E N T R I X

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Since 1984 - Environmental Excellence

326903

July 28, 1999

Mark Johnson
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite1400
Oakland, CA 94612

Re: Modifications to ENTRIX's Draft QAPP for Sherwin-Williams Emeryville Facility and Addendum

Dear Mr. Johnson:

As set out in the Regional Water Quality Control Board (RWQCB) Order 98-009, ENTRIX, on behalf of Sherwin-Williams Company, is providing the attached set of modifications as an Addendum to the ENTRIX Draft Quality Assurance Project Plan for the Site Investigation of the Sherwin-Williams Facility, Emeryville, California, April 30, 1998 (Draft QAPP). The attached modifications contain the specifications for the current analytical laboratory and consultant conducted the Site Investigation, which are different from the firms listed in the Draft QAPP. The analytical laboratory currently conducting the analyses for this investigation is Curtis & Tompkins of Berkeley, California, and the consultant conducting this investigation is ENTRIX.

As stated in the July 16, 1998, Draft QAPP Addendum letter, a Workplan Addendum was produced in consultation with the Consultative Work Group (CWG). This Workplan Addendum, dated January 1999, presented the data gaps analysis, which identified new sampling locations. The suite of matrices and analytical methods to be analyzed under the Workplan Addendum did not change significantly from that described in the Draft QAPP. Therefore, this letter of modifications will be an addendum to the Draft QAPP, and the Draft QAPP will not be revised.

The following sections of the Draft QAPP, which reflect the laboratory and consultant specific information, are superceded by this addendum.

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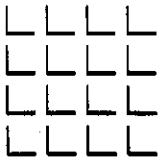
ENVIRONMENTAL PROTECTION



- Section 2.1:

For Section 2.1 Project Organization and Roles and Responsibilities, the roles and the respective responsibilities have not changed only the individuals filling each role.

Project Manager – Sandra Maxfield, of ENTRIX
Quality Assurance Manager and Project Chemist – Linda Wilhelm, of ENTRIX
Field Team Leader – Kim Jolitz, of ENTRIX
Lead Risk Assessor – Winifred Curley, of ENTRIX
Data Manager – Tricia Winter, of Weston
Laboratory Project Manager – Carol Wortham, of Curtis & Tompkins

- Section 3.4

Modifications to laboratory specifications presented in Section 3.4 - Analytical Methods Requirements are addressed in the June 10, 1999, letter from Curtis & Tompkins (attached). Excerpts from Curtis & Tompkins' Quality Assurance Management Plan replace appendices B through E. The key modification of Curtis & Tompkins is that they will not report sample concentrations that are between the reporting limit and the method detection limit (MDL), as these would be estimated concentrations. Therefore, the lowest arsenic reporting limit for water samples will be 5.0 micrograms per liter (µg/l), as opposed to the preceeding laboratory's MDL of 1.3 µg/l.

In addition to these modifications to the Draft QAPP, this letter also provides the modification to the sample designations described in Section F.5.2 of the Sampling and Analysis Plan (SAP) (Appendix F of the Workplan Addendum). The framework of sample designation scheme has been maintained. However, the sample number will not "blind" to the laboratory by translating the sample location information into numeric codes. The field duplicate samples, which had been designated by adding a "D" to the parent sample number, will be "blind" to the laboratory. The component of the parent sample number that designates the individual borehole, will be converted to a "90" series number. For example, if a groundwater sample SA-BH-01-062599 is collected in duplicate, then the field duplicate sample number would be SA-BH-90-062599. The sample being duplicated will be noted in the daily field log.

These modifications are an integral part of the Draft QAPP and SAP, and should be attached to the original documents.

If you have any questions, please contact me directly.

Sincerely,

ENTRIX, Inc.

Linda Wilhelm
Environmental Scientist
LW/lw

cc: Distribution List
Stephen Clough, Weston

Curtis & Tompkins, Ltd.

June 10, 1999

Ms. Linda DeMartino
ENTRIX Inc.
Walnut Creek, CA

Subject: Variances to the Quality Assurance Project Plan (QAPP) for Site Investigation at the Sherwin-Williams Facility in Emeryville, California, April 27, 1998

Dear Ms. DeMartino,

Curtis & Tompkins (C&T) would like to submit variance requests regarding analytical services in support of the Sherwin-Williams Facility in Emeryville, based on the Quality Assurance Project Plan dated April 27, 1998. It is important to the success of the project that all issues are addressed prior to sample receipt. We are committed to providing services which meet your needs and meet project data quality objectives.

General Comments

- Curtis & Tompkins will analyze a matrix spike and matrix spike duplicate if sufficient sample volume is provided. If the laboratory does not receive sufficient sample volume to perform matrix spikes, a blank spike and blank spike duplicate will be used to evaluate precision and accuracy.

- Curtis & Tompkins would prefer to use method EPA 3520 continuous liquid/liquid extraction for extractable water samples rather than method EPA 3510 separatory extraction mentioned in Table 3-2, page 3-21, as method EPA 3520 minimizes matrix interferences and improves recoveries.

- Curtis and Tompkins would prefer not to report data between the MDL and the reporting limit as stated in section 3.4.2, page 3-20, as this is a technically unsound practice; project reporting limits should be based on the DQO process. Due to LIMS programming limitations we cannot report levels lower than our standard reporting limits for metals.

- Curtis and Tompkins would prefer to use method EPA 300.0 for sulfate and chloride analysis rather than the methods stated in Table 3-2, page 3-21.

- Curtis and Tompkins prefers to use our method performance requirements rather than Quanterra's as referenced in Section 3.4.3.

- Curtis and Tompkins hardcopy reports for the TPH analyses use "<" for results less than the RL, in place of the "U"-flag as mentioned in Table 5-1, page 5-6. Reports for all other analyses use "ND". The software programs used to produce the hardcopy reports do not allow substitution of different data qualifier flags, but the electronic deliverables can reflect either the flag shown on the hardcopy or the flags described in the QAPP.

