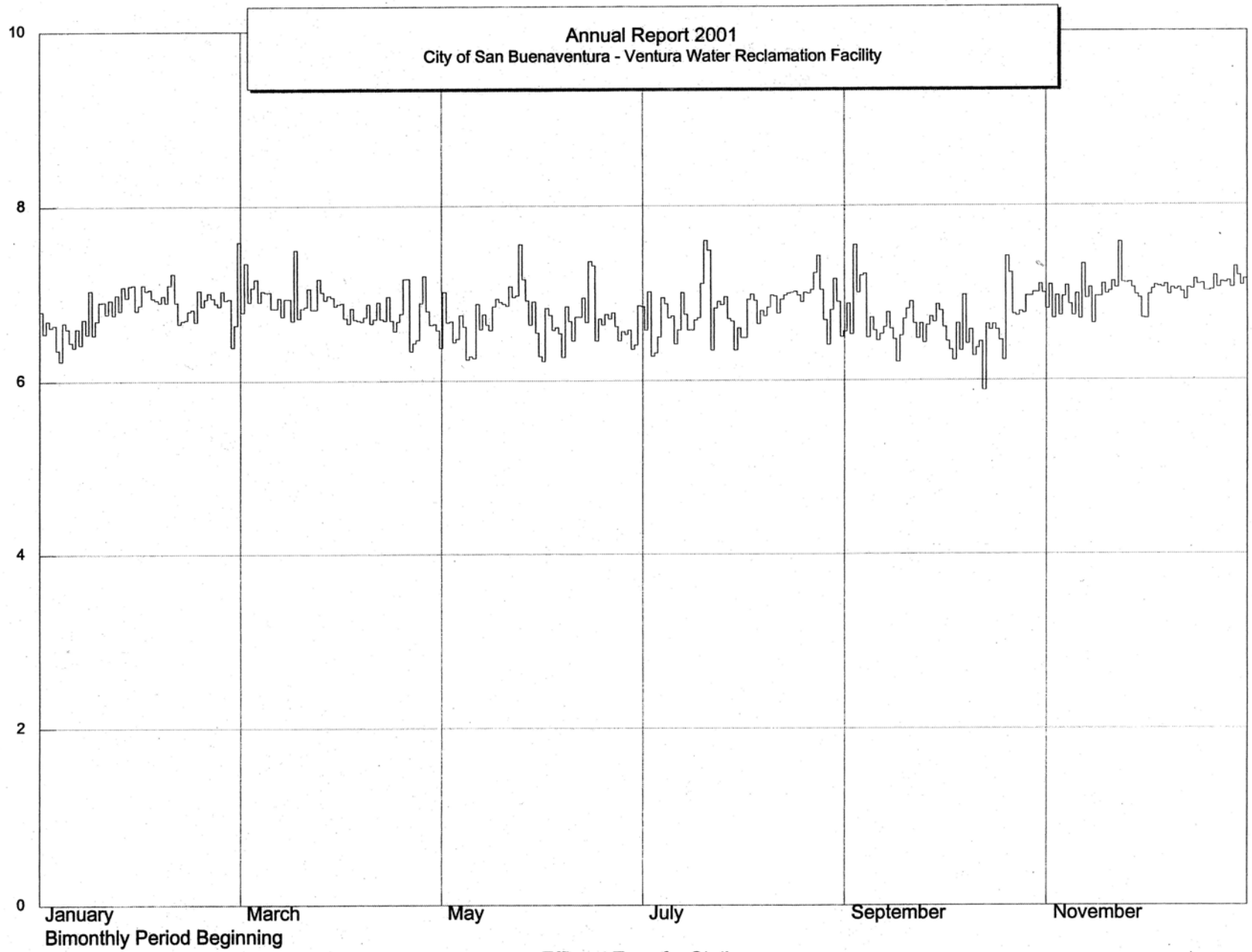


Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent 30 Day Average Ammonia-N - mg/l

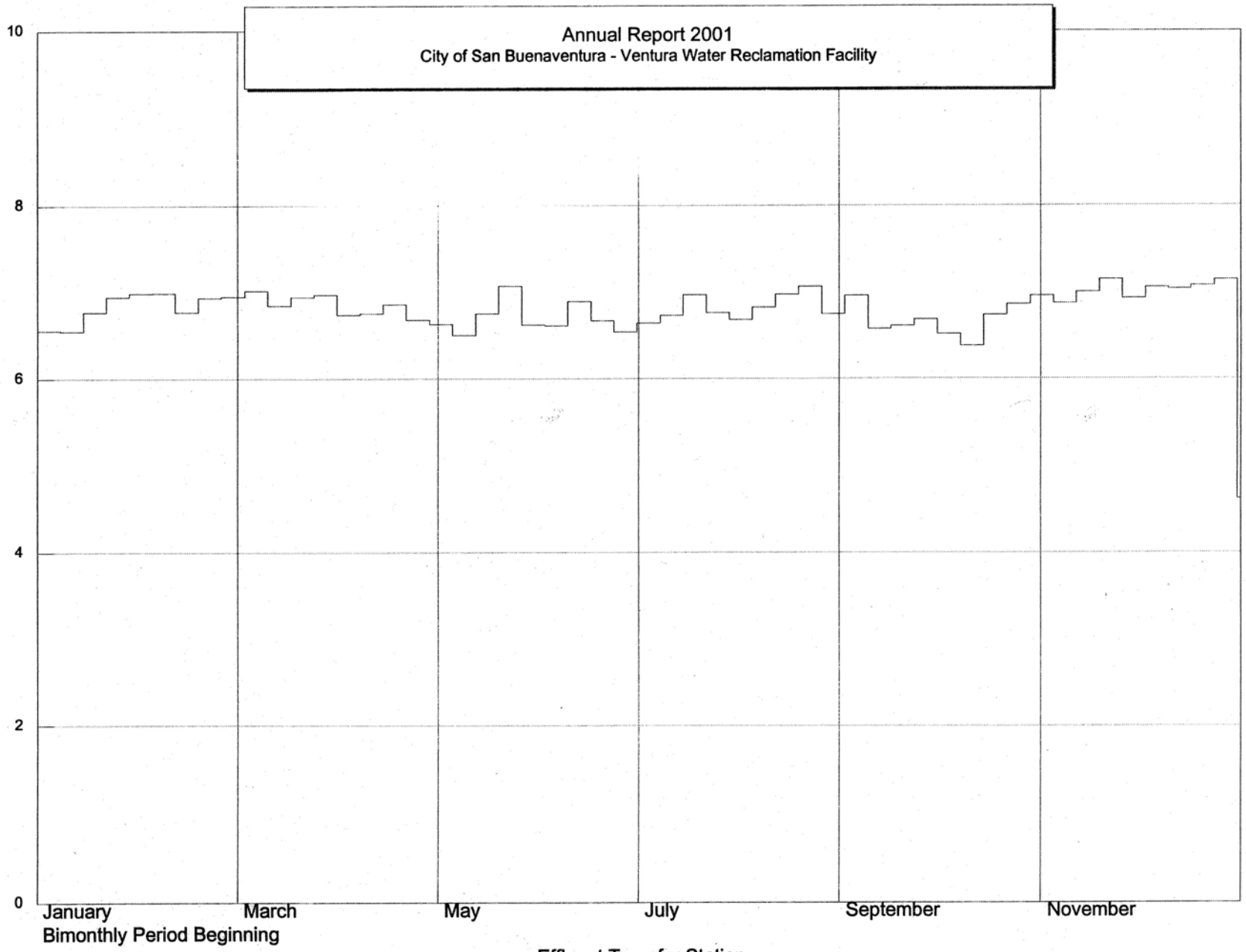

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Monthly TKN - mg/l



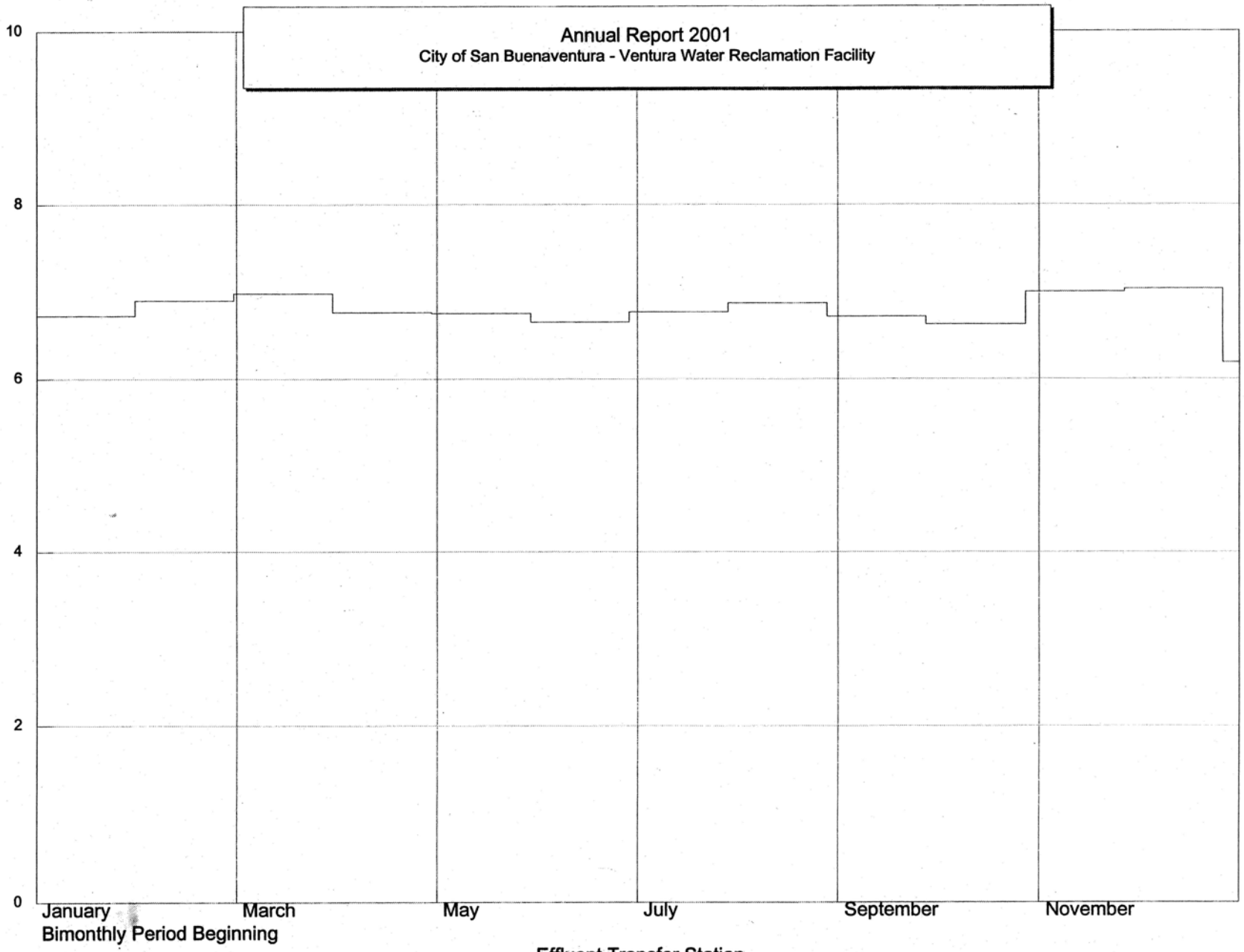
Mixed Media Filter Station Surge Pond Influent
Activated Sludge Effluent Monthly MBAS - mg/l



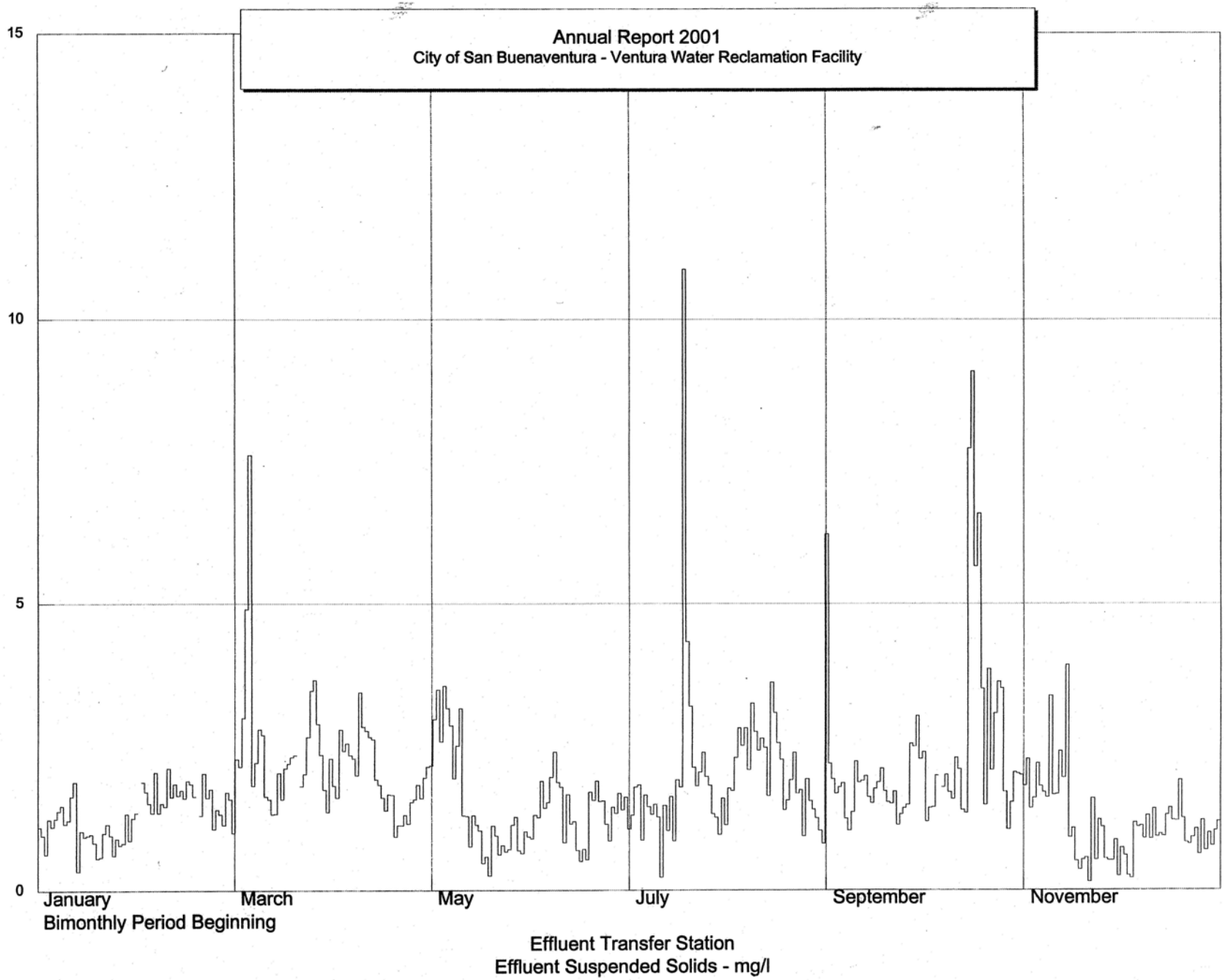
Effluent Transfer Station
Effluent pH - pH Units

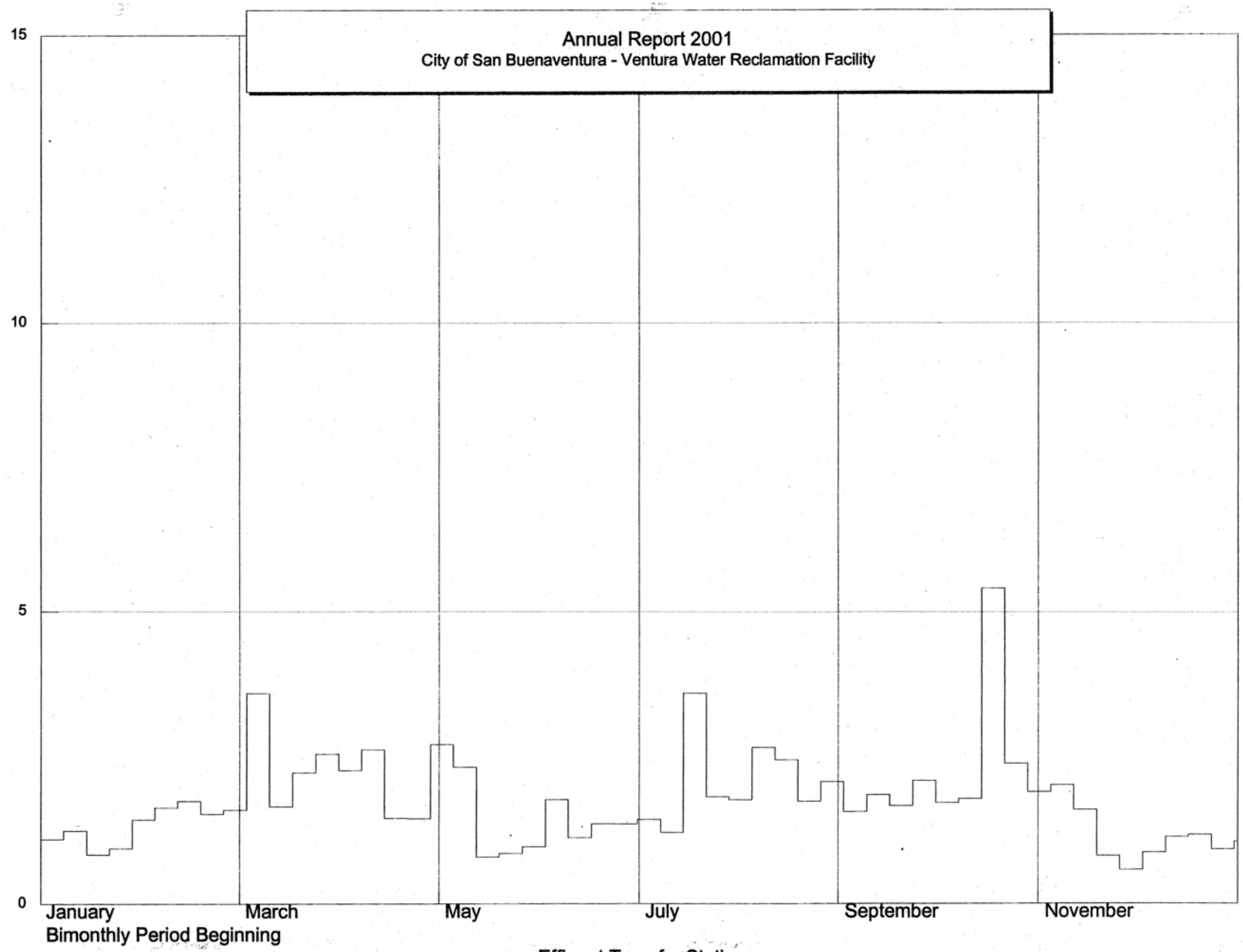


Effluent Transfer Station
Effluent 7 Day Average pH - pH Units

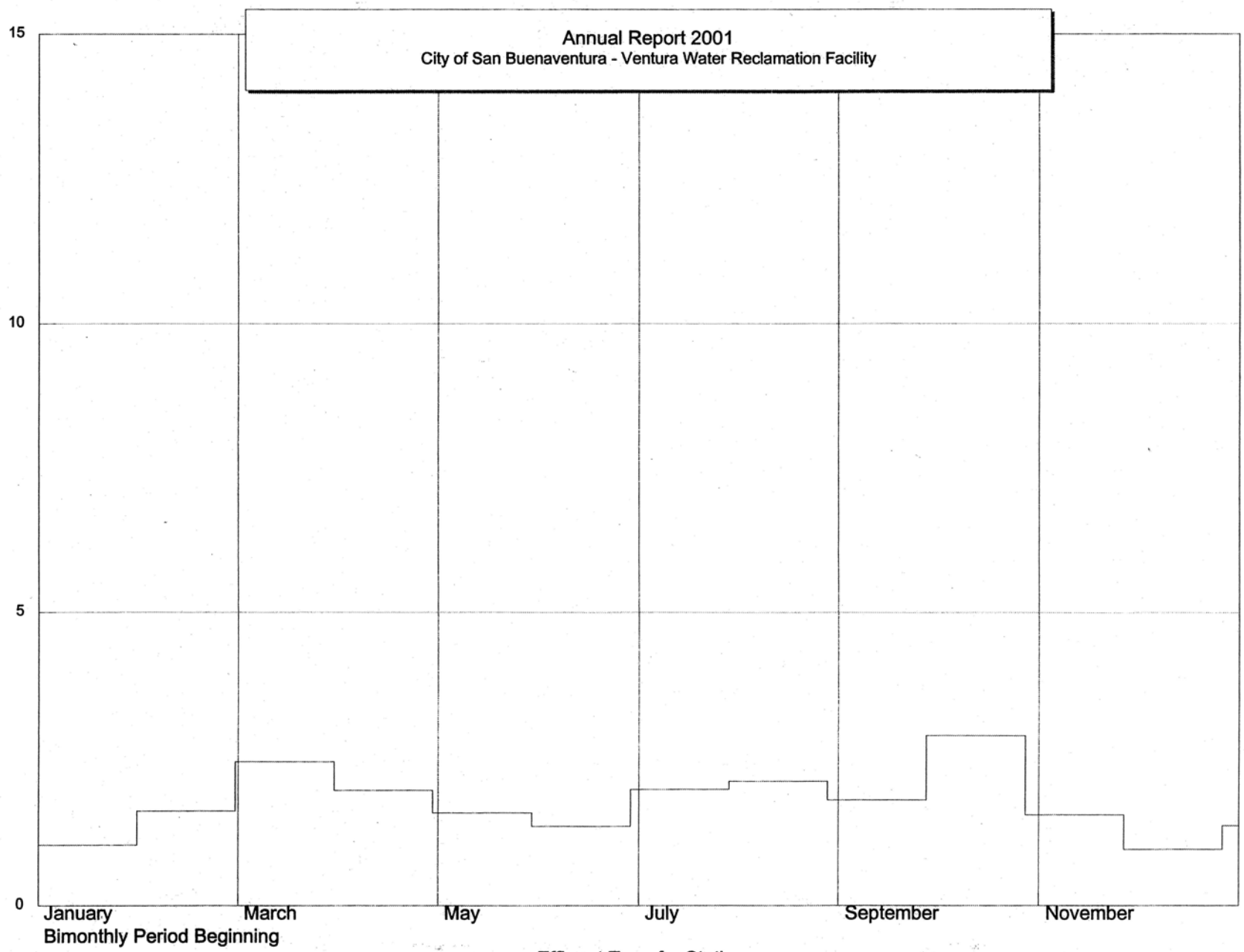


Effluent Transfer Station
Effluent 30 Day Average pH - pH Units

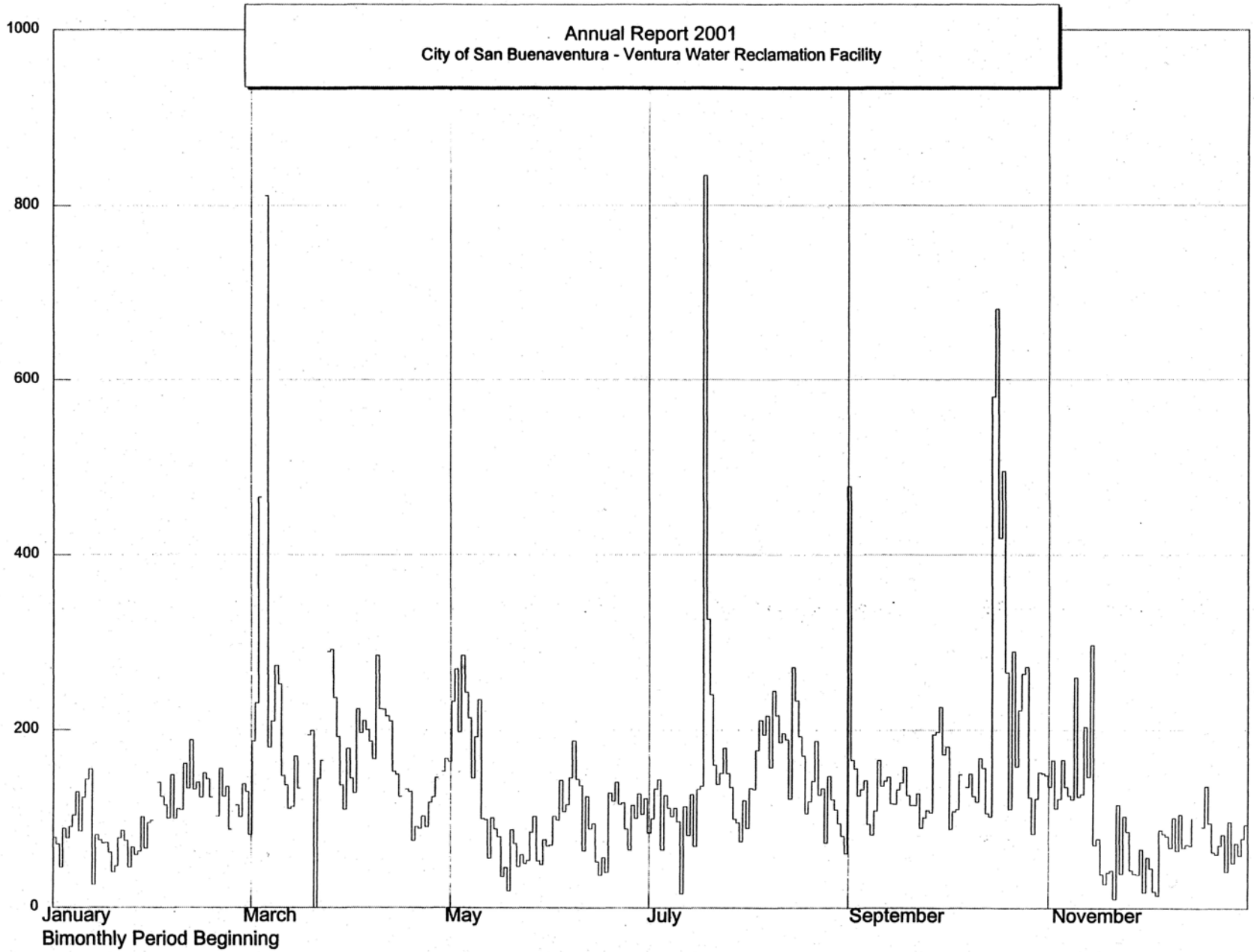

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Suspended Solids - mg/l



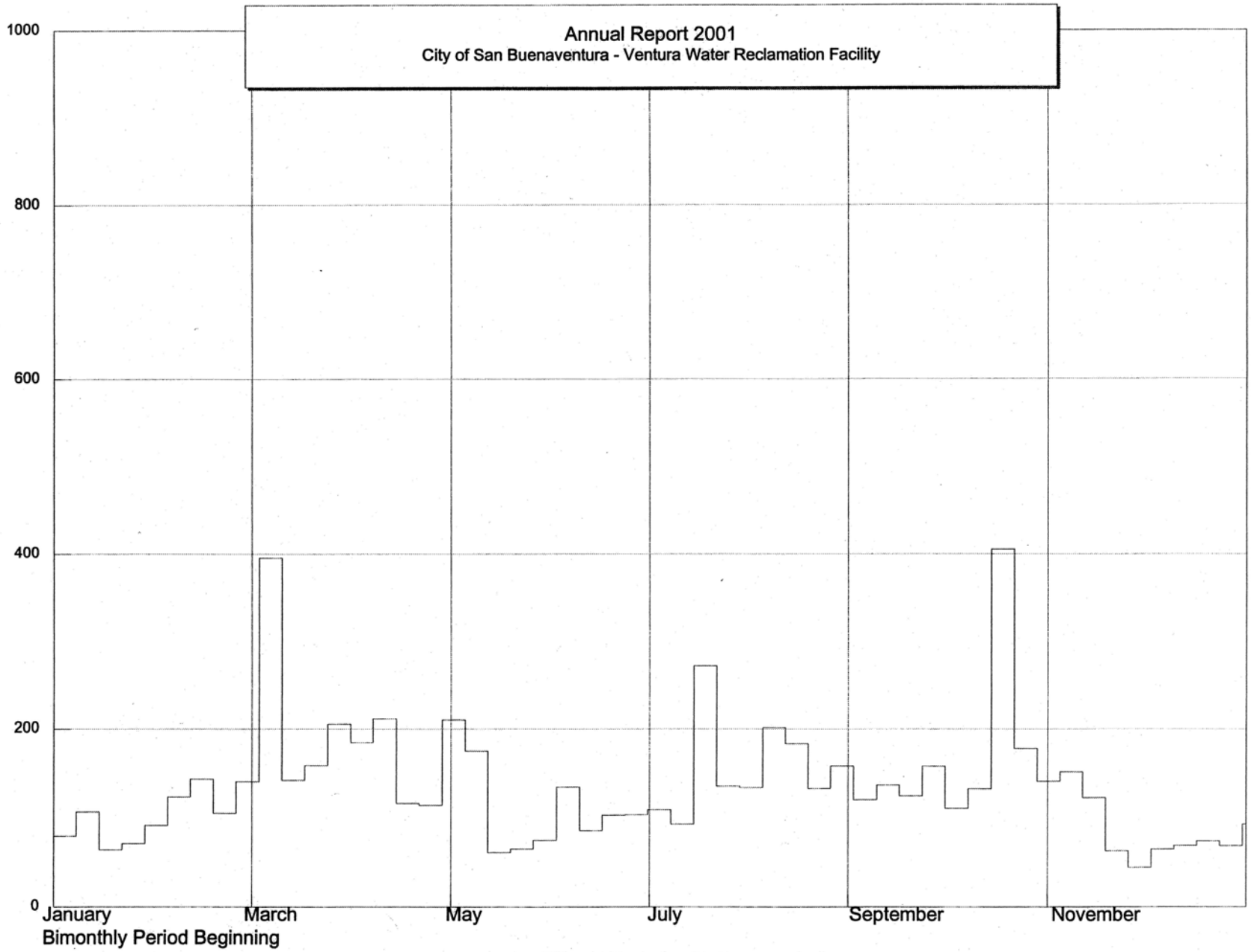
Effluent Transfer Station
Effluent 7 Day Average Suspended Solids - mg/l



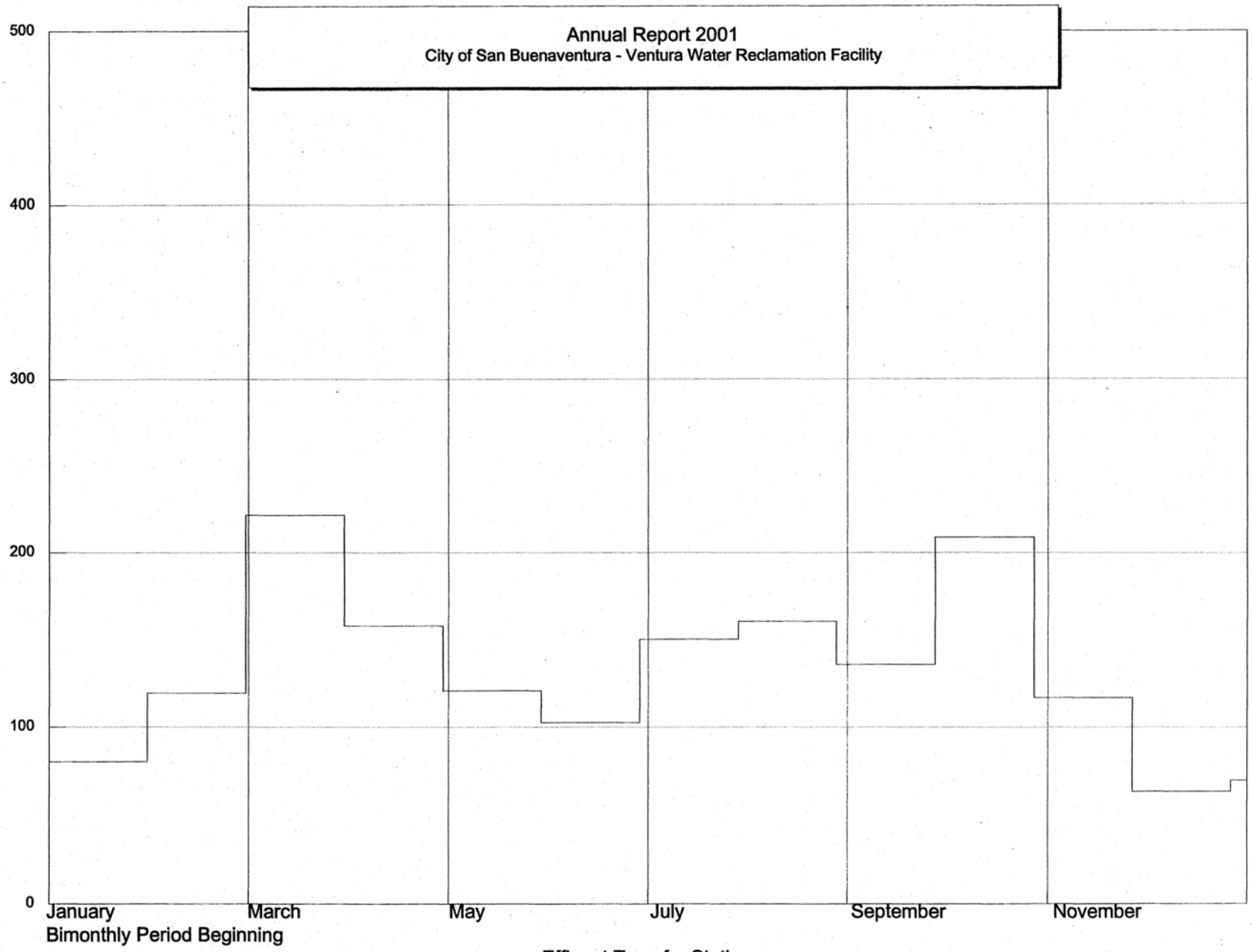
Effluent Transfer Station
Effluent 30 Day Average Suspended Solids - mg/l



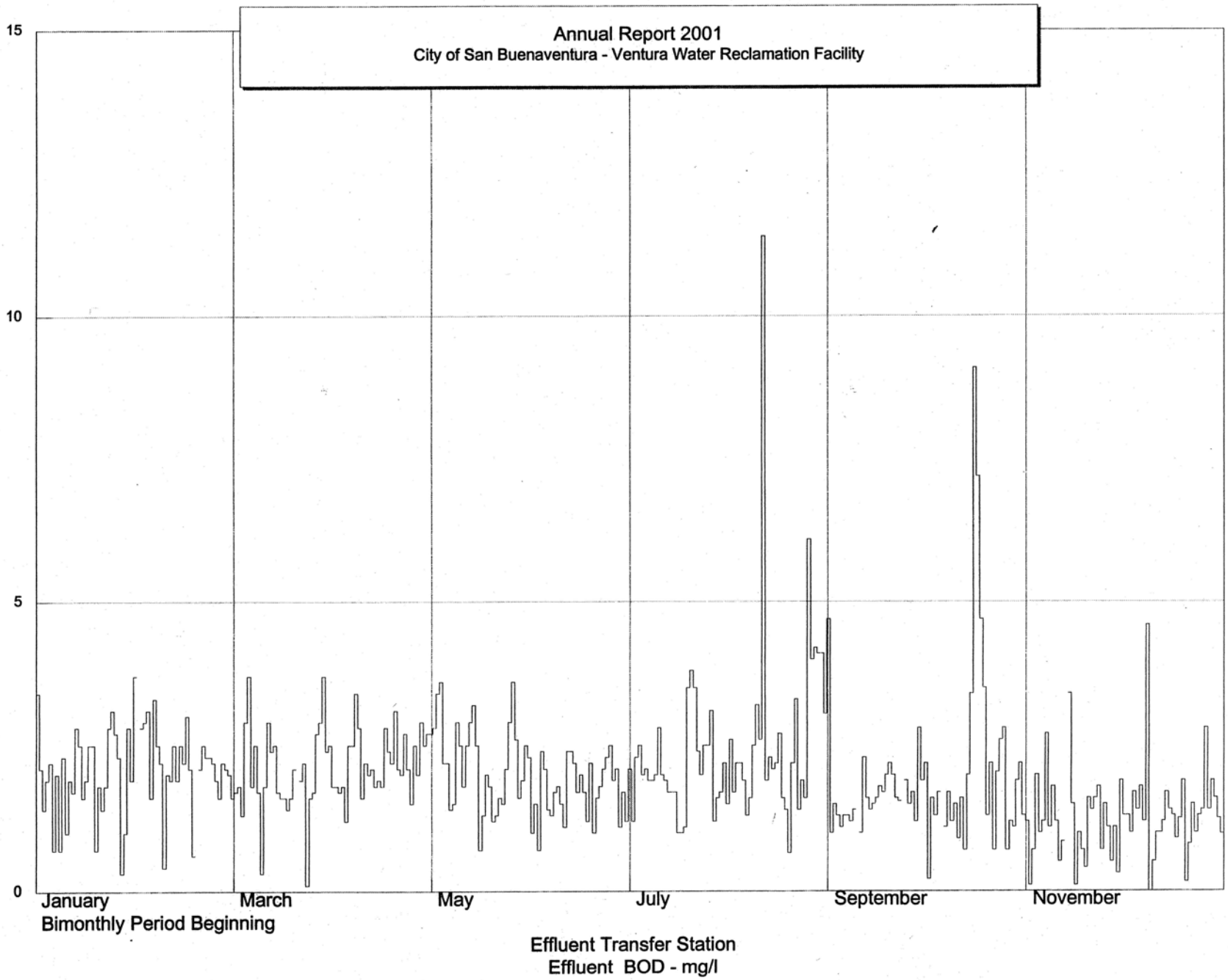
Effluent Transfer Station
Effluent Suspended Solids Mass Emission Rate - lb/Day

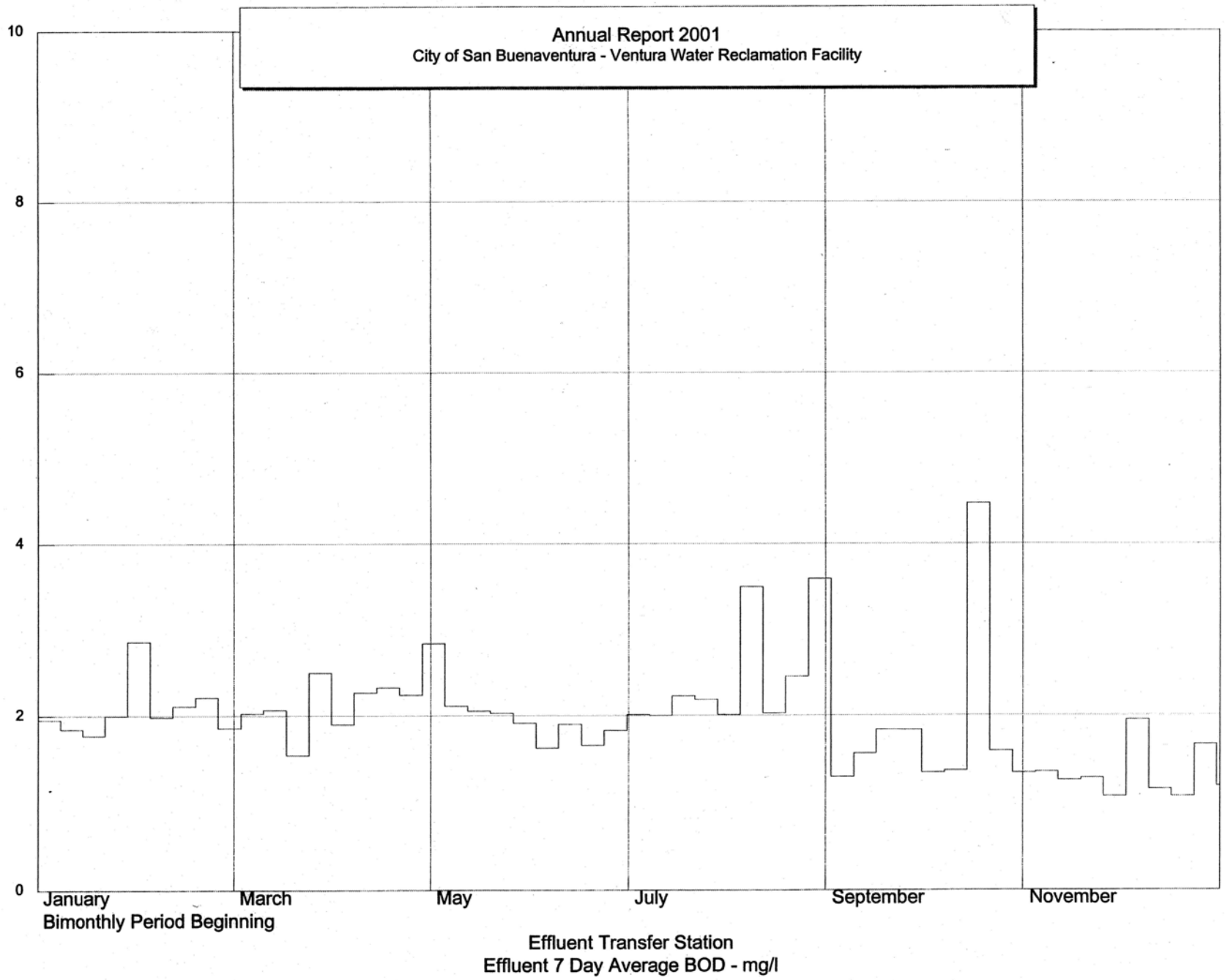


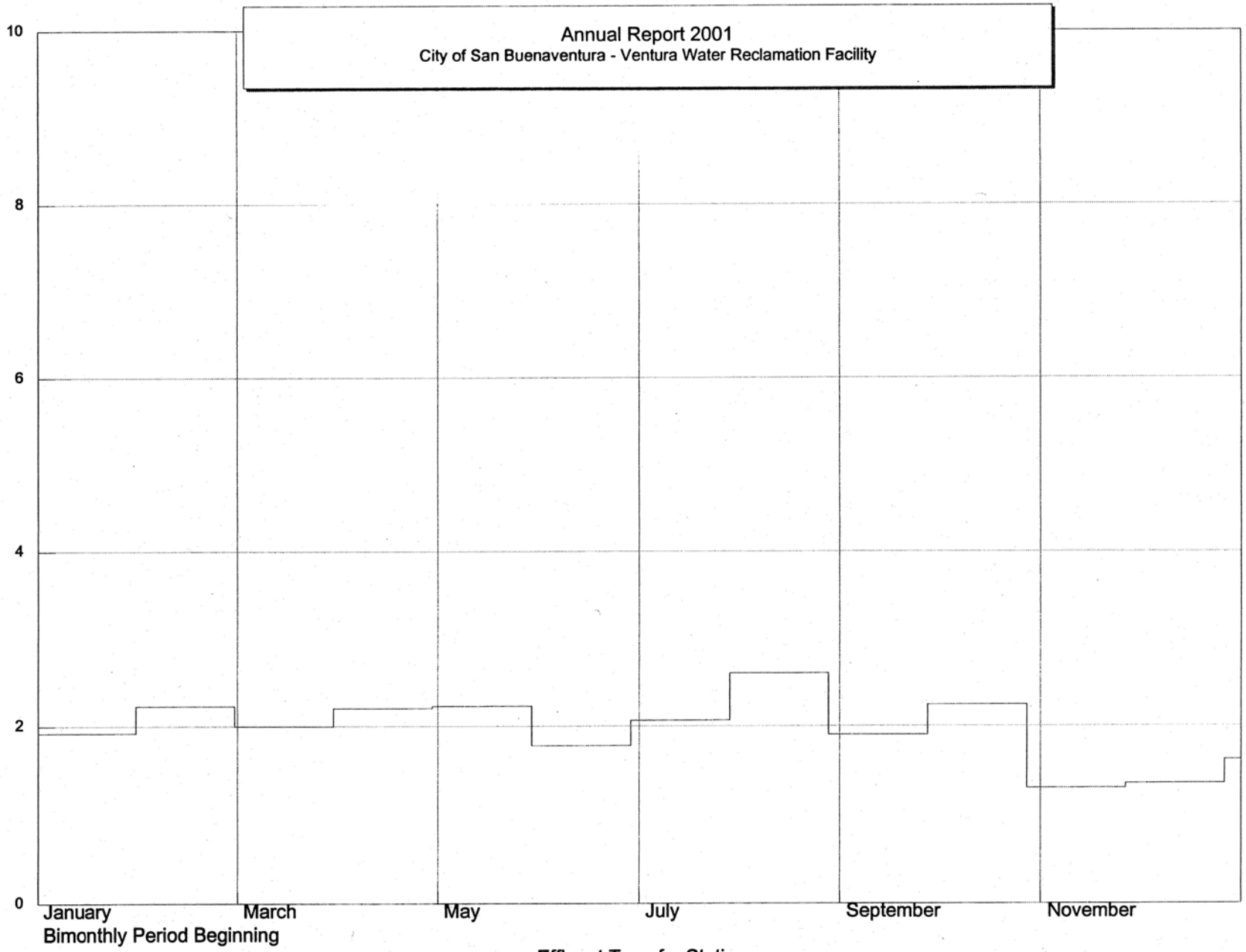
Effluent Transfer Station
Effluent 7 Day Average Suspended Solids Mass Emission Rate - lb/Day



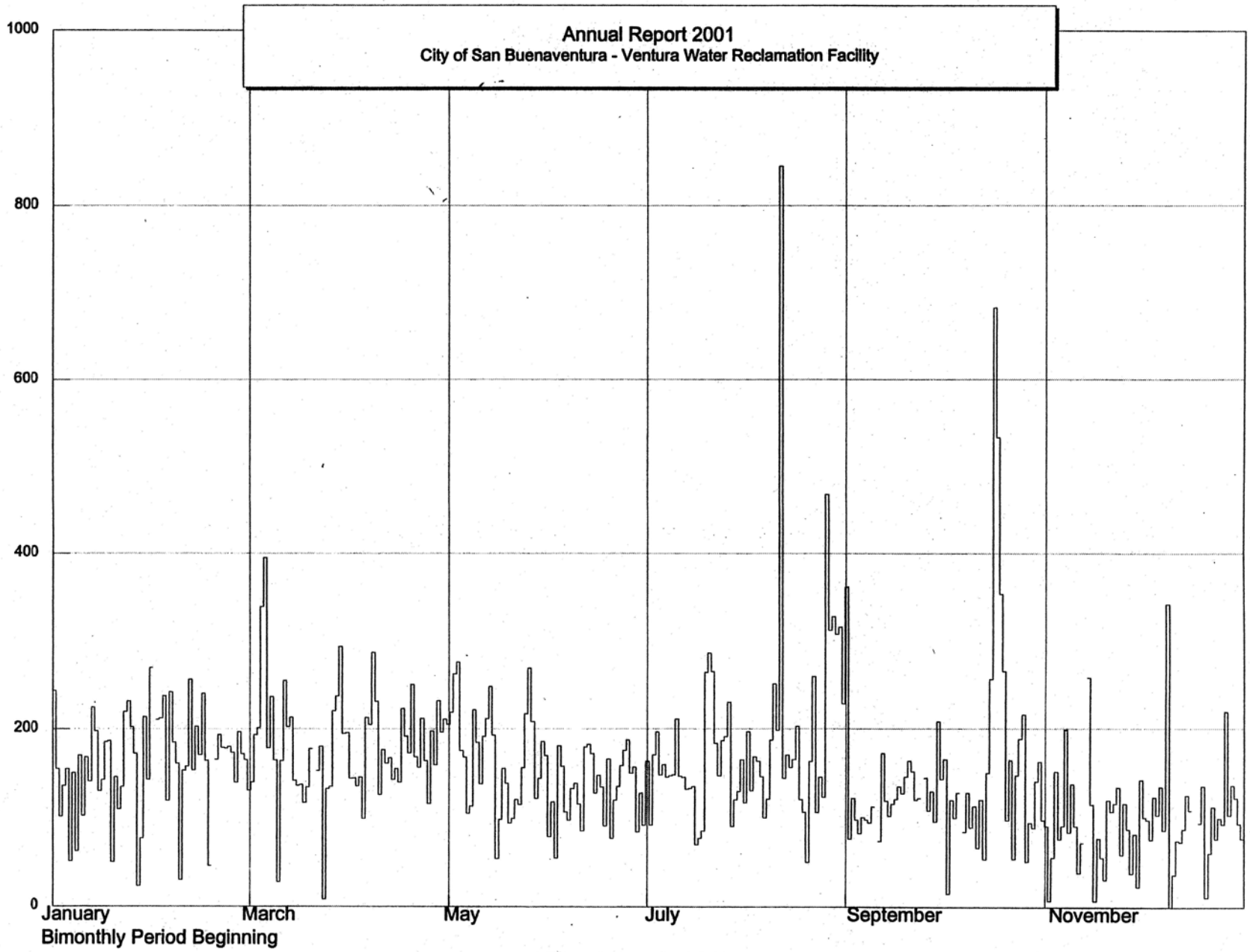
Effluent Transfer Station
Effluent 30 Day Average Suspended Solids Mass Emission Rate - lb/Day


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent BOD - mg/l

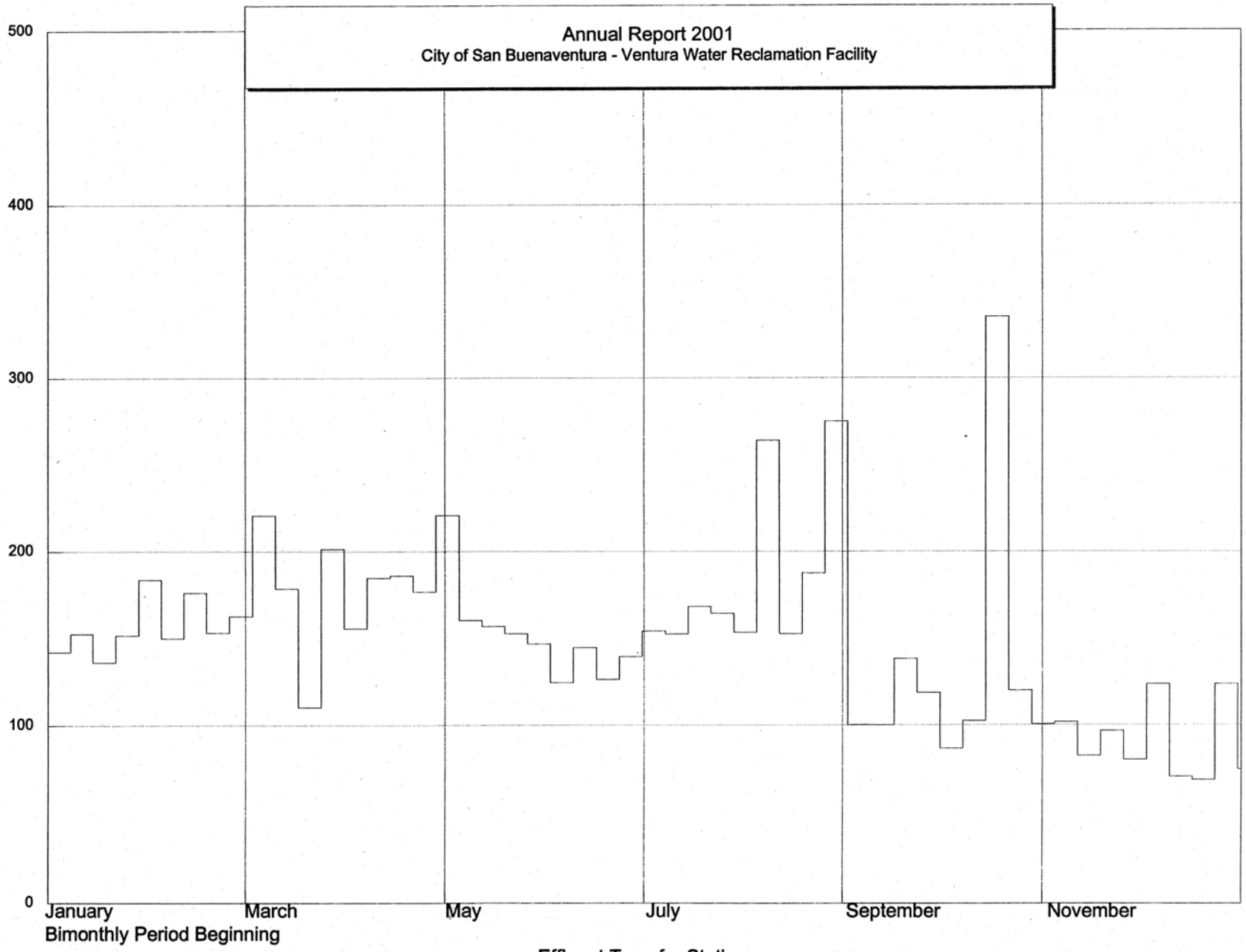

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
6
4
2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent 7 Day Average BOD - mg/l



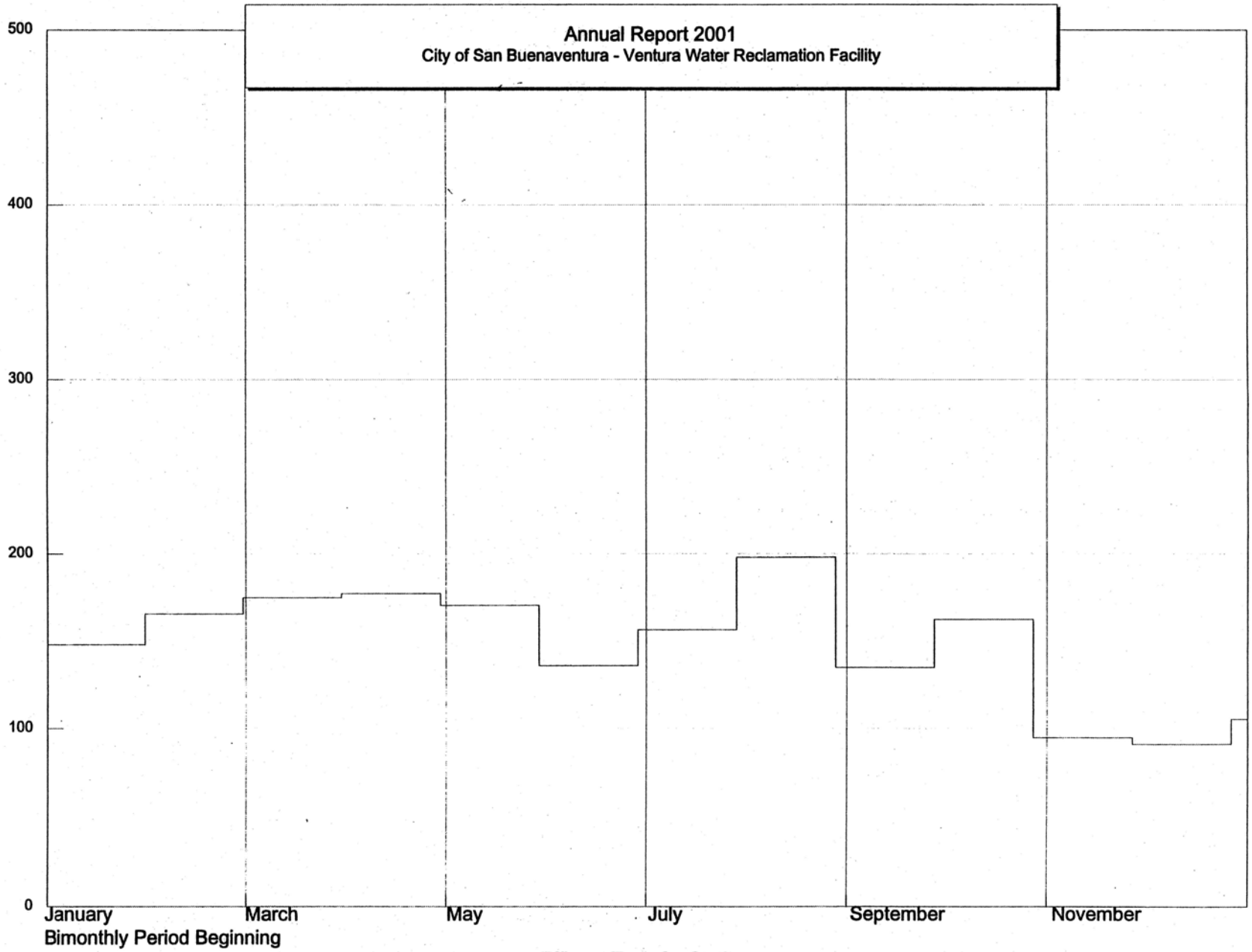
Effluent Transfer Station
Effluent 30 Day Average BOD - mg/l



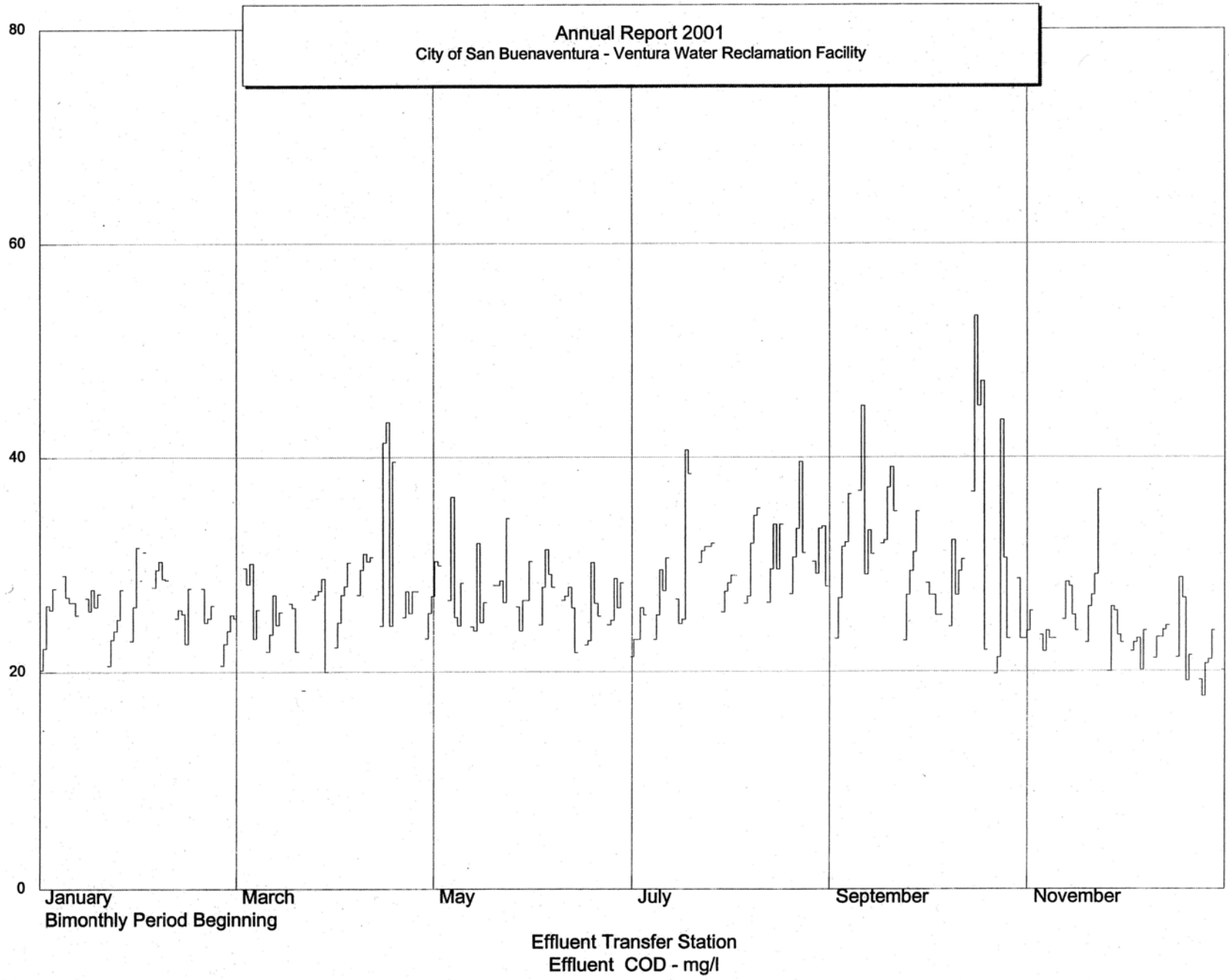
Effluent Transfer Station
Effluent BOD Mass Emission Rate - mg/l

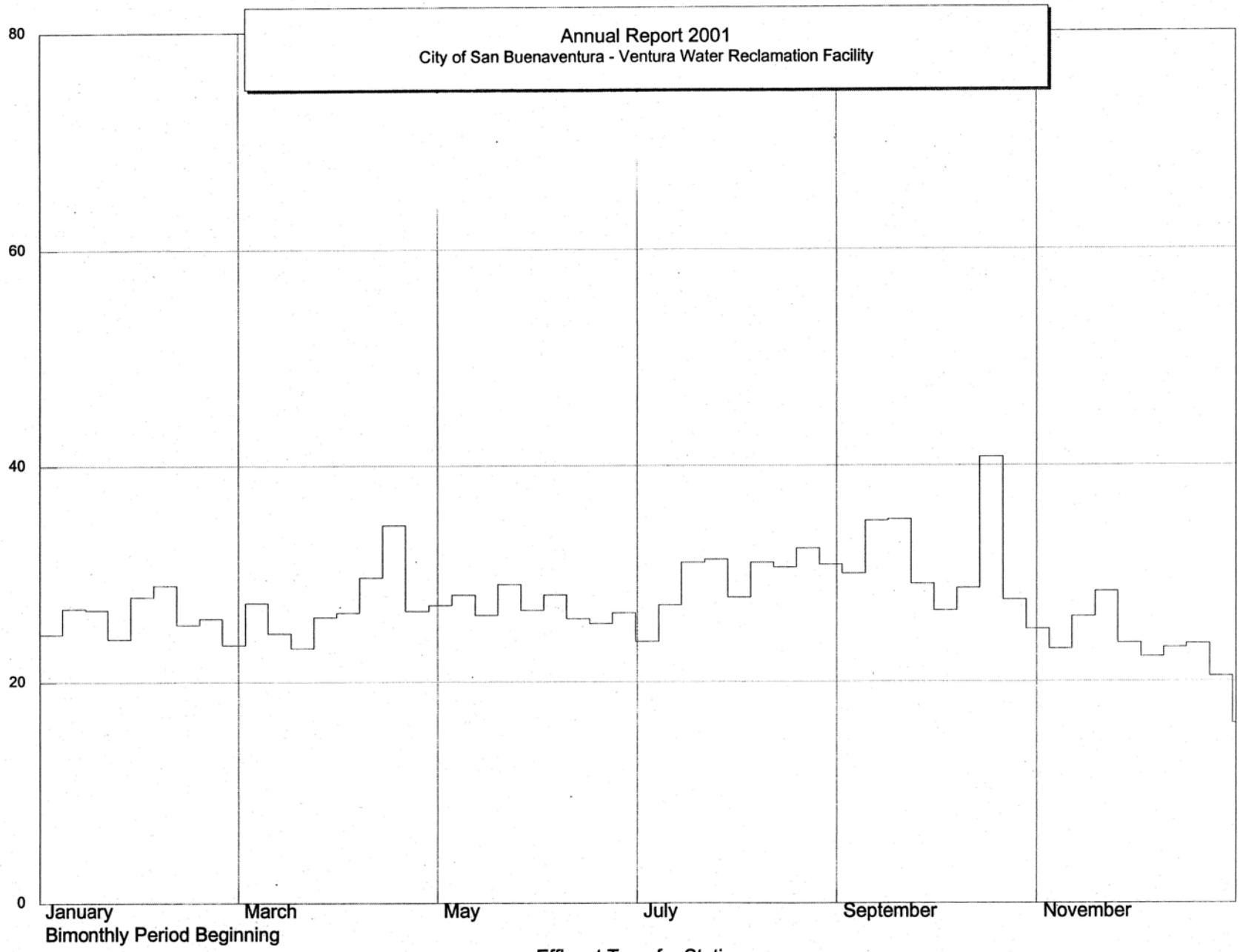


Effluent Transfer Station
Effluent 7 Day Average BOD Mass Emission Rate - mg/l

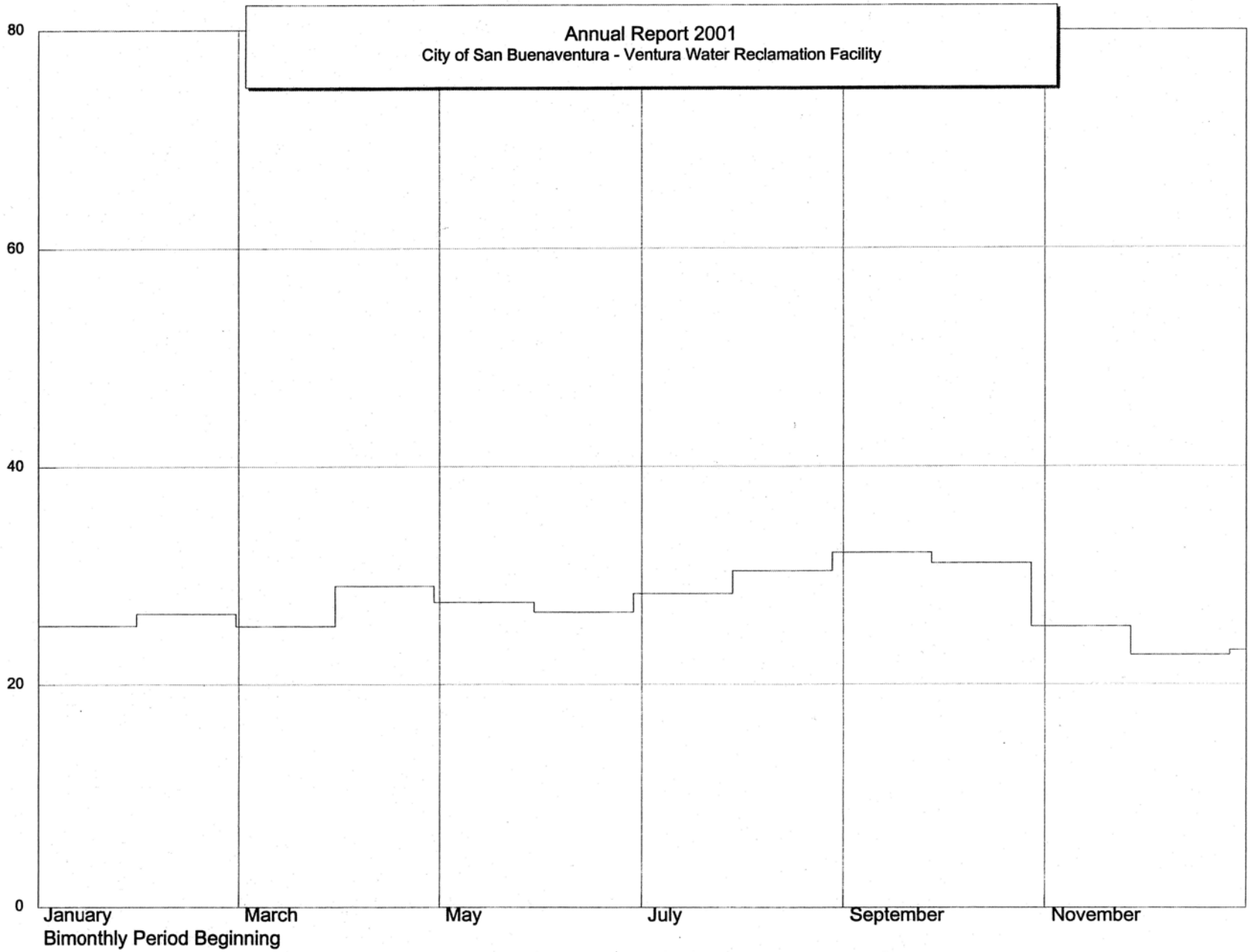


Effluent Transfer Station
Effluent 30 Day Average BOD Mass Emission Rate - mg/l

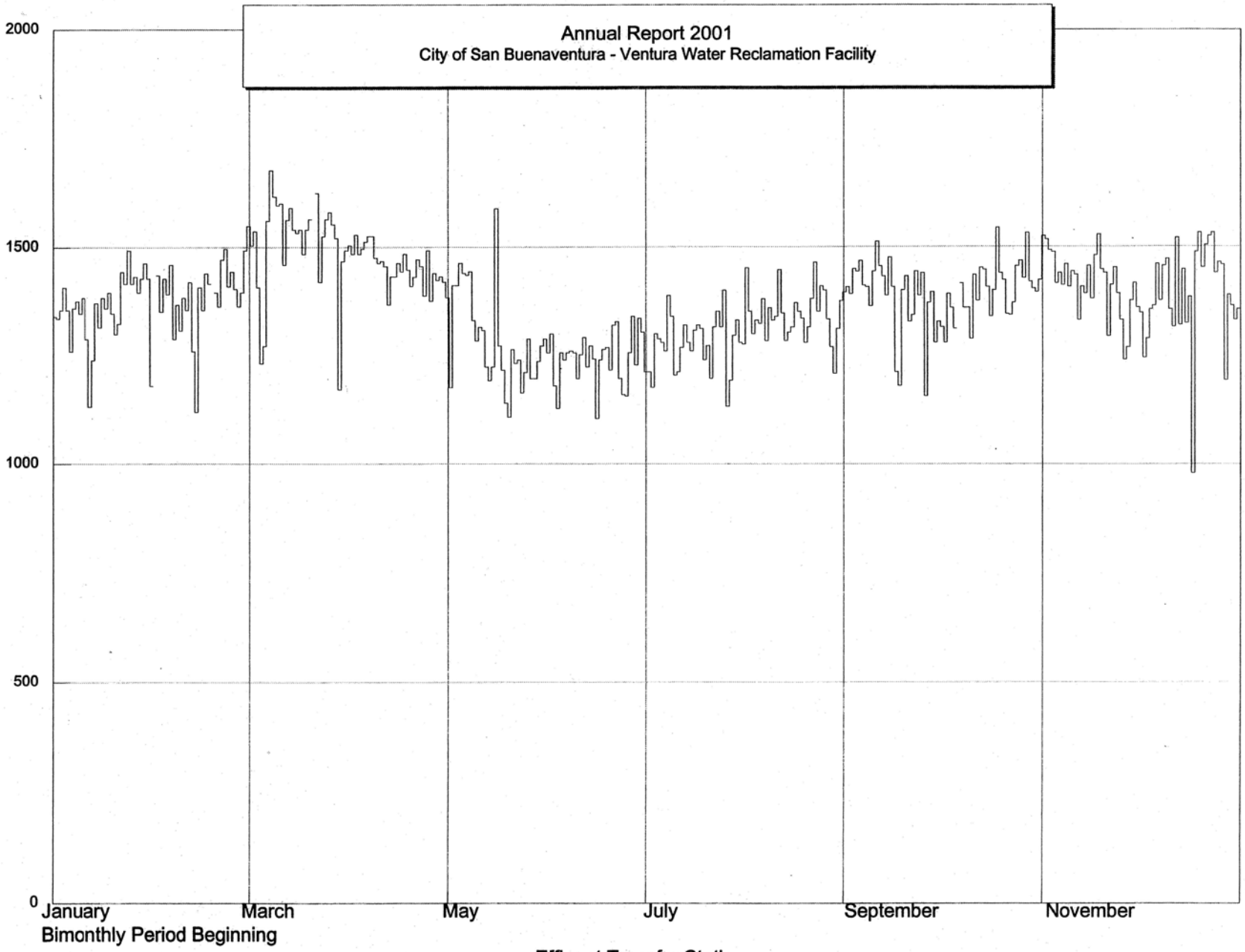

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent COD - mg/l



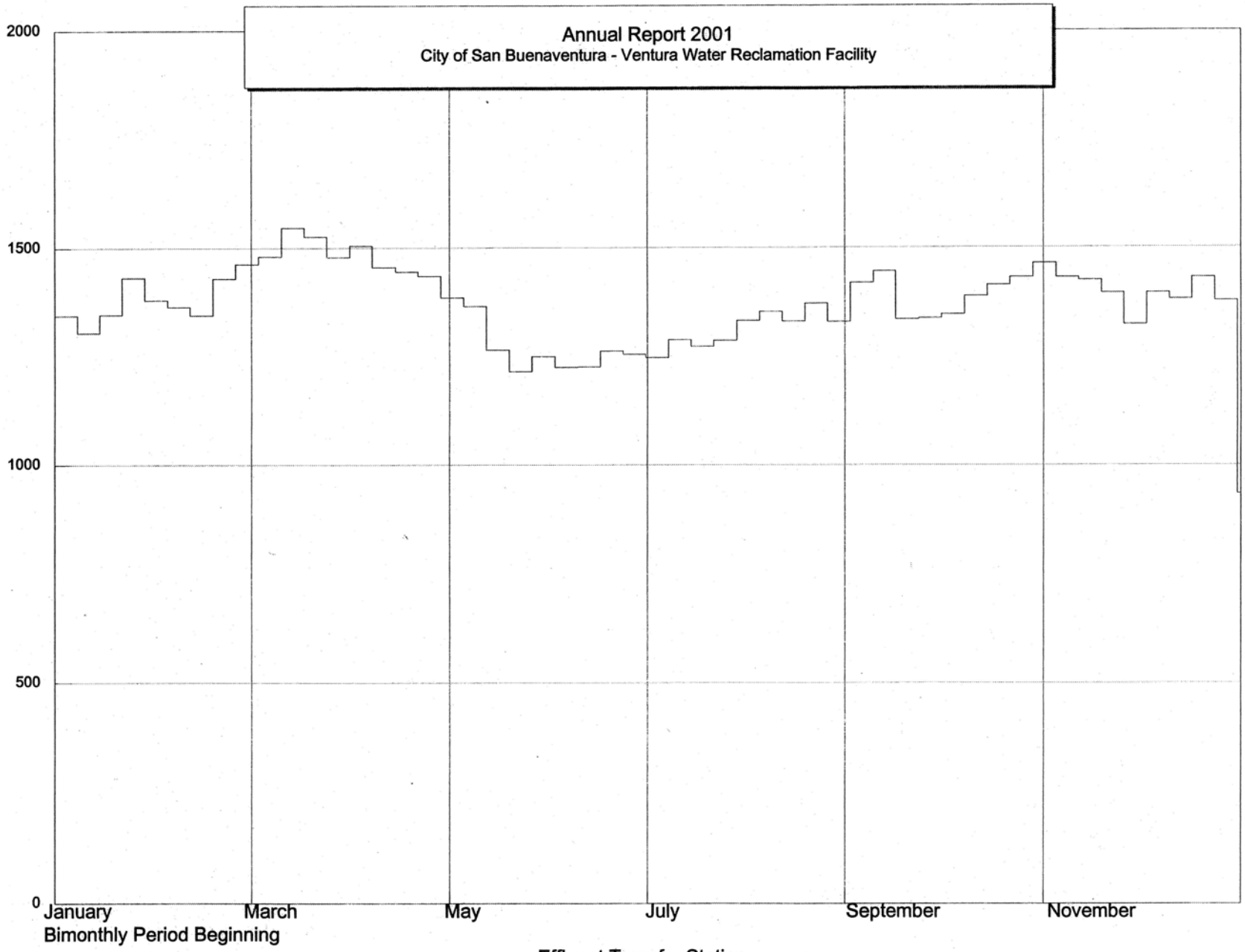
Effluent Transfer Station
Effluent 7 Day Average COD - mg/l



