– Ventura Water Reclamation Facility –

Annual Report of Analysis • 2011

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Wastewater Utility

NPDES# CA0053651

CITY OF VENTURA
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Cover Photos: Ventura Water Reclamation Facility Nutrient Removal Process – Online October 2011

ANNUAL REPORT OF ANALYSIS

CITY OF SAN BUENAVENTURA

VENTURA WATER RECLAMATION FACILITY

2011

NPDES NO. CA0053651, ORDER NO. R4-2008-0011

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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, and for the North Coast Communities (Ventura County Service Area 29). These areas include a population of approximately 109,000 people.

THE WASTEWATER DIVISION:

Wastewater collection and treatment facilities are operated by the Wastewater Division, which along with the Water Division, comprises the Ventura Water Department. The City of Ventura operates 290 miles of gravity sewer line and 11 lift stations. The Ventura Water Reclamation Facility (VWRF) is a tertiary treatment plant.

THE VWRF UNIT PROCESS:

The VWRF, at 1400 Spinnaker Drive, is located on the north bank of the Santa Clara River and discharges tertiary treated effluent to the Santa Clara River Estuary.

Processes employed at the treatment facility during 2011 include; influent screening, grit removal, primary sedimentation, primary flow equalization, activated sludge secondary biological treatment, including biological nitrification, de-nitrification (NDN), tertiary effluent filtration chlorination and de-chlorination.

March 2011 time schedule order number R4-2008-0012 expired and permit limitations for total inorganic nitrogen (TIN) in order number R4-2008-0011 became in full effect. The plant performance for TIN removal met permit limitations of 10 mg/L for the entire reporting period of 2011.

On June 16, 2011 the Los Angeles Regional Water Quality Control Board (Regional Water Board) approved a 90-day interim effluent limitations for TIN beginning on July 5th 2011 and ending on October 3rd 2011 for the construction of Bio-augmentation Re-aeration (BAR) and (NDN) process. The NDN process was fully functional beginning October 3, 2011. During the 90-day interim effluent limitations period there were no exceeded limitations.

Process solids are treated by anaerobic digestion to class B standards, dewatered and sent to Toland Road Landfill in Santa Paula, California and processed further to class A standards. 12 percent of the solids were heat treated and 88 percent were landfill applied. Screenings and grit removed during the treatment process are disposed of at the Toland Road Landfill.

Wastewater facilities include pump stations and pipelines for water reclamation. In 2011, the daily average volume of treated effluent reclaimed was 501,500 GPD . The maximum daily reuse volume measured in 2011 was 1,502,000 gallons.

The effluent reuse system provides effluent for irrigation of golf courses, 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 183.732 million gallons.

NPDES permit CA0053651, issued by the Los Angeles Regional Water Quality Control Board (Water Board) as Order R4-2008 – 0011 with a companion TSO R4-2008-0012, regulates discharge of treated effluent to the Santa Clara Tidal Prism. Regional Water Control Board issued these new permits in March 2008.

Reuse of effluent is regulated by Water Board Order 87-45.

The wastewater facility operation staff consists of certified operators. All hold State of California certificates as listed:

	POSITION	GRADE	CERTIFICATE NUMBER
Daniel E. Pfeifer	Wastewater Utility Manager	V	6737
John S. Willis	Wastewater Utility Manager	IV	9370
Eric W. Miller	Lead Plant Operator	V	9798
Joseph E. Volpe	Lead Plant Operator	V	8987
Joe Majarucon	Lead Plant Operator	V	9118
Curtiss W. Montague	Lead Plant Operator	III	10475
Cary A. Adams	Plant Operator	III	9785
Chad M. Steinlicht	Plant Operator	III	10297
Baltazar Cervantez Jr.	Plant Operator	II	9419
Daniel J. Jacquez	Plant Operator	II	28722
Raymond J. Flinchum	Plant Operator	I	
Erin F. Fadani	Operator In Training (issued 1/13/11)		

	POSITION	GRADE
Daniel A. Marin	Operator In Training (issued 3/29/10)	I
Jack D. Sauceda	Operator In Training (issued 4/30/10)	I

II. PROCESS PERFORMANCE AND COMPLIANCE WITH DISCHARGE REQUIREMENTS

During the reporting period of 2011 the effluent 7-day median total coliform limit was exceeded 19 times. Seven days in March due to heavy rains and associated high flows, two days in April and ten days in May due in part to Micro 2000 chlorine analyzer malfunction.

During the reporting period the effluent turbidity for a 24-hour period exceeded the average of 2 NTU on two days, with values of 2.95 NTU on August 15th and 2.76 NTU on August 16th, 2011. This occurred during start-up of the new Biological Nutrient Removal System.

During the reporting period the monthly average total recoverable copper in December exceeded the limit of 6.7 ug/l with a concentration of 7.6 ug/l.

III. IRRIGATION EFFLUENT QUALITY

A summary of principle effluent mineral concentrations is presented below.

Year	Average TDS	Average Chloride	Average Sulfate	Average Boron	Average Fluoride	Average Sodium	Average Calcium	Average Magnesium	Average Potassium
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	354	112	45	17
1976	1474	366	398	1.4	0.65	331	118	36	15
1977	1479	372	383	1.2	0.64	320	109	40	15
1978	1525	358	409	1.0	0.80	325	110	40	17
1979	1527	359	481	1.1	0.89	308	117	45	14
1980	1451	342	463	1.2	0.73	295	120	43	15
1981	1330	312	424	0.9	0.88	278	117	41	18
1982	1452	334	443	0.8	0.80	280	136	46	17
1983	1367	308	435	0.7	0.81	275	125	43	13
1984	1398	312	454	0.7	0.80	257	130	42	20
1985	1380	313	393	0.8	0.78	249	126	42	16
1986	1411	309	415	0.8	0.62	269	132	44	19
1987	1309	317	371	0.8	0.63	240	117	39	19
1988	1457	333	412	0.8	0.58	274	123	44	17
1989	1424	324	418	0.7	0.59	274	117	43	17
1990	1561	328	444	0.9	0.67	307	126	46	18
1991	1583	334	418	0.9	0.56	308	130	46	20
1992	1569	333	456	0.7	0.55	283	140	46	18
1993	1493	315	446	0.7	0.67	295	138	46	18
1994	1403	304	416	0.7	0.71	289	131	44	19
1995	1508	293	460	0.8	0.66	286	145	38	16

Year	Average TDS	Average Chloride	Average Sulfate	Average Boron	Average Fluoride	Average Sodium	Average Calcium	Average Magnesium	Average Potassium
1996	1425	295	425	0.7	0.52	273	130	42	20
1997	1310	279	366	0.7	0.41	249	115	40	19
1998	1387	263	405	0.6	0.71	261	124	42	19
1999	1348	285	388	0.7	0.72	249	116	43	21
2000	1474	286	423	0.8	0.58	287	130	48	23
2001	1370	241	435	0.7	0.63	255	121	43	21
2002	1370	277	418	0.7	0.62	255	121	43	21
2003	1408	316	471	0.7	0.59	267	139	50	21
2004	1512	334	511	0.8	0.58	293	144	49.	23
2005	1533	297	563	0.7	0.53	281	135	50	23
2006	1502	268	540	0.5	0.53	274	138	48	26
2007	1431	286	497	0.8	0.55	261	117	47	28
2008	1512	298	535	0.7	0.61	266	120	51	28
2009	1478	303	505	0.8	0.53	273	113	47	28
2010	1438	296	476	0.7	0.53	269	117	48	26
2011	1564	285	485	0.6	0.57	238	115	47	23

LOCATION OF SAMPLE POINTS FOR MONITORING AND REPORTING PROGRAMS

From the wildlife ponds the flow discharges into the Santa Clara Tidal Prism and treated effluent is used for landscape irrigation as shown in the schematic plant flow diagram which follows. This has been the treatment plant operating mode throughout all of 2011.

The total wastewater flow is treated and disinfected through the system as shown regardless to the ultimate discharge designation.

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

LOCATION 1 - INFLUENT PUMP STATION (IPS)

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 a duplicate influent sampling programs is not warranted. IPS coordinates are 34 ° 14'21.45" N / 119° 115' 25.53" W.

The samplers used here are the ISCO 6712R which is programmed flow proportion .

The sampler is located in the main stream of the influent channel prior to the headwork adjacent to Harbor Boulevard.

Sampling is performed here for compliance monitoring and for process control. IPS is analyzed daily for pH, 5-day BOD, COD, suspended solids; weekly for ammonia; monthly for TKN; quarterly grab for metals and semi-annual priority pollutants.

LOCATION 2 – FLOW EQUALIZATION BASIN - PRIMARY EFFLUENT (EPE)

All effluent from the Primary Clarifier passes through this location. This sample station can be bypassed and raw sewage delivered directly to the Activated Sludge System for routine maintenance or emergency. EPE coordinates are 34°14'29.83" N / 119° 15'27.88" W.

ISCO Model 6712R sampler programmed to collect samples at uniform time intervals proportional to the flow to the secondary treatment process was used for sample collection.

Sampling is performed at this location is for process control.

Analyses performed daily at this location are 5-day BOD, COD, pH, suspended solids; weekly for ammonia; monthly for TKN and MBAS.

LOCATION 3 - ACTIVATED SLUDGE PROCESS EFFLUENT

This site is at the end of the 36 inch line from the Activated Sludge Final Sedimentation (FS) Tanks and before the Mixed Media Filter Station Pump Wet Well. FS coordinates are 34° 14'22.89" N / 119° 15'27.45" W.

ISCO Model 6712R programmed to collect samples at uniform time intervals proportional to the flow to the Activated Sludge System was used for sample collection..

Sampling at this site is for process control.

Analyses performed are : daily 5-day BOD, COD, suspended solids; weekly for ammonia, nitrate, nitrite and monthly for TKN and MBAS. The stream from the Activated Sludge System is monitored continuously by a process turbidimeter.

LOCATION 4 - EFFLUENT TRANSFER STATION (ETS)

This location follows the plant's filtration and disinfection. From here all treated effluent is pumped to the Wildlife Ponds. ETS coordinates are 34° 14'21.45" N / 119° 15' 31.26" W.

ISCO Model 6712FR programmed to collect samples at uniform time intervals proportional to the flow leaving the Mixed Media Filter Station was used for sample collection.

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

ETS is analyzed daily for pH, 5-day BOD, COD, turbidity, chlorine residual, temperature, settleable solids, suspended solids and total dissolved solids. Weekly analyses include ammonia, nitrate and nitrite, chloride, sulfate, grease and oil, and ammonia. Monthly analyses are phosphate, TKN, total phosphorous, MBAS, boron, fluoride, sodium, calcium, magnesium, potassium, chlorophyll A , chronic bioassay, and metals. Analyses conducted semi-annually are phenols, pesticides, 17 dioxin congeners and the remaining priority pollutants. The flow from the Filtration and Disinfection processes is also continuously monitored here by a process turbidimeter.

Grab samples for bacteriological examination, pH, total chlorine residual and temperature are collected daily at 11:00 AM from the Chlorine Contact Chamber and Effluent Transfer Station.

RECEIVING WATER SAMPLE STATIONS

Five sample stations, designated R1 through R4 and R5 (formerly L5) within the Santa Clara Tidal Prism are specified by the Los Angeles Regional Water Quality Control Board in the facility NPDES permit in 2008.

Locations coordinates are:

1. R1 34° 13'55.58" N / 119° 15'27.59" W.
2. R2 34° 13'47.37" N / 119° 15'43.15" W.
3. R3 Variable at the mouth of the river.
4. R4 34° 14'04.15" N / 119°15'54.19" W.
5. R5 34° 14'01.63" N / 119°15'23.79"W.

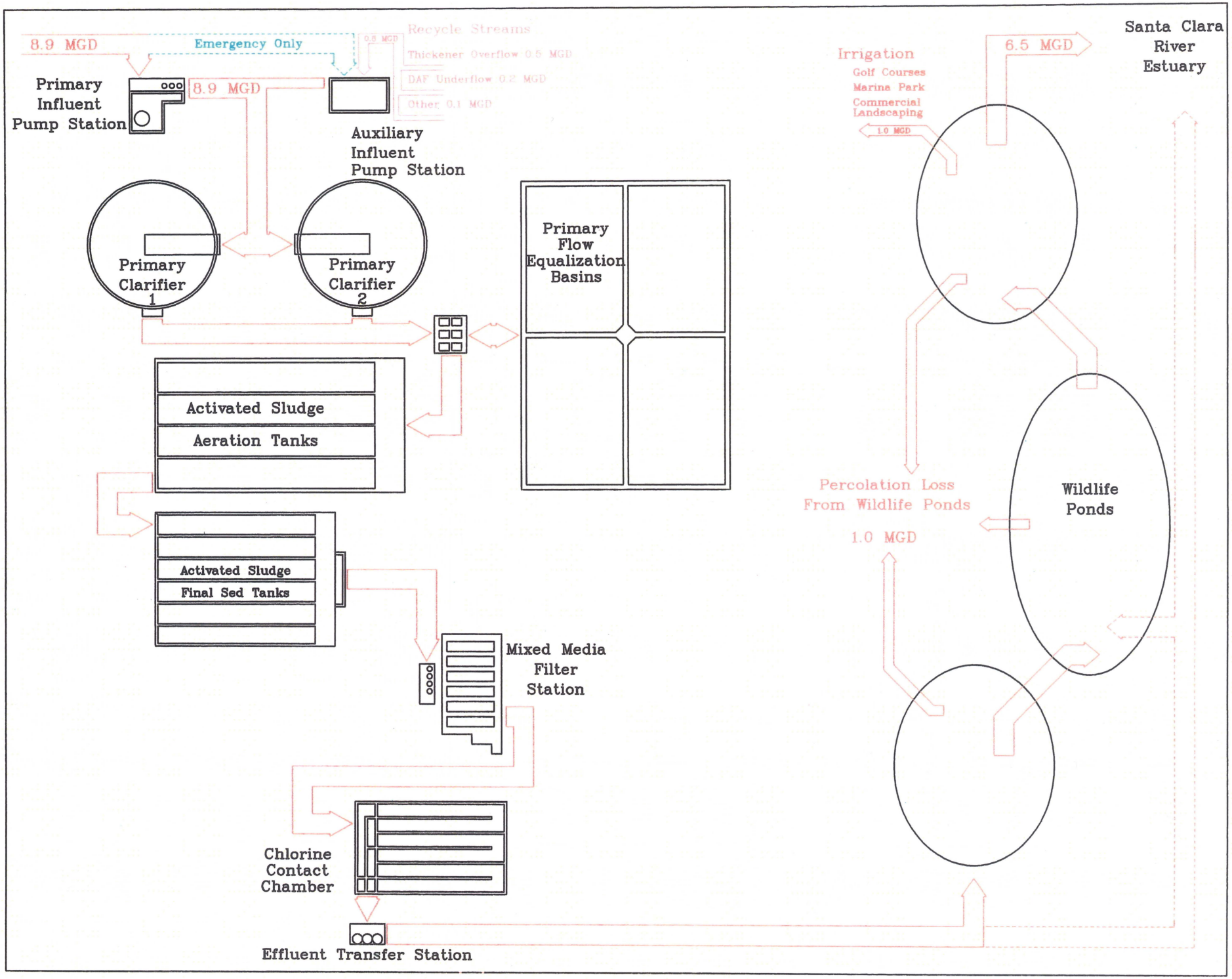
Water quality observations and field analyses performed at this site are water color, odor, visible sludge, foam, oil or grease, pH, temperature (air & water), salinity, chlorine residual and dissolved oxygen.

Weekly grab samples are analyzed for total coliform, fecal coliform and total hardness. Monthly analyses performed are total phosphorous, nitrogen compounds, metals, and chlorophyll A

Grab samples from station R3, on the west shoreline near the point of discharge, R4 located at the northwest shoreline if the Santa Clara estuary and R5 located at the upstream from the Santa Clara River and at the Harbor Boulevard Bridge crossing are analyzed monthly for metals, quarterly for chronic toxicity and semiannual for priority pollutants.

Station R2 located downstream form the discharge point is analyzed semiannually for seventeen 2,3,7,8-TCDD.

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


8.9 MGD
Emergency Only
0.8 MGD
Recycle Streams
Thickener Overflow 0.5 MGD
DAF Underflow 0.2 MGD
Other 0.1 MGD
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
1.0 MGD
6.5 MGD
Santa Clara River Estuary
Percolation Loss From Wildlife Ponds
1.0 MGD
Wildlife Ponds

Inf-001
Discharge to the Ponds
1400 Spinnaker Drive, Ventura CA
M-001 Effluent Transfer
Harbor Blvd
Discharge to Estuary
© 2009 Tele Atlas
Image U.S. Geological Survey
Google
Pointer 34°14'20.15" N 119°15'38.85" W elev 5 ft Streaming 100%
Eye alt 2511 ft

Discharge to Estuary
Harbor Blvd
R-004
R-005
R-001
N Harbor Blvd
R-002
R-003
Image U.S. Geological Survey
© 2009 Tele Atlas
Google
Pointer 34°13'59.40" N 119°15'34.29" W elev 8 ft Streaming 100%
Eye alt 3295 ft

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Influent Pump Station

Month	Influent Total Flow MGD	Influent pH @ Lab SU	Influent Suspended Solids @ 105C MG/L	Influent BOD MG/L	Influent COD mg/l	Influent Ammonia mg/l	Influent Total Kjeldahl Nitrogen mg/l
January	8.90	7.45	464	349	738	27.8	43.0
February	8.78	7.46	307	278	584	31.7	45.0
March	9.36	7.45	262	265	567	29.7	45.1
April	8.85	7.45	283	269	598	27.5	45.3
May	8.55	7.37	315	277	654	29.7	44.1
June	8.68	7.33	291	273	623	29.5	44.1
July	8.65	7.34	327	306	689	28.0	45.8
August	9.00	7.44	265	272	600	31.7	48.1
September	8.81	7.41	266	259	601	25.8	46.3
October	8.29	7.45	265	262	589	29.9	47.9
November	8.33	7.41	313	276	613	30.7	54.2
December	8.31	7.34	367	303	681	27.4	46.1
Minimum	7.90	7.08	138	162	455	22.6	43.0
Maximum	13.00	7.80	1,022	622	1,262	40.8	54.2
Average	8.73	7.42	308	281	627	29.2	46.3

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Influent Pump Station

Month	Influent Lead, Total ug/l	Influent Manganese * ug/l	Influent Mercury, Total ug/l	Influent Molybdenum, Total ug/l	Influent Nickel, Total ug/l	Influent Selenium, Total ug/l	Influent Silver, Total ug/l	Influent Thallium, Total ug/l	Influent Tin, Total ug/l	Influent Vanadium, Total ug/l	Influent Zinc, Total ug/l
Jan 2011											
Feb 2011	<5.000	144.00	<0.020	6.600	10.400	<2.000	<0.200	<1.000	<100.00	<4.000	156.00
Mar 2011											
Apr 2011											
May 2011		220.00	<0.020				<0.200				79.90
Jun 2011											
Jul 2011											
Aug 2011	<5.000	210.00	<0.020	5.860	12.700	<2.000	<0.200	<1.000	<100.00	<4.000	226.00
Sep 2011											
Oct 2011											
Nov 2011		130.00	<0.020				<0.200				38.30
Dec 2011											
Minimum	<5.000	130.00	<0.020	5.860	10.400	<2.000	<0.200	<1.000	<100.000	<4.000	38.30
Maximum	<5.000	220.00	<0.020	6.600	12.700	<2.000	<0.200	<1.000	<100.000	<4.000	226.00
Average	<5.000	176.00	<0.020	6.230	11.550	<2.000	<.2000	<1.000	<100.000	<4.000	125.05

Analyzed by American Scientific Laboratories, Los Angeles, CA 90065
*Analyzed by City of San Buenaventura Wastewater Laboratory, Ventura, CA 93001

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Influent Pump Station

Month	Influent Aluminun, Total ug/l	Influent Antimony, Total ug/l	Influent Arsenic, Total ug/l	Influent Barium Total ug/l	Influent Beryllium, Total ug/l	Influent Cadmium, Total ug/l	Influent Chromium, Hexavalent Total ug/l	Influent Chromimun, Total ug/l	Influent Cobalt, Total ug/l	Influent Copper, Total ug/l	Influent Iron * ug/l
Jan 2011											
Feb 2011	368.0	<1.000	2.210	<2.000	<2.000	<4.000	<1.000	<7.000	<1.000	65.30	835.6
Mar 2011											
Apr 2011											
May 2011										68.70	1,202.0
Jun 2011											
Jul 2011											
Aug 2011	242.0	<1.000	7.500	<2.000	<2.000	<4.000	<1.000	<7.000	<1.000	49.20	2,420.0
Sep 2011											
Oct 2011											
Nov 2011										79.60	210.0
Dec 2011											
Minimum	242.0	<1.000	2.210	<2.000	<2.000	<4.000	<1.000	<7.000	<1.000	29.60	210.0
Maximum	368.0	<1.000	7.500	<2.000	<2.000	<4.000	<1.000	<7.000	<1.000	66.20	2,420.0
Average	305.0	<1.000	4.855	<2.000	<2.000	<4.000	<1.000	<7.000	<1.000	47.90	1,166.9

Analyzed by American Scientific Laboratories, Los Angeles, CA 90065
*Analyzed by City of San Buenaventura Wastewater Laboratory, Ventura, CA 93001

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Influent Pump Station

Month	Acetone ug/l	Chloroform ug/l	Toluene ug/l	Ethlylbenezene ug/l	Tetrachloroethylene ug/l	Xylene ug/l	1,1,1-Trichloroethane ug/l	1,4 Dichlorobenzene UG/L
February	54	1.320	0.365	<0.340	<0.030	<0.500	<0.030	<0.500
August	72	2.790	0.695	<0.340	<0.030	1.750	<0.030	<4.400
Minimum	54	1.320	0.365	<0.340	<0.030	<0.500	<0.030	<0.500
Maximum	72	2.790	0.695	<0.340	<0.030	1.750	<0.030	<4.400
Average	63	2.055	0.530	<0.340	<0.030	<1.125	<0.030	<2.450

Analysis Performed by American Scientific Laboratory, Los Angeles, CA 90065

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Flow Equaliztion Basin - Primary Effluent

Month	EPE pH @ Lab SU	EPE BOD mg/l	EPE COD mg/l	EPE Suspended Solids @ 105C mg/l	EPE Ammonia mg/l	EPE Total Kjeldahl Nitrogen mg/l	EPE MBAS mg/l
January	7.53	156.7	328	96.2	31.0	39.3	6.90
February	7.53	223.3	362	112.6	35.0	42.4	7.65
March	7.52	156.9	319	92.3	27.9	38.8	8.36
April	7.56	171.7	341	96.0	28.1	32.5	10.81
May	7.49	164.4	361	95.0	29.5	38.0	11.56
June	7.48	159.3	350	80.3	29.0	36.3	12.07
July	***	***	***	***	***	***	***
August	***	***	***	***	***	***	***
September	***	***	***	***	***	***	***
October	7.52	162.6	360	88.2	33.1	43.9	12.77
November	7.51	157.8	360	86.5	29.6	44.4	13.32
December	7.47	177.5	377	92.7	31.9	46.5	11.51
Minimum	7.29	100.3	236	51.4	23.6	32.5	6.90
Maximum	7.71	353.2	454	182.0	42.0	46.5	13.32
Average	7.52	169.7	351	93.4	30.8	40.2	10.55

*** No Data Due to Samlpler Failure or Other Loss

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Mixed Media Filter Station (FS) Influent

Month	Mixed Media Filter Flow MGD	FS Suspended Solids @ 105C mg/l	FS BOD mg/l	FS COD mg/l	FS Nitrate mg/l	FS Nitrite mg/l	FS Ammonia mg/l	FS Total Kjeldahl Nitrogen mg/l	FS MBAS mg/l
January,	9.16	12.76	9.8	37.1	14.3	0.9	0.3	2.7	<0.5
February	8.98	8.54	7.6	36.3	17.2	<.4	0.1	0.8	<0.5
March	9.78	8.80	8.3	33.7	14.0	0.8	1.0	1.0	<0.5
April	9.24	8.20	11.2	37.9	10.2	0.4	2.2	2.6	<0.5
May	8.95	8.12	8.2	37.4	8.2	<.4	1.1	1.7	<0.5
June	9.12	10.54	11.1	41.7	7.4	<.4	1.4	1.5	<0.5
July	8.94	11.15	9.4	44.4	13.4	<.4	1.2	2.8	<0.5
August	9.26	14.73	12.5	48.2	14.9	0.5	2.2	1.9	<0.5
September	9.05	11.54	7.7	37.8	14.1	<.4	0.7	1.4	<0.5
October	8.65	7.88	5.3	32.0	9.3	<.4	1.0	1.4	<0.5
November	8.48	10.18	7.2	35.9	5.9	<.4	0.9	2.1	<0.5
December	8.66	11.12	7.6	33.5	7.0	<.4	0.7	2.4	<0.5
Minimum	7.97	2.80	2.2	18.8	4.6	0.4	0.1	0.8	<0.5
Maximum	12.8	27.6	34.0	67.8	19.5	2.3	4.4	2.8	<0.5
Average	9.04	10.42	8.9	38.5	11.9	0.5	1.1	1.9	<0.5

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Effluent Transfer Station

Month	Effluent pH @ Lab	Effluent Suspended Solids @ 105C	Effluent Suspended Solid Load	Effluent Total Dissolved Solids	Effluent Conductivity	Effluent BOD	Effluent BOD Load	Effluent COD	Effluent Settable Solids	Effluent Dissolved Oxygen
	SU	MG/L	lbs/day	MG/L	umhos/cm	MG/L	lbs/day	MG/L	MG/L	MG/L
January	7.1	1.80	133	1,564	2,467	2.5	188	27.1	<0.10	7.6
February	7.0	0.85	63	1,498	2,296	2.7	196	27.8	<0.10	7.5
March	7.1	2.00	164	1,581	2,328	3.4	279	27.7	<0.10	7.3
April	7.0	2.24	164	1,597	2,365	4.2	305	31.1	<0.10	6.4
May	6.9	1.65	113	1,310	1,949	4.0	275	30.2	<0.10	6.1
June	6.8	1.57	109	1,152	1,822	3.8	264	32.7	<0.10	6.3
July	6.9	2.00	133	1,386	2,012	3.5	231	30.6	<0.10	6.3
August	6.9	1.99	142	1,410	2,098	4.3	306	33.3	<0.10	6.1
September	6.9	1.59	111	1,420	2,131	3.5	245	28.0	<0.10	6.4
October	7.0	1.72	117	1,480	2,197	3.2	220	26.4	<0.10	6.6
November	7.0	1.84	127	1,373	2,102	3.3	229	26.9	<0.10	6.6
December	6.9	1.47	104	1,388	2,033	3.2	223	26.8	<0.10	7.0
Minimum	6.9	0.79	65	1,212	2,210	<2.0	70	16.0	<0.10	7.3
Maximum	7.2	2.89	207	1,722	2,690	4.3	367	34.3	<0.10	8.2
Average	7.1	1.80	133	1,564	2,467	2.5	188	27.1	<0.10	7.6

Limitations of Permit CA0053651

Daily Maximum		45	5,300		45	5,300	0.3
Weekly Average		40	4,700		30	3,500	
Monthly Average		15	1,800		20	2,300	0.1
Instantaneous Min	6.5						
Instantaneous Max	8.5						

Ventura Water Reclamation Facility
Annual Report 2011

Effluent Transfer Station

Month	Effluent Grease & Oil MG/L	Effluent Grease & Oil Load lbs/day	Effluent ETS Turbidity Max NTU	Effluent Nitrate mg/l	Effluent Nitrite mg/l	Effluent Ammonia mg/l	Effluent Total Kjeldahl Nitrogen mg/l	Effluent Total Organic Nitrogen mg/l
January	<1.0	<75.2	0.7	14.7	0.5	1.1	1.0	.1
February	<1.8	<132.8	0.7	18.9	<0.4	1.0	2.0	1.2
March	<1.0	<81.8	1.1	14.4	<0.4	2.7	0.4	.1
April	<1.0	<75.0	1.1	9.6	<0.4	2.5	2.2	0.8
May	<1.0	<70.4	1.5	6.6	<0.4	1.4	2.1	1.8
June	<3.3	<224.5	1.5	7.8	<0.4	2.2	2.3	1.1
July	<1.0	<65.9	1.2	13.8	<0.4	1.0	1.7	0.8
August	<1.0	<69.9	1.5	7.4	0.4	2.5	0.3	.1
September	<1.0	<72.0	0.9	12.3	<0.4	1.6	1.9	0.8
October	<1.0	<70.1	0.9	9.2	<0.4	1.0	1.4	0.5
November	3.7	255.3	1.2	6.2	<0.4	1.0	2.5	0.5
December	4.2	293.6	0.9	7.6	<0.4	0.7	2.2	1.5
Minimum	<1.0	<65.9	0.4	6.2	<0.4	0.7	0.3	0.1
Maximum	4.2	293.6	1.9	14.7	0.5	2.7	2.5	1.8
Average	<1.8	<123.9	0.7	10.7	<0.4	1.6	1.7	0.8

Limitations of Permit CA0053651

Daily Maximum	15	1,800
7 Day Average		
30 Day Average	10	1,200

Ventura Water Reclamation Facility

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Effluent Transfer Station

Month	Effluent Chloride mg/l	Effluent Sulfate mg/l	Effluent Sodium mg/l	Effluent Calcium mg/l	Effluent Magnesium mg/l	Effluent Potassium mg/l
January	291	605	298	146	60	24
February	320	558	277	141	55	26
March	275	522	285	135	44	24
April	277	559	283	135	56	25
May	297	573	297	136	61	27
June	291	391	212	89	38	22
July	277	381	243	107	45	27
August	238	380	257	102	41	26
September	297	442	173	75	32	17
October	282	492	259	118	49	24
November	282	444	248	114	44	23
December	291	477	187	86	36	17
Minimum	238	380	173	75	32	17
Maximum	320	605	298	146	61	27
Average	285	485	252	115	47	23

Ventura Water Reclamation Facility

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Effluent Transfer Station

Month	Effluent Phosphate mg/l	Effluent Total Phosphorus mg/l	Effluent Boron mg/l	Effluent Fluoride mg/l	Effluent Total Alkalinity mg/l	Effluent MBAS mg/l	Effluent Chlorophyll A* mg/l
January	2.19	2.61	0.73	0.54	211	0.12	<0.002
February	2.60	1.98	0.62	0.58	170	0.15	0.002
March	3.83	2.80	0.20	0.64	185	0.05	<0.002
April	2.99	2.60	0.64	0.59	236	0.06	<0.002
May	2.59	2.74	0.68	0.61	233	0.11	<0.002
June	3.20	3.07	0.54	0.50	194	0.11	<0.002
July	4.07	3.92	0.53	0.52	145	0.07	<0.002
August	3.27	3.94	0.60	0.60	160	0.12	<0.002
September	4.77	3.98	0.60	0.63	171	0.07	<0.002
October	4.94	3.78	0.67	0.60	194	0.04	<0.002
November	2.61	2.07	0.79	0.42	198	0.10	<0.002
December	3.09	3.76	0.41	0.55	207	0.08	<0.002
Minimum	2.19	1.98	0.20	0.42	145	0.04	<0.002
Maximum	4.94	3.98	0.79	0.64	236	0.15	0.002
Average	3.35	3.10	0.58	0.57	192	0.09	<0.002

* Analyzed by Sierra Environmental Monitoring, Inc, Reno, NV 89502

Ventura Water Reclamation Facility
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Effluent Transfer Station

Month	Effluent Total Cyanide (As CN) ug/l	Effluent Aluminum, Total ug/l	Effluent Antimony, Total ug/l	Effluent Arsenic, Total ug/l	Effluent Barium, Total ug/l	Effluent Beryllium, Total ug/l	Effluent Cadmium, Total ug/l	Effluent Cobalt, Total ug/l	Effluent Chromium, Hexavalent, Total ug/l	Effluent Copper, Total ug/l
January										2.86
February	<5.000	34.000	<1.000	<2.000	<2.000	<0.200	<4.000	<1.000	<1.000	4.09
March										2.61
April										2.87
May										<2.00
June										4.94
July										<2.00
August	<5.000	35.400	<1.000	<1.000	<2.000	<0.200	<4.000	<1.000	<1.000	<2.00
September										<2.00
October										5.81
November										4.35
December										7.63
Minimum	<5.000	34.00	<1.000	<2.000	<2.000	<.2000	<4.000	<1.000	<1.000	<2.00
Maximum	<5.000	35.40	<1.000	<2.000	<2.000	<.2000	<4.000	<1.000	<1.000	8.07
Average	<5.000	34.70	<1.000	<2.000	<2.000	<.2000	<4.000	<1.000	<1.000	3.63

