AD-A190 445 INSTALLATION RESTORATION PROGRAM PHASE 2 CONFIRMATION/QUANTIFICATION STAG (U) RADIAN CORP AUSTIN TX DEC 87 F33615-83-D-4001 1/6

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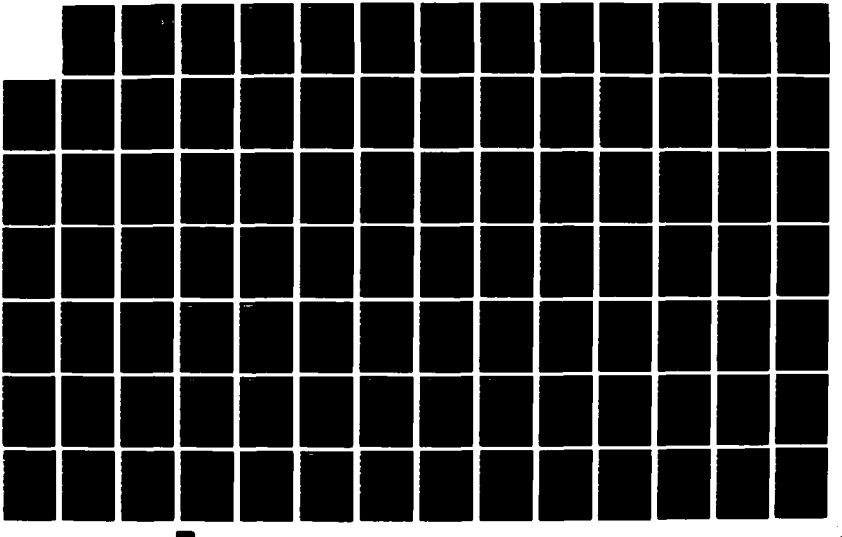

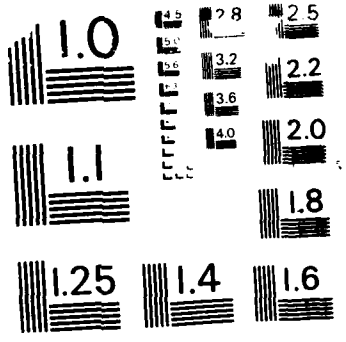

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INSTALLATION RESTORATION PROGRAM
PHASE II - CONFIRMATION/QUANTIFICATION
STAGE 1

FINAL REPORT
FOR
AIR FORCE PLANT 4
FORT WORTH, TEXAS

VOLUME 5. APPENDIX A-2

HEADQUARTERS AERONAUTICAL SYSTEMS DIVISION
FACILITIES MANAGEMENT DIVISION (ASD/PMDA)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433-6503

AND

HEADQUARTERS, AIR FORCE SYSTEMS COMMAND
COMMAND BIOENVIRONMENTAL ENGINEER (AFSC/SGPB)
ANDREWS AIR FORCE BASE, DC 20334-5000

DECEMBER 1987

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RADIAN CORPORATION
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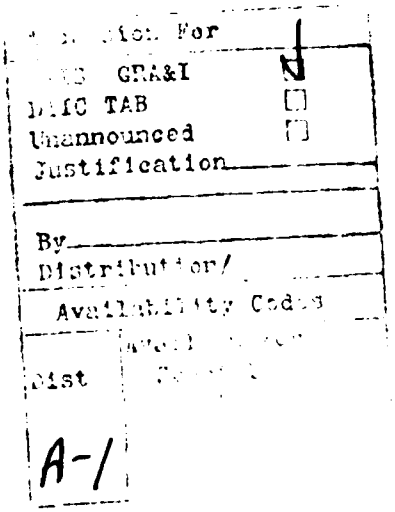

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This report contains information [illegible] environmental protection [illegible]

APPENDIX A-2

Water Quality Assurance/Quality Control Data

Volume 5 and Volume 6 contain all QA/QC reports for water analyses (organized by work order number). Also included are summary tables (Tables A.2-1 through A.2-9) of the QC reports.

Pages in Appendix A are numbered by the volume number followed by the page number of that volume. For example, Page 5 001 is Page 1 of Volume 5.

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TABLE A.2-1A

EPA METHOD 601: MATRIX SPIKE RECOVERY RESULTS FOR WATER SAMPLES

Sample I.D.	8601239-09A	8602001-06A	8602031-03D	8602047-05A	8602060-02E	8602075-07A
Date Extracted	2/03/86	2/04/86	2/10/86	2/13/86	2/13/86	2/15/86
Parameter	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Methylene chloride	121	104	113	82	93	98
1,1-Dichloroethane	90	89	84	86	72	73
trans-1,2-Dichloroethene	107	105	112	77	89	97
Chloroform	141	140	160	117	169	153
1,2-Dichloroethane	102	89	92	72	90	88
1,1,1-Trichloroethane	125	113	113	92	107	107
Carbon Tetrachloride	125	112	114	97	109	105
Bromochloromethane	125	113	117	99	123	113
1,2-Dichloropropane	114	103	108	97	102	106
Trichloroethene	180	180	116	89	100	108
Dibromochloromethane	79	68	86	NR	67	92
Bromoform	133	99	104	86	112	108
Chlorobenzene	125	124	119	111	119	126
1,1,2,2-Tetrachloroethane	[a]	[a]	[a]	[a]	[a]	[a]
Tetrachloroethylene	99	95	88	78	90	95
Standard Deviation (n-1)	18.3	18.9	26.4	16.0	34.1	27.2
Mean	114	107	112	88	103	103
Coefficient of Variation	6.0	17.7	23.5	18.2	33.0	26.5

NR = Not Reported

[a] 1,1,2,2-Tetrachloroethane and tetrachloroethylene co-elute and were both contained in the spike solution. The analyst quantitated the combined peak area as tetrachloroethylene.

TABLE A.2-1B

EPA METHOD 601: MATRIX SPIKE RECOVERY RESULTS FOR WATER SAMPLES

Sample I.D. Date Extracted	8602087-06A 2/15/86	8602113-02C 2/20/86	8602120-03A 2/21/86	8602138-09A 2/25/86	8602176-04A 2/27/86	8602197-02A 2/28/86
Parameter	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Methylene chloride	98	101	75	77	85	102
1,1-Dichloroethane	77	70	61	65	64	80
trans-1,2-Dichloroethene	102	95	86	97	98	100
Chloroform	152	149	117	119	125	114
1,2-Dichloroethane	92	86	73	77	76	149
1,1,1-Trichloroethane	109	103	92	106	97	123
Carbon Tetrachloride	110	103	79	101	92	118
Bromochloromethane	120	115	101	104	99	127
1,2-Dichloropropane	117	102	93	94	96	127
Trichloroethene	119	106	91	130	97	128
Dibromochloromethane	104	83	82	67	87	118
Bromoform	111	114	98	106	95	126
Chlorobenzene	135	106	87	95	100	126
1,1,2,2-Tetrachloroethane	[a]	[a]	[a]	[a]	[a]	[a]
Tetrachloroethylene	97	80	64	74	70	93
Standard Deviation (n-1)	25.4	26.6	19.4	20.5	21.1	23.5
Mean	105	101	84	90	91	111
Coefficient of Variation	24.2	26.4	23.1	22.8	23.3	21.1

NR = Not Reported

[a] 1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute and were both contained in the spike solution. The analyst quantitated the combined peak area as tetrachloroethylene.

TABLE A.2-1C

EPA METHOD 601: MATRIX SPIKE RECOVERY RESULTS FOR WATER SAMPLES

Sample I.D. Date Extracted	8603002-04B 3/05/86	8603003-04A 3/05/86	STANDARD DEVIATION	MEAN	COEFFICIENT OF VARIATION
Parameter	% Recovery	% Recovery	(n-1)	% Recovery	CV - %
Methylene chloride	91	82	13.5	94	14.3
1,1-Dichloroethane	73	62	9.9	75	13.3
trans-1,2-Dichloroethene	97	81	9.8	96	10.2
Chloroform	143	131	17.7	138	12.8
1,2-Dichloroethane	94	84	19.0	90	21.0
1,1,1-Trichloroethane	114	107	9.9	108	9.2
Carbon Tetrachloride	115	103	11.6	106	11.0
Bromochloromethane	122	114	9.6	114	8.5
1,2-Dichloropropane	107	110	9.5	105	9.0
Trichloroethene	156	109	30.1	122	24.7
Dibromochloromethane	71	86	26.6	78	34.2
Bromoform	113	109	12.1	108	11.1
Chlorobenzene	110	114	13.5	114	11.8
1,1,2,2-Tetrachloroethane	a	a	—	—	—
Tetrachloroethylene	91	79	11.0	85	12.9
Standard Deviation (n-1)	24.0	24.2			
Mean	102	91			
Coefficient of Variation	23.5	26.5			

NR = Not Reported

[a]1,1,2,2-tetrachloroethane and tetrachloroethylene co-elute and were both contained in the spike solution. The analyst quantitated the combined peak area as tetrachloroethylene.

TABLE A.2-2

EPA METHOD 601 : SURROGATE SPIKE RECOVERY RESULTS FOR WATER SAMPLES

LAB ID	QC	DATE	BROMOCHLOROMETHANE % Recovery	2-BROMO-1-CHLOROPROPANE % Recovery
8601239-09A		20386	98	107
8601239-08A		13186	103	83
8601239-07A		13186	120	106
8601239-06A		13186	102	96
8601239-05A	D1	13186	86	98
8601239-05A	D2	13186	115	113
8601239-04A		13186	102	100
8601239-03A		13186	95	92
8601239-02A		13186	101	99
8601239-01A		13186	97	94
8602001-01A		20386	104	112
8602001-02A	D1	20386	101	100
8602001-02A	D2	20386	97	94
8602001-03A		20386	108	98
8602001-04A		20486	114	151
8602001-05A		20486	100	130
8602001-06A		20486	103	111
8602015-01A		21186	96	117
8602015-02A		21186	88	118
8602015-03A		21186	100	128
8602019-03C		20686	95	103
8602019-04C		20686	99	129
8602019-05C		20686	101	98
8602031-02C		20686	109	100
8602031-03C		20686	90	81
8602031-04B		20686	117	102
8602031-05B		20686	120	121
8602031-07A	FB	20686	105	110
8602031-08A	TB	20686	125	117
8602041-01A	D1	21186	102	108
8602041-01A	D2	21186	93	89
8602041-02A		21186	97	118
8602041-03A		21286	114	123
8602041-04A		21286	96	120
8602041-05A		21286	105	114
8602041-05A		21286	108	124
8602041-07A	FB	21286	108	98
8602041-08F	TB	21286	118	102
8602047-01A		21286	91	106
8602047-02A		21286	111	138
8602047-03A		21286	86	105
8602047-04A		21386	95	100

(Continued)

TABLE A.2-2 (Continued)

LAB ID	QC	DATE	BROMOCHLOROMETHANE % Recovery	2-BROMO-1-CHLOROPROPANE % Recovery
8602047-05A		21386	123	118
8602047-06A	FB	21386	98	111
8602047-07A	TB	21286	119	119
8602060-01E		21286	124	119
8602060-02E		21386	103	110
8602060-03E		21386	116	127
8602060-05B	D1	21386	123	138
8602060-05B	D2	21386	104	109
8602067-02A		21486	92	105
8602067-03A		21386	102	114
8602067-04A		21486	83	86
8602067-05A		21486	127	158
8602067-06A	TB	21386	121	109
8602067-01A		21386	111	130
8602087-02C		21486	106	106
8602087-01C		21486	96	107
8602087-04B		21486	114	110
8602087-05B	D1	21586	91	122
8602087-05B	D2	21586	88	108
8602075-01A		21486	96	95
8602075-02A	D1	21486	98	110
8602075-02A	D2	21486	107	123
8602075-03A		21486	100	108
8602075-04A		21486	108	137
8602075-05A		21486	106	121
8602075-06A		21486	114	118
8602075-07A		21586	97	104
8602075-08A	FB	21586	96	96
8602075-08A	TB	21486	106	100
8602087-06A	TB	21586	93	99
8602120-01A		22186	108	94
8602113-01C		21986	106	104
8602113-02C		21986	101	104
8602113-03C		22086	94	83
8602113-04D		22186	119	106
8602120-03A		22186	112	112
8602120-04A	D1	22486	100	117
8602120-04A	D2	22486	95	118
8602120-05A		22486	99	114
8602138-09A		22586	106	119
8602138-01A		22486	88	99
8602138-02A		22486	93	104

(Continued)

TABLE A.2-2 (Continued)

LAB ID	QC	DATE	BROMOCHLOROMETHANE % Recovery	2-BROMO-1-CHLOROPROPANE % Recovery	
8602138-03A		22486	100	110	
8602138-04A		22486	102	108	
8602138-05A	D1	22486	92	105	
8602138-05A	D2	22486	98	111	
8602138-06A		22486	86	94	
8602138-07A		22486	121	122	
8602138-08A	*	22586	106	133	Int
8602159-01A		22686	119	110	
8602159-02A		22686	121	133	
8602159-03A		22686	105	109	
8602159-04A		22686	101	122	
8602159-05A	D1	22686	111	116	
8602159-05A	D2	22686	99	105	
8602159-06A	FB	22686	112	118	
8602159-07A	TB	22686	111	114	
8602176-01A		22786	97	115	
8602176-02A		22786	106	117	
8602176-03A		22786	110	135	
8602176-04B		22786	101	105	
8602176-05A		22786	115	135	
8602197-01A		22886	119	122	
8602197-02A		22886	113	101	
8602197-03A		22886	100	93	
8602197-04A		22886	135	121	
8602197-05A		22886	122	111	
8602197-06A		22886	101	107	
8603002-08A		30486	99	79	
8603002-07A		30486	105	96	
8603002-06A		30486	116	80	
8603002-05A		30486	120	82	
8603002-04A		30486	112	129	
8603002-03A		30486	107	104	
8603002-02A	D1	30486	103	75	
8603002-02A	D2	30486	86	83	
8603002-01A		30486	99	89	
8603003-08A	TB	30586	90	80	
8603003-07A		30586	99	118	
8603003-06A	FB	30586	110	122	
8603003-05A	D1	30586	118	117	
8603003-05A	D2	30586	127	112	
8603003-04A		30586	98	96	
8603003-03A		30486	109	103	

TABLE A.2-2 (Continued)

LAB ID	QC	DATE	BROMOCHLOROMETHANE % Recovery	2-BROMO-1-CHLOROPROPANE % Recovery
8603003-02A		30486	100	93
8603003-01A		30586	94	114
8602100-02B		21786	109	103
8602100-03B		21786	109	110
8602100-04D	D1	21786	101	118
8602100-04D	D2	21786	109	137
8602100-05B		21786	99	113
8602100-07A		21786	113	109
Standard Deviation (n-1)			10.4	14.7
Mean			105	110
Coefficient of Variation			9.9	13.4

D = Duplicate analysis
FB = Field blank
TB = Trip blank

TABLE A.2-3A

EPA METHOD 602: MATRIX SPIKE RECOVERY RESULTS FOR WATER SAMPLES

Sample I.D. / Date Extracted / Parameter	8601239-09C 2/03/86 % Recovery	8602001-04C 2/04/86 % Recovery	8602015-03C 2/05/86 % Recovery	8602031-06D 2/06/86 % Recovery
Benzene	134	127	107	110
Toluene	150	182	107	69
Ethyl benzene	126	141	100	97
o-Xylene	120	133	99	86
m-Xylene	131	142	107	103
p-Xylene	128	150	109	105
Chlorobenzene	NS	NS	NS	NS
1,4-Dichlorobenzene	NS	NS	NS	NS
1,3-Dichlorobenzene	NS	NS	NS	NS
1,2-Dichlorobenzene	NS	NS	NS	NS
Standard Deviation (n-1)	10.2	19.4	4.2	15.2
Mean	132	146	105	95
Coefficient of Variation	7.8	13.3	4.0	16.0
a,a,a-Trifluorotoluene	NR	NR	NR	NR

NS = Not Spike Compound
NR = Not Reported

TABLE A.2-3B

EPA METHOD 602: MATRIX SPIKE RECOVERY RESULTS FOR WATER SAMPLES

Sample I.D. Date Extracted	8602041-01C 2/10/86	8602047-03C 2/11/86	8602067-04C 2/13/86	8602075-01 2/13/86
Parameter	% Recovery	% Recovery	% Recovery	% Recovery
Benzene	103	105	126	136
Toluene	122	138	132	140
Ethyl benzene	90	113	112	96
o-Xylene	88	112	90	118
m-Xylene	99	120	138	104
p-Xylene	98	118	119	104
Chlorobenzene	NS	NS	NS	NS
1,4-Dichlorobenzene	NS	NS	NS	NS
1,3-Dichlorobenzene	NS	NS	NS	NS
1,2-Dichlorobenzene	NS	NS	NS	NS
Standard Deviation (n-1)	12.2	11.3	17.1	18.3
Mean	100	118	120	116
Coefficient of Variation	12.2	9.6	14.3	15.7
a,a,a-Trifluorotoluene	NR	NR	NR	NR

NS = Not Spike Compound
NR = Not Reported

TABLE A.2-3C

EPA METHOD 602: MATRIX SPIKE RECOVERY RESULTS FOR WATER SAMPLES

Sample I.D. Date Extracted	8602138-04C 2/26/86	8603002-06C 3/05/86	8603003-04C 3/05/86	STANDARD DEVIATION	MEAN	COEFFICIENT OF VARIATION
Parameter	% Recovery	% Recovery	% Recovery	SD (n-1)	% Recovery	CV - %
Benzene	124	116	120	11.6	119	9.7
Toluene	106	92	100	31.2	122	25.7
Ethyl benzene	112	112	116	14.6	110	13.2
o-Xylene	87	86	89	17.0	101	16.8
m-Xylene	184	182	127	29.7	131	22.7
p-Xylene	118	116	120	14.0	117	12.0
Chlorobenzene	NS	NS	NS	---	---	---
1,4-Dichlorobenzene	NS	NS	NS	---	---	---
1,3-Dichlorobenzene	NS	NS	NS	---	---	---
1,2-Dichlorobenzene	NS	NS	NS	---	---	---
Standard Deviation (n-1)	33.0	34.2	14.4			
Mean	122	117	112			
Coefficient of Varation	27.1	29.1	12.9			
a,a,a-Trifluorotoluene	NR	NR	NR			

NS = Not Spike Compound
NR = Not Reported

TABLE A.2-4

EPA METHOD 602: SURROGATE SPIKE RECOVERY RESULTS FOR WATER SAMPLES

SAMPLE I.D.	QC	DATE	a,a,a-Trifluorotoluene % Recovery
8601239-09C		20386	128
8601239-08C		20386	122
8601239-07C		20386	109
8601239-06C		20386	117
8601239-05C	D1	20386	114
8601239-05C	D2	20386	105
8601239-04C		20386	100
8601239-03C		20386	97
8601239-02C		20386	100
8601239-01C		20386	98
8602001-06C		20486	85
8602001-05C		20486	91
8602001-04C		20486	86
8602001-03C	D1	20486	101
8602001-03C	D2	20486	96
8602001-01C		20386	94
8602001-02C		20386	122
8602015-01C		20586	98
8602015-02C		20586	85
8602015-03C		20586	95
8602019-03E		20586	103
8602019-04E		20586	97
8602019-05E		20586	96
8602031-08A	TB	20686	96
8602031-07B	FB	20686	94
8602031-06D		20686	100
8602031-2E		20686	106
8602031-3E	D1	20686	109
8602031-3E	D2	20686	109
8602031-4E		20686	114
8602031-5D		20686	112
8602041-01C		21086	112
8602041-02C		21086	95
8602041-03C		21086	91
8602041-04C		21086	94
8602041-05C		21086	91
8602041-06C	D1	21186	104
8602041-06C	D2	21186	101
8602113-01E		22086	100
8602041-07B	TB,D1	21186	101
8602041-07B	TB,D2	21386	102
8602041-08A	TB	21286	98

(Continued)

TABLE A.2-4 (Continued)

SAMPLE I.D.	QC	DATE	a,a,a-Trifluorotoluene % Recovery
8602047-01C		21186	98
8602047-02C		21186	106
8602047-03C		21186	106
8602047-04C		21186	98
8602047-05C		21186	114
8602047-06B	FB	21186	103
8602047-07A	TB	21286	104
8602060-01G		21186	101
8602060-02G		21286	102
8602060-03G		21286	115
8602060-05D		21286	116
8602067-06A	TB,D1	21386	98
8602067-06A	TB,D2	21386	103
8602067-05C		21386	90
8602067-04C		21286	105
8602067-03C		21286	113
8602067-02C	*	21286	298
8602067-01C		21286	89
8602075-01C		21786	98
8602075-02C		21486	104
8602075-03C		21386	107
8602075-04C		21486	108
8602075-05C		21786	105
8602075-06C		21386	104
8602075-07C		21786	107
8602075-08B	FB	21486	103
8602075-09A	TB	21486	98
8602087-01E	D1	21486	116
8602087-01E	D2	21486	101
8602087-02E		21486	110
8602087-04D		21486	97
8602087-05D		21486	107
8602087-06B	FB	21486	105
8602100-02D		21786	111
8602100-03D		21786	115
8602100-04F		21786	114
8602100-05D	D1	21786	119
8602100-05D	D2	21786	111
8602100-06B		21786	108
8602100-07A	TB	21786	107
8602113-02E	D1	22186	106
8602113-02E	D2	22186	107

(Continued)

TABLE A.2-4 (Continued)

SAMPLE I.D.	QC	DATE	a,a,a-Trifluorotoluene % Recovery
8602113-03E		22186	101
8602113-04E		22186	102
8602113-05B		22186	103
8602120-01C	D1	22186	103
8602120-01C	D2	22186	102
8602120-02C		22586	131
8602120-03C		22586	123
8602120-04C		22586	111
8602120-05C	D1	22586	106
8602120-05C	D2	22586	102
8602138-02C	D1	22586	104
8602138-02C	D2	22586	109
8602138-03C		22686	103
8602138-04C		22686	112
8602138-05C		22686	101
8602138-06A		22686	104
8602138-07C		22686	111
8602138-08C		22786	98
8602138-09C		22786	97
8602138-01C		22586	114
8602159-02C		22786	93
8602159-03C	D1	22786	120
8602159-03C	D2	22786	98
8602159-04C		22786	107
8602159-05C		22786	112
8602159-06B	FB	22786	111
8602159-07A	TB	30586	92
8602159-01C		22786	102
8602176-06A		22886	97
8602176-05C		22786	110
8602176-04C		22786	103
8602176-03C		22786	104
8602176-02C		22786	114
8602176-01C	D1	22786	108
8602176-01C	D2	22786	110
8602176-06C		22186	104
8602197-05C		22886	104
8602197-04C		22886	115
8602197-03C		22886	104
8602197-02C		22886	119
8602197		22886	103
8603002-08B	TB	30586	94

(Continued)

TABLE A.2-4 (Continued)

SAMPLE I.D.	QC	DATE	a,a,a-Trifluorotoluene % Recovery	NT
8603002-07C		30586	97	
8603002-06C		30586	93	
8603002-05C		30586	101	
8603002-04C		30486	95	
8603002-03C		30486	94	
8603002-02C		30486	77	
8603003-08B	TB	30586	97	
8603003-07C		30586	97	
8603003-06C	FB	30586	106	
8603003-05C		30586	107	
8603003-04C		30586	104	
8603003-03C		30586	107	
8603003-02C	FB	30586	107	
8603003-01C		30586	95	
Standard Deviation (n-1)			18.6	
Mean			105	
Coefficient of Variation			17.6	

D = Duplicate analysis
FB = Field blank
TB = Trip blank

TABLE A.2-5A

EPA METHOD 625 : MATRIX SPIKE RECOVERY RESULTS FOR WATER SAMPLES

Sample I.D.	8602016-06A	8602058-05A	8602078-05A	8602116-05A	8602152-06A
Date Extracted	2/03/86	2/12/86	2/13/86	2/20/86	2/25/86
Date Injected	2/18/86	2/26/86	2/28/86	3/07/86	3/11/86
Parameter	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
ACID FRACTION					
2,4,6-Trichlorophenol	41	87	60	57	3
4-Chloro-3-methylphenol	28	82	64	60	79
2-Chlorophenol	57	78	65	74	25
2,4-Dichlorophenol	62	82	55	54	20
2,4-Dimethylphenol	56	57	36	29	49
2-Nitrophenol	64	70	54	78	11
4-Nitrophenol	38	57	61	130	10
2,4-Dinitrophenol	52	10	ND	54	ND
2-Methyl-4,6-dinitrophenol	74	140	32	110	ND
Pentachlorophenol	85	260	ND	37	ND
Phenol	54	65	60	67	47
BASE FRACTION					
Acenaphthene	45	65	77	110	83
Benzidine	1	10	140	ND	NA
1,2,4-Trichlorobenzene	102	76	55	99	74
Hexachlorobenzene	111	84	74	130	117
Hexachloroethane	86	69	63	110	70
Bis(2-chloroethyl)ether	57	55	60	110	70
2-Chloronaphthalene	46	75	68	120	87
1,2-Dichlorobenzene	66	66	64	110	72
1,3-Dichlorobenzene	67	67	62	100	73
1,4-Dichlorobenzene	68	66	61	90	61
3,3-Dichlorobenzidine	20	117	91	220	415
2,4-Dinitrotoluene	41	81	80	130	103
2,6-Dinitrotoluene	49	77	79	140	106
Fluoranthene	110	78	77	100	94
4-Chlorophenyl phenyl ether	44	67	82	120	104
N-Nitrosodimethylamine	ND	23	3	94	17
N-Nitrosodiphenylamine	85	77	96	160	267
N-Nitrosodi-n-propylamine	34	61	63	100	74
Bis(2-ethylhexyl)phthalate	68	67	98	110	101
Butyl benzyl phthalate	32	27	50	80	64
Di-butyl phthalate	93	60	81	110	100
Di-n-octyl phthalate	41	53	88	100	82
Dietyl phthalate	43	70	80	120	89

(Continued)

TABLE A.2-5A (Continued)

Sample I.D.	8602016-06A	8602058-05A	8602078-05A	8602116-05A	8602152-06A
Date Extracted	2/03/86	2/12/86	2/13/86	2/20/86	2/25/86
Date Injected	2/18/86	2/26/86	2/28/86	3/07/86	3/11/86
Parameter	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
Dimethyl phthalate	50	68	77	60	41
Benzo(a)anthracene	98	77	87	110	99
Benzo(a)pyrene	88	79	81	95	88
Benzo(b)fluoranthene	47	75	83	110	79
Benzo(k)fluoranthene	53	74	70	100	92
Chrysene	87	75	81	110	111
Acenaphthylene	62	65	69	110	80
Anthracene	106	79	84	110	103
4-Bromophenyl phenyl ether	91	74	81	120	114
Bis(2-chloroisopropyl)ether	46	61	68	130	71
Bis(2-chloroethoxy)methane	71	61	62	100	66
Hexachlorobutadiene	94	78	56	ND	78
Hexachlorocyclopentadiene	1	ND	7	4	30
Isosphorone	80	62	62	100	72
Naphthalene	91	61	61	100	63
Nitrobenzene	75	61	57	110	64
Benzo(ghi)perylene	31	89	83	120	91
Fluorene	51	75	79	110	93
Phenanthrene	100	75	81	100	94
Dibenzo(a,h)anthracene	26	98	82	100	89
Indeno(1,2,3-cd)pyrene	26	85	88	110	84
Pyrene	83	64	89	110	108
1,2-Diphenylhydrazine	ND	NA	ND	ND	NA
Standard Deviation (n-1)	27.8	34.0	24.5	37.3	62.6
Mean	60.3	71.7	67.3	97.0	78.2
Coefficient of Variation	46.1	47.5	36.4	38.5	80.1

(Continued)

TABLE A.2-5A (Continued)

Sample I.D.	8602016-06A	8602058-05A	8602078-05A	8602116-05A	8602152-06A
Date Extracted	2/03/86	2/12/86	2/13/86	2/20/86	2/25/86
Date Injected	2/18/86	2/26/86	2/28/86	3/07/86	3/11/86
Parameter	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery
SURROGATE SPIKE COMPOUNDS					
ACID FRACTION					
d5-Phenol	56	71	83	70	46
2-Fluorophenol	226	44	66	70	7
2,4,6-Tribromophenol	43	87	59	58	11
d3-Phenol	NR	NR	NR	NR	NR
BASE FRACTION					
d5-Nitrobenzene	39	90	93	138	91
2-Fluorophenyl	22	72	87	134	100
d14-Terphenyl	34	60	81	110	54
d10-Biphenyl	NR	NR	NR	NR	NR

NR = Not Reported
ND = Not Detected

TABLE A.2-5B

EPA METHOD 625 : MATRIX SPIKE RECOVERY RESULTS FOR WATER SAMPLES

Sample I.D.	8602179-05A	8603018-05A	8604085-04A	STANDARD	MEAN	COEFFICIENT
Date Extracted	2/28/86	3/06/86	4/14/86	DEVIATION		OF
Date Injected	3/12/86	3/24/86	4/24/86			VARIATION
Parameter	**% Recovery**	**% Recovery**	**% Recovery**	**SD (n-1)**	**% Recovery**	**CV - %**
ACID FRACTION						
2,4,6-Trichlorophenol	84	79	115	33.9	66	51.6
4-Chloro-3-methylphenol	96	110	105	27.0	78	34.7
2-Chlorophenol	67	91	99	22.6	70	32.6
2,4-Dichlorophenol	77	68	105	24.8	65	37.9
2,4-Dimethylphenol	52	30	61	12.7	46	27.5
2-Nitrophenol	62	95	105	28.5	67	42.3
4-Nitrophenol	69	12	145	49.7	65	76.2
2,4-Dinitrophenol	64	27	130	43.5	42	103.3
2-Methyl-4,6-dinitrophenol	106	90	147	50.8	87	58.1
Pentachlorophenol	105	93	139	85.0	90	94.6
Phenol	69	81	80	11.8	65	18.0
BASE FRACTION						
Acenaphthene	109	90	86	21.6	83	26.0
Benzidine	NA	ND	38	48.8	24	206.6
1,2,4-Trichlorobenzene	112	80	91	18.4	86	21.4
Hexachlorobenzene	132	102	95	20.8	106	19.7
Hexachloroethane	81	82	94	15.2	82	18.6
Bis(2-chloroethyl)ether	82	76	88	18.6	75	24.9
2-Chloronaphthalene	110	82	82	23.2	84	27.7
1,2-Dichlorobenzene	89	84	86	15.8	80	19.8
1,3-Dichlorobenzene	81	79	86	12.4	77	16.1
1,4-Dichlorobenzene	80	77	82	10.7	73	14.6
3,3-Dichlorobenzidine	2000	ND	131	669.7	374	178.9
2,4-Dinitrotoluene	114	87	111	27.5	93	29.4
2,6-Dinitrotoluene	105	81	110	27.6	93	29.6
Fluoranthene	109	89	79	13.5	92	14.7
4-Chlorophenyl phenyl ether	117	95	103	25.9	92	28.3
N-Nitrosodimethylamine	60	1	123	47.1	40	117.3
N-Nitrosodiphenylamine	272	1700	106	552.9	345	160.1
N-Nitrosodi-n-propylamine	79	65	100	21.8	72	30.2
Bis(2-ethylhexyl)phthalate	97	80	81	16.0	88	18.2
Butyl benzyl phthalate	44	32	47	17.9	47	38.1
Di-butyl phthalate	100	88	69	16.9	88	19.2
Di-n-octyl phthalate	67	86	78	19.5	74	26.3
Dietyl phthalate	75	92	81	21.7	81	26.8