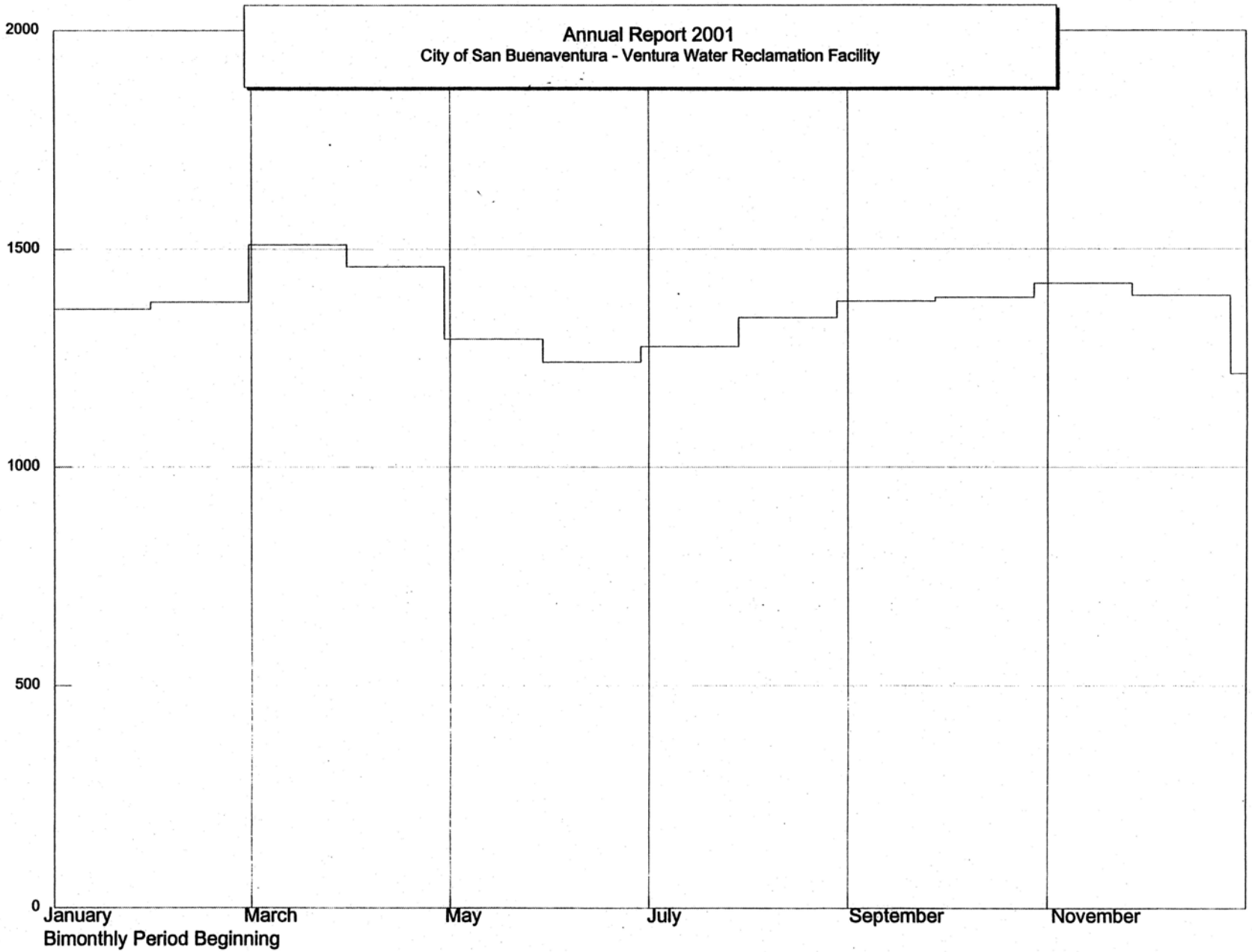
Effluent Transfer Station
Effluent 30 Day Average COD - mg/l



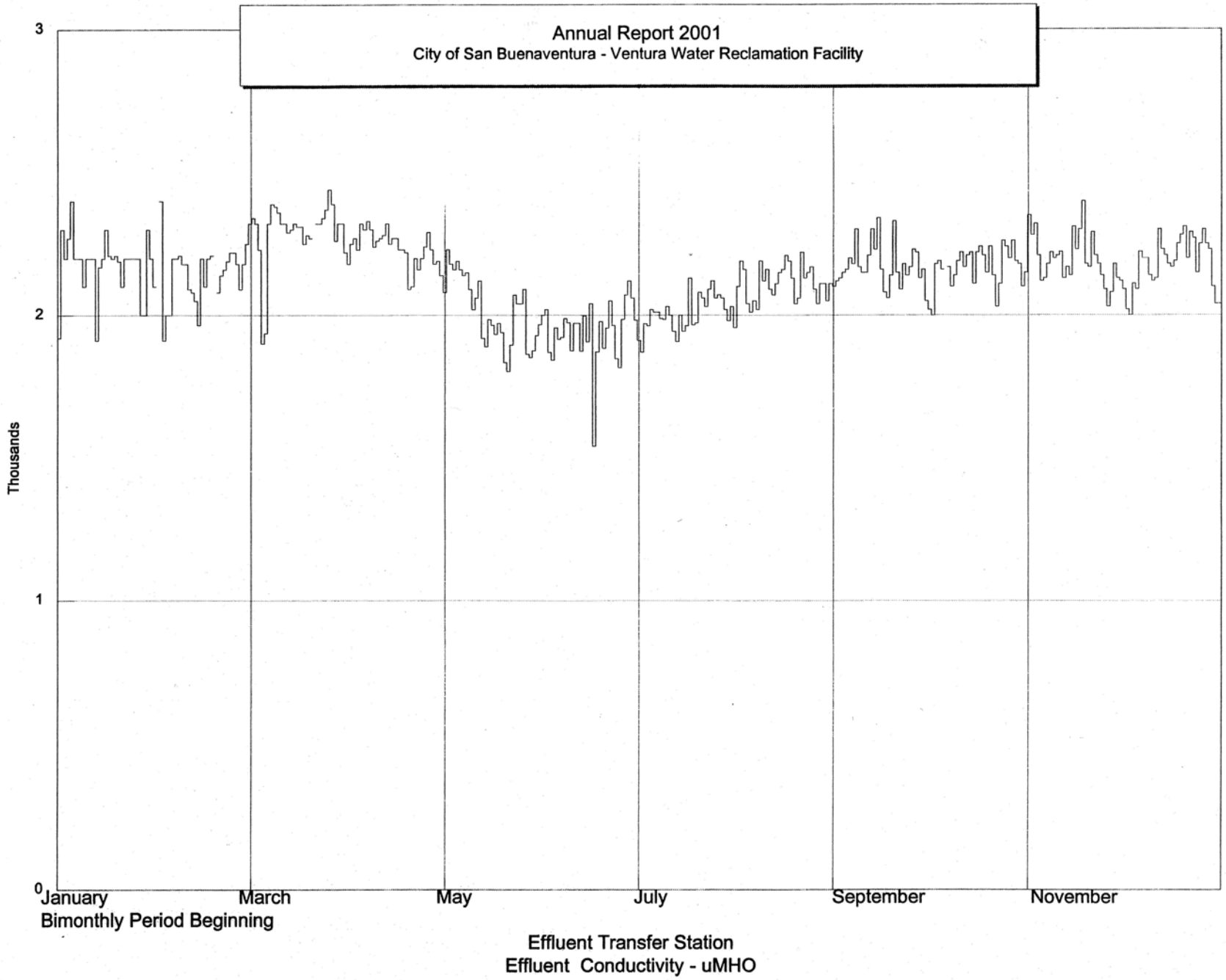
Effluent Transfer Station
Effluent Total Dissolved Solids - mg/l

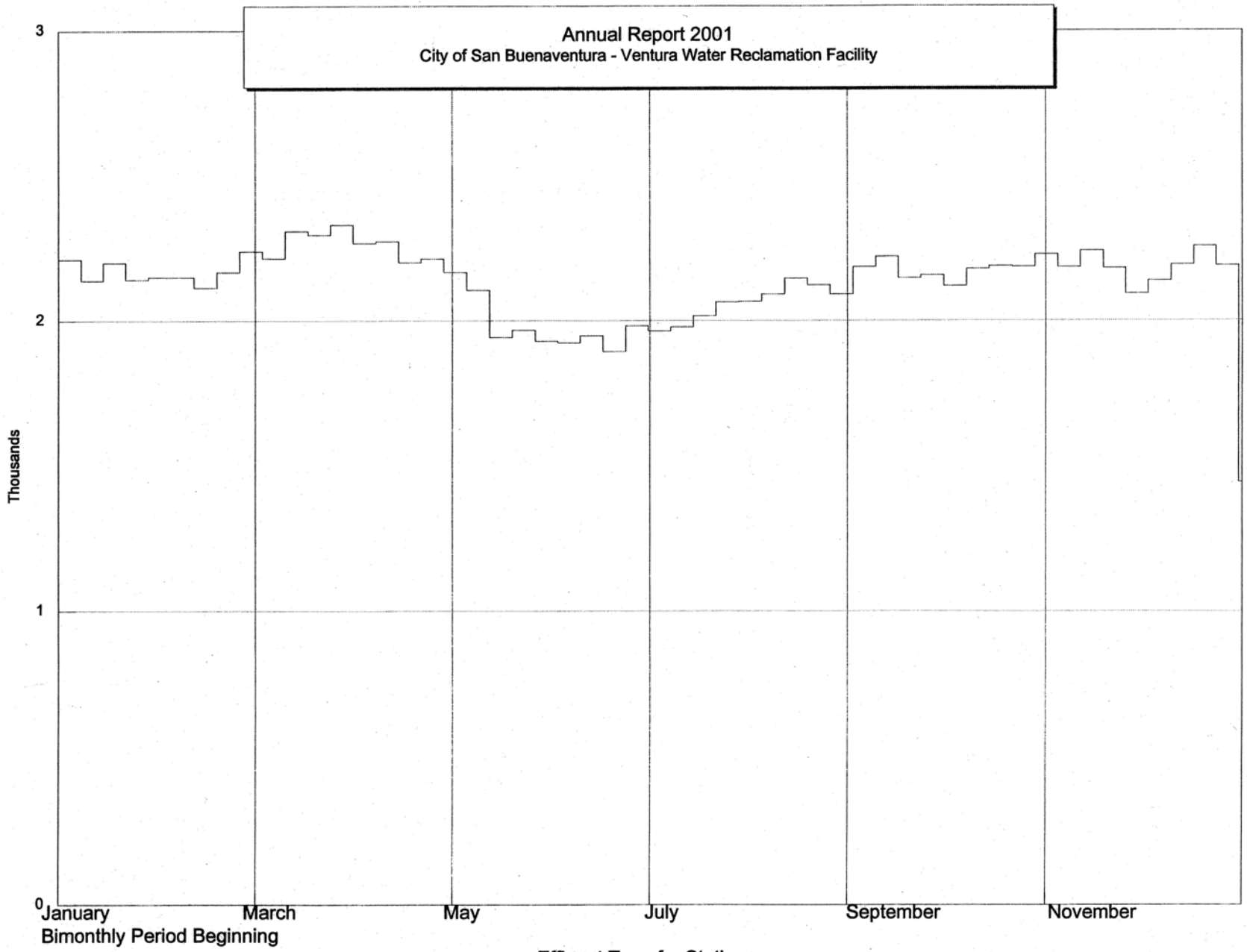


Effluent Transfer Station
Effluent 7 Day Average Total Dissolved Solids - mg/l

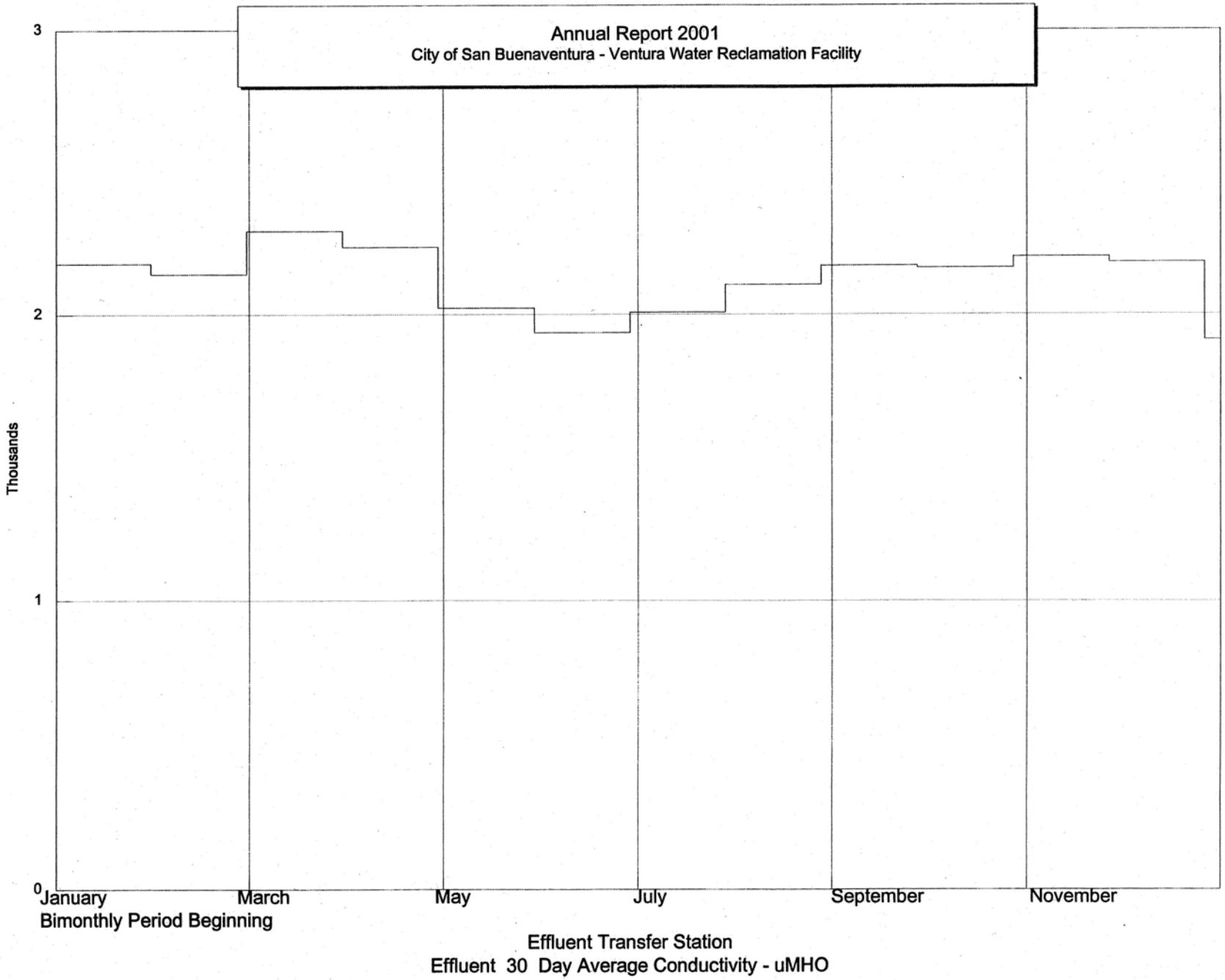


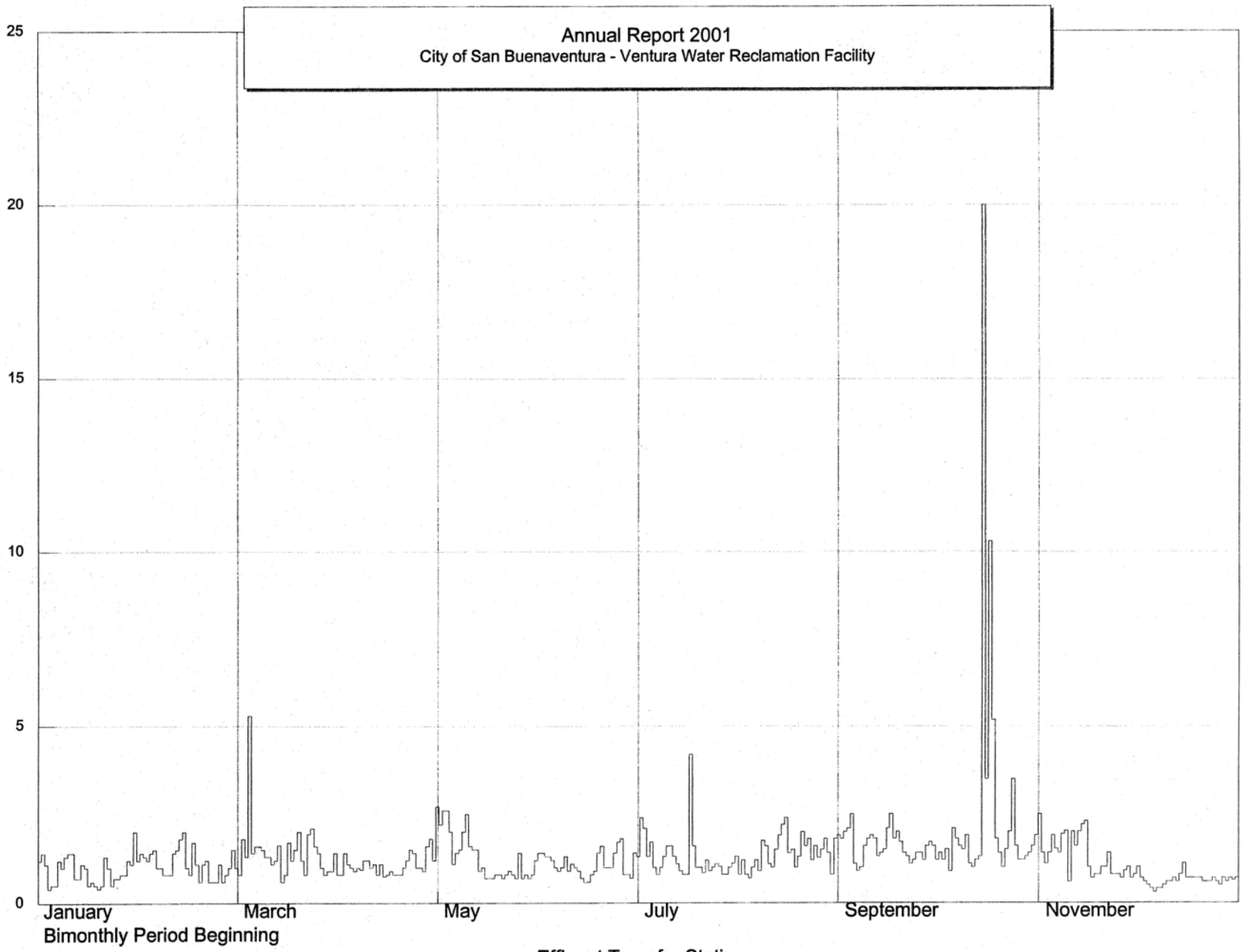
Effluent Transfer Station
Effluent 30 Day Average Total Dissolved Solids - mg/l


Annual Report 2001
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

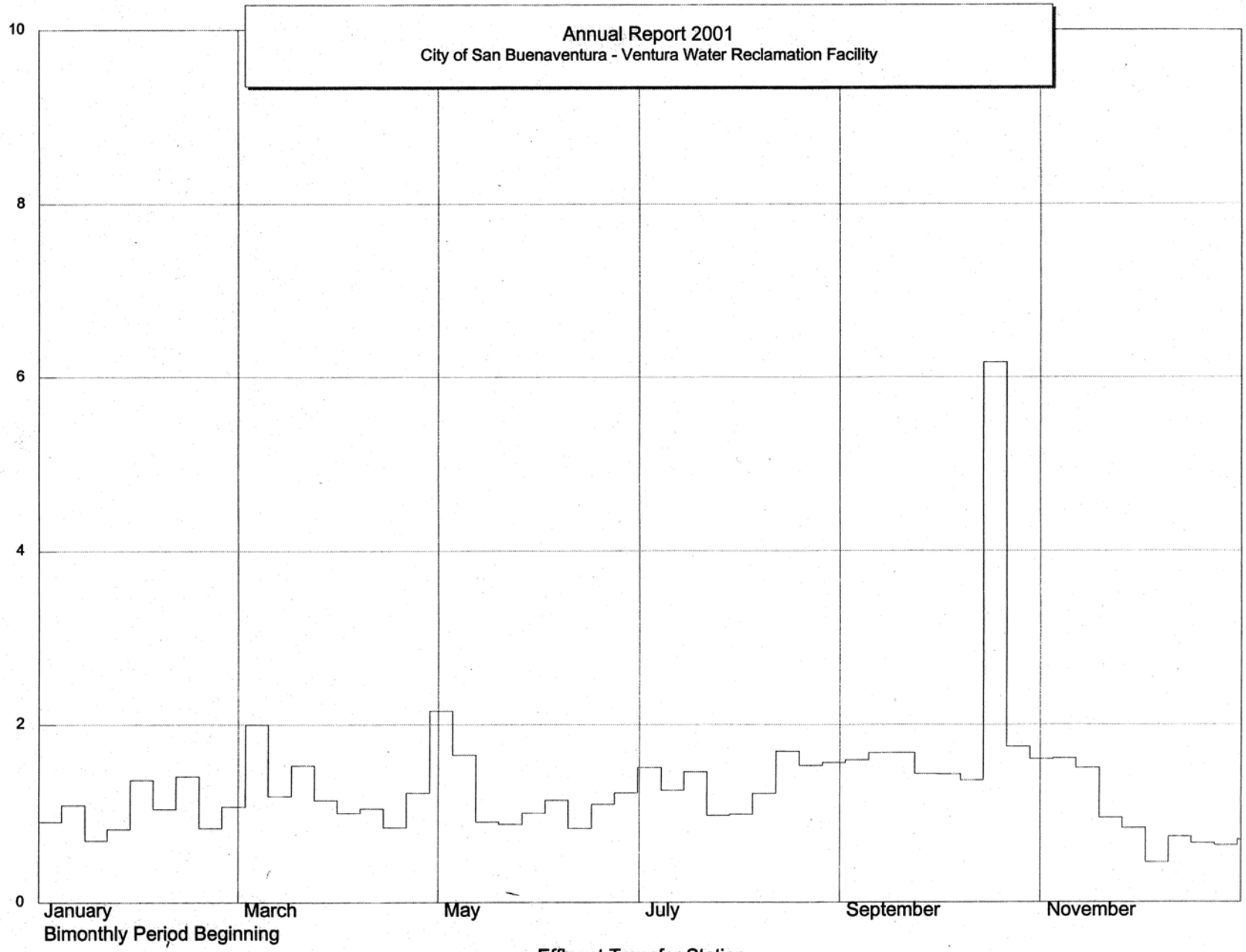


Effluent Transfer Station
Effluent 7 Day Average Conductivity - uMHO

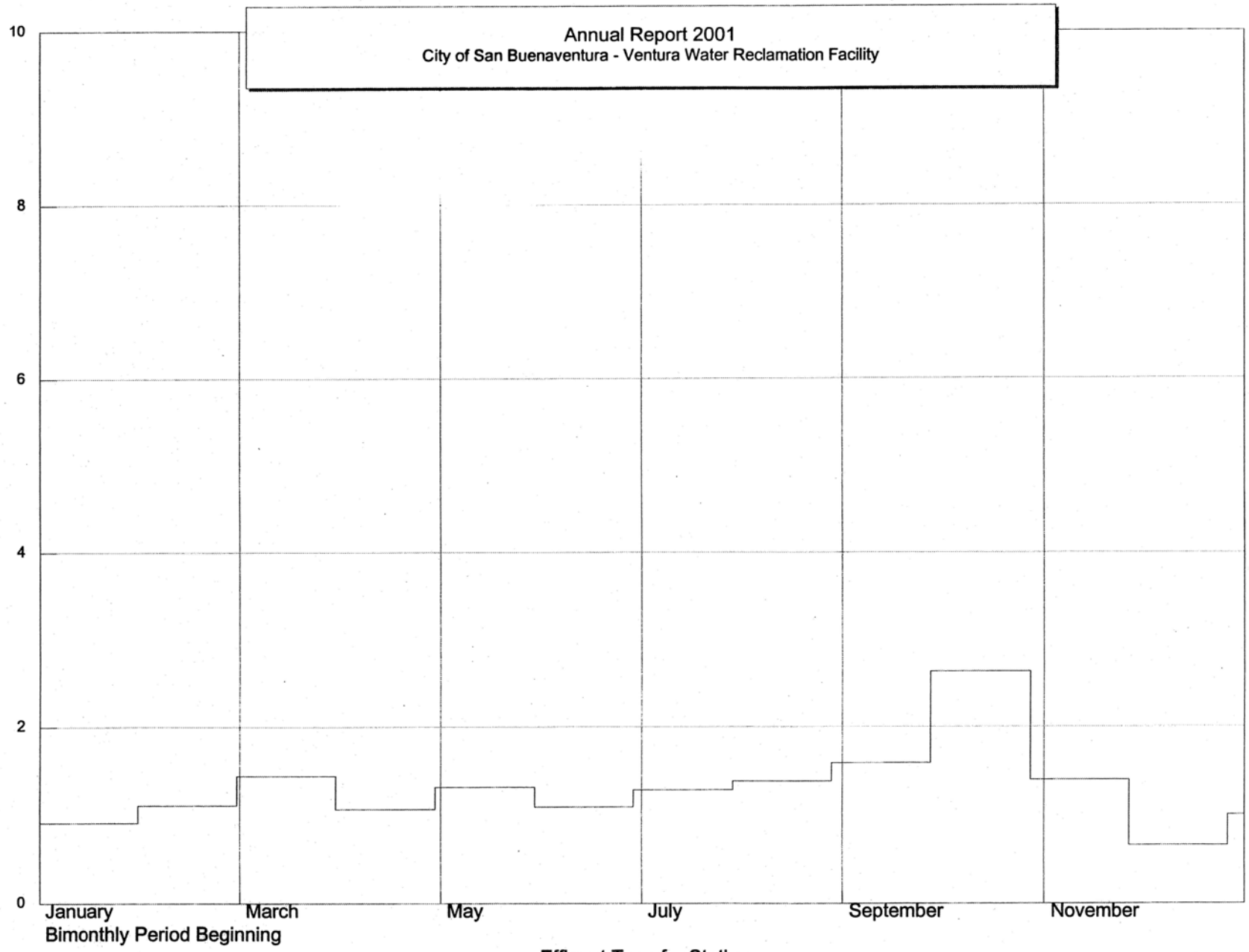

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
3
2
1
0
Thousands
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent 30 Day Average Conductivity - uMHO



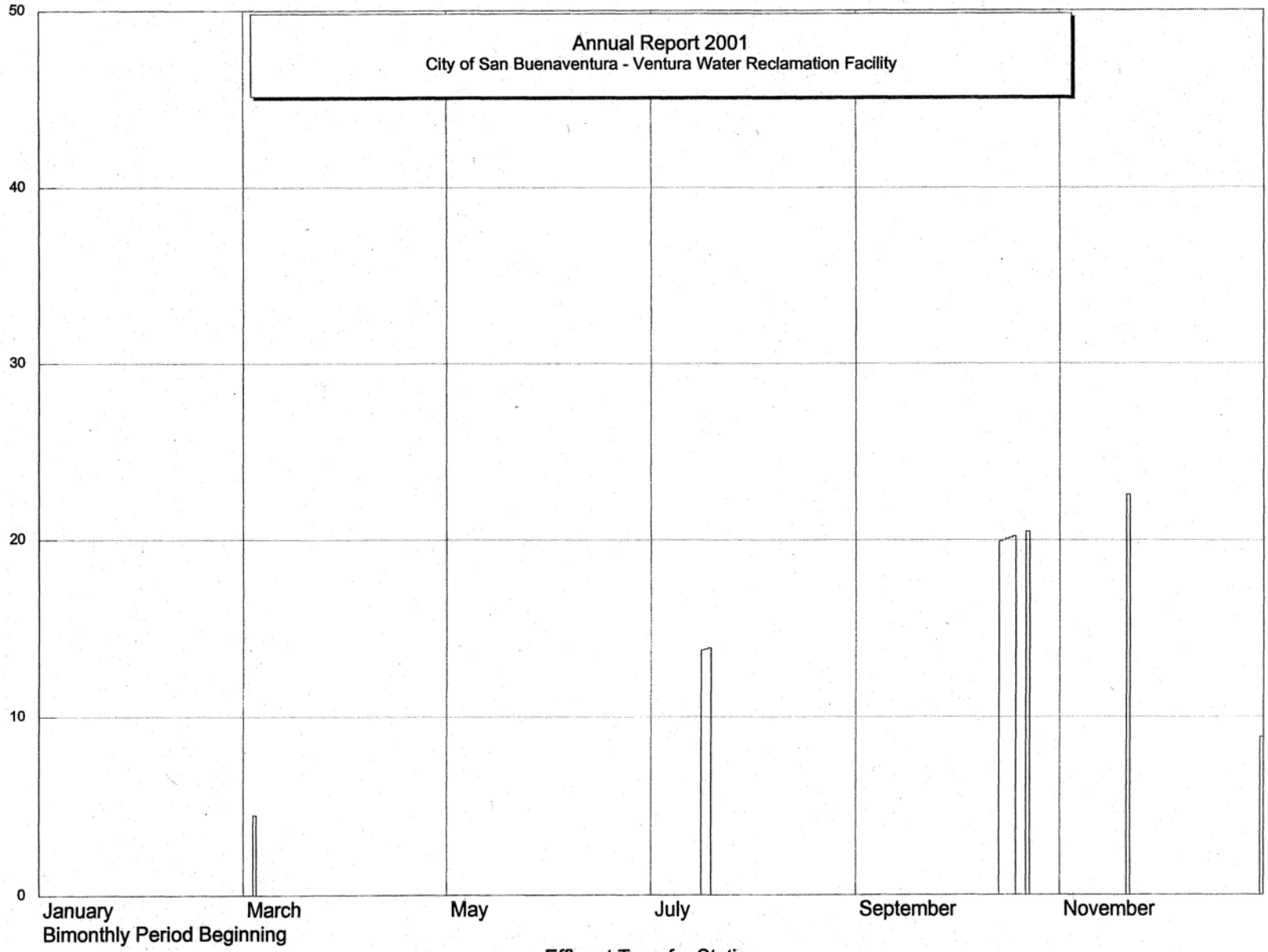
Effluent Transfer Station
Effluent Daily Turbidity - NTU



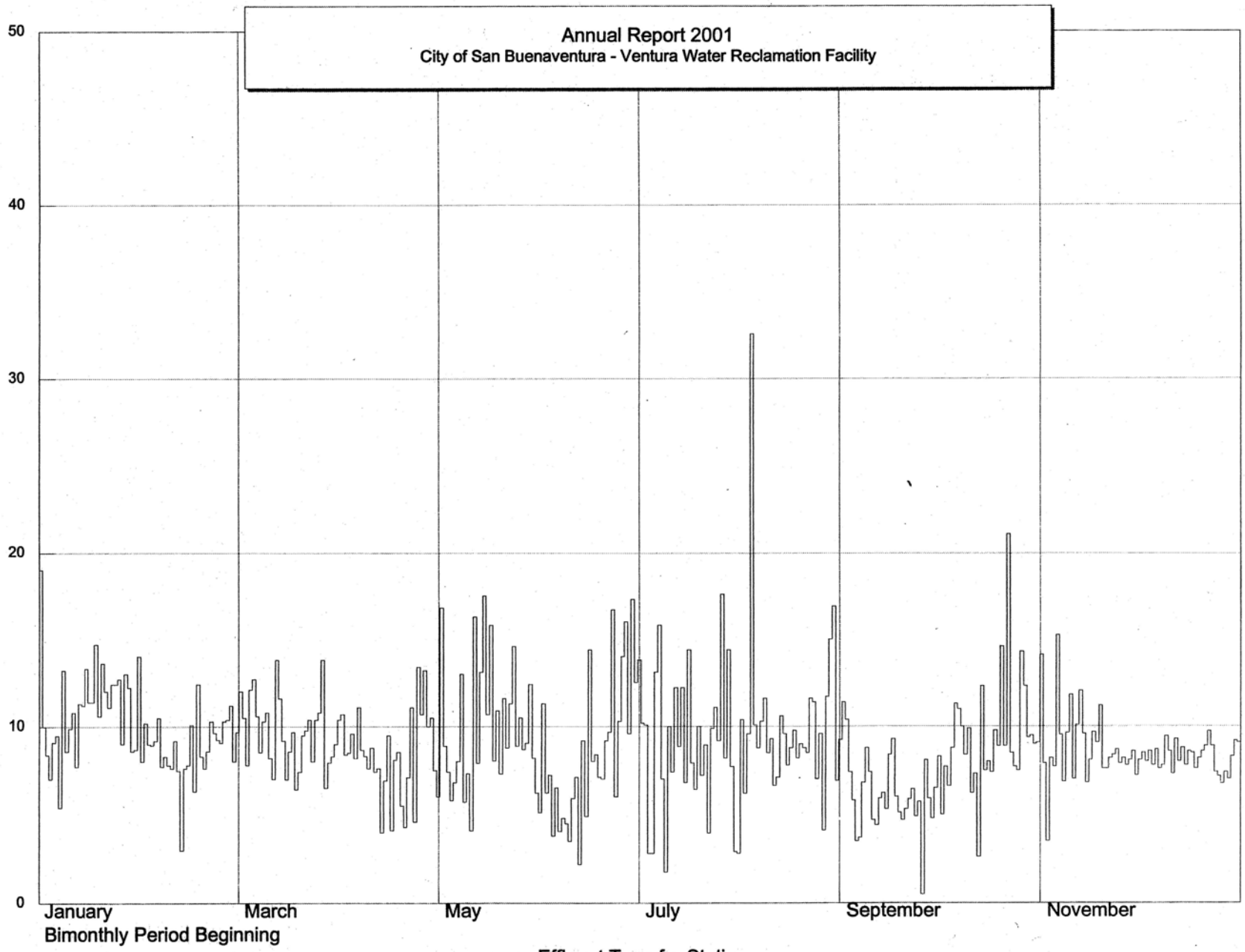
Effluent Transfer Station
Effluent 7 Day Average Turbidity - NTU



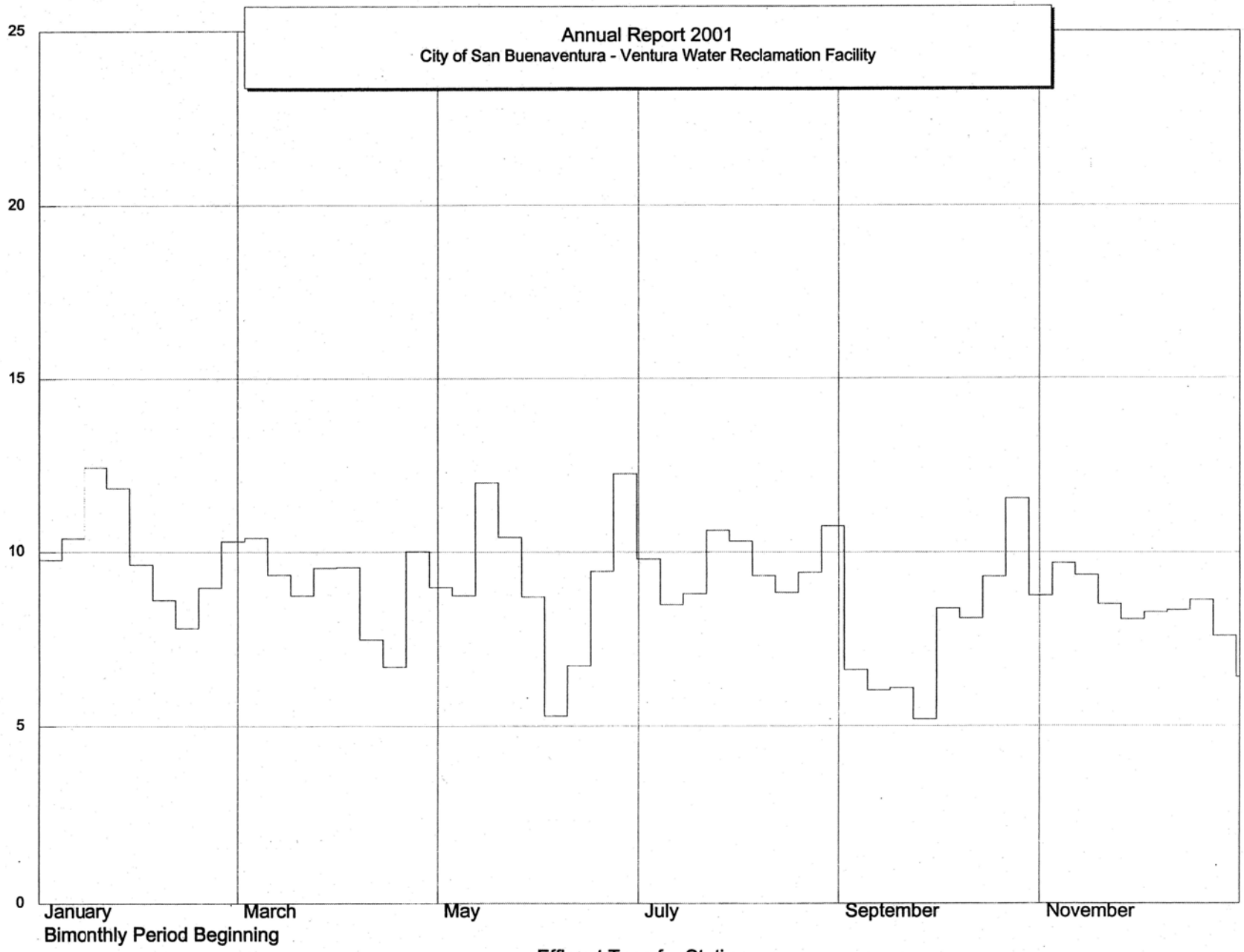
Effluent Transfer Station
Effluent 30 Day Average Turbidity - NTU



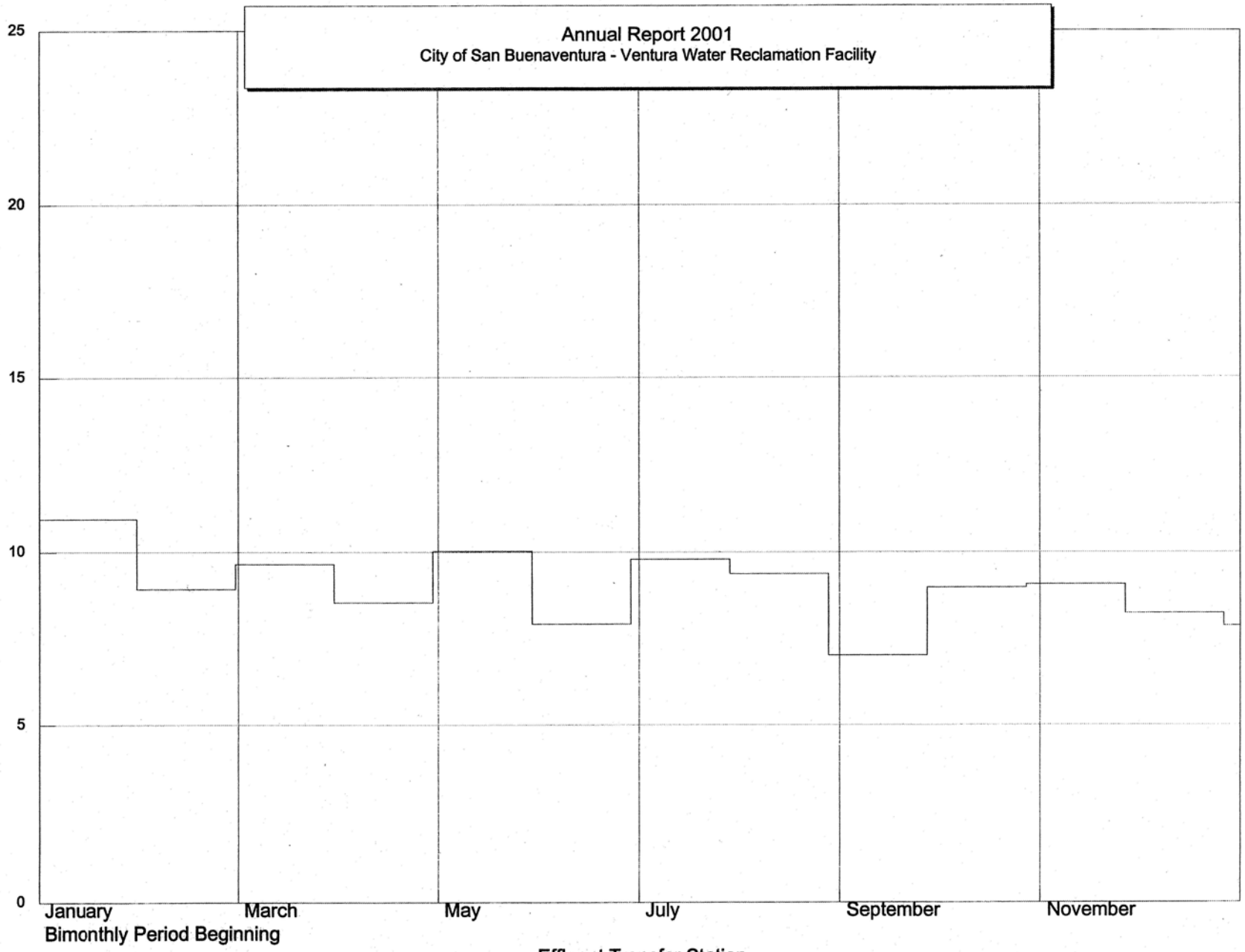
Effluent Transfer Station
Effluent Turbidity Exceeding 5 NTU - %



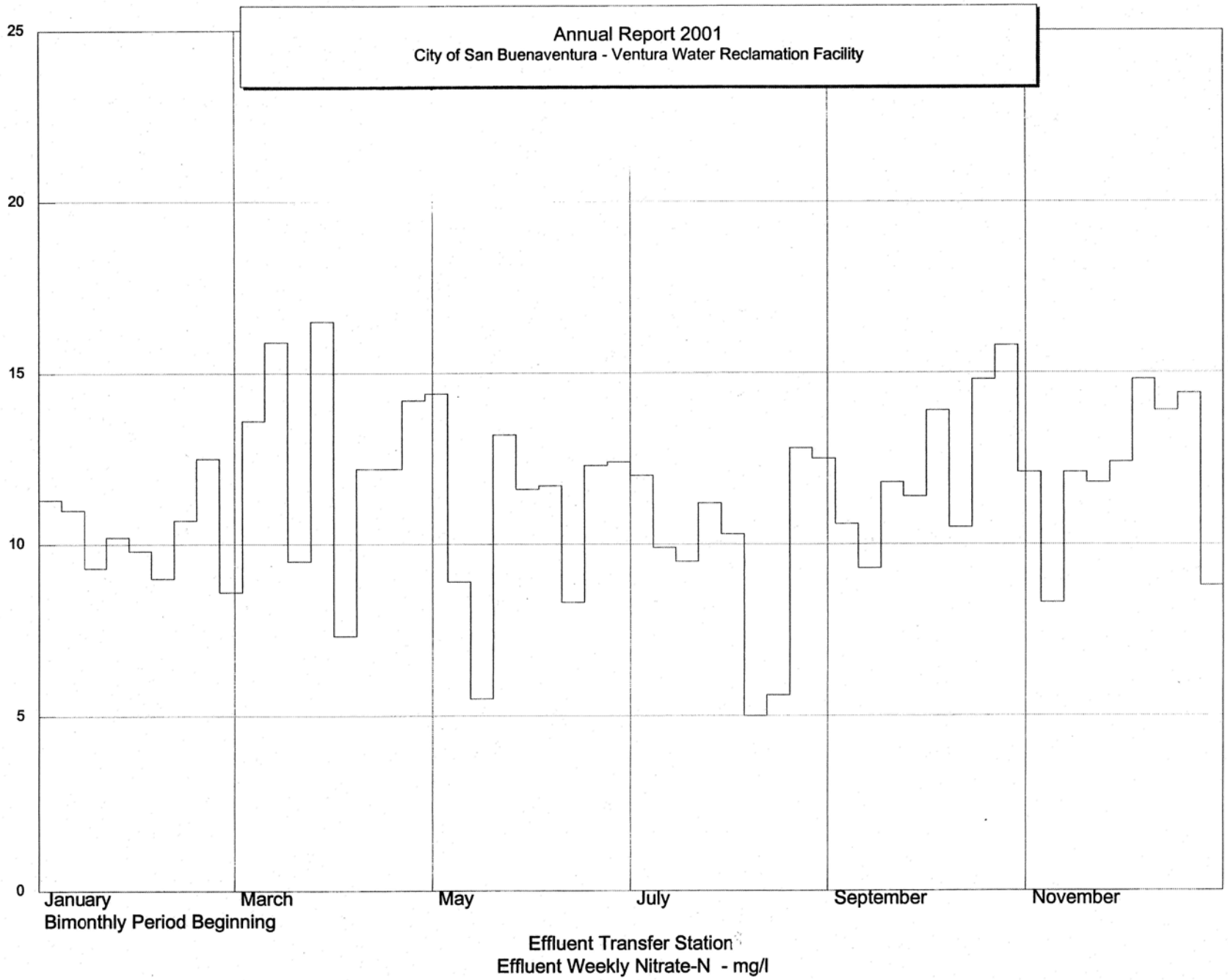
Effluent Transfer Station
Effluent Chlorine Residual - mg/l

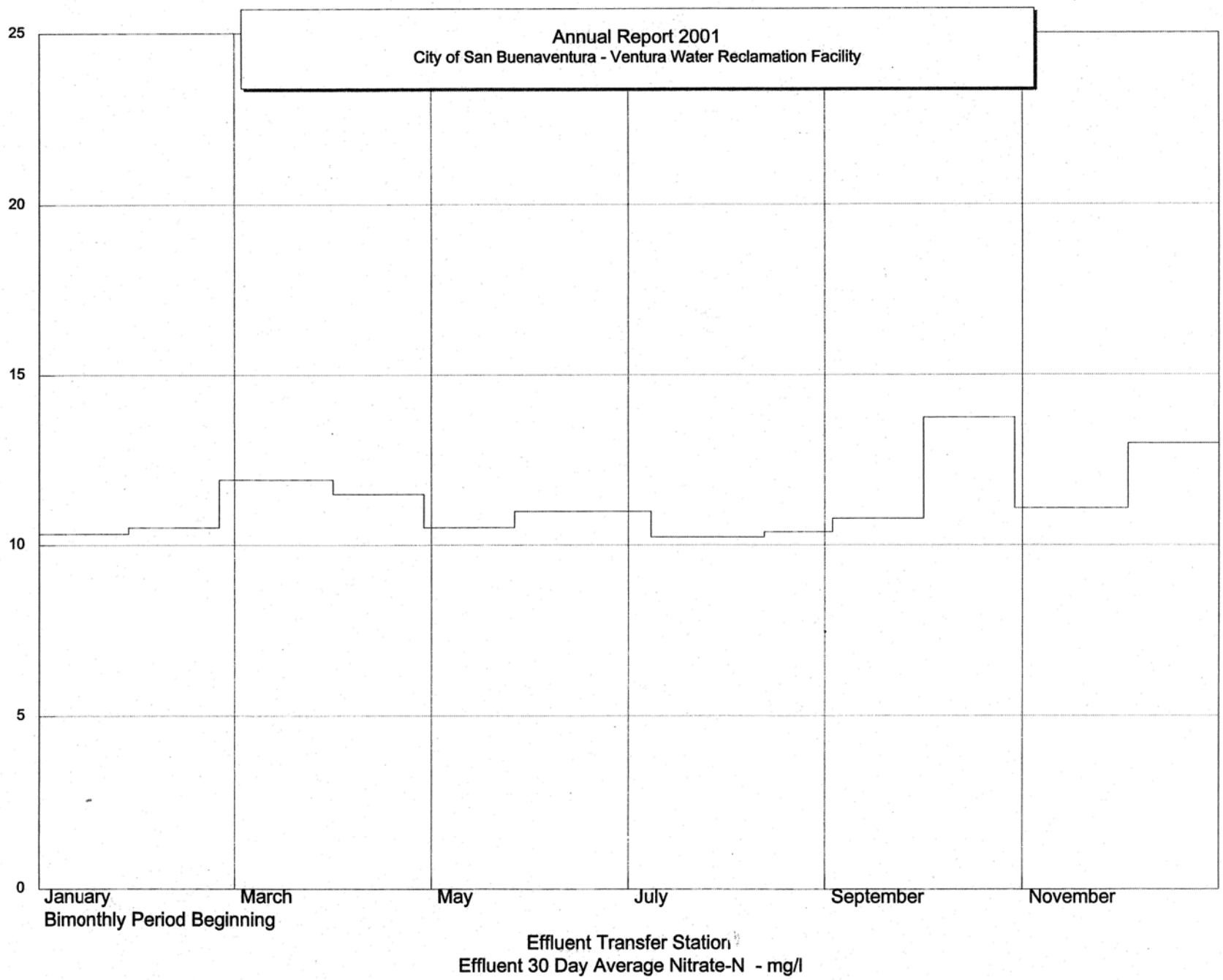


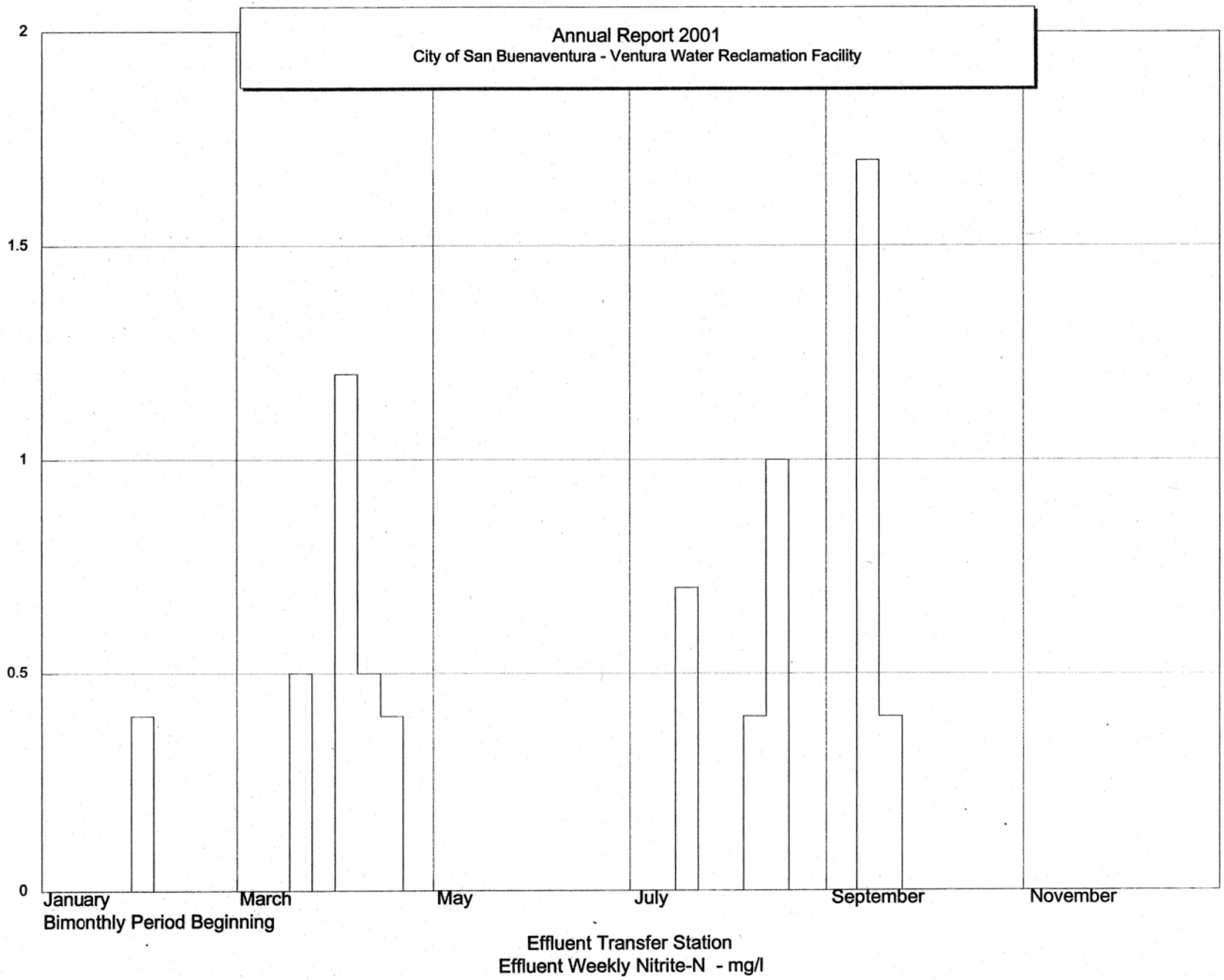
Effluent Transfer Station
Effluent 7 Day Average Chlorine Residual - mg/l

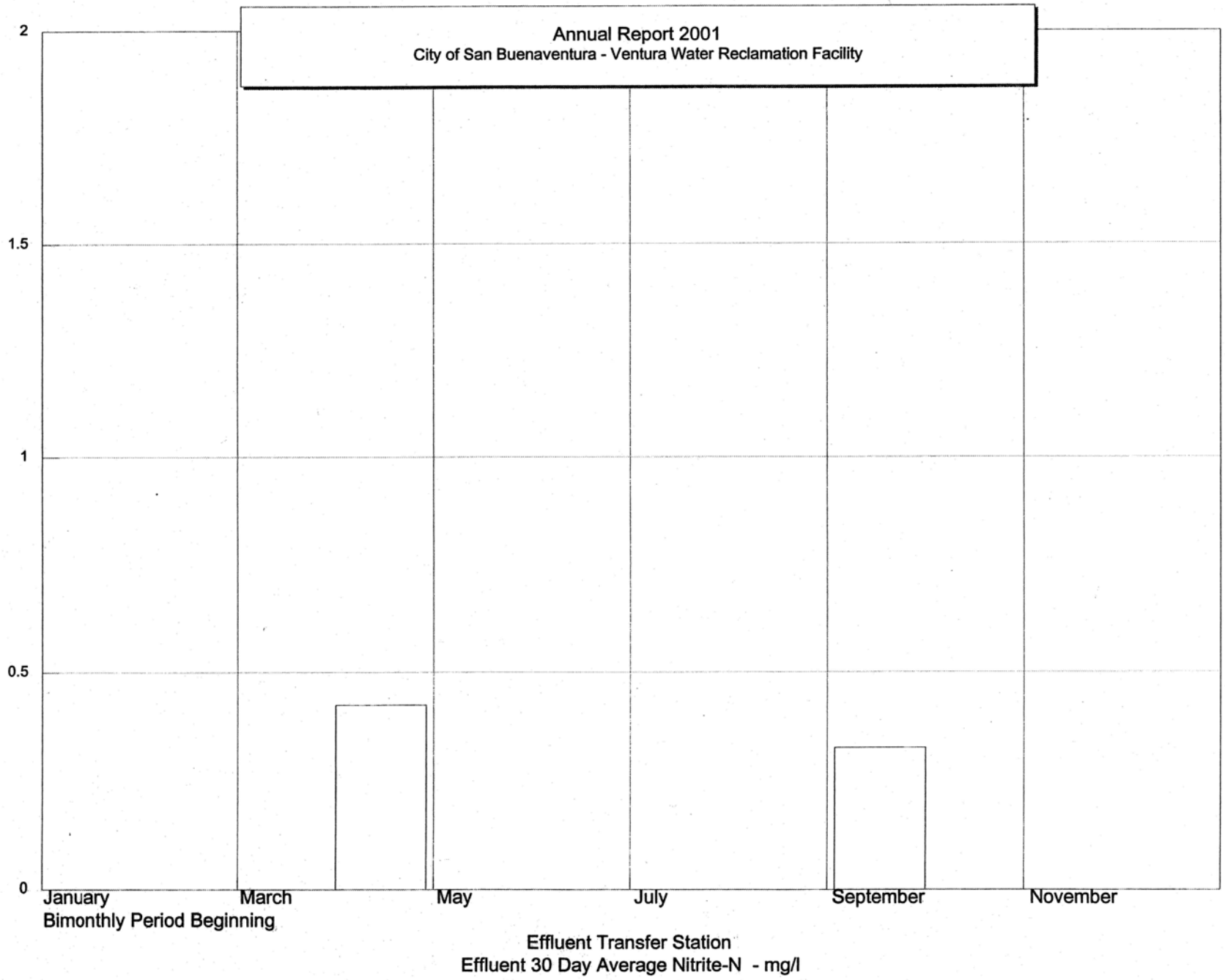


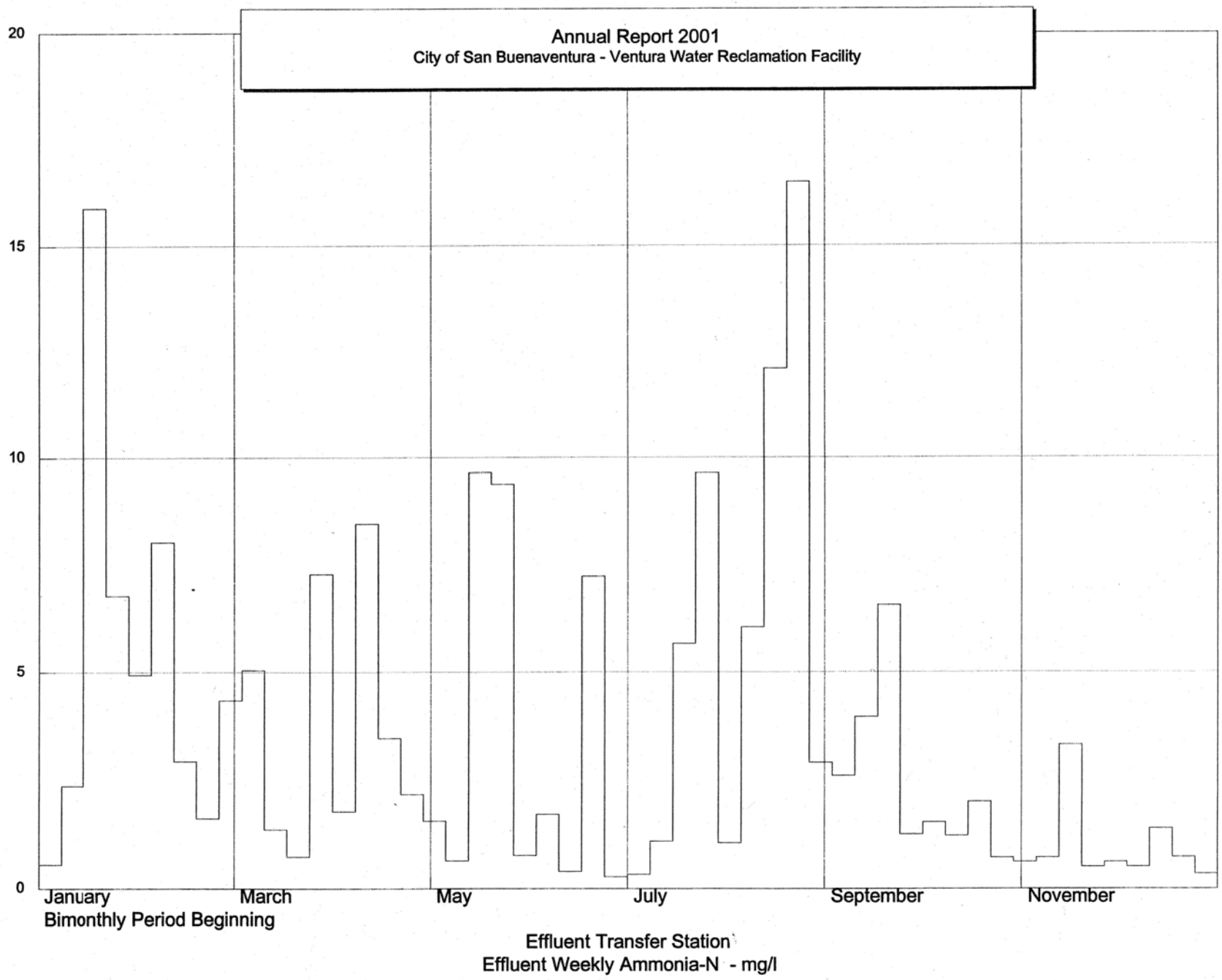
Effluent Transfer Station
Effluent 30 Day Average Chlorine Residual - mg/l