- Curtis and Tompkins would prefer to use the currently promulgated versions of the analytical methods (6010B, 8270C, 8260B) rather than those referenced in Table 8.

- Curtis and Tompkins requires a six sample per submittal minimum for surfactant analysis and requires a minimum of 72 hours notice prior to sample submittal.

- Curtis and Tompkins would prefer to use C&T standard reporting limits and quality control limits rather than those provided by Quanterra. (see attatchments)

- In cases where matrix interferences could be minimized by the use of appropriate cleanup procedures, Curtis and Tompkins would like to recommend the option of doing clean-up (silica gel, GPC) on sample extracts as we deem necessary. Clean-up procedures will be billed at an additional cost, but effectively minimize matrix interferences which often cause elevated reporting limits.

Semivolatile Organics

- Curtis and Tompkins reports benzo(b)fluoranthene and benzo(k)fluoranthene as total results (benzo(b,k)fluoranthene) as the laboratory can not achieve the peak resolution criterion specified in SW-846.

- The standards used by Curtis and Tompkins contain 3- and 4-methyphenol which coelute. These compounds will be reported as total results (3-, 4-methylphenol).

Curtis & Tompkins goal is to provide the highest possible data quality and we are looking forward to working with you on this project. Please call me at (510)-486-0925 x 101 if you have any comments or questions regarding these issues.

Sincerely,

Carol Wortham

Carol Wortham
Project Manager

Curtis & Tompkins, Ltd.

EPA 8270 - Semivolatile Organic Compounds

CAS #	Target Compound	Reporting Limit (ug/L)	Reporting Limit (ug/Kg)
83-32-9	Acenaphthene	10	330
208-96-8	Acenaphthylene	10	330
120-12-7	Anthracene	10	330
103-33-3	Azobenzene	10	330
56-55-3	Benzo(a)anthracene	10	330
50-32-8	Benzo(a)pyrene	10	330
205-99-2	Benzo(b,k)fluoranthene	10	330
191-24-2	Benzo(g,h,i)perylene	10	330
65-85-0	Benzoic acid	50	1,700
100-51-6	Benzyl alcohol	10	330
111-91-1	bis(2-Chloroethoxy)methane	10	330
111-44-4	bis(2-Chloroethyl)ether	10	330
108-60-1	bis(2-Chloroisopropyl)ether	10	330
117-81-7	bis(2-Ethylhexyl)phthalate	10	330
101-55-3	4-Bromophenyl-phenylether	10	330
85-68-7	Butylbenzylphthalate	10	330
106-47-8	4-Chloroaniline	10	330
59-50-7	4-Chloro-3-methylphenol	10	330
91-58-7	2-Chloronaphthalene	10	330
95-57-8	2-Chlorophenol	10	330
7005-72-3	4-Chlorophenyl-phenylether	10	330
218-01-9	Chrysene	10	330
53-70-3	Dibenz(a,h)anthracene	10	330
132-64-9	Dibenzofuran	10	330
95-50-1	1,2-Dichlorobenzene	10	330
541-73-1	1,3-Dichlorobenzene	10	330
106-46-7	1,4-Dichlorobenzene	10	330
91-94-1	3,3'-Dichlorobenzidine	50	1,700
120-83-2	2,4-Dichlorophenol	10	330
84-66-2	Diethylphthalate	10	330
105-67-9	2,4-Dimethylphenol	10	330
131-11-3	Dimethylphthalate	10	330
84-74-2	Di-n-butylphthalate	10	330
534-52-1	4,6-Dinitro-2-methylphenol	50	1,700
51-28-5	2,4-Dinitrophenol	50	1,700
121-14-2	2,4-Dinitrotoluene	10	330
606-20-2	2,6-Dinitrotoluene	10	330
117-84-0	Di-n-octylphthalate	10	330
206-44-0	Fluoranthene	10	330
86-73-7	Fluorene	10	330
118-74-1	Hexachlorobenzene	10	330
87-68-3	Hexachlorobutadiene	10	330
77-47-4	Hexachlorocyclopentadiene	50	1,700
67-72-1	Hexachloroethane	10	330
193-39-5	Indeno(1,2,3-cd)pyrene	10	330
78-59-1	Isophorone	10	330
91-57-6	2-Methylnaphthalene	10	330
95-48-7	2-Methylphenol	10	330
1319-77-3	3-,4-Methylphenol	10	330
88-74-4	2-Nitroaniline	50	1,700
99-09-2	3-Nitroaniline	50	1,700
100-01-6	4-Nitroaniline	50	1,700
88-75-5	2-Nitrophenol	50	1,700
100-02-7	4-Nitrophenol	50	1,700
621-64-7	N-Nitroso-di-n-propylamine	10	330
62-75-9	N-Nitrosodimethylamine	10	330
86-30-6	N-Nitrosodiphenylamine	10	330
91-20-3	Naphthalene	10	330
98-95-3	Nitrobenzene	10	330
87-86-5	Pentachlorophenol	10	1,700
85-01-8	Phenanthrene	10	330
108-95-2	Phenol	10	330
129-00-0	Pyrene	10	330
120-82-1	1,2,4-Trichlorobenzene	10	330
95-95-4	2,4,5-Trichlorophenol	50	1,700
88-06-2	2,4,6-Trichlorophenol	10	330

Additional Compounds (may be added to target list):

62-53-3	Aniline	10	330
92-87-5	Benzidine	10	330
87-65-0	2,6-Dichlorophenol	10	330
110-86-1	Pyridine	100	1,700
58-90-2	2,3,4,6-Tetrachlorophenol	10	330

Recommended Surrogates:

321-60-8	2-Fluorobiphenyl
367-12-4	2-Fluorophenol
4165-60-0	Nitrobenzene-d5
13127-88-3	Phenol-d5
1718-51-0	Terphenyl-d14
118-79-6	2,4,6-Tribromophenol

NOTE: Standard reporting limits are listed: lower reporting limits may be achievable for specific compounds.