Limitation of Permit CA0053651

Daily Maximum	14
Monthly Average	6.7

Analyzed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Water Reclamation Facility
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Effluent Transfer Station

Month	Effluent Lead, Total ug/l	Effluent Mercury, Total ug/l	Effluent Molybdenum, Total ug/l	Effluent Nickel, Total ug/l	Effluent Selenium, Total ug/l	Effluent Silver, Total ug/l	Effluent Thallium, Total ug/l	Effluent, Tin Total ug/l	Effluent Vanadium, Total ug/l	Effluent Zinc, Total ug/l
January		<0.020				<0.200				30.500
February	<5.000	<0.020	10.800	11.400	13.700	<0.200	<1.000	<100.000	<4.000	26.100
March		<0.020				<0.200				33.000
April		<0.020				<0.200				35.000
May		<0.020				<0.200				<2.000
June		<0.020				<0.200				34.800
July		<0.020				<0.200				34.200
August	<5.000	<0.020	10.400	<1.000	<2.000	<0.200	<1.000	<100.000	<4.000	35.400
September		<0.020				<0.200				42.100
October		<0.020				<0.200				36.500
November		<0.020				<0.200				18.500
December		<0.020				<0.200				68.800
Minimum	<5.000	<0.020	10.400	<1.000	<2.000	<0.200	<1.000	<100.00	<4.000	<2.000
Maximum	<5.000	<0.020	10.800	11.400	13.700	<0.200	<1.000	<100.00	<4.000	68.800
Average	<5.000	<0.020	10.600	6.200	7.850	<0.200	<1.000	<100.00	<4.000	31.000

Limitation of Permit CA0053651

Daily Maximum	0.10	2.2	107
Monthly Average	0.051	0.71	45

Analyzed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Water Reclamation Facility
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Effluent Transfer Station

Month	Effluent Iron ug/l	Effluent Manganese ug/l	Effluent Chromium, Total * ug/l
January	<100.00	30.00	
February	170.00	60.00	<7.00
March	<100.00	30.00	
April	<100.00	130.00	
May	<100.00	20.00	
June	<100.00	30.00	
July	<100.00	70.00	
August	<100.00	110.00	<7.00
September	<100.00	40.00	
October	<100.00	<20.00	
November	<100.00	30.00	
December	<100.00	<20.00	
Minimum	<100.00	<20.00	<7.00
Maximum	170.00	130.00	<7.00
Average	<100.00	45.83	<7.00

*Analyses Performed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Water Reclamation Facility

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Effluent Transfer Station

Month	Aldrin ug/l	alpha - BHC ug/l	beta - BHC ug/l	delta - BHC ug/l	Lindane ug/l	PCBs ug/l	Chlordane ug/l	Toxaphene ug/l	DDD ug/l	alpha Endosulfan ug/l	beta Endosulfan ug/l
February	<0.004	<0.003	<0.006	<0.009	<0.004	<0.390	<0.014	<0.200	<2.800	<0.014	<0.004
August	<0.004	<0.003	<0.006	<0.009	<0.004	<0.390	<0.014	<10.000	<2.800	<0.014	<0.004
Average	<0.004	<0.003	<0.006	<0.009	<0.004	<0.390	<0.014	<0.200	<2.800	<0.014	<0.004
Maximum	<0.004	<0.003	<0.006	<0.009	<0.004	<0.390	<0.014	<0.200	<2.800	<0.014	<0.004
Minimum	<0.004	<0.003	<0.006	<0.009	<0.004	<0.390	<0.014	<5.100	<2.800	<0.014	<0.004

Permit Limit CA0053651

Analyses Performed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Water Reclamation Facility

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Effluent Transfer Station

Month	Bromoform ug/l	Chloroform ug/l	Dibromchloromethane ug/l	Dichlorobromomethane ug/l	Carbon Tetrachloride ug/l	1, 4 Dichlorobenzene ug/l
January						
February	<0.20	6.28	3.79	6.80	<1.00	<1.00
March						
April						
May						
June						
July						
August	<0.20	14.90	2.90	8.25	<0.25	<4.40
September						
October						
November						
December						
Minimun	<0.20	6.28	2.90	6.80	<0.25	<1.00
Maximum	<0.20	14.90	3.79	8.25	<1.00	<4.40
Annual Average	<0.20	10.59	3.35	7.53	<0.63	<2.70

Permit Limit CA0053651

Analyses Performed by American Scientific Laboratories, Los Angeles, CA 90065

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Effluent Transfer Station

Month	Pentachlorophenol ug/l	Benzene ug/l	Bis (2-Ethylhexyl)phthalate ug/l	Acetone ug/l	Xylene ug/l	Chlorobenzene ug/l
January						
February	<3.60	<0.50	<2.50	<5.00	<3.00	<0.20
March						
April						
May						
June						
July						
August	<3.60	<0.20	<2.50	<5.00	<0.50	<0.20
September						
October						
November						
December						
Minimun	<3.60	<0.20	<2.50	<5.00	<0.50	<0.20
Maximum	<3.60	<0.50	<2.50	<5.00	<3.00	<0.20
Annual Average	<3.60	<0.35	<2.50	<5.00	<1.75	<0.20

Permit Limit CA0053651

Analyses Performed By American Scientific Laboratories, Los Angeles, CA 90065

Ventura Water Reclamation Facility

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Effluent Transfer Station

Month	Effluent - Contact Chamber CL2 @ 11AM MG/L	Effluent Lab Chlorine Residual @ 11 AM mg/l
January	5.2	<0.1
February	4.9	<0.1
March	4.6	<0.1
April	3.5	<0.1
May	5.4	<0.1
June	5.6	<0.1
July	4.9	<0.1
August	5.6	<0.1
September	5.7	<0.1
October	5.5	<0.1
November	5.3	<0.1
December	5.9	<0.1
Minimum	2.1	<0.1
Maximum	7.3	<0.1
Average	5.2	<0.1

Ventura Water Reclamation Facility

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Effluent Transfer Station

Month	Effluent Estuary Flow MGD	Effluent Chlorine Residual Daily Max MG/L	Effluent Temperature Deg. C	Acute 96hr Toxicity Pimphales * %	Chronic Ceriodaphnia - Survival * TUc	Chronic Ceriodaphnia - Reproduction * TUc
January	8.17	0.10	21.1	100.00	1.00	1.00
February	8.14	0.10	21.4			
March	8.57	0.10	21.5			
April	7.83	0.10	22.8			
May	7.35	0.10	23.7			
June	7.21	0.10	24.3			
July	7.26	0.10	25.7			
August	7.41	0.10	25.4			
September	7.41	0.10	25.3			
October	7.54	0.10	24.9			
November	7.80	0.10	23.3			
December	7.65	0.10	21.7			
Minimum	6.25	0.10	21.1	100.00	1.00	1.00
Maximum	12.58	0.10	25.7	100.00	1.00	1.00
Average	7.69	0.10	23.4	100.00	1.00	1.00
Limitation of Permit CA0053651				90.00	1	1

Bioassays performed by Aquatic Bioassay Consulting Labortories, Ventura, CA 93001

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Effluent Transfer Station

	Chronic Fathead Larvae - Growth *	Chronic Fathead Larvae- Survival *	Chronic Selenastrum - Growth
	TUc	TUc	TUc
January	1.00	1.00	1.00
February			1.00
March			1.00
April			1.00
May			1.00
June			1.00
July			1.00
August			1.00
September			1.00
October			1.00
November			1.00
December			1.00
Minimum	1.00	1.00	1.00
Maximum	1.00	1.00	1.00
Average	1.00	1.00	1.00

Limiitation of Permit CA005365'	1.00	1.00	1.00

*Analyzed by Aquaic Bioassay Consulting Laboratoires, INC., Ventura, CA 93001

Ventura Water Reclamation Facility
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Receiving Water Stations -Temperatures

Month	R1 Air Temperature Deg. C	R2 Air Temperature Deg. C	R3 Air Temperature Deg. C	R4 Air Temperature Deg. C	R5 Air Temperature Deg. C	R1 Water Temperature Deg. C	R2 Water Temperature Deg. C	R3 Water Temperature Deg. C	R4 Water Temperature Deg. C	R5 Water Temperature Deg. C
January	14.8	15.2	15.0	15.3	15.5	13.8	14.1	13.1	14.8	14.0
February	16.9	17.1	17.4	17.4	17.1	15.1	15.8	15.2	16.9	15.3
March	16.3	17.0	16.1	16.2	16.0	13.6	13.6	15.2	16.9	12.0
April	16.5	17.1	16.6	16.8	16.5	16.0	16.7	19.8	20.5	17.0
May	15.6	15.7	15.8	16.4	15.7	16.1	16.9	19.0	20.6	16.8
June	15.8	15.9	15.5	15.6	15.5	20.2	19.3	18.8	22.8	19.7
July	17.8	18.4	16.3	16.8	17.0	22.5	20.2	20.9	24.4	22.8
August	16.4	16.9	15.6	15.9	16.0	20.8	20.1	20.2	21.9	26.9
September	17.0	***	16.0	16.4	16.5	20.2	***	20.5	20.7	21.0
October	15.8	16.5	15.8	15.8	15.5	18.6	19.3	18.8	19.1	19.7
November	17.1	17.2	15.4	15.8	16.4	14.3	15.7	14.9	15.3	15.7
December	14.5	14.8	13.0	13.5	13.8	10.6	12.1	10.8	10.9	11.7
Minimum	12.0	12.0	12.0	12.0	12.5	10.3	12.1	10.8	10.9	9.2
Maximum	20.0	20.0	20.0	20.0	20.0	24.6	20.2	20.9	24.4	24.7
Average	16.3	16.6	15.8	16.1	16.0	15.7	16.7	17.3	18.7	15.5

*** No Data Due to Equipment Failure or Other Loss

Ventura Water Reclamation Facility

Annual Report 2011

Receiving Water Stations - Chlorine Residual & Salinity

Month	R1 Chlorine Residual MG/L	R2 Chlorine Residual MG/L	R3 Chlorine Residual MG/L	R4 Chlorine Residual MG/L	R5 Chlorine Residual MG/L	R1 Salinity PPT	R2 Salinity PPT	R3 Salinity PPT	R4 Salinity PPT	R5 Salinity PPT
January	<0.10	<0.10	<0.10	<0.10	<0.10	9.6	17.7	18.6	11.2	2.1
February	<0.10	<0.10	<0.10	<0.10	<0.10	7.6	7.9	6.6	3.9	8.0
Mar	<0.10	<0.10	<0.10	<0.10	<0.10	2.7	0.9	6.1	6.9	0.6
Apr	<0.10	<0.10	<0.10	<0.10	<0.10	2.1	0.7	1.9	1.3	0.7
May	<0.10	<0.10	<0.10	<0.10	<0.10	2.1	0.9	2.8	1.1	0.6
June	<0.10	<0.10	<0.10	<0.10	<0.10	6.1	18.5	20.0	1.0	1.1
July	<0.10	<0.10	<0.10	<0.10	<0.10	8.2	29.6	31.0	1.2	1.4
August	<0.10	<0.10	<0.10	<0.10	<0.10	3.7	11.4	9.0	2.2	2.0
September	<0.10	***	<0.10	<0.10	<0.10	2.0	***	1.9	1.9	1.7
October	<0.10	<0.10	<0.10	<0.10	<0.10	1.5	1.4	1.4	1.4	1.4
November	<0.10	<0.10	<0.10	<0.10	<0.10	1.4	1.4	1.3	1.3	1.4
December	<0.10	<0.10	<0.10	<0.10	<0.10	2.1	2.0	1.7	1.7	1.9
Minimum	<0.10	<0.10	<0.10	<0.10	<0.10	1.1	0.2	1.0	0.8	0.5
Maximum	<0.10	<0.10	<0.10	<0.10	<0.10	23.6	33.1	33.0	32.4	16.9
Average	<0.10	<0.10	<0.10	<0.10	<0.10	3.9	8.5	8.6	3.0	1.9

***No Data Due to Equipment Failure or Other Loss

Ventura Water Reclamation Faclity

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Receiving Water Stations - DO & Hardness

Month	R1 Dissolved Oxygen MG/L	R2 Dissolved Oxygen MG/L	R3 Dissolved Oxygen MG/L	R4 Dissolved Oxygen MG/L	R5 Dissolved Oxygen MG/L	R1 Hardness MG/L	R2 Hardness MG/L	R3 Hardness MG/L	R4 Hardness MG/L	R5 Hardness MG/L
January	15.7	18.3	15.0	13.4	19.3	1,993	2,097	1,615	850	1,195
February	14.3	17.4	15.4	15.7	17.0	1,508	1,508	1,098	770	1,128
March	8.8	14.6	12.5	11.7	14.8	1,716	507	644	652	478
April	6.5	9.5	9.0	9.2	9.6	1,820	628	765	668	560
May	8.5	10.7	9.6	9.5	10.3	1,796	632	970	544	544
June	13.8	16.2	10.6	12.5	16.7	1,988	1,948	1,693	513	898
July	20.2	16.3	15.0	12.5	18.7	2,280	1,923	2,293	563	1,110
August	10.4	15.9	13.3	10.3	12.2	1,418	1,428	1,522	736	1,184
September	6.9	***	16.6	16.1	18.2	810	***	763	733	888
October	3.7	7.5	6.3	5.0	8.0	715	690	685	660	785
November	8.8	11.0	9.6	9.4	11.3	764	746	694	672	800
December	7.7	9.8	9.6	9.4	10.8	915	855	770	720	1,005
Minimum	2.1	4.6	4.1	1.7	6.5	650	380	520	420	370
Maximum	35.3	28.7	24.0	24.2	24.7	2,870	3,400	3,890	1,270	1,450
Average	10.3	13.3	11.9	11.2	13.9	1,486	1,165	1,128	671	867

***No Data Due to Equipment Failure or Other Loss

Ventura Water Reclamaton Facililty
Annual Report 2011

Receiving Water Stations -Nitrate & Nitrite

Month	R1 Nitrate MG/L	R2 Nitrate MG/L	R3 Nitrate MG/L	R4 Nitrate MG/L	R5 Nitrate MG/L	R1 Nitrite MG/L	R2 Nitrite MG/L	R3 Nitrite MG/L	R4 Nitrite MG/L	R5 Nitrite MG/L
January	0.6	0.6	9.4	12.8	4.6	<0.4	<0.4	<0.4	<0.4	<0.4
February	11.0	7.3	6.9	13.7	9.6	<0.4	<0.4	<0.4	<0.4	<0.4
March	0.7	0.9	13.2	14.2	1.0	<0.4	<0.4	<0.4	<0.4	<0.4
April	1.7	1.0	11.9	11.9	1.2	<0.4	<0.4	<0.4	<0.4	<0.4
May	1.0	1.5	4.7	5.6	1.7	<0.4	<0.4	<0.4	<0.4	<0.4
June	0.4	1.0	5.1	7.0	1.3	<0.4	<0.4	<0.4	<0.4	<0.4
July	0.4	5.3	8.3	11.8	5.1	<0.4	<0.4	0.5	0.6	<0.4
August	2.8	6.5	12.0	13.9	6.4	<0.4	<0.4	<0.4	<0.4	<0.4
September	3.2	***	3.9	4.1	4.1	0.5	***	0.7	0.7	<0.4
October	3.6	3.8	6.5	7.3	5.0	<0.4	<0.4	0.4	0.4	0.4
November	2.4	3.0	4.9	5.7	2.9	<0.4	<0.4	<0.4	<0.4	<0.4
December	2.1	3.6	4.5	4.6	3.4	<0.4	<0.4	<0.4	<0.4	<0.4
Minimum	0.4	0.6	3.9	4.1	1.0	<0.4	<0.4	<0.4	<0.4	<0.4
Maximum	11.0	7.3	13.2	14.2	9.6	0.5	<0.4	0.7	0.7	0.4
Average	2.5	3.1	7.6	9.4	3.9	<0.4	<0.4	<0.4	<0.4	<0.4

***no Data Due ro Equipment Failure ot Other Loss

Ventura Water Reclamation Facility
Annual Report 2011

Receiving Water Stations - Ammonia & TKN

Month	R1 Ammonia MG/L	R2 Ammonia MG/L	R3 Ammonia MG/L	R4 Ammonia MG/L	R5 Ammonia MG/L	R1 Total Kjeldahl Nitrogen MG/L	R2 Total Kjeldahl Nitrogen MG/L	R3 Total Kjeldahl Nitrogen MG/L	R4 Total Kjeldahl Nitrogen MG/L	R5 Total Kjeldahl Nitrogen MG/L
January	0.2	0.8	0.5	0.5	0.3	1.0	1.3	1.6	1.7	1.3
February	<0.1	<0.1	0.1	0.1	0.5	2.4	2.5	1.3	3.6	5.1
March	0.2	<0.1	0.2	0.2	0.1	0.5	2.1	2.0	0.4	1.1
April	0.2	0.1	0.2	0.3	0.1	0.8	0.7	1.0	1.0	0.5
May	0.3	0.2	0.4	0.5	0.4	0.8	0.7	1.2	1.8	0.5
June	0.3	0.1	0.3	0.3	0.1	0.9	0.5	0.7	1.5	0.6
July	0.1	0.2	0.3	0.3	0.1	2.1	0.7	2.5	2.8	0.8
August	0.3	0.2	0.3	0.3	0.2	2.6	1.3	2.1	1.3	0.8
September	0.2	***	0.2	0.2	0.1	4.5	***	2.9	2.5	2.9
October	0.5	2.1	0.5	0.7	0.5	3.3	4.7	2.0	5.8	2.1
November	2.0	0.2	<0.1	0.1	<0.1	2.3	1.5	1.6	1.6	1.3
December	2.6	0.2	0.2	0.1	0.1	2.0	1.2	1.1	1.4	1.1
Minimum	<0.1	<0.1	<0.1	0.1	<0.1	0.5	0.5	0.7	0.4	0.5
Maximum	2.6	2.1	0.5	0.7	0.5	4.5	4.7	2.9	5.8	5.1
Average	0.6	0.4	0.3	0.3	0.2	1.9	1.6	1.7	2.1	1.5

***No Data Due to Equipment Failure or Other Loss

Ventura Water Reclamation Facility
Annual Report 2011

Receiving Water Stations - Total Phosphorus & Chlorophyll A

Month	R1 Total Phosphorus MG/L	R2 Total Phosphorus MG/L	R3 Total Phosphorus MG/L	R4 Total Phosphorus MG/L	R5 Total Phosphorus MG/L	R1 Chlorophyll A MG/L	R2 Chlorophyll A MG/L	R3 Chlorophyll A MG/L	R4 Chlorophyll A MG/L	R5 Chlorophyll A MG/L
January	0.20	0.7	1.70	2.40	0.10	0.003	0.007	0.004	0.006	<0.002
February	1.70	0.9	0.80	1.90	1.10	0.013	0.015	0.009	0.008	0.039
March	0.20	***	3.90	2.90	0.40	0.005	0.004	0.004	0.007	<0.002
April	0.10	0.4	2.30	2.40	0.40	0.014	<0.002	0.003	0.004	<0.002
May	0.10	0.1	2.40	2.70	2.30	0.009	0.019	<0.002	<0.002	<0.002
June	0.10	<0.1	2.20	3.00	0.10	0.029	0.004	0.003	<0.002	<0.002
July	0.20	1.3	2.80	3.70	0.10	0.200	0.004	0.003	0.008	0.006
August	0.50	1.6	2.80	3.20	0.10	0.120	0.082	0.120	0.039	0.013
September	1.10	***	1.50	2.70	0.30	0.069	***	0.075	0.027	0.065
October	1.90	1.7	2.20	1.90	1.40	0.013	0.003	0.004	0.004	0.005
November	1.40	1.4	2.10	1.40	1.10	0.043	0.022	0.017	0.033	0.019
December	1.80	2.3	2.60	2.80	1.70	0.004	0.016	0.015	0.014	0.020
Minimum	0.10	<0.1	0.80	1.40	0.10	0.003	<0.002	<0.002	<0.002	<0.002
Maximum	1.90	2.30	3.90	3.70	2.30	0.200	0.082	0.120	0.039	0.065
Average	0.78	1.05	2.28	2.58	0.76	0.044	0.016	0.022	0.013	0.015

Chlorophyll A Analyzed By Sierra Environmental Monitoring, Inc., Reno, NV 89502-2400
***No Data Due to Equipment Failure or Other Loss

Ventura Water Reclamation Facility

Annual Report 2011

Receiving Water Station

Month	R3 - Acute 96 hr Toxicity Pimphales % TU	R3 Chronic Selenastrum - Growth TUc	R3 Chronic Ceriodaphnia - Reproduction TUc	R3 Chronic Ceriodaphnia - Survival TUc	R3 Chronic Fathead Larvae - Growth TUc	R3 Chronic Fathead Larvae - Survival TUc
January	28.00	1.79	10.00	3.13	1.79	1.79
February		1.79				
March						
April						
May		1.00				
June						
July						
August		1.00				
September						
October						
November		1.00				
December						
Minimum	28.00	1.00	10.00	3.13	1.79	1.79
Maximum	28.00	1.79	10.00	3.13	1.79	1.79
Average	28.00	1.32	10.00	3.13	1.79	1.79

Analyzed by Aquatic Bioassay Consulting Laboratories, INC., Ventura, CA 93001

Ventura Water Reclamation Facility

Annual Report 2011

Receiving Water Station

Month	R4 - Acute 96 hr Toxicity Pimphales % TU	R4 - Chronic Selenastrum- Growth TUc	R4 - Chronic Ceriodaphnia - Reproduction TUc	R4 - Chronic Ceriodaphnia - Survival TUc	R4 - Chronic Fathead Larvae - Growth TUc	R4 - Chronic Fathead Larvae - Survival TUc
January	100.00	1.00	1.00	1.00	1.00	1.00
February		1.00				
March						
April						
May		1.00				
June						
July						
August		1.79				
September						
October						
November		1.00				
December						
Minimum	100.00	1.00	1.00	1.00	1.00	1.00
Maximum	100.00	1.79	1.00	1.00	1.00	1.00
Average	100.00	1.16	1.00	1.00	1.00	1.00

Analyzed by Aquatic Bioassay Consulting Laboratories, INC., Ventura, CA 93001

Ventura Water Reclamation Facility

Annual Report 2011

Receiving Water Station

Month	R5 - Acute 96 hr Toxicity Pimphales % TU	R5 - Chronic Selenastrum - Growth TUc	R5 - Chronic Cerodaphnia - Reproduction TUc	R5 - Chronic Ceriodaphnia - Survival TUc	R5 - Chronic Fathead Larvae - Growth TUc	R5 - Chronic Fathead Larvae - Survial TUc
January	92.00	1.00	1.00	1.00	1.00	1.00
February		1.00				
March						
April						
May		1.00				
June						
July						
August		1.00				
September						
October						
November		1.00				
December						
Minimum	92.00	1.00	1.00	1.00	1.00	1.00
Maximum	92.00	1.00	1.00	1.00	1.00	1.00
Average	92.00	1.00	1.00	1.00	1.00	1.00

Analyzed by Aquatic Bioassay Laboratories, INC., Ventura, CA 93001

Ventura Water Reclamation Facility
Annual Report 2011

Solid Streams

Total Metals - Dewatered Digested Sludge

Month	Filter Press 1 Run 1, Aluminum mg/kg/dry	Filter Press 1 Run 1, Antimony mg/kg/dry	Filter Press 1, Run 1, Arsenic mg/kg/dry	Filiter Press 1, Run 1, Barium mg/kg/dry	Filter Press 1 Run 1, Beryillum mg/kg/dry	Filter Press 1 Run 1, Cadmium mg/kg/dry	Filter Press 1 Run 1, Chromium mg/kg/dry	Filter Press 1 Run 1, Cobalt mg/kg/dry	Filter Press 1 Run 1, Copper mg/kg/dry
January									
February									
March									
April	5,140.5	<4.1	<4.1	361.2	<4.1	<4.1	28.1	15.3	1,363.6
May									
June	4,318.8	4.2	<3.6	265.9	<3.6	<3.6	22.4	13.1	1,101.4
July									
August	4,534.0	<2.6	3.1	377.5	<2.6	<2.6	29.9	18.6	1,345.5
September									
October	5,024.6	3.3	<2.5	352.2	<2.5	<2.5	29.4	15.4	1,389.2
November									
December	4,143.8	<3.1	<3.1	330.6	<3.1	<3.1	27.0	13.3	1,375.0
Minimum	4,143.8	<2.6	<2.5	265.9	<2.5	<2.5	22.4	13.1	1,101.4
Maximum	5,140.5	3.3	3.1	377.5	<4.1	<4.1	29.9	18.6	1,389.2
Average	4,632.3	<3.5	<3.3	337.5	<3.2	<3.2	27.4	15.1	1,315.0

Analyses Performed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Water Reclamation Facility
Annual Report 2011

Solid Streams

Total Metals - Dewatered Digested Sludge

Month	Filter Press 1 Run 1, Lead mg/kg/dry	Filter Press 1 Run 1, Mercury mg/kg/dry	Filter Press 1 Run 1, Molybdenum mg/kg/dry	Filter Press 1 Run 1, Nickel mg/kg/dry	Filter Press 1 Run 1, Selenium mg/kg/dry	Filter Press 1 Run 1, Silver mg/kg/dry	Filter Press 1 Run 1, Thallium mg/kg/dry	Filter Press 1 Run 1, Tin mg/kg/dry	Filter Press 1 Run 1, Vanadium mg/kg/dry	Filiter Press 1 Run 1, Zinc mg/kg/dry
January										
February										
March										
April	26.0	1.8	22.6	22.9	32.4	4.1	<4.1	<41.3	43.1	1,289.3
May										
June	9.4	<1.4	20.3	21.3	23.6	5.5	<3.6	<36.2	33.7	934.8
July										
August	24.1	1.6	25.9	23.5	25.1	6.2	<2.6	<26.2	31.6	1,209.4
September										
October	15.5	<1.0	27.4	19.7	26.2	6.1	<2.5	34.4	35.0	1,113.3
November										
December	14.0	1.3	26.8	26.0	31.2	8.3	<3.1	34.3	32.5	1,006.3
Minimum	9.4	<1.0	20.3	19.7	23.6	4.1	<2.5	<26.2	31.6	934.8
Maximum	26.0	1.8	27.4	26.0	32.4	8.3	<4.1	<41.3	43.1	1,289.3
Average	17.8	1.4	24.6	22.7	27.7	6.0	<3.2	<34.5	35.2	1,110.6

Analyses Performed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Water Reclamation Facility
Annual Report 2011

Solid Streams

Total Metals - Dewatered Digested Sludge

Month	Filter Press 1 Run 2, Aluminum mg/kg/dry	Filter Press 1 Run 2, Antimony mg/kg/dry	Filter Press 1 Run 2, Arsenic mg/kg.dry	Filter Press 1 Run 2, Barium mg/kg/dry	Filter Press 1 Run 2, Beryllium mg/kg.dry	Filter Press 1 Run 2, Cadmium mg/kg/dry	Filter Press 1 Run 2, Chromium mg/kg/dry	Filter Press 1 Run 2, Cobalt mg/kg/dry	Filter Press 1 Run 2, Copper mg/kg/dry
January									
February									
March									
April									
May									
June									
July									
August	4,021.0	2.5	3.1	338.2	<2.1	<2.1	25.0	16.8	1,201.7
September									
October									
November									
December									
Minimum	4,021.0	2.5	3.1	338.2	<2.1	<2.1	25.0	16.8	1,201.7
Maximum	4,021.0	2.5	3.1	338.2	<2.1	<2.1	25.0	16.8	1,201.7
Average	4,021.0	2.5	3.1	338.2	<2.1	<2.1	25.0	16.8	1,201.7

*Analyses Performed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Water Reclamation Facility
Annual Report 2011

Solid Streams

Total Metals - Dewatered Digested Sludge

Month	Filter Press 1 Run 2, Lead mg/kg/dry	Filter Press 1 Run 2, Mercury mg/kg/dry	Filter Press 1 Run 2, Molybdenum mg/kg.dry	Filter Press 1 Run 2, Nickel mg/kg/dry	Filter Press 1 Run 2, Selenium mg/kg.dry	Filter Press 1 Run 2, Silver mg/kg/dry	Filter Press 1 Run 2, Thallium mg/kg/dry	Filter Press 1 Run 2, Tin mg/kg/dry	Filter Press 1 Run 2, Vanadium mg/kg.dry	Filter Press 1 Run 2, Zinc mg/kg/dry
January										
February										
March										
April										
May										
June										
July										
August	12.0	1.0	23.8	21.7	23.9	7.2	<2.1	27.9	28.7	1,088.2
September										
October										
November										
December										
Minimum	12.0	1.0	23.8	21.7	23.9	7.2	<2.1	27.9	28.7	1,088.2
Maximum	12.0	1.0	23.8	21.7	23.9	7.2	<2.1	27.9	28.7	1,088.2
Average	12.0	1.0	23.8	21.7	23.9	7.2	<2.1	27.9	28.7	1,088.2

Analyses Performed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Reclamation Facility
Annual Report 2011

Solid Streams

Total Metals - Dewatered Digested Sludge

Month	Filter Press 2 Run 1, Aluminum mg/kg/dry	Filter Press 2 Run 1, Antimony mg/kg.dry	Filter Press 2 Run 1, Arsenic mg/kg/dry	Filter Press 2 Run 1, Barium mg/kg/dry	Filter Press 2 Run 1, Beryllium mg/kg/dry	Filter Press 2 Run 1, Cadmium mg/kg/dry	Filter Press 2 Run 1, Chromium mg/kg/dry	Filter Press 2 Run 1, Cobalt mg/kg/dry	Filter Press 2 Run 1, Copper mg/kg/dry
January									
February	6,526.7	<3.3	4.4	429.3	<3.3	3.3	28.9	14.9	1,520.0
March									
April									
May									
June									
July									
August	4,004.1	3.0	3.3	335.8	<2.1	2.1	26.5	16.6	1,193.4
September									
October									
November									
December									
Minimum	4,004.1	<3.3	3.3	335.8	<2.1	<2.1	26.5	14.9	1,193.4
Maximum	6,526.7	3.0	4.4	429.3	<3.3	<3.3	28.9	16.6	1,520.0
Average	5,265.4	<3.2	3.8	382.6	<2.7	<2.7	27.7	15.7	1,356.7

Analyses Performed By American Scientific Laboratories, Los Angeles, CA 90065

Ventura Reclamation Facility

Annual Report 2011

Soild Streams

Total Metals - Dewatered Digested Sludge

Month	Filter Press 2 Run 1, Lead mg/kg/dry	Filter Press 2, Run 1, Mercury mg/kg.dry	Filter Press 2 Run 1, Molybdenum mg/kg/dry	Filter Press 2 Run 1, Nickel mg/kg/dry	Filter Press 2 Run1, Selenium mg/kg/dry	Filter Press 2 Run 1, Silver mg/kg/dry	Filter Press 2 Run 1, Thallium mg/kg/dry	Filter Press 2 Run 1, Tin mg/kg/dry	Filter Press 2 Run 1, Vanadium mg/lkg/dry	Filter Press 2, Run 1, Zinc mg/kg/dry
January										
February	14.5	1.6	28.6	26.3	40.5	8.8	<3.3	42.0	53.1	1,286.7
March										
April										
May										
June										
July										
August	12.1	1.6	23.6	21.6	22.6	5.4	<2.1	25.1	28.6	1,061.7
September										
October										
November										
December										
Minimum	12.1	1.6	23.6	21.6	22.6	5.4	<2.1	25.1	28.6	1,061.7
Maximum	14.5	1.6	28.6	26.3	40.5	8.8	<3.3	42.0	53.1	1,286.7
Average	13.3	1.6	26.1	23.9	31.6	7.1	<2.7	33.6	40.8	1,174.2

Analyses Performed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Reclamation Facility
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Solid Streams