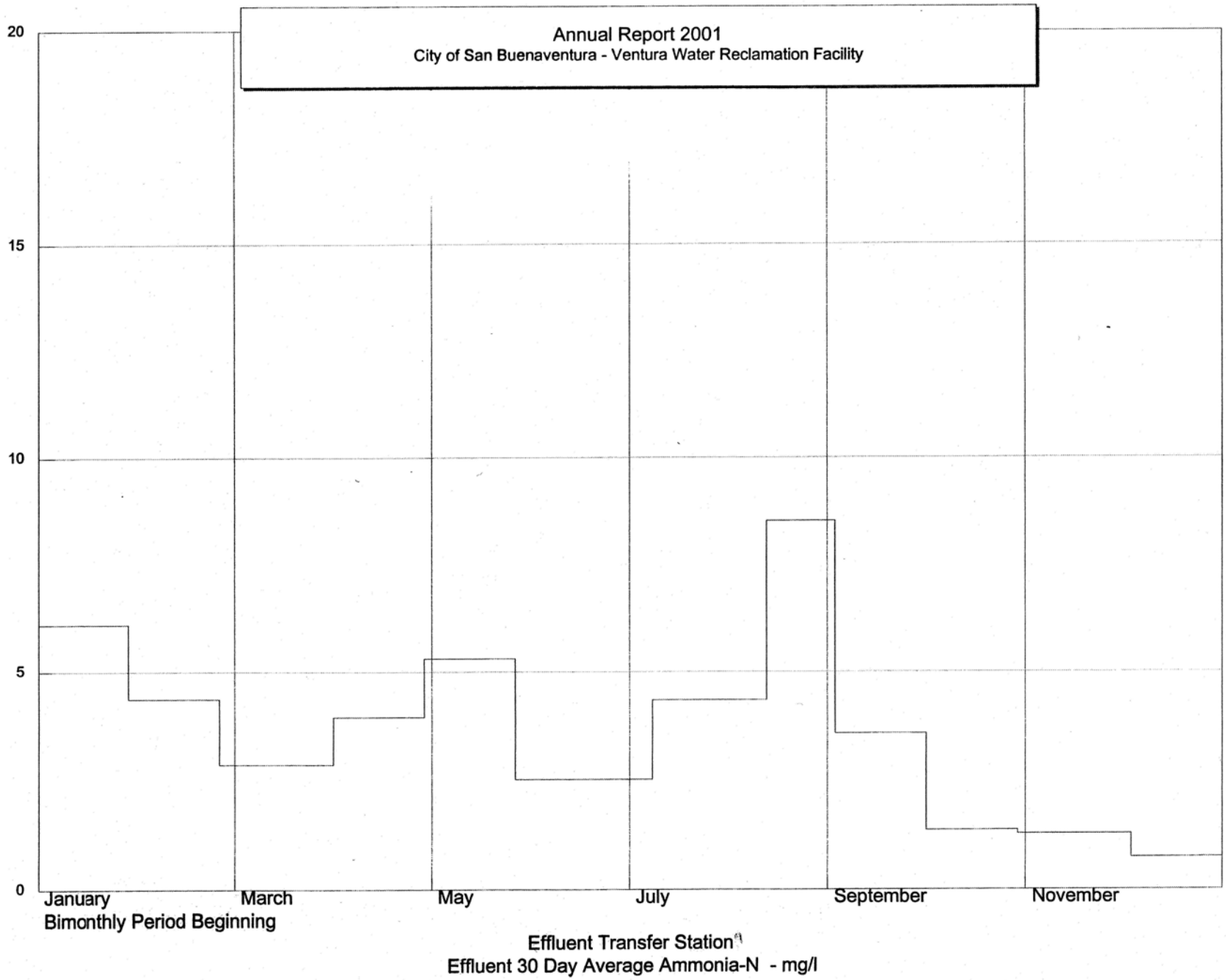

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
25
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Weekly Nitrate-N - mg/l

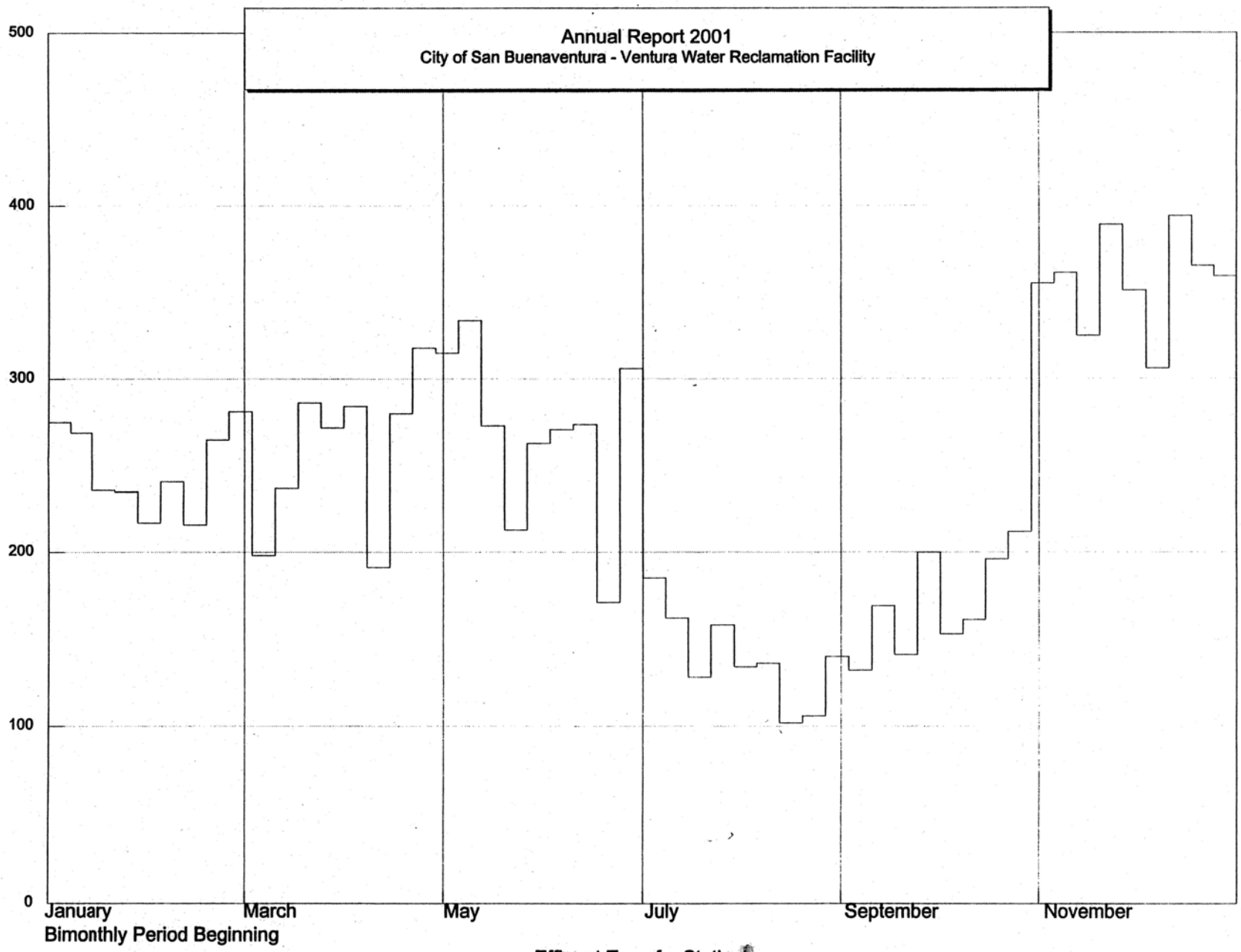

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
25
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent 30 Day Average Nitrate-N - mg/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
2
1.5
1
0.5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Weekly Nitrite-N - mg/l

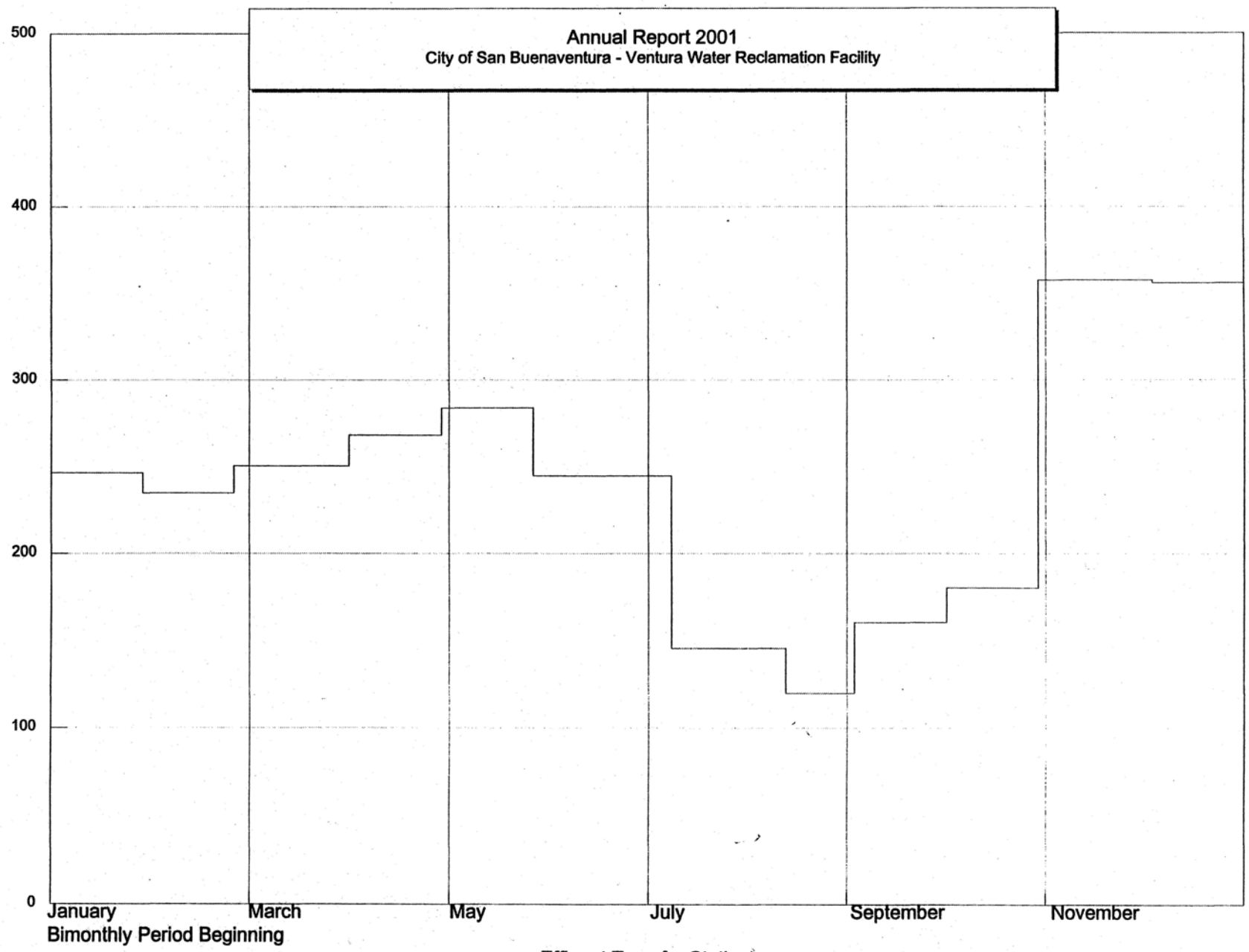

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
2
1.5
1
0.5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent 30 Day Average Nitrite-N - mg/l


Annual Report 2001
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 Weekly Ammonia-N - mg/l

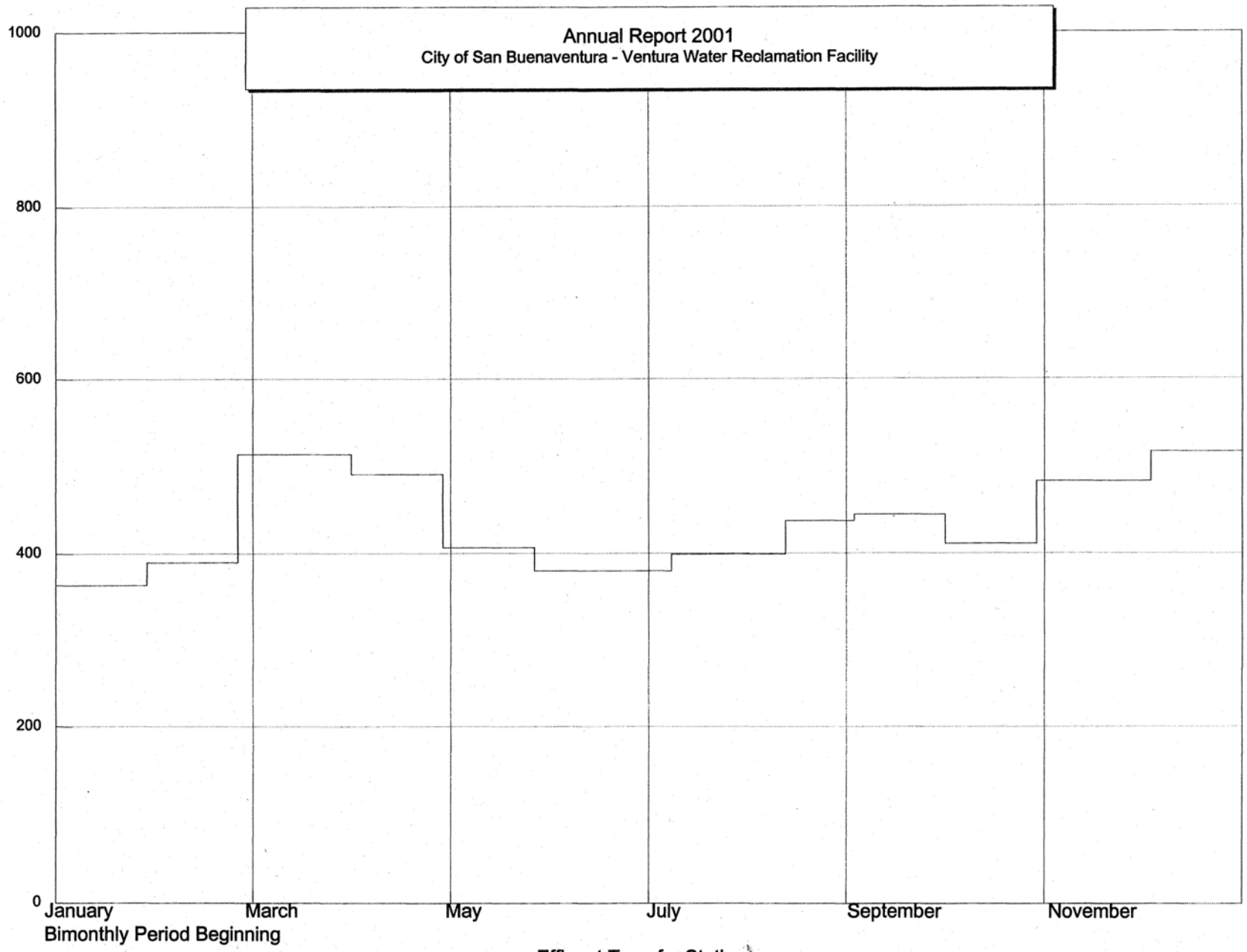

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent 30 Day Average Ammonia-N - mg/l



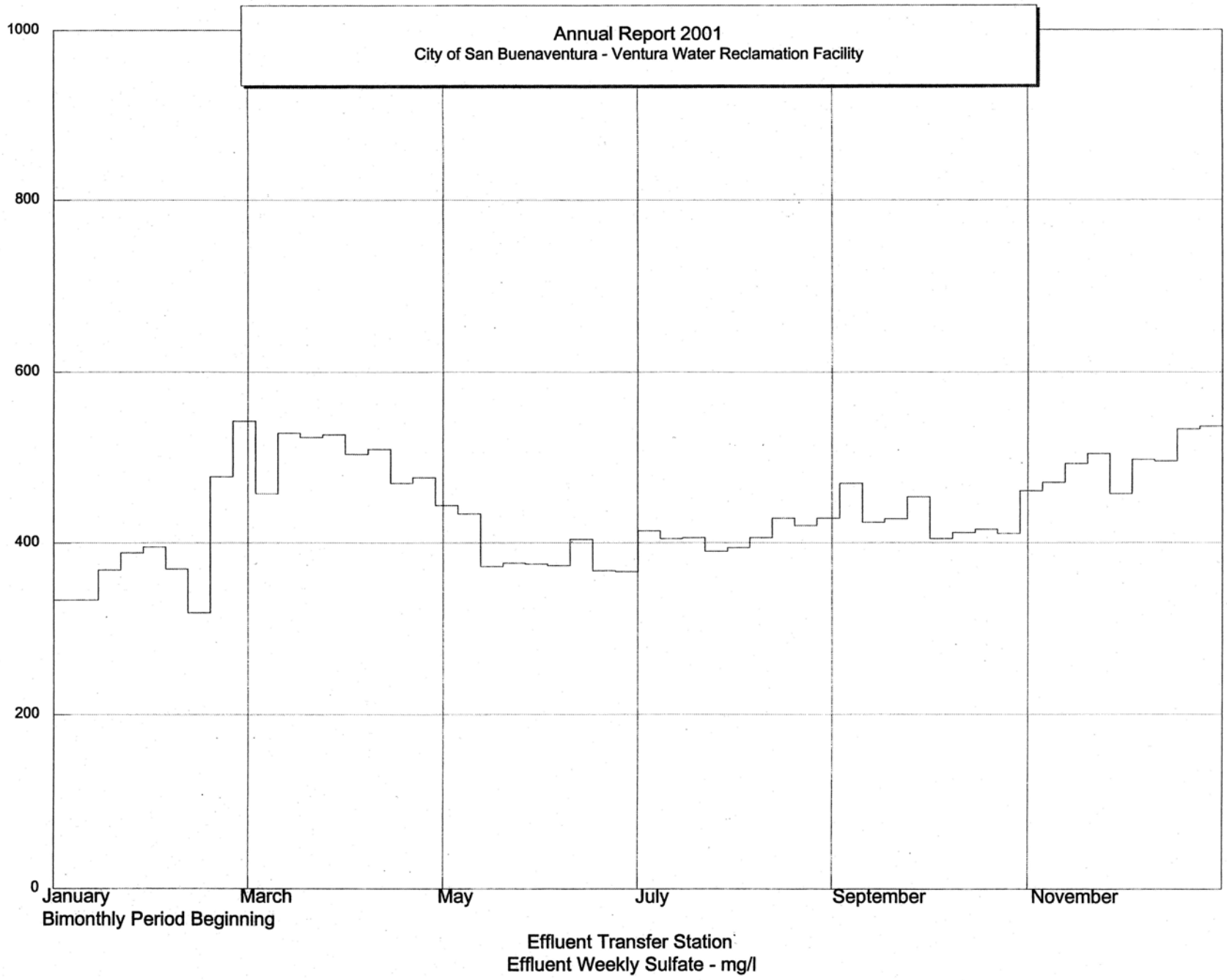
Effluent Transfer Station
Effluent Weekly Chloride - mg/l

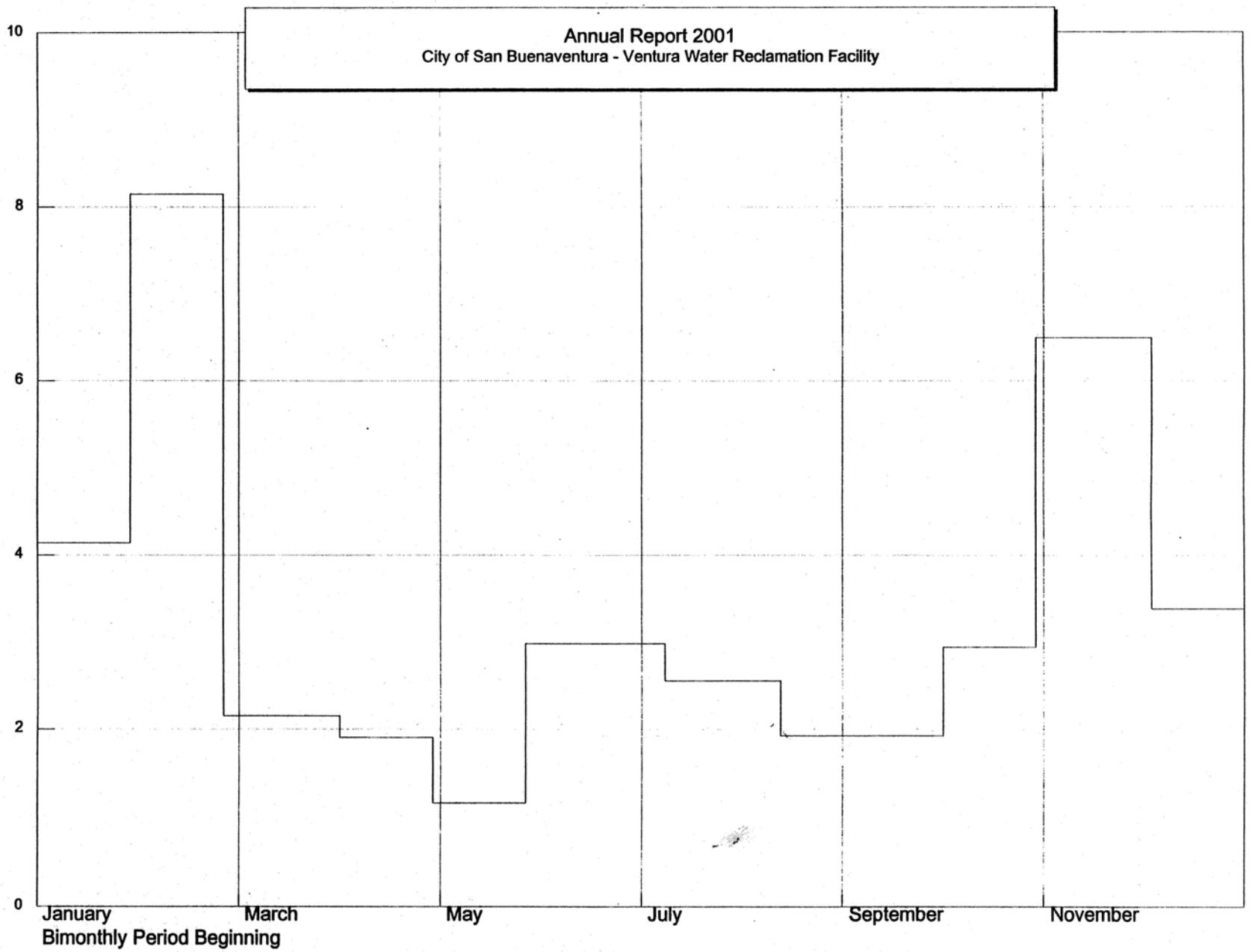


Effluent Transfer Station
Effluent 30 Day Average Chloride - mg/l

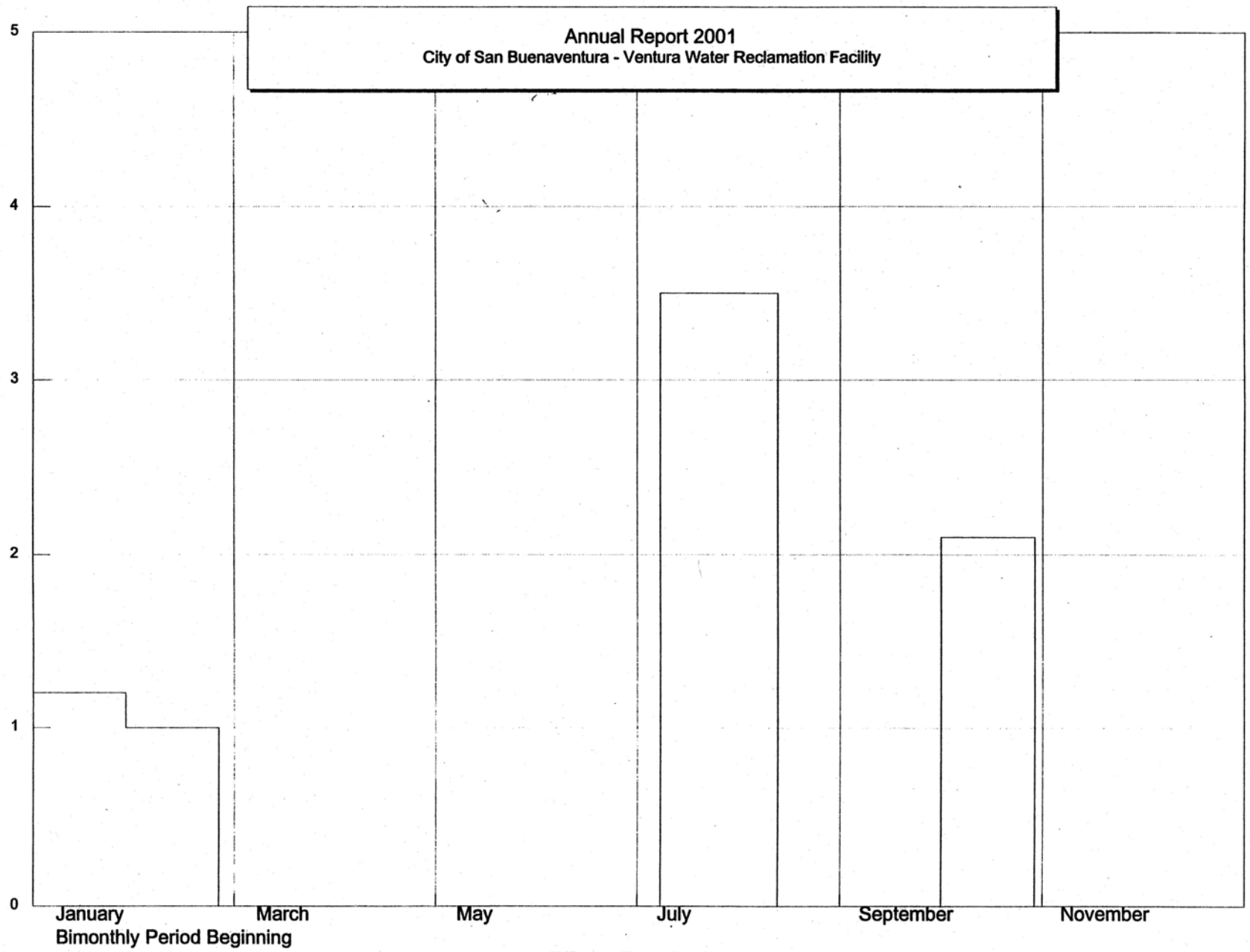


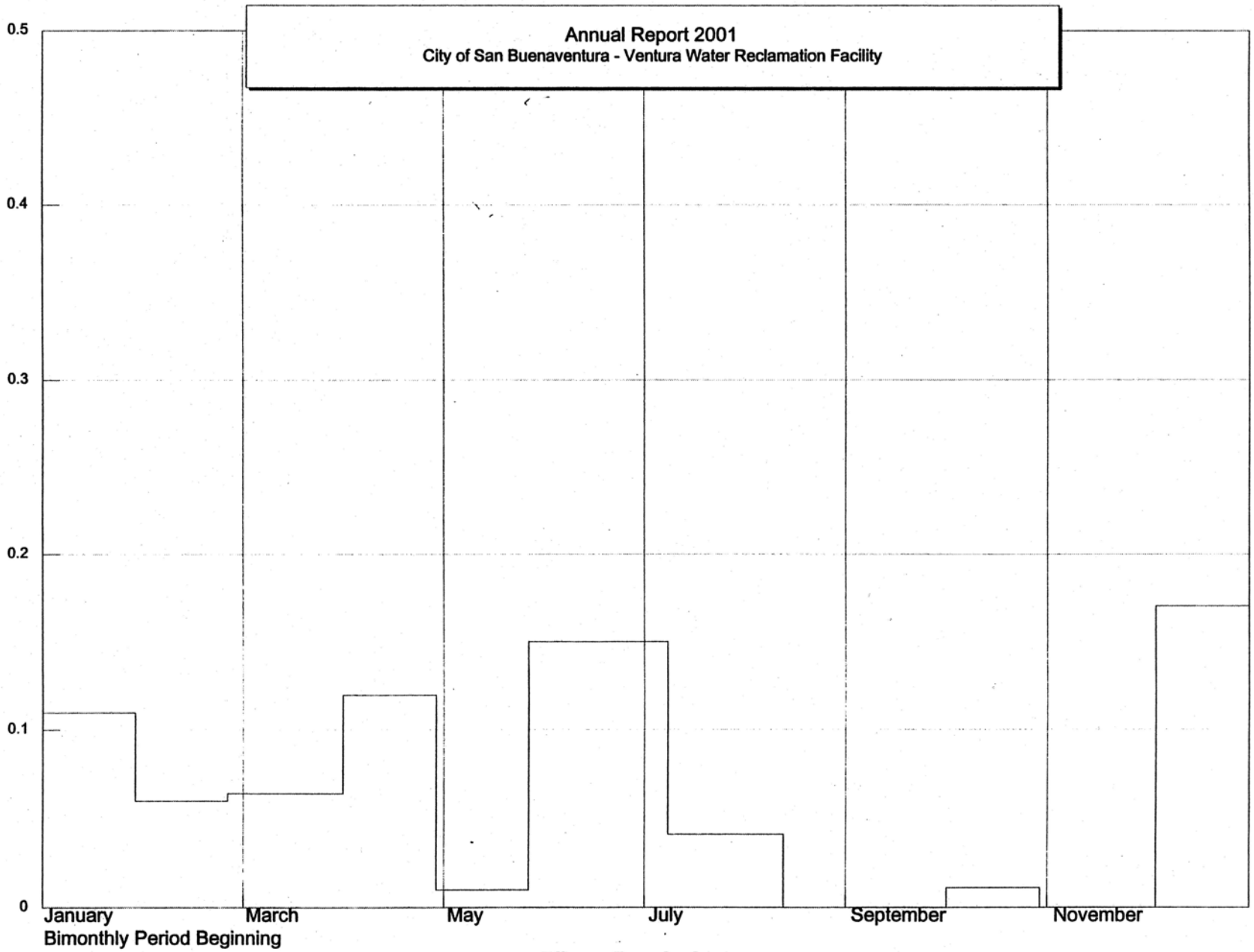
Effluent Transfer Station
Effluent 30 Day Average Sulfate - mg/l

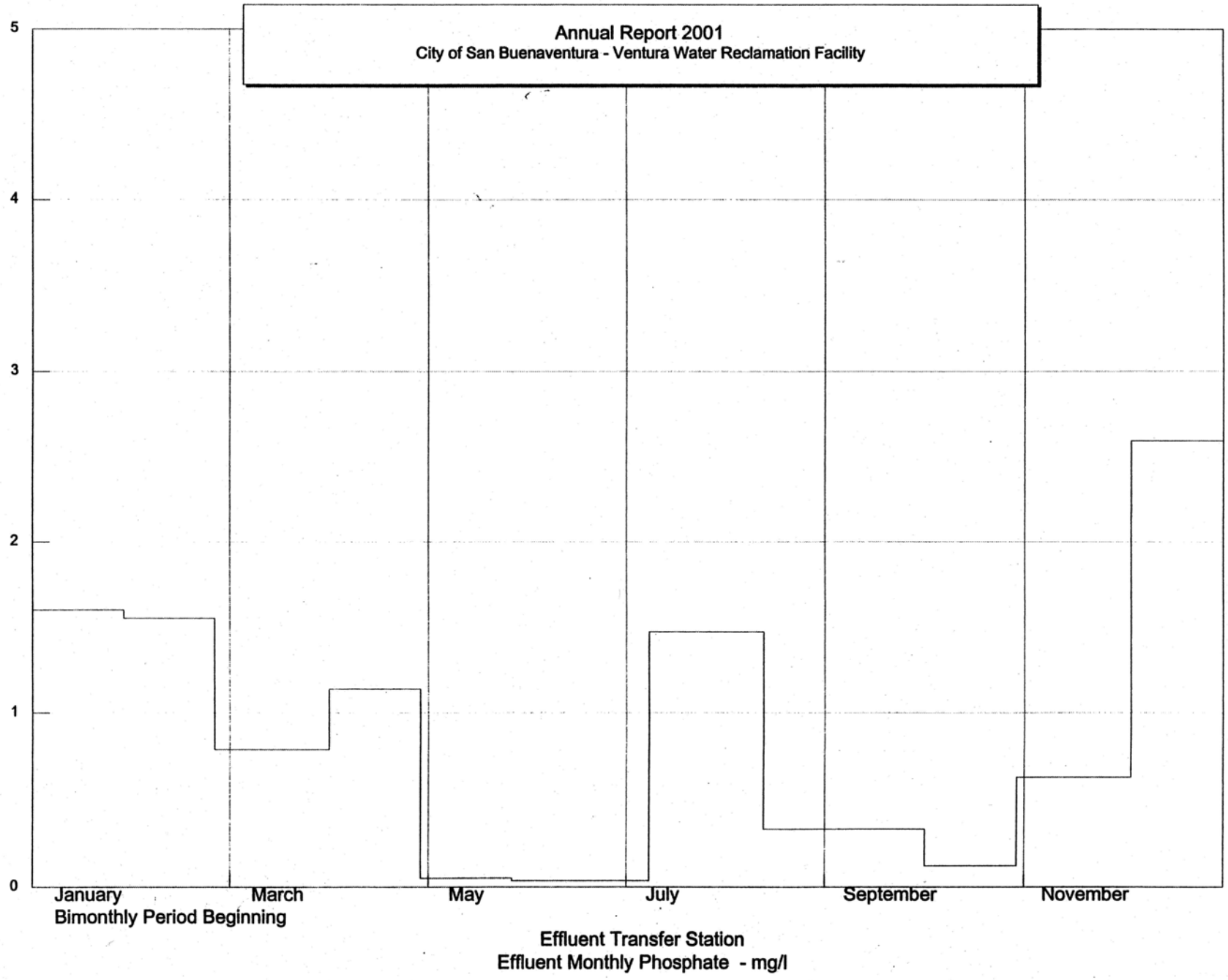

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
1000
800
600
400
200
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Weekly Sulfate - mg/l

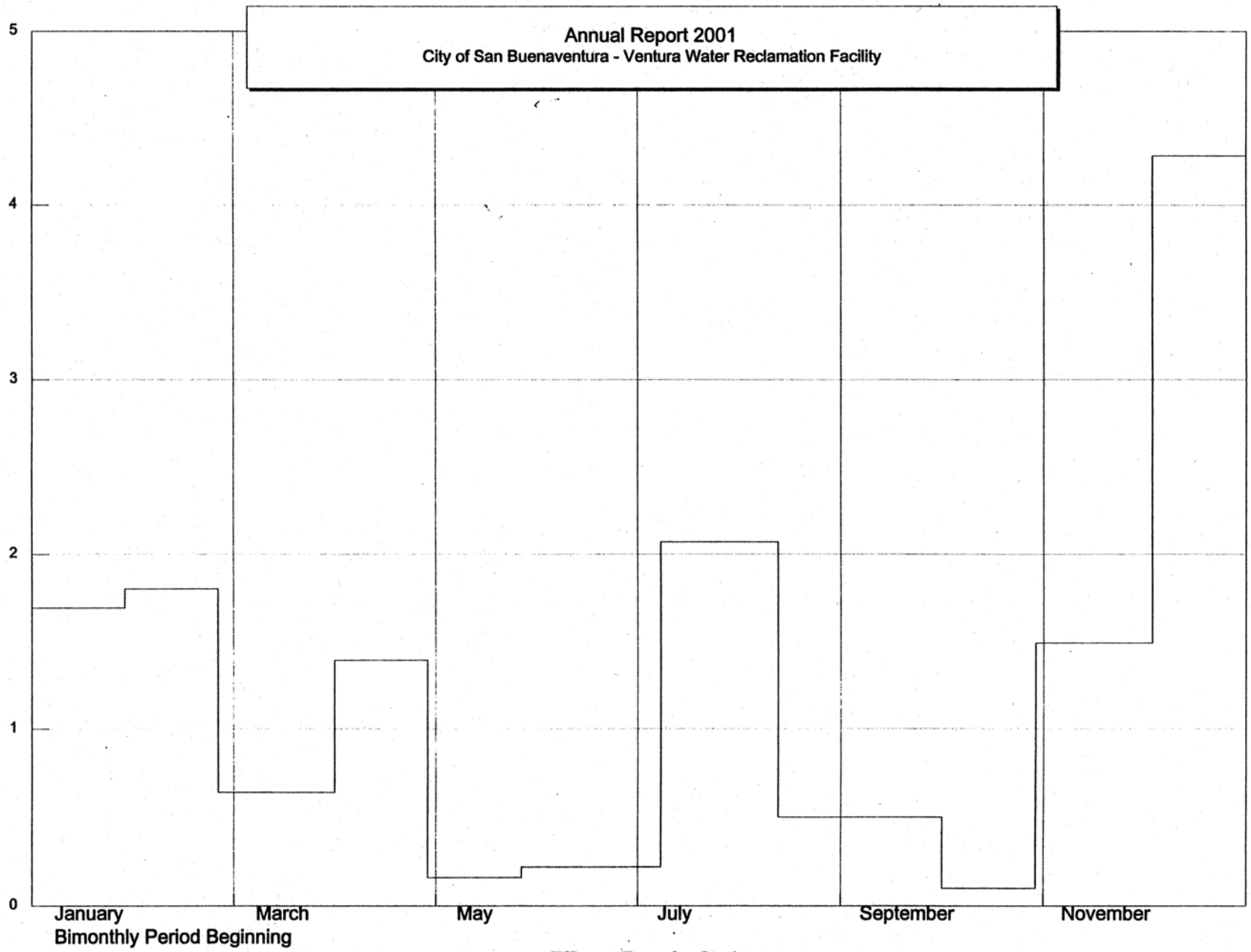


Effluent Transfer Station
Effluent Monthly TKN - mg/l

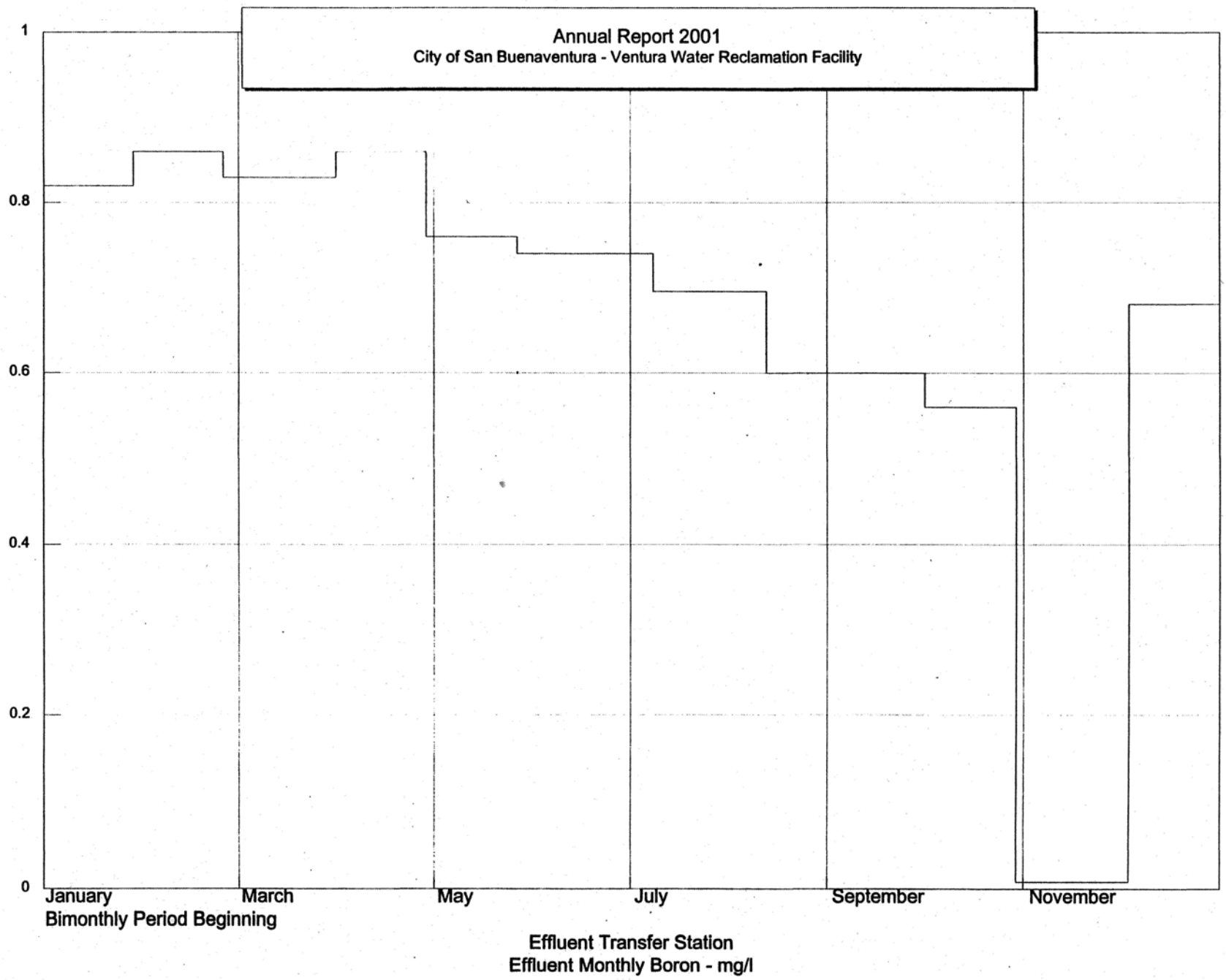

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
5
4
3
2
1
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly Chlorophyll A - ug/l

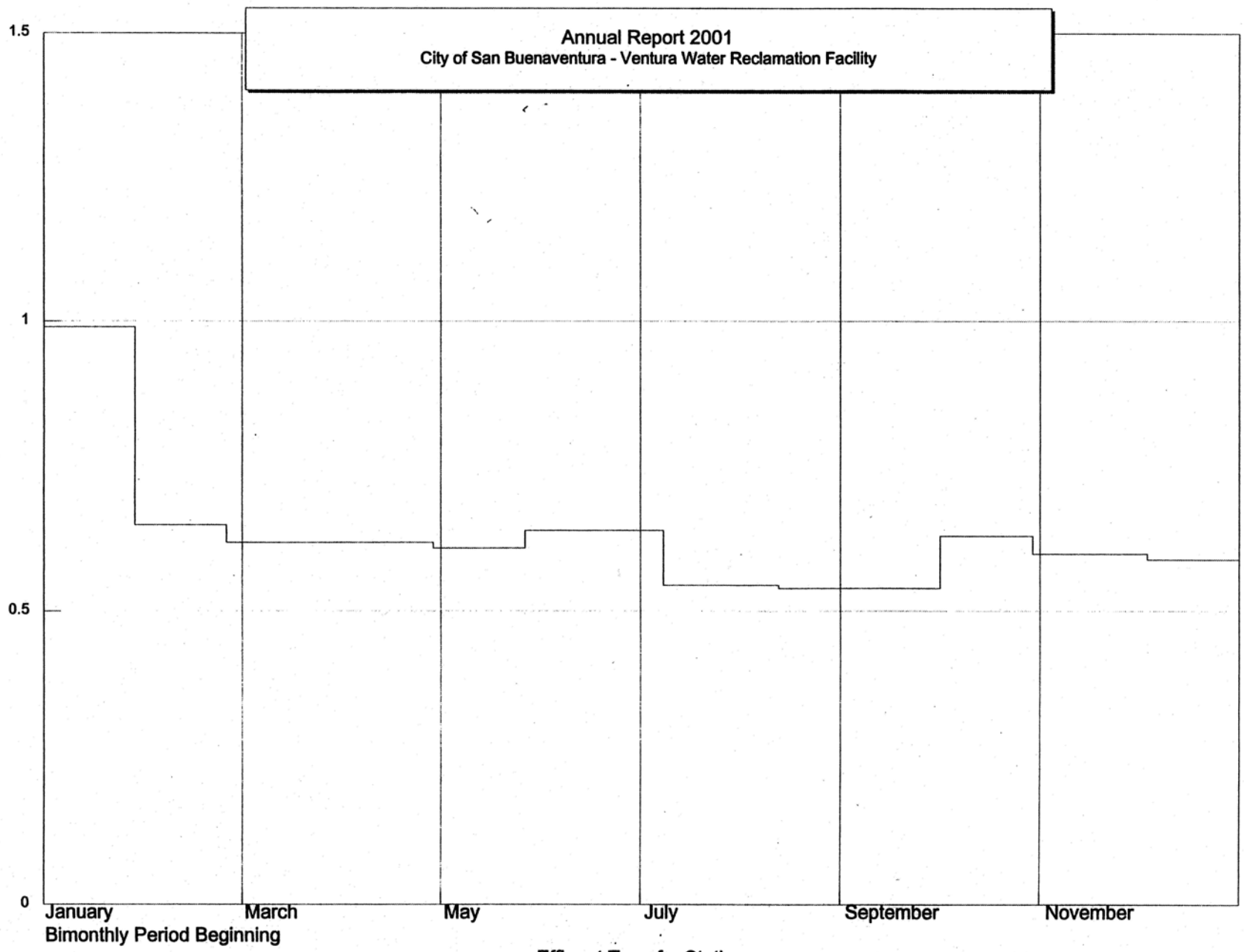

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
0.5
0.4
0.3
0.2
0.1
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly MBAS - mg/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
5
4
3
2
1
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly Phosphate - mg/l

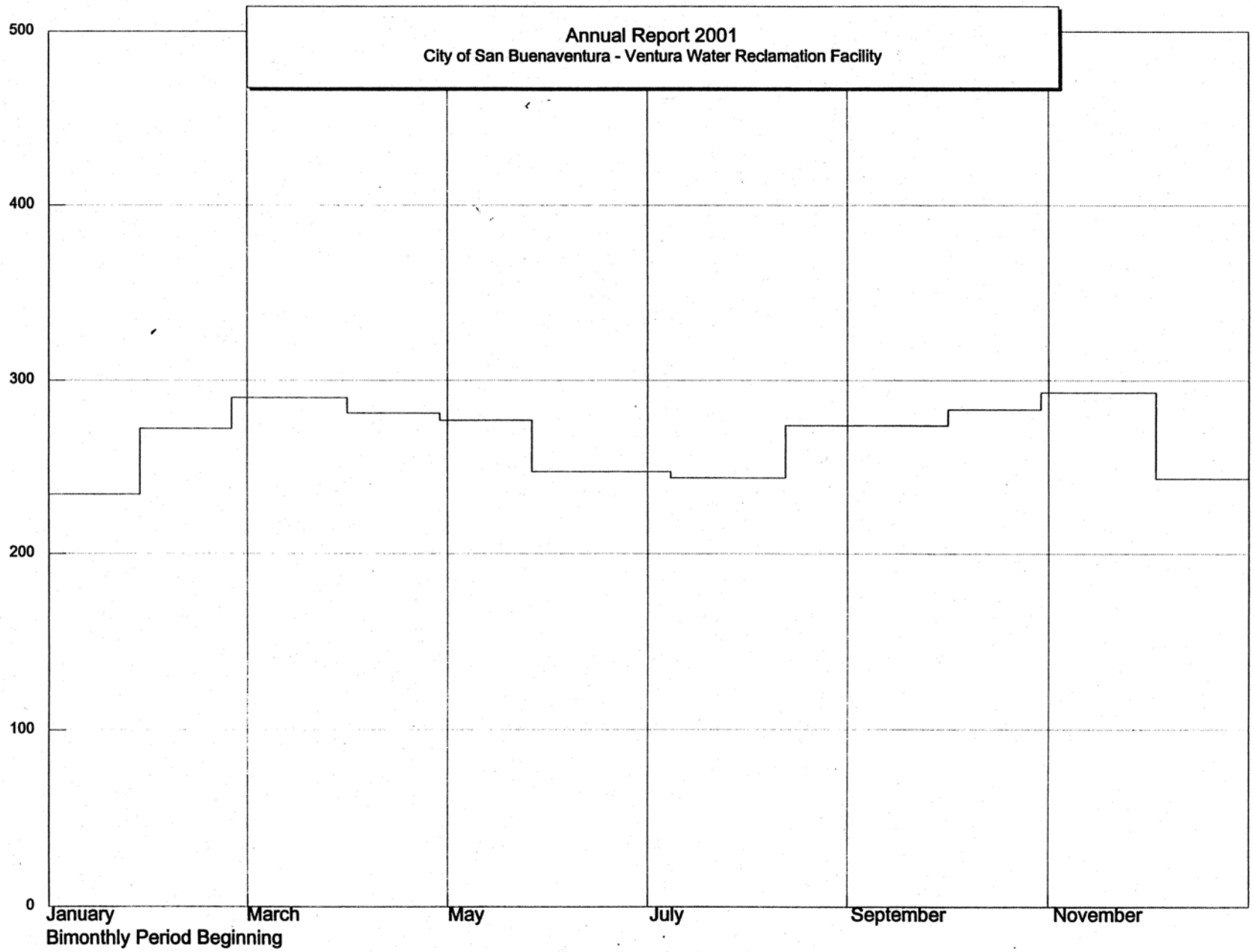


Effluent Transfer Station
Effluent Monthly Total Phosphorus - mg/l

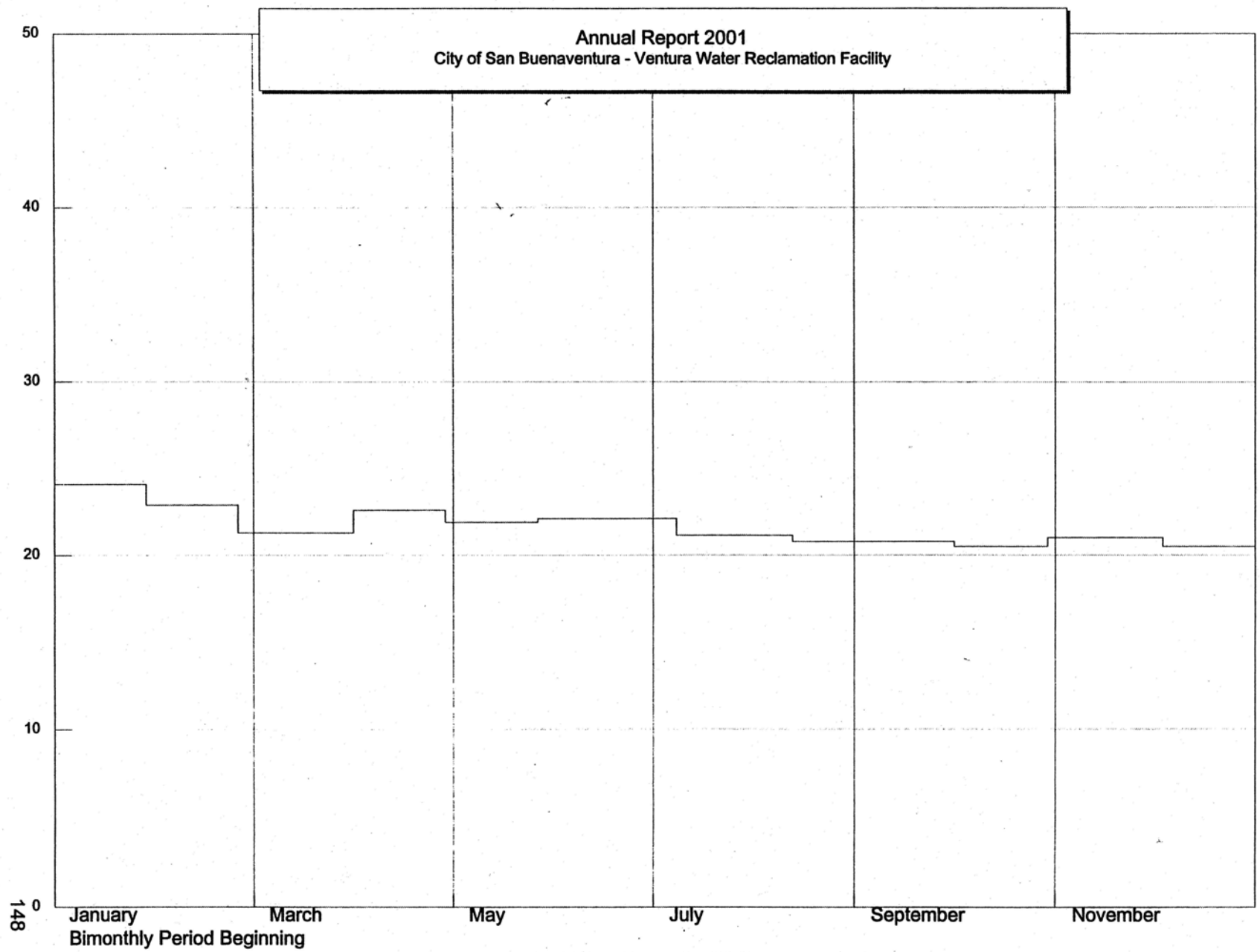

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
1
0.8
0.6
0.4
0.2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly Boron - mg/l



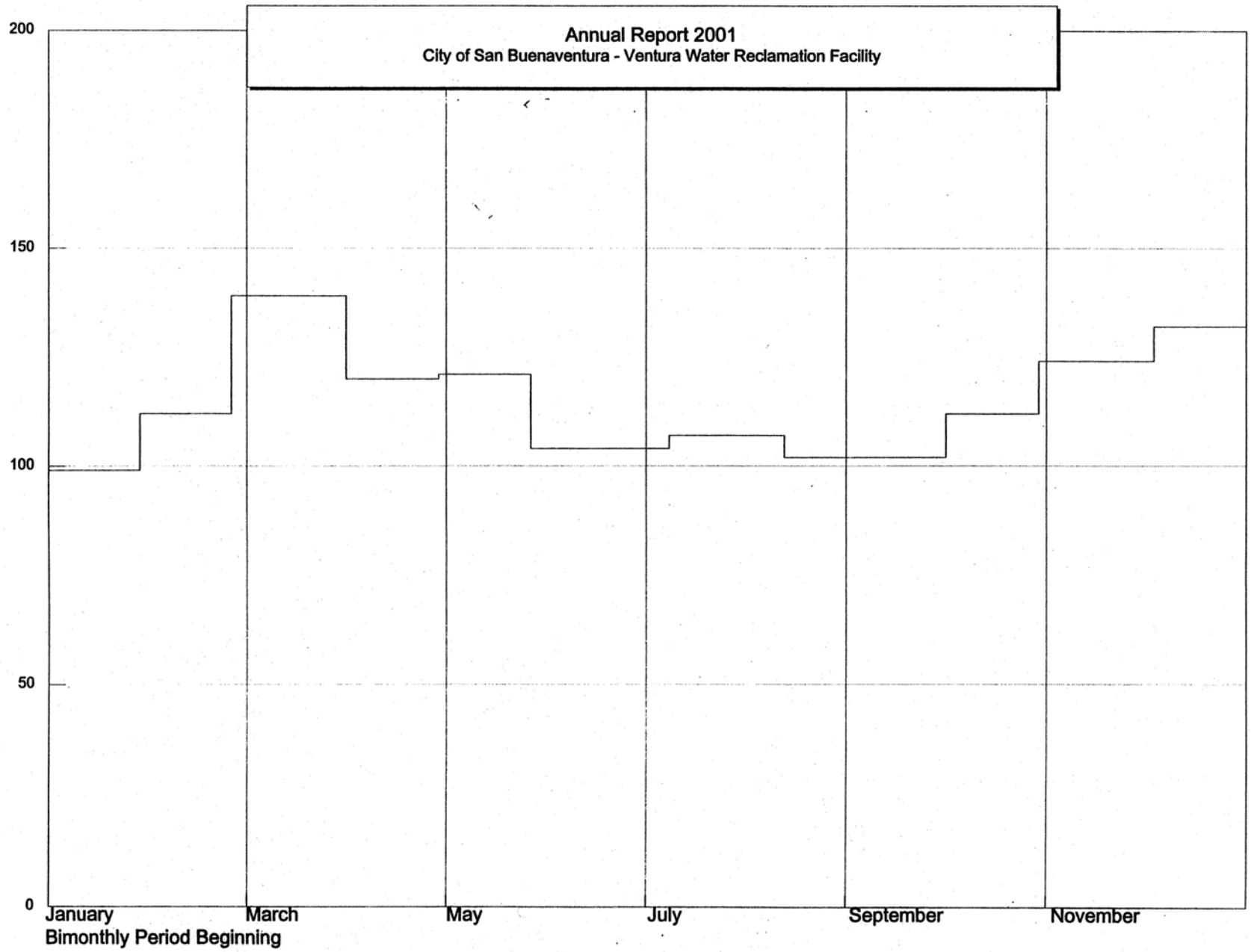
Effluent Transfer Station
Effluent Monthly Fluoride - mg/l



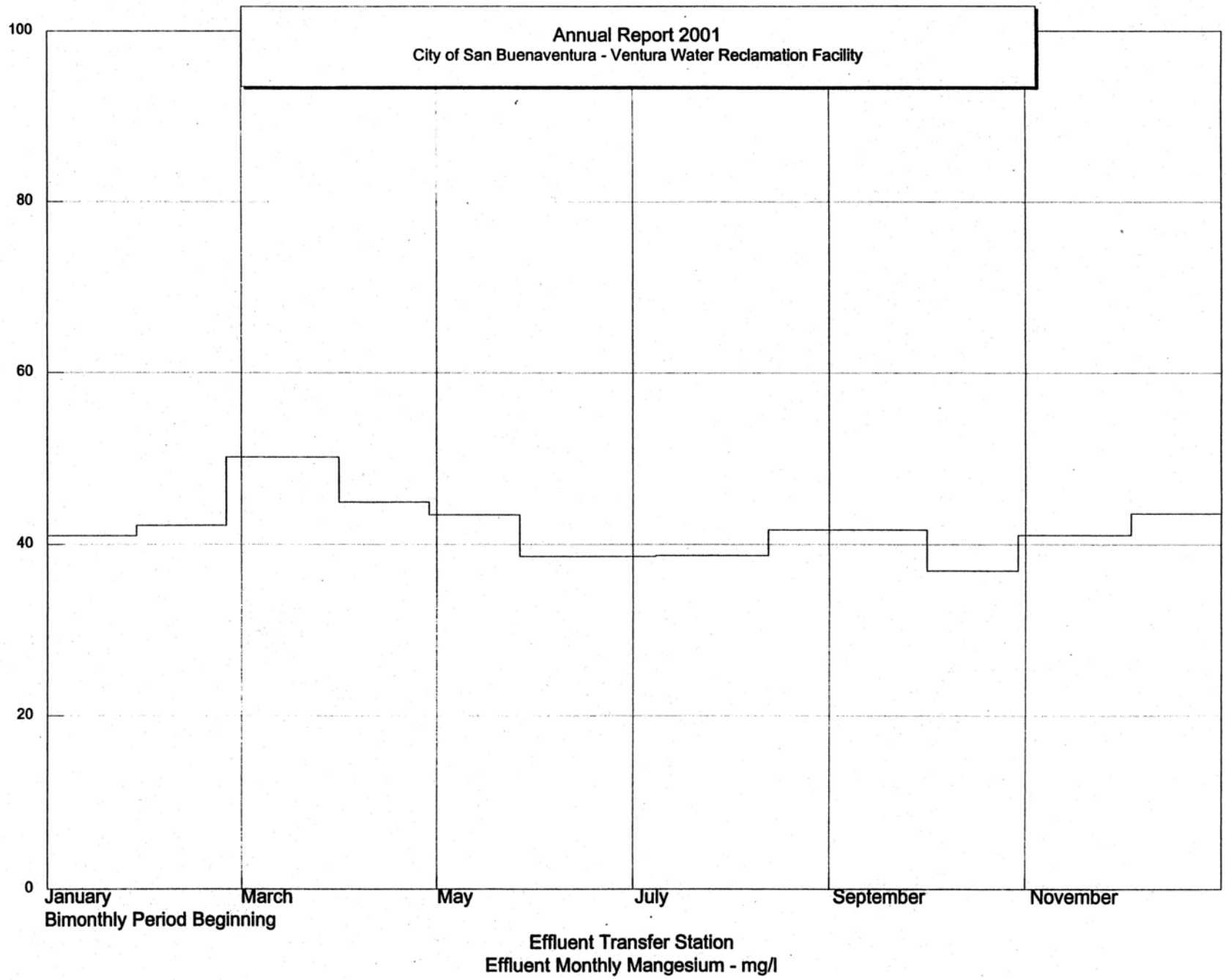
Effluent Transfer Station
Effluent Monthly Sodium - mg/l

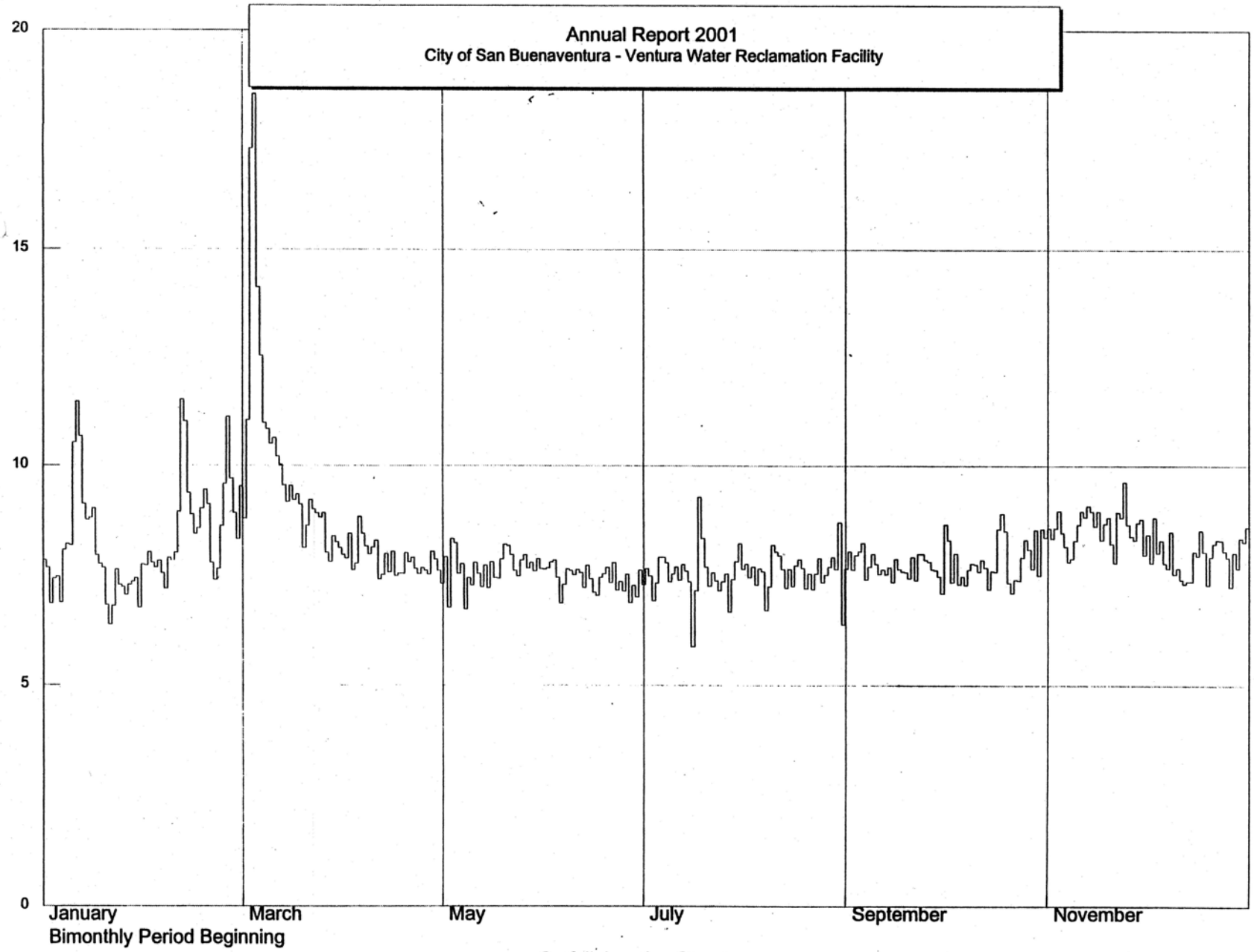


Effluent Transfer Station
Effluent Monthly Potassium - mg/l

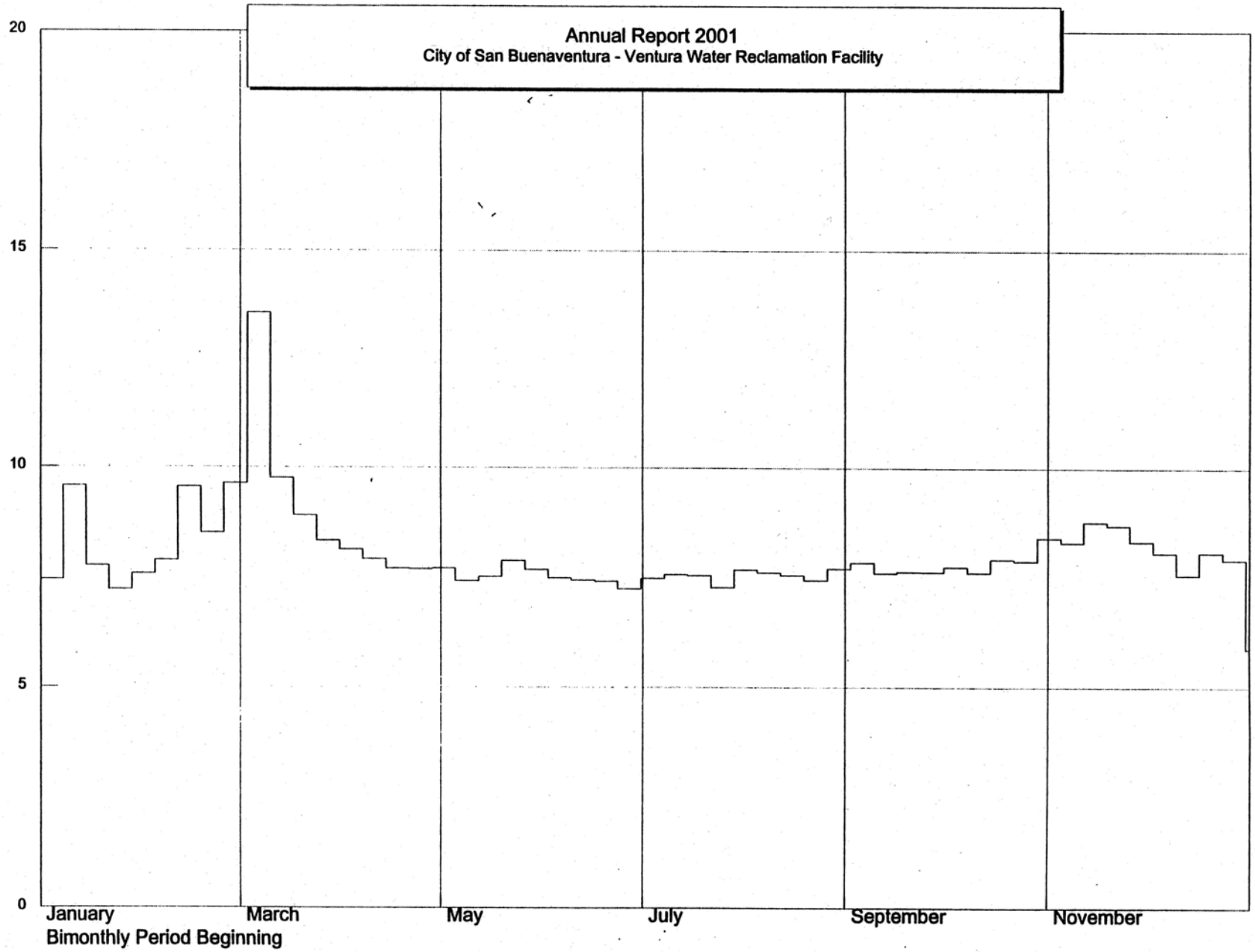


Effluent Transfer Station
Effluent Monthly Calcium - mg/l

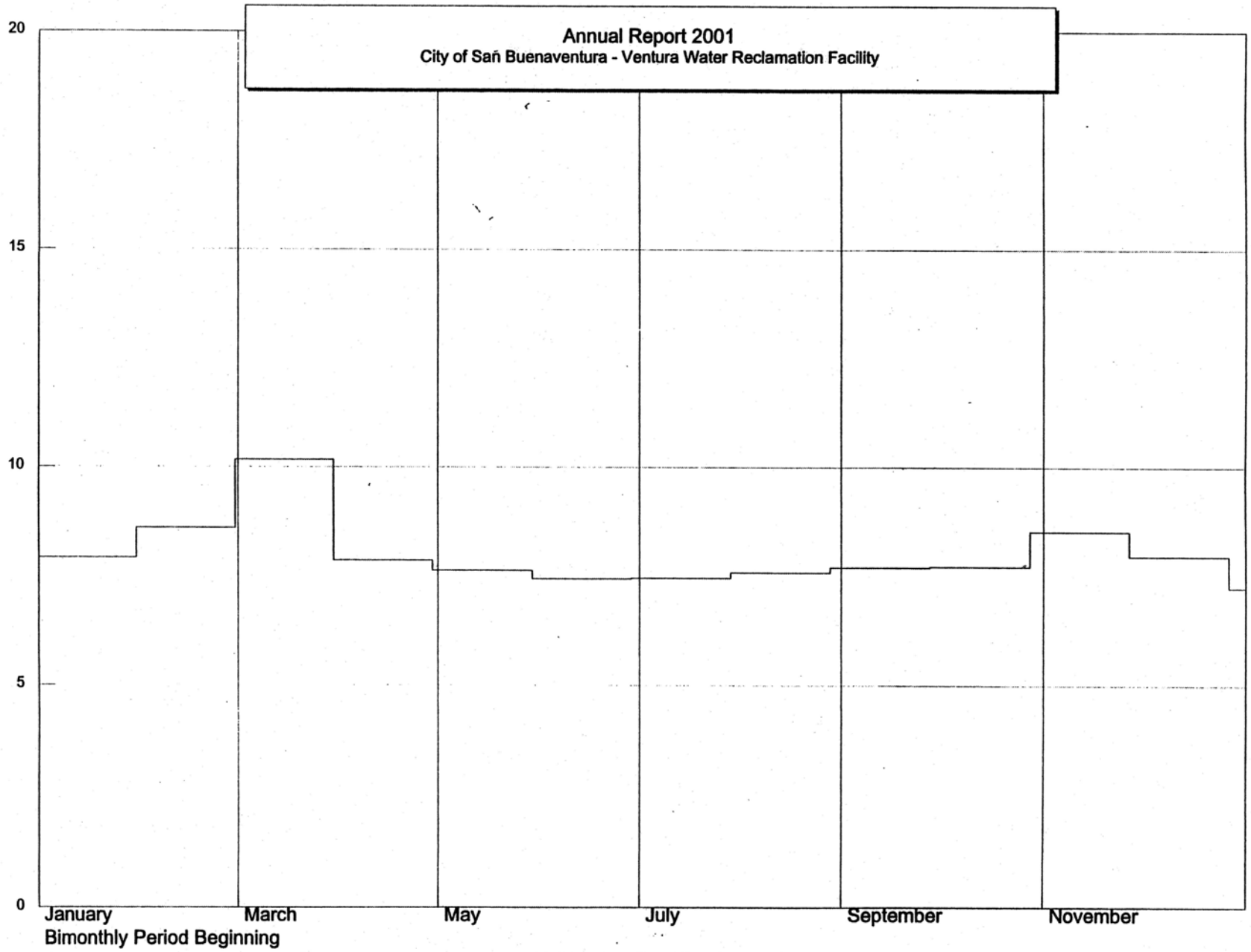

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
100
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
Effluent Transfer Station
Effluent Monthly Mangesium - mg/l