(Continued)

TABLE A.2-5B (Continued)

Sample I.D.	8602179-05A	8603018-05A	8604085-04A	STANDARD	MEAN	COEFFICIENT
Date Extracted	2/28/86	3/06/86	4/14/86	DEVIATION		OF
Date Injected	3/12/86	3/24/86	4/24/86			VARIATION
Parameter	% Recovery	% Recovery	% Recovery	SD (n-1)	% Recovery	CV - %
Dimethyl phthalate	31	85	59	18.0	59	30.6
Benzo(a)anthracene	94	74	87	11.9	91	13.2
Benzo(a)pyrene	80	83	98	7.1	87	8.2
Benzo(b)fluoranthene	80	198	90	45.0	95	47.3
Benzo(k)fluoranthene	85	158	90	31.1	90	34.5
Chrysene	105	83	83	14.4	92	15.7
Acenaphthylene	102	91	73	17.8	82	21.8
Anthracene	116	97	90	13.0	98	13.2
4-Bromophenyl phenyl ether	144	108	108	22.6	105	21.5
Bis(2-chloroisopropyl)ether	74	56	101	27.1	76	35.8
Bis(2-chloroethoxy)methane	88	76	86	14.0	76	18.3
Hexachlorobutadiene	124	94	90	36.5	77	47.6
Hexachlorocyclopentadiene	1	10	3	9.9	7	141.2
Isosphorone	96	83	78	14.0	79	17.7
Naphthalene	88	81	71	15.1	77	19.7
Nitrobenzene	81	63	86	17.6	75	23.6
Benzo(ghi)perylene	94	62	106	27.4	85	32.4
Fluorene	107	88	80	18.9	85	22.1
Phenanthrene	105	88	77	11.5	90	12.7
Dibenzo(a,h)anthracene	90	43	108	29.2	80	36.8
Indeno(1,2,3-cd)pyrene	100	17	107	35.8	77	46.4
Pyrene	100	83	74	16.2	89	18.3
1,2-Diphenylhydrazine	NA	ND	NA	0.0	0	ERR
Standard Deviation (n-1)	257.8	219.9	24.7			
Mean	124.1	104.4	91.5			
Coefficient of Variation	207.7	210.6	27.0			

(Continued)

TABLE A.2-5B (Continued)

Sample I.D.	8602179-05A	8603018-05A	8604085-04A	STANDARD	MEAN	COEFFICIENT OF
Date Extracted	2/28/86	3/06/86	4/14/86	DEVIATION		VARIATION
Date Injected	3/12/86	3/24/86	4/24/86			
Parameter	% Recovery	% Recovery	% Recovery	SD (n-1)	% Recovery	CV - %
SURROGATE SPIKE COMPOUNDS						
ACID FRACTION						
d5-Phenol	65	70	83	12.6	68	18.5
2-Fluorophenol	52	66	83	64.5	77	84.1
2,4,6-Tribromophenol	110	86	95	32.1	69	46.8
d3-Phenol	NR	NR	NR	---	--	---
BASE FRACTION						
d5-Nitrobenzene	106	70	117	29.8	93	32.1
2-Fluorophenyl	118	68	103	34.6	88	39.4
d14-Terphenyl	126	60	54	31.2	72	43.1
d10-Biphenyl	NR	NR	NR	---	--	---

TABLE A.2-6A

EPA METHOD 625: SURROGATE SPIKE RECOVERY RESULTS FOR WATER SAMPLES

LAB I.D.	QC	INJECTION DATE	ACID FRACTION			
			d5-Phenol % Recovery	2-Fluorophenol % Recovery	2,4,6-Tribromophenol % Recovery	d3-Phenol % Recovery
8601242-01A		20786	63	48	141	NR
8601242-02A		20786	32	62	32	NR
8601242-03A		20786	33	30	31	NR
8601242-04A		20786	54	82	118	NR
8601242-05A		20786	135	236	115	NR
8601242-06A		20786	38	71	33	NR
8601242-07A		21186	47	45	43	NR
8601242-08A		21186	111	109	78	NR
8601242-09B	D1	21186	146	147	123	NR
8601242-09A	D2	21186	150	79	78	NR
8601242-10A		21186	49	54	41	NR
8602004-01A		21186	62	73	50	NR
8602004-02A		21186	71	69	61	NR
8602004-03A		21186	62	59	36	NR
8602004-04A		21286	60	17	12	NR
8602004-05A		21286	97	94	67	NR
8602004-06A		21286	85	81	43	NR
8602016-01A		21486	54	60	39	NR
8602016-02A	D1	21486	61	64	65	NR
8602016-03A		21486	70	77	48	NR
8602016-04A		21486	70	76	60	NR
8602016-05A		21486	66	73	40	NR
8602016-06B	D2	21686	76	115	103	NR
8602030-01A		21686	116	147	139	NR
8602030-02A		21686	143	126	142	NR
8602030-03A		21686	81	97	73	NR
8602030-04A		22186	74	87	52	NR
8602030-05A		21686	66	81	55	NR
8602038-01A	D1	22486	26	38	37	NR
8602038-02A		22486	29	32	31	NR
8602038-03A		22586	31	33	32	NR
8602038-04A		22586	33	70	18	NR
8602038-05A		22586	26	35	35	NR
8602038-06B	D2	22486	33	72	20	NR
8602044-01A		22586	54	36	37	NR
8602044-02A		22586	59	58	63	NR
8602044-03A		22586	72	24	73	NR
8602044-04A		22586	5	2	NR	NR
8602044-05A		22586	98	26	40	NR
8602058-01A		22686	60	65	67	NR

(Continued)

TABLE A.2-6A (Continued)

LAB I.D.	QC	INJECTION DATE	ACID FRACTION d5-Phenol % Recovery	2-Fluorophenol % Recovery	2,4,6-Tribromophenol % Recovery	d3-Phenol % Recovery
8602058-02A		22686	65	68	43	NR
8602058-03A		22686	69	74	59	NR
8602058-04A		22686	62	91	46	NR
8602058-05B		22686	73	79	70	NR
8602070-01A		22786	68	190	79	**NA
8602070-02A		22786	75	86	79	**NA
8602070-03A		22786	88	130	79	**NA
8602070-04A		22786	62	76	60	**NA
8602078-01A	D1	22786	65	66	77	NR
8602078-02A		22786	53	72	72	NR
8602078-03A		22886	67	53	59	NR
8602078-04A		22886	85	78	81	NR
8602078-05B	D2	22886	75	58	33	NR
8602091-01A		30586	72	67	121	2
8602091-02A		30586	77	77	111	NR
8602109-01A		30586	66	64	91	NR
8602109-02A		30586	66	67	104	NR
8602109-03A		30586	50	54	96	NR
8602116-01A		30686	54	48	82	NR
8602116-02A		30686	85	80	135	NR
8602116-03A		30686	79	79	162	NR
8602116-04A		30786	52	49	44	NR
8602116-05B		30786	130	120	156	NR
8602122-01A		30586	53	56	80	NR
8602122-02A		30686	67	65	93	NR
8602122-03A		30686	9	32	113	NR
8602132-01A		30686	72	63	107	NR
8602132-02A		30686	78	79	118	NR
8602132-03A		30686	71	66	114	NR
8602132-04A		30686	75	70	131	NR
8602132-05A		30686	78	74	133	NR
8602152-03A		31086	87	80	148	NR
8602152-04A		31086	130	45	40	NR
8602152-05A	D1	31186	79	75	153	NR
8602152-06B	D2	31186	101	106	143	NR
8602169-01A		31286	75	73	127	NR
8602169-02A		31286	64	58	124	NR
8602169-03A		31286	62	62	112	NR
8602169-04A		31186	87	78	127	NR
8602179-01A		31286	62	59	112	NR

(Continued)

TABLE A.2-6A (Continued)

LAB I.D.	QC	INJECTION DATE	ACID FRACTION d5-Phenol % Recovery	2-Fluorophenol % Recovery	2,4,6-Tribromophenol % Recovery	d3-Phenol % Recovery
8602179-02A		31286	78	74	140	NR
8602179-03A		31286	68	68	132	NR
8602179-04A		31286	66	66	122	NR
8602179-05B		31386	71	72	84	NR
8602198-01A		31386	62	68	105	NR
8602198-02A		31386	76	85	130	NR
8602198-03A		31386	69	75	125	NR
8602198-04A		31386	61	71	107	NR
8602198-05A		31386	63	76	112	NR
8602198-06A		31386	55	62	102	NR
8603018-01A		32486	59	66	69	NR
8603018-02A		32486	60	57	70	NR
8603018-03A	D1	32486	70	75	77	NR
8603018-04A		32486	62	72	71	NR
8603018-05B	D2	32486	54	60	61	NR
8603021-01A		32486	65	70	70	NR
8603021-02A		32486	63	69	83	NR
8603021-03A		32486	34	52	49	NR
8603021-04A		32486	44	53	53	NR
8604070-01A		42386	75	66	88	NR
8604070-02A		42286	84	67	69	NR
8604085-01A	D1	42286	92	32	59	NR
8604085-02A		42486	82	78	65	NR
8604085-03A	D2	42486	80	81	78	NR
8604135-01A		42886	86	82	35	NR
8604135-02A		42886	63	79	78	NR
Standard Deviation (n-1)			25.4	30.9	37.7	---
Mean			59	88	78	---
Coefficient of Variation			42.9	35.0	48.2	---

NR = Not Reported
NA = Not Ar lyzed for this compound

TABLE A.2-6B

EPA METHOD 625: SURROGATE SPIKE RECOVERY RESULTS FOR WATER SAMPLES

		BASE FRACTION				
LAB I.D.	QC	INJECTION DATE	d5-Nitrobenzene % Recovery	2-Fluorobiphenyl % Recovery	d14-Terphenyl % Recovery	d10-Biphenyl % Recovery
8601242-01A		20786	43	44	56	NR
8601242-02A		20786	97	74	139	NR
8601242-03A		20786	88	75	137	NR
8601242-04A		20786	47	47	64	NR
8601242-05A		20786	103	79	156	NR
8601242-06A		20786	110	86	77	NR
8601242-07A		21186	85	64	37	NR
8601242-08A		21186	125	66	38	NR
8601242-09B	D1	21186	58	54	115	NR
8601242-09A	D2	21186	75	76	43	NR
8601242-10A		21186	59	78	40	NR
8602004-01A		21186	64	84	46	NR
8602004-02A		21186	123	80	44	NR
8602004-03A		21186	133	100	67	NR
8602004-04A		21286	110	93	48	NR
8602004-05A		21286	106	89	60	NR
8602004-06A		21286	120	76	32	NR
8602016-01A		21486	38	41	31	NR
8602016-02A	D1	21486	75	77	80	NR
8602016-03A		21486	80	91	48	NR
8602016-04A		21486	80	89	60	NR
8602016-05A		21486	78	82	62	NR
8602016-06B	D2	21686	94	75	106	NR
8602030-01A		21686	47	53	31	NR
8602030-02A		21686	73	50	28	NR
8602030-03A		21686	68	44	32	NR
8602030-04A		21686	42	36	38	NR
8602030-05A		21686	53	41	37	NR
8602038-01A	D1	22486	72	41	32	NR
8602038-02A		22486	50	39	27	NR
8602038-03A		22586	65	46	36	NR
8602038-04A		22586	56	47	44	NR
8602038-05A		22586	61	40	39	NR
8602038-06B	D2	22486	51	38	31	NR
8602044-01A		22486	76	62	66	NR
8602044-02A		22586	114	76	73	NR
8602044-03A		22586	110	80	44	NR
8602044-04A		22586	116	84	66	NR
8602044-05A		22586	99	84	56	NR
8602058-01A		22686	83	71	46	NR

(Continued)

TABLE A.2-6B (Continued)

LAB I.D.	QC	INJECTION DATE	BASE FRACTION d5-Nitrobenzene % Recovery	2-Fluorobiphenyl % Recovery	d14-Terphenyl % Recovery	d10-Biphenyl % Recovery
8602179-02A		31286	92	112	170	NR
8602179-03A		31286	86	96	153	NR
8602179-04A		31286	80	94	144	NR
8602179-05B		31386	82	86	118	NR
8602198-01A		31386	38	36	15	NR
8602198-02A		31386	36	36	19	NR
8602198-03A		31386	44	49	21	NR
8602198-04A		31386	29	35	20	NR
8602198-05A		31386	62	66	38	NR
8602198-06A		31386	70	78	38	NR
8603018-01A		32486	48	56	50	NR
8603018-02A		32486	43	57	75	NR
8603018-03A	D1	32486	43	54	67	NR
8603018-04A		32486	45	52	70	NR
8603018-05B	D2	32486	34	37	74	NR
8603021-01A		32486	39	36	53	NR
8603021-02A		32486	57	56	71	NR
8603021-03A		32486	14	32	78	NR
8603021-04A		32486	18	53	64	NR
8604070-01A		42386	89	89	110	NR
8604070-02A		42286	110	110	120	NR
8604085-01A	D1	42286	97	84	44	NR
8604085-02A		42486	77	78	58	NR
8604085-03A	D2	42486	107	94	61	NR
8604135-01A		42886	86	82	35	NR
8604135-02A		42886	63	79	37	NR
Standard Deviation (n-1)			28.8	25.5	41.0	---
Mean			81	68	105	---
Coefficient of Variation			35.4	37.8	39.1	---

NR = Not Reported
NA = Not Analyzed for this compound

a Co-eluting compound interfered with qualitative identification. No value reported.

TABLE A.2-6B (Continued)

LAB I.D.	QC	BASE FRACTION				
		INJECTION DATE	d5-Nitrobenzene % Recovery	2-Fluorobiphenyl % Recovery	d14-Terphenyl % Recovery	d10-Biphenyl % Recovery
8602058-02A		22686	74	64	74	NR
8602058-03A		22686	94	80	51	NR
8602058-04A		22786	60	56	64	NR
8602058-05B		22686	98	80	46	NR
8602070-01A		22786	82	68	120	**NA
8602070-02A		22786	110	93	120	NR
8602070-03A		22786	120	88	190	NR
8602070-04A		22786	66	64	150	NR
8602078-01A	D1	22786	66	65	77	NR
8602078-02A		22786	74	65	46	NR
8602078-03A		22886	140	120	102	NR
8602078-04A		22886	95	81	168	NR
8602078-05B	D2	22886	91	84	184	NR
8602091-01A		30586	100	86	40	NR
8602091-02A		30586	100	88	51	NR
8602109-01A		30586	77	74	92	NR
8602109-02A		30586	98	90	72	NR
8602109-03A		30586	78	75	66	NR
8602116-01A		30686	114	131	104	NR
8602116-02A		30686	115	132	140	NR
8602116-03A		30686	55	63	69	NR
8602116-04A		30786	110	122	132	NR
8602116-05B		30786	148	143	162	NR
8602122-01A		30586	50	52	78	NR
8602122-02A		30686	72	70	86	NR
8602122-03A		30686	116	90	60	NR
8602132-01A		30686	116	126	54	NR
8602132-02A		30686	98	92	50	NR
8602132-03A		30686	98	108	76	NR
8602132-04A		30686	92	106	52	NR
8602132-05A		30686	102	128	108	NR
8602152-03A		31086	75	88	55	NR
8602152-04A		31086	a	130	100	NR
8602152-05A	D1	31186	120	126	48	NR
8602152-06B	D2	31186	89	81	62	NR
8602169-01A		31286	94	100	106	NR
8602169-02A		31286	72	78	102	NR
8602169-03A		31286	82	90	110	NR
8602169-04A		31286	106	116	122	NR
8602179-01A		31286	72	84	138	NR

(Continued)

TABLE A.2-7

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery		Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Ag	04-Mar	fn-5	QC	102				
Ag	04-Mar	fn-5	QC	100				
Ag	04-Mar	fn-5	QC	100				
Ag	04-Mar	fn-5	QC	102				
Ag	31-Mar	fn-1	QC	98				
Ag	31-Mar	fn-1	QC	100				
Ag	31-Mar	fn-3	QC	99				
Ag	31-Mar	fn-1	QC	101				
Ag	31-Mar	fn-3	QC	99				
Ag	31-Mar	fn-3	QC	99				
Ag	31-Mar	fn-1	QC	100				
Ag	31-Mar	fn-3	QC	99				
Ag	23-Apr	8602113	QC	77				
Ag	23-Apr	8602113	QC	77				
Ag	04-Mar	8601240	-02A		99	a		
Ag	27-Feb	8602019	-04G		98	a		
Ag	04-Mar	8602087	-05A		98	a		
Ag	04-Mar	8602067	-02E		98	a		
Ag	04-Mar	8602041	-02E		98	a		
Ag	31-Mar	8602047	-03		96	a		
Ag	31-Mar	8602159	-05E		96	a		
Ag	31-Mar	8602120	-03E		95			
Ag	31-Mar	8602197	-06		95	a		
Ag	31-Mar	8602197	-05		95	a		
Ag	31-Mar	8602139	-08A		95	a		
Ag	31-Mar	8603004	-10		95	a		
Ag	31-Mar	8602197	-06		91	p		
Ag	23-Apr	8602113	-03		84	p		
Ag	04-Mar	8602079	-03		80	p		

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery		Duplicate Analyses % RPD		Reagent Blanks (ug/ml)
Ag	31-Mar	8602047	-02		80				
Ag	04-Mar	8601240	-02A		79	p			
Ag	04-Mar	8602031	-03G		77	p			
Ag	27-Feb	8602001	-06d		76	p			
A	23-Apr	8602113	-04		76	a			
Ag	31-Mar	8602100	-03A		73				
Ag	31-Mar	8602159	-02E		70	p			
Ag	27-Feb	8602001	-05D				0.0	p	
Ag	27-Feb	8602001	-01D				NC	a	
Ag	27-Feb	8602019	-03G				NC		
Ag	04-Mar	8602087	-04A				NC	a	
Ag	04-Mar	8602087	-04A				NC	p	
Ag	04-Mar	8602041	-01E				NC		
Ag	31-Mar	8602197	-05				18.2	p	
Ag	31-Mar	8602047	-01				NC	p	
Ag	31-Mar	8602120	-01E				NC	p	
Ag	31-Mar	8602159	-01E				NC	a	
Ag	31-Mar	8602120	-04E				0.0	a	
Ag	31-Mar	8603004	-03				NC		
Ag	31-Mar	8602100	-02A				NC	a	
Ag	31-Mar	8602047	-04				0.0	a	
Ag	31-Mar	8602159	-01E				NC	p	
Ag	31-Mar	8602100	-02A				NC	p	
Ag	23-Apr	8602113	-08				*75		
Ag	04-Mar	fn-5	Blank						<.002
Ag	04-Mar	fn-6	Blank						<.002
Ag	04-Mar	8601240	Blank						<.002
Ag	31-Mar	fn-2	Blank						<.002
Ag	31-Mar	fn-4	Blank						<.002

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Ag	31-Mar	8602047	Blank				<.002
Ag	31-Mar	8602100	Blank				<.002
Ag	31-Mar	8602159	Blank				0.01
Ag	31-Mar	8603004	Blank				<.002
Ag	23-Apr	8602113	Blank				<.002
Mean				97	88		
RSD (%)				8.7	11.3		
As	08-Feb	8601240	QC	100			
As	08-Feb	8601240	QC	103			
As	08-Feb	8601240	QC	103			
As	15-Feb	8602067	QC	105			
As	15-Feb	8602067	QC	107			
As	19-Feb	8602041	QC	88			
As	19-Feb	8602019	QC	93			
As	19-Feb	8602041	QC	93			
As	19-Feb	8602047	QC	90			
As	19-Feb	8602019	QC	98			
As	19-Feb	8602047	QC	88			
As	19-Feb	8602047	QC	98			
As	19-Feb	8602041	QC	98			
As	19-Feb	8602019	QC	100			
As	21-Feb	8602079	QC	105			
As	21-Feb	8602079	QC	105			
As	21-Feb	8602079	QC	105			
As	24-Feb	8602100	QC	93			
As	24-Feb	8602113	QC	93			
As	24-Feb	8602113	QC	93			

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery		Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
As	24-Feb	8602113	QC	95				
As	24-Feb	8602100	QC	90				
As	24-Feb	8602100	QC	90				
As	24-Feb	8602113	QC	90				
As	10-Mar	8602139	QC	100				
As	10-Mar	8602139	QC	115				
As	10-Mar	8602120	QC	110				
As	10-Mar	8602139	QC	110				
As	10-Mar	8602120	QC	95				
As	10-Mar	8602139	QC	95				
As	12-Mar	8602176	QC	110				
As	12-Mar	8602176	QC	100				
As	12-Mar	8602176	QC	93				
As	13-Mar	8603004	QC	93				
As	13-Mar	8603004	QC	103				
As	17-Mar	8602159	QC	105				
As	17-Mar	8602159	QC	104				
As	17-Mar	8602159	QC	105				
As	21-Feb	8602079	-01A		113	a		
As	19-Feb	8602001	-01D		108	a		
As	12-Mar	8602176	-03G		108	a		
As	10-Mar	8602139	-01A		104	a		
As	10-Mar	8602120	-01E		104	a		
As	08-Feb	8601240	-01A		100	a		
As	15-Feb	8602060	-05C		100	a		
As	24-Feb	8602087	-05A		100	a		
As	24-Feb	8602113	-01G		100	a		
As	13-Mar	8603004	-04		100	p		
As	19-Feb	8602019	-03G		96	a		

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
As	19-Feb	8602031	-02G		96 a		
As	21-Feb	8602100	-04A		96 a		
As	17-Mar	8602197	-02		96 a		
As	19-Feb	8602019	-04G		95 p		
As	21-Feb	8602079	-02A		95 p		
As	19-Feb	8602041	-01E		92 a		
As	19-Feb	8602047	-01E		92 a		
As	24-Feb	8602113	-02G		90 p		
As	15-Feb	8602067	-03E		88 a		
As	13-Mar	8603004	-06		88 a,d		
As	15-Feb	8602060	-02C		85 p		
As	19-Feb	8602001	-06D		85 p		
As	20-Feb	8602100	-04A		85 p		
As	10-Mar	8602139	-01A		85 p		
As	17-Mar	8602197	-02		85 p		
As	13-Mar	8603004	-06		83 a,b		
As	19-Feb	8602047	-05E		70 a		
As	15-Feb	8602060	-01C			NC p	
As	19-Feb	8602047	-04E			8.0 p	
As	19-Feb	8602047	-01E			NC a	
As	21-Feb	8602079	-01A			0.0	
As	21-Feb	8602079	-01A			9.5	
As	24-Feb	8602100	-02A			NC	
As	24-Feb	8602113	-01G			NC a	
As	24-Feb	8602087	-04A			0.0 a	
As	24-Feb	8602113	-01G			NC p	
As	24-Feb	8602100	-03A			15	
As	10-Mar	8602139	-02A			NC p	
As	10-Mar	8602139	-01A			6.9 p	

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
As	10-Mar	8602120	-01E			NC a	
As	17-Mar	8602197	-01			54 p	
As	08-Feb	8601240	Blank				<.005
As	24-Feb	8602100	Blank				<.002
As	10-Mar	8602139	Blank				<.003
As	24-Feb	8602113	Blank				<.002
As	12-Mar	8602176	Blank				<.003
As	15-Feb	8602067	Blank				<.002
As	10-Mar	8602120	Blank				<.003
As	19-Feb	8602047	Blank				<.005
As	17-Mar	8602197	Blank				<.002
As	17-Mar	8602159	Blank				<.002
As	17-Mar	8602159	Blank				<.002
As	17-Mar	8602159	Blank				<.002
As	19-Feb	8602041	Blank				<.005
Mean				99	94		
RSD (%)				7.1	9.9		
Ba	04-Mar	fn-5	QC	101			
Ba	04-Mar	fn-5	QC	101			
Ba	04-Mar	fn-5	QC	101			
Ba	04-Mar	fn-5	QC	101			
Ba	31-Mar	fn-3	QC	99			
Ba	31-Mar	fn-3	QC	98			
Ba	31-Mar	fn-1	QC	99			
Ba	31-Mar	fn-1	QC	99			
Ba	31-Mar	fn-1	QC	98			
Ba	31-Mar	fn-1	QC	99			

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery		Duplicate Analyses % RPD		Reagent Blanks (ug/ml)
Ba	31-Mar	fn-3	QC	99					
Ba	31-Mar	fn-3	QC	99					
Ba	23-Apr	8602113	QC	104					
Ba	23-Apr	8602113	QC	106					
Ba	04-Mar	8602067	-02E		99	a			
Ba	04-Mar	8601240	-02A		98	a			
Ba	04-Mar	8602041	-02E		98	a			
Ba	04-Mar	8602087	-05A		97	a			
Ba	23-Apr	8602113	-04		97	a			
Ba	31-Mar	8602197	-06		95	a			
Ba	31-Mar	8602197	-05		94	a			
Ba	31-Mar	8602139	-08A		94	a			
Ba	31-Mar	8603004	-10		94	a			
Ba	31-Mar	8602120	-03E		93				
Ba	31-Mar	8602047	-03		93	a			
Ba	31-Mar	8602159	-05E		93	a			
Ba	23-Apr	8602113	-03		92	p			
Ba	04-Mar	8602079	-03		89	p			
Ba	04-Mar	8602031	-03G		87	p			
Ba	27-Feb	8602019	-04G		86	a			
Ba	04-Mar	8601240	-02A		86	p			
Ba	31-Mar	8602197	-06		86	p			
Ba	27-Feb	8602001	-06d		84	p			
Ba	31-Mar	8602047	-02		84				
Ba	31-Mar	8602159	-02E		83	p			
Ba	31-Mar	8602100	-03A		79				
Ba	27-Feb	8602019	-03G				0.0		
Ba	27-Feb	8602001	-01D				9.5	a	
Ba	27-Feb	8602001	-05D				0.0	p	

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD		Reagent Blanks (ug/ml)
Ba	04-Mar	8602087	-04A			0.0	p	
Ba	04-Mar	8602041	-01E			1.3		
Ba	04-Mar	8602087	-04A			0.0	a	
Ba	31-Mar	8602047	-04			0.0	a	
Ba	31-Mar	8602047	-01			1.0	p	
Ba	31-Mar	8602197	-05			12	p	
Ba	31-Mar	8603004	-03			0.91	a	
Ba	31-Mar	8602100	-02A			2.9	a	
Ba	31-Mar	8602120	-01E			53	p	
Ba	31-Mar	8602100	-02A			0.0	p	
Ba	31-Mar	8602120	-04E			0.0	a	
Ba	31-Mar	8602159	-01E			2.7	p	
Ba	31-Mar	8602159	-01E			1.4	a	
Ba	23-Apr	8602113	-08			3.0		
Ba	31-Mar	8602100	Blank					*.003
Ba	31-Mar	8602159	Blank					*.004
Ba	31-Mar	fn-4	Blank					*.004
Ba	31-Mar	8603004	Blank					*.002
Ba	04-Mar	8601240	Blank					<.001
Ba	04-Mar	fn-6	Blank					*.005
Ba	04-Mar	fn-5	Blank					*.005
Ba	31-Mar	8602047	Blank					<.001
Ba	23-Apr	8602113	Blank					.002
Ba	31-Mar	fn-2	Blank					*.002
Mean				100	91			
RSD (%)				2.3	6.3			
Cd	04-Mar	fn-5	QC	103				

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery		Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Cd	04-Mar	fn-5	QC	104				
Cd	04-Mar	fn-5	QC	104				
Cd	04-Mar	fn-5	QC	105				
Cd	31-Mar	fn-1	QC	102				
Cd	31-Mar	fn-3	QC	101				
Cd	31-Mar	fn-3	QC	100				
Cd	31-Mar	fn-1	QC	98				
Cd	31-Mar	fn-1	QC	100				
Cd	31-Mar	fn-3	QC	98				
Cd	31-Mar	fn-1	QC	99				
Cd	31-Mar	fn-3	QC	103				
Cd	23-Apr	8602113	QC	104				
Cd	23-Apr	8602113	QC	104				
Cd	04-Mar	8601240	-02A		98	a		
Cd	04-Mar	8602041	-02E		94	a		
Cd	04-Mar	8602087	-05A		94	a		
Cd	04-Mar	8602067	-02E		94	a		
Cd	31-Mar	8602139	-08A		92	a		
Cd	27-Feb	860201	-04G		90	a		
Cd	23-Apr	8602113	-04		89	a		
Cd	31-Mar	8602120	-03E		88			
Cd	31-Mar	8602197	-06		88	a		
Cd	31-Mar	8602159	-05E		88	a		
Cd	31-Mar	8602047	-03		87	a		
Cd	31-Mar	8602197	-05		87	a		
Cd	31-Mar	8603004	-10		87	a		
Cd	27-Feb	8602001	-06d		74	p		
Cd	04-Mar	8601240	-02A		74	p		
Cd	04-Mar	8602079	-03		72	p		

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery		Duplicate Analyses % RPD		Reagent Blanks (ug/ml)
Cd	04-Mar	8602031	-03G		72	p			
Cd	31-Mar	8602159	-02E		72	p			
Cd	31-Mar	8602197	-06		70	p			
Cd	31-Mar	8602047	-02		66				
Cd	23-Apr	8602113	-03		60	p			
Cd	31-Mar	8602100	-03A		56				
Cd	27-Feb	8602019	-03G				NC		
Cd	27-Feb	8602001	-01D				NC	a	
Cd	27-Feb	8602001	-05D				NC	p	
Cd	04-Mar	8602087	-04A				NC	a	
Cd	04-Mar	8602087	-04A				NC	p	
Cd	04-Mar	8602041	-01E				NC		
Cd	31-Mar	8602159	-01E				NC	a	
Cd	31-Mar	8603004	-03				NC		
Cd	31-Mar	8602197	-05				NC	p	
Cd	31-Mar	8602120	-01E				NC	p	
Cd	31-Mar	8602120	-04E				NC	a	
Cd	31-Mar	8602047	-01				NC	p	
Cd	31-Mar	8602100	-02A				NC	p	
Cd	31-Mar	8602047	-04				NC	a	
Cd	31-Mar	8602159	-01E				NC	p	
Cd	31-Mar	8602100	-02A				NC	a	
Cd	23-Apr	8602113	-08				NC		
Cd	31-Mar	8602047	Blank						<.002
Cd	31-Mar	8602159	Blank						<.002
Cd	23-Apr	8602113	Blank						<.002
Cd	31-Mar	8602100	Blank						<.002
Cd	31-Mar	fn-4	Blank						<.002
Cd	04-Mar	fn-5	Blank						<.002