Curtis & Tompkins, Ltd.

Precision & Accuracy Limits
C&T In-House Limits

Analysis	Compound	LCS Recovery	MS/MSD Recovery	RPD	
		Water & Soil	Water & Soil	Water	Soil
Metals	each element	80-120	65-135	20	35

Precision & Accuracy Limits

C&T In-House Limits for 1999

Feb.99 - Jan.2000

Analysis: 8260

Matrix: Soil

Curtis & Tompkins, Ltd.

#	CMPD	RL	UNITS	COUNT	BS/BSD low-hi	BS/BSD rpd	BS/BSD amt	MS/MSD low-hi	MS/MSD rpd	MS/MSD amt
1	Freon 12	10	ug/Kg	1	-			-		
2	Chloromethane	10	ug/Kg	1	-			-		
3	Vinyl Chloride	10	ug/Kg	1	-			-		
4	Bromomethane	10	ug/Kg	1	-			-		
5	Chloroethane	10	ug/Kg	1	-			-		
6	Trichlorofluoromethane	5	ug/Kg	1	-			-		
7	Acetone	20	ug/Kg	1	-			-		
8	Freon 113	5	ug/Kg	1	-			-		
9	1,1-Dichloroethene	5	ug/Kg	1	63-144	18	50	51-137	35	50
10	Methylene Chloride	20	ug/Kg	1	-			-		
11	Carbon Disulfide	5	ug/Kg	1	-			-		
12	trans-1,2-Dichloroethene	5	ug/Kg	1	-			-		
13	Vinyl Acetate	50	ug/Kg	1	-			-		
14	1,1-Dichloroethane	5	ug/Kg	1	-			-		
15	2-Butanone	10	ug/Kg	1	-			-		
16	cis-1,2-Dichloroethene	5	ug/Kg	1	-			-		
17	2,2-Dichloropropane	5	ug/Kg	1	-			-		
18	Chloroform	5	ug/Kg	1	-			-		
19	Bromochloromethane	5	ug/Kg	1	-			-		
20	1,1,1-Trichloroethane	5	ug/Kg	1	-			-		
21	1,1-Dichloropropene	5	ug/Kg	1	-			-		
22	Carbon Tetrachloride	5	ug/Kg	1	-			-		
23	1,2-Dichloroethane	5	ug/Kg	1	-			-		
24	Benzene	5	ug/Kg	1	74-127	10	50	53-128	24	50
25	Trichloroethene	5	ug/Kg	1	70-131	10	50	33-153	44	50
26	1,2-Dichloropropane	5	ug/Kg	1	-			-		
27	Bromodichloromethane	5	ug/Kg	1	-			-		
28	Dibromomethane	5	ug/Kg	1	-			-		
29	4-Methyl-2-Pentanone	10	ug/Kg	1	-			-		
30	cis-1,3-Dichloropropene	5	ug/Kg	1	-			-		
31	Toluene	5	ug/Kg	1	72-131	10	50	45-134	44	50
32	trans-1,3-Dichloropropene	5	ug/Kg	1	-			-		
33	1,1,2-Trichloroethane	5	ug/Kg	1	-			-		
34	2-Hexanone	10	ug/Kg	1	-			-		
35	1,3-Dichloropropane	5	ug/Kg	1	-			-		
36	Tetrachloroethene	5	ug/Kg	1	-			-		
37	Dibromochloromethane	5	ug/Kg	1	-			-		
38	1,2-Dibromoethane	5	ug/Kg	1	-			-		
39	Chlorobenzene	5	ug/Kg	1	74-126	10	50	39-132	47	50
40	1,1,1,2-Tetrachloroethane	5	ug/Kg	1	-			-		
41	Ethylbenzene	5	ug/Kg	1	-			-		
42	m,p-Xylenes	5	ug/Kg	1	-			-		
43	o-Xylene	5	ug/Kg	1	-			-		
44	Styrene	5	ug/Kg	1	-			-		
45	Bromoform	5	ug/Kg	1	-			-		
46	Isopropylbenzene	5	ug/Kg	1	-			-		
47	1,1,2,2-Tetrachloroethane	5	ug/Kg	1	-			-		
48	1,2,3-Trichloropropane	5	ug/Kg	1	-			-		
49	Propylbenzene	5	ug/Kg	1	-			-		
50	Bromobenzene	5	ug/Kg	1	-			-		
51	1,3,5-Trimethylbenzene	5	ug/Kg	1	-			-		
52	2-Chlorotoluene	5	ug/Kg	1	-			-		
53	4-Chlorotoluene	5	ug/Kg	1	-			-		
54	tert-Butylbenzene	5	ug/Kg	1	-			-		
55	1,2,4-Trimethylbenzene	5	ug/Kg	1	-			-		
56	sec-Butylbenzene	5	ug/Kg	1	-			-		
57	para-Isopropyl Toluene	5	ug/Kg	1	-			-		
58	1,3-Dichlorobenzene	5	ug/Kg	1	-			-		
59	1,4-Dichlorobenzene	5	ug/Kg	1	-			-		
60	n-Butylbenzene	5	ug/Kg	1	-			-		
61	1,2-Dichlorobenzene	5	ug/Kg	1	-			-		
62	1,2-Dibromo-3-Chloropropane	5	ug/Kg	1	-			-		
63	1,2,4-Trichlorobenzene	5	ug/Kg	1	-			-		
64	Hexachlorobutadiene	5	ug/Kg	1	-			-		
65	Naphthalene	5	ug/Kg	1	-			-		
66	1,2,3-Trichlorobenzene	5	ug/Kg	1	-			-		
s1	Dibromofluoromethane	5	ug/Kg	1	67-140		50	67-140		50
s2	1,2-Dichloroethane-d4	5	ug/Kg	1	80-129		50	80-129		50
s3	Toluene-d8	5	ug/Kg	1	88-111		50	88-111		50
s4	Bromofluorobenzene	5	ug/Kg	1	76-128		50	76-128		50

TCW

Precision & Accuracy Limits

C&T In-House Limits for 1999

Feb.99 - Jan.2000

Analysis: 8260

Matrix: Water

Curtis & Tompkins, Ltd.