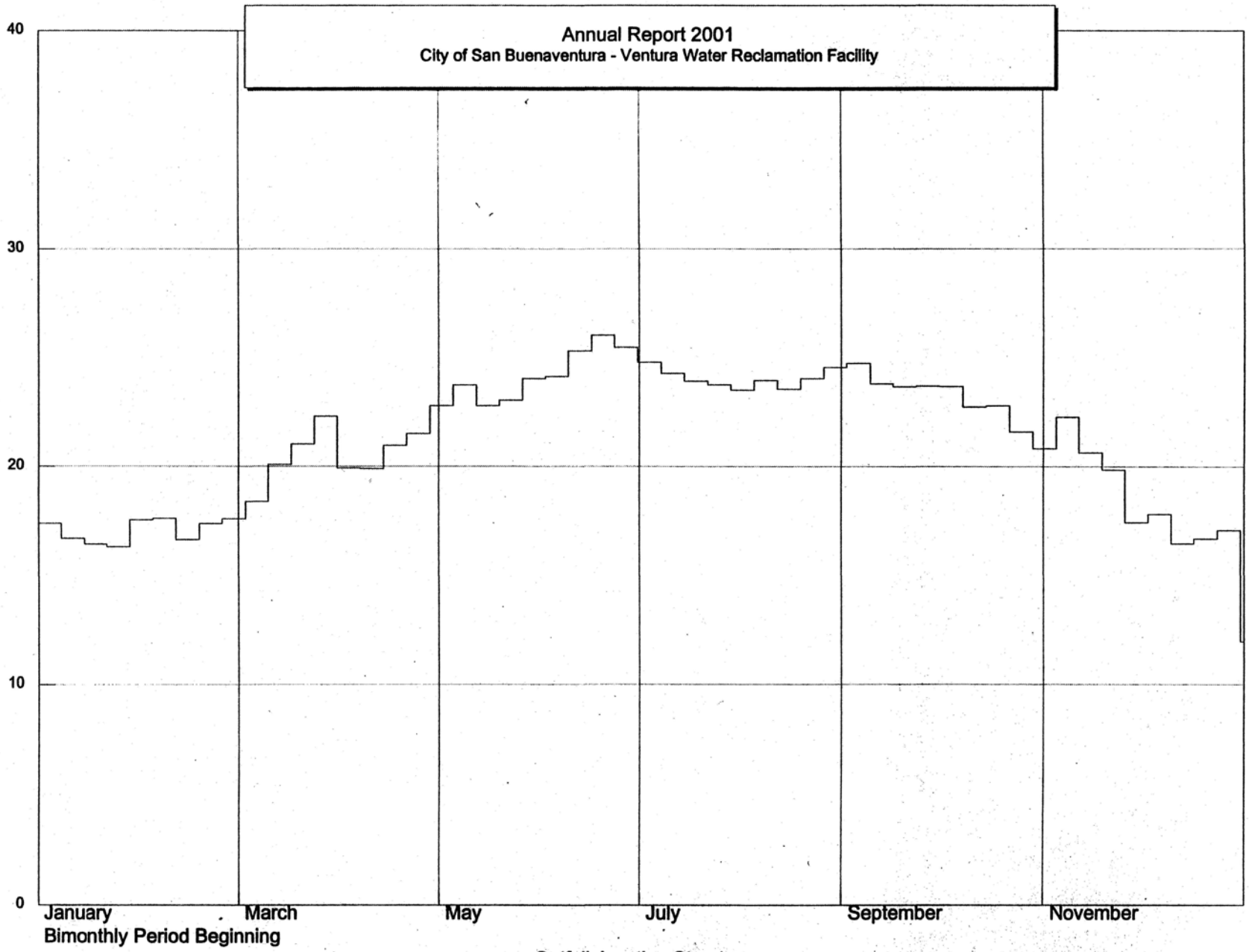
Outfall Junction Structure
Effluent Discharge to the Santa Clara Tidal Prism - MGD



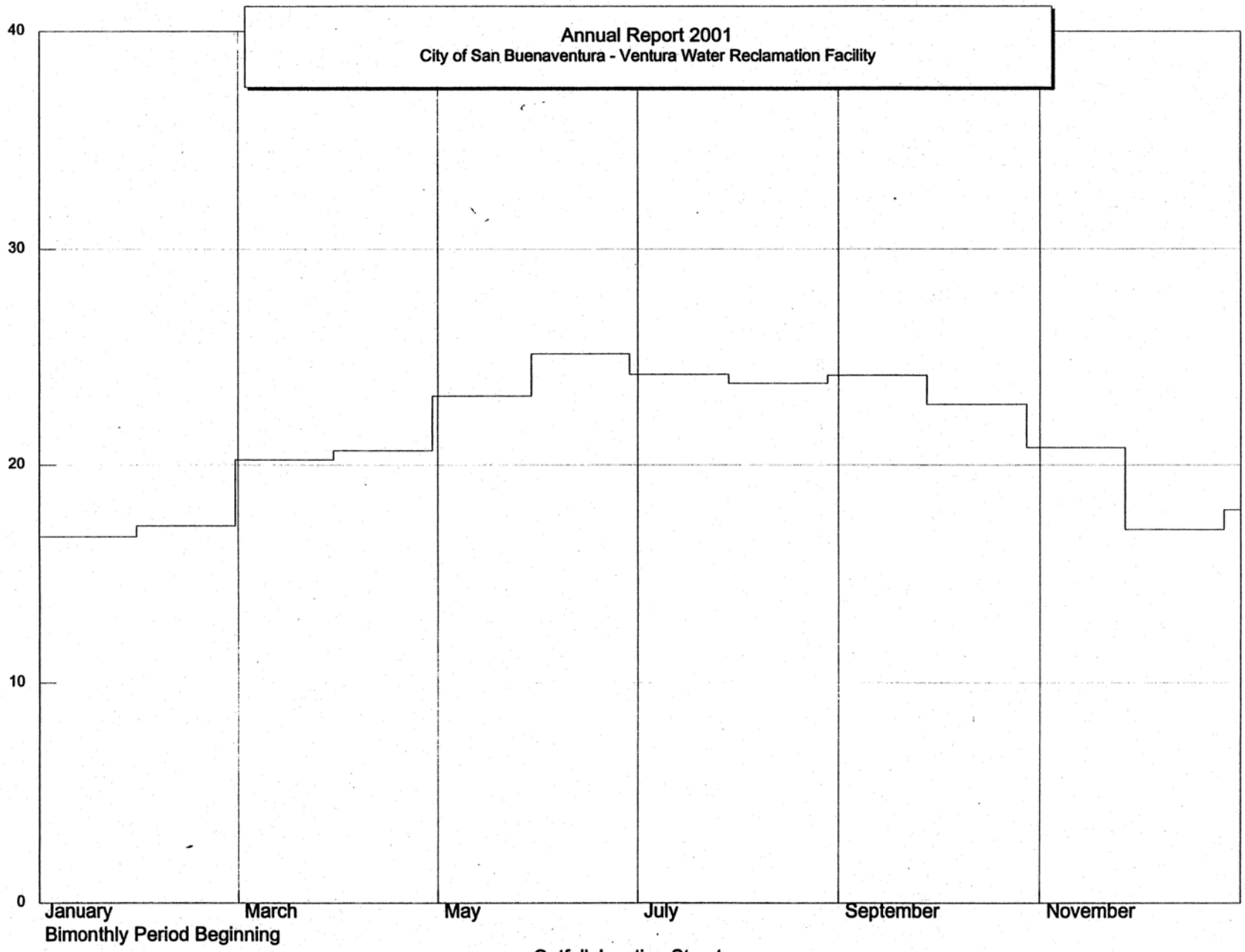
Outfall Junction Structure
Effluent Discharge 7 Day Average to the Santa Clara Tidal Prism - MGD



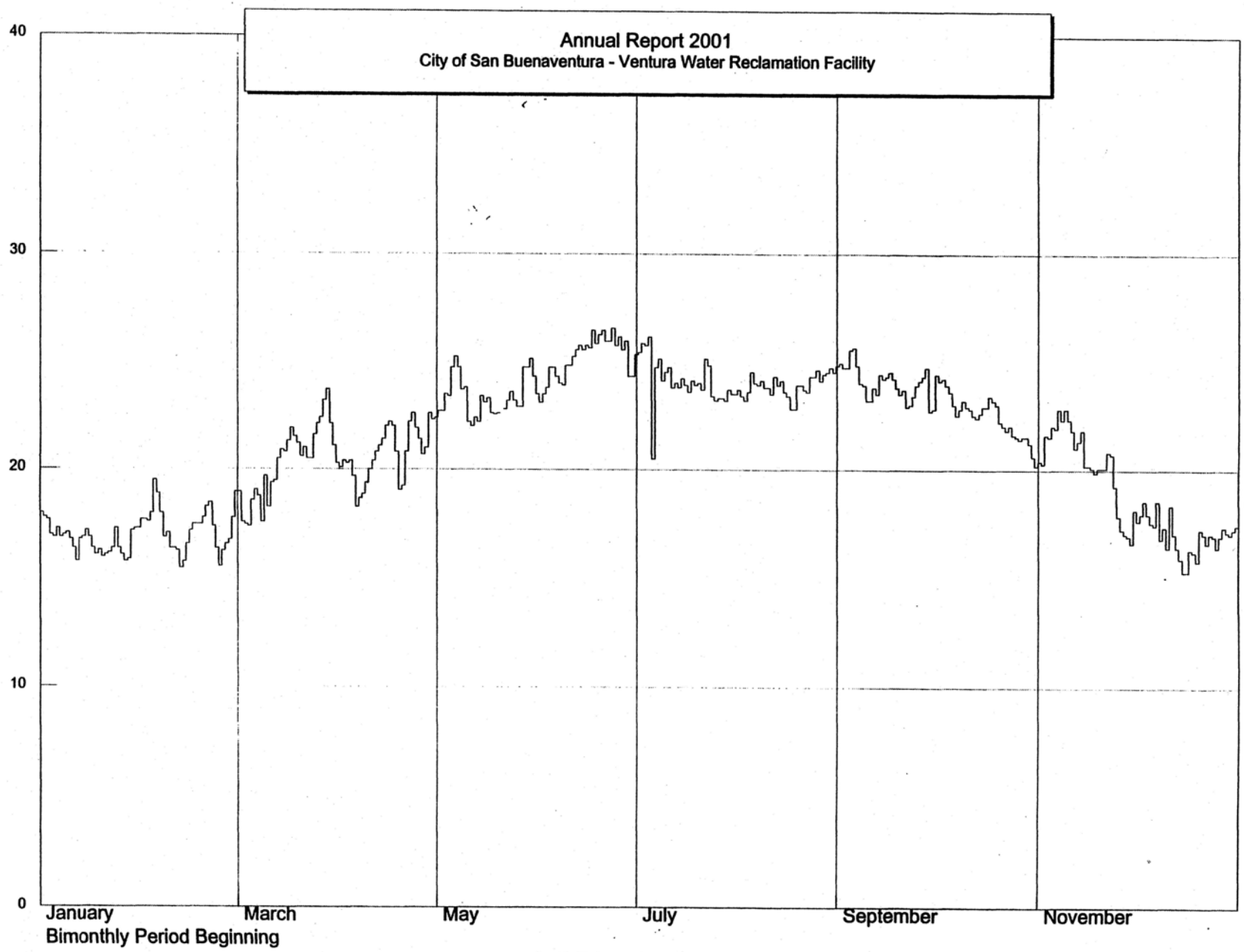
Outfall Junction Structure
Effluent Discharge 30 Day Average to the Santa Clara Tidal Prism - MGD



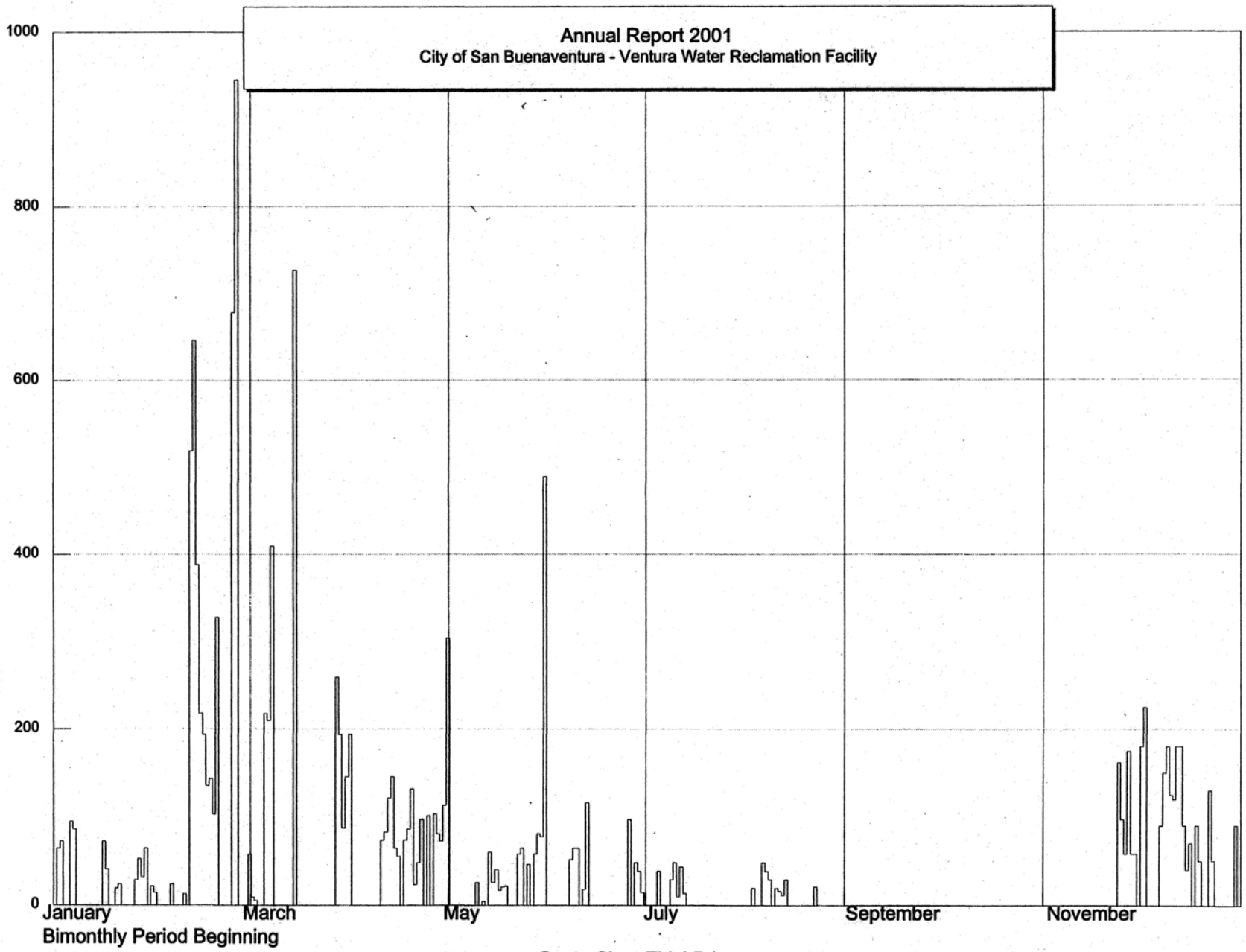
Outfall Junction Structure
Effluent 7 Day Average Temperature at 11:00 AM - Degrees C



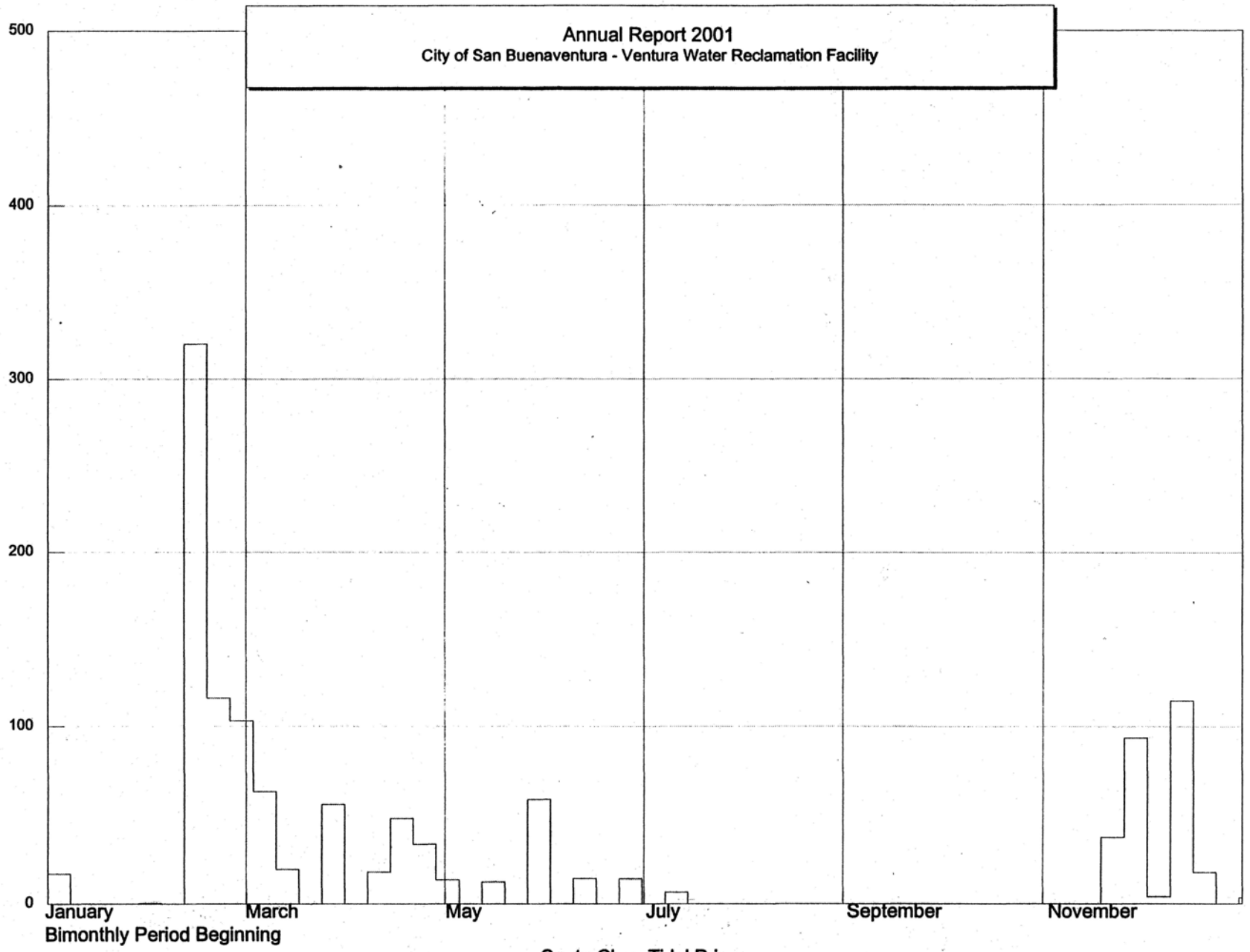
Outfall Junction Structure
Effluent 30 Day Average Temperature at 11:00 AM - Degrees C



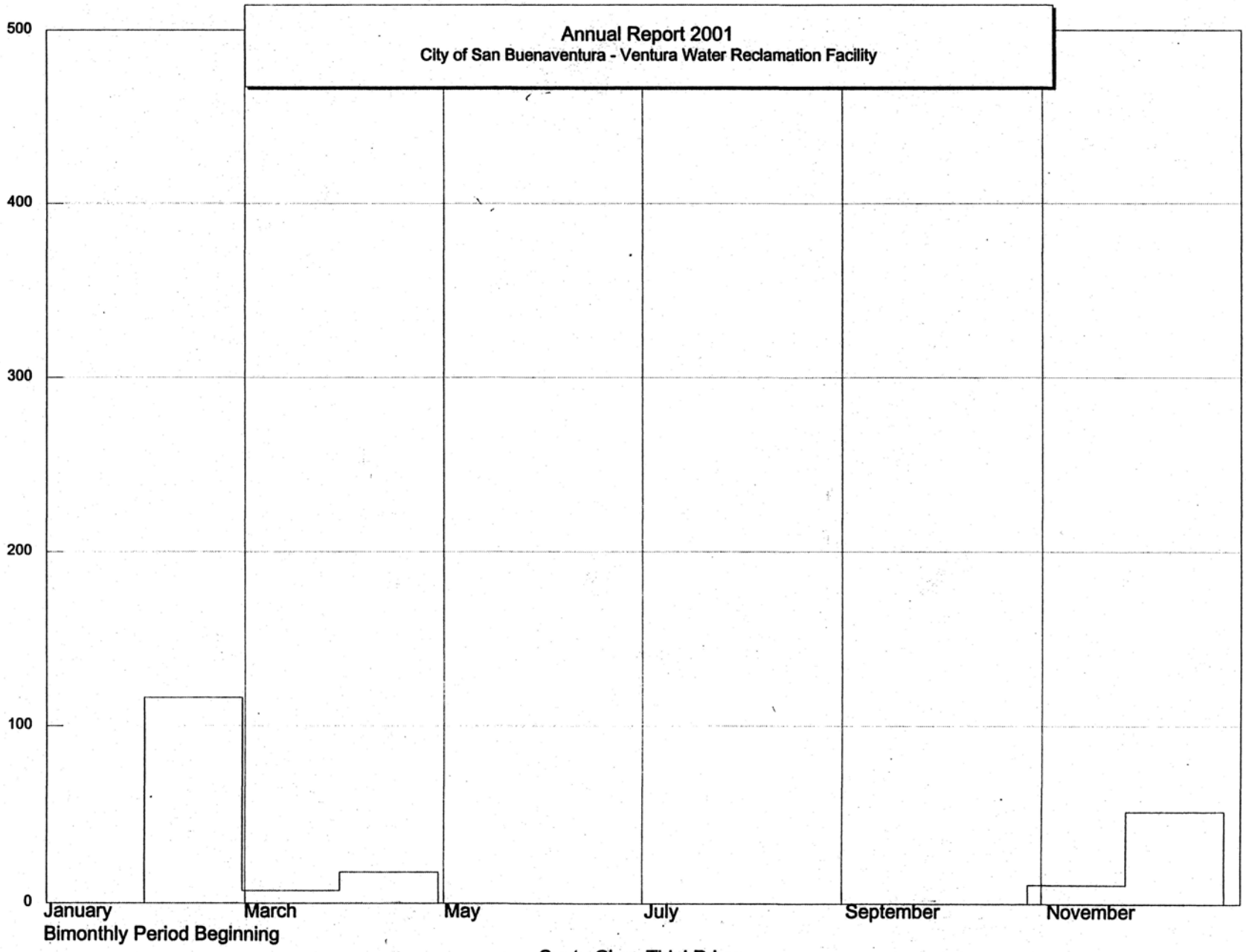
Outfall Junction Structure
Effluent Temperature at 11:00 AM - Degrees C



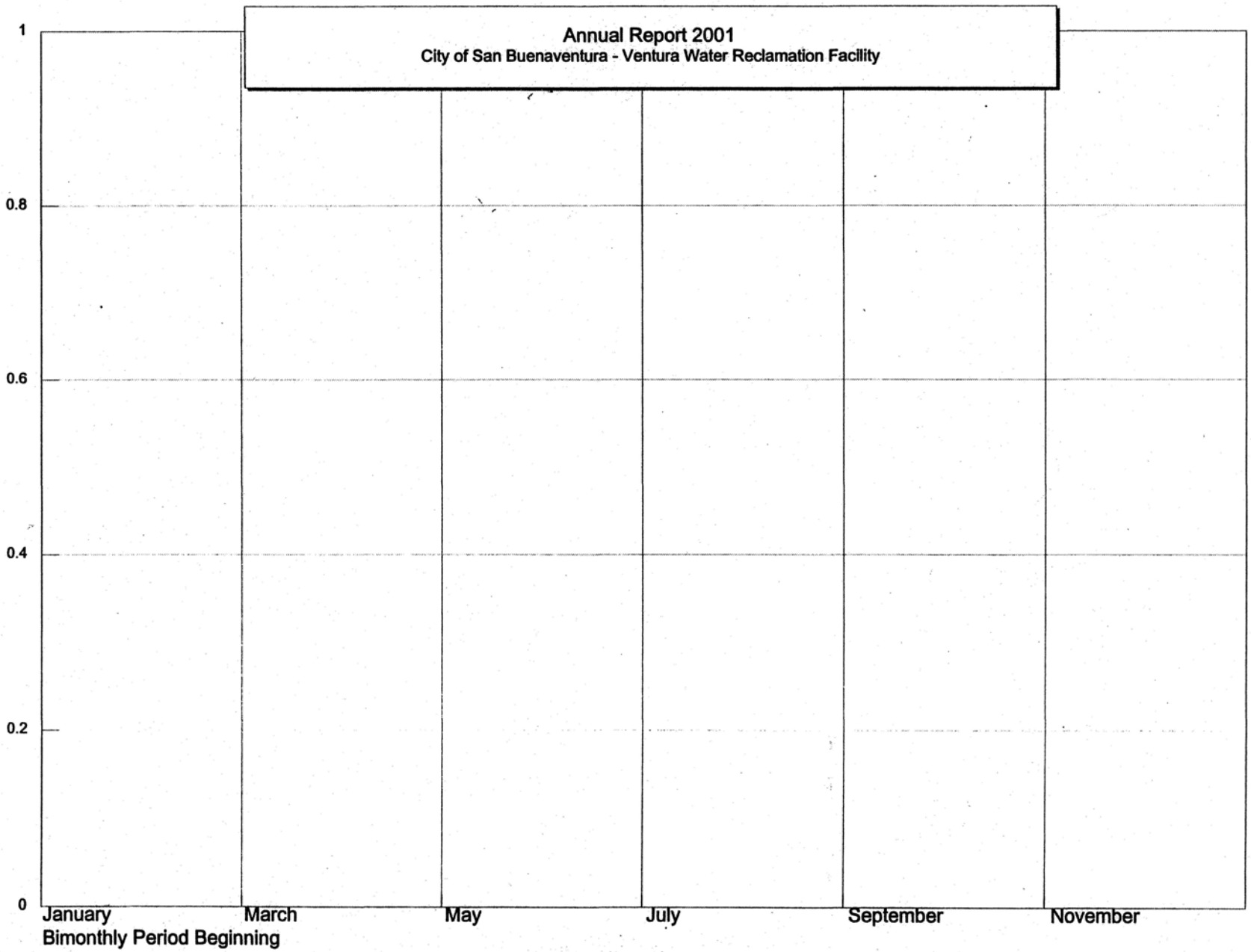
Santa Clara Tidal Prism
Estimated Discharge to the Pacific Ocean - MGD



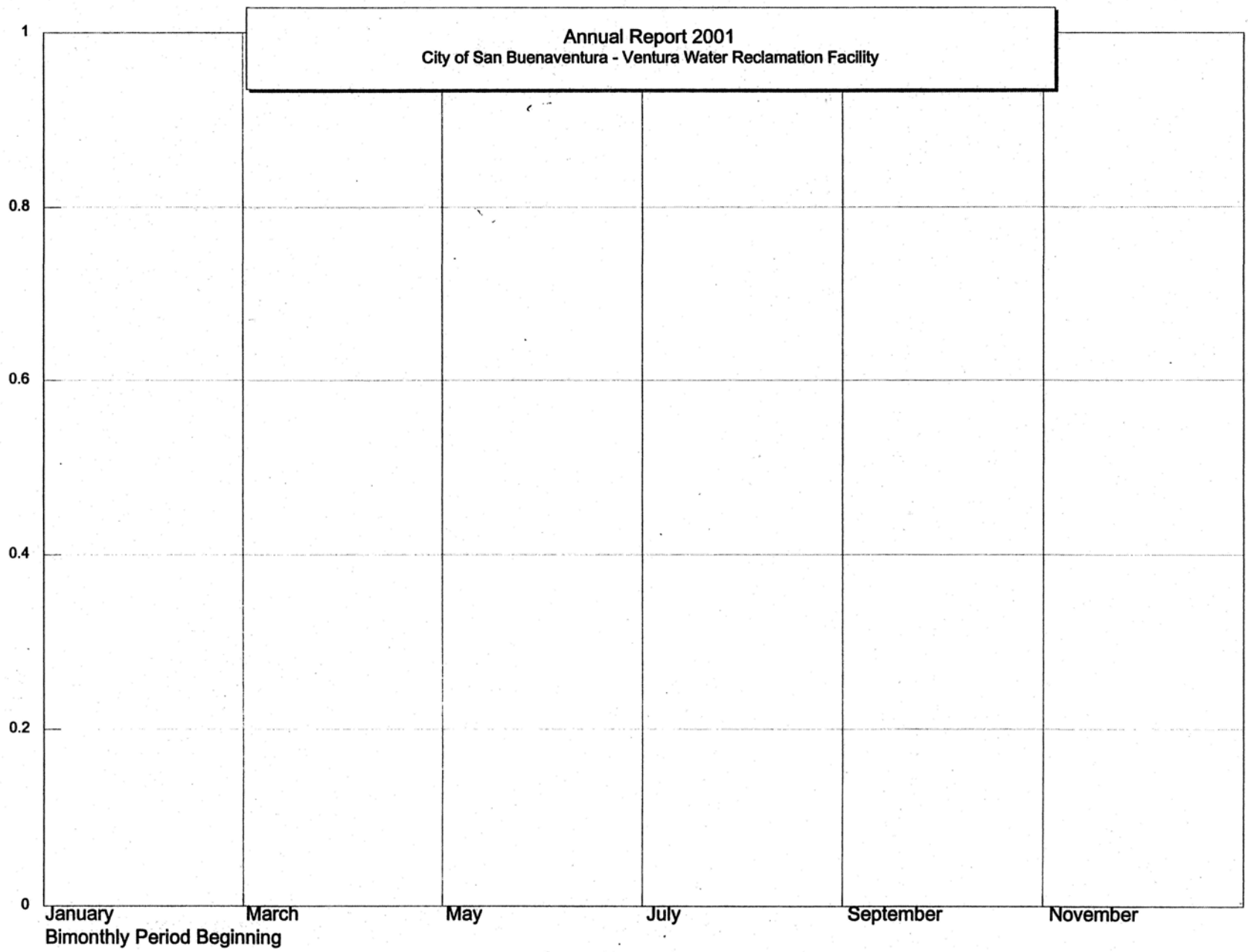
Santa Clara Tidal Prism
Estimated 7 Day Average Discharge to the Pacific Ocean - MGD



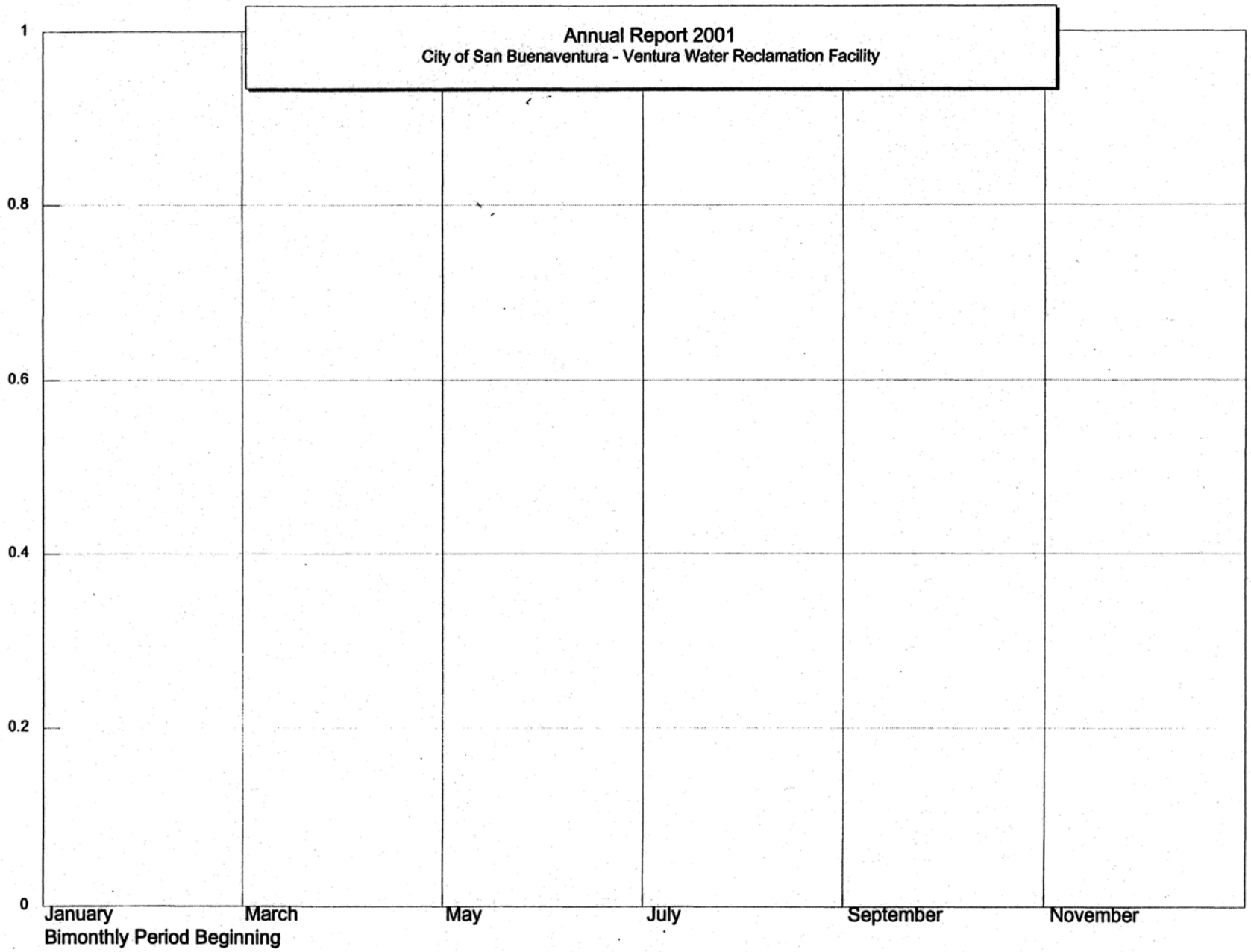
Santa Clara Tidal Prism
Estimated 30 Day Average Discharge to the Pacific Ocean - MGD



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

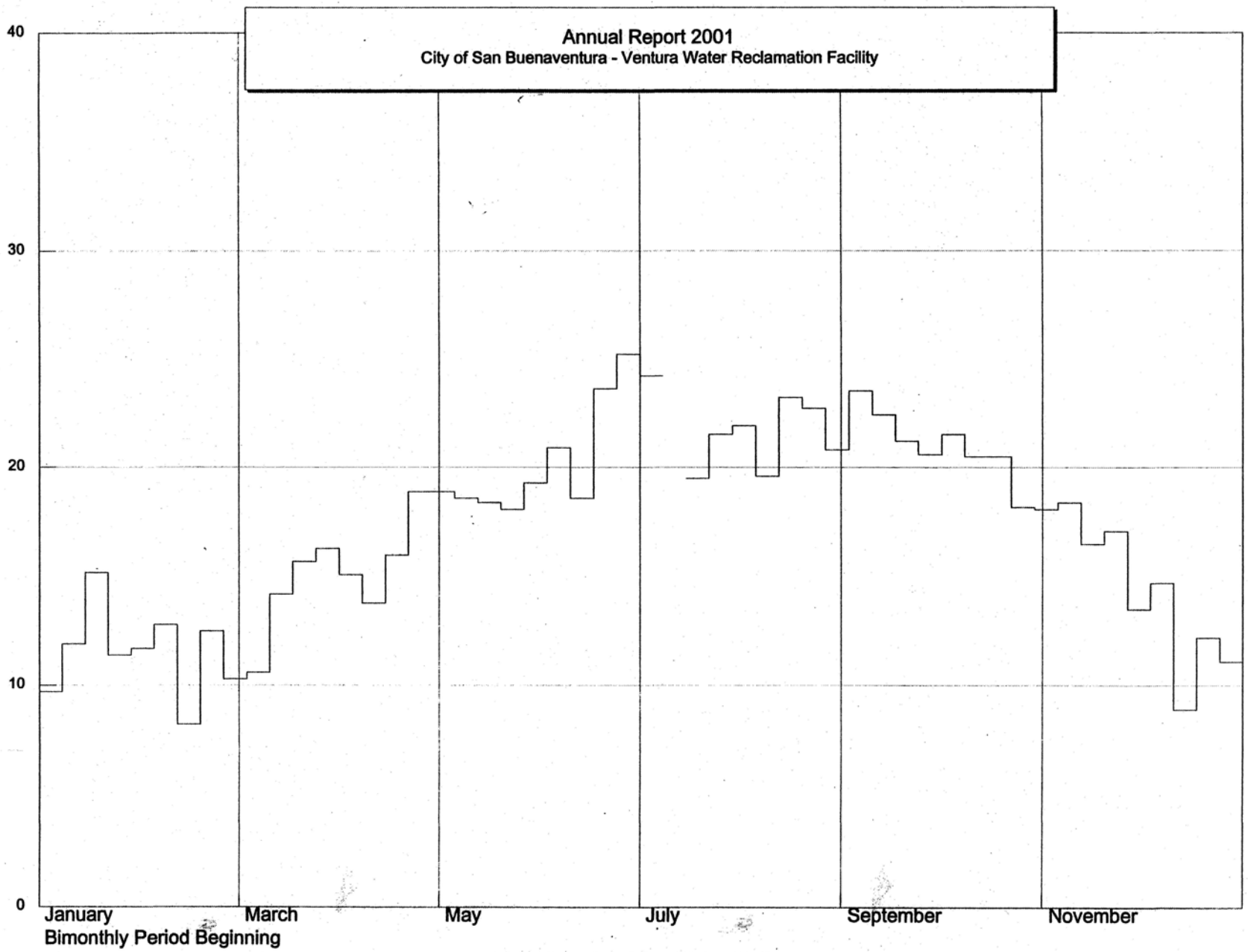


Santa Clara Tidal Prism
Estimated 7 Day Average Influx to the Pacific Ocean - MGD

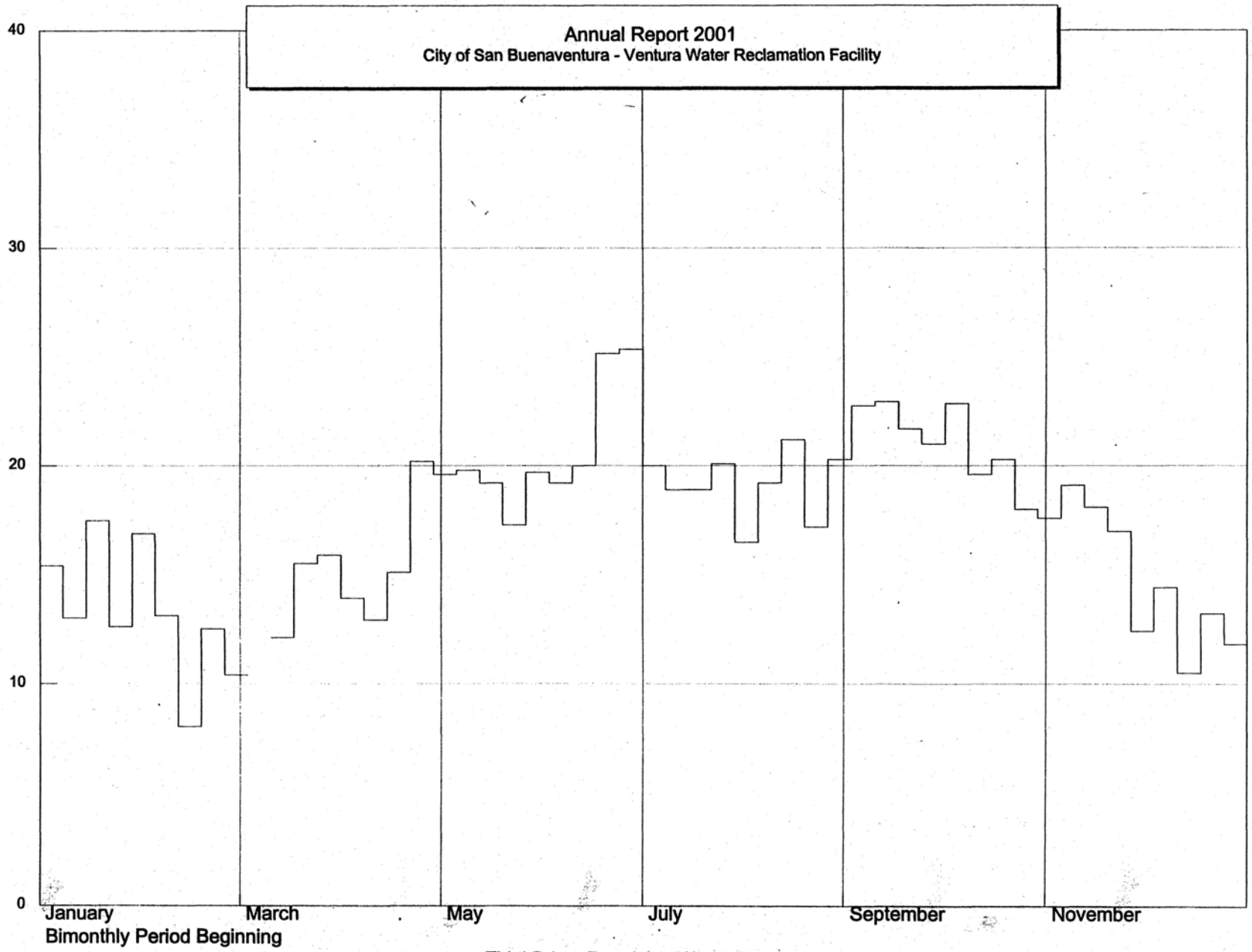


Santa Clara Tidal Prism
Estimated 30 Day Average Influx to the Pacific Ocean - MGD

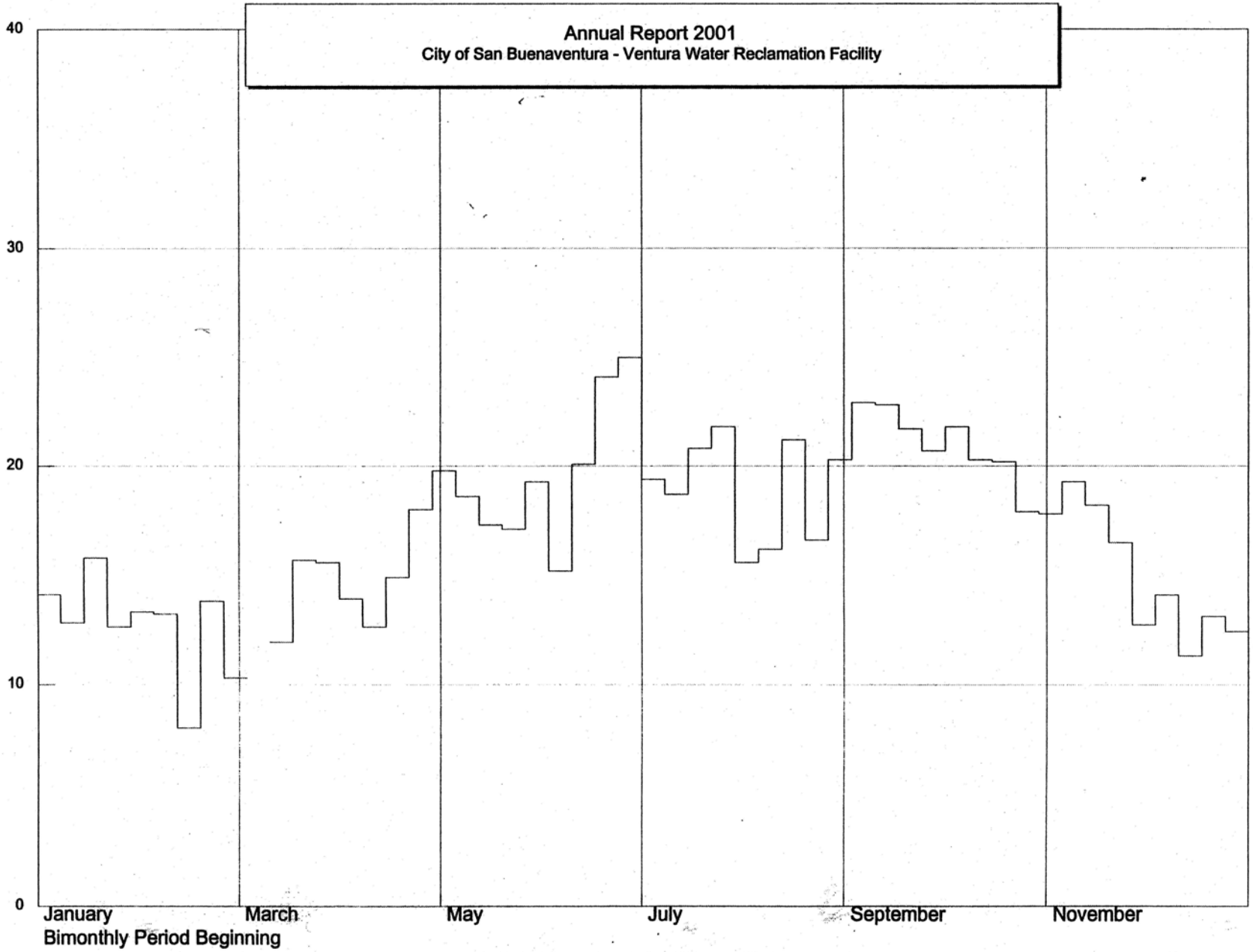
Santa Clara Tidal Prism
Observed Exchange Between the Tidal Prism and Ocean



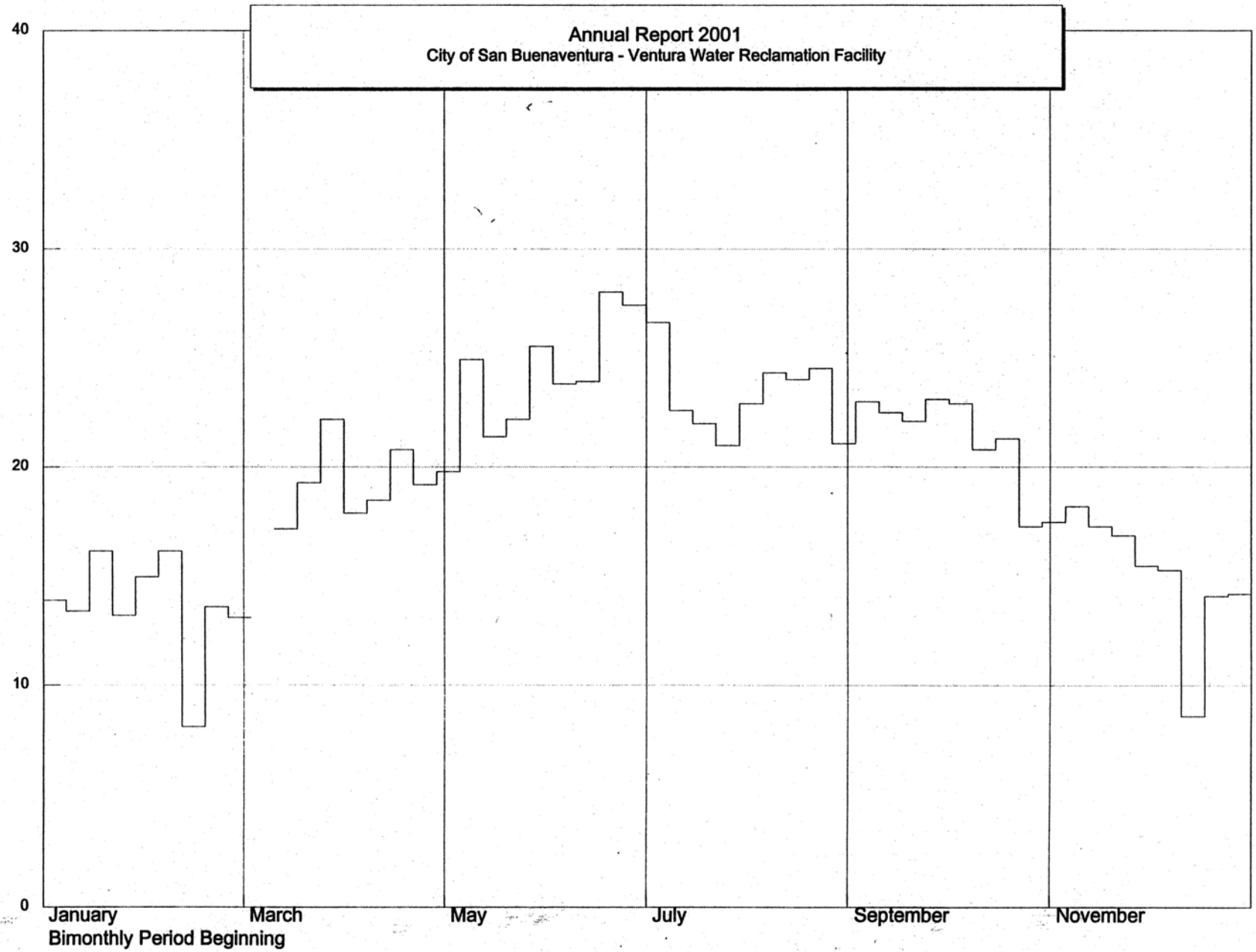
Tidal Prism Receiving Water Stations
R1 Weekly Temperature - Degrees C



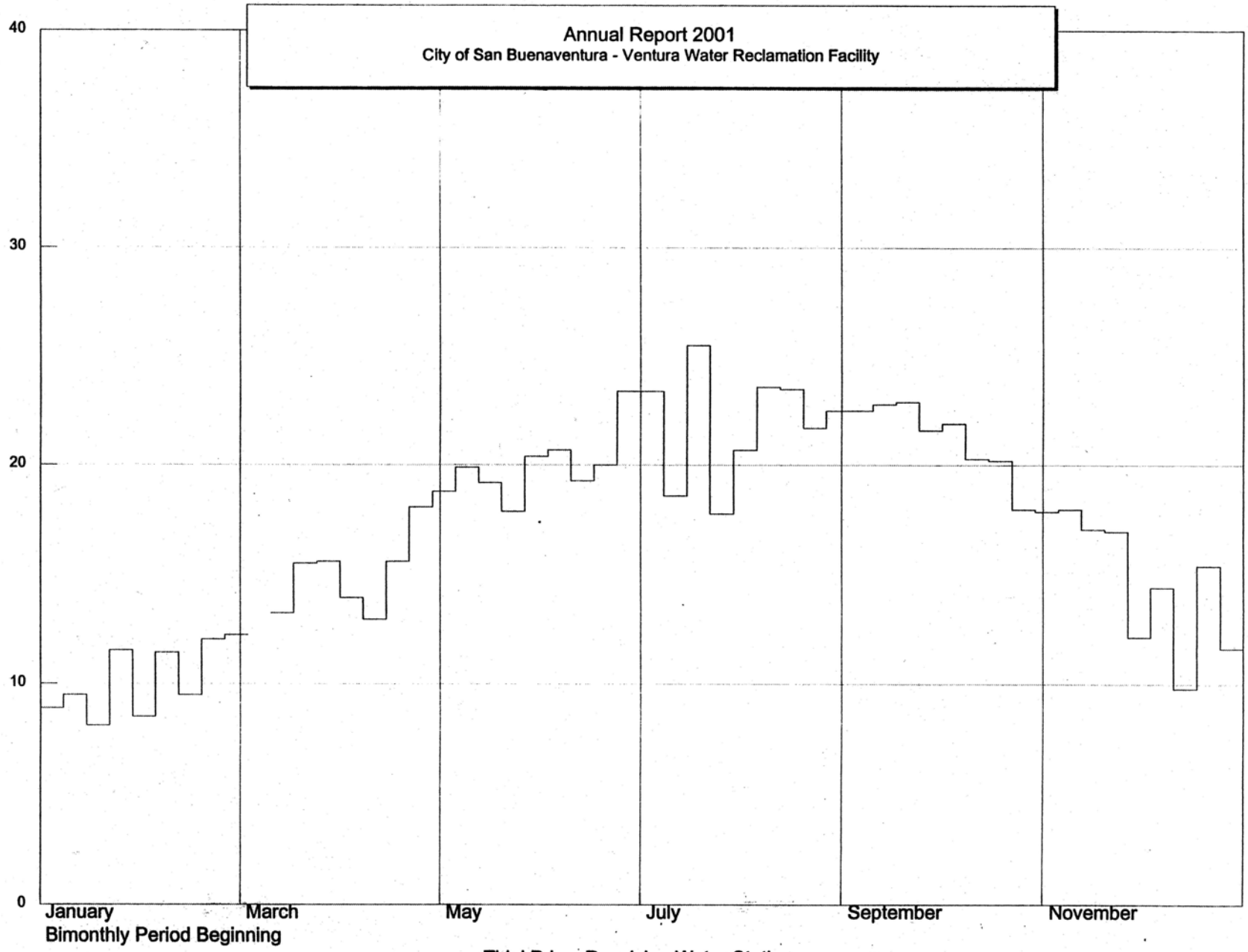
Tidal Prism Receiving Water Stations
R2 Weekly Temperature - Degrees C



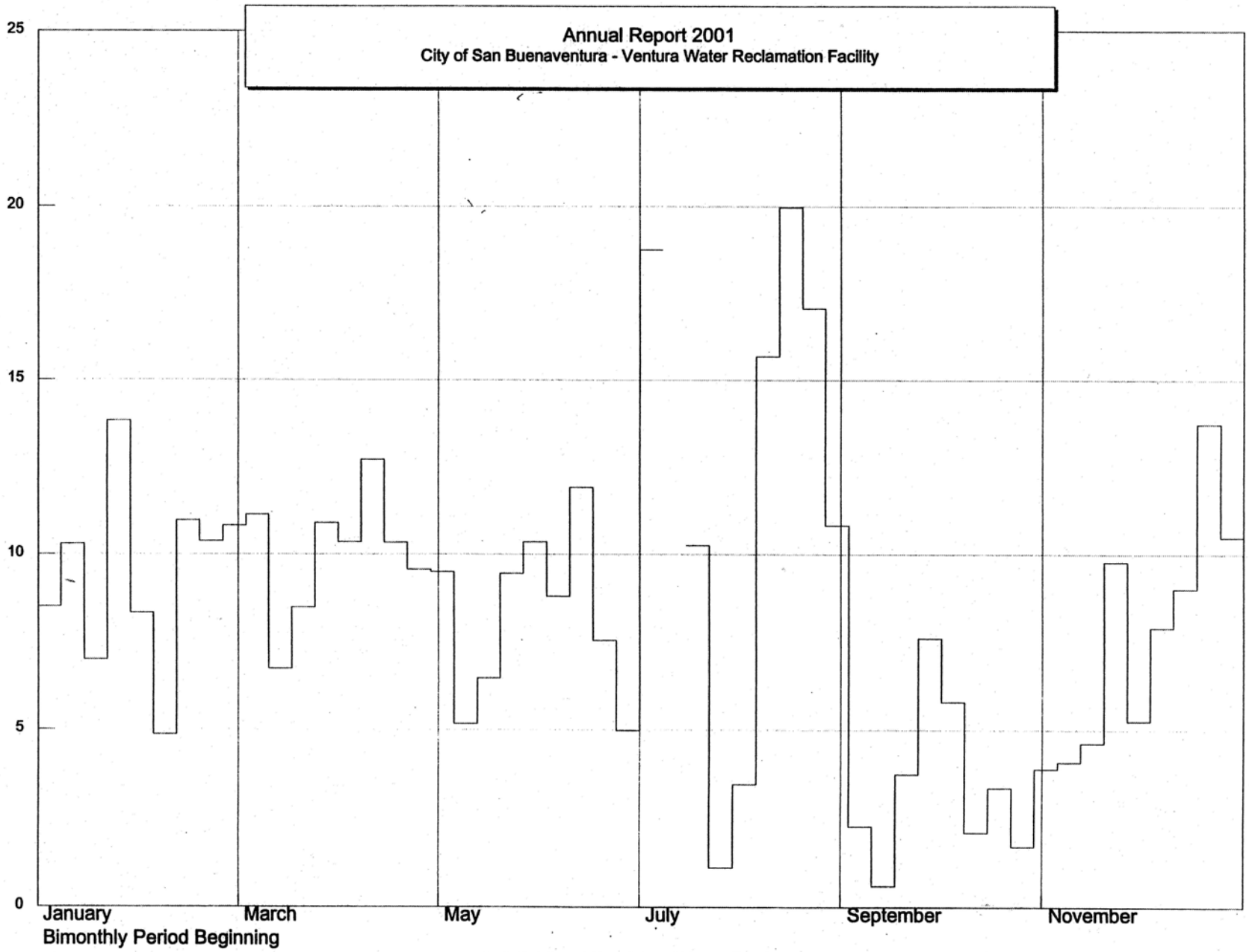
Tidal Prism Receiving Water Stations
R3 Weekly Temperature - Degrees C



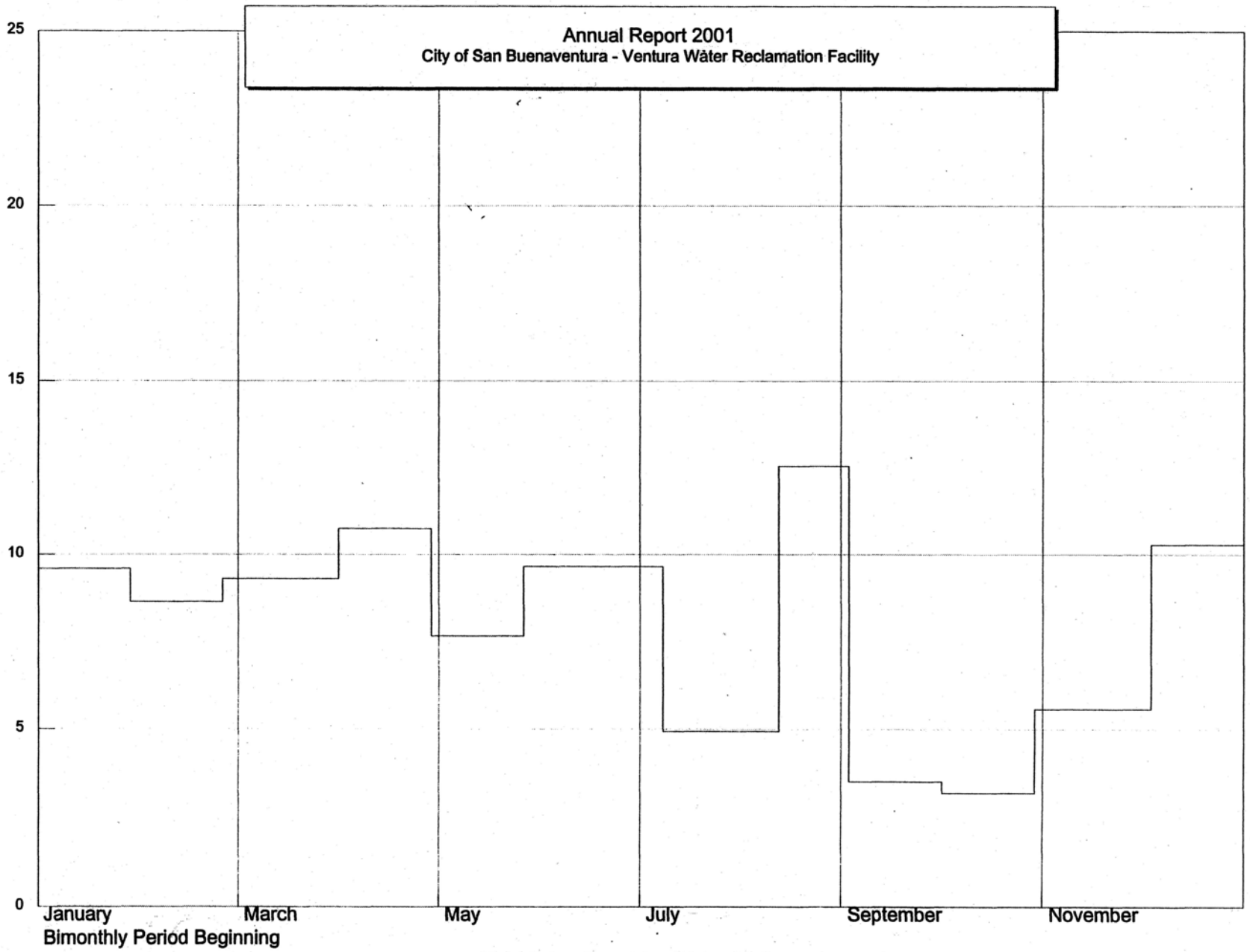
Tidal Prism Receiving Water Stations
R4 Weekly Temperature - Degrees C



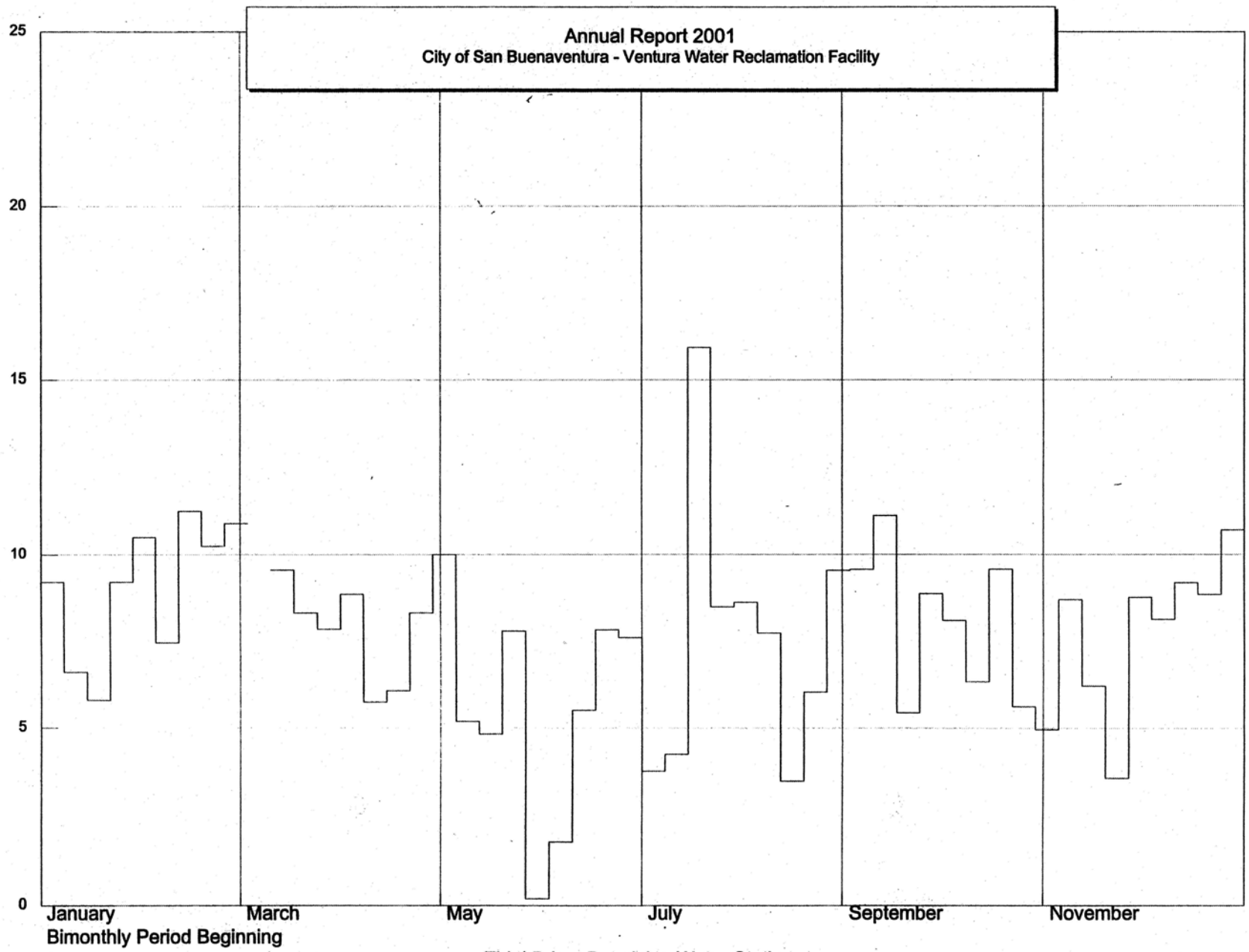
Tidal Prism Receiving Water Stations
L5 Weekly Temperature - Degrees C