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery		Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Cd	31-Mar	fn-2	Blank					<.002
Cd	04-Mar	8601240	Blank					<.002
Cd	04-Mar	fn-6	Blank					<.002
Cd	31-Mar	8603004	Blank					<.002
Mean				102	81			
RSD (%)				2.4	14.8			
Cr	04-Mar	fn-5	QC	102				
Cr	04-Mar	fn-5	QC	101				
Cr	04-Mar	fn-5	QC	102				
Cr	04-Mar	fn-5	QC	101				
Cr	31-Mar	fn-1	QC	98				
Cr	31-Mar	fn-3	QC	99				
Cr	31-Mar	fn-1	QC	99				
Cr	31-Mar	fn-3	QC	102				
Cr	31-Mar	fn-1	QC	99				
Cr	31-Mar	fn-1	QC	101				
Cr	31-Mar	fn-3	QC	101				
Cr	31-Mar	fn-3	QC	98				
Cr	23-Apr	8602113	QC	105				
Cr	23-Apr	8602113	QC	105				
Cr	04-Mar	8601240	-02A		96	a		
Cr	04-Mar	8602041	-02E		96	a		
Cr	04-Mar	8602087	-05A		96	a		
Cr	04-Mar	8602067	-02E		94	a		
Cr	31-Mar	8602139	-08A		94	a		
Cr	27-Feb	8602019	-04G		93	a		
Cr	31-Mar	8602120	-03E		92			

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery		Duplicate Analyses % RPD		Reagent Blanks (ug/ml)
Cr	31-Mar	8602047	-03		92	a			
Cr	31-Mar	8603004	-10		92	a			
Cr	31-Mar	8602197	-06		91	a			
Cr	31-Mar	8602197	-05		91	a			
Cr	31-Mar	8602159	-05E		90	a			
Cr	23-Apr	8602113	-04		89	a			
Cr	04-Mar	8602031	-03G		85	p			
Cr	04-Mar	8602079	-03		82	p			
Cr	04-Mar	8601240	-02A		81	p			
Cr	31-Mar	8602047	-02		81				
Cr	27-Feb	8602001	-06d		80	p			
Cr	31-Mar	8602197	-06		79	p			
Cr	31-Mar	8602159	-02E		78	p			
Cr	31-Mar	8602100	-03A		76				
Cr	23-Apr	8602113	-03		70	p			
Cr	27-Feb	8602019	-03G				NC		
Cr	27-Feb	8602001	-01D				0.0	a	
Cr	27-Feb	8602001	-05D				0.0	p	
Cr	04-Mar	8602041	-01E				NC		
Cr	04-Mar	8602087	-04A				0.0	p	
Cr	04-Mar	8602087	-04A				0.0	a	
Cr	31-Mar	8602120	-04E				2.7	a	
Cr	31-Mar	8602100	-02A				NC	p	
Cr	31-Mar	8602159	-01E				NC	a	
Cr	31-Mar	8602047	-01				NC	p	
Cr	31-Mar	8602159	-01E				NC	p	
Cr	31-Mar	8602047	-04				0.0	a	
Cr	31-Mar	8602120	-01E				25	p	
Cr	31-Mar	8602100	-02A				NC	a	

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Cr	31-Mar	8602197	-05			15.9 p	
Cr	31-Mar	8603004	-03			NC	
Cr	23-Apr	8602113	-08			NC	
Cr	31-Mar	8602100	Blank				<.005
Cr	31-Mar	8602047	Blank				<.005
Cr	31-Mar	8602159	Blank				*.009
Cr	31-Mar	8603004	Blank				<.005
Cr	04-Mar	fn-6	Blank				*.012
Cr	31-Mar	fn-4	Blank				<.005
Cr	31-Mar	fn-2	Blank				<.005
Cr	23-Apr	8602113	Blank				0.042
Cr	04-Mar	8601240	Blank				<.005
Cr	04-Mar	fn-5	Blank				<.005
Mean				101	87		
RSD (%)				2.2	8.7		
Hg	03-Feb	8601240	QC	108			
Hg	03-Feb	8601240	QC	108			
Hg	03-Feb	8601240	QC	100			
Hg	03-Feb	8601240	QC	100			
Hg	06-Feb	8602019	QC	90			
Hg	06-Feb	8602019	QC	107			
Hg	06-Feb	8602019	QC	95			
Hg	10-Feb	8602047	QC	100			
Hg	10-Feb	8602047	QC	100			
Hg	10-Feb	8602047	QC	108			
Hg	12-Feb	8602019	QC	100			
Hg	12-Feb	8602019	QC	105			

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery		Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Hg	12-Feb	8602019	QC	100				
Hg	20-Feb	8602100	QC	96				
Hg	20-Feb	8602067	QC	110				
Hg	20-Feb	8602100	QC	105				
Hg	20-Feb	8602067	QC	110				
Hg	20-Feb	8602067	QC	96				
Hg	24-Feb	8602120	QC	96				
Hg	24-Feb	8602120	QC	100				
Hg	24-Feb	8602113	QC	96				
Hg	24-Feb	8602067	QC	96				
Hg	24-Feb	8602113	QC	100				
Hg	06-Mar	8602139	QC	100				
Hg	06-Mar	8602139	QC	105				
Hg	06-Mar	8602139	QC	100				
Hg	07-Mar	8602176	QC	84				
Hg	07-Mar	8602176	QC	92				
Hg	07-Mar	8602159	QC	92				
Hg	07-Mar	8602159	QC	92				
Hg	07-Mar	8602159	QC	80				
Hg	09-Mar	8602197	QC	100				
Hg	09-Mar	8603004	QC	100				
Hg	09-Mar	8603004	QC	88				
Hg	09-Mar	8602197	QC	100				
Hg	09-Mar	8602197	QC	88				
Hg	03-Feb	8601240	-09A		140	P		
Hg	08-Feb	8601240	-04A		120	P		
Hg	06-Feb	8602001	-01D		110	a		
Hg	10-Feb	8602047	-01E		110	P		
Hg	12-Feb	8602019	-03G		110	a		

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Hg	20-Feb	8602041	-05E		110 p		
Hg	09-Mar	8603004	-10		110 a		
Hg	09-Mar	8602197	-06		110 p		
Hg	20-Feb	8602079	-04A		105 p		
Hg	20-Feb	8602060	-05C		100 a,d		
Hg	24-Feb	8602113	-04G		100 p		
Hg	24-Feb	8602067	-04E		100 p		
Hg	20-Feb	8602031	-03G		95 p		
Hg	20-Feb	8602087	-05A		95 p		
Hg	24-Feb	8602120	-05E		95 p		
Hg	06-Mar	8602139	-08A		90 p		
Hg	20-Feb	8602100	-04A		85 p		
Hg	07-Mar	8602176	-05G		80 p		
Hg	06-Feb	8602019	-04G		54 p		
Hg	10-Feb	8602047	-02E			NC p	
Hg	20-Feb	8602060	-03C			NC a	
Hg	20-Feb	8602079	-01A			NC	
Hg	24-Feb	8602120	-05E			NC p	
Hg	06-Mar	8602139	-08A			NC p	
Hg	07-Mar	8602159	-01			7.5 a	
Hg	07-Mar	8602176	Blank				<.0002
Hg	08-Feb	8601240	Blank				<.0002
Hg	06-Mar	8602139	Blank				<.0002
Hg	10-Feb	8602047	Blank				*.0002
Hg	24-Feb	8602067	Blank				<.0002
Hg	24-Feb	8602113	Blank				<.0002
Hg	24-Feb	8602120	Blank				<.0002
Hg	03-Feb	8601240	Blank				*.0004
Hg	09-Mar	8602197	Blank				<.0002

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Hg	20-Feb	8602100	Blank				<.0002
Mean				99	101		
RSD (%)				7.2	17.3		
Pb	11-Feb	8601240	QC	93			
Pb	11-Feb	8601240	QC	102			
Pb	17-Feb	8602047	QC	107			
Pb	17-Feb	8602047	QC	98			
Pb	17-Feb	8602047	QC	104			
Pb	17-Feb	8602019	QC	111			
Pb	17-Feb	8602067	QC	105			
Pb	17-Feb	8602019	QC	98			
Pb	17-Feb	8602019	QC	100			
Pb	17-Feb	8602067	QC	114			
Pb	21-Feb	8602113	QC	98			
Pb	21-Feb	8602113	QC	100			
Pb	21-Feb	8602100	QC	100			
Pb	21-Feb	8602100	QC	98			
Pb	21-Feb	8602113	QC	100			
Pb	07-Mar	8602139	QC	100			
Pb	07-Mar	8602139	QC	95			
Pb	07-Mar	8602120	QC	100			
Pb	07-Mar	8602120	QC	100			
Pb	09-Mar	8602139	QC	93			
Pb	09-Mar	8602139	QC	95			
Pb	11-Mar	8602176	QC	107			
Pb	11-Mar	8602176	QC	105			
Pb	11-Mar	8603004	QC	107			

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorde:	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Pb	11-Mar	8603004	QC	98			
Pb	11-Mar	8602176	QC	98			
Pb	12-Mar	8602197	QC	104			
Pb	12-Mar	8602159	QC	111			
Pb	12-Mar	8602159	QC	104			
Pb	12-Mar	8602159	QC	107			
Pb	12-Mar	8602197	QC	100			
Pb	12-Mar	8602159	QC	107			
Pb	12-Mar	8602159	QC	111			
Pb	12-Mar	8602159	QC	104			
Pb	12-Mar	8602197	QC	100			
Pb	17-Feb	8602047	-05E		167 p,c		
Pb	21-Feb	8602079	-04A		113 a,d		
Pb	21-Feb	8602113	-04G		108 a,d		
Pb	17-Feb	8602060	-02C		100 a		
Pb	21-Feb	8602087	-05A		100 a,d		
Pb	07-Mar	8602120	-01E		100 a		
Pb	17-Feb	8602047	-01E		92 a		
Pb	21-Feb	8602100	-02A		92 a,d		
Pb	17-Feb	8602041	-01E		88 a		
Pb	07-Mar	8602139	-08A		88 a		
Pb	11-Mar	8602176	-05G		88 a,b		
Pb	17-Feb	8602019	-04G		85 p		
Pb	17-Feb	8602001	-02D		83 a,d		
Pb	17-Feb	8602031	-02G		83 a		
Pb	11-Feb	8601240	-09A		79 a		
Pb	11-Mar	8603004	-08		79 a		
Pb	12-Mar	8602197	-01		79 a,d		
Pb	12-Mar	8602197	-01		79 a,d		

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Pb	17-Feb	8602019	-03G		75 a		
Pb	17-Feb	8602001	-02D		71 a,b		
Pb	21-Feb	8602087	-05A		71 a,b		
Pb	17-Feb	8602001	-06D		65 p		
Pb	07-Mar	8602139	-01A		65 p		
Pb	17-Feb	8602067	-03E		63 a		
Pb	21-Feb	8602100	-02A		63 a,b		
Pb	21-Feb	8602113	-02G		60 p		
Pb	11-Mar	8602176	-05G		54 a,b		
Pb	12-Mar	8602197	-02		51 p		
Pb	20-Feb	8602100	-04A		50 p,b		
Pb	21-Feb	8602113	-04G		50 a,b		
Pb	21-Feb	8602079	-04A		46 a,b		
Pb	21-Feb	8602079	-02A		45 p		
Pb	17-Feb	8602047	-04E			NC p	
Pb	17-Feb	8602047	-01E			0.0 a	
Pb	17-Feb	8602067	-04E			2.7 a	
Pb	17-Feb	8602060	-01C			9.1 p	
Pb	19-Feb	8602031	-02G			9.4	
Pb	21-Feb	8602113	-01G			NC p	
Pb	21-Feb	8602100	-03A			22	
Pb	21-Feb	8602079	-01A			2.1	
Pb	07-Mar	8602139	-02A			3.3 p	
Pb	07-Mar	8602139	-08A			NC a	
Pb	11-Mar	8603004	-03			15	
Pb	11-Mar	8603004	-10			13	
Pb	12-Mar	8602197	-01			20 p	
Pb	12-Mar	8602197	-01			0.0 a	
Pb	07-Mar	8602120	Blank				<.0011

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Pb	11-Mar	8602176	Blank				*.004
Pb	17-Feb	8602047	Blank				<.002
Pb	12-Mar	8602159	Blank				<.002
Pb	12-Mar	8602159	Blank				<.002
Pb	11-Feb	8601240	Blank				<.002
Pb	12-Mar	8602197	Blank				<.002
Pb	07-Mar	8602139	Blank				<.001
Pb	21-Feb	8602100	Blank				*.002
Pb	17-Feb	8602067	Blank				*.004
Pb	21-Feb	8602113	Blank				*.003
Mean				102	79		
RSD (%)				5.1	30.8		
Se	09-Feb	8601240	QC	88			
Se	09-Feb	8601240	QC	88			
Se	17-Feb	8602067	QC	99			
Se	17-Feb	8602019	QC	98			
Se	17-Feb	8602019	QC	100			
Se	17-Feb	8602019	QC	105			
Se	17-Feb	8602067	QC	105			
Se	21-Feb	8602113	QC	103			
Se	21-Feb	8602100	QC	108			
Se	21-Feb	8602113	QC	103			
Se	21-Feb	8602113	QC	103			
Se	21-Feb	8602100	QC	103			
Se	25-Feb	8602047	QC	90			
Se	25-Feb	8602047	QC	85			
Se	25-Feb	8602047	QC	103			

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Se	25-Feb	8602047	QC	108			
Se	07-Mar	8602120	QC	85			
Se	07-Mar	8602120	QC	90			
Se	09-Mar	8602139	QC	98			
Se	09-Mar	8602139	QC	100			
Se	11-Mar	8602176	QC	98			
Se	11-Mar	8603004	QC	98			
Se	11-Mar	8602176	QC	92			
Se	12-Mar	8602197	QC	94			
Se	12-Mar	8602159	QC	94			
Se	12-Mar	8602159	QC	90			
Se	12-Mar	8602197	QC	86			
Se	12-Mar	8602159	QC	86			
Se	21-Feb	8602100	-02A		104 a,d		
Se	21-Feb	8602079	-04A		100 a,d		
Se	11-Mar	8603004	-03		100 a,d		
Se	11-Mar	8602176	-03G		100 a,d		
Se	17-Feb	8602060	-05C		96 a,d		
Se	21-Feb	8602087	-04A		96 a,d		
Se	09-Feb	8601240	-05A		92 a,d		
Se	09-Mar	8602139	-03A		92 a,d		
Se	17-Feb	8602067	-04E		88 a,d		
Se	17-Feb	8602019	-04G		88 a,d		
Se	21-Feb	8602113	-04G		88 a,b		
Se	25-Feb	8602047	-01E		88 p		
Se	17-Feb	8602001	-01D		83 a,d		
Se	11-Mar	8603004	-03		83 a,b		
Se	17-Feb	8602001	-06D		78 p		
Se	07-Mar	8602120	-01E		76 a,d		

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Se	09-Feb	8601240	-05A		75 a,b		
Se	17-Feb	8602031	-02G		75 a		
Se	17-Feb	8602041	-03E		75 a		
Se	11-Mar	8602176	-03G		75 a,d		
Se	12-Mar	8602197	-02		71 a,d		
Se	17-Feb	8602019	-04G		67 a,b		
Se	21-Feb	8602079	-04A		67 a,c		
Se	21-Feb	8602100	-02A		67 a,b		
Se	17-Feb	8602001	-01D		63 a,b		
Se	21-Feb	8602087	-04A		63 a,b		
Se	09-Mar	8602139	-03A		54 a,c		
Se	07-Mar	8602120	-01E		52 a,b		
Se	17-Feb	8602060	-02C		50 p		
Se	21-Feb	8602113	-04G		50 a,b		
Se	12-Mar	8602197	-02		29 a,b		
Se	21-Feb	8602079	-02A		0 p		
Se	21-Feb	8602100	-04A		0 p		
Se	21-Feb	8602113	-02G		0 p		
Se	25-Feb	8602047	-05E		0 p		
Se	09-Mar	8602139	-01A		0 p		
Se	12-Mar	8602197	-02		0 p		
Se	17-Feb	8602067	-01E			NC a	
Se	17-Feb	8602060	-01C			NC p	
Se	21-Feb	8602113	-01G			NC p	
Se	21-Feb	8602079	-01A			NC	
Se	21-Feb	8602100	-03A			NC	
Se	25-Feb	8602047	-04E			NC p	
Se	25-Feb	8602047	-01E			NC a	
Se	09-Mar	8602139	-02A			NC p	

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Se	12-Mar	8602197	-01			NC p	
Se	25-Feb	8602047	Blank				<.003
Se	12-Mar	8602159	Blank				<.003
Se	21-Feb	8602100	Blank				<.002
Se	17-Feb	8602067	Blank				<.002
Se	07-Mar	8602120	Blank				<.003
Se	09-Mar	8602139	Blank				<.002
Se	12-Mar	8602197	Blank				<.003
Se	11-Mar	8602176	Blank				<.003
Se	21-Feb	8602113	Blank				<.002
Se	09-Feb	8601240	Blank				<.003
Mean				96	64		
RSD (%)				7.6	51.4		

a - analytical spike or duplicate
b - recovery in undiluted sample
c - spike added less than 0.2 times endogenous level
d - recovery in diluted (1:10 usually) sample
p - predigestion spike or duplicate
* - measured value less than limit of quantitation

fn-1 = for workorders: 8602047, 8602176, 8602197, 8603004
fn-2 = for workorders: 8602176 & 8602219
fn-3 = for workorders: 8602100, 8602120, 8602139, 8602159
fn-4 = for workorders: 8602120 & 8602139
fn-5 = for workorders: 8601240, 8602031, 8602041, 8602060, 8602067, 8602079, 8602087

TABLE A.2-7 (Continued)

QC SAMPLE RESULTS FOR METALS ANALYSES IN AQUEOUS SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)

fn-6 = for workorders: 8602060 & 8602067

TABLE A.2-8

QC SAMPLE RESULTS FOR HYDROCARBON AND OIL & GREASE ANALYSES IN WATER SAMPLES

Parameter	Analysis Date	SAM Workorder	SAM Fraction	QC Check % Recovery	Matrix Spike % Recovery	Duplicate Analyses % RPD	Reagent Blanks (ug/ml)
Hydrocarbons	26-Feb	8602123	QC	104			
Hydrocarbons	26-Feb	8602123	QC	118			
Mean				111			
RSD (%)				8.9			
Oil & Greas	14-Mar	8602120	QC	96			
Oil & Grease	14-Feb	8602067	QC	99			
Oil & Grease	14-Feb	8602067	QC	99			
Mean				98			
RSD (%)				1.8			

TABLE A.2-9

Gross α/β QA/QC 12-18-85

		Net Activities α	Net Activities β	
I.	**Duplicate Samples**			
1)	860048 SB-11-C	6.5 ±6.2	16.8 ±4.1	pCi/g
		7.6 ±5.8	10.0 ±3.9	pCi/g
2)	860260 - 03A	3.3 ±2.4	7.2 ±2.2	pCi/L
		3.5 ±2.3	5.6 ±2.1	pCi/L
II.	**Duplicate Counts**	<1.6	<4.2	pCi/L
	860259 - 02A	3.6 ±4.0	<4.2	pCi/L
III.	**Samples Spiked with 10uL ^{241}Am + 0.5 mL ^{90}Sr Standard Solutions**			
1)	860259 - 02A + Mixed Spike (corrected for sample volume = 65 mL)	21.0 ±5.2	131.1 ±7.7	pCi/L
	Mixed spike alone	2.4 ±0.3	9.6 ±0.5	pCi/spike
	860259 - 02A alone	<1.6	<4.2	pCi/L
2)	860038 SB-6-D + Mixed Spike (corrected for sample mass = 0.10158g)	87.9 ±10.5	113.6 ±7.0	pCi/g
	Mixed spike alone	1.7 ±0.3	7.2 ±0.5	pCi/spike
	860038, SB-6-D alone	12.4 ±7.9	19.5 ±4.3	pCi/g
IV.	**DIW Blanks, Duplicate Samples**			
	0.5 L	<0.4	<0.7	pCi/L
	0.5 L	<0.4	<0.7	pCi/L

TABLE A.2-9 (Continued)

V. Stock Standard Solutions

		α	β	Date Counted
Am	1)	2.18 ±0.3	0.55 ±0.3	8/18
	2)	2.34 ±0.3	0.76 ±0.3	9/9
Sr-90	1)	<0.4	6.52 ±0.4	8/19
	2)	<0.4	7.53 ±0.5	9/6
Mixed	1)	1.69 ±0.3	7.22 ±0.5	8/18
	2)	2.40 ±0.3	9.56 ±0.5	9/6

VI. Standard Instrument Check Sources (1 minute counts)

		α	β
C14	1986 Avg.	-	59019 ±1025 (1.7%)
			58878
	1 Jul	-	58540
			59038
	13 Aug	-	58636
Pb-210	1986	1189 ±73 (6.1%)	2266 ±223 (9.8%)
		1144	2203
	1 Jul	1106	2055
		1133	2098
	13 Aug	1226	1995

TABLE A.2-9 (Continued)

AIR FORCE GAMMA CS-137 QA/QC

I.	EPA-LV Interlab Unknown CS-137 Meas.	11.2 ±2.0	pCi/L	(6/30)
	EPA Reported Actual	10 ±5	pCi/L	
II.	Duplicate Counts			Detector
	1) 860038 SB-6-D	<46	pCi/kg	Lo-Pro
	(97.0 g (in teflon jar))	<41	pCi/kg	Lo-Pro
	2) 860258-01A	<10.7	pCi/kg	Lo-Pro
		<9.9	pCi/kg	Lo-Pro
	3) 860259-02A	<12.6	pCi/kg	Hi-Pro
		<12.9	pCi/kg	Hi-Pro
III.	CS-137 Std in Teflon Jar			
	8-13	238169	pCi	Hi-Pro
	8-22	239918	pCi	Hi-Pro
	8-13	235603	pCi	Lo-Pro
	8-22	240559	pCi	Lo-Pro
	Activity based in known std. concen.	237498	pCi	
IV.	1) DIW Blank in Teflon Jar	<71 pCi/kg		Lo-Pro
	0.093 kg in Teflon Jar	<100 pCi/kg		Hi-Pro
	2) DIW Blank in Marinelli Beaker (1.00 ug)	<3.4 pCi/kg		Lo-Pro

CS-137 Standard in Marinelli Beaker

Net cps		
Lo-Pro	Hi-Pro	Date
-	8.41	3/10
-	8.17	6/9
11.63	-	6/10
-	8.03	8/28
11.16	-	8/29
-	7.98	10/24
11.40	-	10/25
11.57	7.87	10/27
11.38	-	12/3
11.43 ±0.18	8.09 ±0.21	Avg.

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RADIAN CORPORATION

METALS: C-1, C-2, C-3, C-4, C-5, P-4, P-7m, P-7u, CREEK, SEEP
EPA 601: C-1, C-2, C-3, C-4, C-5, P-4, P-7m, P-7u, CREEK, SEEP
EPA 602: C-1, C-2, C-3, C-4, C-5, P-4, P-7m, P-7u, CREEK, SEEP

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address GENERAL DYNAMICS - FORT WORTH, PLANT 4
Sample Point Description Ground Water & Surface Water

Stream Characteristics:
Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name NEIL ROBINSON Date/Time Sampled 1-29-86, 1-30-86
Amount of Sample Collected NINE 500ml PLASTIC, THIRTY SIX 40ml GLASS
Sample Description SURFACE WATER, GROUND WATER
Store at: ☐ Ambient ☐ 5°C ☐ -10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions
Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:
Organization Name RADIAN CORP.
Received By NEIL ROBINSON Date Received 1-30-86 Time 1800
Transported By NEIL ROBINSON Lab Sample No. 86-01-239
Comments _____
Inclusive Dates of Possession 1-29-86, 1-30-86

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

5 001

work order EGC1231

Volatile Organics

DETECTION LIMITS

COMPOUND	METHOD 601 -C1>-C9		METHOD DETECTION LIMIT UG/L
Chloromethane	0.8		
Bromomethane	11.8		
Vinyl Chloride	1.8		
Chloroethane	5.2		
Methylene Chloride	2.5		
Trichlorofluoromethane	1.0		
1,1-Dichloroethene	1.3		
1,1-Dichloroethane	0.7		
Trans-1,2-Dichloroethene	1.0		
Chloroform	0.5		
1,2-Dichloroethane	0.3		
1,1,1-Trichloroethane	0.3		
Carbon Tetrachloride	1.2		
Bromodichloromethane	1.0		
1,2-Dichloropropane	0.4		
Trichloroethene	1.2		
Dibromochloromethane	0.9		
2-Chloroethylvinyl Ether	1.3		
Bromoform	2.0		
Tetrachloroethene	0.3		
Chlorobenzene	2.5		
1,3-Dichlorobenzene	3.2		
1,2-Dichlorobenzene	1.5		
1,4-Dichlorobenzene	2.4		

Detection Limits

Volatile Organics

Method CC2

Compound	Detection Limit UG/L -01 thru -04				
Benzene	0.2				
Toluene	0.3				
Ethylbenzene	0.2				
1,4-Dichlorobenzene	0.3				
1,3-Dichlorobenzene	0.4				
1,2-Dichlorobenzene	0.4				
Chlorobenzene	0.2				

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/3/92 ANALYST: JSC INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # Reagent Blank	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/3/86 ANALYST: CP INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/13/86 ANALYST: JSC INSTRUMENT: Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # REAGENT BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/3/86 ANALYST: CAP INSTRUMENT: Glenaire	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # System Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 1/26 ANALYST: JSC INSTRUMENT: Varian	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # METHOD BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 1/31/86 ANALYST: CP INSTRUMENT Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

1/31/86 G G

	CERTIFIED VALUE (mg/L)	ANALYZED VALUE	% REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	8.7	94
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	7.9	79
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	58.3	136
1,2-Dichloroethane	27.6	23.6	86
1,1,1-Trichloroethane	14.3	14.5	101
Carbon tetrachloride	20.0	18.0	90
Bromodichloromethane	7.9	8.4	106
1,2-Dichloropropane	8.0	8.2	103
Trichloroethene	22.2	22.4	101
Dibromochloromethane	16.7	14.4	86
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	10.4	105
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	9.6	117
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/3/86

	CERTIFIED VALUE (mg/L)	G ANALYZED VALUE	G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	10.5	114
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.0	80
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	55.0	128
1,2-Dichloroethane	27.6	25.0	91
1,1,1-Trichloroethane	14.3	14.9	104
Carbon tetrachloride	20.0	19.2	96
Bromodichloromethane	7.9	9.7	123
1,2-Dichloropropane	8.0	9.4	117
Trichloroethene	22.2	24.9	112
Dibromochloromethane	16.7	16.2	97
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	9.2	93
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.9	109
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/3/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		C			C		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	34.0			111		
	Toluene	4.1	4.6			113		
	Ethylbenzene	11.5	11.6			100		
	P-Xylene	19.1	21.2			111		
	M-Xylene	42.6	46.9			110		
	O-Xylene	10.6	10.6			100		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC1239-C1A

SAMPLE ID: C-1

DATE: 1-31-84

INSTRUMENT: C

601/8010

BROMOCHLOROMETHANE: 97%

2-BROMO-1-CHLOROPROPANE: 94%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC1236-C2A

SAMPLE ID: C-2

DATE: 1-31-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 101%

2-BROMO-1-CHLOROPROPANE: 99%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 86C1239-03A

SAMPLE ID: C-3

DATE: 1-31-86

INSTRUMENT: C

601/8010

BROMOCHLOROMETHANE: 95%

2-BROMO-1-CHLOROPROPANE: 92%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC1239-C4A

SAMPLE ID: C-4

DATE: 1-31-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 102%

2-BROMO-1-CHLOROPROPANE: 100%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C1234-15A

SAMPLE ID: C-5

DATE: 1-31-E6

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 86%, 115%

2-BROMO-1-CHLOROPROPANE: 98%, 113%

602/802

a,a,a-TRIFLUOROTOLUENE:

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C1539-06A

SAMPLE ID: P 4

DATE: 1-31-86

INSTRUMENT: 4

601/8010

BROMOCHLOROMETHANE: 106%

2-BROMO-1-CHLOROPROPANE: 96%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 86C1231-C7A

SAMPLE ID: P-7M

DATE: 1-31-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 120%

2-BROMO-1-CHLOROPROPANE: 100%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC1339-CEA

SAMPLE ID: P-7

DATE: 1-31-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 103%

2-BROMO-1-CHLOROPROPANE: 83%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C1339-09A

SAMPLE ID: Creek Seep

DATE: 2-3-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 98%

2-BROMO-1-CHLOROPROPANE: 107%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C1259-C1C

SAMPLE ID: C-1

DATE: 2-3-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 98%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC1234-020

SAMPLE ID: C-2

DATE: 2-3-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 100%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC1239-C3C

SAMPLE ID: C-3

DATE: 2-3-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 97%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC1239-C4C

SAMPLE ID: C-4

DATE: 2-3-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 100%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC1239-CSC

SAMPLE ID: C-5

DATE: 2-3-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 114%, 105%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C1239-C6C

SAMPLE ID: P-4

DATE: 2-3-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 117%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EMC1239-C7C

SAMPLE ID: P-7N1

DATE: 2-3-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 109%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC1339-CBC

SAMPLE ID: R-74

DATE: 2-3-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 122%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: SCC1239-CAC

SAMPLE ID: Creek Seep

DATE: 2-3-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 128%

RADIAN
CORPORATION

SPIKE RECOVERY

EPA Method 602 2/3/82
Volatile Organics MP
D

SAMPLE # 86 01838-09C
UNITS [redacted] Plant 4
Creek Seep

COMPOUND	SSR	SR	SA	%R
Benzene	41.0		30.7	134
Toluene	6.2		4.1	150
Ethyl benzene	14.5		11.5	126
1,4-Dichlorobenzene				
1,3-Dichlorobenzene				
1,2-Dichlorobenzene				
O-Xylene	12.9		10.6	120
M-Xylene	55.9		42.6	131
P-Xylene	24.4		19.1	128
Chlorobenzene			-	

SSR = Spiked Sample Result
SR = Sample Result
SA = Spike Added

RADIAN
CORPORATION

SPIKE RECOVERY

EPA METHOD 601 Volatile Organics	8601239-USA PUNT 4 CREEK SEEP 2/3/86 RP G							
COMPOUNDS	SSR	SR	SA	%R	SSR	SR	SA	%R
Chloromethane								
Bromomethane								
Vinyl chloride								
Chloroethane								
Methylene chloride	11.1		9.2	121				
Trichlorofluoromethane								
1,1-Dichloroethene	9.0		10.0	90				
1,1-Dichloroethane								
trans-1,2-Dichloroethene	8.8	3.7	5.4	107				
Chloroform	60.7		43.0	141				
1,2-Dichloroethane	28.1		27.6	102				
1,1,1-Trichloroethane	17.9		14.3	125				
Carbon Tetrachloride	25.0		20.0	125				
Bromodichloroemethane	9.9		7.9	125				
1,2-Dichloropropane	9.1		8.0	114				
Trichloroethene	60.0	20.0	22.8	180				
Dibromochloromethane	13.2		16.7	79				
1,1,2-Trichloroethane								
cis-1,2-Dichloropropene								
2-Chlorethylvinyl ether								
Bromoform	12.0		9.0	133				
1,1,2,2-Tetrachloreothane		3.08	10.1					
Tetrachlorethylene			6.2					
Chlorobenzene	10.2		8.2	125				
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								

SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

RADIAN
CORPORATION

DUPLICATE ANALYSIS

Sample ID: C-5

EPA METHOD 602
VOLATILE ORGANICS

SAMPLE # EC01239-C5C
UNITS ug/L

COMPOUND	RUN#1	RUN#2	RPD
Benzene	ND	ND	N.C.
Toluene			
Ethyl benzene			
1,4-Dichlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
O-Xylene			
M-Xylene			
P-Xylene			
Chlorobenzene			

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN CORPORATION

Work order 86C1036-CSA
Sample ID: C-5

DUPLICATE ANALYSIS

EPA Method 601 Volatile Organics						
COMPOUND	RUN#1	RUN#2	RPD	RUN#1	RUN#2	RPD
Chloromethane	ND	ND	NC			
Bromomethane						
Vinyl chloride						
Chloroethane						
Methylene chloride						
Trichlorofluoromethane						
1,1-Dichloroethene						
1,1-Dichloroethane						
trans-1,2-Dichloroethene						
Chloroform						
1,2-Dichloroethane						
1,1,1-Trichloroethane						
Carbon Tetrachloride						
Bromodichloroemethane						
1,2-Dichloropropane						
Trichloroethene						
Dibromochloromethane						
1,1,2-Trichloroethane						
cis-1,2-Dichloropropene						
2-Chloroethylvinyl ether						
Bromoform						
1,1,2,2-Tetrachloreothane						
Tetrachlorethylene						
Chlorobenzene						
1,3-Dichlorobenzene						
1,2-Dichlorobenzene						
1,4-Dichlorobenzene						

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN CORPORATION

METALS: C-1, C-2, C-3, C-4, C-5, P-4, P-7m, P-7u, CRE SE
EPA 601: C-1, C-2, C-3, C-4, C-5, P-4, P-7m, P-7u; CRE SE
EPA 602: C-1, C-2, C-3, C-4, C-5, P-4, P-7m, P-7u; CRE SE

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address GENERAL DYNAMICS - FORT WORTH, PLANT 4
Sample Point Description Ground Water & Surface Water

Stream Characteristics:
Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name NEIL ROBINSON Date/Time Sampled 1-29-86, 1-30-86
Amount of Sample Collected NINE 500ml PLASTIC, THIRTY SIX 40ml GLASS
Sample Description SURFACE WATER, GROUND WATER
Store at: ☐ Ambient ☐ 5°C ☐ -10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions
Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:
Organization Name RADIAN CORP.
Received By NEIL ROBINSON Date Received ~~1-30-86~~ Time ~~1500~~
Transported By NEIL ROBINSON Lab Sample No. 86-C1-240
Comments _____
Inclusive Dates of Possession 1-29-86, 1-30-86

Organization Name RAS
Received By _____ Date Received 1-31-86 Time 1000
Transported By Fed Ex Lab Sample No. 8601239, 240
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Form V

Q. C. Report No. 2

SPIKE SAMPLE RECOVERY

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4

EPA Sample No.