Total Metals - Dewatered Digested Sludge

Month	Filter Press 2 Run 2, Aluminum mg/kg/dry	Filter Press 2 Run 2, Antimony mg/kg/dry	Filter Press 2 Run 2, Arsenic mg/kg/dry	Filter Press 2 Run 2, Barium mg/kg/.dry	Filter Press 2 Run 2, Beryllium mg/kg/dry	Filter Press 2 Run 2, Cadmium mg/kg/dry	Filter Press 2 Run 2, Chromium mg/kg/dry	Filter Press 2 Run 2, Cobalt mg/kg/dry	Filter Press 2 Run 2, Copper mg/kg/dry
January									
February	6,018.2	4.0	3.7	394.5	<3.0	<3.0	26.5	14.4	1,400.0
March									
April									
May									
June									
July									
August	4,080.5	<3.4	<3.4	344.3	<3.4	<3.4	25.4	16.4	1,194.6
September									
October									
November									
December									
Minimum	4,080.5	<3.2	<3.4	344.3	<3.0	<3.0	25.4	14.4	1,194.6
Maximum	6,018.2	4.0	3.7	394.5	<3.4	<3.4	26.5	16.4	1,400.0
Average	5,049.4	<3.7	<3.5	369.4	<3.2	<3.2	25.9	15.4	1,297.3

Analyses Performed By American Scientific Laboratories, Los Angeles, CA 90065

Ventura Reclamation Facility

Annual Report 2011

Soild Streams

Total Metals - Dewatered Digested Sludge

Month	Filter Press 2 Run 2, Lead mg/kg/dry	Filter Press 2 Run2, Mercury mg/kg/dry	Filter Press 2 Run 2, Molybdenum mg/kg/dry	Filter Press 2 Run 2, Nickel mg/kg/dry	Filter Press 2 Run 2, Selenium mg/kg/dry	Filter Press 2 Run 2, Silver mg/kg/dry	Filter Press 2 Run 2, Thallium mg/kg/dry	Filter Press 2 Run 2, Tin mg/kg.dry	Filter Press 2 Run 2, Vanadium mg/kg/dry	Filter Press 2 Run 2, Zinc mg/kg/dry
January										
February	12.9	1.4	26.4	25.2	36.4	5.6	<3.0	36.7	50.3	1,200.0
March										
April										
May										
June										
July										
August	16.5	1.6	22.3	19.3	24.2	3.4	<3.4	<33.6	28.3	1,161.1
September										
October										
November										
December										
Minimum	12.9	1.4	22.3	19.3	24.2	3.4	<3.0	<33.6	28.3	1,161.1
Maximum	16.5	1.5	26.4	25.2	36.4	5.6	<3.4	36.7	50.3	1,200.0
Average	14.7	1.5	24.4	22.2	30.3	4.5	<3.2	35.1	39.3	1,180.5

Analyses Performed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Water Reclamation Facility
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Solid Streams

Organics - Dewatered Digested Sludge

Month		Acetone mg/kg/dry	Chloromethane mg/kg/dry	Bis (2-Ethyylhexylphthalate) mg/kg/dry	1,4-Dichlorobenzene mg/kg/dry	Toluene mg/kg/dry	Xylene mg/kg/dry	TOX mg/kg/dry
February	Filter Press 2 Run 1	<0.33	<0.07	6.01	<0.07	<0.01	<0.04	<333.33
August	Filter Press 1 Run 1	<0.26	<0.16	5.54	<0.05	<0.01	<0.31	125.65
Minimum		<0.26	<0.07	5.54	<0.05	<0.01	<0.04	125.65
Maximum		<0.33	<0.16	6.01	<0.07	<0.01	<0.31	<333.33
Average		<0.30	<0.12	5.78	<0.06	<0.01	<0.18	<229.49

Analyses Performed by American Scientific Laboratories, Los Angeles, CA 90065

Ventura Water Reclamation Facility
Annual Report 2011

Solid Streams

Total Metals - Dry Weight
Dissolverd Air Flotation System (Waste Activated Sludge)

Month	Cadmium mg/kg/dry	Chromium mg/kg dry	Copper mg/kg/dry	Lead mg/kg/dry	Nickel mg/kg/dry	Silver mg/kg/dry	Zinc mg/kg/dry
February	<0.05	27.23	2,078.57	30.00	33.75	7.86	1,157.89
May							
August	<0.50	19.71	1,034.09	24.10	16.39	1.19	683.49
November							
Annual Average	<0.05	23.5	1,556.3	27.1	25.1	4.5	920.7

Gravity Thickener (Primary Sludge)

Month	Cadmiun mg/kg/dry	Chromium mg/kg/dry	Copper mg/kg/dry	Lead mg/kg/dry	Nickel mg/kg/dry	Silver mg/kg/dry	Zinc mg/kg/dry
February	<0.05	18.93	669.12	28.29	19.86	3.08	784.10
May							
August	<0.05	20.17	478.45	30.00	16.95	0.16	787.24
November							
Annual Average	<0.05	19.55	573.79	29.15	18.41	1.62	785.67

Ventura Water Reclamation Facility

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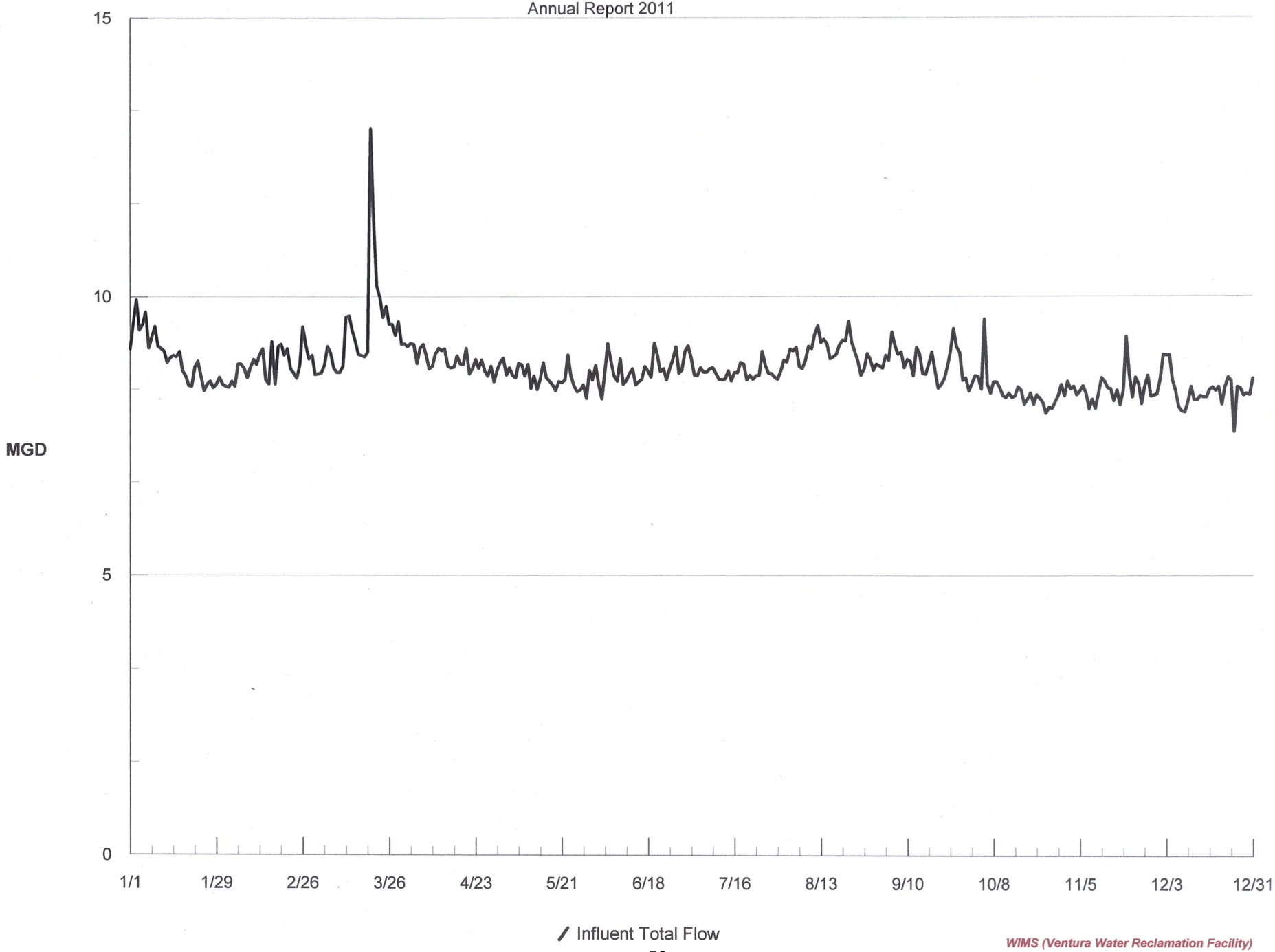
Irrigation Reuse Flows

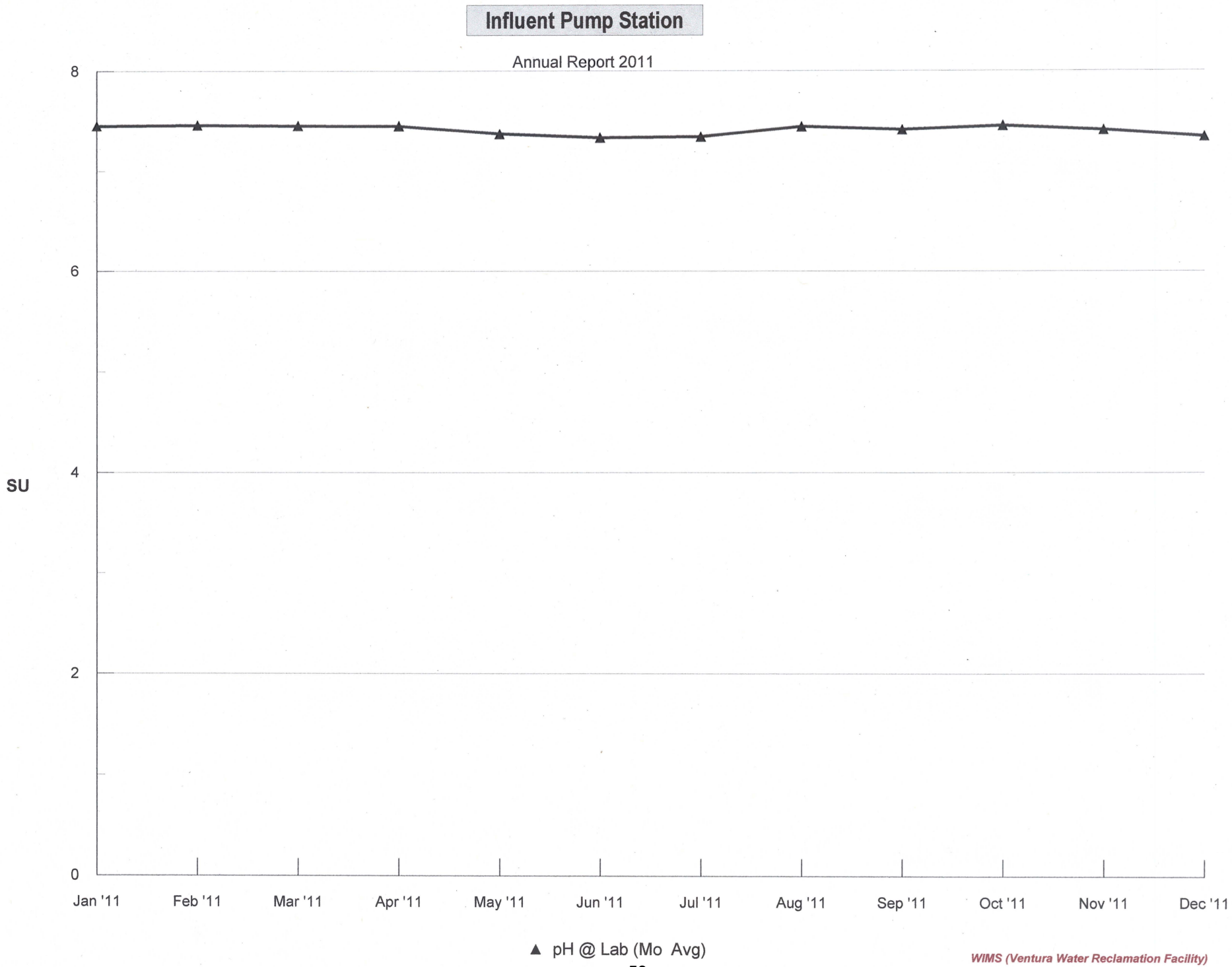
Month	Olivas Irrigation MGD	Buena Irrigation MGD	Marina Irrigation MGD	Irrigation Total MGD
January	0.0669	0.1177	0.0126	0.1973
February	0.0818	0.1100	0.0104	0.2023
March	0.0464	0.1036	0.0089	0.1590
April	0.1813	0.3000	0.0349	0.5162
May	0.3290	0.3402	0.0500	0.7193
June	0.4886	0.2969	0.0577	0.8431
July	0.5940	0.3731	0.0570	1.0241
August	0.4208	0.2946	0.0517	0.7670
September	0.4094	0.2168	0.0534	0.6797
October	0.2470	0.1628	0.0379	0.4477
November	0.1123	0.0929	0.0251	0.2303
December	0.1121	0.0967	0.0246	0.2334
Minimum	0.0001	0.0000	0.0000	0.0003
Maximum	1.0000	0.5390	0.1187	1.5021
Average	0.2585	0.2094	0.0355	0.5034

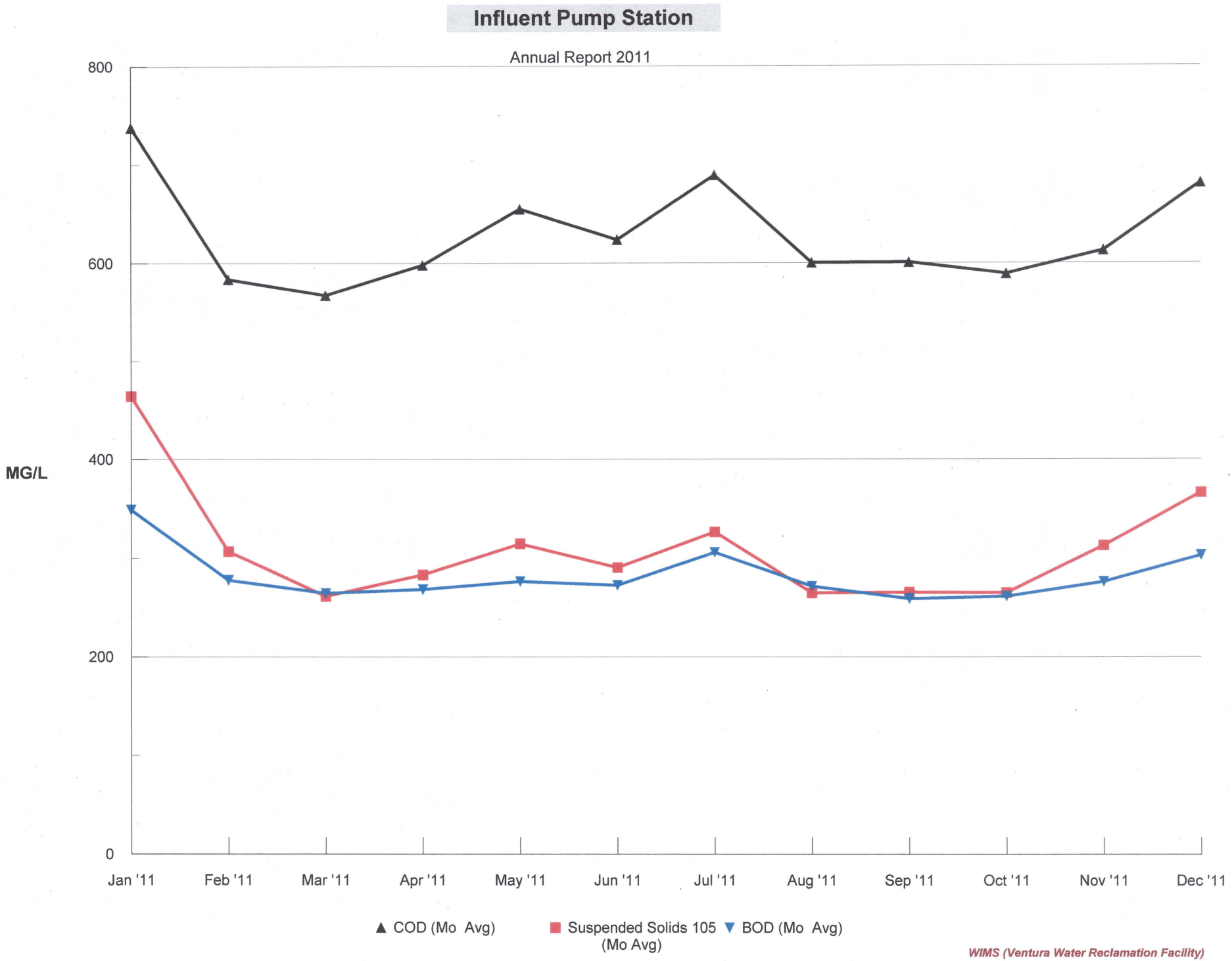
Influent Pump Station

Annual Report 2011

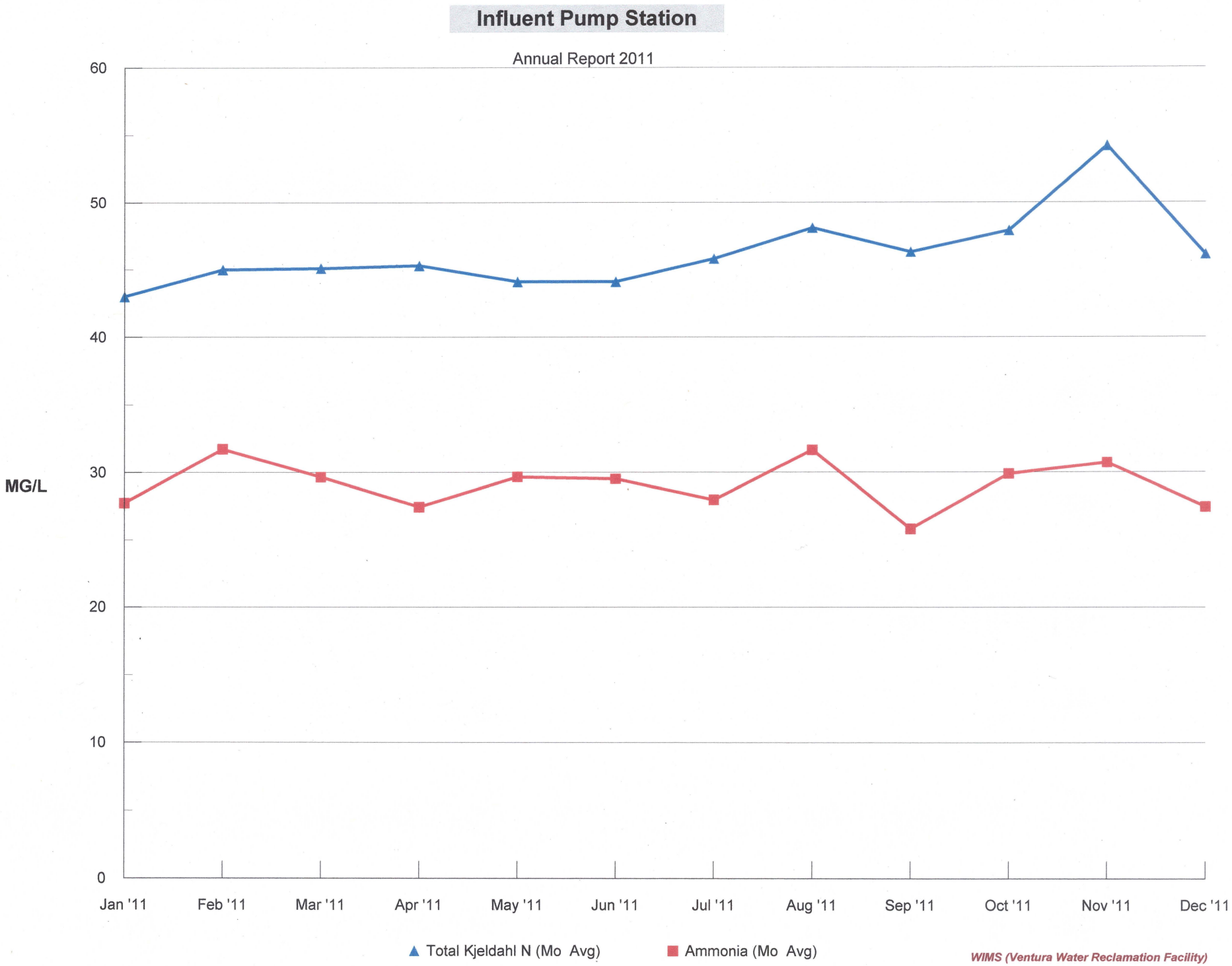


WIMS (Ventura Water Reclamation Facility)
Influent Flow 11


Influent Pump Station
Annual Report 2011
8
6
4
2
0
SU
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep '11
Oct '11
Nov '11
Dec '11
▲ pH @ Lab (Mo Avg)
WIMS (Ventura Water Reclamation Facility)
IPS pH 2011

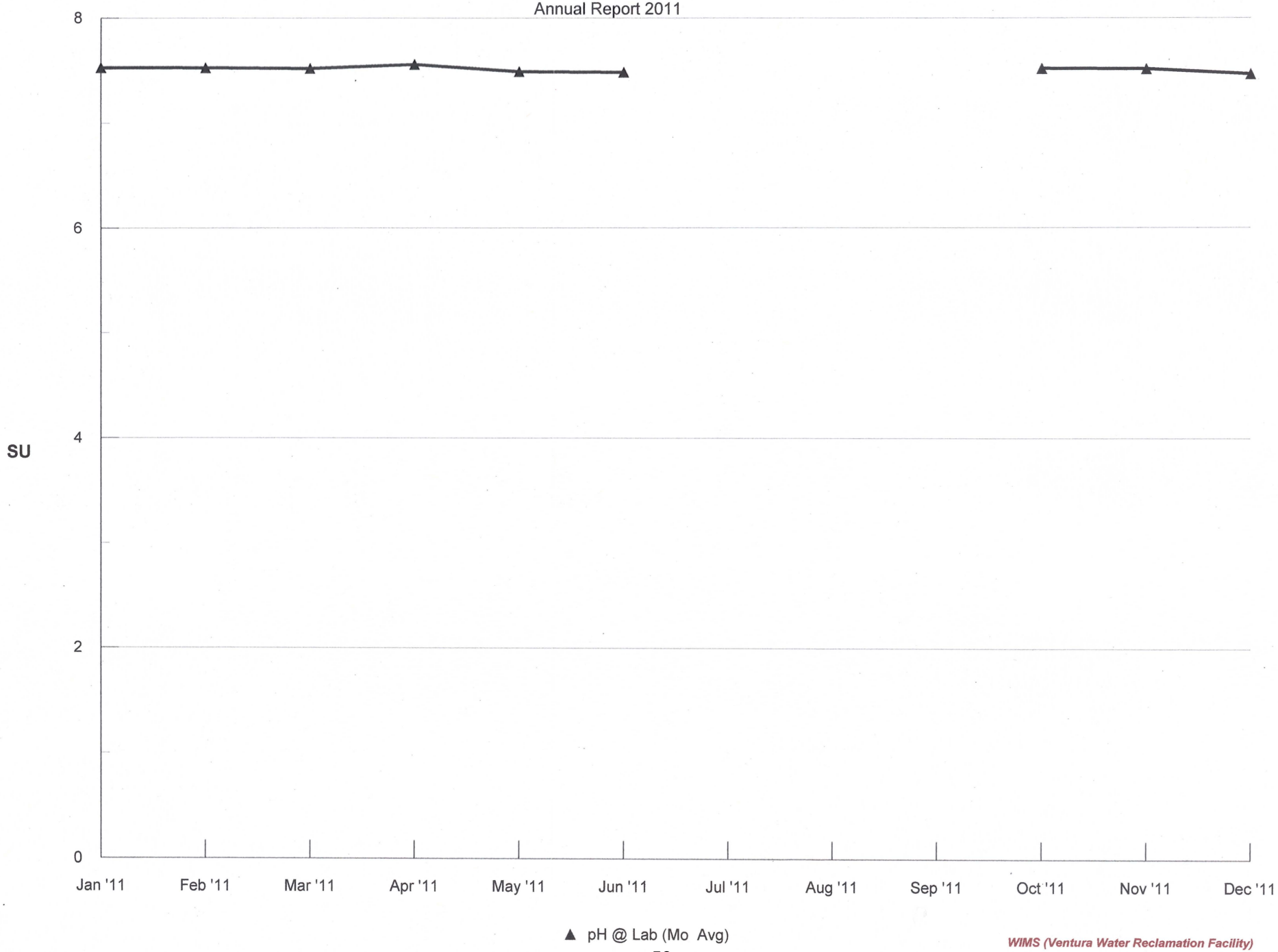


WIMS (Ventura Water Reclamation Facility)
IPS - COD, SSolids, BOD


Influent Pump Station
Annual Report 2011
MG/L
60
50
40
30
20
10
0
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep '11
Oct '11
Nov '11
Dec '11
Total Kjeldahl N (Mo Avg)
Ammonia (Mo Avg)
WIMS (Ventura Water Reclamation Facility)
IPS - TKN & Ammonia

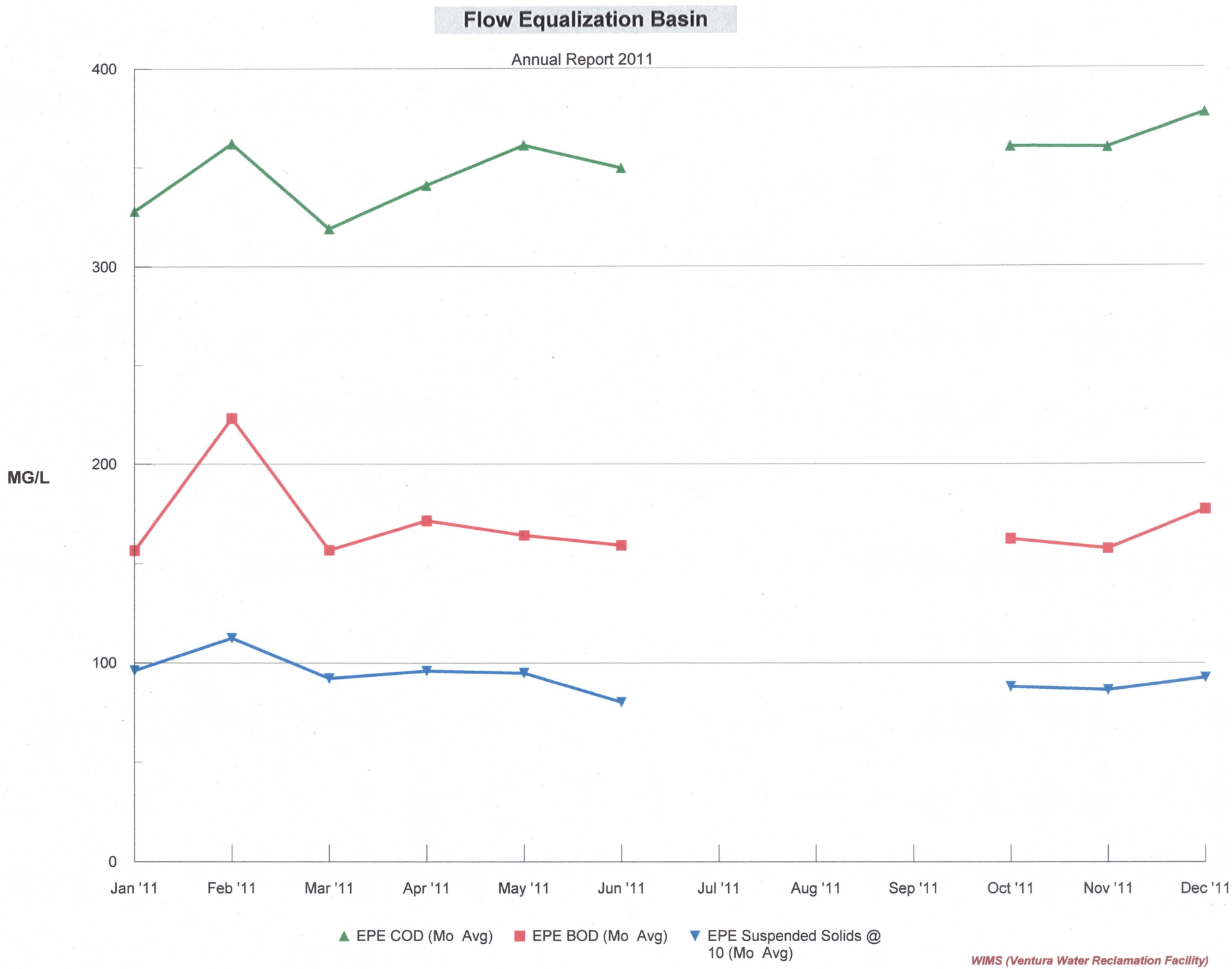
Flow Equalization Basin

Annual Report 2011

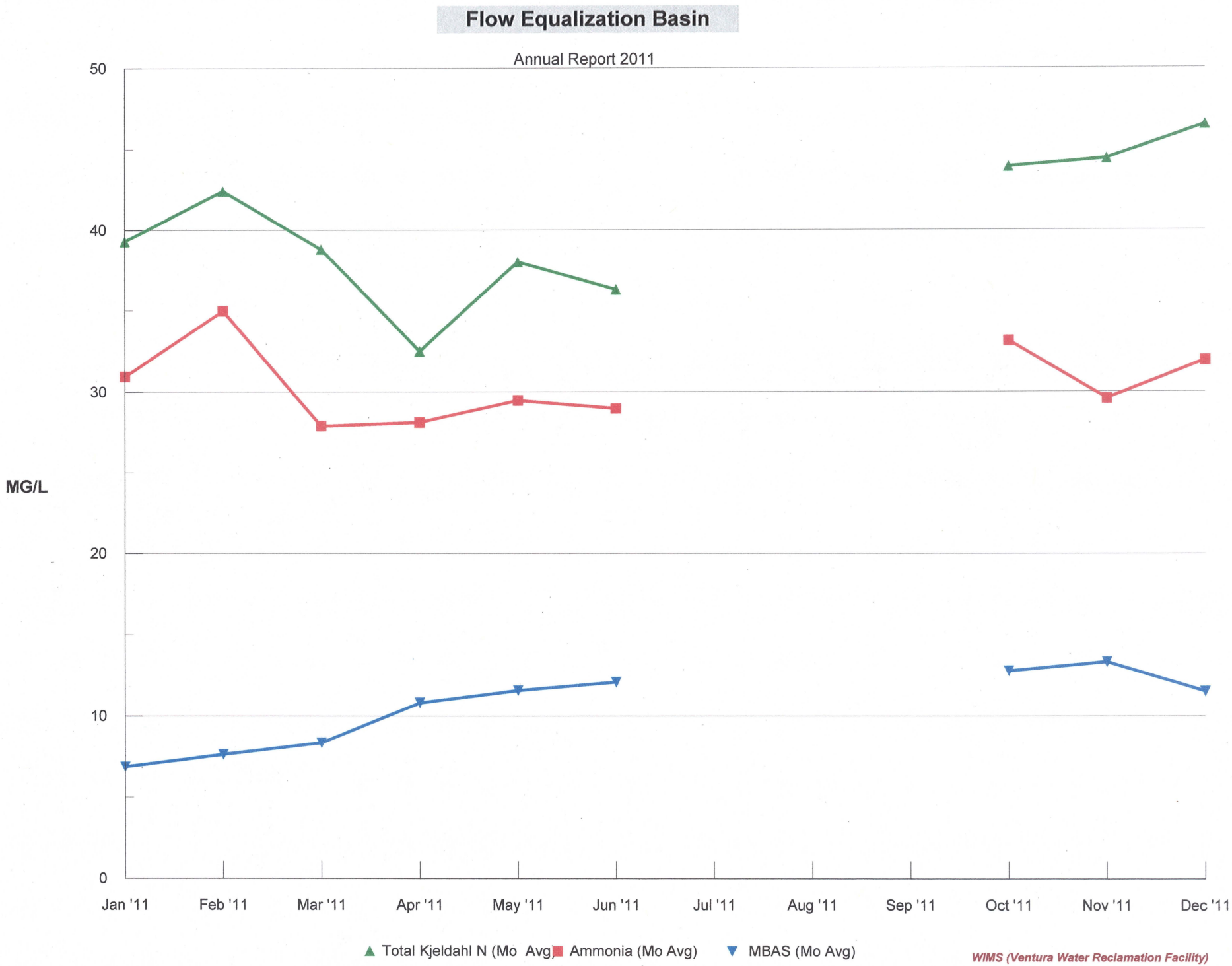


WIMS (Ventura Water Reclamation Facility)