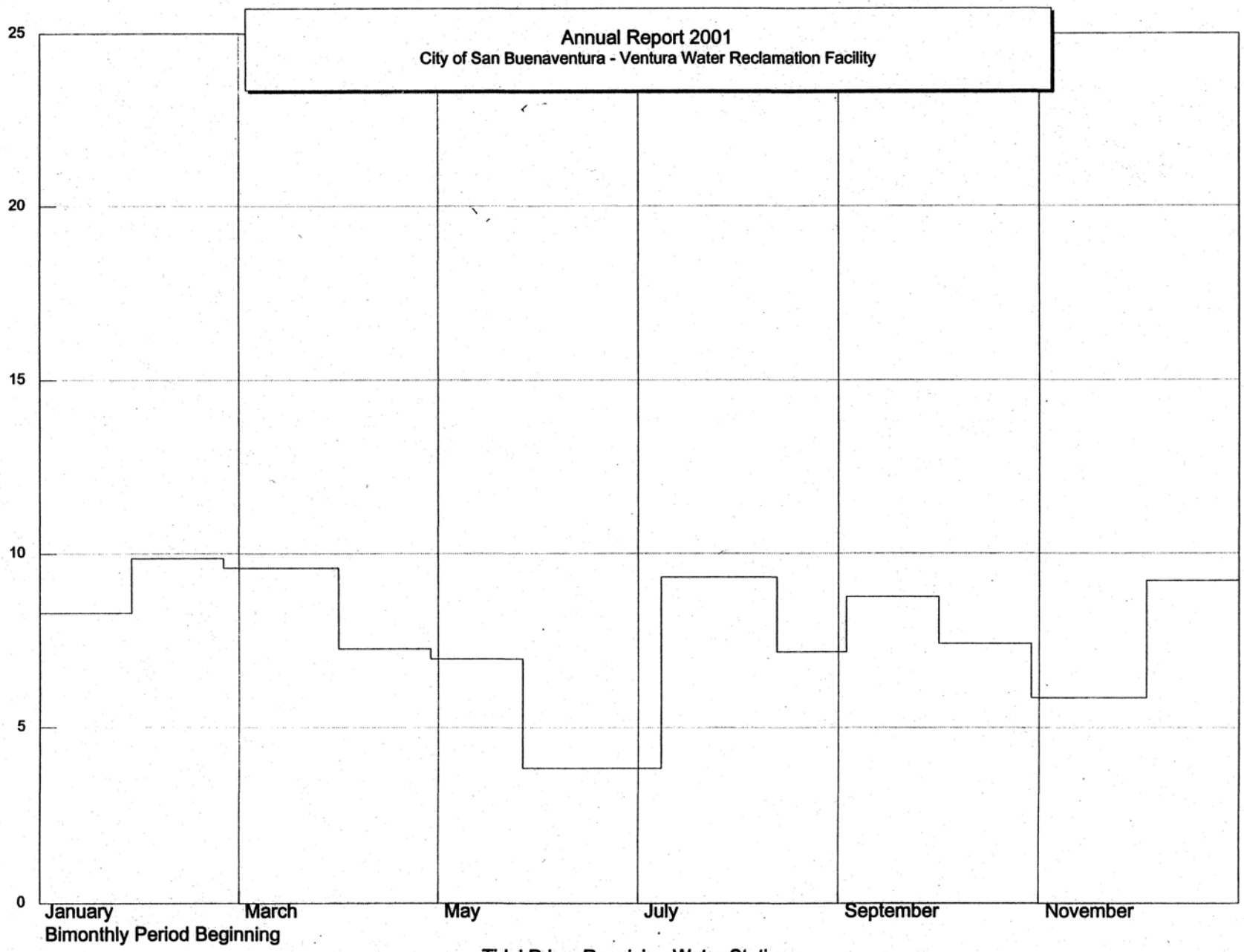
Tidal Prism Receiving Water Stations
R1 Weekly Dissolved Oxygen - mg/l



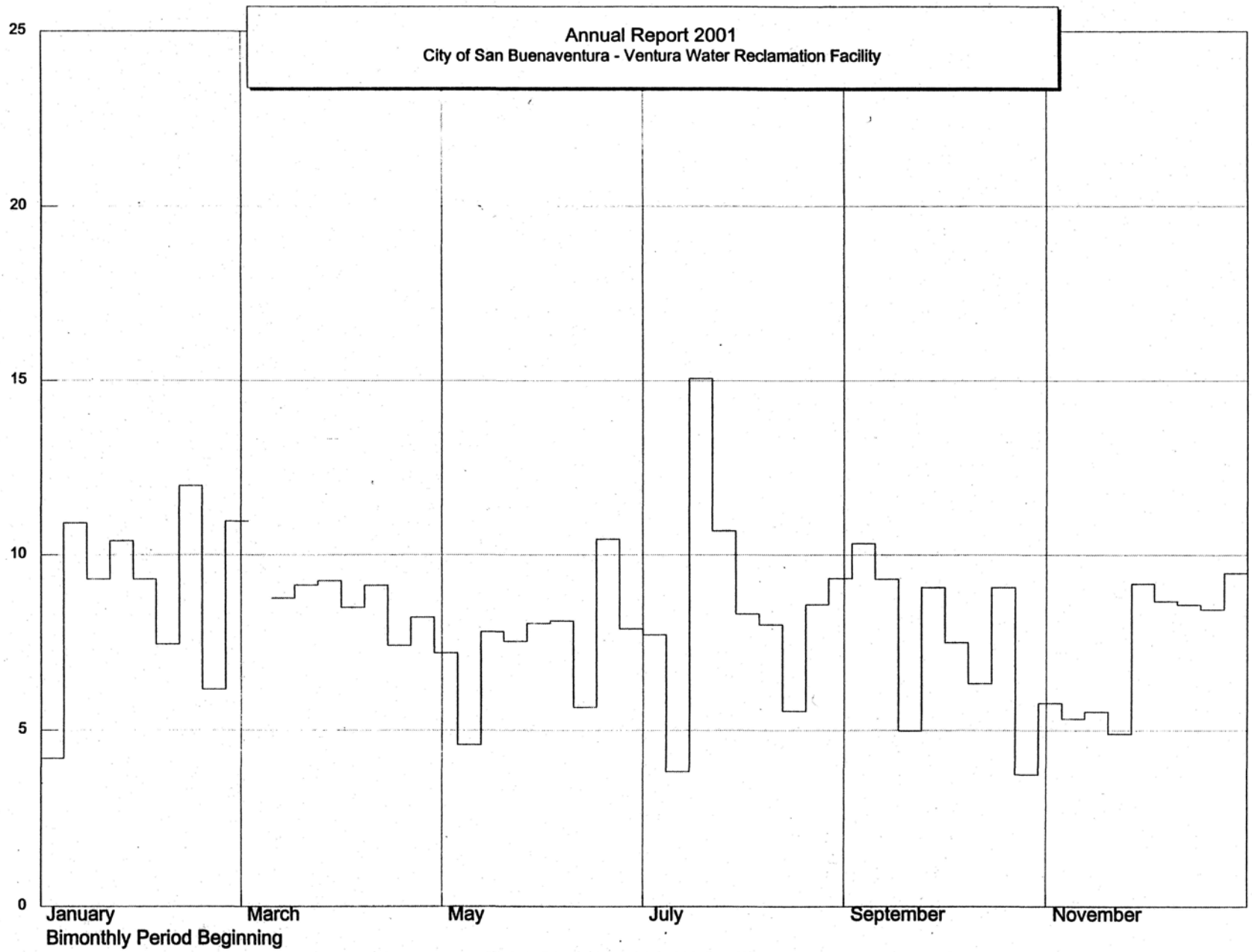
Tidal Prism Receiving Water Stations
R1 30 Day Average Dissolved Oxygen - mg/l



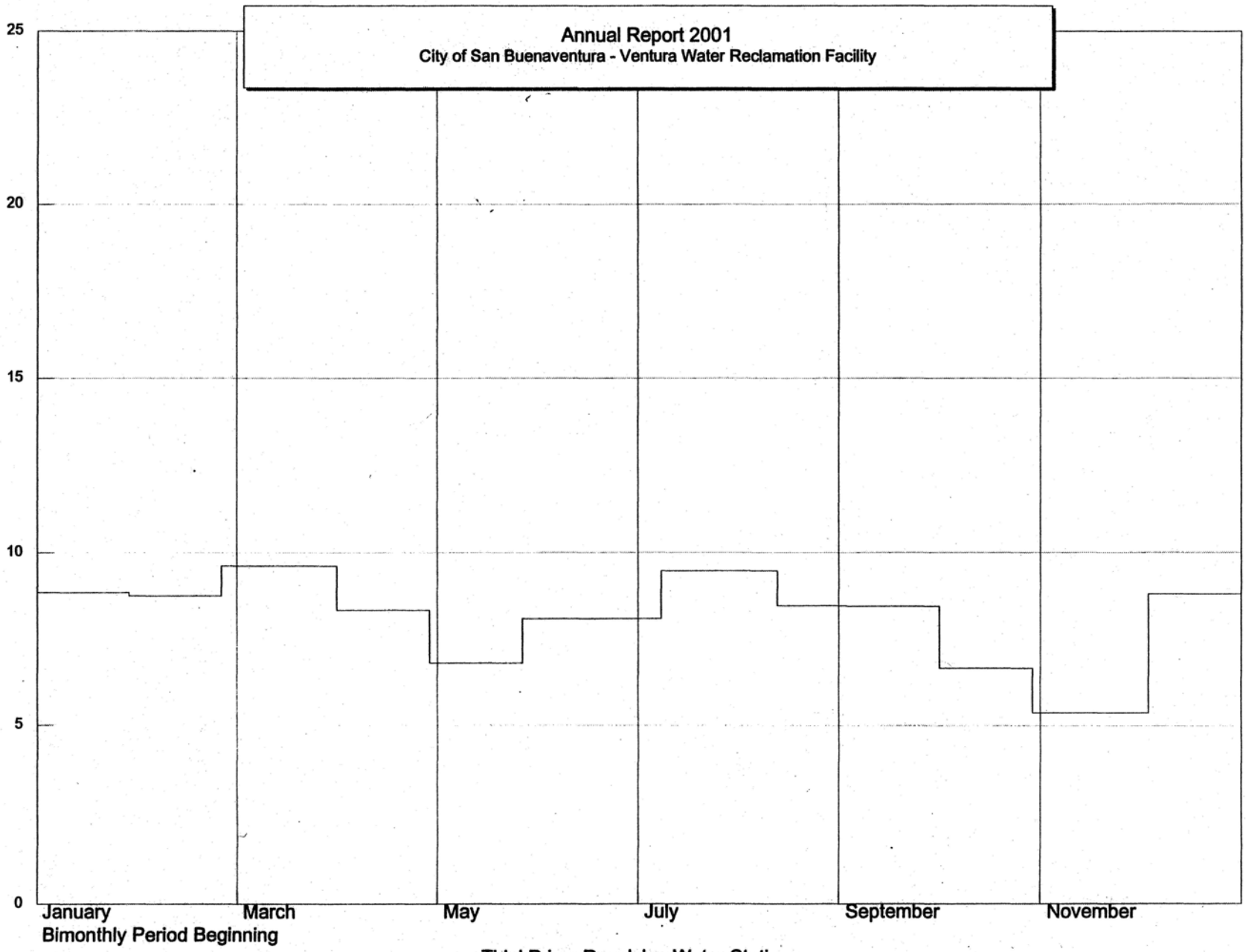
Tidal Prism Receiving Water Stations
R2 Weekly Dissolved Oxygen - mg/l



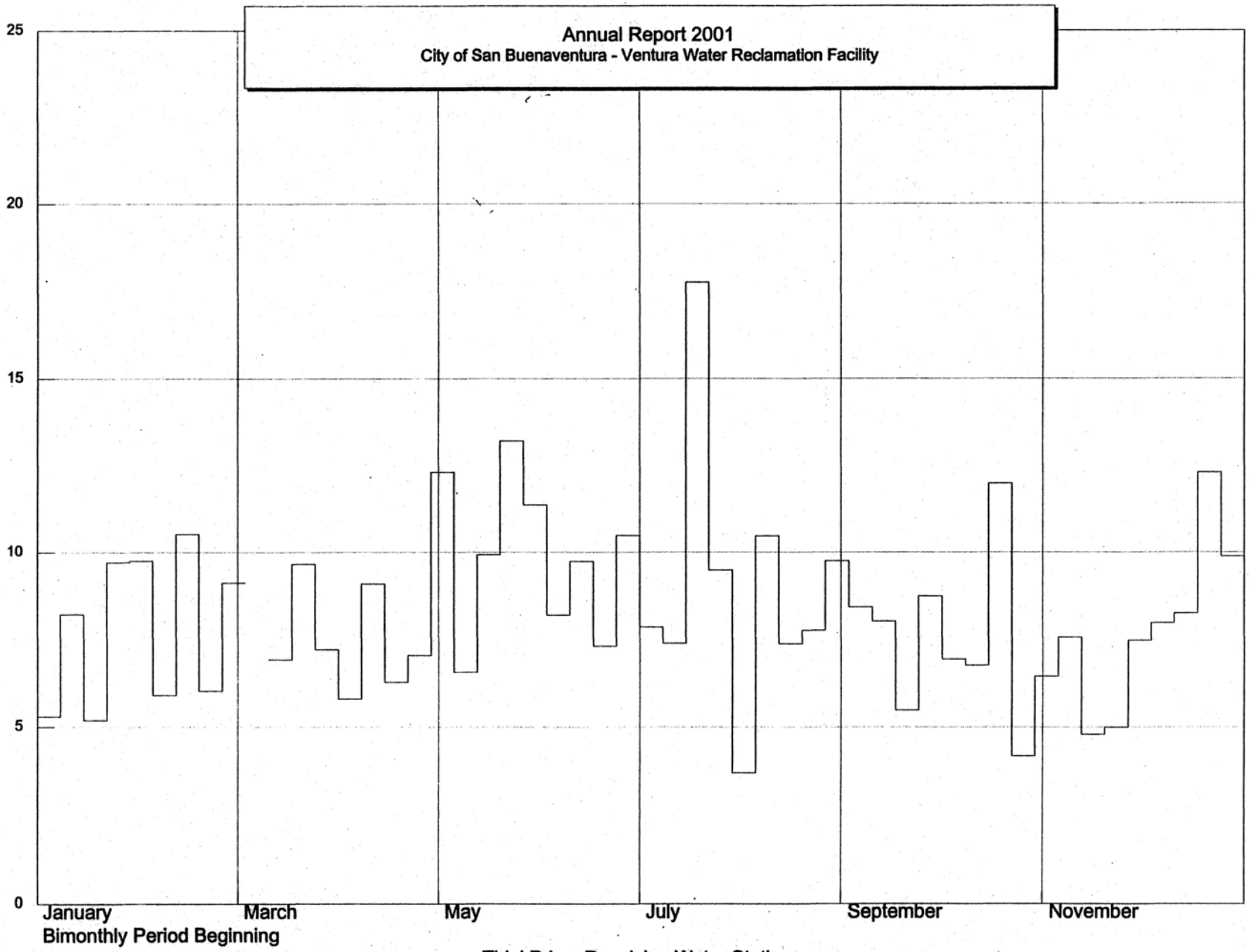
Tidal Prism Receiving Water Stations
R2 30 Day Average Dissolved Oxygen - mg/l



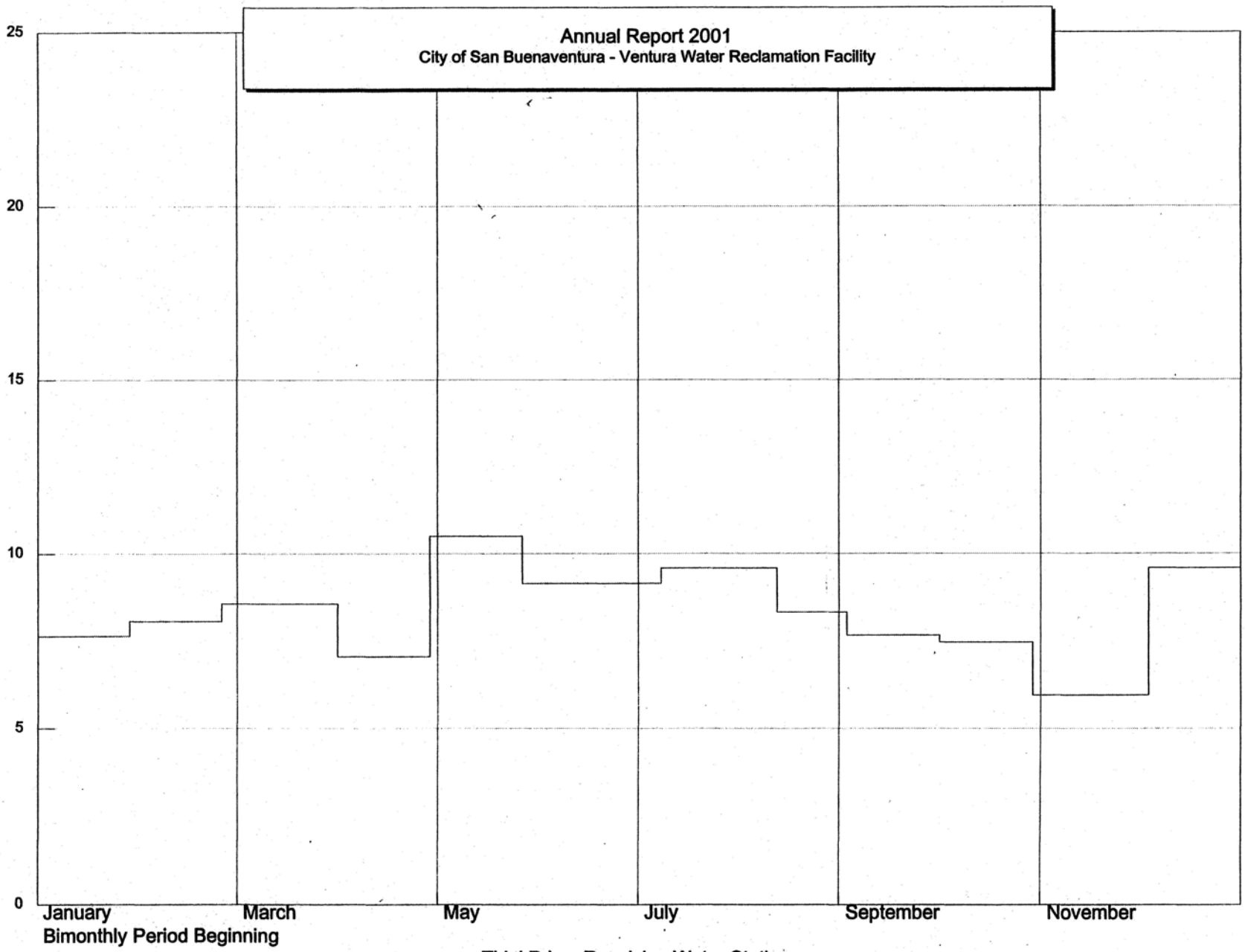
Tidal Prism Receiving Water Stations
R3 Weekly Dissolved Oxygen - mg/l



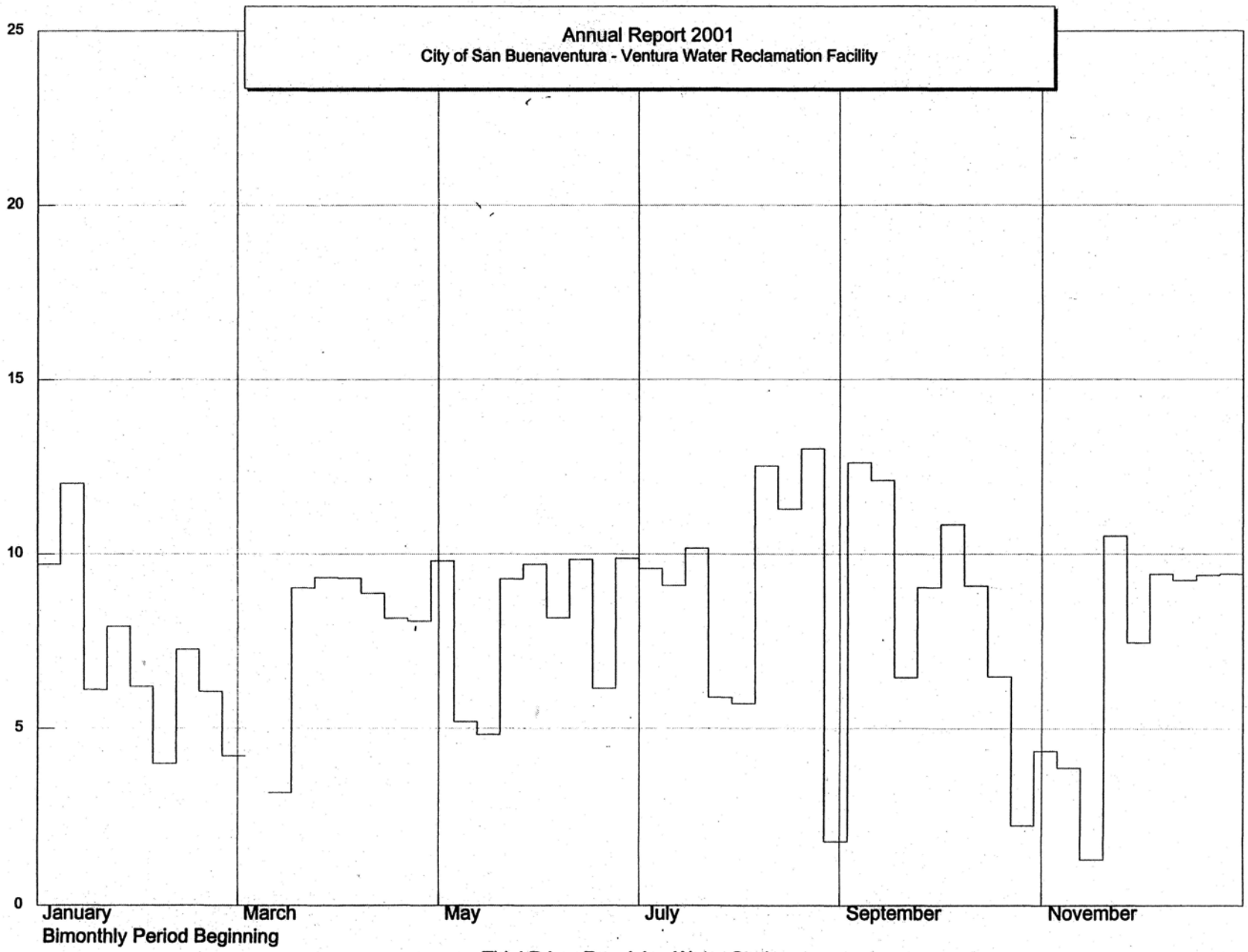
Tidal Prism Receiving Water Stations
R3 30 Day Average Dissolved Oxygen - mg/l



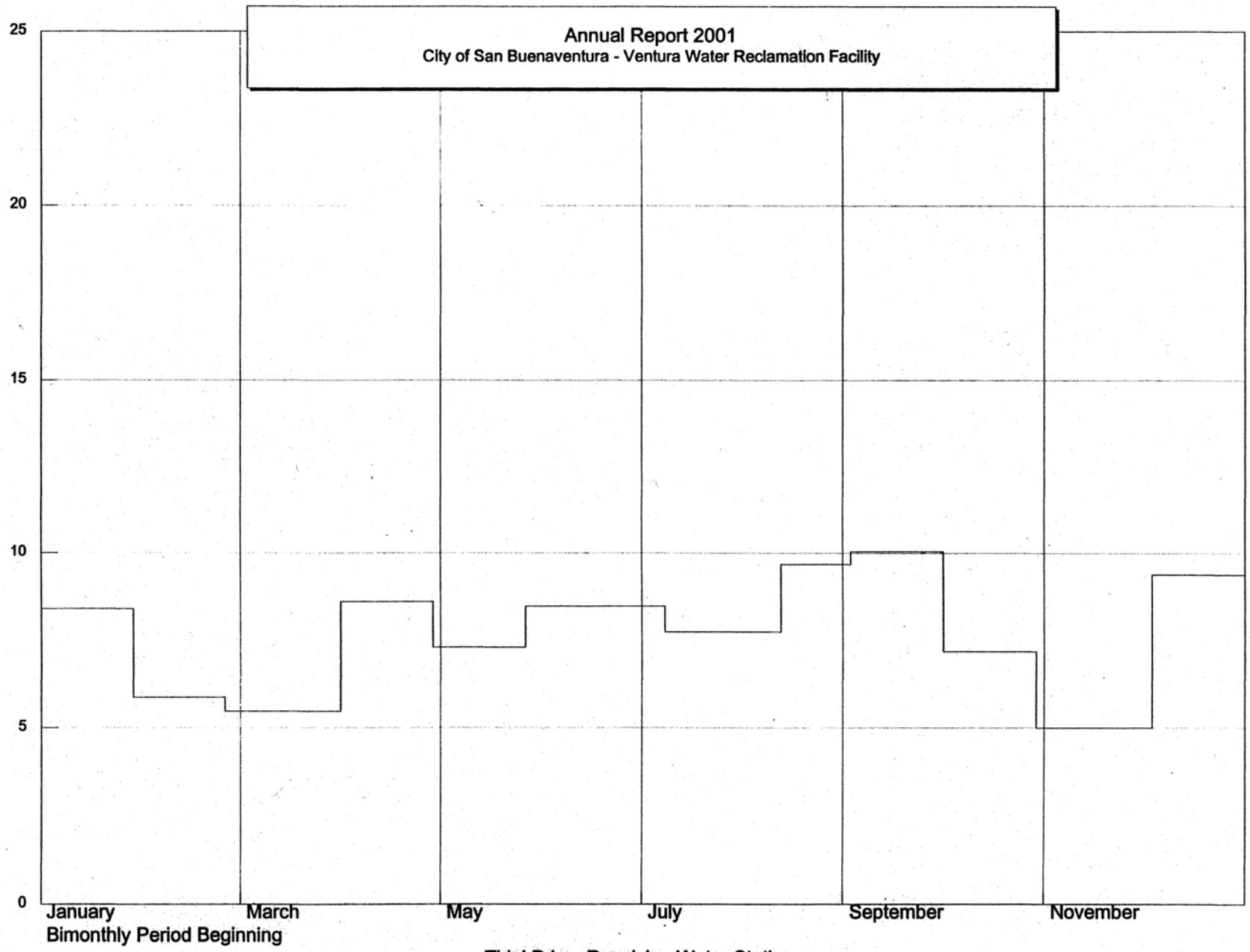
Tidal Prism Receiving Water Stations
R4 Weekly Dissolved Oxygen - mg/l



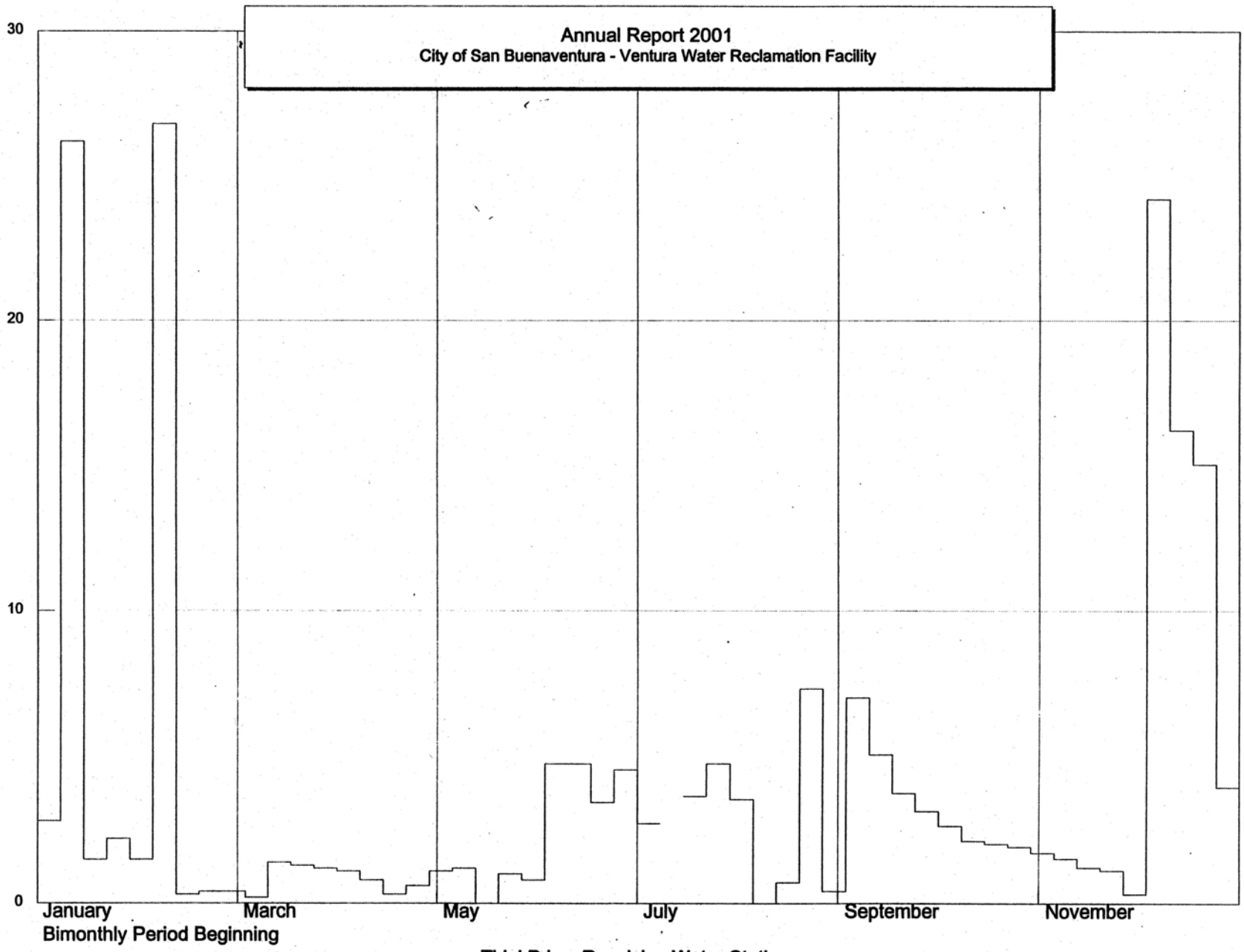
Tidal Prism Receiving Water Stations
R4 30 Day Average Dissolved Oxygen - mg/l



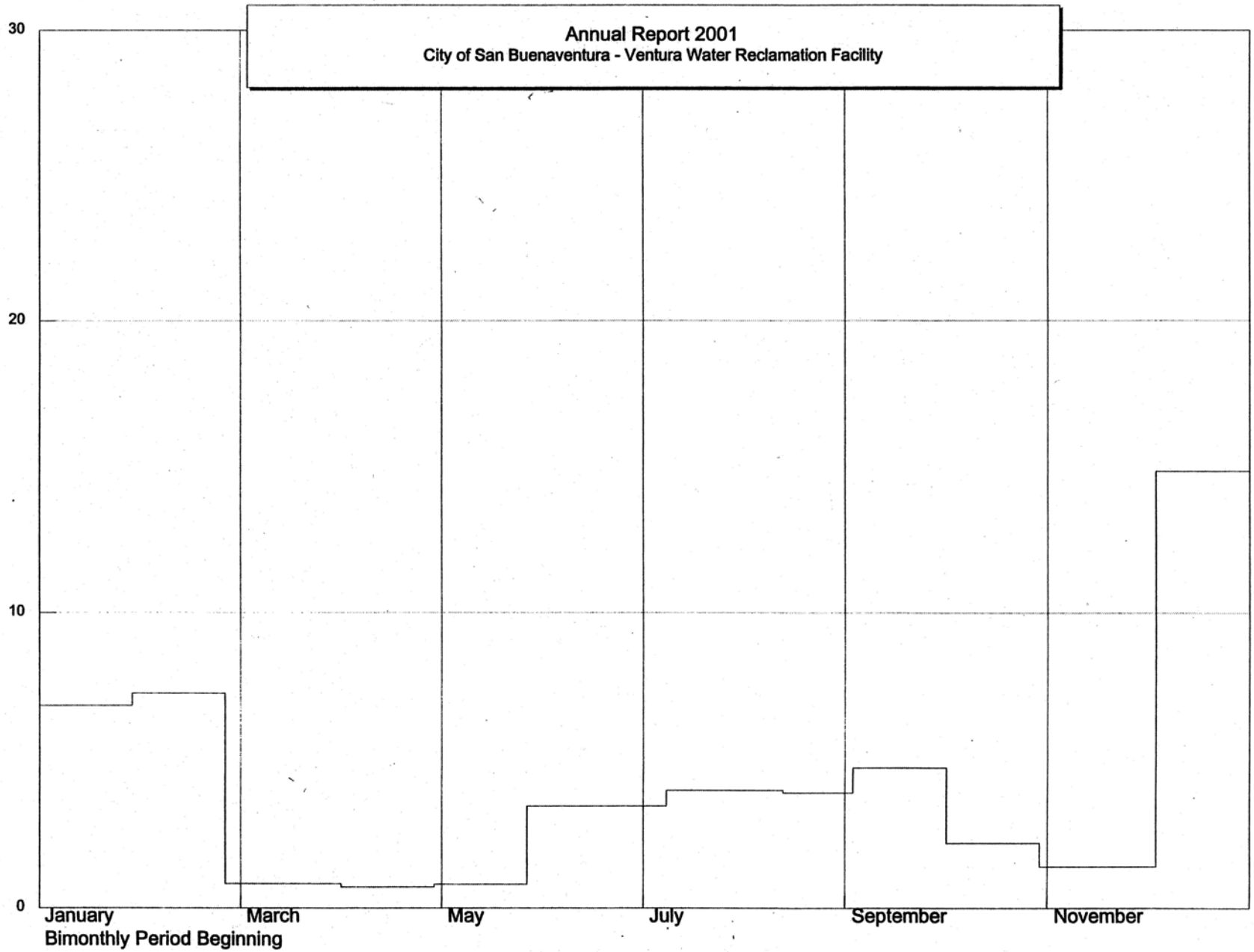
Tidal Prism Receiving Water Stations
L5 Weekly Dissolved Oxygen - mg/l



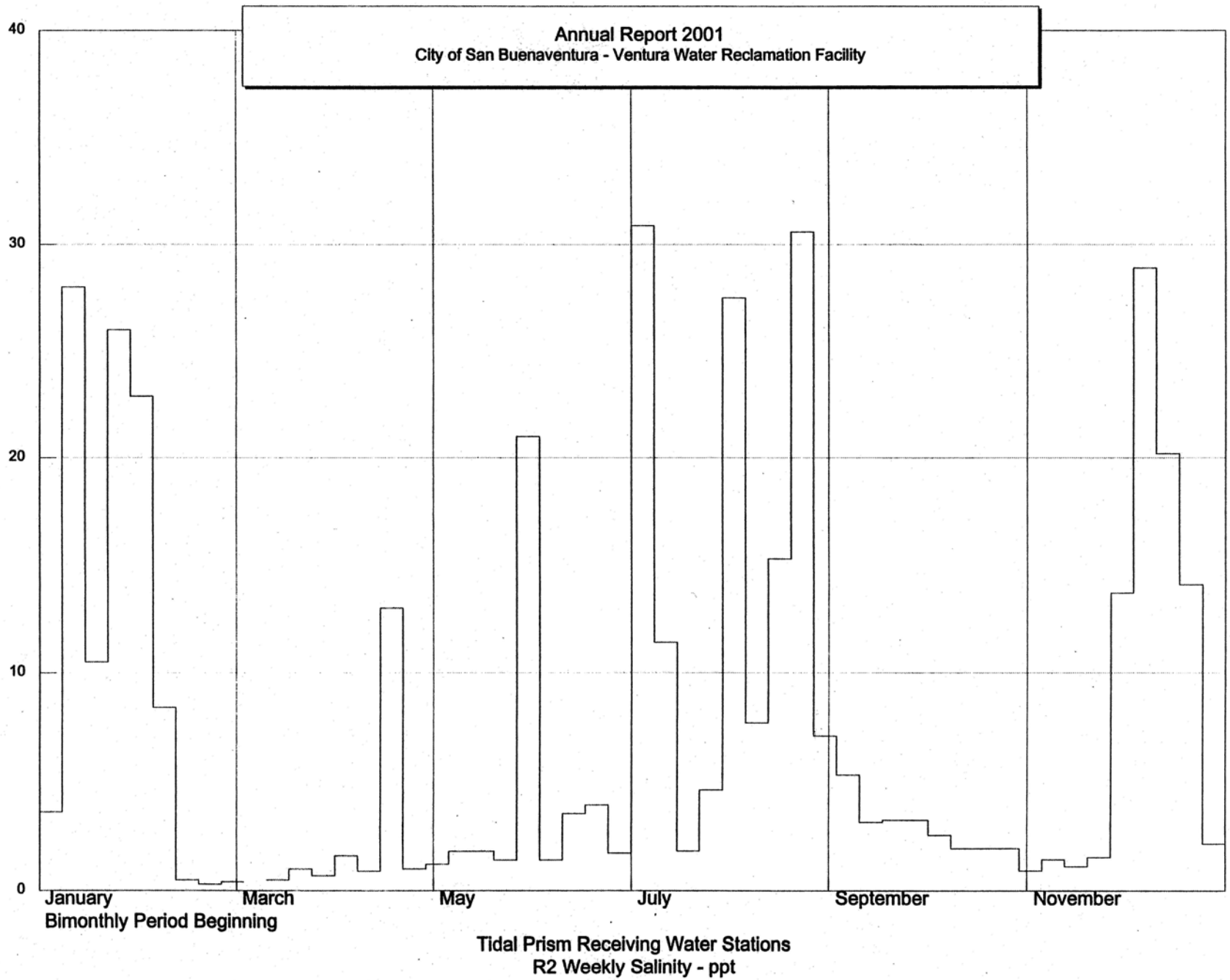
Tidal Prism Receiving Water Stations
L5 30 Day Average Dissolved Oxygen - mg/l

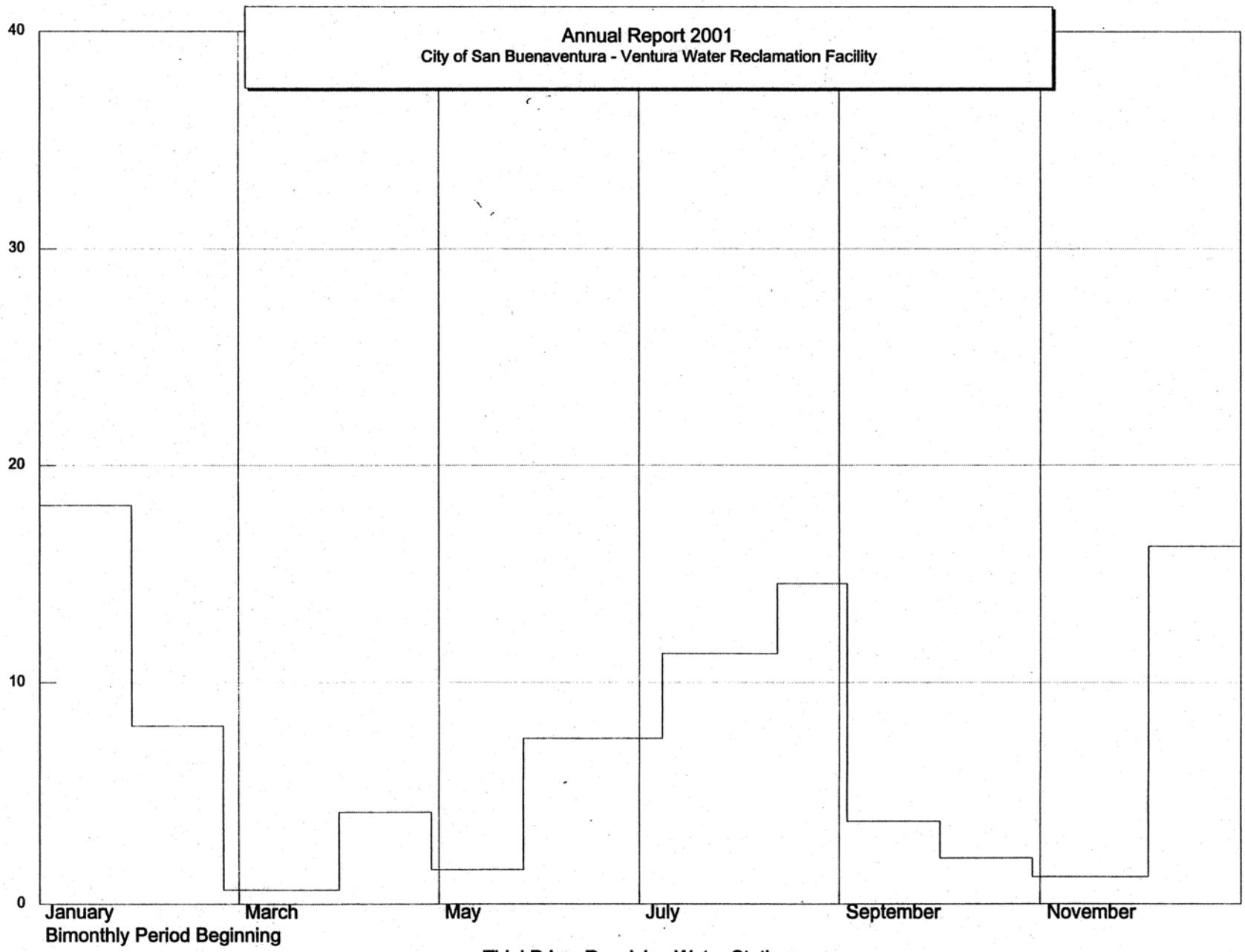


Tidal Prism Receiving Water Stations
R1 Weekly Salinity - ppt

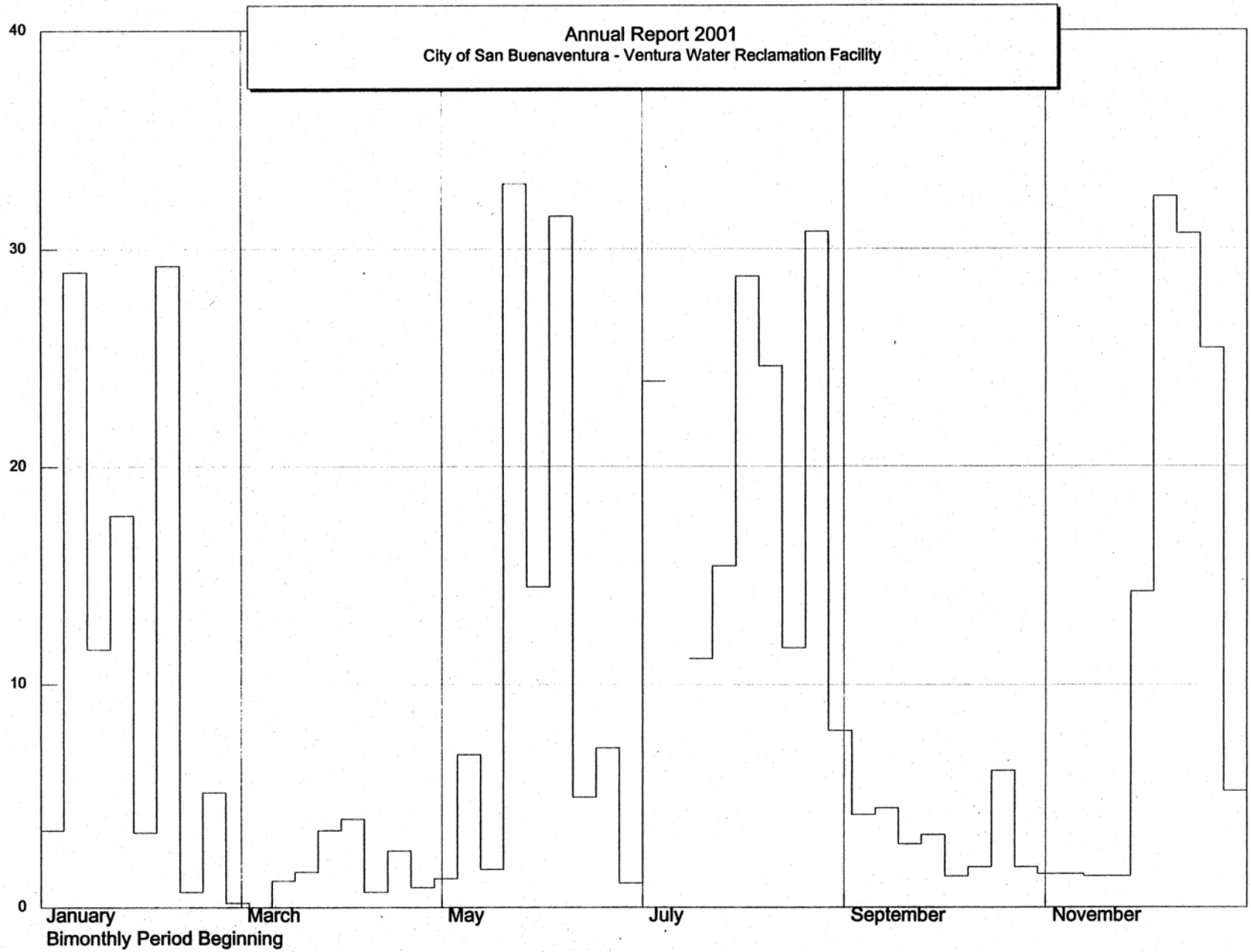


Tidal Prism Receiving Water Stations
R1 30 Day Average Salinity - ppt

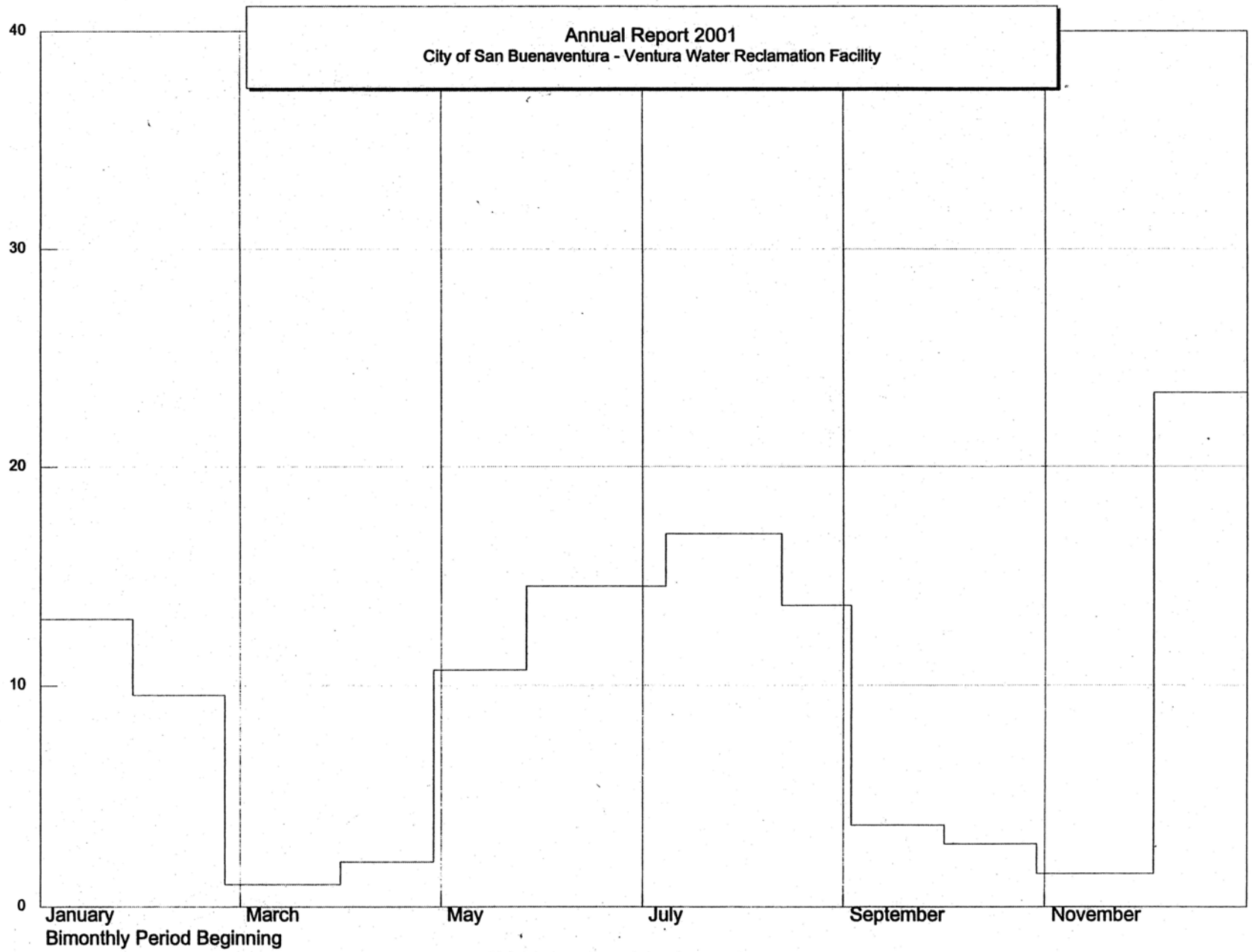

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
40
30
20
10
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R2 Weekly Salinity - ppt



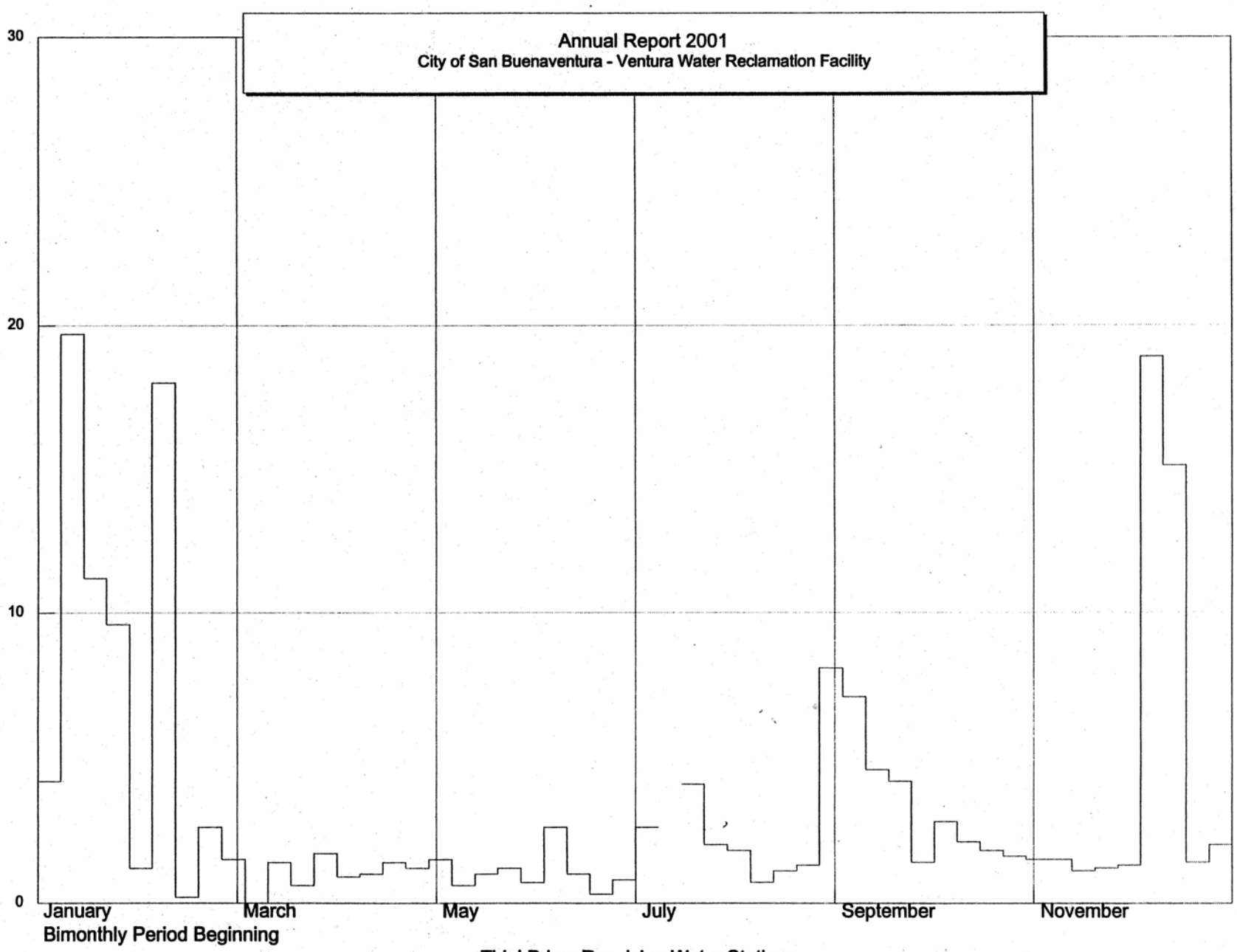
Tidal Prism Receiving Water Stations
R2 30 Day Average Salinity - ppt



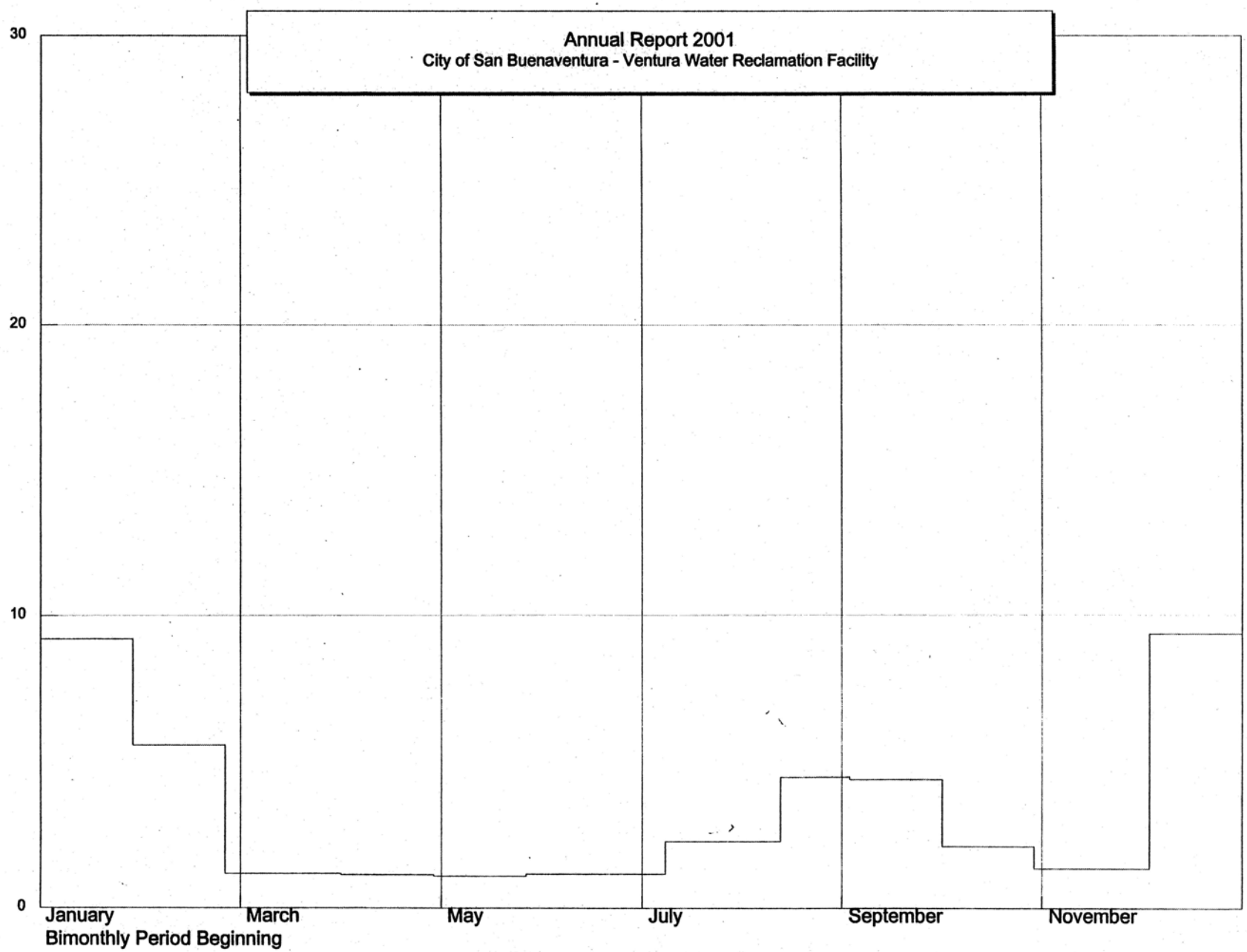
Tidal Prism Receiving Water Stations
R3 Weekly Salinity - ppt



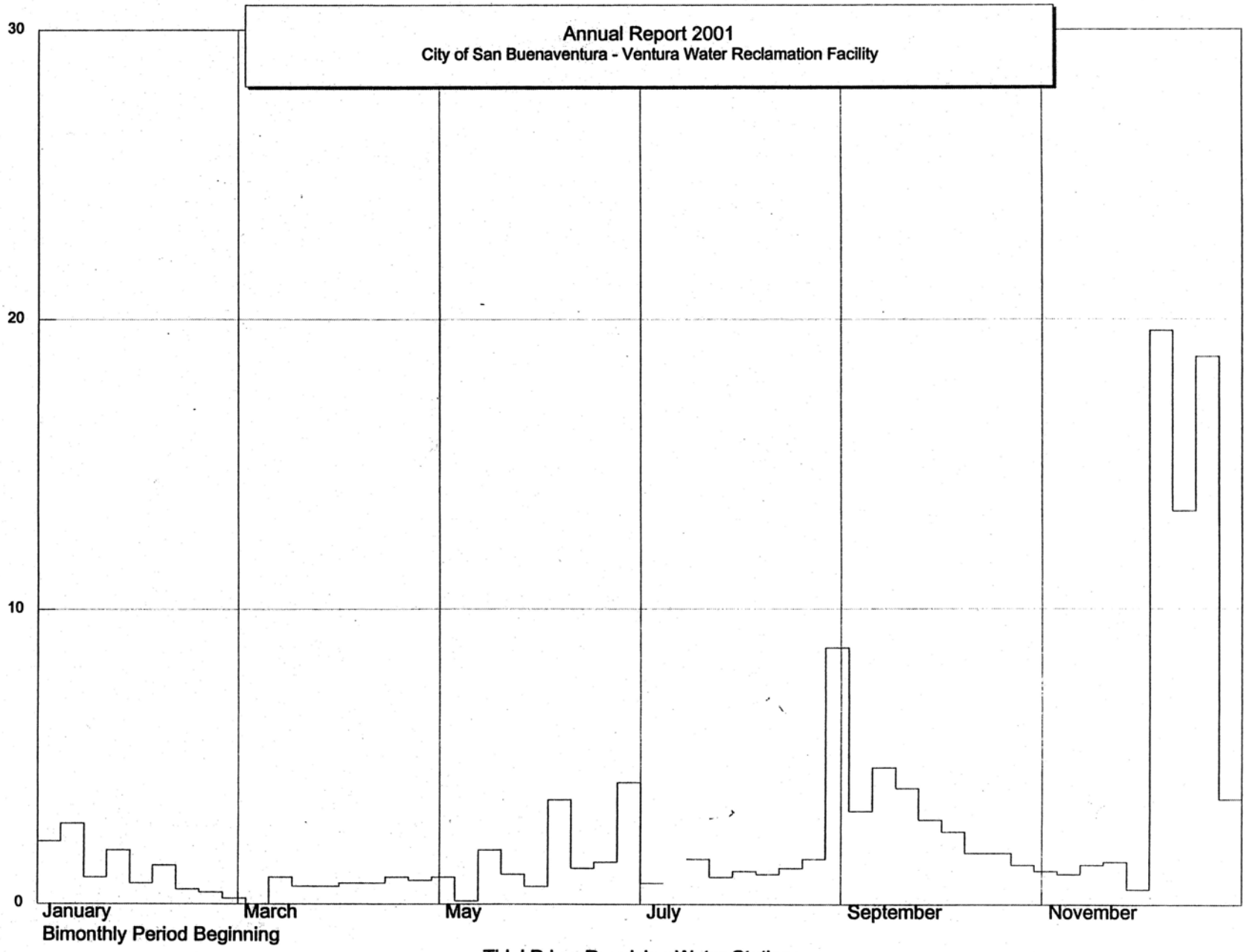
Tidal Prism Receiving Water Stations
R3 30 Day Average Salinity - ppt



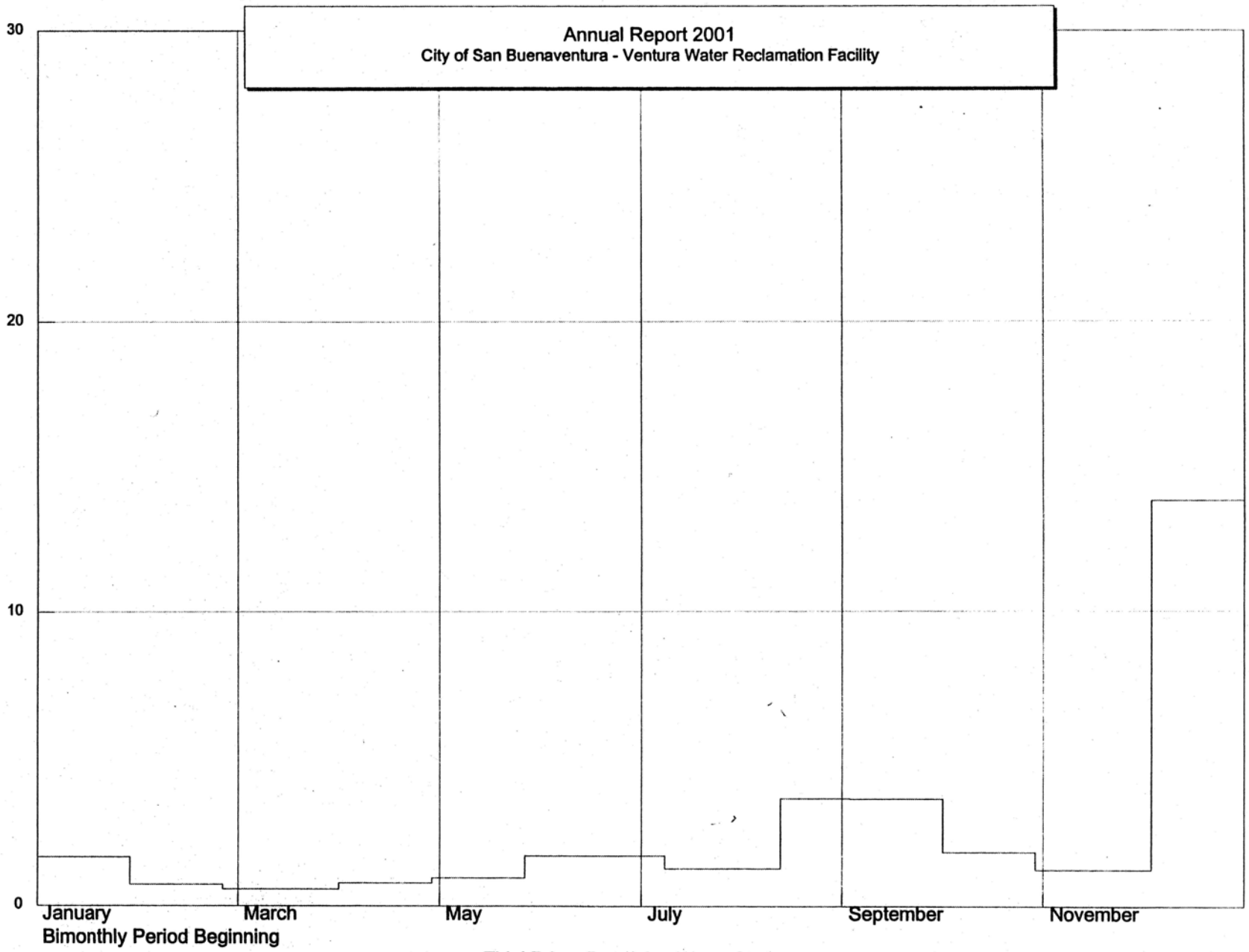
Tidal Prism Receiving Water Stations
R4 Weekly Salinity - ppt



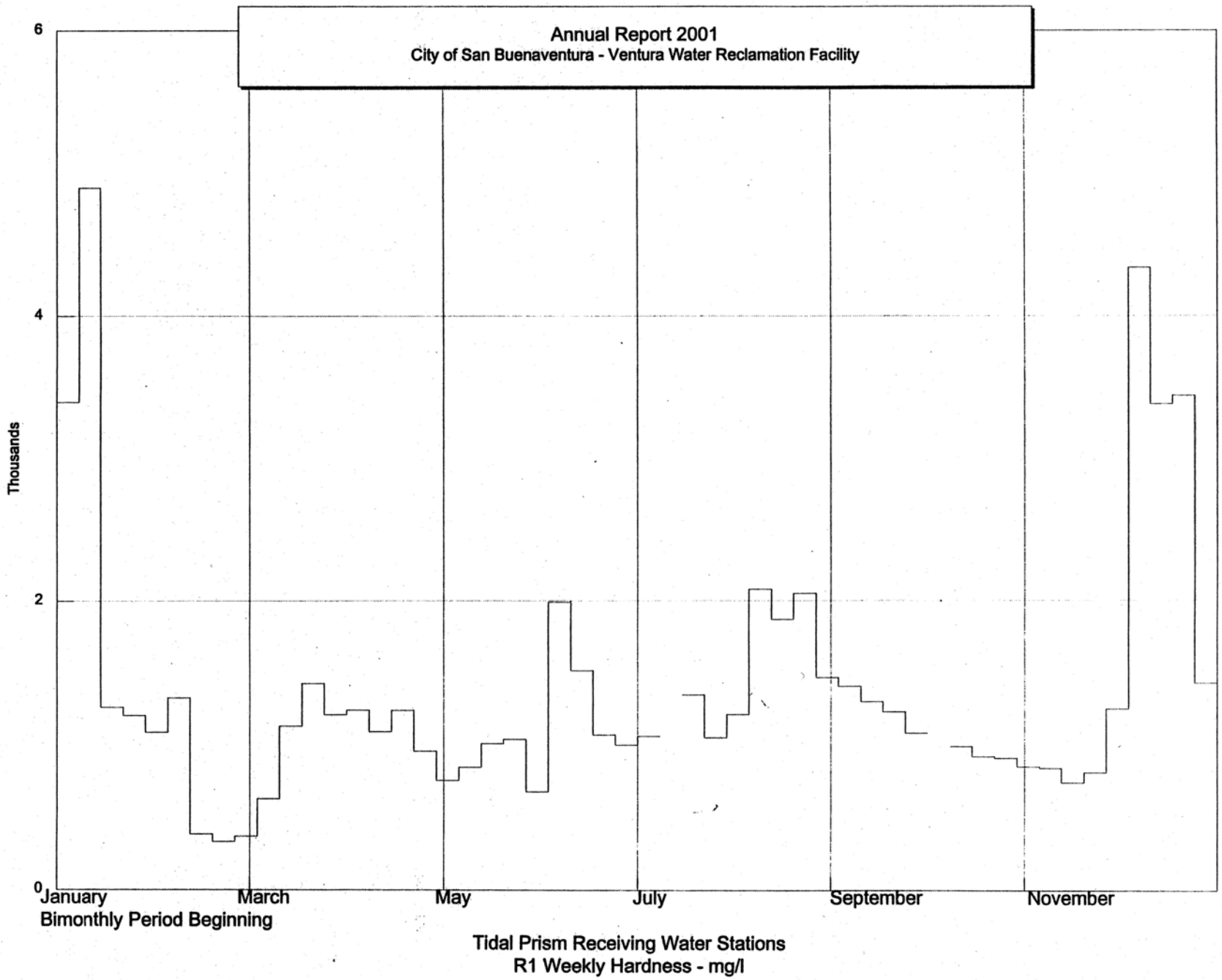
Tidal Prism Receiving Water Stations
R4 30 Day Average Salinity - ppt