Lab Sample ID No. 8601240-02A

Units ug/ml

Matrix water

prediget spike

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	"				
3. Arsenic	"				
4. Barium	"	1.78	.059	2.00	86
5. Beryllium	"				
6. Cadmium	"	.040	.003*	.050	74
7. Calcium	"				
8. Chromium	"	.18	.019*	.20	81
9. Cobalt	"				
10. Copper	"				
11. Iron	"				
12. Lead	"				
13. Magnesium	"				
14. Manganese	"				
15. Mercury	"				
16. Nickel	"				
17. Potassium	"				
18. Selenium	"				
19. Silver	"	.21	.013	.25	79
20. Sodium	"				
21. Thallium	"				
22. Tin	"				
23. Vanadium	"				
24. Zinc	"				
Other:					
Cyanide	"				

[1] %R = [(SSR - SR)/SA] x 100

"R" = out of control

Comments: spike added to sample prior to [illegible]

* value is less than 5x MDL

B - [illegible]

5 036

Form V

Q. C. Report No. 2

SPIKE SAMPLE RECOVERY

LAB NAME Radian Analytical CASE NO. PLANT 4

DATE 3-4-86 EPA Sample No.

Lab Sample ID No. 8601240-02A

Units ug/ml

Matrix water

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	-				
3. Arsenic	-				
4. Barium	-	1.04	.059	1.00	98
5. Beryllium	-				
6. Cadmium	-	0.98	0.003 *	1.00	98
7. Calcium	-				
8. Chromium	-	0.98	0.019 *	1.00	96
9. Cobalt	-				
10. Copper	-				
11. Iron	-				
12. Lead	-				
13. Magnesium	-				
14. Manganese	-				
15. Mercury	-				
16. Nickel	-				
17. Potassium	-				
18. Selenium	-				
19. Silver	-	1.00	0.013	1.00	99
20. Sodium	-				
21. Thallium	-				
22. Tin	-				
23. Vanadium	-				
24 Zinc	-				
Other:					
Cyanide	-				

[1] %R = [(SSR - SR)/SA] x 100

*R = out of control

Comments: * Value is less than 5 x MDL

5 037

8601240

Form III

Q. C. Report No. 3

BLANKS

3-10-86

LAB NAME Radian CASE NO. PLANT 4

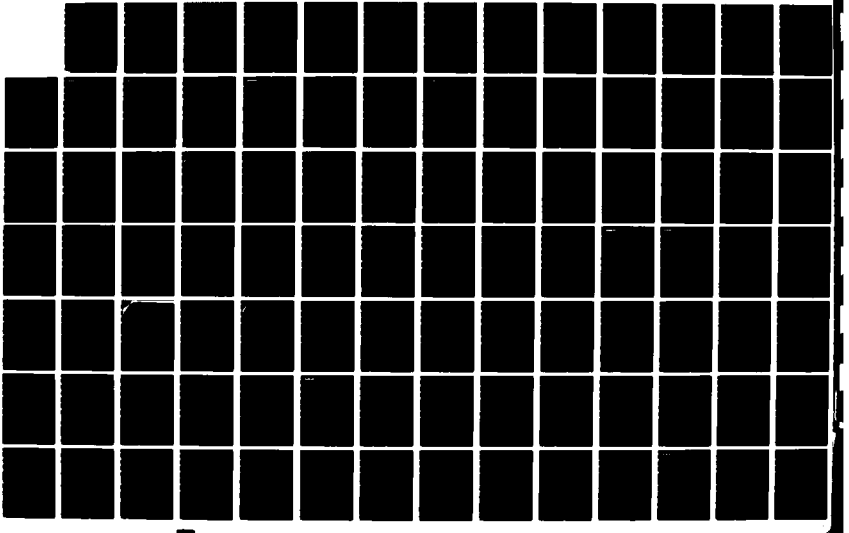
DATE 3-4-86 UNITS ug/ml.

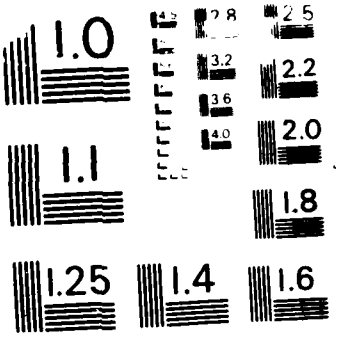
Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium						<.001	
5. Beryllium							
6. Cadmium						<.002	
7. Calcium							
8. Chromium						<.005	
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver						<.00	
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

AD-A190 445 INSTALLATION RESTORATION PROGRAM PHASE 2 2/6
CONFIRMATION/QUANTIFICATION STAG (U) RADIAN CORP
AUSTIN TX DEC 87 F33615-83-D-4001

UNCLASSIFIED F/G 24/7 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS - 1963

FOR W.O. 86-01-240 86-02-031 86-02-041 86-02-060 86-02-067 86-02-079 86-02-087

UNITS ug/ml

PLANT 4 86-01-240 samples 01-09

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2/8/86	.041	.040	103	an dup 01 A	<.005	<.005	NC	an sp 01 A	<.005	.024	.024	100	prep bl <.005
	idl=.005	.041	.040	103										col bl <.005
		.040	.040	100										
Hg	2/3/86	.0054	.0050	108	dig dup 09A	<.0002	.0003*	NC	dig sp 09A	<.0002	.0028	.0020	140	prep bl .0004*
	idl=.0002	.0040	.0040	100										
Pb	2-11/86	.042	.045	93	an dup 09A	<.002	<.002	NC	an sp 09 A	<.002	.019	.024	79	prep bl .002
	idl=.002	.046	.045	102										col bl <.002
Sc	2/9/86	.044	.050	88	an dup 05 A	<.003	<.003	NC	an sp 05 A	<.003	.018	.024	75	prep bl <.003
	idl=.003	.044	.050	88					an sp 05 1:10 dilution	<.003	.022	.024	92	col bl <.003
Hg	2/8/86	.0054	.0050	108	dig dup 03A	<.0002	<.0002	NC	dig sp 04 A	<.0002	.0024	.0020	120	<.0002 prep bl
	idl=.0002	.0040	.0040	100										

an dup = analytical duplicate
dig dup = digestion duplicate
i.d.l. = instrument detection limit

an sp = analytical spike
dig sp = digestion spike or matrix

* indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-031 samples (01-, 03, 03, 06)-Oil & Grease 02, 03-METALS

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 02 G	<.005	<.005	NC	an. sp 02 G	<.005	.023	.024	96	prep bl <.005
	idl = .005	.040	.040	100										cal bl <.005
Hg	2-20-86	.0048	.0050	96	—				dig sp 03 G	<.0002	.0019	.0020	95	prep bl <.0002
	idl = .0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 02 G	.033	.030	9.4	an. sp 02 G	.033	.053	.024	83	prep bl <.002
	idl = .002	.045	.045	100										
Se	2-17-86	.042	.040	105	—				an. sp. 02 G	.003	.021	.024	75	prep bl <.002
	idl = .002	.040	.040	100										cal bl <.002
		.039	.040	98										
Oil and Grease	2-14-86	197	200	99	—				—					
	idl = 1	197	200	99										
HC	2-26-86	430	415	104										
	idl = 1	208	245	118										

5040

an. sp = analytical spike
dig sp = prodigest or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-041 samples 01-06

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 01 E	<.005	<.005	NC	an sp 01 E	<.005	.022	.024	92	prep bl <.005
	idl = .005	.037	.040	93										cal bl <.005
		.035	.040	88										
Hg	2-20-86	.0048	.0050	96	dig dup 06 E	<.0002	.0002*	NC	dig sp 05 E	<.0002	.0022	.0020	110	prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 01 E	<.002	<.002	NC	an sp 01 E 1:10 dilution	<.002	.021	.024	88	prep bl <.002
	idl = .002	.045	.045	100										
		.048	.045	107										
Se	2-17-86	.042	.040	105	—				an sp 03 E	.003*	.021	.024	75	prep bl <.002
	idl = .002	.039	.040	98										cal bl <.002
oil and grease	2-14-86	197	200	99										
	idl = 1	197	200	99										
HC - idl = 1	2-14-86				an. dup 03	<1	<1	NC						

an sp = analytical spike
dig sp = digestion spike or matrix spike

an dup = analytical duplicate
dig dup = digestion duplicate

idl = instrument det. limit

* indicates value is less than 5x instrument detection limit

NC = not calculable

5041

UNITS ug/gal

PLANT 4 86-02-060 samples 01-05

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	dig dup 01C	.002*	.003*	40	dig sp 02C	.006*	.023	.020	85	prep bl <.002
	idl = .002	.042	.040	105	an. dup 03C	.006*	.003*	67	an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Hg	2-20-86	.0048	.0050	96	–				05A	<.0002	.0020	.0020	100	prep bl <.0002
	idl = .0002	.0042	.0040	105										
Pb	2-17-86	.045	.043	105	dig dup 01C	.034	.031	9.1	dig sp 02C	.27	.29	.020	100	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	dig dup 01C	.003*	.002*	40	dig sp 02C	<.002	.005	.010	50	prep bl <.002
	idl = .002	.040	.040	100					an sp 05A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
Oil and Grease	2-14-86	197	200	99	–				–					
	idl = 1	197	200	99										

an sp = analytical spike
dig sp = digestion or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5X instrument detection limit
NC = not calculable

5042

PLANT 4 86-02-067

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	—				an sp 03E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.042	.040	105					1:10 dilution					cal bl <.002
Hg	2-24-86	.0048	.0050	96	—				dig sp 04E	<.0002	.0020	.0020	100	prep bl <.0002
	2-20-86	.0048	.0050	96										prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.045	.043	105	an dup 04E	.037	.038	2.7	an sp 03E	.020	.035	.024	63	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	an dup 01E	.007*	.007*	0	an sp 04E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.040	.040						1:10 dilution					cal bl <.002
Oil and Grease	2-14-86	197	200	99										
	idl = 1	197	200	99										

idl = instrument detection limit

an sp = analytical spike
dig sp = digestion or matrix spike

dig = digestion duplicate
an dup = analytical duplicate

* indicates value is less than 5 x instrument detection limit
NC = not calculable

SD48

PLANT 4 86-03-079 samples 01 – 04 samples 05, 06, 07-09G, HC UNITS µg/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-21-86	.043	.040	105	an. dup 01A	.011	.010	9.5	on sp. 01A	.011	.038	.024	113	prep bl <.002
	idl = .002	.042	.040	105	dig dup 01A	.011	.011	0	dig dup 02A	* .007	.026	.020	95	cal bl <.002
		.042	.040	105										<.002 <.002
Hg	2-20-86	.0048	.0050	96	dig dup 01A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0021	.0020	105	prep bl <.0002
	idl = .0002	.0043	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	dig dup 01A	.048	.047	2.1	dig sp 02A	<.0002	.009	.020	45	prep bl <.002
	idl = .002	.043	.043	100					an sp 04A	<.0002	.011	.024	46	cal bl <.002
									an sp 04A	<.0002	.027	.024	113	cal bl <.002
									1:10 dilution					
Se	2-21-86	.041	.040	103	dig dup 01A	<.002	<.002	NC	dig sp 02A	<.002	<.002	.010	0	prep bl <.002
	idl = .002	.043	.040	108					an sp 04A	<.002	.016	.024	67	cal bl <.002
									an sp 04A 1:10 dilution	<.002	.024	.024	100	
Oil & Grease	3-14-86	191	200	96										
	idl = 1													

an dup = analytical duplicate dig dup = pre-digest duplicate idl = instrument detection limit NC = NOT CALCULABLE
an sp = analytical spike dig sp = pre-digest spike * = value is less than 5 x idl

S 044

PLANT 4 86-02-087 samples 04,05 (metals) 01,02(DHG) 01,02,03(HC) UNITS ~~ug/ml~~

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-24-86	.036	.040	90	an dup 04A	.038	.038	0	an sp 05A	<.002	.024	.024	100	prep bl <.002
	idl=.002	.036	.040	90										cal bl <.008
		.037	.040	93	-									cal bl <.002
Hg	2-20-86	.0048	.0050	96	-				dig sp 05A	<.0002	.0019	.0020	95	prep bl <.0002
	idl=.0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	-				an sp 05A	<.002	.017	.024	71	prep bl .002*
	idl=.002	.043	.043	100					an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Se	2-21-86	.041	.040	103					an sp 04A	<.002	.015	.024	63	prep bl <.002
	idl=.002	.043	.040	108					an sp 04A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
oil and grease	3-14-86	191	200	96										
	idl=1													

an dup=analytical duplicate an sp=analytical spike dig dup=pre-digest duplicate dig sp=pre-digest spike
idl = instrument detection limit *=value is less then five times the instrument detection limit NC=not calculable

5 045

for work orders 8601240
8602031
8602041
8602060
8602067
8602079
8602087

Form VII

Q.C. Report No. 2

INSTRUMENT DETECTION LIMITS AND

LABORATORY CONTROL SAMPLE

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 LCS UNITS ~~ug/L~~ mg/kg

µg/ml (Circle One)

Compound	Required Detection Limits (CRDL)-ug/l	Instrument Detection Limits (IDL)-ug/l ICP/AA	Furnace*	Lab Control Sample True	Found	%R
Metals:						
1. Aluminum	200					
2. Antimony	60					
3. Arsenic	10					
4. Barium	200	<.001				
5. Beryllium	5					
6. Cadmium	5	<.002				
7. Calcium	5000					
8. Chromium	10	<.005				
9. Cobalt	50					
10. Copper	25					
11. Iron	100					
12. Lead	5					
13. Magnesium	5000					
14. Manganese	15					
15. Mercury	0.2					
16. Nickel	40					
17. Potassium	5000					
18. Selenium	5					
19. Silver	10	<.002				
20. Sodium	5000					
21. Thallium	10					
22. Tin	40					
23. Vanadium	50					
24. Zinc	20					
Other:						
Cyanide	10					

5 046 * dection limits are given on 8-13 furnace /Hg/ORG QA/QC SUMMARY SHEETS

ICP 9+ / QC DATA

For work orders: 8601240, 8602031, 8602041, 8602060, 8602067, 8602079, 8602087

Form II

Q. C. Report No. 3

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals[4]:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium	100	1.01	101	1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium	1.00	1.04	104	1.00	1.05	105	1.04	104	
7. Calcium									
8. Chromium	100	1.01	101	1.00	1.02	102	1.02	102	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver	1.00	1.00	100	1.00	1.02	102	1.00	100	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

Form II

Q. C. Report No. 3

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO. _____

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium				1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium				1.00	1.04	104	1.03	103	
7. Calcium									
8. Chromium				1.00	1.00	100	1.01	101	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver				1.00	1.01	101	1.02	102	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

8601240
8602031
8602041
8602060
8602067
8602079
8602087

Form III

Q. C. Report No. 2

BLANKS

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium	<.001	<.001	<.001	<.001	<.001		
5. Beryllium							
6. Cadmium	<.002	<.002	<.002	.002*	.002*		
7. Calcium							
8. Chromium	<.005	<.005	<.005	<.005	<.005		
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver	.006*	.018	.010	.009*	.014		
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

*value is less than 5x idl

5 049

Form VI

Q. C. Report No. 2

DUPLICATES
PRE DIGESTION
DUPLICATE

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4
EPA Sample No.
Lab Sample ID No. 8601240 -01A
Units ug/ml

Matrix water.

digestio dup

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		.053	051	3.8
5. Beryllium				
6. Cadmium		<.002	.002*	NC
7. Calcium				
8. Chromium		.007*	.007*	0
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		.011	.010*	9.5
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* ~~Out of Control~~

To be added at a later date.

[2] RPD = [|S - D| / ((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

* value is less than 5 x IDL

Form VI

Q. C. Report No. 2

DUPLICATES
ANALYTICAL

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4
EPA Sample No.
Lab Sample ID No. 86C124C-C1A
Units ug/ml

Matrix water

analytical

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		.053	.053	0
5. Beryllium				
6. Cadmium		<.002	.003*	NC
7. Calcium				
8. Chromium		.007*	<.005	NC
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		.011	.012	8.7
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* ~~Out of Control~~

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

* value is less than 5x cdl

EPA 625: P-4; C-4; C-3; P7u

RADIAN CORPORATION

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth Texas Plant 4
Sample Point Description Surface and ground water

Stream Characteristics:
Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name Neil Robinson Date/Time Sampled 1-29-86; 1-30-86
Amount of Sample Collected _____
Sample Description Surface & Ground Water
Store at: ☐ Ambient ☐ 5°C ☐ – 10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions
Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive
☐ Other _____		

Sample Allocation/Chain of Possession:
Organization Name RADIAN
Received By ~~Neil Robinson~~ NR Date Received 1-30-86 Time _____
Transported By ~~Neil Robinson~~ Lab Sample No. SW-01-34
Comments _____
Inclusive Dates of Possession 1-29-86 to 1-30-86

Organization Name Radian Analytical Services
Received By C. Rahmuller Date Received 1-31-86 Time 9:45
Transported By Federal Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

RADIAN CORPORATION

EPA 625 & C-2; C-1; Creek Seep
P-7m

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth, PLANT 4
Sample Point Description Surface Water ("C") and Well Water (P-7m)

Stream Characteristics:
Temperature _____ Flow _____ pH _____
Visual Observations/Comments (2) 1,000ml DK Glass Bottles (NR)

Collector's Name NEIL ROBINSON Date/Time Sampled 1-29-86; 1-30-86
Amount of Sample Collected (7) 1,000ml DK Glass Bottles
Sample Description Surface & Well Water
Store at: ☐ Ambient ☐ 5°C ☐ – 10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive
☐ Other _____		

Sample Allocation/Chain of Possession:
Organization Name RADIAN CORP
Received By [signature] Date Received 1-30-86 Time 6PM
Transported By NEIL ROBINSON Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name Radian Analytical Services
Received By [signature] Date Received 1-31-86 Time 9:45
Transported By Federal Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

5 053

RADIAN CORPORATION

EPA 625: P-7m; C-5

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth Texas, Plant 4
Sample Point Description SURFACE AND WELL WATER

Stream Characteristics:
Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name NELL ROBINSON Date/Time Sampled 1-29-86; 1-30-86
Amount of Sample Collected (3) 1,000 ml DK Glass Bottles
Sample Description Surface & Ground Water
Store at: ☐ Ambient ☐ 5°C ☐ −10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions
Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive
☐ Other _____		

Sample Allocation/Chain of Possession:
Organization Name RADIAN
Received By NELL ROBINSON / Neil Robinson Date Received 1-30-86 Time ~~585~~ 6pm
Transported By Neil Robinson Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name Radian Analytical Services
Received By C. Robinson Date Received 1-31-86 Time 0945
Transported By Federal Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

5 054

HYDROCARBONS - 860111, 860110
METALS - 860113, 860110, 860114, 860109, 860111, 860112
EPA 602 - 860109, 860110, 860111, 860112, 860113, 8601
EPA 601 - 860109, 860110, 860111, 860112, 860113, 8601

RADIAN CORPORATION AUSTIN, TEXAS

CHAIN OF CUSTODY RECORD

CHROMIUM - 860111, 860110
OIL & GREASE - 860111, 860110

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth, Plant 4
Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name Neil Robinson, Art Morrell Date/Time Sampled 1-31-86
Amount of Sample Collected _____ (MASON JARS)
Sample Description EIGHT 500 ml plastic, Four 1 liter glass, Twenty Four 40 ml glass
Store at: ☐ Ambient ☐ 5°C ☐ -10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name Radian Corp.
Received By _____ Date Received _____ Time _____
Transported By Art Morrell Lab Sample No. _____
Comments _____
Inclusive Dates of Possession 1-31-86

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Volatile Organics DETECTION LIMITS

EPA METHOD 601				METHOD DETECTION LIMIT ug/L
	WORK ORDER #: 8L02001			
COMPOUND FRACTIONS:	01 & 06	02 & 03	05	04
Chloromethane	2.0	0.08	0.80	40
Bromomethane	29.	1.18	1.2	58
Vinyl Chloride	4.5	0.18	1.8	9.0
Chloroethane	13	0.52	5.2	26
Methylene Chloride	6.3	0.25	2.5	12.6
Trichlorofluoromethane	2.5	0.10	1.0	5.0
1,1-Dichloroethene	3.3	0.13	1.3	6.6
1,1-Dichloroethane	1.8	0.07	0.70	3.6
Trans-1,2-Dichloroethene	2.5	0.10	1.0	5.0
Chloroform	1.3	0.05	0.50	2.6
1,2-Dichloroethane	0.75	0.03	0.30	1.5
1,1,1-Trichloroethane	0.75	0.03	0.30	1.5
Carbon Tetrachloride	3.0	0.12	1.2	6.0
Bromodichloromethane	2.5	0.10	1.0	5.0
1,2-Dichloropropane	1.0	0.04	4.0	2.0
Trichloroethene	4.5	0.18	1.8	9.0
Dibromochloromethane	2.3	0.09	9.0	4.6
2-Chloroethylvinyl Ether	3.3	0.13	1.3	6.6
Bromoform	5.0	0.20	2.0	10.0
Tetrachloroethene	0.75	0.03	0.3.	1.5
Chlorobenzene	6.3	0.25	2.5	12.6
1,3-Dichlorobenzene	8.0	0.32	3.2	16.0
1,2-Dichlorobenzene	3.4	0.13	1.5	6.8
1,4-Dichlorobenzene	6.0	0.24	2.4	12.0

EPA Method 602
Volatile Organics

WORK ORDER # 8600001

FRACTIONS: 01 02-06

Detection Limits		
Compound	Method Detection	Limit ug/L
Benzene	0.2	1.0
Toluene	0.2	1.0
Ethylbenzene	0.2	1.0
1,4-Dichloropenzene	0.3	1.5
1,3-Dichlprobenzene	0.4	2.0
1,2-Dichlorobenzene	0.4	2.0
Chlorobenzene	0.2	1.0

RADIAN
CORPORATION

DUPLICATE ANALYSIS

EPA Method 601 Volatile Organics	WORK ORDER - 8602001 FRACTION - 02A					
COMPOUND	RUN#1	RUN#2	RPD	RUN#1	RUN#2	RPD
Chloromethane						
Bromomethane						
Vinyl chloride DID NOT CONFIRM	1.58	1.46	7.9			
Chloroethane						
Methylene chloride						
Trichlorofluoromethane						
1,1-Dichloroethene						
1,1-Dichloroethane						
trans-1,2-Dichloroethene DID NOT CONFIRM	10.9	10.6	2.8			
Chloroform						
1,2-Dichloroethane						
1,1,1-Trichloroethane						
Carbon Tetrachloride						
Bromodichloroemethane						
1,2-Dichloropropane						
Trichloroethene D.O NOT CONFIRM	0.24	0.16	40			
Dibromochloromethane						
1,1,2-Trichloroethane						
cis-1,2-Dichloropropene						
2-Chloroethylvinyl ether						
Bromoform						
1,1,2,2-Tetrachloreothane						
Tetrachlorethylene						
Chlorobenzene						
1,3-Dichlorobenzene						
1,2-Dichlorobenzene						
1,4-Dichlorobenzene						

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN
CORPORATION

DUPLICATE ANALYSIS

EPA METHOD 602
VOLATILE ORGANICS

SAMPLE # 8602001-03C
UNITS µg/L

COMPOUND	RUN#1	RUN#2	RPD
Benzene	ND	ND	
Toluene	ND	ND	
Ethyl benzene	ND	ND	
1,4-Dichlorobenzene	ND	ND	
1,3-Dichlorobenzene	ND	ND	
1,2-Dichlorobenzene	ND	ND	
O-Xylene			
M-Xylene			
P-Xylene			
Chlorobenzene			

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN
CORPORATION

SPIKE RECOVERY

EPA Method 602 2/4/22
Volatile Organics 1:10 MP
D

SAMPLE # 8602001-04C
UNITS Plant 4
86112

COMPOUND	SSR	SR	SA	%R
Benzene	39.1		30.7	127
Toluene	7.5		4.1	182
Ethyl benzene	16.2		11.5	141
1,4-Dichlorobenzene				
1,3-Dichlorobenzene				
1,2-Dichlorobenzene				
O-Xylene	14.0		10.6	133
M-Xylene	60.3		42.6	142
P-Xylene	28.7		19.1	150
Chlorobenzene				

SSR = Spiked Sample Result
SR = Sample Result
SA = Spike Added

RADIAN
CORPORATION

SPIKE RECOVERY

EPA METHOD 601 Volatile Organics	8602w1-06A PUNTY 8601LY 5m 1.05		2/16/61 AP Q					
COMPOUNDS	SSR	SR	SA	%R	SSR	SR	SA	%R
Chloromethane								
Bromomethane								
Vinyl chloride		8.57						
Chloroethane								
Methylene chloride	9.5		9.2	104				
Trichlorofluoromethane								
1,1-Dichloroethene	8.9		10.0	89				
1,1-Dichloroethane								
trans-1,2-Dichloroethene	5.7	160	5.4	105①				
Chloroform	60.3		43.0	140				
1,2-Dichloroethane	24.4		27.6	89				
1,1,1-Trichloroethane	16.1		14.3	113				
Carbon Tetrachloride	22.4		20.0	112				
Bromodichloroemethane	8.9		7.9	113				
1,2-Dichloropropane	8.3		8.0	103				
Trichloroethene	40.0	402	22.2	180①				
Dibromochloromethane	11.4		16.7	68				
1,1,2-Trichloroethane								
cis-1,2-Dichloropropene								
2-Chlorethylvinyl ether								
Bromoform	9.8		9.9	99				
1,1,2,2-Tetrachloreothane			10.6					
Tetrachlorethylene			6.2					
Chlorobenzene	10.2		9.2	104				
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								

① AREA COUNT OF SAMPLE ALREADY SUBTRACTED OUT.

SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/4/86

	CERTIFIED VALUE (mg/L)	G ANALYZED VALUE	G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	9.7	105
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	9.9	100
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	65.7	153
1,2-Dichloroethane	27.6	26.0	94
1,1,1-Trichloroethane	14.3	17.8	125
Carbon tetrachloride	20.0	22.5	113
Bromodichloromethane	7.9	9.4	118
1,2-Dichloropropane	8.0	8.1	101
Trichloroethene	22.2	24.5	110
Dibromochloromethane	16.7	15.7	94
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	11.8	119
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	9.5	116
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

8/13/86

	CERTIFIED VALUE (mg/L) G	ANALYZED VALUE G	% REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	10.5	114
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.0	80
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	55.0	128
1,2-Dichloroethane	27.6	25.0	91
1,1,1-Trichloroethane	14.3	14.9	104
Carbon tetrachloride	20.0	17.2	96
Bromodichloromethane	7.9	9.7	123
1,2-Dichloropropane	8.0	9.4	117
Trichloroethene	22.2	24.9	112
Dibromochloromethane	16.7	16.2	97
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	9.2	93
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.9	109
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/3/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		Q			Q		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	34.0			111		
	Toluene	4.1	4.6			113		
	Ethylbenzene	11.5	11.6			100		
	P-Xylene	19.1	21.2			111		
	M-Xylene	42.6	46.9			110		
	O-Xylene	10.6	10.6			100		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/3/86 ANALYST: JSC INSTRUMENT: Dale
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/3/86 ANALYST: CP INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: 2/3/86 ANALYST: JC INSTRUMENT: Hranica	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # REAGENT BLANK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: 2/3/86 ANALYST: RP INSTRUMENT: Varian	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	NP	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/4/82 ANALYST: [illegible] INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Brome-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # REAGENT BLANK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/4/86 ANALYST: RP INSTRUMENT # Delmar
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # System Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/16/86 ANALYST: JSC INSTRUMENT: Gemini	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/4/92 ANALYST: RP INSTRUMENT: Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

Surrogate Recoveries

Lab #: 8602001 -01A
Sample ID: 860109
Date: 2/3/86
Instrument: G

601/801C
Bromochloromethane: 104 %
2-Bromo-1-Chloropropane: 112 %

602/802
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602001-02A
Sample ID: 860110
Date: 2/3/86
Instrument: G

601/8010
Bromochloromethane: 101/97 %
2-Bromo-1-Chloropropane: 100/94 %

602/8020
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602001-03A
Sample ID: 86C:11
Date: 2/3/86
Instrument: G

601/8010
Bromochloromethane: 108%
2-Bromo-1-Chloropropane: 98%

602/8020
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 86-02-001-04A
Sample ID: 860112
Date: 2/4/86
Instrument: G

601/8010
Bromochloromethane: 114%
2-Bromo-1-Chloropropane: 151%

602/802
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602001 - C5A
Sample ID: 86113
Date: 2/4/86
Instrument: G

601 / 8010
Bromochloromethane: 100%
2-Bromo-1-Chloropropane: 130 %

602 / 802
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602001-06A
Sample ID: 860114
Date: 2/4/86
Instrument: G

601/8010
Bromochloromethane: 103%
2-Bromo-1-Chloropropane: 111%

602/8020
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602001 -01C
Sample ID: 860109
Date: 2/3/86
Instrument: D

601 / 8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602 / 802
a,a,a-Trifluorotoluene: 94 %

Surrogate Recoveries

Lab #: 8602001-02C
Sample ID: 860110
Date: 2/3/86
Instrument: D

601/8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602/8020
a,a,a-Trifluorotoluene: 122%

Surrogate Recoveries

Lab #: 8602001-03C
Sample ID: 860111
Date: 2/4/86
Instrument: D

601/8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602/8020
a,a,a-Trifluorotoluene: 101/96%

Surrogate Recoveries

Lab #: 8602001-01C
Sample ID: 860112
Date: 2/4/16
Instrument: D

601/8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602/8020
a,a,a-Trifluorotoluene: 86%

Surrogate Recoveries

Lab #: 8602001-05C
Sample ID: 860113
Date: 2/4/86
Instrument: D

601/8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602/502
a,a,a-Trifluorotoluene: 91%

Surrogate Recoveries

Lab #: 8602-001-006
Sample ID: 860114
Date: 2/4/86
Instrument: D

601/8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602/8020
a,a,a-Trifluorotoluene: 85%

Form VI

Q. C. Report No. 1

DUPLICATES

LAB NAME Badger Analytical CASE NO. Plant 4

DATE 2-27-86 EPA Sample No.

