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METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Office of the General Manager

(205)

May 14, 2001

Ms. Teresa Newkirk California Regional Water Quality Control Board Colorado River Basin Region 73-720 Fred Waring Drive, Suite 100 Palm Desert, CA 92260

Dear Ms. Newkirk:

Response to Public Solicitation of Water Quality Information

In response to the February 28, 2001 public solicitation of water quality information issued by the California Regional Water Quality Control Board, Colorado River Basin Region (Regional Board), Metropolitan submits the enclosed data it has generated on water quality conditions in surface waters within the Colorado River Basin Region of California since July 1997. Pursuant to the Regional Board's request, an electronic file and paper copies are enclosed for each of the following data sets:

- Lake Havasu radiological data (near Whitsett Intake Pumping Plant on the lake);
- Lake Havasu general mineral data (near Whitsett Intake on the lake);
- Lake Havasu trace metals (near Whitsett Intake on the lake);
- Lake Havasu perchlorate data (various sample point locations);
- Lake Havasu coliform results (monthly averages at influent to the Whitsett Intake);
- Pathogen monitoring data (at influent to the Whitsett Intake);
- Pesticide, herbicide, and semi-volatile organic compound data for various source waters and treated waters.

The majority of data was generated by Metropolitan at its Water Quality Laboratory (WQL), which is a certified laboratory under the California Department of Health Services' Environmental Laboratory Accreditation Program. Analyses for the radiologicals, pesticide, herbicide, and semi-volatile organic compounds were conducted by certified commercial laboratories. Metropolitan's WQL maintains a Quality Assurance Manual which details sample collection procedures, sample and data tracking systems, quality assurance protocols, and standard operating procedures for methods used in its laboratory. This document is available upon request.

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For questions on the enclosed data or for additional information, please contact:

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Very truly yours,

Stephen N. Arakawa

, Stephen aruh

Manager

Water Resources Management Group

JLS:bps

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Enclosures

SAMPLE	Gross alpha		Total U	Iranium	Gross	Beta	Radiun	1 226
MONTH	Result	error	Result	error	Result	error	Result	error
Jul-97	6.29	2.02					***	
Aug-97	2.3	1.0			· 1			
Sep-97	2.5	0.5				•	-	***************************************
Oct-97	3.90	0.6						
Nov-97	5.32	1.9			i .			
Dec-97	7.37	2.31						***************************************
Jan-98	5.47	1.96						
Feb-98	· 6.81	2.15				***************************************		
Mar-98	5.84	2.0	•			***************************************		***************************************
Apr-98	6.07	2.09						***************************************
May-98	4.9	1.9					•	······································
Jun-98	4.2	2.1						
Jul-98	7.41	2.19						
Aug-98	6.0	1.7	3	0.9	4.7	1.3	. 0	0.19
Sep-98	4.65	1.95	3.2	0.87	İ		***************************************	······································
Oct-98	6.70	2.2	3.13	0.88	4.86	3.29	0.65	0.23
Nov-98	6.90	2.5	2.65	0.81			····	***************************************
Dec-98	1.97	1.9	3.54	0.91		••••••••••••••••••••••••••••••••••••••	·····	······································
Jan-99	5.31	2.1	3.13	0.84	6.24	3.27	0.19	0.11
Feb-99	4.00	2.2	3.18	0.88	-	·····		······································
Mar-99	4.50	2.3	3.76	0.94		***************************************	***************************************	***************************************
Apr-99	6.08	1.91	2.26	0.79	4.23	3.37	0.55	0.25
May-99	4.6	1.5	3.6	0.9				······································
Jun-99	4.8	1.5	2.68	0.79		-		
Jul-99	1.10	1.15	3.53	0.86				***************************************
Aug-99	2.3	1.3	3.68	1.08	<u> </u>		······	······································
Sep-99	3.59	1.40	3	0.91	l	·····	<u>-</u>	***************************************
Oct-99	3.67	1.40	3.36	0.94				***************************************
Nov-99	4.67	1.41	2.87	0.84				······································
Dec-99	6.10	2.10	3.27	0.88		· · · · · · · · · · · · · · · · · · ·	-	,
Jan-00	4.52	1.45	4.02	1.08				·····
Feb-00	3.51	1.34	4.83	1.17		·····		***************************************
Mar-00	4.27	1.46	3.92	1.08		····		
Арг-00	2.93	1.34	2.96	0.96	 		······································	***************************************
May-00	6.34	1.76	4.33	1.09				***************************************
Jun-00	3.87	1.33	3.5	1.13		·····		
Jul-00	3.89	1.47	4.57	1.14		····		
Aug-00	4.22	1.49	2.42	0.86				······································
Sep-00	. 2.7	1.22	3.4	0.99	1	<u></u>		
Oct-00	4.14	1.42	4.32	1.1				<u> </u>
Nov-00	5.31	1.59	3.29	1.01	<u> </u>			•
Dec-00	3.57	1.42	3.64	1.05	†	ĺ		······································
Jan-01	4.32	0.9	3.62	1	1		······	······································
Feb-01	3.72	0.94	3.02	0.6	 			***************************************

Sep-98	SAMPLE	Radiu	m 228	Strontium 90		Triti	ium	Radon 222		
Aug-97 Sep-97 Cd-97 Sep-97 Cd-97 Sep-97 Cd-97 Sep-98 Sep-98	MONTH	Result	error	Result	error	Result	error	Result	error	
Sep-97	⊶Jul-97∷									
Oct-97 Nov-97 Dec-97 Nov-97 Dec-97 Nov-97 Dec-97 Nov-97 Dec-97 Nov-98 Nov-99 N	Aug-97			-			······································	·	······································	
Nov-97 Dec-97 Jan-98 Jan-98 Mar-98 Apr-96 May-98 Jul-98 Jul-98 Apr-98 Apr-98 Apr-98 Apr-98 Apr-98 Apr-98 Apr-99 Apr-99 Apr-99 Apr-99 Apr-99 Bec-99 Jun-99 Bec-99 Jan-99 Apr-99 Apr-99 Apr-99 Apr-99 Apr-99 Apr-99 Bec-99 Apr-99 Apr-99 Bec-99 Apr-99 Apr-90 Ap	Sep-97					•				
Dec-97 Jan-98 Feb-88 Mar-98 Jun-98 Jun-99 J	- Oct-97							***************************************		
Jan-98 Jan	Nov-97						······································			
Feb-98 Mar-98 Mar-98 Mar-98 Mar-98 Mar-98 Mar-98 Mar-98 May-98 May-98 May-98 May-98 May-98 May-98 May-99 Mar-99 Mar-99 Mar-99 May-99 May-99 May-99 May-99 Mar-99 May-99 Mar-99 Mar-90 Mar	Dec-97		<u> </u>	••••					······	
Mar-98	Jan-98					-		-		
Apri-98							·		·	
May-98 Jul-98			-							
Jul-98 Jul-98 Jul-98 O 0.39 1.14 0.19 40.9 150 51 Sep-98 O O.23 1.95 0.73 50.5 110 18 Nov-98 Dec-98 O O.39										
Jul-98								-		
Aug-98 0 0.39 1.14 0.19 40.9 150 51 Sep-98 0.00-98 1.05 0.23 1.95 0.73 50.5 110 18 Nov-98 0.00-98 0.00 1 0.88 0.35 66.6 110 58 Feb-99 0.00-		-		***************************************						
Sep-98										
Sep-98		0		1.14	0.19	40.9	. 150	51	14	
Nov-98. Dec-98 Jan-99 1.09 1 0.88 0.35 66.6 110 58 Feb-99 Mar-99 Mar-99 1.64 0.4 1.26 0.4 36.7 170 51 May-99 Jun-99 Jun-99 Oct-99 Nov-99 Jan-00 Feb-00 Jun-00 Jun-00 Jun-00 Jun-00 Jun-00 Sep-00 Sep-00 Dec-00 Dec-00 Jan-01										
Dec-98		1.05	0.23	1.95	0.73	50.5	110	18	5	
Jan-98										
Feb-99 Mar-99 Mar-90 M	X-2-2-									
Mar-99		1.09	1	0.88	0.35	66.6	110	58	14	
Apr-99	375 - 386				***************************************	•				
May-99 Juli-99 Aug-99 Sep-99 Oct-90 May-00 Juli-00 Juli-00 Aug-00 Sep-00 Oct-00 Nov:00 Dec:00 Jan-01	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7									
Jul-99		1.64	0.4	1.26	0.4	36.7	170	51	12	
Jul-99				······································	······					
Aug-99 Sep-99 S	 		***************************************				*************	annak alppoolen (de Ste Sank) diponenenci del di lessocci del di cystalogi		
Sep-99	ネシーショ 中午・シャングラ				·					
Oct-99 Nov-99 Dec-99 Jan-00 Feb-00 Mai-00 May-00 Jun-00 Jul-00 Jul-00 Sep-00 Oct-00 Nov-00 Dec-00 Jan-01			-		•			······································		
Nov-99			,					-		
Dec-99								***************************************		
Jan-00 Feb-00 Mair-00 May-00 Jun-00 Jun-00 Jul-00 Sep-00 Oct-00 Nov-00 Jan-01		***************************************							·····	
Feb-00								······································		
Mai-00 May-00 May	7.5						***************************************			
Apr-00 May-00 Jun-00 Jun-00 Aug-00 Sep-00 Nov-00 Dec-00 Jan-01				***************************************	***************************************	-	******************************			
May-00	2 2 1 1 V V V V V V V V V V V V V V V V									
Jul-00				······································			***************************************		·····	
Jul-00		······································								
Aug-00 Sep-00 Sep		***************************************		-				***************************************		
Sep-00			·							
Oct-00										
Nov-90		······································						· · · · · · · · · · · · · · · · · · ·		
./ Dec-00	31.5			·	ear glinne jobyne nannjaeakk, rawajaliku reniowenia	***************************************	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
Jan-01										
	······································									
				······································		***************************************		······		
Feb-01	Feb-01								-	

SAMPLE	Gross alpha		Total Uranium		Gross	Beta	Radiur	n 226
MONTH	Result	error	Result	error	Result	error	Result	error
Jul-97	. 6.29	2:02						
Aug-97	2.3	1.0					,	
Sep-97	2.5	0.5				-		
Oct-97	3.90	0.6	-	,				
Nov-97	5.32	· 1.9						
Dec-97	7.37	2.31					•	
Jan-98	5.47	1.96						
Feb-98	6.81	2.15				•••••••••••••••••••••••••••••••••••••••		` '
Mar-98	5.84	2.0						
Apr-98	6.07	2.09				·	·	
May-98	4.9	1.9				-	1	•
Jun-98.	4.2	2.1	·					
Jul-98	7.41	2.19						
Aug-98	6.0	1.7	3	0.9	4.7	1.3	· O	0.19
Sep-98	4.65	1.95	3.2	0.87	-			
Oct-98	6.70	2.2	3.13	0.88	4.86	3.29	0.65	0.23
Nov-98	6.90	2.5	2.65	- 0.81				
Dec-98	1.97	1.9	3.54	0.91				
Jan-99	5.31	2.1	3.13	0.84	6.24	3.27	0.19	0.11
Feb-99	4.00	2.2	3.18	0.88				**************************************
Mar-99	4.50	2.3	3.76	0.94		-		
Apr-99	6.08	1.91	2.26	0.79	4.23	3.37	0.55	0.25
May-99	4.6	1.5	3.6	0.9				······
Jun-99	4.8	1.5	2.68	0.79		······································		
Jul-99	1.10	1.15	3.53	0.86				
Aug-99	2.3	1.3	3.68	1.08				
Sep-99	3.59	1.40	3	0.91				
Oct-99	3.67	1.40	3.36	0.94				····
Nov-99	4.67	1.41	2.87	0.84			····	······
Dec-99	6.10	2.10	3.27	0.88	-			
Jan-00	4.52	1.45	4.02	1.08		<u> </u>		······································
Feb-00	3.51	1.34	4.83	1.17				
Mar-00	4.27	1.46	3.92	1.08				
Apr-00	2.93	1.34	2.96	0.96	-			······
May-00	6.34	1.76	4.33	1.09	<u> </u>	 	······································	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Jun-00	3.87	1.33	3.5	1.13	<u> </u>		**************************************	
Jul-00	3.89	1.47	4.57	1.14	1			
Aug-00	4.22	1.49	2.42	0.86	<u> </u>	 	······································	
Sep-00	2.7	1.22	3.4	0.99	!			
Oct-00	4.14	1.42	4.32	1.1	!	<u> </u>	1900-1919-1919-1919-1919-1919-1919-1919	
Nov-00 Dec-00	5.31	1.59	3.29	1.01	-	!		
	3.57	1.42	3.64	1.05	<u> </u>		······································	
Jan-01	4.32	0.9	3.62	1	<u> </u>			
Feb-01	3.72	0.94	3.02	0.6	<u> </u>	1		

SAMPLE	Radiun	n 228	Strontium 90		Triti	ium ·	Radon 222		
MONTH	Result	error	Result	error	Result	error	Result	error	
Jul-97					_				
Aug-97					,			*******************************	
Sep-97	i	<u>i</u>			······	······································			
Oct-97	·		•						
Nov-97	1			***************************************	***************************************	· ·			
Dec-97					***************************************			`	
Jan-98								······································	
Feb-98		·····	•						
Mar-98				***************************************				***************************************	
« Apr-98									
May-98								•	
Jun-98		··							
Jul-98		•			***************************************	**************************************	**************************************	***************************************	
Aug-98	0	0.39	1.14	0.19	40.9	· 150	51	14	
Sep-98		***************************************						······································	
Oct-98	1.05	0.23	1.95	0.73	50.5	110	18	5	
Nov-98								***************************************	
Dec-98				-				······································	
Jan-99	1.09	1	0.88	0.35	66.6	. 110	58	14	
Feb-99	·····	~~~~	***************************************		***************************************			•••••••••••	
Mar-99						XXXXX444444444444444444444444444444444		4,000,000,000,000,000,000,000,000,000,0	
Apr-99	1.64	0.4	1.26	0.4	36.7	170	51	12	
May-99							` ` .		
Jun-99								······································	
Jul-99		***************************************			***************************************	·····			
Aug-99	l						•		
Sep-99		· · · · · · · · · · · · · · · · · · ·			······································				
Oct-99	· · · · · · · · · · · · · · · · · · ·				······································			***************************************	
Nov-99				***************************************				,	
Dec-99	•	i			·	-		······································	
Jan-00		·	***************************************						
Feb-00		· ·			······································		***************************************	······································	
Mar-00			-		***************************************	**************************************	444	apjourade east operate addings assessment over controller of	
Apr-00	ì	······································	·		-			······································	
May-00			······································	***************************************	***************************************		***************************************	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Jun-00	į	***************************************							
Jul-00		***************************************	_		***************************************			·	
Aug-00	·				•	······································			
Sep-00			•		······		······································	······································	
Oct-00	-								
Nov-00			***************************************		***************************************	, , , , , , , , , , , , , , , , , , , 	***************************************	***************************************	
Dec-00			······································		••••••••••••		······································	······································	
Jan-01.	·····			······································	······································				
Feb-01					······································	***************************************		······································	

Date	L. Havasu	L. Havasu	L. Havasu	L. Havasu	L. Havasu	L. Havasu	L. Havasu
	Boron	Bromide	Calcium	Chloride	CO2 .	Carbonate	Color
	ppm	ppm	ppm	ppm	ppm	ppm	·
7/7/1997		0.09	76 ·	85	1.5	0	-
8/5/1997		0.10	73	82	1.0	-1	
9/2/1997	0.11	0.08	71	81 ⁻	1.0	2.	
10/7/1997		0.07	73	80	1.2	1	
11/4/1997		0.07	74	82	1.5	, 0	. 5
12/1/1997	0.12	0.06	7 .5	82	1.4	, 0	
1/6/1998		0.07	75	82	1.7	0	,
2/3/1998		0.07	75	77	1.8	. 0 .	4
3/2/1998	0.09	0.08	73	75	1.7	0 .	
4/7/1998		0.07	74	74	1.3	0	
5/5/1998		0.06	75	75	1.3	0	2
6/2/1998	0.11	0.07	74	73	1.9	0	• .
7/7/1998		0.06	. 71	73	1.6	0	
8/11/1998		0.08	· 70	75	0.8	4	7
9/1/1998	0.11	0.07	70	- 72	1.4	0	-
10/13/1998		0.08	72	78	1.5	. 0	
11/3/1998		0.07	70	73	1.3	0	6
12/1/1998	0.11	0.07	- 69	71	1.5	0	
1/12/1999		0.07	73	71	1.2	1	
2/2/1999		0.07	72	70	1.4	0	5
3/2/1999	0.13	0.06	73	72	1.4	0	
4/6/1999	•	0.07	73	72	1.5	0	
5/4/1999		0.07	72	69	1.4	0 ·	5
6/2/1999	0.13	0.07	72	67	1.6	0	
7/20/1999		0.06	73	68	1.8	. 0	
8/3/1999		0.06	72	69	0.9	2	5
9/8/1999	0.08	0.07	71	67	2.0	. 0	
10/5/1999		0.07	72	68	1.6	0	
11/2/1999		0.07	70	70	1.4	. 0	-2
12/7/1999	0.08	0.07	73	68	1.4	0	·
1/4/2000		0.07	72	69	1.8	. 0	
1/31/2000		0.06	74	67	1.2	1	3
3/13/2000	0.09	0.06	72	69	1.5	0	-
4/3/2000		0.06	73	66	1.3	1	
5/2/2000		0.06	72	66	1.5	0	4
6/6/2000	0.10	0.06	71	65	. 1.7	0	
7/5/2000		0.05	69	65	1.7	Ό.	•
8/1/2000		0.06	69	66	1.7	0	6
9/11/2000	0.08	0.05	68	65	1.8	0	
10/3/2000		0.06	68	65	1.3	0	
11/8/2000		0.07	70	. 68	1.3	. 0	10
12/5/2000	0.12	0.07	. 70	. 68	. 1.2	1	
1/10/2001		0.06	· 73	69	1.1	1	
2/6/2001		0.07	71	68	1.1	1	· 6
Min	0.08	0.05	. 68	65	0.8	0	2
Max	0.13	0.10	76	85	2.0	4	10
Avg	0.10	0.07	72	72	1.4	0	5