#	CMPD	PL	UNITS	COUNT	BS/BSD low-hi	BS/BSD rpd	BS/BSD amt	MS/MSD low-hi	MS/MSD rpd	MS/MSD amt
1	Freon 12	10	ug/L	1	-			-		
2	Chloromethane	10	ug/L	1	-			-		
3	Vinyl Chloride	10	ug/L	1	-			-		
4	Bromomethane	10	ug/L	1	-			-		
5	Chloroethane	10	ug/L	1	-			-		
6	Trichlorofluoromethane	5	ug/L	1	-			-		
7	Acetone	20	ug/L	1	-			-		
8	Freon 113	5	ug/L	1	-			-		
9	1,1-Dichloroethene	5	ug/L	1	64-139	13	50	59-144	13	50
10	Methylene Chloride	20	ug/L	1	-			-		
11	Carbon Disulfide	5	ug/L	1	-			-		
12	trans-1,2-Dichloroethene	5	ug/L	1	-			-		
13	Vinyl Acetate	50	ug/L	1	-			-		
14	1,1-Dichloroethane	5	ug/L	1	-			-		
15	2-Butanone	10	ug/L	1	-			-		
16	cis-1,2-Dichloroethene	5	ug/L	1	-			-		
17	2,2-Dichloropropane	5	ug/L	1	-			-		
18	Chloroform	5	ug/L	1	-			-		
19	Bromochloromethane	10	ug/L	1	-			-		
20	1,1,1-Trichloroethane	5	ug/L	1	-			-		
21	1,1-Dichloropropene	5	ug/L	1	-			-		
22	Carbon Tetrachloride	5	ug/L	1	-			-		
23	1,2-Dichloroethane	5	ug/L	1	-			-		
24	Benzene	5	ug/L	1	71-127	10	50	67-128	10	50
25	Trichloroethene	5	ug/L	1	72-129	10	50	61-136	10	50
26	1,2-Dichloropropane	5	ug/L	1	-			-		
27	Bromodichloromethane	5	ug/L	1	-			-		
28	Dibromomethane	5	ug/L	1	-			-		
29	4-Methyl-2-Pentanone	10	ug/L	1	-			-		
30	cis-1,3-Dichloropropene	5	ug/L	1	-			-		
31	Toluene	5	ug/L	1	73-129	10	50	72-126	10	50
32	trans-1,3-Dichloropropene	5	ug/L	1	-			-		
33	1,1,2-Trichloroethane	5	ug/L	1	-			-		
34	2-Hexanone	10	ug/L	1	-			-		
35	1,3-Dichloropropane	5	ug/L	1	-			-		
36	Tetrachloroethene	5	ug/L	1	-			-		
37	Dibromochloromethane	5	ug/L	1	-			-		
38	1,2-Dibromoethane	5	ug/L	1	-			-		
39	Chlorobenzene	5	ug/L	1	77-126	10	50	78-122	10	50
40	1,1,1,2-Tetrachloroethane	5	ug/L	1	-			-		
41	Ethylbenzene	5	ug/L	1	-			-		
42	m,p-Xylenes	5	ug/L	1	-			-		
43	o-Xylene	5	ug/L	1	-			-		
44	Styrene	5	ug/L	1	-			-		
45	Bromoform	5	ug/L	1	-			-		
46	Isopropylbenzene	5	ug/L	1	-			-		
47	1,1,2,2-Tetrachloroethane	5	ug/L	1	-			-		
48	1,2,3-Trichloropropane	5	ug/L	1	-			-		
49	Propylbenzene	5	ug/L	1	-			-		
50	Bromobenzene	5	ug/L	1	-			-		
51	1,3,5-Trimethylbenzene	5	ug/L	1	-			-		
52	2-Chlorotoluene	5	ug/L	1	-			-		
53	4-Chlorotoluene	5	ug/L	1	-			-		
54	tert-Butylbenzene	5	ug/L	1	-			-		
55	1,2,4-Trimethylbenzene	5	ug/L	1	-			-		
56	sec-Butylbenzene	5	ug/L	1	-			-		
57	para-Isopropyl Toluene	5	ug/L	1	-			-		
58	1,3-Dichlorobenzene	5	ug/L	1	-			-		
59	1,4-Dichlorobenzene	5	ug/L	1	-			-		
60	n-Butylbenzene	5	ug/L	1	-			-		
61	1,2-Dichlorobenzene	5	ug/L	1	-			-		
62	1,2-Dibromo-3-Chloropropane	5	ug/L	1	-			-		
63	1,2,4-Trichlorobenzene	5	ug/L	1	-			-		
64	Hexachlorobutadiene	5	ug/L	1	-			-		
65	Naphthalene	5	ug/L	1	-			-		
66	1,2,3-Trichlorobenzene	5	ug/L	1	-			-		
s1	Dibromofluoromethane	5	ug/L	1	81-121		50	81-121		50
s2	1,2-Dichloroethane-d4	5	ug/L	1	76-127		50	76-127		50
s3	Toluene-d8	5	ug/L	1	90-109		50	90-109		50
s4	Bromofluorobenzene	5	ug/L	1	82-118		50	82-118		50

TCW

Precision & Accuracy Limits

C&T In-House Limits for 1999

Feb.99 - Jan.2000

Analysis: 8270

Matrix: Water

Curtis & Tompkins, Ltd.