EPE - pH

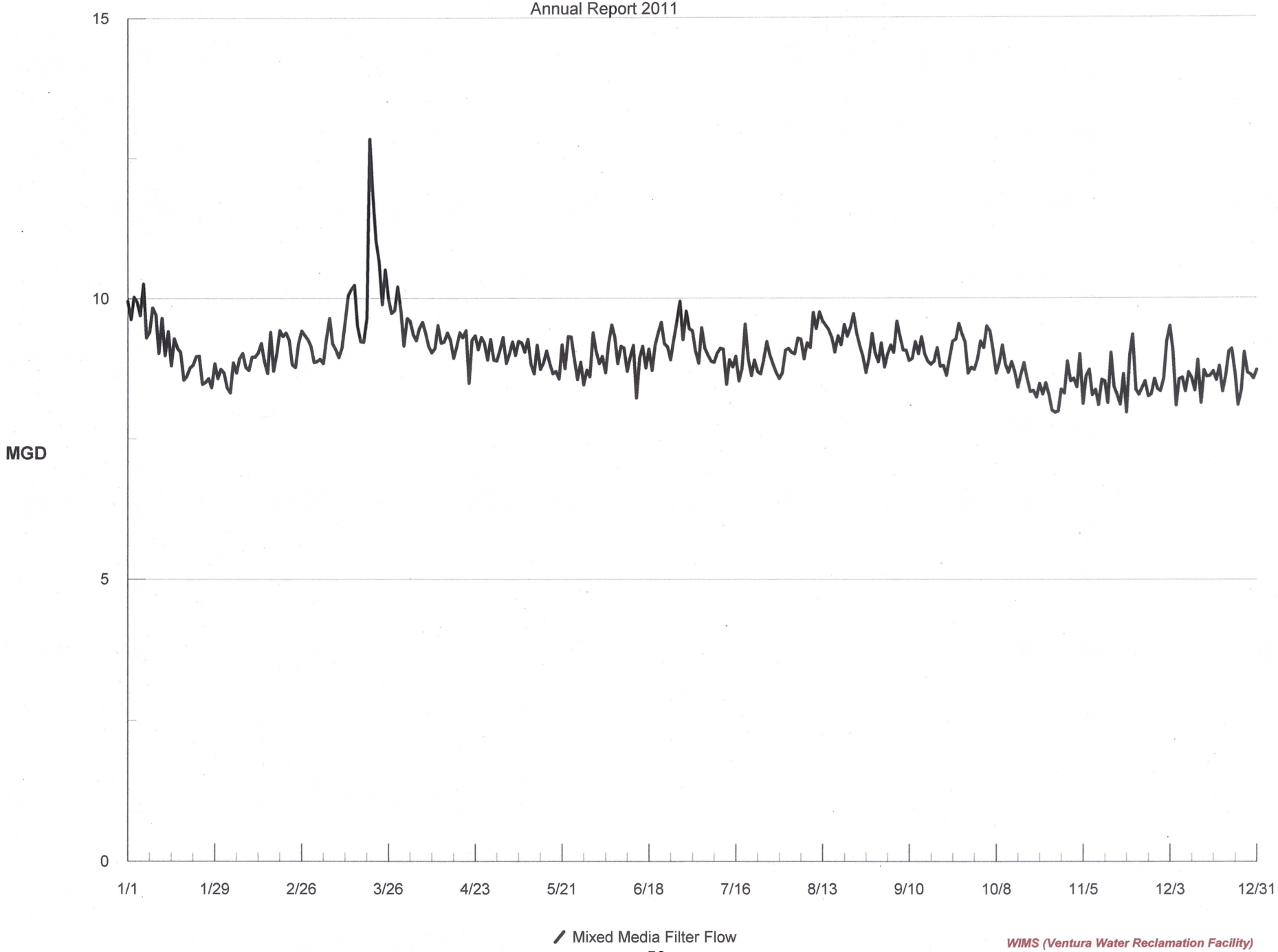


WIMS (Ventura Water Reclamation Facility)
EPE - BOD, COD, Suspended Soilds

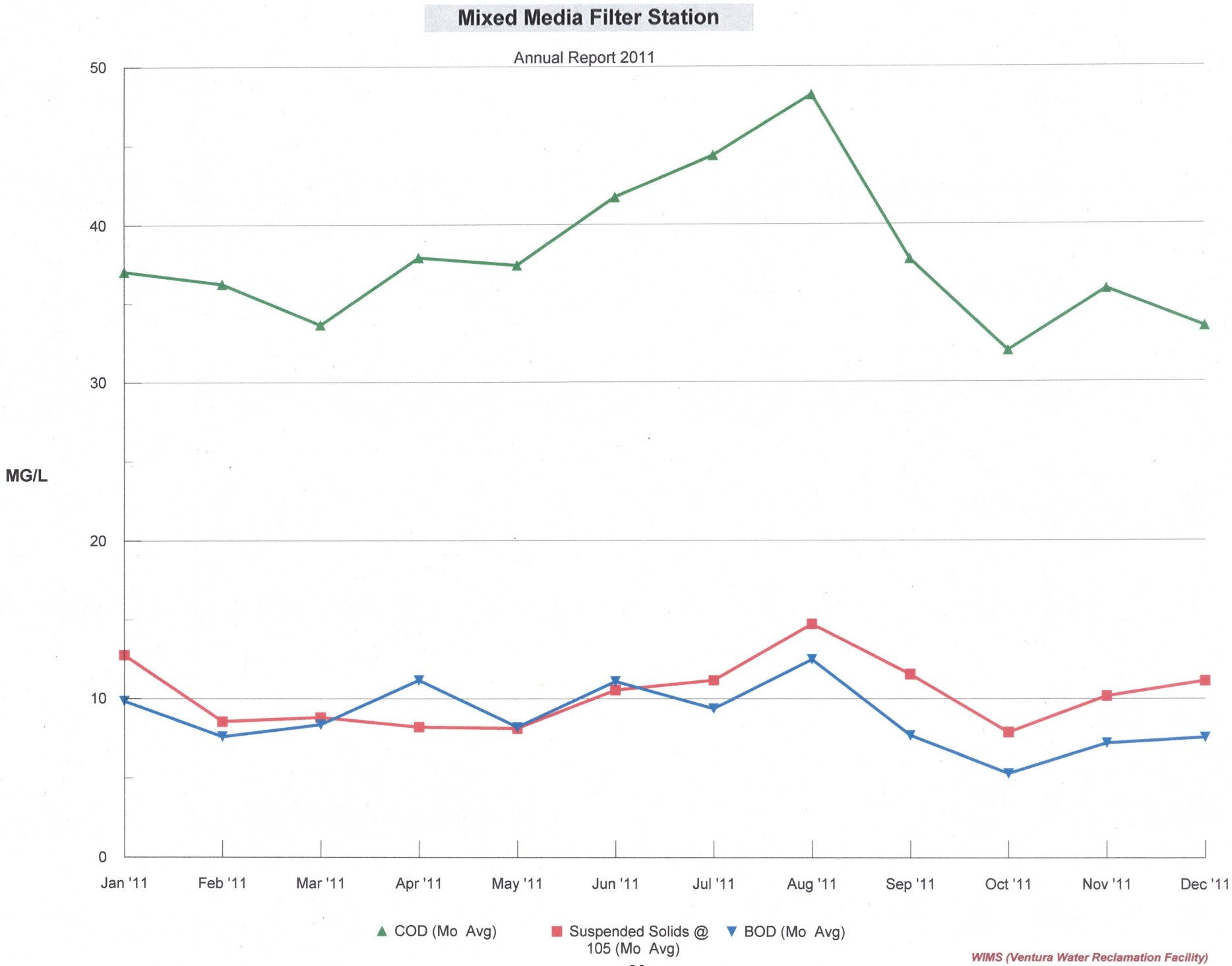

Flow Equalization Basin
Annual Report 2011
MG/L
50
40
30
20
10
0
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep '11
Oct '11
Nov '11
Dec '11
Total Kjeldahl N (Mo Avg)
Ammonia (Mo Avg)
MBAS (Mo Avg)
WIMS (Ventura Water Reclamation Facility)
EPE - TKN, Ammonia & MBAS

Mixed Media Filter Station

Annual Report 2011



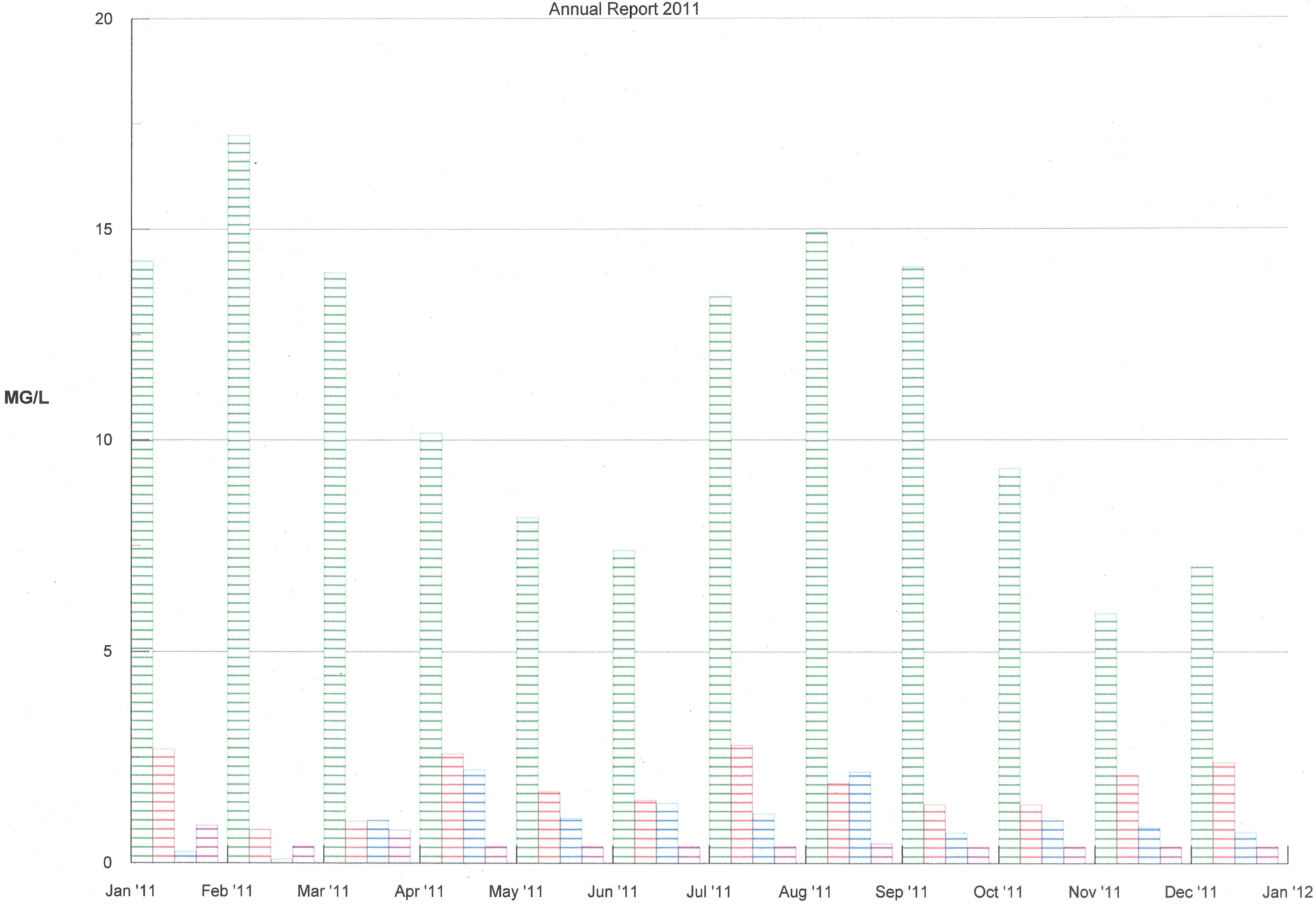
WIMS (Ventura Water Reclamation Facility)
MMM Flow



WIMS (Ventura Water Reclamation Facility)
MMM COD, SSolids & BOD

Mixed Media Filter Station

Annual Report 2011

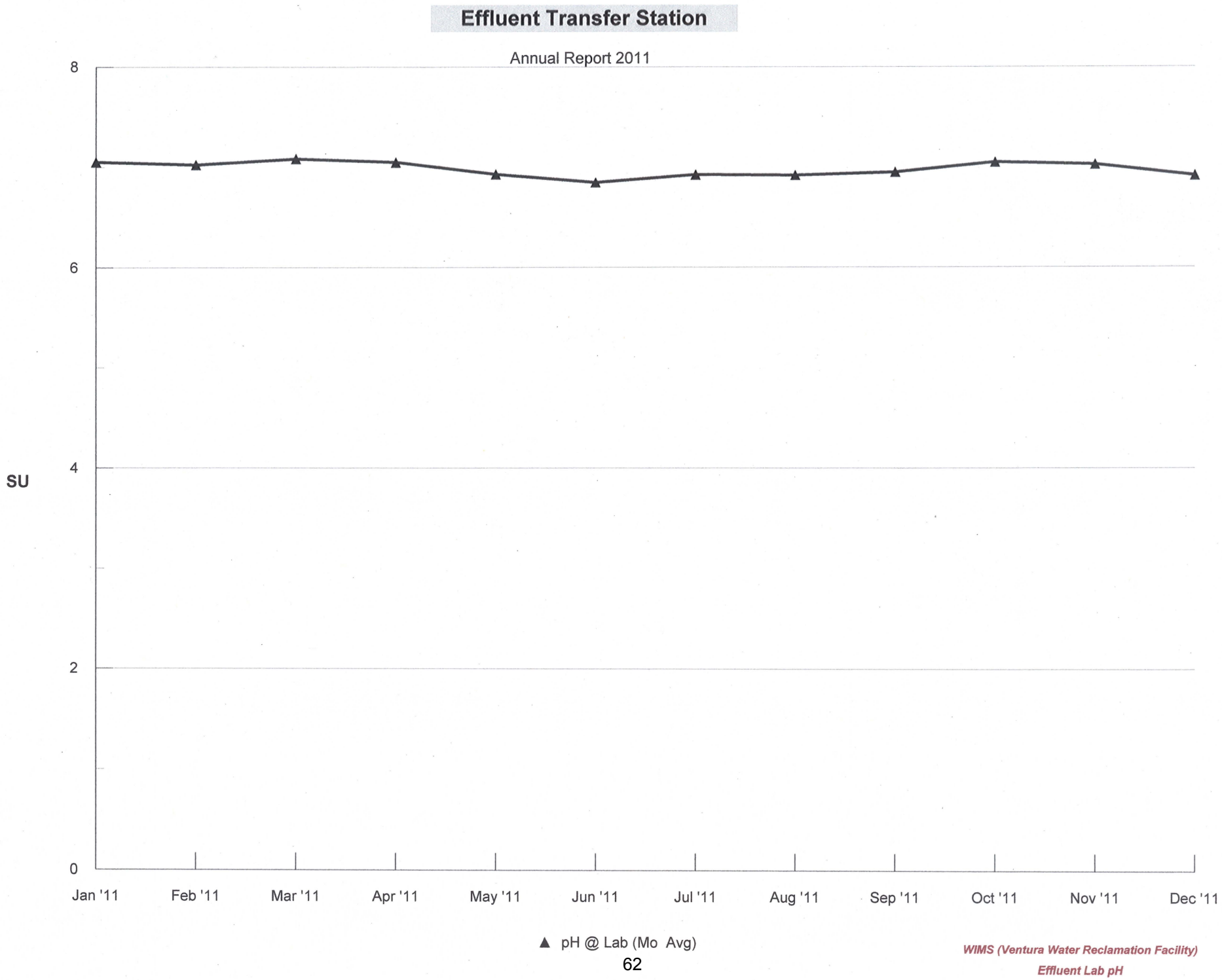


Nitrogens - Monthly Averages

Nitrate | Total Kjeldahl N | Ammonia | Nitrite

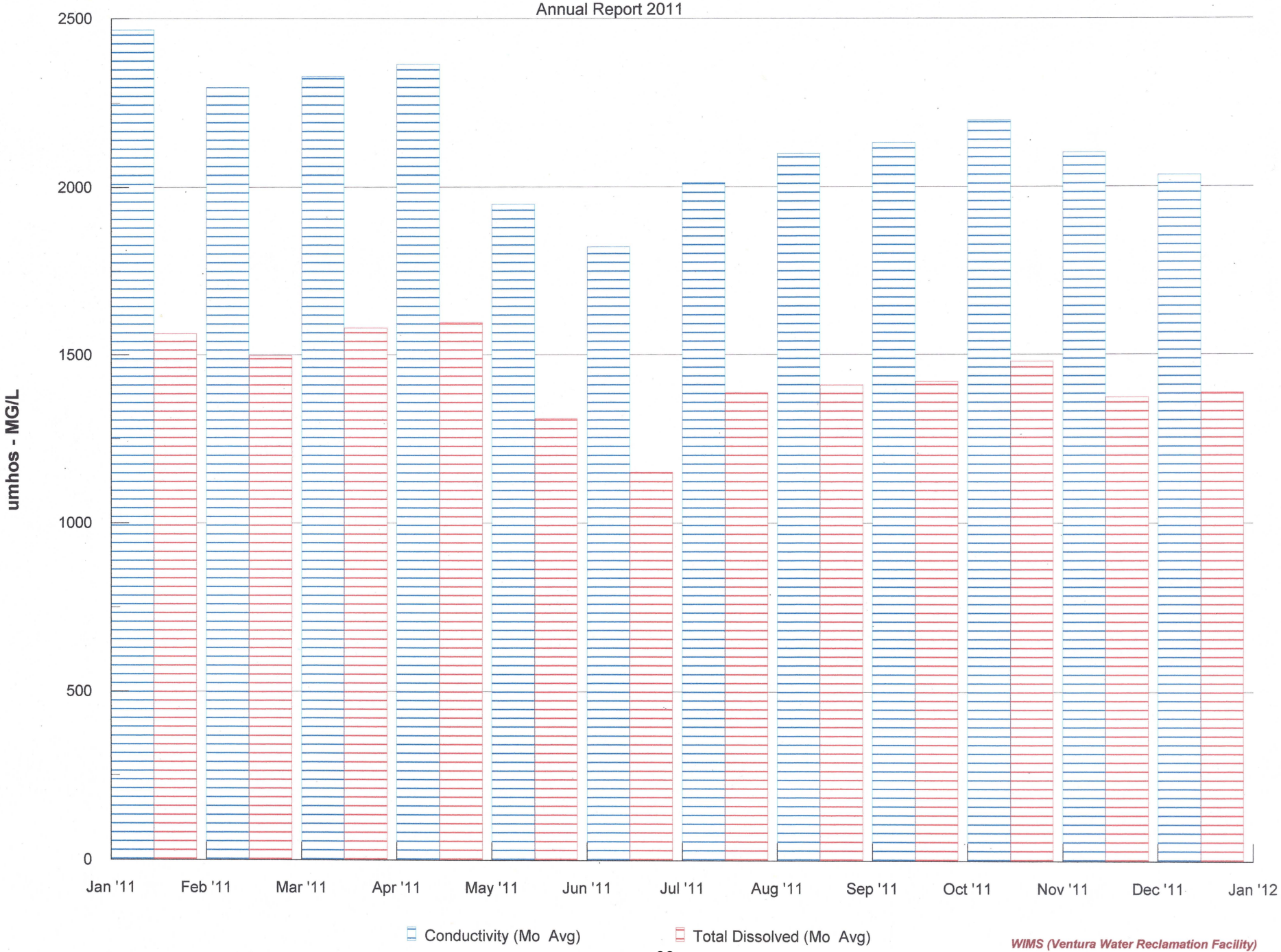
WIMS (Ventura Water Reclamation Facility)

MMM Nitrogens


Effluent Transfer Station
Annual Report 2011
SU
8
6
4
2
0
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep '11
Oct '11
Nov '11
Dec '11
▲ pH @ Lab (Mo Avg)
WIMS (Ventura Water Reclamation Facility)
Effluent Lab pH

Effluent Transfer Station

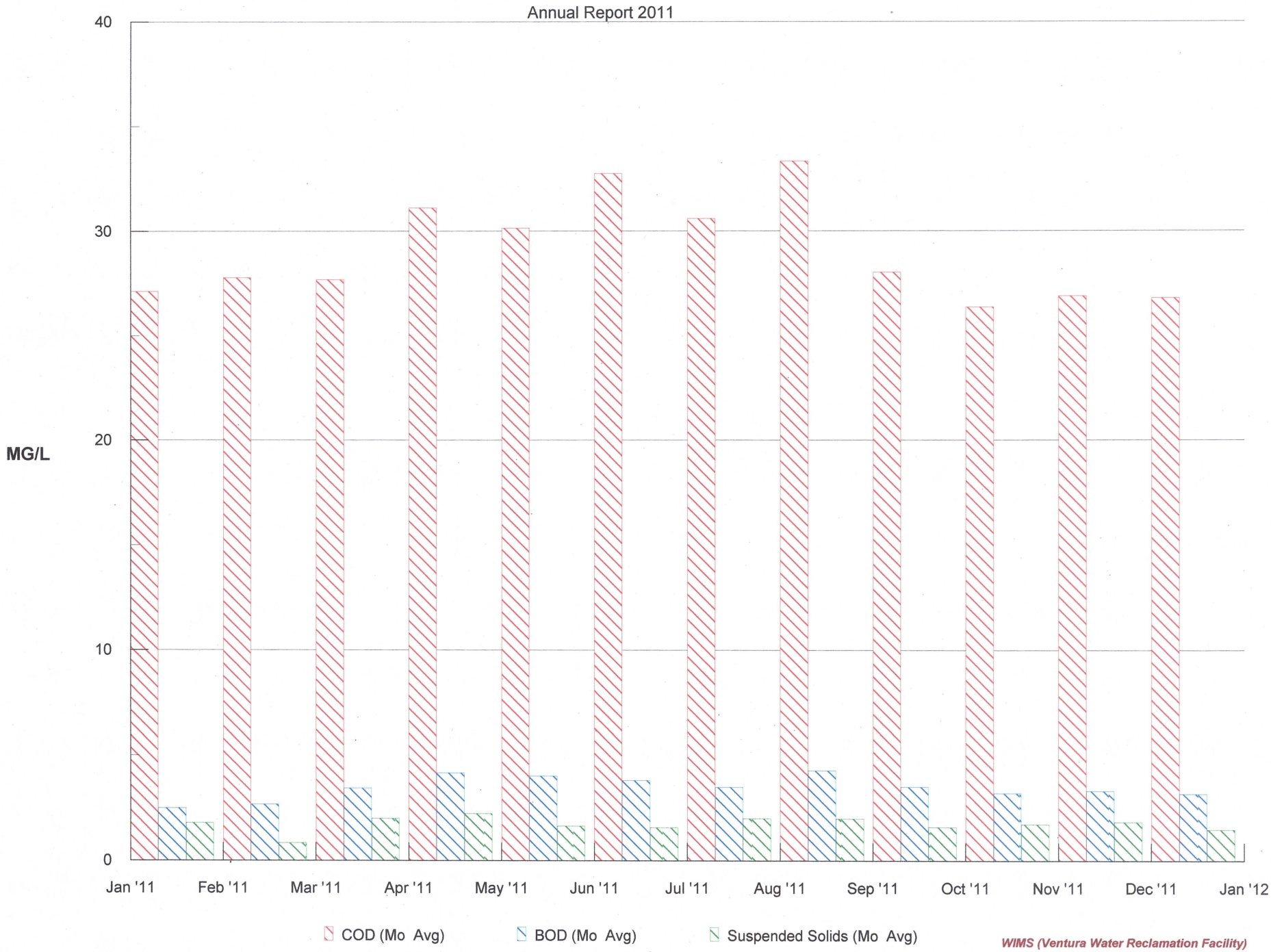
Annual Report 2011



WIMS (Ventura Water Reclamation Facility)

ETS - Conductivity & TDS

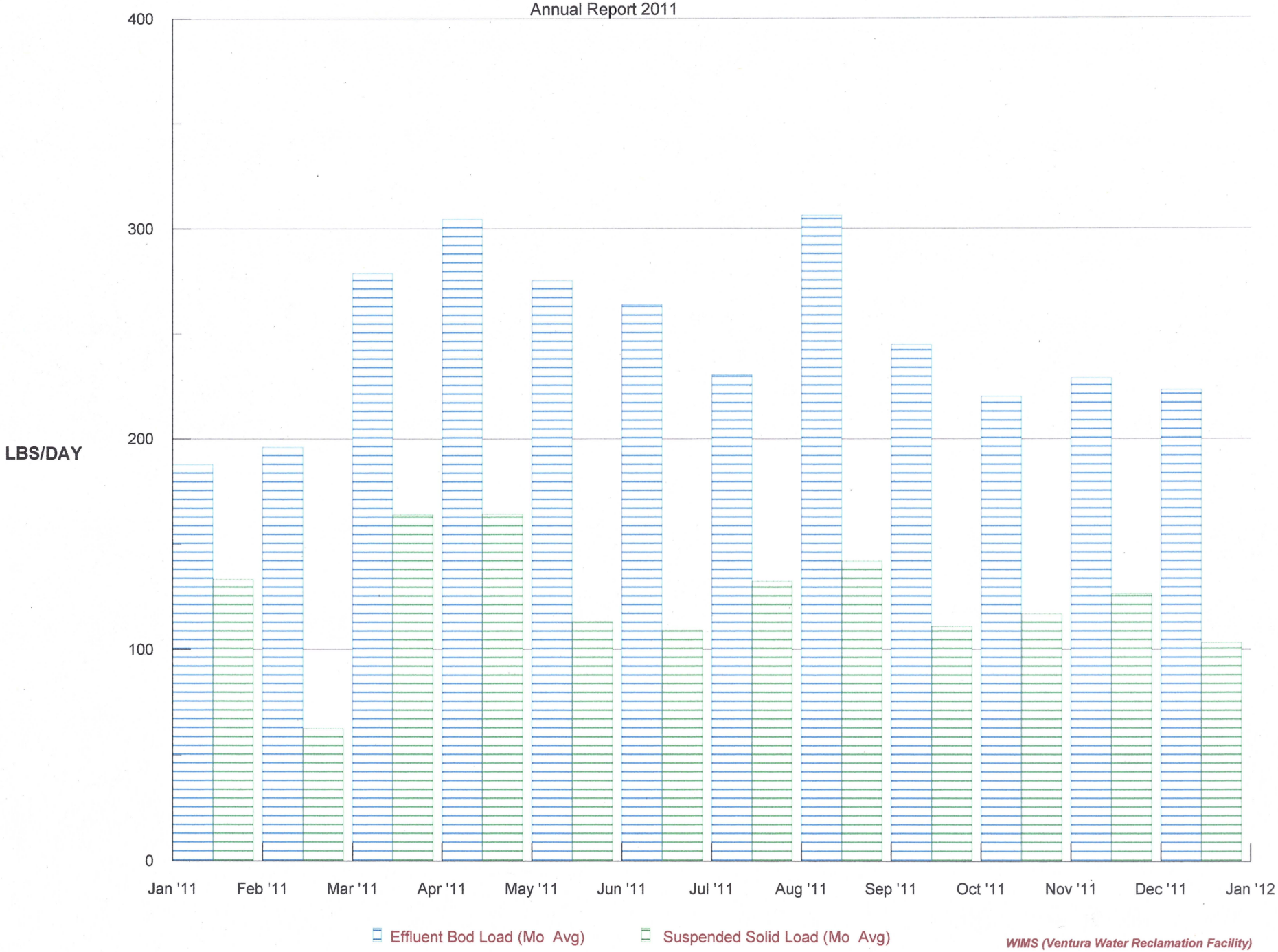
Effluent Transfer Station



WIMS (Ventura Water Reclamation Facility)
ETS - COD, BOD & S Solids

Effluent Transfer Station

Annual Report 2011

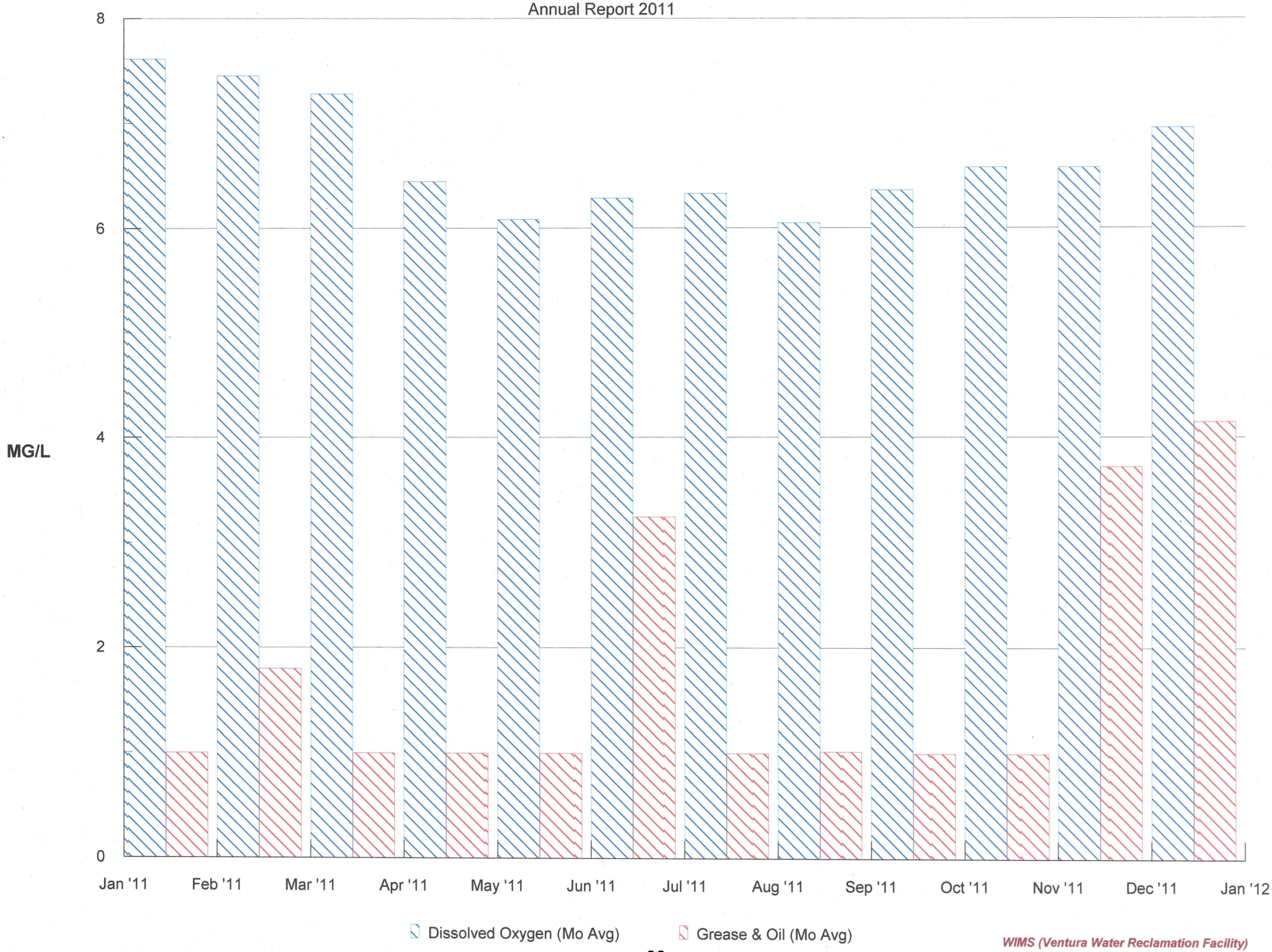


WIMS (Ventura Water Reclamation Facility)