Date	L. Havasu Conductivity	L. Havasu Fluoride	L. Havasu Bicarbonate	L. Havasu Potassium	L. Havasu Magnesium	L. Havasu Sodium	L. Havasu [*] Nitrate
	umho/cm	ppm	ppm	ppm	ppm	ppm	ppm ⁻
7/7/1997	956	0.26	163	4.2	27	· 87	0.5
8/5/1997	993	0.28	. 161	4.4	27.5	89	0.5
9/2/1997	978	0.29	153	4.3	27.5	93	0.5
10/7/1997	958	0.30	156	4.3	27.5	- 92	0.6
11/4/1997	972	0.33	159	4.3	27 -	89	0.8
12/1/1997	952	0.33	163	4.4	26.5	. 89	8.0
1/6/1998	970	0.34	168	4.3	27	88	0.9
2/3/1998	948	0.35	163	3.9	26.5	85	1.1
3/2/1998	917	0.31	161	4.0	26.5	84	1.1
4/7/1998	917	0.25	161	4.0	25.5	82	1.0
5/5/1998	910	0.33	162	4.1	25	81	1.0
6/2/1998	930	0.30	161	4.1	25	81	Ó.9 ·
7/7/1998	928	0.29	162	3.9	25.5	· 84	0.9
8/11/1998	923 -	0.29	148	4.0	27.5	85	0.5
9/1/1998	918	0.32	159	3.9	26	82	0.6
10/13/1998		0.29	160	3.9	26.5	82	0.8
11/3/1998	933	0.31	160	3.9	26	85	0.7
12/1/1998	922	0.31	- 160	4.0	27.5	87	0.8
1/12/1999	916	0.29	161	3.9	26	82	1.2
2/2/1999.	922	0.30	163	3.9	26	81	1.2
3/2/1999	917	0.32	162	4.0	26	81	1.2
4/6/1999	914	0.27	161	4.0	26	83	1.2
5/4/1999	901	0.28	161	4.1	25.5	79	1.0
6/2/1999	898	0.28	159	4.0	25.5	81	1.0
7/20/1999	895	0.29	156	3.9	25.5 25	79	1.0
8/3/1999	904	0.29	155	4.0	25.5	80	0.6
9/8/1999	892	0.28	155	3.9	25.5	79	0.8
10/5/1999	880	0.31	156	4.0	25 25	79	0.8
11/2/1999	901	0.27	155	4.1	25.5	79	0.9
12/7/1999	898	0.30	160 .	4.0	25.5	. 79	1.0
1/4/2000	881	0.28	160 .	3.8	25.5	79	1.1
1/31/2000	916	0.31	159	3.8	24.5	78	1.2
3/13/2000	911	0.32	160	3.9	26	82	1.3
4/3/2000	896	0.29	160	4.0	25.5	75	1.1
5/2/2000	885	0.31	161	4.1	25.5	, 74	1.1
6/6/2000	890	0.27	162	4.1	26	77	1.1
7/5/2000	898	0.28	162	4.0	25.5	74	1.0
8/1/2000	895	0.29	162	4.0	25.5	7 -1 75	1.0
9/11/2000		0.28	160	4.1	25.5	75 76	0.7
10/3/2000		0.28	153	4.0	26.5	75	0.7
11/8/2000	894	0.28	161	4.0	26.5	73 78	0.7
12/5/2000	i i	0.28	160	3.9	26 26	78	0.6
1/10/2001	917	0.29	160	4.0	26.5	76	0.8
2/6/2001	910	0.28	161	4.1	26	77	1.1
Min	880	0.25	148	3.8	24.5	74	0.5
Max	993	0.35	168	4.4	27.5	93	1.3
Avg	917	0.30	160	4.0	26.5	- 81	0.9

Date	L. Havasu pH	L. Havasu Silica	L. Havasu Sulfate	L. Havasu Alkalinity	L. Havasu TDS	L. Havasu Temp	L. Havasu Hardness
	-	ppm	ppm	ppm as CaCO3	ppm	, C	ppm as CaCO3
7/7/1997	. 8.27	8.8	250	134	620	26	301
8/5/1997	8.44	9.9	247	134	616	29	296
9/2/1997	8.43	9.7	245	129	611	27	291
10/7/1997	8.36	9.3	242	130	608	25	. 296
11/4/1997	8.25	9.2	249	130	615	18	296
12/1/1997	8.29	·9.0	243	134	612	16	296
1/6/1998	8.21	9.6	247	138	618	11	298
2/3/1998	8.18	9.6	236	134	596	13	296
3/2/1998	8.19	9.5	229	132	582	14	291
4/7/1998	8.31	9.1	228	132	578	15	290
5/5/1998	8.33	9.5	232	133	584	20	290
6/2/1998	8.14	9.3	229	132	577	20	288
7/7/1998	8.24	9.3	229	133	578	23	282
8/11/1998	8.51	9.3	236	127	585	28	288
9/1/1998	8.27	8.6	230	130	573	25	282
10/13/1998	8.24	8.9	229	.131	582	20	289
11/3/1998	8.30	· 8.9	230	. 131	578	19	282
12/1/1998	8.24	8.5	- 226	131	574	· 15	286
1/12/1999	8.36	9.0	230	134	578	10	289
2/2/1999	8.30	8.6	230	134	575	10	287
3/2/1999	8.30	8.6	231	133	578	13	289
4/6/1999	8.25	8.4	234	132	582	16	289
5/4/1999	8.29	8.8	225	132	565	18	285
6/2/1999	8.23	8.3	223	. 130	561	20	285
7/20/1999	8.15	9.2	222	128	560	23	285
8/3/1999	8.47	8.4	226	131	566	28	285
9/8/1999	8.11	9.0	220	127	554	24	280
10/5/1999	8.21	9.0	223	128	559	23	283
11/2/1999	8.25	8.9	227	127	563	· 19	280
12/7/1999	. 8.29	9.0	224	131	563	13	287
1/4/2000	8.16	9.0	224	131	564	11	285
1/31/2000	8.36	. 8.7	221	132	559	- 12	286
3/13/2000	8.25	8.8	228	131	572	. 15	287
4/3/2000	8.33	8.0	218	133	553	16 -	287
5/2/2000	8.24	8.1	217	132	549	20	285
6/6/2000	8.19	8.8	214	133	548	22	284
7/5/2000	8.21	8.8	213	133	541	23	277
8/1/2000	8.19	9.0	214	133	545	24	277 ·
9/11/2000	8.18	8.7	213	131	542	23	277
10/3/2000	8.28	8.9	214	125	539	21	279
11/8/2000	8.30	9.0	220	132	556	18	282
12/5/2000	8.35	8.8	220	133	557	13	282
1/10/2001	8.39	9.5	223	133	563	11	291
2/6/2001	8.41	8.9	222	134	560	15	284
,	1					• .	
Min	8.11	8.0	213	125	539	. 10	277
Max	8.51	9.9	250	138	620	29	301
Avg	8.28	9.0	228	132	574	19	287
	1		- -	· 			

		;
Date	L. Havasu	L. Havasu
	TOC	Turbidity
	ppm	NTU
7/7/1997	2.69	. 1.4
8/5/1997	2.79	- 0.66
9/2/1997	3.00	0.75
10/7/1997	2.78	0.61
11/4/1997	2.64	2.2
12/1/1997	2.70	2.3
1/6/1998	2.64	1.2
2/3/1998	2.58	1.3
3/2/1998	2.70	1.6
4/7/1998	2.74	1.5
5/5/1998	2.75	0.57 *
6/2/1998	2.88	1.6
7/7/1998	2.84	1.3
8/11/1998	2.98	0.81
9/1/1998	2.96	1
10/13/1998	3.01	1.7
11/3/1998	2.84	1.5
12/1/1998	2.82	1.5
1/12/1999	2.72	1.8
2/2/1999	2.73	1.2
3/2/1999	2.83	0.99
4/6/1999	2.86	1.9
5/4/1999	2.89	1.2
6/2/1999	2.83	1.2
7/20/1999	2.93	1.4
8/3/1999	2.87	0.76
9/8/1999	2.92	1.7
10/5/1999	2.93	2.6
11/2/1999	2.84	1.5
12/7/1999	2.74	0.91
1/4/2000	. 2.74	1.31
1/31/2000	2.67	0.9
3/13/2000	2.60	1.4
4/3/2000	2:69	1.8
5/2/2000	2.99	1.1
6/6/2000	2.92	1.3
7/5/2000	3.03	1.2
8/1/2000	2.85	1.6
9/11/2000	2.85	1.7
10/3/2000	2.87	1.9
11/8/2000	3.00	2.9
12/5/2000	2.98	2.3
1/10/2001	3.03	2 .
2/6/2001	2.95	1.5
Min	2.58	0.57
Max	3.03	2.9
Avg	2.83	1.4

Date	L. Havasu Boron	L. Havasu Bromide	L. Havasu Calcium	L. Havasu Chloride	L. Havasu CO2	L. Havasu Carbonate	L. Havasu Color
	ppm	ppm	ppm	ppm	ppm	ppm	
7/7/1997		0.09	76	85 .	1.5	0	
8/5/1997		0.10	73	82	. 1.0	1	
9/2/1997	0.11	0.08	71	· 81	1.0	2	
10/7/1997		0.07	73	80	1.2	1	
11/4/1997		0.07	74	82	1.5	0	5
12/1/1997	0.12	0.06	75	82	1.4	0	
1/6/1998		0.07	75	82	1.7	0 ′	
2/3/1998		0.07	75	77	1.8	. 0	4 .
3/2/1998	0.09	0.08	73	· 75	1.7	0	
4/7/1998		0.07	74	74	1.3	0	
5/5/1998		0.06	75	75	1.3	0	2
6/2/1998	0.11	0.07	74	73	1.9	0	
7/7/1998		0.06	71	73	1.6	0	
8/11/1998		0.08	70	75	0.8	. 4	. 7
9/1/1998	0.11	0.07	70	72	1.4	0	
10/13/1998		0.08	72	78	1.5	0	
11/3/1998		0.07	.70	73	1.3	0	6
12/1/1998	0.11	0.07	~ 69	71	1.5	0	,
1/12/1999	-	0.07	73	71	1.2	1	
2/2/1999		0.07	72	70	1.4	0	5
3/2/1999	0.13	0.06	73	72	1.4	0	_
4/6/1999		0.07	73	72	1.5	0	
5/4/1999		0.07	72	69	1.4	0	- 5
6/2/1999	0.13	0.07	72	67	1.6	0	
7/20/1999		0.06	73	68	1.8	0	•
8/3/1999		0.06	72	69	0.9	. 2	5
9/8/1999	0.08	0.07	71	67	2.0	0	
10/5/1999		0.07	72	68	1.6	0	
11/2/1999		0.07	70	70	1.6	0	2
12/7/1999	0.08	0.07	70 73	· 68	1.4	. 0	2
1/4/2000	0.00	0.07	73 . 72	69	1.8	0	
1/31/2000	ļ	0.06	74	67	1.2	. 1	. 3
3/13/2000	0.09	0.06	72	69	1.5	0	_ 0 -
4/3/2000	, ,	0.06	73	66	1.3	. 1	•
5/2/2000	,	0.06	73 72	66	1.5	0	4
6/6/2000	· 0.10	0.06	71	65	1.7	0	•
7/5/2000		0.05	69	65	1.7	. 0	
8/1/2000		0.06	69	66	1.7	. 0	. 6
9/11/2000	0.08	0.05	68	65	1.8	, 0	. •
10/3/2000		. 0.06	68	65	1.3	0.	
11/8/2000		0.07	. 70	68 68	1.3	0.	. 10
12/5/2000	0.12	0.07	70	68	1.2	1	. ,3
1/10/2001	2	0.06	70 · · · · · · · · · · · · · · · · · · ·	. 69	1.1	. 1	
			-				Č.
2/6/2001	1	0.07	71	. 68	1.1	1	. 6
Min	0.08	0.05	68	65	0.8	0	2
Max	-0.13	0.10	76	85	2.0	4	10
Avg	0.10	0.07	72	72	1.4	0	5

	⁻ Date	L. Havasu Conductivity	L. Havasu Fluoride	L. Havasu Bicarbonate	L. Havasu Potassium	L. Havasu Magnesium	L. Havasu Sodium	L. Havasu Nitrate
	-	umho/cm	ppm	ppm	ppm	ppm	ppm	ppm
-	7/7/1997	. 956	0.26	163	4.2	27	87	0.5
	8/5/1997	993	0.28	161	`4.4	27.5	. 89	0.5
	9/2/1997	978	0.29	153	4.3	27.5	93	0.5
	10/7/1997	958	. 0.30	156 ·	4.3	27.5	92	٥.6
	11/4/1997	972	0.33	159	4.3	27	89	0.8
	12/1/1997	952	0.33	163	4.4	26.5	89	0.8
	1/6/1998	970	0.34	168	4.3	27	88	0.9
-	2/3/1998	948	0.35	163	3.9	26.5	85	1.1
	3/2/1998	917	0.31	161	4.0	26.5	84	1.1
	4/7/1998	917	0.25	161	4.0	25.5	82	1.0
	5/5/1998	910	0.33	162	4.1	25	81	1.0
	6/2/1998	930	0.30	161	4.1	25	81	0.9
	7/7/1998	928	0.29	162	3.9	25.5	84	. 0.9
	8/11/1998	923	0.29	148	4.0	27.5	85	0.5
	9/1/1998	918	0.32	ຸ 159	3.9	26	82	0.6
•	10/13/1998	925	0.29	160	3.9	26.5	82	0.8
	11/3/1998	933	0.31	160	3.9	26	85	0.7
	12/1/1998	922	0.31	- 160	4.0	27.5	87	0.8
	1/12/1999	916	0.29	161	3.9	26	82	1.2
	2/2/1999	922	0.30	163	3.9	26	81	1.2
	3/2/1999	917	0.32	162	4.0	26	- 81	1.2
	4/6/1999	914	0.27	161	4.0	26	83	1.2
	5/4/1999	901	0.28	161	4.1	25.5	79	1.0
	6/2/1999	898	0.28	159	4.0	25.5	81	1.0
	7/20/1999	895	0.29	156	3.9	25	79	1.0
	8/3/1999	904	0.31	155	4.0	25.5	80	0.6
	9/8/1999	892	0.28	155	3.9	25	79	0.8
	10/5/1999	880	0.31	156	4.0	25	79	0.8
	11/2/1999	901	0.27	155	4.1	25.5	. 79	0.9
	12/7/1999	898	0.30	160	4.0	25.5	79	1.0
	1/4/2000	881	0.28	160	3.8	25.5	79	1.1
	1/31/2000	916	0.31	159	3.8	24.5	78	1.2
	3/13/2000	911	0.32	160	3.9	26	82	1.3
	4/3/2000	896	0.29	160	4.0	25.5	75	1.1
	5/2/2000	885	0.31	161	4.1	25.5	74	1.1
	6/6/2000	890	0.27	162	4.1	26	77	1.1
	7/5/2000	898	0.28	162	4.0	⁻ 25.5	· 74	1.0
	8/1/2000	895	0.29	162	4.0	25.5	75	1.0
	9/11/2000	. 893	0.28	160	4.1	26	76	0.7
	10/3/2000	· 883	0.28	153	4.0	26.5	75	0.7
٠	11/8/2000	894	0.28	. 161	4.1	26	78	0.6
	12/5/2000	903	0.29	160	3,9	26	78	0.6
	1/10/2001	917	0.29	160	4.0	26.5	76	0.8
	2/6/2001	910	0.28	161	4.1	26	77	1.1
	Min	. 880	0.25	148	3.8	24.5	74	0.5
	Max	993	0.35	168	4.4	27.5	93	1.3
	Avg	917	0.30	160	4.0	26.5	81	0.9