	CMPD	RL	UNITS	COUNT	BS/BSD low-hi	BS/BSD rpd	BS/BSD amt	MS/MSD low-hi	MS/MSD rpd	MS/MSD amt
1	N-Nitrosodimethylamine	10	ug/L	1	-			-		
2	Phenol	10	ug/L	1	41-110	26	100	31-111	21	100
3	bis(2-Chloroethyl)ether	10	ug/L	1	-			-		
4	2-Chlorophenol	10	ug/L	1	38-110	27	100	35-110	25	100
5	1,3-Dichlorobenzene	10	ug/L	1	-			-		
6	1,4-Dichlorobenzene	10	ug/L	1	36-110	24	50	33-110	30	50
7	Benzyl alcohol	10	ug/L	1	-			-		
8	1,2-Dichlorobenzene	10	ug/L	1	-			-		
9	2-Methylphenol	10	ug/L	1	-			-		
10	bis(2-Chloroisopropyl) ether	10	ug/L	1	-			-		
11	3,4-Methylphenol	10	ug/L	1	-			-		
12	N-Nitroso-di-n-propylamine	10	ug/L	1	22-112	27	50	37-110	20	50
13	Hexachloroethane	10	ug/L	1	-			-		
14	Nitrobenzene	10	ug/L	1	-			-		
15	Isophorone	10	ug/L	1	-			-		
16	2-Nitrophenol	50	ug/L	1	-			-		
17	2,4-Dimethylphenol	10	ug/L	1	-			-		
18	Benzoic acid	50	ug/L	1	-			-		
19	bis(2-Chloroethoxy)methane	10	ug/L	1	-			-		
20	2,4-Dichlorophenol	10	ug/L	1	-			-		
21	1,2,4-Trichlorobenzene	10	ug/L	1	36-110	26	50	32-110	18	50
22	Naphthalene	10	ug/L	1	-			-		
23	4-Chloroaniline	10	ug/L	1	-			-		
24	Hexachlorobutadiene	10	ug/L	1	-			-		
25	4-Chloro-3-methylphenol	10	ug/L	1	44-110	27	100	45-110	15	100
26	2-Methylnaphthalene	10	ug/L	1	-			-		
27	Hexachlorocyclopentadiene	50	ug/L	1	-			-		
28	2,4,6-Trichlorophenol	10	ug/L	1	-			-		
29	2,4,5-Trichlorophenol	10	ug/L	1	-			-		
30	2-Chloronaphthalene	10	ug/L	1	-			-		
31	2-Nitroaniline	50	ug/L	1	-			-		
32	Dimethylphthalate	10	ug/L	1	-			-		
33	Acenaphthylene	10	ug/L	1	-			-		
34	2,6-Dinitrotoluene	10	ug/L	1	-			-		
35	3-Nitroaniline	50	ug/L	1	-			-		
36	Acenaphthene	10	ug/L	1	43-110	26	50	44-110	15	50
37	2,4-Dinitrophenol	50	ug/L	1	-			-		
38	4-Nitrophenol	50	ug/L	1	25-110	37	100	17-113	56	100
39	Dibenzofuran	10	ug/L	1	-			-		
40	2,4-Dinitrotoluene	10	ug/L	1	40-110	25	50	47-110	17	50
41	Diethylphthalate	10	ug/L	1	-			-		
42	Fluorene	10	ug/L	1	-			-		
43	4-Chlorophenyl-phenylether	10	ug/L	1	-			-		
44	4-Nitroaniline	50	ug/L	1	-			-		
45	4,6-Dinitro-2-methylphenol	50	ug/L	1	-			-		
46	N-Nitrosodiphenylamine	10	ug/L	1	-			-		
47	Azobenzene	10	ug/L	1	-			-		
48	4-Bromophenyl-phenylether	10	ug/L	1	-			-		
49	Hexachlorobenzene	10	ug/L	1	-			-		
50	Pentachlorophenol	50	ug/L	1	17-137	43	100	32-118	19	100
51	Phenanthrene	10	ug/L	1	-			-		
52	Anthracene	10	ug/L	1	-			-		
53	Di-n-butylphthalate	10	ug/L	1	-			-		
54	Fluoranthene	10	ug/L	1	-			-		
55	Pyrene	10	ug/L	1	35-107	27	50	16-110	18	50
56	Butylbenzylphthalate	10	ug/L	1	-			-		
57	3,3'-Dichlorobenzidine	50	ug/L	1	-			-		
58	Benzo(a)anthracene	10	ug/L	1	-			-		
59	Chrysene	10	ug/L	1	-			-		
60	bis(2-Ethylhexyl)phthalate	10	ug/L	1	-			-		
61	Di-n-octylphthalate	10	ug/L	1	-			-		
62	Benzo(b,k)fluoranthene	10	ug/L	1	-			-		
63	Benzo(a)pyrene	10	ug/L	1	-			-		
64	Indeno(1,2,3-cd)pyrene	10	ug/L	1	-			-		
65	Dibenz(a,h)anthracene	10	ug/L	1	-			-		
66	Benzo(g,h,i)perylene	10	ug/L	1	-			-		
s1	2-Fluorophenol	10	ug/L	1	30-136		100	30-136		100
s2	Phenol-d5	10	ug/L	1	33-140		100	33-140		100
s3	2,4,6-Tribromophenol	10	ug/L	1	31-140		100	31-140		100
s4	Nitrobenzene-d5	10	ug/L	1	24-128		50	24-128		50
s5	2-Fluorobiphenyl	10	ug/L	1	35-116		50	35-116		50
s6	Terphenyl-d14	10	ug/L	1	16-139		50	16-139		50

TLM

Precision & Accuracy Limits

C&T In-House Limits for 1999

Feb.99 - Jan.2000

Analysis: 8270

Matrix: Soil

Curtis & Tompkins, Ltd.