Lab Sample ID No. 8602001-01D

Units ug/ml

Matrix H2O

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		0.10	0.10	9.5
5. Beryllium				
6. Cadmium		0.003*	<.002	NC
7. Calcium				
8. Chromium		0.14	0.14	0
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		0.005 *	0.005 *	NC
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* Out of Control

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

* value < 5 x IDL

Form VI

S. C. Report No. 1 -

DUPLICATES

LAB NAME Radian — Matrix — CASE NO. Plant

DATE 2-27-86 — EPA Sample No. —

Lab Sample ID No. 800200 1 -OSD

Units ug/ml

Matrix H20

Compound	Control Limit[1]	Sample(S)	Duplicate D	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		0.12	0.12	0
5. Beryllium				
6. Cadmium		0.003*	0.003*	0
7. Calcium				
8. Chromium		0.13	0.13	0
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		0.02	0.02	0
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* Out of Control

To be added at a later date.

[2] RPD = [(S - D) / ((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

* Value < 5 x IDL

Form V

Q. C. Report No. 1

SPIKE SAMPLE RECOVERY

Matrix

LAB NAME Radian

CASE NO. Plant 4

EPA Sample No. —

DATE 2-27-86

Lab Sample ID No. 860200 1-060

Units ug/ml

Matrix H20

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	-				
3. Arsenic	-				
4. Barium	-	1.73	0.05	2.00	84
5. Beryllium	-				
6. Cadmium	-	0.04	0.003 *	0.05	74
7. Calcium	-				
8. Chromium	-	0.18	0.02 *	0.20	80
9. Cobalt	-				
10. Copper	-				
11. Iron	-				
12. Lead	-				
13. Magnesium	-				
14. Manganese	-				
15. Mercury	-				
16. Nickel	-				
17. Potassium	-				
18. Selenium	-				
19. Silver	-	0.21	0.02	0.25	76
20. Sodium	-				
21. Thallium	-				
22. Tin	-				
23. Vanadium	-				
24. Zinc	-				
Other:					
Cyanide	-				

[1] %R = [(SSR - SR)/SA] x 100

"R" - out of control

Comments: * value < 5x IDL

For samples: 86 02 001-01D -06D

UNITS ug/mL

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
Hg		0.041	0.040	103	-01D *	<.005	<.005	NC	-01D *	<.005	.026	.024	108	(prep) <.005
		0.044	0.040	103	-05D **	<.005	<.005	NC	-06D **	<.005	.017	.020	85	<.005
		0.040	0.040	100										<.005
Pb		0.042	0.040	93	-05D **	.009	.009	NC	-02D *	<.002	.019	.024	71 (A)	(prep) <.002
		0.047	0.045	104					-02D 1:10	<.002	.020	.024	83	<.002
		0.045	0.045	100					-06D **	<.002	.013	.020	65	<.002
Se		0.050	0.044	88	-05D **	<.003	<.003	NC	-01D *	<.003	.015	.024	63 (A)	(prep) <.003
		0.044	0.050	88					-01D 1:10	<.003	.020	.024	83	<.003
		0.046	0.050	92					-06D **	.016	.211	.25	78	<.003
		0.044	0.50	88										<.003
Hg	2-6-86	0.0004	0.0060	107	-02D	<.0002	<.0002	NC	-01D	<.0002	.0022	.0020	110	<.0002
		0.0038	0.0040	95										
		0.0036	0.0040	90										

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* Analytical (or post-digestion) spike or duplicate

** Matrix (pre-digestion) spike or duplicate

(A) Because of low recovery, sample was diluted 1:10 and re-spiked. The increased recovery indicates matrix interferences.

RADIAN CORPORATION SACRAMENTO EPA 625: 860110; 860111; 860112; 860114 860109 (1 received in return) 2/3/86 10 days

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth Plant 4

Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name NEIL ROBINSON Date/Time Sampled 1-30-86/ALL DAY

Amount of Sample Collected ~~1 Gal~~ NONE 1000ml PK GLASS BOTTLES (AMBER)

Sample Description Ground Water

Store at: ☐ Ambient ☐ 5°C ☐ – 10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions - Special Handling - Hazards _____

860112 received only !

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name RADIAN CORP

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. 86-02-004

Comments _____

Inclusive Dates of Possession 1-30-86 only

Organization Name RAS - Sue

Received By _____ Date Received 2/1/86 Time 1000

Transported By Fed Ex 3217-1390 Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

HM 20 ... (revision 2/3/86 - 86-0-10) (Radiation Dosimetry)

OIL & GREASE : 860116, 860117, 860115
Hydrocarbons 860117, 860116, 860115
CHROMIUM : 860117, 860116, 860115
METALS 860116, 860115, 860117

EPA 602 860117
860115, 860116

EPA 601 : 860117
860115
860116

RADIAN CORPORATION

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics, Fort Worth, Plant 4

Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name Neil Robinson, Art Morrill Date/Time Sampled _____

Amount of Sample Collected Six Mason Jars, Six 500 ml Plastic, Twelve 40 ml glass

Sample Description _____

Store at: ☐ Ambient ☐ 5°C ☐ – 10°C ☒ Other 4° C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name Radian Corp.

Received By _____ Date Received _____ Time _____

Transported By Art Morrill Lab Sample No. 86-02-015

Comments _____

Inclusive Dates of Possession 2-3-86

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Volatile Organics DETECTION LIMITS

EPA METHOD 601

For work order # E6C2015

COMPOUND	FRACTION 01	02	03	METHOD DETECTION LIMIT ug/L
Chloromethane	0.08	8.0	0.08	
Bromomethane	1.18	118	1.18	
Vinyl Chloride	0.18	18	0.18	
Chloroethane	0.52	52	0.52	
Methylene Chloride	0.25	25	0.25	
Trichlorofluoromethane	0.10	10	0.10	
1,1-Dichloroethene	0.13	13	0.13	
1,1-Dichloroethane	0.07	7.0	0.07	
Trans-1,2-Dichloroethene	0.10	10	0.10	
Chloroform	0.05	5.0	0.05	
1,2-Dichloroethane	0.03	3.0	0.03	
1,1,1-Trichloroethane	0.03	3.0	0.03	
Carbon Tetrachloride	0.12	12	0.12	
Bromodichloromethane	0.10	10	0.10	
1,2-Dichloropropane	0.04	4.0	0.04	
Trichloroethene	0.12	12	0.12	
Dibromochloromethane	0.09	9.0	0.09	
2-Chloroethylvinyl Ether	0.13	13	0.13	
Bromoform	0.20	20	0.20	
Tetrachloroethene	0.03	3.0	0.03	
Chlorobenzene	0.25	25	0.25	
1,3-Dichlorobenzene	0.32	32	0.32	
1,2-Dichlorobenzene	0.15	15	0.15	
1,4-Dichlorobenzene	0.24	24	0.24	

EPA Method 602
Volatile Organics

FOR SAMPLES 860 2015-
01, 02, 03

Detection Limits	
Compound	Method Detection Limit ug/L
Benzene	0.2
Toluene	0.2
Ethylbenzene	0.2
1,4-Dichlorobenzene	0.3
1,3-Dichlorobenzene	0.4
1,2-Dichlorobenzene	0.4
Chlorobenzene	0.2

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/5/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		Q			Q		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	31.2			102		
	Toluene	4.1	4.1			100		
	Ethylbenzene	11.5	10.3			90		
	P-Xylene	19.1	19.2			101		
	M-Xylene	42.6	43.0			101		
	O-Xylene	10.6	9.6			91		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/4/86

		G/B	G/B
	CERTIFIED VALUE (mg/L)	ANALYZED VALUE	% REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	10.2 / 9.6	112 / 105
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	10.9 / 7.9	109 / 79
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	47.1 / 45.8	110 / 107
1,2-Dichloroethane	27.6	42.9 / 22.3	156 / 81
1,1,1-Trichloroethane	14.3	15.0 / 13.9	105 / 97
Carbon tetrachloride	20.0	21.2 / 17.1	106 / 85
Bromodichloromethane	7.9	9.2 / 7.9	116 / 100
1,2-Dichloropropane	8.0	9.8 / 8.16	123 / 102
Trichloroethene	22.2	26.7 / 20.8	120 / 94
Dibromochloromethane	16.7	18.7 / 16.4	112 / 98
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	10.8 / 8.9	109 / 90
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	10.1 / 9.7	123 / 118
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: / ANALYST: / INSTRUMENT:	EPA METHOD 602	DATE: 2/16/88 ANALYST: CP INSTRUMENT: Ola
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloroethane
2-Bromo-1-Chloro
1,4-Dichlo

602

VOA RESULTS

LAB # SYSTEM BANK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/5/86 ANALYST: JSC INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/11/92 ANALYST: CP INSTRUMENT: Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # System Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/11/86 ANALYST: JSC INSTRUMENT: Hewlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	N/D	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

RADIAN
CORPORATION

SPIKE RECOVERY

EPA Method 602
Volatile Organics

2/5/86
C
D

SAMPLE # 8602015-03C
UNITS Purgeable Aromatics
5m

COMPOUND	SSR	SR	SA	%R
Benzene	33.0		30.7	107
Toluene	5.81	1.44	4.1	107
Ethyl benzene	11.5		11.5	100
1,4-Dichlorobenzene				
1,3-Dichlorobenzene				
1,2-Dichlorobenzene				
O-Xylene	10.5		10.6	99
M-Xylene	45.7		42.6	107
P-Xylene	20.9		19.1	109
Chlorobenzene				

SSR = Spiked Sample Result
SR = Sample Result
SA = Spike Added

Surrogate Recoveries

Lab #: 8602015-01A
Sample ID: 860115
Date: 2/11/86
Instrument: G

601/8010
Bromochloromethane: 96%
2-Bromo-1-Chloropropane: 119%

602/8020
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602015-02A
Sample ID: 86-0116
Date: 3/11/86
Instrument: G

601/8010
Bromochloromethane: 88%
2-Bromo-1-Chloropropane: 118%

602/SC2
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602015-03A
Sample ID: 860117
Date: 2/11/86
Instrument: G

601/8010
Bromochloromethane: 100%
2-Bromo-1-Chloropropane: 128%

602/8020
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602015-01C
Sample ID: 860115
Date: 2/5/86
Instrument: D

601/8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602/8020
a,a,a-Trifluorotoluene: 98%

Surrogate Recoveries

Lab #: 8602015-02C
Sample ID: 860116
Date: 2/5/86
Instrument: D

601/8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602/8020
a,a,a-Trifluorotoluene: 85%

Surrogate Recoveries

Lab #: 8602015-03C
Sample ID: 86-0117
Date: 2/5/86
Instrument: D

601/8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602/8020
a,a,a-Trifluorotoluene: 95%

Plant 4 Analyzed with samples:

8601205 - 14, 15
8602001 - 02F, 03F
8602015 - 01G → 03G
8602019 - 01A → 05A

} analysis date: 2-14-86

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
O&G	2-14-86	197	200	98.5										
		197	200	98.5										

5106

Form VI

Q. C. Report No. 1-

DUPLICATES

LAB NAME Radian — analytical — CASE NO. Plant 4

DATE 2-27-86 — EPA Sample No. —

Lab Sample ID No. 8602015-01E

Units ug/ml

Matrix H2O

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		0.098	0.097	0.5
5. Beryllium				
6. Cadmium		<.002	<.002	NC
7. Calcium				
8. Chromium		0.028	0.030	9.8
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		0.011	0.012	6.3
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* Out of Control

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

Form V

Q. C. Report No. 1-

SPIKE SAMPLE RECOVERY

LAB NAME Radian analytical

CASE NO. Plant 4

EPA Sample No. —

DATE 8-27-86

Lab Sample ID No. 8603015-03E

Units ug/ml

Matrix H_2O

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	-				
3. Arsenic	-				
4. Barium	-	1.04	0.08	1.00	96
5. Beryllium	-				
6. Cadmium	-	0.90	<.002	1.00	90
7. Calcium	-				
8. Chromium	-	0.95	0.02*	1.00	93
9. Cobalt	-				
10. Copper	-				
11. Iron	-				
12. Lead	-				
13. Magnesium	-				
14. Manganese	-				
15. Mercury	-				
16. Nickel	-				
17. Potassium	-				
18. Selenium	-				
19. Silver	-	0.96	.008 *	1.00	95
20. Sodium	-				
21. Thallium	-				
22. Tin	-				
23. Vanadium	-				
24. Zinc	-				
Other:					
Cyanide	-				

[1] %R = [(SSR - SR)/SA] x 100

"R" - out of control

Comments: * Value < 5x IDL

For samples: 86 02 015 · 01E – 03E

UNITS µg/mL

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As		0.041	0.040	103	-01E*	<.005	<.005	NC	-03E*	<.005	.026	.024	108	(prep) <.005
		0.040	0.040	100										<.005
		0.040	0.040	100										<.005
Pb		0.042	0.045	93	–	–	–	–	-03E*	<.002	.018	.024	75 (A)	(prep) .002
		0.047	0.045	104					-03E 1:10	<.002	.021	.024	88	<.002
		0.045	0.045	100										<.002
														<.002
Se		0.050	0.044	88					-01E*	<.005	.026	.024	108	(prep) <.003
		0.044	0.050	88					-03E	<.003	.013	.024	54 (A)	<.003
		0.046	0.050	92					-03E 1:10	<.003	.023	.024	96	<.003
		0.044	0.050	88										<.003
Hg	2-6-86	0.0064	0.0060	107	-02E	<.0002	<.0002	NC	-03E	<.0002	.0015	.0020	75 (B)	<.0002
		0.0038	0.0040	95										
		0.0036	0.0040	90										

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* Represents analytical (post-digestion) duplicate or spike

** Represents matrix (pre-digestion) duplicate a spike

(A) Because of low recovery, sample was diluted 1:10 and re-spiked. Increased recovery indicates sample matrix interference.

(B) See rerun on 2-12-86

For samples: 8602015 01E - 03E

UNITS µg/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
Hg	8-12-86	0.050	0.050	100					01E	<.0002	.0020	.0020	100	<.0002
		0.0042	0.0040	105										
		0.0040	0.0040	100										

OTT 5 410

(1) (2) (1) (1) (1)

RADIAN CORPORATION EPA 625: 860112, 860113, 860115, 860116, 860117

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics, Fort Worth, Plant 4

Sample Point Description _____

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name Neil Robinson, Art Morrill Date/Time Sampled 1-30-86, 2-3-86

Amount of Sample Collected Six, 1000 ml Amber Glass

Sample Description Ground Water

Store at: ☐ Ambient ☐ 5°C ☐ -10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive
☐ Other _____		

Sample Allocation/Chain of Possession:

Organization Name RADIAN CORP.

Received By _____ Date Received _____ Time _____

Transported By Arthur Morrill Lab Sample No. [illegible]

Comments _____

Inclusive Dates of Possession 1-30-86, 2-3-86

Organization Name EAS-Sac

Received By Wanda Brown Date Received 2/4/86 Time 9:15

Transported By Fed Ex 3211752 60 Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

RADIAN
CORPORATION

AUSTIN

OIL AND GREASE - 860123, 860120, 860121, 860119, 860118
HYDROCARBONS - 860123, 860120, 860121
METALS - 860124, 860120
CHROMIUM - 860120,

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth, Plant 4
Sample Point Description Ground Water

Stream Characteristics:
Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name Neil Robinson Art Morrill Date/Time Sampled 2-4-86
Amount of Sample Collected EIGHT MASON JARS, THREE 500 ml plastic
Sample Description _____
Store at: ☐ Ambient ☐ 5°C ☐ −10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions
Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive
☐ Other _____		

Sample Allocation/Chain of Possession:
Organization Name Radian Corp.
Received By _____ Date Received _____ Time _____
Transported By Arthur Morrill Lab Sample No. 86-02-019
Comments _____
Inclusive Dates of Possession 2-4-86

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Volatile Organics DETECTION LIMITS

EPA METHOD 601

FOR WORK ORDER 86-02-019

COMPOUND	FRACTIONS: 03	04	05	METHOD DETECTION LIMIT ug/L
Chloromethane	0.08	80	0.08	
Bromomethane	1.18	1180	1.18	
Vinyl Chloride	0.18	180	0.18	
Chloroethane	0.52	520	0.52	
Methylene Chloride	0.25	250	0.25	
Trichlorofluoromethane	0.10	100	0.10	
1,1-Dichloroethene	0.13	130	0.13	
1,1-Dichloroethane	0.07	70	0.07	
Trans-1,2-Dichloroethene	0.10	100	0.10	
Chloroform	0.05	50	0.05	
1,2-Dichloroethane	0.03	30	0.03	
1,1,1-Trichloroethane	0.03	30	0.03	
Carbon Tetrachloride	0.12	120	0.12	
Bromodichloromethane	0.10	100	0.10	
1,2-Dichloropropane	0.04	40	0.04	
Trichloroethene	0.18	180	0.18	
Dibromochloromethane	0.09	90	0.09	
2-Chloroethylvinyl Ether	0.13	130	0.13	
Bromoform	0.20	20	0.20	
Tetrachloroethene	0.03	30	0.03	
Chlorobenzene	0.25	250	0.25	
1,3-Dichlorobenzene	0.32	320	0.32	
1,2-Dichlorobenzene	0.15	150	0.15	
1,4-Dichlorobenzene	0.24	240	0.24	

EPA Method 602
Volatile Organics

FOR WORK ORDER 86 02-019

FRACTIONS 03 & 05 04

Detection Limits		
Compound	Method Detection Limit ug/L	
Benzene	0.2	100
Toluene	0.2	100
Ethylbenzene	0.2	100
1,4-Dichlorobenzene	0.3	150
1,3-Dichlorobenzene	0.4	200
1,2-Dichlorobenzene	0.4	200
Chlorobenzene	0.2	100

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/6/76

	CERTIFIED VALUE (mg/L)	G ANALYZED VALUE	G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	10.1	110
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.0	80
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	67.1	156
1,2-Dichloroethane	27.6	25.1	91
1,1,1-Trichloroethane	14.3	13.5	95
Carbon tetrachloride	20.0	18.2	91
Bromodichloromethane	7.9	8.8	111
1,2-Dichloropropane	8.0	8.0	100
Trichloroethene	22.2	23.5	106
Dibromochloromethane	16.7	13.5	81
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	9.8	99
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	9.7	119
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/5/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		Q			Q		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	31.2			102		
	Toluene	4.1	4.1			100		
	Ethylbenzene	11.5	10.3			90		
	P-Xylene	19.1	19.2			101		
	M-Xylene	42.6	43.0			101		
	O-Xylene	10.6	9.6			91		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

VOA RESULTS

LAB # System Blank	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: 2/4/86 ANALYST: JSC INSTRUMENT: Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene	0.15		
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601

Bromochloromethane _____

2-Bromo-1-Chloropropane _____

1,4-Dichlorobutane _____

602

a,a,a,-Trifluorotoluene _____

VOA RESULTS

LAB # REAGENT BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/6/85 ANALYST: CY INSTRUMENT Bumino	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene	918	Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # 6 System Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/5/92 ANALYST: JSG INSTRUMENT: Delmar
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Method Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/5/86 ANALYST: Y INSTRUMENT: Delsi
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichloroethene		1,2-Dichlorobenzene	
1,1-Dichloroethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichloroethane			
1,1,1-Trichloroethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichloroethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachloroethane			
Tetrachloroethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

Surrogate Recoveries

Lab #: 8602019-03C
Sample ID: 860120
Date: 2/6/86
Instrument: G

601/8010
Bromochloromethane: 95%
2-Bromo-1-Chloropropane: 103%

602/802
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602019-04C
Sample ID: 86021
Date: 2/6/86
Instrument: G

601/8010
Bromochloromethane: 99%
2-Bromo-1-Chloropropane: 129%

602/SC2
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602019-05C
Sample ID: 860123
Date: 2/6/86
Instrument: G

601/8010
Bromochloromethane: 101 %
2-Bromo-1-Chloropropane: =98 %

602/SC2
a,a,a-Trifluorotoluene:

Surrogate Recoveries

Lab #: 8602019-03E
Sample ID: 86020
Date: 2/5/86
Instrument: D

601 / 8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602 / 802
a,a,a-Trifluorotoluene: 103%

Surrogate Recoveries

Lab #: 8602019-04E
Sample ID: 860121
Date: 2/5/86
Instrument: D

601/8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602/8020
a,a,a-Trifluorotoluene: 97%

Surrogate Recoveries

Lab #: 8602019-05E
Sample ID: 860123
Date: 2/5/86
Instrument: D

601/8010
Bromochloromethane:
2-Bromo-1-Chloropropane:

602/802
a,a,a-Trifluorotoluene: 96%

Form V

Q. C. Report No. 1 -

SPIKE SAMPLE RECOVERY

LAB NAME Radian Analytical CASE NO. Plant 4

DATE 2-27-86 EPA Sample No.

Lab Sample ID No. 8602019-046

Units ug/ml

Matrix H2O

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	-				
3. Arsenic	-				
4. Barium	-	0.99	0.13 x	1.00	86
5. Beryllium	-				
6. Cadmium	-	0.90	<.002	1.00	90
7. Calcium	-				
8. Chromium	-	1.26	0.33	1.00	93
9. Cobalt	-				
10. Copper	-				
11. Iron	-				
12. Lead	-				
13. Magnesium	-				
14. Manganese	-				
15. Mercury	-				
16. Nickel	-				
17. Potassium	-				
18. Selenium	-				
19. Silver	-	0.99	0.012	1.00	98
20. Sodium	-				
21. Thallium	-				
22. Tin	-				
23. Vanadium	-				
24. Zinc	-				
Other:					
Cyanide	-				

[1] %R = [(SSR - SR)/SA] x 100

"R" - out of control

Comments:

Form VI

Q. C. Report No. 1-

DUPLICATES

LAB NAME Radian Matrix

CASE NO. Plant 4

EPA Sample No. —

DATE 2-27-86

Lab Sample ID No. 8602019-036

Units ug/l

Matrix H20

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		0.08	0.08	0
5. Beryllium				
6. Cadmium		<.002	<.002	NC
7. Calcium				
8. Chromium		0.006 *	0.006 *	0
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		0.007 *	0.007 *	0
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* Out of Control

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

* Value < 5 x IDL

For samples : 86 02 019-03G
-04G

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS (Prep.)
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
Pb	2-17-86	0.045	0.044	98	03G*	<.002	<.002	NC	03G*	<002	.018	.024	75	<.002
		0.045	0.050	111	03G**	<.002	<.002	NC	04G**	.004	.021	.020	85	
		0.045	0.045	100										
As	2-19-86	0.039	0.040	98	03G*	<.005	<.005	NC	03G*	<.005	.023	.024	96	<.005
		0.040	0.040	100	03G**	<.005	<.005	NC	04G**	<005	.019	.020	95	
		0.037	0.040	93										
Se	2-17-86	0.042	0.040	105	03G**	<.003	<.003	NC	04G*	<.003	.0116	.024	67	<.003
		0.040	0.040	100					04G*1	<.003	.021	.024	88	
		0.039	0.040	98					04G**	<.003	.0054	.010	54	
Hg	2-16-86	0.00164	0.0060	107					03G	<.0002	.0026	.0020	123 2.	<.0002
		0.0038	0.0040	95										
		0.00316	0.0040	90										

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* Represents analytical or post-digestion duplication or spiking

** Represents matrix or pre-digestion duplication or spiking

1 Sample was diluted 1:10 and re-spiked.

2. See rerun on 2-12-86

For samples: 86,02 019 03G + 04G

UNITS µg/ml

IENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
Hg	2-12-86	0.050	0.050	100					-03G	<.0002	.0022	.0020	110	<.0002
		0.0042	0.0040	105										
		0.0040	0.040	100										

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EPA 625 860125; 860124; 860120; 860121
860123

RADIAN CORPORATION
SACRAMENTO

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address Air Force Plant 4 Fortworth Texas
Sample Point Description Ground Water

Stream Characteristics:
Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name NEIL ROBINSON Date/Time Sampled 2-5-86 AND 2-4-86
Amount of Sample Collected (2) 1,000 ml PK Glass Bottles
Sample Description Ground Water
Store at: ☐ Ambient ☐ 5°C ☐ – 10°C ☒ Other 4°C

☒ Caution · No more sample available ☐ Return unused portion of sample ☐ Discard unused portions
Other Instructions · Special Handling · Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic · suspect
☐ Caustic	☐ Peroxide	☐ Radioactive
☐ Other _____		

Sample Allocation/Chain of Possession:
Organization Name RADIAN
Received By _____ Date Received _____ Time _____
Transported By Neil Robinson Lab Sample No. 860120 - 860130
Comments _____
Inclusive Dates of Possession 2-4-86 → 2-5-86

Organization Name Radian Analytical Services
Received By Chris Kammuller Date Received 2-6-86 Time 10:00
Transported By Federal Lab Sample No. 860 2030
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Two Field Blanks (at HMTA)

RADIAN CORPORATION

ONE TRIP BLANK AUSTIN

METALS 860125; 860124 CHROMIUM 860124; 860
EPA 601 860128, 860127; 860124; 860125
EPA 602 860128, 860127; 860124; 860125

CHAIN OF CUSTODY RECORD

XYLENE 860129 METHYL ETHYLKETONE 860129

Field Sample No. _____

Company Sampled/Address Air Force Plant 4 Fortworth Texas

Sample Point Description GROUND WATER

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name NEIL ROBINSON Date/Time Sampled 2-5-86

Amount of Sample Collected TWENTY 40ML VOAS AND FOUR 500ml PLASTIC BOTTLES

Sample Description TWO FIELD BLANKS; ONE TRIP BLANK

Store at: ☐ Ambient ☐ 5°C ☐ −10°C ☒ Other 4°C

☒ Caution · No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions · Special Handling · Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic · suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name RADIAN

Received By _____ Date Received _____ Time _____

Transported By Neil Robinson Lab Sample No. 860201

Comments _____

Inclusive Dates of Possession 2-5-86

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

AA, Vitreous Grease, AL [illegible]

FOR W.O. 86-01-240 86-02-031 86-02-041 86-02-060 86-02-067 86-02-079 86-02-087

UNITS ug/ml

PLANT 4 86-01-240 samples 01-09

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2/8/86	.041	.040	103	an dup 01A	<.005	<.005	NC	an sp 01A	<.005	.024	.024	100	prep bl <.005
	idl = .005	.041	.040	103										cal bl <.005
		.040	.040	100										
Hg	2/3/86	.0054	.0050	108	dig dup 09A	<.0002	.0003*	NC	dig sp 09A	<.0002	.0028	.0020	140	prep bl .0004*
	idl = .0002	.0040	.0040	100										
Pb	2-11/86	.042	.045	93	an dup 09A	<.002	<.002	NC	an sp 09A	<.002	.019	.024	79	prep bl .002
	idl = .002	.046	.045	102										cal bl <.002
5c	2/9/86	.044	.050	88	an dup 05A	<.003	<.003	NC	an sp 05A	<.003	.018	.024	75	prep bl <.003
	idl = .003	.044	.050	88					an sp 05 1:10 dilution	<.003	.022	.024	92	cal bl <.003
Hg	2/8/86	.0054	.0050	108	dig dup 03A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0024	.0020	120	<.0002 prep bl
	idl = .0002	.0040	.0040	100										

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an dup = analytical duplicate
dig dup = digestion duplicate
i.d.l. = instrument detection limit

an sp = analytical spike
dig sp = digestion spike or matrix

* indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-031 samples (01-, 03, 03, 06) - Oil & Grease 02, 03 - METALS

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 02 G	<.005	<.005	NC	an. sp 02 G	<.005	.023	.024	96	prep bl <.005
	idl = .005	.040	.040	100										cal bl <.005
Hg	2-20-86	.0048	.0050	96	—				dig sp 03 G	<.0002	.0019	.0020	95	prep bl <.0002
	idl = .0002	.0042	.0040	105										
		.0044	.0040	110										
[illegible]	2-12-86	.044	.045	98	an dup 02 G	.033	.030	9.4	an. sp. 02 G	.033	.053	.024	83	prep bl <.002
	idl .002	.045	.045	100										
[illegible]	[illegible]	.042	.040	105	—				an. sp. 02 G	.003	.021	.024	75	prep bl <.002
	[illegible]	.040	.040	100										cal bl <.002
		.039	.040	98										
	[illegible]	197	200	99	—				—					
	[illegible]	198	200	99										
	[illegible]	115	115	104										
	[illegible]	245	245	118										

an dup = analytical duplicate

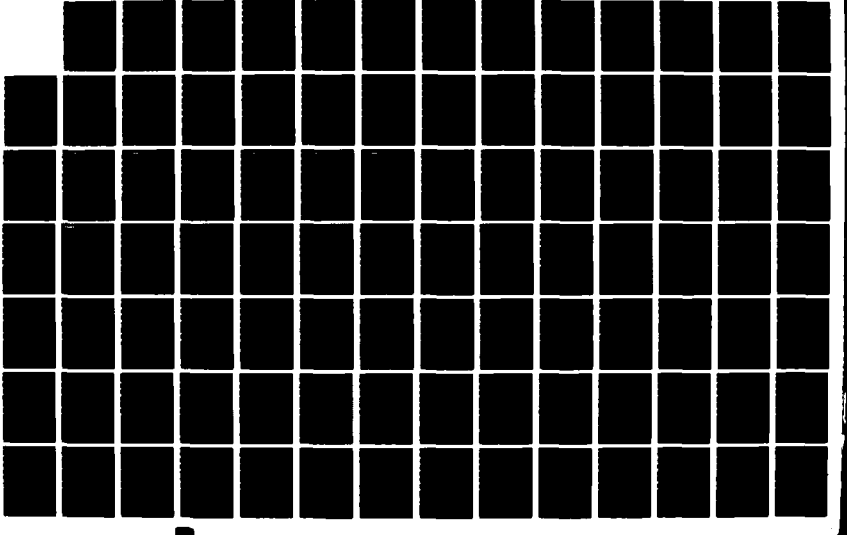
[illegible] dup = digestion duplicate

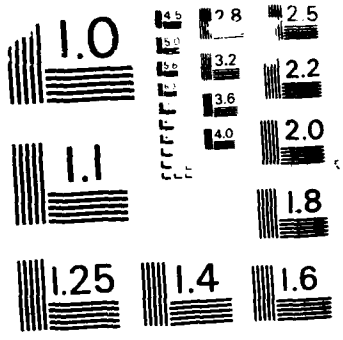
* indicates value is less than 5x instrument detection limit