ETS - BOD & SSolids Load

Effluent Transfer Station

Annual Report 2011

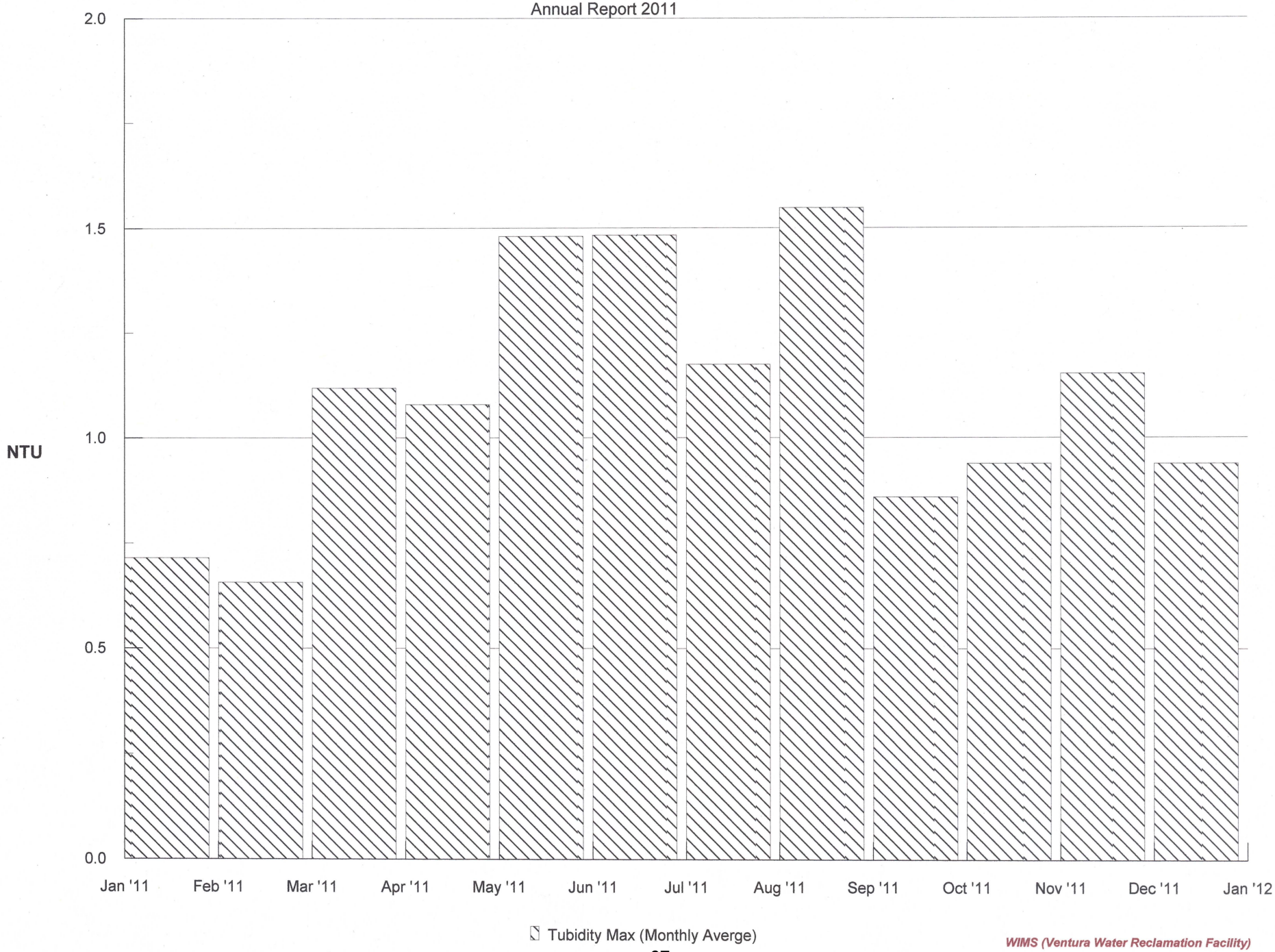


WIMS (Ventura Water Reclamation Facility)

ETS - DO & O & G

Effluent Transfer Station

Annual Report 2011

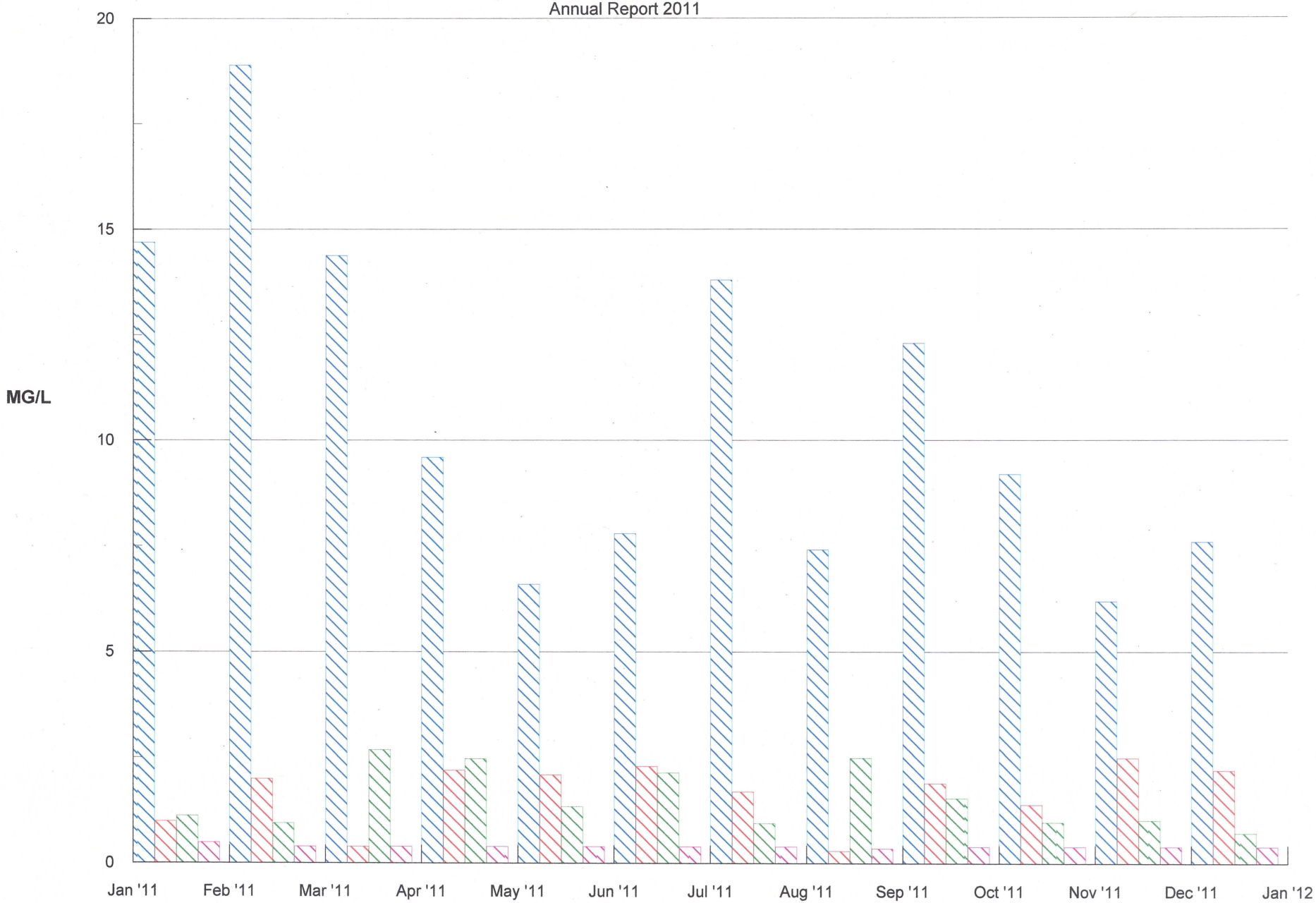


WIMS (Ventura Water Reclamation Facility)

ETS - Turbidity Max

Effluent Transfer Station

Annual Report 2011



Nitrogens - Monthly Averages

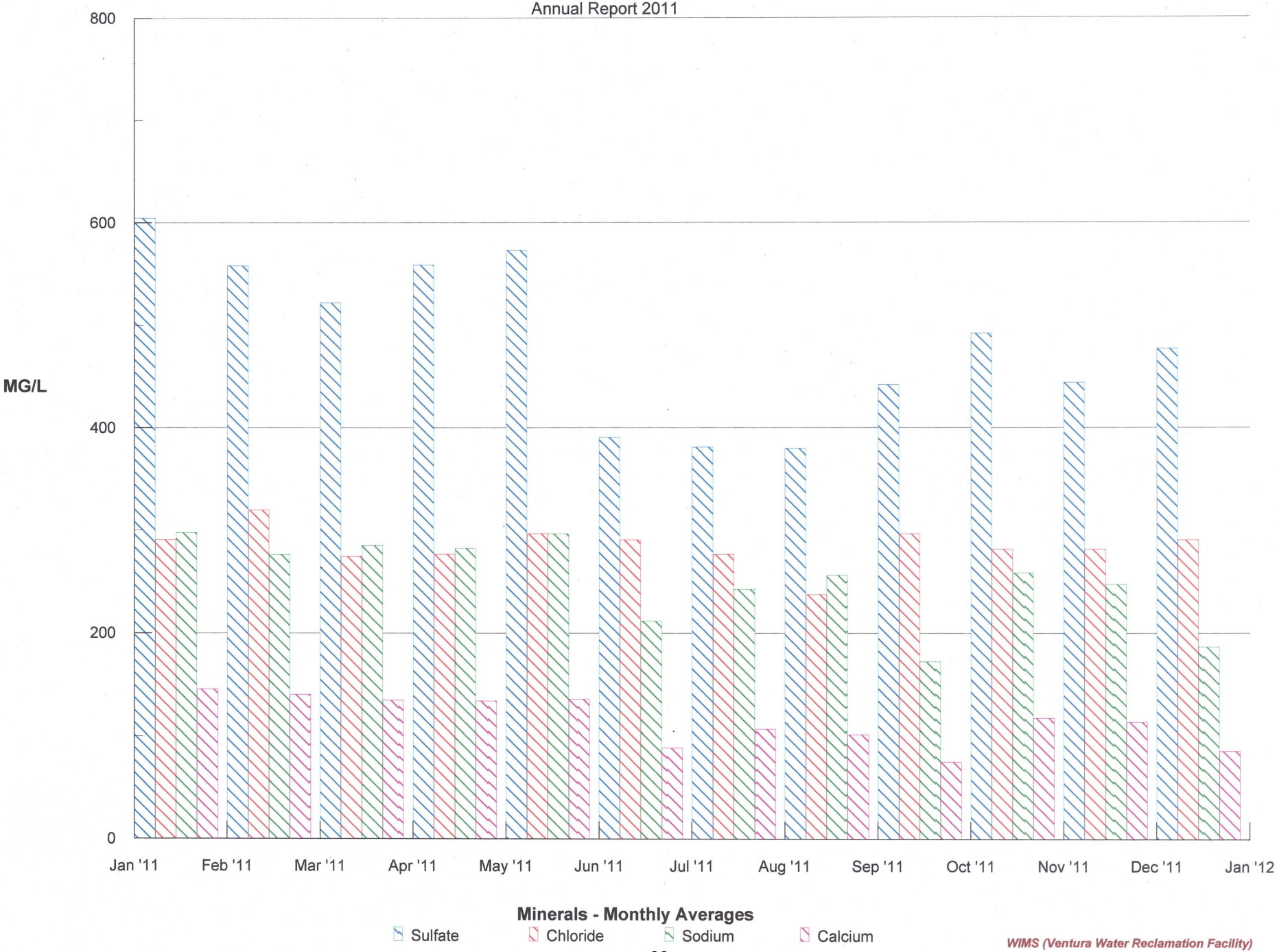
Nitrate Total Kjeldahl N Ammonia Nitrites

WIMS (Ventura Water Reclamation Facility)

ETS - Nitrogens

Effluent Transfer Station

Annual Report 2011

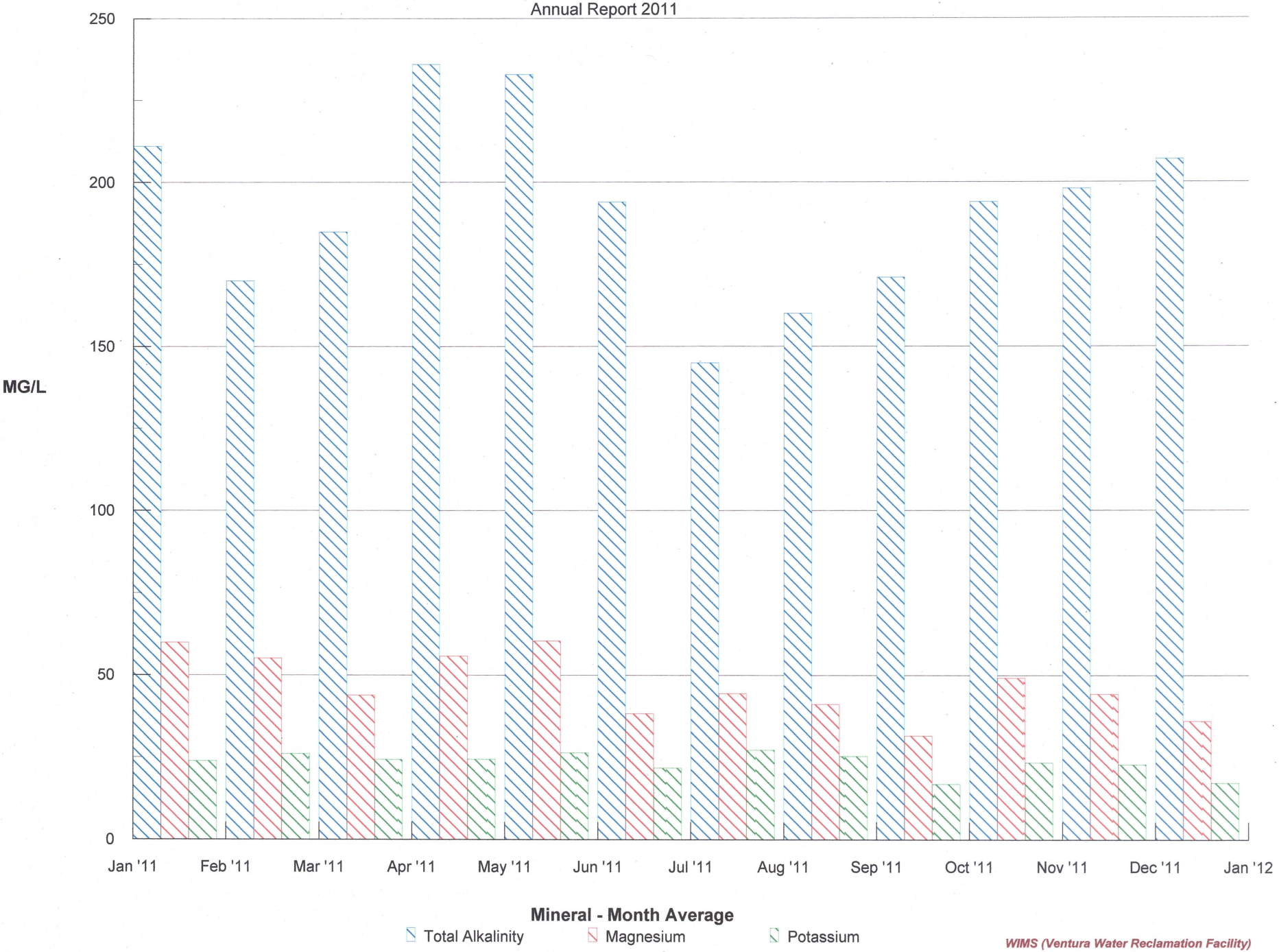


WIMS (Ventura Water Reclamation Facility)

ETS - Sulfate, Chloride, Sodium & Calcium

Effluent Transfer Station

Annual Report 2011

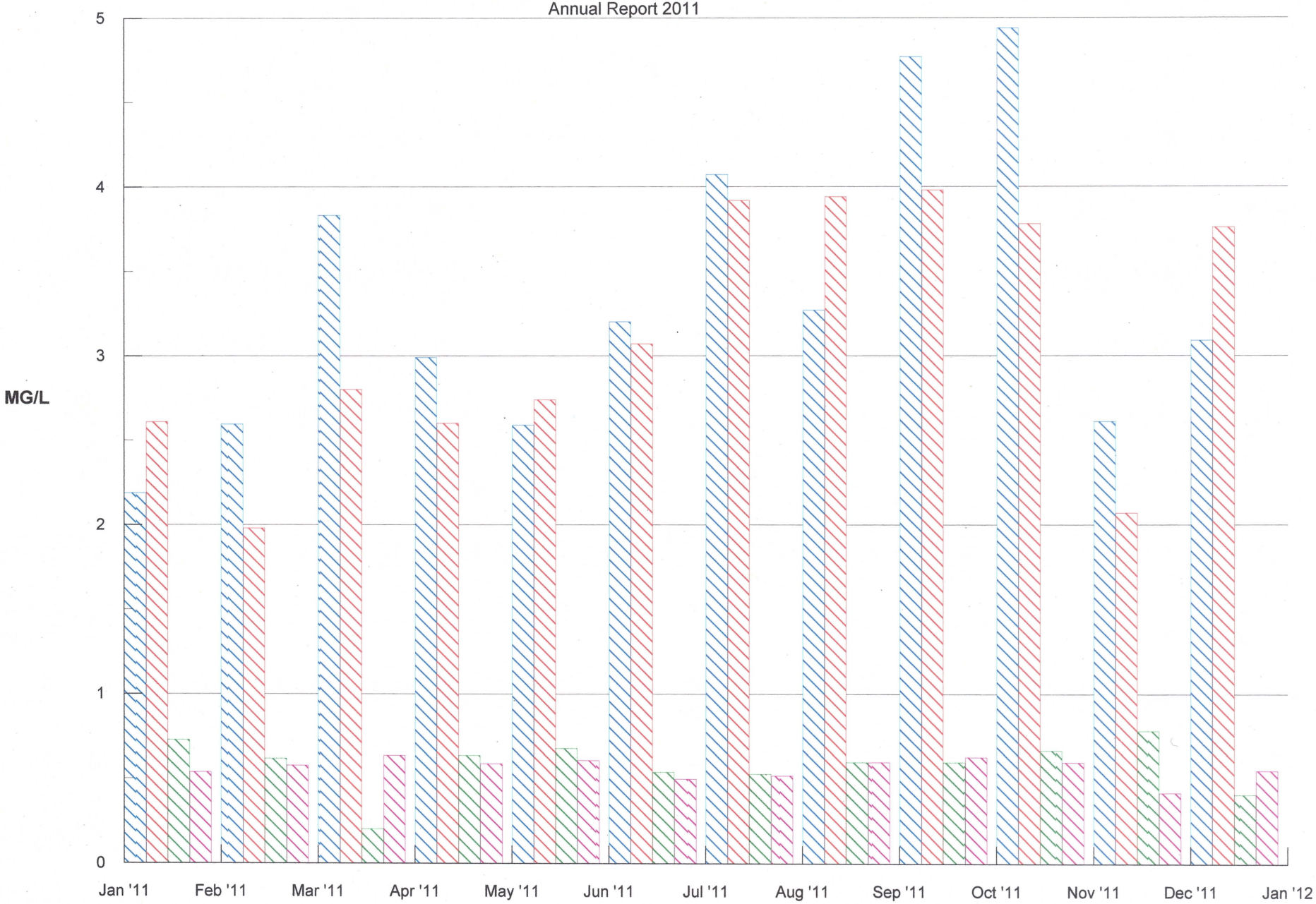


WIMS (Ventura Water Reclamation Facility)

ETS - Alkalinity, Maganesium & Potassium

Effluent Transfer Station

Annual Report 2011



Minerals - Monthly Averages

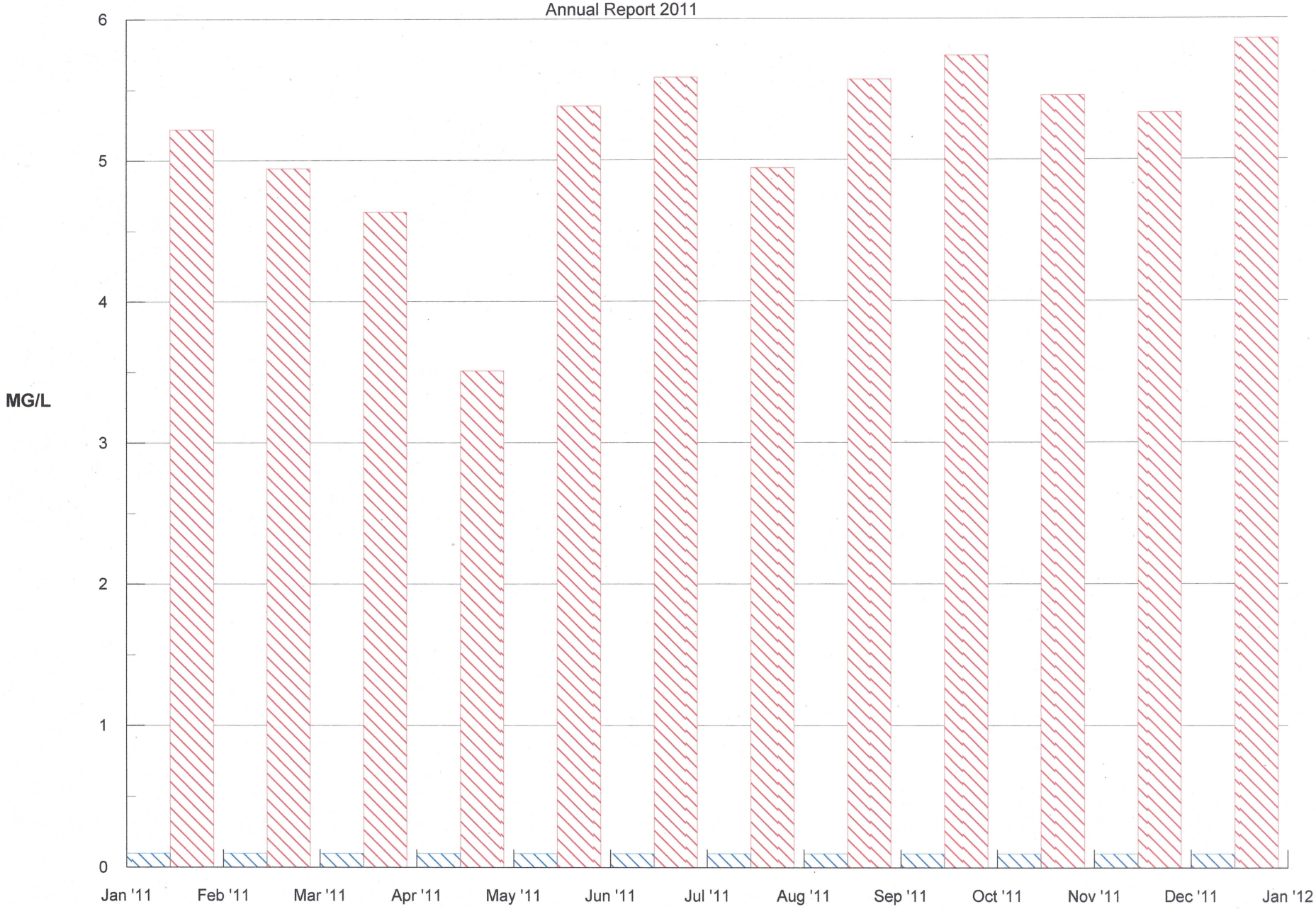
Phosphate Tot. Phosphorus Boron Fluoride

WIMS (Ventura Water Reclamation Facility)

ETS - Phosphate, Phosphorous, Boron & Fluoride

Effluent Transfer Station

Annual Report 2011

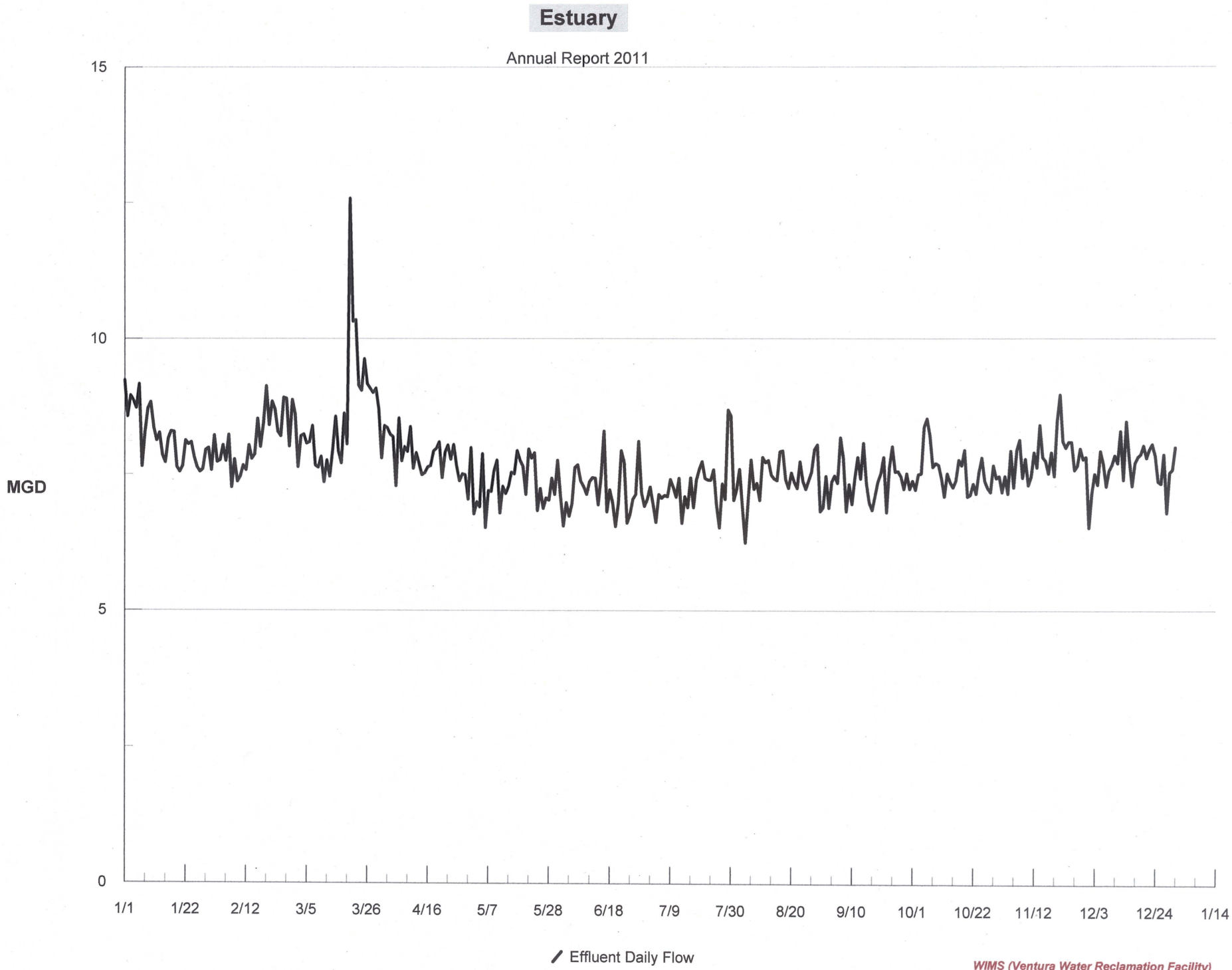


Lab Chlorine Residual @ 11 AM

Effluent (Mo Avg) Contact Chamber (Mo Avg)

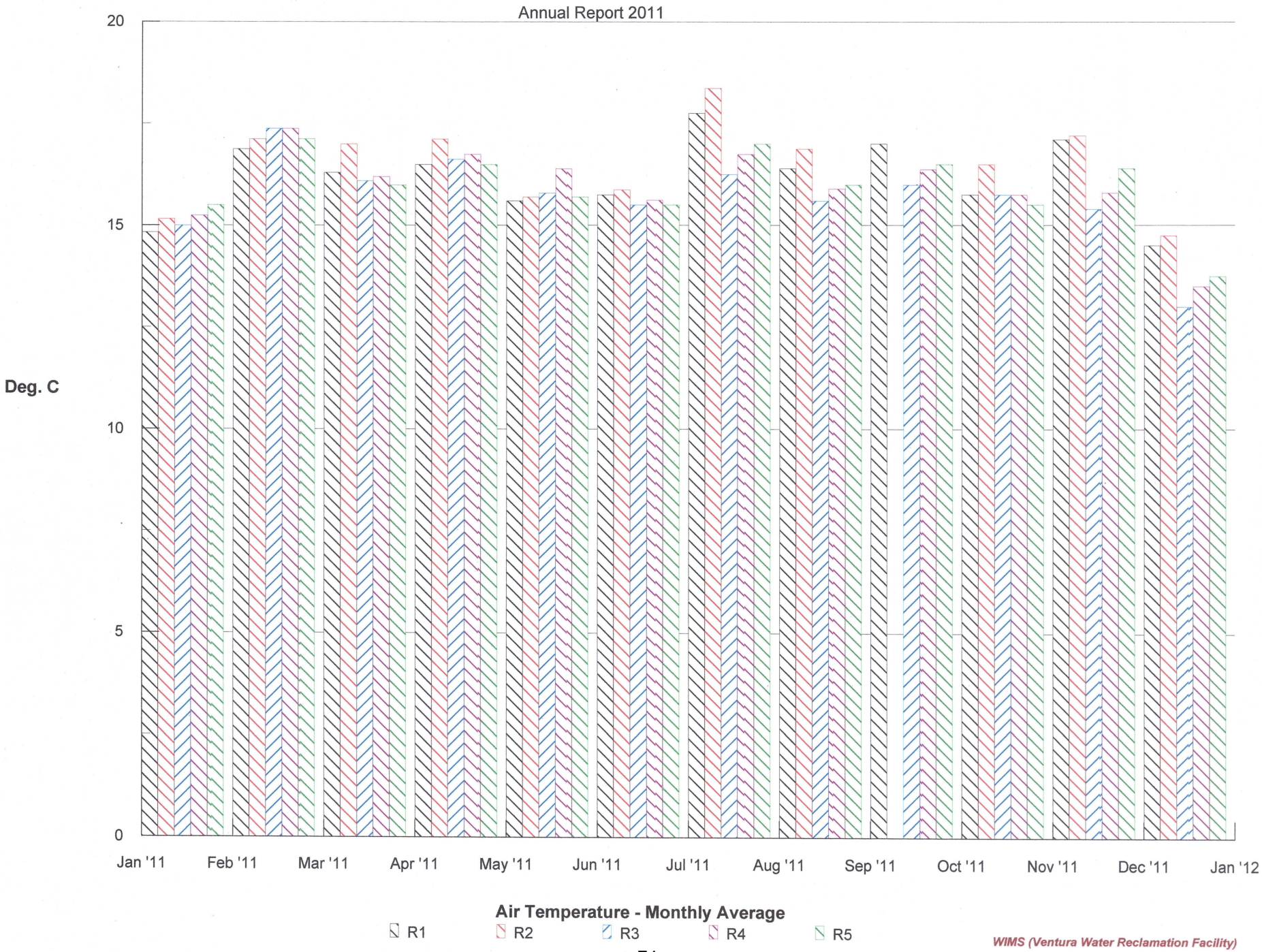
WIMS (Ventura Water Reclamation Facility)