Date	L. Havasu	L. Havasu Silica	L. Havasu Sulfate	L. Havasu Alkalinity	L. Havasu TDS	L. Havasu Temp	L. Havasu Hardness
		ppm	ppm	ppm as CaCO3	ppm	· C	ppm as CaCO3
7/7/1997	8.27	8.8	250	134	620	26	301
8/5/1997	8.44	9.9	247	~ 134	616	29	296
9/2/1997	8.43	9.7	245	129	611	27	291
10/7/1997	8.36	9.3	242	130	608	25	296
11/4/1997	8.25	9.2	249	130	615	18	296
12/1/1997	8.29	9.0	243	134	612	16	296
1/6/1998	8.21	9.6	247	138	618	11	298
2/3/1998	8.18	9.6	236	134	596	13	296
3/2/1998	8.19	9.5	229	132	582	14	291
4/7/1998	8.31	9.1	228	132	578	15	290
5/5/1998	8.33	9.5	232	133	584	20	290
6/2/1998	8.14	9.3	229	132	577	20	288
7/7/1998	8.24	9.3	229	133	578	23	282
8/11/1998	8.51	9.3	236	127	585	28	288
9/1/1998	8.27	8.6	230	130	573	25	282
10/13/1998	8.24	8.9	229	131	582	20	289
. 11/3/1998	8.30	8.9	[^] 230	131 .	578	19 [°]	282
12/1/1998	8.24	8.5	226	131	574	.15	286
1/12/1999	8.36	9.0	230	134	578	10	· 289
2/2/1999	8.30	8.6	230	134	575	10 .	287
3/2/1999	8.30	8.6	. 231	133	578	13	289
4/6/1999	8.25	8.4	234	132	582	16	289
5/4/1999	8.29	8.8	225	132	565	18	285
6/2/1999	8.23	8.3	223	130	561	20	285
7/20/1999	8.15	9.2	222	128	560	23	285
8/3/1999	8.47	8.4.	226	131	566	28	285
9/8/1999	8.11	9.0	220	127	554 °	- 24	280
10/5/1999	8.21	9.0	223	128	559	23	283
11/2/1999	8.25	8.9	227	127	563	19	280
12/7/1999	8.29	9.0	224	131	563	13	287
1/4/2000	8.16	9.0	224	131	564	.11	285
1/31/2000	8.36	8.7	221	132	559	12	286
3/13/2000	8.25	8.8	228	131	572	15	287
4/3/2000	8:33	8.0	218	133	553	16	. 287
5/2/2000	8.24	8.1	217	132	549	20	285
6/6/2000	8.19	8.8	214	. 133	.548	22	284
7/5/2000	8.21	8.8	213	133	541	23 ,	277
8/1/2000	8.19	9.0	214	133	545	24	277
9/11/2000	8.18	8.7	213	131	542	23	277
10/3/2000	8.28	8.9	214	125	539	21	279
11/8/2000	8.30	9.0	220	132	556	18	282
12/5/2000	8.35	8.8	220	133	557	13	282
1/10/2001	8.39	9.5	223	133	563	11	291
2/6/2001	8.41	8.9	222	134	560	15	284
. Min	8.11	8.0	213	125	539	10	277
Max	8.51	9.9	250	138	620	29	301
Avg	8.28	9.0	228	132	574	19	287

	1	
Date	L. Havasu	L. Havasu
	TOC	Turbidity
	ppm	NTU
7/7/1997 ⁻ .	2.69	1.4
8/5/1997	2.79	0.66
9/2/1997	3.00	0.75
10/7/1997	2.78	0.61
11/4/1997	2.64	2.2
12/1/1997	2.70	2.3
1/6/1998	2.64	1.2
2/3/1998	2.58	1.3
3/2/1998	2.70	1.6
4/7/1998	2.74	1.5
5/5/1998	2.75	0.57
6/2/1998	2.88	1.6
7/7/1998	2.84	1.3
8/11/1998	2.98	0.81
9/1/1998	· 2.96	1
10/13/1998	3.01	1.7
11/3/1998	2.84	1.5
12/1/1998	2.82	1.5
1/12/1999	2.72	1.8
2/2/1999	2.73	1.2
3/2/1999	2.83	0.99
4/6/1999	2.86	1.9
5/4/1999	2.89	1.2
6/2/1999	2.83	1.2
7/20/1999	2.93	1.4
8/3/1999	2.87	0.76
9/8/1999	2.92	1.7
10/5/1999	2.93	2.6
11/2/1999	2.84	1.5
12/7/1999	2.74	0.91
1/4/2000	2.74	1.31
1/31/2000	2.67	0.9
3/13/2000	2.60	1.4
4/3/2000	2.69	1.8
5/2/2000	2.99	1.1
6/6/2000	2.92	1.3
7/5/2000	3.03	1.2
8/1/2000	2.85	1.6
9/11/2000	2.85	1.7
10/3/2000	2.87	1.9
11/8/2000	3.00	2.9
12/5/2000	2.98	2.3
1/10/2001	3.03	2.3
2/6/2001	2.95	1.5
21012001	1 2.50	
Min	2.58	0.57
Max	3.03	2.9
Avg	2.83	1.4

SAMPLEID	Reporting	L20688-12	L25397-15	L257O3-14	L26652-14	L26850-3	L26864-12	L27346-12	L27785-15	L28 5 26-13	L28736-13
SAMPLE DATE	Limit	21-Jul-97	18-Aug-97	29-Sep-97	27-Oct-97	4-Nov-97	18-Nov-97	16-Dec-97	27-Jan-98	23-Feb-98	30-Mar-98
Aluminum	5					48					
Antimony	2					ND	·	b		·	***************************************
Arsenic	0.5			***************************************		. 2.8					
Barium	5					.104					
Beryllium	0.1					ND	,				
Cadmium	0.1	ND	ND	ND	ND	. ND	ND	ND	ND	. N D	. ND
Chromium	1(2)*		. 1	~		2**			·		٠,
Copper	10	ND	ND	ND	ND .	ND	ND	ND	14	ND	ND
lron	50	······································				ND					
Lead	1			***************************************		ND .			·	,	
Lithium	10	CONSTRUCTION OF THE PROPERTY O		***************************************	~~~~	. 37					
Manganese	5				***************************************	. 6	· .			······································	
Mercury	0.2			***************************************		ND				***************************************	
Molybdenum	2 .	·		***************************************		5					
Nickel	2			***************************************	***************************************	ND					
Selenjum	5	***************************************		~~ <u>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</u>	***************************************	ND					
Silver	10	***************************************		~~~		ND .	,				
Strontium	20			, 	***************************************	1040				***************************************	
Thallium	1			**************************************	********************************	ND	***************************************		٠. ا	**************************************	·
Vanadjum ···	1			~						· 3	
Zinc	20					, ND		,			,

^{*} RDL for chromium was changed from 2 ug/L to 1 ug/L beginning September 2000 after analytical methodology was modified.

^{**} Suspected to be a result of positive interference by ICP-MS methodology.

						•					
SAMPLE ID	Reporting	L29337-1	L29353-13	L30032-12	L30623-13	L31066-13	L31585-13	L32084-12	L32643-1	L32662-12	L33145-14
SAMPLE DATE	Limit	7-Apr-98	27-Apr-98	26-May-98	22-Jun-98	27-Jul-98	24-Aug-98	28-Sep-98	13-Oct-98	28-Oct-98	23-Nov-98
Aluminum	5	20					,		11		
Antimony :	2	ND				-			ND		,
Arsenic	0.5	2.5			,				3		
Barium	5	102		,		·		•	94		
Beryllium	0.1	ND							′ NĎ		,
Cadmium	0.1	0.31	DM	ND	ND	ND	ND	ND	ND	ND	ND ·
Chromium	1(2)*	ND.		**************************************		***************************************			. ND		-
Copper	10	ND	ND.	ND	ND	ND	ND	ND	ND .	· ND	ND ·
in tron and a	50	ND	,				ì		ND		
Lead	1	ND		-		***************************************	`		ND	,	
Lithium	10	41			***************************************	***************************************		,	39		
Manganese	5	ND		,	***************************************			`	DИ		
Mercury	0.2	ND		·*·	***************************************	***************************************		****	ND		
Molybdenum	2	5		+2 44**** *******************************	~~~~~				5		
Nickel	2	2		·***	***************************************	***************************************		***************************************	2	· · · · · · · · · · · · · · · · · · ·	·
Selenium	. 5	ND			***************************************	***************************************		***************************************	ND		***************************************
Silver	10	ND		,-ca		******************************		a-Cirlationic emissionic coloris consequence coloris color	ND		*************************
Strontium	20 .	1000			***************************************	*******************************			912	******************************	***************************************
Thallium	1	ND							ND	•	·
Vanadium	1				<i>(</i>				·····	***************************************	***************************************
Zinc	20	ND			<u>.</u>				. ND	,	

^{*} RDL for chromium was changed from 2 ug/L to 1 ug/L beginning September 2000 after analytical methodology was modified.

^{**} Suspected to be a result of positive interference by ICP-MS methodology.

SAMPLE ID	Reporting	M614-34	M843-23	M13O4-1	M1317-12	M1977-1	M2471-12	M3074-12	M3558-1	M4143-12	M4826-1	M4839-12
SAMPLE DATE	Limit	22-Feb-99	22-Mar-99	6-Ap r -99	26-Apr-99	2-Jun-99	28-Jun-99	26-Jul-99	3-Aug-99	27-Sep-99	4-Oct-99	25-Oct-99
Aluminum	5 ·			51							13	
Antimony	2			ND							ND	
Arsenic	0.5			2.6							2.9	
Barium	5	'		97							88	
Beryllium	0.1			ND					**************************************		ND	
Cadmium	0.1	ND	· ND	ИĎ	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	1(2)*			ND				,			ND	
Copper	10	ND	ND	ND	ND	ND	- ND	ND	N D	ND	ND	ND
Iron	50			ND					***************************************		ND	
Lead	1			ND		***************************************		***************************************	·.		ND	
Eithiúm	10			38	*************************************	***************************************	,		***************************************		34	
Manganese	5			ND		June concessor and company the commence of the	······································		***************************************		ND	
Mercury	0.2	***************************************		ND	***************************************			***************************************			ND	
Molybdenum	2 .			5		~***					4	
Nickel	2			3		***************************************		***************************************			2	
Selenium	5			ND	***************************************		-		**************************************		ND	
Silver	10			ND							ND	
Strontium	20			962			·		**************************************	,	892	
Thallium	1	40000000000000000000000000000000000000		ND	<u> </u>				······		ND	
Vanadium	1			***************************************			······································					
Zinc	20			- ND	·						ND	

^{*} RDL for chromium was changed from 2 ug/L to 1 ug/L beginning September 2000 after analytical methodology was modified.

^{**} Suspected to be a result of positive interference by ICP-MS methodology.

**************************************	. 1	·		· · ·				·				T
SAMPLE ID	Reporting	M5436-1	. М6797-1	M7334-14	M8098-12	M8657-1	M9275-1	M11748-1	M12058-1	M12201-7	M12775-1	M12795-1
SAMPLE DATE	Limit	29-Nov-99	31-Jan-00	28-Feb-00	27-Mar-00	3-Apr-00	29-May-00	31-Jul-00	28-Aug-00	25-Sep-00	4-Oct-00	4-Oct-00
Aluminum 3	5.					19					16	
Antimony	2		******************************	***************************************		ND .			***************************************	*******************************	ЙD ·	
Arsenio	0.5		ł	***************************************		2.8			***************************************		3	
Barlum	5					94			***************************************		96	
Beryllium	0.1 ՝					ND					ND	
- Cadmium	. 0.1	ND,	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	1(2)*					ND					. ND	
Copper	. 10 ,	. ND	ND	ND	ND	ND	ND '	ND	ND	ND ·	ΝĎ	. ND
lron	50	• .				ND			•		· ND	
Lead	1					ND					ND	·
Lithium	10					32 .					. 40	
Manganèse	· · ·5					ИD			·		ND	
Mercury	0.2					ND			14		ND	
Molybdenum	2					5					. 5	
Nickel	2					ND			,		3	
Selenjum	5	, .				ND		·			ND	,
Silver	. 10					ND					ND	
Strontium	20		,	,		942					1000	,
Thallium	1					ND	·	·			· ND	
Vanadium	1			,				1	•	•	2	
Zinc	20	÷ ,	,			ND				٠	ND	

^{*} RDL for chromium was changed from 2 ug/L to 1 ug/L beginning September 2000 after analytical methodology was modified.

^{**} Suspected to be a result of positive interference by ICP-MS methodology.

SAMPLE ID	Reporting	M13436-12	M14206-7	M1 4750-1	M15224-8
SAMPLE DATE	Limit	27-Nov-00	19-Dec-00	10-Jan-01	6-Feb-01
Aluminum	· 5				
Antimony	2				
Arsenic	0.5				
Barium	5 .				
Beryllium	0.1	(**************************************	***************************************	
Cadmium	0.1	ND	ND	ND	ND
Chromiúm	1(2)*			**************************************	***************************************
Copper	10	ND	ND .	ND	ND
Îron	50		~		***************************************
Lead	1		***************************************	,	
Lithium	10			,	
Manganese	5	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		***************************************	······································
Mercury	0.2				
Molybdenum	2				
Nickel	. 2	*********		·	***************************************
Selenium	5	***************************************			•
Silver	10	****		***************************************	
Strontium	20	·	······································	**************************************	***************************************
Thallium	1	······································	***************************************	**************************************	
Vanadium	1 .		· · · · · · · · · · · · · · · · · · ·		***************************************
Zinc	20				

^{*} RDL for chromium was changed from 2 ug/L to 1 ug/L beginning September 2000 after analytical methodology was modified.

^{**} Suspected to be a result of positive interference by ICP-MS methodology.

SAMPLE ID	Reporting	L20688-12	L25397-15	L25703-14	L26652-14	L26850-3	L26864-12	L27346-12	L27785-15	L28526-13	L28736-13
SAMPLE DATE	Limit	21-Jul-97	18-Aug-97	29-Sep-97	27-Oct-97	4-Nov-97	18-Nov-97	16-Dec-97	27-Jan-98	23-Feb-98	30-Mar-98
Aluminum	5					. 48 .					
Antimony	2					, ND					,
Arsenic	0.5				,	2.8					
Barium	5 [***************************************	***************************************		1	104	***************************************				
Beryllium	0.1			***************************************		ND	***************************************	·			-
Cadmium	0.1	ND	ND .	ND	ND	ND	ND	ND	ND ·	ND	ND
Chromium	1(2)*.	***************************************	***************************************	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	**************************************	2**				,	
Copper	10 -	ND	· ND	ND	ND	ND	ND	ND	14	. ND	ND
lron	50 '	***************************************	***************************************		***************************************	NĎ					
Lead	1	***************************************			***************************************	ND .	***************************************		•		
Cithium - ?	10		***************************************	***************************************	***************************************	37	************************************		~**************************************		
Manganese	5	·	***************************************		***************************************	6	***************************************			***************************************	
Mercury	0.2		***************************************	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	**************************************	ND	***************************************		•••		
Molybdenum	2		***************************************			5	***************************************				
Nickel	2	·××····	~*************************************	***************************************		ND	************************************	***************************************		***************************************	
Selenium	5			***************************************	***************************************	ND	***************************************				***************************************
Silver	10)		·		. ND	***************************************				*
Strontium	20	······································		***************************************		1040			- C-41/2-20-2-20-1 -1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1		***************************************
Thallium	1	********************************		***************************************	·	ND					*******************************
Vanadium		***************************************			***************************************	***************************************				3	
Zinc	20					ND.			***************************************	-	,

^{*} RDL for chromium was changed from 2 ug/L to 1 ug/L beginning September 2000 after analytical methodology was modified.

^{**} Suspected to be a result of positive interference by ICP-MS methodology.

										,	
SAMPLE ID	Reporting	L29337-1	,L29353-13	L30032-12	L30623-13	L31066-13	L31585-13	L32084-12	L32643-1	L32662-12	L33145-14
SAMPLE DATE	Limit	7-Apr-98	27-Apr-98	26-May-98	22-Jun-98	27-Jul-98	24-Aug-98	28-Sep-98	13-Oct-98	28-Oct-98	23-Nov-98
Aluminum	5	20				·			1.1		
Antimony	2	ND							· ND		,
Arsenic	0.5	2.5							3		
Barium	5	102							94		······································
Beryllium	0.1	ND		,					ND		·
Cadmium	0.1	0.31	ND .	ND	ND	ND	ND	ND.	ND .	ND	. ND
Chromium [©]	1(2)*	ND	·			***************************************			ND		,
Copper	10	ND	ND	ND	ND	ND	ND	, ND	ND	ND	ND
lron	50 ·	ŇD					***************************************	······································	. ND		
Lead	1	ND							ND		
Lithium	10	41			ygana yyggyygga an ar synak ykiyyar nanoo akii raha. Abbi akaktii				39		
Manganese	5	ND		***************************************	······································	·			ND		
Mercury	0.2	ŊD	<u></u>			***************************************			ND		***************************************
Molybdenum	2	5	<u></u>					***************************************	5		······································
Nickel	2 ·	. 2	<u></u>			*******************************	***************************************		2		manca sepanalan secand representativos substantes de canada de canada de canada de canada de canada de canada d
Selenium	5	ND	<u></u>			1 '	***************************************	**************************************	ND	-	·
Silver	10	ND				***************************************	***************************************		ND		***************************************
Strontlum	20	1000					***************************************	*******************************	912		***************************************
Thallium	1	ND							ND		
Vanadium	1									***************************************	***************************************
Zinc	20 .	ND							ND	1	

^{*} RDL for chromium was changed from 2 ug/L to 1 ug/L beginning September 2000 after analytical methoclology was modified.

^{**} Suspected to be a result of positive interference by ICP-MS methodology.

	,					`					·	,
SAMPLE ID	Reporting	M614-34	M843-23	M1304-1	M1317-12	M1977-1	M2471-12	M3074-12	M3558-1	M4143-12 .	M4826-1	M4839-12
SAMPLE DATE	Limit	22-Feb-99	22-Mar-99	6-Apr-99	26-Apr-99	2-Jun-99	28-Jun-99	26-Jul-99	3-Aug-99	27-Sep-99	4-Oct-99	25-Oct-99
Aluminum	5			51						• .	13	
Antimony	. 2			ND						,	ND	
Arsenic	0.5			2.6							2.9	
Barium	5			97							88	
Beryllium	0.1			ND			:		,		ND	
Cadmium	. 0.1	ND	ND	ND	ND	ND	ΝŌ	ND	ND	ND .	ND	ND
Chromium	1(2)*		,	ND							ND ·	
Copper	10	ND	ND	- ND	ND	ND	ND	· ND	ND	ND	ND	ND .
lron	50			ND		****				`	ND	
Lead	1			ND	***************************************	**************************************			~~~~~		ND	
(a. Lithium	10			38							34	
Manganese	5			ND				,			ND	
Mercury	0.2			ND		***************************************		***************************************	······································		ND	
Molybdenum	2			5	·	**************************************		·····	······································		4	***************************************
Nickel	2		***************************************	3							2	***************************************
Selenium	5	······	***************************************	ND T		. •	***************************************	***************************************	*		ND	***************************************
Silver	10			ND		******************************		······································		,	ND.	***************************************
Strontium	20			962		***************************************	***************************************		<u></u>		892 ·	
Thallium	1			ND		***************************************		344 (444 (44 (44 (44 (44 (44 (44 (44 (44	***************************************		ND	***************************************
Vanadium	1	***************************************				*************************************						
Zinc	20			ND		,					· ND	

^{*} RDL for chromium was changed from 2 ug/L to 1 ug/L beginning September 2000 after analytical methodology was modified.