NC = not calculable

AD-A198 445 INSTALLATION RESTORATION PROGRAM PHASE 2 1/6
CONFIRMATION/QUANTIFICATION STAG (U) RADIAN CORP
AUSTIN TX DEC 87 F33615-83-D-4001

UNCLASSIFIED F/G 24/7 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-

PLANT 4 86-02-041 samples 01-06

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 01 E	<.005	<.005	NC	an sp 01 E	<.005	.022	.024	92	prep bl <.005
	idl = .005	.037	.040	93										cal bl <.005
		.035	.040	88										
Hg	2-20-86	.0048	.0050	96	dig dup 06 E	<.0002	.0002*	NC	dig sp 05 E	<.0002	.0022	.0020	110	prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 01 E	<.002	<.002	NC	an sp 01 E 1:10 dilution	<.002	.021	.024	88	prep bl <.002
	idl = .002	.045	.045	100										
		.048	.045	107										
Sc	2-17-86	.042	.040	105	—				an sp 03 E	.003*	.021	.024	75	prep bl <.002
	idl = .002	.039	.040	98										cal bl <.002
oil and grease	2-14-86	197	200	99										
	idl = 1	197	200	99										
HC - idl = 1	2-14-86				an dup 03	<1	<1	NC						

* indicates value is less than 5x instrument detection limit

an sp = analytical spike
dig sp = digestion spike or matrix spike
an dup = analytical duplicate
dig dup = digestion duplicate
idl = instrument det. limit
NC = not calculable

PLANT 4 86-02-060 samples 01-05

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	dig dup 01C	.002*	.003*	40	dig sp 02C	.006*	.023	.020	85	prep bl <.002
	idl = .002	.042	.040	105	an. dup 03C	.006*	.003*	67	an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Hg	2-20-86	.0048	.0050	96	-				05A	<.0002	.0020	.0020	100	prep bl <.0002
	idl = .0002	.0042	.0040	105										
Pb	2-17-86	.045	.043	105	dig dup 01C	.034	.031	9.1	dig sp 02C	.27	.29	.020	100	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	dig dup 01C	.003*	.002*	40	dig sp 02C	<.002	.005	.010	50	prep bl <.002
	idl = .002	.040	.040	100					an sp 05A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
Oil and Grease	2-14-86	197	200	99	—				—					
	idl = 1	197	200	99										

an sp = analytical spike
dig sp = digestion or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5x instrument detection limit
NC = not calculable

PLANT 4 86-02-067

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	—				an sp 03E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.042	.040	105					1:10 dilution					cal bl <.002
Hg	2-24-86	.0048	.0050	96	—				dig sp 04E	<.0002	.0020	.0020	100	prep bl <.0002
	2-20-86	.0048	.0050	96										prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.045	.043	105	an dup 04E	.037	.038	2.7	an sp 03E	.020	.035	.024	63	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	an dup 01E	.007*	.007*	0	an sp 04E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.040	.040						1:10 dilution					cal bl <.002
Oil and Grease	2-14-86	197	200	99										
	idl = 1	197	200	99										

1371

idl = instrument detection limit

an sp = analytical spike

dig sp = digestion or matrix spike

dig = digestion duplicate

an dup = analytical duplicate

* indicates value is less than 5 x instrument detection limit

NC = not calculable

PLANT 4 86-03-079 samples 01 – 04 samples 05, 06, 07-046, HC UNITS µg/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-21-86	.042	.040	105	an. dup 01A	.011	.010	9.5	on. sp. 01A	.011	.038	.024	113	prep bl <.002
	idl = .002	.042	.040	105	dig dup 01A	.011	.011	0	dig dup 03A	* .007	.026	.020	95	cal bl <.002
		.042	.040	105										<.002 <.002
Hg	2-20-86	.0048	.0050	96	dig dup 01A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0021	.0020	105	prep bl <.0002
	idl = .0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	dig dup 01A	.048	.047	2.1	dig sp 02A	<.0002	.009	.020	45	prep bl <.002
	idl = .002	.043	.043	100					an sp 04A	<.0002	.011	.024	46	cal bl <.002
									an sp 04A	<.0002	.027	.024	113	cal bl <.002
									1:10 dilution					
Se	2-21-86	.041	.040	103	dig dup 01A	<.002	<.002	NC	dig sp 02A	<.002	<.002	.010	0	prep bl <.002
	idl = .002	.043	.040	108					an sp 04A	<.002	.016	.024	67	cal bl <.002
									an sp 04A 1:10 dilution	<.002	.024	.024	100	
Oil & Grease	3-14-86	191	200	96										
	idl = 1													

an dup = analytical duplicate
an sp = analytical spike
dig dup = pre-digest duplicate
dig sp = pre-digest spike
idl = instrument detection limit
* = value is less than 5 x idl
NC = NOT CALCULABLE

PLANT 4 86-02-087 samples 04,05 (metals) 01,02(DHG) 01,02,03(HC) UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-24-86	.036	.040	90	an dup 04A	.038	.038	0	an sp 05A	<.002	.024	.024	100	prep bl <.002
	idl=.002	.036	.040	90										cal bl <.008
		.037	.040	93	–									cal bl <.002
Hg	2-20-86	.0048	.0050	96	–				dig sp 05A	<.0002	.0019	.0020	95	prep bl <.0002
	idl=.0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	–				an sp 05A	<.002	.017	.024	71	prep bl .002*
	idl=.002	.043	.043	100					an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Se	2-21-86	.041	.040	103					an sp 04A	<.002	.015	.024	63	prep bl <.002
	idl=.002	.043	.040	108					an sp 04A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
oil and grease	3-14-86	191	200	96										
	idl=1													

an dup=analytical duplicate an sp=analytical spike dig dup=pre-digest duplicate dig sp=pre-digest spike
idl = instrument detection limit *=value is less then five times the instrument detection limit NC=not calculable

For work orders 8601240
8602031
8602041
8602060
8602067
8602079
8602087

Form VII

Q.C. Report No. 2

INSTRUMENT DETECTION LIMITS AND

LABORATORY CONTROL SAMPLE

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 LCS UNITS ~~ug/L~~ mg/kg

µg/ml (Circle One)

Compound	Required Detection Limits (CRDL)-ug/l	Instrument Detection Limits (IDL)-ug/l ICP/AA	Furnace*	Lab Control Sample True	Found	%R
Metals:						
1. Aluminum	200					
2. Antimony	60					
3. Arsenic	10					
4. Barium	200	<.001				
5. Beryllium	5					
6. Cadmium	5	<.002				
7. Calcium	5000					
8. Chromium	10	<.005				
9. Cobalt	50					
10. Copper	25					
11. Iron	100					
12. Lead	5					
13. Magnesium	5000					
14. Manganese	15					
15. Mercury	0.2					
16. Nickel	40					
17. Potassium	5000					
18. Selenium	5					
19. Silver	10	<.002				
20. Sodium	5000					
21. Thallium	10					
22. Tin	40					
23. Vanadium	50					
24. Zinc	20					
Other:						
Cyanide	10					

* dection limits are given on Furnace/Hg/ORG QA/QC SUMMARY SHEETS 3 13

ICP QA/QC DATA

For work orders: 8601240, 8602031, 8602041, 8602060, 8602067, 8602079, 8602087

Form II

Q. C. Report No. 2

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian | CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 | UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals[5]:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium	1.00	1.01	101	1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium	1.00	1.04	104	1.00	1.05	105	1.04	104	
7. Calcium									
8. Chromium	1.00	1.01	101	1.00	1.02	102	1.02	102	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver	1.00	1.00	100	1.00	1.02	102	1.00	100	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

Form II

Q. C. Report No. 3

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals[4]:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium				1.00	1.01	101	1.01	101	+
5. Beryllium									
6. Cadmium				1.00	1.04	104	1.03	103	
7. Calcium									
8. Chromium				1.00	1.00	100	1.01	101	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver				1.00	1.01	101	1.02	102	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

8601240
8602031
8602041
8602060
8602067
8602079
8602087

Form III

Q. C. Report No. 2

BLANKS

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium	<.001	<.001	<.001	<.001	<.001		
5. Beryllium							
6. Cadmium	<.002	<.002	<.002	.002*	.002*		
7. Calcium							
8. Chromium	<.005	<.005	<.005	<.005	<.005		
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver	.006*	.018	.010	.004*	.014		
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

*value is less than 5 x idl

86-02031
86-02041

Form III

Q. C. Report No. 3

BLANKS

2-11-86

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium						.004*	
5. Beryllium							
6. Cadmium						<.002	
7. Calcium							
8. Chromium						<.005	
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver						<.002	
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

* value is less than 5 x idl

Form VI

Q. C. Report No. 2

DUPLICATES

PRE-DIGESTION DUPLICATE

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4

EPA Sample No.

Lab Sample ID No. 8602031-02G

Units ug/ml

Matrix water digest

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]	
Metals:					
1. Aluminum					
2. Antimony					
3. Arsenic					
4. Barium		.076	.076	0.0	
5. Beryllium					
6. Cadmium		<.002	<.002	NC	
7. Calcium					
8. Chromium		.009*	.005*	57	A
9. Cobalt					
10. Copper					
11. Iron					
12. Lead					
13. Magnesium					
14. Manganese					
15. Mercury					
16. Nickel					
17. Potassium					
18. Selenium					
19. Silver		.005*	.010*	67	A
20. Sodium					
21. Thallium					
22. Tin					
23. Vanadium					
24. Zinc					
Other:					
Cyanide					

~~* Out of Control~~

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

A - sample values are less than 5x the detection limit, therefore RPDs are high.

* value is less than 5 x idl

Form V

Q. C. Report No. 2

SPIKE SAMPLE RECOVERY

PRE-DIGEST

LAB NAME Radian

CASE NO. PLANT 4

EPA Sample No.

DATE 3-4-86

Lab Sample ID No. 860203I-03

Units ug/ml

Matrix water

pre-digest spi

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	"				
3. Arsenic	"				
4. Barium	"	1.81	.072	2.00	87
5. Beryllium	"				
6. Cadmium	"	.036	<.002	.050	72
7. Calcium	"				
8. Chromium	"	.17	<.005	.20	85
9. Cobalt	"				
10. Copper	"				
11. Iron	"				
12. Lead	"				
13. Magnesium	"				
14. Manganese	"				
15. Mercury	"				
16. Nickel	"				
17. Potassium	"				
18. Selenium	"				
19. Silver	"	.20	.007*	.25	77
20. Sodium	"				
21. Thallium	"				
22. Tin	"				
23. Vanadium	"				
24. Zinc	"				
Other:					
Cyanide	"				

[1] %R = [(SSR - SR)/SA] x 100

"R"- out of control

Comments: Spike added to sample - no ~~dilution~~ volume change

* value is less than 5X idl

Organics QA/QC → 86-02-031

Volatile Organics DETECTION LIMITS

86020311-02→-08

METHOD 601

COMPOUND	-02→08	METHOD DETECTION LIMIT ug/l	
Chloromethane	0.08		
Bromomethane	1.18		
Vinyl Chloride	0.18		
Chloroethane	0.52		
Methylene Chloride	0.25		
Trichlorofluoromethane	0.10		
1,1-Dichloroethene	0.13		
1,1-Dichloroethane	0.07		
Trans-1,2-Dichloroethene	0.10		
Chloroform	0.05		
1,2-Dichloroethane	0.03		
1,1,1-Trichloroethane	0.03		
Carbon Tetrachloride	0.12		
Bromodichloromethane	0.10		
1,2-Dichloropropane	0.04		
Trichloroethene	0.18		
Dibromochloromethane	0.09		
2-Chloroethylvinyl Ether	0.13		
Bromoform	0.20		
Tetrachloroethene	0.03		
Chlorobenzene	0.25		
1,3-Dichlorobenzene	0.32		
1,2-Dichlorobenzene	0.15		
1,4-Dichlorobenzene	0.24		

DETECTION LIMITS

VOLATILE ORGANICS

METHOD 602

COMPOUND	DETECTION LIMIT ug/l						
	-02,-03, -05,-07,-08	-04	-06				
BENZENE	0.2	200	—				
TOLUENE	0.2	200	—				
ETHYLBENZENE	0.2	200	—				
CHLOROBENZENE	0.2	200	—				
1,4-DICHLOROBENZENE	0.3	300	—				
1,3-DICHLOROBENZENE	0.4	400	—				
1,2-DICHLOROBENZENE	0.4	400	—				
P-xylene	—	—	0.2				
m-xylene	—	—	0.2				
O-xylene	—	—	0.2				

VOA RESULTS

LAB # System Blank	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: 2/6/86 ANALYST: JSC INSTRUMENT: Hewlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene	0.15	Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Reagent Blank	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: 2/6/86 ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene	0.18	Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTA BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 3/10/86 ANALYST: BC INSTRUMENT: Bureau	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # REAGENT BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/10/92 ANALYST: CP INSTRUMENT: Hewlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride	0.44	1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYS BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 4/6/91 ANALYST: SC INSTRUMENT: 20 m
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # Norcent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/16/96 ANALYST: C INSTRUMENT: Ch
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/6/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		C			C		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	36.1			118		
	Toluene	4.1	4.7			114		
	Ethylbenzene	11.5	11.8			102		
	P-Xylene	19.1	21.6			113		
	M-Xylene	42.6	47.5			112		
	O-Xylene	10.6	10.9			103		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/6/76

	CERTIFIED VALUE (mg/L)	G ANALYZED VALUE	G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	10.1	110
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.0	80
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	67.1	156
1,2-Dichloroethane	27.6	25.1	91
1,1,1-Trichloroethane	14.3	13.5	95
Carbon tetrachloride	20.0	18.2	91
Bromodichloromethane	7.9	8.8	111
1,2-Dichloropropane	8.0	8.0	100
Trichloroethene	22.2	23.5	106
Dibromochloromethane	16.7	13.5	81
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	9.8	99
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	9.7	119
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

5/10/86

	Certified Value (mg/L)	B / G Analyzed Value	B / G % Rec
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	9.6 / 10.9	104 / 119
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.9 / 7.2	89 / 72
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	55.2 / 66.5	129 / 155
1,2-Dichloroethane	27.6	24.7 / 22.9	90 / 83
1,1,1-Trichloroethane	14.3	16.3 / 14.5	114 / 101
Carbon tetrachloride	20.0	19.9 / 17.3	99 / 87
Bromodichloromethane	7.9	8.9 / 8.4	112 / 107
1,2-Dichloropropane	8.0	8.0 / 7.3	100 / 91
Trichloroethene	22.2	23.7 / 22.7	107 / 102
Dibromochloromethane	16.7	16.9 / 13.4	101 / 80
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	8.6 / 9.5	87 / 96
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.4 / 7.5	102 / 92
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

RADIAN
CORPORATION

SPIKE RECOVERY

EPA METHOD 601 Volatile Organics	860231-03D PLANT 860125 5 ml		2/10/86 CO Hexane					
COMPOUNDS	SSR	SR	SA	%R	SSR	SR	SA	%R
Chloromethane								
Bromomethane								
Vinyl chloride								
Chloroethane								
Methylene chloride	10.4		9.2	113				
Trichlorofluoromethane								
1,1-Dichloroethene	8.40		10.0	84				
1,1-Dichloroethane								
trans-1,2-Dichloroethene	6.03		5.4	112				
Chloroform	68.6		43.0	160				
1,2-Dichloroethane	25.5		27.6	92				
1,1,1-Trichloroethane	16.1		14.3	113				
Carbon Tetrachloride	22.7		20.0	114				
Bromodichloroemethane	9.3		7.5	117				
1,2-Dichloropropane	8.6		8.0	108				
Trichloroethene	25.7		22.2	116				
Dibromochloromethane	14.3		16.7	86				
1,1,2-Trichloroethane								
cis-1,2-Dichloropropene								
2-Chlorethylvinyl ether								
Bromoform	10.3		9.9	104				
1,1,2,2-Tetrachloreothane			10.0					
Tetrachlorethylene			6.2					
Chlorobenzene	9.8		9.2	115				
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								

SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

RADIAN
CORPORATION

SPIKE RECOVERY

EPA Method 602
Volatile Organics

2/4/86
PP
D

SAMPLE # 860231-B6D
UNITS Purity
860105

COMPOUND	SSR	SR	SA	%R
Benzene	33.6		30.7	110
Toluene	5.09	2.28	4.1	69
Ethyl benzene	11.1		11.5	97
1,4-Dichlorobenzene				
1,3-Dichlorobenzene				
1,2-Dichlorobenzene				
O-Xylene	9.1		10.6	86
M-Xylene	44.1		42.6	103
P-Xylene	30.0		19.1	105
Chlorobenzene				

SSR = Spiked Sample Result
SR = Sample Result
SA = Spike Added

RADIAN
CORPORATION

DUPLICATE ANALYSIS

EPA METHOD 602
VOLATILE ORGANICS

SAMPLE # 860831-03E
UNITS ug/l
860125

COMPOUND	RUN#1	RUN#2	RPD
Benzene	ND	ND	NC
Toluene	"	"	"
Ethyl benzene	"	"	"
1,4-Dichlorobenzene	"	"	"
1,3-Dichlorobenzene	"	"	"
1,2-Dichlorobenzene	"	"	"
O-Xylene	"	"	"
M-Xylene	"	"	"
P-Xylene	"	"	"
Chlorobenzene	"	"	"

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602031-02C

SAMPLE ID: 800124

DATE: 2-6-84

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 109%

2-BROMO-1-CHLOROPROPANE: 100%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602031-03C

SAMPLE ID: 860125

DATE: 2-6-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 90%

2-BROMO-1-CHLOROPROPANE: 81%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600231-04B

SAMPLE ID: 8600127

DATE: 2-10-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 117%

2-BROMO-1-CHLOROPROPANE: 102%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602031-05B

SAMPLE ID: 860128

DATE: 2-6-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 120%

2-BROMO-1-CHLOROPROPANE: 121%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 860A031-07A

SAMPLE ID: FIELD BLANK

DATE: 2-6-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 105%

2-BROMO-1-CHLOROPROPANE: 110%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8608031-08A

SAMPLE ID: TRIP BLANK

DATE: 2-10-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 125%

2-BROMO-1-CHLOROPROPANE: 117%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600831-02E

SAMPLE ID: 8600124

DATE: 2-6-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 100%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600231-03E

SAMPLE ID: 860125

DATE: 2-10-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 109%, 109%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600831-CHE

SAMPLE ID: 800177

DATE: 2-6-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 114%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600831-05D

SAMPLE ID: 860128

DATE: 2-6-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 112%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8002031-CCD

SAMPLE ID: 800129

DATE: 2-6-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 100%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602031-07B

SAMPLE ID: FIELD BLANK

DATE: 2-6-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 94%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602031-08A

SAMPLE ID: TRIP BLANK

DATE: 2-6-86

INSTRUMENT: 1D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 96%

RADIAN CORPORATION

SACRAMENTO

DCA 625 860126; 860129; 860132; 860134

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fortworth Plant 4

Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name Neil Robinson Date/Time Sampled 2-6-86

Amount of Sample Collected 7 (seven) 1,000 ml DK Glass Bottles

Sample Description Ground Water

Store at: ☐ Ambient ☐ 5°C ☐ – 10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions · Special Handling · Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic · suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name RADIAN

Received By _____ Date Received _____ Time _____

Transported By Neil Robinson Lab Sample No. [illegible]

Comments _____

Inclusive Dates of Possession 2-6-86

Organization Name Radian Analytical Services

Received By C Rasmussen Date Received 2-7-86 Time 0925

Transported By Federal Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

RADIAN CORPORATION

SACTO.

EPA 625 860135, 860120

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fortworth, Plant 4

Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name NEIL ROBINSON Date/Time Sampled 2-6-86

Amount of Sample Collected (3) Three 1,000ml DK Glan bottles

Sample Description Ground Water

Store at: ☐ Ambient ☐ 5°C ☐ – 10°C ☒ Other 4°C

☒ Caution · No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions · Special Handling · Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic · suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name RADIAN

Received By _____ Date Received _____ Time _____

Transported By Neil Robinson Lab Sample No. [illegible]

Comments _____

Inclusive Dates of Possession 2-6-86

Organization Name Radian Analytical Services

Received By C Rasmussen Date Received 2-7-86 Time 0925

Transported By Federal Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

METALS 860134; 860126; 860135, 860131; 860132; 860130
HYDROCARBON FUELS 860131; 860130 OIL & GREASE 860130; 860131
EPA 601 860132; 860126; 860131; 860130, 860135, FIELD DUPE
EPA 602 860132 860126; 860131; 860130, 860135; FIELD DUPE

RADIAN CORPORATION
AUSTIN

CHAIN OF CUSTODY RECORD ONE TRIP BLANK

EPA 601 860134
EPA 602 860134

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth, Plant 4
Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name Neil Robinson Date/Time Sampled 2-6-86
Amount of Sample Collected (27) twenty seven 40ml VOAs; (6) six) plastic 500ml; (4) four 1QT MASON JARS
Sample Description Ground Water
Store at: ☐ Ambient ☐ 5°C ☐ – 10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions
Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name RADIAN
Received By _____ Date Received _____ Time _____
Transported By Neil Robinson Lab Sample No. _____
Comments _____
Inclusive Dates of Possession 2-6-86

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

AA, Furnace, PIC Plant

FOR W.O. 86-01-240 86-02-031 86-02-041 86-02-060 86-02-067 86-02-079 86-02-087

PLANT 4 86-01-240 samples 01-09 UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2/8/86	.041	.040	103	an dup 01A	<.005	<.005	NC	an sp 01A	<.005	.024	.024	100	prep bl <.005
	idl=.005	.041	.040	103										col bl <.005
		.040	.040	100										
Hg	2/3/86	.0054	.0050	108	dig dup 09A	<.0002	.0003*	NC	dig sp 09A	<.0002	.0028	.0020	140	prep bl .0004*
	idl=.0002	.0040	.0040	100										
Pb	2-11/86	.042	.045	93	an dup 09A	<.002	<.002	NC	an sp 09A	<.002	.019	.024	79	prep bl .002
	idl=.002	.046	.045	102										col bl <.002
Sc	2/9/86	.044	.050	88	an dup 05A	<.003	<.003	NC	an sp 05 A	<.003	.018	.024	75	prep bl <.003
	idl=.003	.044	.050	88					an sp 05 1:10 dilution	<.003	.022	.024	92	col bl <.003
Hg	2/8/86	.0054	.0050	108	dig dup 03A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0024	.0020	120	<.0002 prep bl
	idl=.0002	.0040	.0040	100										

an dup = analytical duplicate
dig dup = digestion duplicate
i.d.l. = instrument detection limit

an sp = analytical spike
dig sp = digestion spike or matrix

* indicates value is less than 5x instrument detection limit
NC = not calculable

UNITS ug/ml

PLANT 4 86-02-031 samples (01-, 02, 03, 06)-011 & Grease 02, 03-METALS

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 02 G	<.005	<.005	NC	an. sp 02 G	<005	.023	.024	96	prep bl <.005
	idl = .005	.040	.040	100										cal bl <.005
Hg	2-20-86	.0048	.0050	96	—				dig sp 03 G	<.0002	.0019	.0020	95	prep bl <.0002
	idl = .0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 02 G	.033	.030	9.4	an. sp 02 G	.033	.053	.024	83	prep bl <.002
	idl = .102	.045	.045	100										
Se	2-17-86	.042	.040	105	—				an. sp. 02 G	.003	.021	.024	75	prep bl <.002
	idl = .002	.040	.040	100										cal bl <.002
		.039	.040	98										
Oil and Grease	2-14-86	197	200	99	—				—					
	idl = 1	197	200	99										
HC	2-26-86	430	415	104										
	idl = 1	208	245	118										

an. sp = analytical spike
dig sp = predigest or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-041 samples 01-06

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 01 E	<.005	<.005	NC	an sp 01 E	<.005	.022	.024	92	prep bl <.005
	idl = .005	.037	.040	93										cal bl <.005
		.035	.040	88										
Hg	2-20-86	.0048	.0050	96	dig dup 06 E	<.0002	.0002*	NC	dig sp 05 E	<.0002	.0022	.0020	110	prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 01 E	<.002	<.002	NC	an sp 01 E 1:10 dilution	<.002	.021	.024	88	prep bl <.002
	idl = .002	.045	.045	100										
		.048	.045	107										
Sc	2-17-86	.042	.040	105	—				an sp 03 E	.003*	.021	.024	75	prep bl <.002
	idl = .002	.039	.040	98										cal bl <.002
oil and grease	2-14-86	197	200	99										
	idl = 1	197	200	99										
HC - idl = 1	2-14-86				an. dup 03	<1	<1	NC						

an sp = analytical spike
dig sp = digestion spike or matrix spike

an dup = analytical duplicate
dig dup = digestion duplicate

idl = instrument det. limit

* indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-060 samples 01-05

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
ds	2-15-86	.029	.027	107	dig dup 01C	.002*	.003*	40	dig sp 03C	.006*	.023	.020	85	prep bl <.002
	idl = .002	.042	.040	105	an. dup 03C	.006*	.003*	67	an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Hg	2-20-86	.0048	.0050	96	-				05A	<.0002	.0020	.0020	100	prep bl <.0002
	idl = .0002	.0042	.0040	105										
Pb	2-17-86	.045	.043	105	dig dup 01C	.034	.031	9.1	dig sp 02C	.27	.29	.020	100	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	dig dup 01C	.003*	.002*	40	dig sp 02C	<.002	.005	.010	50	prep bl <.002
	idl = .002	.040	.040	100					an sp 05A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
Oil and Grease	2-14-86	197	200	99	-				-					
	idl = 1	197	200	99										

5180

an sp = analytical spike
dig sp = digestion or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5x instrument detection limit

NC = not calculable

PLANT 4 86-02-067

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	—				an sp 03E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.042	.040	105					1:10 dilution					cal bl <.002
Hg	2-24-86	.0048	.0050	96	—				dig sp 04E	<.0002	.0020	.0020	100	prep bl <.0002
	2-20-86	.0048	.0050	96										prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.045	.043	105	an dup 04E	.037	.038	2.7	an sp 03E	.020	.035	.024	63	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	an dup 01E	.007*	.007*	0	an sp 04E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.040	.040						1:10 dilution					cal bl <.002
Oil and Grease	2-14-86	197	200	99										
	idl = 1	197	200	99										

idl = instrument detection limit

an sp = analytical spike
dig sp = digestion or matrix spike

dig = digestion duplicate
an dup = analytical duplicate

* indicates value is less than 5 x instrument detection limit
NC = not calculable

181

PLANT 4 86-03-079 samples 01 – 04 samples 05, 06, 07-09 G, HC UNITS µg/mL

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-21-86	.043	.040	105	an. dup 01A	.011	.010	9.5	on sp 01A	.011	.038	.024	113	prep bl <.002
	idl = .002	.042	.040	105	dig dup 01A	.011	.011	0	dig dup 03A	.007*	.026	.020	95	cal bl <.002
		.042	.040	105										<.002 <.002
Hg	2-20-86	.0048	.0050	96	dig dup 01A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0021	.0020	105	prep bl <.0002
	idl=.0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	dig dup 01A	.048	.047	2.1	dig sp 03A	<.0002	.009	.020	45	prep bl <.002
	idl = .002	.043	.043	100					an sp 04A	<.0002	.011	.024	46	cal bl <.002
									an sp 04A	<.0002	.027	.024	113	cal bl <.002
									1:10 dilution					
Se	2-21-86	.041	.040	103	dig dup 01A	<.002	<.002	NC	dig sp 03A	<.002	<.002	.010	0	prep bl <.002
	idl = .002	.043	.040	108					an sp 04A	<.002	.016	.024	67	cal bl <.002
									an sp 04A 1:10 dilution	<.002	.024	.024	100	
Oil & Grease	3-14-86	191	200	96										
	idl = 1													

an dup = analytical duplicate
an sp = analytical spike
dig dup = pre-digest duplicate
dig sp = pre-digest spike
idl = instrument detection limit
* = value is less than 5 x idl
NC = NOT CALCULABLE

PLANT 4 86-02-087 samples 04,05 (metals) 01,02(O&G) 01,02,03(HC) UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-24-86	.036	.040	90	an dup 04A	.038	.038	0	an sp 05A	<.002	.024	.024	100	prep bl <.002
	idl=.002	.036	.040	90										col bl <.008
		.037	.040	93	-									col bl <.002
Hg	2-20-86	.0048	.0050	96	-				dig sp 05A	<.0002	.0019	.0020	95	prep bl <.0002
	idl=.0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	-				an sp 05A	<.002	.019	.024	71	prep bl .002*
	idl=.002	.043	.043	100					an sp 05A 1:10 dil	<.002	.024	.024	100	col bl <.002
Se	2-21-86	.041	.040	103					an sp 04A	<.002	.015	.024	63	prep bl <.002
	idl=.002	.043	.040	108					an sp 04A 1:10 dilution	<.002	.023	.024	96	col bl <.002
oil and grease	3-14-86	191	200	96										
	idl=1													

an dup=analytical duplicate an sp=analytical spike dig dup=pre-digest duplicate dig sp=pre-digest spike
idl = instrument detection limit *=value is less then five times the instrument detection limit NC=not calculable

For work orders 860124
860203
860204
860206
860206
860207
860208

Form VII

Q.C. Report No. 2

INSTRUMENT DETECTION LIMITS AND

LABORATORY CONTROL SAMPLE

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 LCS UNITS ~~ug/L~~ ug/kg

µg/ml (Circle One)

Compound	Required Detection Limits (CRDL)-ug/l	Instrument Detection Limits (IDL)-ug/l ICP/AA	Furnace*	Lab Control Sample True	Found	%R
Metals:						
1. Aluminum	200					
2. Antimony	60					
3. Arsenic	10					
4. Barium	200	<.001				
5. Beryllium	5					
6. Cadmium	5	<.002				
7. Calcium	5000					
8. Chromium	10	<.005				
9. Cobalt	50					
10. Copper	25					
11. Iron	100					
12. Lead	5					
13. Magnesium	5000					
14. Manganese	15					
15. Mercury	0.2					
16. Nickel	40					
17. Potassium	5000					
18. Selenium	5					
19. Silver	10	<.002				
20. Sodium	5000					
21. Thallium	10					
22. Tin	40					
23. Vanadium	50					
24. Zinc	20					
Other:						
Cyanide	10	5184				

* dection limits are given on Furnace/Hg/OHG QA/QC SUMMARY SHEETS 8-13

ICP QA/QC DATA

For work orders: 8601240, 8602031, 8602041, 8602060, 8602067, 8602079, 8602087

Form II

Q. C. Report No. 8

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium	1.00	1.01	101	1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium	1.00	1.04	104	1.00	1.05	105	1.04	104	
7. Calcium									
8. Chromium	1.00	1.01	101	1.00	1.02	102	1.02	102	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver	1.00	1.00	100	1.00	1.02	102	1.00	100	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

(2)

Form II

Q. C. Report No. 3

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium				1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium				1.00	1.04	104	1.03	103	
7. Calcium									
8. Chromium				1.00	1.00	100	1.01	101	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver				1.00	1.01	101	1.02	102	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

8601245
8602021
8602041
8602060
8602067
8602079
8602087

Form III

Q. C. Report No. 2

BLANKS

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium	<.001	<.001	<.001	<.001	<.001		
5. Beryllium							
6. Cadmium	<.002	<.002	<.002	.002*	.002*		
7. Calcium							
8. Chromium	<.005	<.005	<.005	<.005	<.005		
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver	.006*	.018	.010	.004*	.014		
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

*value is less than 5x ida

5 187

86-02031
86-02041

Form III

Q. C. Report No. 3

BLANKS

2-11-86

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium						.004*	
5. Beryllium							
6. Cadmium						<.002	
7. Calcium							
8. Chromium						<.005	
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver						<.002	
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

* value is less than 5x idl

5 188

Form VI

Q. C. Report No. 2

DUPLICATES
ANALYTICAL

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4
EPA Sample No.
Lab Sample ID No. 8602041-01E
Units ug/ml

Matrix water

analytical

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		.076	.077	1.3
5. Beryllium				
6. Cadmium		<.002	<.002	NC
7. Calcium				
8. Chromium		.007*	.009*	25
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		<.002	<.002	NC
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

~~* Out of Control~~

To be added at a later date.