ETS - Effluent & Contact Chamber Cl2 Residuals



WIMS (Ventura Water Reclamation Facility)
Estuary Flow 11

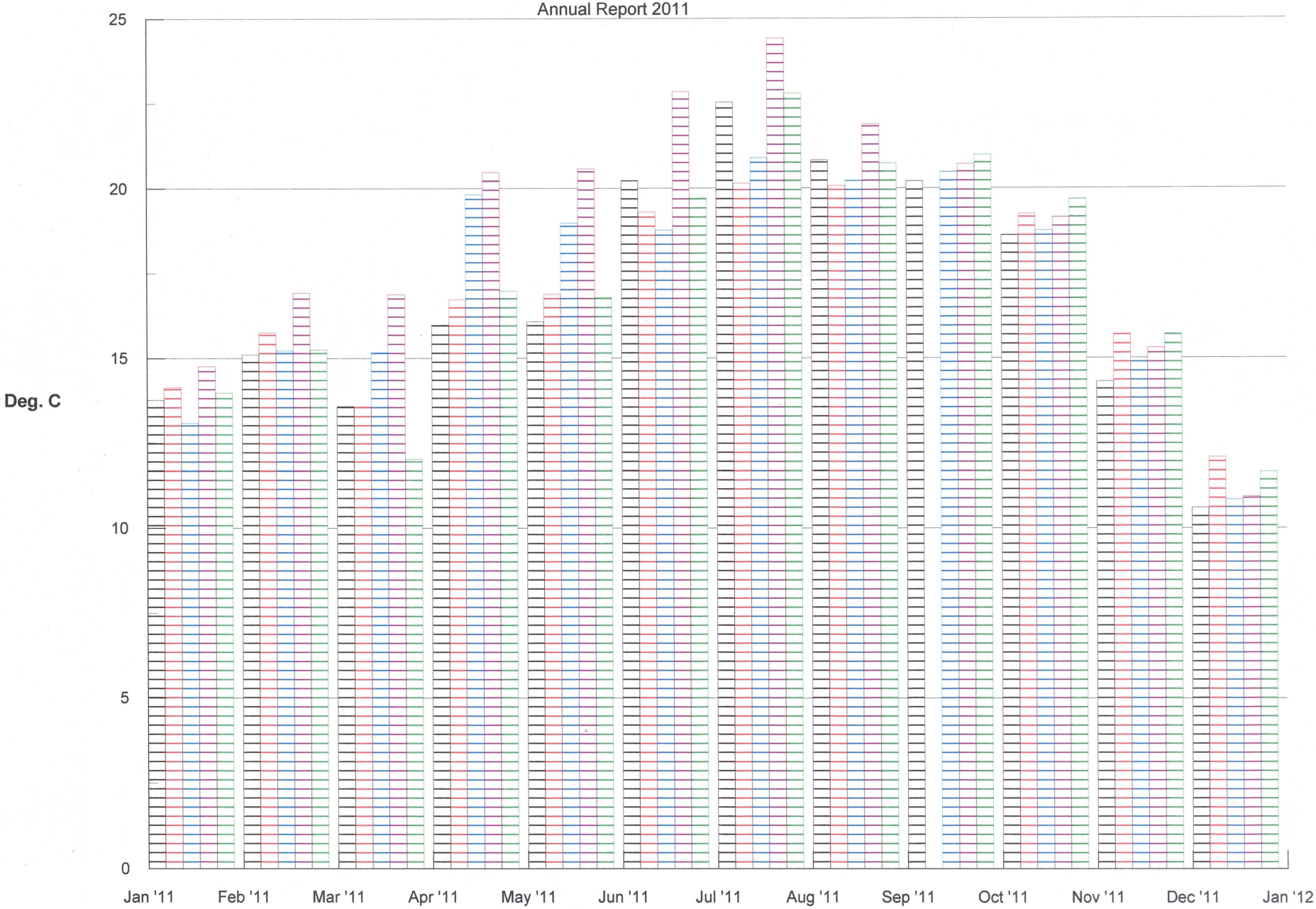
Receiving Waters



WIMS (Ventura Water Reclamation Facility)
Receiving Water Air Temperature

Receiving Waters

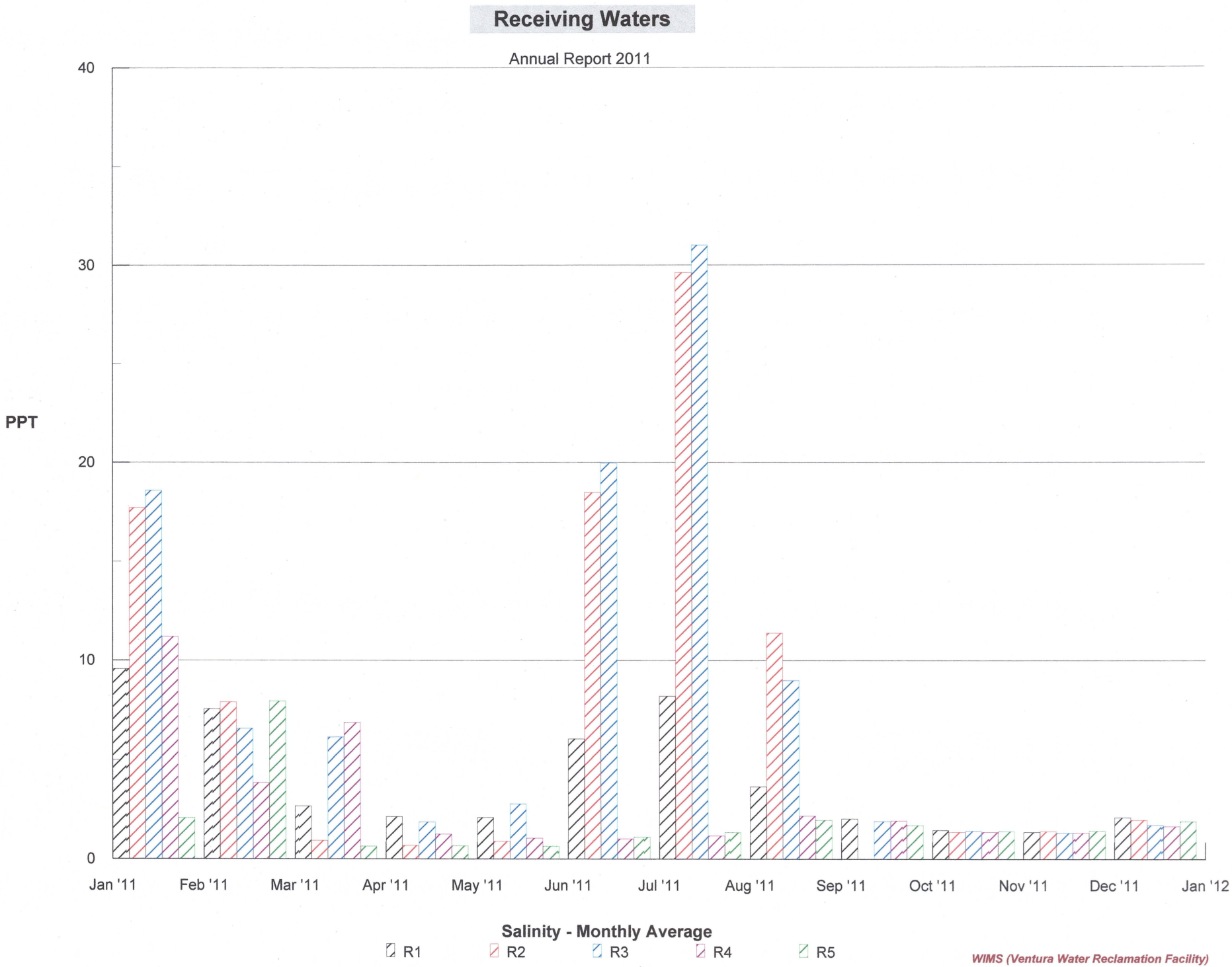
Annual Report 2011



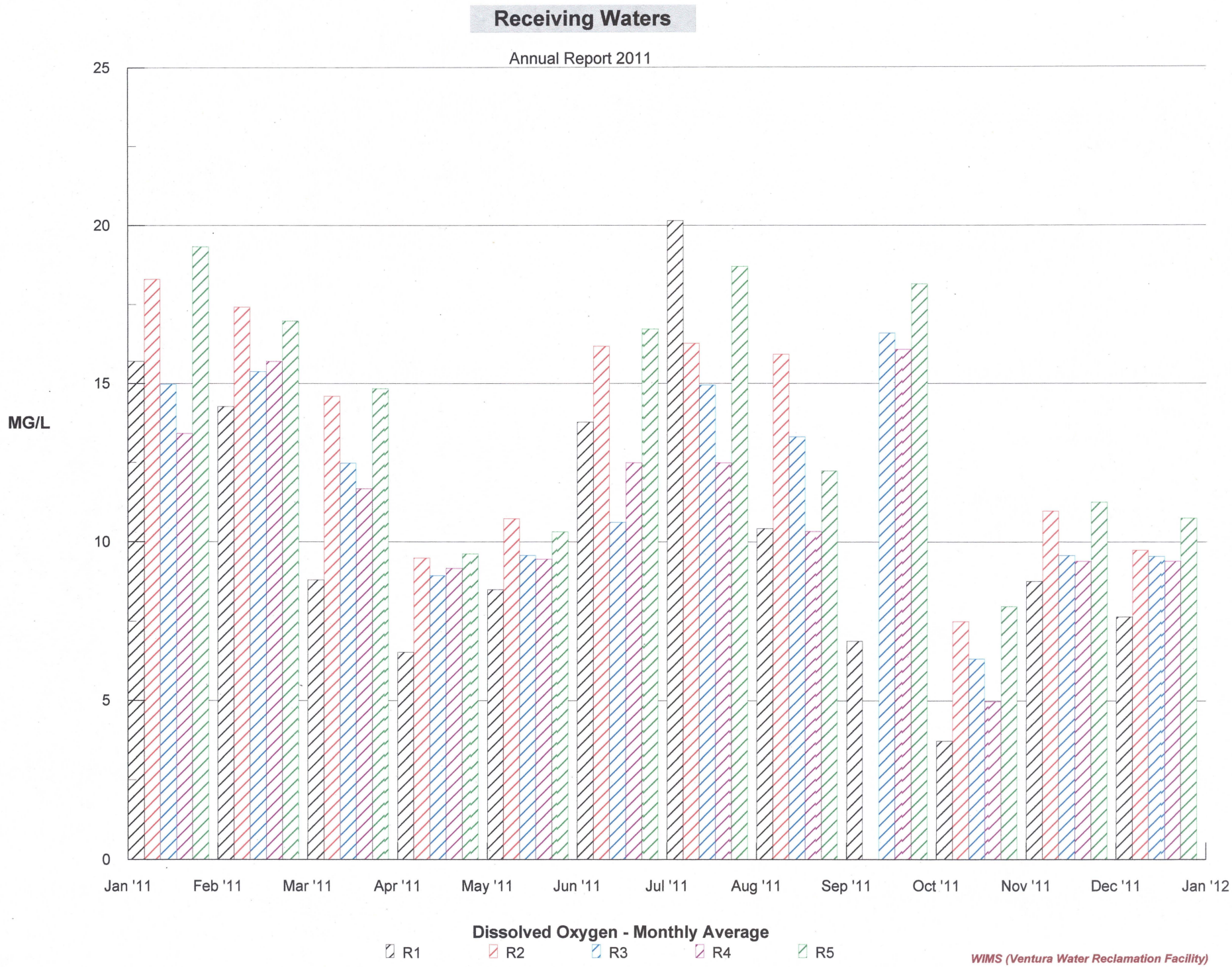
Water Temperature - Monthly Average

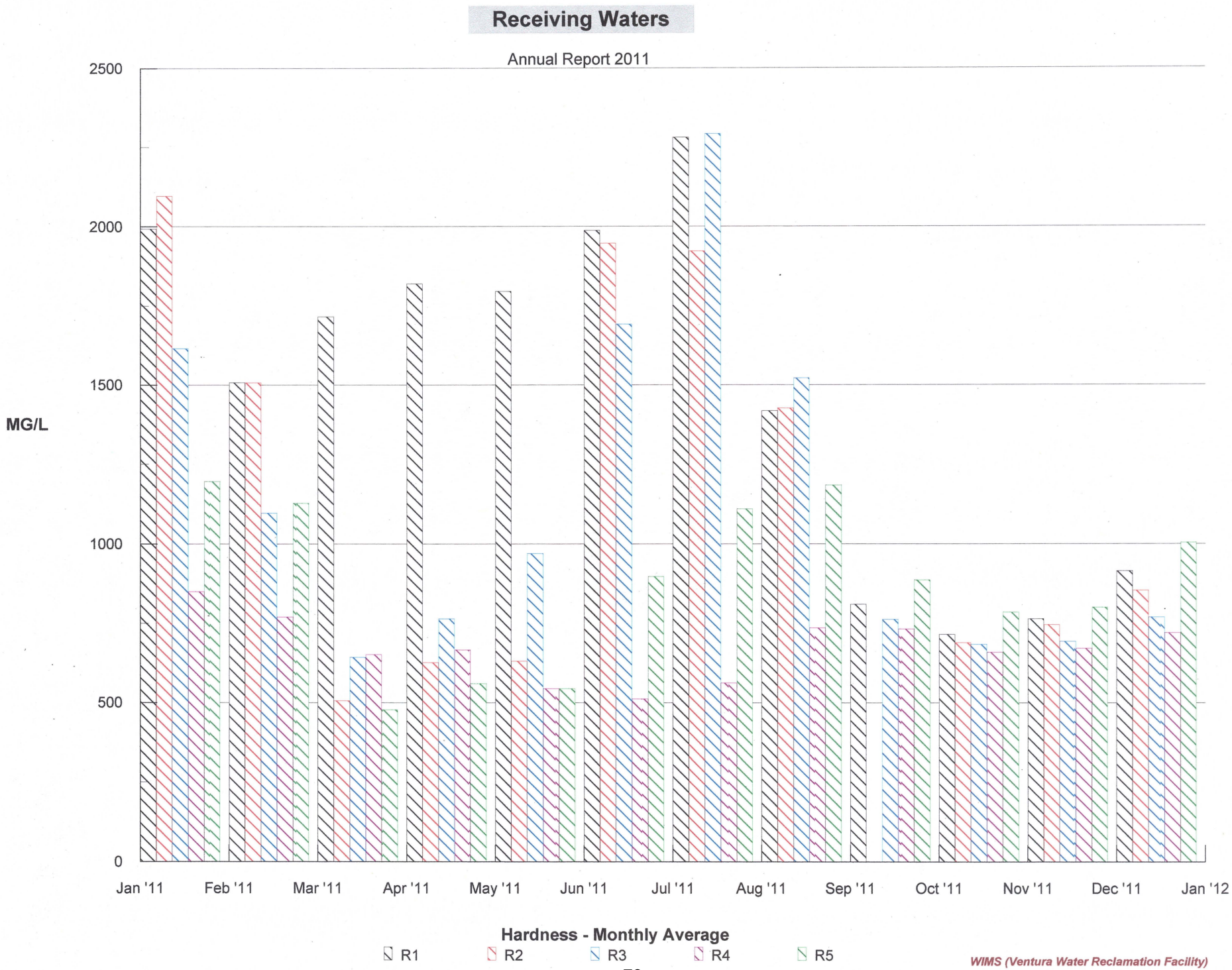
R1 R2 R3 R4 R5

WIMS (Ventura Water Reclamation Facility)
Receiving Water - Water Temperature

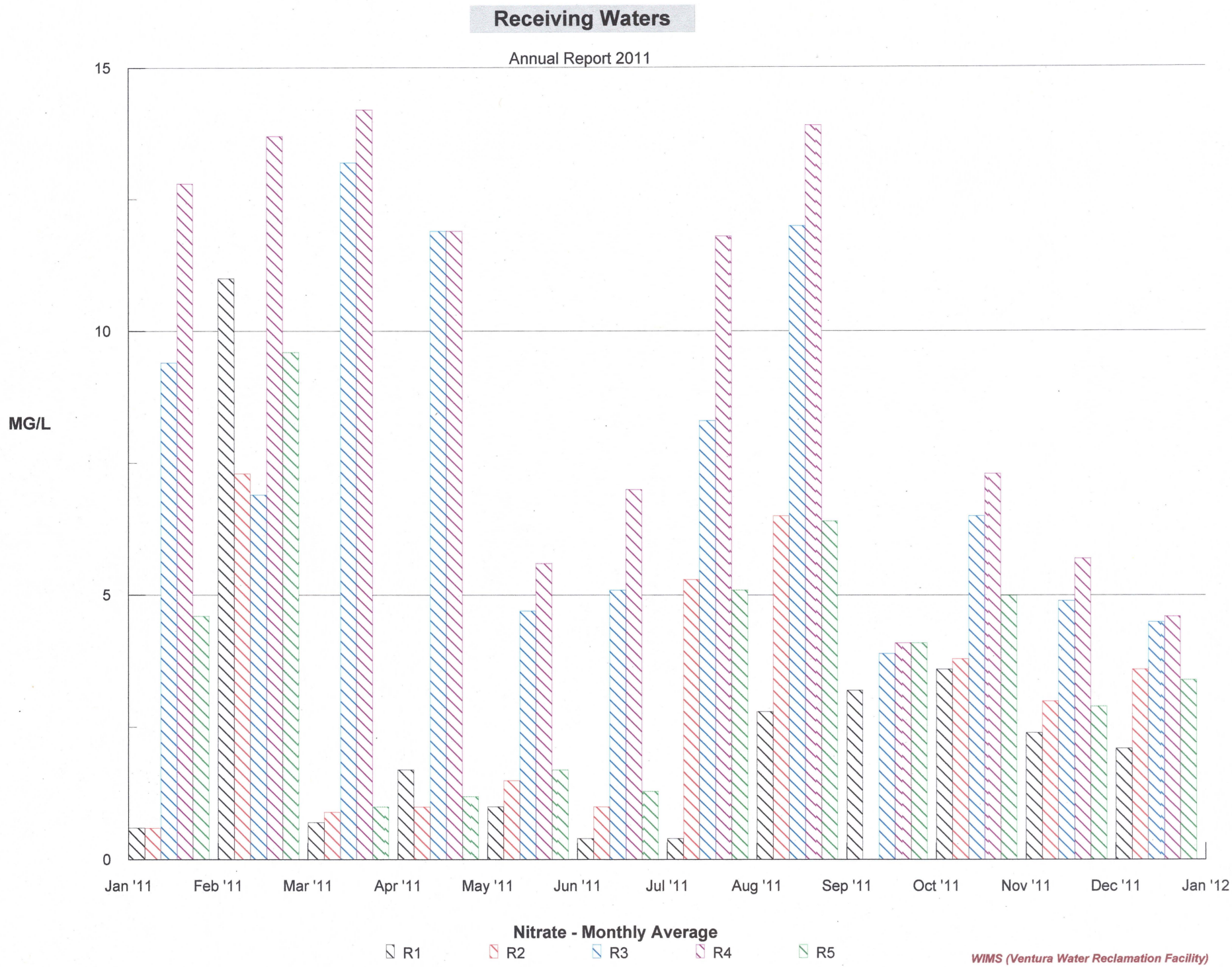


WIMS (Ventura Water Reclamation Facility)
Receiving Water - Salinity

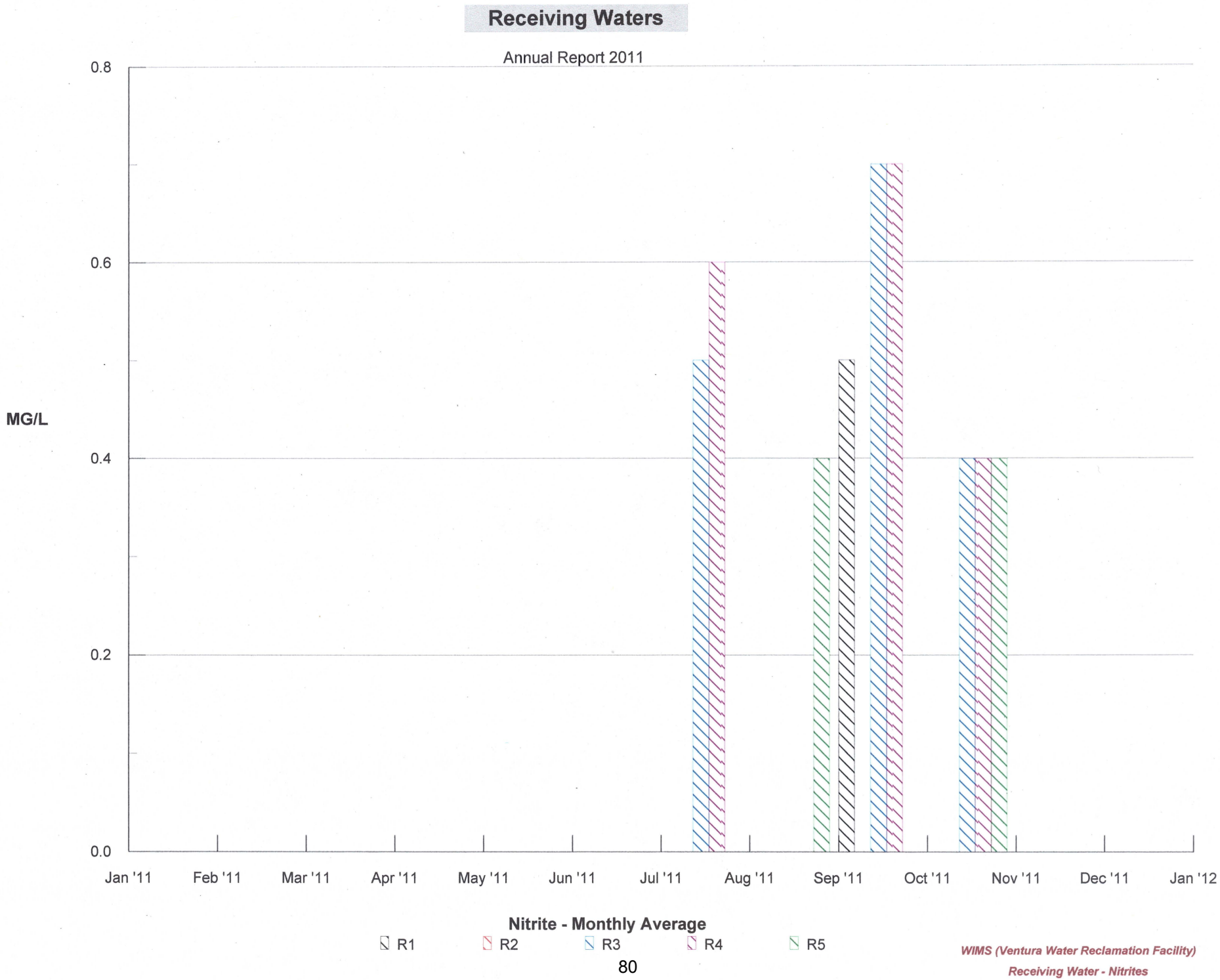

Receiving Waters
Annual Report 2011
MG/L
25
20
15
10
5
0
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep '11
Oct '11
Nov '11
Dec '11
Jan '12
Dissolved Oxygen - Monthly Average
R1
R2
R3
R4
R5
WIMS (Ventura Water Reclamation Facility)
Receiving Water - DO

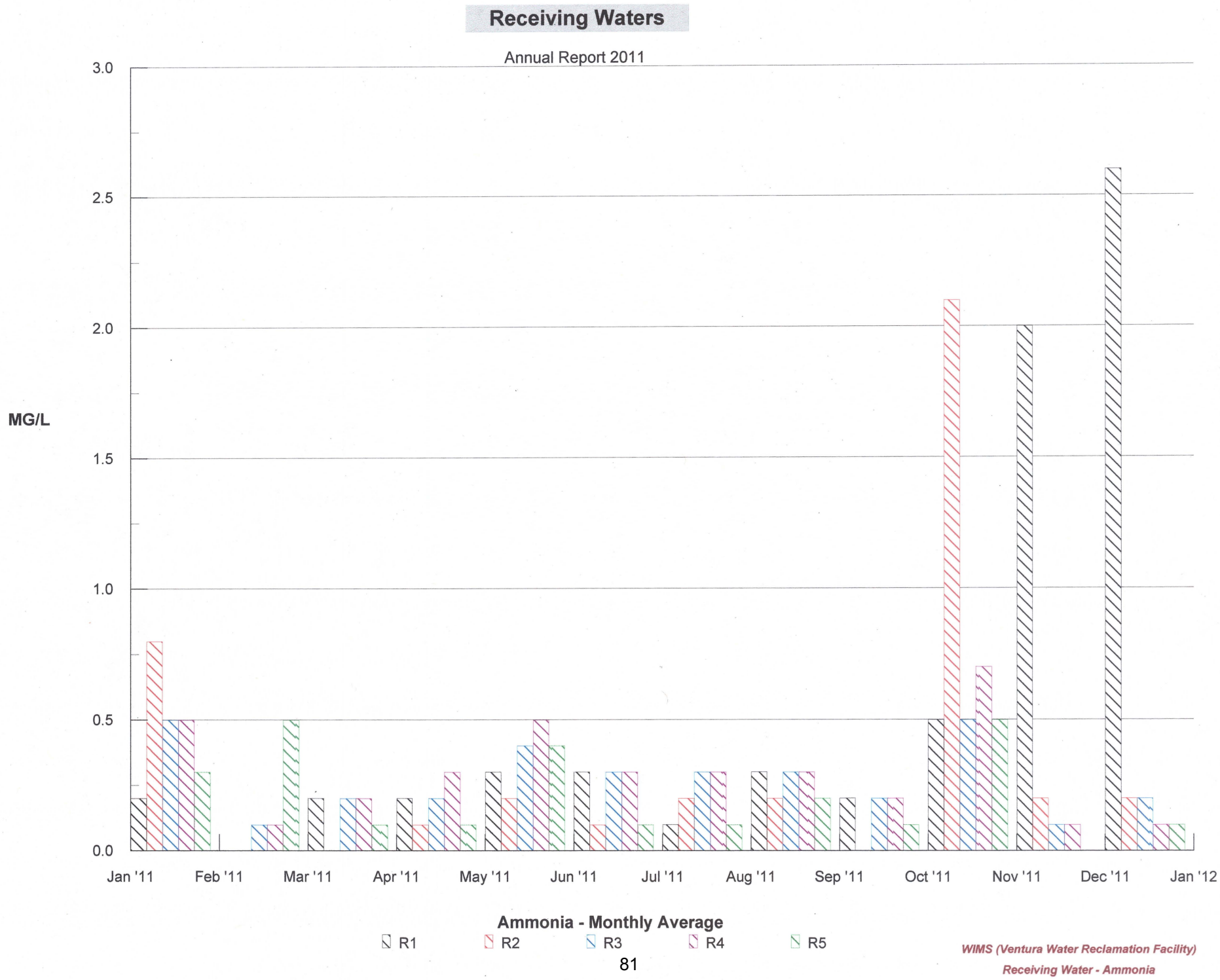


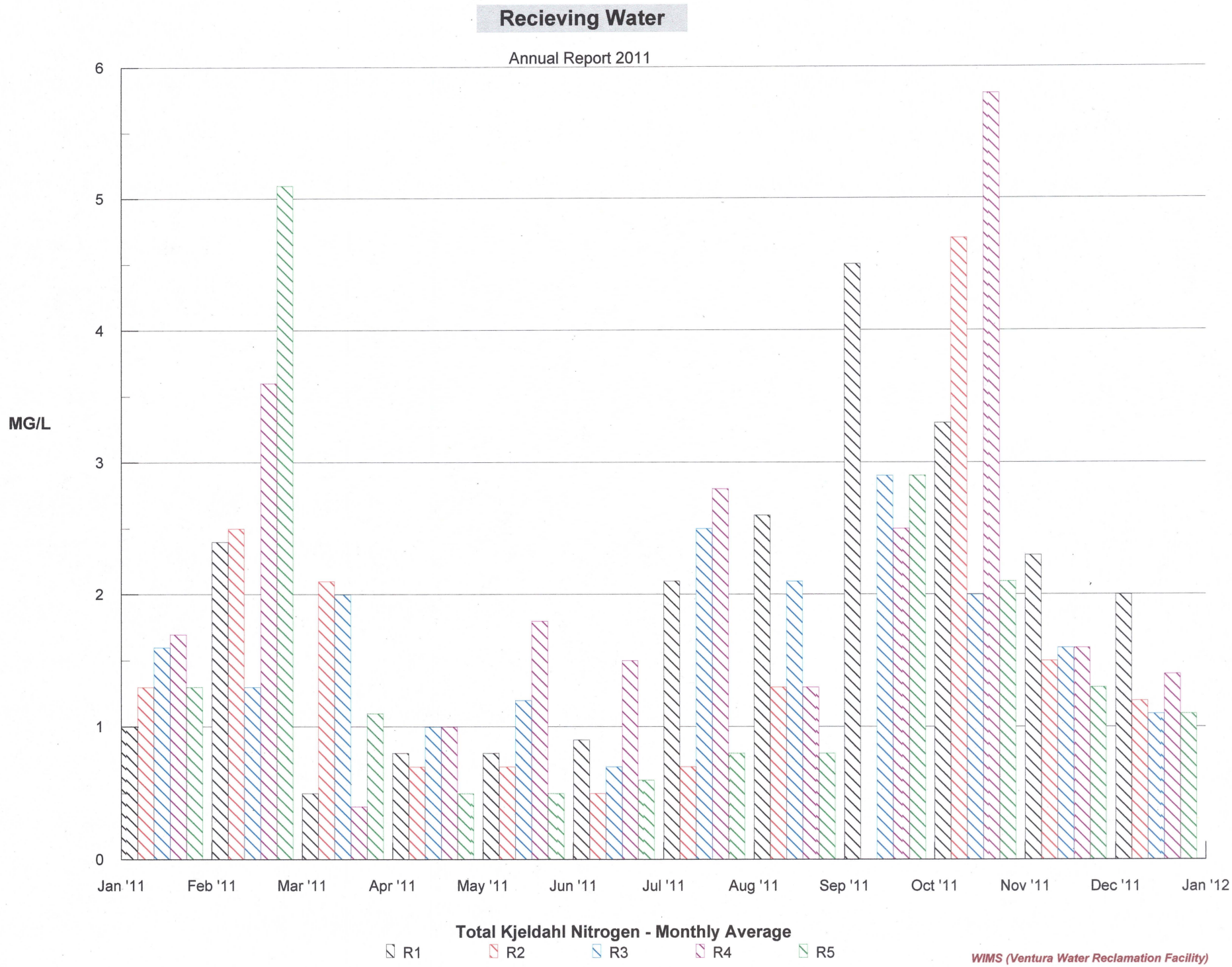
WIMS (Ventura Water Reclamation Facility)
Receiving Water - Hardness



WIMS (Ventura Water Reclamation Facility)
Receiving Water - Nitrates


Receiving Waters
Annual Report 2011
MG/L
0.8
0.6
0.4
0.2
0.0
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep '11
Oct '11
Nov '11
Dec '11
Jan '12
Nitrite - Monthly Average
R1
R2
R3
R4
R5
WIMS (Ventura Water Reclamation Facility)
Receiving Water - Nitrites

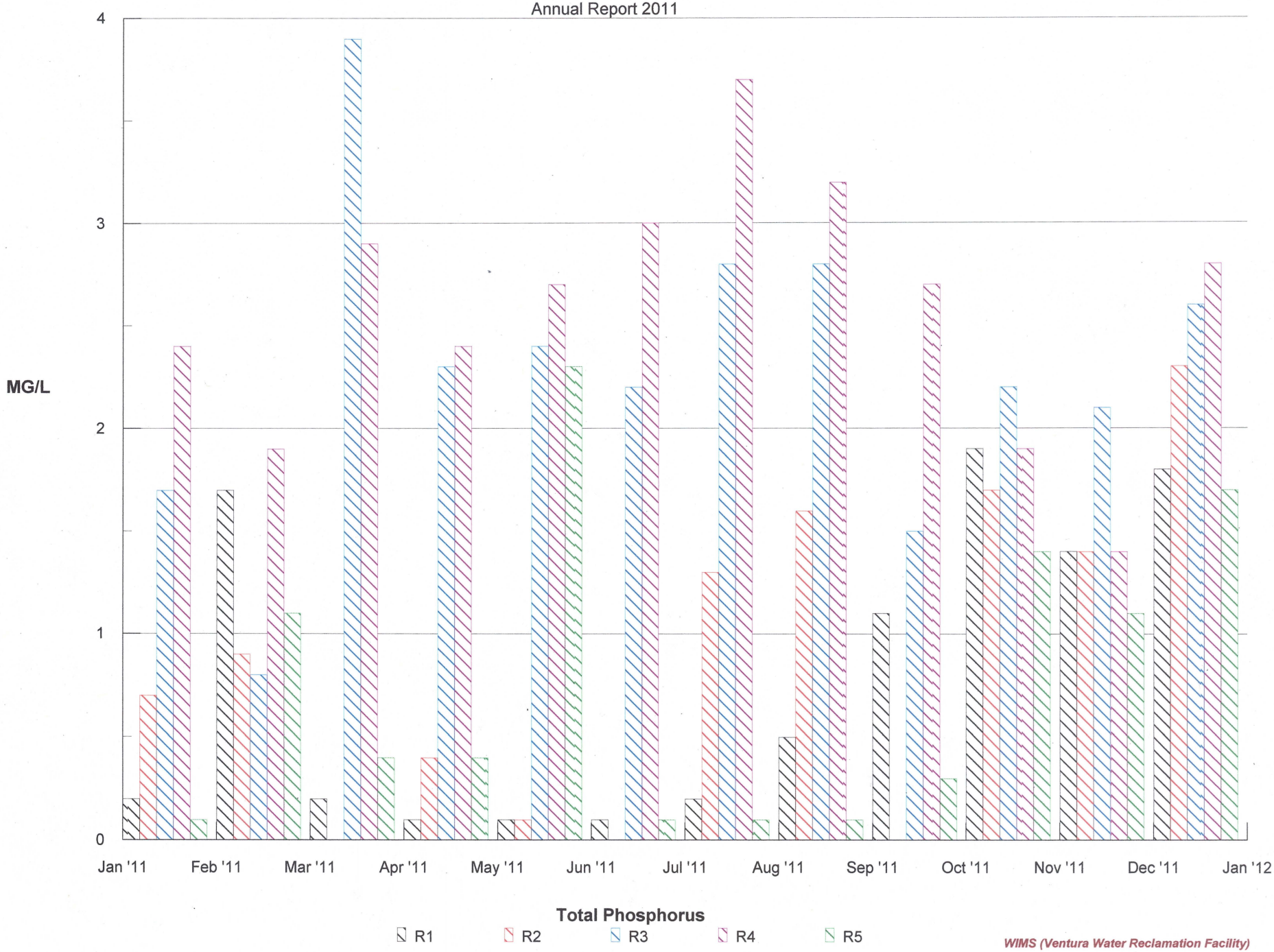

Receiving Waters
Annual Report 2011
MG/L
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep '11
Oct '11
Nov '11
Dec '11
Jan '12
Ammonia - Monthly Average
R1
R2
R3
R4
R5
WIMS (Ventura Water Reclamation Facility)
Receiving Water - Ammonia