^{**} Suspected to be a result of positive interference by ICP-MS methodology.

SAMPLE ID	Reporting	M5436-1	M6797-1	M7334-14	M8098-12	M8657-1	M9275-1	M11748-1	M12058-1	M12201-7	M12775-1	M12795-1
SAMPLE DATE	· · ·	29-Nov-99	31-Jan-00	28-Feb-00	27-Mar-00	3-Apr-00	29-May-00	31-Jul-00	28-Aug-00	25-Sep- O 0	4-Oct-00	4-Oct-00
Áluminum	5				·	19					16	
Antimony	2		-			ND				**************************************	ND	
Arsenic	0.5	***************************************				2.8				,	3 '	
Barlum	5		,	***************************************		94		,			96	
Beryllium	0.1			M*************************************	***************************************	ND					ND	
Cadmium	0.1	ND	ND ·	ND	ND.	ND	ND	ND	ND .	ND	ND	ND
Chromium	1(2)*	***************************************	29°20'20'20'00'00'00'00'00'00'00'00'00'00'0			ND	,	***************************************			ND .	
Copper	10	ND	ND	ND	ND	МD	ND	ND	, ND	ND	ND	מא
Iron	50			······································		ND					ND	
Lead	1		*******	······································		ND	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			***************************************	ND	
Lithium	10	***************************************		********************************	***************************************	32			***************************************		. 40	
Manganese	5		***************************************	Marking and the second		ND	***************************************		**************************************		ND	
Mercury	0.2	**************************************		***************************************		ND	/*************************************				ND	
Molybdenum	2	***************************************		······		5		***************************************	***************************************	***************************************	5	
Nickel	2			***************************************	***************************************	ND			******************************	······································	3	
Selenium	5		·····			ND					ND	
Silver	10	······································	***************************************	~~		ND					ND	
Strontium	20		***************************************	***************************************		942					.1000	,
Thallium	1			····		ND	,		***************************************	***************************************	ND	
Vanadium	1	······································		***************************************							2	
Zinc	20					ND			***************************************		ND	,

^{*} RDL for chromium was changed from 2 ug/L to 1 ug/L beginning September 2000 after analytical methodology was modified.

^{**} Suspected to be a result of positive interference by ICP-MS methodology.

SAMPLE ID	Reporting	M13436-12	M14206-7	M14750-1	M15224-8
SAMPLE DATE	Limit	27-Nov-00	19-Dec-O0	10-Jan-01	6-Feb-01
Aluminum	5	·			
Antimony	2	,	,		
Arsenic	0.5		,	,	h
Barium	5				
Beryllium	0.1	,	, .		
Cadmium	0.1	ND	ND	ND .	ND
Chromium -	1(2)*			424	
Copper	10	ND .	ND	ND	ND
(Iron	50		****************************		
Lead	1	,			
Lithium	10			***************************************	·
Manganese	5	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		******************************	
Mercury	0.2	***************************************	nsakino sononompoidessandeskildandekijdekiinonidekil		· .
Molybdenum	2		***************************************	***********************************	***************************************
Nickel	2			***************************************	***************************************
Selenium	5				******************************
Silver	10			***************************************	
Strontium	20			**************************************	
Thallium	1		***************************************	***************************************	
Vanadium	1			**************************************	***************************************
Zinc	20	,			

^{*} RDL for chromium was changed from 2 ug/L to 1 ug/L beginning September 2000 after analytical methodology was modified.

^{**} Suspected to be a result of positive interference by ICP-MS methodology.

The Metropolitan Water District of Southern California Lake Havasu Perchlorate Data September 1997 to April 2001

Sample Site	Depth	Sample Date	Perchlorate (ppb)
Lake Havasu Intake	3M	29-Sep-97	8
Lake Havasu Intake	6M	29-Sep-97	. 7
Lake Havasu Intake	9M	29-Sep-97	8
Lake Havasu Intake	12M .	29-Sep-97	8
Lake Havasu Intake	15M .	29-Sep-97	7
Lake Havasu Intake	18M	29-Sep-97	. 6
Lake Havasu Intake	0.4M	29-Sep-97	S
Lake Havasu at Contact Point	ÓΜ	29-Sep-97	(6
Lake Havasu at Contact Point	3M	29-Sep-97	. 6
Lake Havasu at Contact Point	6M	29-Sep-97	. 7
Lake Havasu at Contact Point	9M	29-Sep-97	7
Lake Havasu at Contact Point	12M	29-Sep-97	7
Lake Havasu at Mesquite Bay	OM	29-Sep-97	. 7
Lake Havasu at Mesquite Bay	3M	29-Sep-97	· (
Lake Havasu at Mesquite Bay	6M	29-Sep-97	· 6
Lake Havasu at National Wildlife Refuge Buoy Line	3M	29-Sep-97	
Lake Havasu Intake	3M	27-Oct-97	
Lake Havasu Intake	6M	27-Oct-97	
Lake Havasu Intake	9M	27-Oct-97	
Lake Havasu Intake	12M	27-Oct-97	· · · · · · · · · · · · · · · · · · ·
Lake Havasu Intake	15M	27-Oct-97	
Lake Havasu Intake	18M	27-Oct-97	
Lake Havasu Intake	0.4M	27-Oct-97	· .
Lake Havasu Contact Point	ОМ	27-Oct-97	
Lake Havasu Contact Point	3M	27-Oct-97	······································
Lake Havasu Contact Point	6M	27-Oct-97	
Lake Havasu Contact Point	9M	27-Oct-97	
Lake Havasu Contact Point	12M	27-Oct-97	· · · · · · · · · · · · · · · · · · ·
Lake Havasu at Mesquite Bay	ОМ	27-Oct-97	
Lake Havasu at Mesquite Bay	ЗМ	27-Oct-97	· · 6
Lake Havasu at Mesquite Bay	6M	27-Oct-97	
Lake Havasu at National Wildlife Refuge Buoy Line	3M	27-Oct-97	· · · · · · · · · · · · · · · · · · ·
Lake Havasu Intake	Inlet Depth	4-Nov-97	6
Lake Havasu Intake	Inlet Depth	2-Dec-97	
Lake Havasu Intake	Inlet Depth	6-Jan-98	
Lake Havasu Intake	Inlet Depth	3-Feb-98	
Lake Havasu Intake	Inlet Depth	2-Mar-98	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Lake Havasu Intake	Inlet Depth	7-Apr-98	
Lake Havasu Intake	Inlet Depth	5-May-98	
Lake Havasu Intake	Inlet Depth	2-Jun-98	
Lake Havasu Intake	Inlet Depth	7-Jul-98	
Lake Havasu Intake	Inlet Depth	11-Aug-98	
Lake Havasu Intake	Inlet Depth	1-Sep-98	
Lake Havasu Intake	Inlet Depth	13-Oct-98	
Lake Havasu Intake	Inlet Depth	3-Nov-98	
		·	
Lake Havasu Intake	Inlet Depth	1-Dec-98	
Lake Havasu Intake	Inlet Depth	5-Jan-99	

The Metropolitan Water District of Southern California Lake Havasu Perchlorate Data September 1997 to April 2001

Sample Site	Depth	Sample Date	Perchlorate (ppb)
Lake Havasu Intake	Inlet Depth	2-Feb-99	7
Lake Havasu Intake	Inlet Depth	2-Mar-99	8
Lake Havasu Intaké	Inlet Depth	6-Apr-99	. 8
Lake Havasu Intake	Inlet Depth	4-May-99	6
Lake Havasu Intake	Inlet Depth	2-Jun-99	5
Lake Havasu Intake	Inlet Depth	20-Jul-99	8
Lake Havasu Intake	Inlet Depth	3-Aug-99	7
Lake Havasu Intake	Inlet Depth	8-Sep-99	- 6
Lake Havasu Intake	Inlet Depth	5-Oct-99	5
Lake Havasu Intake	Inlet Depth	2-Nov-99	. 6
Lake Havasu Intake	Inlet Depth	7-Dec-99	. 5
Lake Havasu Intake	Inlet Depth	4-Jan-00	. 6
Lake Havasu intake	Inlet Depth	31-Jan-00	6
Lake Havasu Intake	Inlet Depth	13-Mar-00	7
Lake Havasu Intake	Inlet Depth	3-Apr-00	. 7
Lake Havasu Intake	Inlet Depth	2-May-00	7
Lake Havasu Intake	Inlet Depth	6-Jun-00	. 7
Lake Havasu Intake	Inlet Depth	5-Jul-00	8
Lake Havasu Intake	Inlet Depth	1-Aug-00	6
Lake Havasu Intake	Inlet Depth	11-Sep-00	7
Lake Havasu Intake	Inlet Depth	3-Oct-00	5
Lake Havasu Intake	0.4M	8-Nov-00	6
Lake Havasu Intake	0.4M	5-Deç-00	5
Lake Havasu Intake	0.4M	10-Jan-01	5
Lake Havasu Intake	0.4M	6-Feb-01	7
Lake Havasu Intake	0.4M	12-Mar-01	· 6
Lake Havasu Intake	0.4M	3-Apr-01	· 7

YEAR	MONTH	Number of Samples	Total Coliform ¹	Number of Samples	Fecal Coliform ¹	Number of Samples	E. Coli ¹
1997	July	5	9	5	<2	5	<2
`	August	4	9	4	<2	4	<2
,	September	5	26	5	2	5	<2
	October	4	15	4	<2	4	<2
	November	4	3	4	<2	4	<2
	December	5	5	5	<2	. 5	<2
1998	January	4	4 .	4	2	4	2
	February	4	10	4	<2	4	<2
	March	5	2	5	<2	. 5	<2
	April	4	<2	4	<2	4	<2
	May	- 4	<2	. 4	<2	4	<2
	June	5	<2	5	<2	5	<2
	July	4	5	4	<2	4	<2
	August	4	5	. 4	<2	4	<2
	September	5	11	5	<2	5	<2
	October	4	9	4	<2	4	<2
	November	4	5	4	<2	4	<2
	December	5	8	5	<2	5	<2
1999	January	4	11	4	9	4	5
	February	4	7	4	<2	4	<2
	March	4	<2	. 4	<2	4	<2
	April	5	2	5	<2	5	<2
	May	4	5	4	<2	4	<2
	June	5	12	5	<2	5	<2
`	July	4	12	4	<2	4	<2
	August	5	13	5	2	5	<2
	September	4	16	4	2	4	<2
	October	4	17	4	<2	4	<2
	November	5	10	5	<2	5	<2
	December	4	· 5	4	<2	_4	<2

¹Monthly average coliform results analyzed by Multiple Tube Fermentation method (MPN/100 ml).

YEAR	MONTH	Number of Samples	Total Coliform ¹	Number of Samples	Fecal Coliform ¹	Number of Samples	E. Coli ¹
2000	January	4	6	4	<2	4	<2
	February ,	5	26	5	2	5	2
	March	4	7	4	<2	4	<2
·	April	4	11	4	<2	4	<2
	May	5	17	5	<2	5	<2
	June	4	11	4	<2	4	· <2
	July	5	21	5	<2	5	<2
	August	5 -	24	5	~ 2	5	<2
	September	4	37	4	<2	4	<2
	October	5	6	5	<2	5	<2
	November	4	2	4	<2	4	<2
	December	4	2	4	<2	4	<2
2001	January	_5	2	5	<2	5	<2
	February	4	2	4	<2	4	<2
	March	4	13	4	<2 .	4	<2

¹Monthly average coliform results analyzed by Multiple Tube Fermentation method (MPN/100 ml).

YEAR	MONTH	Number of Samples	Total Coliform ¹	Number of Samples	Fecal Coliform ¹	Number of Samples	E. Coli ¹
1997	July	5	9	5	· <2	5	<2
	August	4 .	9	4	<2	4	<2
	September	5	26	5	2	5	<2
	October	4	15	4	<2	4	<2
	November	4	3	4	` <2	4	<2
	December	5	5	5	<2	5	<2
1998	January	4	4	4	2	4	2
	February	4	10	4	<2	4	<2
	March	5	2	5	<2	5	<2
	April	4	<2	4	<2	4	<2
	May	4	<2	4	<2	4	<2
`	June	5	<2	5	<2	5	<2
	July	4	5	4	<2	4	<2
	August	4	5	4	<2	4	<2
	September	5	11	5	<2	5	<2
	October	4	9	4	<2	4	<2
	November	4	5	4	<2	4	· <2
	December	· 5	8	5	<2	5	<2
1999	January	4	11	4	9	4	5
	February	4	7	4	<2	4	<2
	March	4	<2	4	<2	, · 4	<2
•	April	5	2	5	<2	5	<2
	May	4	5	4	<2	4	<2
	June	5	12	5	<2	5	<2
·	July	4	12	4	<2	4	<2
	August	5	13	5	2	5	<2
]-	September	4	16	4	2	4	<2
	October	4	17	4	<2	4	<2
	November	5	10	5	<2	5	<2
	December	4	5	4	<2	4	<2

¹Monthly average coliform results analyzed by Multiple Tube Fermentation method (MPN/100 ml).

YEAR	MONTH	Number of Samples	Total Coliform ¹	Number of Samples	Fecal Coliform ¹	Number of Samples	E. Coli ¹
2000	January	4	6	4	<2	4	<2
	February	5	26	5	2	5	2
	-March	4	7	4	<2	4	<2
	April	4	11	4	<2	4	<2
	May	5	17	5	<2	5	<2
	June	4	11	4	<2	4	<2
	July	5	21	5	<2	5	<2
	August	5	24	5	<2	5	<2
	September	4	37 -	4	<2	4	<2
	October	5	6	5	<2	5	<2
	November	4	2	4	<2	4	<2
	December	4	2	4	<2	4	<2
2001	January	5	2	5 .	<2	5	<2
	February	4	2	4	<2	4.	<2
	March	4	13	4	<2	4	<2

¹Monthly average coliform results analyzed by Multiple Tube Fermentation method (MPN/100 ml).

The Metropolitan Water District of Southern California Water Quality Laboratory Pathogen Monitoring Data for the Colorado River Sanitary Survey Protozoa

	· · · · · · · · · · · · · · · · · · ·		%	Volume of		Giardia sp.	No. of	
	Sample	Sample	Colorado	Sample	No. of	Detection	Cryptosporidium sp.	Cryptosporidium sp.
Sample	Site	Volume	River	Analyzed	Giardią sp.	Limit	Oocysts	Detection Limit
Date	(1)	(liters)	Water	(liters)	Cysts detected	Per 100 L	Detected	Per 100 L
22-Jul-97	Intake Pump Plant	102.2	100	20.4	0	<5	1	5
25-Aug-97	Intake Pump Plant	102.2	100	25.6	0	< 4	0	< 4
22-Sep-97	Intake Pump Plant	102.2	100	27.2	0	< 4	0	< 4
21-Oct-97	Intake Pump Plant	102.2	100	20.4	0	< 5	0	< 5
17-Nov-97	Intake Pump Plant	102.2	100	27.3	0	< 4	0	< 4
15-Dec-97	Intake Pump Plant	102.2	100	40.9	. 0	< 2	. 0	< 2
20-Jan-98	Intake Pump, Plant	102.2	100	27.3	1	4	0	< 4
17-Feb-98	Intake Pump Plant	102.2	100	30.7	0	< 3.3	. 0	< 3.3
17-Mar-98	Intake Pump Plant	102.2	100	8.2	0	< 6	0	< 6
21-Apr-98	Intake Pump Plant	102.2	100	30.7	0	< 3.3	0	< 3.3
18-May-98	Intake Pump Plant	102.2	100	30.7	0	< 3.3	0	< 3.3
16-Jun-98	Intake Pump Plant	102.2	100	30.7	0	< 3.3	0	< 3.3
27-Jul-98	Intake Pump Plant	112.8	100	5.6	0	< 18	1	18
24-Aug-98	Intake Pump Plant	102.2	100	25.6	0	< 3.9	. 0	< 3.9
28-Sep-98	Intake Pump Plant	102.2	100	30.7	0	< 3.3	0	< 3.3

⁽¹⁾ Intake Pump Plant Sample collected at the Roto Valve from Lake Havasu – method used = USEPA Method 1623

The Metropolitan Water District of Southern California Water Quality Laboratory

Pathogen Monitoring Data for the Colorado River Sanitary Survey Protozoa

			%	Volume of		Giardia sp.	No. of	
	Sample	Sample	Colorado	Sample	No. of	Detection	Cryptosporidium sp.	Cryptosporidium sp.
Sample	Site	Volume	River	Analyzed	Giardią sp.	Limit	Oocysts	Detection Limit
Date	(1)	(liters)	Water	(liters)	Cysts detected	Per 100 L	Detected	Per 100 L
22-Jul-97	Intake Pump Plant	102.2	100	20.4	0	<5	1	. 5
25-Aug-97	Intake Pump Plant	102.2	100	25.6	0	< 4 .	0	< 4
22-Sep-97	Intake Pump Plant	102.2	100	27.2	0	<4	. 0	<4
21-Oct-97	Intake Pump Plant	102.2	100	20.4	0	< 5	0	< 5
17-Nov-97	Intake Pump Plant	102.2	100	27.3	0	< 4	0	< 4
15-Dec-97	Intake Pump Plant	102.2	100	40.9	0	< 2	<u> 0 · </u>	< 2
20-Jan-98	Intake Pump, Plant	102.2	100	27.3	1	4	0	< 4
17-Feb-98	Intake Pump Plant	102.2	100	30.7	0	< 3.3		< 3.3
17-Mar-98	Intake Pump Plant	102.2	100	8.2	0 .	< 6	0	< 6
21-Apr-98	Intake Pump Plant	102.2	100	30.7	. 0	< 3.3	. 0	< 3.3
18-May-98	Intake Pump Plant	102.2	100	30.7	0	< 3.3	0	< 3.3
16-Jun-98	Intake Pump Plant	102.2	100	30.7	0	< 3.3	0	< 3.3
27-Jul-98	Intake Pump Plant	112.8	100	5.6	0	< 18	1	18
24-Aug-98	Intake Pump Plant	102.2	100	25.6	0	< 3.9	0	< 3.9
28-Sep-98	Intake Pump Plant	102.2	100	30.7	0	< 3.3	. 0	< 3.3

(1) Intake Pump Plant Sample collected at the Roto Valve from Lake Havasu – method used = USEPA Method 1623



Date:

February 7, 2000

To:

Marshall K. Davis, Water Quality Laboratory Manager

From:

Bart Koch, Principal Chemist

Subject:

Third Quarter 1999 Pesticide, Herbicide, and Semi-Volatile Organic

Compounds (SVOC) Monitoring Program

On September 1, 1999, samples from seven of Metropolitan's source waters and six treatment plant effluents (Table 1) were collected for the 1999 third quarter pesticide, herbicide, and SVOC monitoring program. Table 2 lists the analytes and provides regulatory information, which includes the California Department of Health Services' (CDHS') action levels and maximum contaminant levels (MCLs), U.S. Environmental Protection Agency's (USEPA) MCLs, CDHS' detection limits for purposes of reporting (DLRs), and the laboratories' established reporting levels. No pesticides, herbicides, or SVOCs were detected at or above the DLRs or the laboratory's reporting levels in Metropolitan's source or finished waters.