[2] RPD = [|S - D| / ((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

* value is less than 5x (d)

Form V

Q. C. Report No. 2

SPIKE SAMPLE RECOVERY

ANALYTICAL

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4

EPA Sample No.

Lab Sample ID No. 8603041-07C

Units ug/ml

Matrix water

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	-				
3. Arsenic	-				
4. Barium	-	1.50	0.52	1.00	98
5. Beryllium	-				
6. Cadmium	-	0.94	<.002	1.00	94
7. Calcium	-				
8. Chromium	-	0.98	0.019 *	1.00	96
9. Cobalt	-				
10. Copper	-				
11. Iron	-				
12. Lead	-				
13. Magnesium	-				
14. Manganese	-				
15. Mercury	-				
16. Nickel	-				
17. Potassium	-				
18. Selenium	-				
19. Silver	-	0.98	0.003 *	1.00	98
20. Sodium	-				
21. Thallium	-				
22. Tin	-				
23. Vanadium	-				
24. Zinc	-				
Other:					
Cyanide	-				

[1] %R = [(SSR - SR)/SA] x 100

"R" - out of control

Comments: * value is less than 5 x IDL

Organics QA/QC 86-02-041

Volatile Organics DETECTION LIMITS

8602041-01-08

METHOD 601

COMPOUND	-01 -06-08	-02,-03	METHOD DETECTION LIMIT ug/l -04
Chloromethane	0.08	80	4.0
Bromomethane	1.18	1180	59.0
Vinyl Chloride	0.18	180	9.0
Chloroethane	0.52	520	260
Methylene Chloride	0.25	250	12.5
Trichlorofluoromethane	0.10	100	5.0
1,1-Dichloroethene	0.13	130	6.5
1,1-Dichloroethane	0.07	70	3.5
Trans-1,2-Dichloroethene	0.10	100	5.0
Chloroform	0.05	50	2.5
1,2-Dichloroethane	0.03	30	1.5
1,1,1-Trichloroethane	0.03	30	1.5
Carbon Tetrachloride	0.12	120	6.0
Bromodichloromethane	0.10	100	5.0
1,2-Dichloropropane	0.04	40	2.0
Trichloroethene	0.12	120	6.0
Dibromochloromethane	0.09	90	4.5
2-Chloroethylvinyl Ether	0.13	130	6.5
Bromoform	0.20	200	10.0
Tetrachloroethene	0.03	30	1.5
Chlorobenzene	0.25	250	12.5
1,3-Dichlorobenzene	0.32	320	16.0
1,2-Dichlorobenzene	0.15	150	7.5
1,4-Dichlorobenzene	0.24	240	12.0

Volatile Organics DETECTION LIMITS

8602041-01→-08

METHOD 601

COMPOUND	-05		
	METHOD DETECTION LIMIT ug/l		
Chloromethane	2.0		
Bromomethane	29.5		
Vinyl Chloride	3.0		
Chloroethane	13.0		
Methylene Chloride	6.25		
Trichlorofluoromethane	2.5		
1,1-Dichloroethene	3.25		
1,1-Dichloroethane	1.75		
Trans-1,2-Dichloroethene	2.5		
Chloroform	1.25		
1,2-Dichloroethane	0.75		
1,1,1-Trichloroethane	0.75		
Carbon Tetrachloride	3.0		
Bromodichloromethane	2.5		
1,2-Dichloropropane	1.0		
Trichloroethene	3.0		
Dibromochloromethane	2.25		
2-Chloroethylvinyl Ether	3.25		
Bromoform	5.0		
Tetrachloroethene	0.75		
Chlorobenzene	6.25		
1,3-Dichlorobenzene	8.0		
1,2-Dichlorobenzene	3.75		
1,4-Dichlorobenzene	6.0		

DETECTION LIMITS

VOLATILE ORGANICS 8602011-01-08

METHOD 602

COMPOUND	DETECTION LIMIT ug/l -01-06-08	-02,-03	-04,-05				
BENZENE	0.2	200	2.0				
TOLUENE	0.2	200	2.0				
ETHYLBENZENE	0.2	200	2.0				
CHLOROBENZENE	0.2	200	2.0				
1,4-DICHLOROBENZENE	0.3	300	3.0				
1,3-DICHLOROBENZENE	0.4	400	4.0				
1,2-DICHLOROBENZENE	0.4	400	4.0				

VOA RESULTS

LAB # SYSTEM BLANK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: 4/12/02 ANALYST: JSC INSTRUMENT: Hewlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		ε,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # METHOD BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/12/91 ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/1/86 ANALYST: JSC INSTRUMENT: Hewlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	NP	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SOLVENT BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 12/11/86 ANALYST: eo INSTRUMENT: Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/14/26 ANALYST: JS INSTRUMENT: Dlow
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2 Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # METHOD BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/12/87 ANALYST: CP INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/13/86 ANALYST: JSC INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Method Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/13/22 ANALYST: CL INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/11/26 ANALYST: JSC INSTRUMENT: Oln
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Herbert Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/11/86 ANALYST: CC INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	N/D
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichloroflouromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTO BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 3/15/96 ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	N2
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/16/26 ANALYST: RP INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/11/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		a			a		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	32.3			105		
	Toluene	4.1	3.9			96		
	Ethylbenzene	11.5	10.2			89		
	P-Xylene	19.1	19.0			100		
	M-Xylene	42.6	43.2			102		
	O-Xylene	10.6	9.7			91		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/12/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		CQ			CQ		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	34.8			113		
	Toluene	4.1	4.5			110		
	Ethylbenzene	11.5	11.2			97		
	P-Xylene	19.1	20.8			109		
	M-Xylene	42.6	46.6			109		
	O-Xylene	10.6	10.5			99		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/10/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D	C		D	C	
	ANALYST		G	RP		G	RP	
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	34.2			112		
	Toluene	4.1	4.4			108		
	Ethylbenzene	11.5	11.0			96		
	P-Xylene	19.1	20.3			107		
	M-Xylene	42.6	45.8			108		
	O-Xylene	10.6	10.3			97		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7		55.4			94	
	Aroclor 1260	56.8		54.5			96	

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/16/86

	CERTIFIED VALUE (mg/L)	ANALYZED VALUE G/B	% REC G/B
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	10.2 / 9.6	112 / 105
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	10.9 / 7.9	109 / 79
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	47.1 / 45.8	110 / 107
1,2-Dichloroethane	27.6	42.9 / 22.3	156 / 81
1,1,1-Trichloroethane	14.3	15.0 / 13.9	105 / 97
Carbon tetrachloride	20.0	21.2 / 17.1	106 / 85
Bromodichloromethane	7.9	9.2 / 7.9	116 / 100
1,2-Dichloropropane	8.0	9.8 / 8.16	123 / 102
Trichloroethene	22.2	26.7 / 20.9	120 / 94
Dibromochloromethane	16.7	18.7 / 16.4	112 / 98
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	10.8 / 8.9	109 / 90
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	10.1 / 9.7	123 / 118
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/13/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		Q			Q		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	34.4			112		
	Toluene	4.1	4.9			119		
	Ethylbenzene	11.5	11.8			102		
	P-Xylene	19.1	20.5			103		
	M-Xylene	42.6	44.3			104		
	O-Xylene	10.6	10.6			100		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/12/86

	CERTIFIED VALUE (mg/L)	B/G ANALYZED VALUE	B/G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	8.5 / 10.0	92 / 109
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.6 / 8.1	86 / 81
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	45.2 / 58.0	105 / 135
1,2-Dichloroethane	27.6	20.0 / 23.5	72 / 85
1,1,1-Trichloroethane	14.3	13.8 / 15.3	96 / 107
Carbon tetrachloride	20.0	18.8 / 16.5	94 / 83
Bromodichloromethane	7.9	7.4 / 7.3	94 / 92
1,2-Dichloropropane	8.0	6.6 / 8.4	82 / 105
Trichloroethene	22.2	19.7 / 22.7	89 / 102
Dibromochloromethane	16.7	14.3 / 14.9	86 / 89
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	7.2 / 8.9	72 / 90
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	7.9 / 7.6	96 / 93
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

RADIAN
CORPORATION

SPIKE RECOVERY

EPA Method 602
Volatile Organics

4/10/86
AP
D

SAMPLE # 8602041-01C
UNITS PUMP 4 / 8602G

Spike C
SM

COMPOUND	SSR	SR	SA	%R
Benzene	31.7		30.7	103
Toluene	5.0		4.1	122
Ethyl benzene	10.3		11.5	90
1,4-Dichlorobenzene				
1,3-Dichlorobenzene				
1,2-Dichlorobenzene				
O-Xylene	9.3		10.6	88
M-Xylene	42.3		42.6	99
P-Xylene	18.8		19.1	98
Chlorobenzene				

SSR = Spiked Sample Result
SR = Sample Result
SA = Spike Added

RADIAN
CORPORATION

8602041-01A
860126

DUPLICATE ANALYSIS

EPA Method 601 Volatile Organics						
COMPOUND ug/l	RUN#1	RUN#2	RPD	RUN#1	RUN#2	RPD
Chloromethane	ND	ND	NC			
Bromomethane						
Vinyl chloride						
Chloroethane						
Methylene chloride						
Trichlorofluoromethane						
1,1-Dichloroethene						
1,1-Dichloroethane						
trans-1,2-Dichloroethene						
Chloroform						
1,2-Dichloroethane						
1,1,1-Trichloroethane						
Carbon Tetrachloride						
Bromodichloroemethane						
1,2-Dichloropropane						
Trichloroethene						
Dibromochloromethane						
1,1,2-Trichloroethane						
cis-1,2-Dichloropropene						
2-Chloroethylvinyl ether						
Bromoform						
1,1,2,2-Tetrachloreotbane						
Tetrachlorethylene						
Chlorobenzene						
1,3-Dichlorobenzene						
1,2-Dichlorobenzene						
1,4-Dichlorobenzene						

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN
CORPORATION

DUPLICATE ANALYSIS

EPA METHOD 602
VOLATILE ORGANICS

SAMPLE # 8602041-06C
UNITS ug/L
860135

COMPOUND	RUN#1	RUN#2	RPD
Benzene	ND	ND	NC
Toluene			
Ethyl benzene			
1,4-Dichlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
O-Xylene			
M-Xylene			
P-Xylene			
Chlorobenzene			

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

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CORPORATION

DUPLICATE ANALYSIS

EPA METHOD 602
VOLATILE ORGANICS

SAMPLE # 8602041-07B
UNITS ug/l
FIELD BLANK

COMPOUND	RUN#1	RUN#2	RPD
Benzene			
Toluene	2.19	2.14	2.3
Ethyl benzene			
1,4-Dichlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
O-Xylene			
M-Xylene			
P-Xylene			
Chlorobenzene			

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #8602041-01A

SAMPLE ID: 8601210

DATE: 2-11-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 102%, 93%

2-BROMO-1-CHLOROPROPANE: 108%, 89%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

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CORPORATION

SURROGATE RECOVERIES

LAB #: 8602041-02A

SAMPLE ID: 860130

DATE: 2-11-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 97%

2-BROMO-1-CHLOROPROPANE: 118%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

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CORPORATION

SURROGATE RECOVERIES

LAB #: 8602041-03A

SAMPLE ID: 860131

DATE: 2-12-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 114%

2-BROMO-1-CHLOROPROPANE: 123%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600841-04A

SAMPLE ID: 860132

DATE: 2-12-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 96%

2-BROMO-1-CHLOROPROPANE: 120%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602041-05A

SAMPLE ID: 8600134

DATE: 2-12-86

INSTRUMENT: A

601/8010

BROMOCHLOROMETHANE: 105%

2-BROMO-1-CHLOROPROPANE: 114%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602041-06A

SAMPLE ID: 860135

DATE: 2-12-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 108%

2-BROMO-1-CHLOROPROPANE: 124%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602041-07A

SAMPLE ID: FIELD BLANK

DATE: 2-12-86

INSTRUMENT: G7

601/8010

BROMOCHLOROMETHANE: 108%

2-BROMO-1-CHLOROPROPANE: 98%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602041-08F

SAMPLE ID: TRIP BLANK

DATE: 2-12-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 118%

2-BROMO-1-CHLOROPROPANE: 102%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600841-01C

SAMPLE ID: 8601016

DATE: 2-10-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 112%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602041-02C

SAMPLE ID: 860130

DATE: 2-10-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 95%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600841-03C

SAMPLE ID: 800131

DATE: 2-10-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 91%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602041-04C

SAMPLE ID: 860132

DATE: 2-10-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 94/0

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602041-05C

SAMPLE ID: 860134

DATE: 2-10-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 91%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8002041-06C

SAMPLE ID: 860135

DATE: 2-1-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 104%, 101%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600841-07B

SAMPLE ID: FIELD BLANK

DATE: 2-11-86/2-13-86

INSTRUMENT: D/D

601/8010

BROMOCHLOROMETHANE: _____

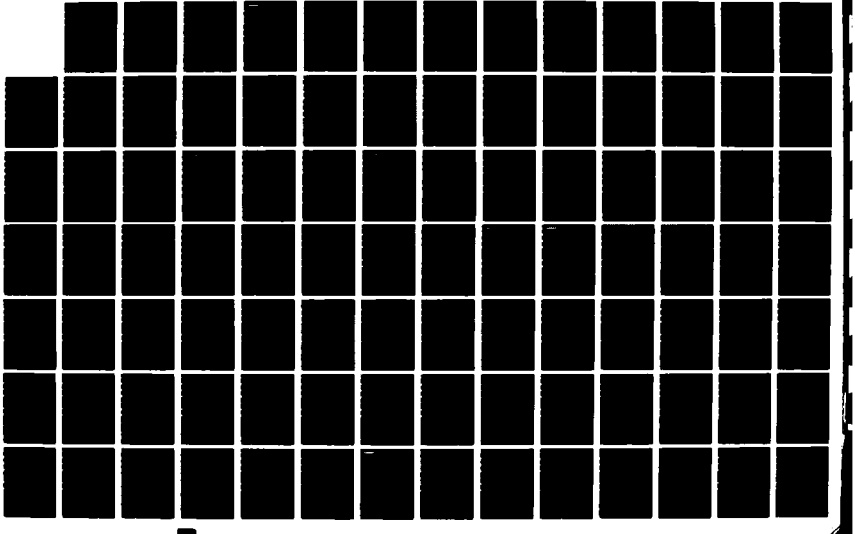
2-BROMO-1-CHLOROPROPANE: _____

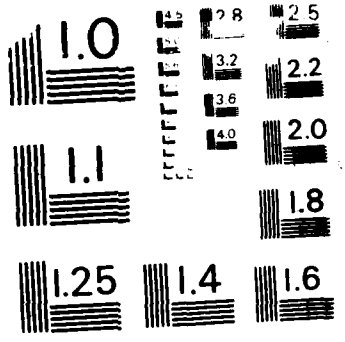
602/8020

a,a,a-TRIFLUOROTOLUENE: 101%, 102%

AD-A198 445 INSTALLATION RESTORATION PROGRAM PHASE 2 4/6
CONFIRMATION/QUANTIFICATION STAG (U) RADIAN CORP
AUSTIN TX DEC 87 F33615-83-D-4001

UNCLASSIFIED F/G 24/7 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS - 1963

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602041-08A

SAMPLE ID: TRIP BLANK

DATE: 2-12-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 98%

RADIAN CORPORATION

SACTO.

EPA 625 (860136, 860137, 860138
860139, 860140

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth, Plant 4

Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name ART MORRILL NEIL ROBINSON Date/Time Sampled 2-7-86

Amount of Sample Collected NINE, 1000 ML. AMBER GLASS

Sample Description Ground Water

Store at: ☐ Ambient ☐ 5°C ☐ −10°C ☒ Other 4°C

☒ Caution · No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions · Special Handling · Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☒ Shock sensitive
☐ Acidic	☐ Biological	☐ Carcinogenic · suspect
☐ Caustic	☐ Peroxide	☐ Radioactive
☐ Other _____		

Sample Allocation/Chain of Possession:

Organization Name RADIAN CORP.

Received By _____ Date Received _____ Time _____

Transported By Arthur Morrill Lab Sample No. [illegible]

Comments _____

Inclusive Dates of Possession 2-7-86

Organization Name Radian Analytical Services

Received By C. Raymundo Date Received 2-8-86 Time 11:00

Transported By Federal Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

AUSTIN

RADIAN CORPORATION

EPA 601 - 860136, 860137, 860138, 860139, 860140
EPA 602 - 860136, 860137, 860138, 860139, 860140
~~EPA 625~~ - METALS - 860136, 860137, 860138, 860139, 860140
CHROMIUM - 860136, 860140
OIL & GREASE - 860136, 860140

CHAIN OF CUSTODY RECORD

FIELD BLANKS EPA 601; EPA 602 + ONE TRIP BLANK

Field Sample No. _____

Company Sampled/Address GENERAL DYNAMICS - FORT WORTH, PLANT FOUR

Sample Point Description GROUNDWATER

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name A. MORRILL / N. ROBINSON Date/Time Sampled 2-7-86

Amount of Sample Collected (4 four) 1 QT MASON JARS, (7 seven) 500ml plastic, (23 twenty three 40ml VOAS

Sample Description _____

Store at: ☐ Ambient ☐ 5°C ☐ -10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name RADIAN CORP.

Received By _____ Date Received _____ Time _____

Transported By Arthur Morrill Lab Sample No. _____

Comments _____

Inclusive Dates of Possession 2-7-86

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

GC QA/QC

Volatile Organics — DETECTION LIMITS

Report 3

8602047-01→-07

METHOD 601

COMPOUND	-02 -05→-07	-01,-04	-03	METHOD DETECTION LIMIT ug/L
Chloromethane	0.08	20.0	80.0	
Bromomethane	1.18	295	1180	
Vinyl Chloride	0.18	30	180	
Chloroethane	0.52	130	520	
Methylene Chloride	0.25	62.5	250	
Trichlorofluoromethane	0.10	25.0	100	
1,1-Dichloroethene	0.13	32.5	130	
1,1-Dichloroethane	0.07	17.5	70.0	
Trans-1,2-Dichloroethene	0.10	25.0	100	
Chloroform	0.05	12.5	50.0	
1,2-Dichloroethane	0.03	7.5	30.0	
1,1,1-Trichloroethane	0.03	7.5	30.0	
Carbon Tetrachloride	0.12	30.0	120	
Bromodichloromethane	0.10	25.0	100	
1,2-Dichloropropane	0.04	10.0	40.0	
Trichloroethene	0.12	30.0	120	
Dibromochloromethane	0.09	22.5	90.0	
2-Chloroethylvinyl Ether	0.13	32.5	130	
Bromoform	0.20	50.0	200	
Tetrachloroethene	0.03	7.5	30.0	
Chlorobenzene	0.25	62.5	250	
1,3-Dichlorobenzene	0.32	80.0	320	
1,2-Dichlorobenzene	0.15	37.5	150	
1,4-Dichlorobenzene	0.24	60.0	240	

DETECTION LIMITS

VOLATILE ORGANICS

METHOD 602

COMPOUND	DETECTION LIMIT ug/l -02 -05 -07	-01, -04	-03				
BENZENE	0.2	5.0	10.0				
TOLUENE	0.2	5.0	10.0				
ETHYLBENZENE	0.2	5.0	10.0				
CHLOROBENZENE	0.2	5.0	10.0				
1,4-DICHLOROBENZENE	0.3	7.5	15.0				
1,3-DICHLOROBENZENE	0.4	10.0	20.0				
1,2-DICHLOROBENZENE	0.4	10.0	20.0				

VOA RESULTS

LAB # System Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/13/84 ANALYST: JSC INSTRUMENT: Beinlitte	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # METHOD BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/13/87 ANALYST: C INSTRUMENT: Bennett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane _____
2-Bromo-1-Chloropropane _____
1,4-Dichlorobutane _____

602
a,a,a,-Trifluorotoluene _____

VOA RESULTS

LAB # System Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/12/86 ANALYST: SC INSTRUMENT: Bertholetts	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
	ND		
Chloromethane		Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # REAGENT BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/12/87 ANALYST: RP INSTRUMENT: Bernadette	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # 5YSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/12/92 ANALYST: JSC INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
- Bromochloromethane
- 2-Bromo-1-Chloropropane
- 1,4-Dichlorobutane

602
- a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/12/92 ANALYST: CL INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	No
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 4/12/86 ANALYST: JSC INSTRUMENT: Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SOLVENT BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/12/86 ANALYST: CP INSTRUMENT: Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Systa Benil	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/11/86 ANALYST: JSC INSTRUMENT: Oln
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	NA
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Reagent Blank	
CLIENT NAME	
SAMPLE ID	
EPA METHOD 601 DATE: ANALYST: INSTRUMENT:	EPA METHOD 602 DATE: 2/11/86 ANALYST: C INSTRUMENT: Delta
COMPOUND / CONCENTRATION (ug/L)	COMPOUND / CONCENTRATION (ug/L)
Chloromethane	Benzene
Bromomethane	Toluene
Vinyl Chloride	Ethyl benzene
Chloroethane	Chlorobenzene
Methylene chloride	1,4-Dichlorobenzene
Trichlorofluromethane	1,3-Dichlorobenzene
1,1-Dichlorethene	1,2-Dichlorobenzene
1,1-Dichlorethane	P-Xylene
Trans-1,2-Dichloroethene	M-Xylene
Chloroform	O-Xylene
1,2-Dichlorethane	
1,1,1-Trichlorethane	
Carbon tetrachloride	
Bromodichlormethane	
1,2-Dichloropropane	SURROGATE RECOVERIES:
Trans-1,3-Dichloropropene	601
Trichloroethene	Bromochloromethane
Dibromochloromethane	2-Bromo-1-Chloropropane
1,1,2-Trichlorethane	1,4-Dichlorobutane
cis-1,3-Dichloropropene	602
2-Chloroethylvinyl ether	a,a,a,-Trifluorotoluene
Bromoform	
1,1,2,2-Tetrachlorethane	
Tetrachlorethylene	
Chlorobenzene	
1,3-Dichlorobenzene	
1,2-Dichlorobenzene	
1,4-Dichlorobenzene	

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/12/86

	CERTIFIED VALUE (mg/L)	B/G ANALYZED VALUE	B/G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	8.5 / 10.0	92 / 109
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.6 / 8.1	86 / 81
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	45.2 / 58.0	105 / 135
1,2-Dichloroethane	27.6	20.0 / 23.5	72 / 85
1,1,1-Trichloroethane	14.3	13.8 / 15.3	96 / 107
Carbon tetrachloride	20.0	18.8 / 16.5	94 / 83
Bromodichloromethane	7.9	7.4 / 7.3	94 / 92
1,2-Dichloropropane	8.0	6.6 / 8.4	82 / 105
Trichloroethene	22.2	19.7 / 22.7	89 / 102
Dibromochloromethane	16.7	14.3 / 14.9	86 / 89
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	7.2 / 8.9	72 / 90
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	7.9 / 7.6	96 / 93
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/13/86

	CERTIFIED VALUE (mg/L)	B/G ANALYZED VALUE	B/G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	9.0 / 10.4	98 / 113
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	9.8 / 10.1	98 / 101
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	50.8 / 52.2	118 / 121
1,2-Dichloroethane	27.6	22.7 / 25.2	82 / 91
1,1,1-Trichloroethane	14.3	14.4 / 15.1	100 / 106
Carbon tetrachloride	20.0	20.5 / 20.9	102 / 105
Bromodichloromethane	7.9	8.4 / 8.0	107 / 102
1,2-Dichloropropane	8.0	8.2 / 8.5	103 / 106
Trichloroethene	22.2	21.2 / 24.6	95 / 110
Dibromochloromethane	16.7	15.8 / 13.5	94 / 81
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	8.3 / 9.5	84 / 96
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.7 / 8.6	107 / 105
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/12/86

	CERTIFIED VALUE (mg/L)	B/C ANALYZED VALUE	B/C % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	8.5 / 10.0	92 / 109
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.6 / 8.1	86 / 81
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	45.2 / 58.0	105 / 135
1,2-Dichloroethane	27.6	20.0 / 23.5	72 / 85
1,1,1-Trichloroethane	14.3	13.8 / 15.3	96 / 107
Carbon tetrachloride	20.0	18.8 / 16.5	94 / 83
Bromodichloromethane	7.9	7.4 / 7.3	94 / 92
1,2-Dichloropropane	8.0	6.6 / 8.4	82 / 105
Trichloroethene	22.2	19.7 / 22.7	89 / 102
Dibromochloromethane	16.7	14.3 / 14.9	86 / 89
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	7.2 / 8.9	72 / 90
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	7.9 / 7.6	96 / 93
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/18/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		CP			CP		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	34.8			113		
	Toluene	4.1	4.5			110		
	Ethylbenzene	11.5	11.2			97		
	P-Xylene	19.1	20.8			109		
	M-Xylene	42.6	46.6			109		
	O-Xylene	10.6	10.5			99		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/11/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		a			a		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	32.3			105		
	Toluene	4.1	3.9			96		
	Ethylbenzene	11.5	10.2			89		
	P-Xylene	19.1	19.0			100		
	M-Xylene	42.6	43.2			102		
	O-Xylene	10.6	9.7			91		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

RADIAN
CORPORATION

SPIKE RECOVERY

EPA METHOD 601 Volatile Organics	860247-05A PLANT 4 860140 2/13/86 RP B							
COMPOUNDS	SSR	SR	SA	%R	SSR	SR	SA	%R
Chloromethane								
Bromomethane								
Vinyl chloride								
Chloroethane								
Methylene chloride	7.5		9.2	82				
Trichlorofluoromethane								
1,1-Dichloroethene	8.6		10.0	86				
1,1-Dichloroethane								
trans-1,2-Dichloroethene	4.2		5.4	77				
Chloroform	50.2		43.0	117				
1,2-Dichloroethane	20.0		27.6	72				
1,1,1-Trichloroethane	13.2		14.3	92				
Carbon Tetrachloride	19.4		20.0	97				
Bromodichloroemethane	7.8		7.9	99				
1,2-Dichloropropane	7.8		8.0	97				
Trichloroethene	19.9		22.0	89				
Dibromochloromethane	[illegible]		16.7					
1,1,2-Trichloroethane								
cis-1,2-Dichloropropene								
2-Chlorethylvinyl ether								
Bromoform	8.5		9.9	86				
1,1,2,2-Tetrachloreothane			10.0					
Tetrachlorethylene			6.2					
Chlorobenzene	8.9		8.0	111				
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								

SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

RADIAN
CORPORATION

SPIKE RECOVERY

EPA Method 602
Volatile Organics

2/11/86
RP
D

SAMPLE # 860047-03C
UNITS Purge 4 1.50
860138

COMPOUND	SSR	SR	SA	%R
Benzene	32.3		30.7	105
Toluene	5.7		4.1	138
Ethyl benzene	13.0		11.5	113
1,4-Dichlorobenzene				
1,3-Dichlorobenzene				
1,2-Dichlorobenzene				
O-Xylene	11.8		10.6	112
M-Xylene	51.2		42.6	120
P-Xylene	23.3		19.1	118
Chlorobenzene				

SSR = Spiked Sample Result
SR = Sample Result
SA = Spike Added

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602047-01A

SAMPLE ID: 8600136

DATE: 2-12-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 91%

2-BROMO-1-CHLOROPROPANE: 100%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602047-02A

SAMPLE ID: 860137

DATE: 2-12-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 111%

2-BROMO-1-CHLOROPROPANE: 138%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602047-03A

SAMPLE ID: 8600138

DATE: 2-12-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 86%

2-BROMO-1-CHLOROPROPANE: 105%

602/8020

a,a,a-TRIFLUOROTOLUENE:

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600847-104A

SAMPLE ID: 860134

DATE: 2-13-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 95%

2-BROMO-1-CHLOROPROPANE: 100%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8608047-05A

SAMPLE ID: 860140

DATE: 2-13-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 123%

2-BROMO-1-CHLOROPROPANE: 118%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 860247-010A

SAMPLE ID: FIELD BLANK

DATE: 2-13-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 98%

2-BROMO-1-CHLOROPROPANE: 111%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN CORPORATION

SURROGATE RECOVERIES

LAB #: 8602047-07A

SAMPLE ID: TRIP BLANK

DATE: 2-12-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 119%

2-BROMO-1-CHLOROPROPANE: 119%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602047-CIC

SAMPLE ID: 860136

DATE: 2-11-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 98%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602047-102C

SAMPLE ID: 860137

DATE: 2-11-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 106%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8605047-C3C

SAMPLE ID: 860138

DATE: 2-11-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 100%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8C02047-04C

SAMPLE ID: 8C00139

DATE: 2-11-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 98%

RADIAN CORPORATION

SURROGATE RECOVERIES

LAB #: 8602047-05C

SAMPLE ID: 860140

DATE: 2-11-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 114%

RADIAN CORPORATION

SURROGATE RECOVERIES

LAB #: 8602047-01B

SAMPLE ID: FIELD BLANK

DATE: 2-17-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 103%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8002047-07A

SAMPLE ID: TRIP BLANK

DATE: 2-12-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 104%

Report 3 PLANT 4 86-02-047 samples 01-05 (metals) samples 01,05 oil & grease, HC UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 01 E	<.005	<.005	NC	an sp 01 E	<.005	.022	.024	92	prep bl <.005
	idl = .005	.035	.040	88	dig dup 04 E	.078	.072	8.0	dig sp 05 E	*.007	.021	.020	70	cal bl <.005
		.036	.040	90										cal bl <.005
Hg	2-10-86	.0054	.0050	108	dig dup 02 E	<.0002	<.0002	NC	dig sp 01 E	<.0003	.0022	.0020	110	prep bl .0002
	idl = .0002	.0040	.0040	100										
		.0040	.0040	100										
Pb	2-17-86	.044	.045	98	an dup 01 E	.035	.035	0	an sp 01 E	.025	.047	.024	92	prep bl <.002
	idl = .002	.048	.045	107	dig dup 04 E	.008*	.007*	13	dig sp 05 E	.20	.24	.024	167 (A)	
		.047	.045	104										
Se	2-25-86	.041	.040	103	an dup 01 E	<.003	<.003	NC	an sp 01 E	<.003	.021	.024	88	prep bl <.003
	idl = .003	.036	.040	90	dig dup 04 E	<.003	<.003	NC	dig sp 05 E	<.003	<.003	.010	0	cal bl <.003
		.034	.040	85										
		.043	.040	108										
oil and grease	2-14-86	197	200	99										
	idl = 1	197	200	99										

an dup=analytical duplicate an sp=analytical spike dig dup=pre-digest duplicate dig sp=pre-digest spike
idl = instrument detection limit *=value is less then five times the instrument detection limit NC=not calculable

(A) sample result is greater than 5X spike added concentration; in this situation, the spike is sometimes out of the recovery range

5 267

Report 3 — Shields (samples 01-05), oil squeeze (samples 01-06)

PLANT 4 — 86-02-176 — QC DATA - AA, OIL & GREASE — UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	3-12-86	0.025	0.027	93					an sp 176-03G	<.003	.026	.024	108	dig bl <.003
	idl=.003	0.040	0.040	100										cal bl <.003
		0.044	0.040	110										
Hg	3-7-86	0.0023	0.0025	92	dig dup 176-04	<.0002	<.0002	NC	dig sp 176-05	<.0002	0.0008	0.0010	80	dig bl <.0002
	idl=.0002	0.0021	0.0025	84										
Pb	3-11-86	0.042	0.043	98					an sp 176-05G	<.001	0.013	0.024	54	dig bl 0.004*
	idl=.001	0.046	0.043	107					an sp 1:10 dilution 176-05G	<.001	0.021	0.024	88	cal bl <.001
		0.045	0.043	105										
Se	3-11-86	0.049	0.050	98					an sp 176-03G	<.003	0.018	.024	75	dig bl <.003
	idl=.003	0.046	0.050	92					an sp 176-03G 1:10 dilution	<.003	0.024	.024	100	cal bl <.003
														cal bl <.003
Oil & Grease	3-14-86	191	200	96										

5 268

an dup=analytical duplicate an sp=analytical spike dig dup=pre-digest duplicate dig sp=pre-digest spike
idl = instrument detection limit *=value is less then five times the instrument detection limit NC=not calculable

Report 3
Plant 4
Radian Workorder 86 02 197 QC DATA - AA,

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
Hg	3-9-86	.22 ug	.25 ug	88	-06**	<.0002	<.0002	NC	-06**	.11	<.0002	.010	110	<.0002**
	10L=.002	.20 ug	.20 ug	100										
		.20 ug	.20 ug	100										
Pb	3-12-86	.047	.045	104	-01*	.22	.22	0	-01*(1:10)	.041	.022	.024	79	<.002**
	10L=.002	.045	.045	100	-01**	.22	.27	20	-01*(1:20)[1]	.030	.011	.024	79	
		.045	.045	100					-02**	.020	.0099	.020	51	
Se	3-12-86	.047	.050	94	-01**	<.003	<.003	NC	-02**	<.003	<.003	.010	0	<.003**
	10L=.003	.043	.050	86					-02*	.007	<.003	.034	29	
									-02*(1:10)[2]	.017	<.003	.024	71	
As	3-17-86	.028	.027	104	-01**	.16	.092	54	-02**	.032	.005	.020	85	<.002*
	10L=.002	.042	.040	105					-02*	.028	.005	.034	96	<.002**
		.042	.040	105										<.002*

RPD=[(/S-D/)/((S+D)/2)]x100
RPD=relative percent difference

SPIKE %R=[(SSR-SR)/SA]x100

* analytical
** digestion

1 Due to low recovery sample was diluted 1:10 + respiked. matrix interference pre

5 26.9

Report 3

SAM # - 8603004 Plant 4 QC DATA - AA, OIL AND GREASE UNITS ug/ml.