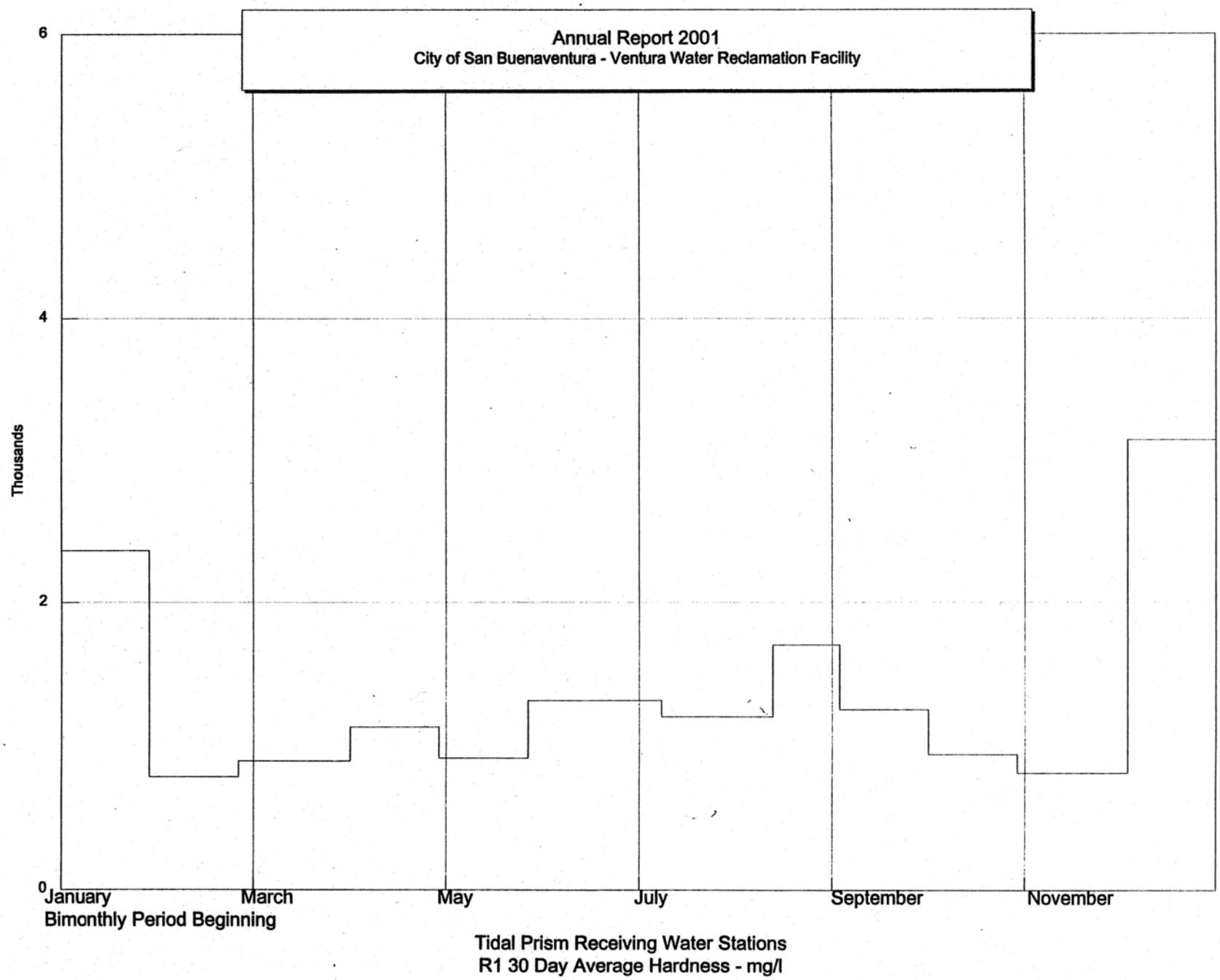


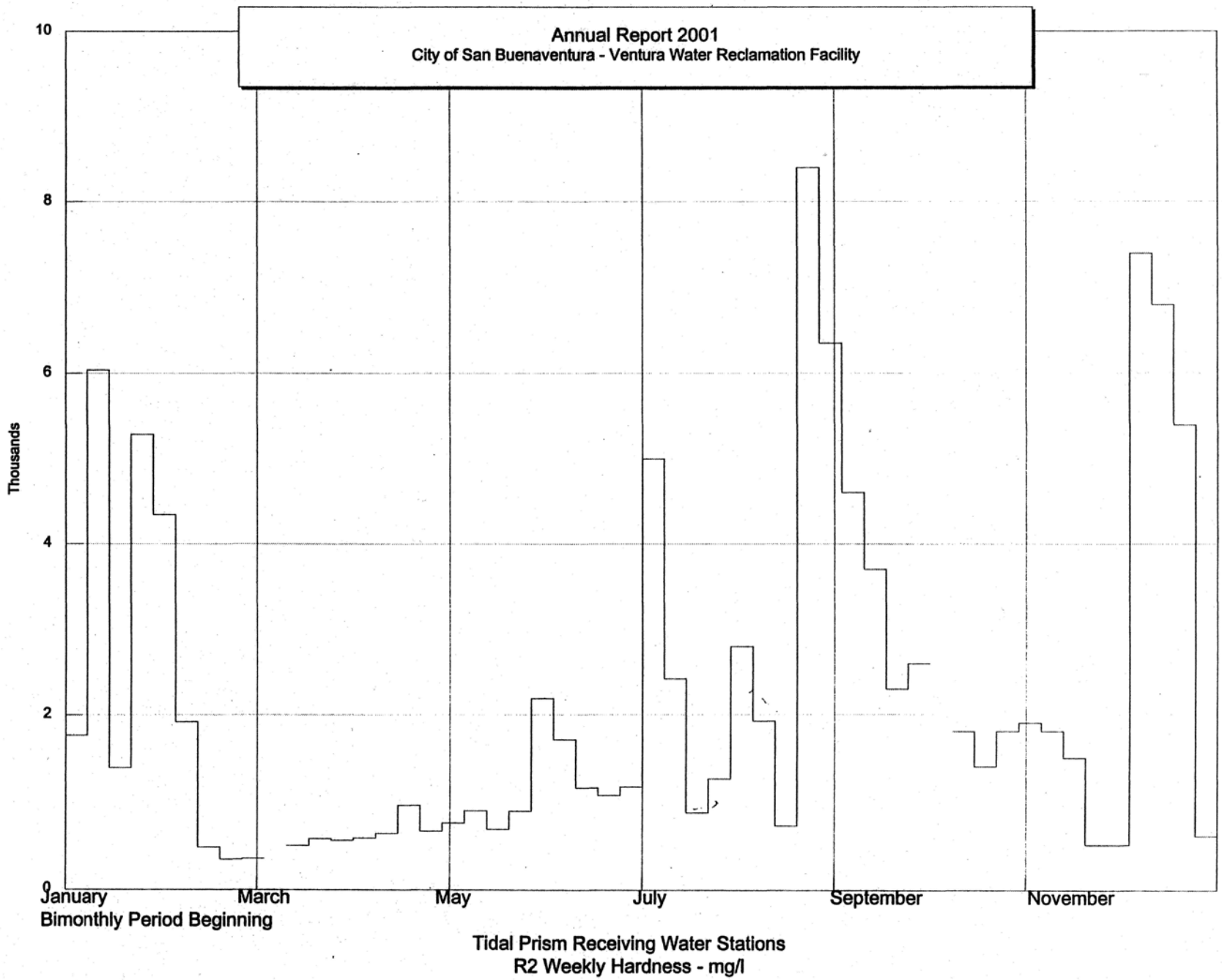
Tidal Prism Receiving Water Stations
L5 Weekly Salinity - ppt

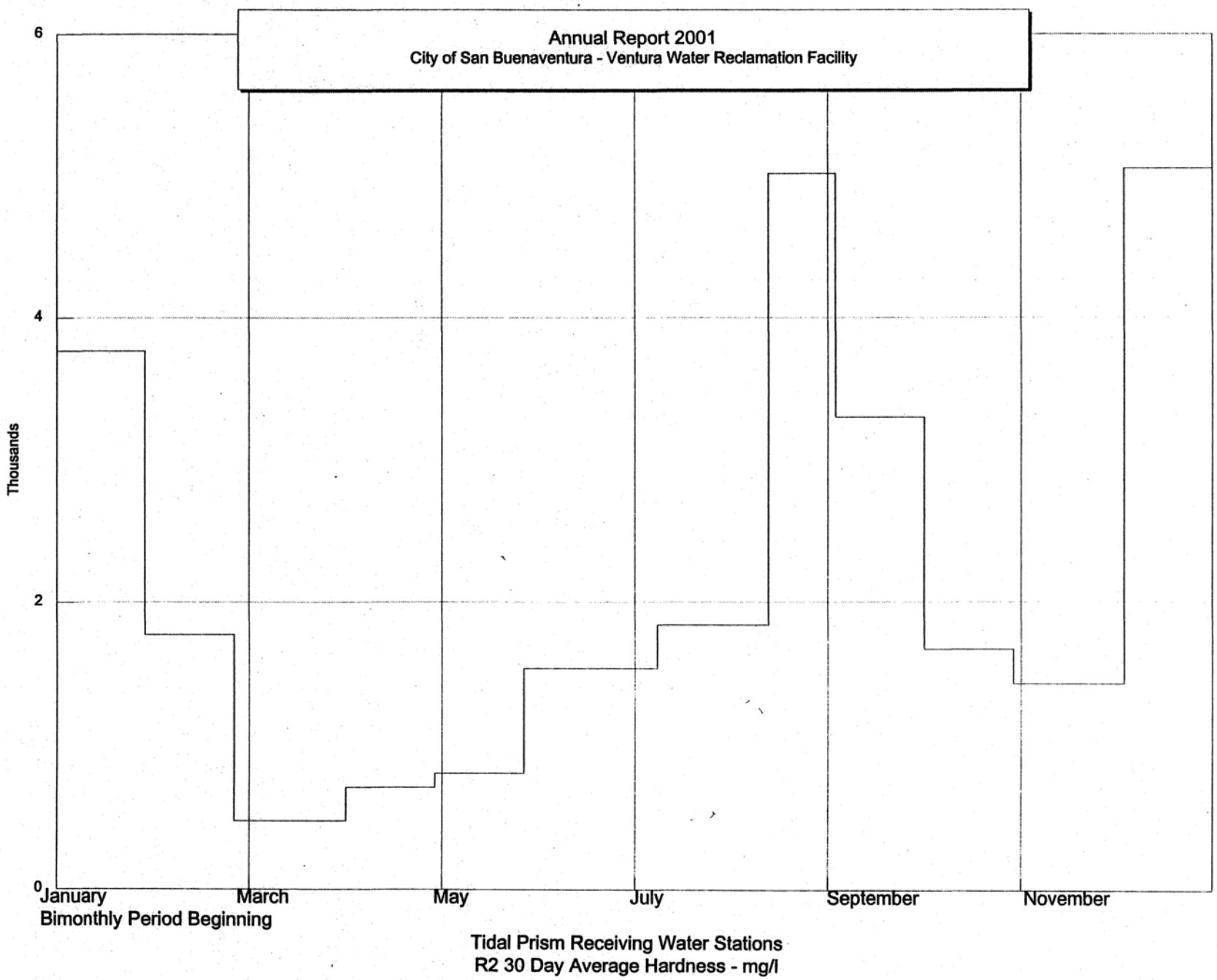


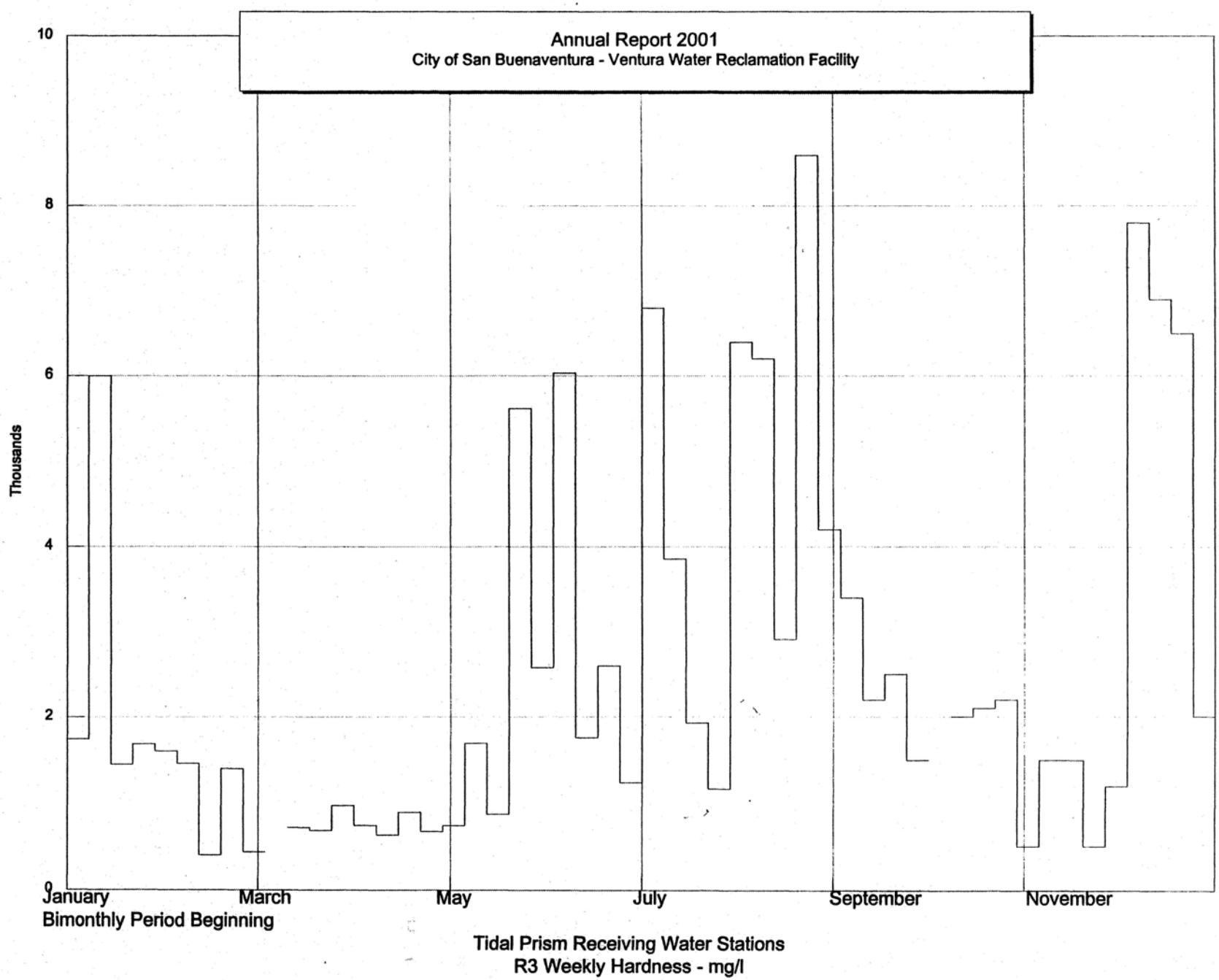
Tidal Prism Receiving Water Stations
L5 30 Day Average Salinity - ppt

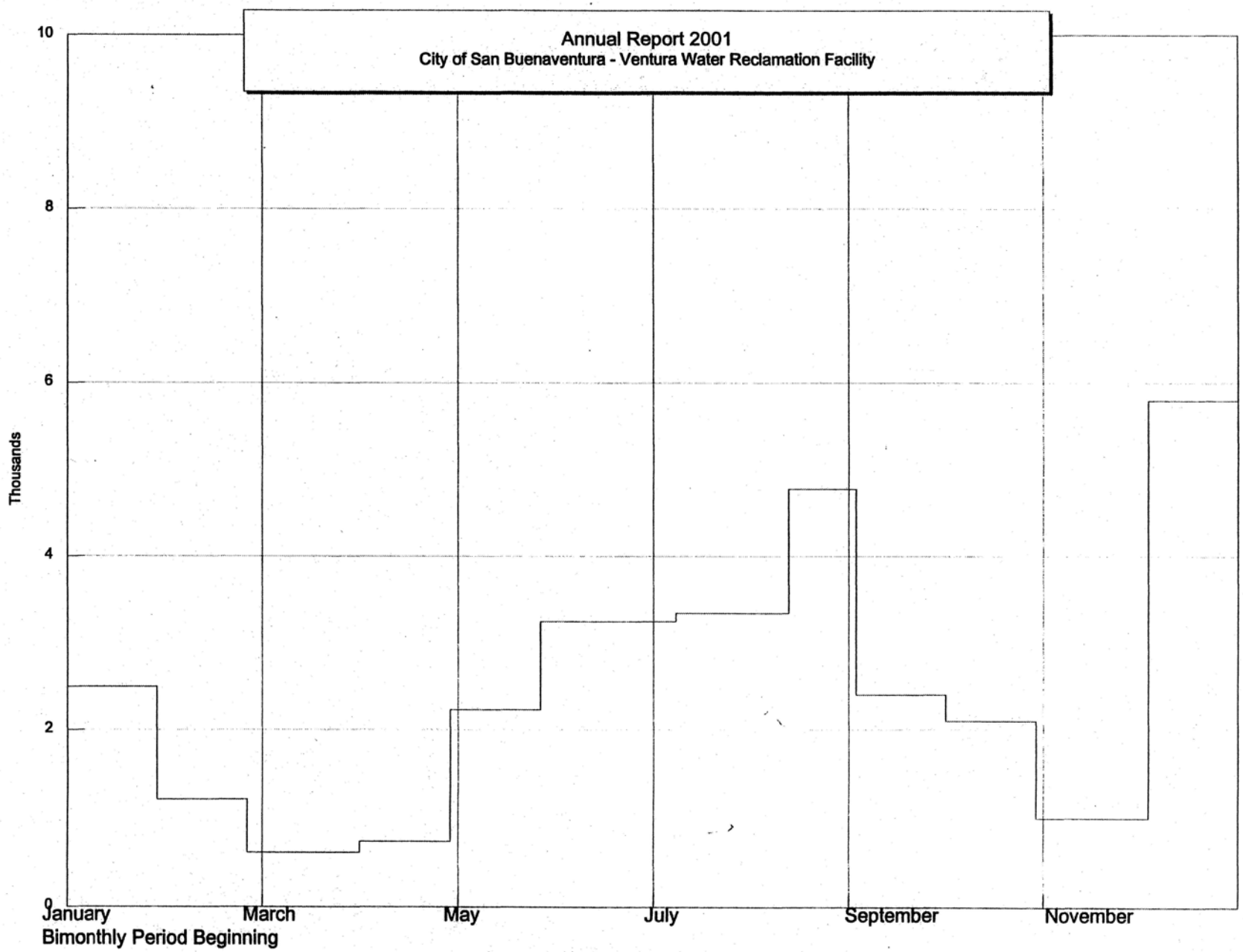

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
6
4
2
0
Thousands
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R1 Weekly Hardness - mg/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
6
4
2
0
Thousands
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R1 30 Day Average Hardness - mg/l

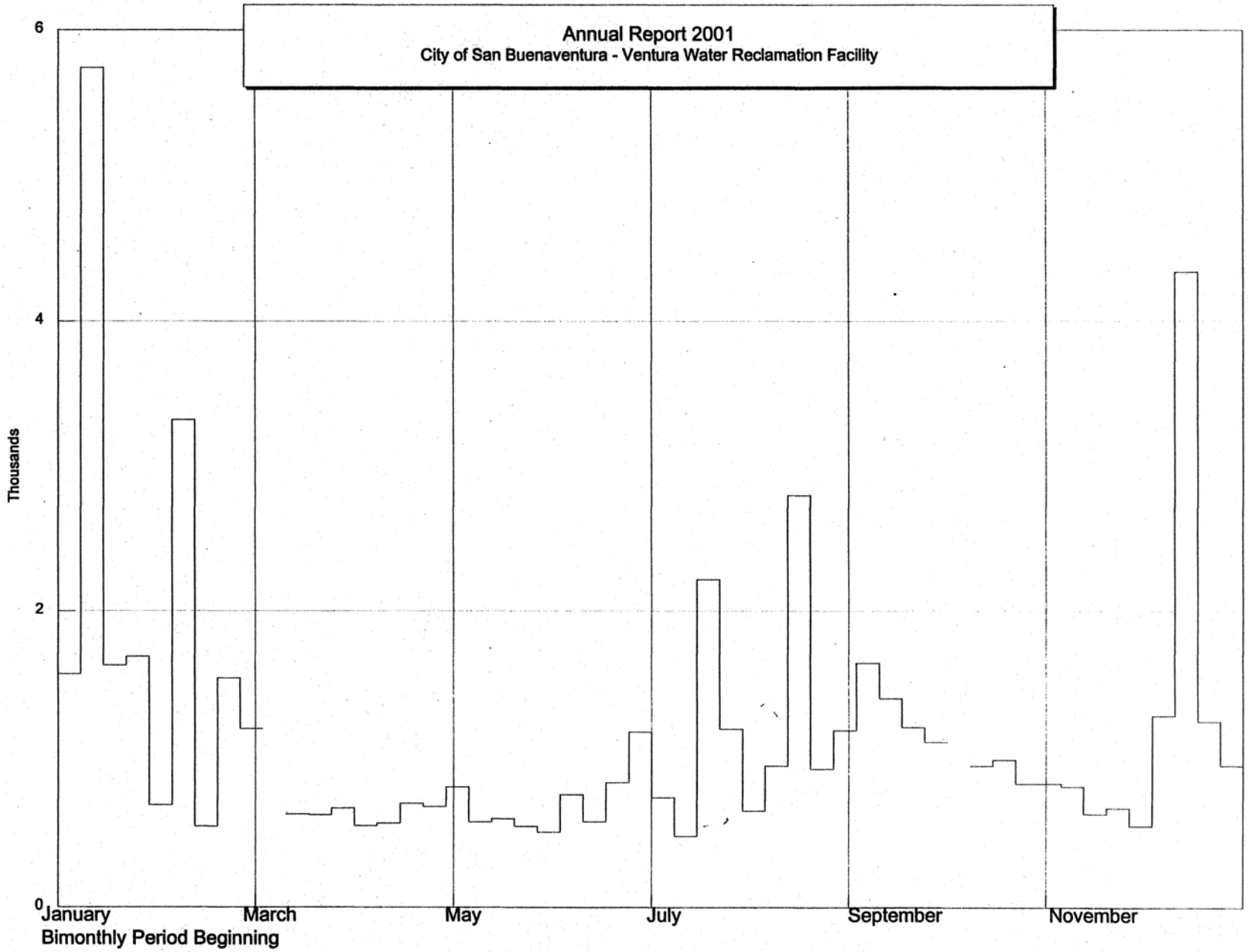

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
6
4
2
0
Thousands
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R2 Weekly Hardness - mg/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
6
4
2
0
Thousands
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R2 30 Day Average Hardness - mg/l

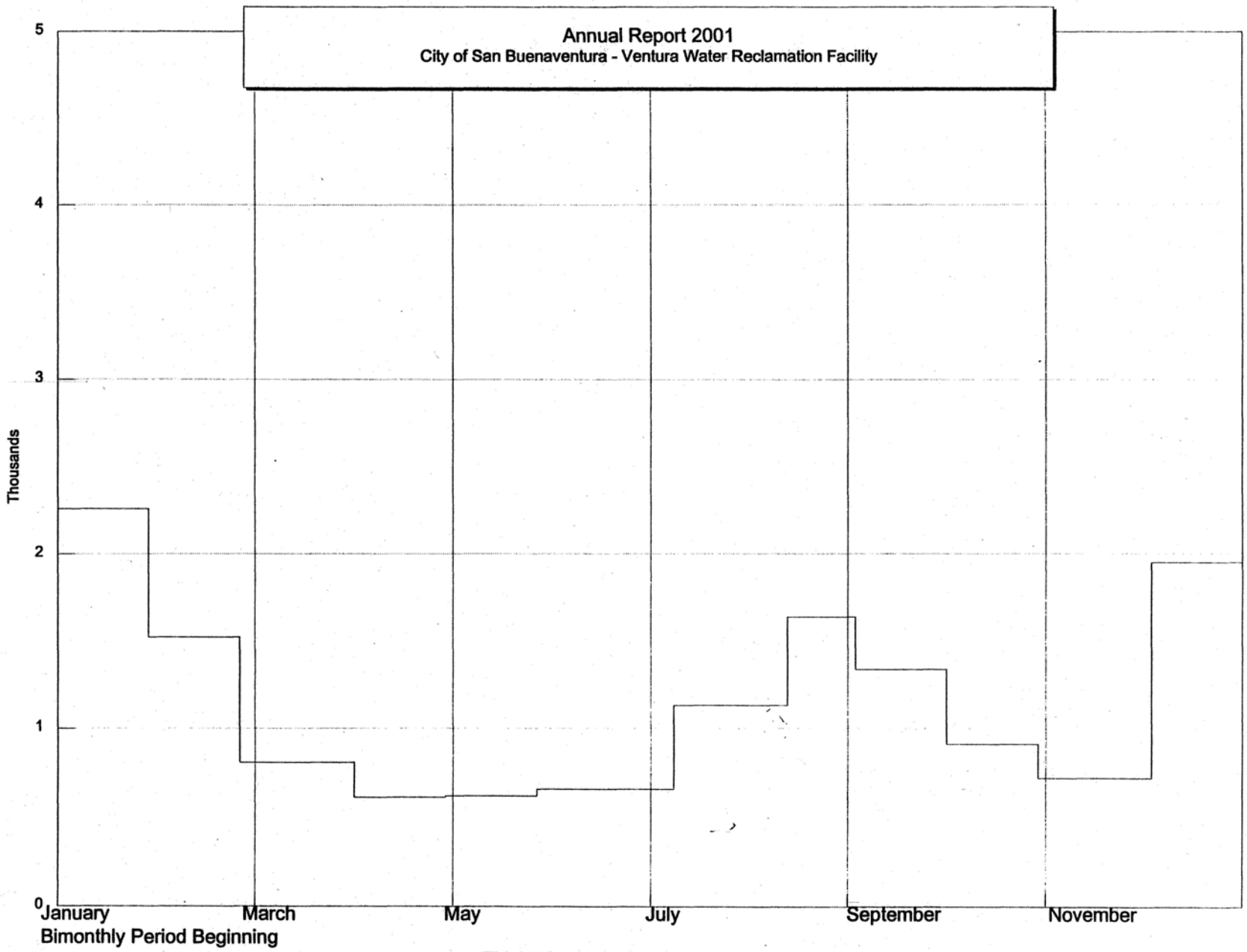

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
6
4
2
0
Thousands
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R3 Weekly Hardness - mg/l

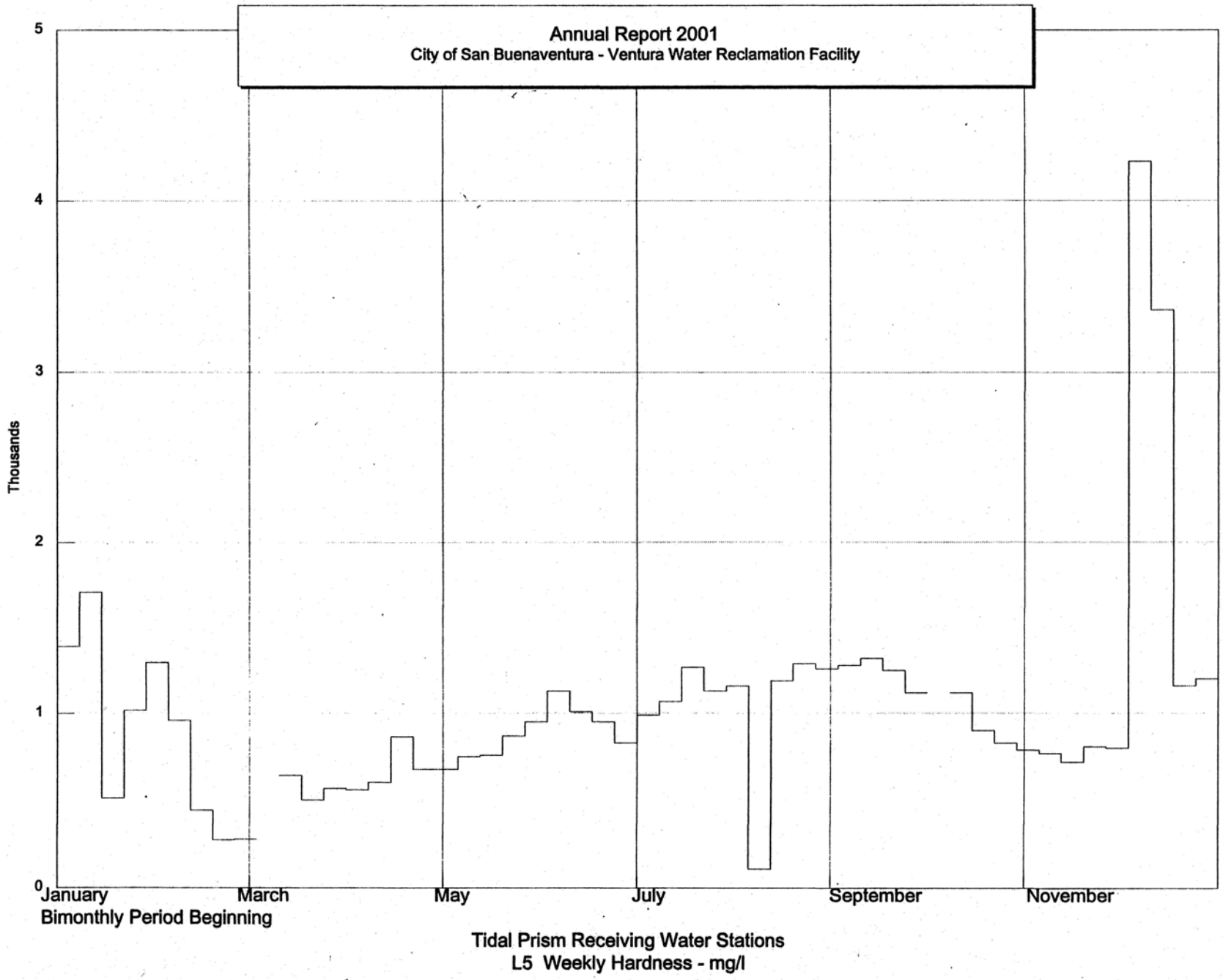


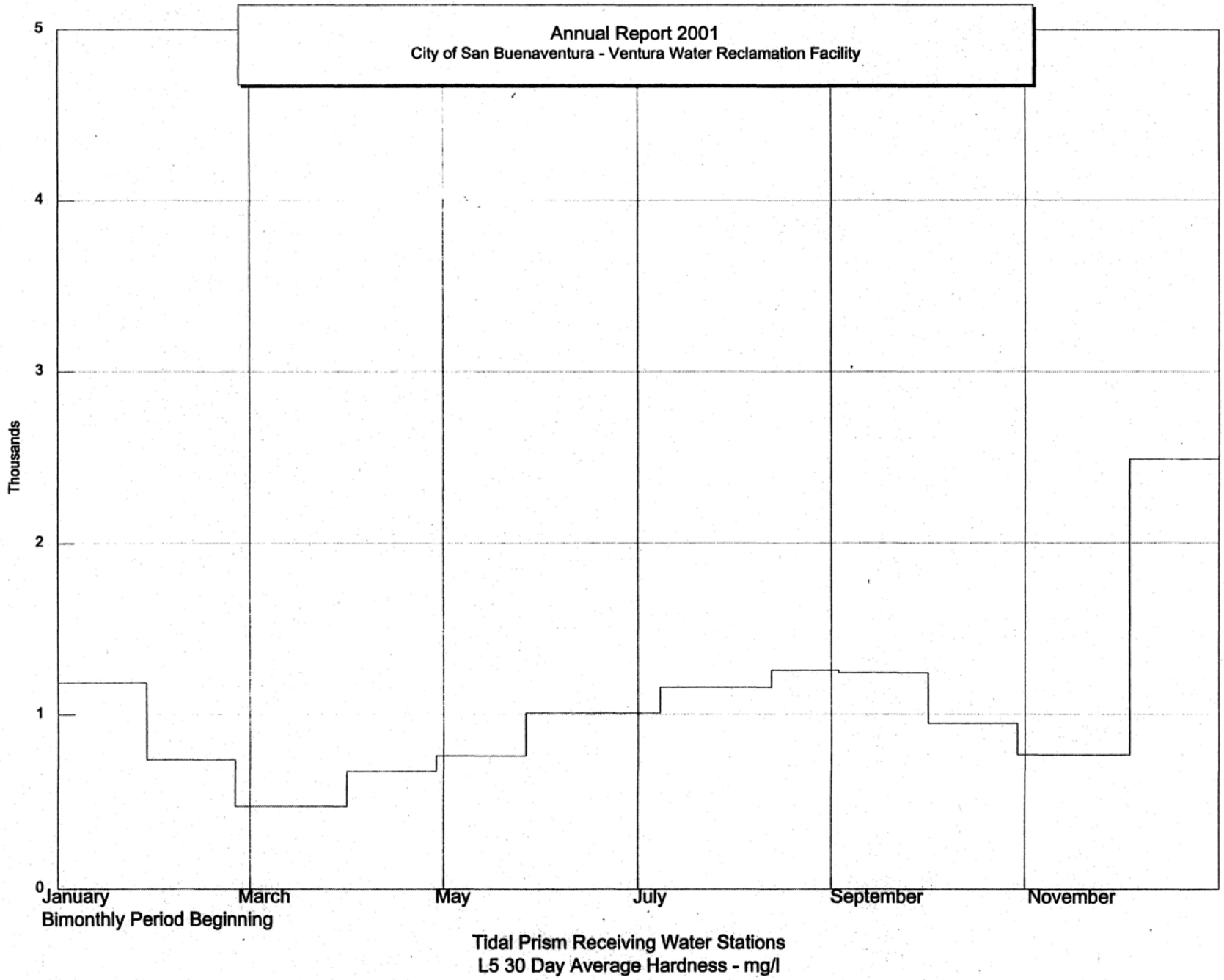
Tidal Prism Receiving Water Stations
R3 30 Day Average Hardness - mg/l

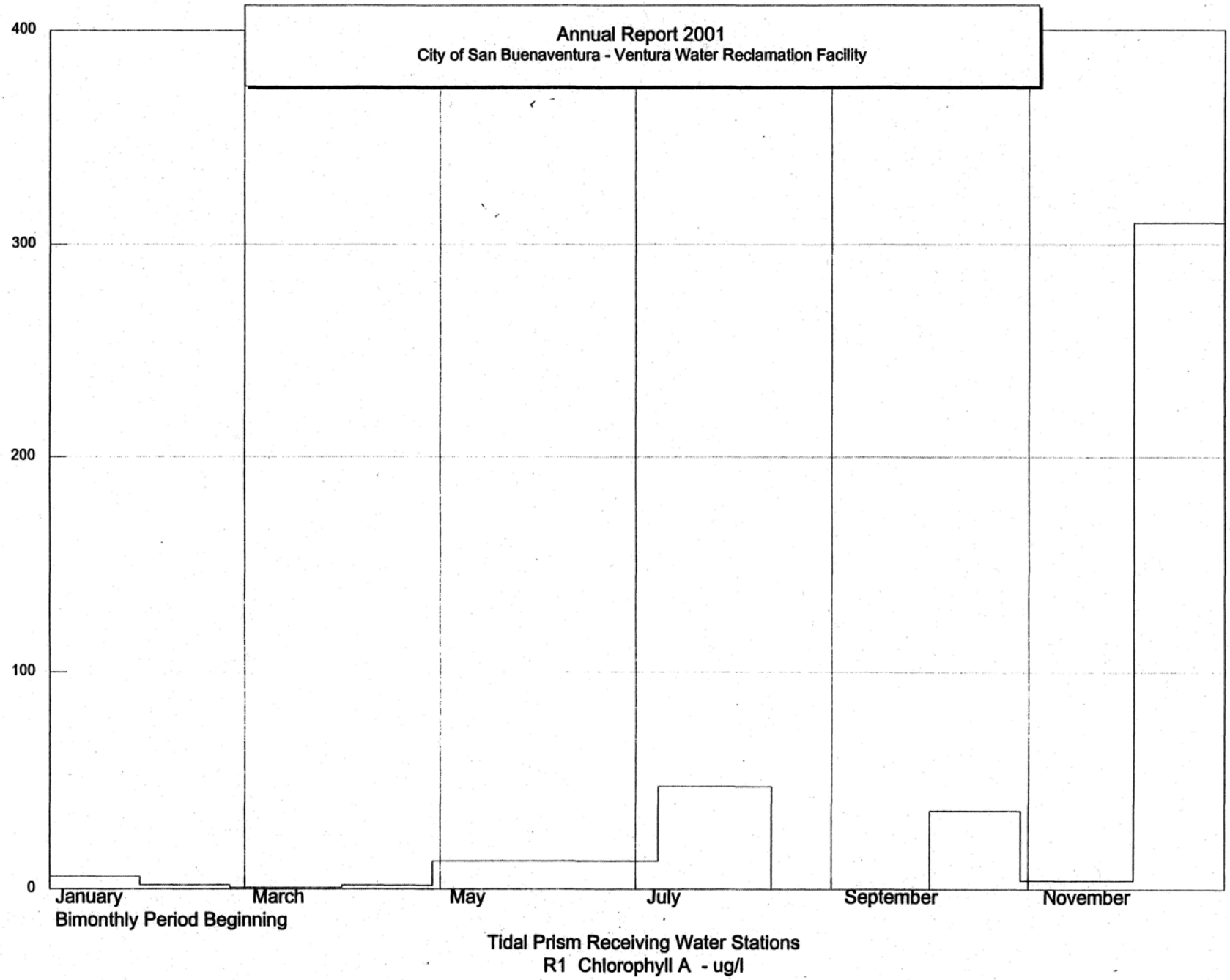


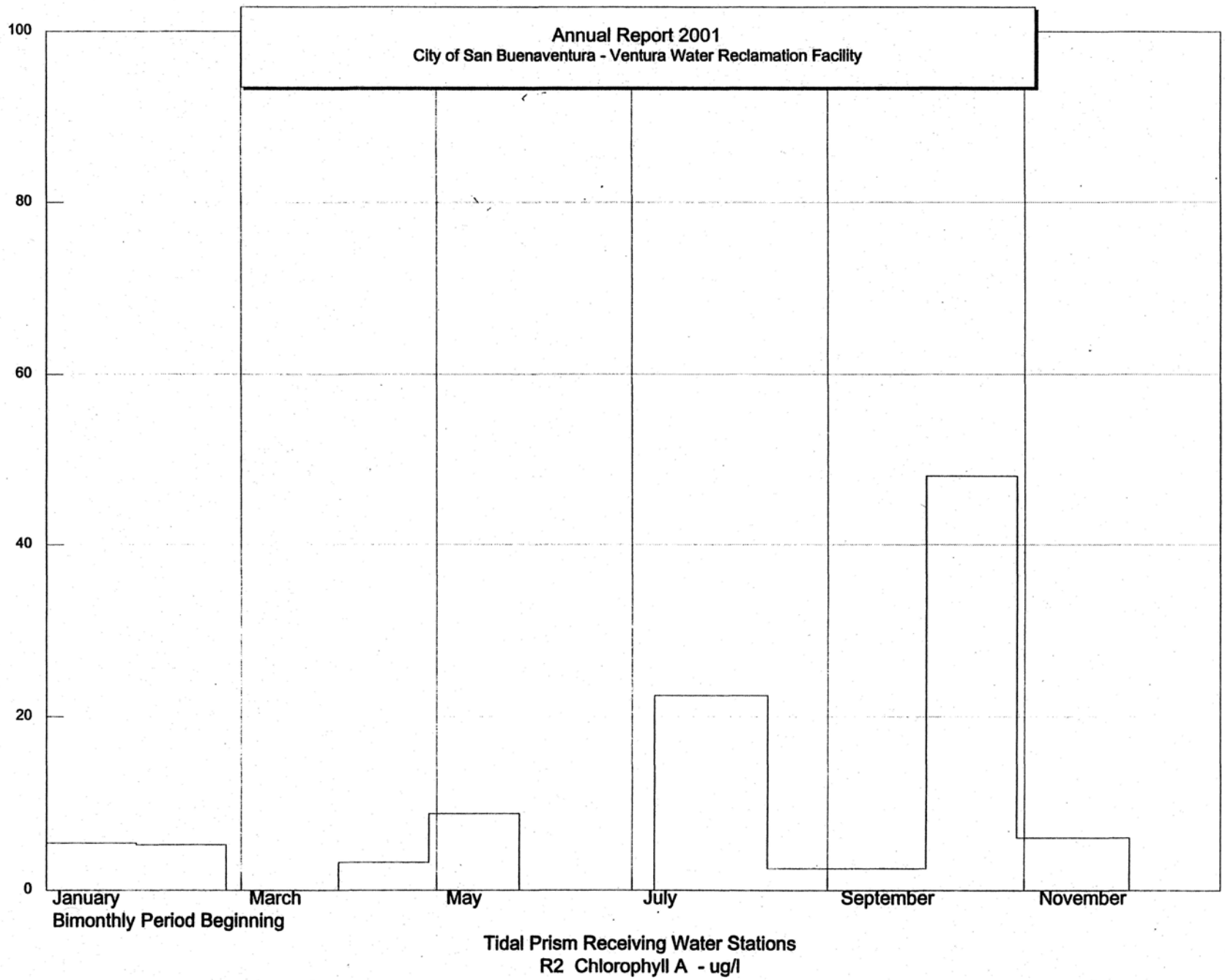
Tidal Prism Receiving Water Stations
R4 Weekly Hardness - mg/l

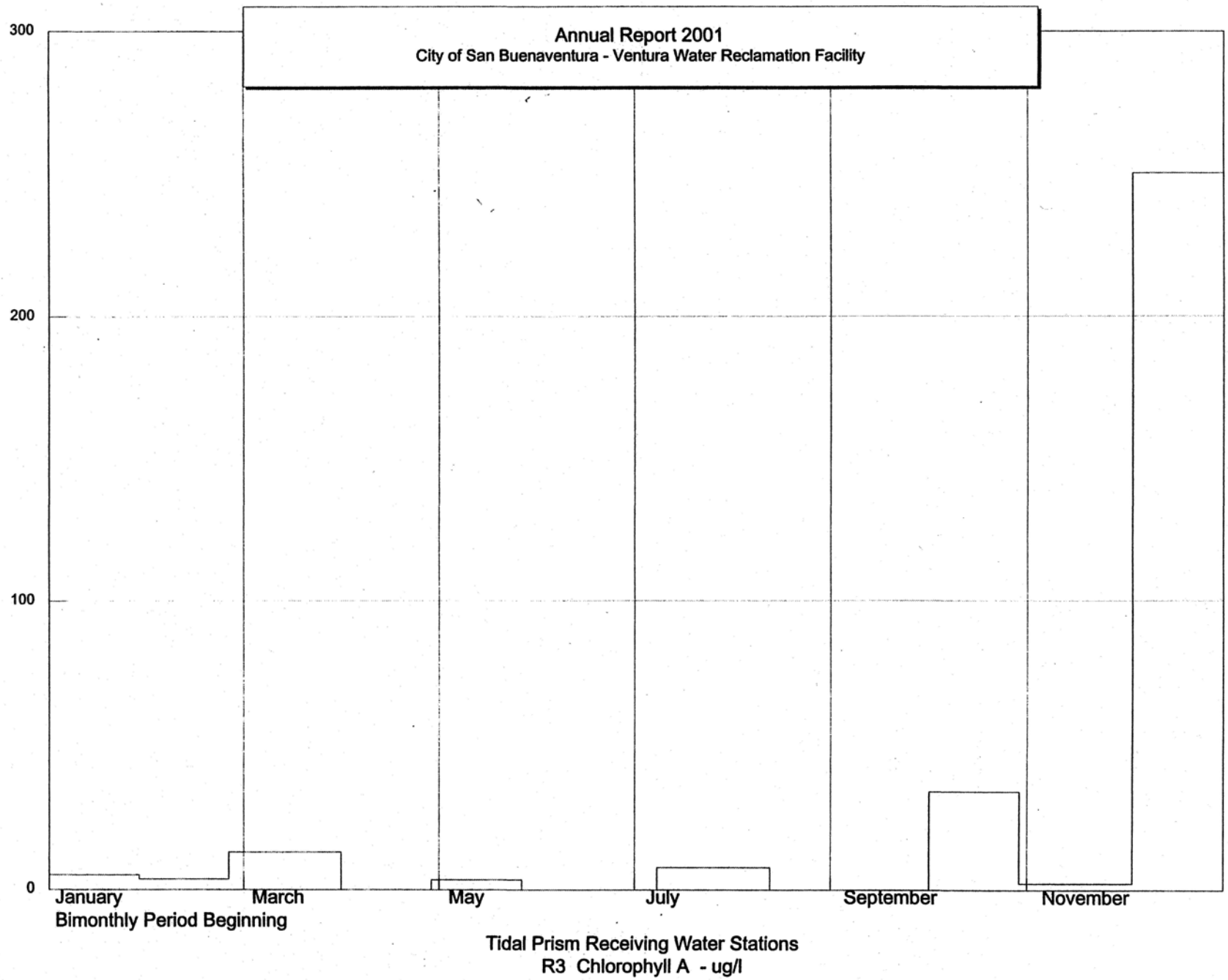

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
Thousands
5
4
3
2
1
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R4 30 Day Average Hardness - mg/l

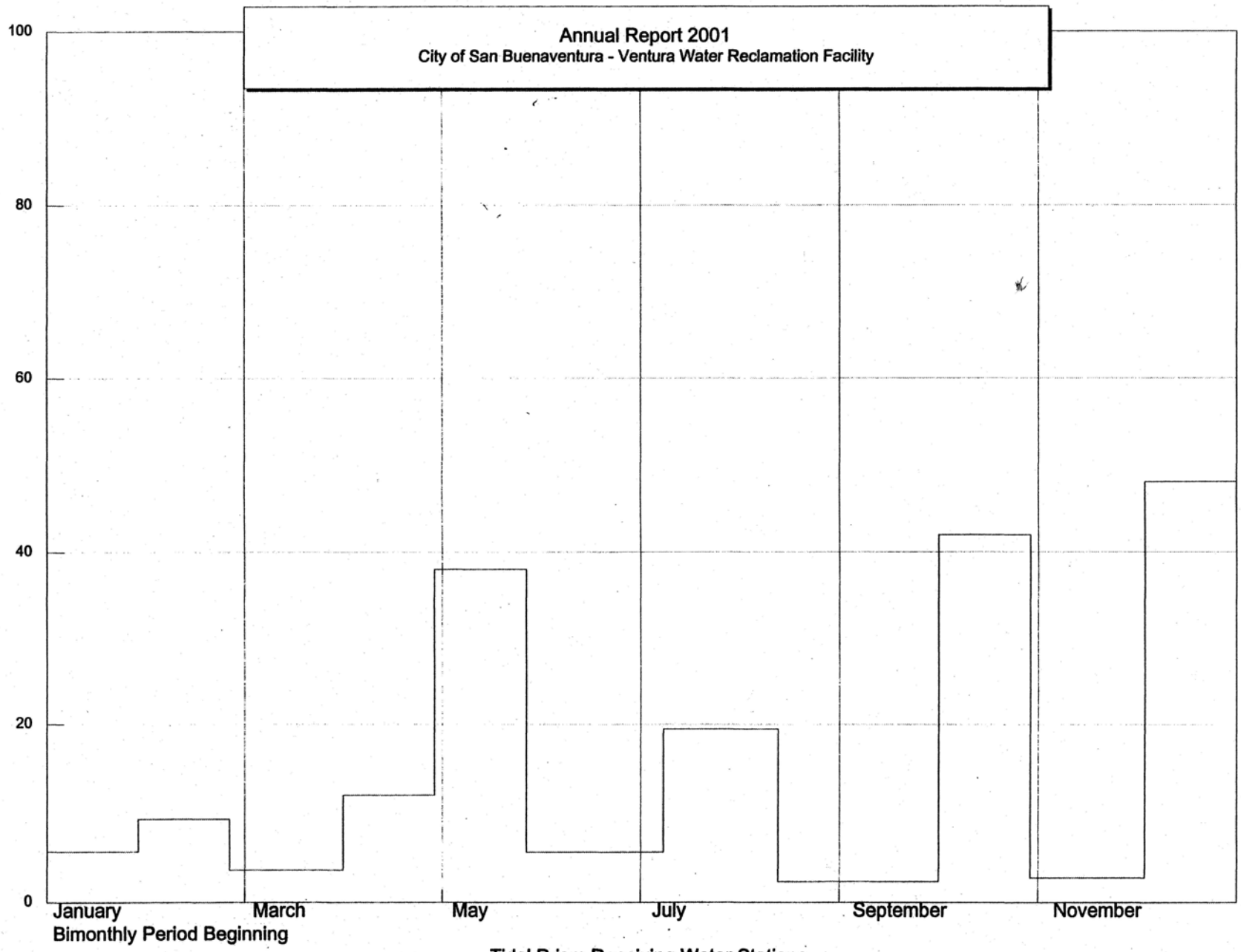

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
Thousands
5
4
3
2
1
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
L5 Weekly Hardness - mg/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
Thousands
5
4
3
2
1
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
L5 30 Day Average Hardness - mg/l

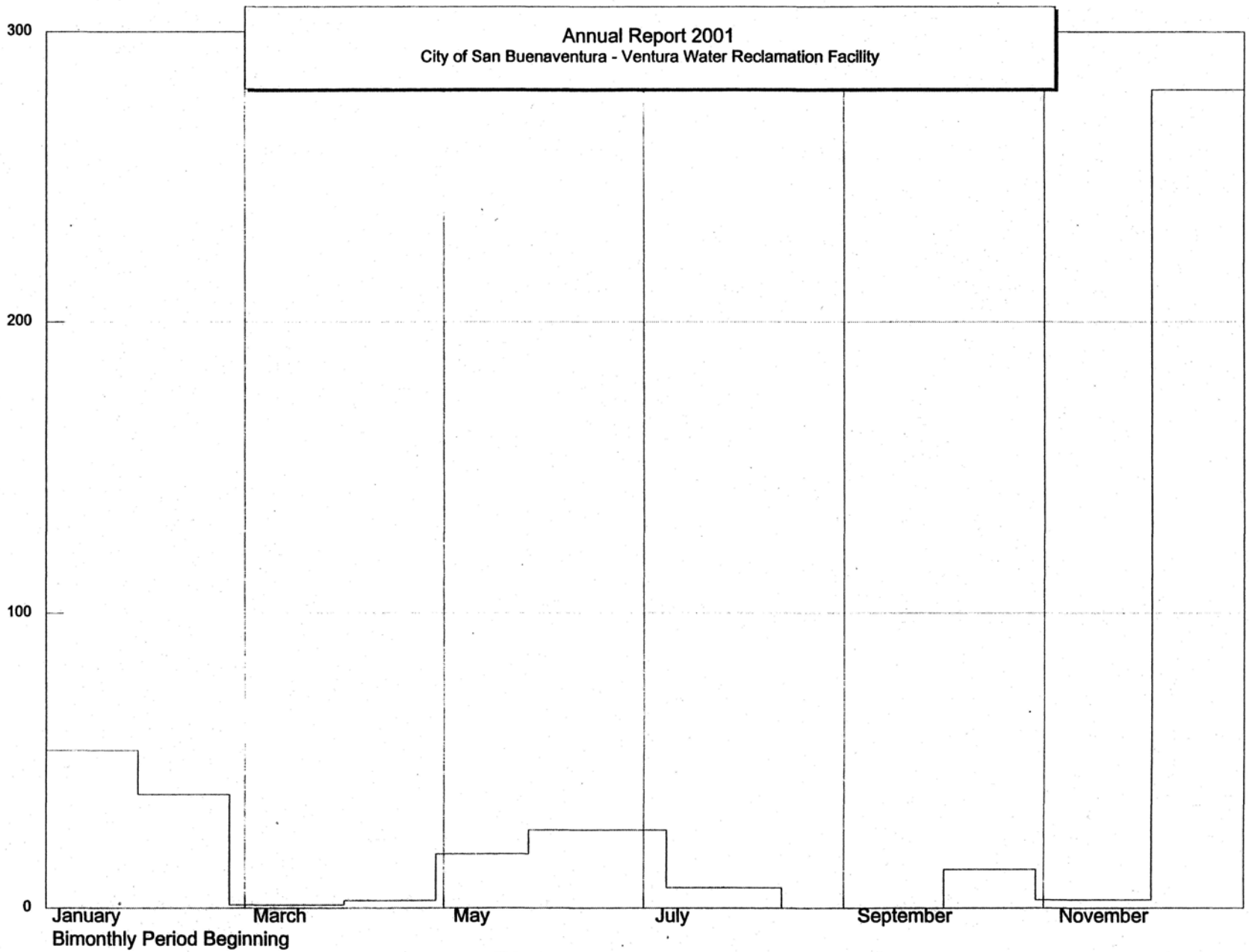

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
400
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R1 Chlorophyll A - ug/l

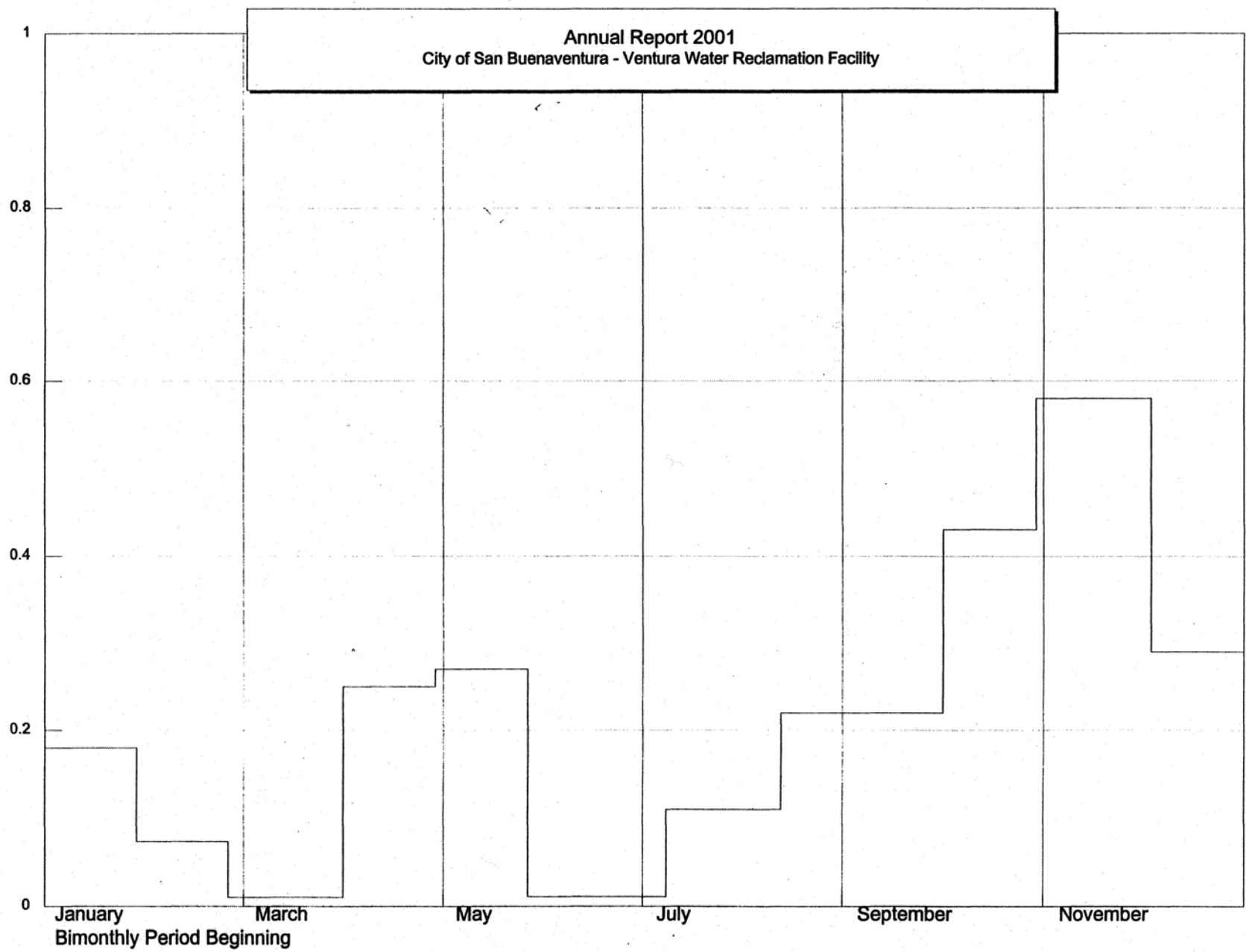

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
100
80
60
40
20
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R2 Chlorophyll A - ug/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R3 Chlorophyll A - ug/l

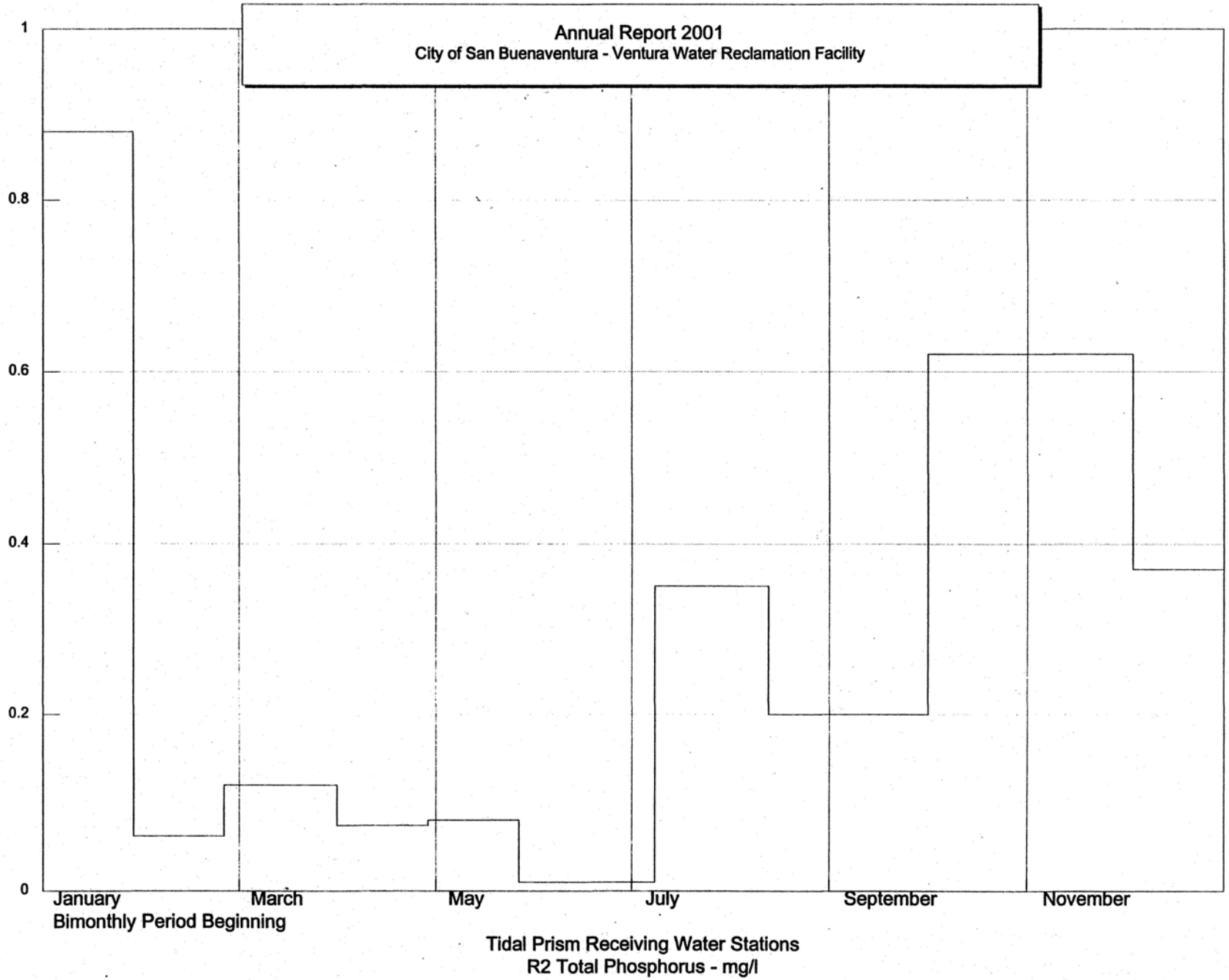


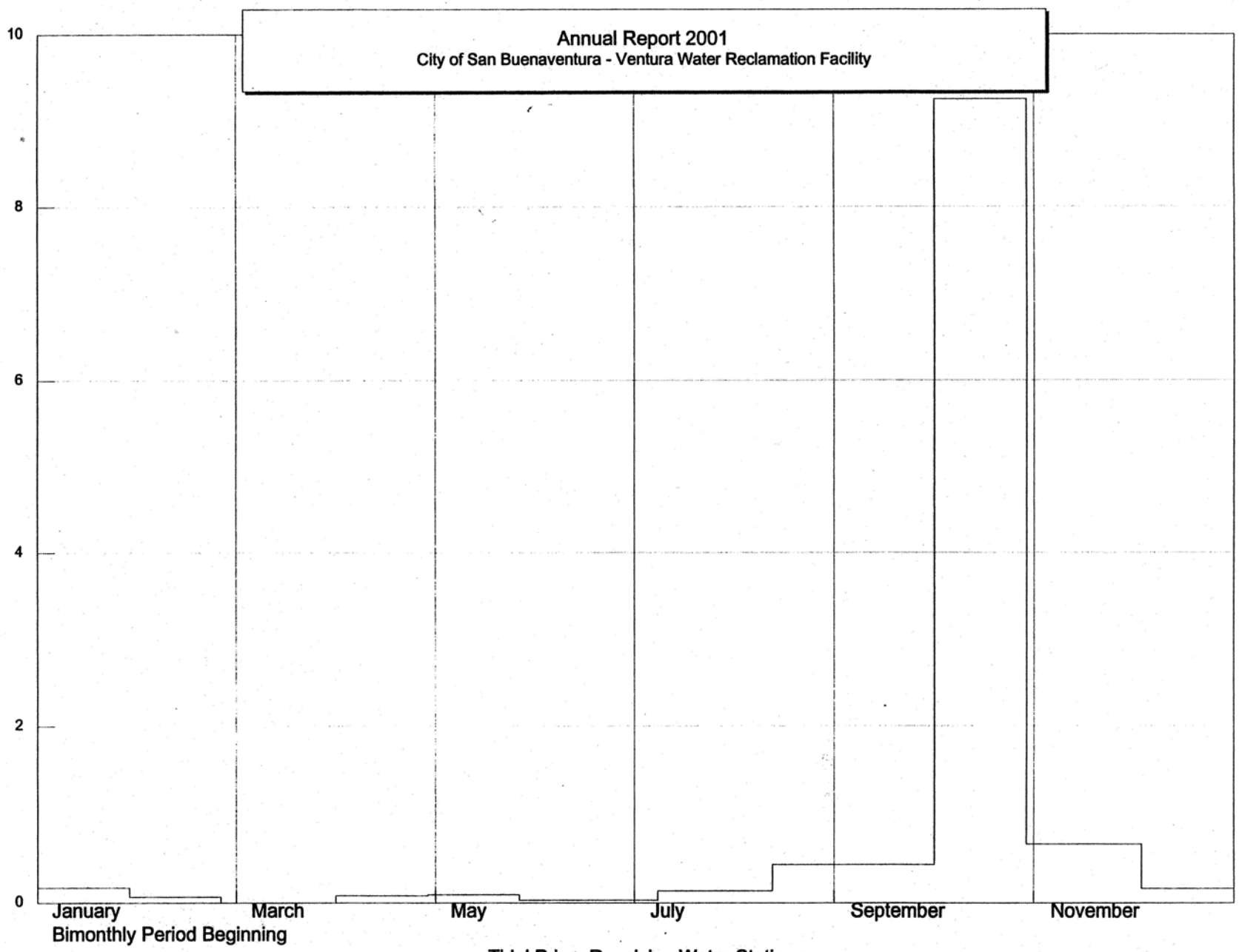
Tidal Prism Receiving Water Stations
R4 Chlorophyll A - ug/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
300
200
100
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
L5 Chlorophyll A - ug/l