The analyses for organochlorine herbicides, organochlorine pesticides; organophosphorous pesticides, and triazine herbicides; fumigants, carbamate pesticides, glyphosate, diquat, diuron, endothall, and SVOCs (USEPA Methods 515.2, 508, 507, 504.1, 531.1, 547, 549.1, 632, 548.1, and 525.2 respectively) were performed by Weck Laboratories. Quantarra Environmental Services performed the analysis for dioxin (Method 1613A).

This sampling is part of Metropolitan's annual pesticide, herbicide, and SVOC monitoring program. This was the second of two quarters of monitoring which is required every three years. The next monitoring will be conducted in the third quarter of 2000.

ORIGINAL SIGNED BY

Bart Koch

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mi 2/8/00

Attachments (2)

Marshall K. Davis, Water Quality Laboratory Manager Page 2 February 7, 2000

cc w/attachments:

J. T. Wicke

M. H. Stewart

M. K. Davis

D. G. Sass

B. Koch

E. W. Crofts

M. S. Dale

Water Quality file

TABLE 1

SAMPLE LOCATIONS FOR PESTICIDE, HERBICIDE, and SVOC MONITORING THIRD QUARTER 1999

Source Waters

Devil Canyon afterbay
Foothill Pressure Control
Structure (PCS)
Lake Havasu near Intake
Lake Mathews headworks
Lake Perris
Lake Skinner outlet conduit
San Jacinto Tunnel

Treated Waters

Diemer plant effluent Mills plant effluent Skinner plant #1 effluent Skinner plant #2 effluent Weymouth plant effluent Jensen plant effluent

TABLE 2

PESTICIDE, HERBICIDE, and SVOC DETECTION LIMITS AND MAXIMUM CONTAMINANT LEVELS THIRD QUARTER 1999

	CDHS				Laboratory	
<u>Analyte</u>	Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Reporting Level (µg/L)	Analytical Results (µg/L)
Owner a chlorine						
Organochlorine Pesticides#:						
Aldrin*	0.00005			0.075	0.08	ND
∝-BHC	0.0007				0.01	ND
ß-BHC	0.0003	•		-	0.05	ND
δ-ВНС		-		0.5	0.05	ND
γ-BHC (Lindane)	•	0.0002	0.0002	0.2	0.20	ND
Chlordane	-	0.0001	0.002	0.1	0.10	ND
Chlorothalonil*	•			5.0	5.0	ND
4,4'-DDD				0.02	0.02	ND
4,4'-DDE		•		0.01	0.01	ND
4,4'-DDT			٠,٠	0.02	0.02	ND
Dieldrin*	0.00005			0.02	0.02	ND
Endrin	ત્ર.	0.002	0.002	0.1	0.1	ND
Heptachlor		0.00001	0.0004	0.01	0.01	ND
Heptachlor epoxide		0.00001	0.0002	0.01	0.01	ND
Hexachlorobenzene		0.001	0.001	0.5	0.5	ND
Hexachlorocyclo-		•				ND
Pentadiene		0.05	0.05	1.0	1.0	ND
Methoxychlor		0.04	0.04	10.0	10.0	ND
Propachlor*				0.5	0.5	ND
Toxaphene	•	0.003	0.003	1.0	1.0	ND
Polychlorinated		0.0005	0.0005	0.5	0.5	ND
Biphenyls (PCB)				•	•	٠.
Organophosphorus	÷					
Pesticides and						
Triazine Herbicides#:			· · · · · · · · · · · · · · · · · · ·			
Alachlor		0.002	0.002	1.0	1.0	ND
Atrazine	•	0.003	0.003	1.0	1.0	ND
Bromacil*				10.0	10.0	ND
Butachlor*		•	•	0.38	0.38	ND
Diazinon	0.014			0.25	0.25	ND
Diazmon Dimethoate*	0.014			10.0	10.0	ND ND
Malathion	0.140		•	10.0	0.5	ND ND
Metalochlor*	. 0.100	•			0.5	ND
Metribuzin*	-			•	0.5	ND
Molinate	-	0.02	•	2.0	2.0	ND

			÷.			in the second se		.
<u>Analyte</u>		CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Laboratory Reporting Level (µg/L)	Analytical Results (μg/L)	
Organophosp Pesticides and Triazine Herl	l "						•	
Prometryn* Simazine Thiobencarb			0.004 0.07(0.001**)	0.004	2.0 1.0 1.0	2.0 1.0 1.0	ND ND ND	
Organochlori <u>Herbicides[#]:</u>	ne							
Bentazon Dalapon Dicamba* Dinoseb			0.018 0.2 0.007	0.2	2.0 10.0 1.5 2.0	2.0 10.0 0.081 2.0	ND ND ND ND	
Pentachloropho Picloram 2,4-D 2,4,5-T (Silvex			0.001 - 0.5 0.07 0.05	0.001 0.5 0.07 0.05	0.2 1.0 10.0 1.0	0.2 1.0 10.0 1.0	ND ND ND ND	
Carbamates <u>Method 632</u> #	٠.		<u>.</u>					
Diuron*					1.0	1.0	ND	
Carbamates <u>Method 531.1</u>	¥ . -			÷ .			•	
Aldicarb* Aldicarb sulfor Aldicarb sulfor	kide*	0.01		0.003 ⁺ 0.002 ⁺ 0.004 ⁺	3.0 4.0 3.0	2 2 2	ND ND ND	
Baygon(Propor Carbofuran Carbaryl*		0.09	0.018	0.04	5.0 5.0	1 2 2	ND ND ND	
3-Hydroxycarb Methomyl* Oxamyl	ofuran*		0.2	0.2	3.0 2.0 20.0	2 2 2	ND ND ND	
Fumigant <u>Method 504.1</u> *							. ~	
Dibromochloro (DBCP) 2thylene dibro	·		0.0002	0.0002	0.01	0.01	ND	
(EDB)	· ·	¥į	0.00005	0.00005	0.02	0.02	ND	
					٠.			i

<u>Analyte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ²	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Laboratory Reporting Level (ug/L)	Analytical Results (<u>ug/L)</u>
SVOC Method 525.2#		•		. •		
Benzo(a)pyrene Di(2-ethylhexyl)adipate Di(2- ethylhexyl)phthalate	3 · · · · · · · · · · · · · · · · · · ·	0.0002 0.4 0.004	0.0002 0.4 0.006	0.1 5 3	0.1 5 3	ND ND ND
Misc.	·			•		, •
Diquat [#]		0.02	0.02	4.0	4.0	ND:
Endothall [#]		0.1	0.1	45.0	45	ND
Glyphosate#		0.7	0.7	25.0	25.	ND
Dioxin (2,3,7,8- TCDD)##		3 x 10 ⁻⁸	3×10^{-8}	5 x 10 ⁻⁶	1.5 -5 x 10 ⁻⁶	ND

² CDHS maximum contaminant level (MCL) (<u>www.dhs.cahwnet.gov</u> update January 7,1999).

* CDHS unregulated organic chemicals (<u>www.dhs.cahwnet.gov</u> update January 7,1999)

California Department of Health Services (CDHS) action levels (<u>www.dhs.cahwnet.gov</u> update January 7,1999).

³ U.S. Environmental Protection Agency, MCLs, <u>Federal Registers</u>, January 30, 1991 and July 17, 1992.

⁴ CDHS required detection limits for purposes of reporting (DLR). <u>www.dhs.cahwnet.gov</u> update January 7,1999.

Effective date of January 1, 1993, has been postponed, <u>Federal Register</u>, May 27, 1992, pending revised MCL.

[#] Analysis performed by Weck Laboratories.

^{##} Analysis performed by Quantarra Environmental Services.

^{**} Secondary CDHS MCL



April 12, 1999

To:

Marshall K. Davis, Water Quality Laboratory Manager

From:

Bart Koch, Principal Chemist

Subject:

1998 Annual Pesticide, Herbicide, and Semi-Volatile (SVOC)

Monitoring Program

- 1. On December 8, 1998, samples from seven of Metropolitan's source waters and five treatment plant effluents (Table 1) were collected for the 1998 annual pesticide, herbicide, and SVOC monitoring program. The Jensen Filtration Plant was out of service at the time of sampling and therefore, an effluent sample could not be collected. However, the influent (source water) to the Jensen plant was collected. Table 2 lists the analyses and provides regulatory information, which includes the California Department of Health Services' (CDHS') action levels and maximum contaminant levels (MCLs), U.S. Environmental Protection Agency's (USEPA) MCLs, CDHS' detection limits for purposes of reporting (DLRs), and the laboratories' established detection limits. No pesticides, herbicides, or SVOCs were detected at or above the DLRs in Metropolitan's source or finished waters.
- 2. The analyses for organochlorine herbicides, organochlorine pesticides; organophosphorous pesticides and triazine herbicides; fumigants, carbamate pesticides, glyphosate, diquat, diuron, endothall, and SVOCs (USEPA Methods 515.2, 508, 507, 504.1, 515.1, 531.1, 547, 549.1, 632, 548.1, and 525.2, respectively) were performed by Weck Laboratories. The analysis for dioxin was performed by Quantarra Environmental Services (Method 1613A).

This represents the 1998 annual monitoring program for pesticides, herbicides, and SVOCs. The next monitoring will be conducted in the first quarter of 1999.

ORIGINAL SIGNED BY Bart Koch

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Attachments (2)

Marshall K. Daivs, Water Quality Laboratory Manager Page 2 April 12, 1999

cc w/attachments:

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B. Koch
E. W. Crofts
J. M. Bruno
M. S. Dale
M. K. Davis
Water Quality file

SAMPLE LOCATIONS FOR PESTICIDE, HERBICIDE, and SVOC MONITORING ANNUAL 1998

Source Waters

Devil Canyon afterbay
Foothill Pressure Control
Structure (PCS)
Lake Havasu near Intake
Lake Mathews headworks
Lake Perris
Lake Skinner outlet conduit
San Jacinto Tunnel

Treated Waters

Diemer plant effluent Mills plant effluent Skinner plant #1 effluent Skinner plant #2 effluent Weymouth plant effluent

PESTICIDE, HERBICIDE, and SVOC DETECTION LIMITS AND MAXIMUM CONTAMINANT LEVELS 1998 ANNUAL

Analyte Organochlorine Pesticides #:	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Detection Limits (µg/L)
Heptachlor Heptachlor epoxide Hexachlorobenzene Hexachlorocyclo- pentadiene Methoxychlor Propachlor*	0.00005 0.0007 0.0003	0.0002 0.0001 0.002 0.00001 0.00001 0.001 0.005 0.004	0.0002 0.002 0.002 0.0004 0.0002 0.001 0.05 0.04	0.075 0.5 0.2 0.1 5.0 0.02 0.01 0.02 0.02 0.1 0.01 0.5 1.0 10.0 0.5	0.08 0.01 0.05 0.05 0.20 0.10 5.0 0.02 0.01 0.02 0.02 0.1 0.01 0.01 0.5 1.0 10.0 0.5
Toxaphene Polychlorinated Biphenyls (PCB) Organophosphorus		0.003 0.0005	0.003 0.0005	1.0 0.5	1.0 0.1
Pesticides and Triazine H	lerbicides #:				
Alachlor Atrazine Bromacil* Butachlor* Diazinon* Dimethoate*	0.014 0.140	0.002 0.003	0.002 0.003	1.0 1.0 10.0 0.38 0.25 10.0	1.0 1.0 10.0 0.38 0.25 10.0

TABLE 2 (continued)

Analyte	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Detection Limits (µg/L)
Organophosphorus Pesticides and <u>Triazine Herbicides #</u> (continued):	. ,			·	
Metalochlor* Metribuzin* Molinate Prometryn* Simazine Thiobencarb		0.02 0.004 0.07(0.00	0.004 l**)	2.0 2.0 1.0 1.0	0.5 0.5 2.0 2.0 1.0
Organochlorine Herbicides#:					
Bentazon Dalapon Dicamba* Dinoseb Pentachlorophenol Picloram 2,4-D 2,4,5-TP (Silvex)		0.018 0.2 0,007 0.001 0.5 0.07 0.05	0.2 0.007 0.001 0.5 0.07 0.05	2.0 10.0 1.5 2.0 0.2 1.0 10.0 1.0	2.0 10.0 0.081 2.0 0.2 1.0 10.0 1.0
Carbamates - Method 632#				· .	
Diuron* <u>Carbamates - Method 531</u> #				1.0	1.0
Aldicarb*	0.01		0.003+	3.0	2
Aldicarb sulfone* Aldicarb sulfoxide* Baygon (Propoxur)	0.090		0.002 ⁺ 0.004 ⁺	4.0 3.0	2 2 1
Carbofuran Carbaryl* 3-Hydroxycarbofuran* Methomyl*	0.060	0.018	0.04	5.0 5.0 3.0 2.0	2 2 3 2 2
Oxamyl		0.2	0.2	20.0	2

TABLE 2 (continued)

<u>Analyte</u>	CDHS Action Level ¹ (µg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Detection Limits (µg/L)	
Fumigants- Method 504 #	•					
Dibromochloropropane (DBCP) Ethylene dibromide		0.0002	0.0002	0.01	0.01	
(EDB)	-	0.00005	0.00005	0.02	0.02	•
SVOC - Method 525.2 #				•	•	
Benzo(a)pyrene Di(2-etyylhexy)adipate Di(2-ethylhexyl)phthalate	-	0.0002 0.4 0.004	0.0002 0.4 0.006	0.1 5 3	0.1 5 3	
Misc.			-			
Diquat#	. سد	0.02	0.02	4.0	4.0	
Endothall#		0.1	0.1	45.0	45	
Glyphosate#		0.7	0.7	25.0	25	
Dioxin (2,3,7,8-TCDD)##		3 x 10 ⁻⁸	3×10^{-8}	5 x 10 ⁻⁶	0.48-1.5 x 10) ⁻⁶

^{1.} California Department of Health Services (CDHS) action levels (www.dhs.cahwnet.gov update January 7,1999).

^{2.} CDHS maximum contaminant level (MCL) (www.dhs.cahwnet.gov update January 7,1999).

^{3.} Environmental Protection Agency MCLs, <u>Federal Registers</u>, January 30, 1991, and July 17, 1992.

^{4.} CDHS required detection limits for purposes of reporting (DLR). www.dhs.cahwnet.gov update November 19, 1998.

^{*} CDHS unregulated organic chemicals (www.dhs.cahwnet.gov update January 7,1999)

⁺ Effective date of January 1, 1993, has been postponed, <u>Federal Register</u>, May 27, 1992, pending revised MCL.

[#] Analysis performed by Weck Laboratories.

^{##} Analysis performed by Quantarra Environmental Services.

^{**} Secondary CDHS MCL.



February 13 2001

To:

Marshall K. Davis, Water Quality Laboratory Manager

From:

Bart Koch, Principal Chemist

Subject:

2000 Annual Pesticide, Herbicide, and Semi-Volatile Organic

Compound (VOC) Monitoring Program

On September 11 and 12, 2000, samples from seven of Metropolitan's source waters and six treatment plant effluents (Table 1) were collected for the 2000 annual pesticide, herbicide and SVOC monitoring program. Table 2 lists the analytes and provides regulatory information, which includes the California Department of Health Services' (CDHS') action levels and maximum contaminant levels (MCLs), U.S. Environmental Protection Agency's (USEPA) MCLs, CDHS' detection limits for purposes of reporting (DLRs), and the laboratories' established reporting levels. No pesticides, herbicides, or SVOCs were detected at or above the reporting levels in Metropolitan's source or finished waters.