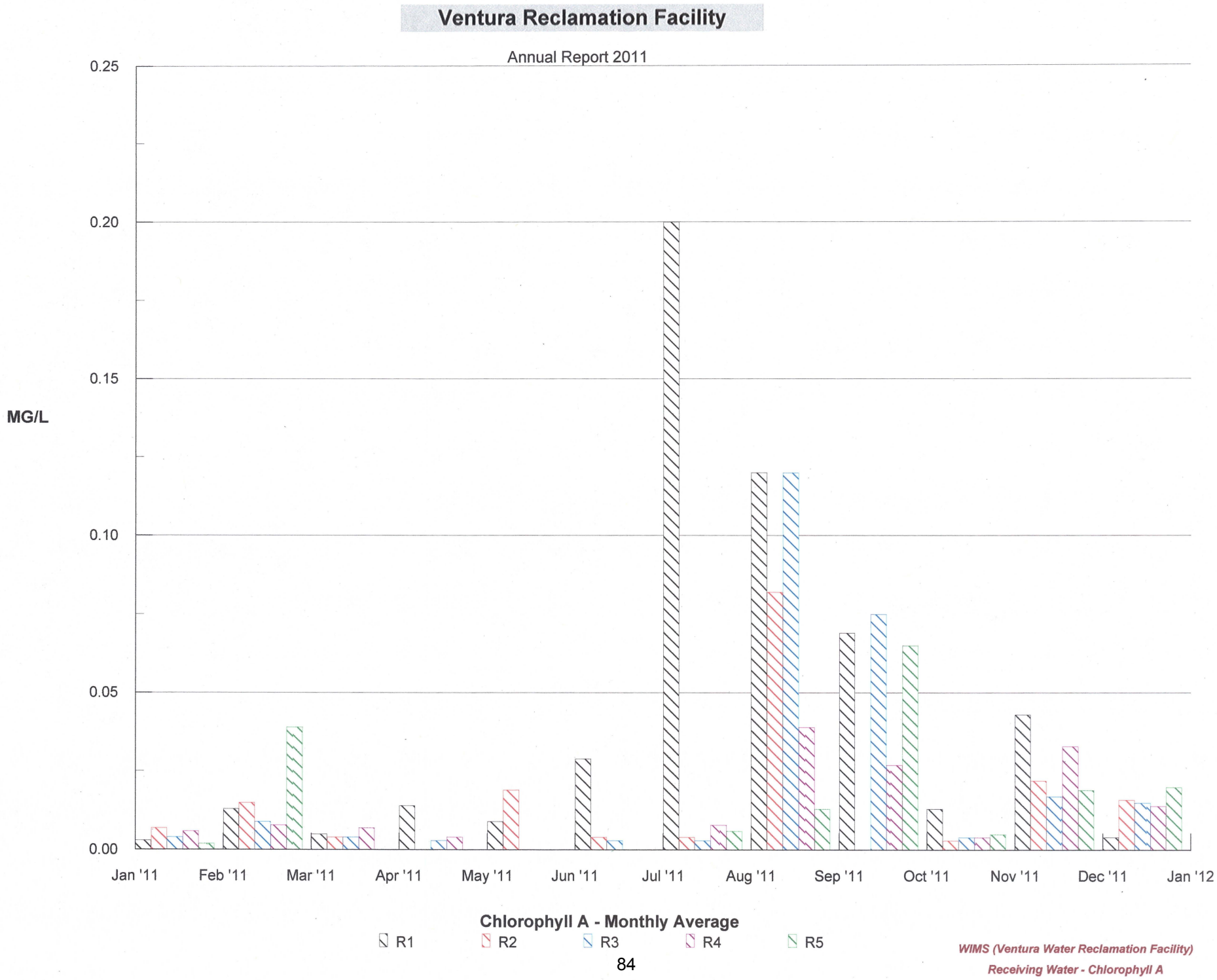
WIMS (Ventura Water Reclamation Facility)
Receiving Waters- TKN

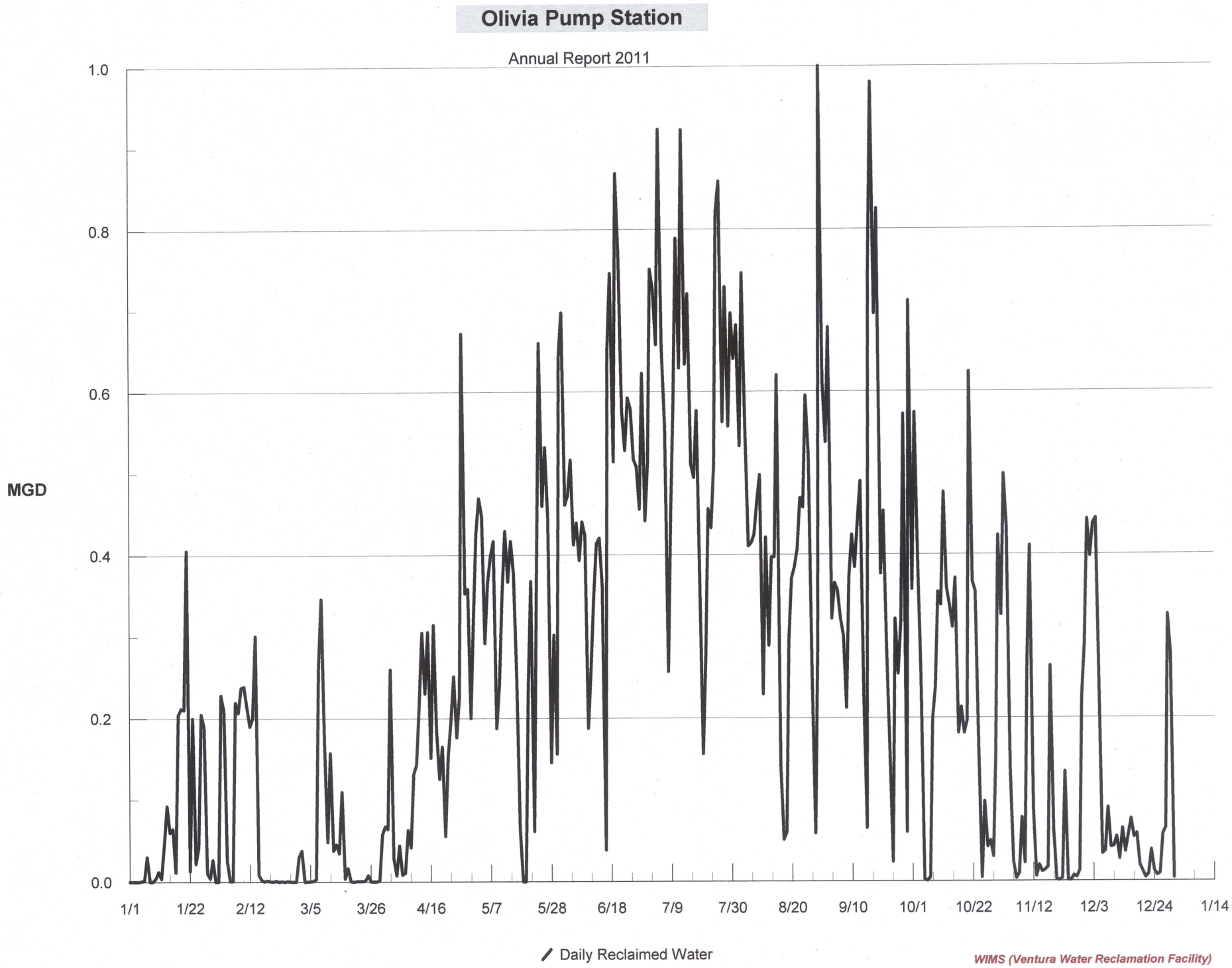
Ventura Reclamation Facility

Annual Report 2011



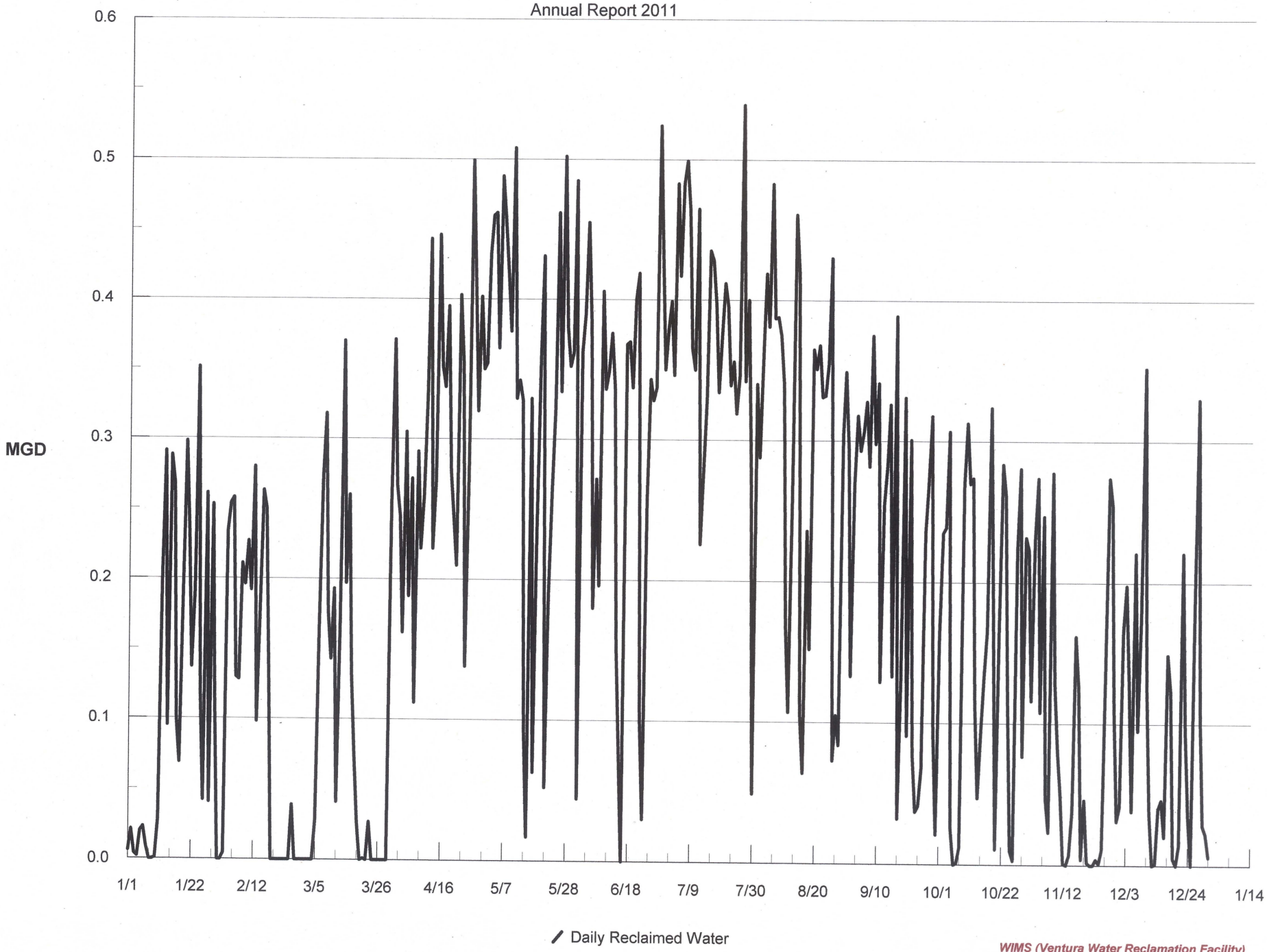
WIMS (Ventura Water Reclamation Facility)
Receiving Water - Total Phosphorus


Ventura Reclamation Facility
Annual Report 2011
MG/L
0.25
0.20
0.15
0.10
0.05
0.00
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep '11
Oct '11
Nov '11
Dec '11
Jan '12
Chlorophyll A - Monthly Average
R1
R2
R3
R4
R5
WIMS (Ventura Water Reclamation Facility)
Receiving Water - Chlorophyll A


Olivia Pump Station
Annual Report 2011
MGD
1.0
0.8
0.6
0.4
0.2
0.0
1/1
1/22
2/12
3/5
3/26
4/16
5/7
5/28
6/18
7/9
7/30
8/20
9/10
10/1
10/22
11/12
12/3
12/24
1/14
Daily Reclaimed Water
WIMS (Ventura Water Reclamation Facility)
Olivas Irrigation

Buena Pump Station

Annual Report 2011

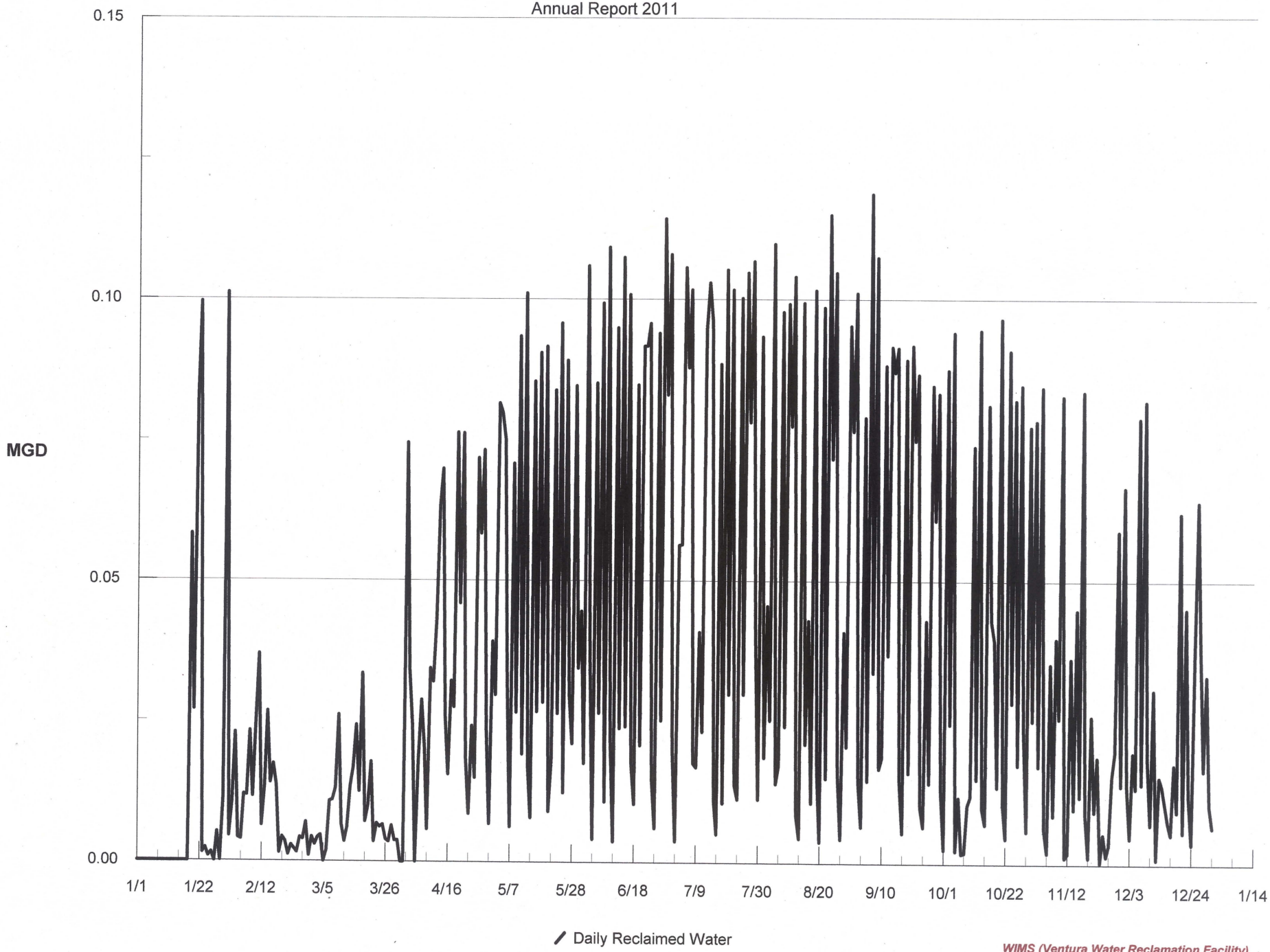


WIMS (Ventura Water Reclamation Facility)

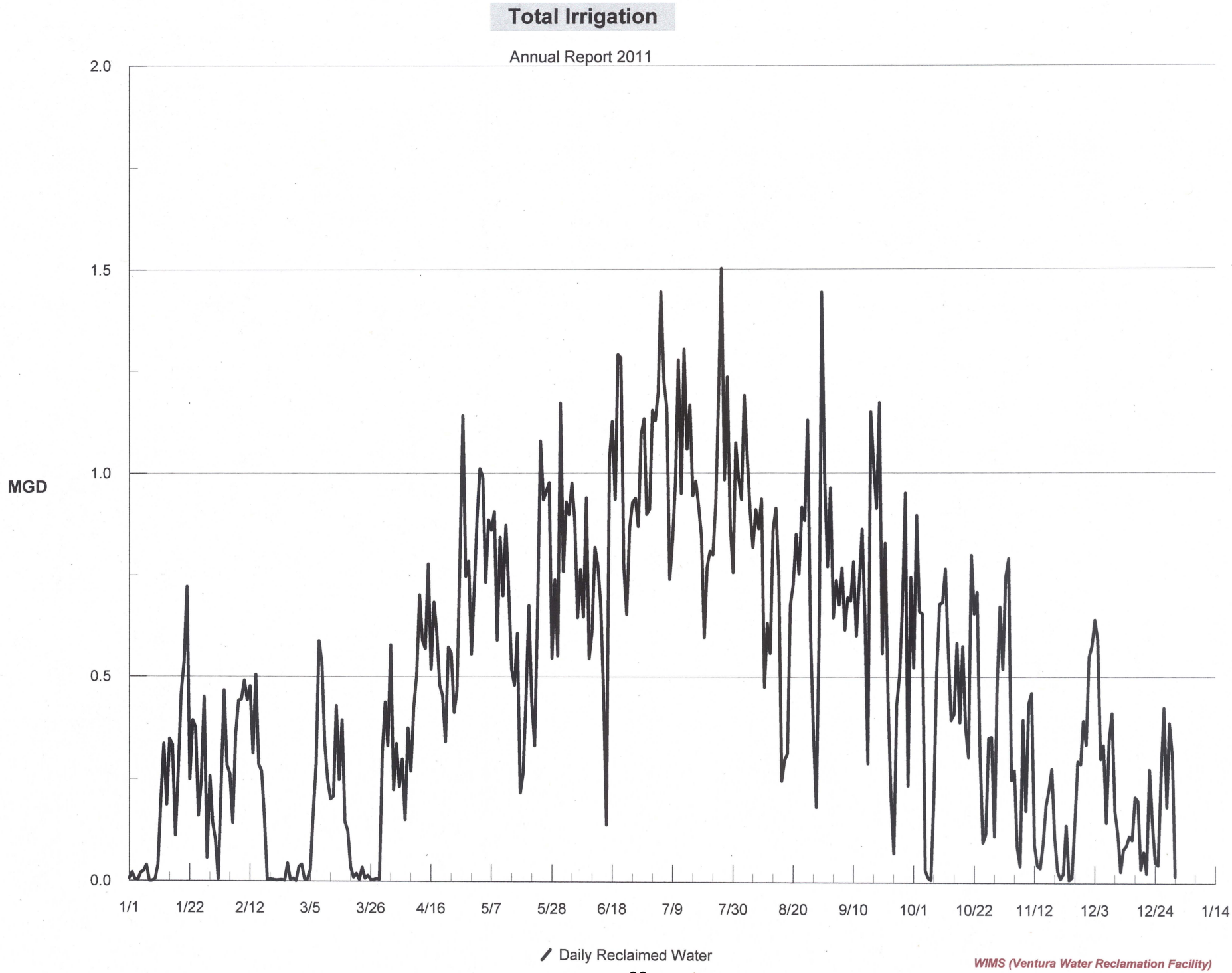
Buena Irrigation

Marina Pump Station

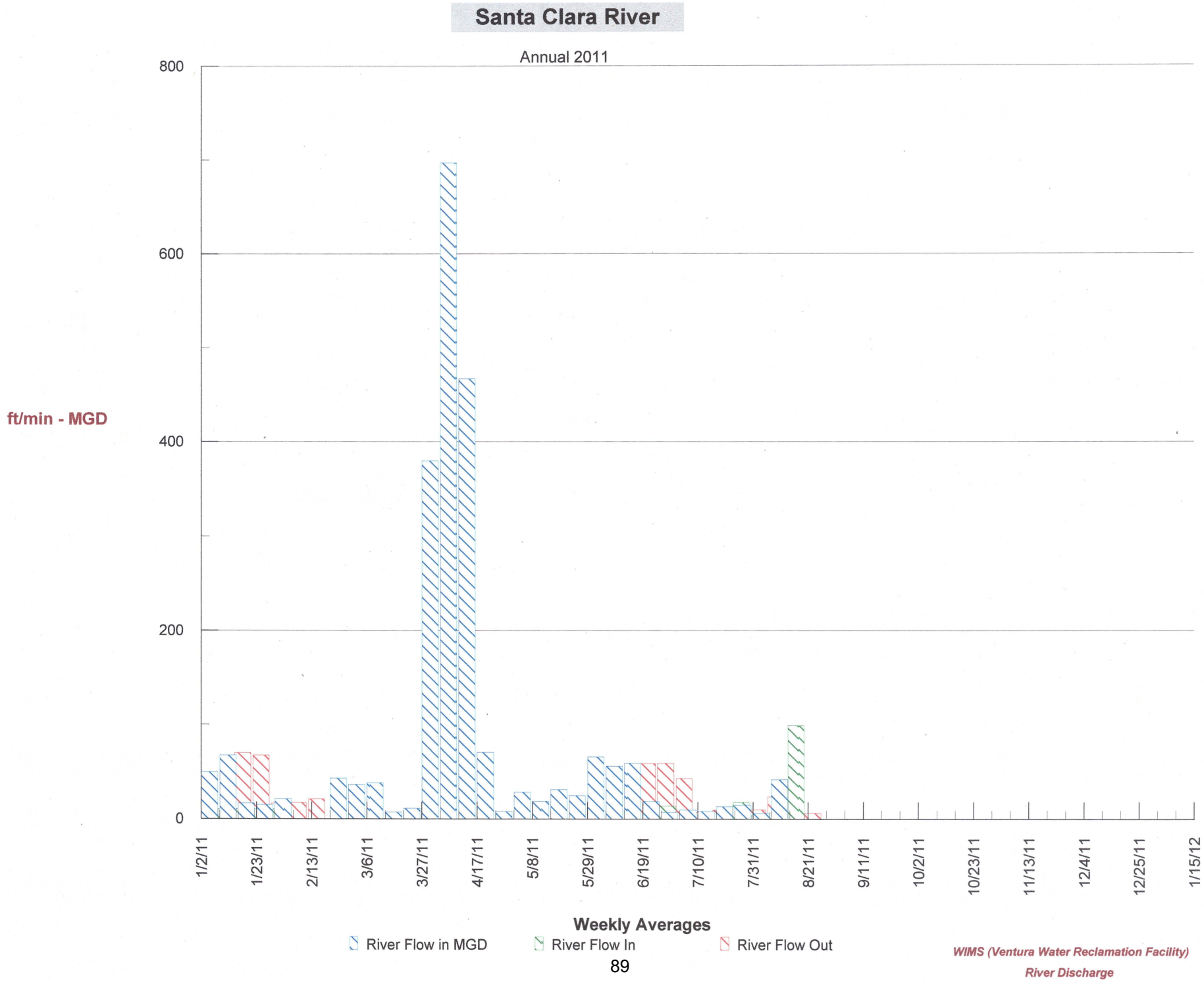
Annual Report 2011



WIMS (Ventura Water Reclamation Facility)
Marina Irrigation



WIMS (Ventura Water Reclamation Facility)
Total Irrigation


Santa Clara River
Annual 2011
ft/min - MGD
800
600
400
200
0
1/2/11
1/23/11
2/13/11
3/6/11
3/27/11
4/17/11
5/8/11
5/29/11
6/19/11
7/10/11
7/31/11
8/21/11
9/11/11
10/2/11
10/23/11
11/13/11
12/4/11
12/25/11
1/15/12
Weekly Averages
River Flow in MGD
River Flow In
River Flow Out
WIMS (Ventura Water Reclamation Facility)
River Discharge

ANALYTICAL QUALITY ASSURANCE PROGRAM 2011

I. LABORATORY DUTIES AND OBJECTIVES

The City of San Buenaventura Wastewater Laboratory is responsible for all sampling and analysis for purposes of NPDES compliance monitoring related to the City operated wastewater treatment plant, industrial waste and for the City domestic water supply and water distribution system monitoring for SDWA compliance. It is aim to provide a product the does not cause harm to the public or the environment.

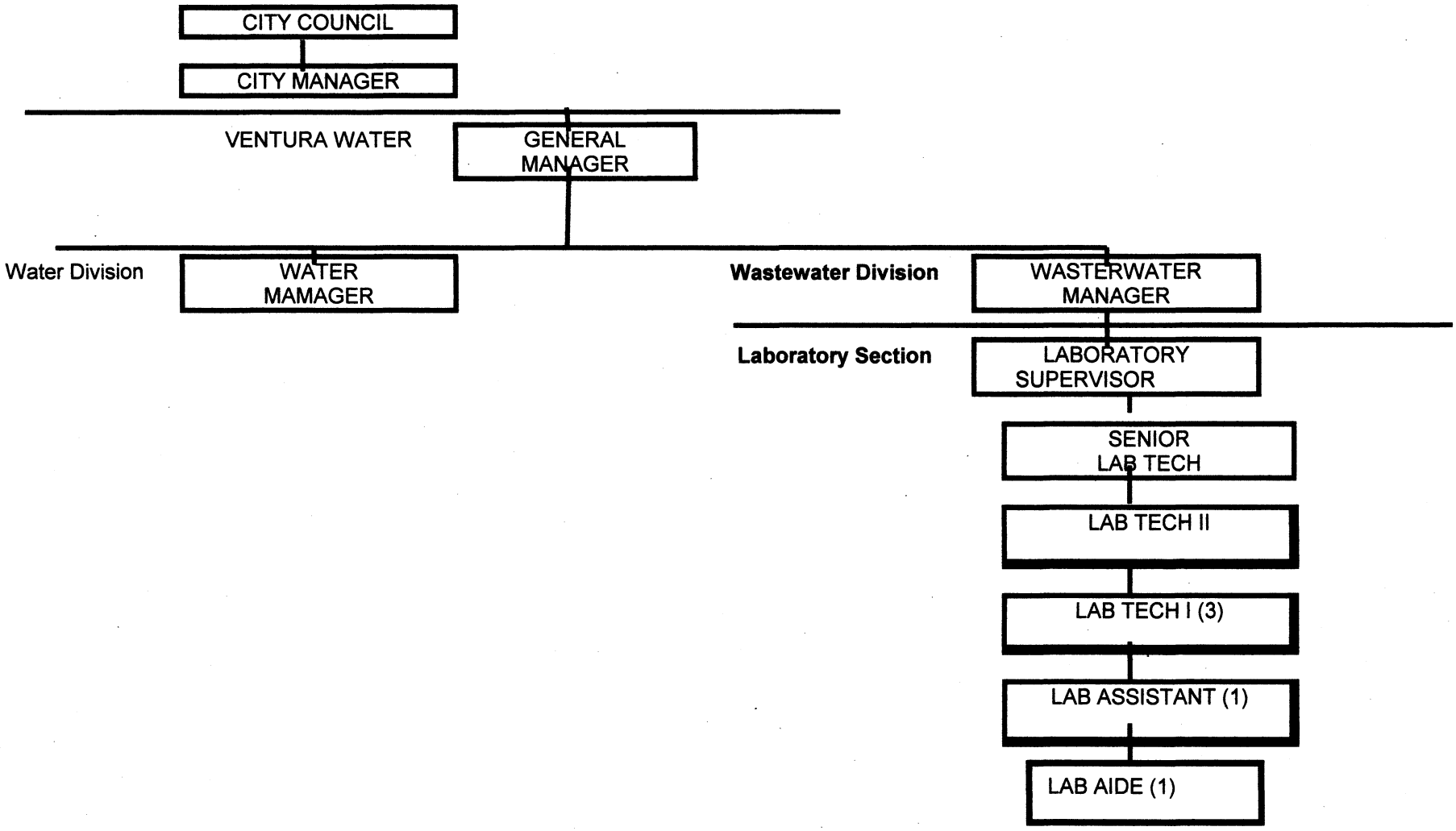
Current State of California Department of Health Services laboratory certification is attached.

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 - May 1998 to Present

Education:

Bachelor of Sciences Fort Valley State - Biology

Master of Sciences Iowa State University - 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:

Responsibilities include the supervision of the laboratory and industrial waste staff, which involves the preparing of employees' evaluations and overseeing the day to day activities. Prepare water and wastewater monitoring reports of analyses including electronic transfer of water data. Prepare the laboratory budget and the ordering of supplies and chemicals. Other administrative duties include attending various meetings, coordination of sample schedule with other departments and assist with the chemical, physical and biological analysis of water, wastewater and industrial waste samples.

Senior Technician: Michael L. Torres - August 1999 to Present

Education:

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

Experience:

Microbiologist – Montgomery Watson Laboratories

Present Duties:

Responsibilities include the inorganic and organic analyses of water, wastewater and industrial waste samples using the Gas Chromatogram and the Ion Chromatograph. As the bench supervisor direst, train and assist the staff with physical, chemical and biological analyses. Operate the laboratory's quality control program, maintain records, data entry of results and oversee the laboratory safety program. Supervise the laboratory in the absence of the supervisor.

Lab Tech II: Craig Jones – September 2000 to Present

Education:

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

Experience:

Laboratory Technician I City of San Buenaventura Wastewater, Ventura California

Laboratory Technician, Ventura County Waterworks, Moorpark, California

Present Duties:

Analyze water, wastewater and industrial waste sample using the Atomic Absorption Spectrometer for mineral and metals. Perform other physical, chemical and biological analyses of water, wastewater and industrial waste samples. Daily input and recording of laboratory data also maintenance and upkeep of laboratory equipment.

Lab Tech I: Mary Champion – July 2005 to Present

Education:

Bachelor of Science in Biology, minor in Chemistry, University of May Harding – Baylor

Experience:

Laboratory Technician, Los Angeles County Sanitation District Via Fastek

Laboratory Technician, San Manuel Bottle Water Group

Present Duties:

Perform routine chemical, physical and biological analysis of water, wastewater and industrial waste samples. Effluent chronic toxicity, collect water, wastewater, and receiving water samples for laboratory analyses. Daily input and recording of laboratory data also general laboratory housekeeping.