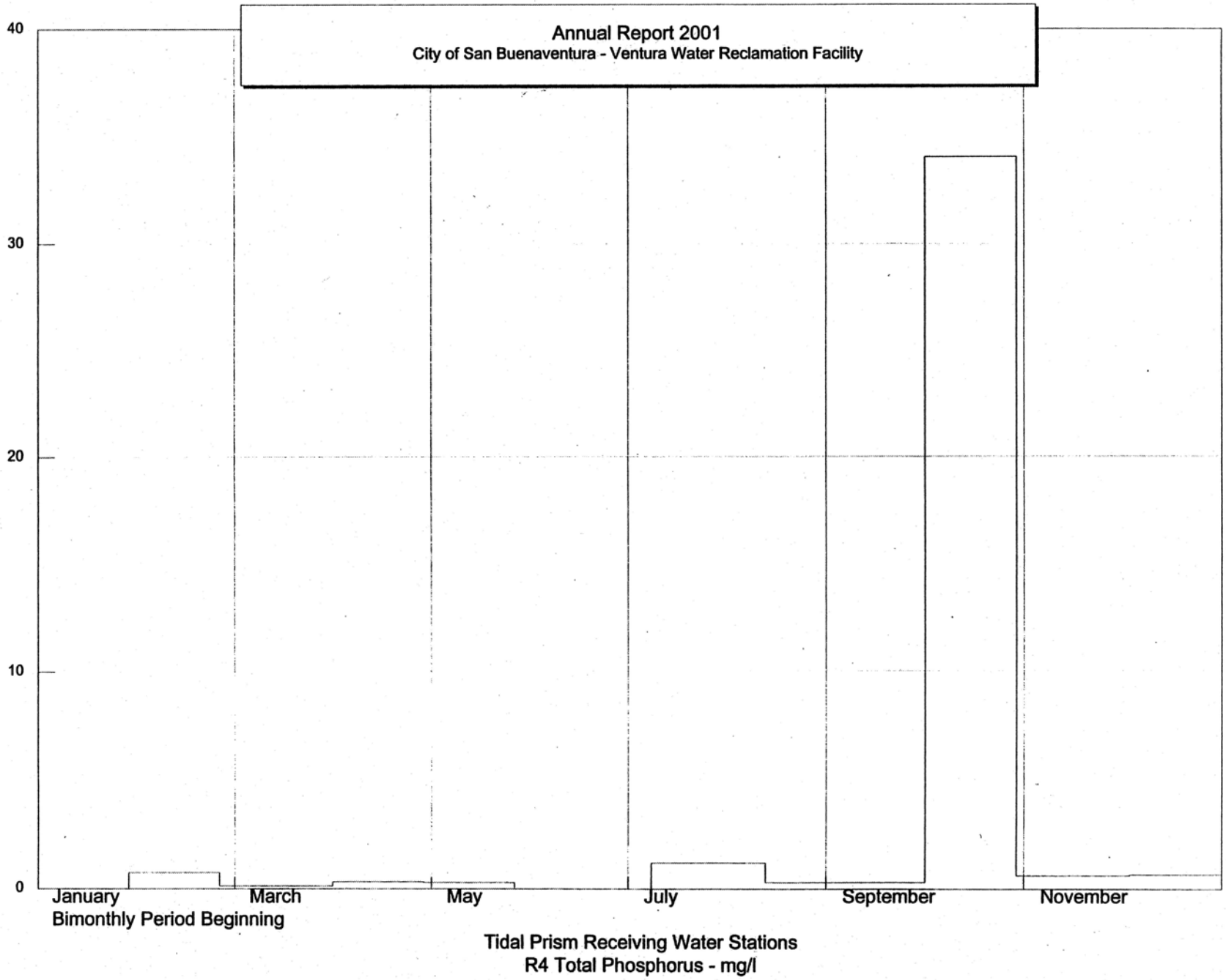


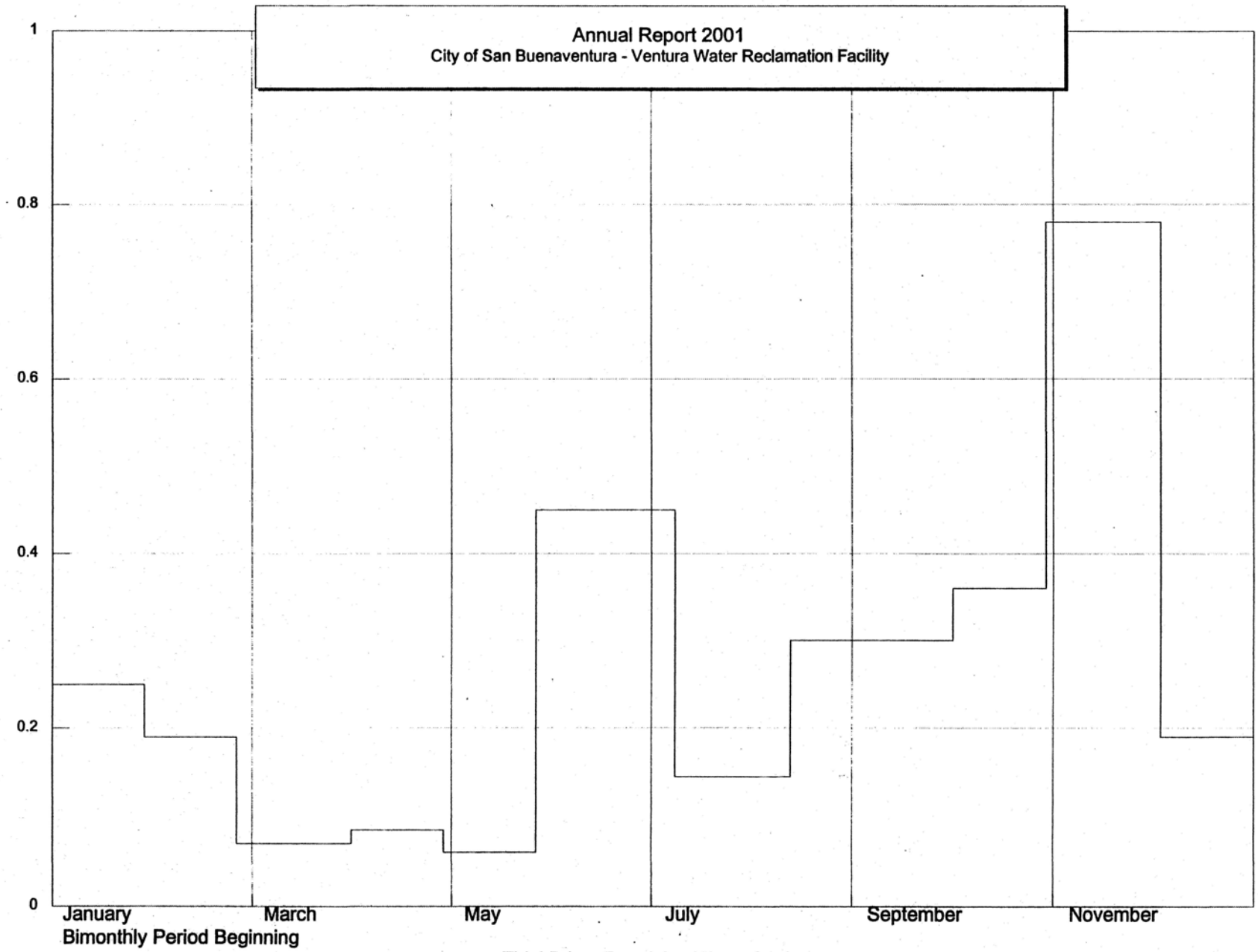
Tidal Prism Receiving Water Stations
R1 Total Phosphorus - mg/l


Annual Report 2001
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
Tidal Prism Receiving Water Stations
R2 Total Phosphorus - mg/l

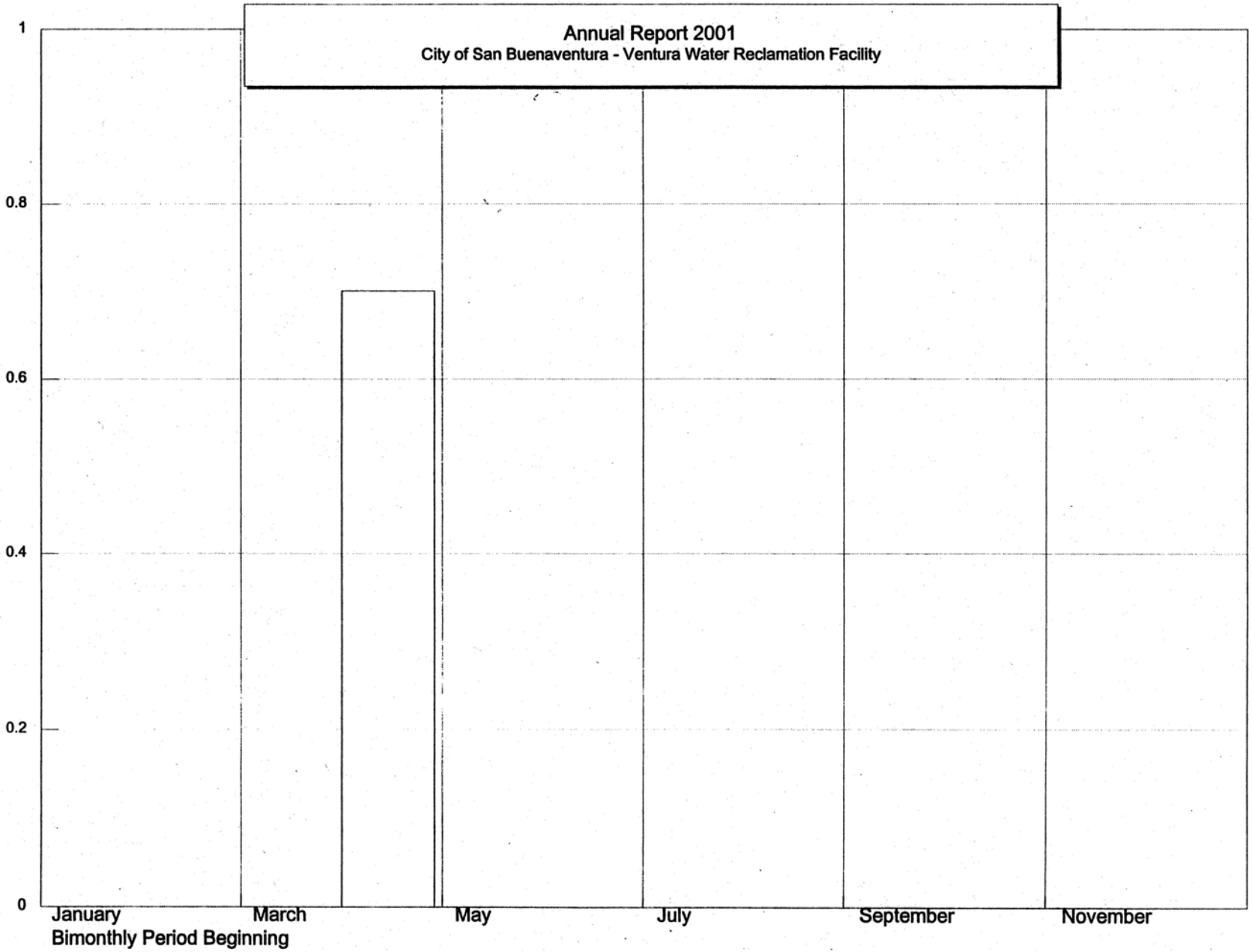


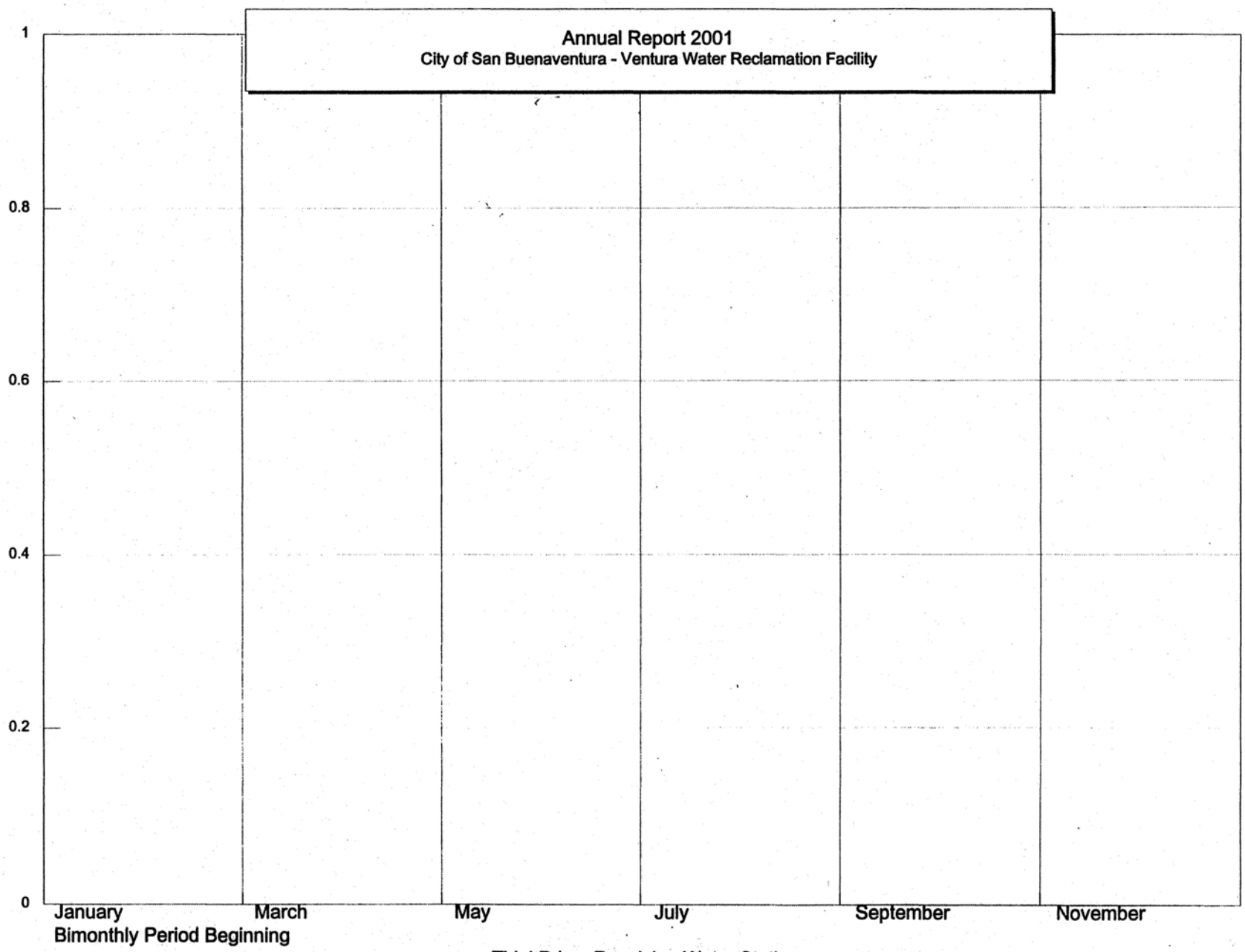
Tidal Prism Receiving Water Stations
R3 Total Phosphorus - mg/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
40
30
20
10
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R4 Total Phosphorus - mg/l

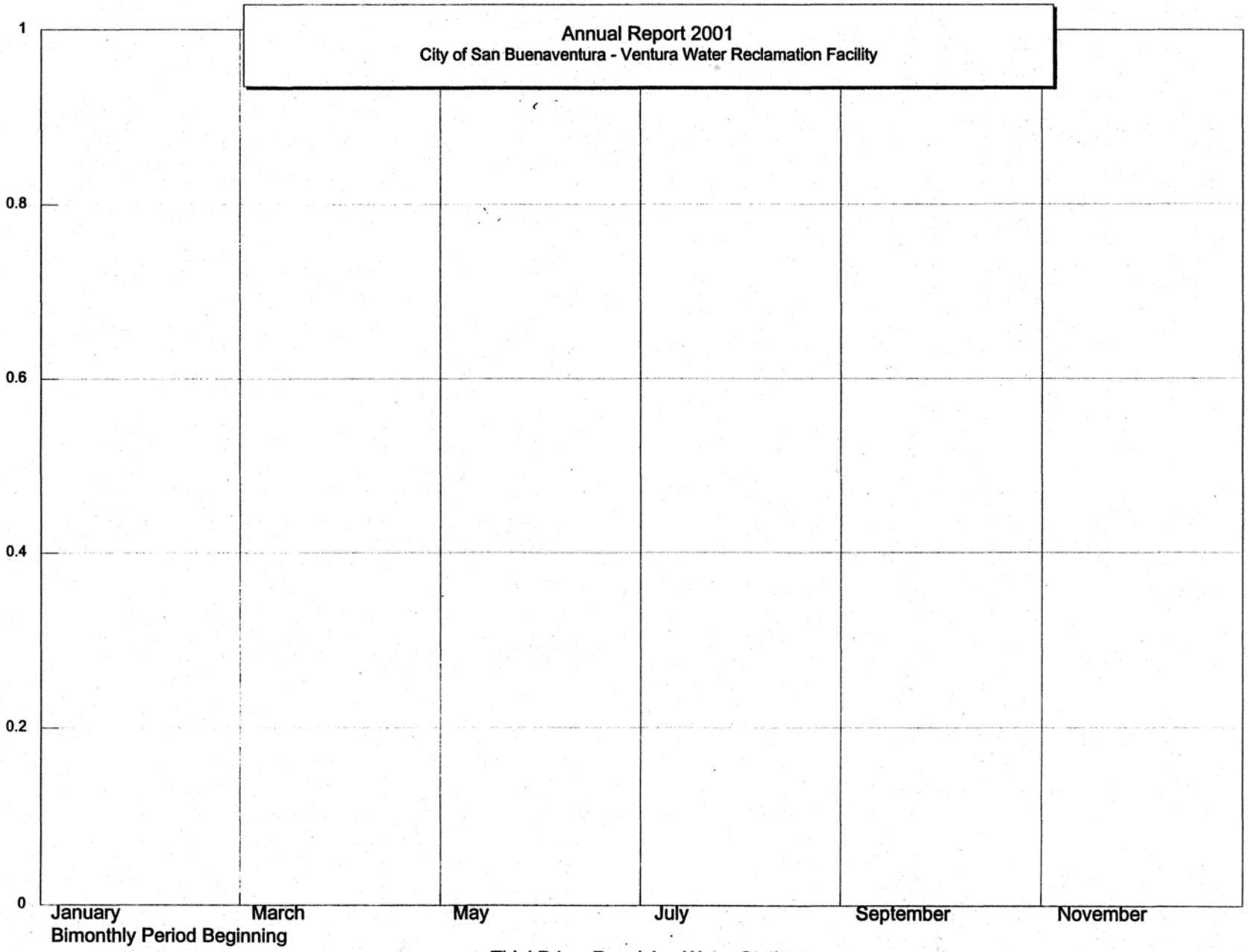


Tidal Prism Receiving Water Stations
L5 Total Phosphorus - mg/l

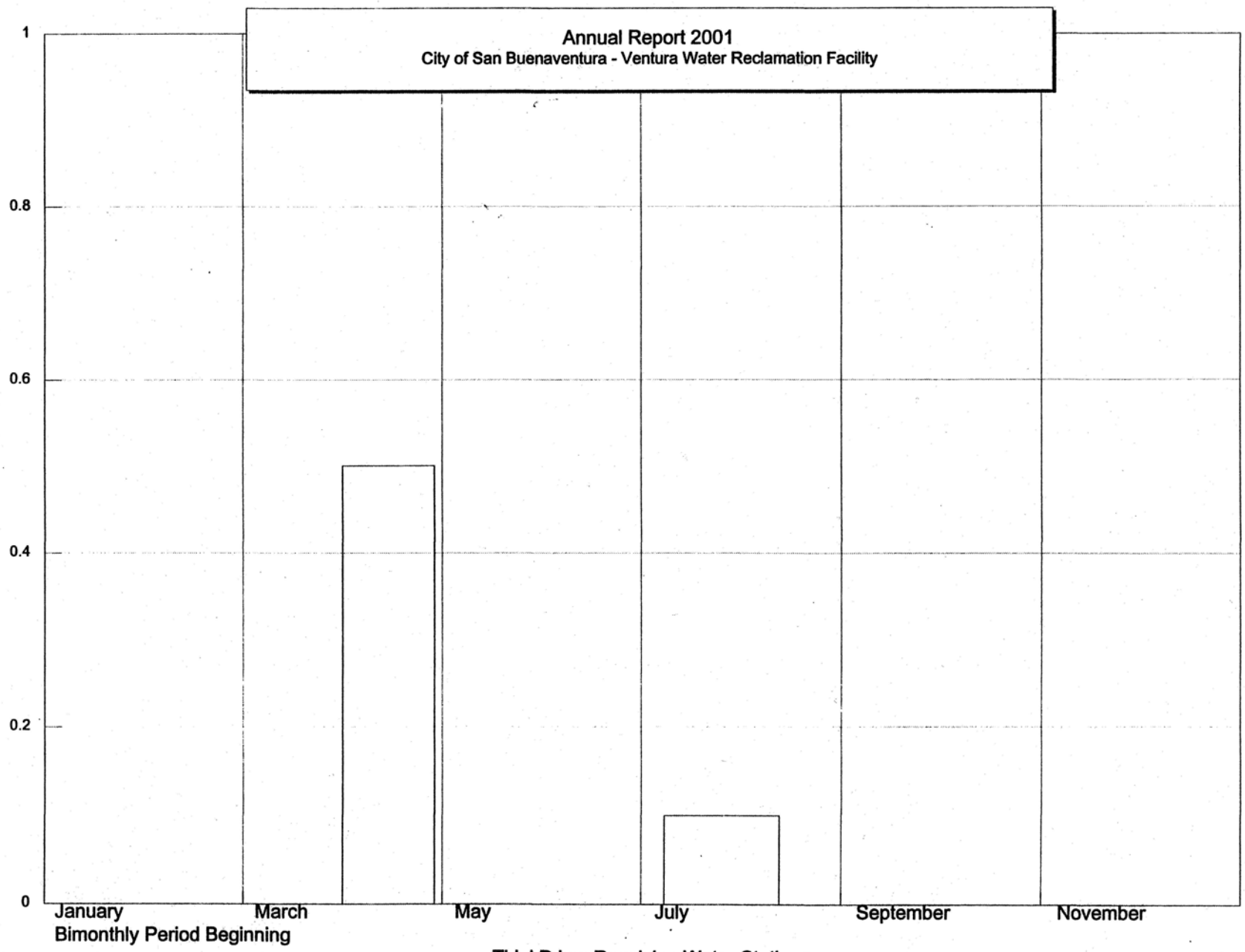

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
1
0.8
0.6
0.4
0.2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R1 Nitrite-N - mg/l



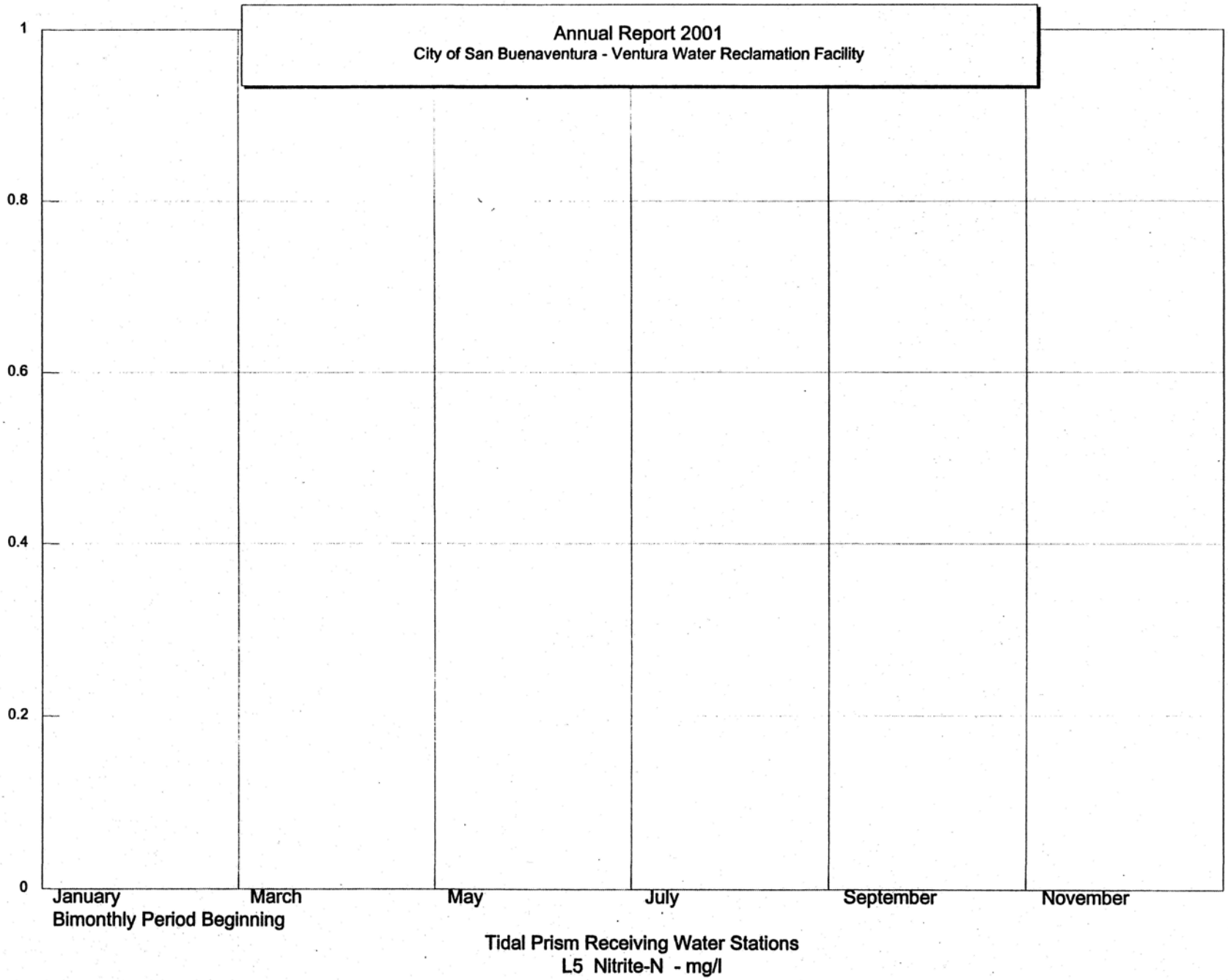
Tidal Prism Receiving Water Stations
R2 Nitrite-N - mg/l



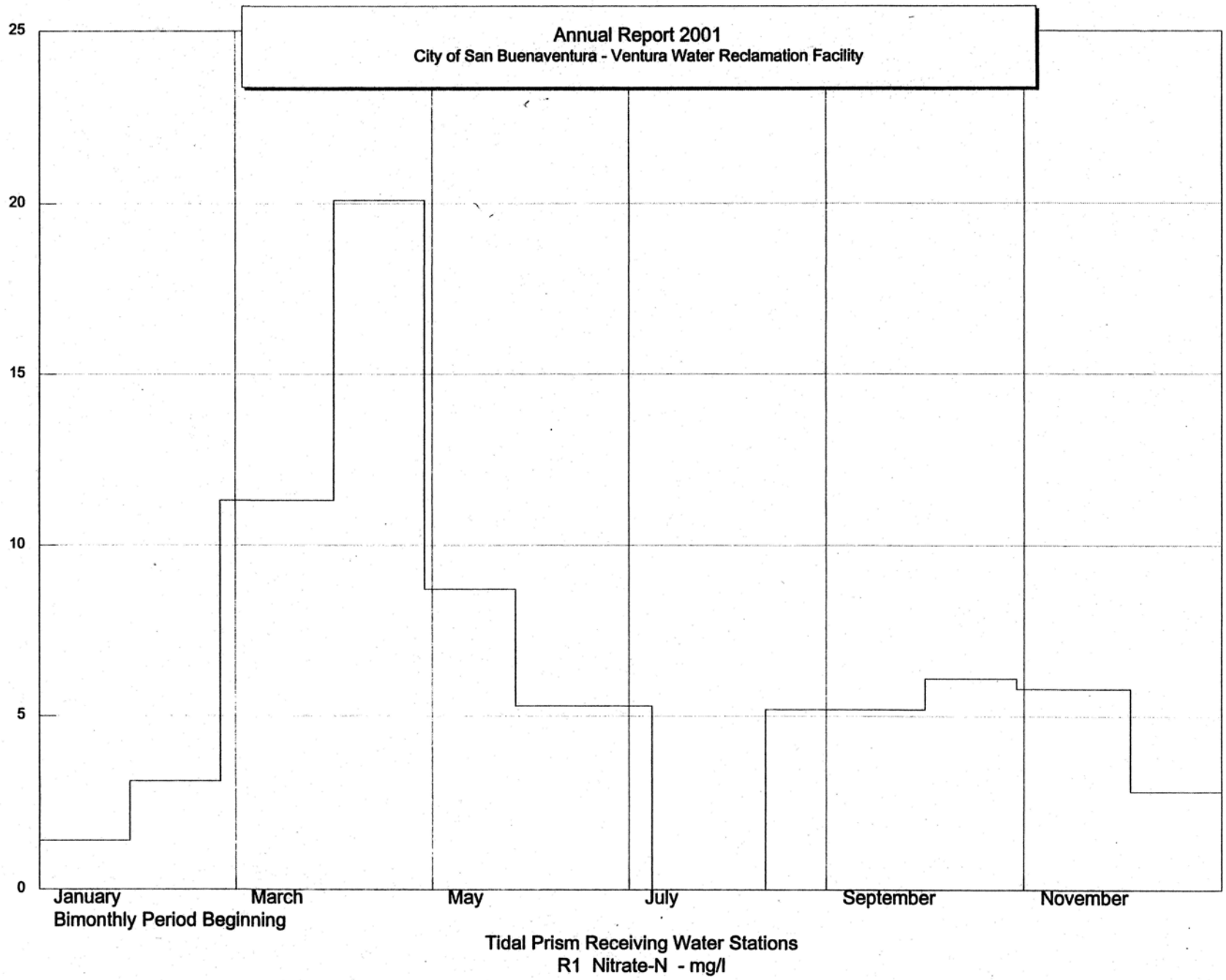
Tidal Prism Receiving Water Stations
R3 Nitrite-N - mg/l

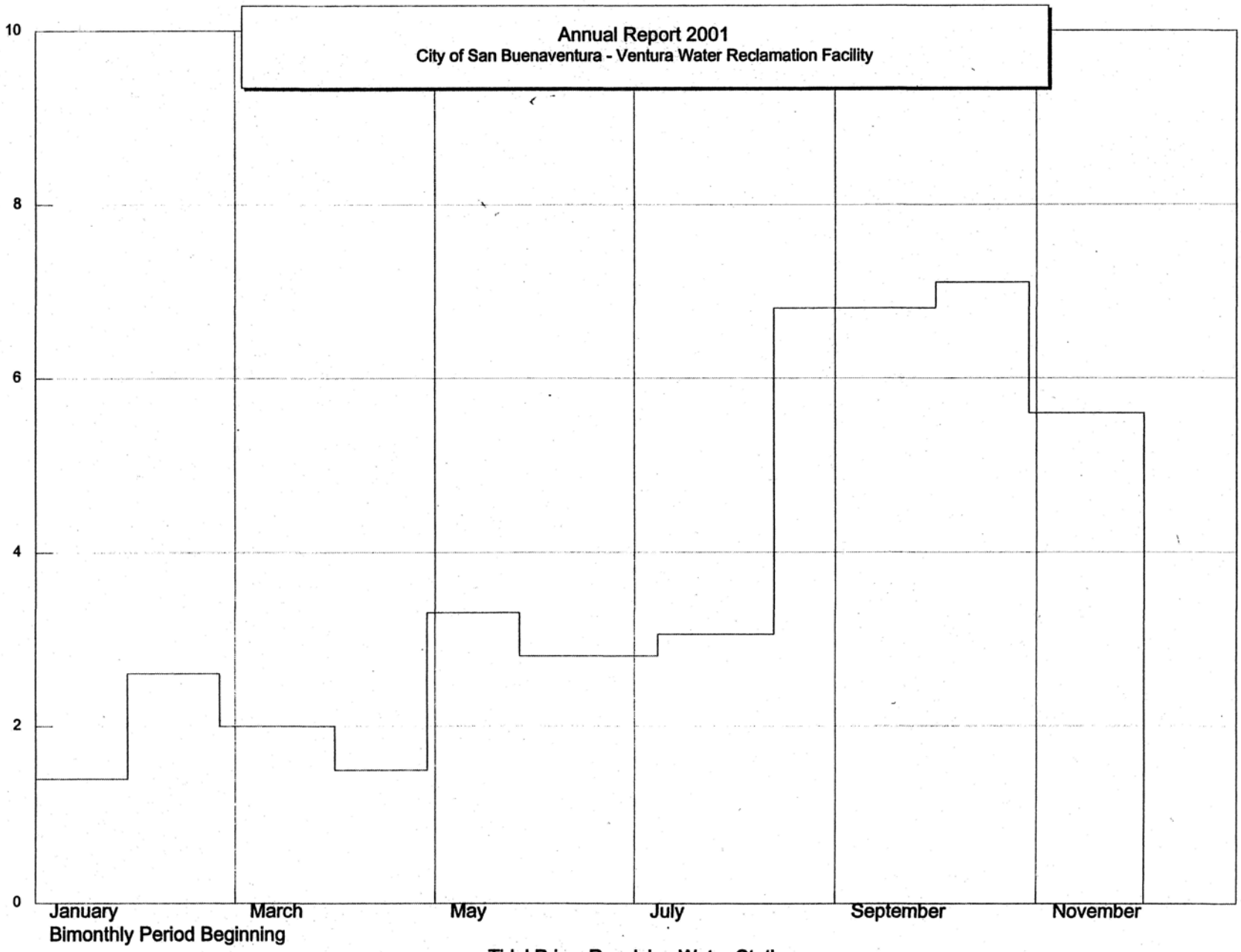


Tidal Prism Receiving Water Stations
R4 Nitrite-N - mg/l

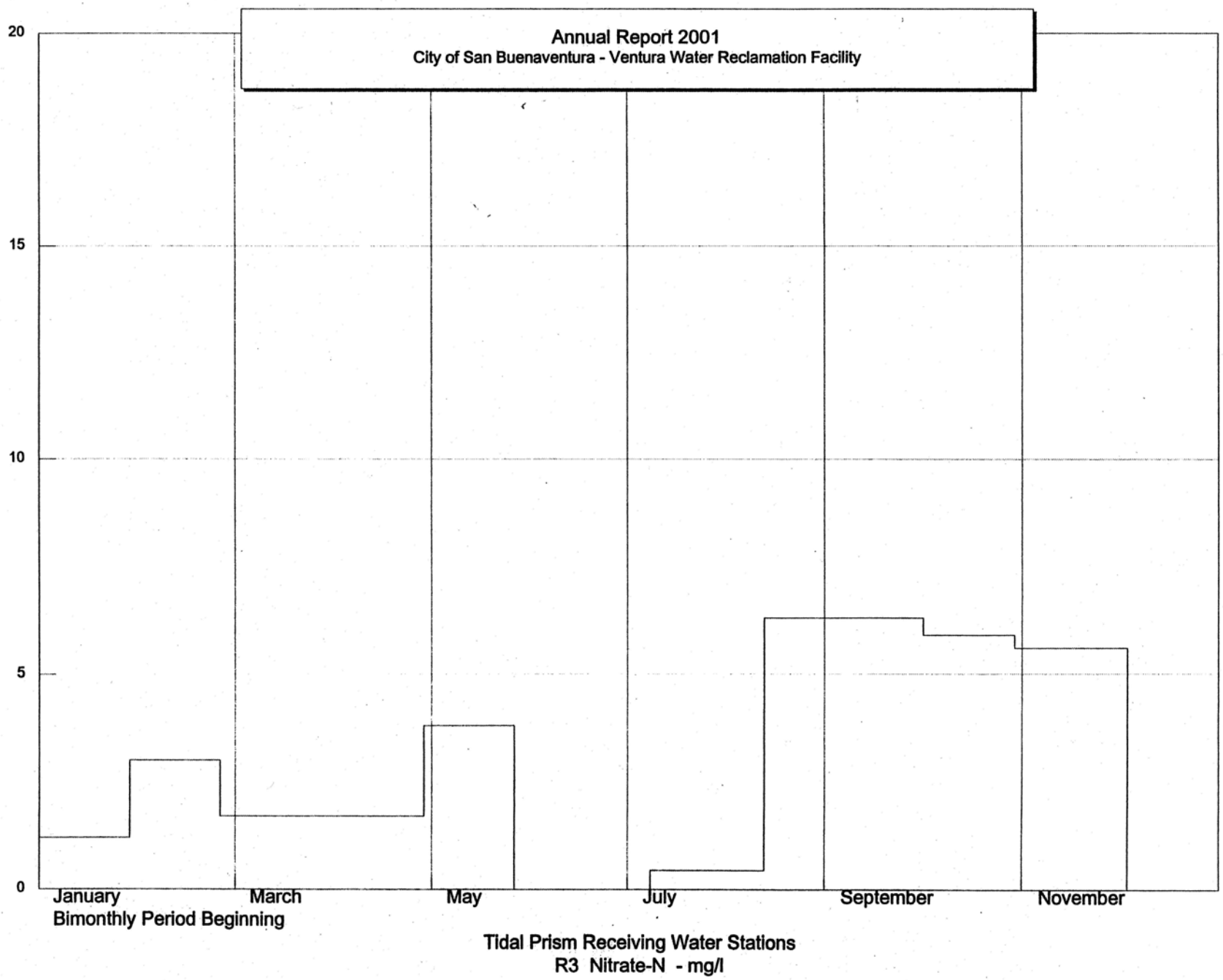


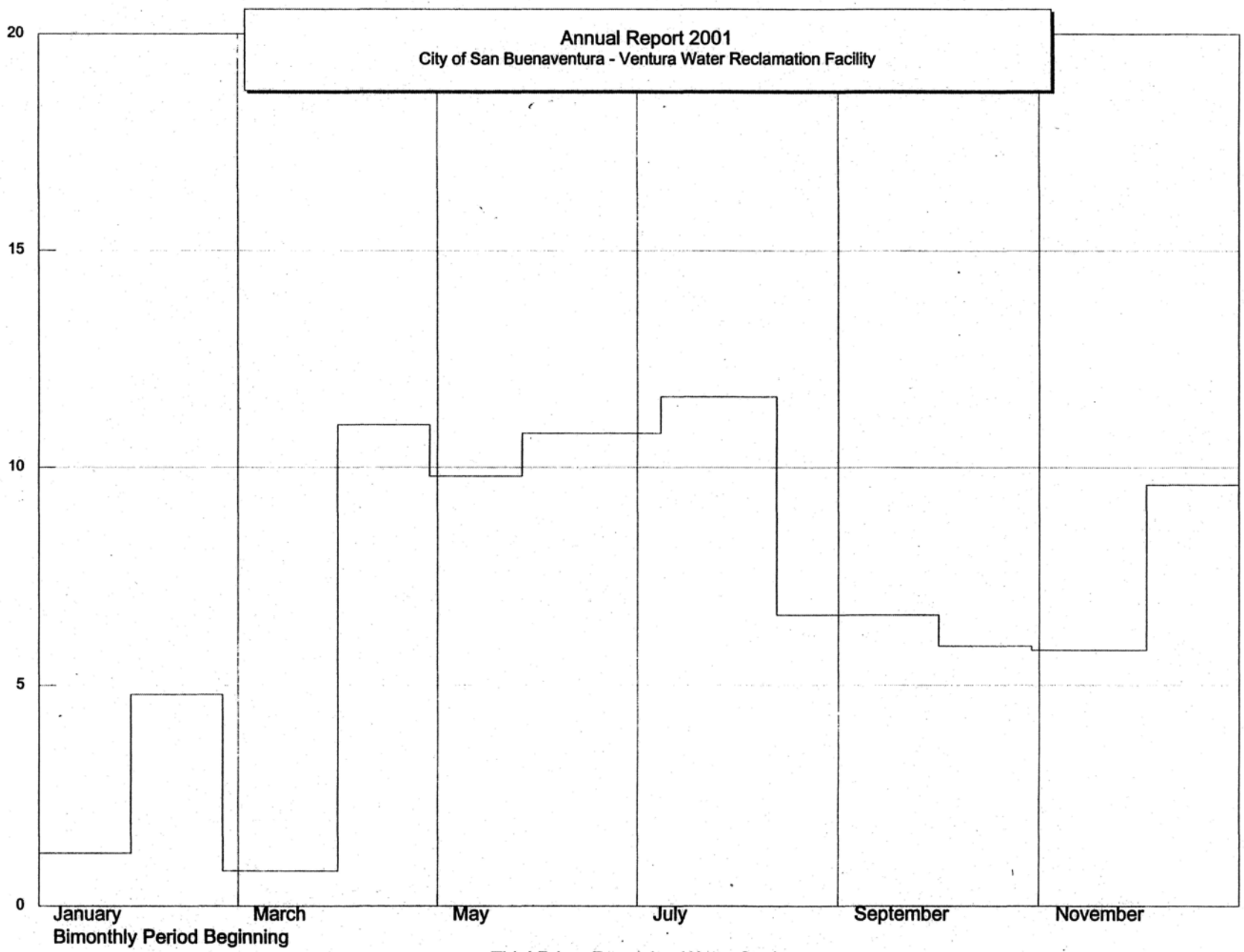
Tidal Prism Receiving Water Stations
L5 Nitrite-N - mg/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
25
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R1 Nitrate-N - mg/l

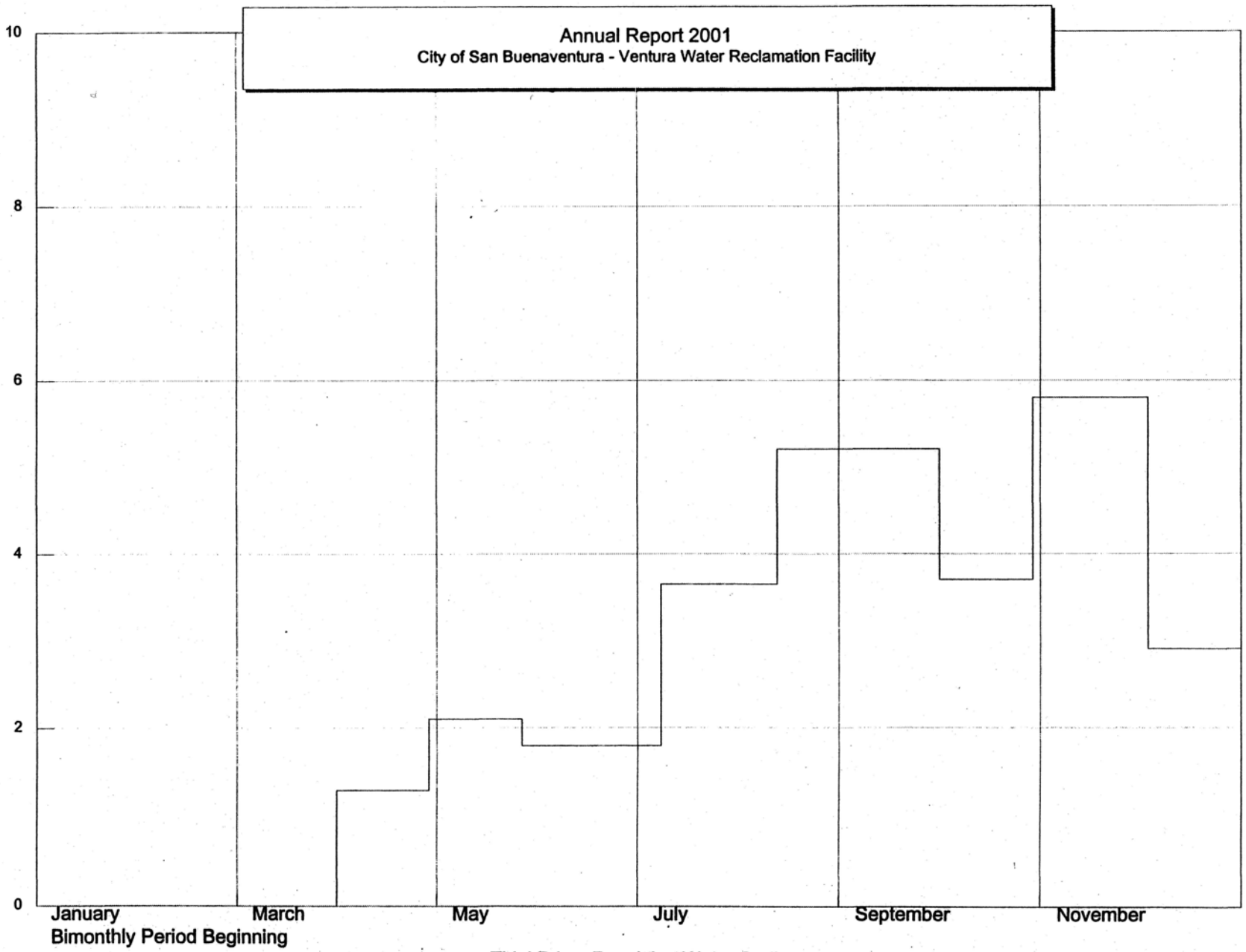


Tidal Prism Receiving Water Stations
R2 Nitrate-N - mg/l

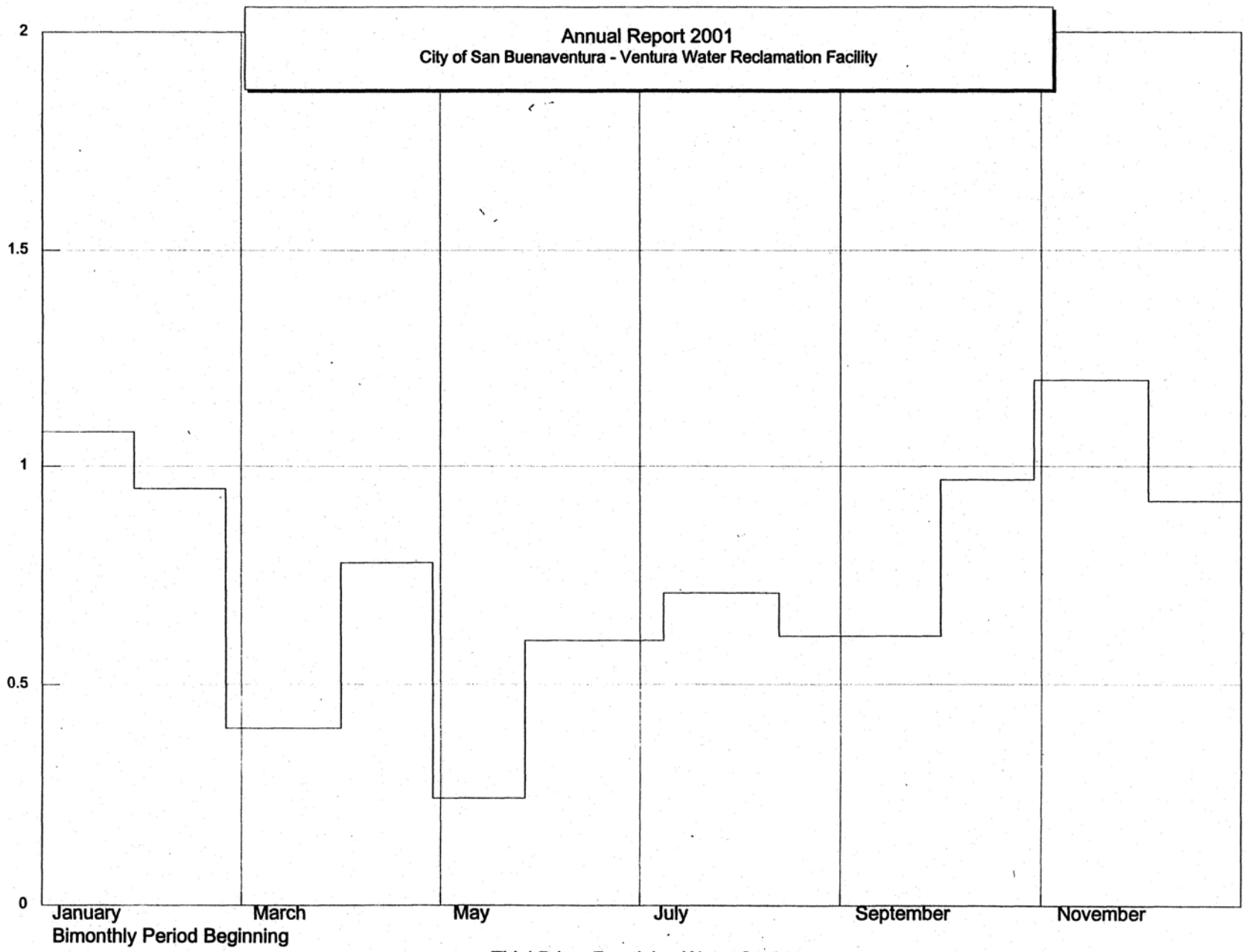

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
20
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R3 Nitrate-N - mg/l



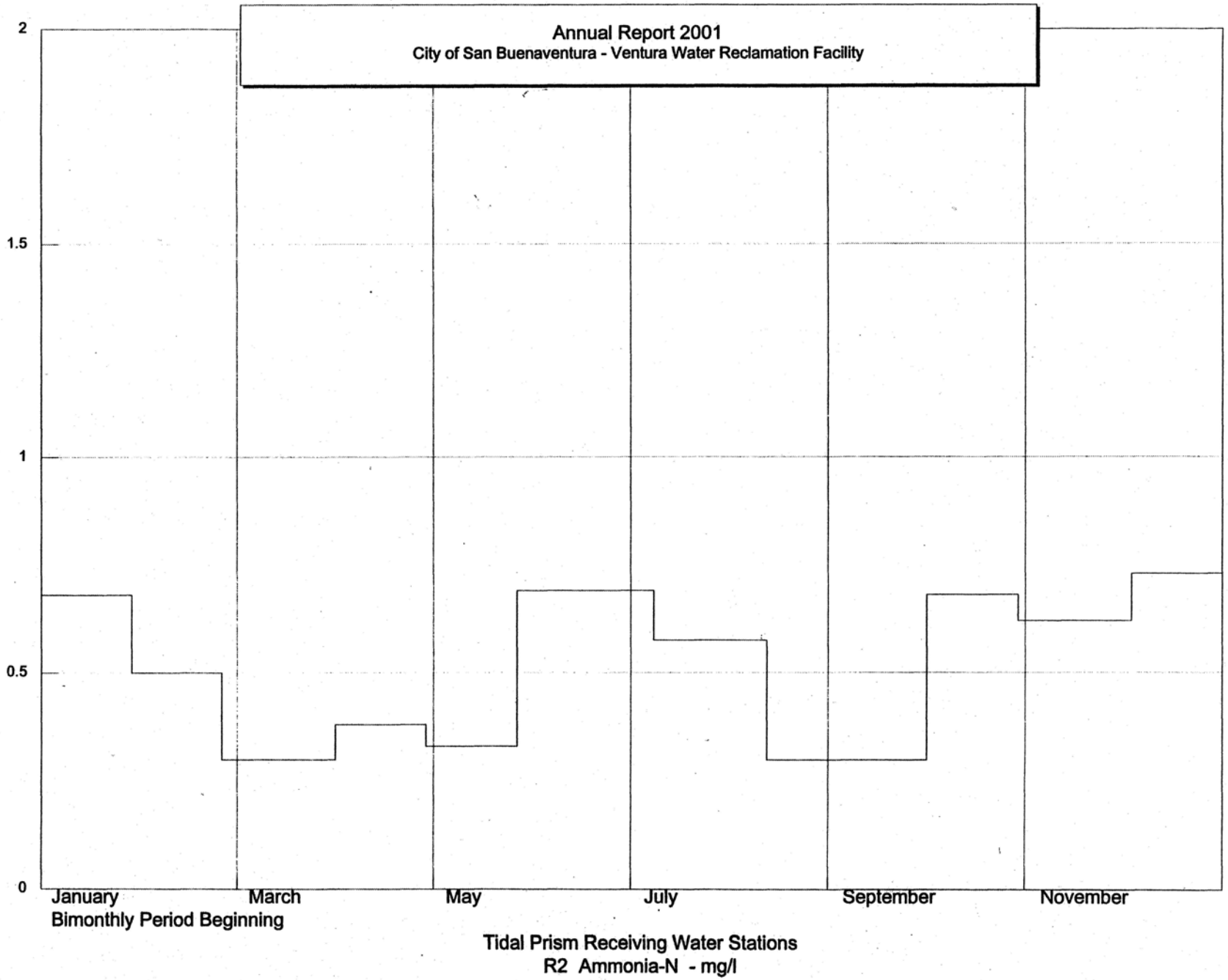
Tidal Prism Receiving Water Stations
R4 Nitrate-N - mg/l

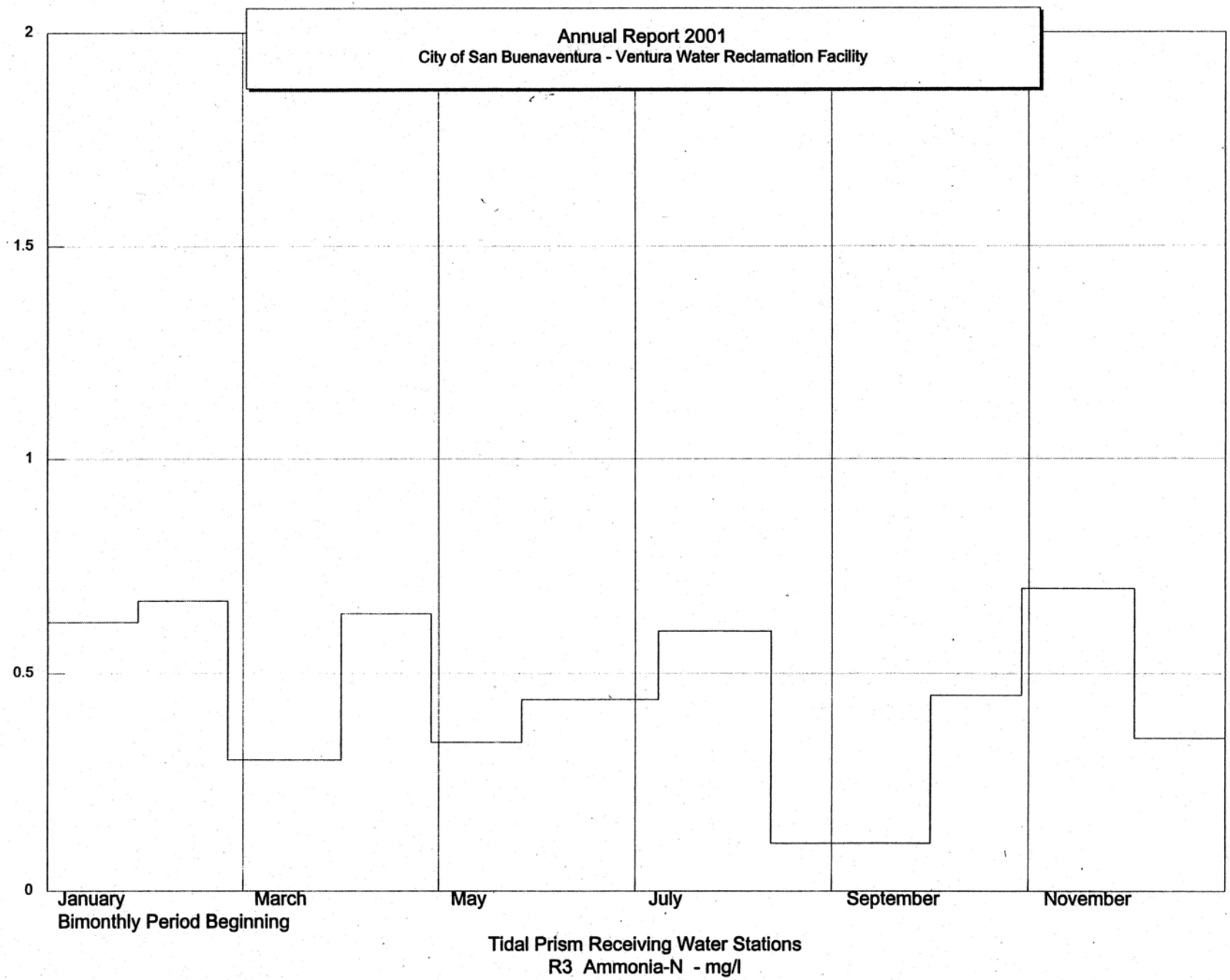


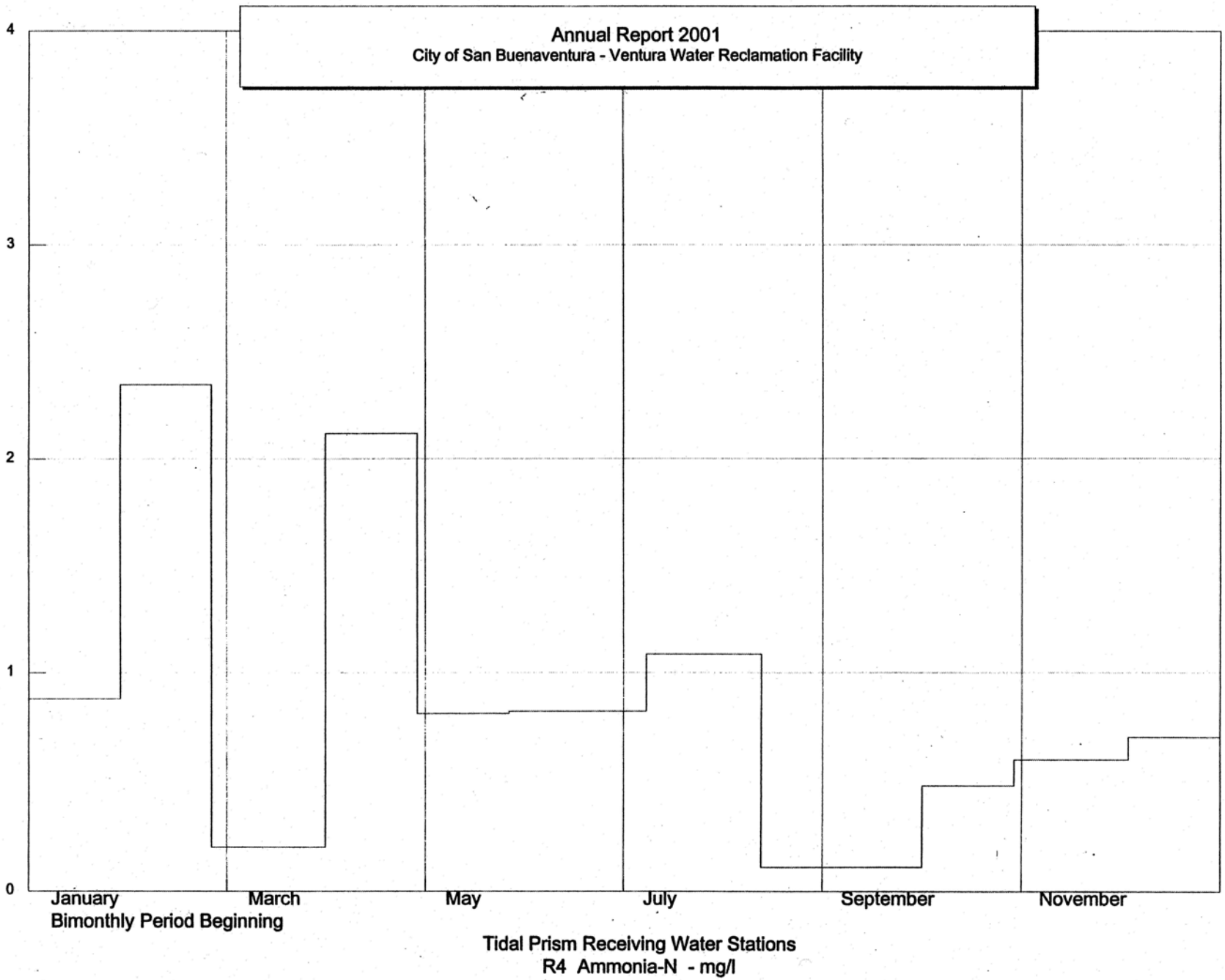
Tidal Prism Receiving Water Stations
L5 Nitrate-N - mg/l

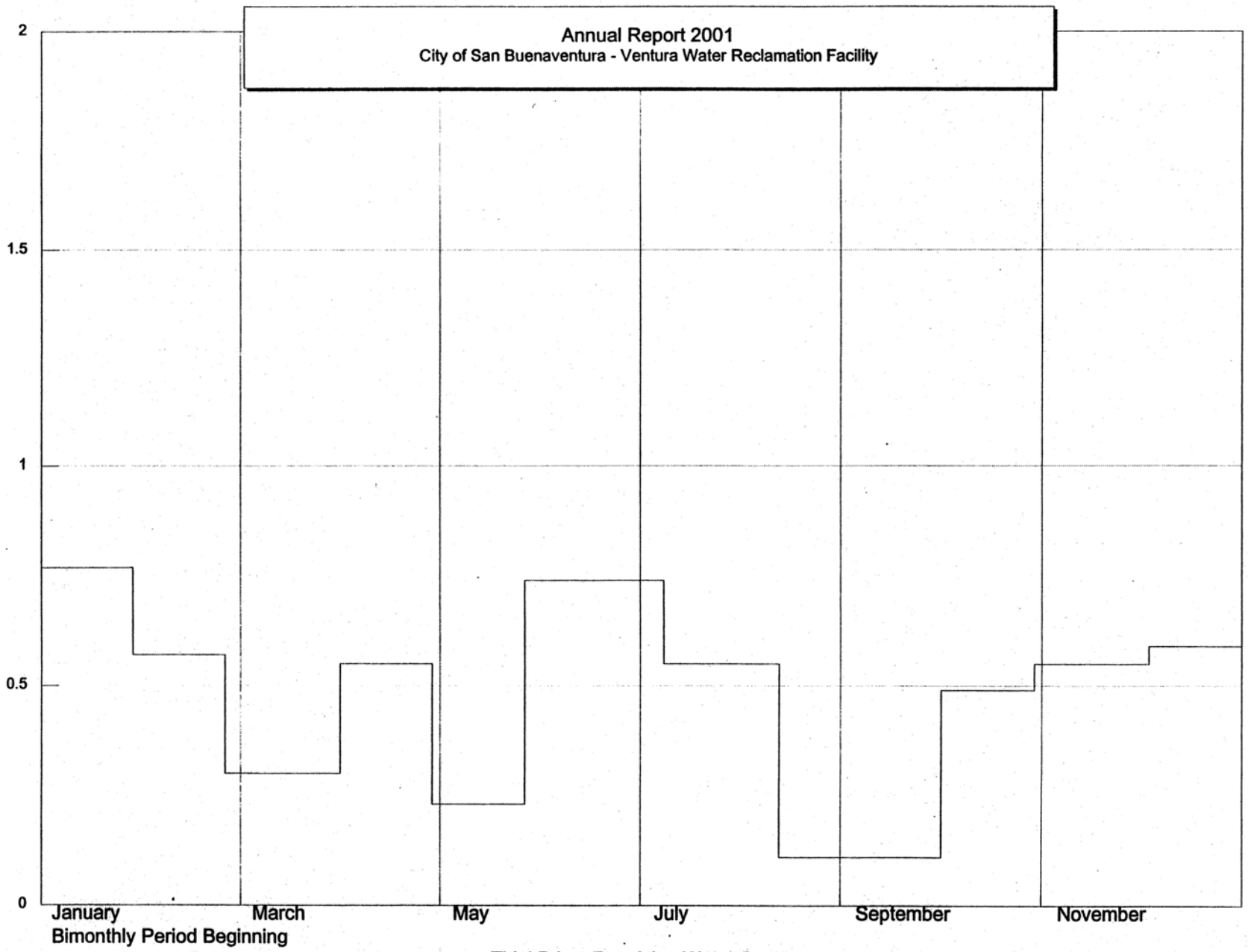


Tidal Prism Receiving Water Stations
R1 Ammonia-N - mg/l

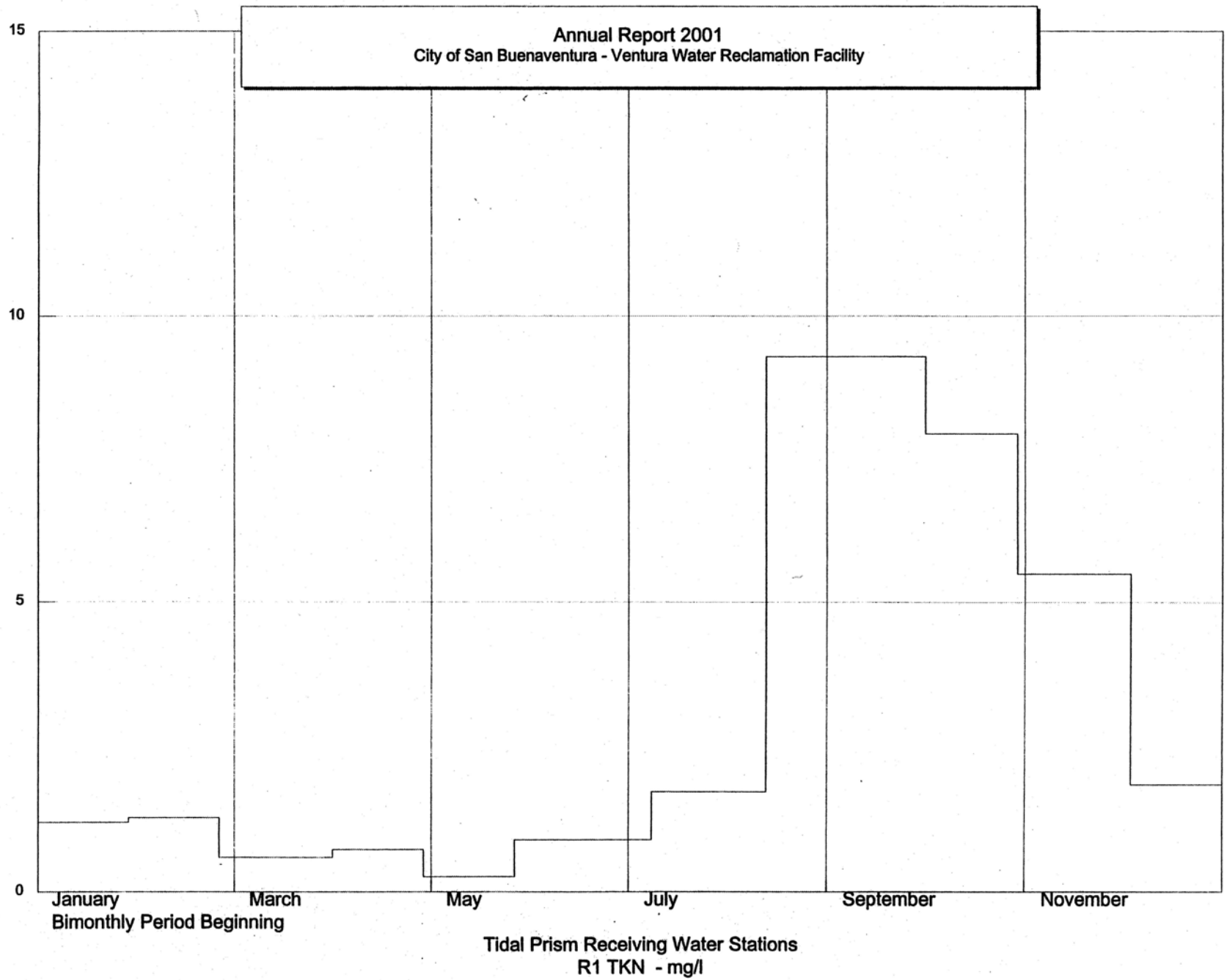

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
2
1.5
1
0.5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R2 Ammonia-N - mg/l

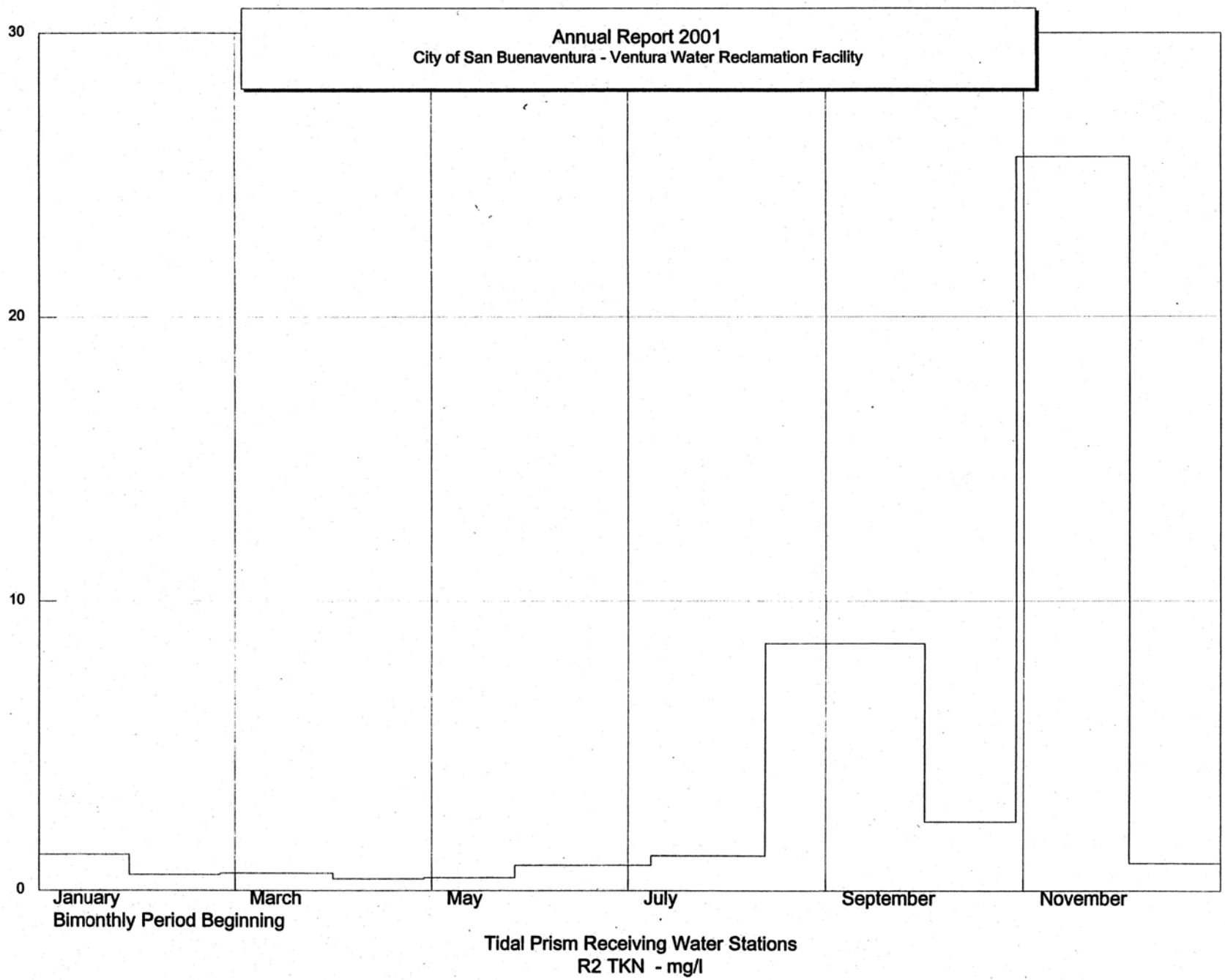

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
2
1.5
1
0.5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R3 Ammonia-N - mg/l