#	CMPD	RL	UNITS	COUNT	BS/BSD low-hi	BS/BSD rpd	BS/BSD amt	MS/MSD low-hi	MS/MSD rpd	MS/MSD amt
1	N-Nitrosodimethylamine	333.333	ug/Kg	1	-			-		
2	Phenol	333.333	ug/Kg	1	30-139	25	3333	36-122	26	3333
3	Aniline	333.333	ug/Kg	1	-			-		
4	bis(2-Chloroethyl)ether	333.333	ug/Kg	1	-			-		
5	2-Chlorophenol	333.333	ug/Kg	1	25-142	26	3333	34-123	27	3333
6	1,3-Dichlorobenzene	333.333	ug/Kg	1	-			-		
7	1,4-Dichlorobenzene	333.333	ug/Kg	1	28-120	27	1667	21-117	30	1667
8	Benzyl alcohol	333.333	ug/Kg	1	-			-		
9	1,2-Dichlorobenzene	333.333	ug/Kg	1	-			-		
10	2-Methylphenol	333.333	ug/Kg	1	-			-		
11	bis(2-Chloroisopropyl) ether	333.333	ug/Kg	1	-			-		
12	3,4-Methylphenol	333.333	ug/Kg	1	-			-		
13	N-Nitroso-di-n-propylamine	333.333	ug/Kg	1	30-122	44	1667	18-116	27	1667
14	Hexachloroethane	333.333	ug/Kg	1	-			-		
15	Nitrobenzene	333.333	ug/Kg	1	-			-		
16	Isophorone	333.333	ug/Kg	1	-			-		
17	2-Nitrophenol	1666.66	ug/Kg	1	-			-		
18	2,4-Dimethylphenol	333.333	ug/Kg	1	-			-		
19	Benzoic acid	1666.66	ug/Kg	1	-			-		
20	bis(2-Chloroethoxy)methane	333.333	ug/Kg	1	-			-		
21	2,4-Dichlorophenol	333.333	ug/Kg	1	-			-		
22	1,2,4-Trichlorobenzene	333.333	ug/Kg	1	29-119	27	1667	26-119	27	1667
23	Naphthalene	333.333	ug/Kg	1	-			-		
24	4-Chloroaniline	333.333	ug/Kg	1	-			-		
25	Hexachlorobutadiene	333.333	ug/Kg	1	-			-		
26	4-Chloro-3-methylphenol	333.333	ug/Kg	1	29-139	26	3333	35-122	27	3333
27	2-Methylnaphthalene	333.333	ug/Kg	1	-			-		
28	Hexachlorocyclopentadiene	1666.65	ug/Kg	1	-			-		
29	2,4,6-Trichlorophenol	333.333	ug/Kg	1	-			-		
30	2,4,5-Trichlorophenol	333.333	ug/Kg	1	-			-		
31	2-Chloronaphthalene	333.333	ug/Kg	1	-			-		
32	2-Nitroaniline	1666.66	ug/Kg	1	-			-		
33	Dimethylphthalate	333.333	ug/Kg	1	-			-		
34	Acenaphthylene	333.333	ug/Kg	1	-			-		
35	2,6-Dinitrotoluene	333.333	ug/Kg	1	-			-		
36	3-Nitroaniline	1666.66	ug/Kg	1	-			-		
37	Acenaphthene	333.333	ug/Kg	1	31-120	26	1667	23-129	29	1667
38	2,4-Dinitrophenol	1666.66	ug/Kg	1	-			-		
39	4-Nitrophenol	1666.66	ug/Kg	1	26 :41	27	3333	24-114	32	3333
40	Dibenzofuran	333.333	ug/Kg	1	-			-		
41	2,4-Dinitrotoluene	333.333	ug/Kg	1	29-111	33	1667	27-110	31	1667
42	Diethylphthalate	333.333	ug/Kg	1	-			-		
43	Fluorene	333.333	ug/Kg	1	-			-		
44	4-Chlorophenyl-phenylether	333.333	ug/Kg	1	-			-		
45	4-Nitroaniline	1666.66	ug/Kg	1	-			-		
46	4,6-Dinitro-2-methylphenol	1666.66	ug/Kg	1	-			-		
47	N-Nitrosodiphenylamine	333.333	ug/Kg	1	-			-		
48	Azobenzene	333.333	ug/Kg	1	-			-		
49	4-Bromophenyl-phenylether	333.333	ug/Kg	1	-			-		
50	Hexachlorobenzene	333.333	ug/Kg	1	-			-		
51	Pentachlorophenol	1666.66	ug/Kg	1	15-148	47	3333	15-119	50	3333
52	Phenanthrene	333.333	ug/Kg	1	-			-		
53	Anthracene	333.333	ug/Kg	1	-			-		
54	Di-n-butylphthalate	333.333	ug/Kg	1	-			-		
55	Fluoranthene	333.333	ug/Kg	1	-			-		
56	Benzidine	333.333	ug/Kg	1	-			-		
57	Pyrene	333.333	ug/Kg	1	22-122	26	1667	29-127	45	1667
58	Butylbenzylphthalate	333.333	ug/Kg	1	-			-		
59	3,3'-Dichlorobenzidine	1666.66	ug/Kg	1	-			-		
60	Benzo(a)anthracene	333.333	ug/Kg	1	-			-		
61	Chrysene	333.333	ug/Kg	1	-			-		
62	bis(2-Ethylhexyl)phthalate	333.333	ug/Kg	1	-			-		
63	Di-n-octylphthalate	333.333	ug/Kg	1	-			-		
64	Benzo(b,k)fluoranthene	333.333	ug/Kg	1	-			-		
65	Benzo(a)pyrene	333.333	ug/Kg	1	-			-		
66	Indeno(1,2,3-cd)pyrene	333.333	ug/Kg	1	-			-		
67	Dibenz(a,h)anthracene	333.333	ug/Kg	1	-			-		
68	Benzo(g,h,i)perylene	333.333	ug/Kg	1	-			-		
s1	2-Fluorophenol	333.333	ug/Kg	1	15-129		3333	15-129		3333
s2	Phenol-d5	333.333	ug/Kg	1	38-132		3333	38-132		3333
s3	2,4,6-Tribromophenol	333.333	ug/Kg	1	23-144		3333	23-144		3333
s4	Nitrobenzene-d5	333.333	ug/Kg	1	22-132		1667	22-132		1667
s5	2-Fluorobiphenyl	333.333	ug/Kg	1	26-137		1667	26-137		1667
s6	Terphenyl-d14	333.333	ug/Kg	1	22-149		1667	22-149		1667

Curtis & Tompkins, Ltd.