The analyses for organochlorine herbicides, organochlorine pesticides, organophosphorous pesticides/triazine herbicides, fumigants, carbamate pesticides, glyphosate, diquat, diuron, endothall, and SVOC's (USEPA Methods 515.2, 508, 507, 504.1, 531.1, 547, 549.1, 632, 548.1 and 525.2, respectively) were performed by Weck Laboratories. The analysis for dioxin was performed by Quantarra Environmental Services (USEPA Method 1613A).

This sampling is part of Metropolitan's annual pesticide, herbicide and SVOC monitoring program. The next monitoring will be conducted in the fourth quarter of 2001.

Bart Koch

BK:mm

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But Karl

Marshall K. Davis, Water Quality Laboratory Manager Page 2 February 12, 2001

cc w/attachments:

E. W. Crofts

M. S. Dale

M. K. Davis

B. Koch

D. G. Sass

M. H. Stewart

M. G. Torobin

J. T. Wicke

Water Quality file

TABLE 1

Sample Locations for Pesticide, Herbicide, and SVOC Monitoring 2000*

Source Waters	Treated Waters
Devil Canyon afterbay	Diemer plant effluent
Foothill Pressure Control	Jensen plant effluent
Structure (PCS)	Mills plant effluent
Lake Havasu near Intake	Skinner plant #1 effluent
Lake Mathews headworks**	Skinner plant #2 effluent
Lake Perris	Weymouth plant effluent
Lake Skinner outlet conduit	
San Jacinto Tunnel	

- * samples collected September 12, 2000 (Lake Havasu was collected on September 11, 2000)
- ** sample for endothall analysis was recollected on December 21, 2000 because of sampling problems.

TABLE 2
Pesticide, Herbicide, SVOC Drinking Water Standards and Reporting Levels
Annual 2000

	CDHS				Minimum	
•	Action	CDHS	USEPA	CDHS	Reporting	Analytical
	Level ¹	MCL1	MCL ²	DLR ³	Levels	Results
Analyte	(mg/L)	(mg/L)	(mg/L)	(μg/L)	$(\mu g/L)$	(µg/L)
Organochlorine Pesticides#:		· · · · · · · · · · · · · · · · · · ·				
Aldrin*	0.000002			0.075	0.075	ND
∞-BHC	0.000015		•		0.05	ND
в-внс	0.000025	-			0.05	ND
δ-ВНС				0.5	0.5	ND
γ-BHC (Lindane)		0.0002	0.0002	0.2	0.20	ND
Chlordane		0.0001	0.002	0.1	0.10	ND
Chlorothalonil*				5.0	5.0	ND
4,4'-DDD		•		0.02	0.02	ND
4,4'-DDE			•	0.01	0.01	ND
4,4'-DDT	. –	•		0.02	0.02	ND
Dieldrin*	0.000002			0.02	0.02	ND
Endosulfan I	•				0.02	ND
Endosulfan II					0.01	ND
Endosulfan sulfate	-				0.05	ND
Endrin		0.002	0.002	0.1	0.1	ND
Endrin aldehyde					0.05	ND
Heptachlor		0.00001	0.0004	0.01	0.01	ND
Heptachlor epoxide		0.00001	0.0002	0.01	0.01	ND
Hexachlorobenzene		0.001	0.001	0.5	0.5	ND
Hexachlorocyclo-						ND
pentadiene		0.05	0.05	1.0	1.0	ND
Methoxychlor		0.04	0.04	10.0	10.0	ND
Propachlor*				0.5	0.5	ND
Toxaphene	-	0.003	0.003	1.0	1.0	ND
Polychlorinated		0.0005	0.0005	0.5	0.5	ND
biphenyls (PCB)			311 - 7		*	
Trifluralin `		•	,		0.01	ND
		ه سید سرت ^ا	I	-		
Organophosphorus Pesticid	es and Triazi		•		4.0	,
Alachlor	. •	0.002	0.002	1.0	1.0	ND
Atrazine		0.003	0.003	1.0	1.0	ND
Bromacil*	÷			10.0	10.0	ND
Butachlor*				0.38	0.38	ND
Diazinon	0.006			0.25	0.25	ND
Dimethoate*	0.001			10.0	10.0	ND

Table 2 (cont'd)

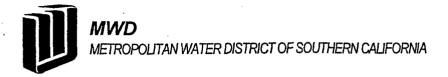
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	CDHS Action	CDHS	USEPA	CDHS	Minimum Reporting	Analytical
	Level ¹	MCL ¹	MCL ²	DLR ³	Levels	Results
Analyte	(mg/L)	(mg/L)	(mg/L)	μg/L)	(µg/L)	(µg/L)
Metalochlor*					0.5	ND
Metribuzin*					0.5	ND
Molinate		0.02		2.0	2.0	ND
Prometon			•		1.0	ND
Prometryn*				2.0	2.0	ND
Simazine		0.004	0.004	1.0	1.0	ND
Thiobencarb		0.07(0.001**)		1.0	1.0	ND
Organochlorine Herbicide	es#:					
Acifluorfen		•			0.5	ND
Bentazon		0.018		2.0	2.0	ND
2,4-D		0.07	0.07	10.0	10.0	ND
2,4-DB					2.0	ND
3,5-Dichlorobenzoic	•			· ;	1.0	ND
acid						-
Dacthal (DCPA)	→.			•	0.10	ND
Dalapon		0.2	0.2	10.0	10.0	ND
Dicamba*				1.5	1.5	ND
Dichlorprop					0.3	ND
Dinoseb		0.007	0.007	2.0	2.0	ND
Pentachlorophenol		0.001	0.001	0.2	0.2	ND
Picloram		0.5	0.5	1.0	1.0	ND
2,4,5-TP (Silvex)		0.05	0.05	1.0	1.0	ND
2,4,5-T					0.2	ND
		•				
Carbamate Pesticides - M		•				
Aldicarb*	0.007		0.003+	3.0	2.0	ND
Aldicarb sulfone*			0.002^{+}	4.0	2.0	ND
Aldicarb sulfoxide*			0.004^{+}	3.0	2.0	ND
Baygon (Propoxur)	0.093				5.0	ND
Carbofuran		0.018	0.04	5.0	5.0	ND .
Carbaryl*	0.7			5.0	2.0	ND
3-Hydroxycarbofuran*				3.0	2.0	ND
Methiocarb	•		· ·		3.0	ND
				2.0		
1 · · · · · · · · · · · · · · · · · · ·	• '	0.2	0.2			•
Methiocarb Methomyl* Oxamyl		0.2	0.2	2.0	3.0 2.0 2.0	ND ND ND

Table 2 (cont'd)

Analyte	CDHS Action Level ¹ (mg/L)	CDHS MCL ¹ (mg/L)	USEPA MCL ² (mg/L)	CDHS DLR ³ (µg/L)	Minimum Reporting Levels (µg/L)	Analytical Results (µg/L)
Fumigants- Method 504#		0.0002	0.0002	0.01	0.01	ND
Dibromochloropropane (DBCP)		0.0002	. 0.0002	0.01	0.01	ND
Ethylene dibromide (EDB)		0.00005	0.00005	0.02	0.02	ND
SVOC - Method 525.2 #		•			•	
Benzo(a)pyrene		0.0002	0.0002	0.1	0.1	ND
Di(2-ethylhexyl)adipate		0.4	0.4	5	5	ND
Di(2-ethylhexyl)		0.004	0.006	3 .	3 ·	ND
phthalate	-				•	
Misc.		0.00	0.00	4.0	4.0	ND
Diquat [#]		0.02	0.02	4.0	4.0	ND
Diuron*		0.1		1.0	1.0	ND
Endothall#		0.1	0.1	45.0	45	ND
Glyphosate#		0.7	0.7	. 25.0	25	ND
Dioxin (2,3,7,8- TCDD) ^{##}		3×10^{-8}	3×10^{-8}	5 x 10 ⁻⁶	5 x 10 ⁻⁶	ND

- California Department of Health Services (CDHS) Drinking Water Standards and Action Levels (May 23, 2000 and November 13, 2000, respectively.)

 (http://www.dhs.cahwnet.gov/ps/ddwem/chemicals/chemindex.htm)
- 2 Federal Registers, January 30, 1991 and July 17, 1992.
- 3 CDHS required detection limits for purposes of reporting (DLR) (February 18, 2000) (http://www.dhs.cahwnet.gov/ps/ddwem/chemicals/chemindex.htm).
- * CDHS unregulated organic chemicals (May 23, 2000)
 (http://www.dhs.cahwnet.gov/ps/ddwem/chemicals/chemindex.htm)
- ** Secondary CDHS MCL
- # Analysis performed by Weck Laboratories.
- ## Analysis performed by Quantarra Environmental Services.
- + Effective date of January 1, 1993, has been postponed, Federal Register, May 27, 1992, pending revised MCL.



February 13 2001

To:

Marshall K. Davis, Water Quality Laboratory Manager

From:

Bart Koch, Principal Chemist

Subject:

2000 Annual Pesticide, Herbicide, and Semi-Volatile Organic

Compound (VOC) Monitoring Program

On September 11 and 12, 2000, samples from seven of Metropolitan's source waters and six treatment plant effluents (Table 1) were collected for the 2000 annual pesticide, herbicide and SVOC monitoring program. Table 2 lists the analytes and provides regulatory information, which includes the California Department of Health Services' (CDHS') action levels and maximum contaminant levels (MCLs), U.S. Environmental Protection Agency's (USEPA) MCLs, CDHS' detection limits for purposes of reporting (DLRs), and the laboratories' established reporting levels. No pesticides, herbicides, or SVOCs were detected at or above the reporting levels in Metropolitan's source or finished waters.

The analyses for organochlorine herbicides, organochlorine pesticides, organophosphorous pesticides/triazine herbicides, fumigants, carbamate pesticides, glyphosate, diquat, diuron, endothall, and SVOC's (USEPA Methods 515.2, 508, 507, 504.1, 531.1, 547, 549.1, 632, 548.1 and 525.2, respectively) were performed by Weck Laboratories. The analysis for dioxin was performed by Quantarra Environmental Services (USEPA Method 1613A).

This sampling is part of Metropolitan's annual pesticide, herbicide and SVOC monitoring program. The next monitoring will be conducted in the fourth quarter of 2001.

Bart Koch

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But Karl

Marshall K. Davis, Water Quality Laboratory Manager Page 2 February 12, 2001

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M. H. Stewart

M. G. Torobin

J. T. Wicke

Water Quality file

TABLE 1

Sample Locations for Pesticide, Herbicide, and SVOC Monitoring 2000*

Source Waters	Treated Waters
Devil Canyon afterbay	Diemer plant effluent
Foothill Pressure Control	Jensen plant effluent
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Lake Havasu near Intake	Skinner plant #1 effluent
Lake Mathews headworks**	Skinner plant #2 effluent
Lake Perris	Weymouth plant effluent
Lake Skinner outlet conduit	•
San Jacinto Tunnel	

^{*} samples collected September 12, 2000 (Lake Havasu was collected on September 11, 2000)

^{**} sample for endothall analysis was recollected on December 21, 2000 because of sampling problems.

TABLE 2
Pesticide, Herbicide, SVOC Drinking Water Standards and Reporting Levels
Annual 2000

	CDHS	Aunuai 200			Minimum	
	Action	CDHS	USEPA	CDHS	Reporting	Analytical
	and the second second	MCL ¹			Levels	Results
Analyte	Level ¹ (mg/L)	(mg/L)	MCL ² (mg/L)	DLR ³ (μg/L)	Levels (μg/L)	Results (μg/L)
Organochlorine Pesticides*:		(g, 2)	(1115/12)	(μ ₈ , Σ)	(46,2)	(μς/ Σ)
Aldrin*	0.000002	•		0.075	0.075	ND
∞-BHC	0.000015			0.075	0.05	ND
в-внс	0.000015		•	•	0.05	•
	0.000023			2.5		ND
δ-BHC		0.0000		0.5	0.5	ND
γ-BHC (Lindane)		0.0002	0.0002	0.2	0.20	ND .
Chloridane		0.0001	0.002	0.1,	0.10	ND
Chlorothalonil*				5.0	5.0	ND
4,4'-DDD			-	0.02	0.02	ND
4,4'-DDE				0.01	0.01	ND
4,4'-DDT	0.00000			0.02	0.02	ND
Dieldrin*	0.000002			0.02	0.02	ND
Endosulfan I	•	•	-		0.02	ND
Endosultan II				. 3	0.01	ND
Endosulfan sulfate			-		0.05	ND.
Endrin	,	0.002	0.002	0.1	. 0.1	ND
Endrin aldehyde	•	3.			0.05	ND
Heptachlor	•	0.00001	0.0004	0.01	0.01	ND
Heptachlor epoxide	•	0.00001	0.0002	0.01	0.01	ND
Hexachlorobenzene		0.001	0.001	0.5	0.5	ND
Hexachlorocyclo-	•					ND
pentadiene	•	0.05	0.05	1.0	1.0	ND .
Methoxychlor		0.04	0.04	10.0	10.0	ND
Propachlor*		•		0:5	0.5	ND
Toxaphene		0.003	0.003	1.0	1.0	ND
Polychlorinated		0.0005	0.0005	0.5	0.5	ND
biphenyls (PCB)			0.000	0.2	, 0.2	110
Trifluralin	,		*		0.01	ND
		•				
Organophosphorus Pesticido	es and Triazine	Herbicides#	:			
Alachlor		0.002	0.002	1.0	1.0	ND
Atrazine		0.003	0.003	1.0	1.0	ND
Bromacil*			•	10.0	10.0	ND
Butachlor*				0.38	0.38	ND
Diazinon	0.006			0.25	0.25	ND
Dimethoate*	0.001			10.0	10.0	ND

Table 2 (cont'd)

F						
Analyte	CDHS Action Level ¹ (mg/L)	CDHS MCL ¹ (mg/L)	USEPA MCL ² (mg/L)	CDHS DLR ³ (µg/L)	Minimum Reporting Levels (µg/L)	Analytical Results (µg/L)
Metalochlor*					0.5	ND
Metribuzin*	•				0.5	ND
Molinate	-	0.02	. •	2.0	2.0	ND
Prometon					1.0	ND
Prometryn*				2.0	2.0	ND
Simazine		0.004	0.004	1.0	1.0	ND
Thiobencarb		0.07(0.001**)		1.0	1.0	ND -
Organochlorine Herbic	ides [#] :					
Acifluorfen	,		•	,	0.5	ND
Bentazon		0.018		2.0	2.0	ND
2,4-D		0.07	0.07	10.0	10.0	ND
2,4-DB	-			•	2.0	ND
3,5-Dichlorobenzoic	·		•		1.0	ND
acid						
Dacthal (DCPA)	÷.	·			0.10	ND
Dalapon	•	0.2	0.2	10.0	10.0	ND
Dicamba*	•			1.5	1.5	ND
Dichlorprop					0.3	ND
Dinoseb		0.007	0.007	2.0	2.0	ND
Pentachlorophenol		0.001	0.001	0.2	0.2	ND
Picloram	•	0.5	0.5	1.0	1.0	ND
2,4,5-TP (Silvex)	•	0.05	0.05	1.0	1.0	ND
2,4,5-T		į			0.2	ND
Carbamate Pesticides -	Method 531#	•				
Aldicarb*	0.007		0.003+	3.0	2.0	ND
Aldicarb sulfone*	•	·	0.002^{+}	4.0	2.0	ND
Aldicarb sulfoxide*		•	0.004^{+}	3.0	2.0	ND
Baygon (Propoxur)	0.093		•		5.0	ND
Carbofuran		0.018	0.04	5.0	5.0	ND
Carbaryl*	0.7			5.0	2.0	ND
3-Hydroxycarbofuran*				3.0	2.0	ND
Methiocarb					3.0	ND
Methomyl*	•			2.0	2.0	ND
Oxamyl	· ·	0.2	0.2	20.0	2.0	ND

Table 2 (cont'd)

		··· ·· · · · · · · · · · · · · · · · ·				
Analyte	CDHS Action Level 1 (mg/L)	CDHS MCL ¹ (mg/L)	USEPA MCL ² (mg/L)	CDHS DLR ³ (µg/L)	Minimum Reporting Levels (µg/L)	Analytical Results (µg/L)
	(8')	(((1-8/	(18-7	(1-5)
Fumigants- Method 504#						
Dibromochloropropane (DBCP)	•	0.0002	0.0002	0.01	0.01	ND
Ethylene dibromide (EDB)		0.00005	0.00005	0.02	0.02	ND
				•		e e
SVOC - Method 525.2 #						
Benzo(a)pyrene		0.0002	0.0002	0.1	0.1	ND
Di(2-ethylhexyl)adipate		0.4	0.4	5 ·	5	ND
Di(2-ethylhexyl)		0.004	0.006	3	3	ND
phthalate						
Misc.	,	0.00		4.0	4.0) TD
Diquat [#]		0.02	0.02	4.0	4.0	ND ·
Diuron*		•		1.0	1.0	ND
Endothall [#]		0.1	0.1	45.0	45	ND
Glyphosate [#]		0.7	0.7	25.0	25	ND
Dioxin (2,3,7,8- TCDD)##	· 	3 x 10 ⁻⁸	3 x 10 ⁻⁸	5 x 10 ⁻⁶	5 x 10 ⁻⁶	· ND

- California Department of Health Services (CDHS) Drinking Water Standards and Action Levels (May 23, 2000 and November 13, 2000, respectively.)