Lab Tech I: Felicitas Ramirez – September 2005 to Present

Education:

Bachelor of Science in Commerce Management - Saint Louis University Philippines

Bachelor of Science - Biology Ventura College

Experience:

Laboratory Technician I Aquatic Bioassay Consulting Laboratories, INC

Aquatic Biologist Aquatic Bioassay Consulting Laboratories, INC

Laboratory Supervisor Aquatic Bioassay Consulting Laboratories, INC

Present Duties:

Perform routine chemical, physical and biological analysis of water, wastewater and industrial waste samples. Chronic bioassay testing of effluent, collect water, wastewater, and receiving water samples for laboratory analyses. Daily input and recording of laboratory data also general laboratory housekeeping.

Lab Tech I: Manuel Zapien – July 2006 – Present

Education:

Associate of Science in General Science – Ventura College

Bachelor of Science in Geology – University California at Santa Barbara

CWEA Grade 1 Laboratory Analyst Certificate

Experience:

Laboratory Technician – Ventura County Water Works

Laboratory Technician – NUSII Technology, INC

Present Duties:

Perform routine chemical, physical and biological analysis of water, wastewater and industrial waste samples. Collect water, wastewater, and receiving water samples for laboratory analyses. Daily input and recording of laboratory data also general housekeeping and equipment maintenance.

Laboratory Assistant: Jason Wong – August 2006 – Present

Education:

High School Diploma - Adolf Camarillo High School

Experience:

Laboratory Aide – City of Ventura Wastewater Laboratory

Present Duties:

Collect water, wastewater, industrial waste and receiving water samples for laboratory analyses. Perform simple chemical, physical and bacteriological analyses on the various water samples. Input laboratory data and perform maintenance of laboratory equipment.

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
	Barnstead Nanopure Diamond	Division
D. I. Water Supply	Purtec Commercial Units	Purtec
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 (Air)	Fisher Scientific Counter Top Model 6500	Division
Incubators (BOD/Bioassay)	Power Scientific, INC & Percival Scientific	Division / Geneva Scientific
Speed Vac	Horizon Speed Vac 9000	Division
Autoclave	Getinge/Castle Model 133LS	Getinge/Castle
	Market Forge Sterilmatic	Thermo - Scientific
pH Meters	Orion Model 701	Division
	Orion Model 701	Division
	Cole-Parmer 5938-00 Portable	Division
Specific Ion System	Orion Model EA 940 Meter/Electrodes	Division
Sealer	Idexx Quant- Tray Sealer Model 2X	Idexx
Conductivity Meter	Orion Model 162A	Division
Centrifuge	Sorvall Legend	Division
D.O. Meters	Orion SL 9 Portable Probe	Division
	Orion Model 9708 Electrode	Division
	Thermo Orion Model 826A	Division
Nepthelometers	Hach Model 2100A	Hach
Water Bath	Blue M Magniwhirl Model 1110A	Division
	Thermo-Scientific Lindberg/Blue M circulating bath	Division
	Precision Circulating Bathe Model 270	Division
Analytical Balances	Mettler Model AT 201 Mettler Model AE 163	Mettler
Top-Loading Balances	Mettler Model PM2000	Mettler
	Mettler Model PM2000	Mettler
Microscopes	American Optical 40-1000X Phastar	Division
	American Optical .7-3X Stereo	Division
	Nikon Eclipse E600	Division

Refrigerators	3 - Thermo Scientific Isotemp	Thermo Fisher, Winkler
Spectrophotometers	2 – Agilent 8453 UV-Visible Spectrophotometer	Aligent Technologies
	Bausch & Lomb Spectronic 20	Division
	Hach DR/4000	HACH
Spectrophotometer AA-	Agilent Technologies 200 Series - 280 FS AA & GTA 150 Autosamplers	Agilent
Ion Chromatographs	Dionex, ASRS-I Self Regenerating Supressor/Dionex, CD20 conductivity Detector Dionex 5000	Dionex
Gas Chromatograph	HP 6890 GCSystem Series Autosampler; Micro EC Detector Flame Ionization Detector	Aligent Technologies
Purge/Trap system	HP 7695	Aligent Technology
Dispenser/Diluter	Gilson 222	Division
Samplers	5 ISCO Model 6712FR	Division/ JR Environmental Services
	2 - American Sigma 900	Division/America Sigma
	1 ISCO Model 3700	Division/ MRC
	5 American Sigma 800SL	Division/America Sigma
Dishwashers	3 - Miele Professional Washers G-7783	Miele
Aligent Technologies	-- Aligent Technologies, Wilmington, DE 19808	
Hach	-- HACH Company, Loveland, CO	
Getinge/ Castle	-- Getinge/Castle Rochester, New York	
Idexx	--Idexx Westbrook, Maine	
Dionex	--Dionex Sunnyvale, CA	
Varian	-- Varian Sugarland, Texas	
JR Environmental Services	--JR Environmental Services, Newberry Park, CA	
Mettler Toledo	--Mettler Toledo Columbus, OH	
Miele	--Miele, Inc, La Verne, CA	
American Sigma	-- Ponton Industries, Inc, Santa Fe, Spring CA	
Division	-- Ventura Sanitation Division Personnel	

D. Preventative Maintenances

The laboratory has preventative maintenance (PM) contracts with Aligent Technologies, Dionex, Getinge/Castle, Hach, JR Environmental Services, and Miele to perform at a minimum annual PM on the equipment listed above. Maintenance ranges from the replacement of parts to the updating of software, which is included in most of the contracts. Staff performs PM on equipment not covered by PM contract annually and more frequently if needed on the sensitivity equipment. In house PM manuals are kept near the instruments.

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

a. Samples are collected and delivered to the Wastewater Laboratory for analysis by wastewater personnel (laboratory staff and plant operators), industrial waste inspector, water division and other City's staff.

b. Samples collected are grabs or 24-hour composites. All composite samples are collected using ISCO Models 6712 FR, 3700. Samplers operate in flow proportion by utilizing the non-uniform time option of the control electronics.

c. Sample containers are of a material that does not produce positive or negative errors or change the condition of the sample. Sample 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.

d. All samples are collected in a aseptic manner preventing contaminates or interference, which cause erroneous results. Sample s are collected daily, weekly, monthly, quarterly, semi-annually in accordance with the NPDES permit or as a special request.

2. Sample Preservation

a. Sample preservations are done in accordance with the analysis to be performed in 40CFR and Title 22. At sample collection the sampler does field measurements for pH, chlorine residuals and temperatures.

b. The laboratory preserves all samples not analyzed immediately that are collected and delivered to the laboratory by wastewater personnel (laboratory staff and plant operators). The technician performing the analysis preserves samples delivered by the Water Division or outside agencies.

c. The industrial waste inspector or the lab assistant preserves industrial samples collected for metals, cyanide and total sulfide analyses. The lab technician performing the analysis preserves all other industrial waste samples.

3. Handling and Storage

a. The person preserving the sample is responsible for storage of the sample. When possible the samples are stored in their original containers in the containers.

b. All samples not requiring immediate analysis are preserved and refrigerated at 2° C or less. They remain in storage until all the analyses have been completed and data approved. The technicians responsible for performing the required analysis remove and replace the samples in storage.

c. Samples placed into storage must be labeled with the sample name, date, and time sampled, the analysis required and the initial of the sampler. A chain of custody is completed for each sample entering the lab from outside the Facility and for out sourced samples.

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

4. Disposal

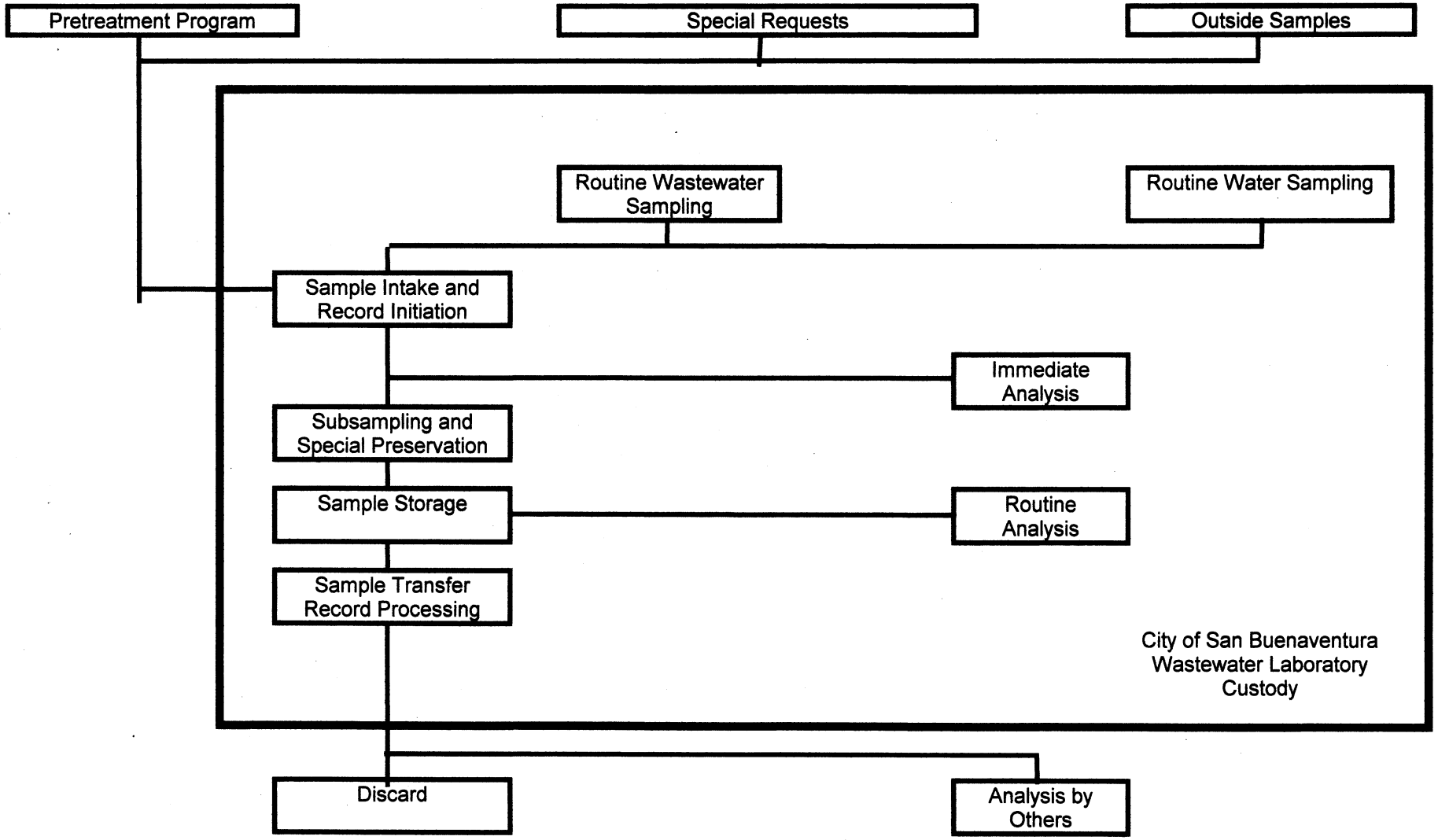
a. A sample can be disposed after the analysis is completed and the data has been reviewed by the laboratory supervisor, senior lab tech or industrial waste inspector. Samples should be disposed of in a safe manner that will not harm employees or the environment. Special care must be taken with samples that have been stored for long periods of times.

b. 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 these samples.

c. Samples analyzed for minerals and some metals maybe dumped down the drain and flushed with large volume of water. Others must be neutralized before they can be disposed such as COD waste. Samples that have been analyzed for pesticides or phenols can be evaporated under the fume hood. Large volumes of waste solvents and other hazardous materials are disposed of at hazardous waste disposal sites.

d. Review the Material Safety Data Sheet (MSDS) or check with the laboratory supervisor or the senior lab tech if you have questions on proper disposal of any laboratory chemical or reagents.

The laboratory sample path is shown in the chart below.



B. Sample Identification

1. Sampling sites for routine wastewater and drinking water, which are, monitored daily, weekly, quarterly or semi-annually have fixed identification 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.

2. The Laboratory Computer Data System assigns a Laboratory Identification Number, variable number to other water, wastewater, industrial waste samples or any non-routine sample received. The variable number is a numerical number assigned from a sequence list. This number is used in sample logs, bench worksheets, and permanent records and on analysis reports. A copy of the Computer Data System is in the laboratory's Standard Operation Procedures (SOP).

C. Custody

1. A Chain of custody is initiated when a sample enters or leaves the laboratory unit. All samples done p[l; on a regular base 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.

2. Custody documents vary with the sampling purpose, but all custody transfers identify the sample by name and/or LID number, the sample collector and documents 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 SOP.

3. Analytical Procedures, which the laboratory is certified to perform, are according to the Standard Methods for the Examination of Water and Wastewater 18th – 20th, EPA Chemical Method for Analysis of Water and Wastes and EPA 40 CFR 136 & 141.

4. 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, equipment and instrumentation with the analytical options for interference correction; samples and sample volumes defined for the samples analyzed. These procedures are reviewed periodically and revised to accommodate method and sample changes.

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

D. 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

E. Reports

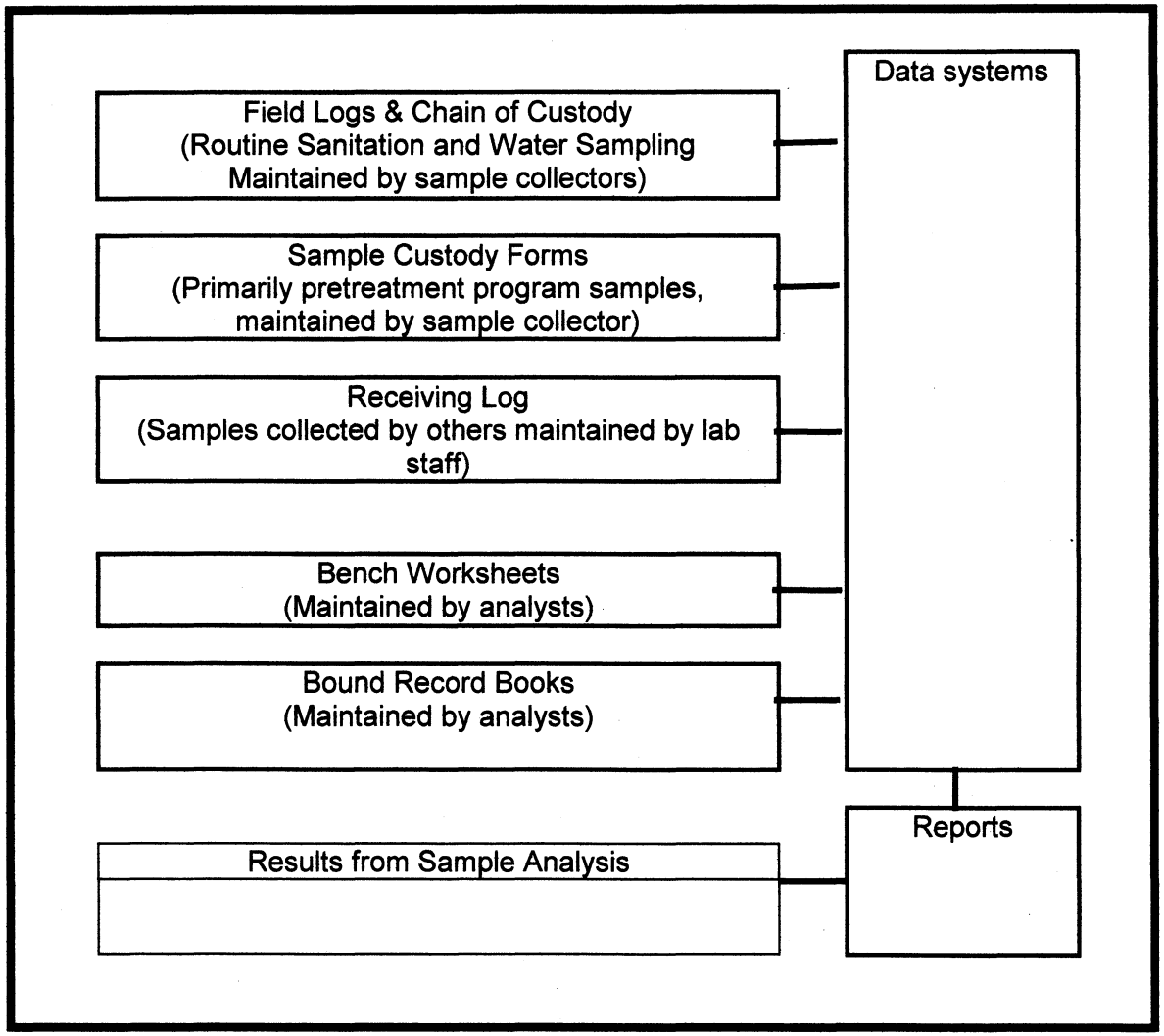
1. Report formats and contents are generally specified by the agency requesting the reports. Reports of routine monitoring are provided by computer methods designed to meet these specifications. Reports for water samples are generated from data entered into Run: Input1and Input 2 through the City Vax system before September 2009. OPS Strategic Data Management program is used to generate wastewater and water reports. OPS was purchased by HACH in December 2009. Industrial Waste reports are generated from the Environmental Control Database.

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

3. Final reports should include a minimum of the following: sample and analysis date, analysis method, quality assurance (control, spike and surrogate if applicable), condition of sample when received, chain of custody and signature of person completing the report.

4. All current procedures, records and reports are available at the laboratory for review and inspection. Records of annual analytical results are available from 1971 to present. Reports are reviewed and signed by the Laboratory Supervisor.

Data flow from generation to reporting is shown 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	Chemical & Physical	Report Reviewed	Lab Supervisor
Drinking Water	Quarterly	THM	Report Reviewed	Lab Supervisor
Drinking Water	Annual	Metals	Report Reviewed	Lab Supervisor
Submerged Wells	Any	All	Report Reviewed	Lab Supervisor
Surface and Ocean	Any	Bacti	Inoculation Complete	Analysts
Wastewater	Daily Grab	pH, Turbidity, Residual	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, Sulfate	Analysis Complete	Analysts
Wastewater	Monthly Composite	MBAS, Total P	Report Reviewed	Lab Supervisor
Wastewater	Monthly Composite	PO4, Alkalinity, B, F	Analysis Complete	Analysts/Supervisor
Wastewater	Weekly Grabs	Oil & Grease	Analysis Complete	Analysts
Wastewater	Semiannual Grabs	Cyanide & Priority Pollutants	Analysis Complete	Analysts
Wastewater	Monthly Composite	Bioassay	Test Complete	Analysts/Supervisor
Wastewater	Monthly Composite	Copper, Mercury, Silver & Zinc	Report Reviewed	Lab Supervisor
Wastewater - Influent	Quarterly Composite	Copper, Mercury, Silver & Zinc	Report Reviewed	Lab Supervisor
Wastewater	Quarterly Composite	Pesticides, Phenol	Report Reviewed	Lab Supervisor
Receiving Waters	Weekly Grab	Bacti, Chemical & Physical	Analysis Completed	Analysts
Receiving Waters	Monthly Grab	Nitrogen, PO_4, Total P	Analysis Completed	Analysts/Supervisor
Receiving Waters	Monthly Grab	Copper, Mercury, Silver & Zinc	Report Reviewed	Lab Supervisor
Receiving Waters	Quarterly Grab	Bioassay	Report Reviewed	Lab Supervisor
Receiving Waters	Semiannual Grab	Priority Pollutants	Report Reviewed	Lab Supervisor
Source Control	Any	All	Report Reviewed	IW Inspector
Special	Any	All	Report Reviewed	Lab Supervisor

IV. QUALITY ASSURANCE PROCEDURES AND DOCUMENTATION

A. General

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

1. Provide primary control over the accuracy reagents, standards and other related materials employed in analysis.
2. Provide day-to-day control over the accuracy of measurements.
3. To ensure that the technicians understand the analyses.

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

B. Laboratory Equipment

Equipment effected by the environmental, mechanical or electronic conditions is checked periodically for alignment. Other equipment, 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
Light Merer		Annually
Turbidimeters	Calibrate with Secondary Turbidity Standards	Daily
Turbidimeters	Calibrate with Certified Standards	Daily
Turbidimeters	Calibrated by Hach	Annually
Spectrophotometer	Verify Wavelength Accuracy with Holmium Oxide Filter	Quarterly
Autoclave	Verify Accuracy of Integral Recorder with Lag Thermometer	Weekly
Weights	Calibrated by Troemner Precision Weights	Annually
Balances	Verify Accuracy with External Calibration Weights	Weekly
Balances	Calibrated Precise Weighing System	Annually

C. Primary Quality Control (QC) And Internal Quality Control

1. Stock standard and reagents used in the analysis are logged with: the quantity, dilutions, final volume, initials of the preparer, date prepared and expiration date. Date prepared, expiration date and initials of the preparer are on each container. The analysis procedure is checked for the stability and storage of the stock solution or the reagent.

2. Reference materials used to make spikes and controls are purchased from NSI Solutions, Inc., Raleigh, NC or prepared in house by staff. Control and spikes are prepared and analyzed under same conditions as the samples. Controls and spikes are analyzed after every ten samples on the Atomic Absorption (AA), Ion Chromatograph (IC) and Gas Chromatograph (GC). For all other analysis a control and spike are analyzed with each analysis.

3. Titration reagents used on a daily basis are standardized weekly. The results from that standardization such as the multiplication factor adjustments; the normality of the reagent; and the initials of the person doing the standardization is label on the buret and the logged into the prep book. Other titration reagents are standardized prior to use and labeled with the same information listed above.

4. Water used for preparing blanks, standards, controls and making dilutions is distilled deionize water from a Corning 3 Liter Megapure Water Still and Barnstead Nanopure Diamond Pack. Dilution water is checked for metals annually and for conductivity, chlorine residual and HP monthly.

D. Chemical Analysis

1. Analysis reagents and standards are prepared from Primary standard materials, calibrated against Primary Standard materials or purchased as certified purity and/or certified concentrations from an approved agency such as NSI.

2. These measures are used to assure conformance to narrow concentration or purity limits when procedures require it. It helps in determining when a reagent must be discarded and calculation factors to avoid errors in analysis results.

E. Data Accuracy and Evaluation

1. The testing for chemical and physical composition is conducted on a batch basis. Each sample batch is run with controls and spikes. An acceptance of sample results as valid is based on the results of the control analyzed and spike recovery. Percentage recovery for the spike and control must be 100 $^{+}/_{-}$ 15(85 –115%). Weekly QC is performed on all daily analyses. QC is performed on all monthly, quarterly and annual analyses following the same format as for weekly QC.

2. In addition to these primary checks on the accuracy and precision of measurement, blank, sample replicates and matrix spikes are carried through all procedures. If any anomalies occur results are ruled invalid until explanation for the discrepancies are corrected. It might mean performing the analysis again.

3. Determine is there is any inconsistencies or other unexplained anomalies, which could lead to miscalculations or conclusions.

4. Separate reliable data from unreliable data.

5. Compare historical data from the site with the test results.

6. Review documentation for data type and source information to determine accuracy and reliability. Check changes in procedures, reagents or instrumentation.

7. Log and report data results if all questions or anomalies have been satisfied. File worksheets, spectrophotometer printout and chromatographs from IC, AA, and GC in the library.

F. Corrective Actions

1. 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.

2. 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 analyzed with the analysis batch are within acceptance standards.

3. 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 repeat of 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 sampled material was accurate an explanation must be recorded for the failure in the "QIR" Qualitative Investigate Report book.

G. Trace Inorganic and Organic Analyses

1. The Quality Assurance requirements for trace inorganic and organic analyses are narrowly defined by the approved analytical procedures. These requirements are adhered to.

2. Materials used for preparing standards, spikes and control for Trace Inorganic analysis are obtained from SCP Science, Champlain, NY, AccuStandard, Inc, New Haven, CT and VHG, Manchester, NH.

3. Materials used to prepare standards; spikes and control for trace organic analysis are normally obtained from Supelco/Sigma Aldrich, Milwaukee, WI. If appropriate materials are not available from this source, they are obtained from NSI Solution, Raleigh, NC or from normal chemical supply sources.

4. As with all other measurements, acceptability of sample results is dependent on controls, spikes and duplicates analysis results being within acceptance limits. No QA analysis data can be recorded if the control, spike or duplicate fail without a valid reason.

H. Toxicity Analysis

1. Instrument Calibration

   a. Continuous temperature recorders for monitoring test solution temperatures are Taylor Instrument drum recorders with remote sensor probes. Recorders are calibrated against ASTM certified reference $-1\ ^0$ to $101\ ^0$ glass thermometer by adjustment of the pen arm. MadgeTech, Warner, New Hampshire performs annual maintenance and calibration portable temperature logger annual.

   b. ASTM $30\ ^0$C thermometers are calibrated annual against the reference thermometer any corrections are labeled on the thermometer.

   c. Control Company of Houston, Texas performs annual calibration and maintenance on the light meter.

   d. pH measurement is made with Thermo Orion meter, which is calibrated prior to use.

   e. D. O. measurement is made with a Thermo Orion meter which is calibrated daily.

Reference materials are analyzed as noted below.

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

2. Test acceptance criteria:

Analysis	Criterion
Algae Growth Chronic Toxicity	Control cell counts >/= 1,000,000,000/ml
Algae Growth Chronic Toxicity	Control Replicate Counts << 20% Different
Ceriodaphnia Survival	Survival in Controls >> 80%
Ceriodaphina Reproduction	Number of young must be 15 or greater
Ceriodaphina Survival and Reproduction	60% of Surviving Adults produce 3 broods
Larval Fathead Minnow Survival and Growth	Survival in Controls >> 80%
Larval Fathead Minnow Survival and Growth	Control Average Dry Weight >> 0.250 mg

a. Moderate hard synthetic dilution water (prepare ahead of time) is used as the control for all chronic bioassay analyses. The controls are exposed to the same conditions as the sample. A summary of the test acceptance for each species is below and in the above table.

b. For Green Alga, *Selenastrum Capricornutum,* at the end of 96- hour the cell mass density in the control must be at least 1×10^6 cells/ml and variability (CV $^o/_o$) among control replicates less than or equal to 20 $^o/_o$ required. Test organisms must be 4 to 7 days old and have a cell density of 10,000 cells/ml.

c. For Daphnia, *Ceriodaphina Dubai,* 60$^o/_o$ or more of the control females must have three brood within an 8 day time period and 80$^o/_o$ or greater survival of all control organisms. Each surviving control female must produce an average of 15 or more babies. Test organisms must be less than 24 hours old and hatched within an 8 hours period.

d. For, Fathead Minnow, *Pimephales Promelas,* at the end of 7 days the control must have 80°/₀ or greater survival. Each survivor must have a dry weight or 0.250 mg or greater. Test organisms must be newly hatched larvae less than 24 hours old. If shipped not more than 48 hours old.

3. Data Evaluation:

   a. Review test conditions such as temperatures, chamber size, lighting and the number of replicates noting any deviations and/or anomalies from standard test method.

   b. Minimum test acceptability as outline in the above table and on EPA-821-R-02-013, "Short Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms." Test results are invalidated if the minimum criteria are not met.

   c. Analytical data is compared against the reference toxicant. Toxicant effect relative to concentration should closely follow a sigmoidal concentration-response curve. Anomalies or invalid results when compared to the reference toxicant can be ruled as such provided the reference toxicant is not errant.

   d. Documentation of organism culture health and performance is used either to identify or eliminate poor culture health as a cause for marginal test performance in a test. Control chart can be used in determining deviations from nominal response culture health. Consideration is to be given to factors other than health that could result in control test anomalies. Ensure that all method criteria and parameters are met and note any deviations.

   e. Test variability is measured as minimum significant differences (MSD) and percent minimum significant difference (PMSD). Detailed explanations of both are included in the Standard Operation Procedures (SOP). MSD or PMSD data gives the laboratory the ability to assess individual test variability in the context of typical variability within the laboratory.

   f. Evaluate the organism's response to the effluent concentration. If a given effluent or toxicant concentration produces a specific, unexpected concentration-response relationship, there might be a physical, chemical or biological cause.

4. Validation of Data

   a. Concentration-response relationship or dose-response relationship is the measures the effects a certain amount of toxicant or effluent effects the growth, reproduction, survival or the lack of it, which is animportant factor when evaluating the validity of test data. Every toxicant should exhibit concentration –response relationship. Classic concentration-response curves are general sigmoidal. However, various factors might produce a non-sigmoidal curve.

   b. There are ten common concentration-response patterns that can help interrupting and assessing the validity of data.

i. Ideal Concentration-Response Relationship
ii. All or Nothing Response
iii. Stimulatory response at low concentrations and detrimental effects at higher concentrations.
iv. Stimulation at low concentrations but no significant effects at higher concentrations.
v. Interrupted concentration-response: significant effect bracketed by non-significant effects.
vi. Interrupted concentration-response: non-significant effects bracketed by significant effects.
vii. Significant effects only at highest concentration.
viii. Significant effects at all test concentration-response curve.
ix. Pathogen effect
x. Inverse concentration-response relationship

c. All concentration-response relationships are discussed in detail in the SOPs.

5. Reporting of Data

a. Use ToxCalc, plot data points into Shaprio-Wilk and Barlett Test to determine toxicity units for algae test.
b. Effluent test results are acceptable and reportable if the above test criteria are met.
c. Include in the report NOEC, LOEC and the LC50 (if appropriate), bench worksheet and computer printouts and chemical analysis.

I. Bacteriological Analysis

1. Drinking water samples are analyzed using Colilert and recreational water by Idexx Quanti Tray method.

2. The Laboratory is equipped to perform Multiple Tube Fermentation (MTF) for total coliform, fecal coliform and fecal streptococci; membrane filter tests for total and fecal coliform analyses. Heterotrophic plate count (HPC) is performed monthly on water samples.

3. Quality assurance is for MTF, Colilert, and idexx methods consist of analyses of a blank, positive and negative control using the appropriate bacteria strand. Each new batch of MTF media and bacti supplies is tested before use. Controls are analyzed with each colilert an idexx tests. Quality assurance is also performed on all sample containers, pipets, sticks and dilution water.

4. Total coliform testing is performed following the procedures of Section 9221B of "Standard Methods for the Examination of Water and Wastewater," 18th – 20th Edition. All Samples are carried through the Brilliant Green Bile confirmation step.

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

6. Fecal Coliform testing is performed following the procedures of Section 9221E of "Standard Methods for the Examination of Water and Wastewater," 18th - 20th Edition.

7. Fecal streptococcus testing is routinely performed following the procedures of Section 9230B of "Standard Methods for the Examination of Water and Wastewater," 18th – 20th Edition.

8. 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 – 20th 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).

9. 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.

10. 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.

11. 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.

J. Quality Assurance Report

1. Laboratory Certification:

   a. To retain it's State Certification, Environmental Laboratory Accreditation Program (ELAP) required the laboratory to do performance Evaluation (PE) annual analysis. The laboratory performs PE for Water, Wastewater, Bioassay and Solid Waste Constituents.

   b. Unknowns and quality assurance (QA) samples are obtained from NSI Solution, Inc and Environmental Resource Association (ERA). Unknowns and (QA) samples are analyzed according to the methods and procedures used in the laboratory.

c. Results are sent to the various agencies for evaluation. Results are deemed "acceptable " if the value is within the limits set by the agency and "unacceptable" if they do not.

d. Troubleshooting is performed on all "unacceptable" results to determine the reason or reasons for the failure. A second unknown and QA samples are obtained from the appropriate agency for all "unacceptable" results.

e. Corrective action documentation is sent to:
Discharge Monitoring Report – William Ray, State Water Resource Control Division – Water Quality
PE Water, Wastewater and Solid Waste – Fred Choske, California Department of Health Services – ELAP

2. Annual or biannual audit of the chemistry, bacteriological and bioassay sections of the laboratory is perform by staff members from ELAP for all fields of test (FOT) the laboratory is certified to analyze. During the audit technicians are questioned on the methods and procedures. Control charts, bench worksheets, chromatography prints, PE results, chemical preparation records including labeling procedures, water suitability and inhibitory results and instrumentation logs are among the things checked.

3. All Standard Operation Procedures (SOPs) have been updated to reflect changes made in test methods and procedures.

4. Staff personnel remained unchanged.

Revised 01/19/2012

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 19th day of March 2012 at Ventura, CA.

Daniel Pfeifer
Wastewater Utility Manager

Florence B. Jay
Laboratory Supervisor