California Title 26 Metals

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7440-36-0	Sb	Antimony	60	3
7440-38-2	As	Arsenic	5	0.25
7440-39-3	Ba	Barium	10	0.5
7440-41-7	Be	Beryllium	2	0.1
7440-43-9	Cd	Cadmium	5	0.25
7440-47-3	Cr	Chromium	10	0.5
7440-48-4	Co	Cobalt	20	1
7440-50-8	Cu	Copper	10	0.5
7439-92-1	Pb	Lead	3	0.15
7439-97-6	Hg	Mercury	0.2	0.04
7439-98-7	Mo	Molybdenum	20	1
7440-02-0	Ni	Nickel	20	1
7782-49-2	Se	Selenium	5	0.25
7440-22-4	Ag	Silver	5	0.25
7440-28-0	Tl	Thallium	5	0.25
7440-62-2	V	Vanadium	10	0.5
7440-66-6	Zn	Zinc	20	1

Cations

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7429-90-5	Al	Aluminum	100	10
7440-70-2	Ca	Calcium	500	25
7439-89-6	Fe	Iron	100	5
7439-95-4	Mg	Magnesium	500	25
7439-96-5	Mn	Manganese	10	0.5
7440-09-7	K	Potassium	500	25
7440-23-5	Na	Sodium	500	25

Miscellaneous Metals

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7440-42-8	B	Boron	20	1
7723-14-0	P	Phosphorous	100	5
7440-21-3	Si	Silicon	200	10
7440-31-5	Sn	Tin	40	2
7440-32-6	Ti	Titanium	10	0.5

California LUFT Metals

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7440-43-9	Cd	Cadmium	5	0.25
7440-47-3	Cr	Chromium	10	0.5
7439-92-1	Pb	Lead	3	0.15
7440-02-0	Ni	Nickel	20	1
7440-66-6	Zn	Zinc	20	1

RCRA Metals

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7440-38-2	As	Arsenic	5	0.25
7440-39-3	Ba	Barium	10	0.5
7440-43-9	Cd	Cadmium	5	0.25
7440-47-3	Cr	Chromium	10	0.5
7439-92-1	Pb	Lead	3	0.15
7439-97-6	Hg	Mercury	0.2	0.04
7782-49-2	Se	Selenium	5	0.25
7440-22-4	Ag	Silver	5	0.25

Priority Pollutant Metals

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7440-36-0	Sb	Antimony	60	3
7440-38-2	As	Arsenic	5	0.25
7440-41-7	Be	Beryllium	2	0.1
7440-43-9	Cd	Cadmium	5	0.25
7440-47-3	Cr	Chromium	10	0.5
7440-50-8	Cu	Copper	10	0.5
7439-92-1	Pb	Lead	3	0.15
7439-97-6	Hg	Mercury	0.2	0.1
7440-02-0	Ni	Nickel	20	1
7782-49-2	Se	Selenium	5	0.25
7440-22-4	Ag	Silver	5	0.25
7440-28-0	Tl	Thallium	5	0.25
7440-66-6	Zn	Zinc	20	1

Curtis & Tompkins, Ltd.

Low Concentration Volatiles by GCMS

CAS #	Target Compound	Reporting Limit (ug/L)
67-64-1	Acetone	10
71-43-2	Benzene	0.5
108-86-1	Bromobenzene	1
74-97-5	Bromochloromethane	1
75-27-4	Bromodichloromethane	0.5
75-25-2	Bromoform	1
74-83-9	Bromomethane	1
78-93-3	2-Butanone	10
104-51-8	n-Butylbenzene	1
135-98-8	sec-Butylbenzene	1
98-06-6	tert-Butylbenzene	1
75-15-0	Carbon disulfide	1
56-23-5	Carbon tetrachloride	0.5
108-90-7	Chlorobenzene	0.5
75-00-3	Chloroethane	1
67-66-3	Chloroform	1
74-87-3	Chloromethane	1
95-49-8	2-Chlorotoluene	1
106-43-4	4-Chlorotoluene	1
124-48-1	Dibromochloromethane	0.5
96-12-8	1,2-Dibromo-3-chloropropane	1
106-93-4	1,2-Dibromoethane (EDB)	1
74-95-3	Dibromomethane	1
95-50-1	1,2-Dichlorobenzene	0.5
541-73-1	1,3-Dichlorobenzene	0.5
106-46-7	1,4-Dichlorobenzene	0.5
75-34-3	1,1-Dichloroethane	0.5
107-06-2	1,2-Dichloroethane	0.5
75-35-4	1,1-Dichloroethene	0.5
156-59-2	cis-1,2-Dichloroethene	0.5
156-60-5	trans-1,2-Dichloroethene	0.5
78-87-5	1,2-Dichloropropane	0.5
142-28-9	1,3-Dichloropropane	1
594-20-7	2,2-Dichloropropane	1
563-58-6	1,1-Dichloropropene	1
10061-01-5	cis-1,3-Dichloropropene	0.5
10061-02-6	trans-1,3-Dichloropropene	0.5
100-41-4	Ethylbenzene	0.5
75-71-8	Freon 12	2
76-13-1	Freon 113	5
87-68-3	Hexachlorobutadiene	1
591-78-6	2-Hexanone	10
98-82-8	Isopropylbenzene	1
99-87-6	para-Isopropyl toluene	1
75-09-2	Methylene chloride	10
108-10-1	4-Methyl-2-pentanone	10
91-20-3	Naphthalene	1
103-65-1	Propylbenzene	1
100-42-5	Styrene	1
630-20-6	1,1,1,2-Tetrachloroethane	0.5
79-34-5	1,1,2,2-Tetrachloroethane	0.5
127-18-4	Tetrachloroethene	0.5
108-88-3	Toluene	0.5
87-61-6	1,2,3-Trichlorobenzene	1
120-82-1	1,2,4-Trichlorobenzene	1
71-55-6	1,1,1-Trichloroethane	0.5
79-00-5	1,1,2-Trichloroethane	0.5
79-01-6	Trichloroethene	0.5
75-69-4	Trichlorofluoromethane	0.5
96-18-4	1,2,3-Trichloropropane	1
95-63-6	1,2,4-Trimethylbenzene	1
108-67-8	1,3,5-Trimethylbenzene	1
108-05-4	Vinyl acetate	10
75-01-4	Vinyl chloride	0.5
1330-20-7	m,p-Xylenes	0.5
95-47-6	o-Xylene	0.5