 (http://www.dhs.cahwnet.gov/ps/ddwem/chemicals/chemindex.htm)
- 2 Federal Registers, January 30, 1991 and July 17, 1992.
- 3 CDHS required detection limits for purposes of reporting (DLR) (February 18, 2000) (http://www.dhs.cahwnet.gov/ps/ddwem/chemicals/chemindex.htm).
- * CDHS unregulated organic chemicals (May 23, 2000) (http://www.dhs.cahwnet.gov/ps/ddwem/chemicals/chemindex.htm)
- ** Secondary CDHS MCL
- # Analysis performed by Weck Laboratories.
- ## Analysis performed by Quantarra Environmental Services.
- + Effective date of January 1, 1993, has been postponed, Federal Register, May 27, 1992, pending revised MCL.



February 7, 2000

To:

Marshall K. Davis, Water Quality Laboratory Manager

From:

Bart Koch, Principal Chemist

Subject:

First Quarter 1999 Pesticide, Herbicide, and Semi-Volatile Organic

Compounds (SVOC) Monitoring Program

On March 22, 1999, samples from seven of Metropolitan's source waters and six treatment plant effluents (Table 1) were collected for the 1999 first quarter pesticide, herbicide, and SVOC monitoring program. On May 26, 1999, all sites were resampled for SVOC's due to quality control problems. Table 2 lists the analytes and provides regulatory information, which includes the California Department of Health Services' (CDHS') action levels and maximum contaminant levels (MCLs), U.S. Environmental Protection Agency's (USEPA) MCLs, CDHS' detection limits for purposes of reporting (DLRs), and the laboratories' established reporting levels. No pesticides, herbicides, or SVOCs were detected at or above the DLRs or the laboratory's reporting levels in Metropolitan's source or finished waters.

The analyses for organochlorine herbicides, organochlorine pesticides; organophosphorous pesticides, and triazine herbicides; fumigants, carbamate pesticides, glyphosate, diquat, diuron, endothall, and SVOCs (USEPA Methods 515.2, 508, 507, 504.1, 531.1, 547, 549.1, 632, 548.1, and 525.2 respectively) were performed by Weck Laboratories. Quantarra Environmental Services performed the analysis for dioxin (Method 1613A).

This sampling is part of Metropolitan's annual pesticide, herbicide, and SVOC monitoring program. This was the first of two quarters of monitoring that are required every three years. The next monitoring will be conducted in the third quarter of 1999.

ORIGINAL SIGNED BY

Bart Koch

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Attachments

Marshall K. Davis, Water Quality Laboratory Manager Page 2 February 7, 2000

cc w/attachments:

J. T. Wicke

M. H. Stewart

M. K. Davis

B. Koch

D. G. Sass

E. W. Crofts

M. S. Dale

Water Quality file

SAMPLE LOCATIONS FOR PESTICIDE, HERBICIDE, and SVOC MONITORING FIRST QUARTER 1999

Source Waters

Devil Canyon afterbay
Foothill Pressure Control
Structure (PCS)
Lake Havasu near Intake
Lake Mathews headworks
Lake Perris
Lake Skinner outlet conduit
San Jacinto Tunnel

Treated Waters

Diemer plant effluent Mills plant effluent Skinner plant #1 effluent Skinner plant #2 effluent Weymouth plant effluent Jensen plant effluent

PESTICIDE, HERBICIDE, and SVOC DETECTION LIMITS AND MAXIMUM CONTAMINANT LEVELS FIRST QUARTER 1999

<u>Analyte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ¹ (µg/L)	Laboratory Reporting Level (ug/L)	Analytical Results (ug/L)
Organochlorine Pesticides [#] :						
Aldrin* α-BHC β-BHC δ-BHC γ-BHC (Lindane) Chlordane Chlorothalonil* 4,4'-DDD 4,4'-DDE 4,4'-DDT Dieldrin* Endrin Heptachlor Heptachlor epoxide Hexachlorobenzene Hexachlorocyclo- Pentadiene Methoxychlor Propachlor* Toxaphene Polychlorinated Biphenyls (PCB) Organophosphorus Pesticides and	0.00005 0.0007 0.0003	0.0002 0.0001 0.002 0.00001 0.00001 0.001 0.05 0.04 0.003 0.0005	0.0002 0.002 0.002 0.0004 0.0002 0.001 0.05 0.04 0.003 0.0005	0.075 0.5 0.2 0.1 5.0 0.02 0.01 0.02 0.02 0.1 0.01 0.01 0.5 1.0 1.0 0.5	0.08 0.01 0.05 0.05 0.20 0.10 5.0 0.02 0.01 0.02 0.02 0.1 0.01 0.01 0.5 1.0 1.0 0.5	
Triazine Herbicides*: Alachlor Atrazine Bromacil* Butachlor* Diazinon Dimethoate* Malathion Metalochlor* Metribuzin*	0.014 0.140 0.160	0.002 0.003	0.002 0.003	1.0 1.0 10.0 0.38 0.25 10.0	1.0 1.0 10.0 0.38 0.25 10.0 0.5 0.5	ND ND ND ND ND ND ND ND

<u>Analyte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (ug/L)	Laboratory Reporting Level (ug/L)	Analytical Results (ug/L)	
Organophosphorus Pesticides and Triazine Herbicides#:							-
Molinate Prometryn* Simazine Thiobencarb	•	0.02 0.004 0.07 (0.001**)	0.004	2.0 2.0 1.0	2.0 2.0 1.0 1.0	ND ND ND	
Organochlorine <u>Herbicides[#]:</u>		·	·				
Bentazon Dalapon Dicamba* Dinoseb Pentachlorophenol Picloram 2,4-D 2,4,5-T (Silvex) Carbamates Method 632*:		0.018 0.2 0.007 0.001 0.5 0.07 0.05	0.2 0.007 0.001 0.5 0.07 0.05	2.0 10.0 1.5 2.0 0.2 1.0 10.0	2.0 10.0 0.081 2.0 0.2 1.0 10.0	ND ND ND ND ND ND ND	
Diuron*			A Section 1	1.0	1.0	ND	
Carbamates Method 531.1#:				Mr. Walter		,	
Aldicarb* Aldicarb sulfone* Aldicarb sulfoxide* Baygon(Propoxur) Carbofuran Carbaryl* 3-Hydroxycarbofuran* Methomyl*	0.01 0.09 0.060	0.018	0.003 ⁺ 0.002 ⁺ 0.004 ⁺ 0.04	3.0 4.0 3.0 5.0 5.0 3.0 2.0	2 2 2 1 2 2 2 2	ND ND ND ND ND ND ND	
Oxamyl	•	0.2	0.2	20.0	2	ND	

<u>Analyte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Laboratory Reporting Level (ug/L)	Analytical Results (µg/L)
Fumigant Method 504.1#:			·			
Dibromochloropropane (DBCP)		0.0002	0.0002	0.01	0.01	ND
Ethylene dibromide (EDB)		0.00005	0.00005	0.02	0.02	ND
SVOC Method 525.2#:				•		
Benzo(a)pyrene		0.0002	0.0002	0.1	0.1	ND
Di(2-ethylhexyl)adipate		0.4	0.4	5	5	ND
Di(2-		0.004	0.006	3	3 .	ND
ethylhexyl)phthalate	-		•			
<u>Miscellaneous</u>	~		•			
Diquat [#]		0.02	0.02	4.0	4.0	ND
Endothall#		0.1	0.1	45.0	45	ND
Glyphosate#	•	0.7	0.7	25.0	25	ND
Dioxin (2,3,7,8- TCDD)##		3×10^{-8}	3×10^{-8}	5×10^{-6}	5×10^{-6}	ND

California Department of Health Services (CDHS) action levels (<u>www.dhs.cahwnet.gov</u> update January 7,1999).

CDHS maximum contaminant level (MCL) (<u>www.dhs.cahwnet.gov</u> update January 7,1999).

³ U.S. Environmental Protection Agency, MCLs, <u>Federal Registers</u>, January 30, 1991 and July 17, 1992.

CDHS required detection limits for purposes of reporting (DLR). www.dhs.cahwnet.gov update January 7,1999.

* CDHS unregulated organic chemicals (www.dhs.cahwnet.gov update January 7,1999)

Effective date of January 1, 1993, has been postponed, <u>Federal Register</u>, May 27, 1992, pending revised MCL.

Analysis performed by Weck Laboratories.

*** Analysis performed by Quantarra Environmental Services.

** Secondary CDHS MCL.



February 7, 2000

To:

Marshall K. Davis, Water Quality Laboratory Manager

From:

Bart Koch, Principal Chemist

Subject:

Third Quarter 1999 Pesticide, Herbicide, and Semi-Volatile Organic

Compounds (SVOC) Monitoring Program

On September 1, 1999, samples from seven of Metropolitan's source waters and six treatment plant effluents (Table 1) were collected for the 1999 third quarter pesticide, herbicide, and SVOC monitoring program. Table 2 lists the analytes and provides regulatory information, which includes the California Department of Health Services' (CDHS') action levels and maximum contaminant levels (MCLs), U.S. Environmental Protection Agency's (USEPA) MCLs, CDHS' detection limits for purposes of reporting (DLRs), and the laboratories' established reporting levels. No pesticides, herbicides, or SVOCs were detected at or above the DLRs or the laboratory's reporting levels in Metropolitan's source or finished waters.

The analyses for organochlorine herbicides, organochlorine pesticides; organophosphorous pesticides, and triazine herbicides; fumigants, carbamate pesticides, glyphosate, diquat, diuron, endothall, and SVOCs (USEPA Methods 515.2, 508, 507, 504.1, 531.1, 547, 549.1, 632, 548.1, and 525.2 respectively) were performed by Weck Laboratories. Quantarra Environmental Services performed the analysis for dioxin (Method 1613A).

This sampling is part of Metropolitan's annual pesticide, herbicide, and SVOC monitoring program. This was the second of two quarters of monitoring which is required every three years. The next monitoring will be conducted in the third quarter of 2000.

ORIGINAL SIGNED BY

Bart Koch Kak

EWC:smh

h:\reports\bk pest herb svoc 3q99.doc

Attachments (2)

Marshall K. Davis, Water Quality Laboratory Manager Page 2 February 7, 2000

cc w/attachments:

J. T. Wicke

M. H. Stewart

M. K. Davis

D. G. Sass

B. Koch

E. W. Crofts

M. S. Dale

Water Quality file

SAMPLE LOCATIONS FOR PESTICIDE, HERBICIDE, and SVOC MONITORING THIRD QUARTER 1999

Source Waters

Devil Canyon afterbay
Foothill Pressure Control
Structure (PCS)
Lake Havasu near Intake
Lake Mathews headworks
Lake Perris
Lake Skinner outlet conduit
San Jacinto Tunnel

Treated Waters

Diemer plant effluent Mills plant effluent Skinner plant #1 effluent Skinner plant #2 effluent Weymouth plant effluent Jensen plant effluent

PESTICIDE, HERBICIDE, and SVOC DETECTION LIMITS AND MAXIMUM CONTAMINANT LEVELS THIRD QUARTER 1999

<u>Analyte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (<u>ug/L)</u>	Laboratory Reporting Level (ug/L)	Analytical Results (µg/L)
Organochlorine Pesticides#:			,		, 	
Aldrin* ∞-BHC β-BHC γ-BHC (Lindane) Chlordane Chlorothalonil* 4,4'-DDD 4,4'-DDE 4,4'-DDT	0.00005 0.0007 0.0003	0.0002 0.0001	0.0002 0.002	0.075 0.5 0.2 0.1 5.0 0.02 0.01 0.02	0.08 0.01 0.05 0.05 0.20 0.10 5.0 0.02 0.01	ND ND ND ND ND ND ND ND
Dieldrin* Endrin Heptachlor Heptachlor epoxide Hexachlorobenzene Hexachlorocyclo- Pentadiene Methoxychlor Propachlor* Toxaphene	0.00005	0.002 0.00001 0.00001 0.001 0.05 0.04	0.002 0.0004 0.0002 0.001 0.05 0.04	0.02 0.02 0.1 0.01 0.01 0.5 1.0 10.0 0.5 1.0	0.02 0.02 0.1 0.01 0.01 0.5 1.0 10.0 0.5 1.0	ND ND ND ND ND ND ND ND ND
Polychlorinated Biphenyls (PCB) Organophosphorus Pesticides and Triazine Herbicides#	<u>:</u>	0.0005	0.0005	0.5	0.5	ND
Alachlor Atrazine Bromacil* Butachlor* Diazinon Dimethoate* Malathion Metalochlor* Metribuzin* Molinate	0.014 0.140 0.160	0.002 0.003	0.002 0.003	1.0 1.0 10.0 0.38 0.25 10.0	1.0 1.0 10.0 0.38 0.25 10.0 0.5 0.5 0.5	ND ND ND ND ND ND ND ND

<u>Analyte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Laboratory Reporting Level (µg/L)	Analytical Results (µg/L)
Organophosphorus						
Pesticides and <u>Triazine Herbicides[#]:</u>						
Prometryn*	•	,	•	2.0	2.0	ND
Simazine Thiobencarb		0.004 0.07(0.001**)	0.004	1.0 1.0	1.0 1.0	· ND ND
		0.07(0.001		. 1.0		
Organochlorine <u>Herbicides[#]:</u>						. •
Bentazon		0.018		2.0	2.0	ND ND
Dalapon Dicamba*		0.2	0.2	10.0 1.5	10.0 0.081	ND
Dinoseb		0.007	0.007	2.0	2.0	ND .
Pentachlorophenol	•	0.001	0.001	0.2	0.2	ND ND
Picloram 2,4-D		- 0.5 0.07	0.5 0.07	1.0 10.0	1.0 10.0	ND
2,4,5-T (Silvex)		0.05	0.05	1.0	1.0	ND
Carbamates Method 632 [#]	-t.		\$ 			
Diuron*				1.0	1.0	ND
Carbamates						
Method 531.1#				,		
Aldicarb*	0.01	•	0.003 ⁺ 0.002 ⁺	3.0	2	ND ND
Aldicarb sulfone* Aldicarb sulfoxide*			0.002 0.004 ⁺	4.0 3.0	2 2	ND ND
Baygon(Propoxur)	0.09		٠	. •	. 1	ND
Carbofuran	0.000	0.018	0.04	5.0	2	ND
Carbaryl* 3-Hydroxycarbofuran*	0.060			5.0 3.0	2 2	ND ND
Methomyl*		,		2.0	2	ND
Oxamyl		0.2	0.2	20.0.	2	ND
Fumigant Method 504.1 [#]			• .			
Dibromochloropropane (DBCP)		0.0002	0.0002	0.01	0.01	ND
Ethylene dibromide (EDB)		0.00005	0.00005	0.02	0.02	ND

<u>Analyte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Laboratory Reporting Level (µg/L)	Analytical Results (µg/L)
SVOC Method 525.2#		•		·		
Benzo(a)pyrene Di(2-ethylhexyl)adipate Di(2- ethylhexyl)phthalate	,	0.0002 0.4 0.004	0.0002 0.4 0.006	0.1 5 3	0.1 5 3	ND ND ND
Misc.			,			
Diquat [#]		0.02	0.02	4.0	4.0	ND,
Endothall [#]		0.1	0.1	45.0	45	ND
Glyphosate#		0.7	0.7	25.0	25	ND
Dioxin (2,3,7,8- TCDD)##		3×10^{-8}	3 x 10 ⁻⁸	5 x 10 ⁻⁶	1.5 -5 x 10 ⁻⁶	ND

² CDHS maximum contaminant level (MCL) (<u>www.dhs.cahwnet.gov</u> update January 7,1999).

* CDHS unregulated organic chemicals (www.dhs.cahwnet.gov update January 7,1999)

California Department of Health Services (CDHS) action levels (<u>www.dhs.cahwnet.gov</u> update January 7,1999).

³ U.S. Environmental Protection Agency, MCLs, <u>Federal Registers</u>, January 30, 1991 and July 17, 1992.

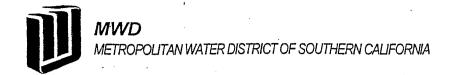
CDHS required detection limits for purposes of reporting (DLR). www.dhs.cahwnet.gov update January 7,1999.

Effective date of January 1, 1993, has been postponed, <u>Federal Register</u>, May 27, 1992, pending revised MCL.

[#] Analysis performed by Weck Laboratories.

^{##} Analysis performed by Quantarra Environmental Services.

^{**} Secondary CDHS MCL



February 7, 2000

To:

Marshall K. Davis, Water Quality Laboratory Manager

From:

Bart Koch, Principal Chemist

Subject:

First Ouarter 1999 Pesticide, Herbicide, and Semi-Volatile Organic

Compounds (SVOC) Monitoring Program

On March 22, 1999, samples from seven of Metropolitan's source waters and six treatment plant effluents (Table 1) were collected for the 1999 first quarter pesticide, herbicide, and SVOC monitoring program. On May 26, 1999, all sites were resampled for SVOC's due to quality control problems. Table 2 lists the analytes and provides regulatory information, which includes the California Department of Health Services' (CDHS') action levels and maximum contaminant levels (MCLs), U.S. Environmental Protection Agency's (USEPA) MCLs, CDHS' detection limits for purposes of reporting (DLRs), and the laboratories' established reporting levels. No pesticides, herbicides, or SVOCs were detected at or above the DLRs or the laboratory's reporting levels in Metropolitan's source or finished waters.

The analyses for organochlorine herbicides, organochlorine pesticides; organophosphorous pesticides, and triazine herbicides; fumigants, carbamate pesticides, glyphosate, diquat, diuron, endothall, and SVOCs (USEPA Methods 515.2, 508, 507, 504.1, 531.1, 547, 549.1, 632, 548.1, and 525.2 respectively) were performed by Weck Laboratories. Quantarra Environmental Services performed the analysis for dioxin (Method 1613A).