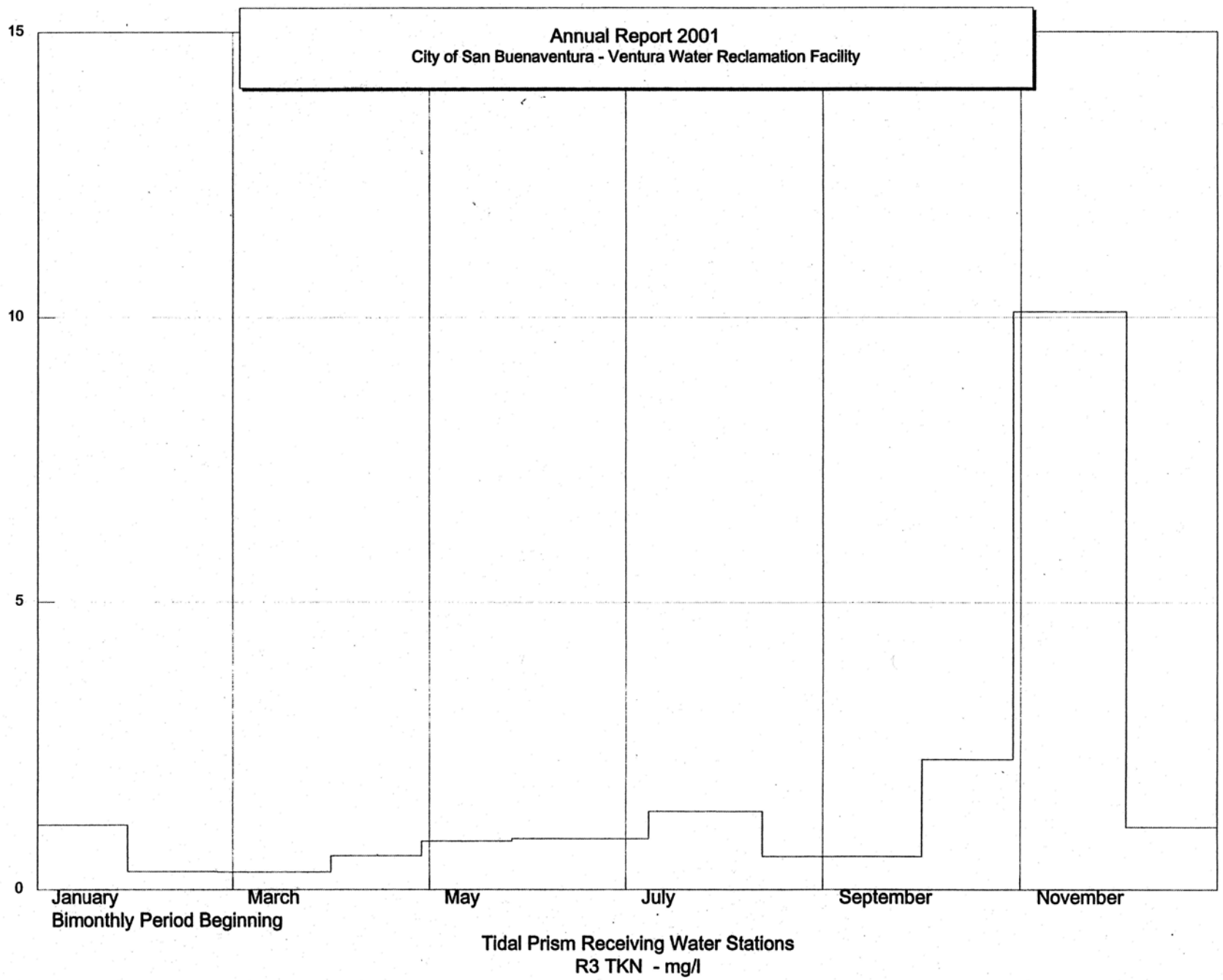

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
4
3
2
1
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R4 Ammonia-N - mg/l

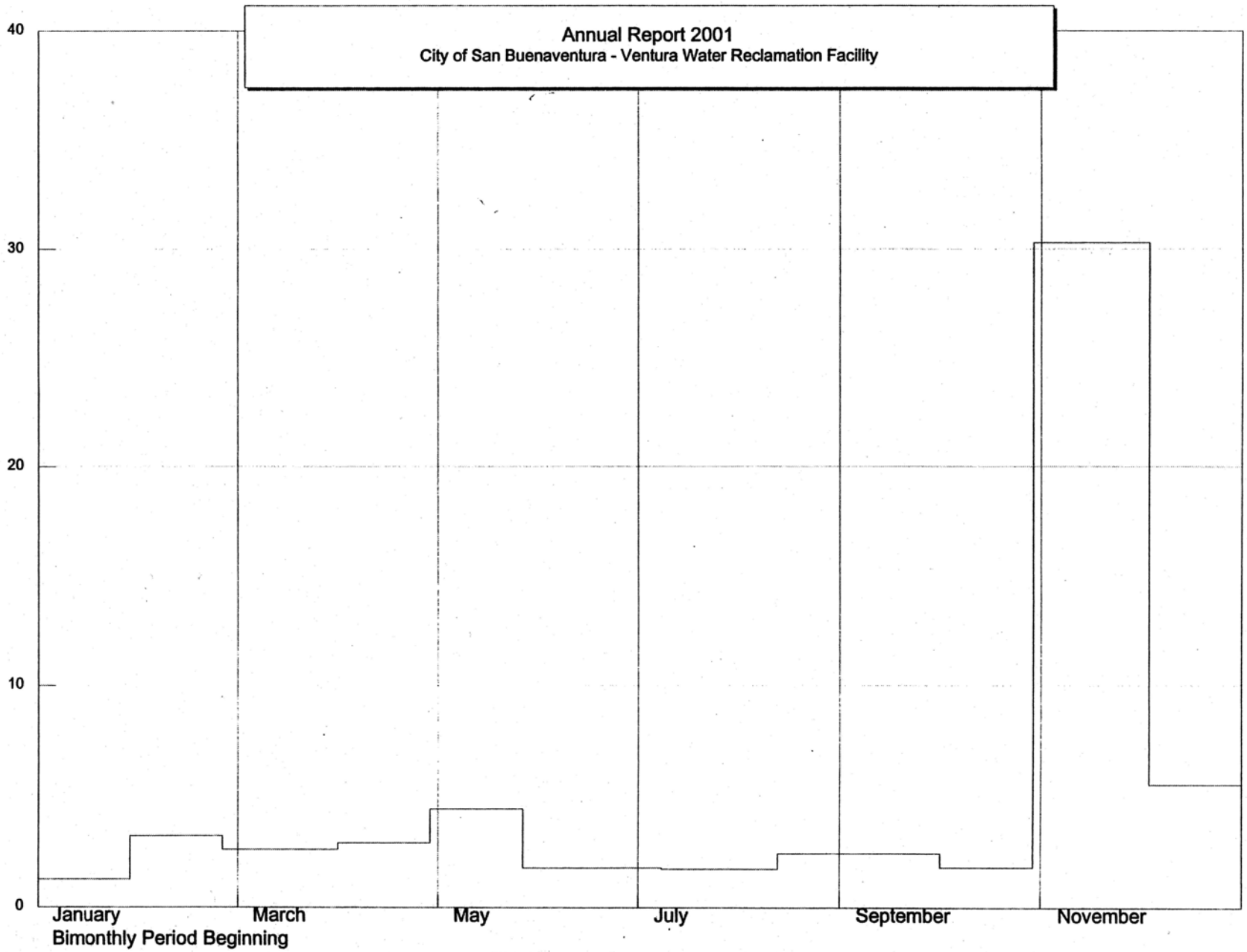


Tidal Prism Receiving Water Stations
L5 Ammonia-N - mg/l

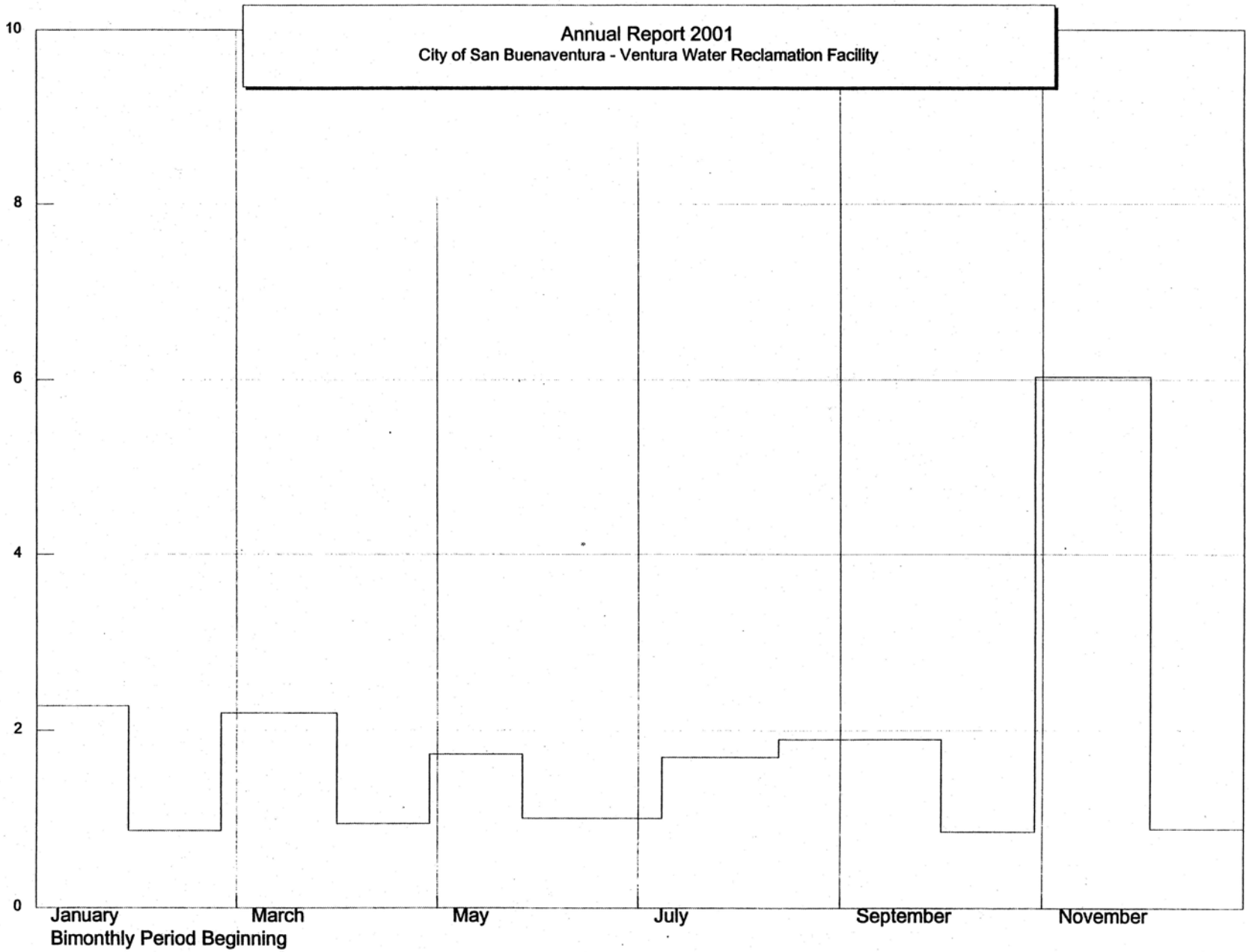

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R1 TKN - mg/l

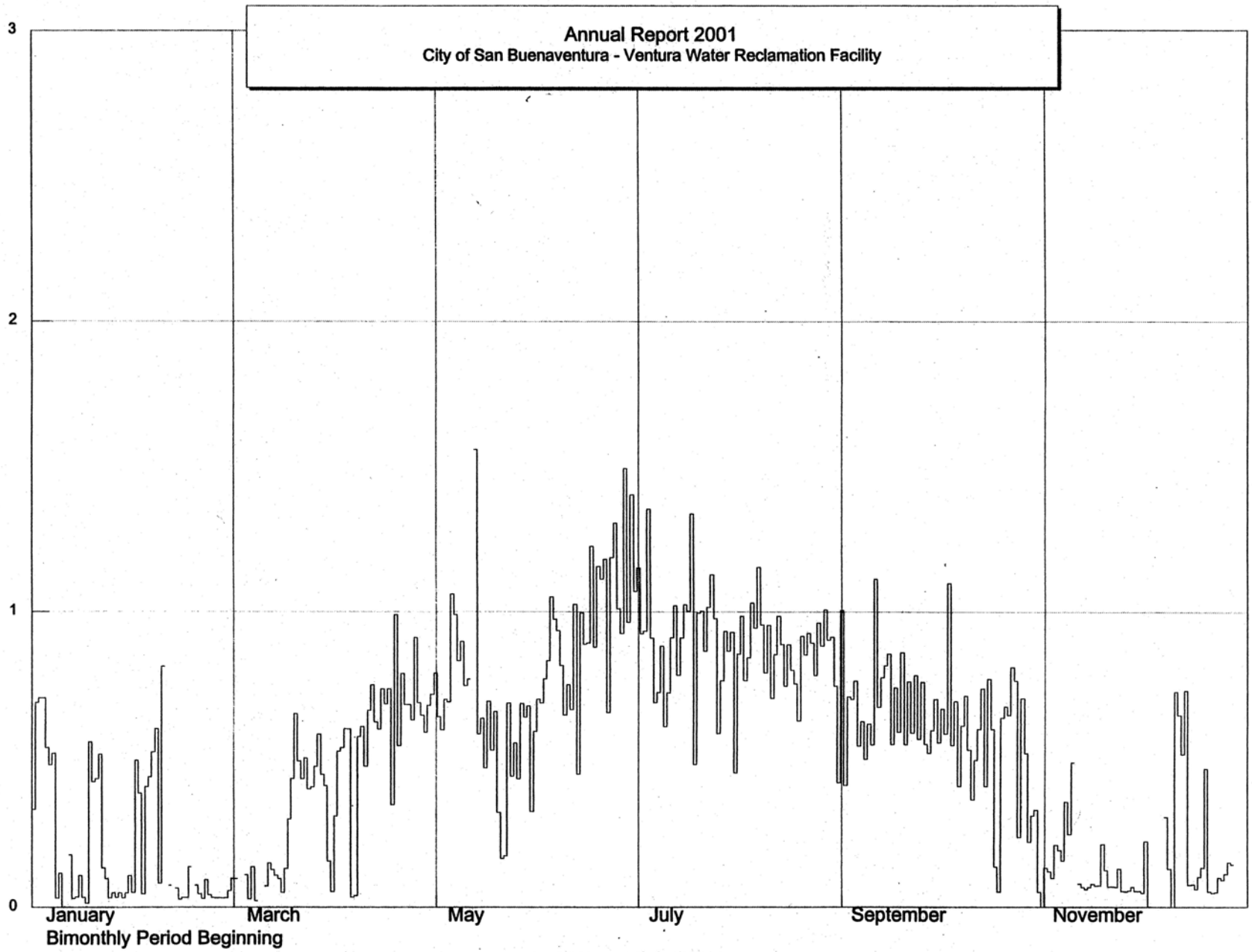

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
30
20
10
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R2 TKN - mg/l


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
15
10
5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
R3 TKN - mg/l

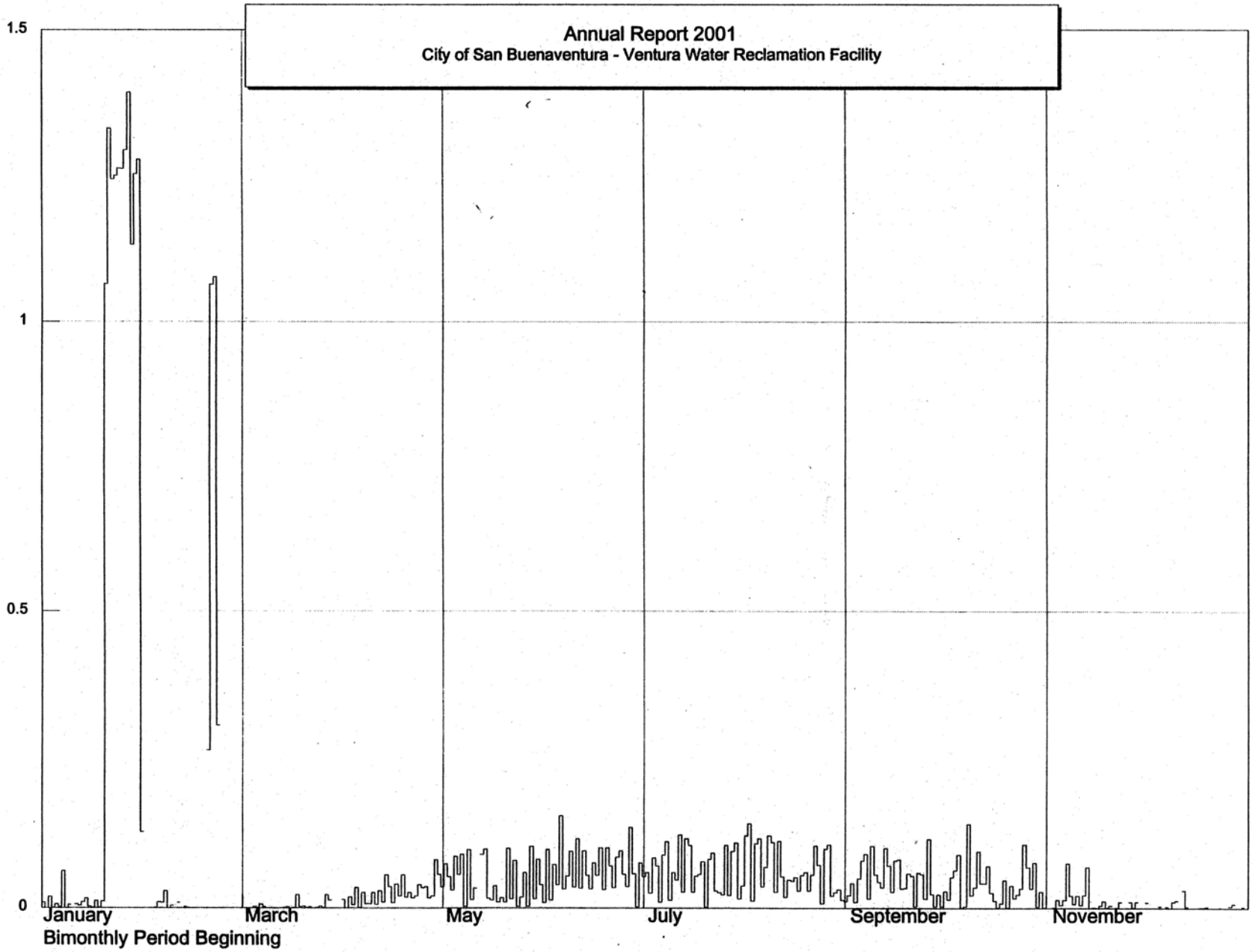


Tidal Prism Receiving Water Stations
R4 TKN - mg/l

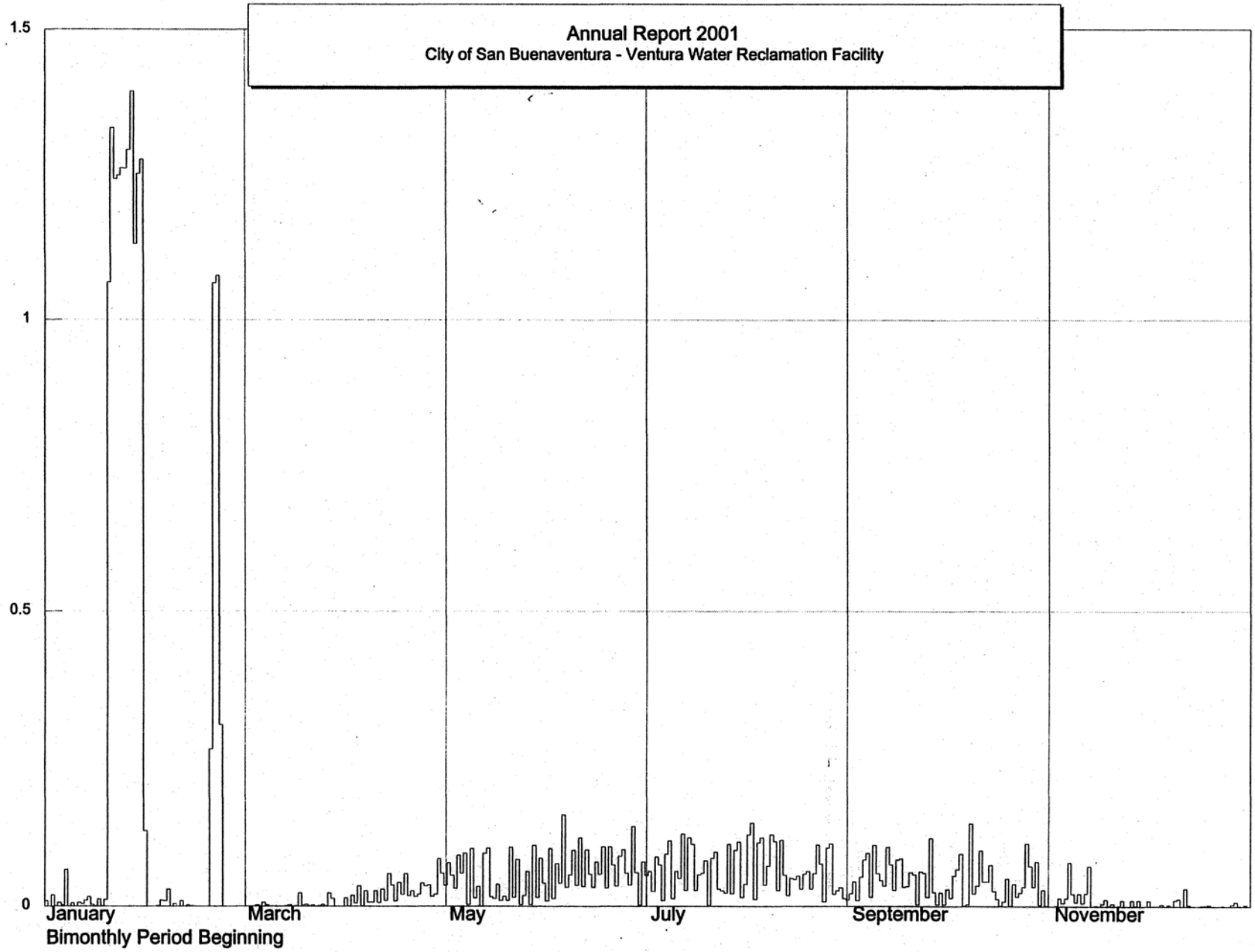

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
10
8
6
4
2
0
January
March
May
July
September
November
Bimonthly Period Beginning
Tidal Prism Receiving Water Stations
L5 TKN - mg/l



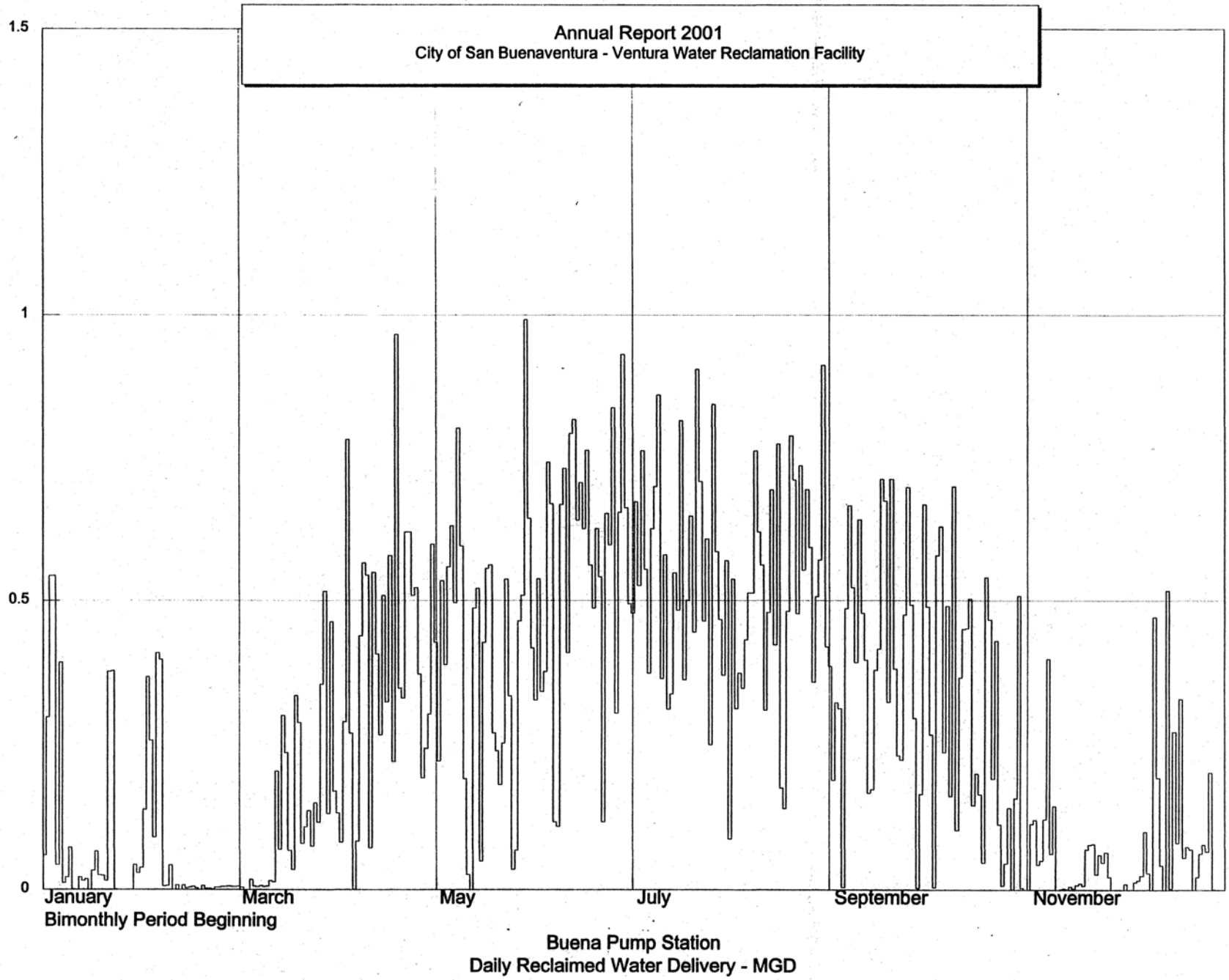
Olivas Pump Station
Daily Reclaimed Water Delivery - MGD

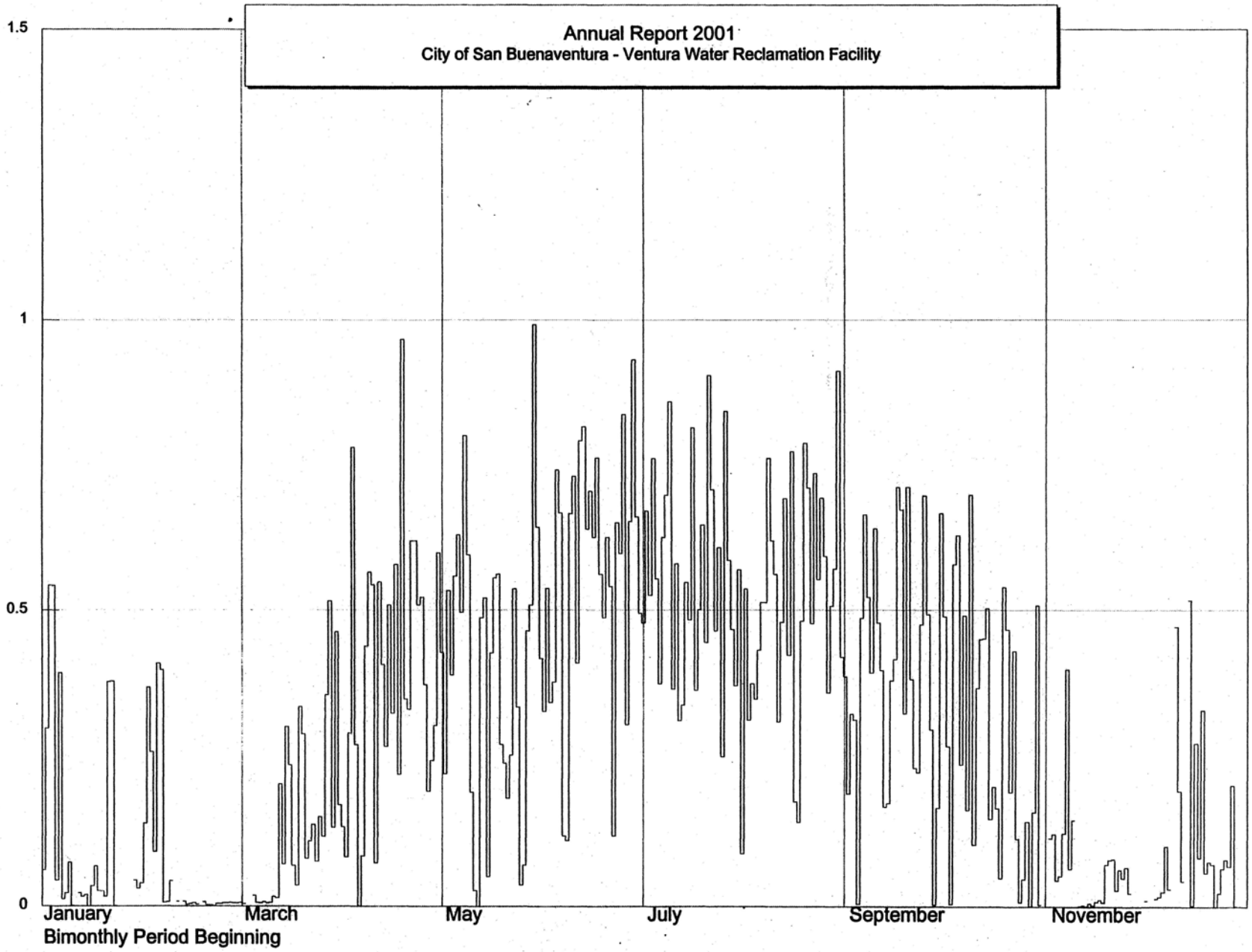


Marina Park Irrigation Systems
Daily Reclaimed Water Delivery - MGD

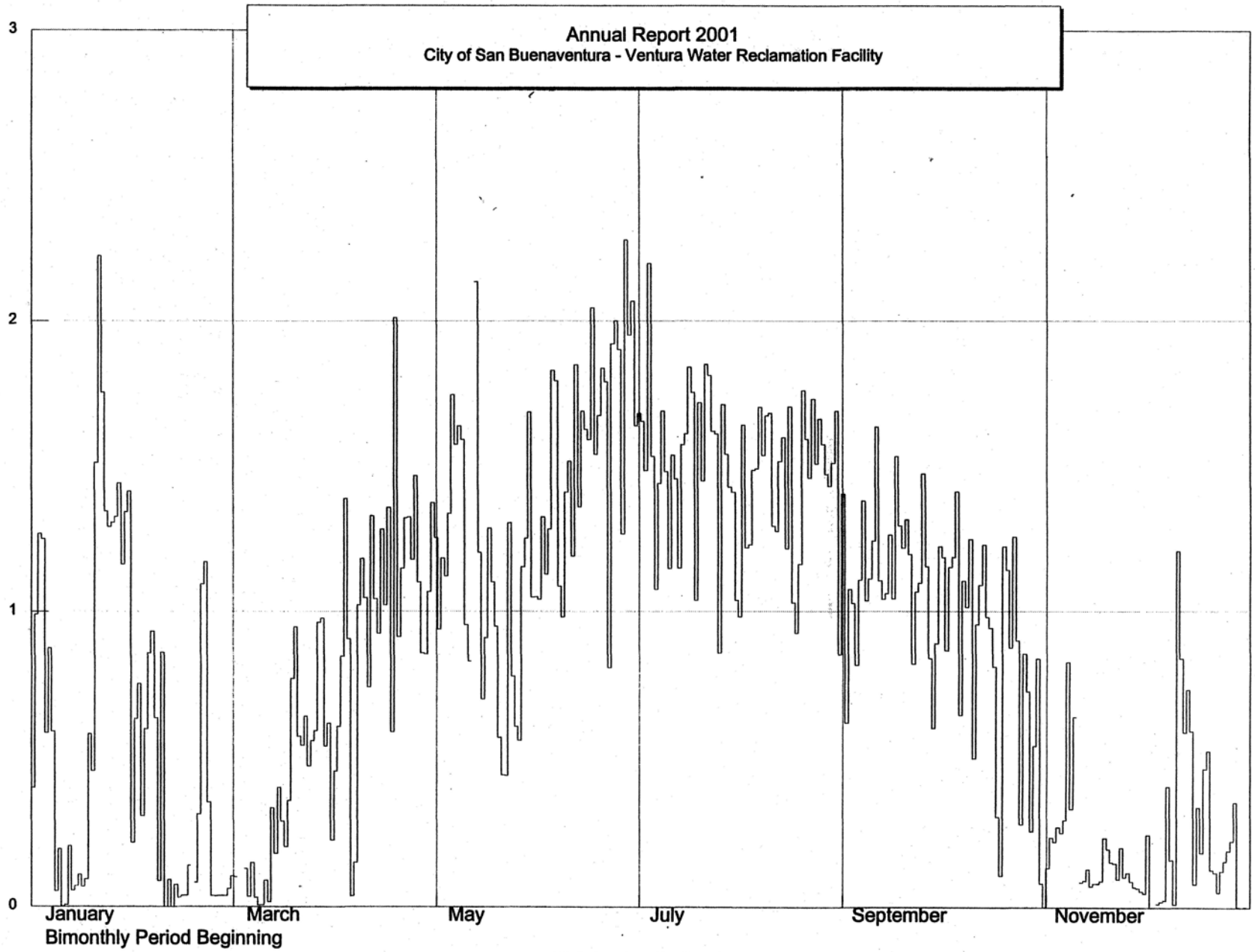


Marina Park Irrigation Systems
Daily Reclaimed Water Delivery - MGD

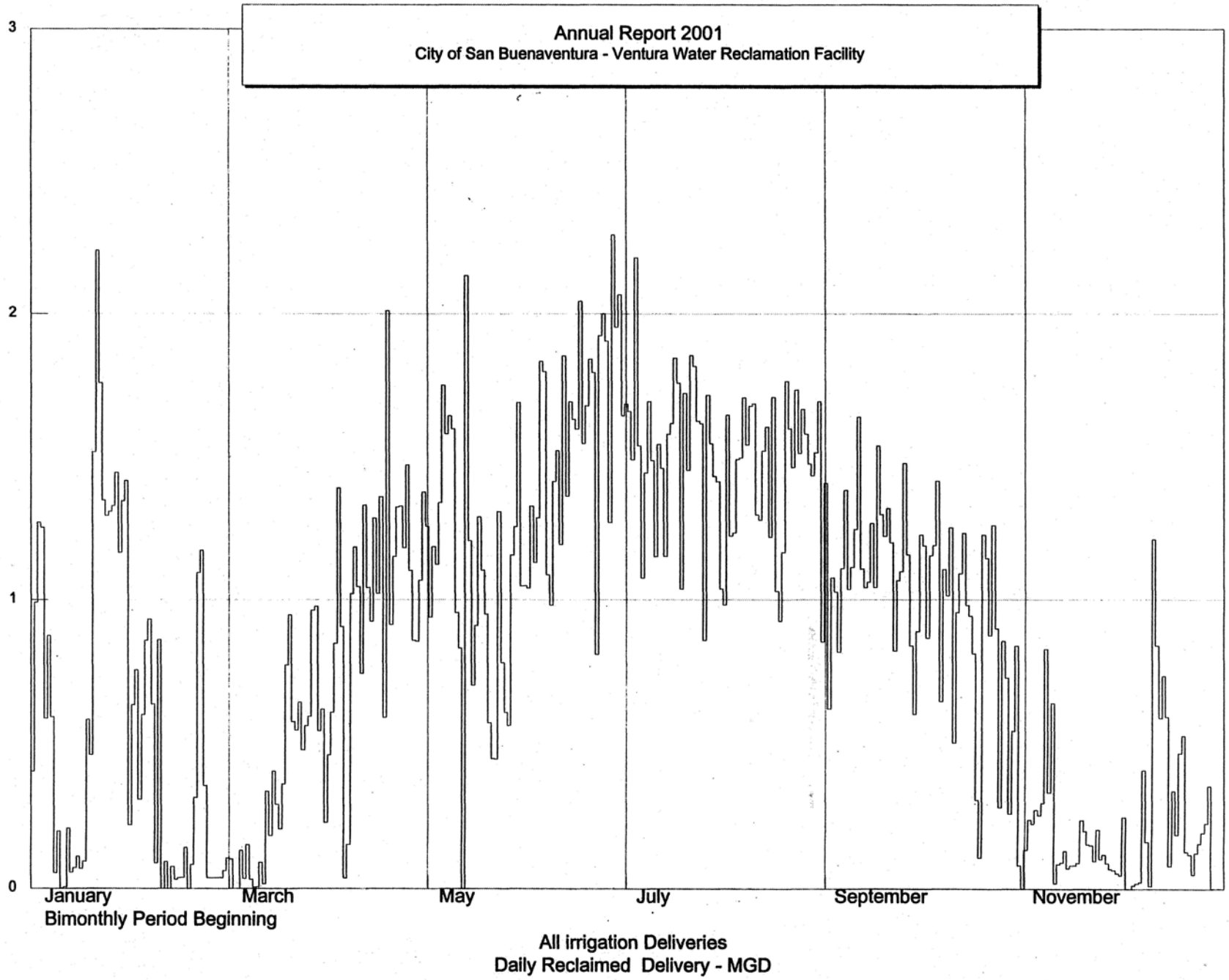

Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
1.5
1
0.5
0
January
March
May
July
September
November
Bimonthly Period Beginning
Buena Pump Station
Daily Reclaimed Water Delivery - MGD

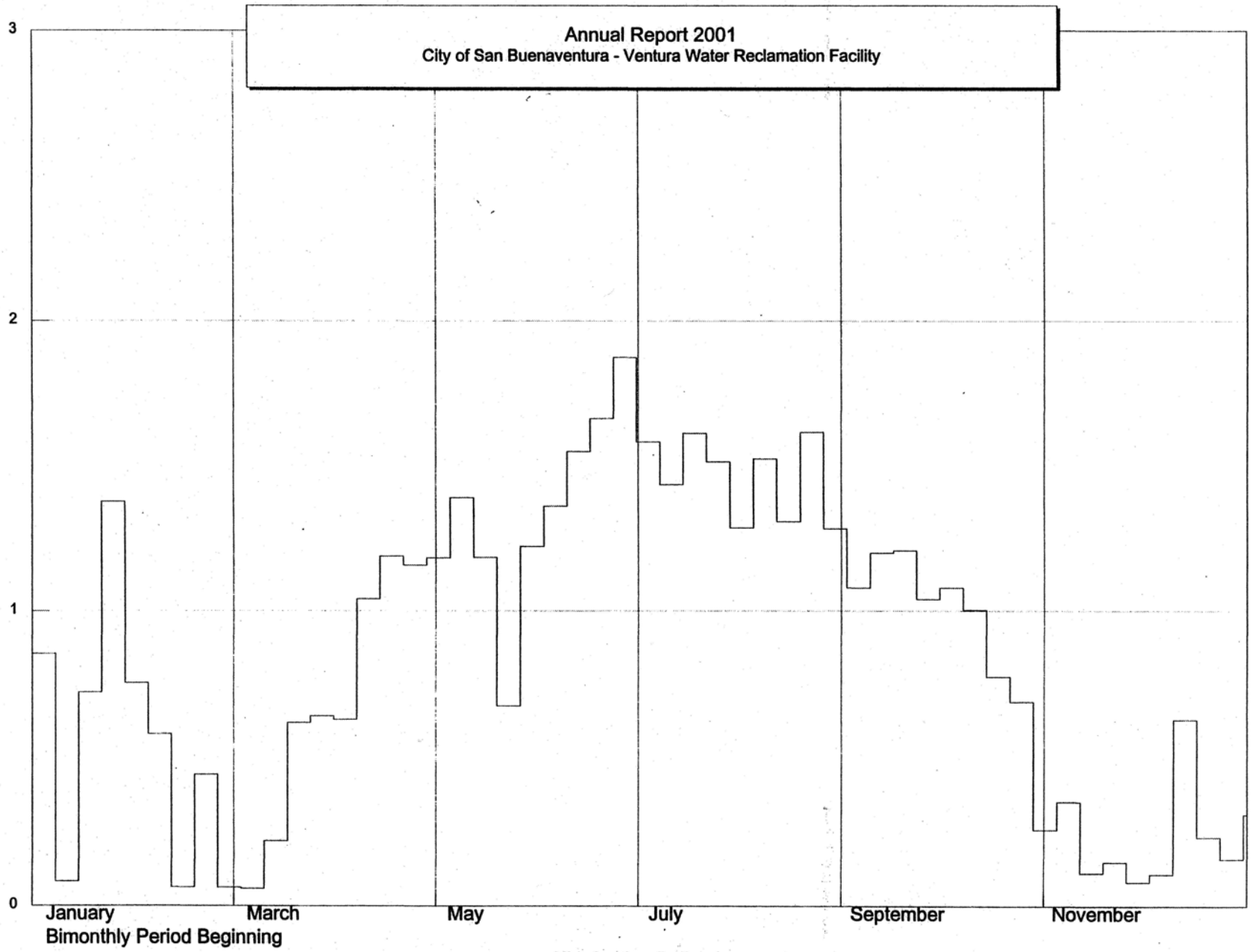


Buena Pump Station
Daily Reclaimed Water Delivery - MGD

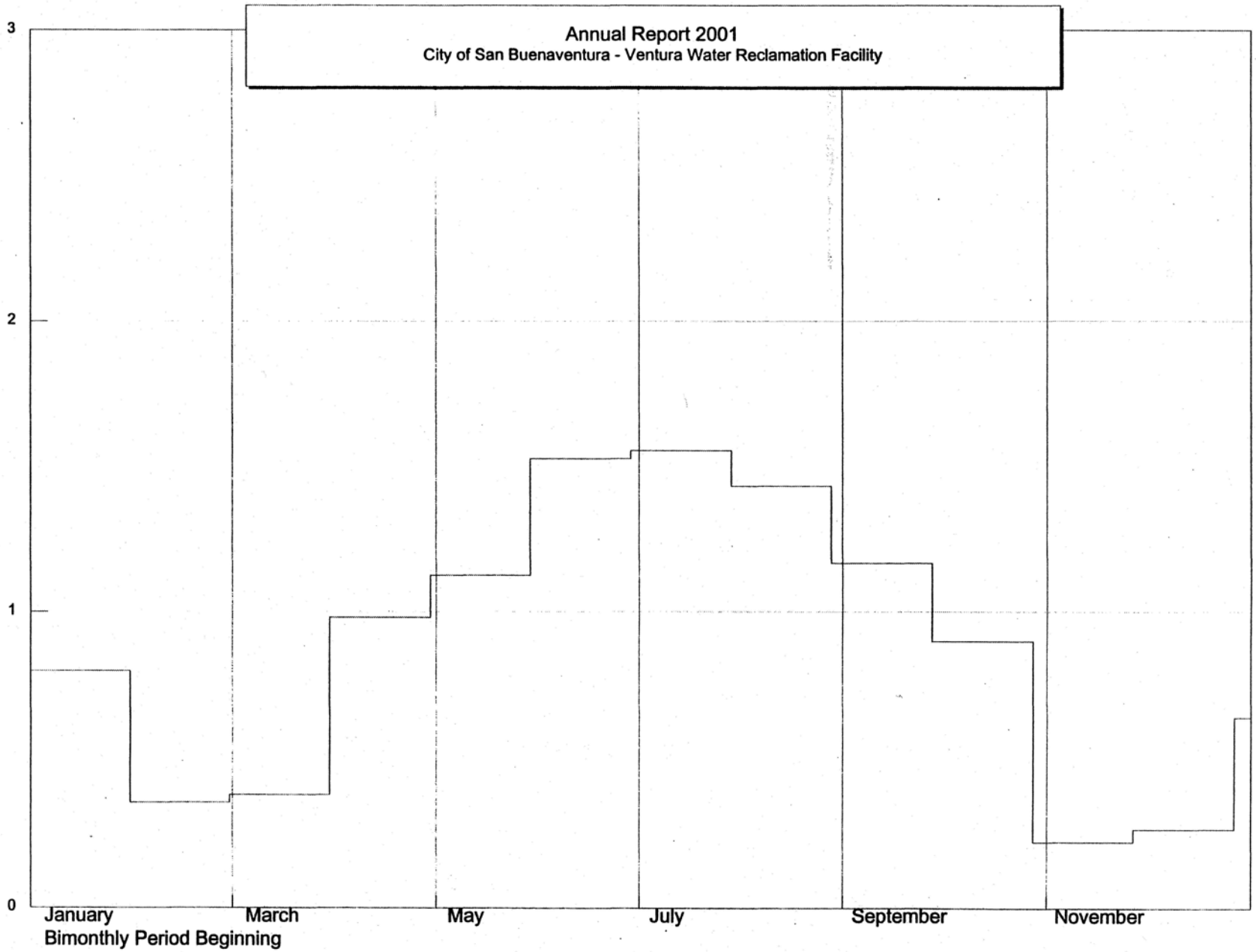


All irrigation Deliveries
Daily Reclaimed Water Delivery - MGD


Annual Report 2001
City of San Buenaventura - Ventura Water Reclamation Facility
3
2
1
0
January
March
May
July
September
November
Bimonthly Period Beginning
All irrigation Deliveries
Daily Reclaimed Delivery - MGD



All irrigation Deliveries
Daily Reclaimed Water 7 Day Average Delivery - MGD



All irrigation Deliveries
Daily Reclaimed Water 30 Day Average Delivery - MGD

ANALYTICAL QUALITY ASSURANCE PROGRAM 2001

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.

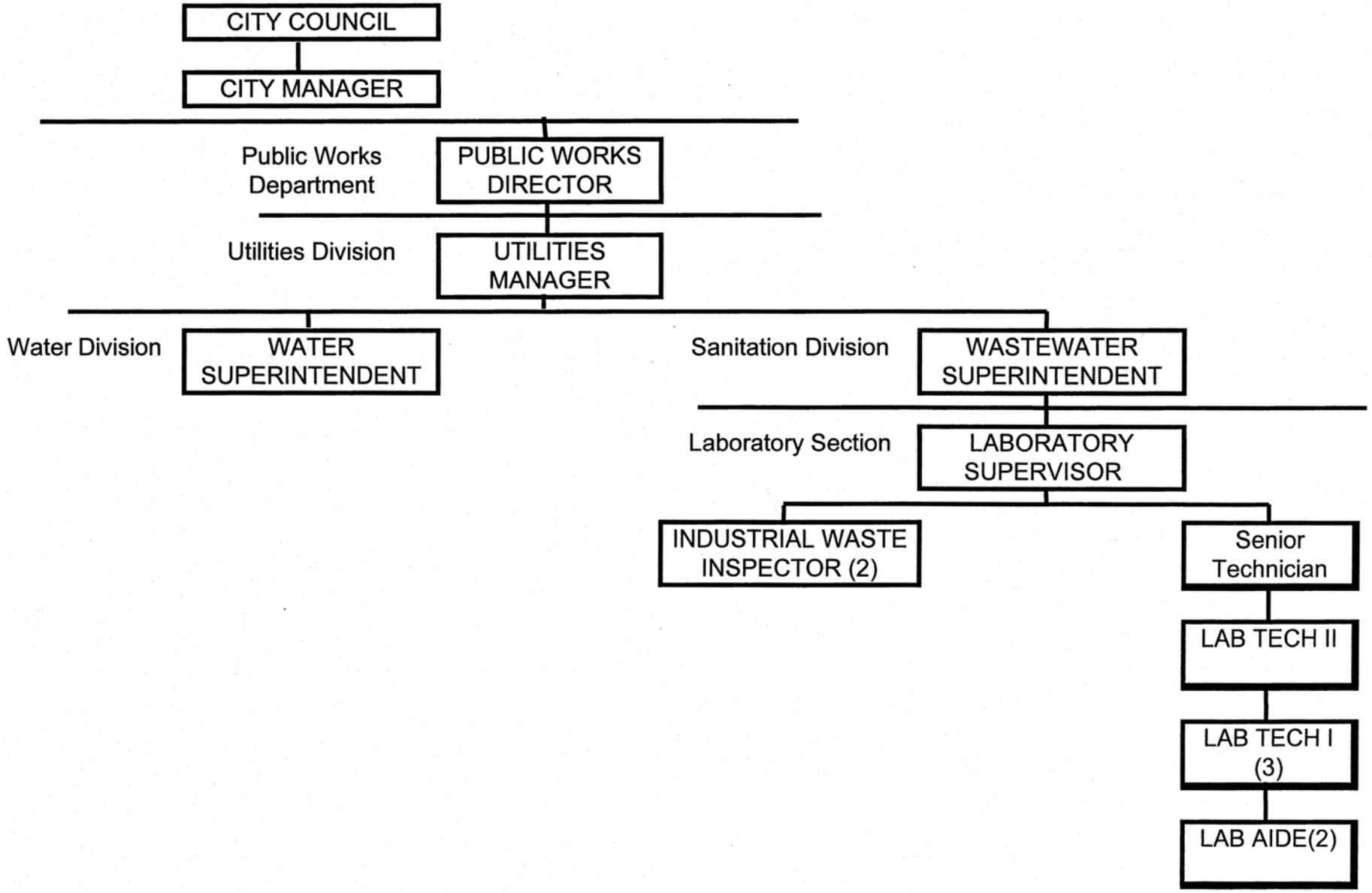
Current State of California Department of Health Services laboratory approval is attached.

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.

II. 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

Senior Lab Tech, City of San Buenaventura Wastewater Division

Present Duties:

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

Senior Technician: **Michael L. Torres**

1999 to Present

Education:

Bachelor of Science Microbiology – California State University @ Northridge (Pending)

Experience:

Microbiologist – Montgomery Watson Laboratories

Present Duties:

Supervise laboratory personnel and perform routine and sophisticated chemical, physical and biological analysis of water, wastewater and industrial waste.

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 and sophisticated chemical, physical and biological analysis of water, wastewater and industrial waste.

Lab Tech I: **George Beswick**

1972 to May 2001

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, wastewater and industrial waste.

Lab Tech I: **Lourdes A Geise**

2000 to Present

Education:

Bachelor of Science in Chemistry – Far Eastern University, Manila, Philippines

Experience:

City of Simi Valley Sanitation Laboratory

Present Duties:

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

Lab Tech I: **Craig Jones**

2000 to Present

Education:

Bachelor of Science in Biology- University of North Carolina @ Chapel Hill

Experience:

Laboratory Technician, Ventura County Waterworks

Present Duties:

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

Lab Tech I: **Catherine Lee**

2001 to Present

Education:

Bachelor of Science in Soil Science – Cal Poly Pomona

Experience:

Analytical Chemist, FGL Environmental, Santa Paula, CA

Present Duties:

Under supervision perform routine chemical, physical and biological analysis of water, wastewater and industrial 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	VWR S/P Model 1370FM	Division
Oven	VWR Model 1670 HAFO Series	Division
Muffle Furnace	Barnstead/Thermolyne Furnace Model F304203C	Division
Incubator (Air)	Precision Model 30M	Division
Incubator (Water Bath)	Blue M Magniwhirl Model 1110A	Division
Incubator (BOD)	Freas Model 815	Division
Autoclave	Getinge/Castle Model 133LS	Getinge/Castle
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 AT 201 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 EC Detector 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
	2 American Sigma 900	Division
	1 ECOA Model E	Division
Agilent Technologies	-- Agilent Technologies Van Nuys, Ca.	
Getinge/ Castle	-- Getinge/Castle Rochester, New York	
Varian	-- Varian Sugarland, Texax	
Division	-- Ventura Sanitation Division Personnel	

III. PROCEDURES, RECORDS AND REPORTS

A. Sampling

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

1. Collection

Samples are collected and delivered to the Sanitation Laboratory for analysis by Wastewater personnel (laboratory staff and plant operators), Industrial Waste Inspector, Water Division and other agency.

Sample collection maybe a grab or a 24-hour composite. All composite samples are collected using ISCO Models 2700 & 2900, American Sigma Models 800SL and 900. Samplers are set to operate in flow proportion by utilizing the non-uniform time option of the control electronics.

Sample container must be of a material that will not produce positive or negative errors or cause contamination to the sample. Sampler containers used for composite samples are pre–clean ICHEM plastic cubtainers or stainless steel container for organic analysis. Grab samples are collected in pre-cleaned plastic ICHEM cubtainers, pre-cleaned glass amber bottles and pre-cleaned 40 vials depending upon the analysis.

All samples are collected in a manner that will not introduce contaminate or cause interference producing erroneous results. Sample collection is done on a daily, weekly, monthly, quarterly, annually or, as in the case of special request, one time basis.

2. Sample Preservation

Sample preservation will be done in accordance with the analysis to be performed.

The laboratory will preserve all samples not analyzed immediately that are collected and delivered to the laboratory by wastewater personnel (laboratory staff and plant operators), Water Division and outside agencies will be preserved by the technician performing the analysis.

The industrial waste inspector will preserve the samples when collected for metals, cyanide and total sulfide analyses. The lab technician performing the

analysis will preserve all other industrial waste samples. Sample preservation will be done in accordance with the analysis to be performed.

3. Handling and Storage

The person who preserved the sample is responsible for placing them into storage. If possible the samples should be stored in the containers in which they are collected and according to the analysis to be performed.

All samples not requiring immediate analysis are to be preserved and refrigerated at 4° C and remain in storage until the analysis is complete and data has been approved. The technician responsible for performing the required analysis should remove and replace the samples in storage.

Samples placed into storage must be labeled with the sample name, date, and time sampled, the analysis required and the initial of the sampler. As part of the chain of custody the technician should fill out the sign in and out label on the sample container.

The amount of time a sample can be held in storage varies from .5 hours to 6 months depending upon the analysis to be performed. Check the holding time for each sample placed into storage to ensure that the analysis is done within that time frame.

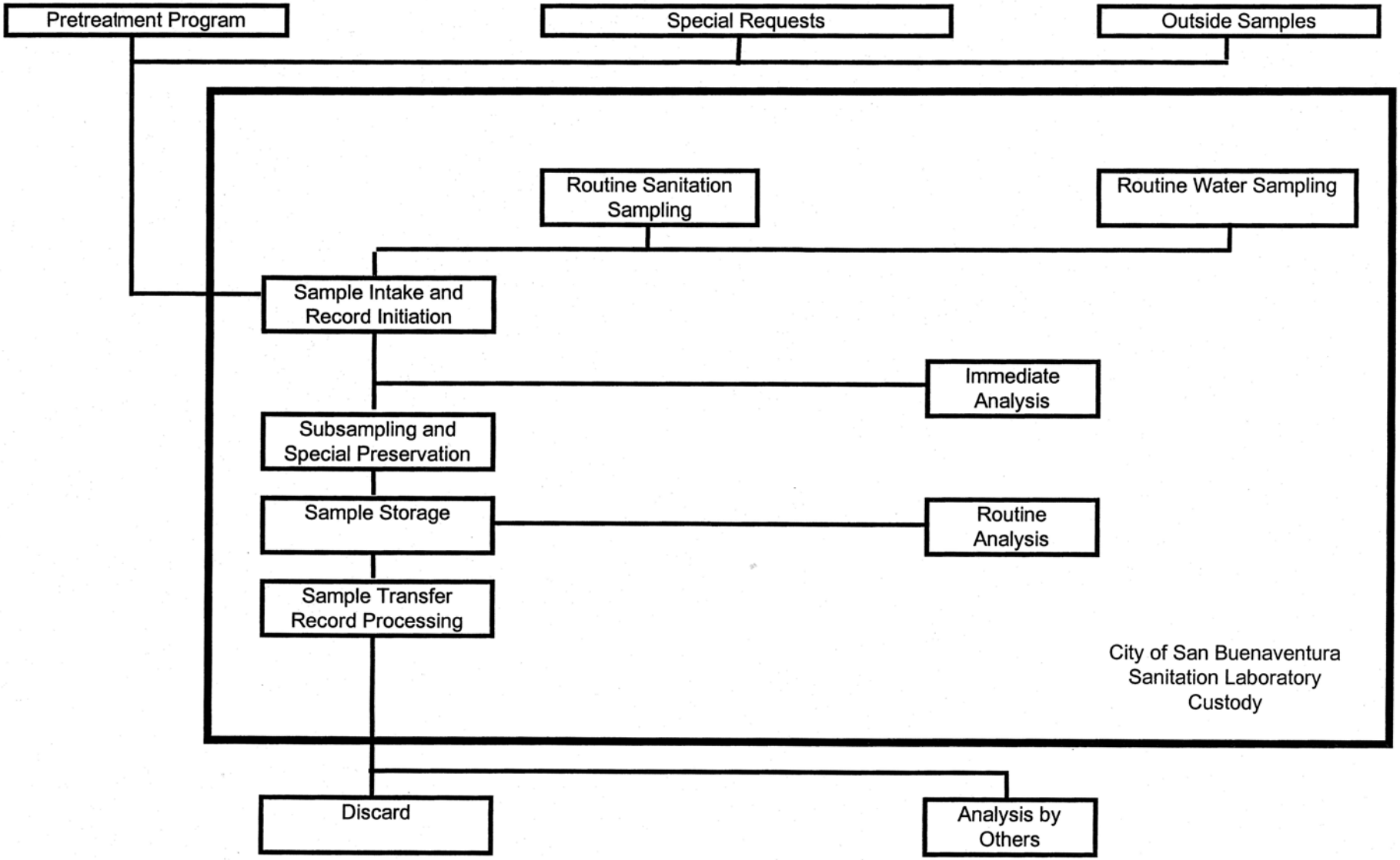
4. Disposal

A sample can be disposed only after the analysis such as in the case of pH has been completed or after the data has been reviewed by the Laboratory Supervisor and Industrial Waste Inspector. Samples should be dispose of in a safe manner that will not harm employees or the environment. Special care must be taken with samples that have been stored for long periods of times.

Wastewater and some Industrial Waste samples that have been stored for several weeks can create hazardous odor such as sulfides at the time of disposal. Proper safety attire and precaution must be taken when disposing of the samples.

Some samples are disposed of by pouring down the drain and flushing with large volume of water such as mineral or metal samples while others have to neutralize before they can be disposed as in the case of COD samples. Samples that have been analyzed for Pesticides or Phenols are evaporated under the fume hood.

The laboratory sample path is shown in the chart below.



Sample Retention Requirements

Sample Source	Frequency	Subsample	Discard After:	Authorization by:
Drinking Water	Weekly	Turbidity, Iron Filters	Analysis Complete	Analysts
Drinking Water	Any	Bacti	Inoculation 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	Inoculation Complete	Analysts
Wastewater	Daily Grab	pH, Turbidity, Residual, Oil and Grease	Analysis Complete	Analysts
Wastewater	Daily Grab	Bacti	Inoculation Complete	Analysts
Wastewater	Daily Composite	pH, Solids, Oxygen Demands, Conductivity	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, Alkalinity, 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

Sample Identification

Sampling sites for routine Sanitation and Drinking Water which are monitored daily, weekly, quarterly or annually have fixed identity 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 (LID) by the Laboratory Computer Data System. The LID is in numerical order and is automatically assigned by the computer. This number is used in sample logs, bench worksheets, permanent records and on analysis reports. A copy of the Computer Data System is in the laboratory's Standard Operation Procedures.

Custody

Change of custody occurs when a sample enters or leaves the laboratory unit. All samples done on regular bases have printed worksheet which sample collectors log in custody information. All other samples enter the laboratory are log in the Incoming Sample Book and given a Laboratory Identification Number.

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, analysis required and circumstances of sample collection along with the history of sample transfers by person and/or organization. An example of the chain of custody form is in the laboratory's Standard Operation Procedures.

B. Analysis Procedures

Analytical Procedures which the laboratory is certified to perform are according to the Standard Methods for the Examination of Water and Wastewater, EPA Chemical Method for Analysis of Water and Wastes and EPA 40 CFR.

Bench procedures for 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; which include reagents, standard preparation and concentration, test procedures and instrumentation with the analytical options for interference correction; samples and sample volumes defined for the samples routinely examined. These procedures are reviewed periodically and revised to accommodate method and sample changes.

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
Chromatographs	Analysis from Gas Chromatograph, Ion Chromatograph and Atomic Absorption	7 Years
Bench Logs	Worksheets for Data and Calculation	7 Years
Bound Record Books	Permanent Record of Analysis Results	7 Years
Reports	Transmittal of Information to Others	7 Years

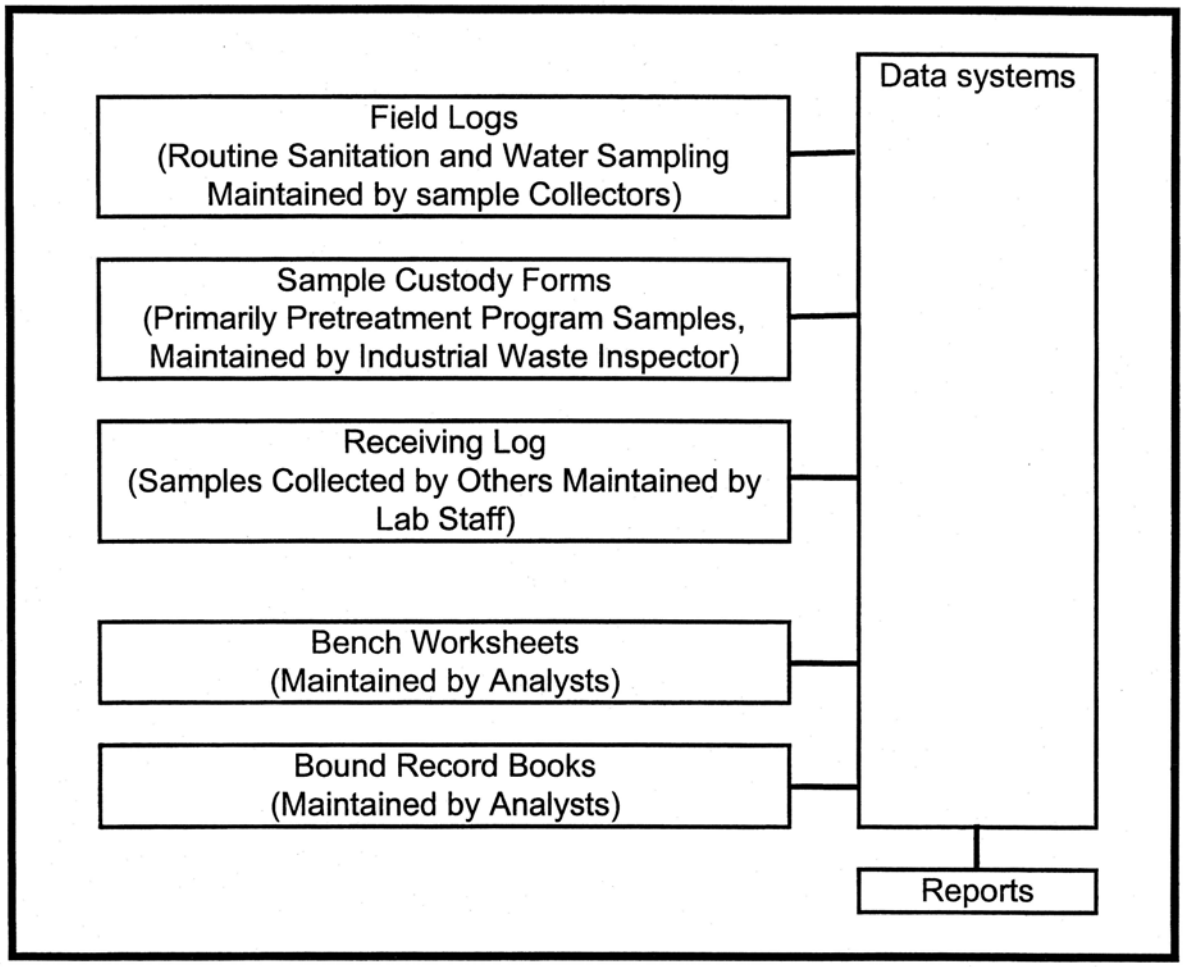
D. Reports

Report formats and contents are generally specified by the agency requesting such reports. Reports of routine monitoring are provided by computer methods designed to meet these specifications. Reports for Water and Wastewater schedule samples are generated from data entered into Run: Input 2, Ioutil, Organic, Metals, Phenols, and Bactin. Industrial Waste and other unscheduled samples reports are obtain from data entered into Run: Input 3 and IWMON. A copy of the Laboratory Computer Data Systems is located in the SOP manual in the Laboratory.

Data from field logs, custody forms, receiving logs, bench worksheets, bound logbooks, chromatographs and spectrophotometer is used to compile information required for these report. A flow chart for data input information is below.

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. Reports are reviewed and signed by the Laboratory Supervisor.

Data flow from generation to reporting is shown below.



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, standards and other related materials 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
Conductivity Meter	Calibrate with 1413 calibration standard	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. Primary QA Control

Stock standard and reagents used in the analysis should be logged with the amount weight out, lot number, finally volume, initials of the preparer, date prepared and discard date. The storage container should be labeled with this information also. Check the method for the stability and storage of the stock solution or the reagent.

Titration reagents used on a daily basis should be standardized weekly. The results from that standardization; the multiplication factor adjustments; the normality of the reagent; and the initials of the person doing the standardization should be on the buret and the worksheet put in the file. Other titration reagents not used on a regular basis should be standardized prior to use and labeled with the same information listed above.

D. 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.

E. 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 routine control samples are prepared in house for frequently performed analyses. For other procedures the Division Laboratory analyzes NSI and Accustandard traceable commercial reference samples.

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

F. Corrective Actions

Some laboratory data reduction is automated in many cases including instrument data generation. For automated applications, when 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. 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.

All controls, spikes and duplicates must be within the acceptance limits before the results from the analysis can be recorded. After reviewing the analysis procedures, calculations and redoing the analysis it cannot be determine the reason for the failure you must check with the QA person and the laboratory supervisor before recording the data. If it is determined that the QA material failed and the same material was accurate you will have to record the reason for the failure in the "QIR" Qualitative Investigate Report book.

G. 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 Accustandard, New Haven, CT. If appropriate materials are not available from this source, they are obtained from manufacturers or from normal chemical supply sources.

Control and spike materials employed in these analyses are also obtained from Accustandard, New Haven, CT.

As with all other measurements, acceptability of sample results is dependent on controls, spikes and duplicates analysis results being within acceptance limits. As with all QA analysis the data cannot be recorded if the control, spike or duplicate fail without a valid reason.

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 done daily during the course of the analysis.

D.O. measurement is made with an Orion SL9 portable meter. Calibration is done daily.

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 inoculation of portions from each prepared batch with Escherichia coli (ATCC 25922), Staphylococcus 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 Staphylococcus aureus and no response upon incubation of non-inoculated media are discarded.

Fecal strep test materials failing to give a positive response to Streptococcus faecalis, a negative response to Staphylococcus aureus and no response upon incubation of non-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 20th day of March, 2002, at Ventura, CA.

Daniel Pfeifer
Wastewater Superintendent

Florence B. Jay
Laboratory Supervisor