Additional Compounds (may be added to target list):

110-75-8	2-Chloro ethyl vinyl ether	10
1634-04-4	Methyl t-butyl ether (MTBE)	2

Recommended Surrogates:

460-00-4	Bromofluorobenzene
1868-53-7	Dibromofluoromethane
17060-07-0	1,2-Dichloroethane-d4
2037-26-5	Toluene-d8

NOTE: Standard reporting limits are listed; lower reporting limits may be achievable for specific compounds.

Curtis & Tompkins, Ltd.

EPA 8260 - Volatile Organic Compounds

CAS #	Target Compound	Reporting Limit (ug/L) or (ug/Kg)
67-64-1	Acetone	20
71-43-2	Benzene	5
108-86-1	Bromobenzene	5
74-97-5	Bromochloromethane	10
75-27-4	Bromodichloromethane	5
75-25-2	Bromoform	5
74-83-9	Bromomethane	10
78-93-3	2-Butanone	10
104-51-8	n-Butylbenzene	5
135-98-8	sec-Butylbenzene	5
98-06-6	tert-Butylbenzene	5
75-15-0	Carbon disulfide	5
56-23-5	Carbon tetrachloride	5
108-90-7	Chlorobenzene	5
75-00-3	Chloroethane	10
67-66-3	Chloroform	5
74-87-3	Chloromethane	10
95-49-8	2-Chlorotoluene	5
106-43-4	4-Chlorotoluene	5
124-48-1	Dibromochloromethane	5
96-12-8	1,2-Dibromo-3-chloropropane	5
106-93-4	1,2-Dibromoethane (EDB)	5
74-95-3	Dibromomethane	5
95-50-1	1,2-Dichlorobenzene	5
541-73-1	1,3-Dichlorobenzene	5
106-46-7	1,4-Dichlorobenzene	5
75-34-3	1,1-Dichloroethane	5
107-06-2	1,2-Dichloroethane	5
75-35-4	1,1-Dichloroethene	5
156-59-2	cis-1,2-Dichloroethene	5
156-60-5	trans-1,2-Dichloroethene	5
78-87-5	1,2-Dichloropropane	5
142-28-9	1,3-Dichloropropane	5
594-20-7	2,2-Dichloropropane	5
563-58-6	1,1-Dichloropropene	5
10061-01-5	cis-1,3-Dichloropropene	5
10061-02-6	trans-1,3-Dichloropropene	5
100-41-4	Ethylbenzene	5
75-71-8	Freon 12	10
76-13-1	Freon 113	5
87-68-3	Hexachlorobutadiene	5
591-78-6	2-Hexanone	10
98-82-8	Isopropylbenzene	5
99-87-6	para-Isopropyl toluene	5
75-09-2	Methylene chloride	20
108-10-1	4-Methyl-2-pentanone	10
91-20-3	Naphthalene	5
103-65-1	Propylbenzene	5
100-42-5	Styrene	5
630-20-6	1,1,1,2-Tetrachloroethane	5
79-34-5	1,1,2,2-Tetrachloroethane	5
127-18-4	Tetrachloroethene	5
108-88-3	Toluene	5
87-61-6	1,2,3-Trichlorobenzene	5
120-82-1	1,2,4-Trichlorobenzene	5
71-55-6	1,1,1-Trichloroethane	5
79-00-5	1,1,2-Trichloroethane	5
79-01-6	Trichloroethene	5
75-69-4	Trichlorofluoromethane	5
96-18-4	1,2,3-Trichloropropane	5
95-63-6	1,2,4-Trimethylbenzene	5
108-67-8	1,3,5-Trimethylbenzene	5
108-05-4	Vinyl acetate	50
75-01-4	Vinyl chloride	10
1330-20-7	m,p-Xylenes	5
95-47-6	o-Xylene	5

Additional Compounds (may be added to target list):

994-05-8	tert-Amyl methyl ether
75-65-0	tert-Butyl alcohol
637-92-3	tert-Butyl ethyl ether
110-75-8	2-Chloro ethyl vinyl ether
108-94-1	Cyclohexanone
64-17-5	Ethanol
110-54-3	Hexane
108-20-3	Isopropyl ether
1634-04-4	Methyl t-butyl ether (MTBE)
67-63-0	2-Propanol (IPA)
109-99-9	Tetrahydrofuran (THF)

Recommended Surrogates:

460-00-4	Bromofluorobenzene
1868-53-7	Dibromofluoromethane
17060-07-0	1,2-Dichloroethane-d4
2037-26-5	Toluene-d8

NOTE: Standard reporting limits are listed; lower reporting limits may be achievable for specific compounds.