This sampling is part of Metropolitan's annual pesticide, herbicide, and SVOC monitoring program. This was the first of two quarters of monitoring that are required every three years. The next monitoring will be conducted in the third quarter of 1999.

CRIGINAL SIGNED BY ~ 2/s/0

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Attachments

Marshall K. Davis, Water Quality Laboratory Manager Page 2 February 7, 2000

cc w/attachments:

J. T. Wicke

M. H. Stewart

M. K. Davis

B. Koch

D. G. Sass

E. W. Crofts

M. S. Dale

Water Quality file

SAMPLE LOCATIONS FOR PESTICIDE, HERBICIDE, and SVOC MONITORING FIRST QUARTER 1999

Source Waters

Devil Canyon afterbay
Foothill Pressure Control
Structure (PCS)
Lake Havasu near Intake
Lake Mathews headworks
Lake Perris
Lake Skinner outlet conduit
San Jacinto Tunnel

Treated Waters

Diemer plant effluent Mills plant effluent Skinner plant #1 effluent Skinner plant #2 effluent Weymouth plant effluent Jensen plant effluent

PESTICIDE, HERBICIDE, and SVOC DETECTION LIMITS AND MAXIMUM CONTAMINANT LEVELS FIRST QUARTER 1999

<u>Analyte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Laboratory Reporting Level (ug/L)	
Organochlorine Pesticides#:		-	•			
Aldrin* α-BHC β-BHC δ-BHC γ-BHC (Lindane) Chlordane Chlorothalonil* 4,4'-DDD 4,4'-DDE	0.00005 0.0007 0.0003	0.0002 0.0001	0.0002 0.002	0.075 0.5 0.2 0.1 5.0 0.02 0.01	0.08 0.01 0.05 0.05 0.20 0.10 5.0 0.02 0.01	ND ND ND ND ND ND ND ND ND ND ND ND ND N
4,4'-DDT Dieldrin* Endrin Heptachlor Heptachlor epoxide Hexachlorobenzene Hexachlorocyclo- Pentadiene	0.00005	0.002 0.00001 0.00001 0.001	0.002 0.0004 0.0002 0.001	0.02 0.02 0.1 0.01 0.01 0.5	0.02 0.02 0.1 0.01 0.01 0.5	ND ND ND ND ND ND ND ND
Methoxychlor Propachlor* Toxaphene Polychlorinated Biphenyls (PCB)		0.04 0.003 0.0005	0.04 0.003 0.0005	10.0 0.5 1.0 0.5	10.0 0.5 1.0 0.5	ND ND ND ND
Organophosphorus Pesticides and <u>Triazine Herbicides</u> #:			•			
Alachlor Atrazine Bromacil* Butachlor* Diazinon Dimethoate* Malathion Metalochlor* Metribuzin*	0.014 0.140 0.160	0.002 0.003	0.002 0.003	1.0 1.0 10.0 0.38 0.25 10.0	1.0 1.0 10.0 0.38 0.25 10.0 0.5 0.5	ND ND ND ND ND ND ND

<u>Analvte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (ug/L)	Laboratory Reporting Level (ug/L)	Analytical Results (ug/L)
Organophosphorus Pesticides and <u>Triazine Herbicides</u> #:			. •			
Molinate Prometryn* Simazine Thiobencarb		0.02 0.004 0.07 (0.001**)	0.004	2.0 2.0 1.0 1.0	2.0 2.0 1.0 1.0	ND ND ND ND
Organochlorine <u>Herbicides[#]:</u>		•				
Bentazon Dalapon Dicamba* Dinoseb Pentachlorophenol Picloram 2,4-D 2,4,5-T (Silvex)	4.	0.018 0.2 0.007 0.001 0.5 0.07 0.05	0.2 0.007 0.001 0.5 0.07 0.05	2.0 10.0 1.5 2.0 0.2 1.0 10.0	2.0 10.0 0.081 2.0 0.2 1.0 10.0	ND N
Carbamates Method 632*: Diuron* Carbamates Method 531.1*:				1.0	1.0	ŅD
Aldicarb* Aldicarb sulfone* Aldicarb sulfoxide* Baygon(Propoxur) Carbofuran Carbaryl* 3-Hydroxycarbofuran* Methomyl* Oxamyl	0.01 0.09 0.060	0.018	0.003 ⁺ 0.002 ⁺ 0.004 ⁺ 0.04	3.0 4.0 3.0 5.0 5.0 3.0 2.0 20.0	2 2 2 1 2 2 2 2 2 2	ND N

<u>Analyte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Laboratory Reporting Level (µg/L)	Analytical Results (ug/L)
Fumigant Method 504.1#:						
Dibromochloropropane (DBCP)		0.0002	0.0002	0.01	0.01	ND
Ethylene dibromide (EDB)		0.00005	0.00005	0.02	0.02	ND
SVOC Method 525.2#:						
Benzo(a)pyrene		0.0002	0.0002	0.1	0.1	ND
Di(2-ethylhexyl)adipate		0.4	0.4	5	5	ND
Di(2- ethylhexyl)phthalate		0.004	0.006	3	3	ND
<u>Miscellaneous</u>	~					
Diquat [#]		0.02	0.02	4.0	4.0	ND
Endothall#		0.1	0.1	45.0	45	ND
Glyphosate#	•	0.7	0.7	25.0	25	ND
Dioxin (2,3,7,8- TCDD)##		3 x 10 ⁻⁸	3×10^{-8}	5 x 10 ⁻⁶	5 x 10 ⁻⁶	ND

California Department of Health Services (CDHS) action levels (<u>www.dhs.cahwnet.gov</u> update January 7,1999).

² CDHS maximum contaminant level (MCL) (<u>www.dhs.cahwnet.gov</u> update January 7,1999).

CDHS required detection limits for purposes of reporting (DLR). www.dhs.cahwnet.gov update January 7,1999.

* CDHS unregulated organic chemicals (www.dhs.cahwnet.gov update January 7,1999)

Analysis performed by Weck Laboratories.

** Secondary CDHS MCL.

U.S. Environmental Protection Agency, MCLs, <u>Federal Registers</u>, January 30, 1991 and July 17, 1992.

Effective date of January 1, 1993, has been postponed, <u>Federal Register</u>, May 27, 1992, pending revised MCL.

^{##} Analysis performed by Quantarra Environmental Services.



Date:

April 12, 1999

To:

Marshall K. Davis, Water Quality Laboratory Manager

From:

Bart Koch, Principal Chemist

Subject:

1998 Annual Pesticide, Herbicide, and Semi-Volatile (SVOC)

Monitoring Program

- 1. On December 8, 1998, samples from seven of Metropolitan's source waters and five treatment plant effluents (Table 1) were collected for the 1998 annual pesticide, herbicide, and SVOC monitoring program. The Jensen Filtration Plant was out of service at the time of sampling and therefore, an effluent sample could not be collected. However, the influent (source water) to the Jensen plant was collected. Table 2 lists the analyses and provides regulatory information, which includes the California Department of Health Services' (CDHS') action levels and maximum contaminant levels (MCLs), U.S. Environmental Protection Agency's (USEPA) MCLs, CDHS' detection limits for purposes of reporting (DLRs), and the laboratories' established detection limits. No pesticides, herbicides, or SVOCs were detected at or above the DLRs in Metropolitan's source or finished waters.
- 2. The analyses for organochlorine herbicides, organochlorine pesticides; organophosphorous pesticides and triazine herbicides; fumigants, carbamate pesticides, glyphosate, diquat, diuron, endothall, and SVOCs (USEPA Methods 515.2, 508, 507, 504.1, 515.1, 531.1, 547, 549.1, 632, 548.1, and 525.2, respectively) were performed by Weck Laboratories. The analysis for dioxin was performed by Quantarra Environmental Services (Method 1613A).

This represents the 1998 annual monitoring program for pesticides, herbicides, and SVOCs. The next monitoring will be conducted in the first quarter of 1999.

ORIGINAL SIGNED BY

Bart Koch

EWC:lk

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Attachments (2)

Marshall K. Daivs, Water Quality Laboratory Manager Page 2 April 12, 1999

cc w/attachments:

J. W. Malinowski

M. D. Beuhler

R. L. Wolfe J. M. Bruno

M. K. Davis

D. Sass

B. Koch

E. W. Crofts

M. S. Dale

Water Quality file

TABLE 1

SAMPLE LOCATIONS FOR PESTICIDE, HERBICIDE, and SVOC MONITORING ANNUAL 1998

Source Waters

Devil Canyon afterbay
Foothill Pressure Control
Structure (PCS)
Lake Havasu near Intake
Lake Mathews headworks
Lake Perris
Lake Skinner outlet conduit
San Jacinto Tunnel

Treated Waters

Diemer plant effluent Mills plant effluent Skinner plant #1 effluent Skinner plant #2 effluent Weymouth plant effluent

TABLE 2

PESTICIDE, HERBICIDE, and SVOC DETECTION LIMITS AND MAXIMUM CONTAMINANT LEVELS 1998 ANNUAL

<u>Analyte</u>	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Detection Limits (μg/L)
Organochlorine Pesticides #:			•		
Aldrin* α-BHC β-BHC δ-BHC γ-BHC (Lindane) Chlordane Chlorothalonil* 4,4'-DDD 4,4'-DDE 4,4'-DDT Dieldrin* Endrin Heptachlor Heptachlor epoxide Hexachlorobenzene Hexachlorocyclopentadiene Methoxychlor Propachlor* Toxaphene Polychlorinated Biphenyls (PCB)	0.00005 0.0007 0.0003	0.0002 0.0001 0.002 0.00001 0.00001 0.005 0.04 0.003 0.0005	0.0002 0.002 0.002 0.0004 0.0002 0.001 0.05 0.04 0.003 0.0005	0.075 0.5 0.2 0.1 5.0 0.02 0.01 0.02 0.02 0.1 0.01 0.5 1.0 10.0 0.5 1.0 0.5	0.08 0.01 0.05 0.05 0.20 0.10 5.0 0.02 0.01 0.02 0.1 0.01 0.01 0.5 1.0 10.0 0.5
Organophosphorus Pesticides and Triazine	Herbicides #:		,		-
Alachlor Atrazine Bromacil* Butachlor* Diazinon* Dimethoate*	0.014 0.140	0.002 0.003	0.002 0.003	1.0 1.0 10.0 0.38 0.25 10.0	1.0 1.0 10.0 0.38 0.25 10.0

TABLE 2 (continued)

Analyte	CDHS Action Level ¹ (mg/L)	CDHS MCL ² (mg/L)	USËPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Detection Limits (µg/L)
Organophosphorus Pesticides and Triazine Herbicides # (continued):				•	
Metalochlor* Metribuzin* Molinate Prometryn* Simazine Thiobencarb		0.02 0.004 0.07(0.00	0.004 1**)	2.0 2.0 1.0 1.0	0.5 0.5 2.0 2.0 1.0
Organochlorine Herbicides#:	, .				
Bentazon Dalapon Dicamba* Dinoseb Pentachlorophenol Picloram 2,4-D 2,4,5-TP (Silvex)		0.018 0.2 0.007 0.001 0.5 0.07 0.05	0.2 0.007 0.001 0.5 0.07 0.05	2.0 10.0 1.5 2.0 0.2 1.0 10.0 1.0	2.0 10.0 0.081 2.0 0.2 1.0 10.0 1.0
Carbamates - Method 632# Diuron*	·		·	1.0	1.0
Carbamates - Method 531#				· ·	
Aldicarb* Aldicarb sulfone* Aldicarb sulfoxide*	0.01		0.003 ⁺ 0.002 ⁺ 0.004 ⁺	3.0 4.0 3.0	2 2 2
Baygon (Propoxur) Carbofuran Carbaryl* 3-Hydroxycarbofuran*	0.090 0.060	0.018	0.04	5.0 5.0 3.0 2.0	2 1 2 2 3 2 2
Methomyl* Oxamyl		0.2	0.2	20.0	2

TABLE 2 (continued)

<u>Analyte</u>	CDHS Action Level ¹ (µg/L)	CDHS MCL ² (mg/L)	USEPA MCL ³ (mg/L)	CDHS DLR ⁴ (µg/L)	Detection Limits <u>(μg/L)</u>
Fumigants- Method 504 #			•		
Dibromochloropropane (DBCP) Ethylene dibromide		0.0002	0.0002	0.01	0.01
(EDB)		0.00005	0.00005	0.02	0.02
SVOC - Method 525.2 #					
Benzo(a)pyrene Di(2-etyylhexy)adipate Di(2-ethylhexyl)phthalate		0.0002 0.4 0.004	0.0002 0.4 0.006	0.1 5 3	0.1 5 3
Misc.					
Diquat#		0.02	0.02	4.0	4.0
Endothall#		0.1	0.1	45.0	45
Glyphosate#		0.7	0.7	25.0	25
Dioxin (2,3,7,8-TCDD)##	! ,	3 x 10 ⁻⁸	3 x 10 ⁻⁸	5 x 10 ⁻⁶	$0.48-1.5 \times 10^{-6}$

^{1.} California Department of Health Services (CDHS) action levels (www.dhs.cahwnet.gov update January 7,1999).

^{2.} CDHS maximum contaminant level (MCL) (www.dhs.cahwnet.gov update January 7,1999).

^{3.} Environmental Protection Agency MCLs, <u>Federal Registers</u>, January 30, 1991, and July 17, 1992.

^{4.} CDHS required detection limits for purposes of reporting (DLR). www.dhs.cahwnet.gov update November 19, 1998.

^{*} CDHS unregulated organic chemicals (www.dhs.cahwnet.gov update January 7,1999)

⁺ Effective date of January 1, 1993, has been postponed, <u>Federal Register</u>, May 27, 1992, pending revised MCL.

[#] Analysis performed by Weck Laboratories.

^{##} Analysis performed by Quantarra Environmental Services.

^{**} Secondary CDHS MCL.

MWD

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

February 27, 1998

To:

Water Quality Laboratory Manager M. K. Davis MU

From:

Principal Chemist Bart Koch

Subject:

Annual Pesticide, Herbicide, and Semi-Volatile Organic Compound (SVOC) Monitoring Program -

Third Ouarter 1997

1. On September 17 and 18, 1997, samples from seven of Metropolitan's source waters and six treatment plant effluents (Table 1) were collected for the 1997 annual pesticide and herbicide and semi-volatile organic compound (SVOC) monitoring program. Table 2 lists the analytes and provides regulatory information, which includes the California Department of Health Services' (CDHS') action levels and maximum contaminant levels (MCLs), U.S. Environmental Protection Agency's (USEPA) MCLs, CDHS' detection limits for purposes of reporting (DLRs), and the laboratories' established detection limits. No pesticides, herbicides, or SVOCs were detected at or above the DLRs in Metropolitan's source or finished waters.

- 2. The analyses for organochlorine herbicides, organochlorine pesticides; organophosphorous pesticides and triazine herbicides; fumigants, carbamate pesticides, glyphosate, diquat, diuron, endothall, and SVOC (USEPA Methods 515.2, 508, 507, 504.1, 515.1, 531.1, 547, 549.1, 632, 548.1, and 525.2, respectively) were performed by Weck Laboratories. The analysis for dioxin was performed by Quantarra Environmental Services (Method 1613A).
- 3. This annual sampling was the only sampling for pesticides, herbicides, and SVOCs conducted in 1997. The next annual monitoring will be conducted in the fourth quarter of 1998.

Bart Koch

BK/EC/saj

TABLE 1

SAMPLE LOCATIONS FOR PESTICIDE, HERBICIDE, and SVOC MONITORING THIRD QUARTER 1997

Source Waters

Devil Canyon afterbay
Foothill Pressure Control
Structure (PCS)
Lake Havasu near Intake
Lake Mathews headworks
Lake Perris
Lake Skinner outlet conduit
San Jacinto Tunnel

Treated Waters

Diemer plant effluent
Jensen plant effluent
Mills plant effluent
Skinner plant #1 effluent
Skinner plant #2 effluent
Weymouth plant effluent

Table 2 (continued)

•			•		
	CDHS Action Level ¹	CDHS MCL ²	USEPA MCL ³	CDHS DLR ⁴	Detection Limits
Analyte	(mg/L)	(mg/L)	(mg/L)	(ug/L)	(µg/L)
Organophosphorus Pesticides and Triazine Herbicides # (continued):					
Malathion Metalochlor* Metribuzin*	0.160	÷			0.5 0.5 0.5
Molinate Prometryn*	. •	0.02		2.02.0	
Simazine Thiobencarb		0.004 0.07(0.00	0.004 01)**	1.01.0)——
Organochlorine Herbicides#:	, -·			r	•
Bentazon Dalapon Dicamba*		0.018 0.2	0.2	2.0 10.0 1.5	2.0 10.0 0.081
Dinoseb Pentachlorophenol Picloram		0.007 0.001 0.5	0.007 0.001 0.5	2.0 0.2 1.0	2.0 0.2 1.0
2,4-D 2,4,5-TP (Silvex)		0.07 0.05	0.07	10.0	10.0
Carbamates - Method 632	<u>#</u>				
Diuron*				1.0	1.0
Carbamates - Method 531	#.				
Aldicarb* Aldicarb sulfone* Aldicarb sulfoxide*	10		0.003 ⁺ 0.002 ⁺ 0.004 ⁺	3.0 4.0 3.0	2 2 2
Baygon (Propoxur)(0.09 Carbofuran Carbaryl* 3-Hydroxycarbofuran*	0.060	0.018	0.04	1) —— 5.0 5.0 3.0	2 2 2 2 2 2
Methomyl* Oxamyl		0.2	0.2	2.0	2

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