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	~~SR~~ SSR	~~SSR~~ SR	SA	%R	
Pb	3-11-86	.042	.043	98	-03**	.022	.019	15	-08*	.019	<.001	.024	79	.004**
		.046	.043	107	-10*	.016	.014	13						<.001*
Hg	3-9-86	.22 ug	.25 ug	88	-10*	<.0002	<.0002	NC	-10	.11	<.0002	.10	110	<.0002**
		.20 ug	.20 ug	100										
As	3-13-86	.025	.027	93	-03**	<.005	<.005	NC	-04**	.020	<.005	.020	100	<.005**
		.041	.040	103					-06*	.020	<.005	.024	83	<.005*
									-06*(1:10dil)	.021	<.005	.024	88	
Se	3-11-86	.049	.050	98	-03	<.003	<.003	NC	-03	.020	<.003	.024	83	<.003
									-03(1:10dil)	.024	<.003	.024	100	<.003
O&G	3-14-86	191	200	96										

5270

* analytical
** - digestion

Form VI

Q. C. Report No. 3

DUPLICATES

Plant 4

LAB NAME Radian

DATE 3-31-86

CASE NO. 8602047-01

EPA Sample No. —

Lab Sample ID No. pretigestion

Units ug/ml

Matrix water

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		0.099	0.098	1.0
5. Beryllium				
6. Cadmium		<0.002	<0.002	NC
7. Calcium				
8. Chromium		*0.018	*0.018	0
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		*0.006	*0.006	0
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* Out of Control

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

* indicates value is less than 5 x idl

Form VI

Q. C. Report No. 3

DUPLICATES

Plant 4

LAB NAME Radian

DATE 3-31-86

CASE NO. 8602047-04

EPA Sample No. —

Lab Sample ID No. analytical

Units ug/ml

Matrix water

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		0.519	0.519	0
5. Beryllium				
6. Cadmium		<0.002	<0.002	NC
7. Calcium				
8. Chromium		0.031	0.031	0
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		0.015	0.015	0
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* Out of Control

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

Form V

Q. C. Report No. 3

SPIKE SAMPLE RECOVERY

Plant 4

LAB NAME Radian

CASE NO. 8602047-03

DATE 3-31-86

EPA Sample No. -

Lab Sample ID No. analytical

Units ug/ml

Matrix water

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	-				
3. Arsenic	-				
4. Barium	-	1.034	0.101	1.0	93
5. Beryllium	-				
6. Cadmium	-	0.868	<0.002	1.0	87
7. Calcium	-				
8. Chromium	-	0.930	*0.007	1.0	92
9. Cobalt	-				
10. Copper	-				
11. Iron	-				
12. Lead	-				
13. Magnesium	-				
14. Manganese	-				
15. Mercury	-				
16. Nickel	-				
17. Potassium	-				
18. Selenium	-				
19. Silver	-	0.964	*0.004	1.0	96
20. Sodium	-				
21. Thallium	-				
22. Tin	-				
23. Vanadium	-				
24. Zinc	-				
Other:					
Cyanide	-				

[1] %R = [(SSR - SR)/SA] x 100

"R"- out of control

Comments: * indicates value is less than 5xidl

Form V

Q. C. Report No. 3

SPIKE SAMPLE RECOVERY

Plant 4

LAB NAME Radian

DATE 3-31-86

CASE NO. 8602047-02

EPA Sample No. —

Lab Sample ID No. preduction

Units ug/ml

Matrix water

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	-				
3. Arsenic	-				
4. Barium	-	1.824	0.149	2.0	84
5. Beryllium	-				
6. Cadmium	-	0.033	<0.002	0.05	66
7. Calcium	-				
8. Chromium	-	0.203	0.042	0.20	81
9. Cobalt	-				
10. Copper	-				
11. Iron	-				
12. Lead	-				
13. Magnesium	-				
14. Manganese	-				
15. Mercury	-				
16. Nickel	-				
17. Potassium	-				
18. Selenium	-				
19. Silver	-	0.207	*0.007	0.25	80
20. Sodium	-				
21. Thallium	-				
22. Tin	-				
23. Vanadium	-				
24. Zinc	-				
Other:					
Cyanide	-				

[1] %R = [(SSR - SR)/SA] x 100

"R" - out of control

Comments: * indicates that value is less than 5 x idl

for workorders
86-02-047
86-02-176
86-02-197
86-03-004

Form II pg 2

Q. C. Report No. 3

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. Plant 4

SOW NO.

DATE 3-31-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium				1.00	0.99	99	0.99	99	P
5. Beryllium									
6. Cadmium				1.00	1.00	100	1.00	100	P
7. Calcium									
8. Chromium				1.00	0.99	99	0.99	99	P
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver				1.00	0.99	99	1.00	100	P
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

for work orders:
86-02-047
86-02-176
86-02-197
86-03-004

ICP QC DATA - PLANT 4

Form II 99 1

Q. C. Report No. 3

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. Plant 4

SOW NO.

DATE 3-31-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium	1.00	0.99	99	1.00	0.98	98	0.99	99	P
5. Beryllium									
6. Cadmium	1.00	0.98	98	1.00	0.99	99	1.02	102	P
7. Calcium									
8. Chromium	1.00	0.98	98	1.00	0.99	99	1.01	101	P
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver	1.00	0.98	98	1.00	1.01	101	1.00	100	P
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

for workorders:
8602047, 8602176
8602197 & 8603004

Form III

Q. C. Report No. 3

BLANKS

LAB NAME Radian CASE NO. Plant 4

DATE 3-31-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:						for 8603004	
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium						<0.002	
5. Beryllium							
6. Cadmium						<0.002	
7. Calcium							
8. Chromium						<0.005	
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17 Potassium							
18. Selenium							
19. Silver						<0.002	
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

for workorders: 8602047, 8602176, 8602197 & 8603004

Form III

Q. C. Report No. 3

BLANKS

LAB NAME Radian CASE NO. Plant 4

DATE 3-31-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:						for 8602047	for 8602176 8602197
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002
5. Beryllium							
6. Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
7. Calcium							
8. Chromium	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver	<0.002	0.025	0.013	<0.005	<0.010	<0.002	<0.002
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

EPA-25 860141, 860143, 860144, 860146

RADIAN CORPORATION

SALTO.

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth, Plant 4

Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name N. Robinson, A. Merrill Date/Time Sampled 2-10-86

Amount of Sample Collected Eight 1000 ml. Amber Glass

Sample Description Groundwater

Store at: ☐ Ambient ☐ 5°C ☐ -10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name Radian Corp.

Received By _____ Date Received _____ Time _____

Transported By Cynthia Monette Lab Sample No. [illegible]

Comments _____

Inclusive Dates of Possession 2-10-86

Organization Name Radian Analytical Services

Received By C. Reynolds Date Received 2-11-86 Time 10:45

Transported By Federal Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

AUSTIN

RADIAN CORPORATION

EPA 601 - 860141, 860142, 860143, 860146
EPA 602 - 860141, 860142, 860143, 860146
Metals 860141, 860146, 860142, 860143
CHROMIUM - 860142
860141 860143
Hydrocarbons 860141, 860143, 860145, 860142
OIL & GREASE 860143, 860141, 860142

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth - Plant 4

Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name N Robinson A. Morrill Date/Time Sampled 2-10-86

Amount of Sample Collected (16) 40 ml glass (1) 500 ml plastic, (1) MASON JARS

Sample Description Ground Water

Store at: ☐ Ambient ☐ 5°C ☐ -10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name Radian Corp

Received By _____ Date Received _____ Time _____

Transported By Arthur Morrill Lab Sample No. [illegible]

Comments _____

Inclusive Dates of Possession 2-10-86

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

AA, Vitrified Clause, HC Rinse Drift

FOR W.O. 86-01-240 86-02-031 86-02-041 86-02-060 86-02-067 86-02-079 86-02-087

UNITS ug/ml

PLANT 4 86-01-240 samples 01-09

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2/8/86	.041	.040	103	an dup 01A	<.005	<.005	NC	an sp 01A	<.005	.024	.024	100	prep bl <.005
	idl=.005	.041	.040	103										col bl <.005
		.040	.040	100										
Hg	2/3/86	.0054	.0050	108	dig dup 09A	<.0002	.0003*	NC	dig sp 09A	<.0002	.0028	.0020	140	prep bl .0004*
	idl=.0002	.0040	.0040	100										
Pb	2-11/86	.042	.045	93	an dup 09A	<.002	<.002	NC	an sp 09A	<.002	.019	.024	79	prep bl .002
	idl=.002	.046	.045	102										col bl <.002
Sc	2/9/86	.044	.050	88	an dup 05A	<.003	<.003	NC	an sp 05A	<.003	.018	.024	75	prep bl <.003
	idl=.003	.044	.050	88					an sp 05 1:10 dilution	<.003	.022	.024	92	col bl <.003
Hg	2/8/86	.0054	.0050	108	dig dup 03A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0024	.0020	120	<.0002 prep bl
	idl=.0002	.0040	.0040	100										

an dup = analytical duplicate
dig dup = digestion duplicate
i.d.l. = instrument detection limit

an sp = analytical spike
dig sp = digestion spike or matrix

* indicates value is less than 5x instrument detection limit
NC = not calculable

UNITS ug/l

PLANT 4 86-02-031 samples (01-,02,03,06)-011&Grease 02,03-METALS

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 02 G	<.005	<.005	NC	an. sp 02 G	<.005	.023	.024	96	prep bl <.005
	idl = .005	.040	.040	100										cal bl <.005
Hg	2-20-86	.0048	.0050	96	—				dig sp 03 G	<.0002	.0019	.0020	95	prep bl <.0002
	idl = .0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 02 G	.033	.030	9.4	an. sp 02 G	.033	.053	.024	83	prep bl <.002
	idl = .002	.045	.045	100										
Se	2-17-86	.042	.040	105	—				an. sp. 02 G	.003	.021	.024	75	prep bl <.002
	idl = .002	.040	.040	100										cal bl <.002
		.039	.040	98										
Oil and Grease	2-14-86	197	200	99	—				—					
	idl = 1	197	200	99										
HC	2-26-86	430	415	104										
	idl = 1	208	245	118										

an. sp = analytical spike
dig sp = prodigest or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-041 samples 01-06

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 01 E	<.005	<.005	NC	on sp 01 E	<.005	.022	.024	92	prep bl <.005
	idl = .005	.037	.040	93										cal bl <.005
		.035	.040	88										
Hg	2-20-86	.0048	.0050	96	dig dup 06 E	<.0002	.0002*	NC	dig sp 05 E	<.0002	.0022	.0020	110	prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 01 E	<.002	<.002	NC	an sp 01 E 1:10 dilution	<.002	.021	.024	88	prep bl <.002
	idl = .002	.045	.045	100										
		.048	.045	107										
Sc	2-17-86	.042	.040	105	—				an sp 03 E	.003*	.021	.024	75	prep bl <.002
	idl = .002	.039	.040	98										cal bl <.002
oil and grease	2-14-86	197	200	99										
	idl = 1	197	200	99										
HC - idl = 1	2-14-86				an dup 03	<1	<1	NC						

* indicates value is less than 5x instrument detection limit

an sp = analytical spike
dig sp = digestion spike or matrix spike

an dup = analytical duplicate
dig dup = digestion duplicate

idl = instrument det. limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-060 samples 01-05

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	dig dup 01C	.002*	.003*	40	dig sp 03C	.006*	.023	.020	85	prep bl <.002
	idl = .002	.042	.040	105	an dup 03C	.006*	.003*	67	an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Hg	2-20-86	.0048	.0050	96	-				05A	<.0002	.0020	.0020	100	prep bl <.0002
	idl = .0002	.0042	.0040	105										
Pb	2-17-86	.045	.043	105	dig dup 01C	.034	.031	9.1	dig sp 02C	.27	.29	.020	100	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	dig dup 01C	.003*	.002*	40	dig sp 02C	<.002	.005	.010	50	prep bl <.002
	idl = .002	.040	.040	100					an sp 05A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
Oil and Grease	2-14-86	197	200	99	-				-					
	idl = 1	197	200	99										

an sp = analytical spike
dig sp = digestion or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5x instrument detection limit
NC = not calculable

PLANT 4 86-02-067

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	—				an sp 03E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.042	.040	105					1:10 dilution					cal bl <.002
Hg	2-24-86	.0048	.0050	96	—				dig sp 04E	<.0002	.0020	.0020	100	prep bl <.0002
	2-20-86	.0048	.0050	96										prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.045	.043	105	an dup 04E	.037	.038	2.1	an sp 03E	.020	.035	.024	63	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	an dup 01E	.007*	.007*	0	an sp 04E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.040	.040						1:10 dilution					cal bl <.002
Oil and Grease	2-14-86	197	200	99										
	idl = 1	197	200	99										

idl = instrument detection limit

an sp = analytical spike
dig sp = digestion or matrix spike

dig = digestion duplicate
an dup = analytical duplicate

* indicates value is less than 5 x instrument detection limit
NC = not calculable

PLANT 4 86-02-079 samples 01 – 04 samples 05, 06, 07-046, HC UNITS µg/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-21-86	.043	.040	105	an. dup 01A	.011	.010	9.5	an. sp. 01A	.011	.038	.024	113	prep bl <.002
	idl = .002	.042	.040	105	dig dup 01A	.011	.011	0	dig dup 02A	*.007	.026	.020	95	cal bl <.002
		.042	.040	105										<.002 <.002
Hg	2-20-86	.0048	.0050	96	dig dup 01A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0021	.0020	105	prep bl <.0002
	idl = .0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	dig dup 01A	.048	.047	2.1	dig sp 02A	<.0002	.009	.020	45	prep bl <.002
	idl = .002	.043	.043	100					an sp 04A	<.0002	.011	.024	46	cal bl <.002
									an sp 04A	<.0002	.027	.024	113	cal bl <.002
									1:10 dilution					
Se	2-21-86	.041	.040	103	dig dup 01A	<.002	<.002	NC	dig sp 02A	<.002	<.002	.010	0	prep bl <.002
	idl = .002	.043	.040	108					an sp 04A	<.002	.016	.024	67	cal bl <.002
									an sp 04A 1:10 dilution	<.002	.024	.024	100	
Oil & Grease	3-14-86	191	200	96										
	idl = 1													

an dup = analytical duplicate dig dup = pre-digest duplicate idl = instrument detection limit NC = NOT CALCULABLE
an sp = analytical spike dig sp = pre-digest spike * = value is less than 5 x idl

PLANT 4 86-02-087 samples 04, 05 (metals) 01, 02 (O&G) 01, 02, 03 (HC) UNITS ~~µg/ml~~

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-24-86	.036	.040	90	an dup 04A	.038	.038	0	an sp 05A	<.002	.024	.024	100	prep bl <.002
	idl=.002	.036	.040	90										col bl <.008
		.037	.040	93	–									col bl <.002
Hg	2-20-86	.0048	.0050	96	–				dig sp 05A	<.0002	.0019	.0020	95	prep bl <.0002
	idl=.0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	–				an sp 05A	<.002	.017	.024	71	prep bl .002*
	idl=.002	.043	.043	100					an sp 05A 1:10 dil	<.002	.024	.024	100	col bl <.002
Se	2-21-86	.041	.040	103					an sp 04A	<.002	.015	.024	63	prep bl <.002
	idl=.002	.043	.040	108					an sp 04A 1:10 dilution	<.002	.023	.024	96	col bl <.002
Oil and Grease	3-14-86	191	200	96										
	idl=1													

an dup=analytical duplicate an sp=analytical spike dig dup=pre-digest duplicate dig sp=pre-digest spike
idl = instrument detection limit *=value is less then five times the instrument detection limit NC=not calculable

For work orders 8601244
8602031
8602041
8602060
8602067
8602079
8602087

Form VII

Q.C. Report No. 2

INSTRUMENT DETECTION LIMITS AND

LABORATORY CONTROL SAMPLE

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 LCS UNITS ~~ug/l~~ mg/kg

µg/ml (Circle One)

Compound	Required Detection Limits (CRDL)-ug/l	Instrument Detection Limits (IDL)-ug/l ICP/AA	Furnace*	Lab Control Sample True	Found	%R
Metals:						
1. Aluminum	200					
2. Antimony	60					
3. Arsenic	10					
4. Barium	200	<.001				
5. Beryllium	5					
6. Cadmium	5	<.002				
7. Calcium	5000					
8. Chromium	10	<.005				
9. Cobalt	50					
10. Copper	25					
11. Iron	100					
12. Lead	5					
13. Magnesium	5000					
14. Manganese	15					
15. Mercury	0.2					
16. Nickel	40					
17. Potassium	5000					
18. Selenium	5					
19. Silver	10	<.002				
20. Sodium	5000					
21. Thallium	10					
22. Tin	40					
23. Vanadium	50					
24. Zinc	20					
Other:						
		5 288				
Cyanide	10					

* dection limits are given on B-13 Furnace/Hg/040 QA/QC SUMMARY SHEETS

ICP QA/QC DATA

For work orders: 8601240, 8602031, 8602041, 8602060, 8602067, 8602079, 8602087

Form II

Q. C. Report No. 8

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium	1.00	1.01	101	1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium	1.00	1.04	104	1.00	1.05	105	1.04	104	
7. Calcium									
8. Chromium	1.00	1.01	101	1.00	1.02	102	1.02	102	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver	1.00	1.00	100	1.00	1.02	102	1.00	100	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

Form II

Q. C. Report No. 3

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals[4]:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium				1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium				1.00	1.04	104	1.03	103	
7. Calcium									
8. Chromium				1.00	1.00	100	1.01	101	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver				1.00	1.01	101	1.02	102	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

8601240
8602031
8602041
8602060
8602067
8602079
8602087

Form III

Q. C. Report No. 2

BLANKS

LAB NAME Radian CASE NO. PLANT 4

DATE 2-4-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium	<.001	<.001	<.001	<.001	<.001		
5. Beryllium							
6. Cadmium	<.002	<.002	<.002	.002*	.002*		
7. Calcium							
8. Chromium	<.005	<.005	<.005	<.005	<.005		
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver	.006*	.018	.010	.004*	.014		
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

*value is less than 5x id l

8602060
8602067

Form III

Q. C. Report No. 3

BLANKS

(2-4-86)

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 UNITS ug/ml.

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium						.005*	
5. Beryllium							
6. Cadmium						<.002	
7. Calcium							
8. Chromium						.012*	
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver						<.002	
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

*value is less than 5x idl

Form VI

Q. C. Report No. 3

DUPLICATES
PRE-DIGEST

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4
EPA Sample No.
Lab Sample ID No. 8602060-01C
Units ~~mg~~ ug/ml digestion

Matrix water

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		.068	.066	3.0
5. Beryllium				
6. Cadmium		<.002	<.002	NC
7. Calcium				
8. Chromium		.005*	<.005	NC
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		<.002	.003*	NC
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

~~* Out of Control~~

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

* value is less than 5 x IDL

Form V

Q. C. Report No. 2

SPIKE SAMPLE RECOVERY
PRE-DIGEST

LAB NAME Radian

CASE NO. PLANT 4

DATE 3-4-86

EPA Sample No.

Lab Sample ID No. 8602060-02

Units ug/ml.

Matrix water pre-digest

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	"				
3. Arsenic	"				
4. Barium	"	1.81	.12	2.00	85
5. Beryllium	"				
6. Cadmium	"	.035	.003*	.050	64
7. Calcium	"				
8. Chromium	"	.19	.034	.20	78
9. Cobalt	"				
10. Copper	"				
11. Iron	"				
12. Lead	"				
13. Magnesium	"				
14. Manganese	"				
15. Mercury	"				
16. Nickel	"				
17. Potassium	"				
18. Selenium	"				
19. Silver	"	.20	.004*	.25	78
20. Sodium	"				
21. Thallium	"				
22. Tin	"				
23. Vanadium	"				
24. Zinc	"				
Other:					
Cyanide	"				

[1] %R = [(SSR - SR)/SA] x 100

"R"- out of control

Comments: * value is less than 5 x idl

organics QA/QC 86-02-060

Volatile Organics DETECTION LIMITS

METHOD 601	8602060-01→-03,-05		METHOD DETECTION LIMIT ug/l
COMPOUND	-01→-03	-05	
Chloromethane	0.08	0.40	
Bromomethane	1.18	5.9	
Vinyl Chloride	0.18	0.90	
Chloroethane	0.52	2.6	
Methylene Chloride	0.25	1.25	
Trichlorofluoromethane	0.10	0.50	
1,1-Dichloroethene	0.13	0.65	
1,1-Dichloroethane	0.07	0.35	
Trans-1,2-Dichloroethene	0.10	0.5	
Chloroform	0.05	0.25	
1,2-Dichloroethane	0.03	0.15	
1,1,1-Trichloroethane	0.03	0.15	
Carbon Tetrachloride	0.12	0.60	
Bromodichloromethane	0.10	0.50	
1,2-Dichloropropane	0.04	0.20	
Trichloroethene	0.12	0.60	
Dibromochloromethane	0.09	0.45	
2-Chloroethylvinyl Ether	0.13	0.65	
Bromoform	0.20	1.0	
Tetrachloroethene	0.03	0.15	
Chlorobenzene	0.25	1.25	
1,3-Dichlorobenzene	0.32	1.60	
1,2-Dichlorobenzene	0.15	0.75	
1,4-Dichlorobenzene	0.24	1.20	

DETECTION LIMITS

VOLATILE ORGANICS

METHOD 602

8602060-01 thru -03, -05

COMPOUND	DETECTION LIMIT ug/l (-05, -01 thru -03)						
BENZENE	0.2						
TOLUENE	0.2						
ETHYLBENZENE	0.2						
CHLOROBENZENE	0.2						
1,4-DICHLOROBENZENE	0.3						
1,3-DICHLOROBENZENE	0.4						
1,2-DICHLOROBENZENE	0.4						

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/15/2 ANALYST: JBC INSTRUMENT: Hewlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	NP	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # REAGENT BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 4/13/16 ANALYST: CY INSTRUMENT Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2 Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/11/86 ANALYST: JSC INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	NP
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Method Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/11/91 ANALYST: CJ INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	NP
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichlorcethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/12/92 ANALYST: JSC INSTRUMENT: Hewlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # REAGENT BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/12/86 ANALYST: C INSTRUMENT: Jarvis	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # System BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/12/92 ANALYST: JSC INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	NO
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Method Blank	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/11/26 ANALYST: CJ INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

3/13/86

	CERTIFIED VALUE (mg/L)	B/G ANALYZED VALUE	B/G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	9.0 / 10.4	98 / 113
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	9.8 / 10.1	98 / 101
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	50.8 / 52.2	118 / 101
1,2-Dichloroethane	27.6	22.7 / 25.2	82 / 91
1,1,1-Trichloroethane	14.3	14.4 / 15.1	100 / 106
Carbon tetrachloride	20.0	20.5 / 20.9	102 / 105
Bromodichloromethane	7.9	8.4 / 8.0	107 / 102
1,2-Dichloropropane	8.0	8.2 / 8.5	103 / 106
Trichloroethene	22.2	21.2 / 24.6	95 / 110
Dibromochloromethane	16.7	15.8 / 13.5	94 / 81
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	8.3 / 9.5	84 / 96
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.7 / 8.6	107 / 105
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/12/86

	Certified Value (mg/L)	B/G Analyzed Value	B/G % Rec
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	8.5 / 10.0	92 / 109
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.6 / 8.1	86 / 81
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	45.2 / 58.0	105 / 135
1,2-Dichloroethane	27.6	20.0 / 23.5	72 / 85
1,1,1-Trichloroethane	14.3	13.8 / 15.3	96 / 107
Carbon tetrachloride	20.0	18.8 / 16.5	94 / 83
Bromodichloromethane	7.9	7.4 / 7.3	94 / 92
1,2-Dichloropropane	8.0	6.6 / 8.4	82 / 105
Trichloroethene	22.2	19.7 / 22.7	89 / 102
Dibromochloromethane	16.7	14.3 / 14.9	86 / 89
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	7.2 / 8.9	72 / 90
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	7.9 / 7.6	96 / 93
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/18/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		CQ			CQ		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	34.8			113		
	Toluene	4.1	4.5			110		
	Ethylbenzene	11.5	11.2			97		
	P-Xylene	19.1	20.8			109		
	M-Xylene	42.6	46.6			109		
	O-Xylene	10.6	10.5			99		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/11/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		a			a		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	32.3			105		
	Toluene	4.1	3.9			96		
	Ethylbenzene	11.5	10.2			89		
	P-Xylene	19.1	19.0			100		
	M-Xylene	42.6	43.2			102		
	O-Xylene	10.6	9.7			91		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

RADIAN
CORPORATION

SPIKE RECOVERY

EPA METHOD 601 Volatile Organics	860260-025 PLANT 86042 4/13/86 [illegible] Grams							
COMPOUNDS	SSR	SR	SA	%R	SSR	SR	SA	%R
Chloromethane								
Bromomethane								
Vinyl chloride								
Chloroethane								
Methylene chloride	9.3	0.74	9.2	93				
Trichlorofluoromethane								
1,1-Dichloroethene	7.2		10.0	72				
1,1-Dichloroethane								
trans-1,2-Dichloroethene	4.8		5.4	89				
Chloroform	76.2	3.79	43.0	169				
1,2-Dichloroethane	25.0		27.6	90				
1,1,1-Trichloroethane	15.3		14.3	107				
Carbon Tetrachloride	21.8		20.0	109				
Bromodichloroemethane	11.5	1.81	7.9	123				
1,2-Dichloropropane	8.2		8.0	102				
Trichloroethene	23.2	0.95	22.2	100				
Dibromochloromethane	11.9	0.72	16.7	67				
1,1,2-Trichloroethane								
cis-1,2-Dichloropropene								
2-Chlorethylvinyl ether								
Bromoform	11.1		9.9	112				
1,1,2,2-Tetrachloreothane			10.0					
Tetrachlorethylene		0.08	6.2					
Chlorobenzene	9.8		8.2	119				
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								

SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

RADIAN CORPORATION

8602060-05B
8601146

DUPLICATE ANALYSIS

EPA Method 601 Volatile Organics						
COMPOUND	RUN#1	RUN#2	RPD	RUN#1	RUN#2	RPD
Chloromethane						
Bromomethane						
Vinyl chloride						
Chloroethane						
Methylene chloride						
Trichlorofluoromethane						
1,1-Dichloroethene						
1,1-Dichloroethane						
* trans-1,2-Dichloroethene	8.48	7.81	8.2			
Chloroform						
1,2-Dichloroethane						
1,1,1-Trichloroethane						
Carbon Tetrachloride						
Bromodichloroemethane						
1,2-Dichloropropane						
Trichloroethene	26.4	22.3	16.8			
Dibromochloromethane						
1,1,2-Trichloroethane						
cis-1,2-Dichloropropene						
2-Chloroethylvinyl ether						
Bromoform						
1,1,2,2-Tetrachloreothane						
Tetrachlorethylene	1.31	0.74	55.6			
Chlorobenzene						
1,3-Dichlorobenzene						
1,2-Dichlorobenzene						
1,4-Dichlorobenzene						

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

* - did not confirm

RADIAN CORPORATION

SURROGATE RECOVERIES

LAB #: 8600200-01E

SAMPLE ID: 800141

DATE: 2-12-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 124%

2-BROMO-1-CHLOROPROPANE: 119%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600600-CBE

SAMPLE ID: 860142

DATE: 2-13-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 103%

2-BROMO-1-CHLOROPROPANE: 110%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602060-C3E

SAMPLE ID: 860143

DATE: 2-13-86

INSTRUMENT: 4

601/8010

BROMOCHLOROMETHANE: 116%

2-BROMO-1-CHLOROPROPANE: 127%

602/8020

a,a,a-TRIFLUOROTOLUENE:

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602060-05B

SAMPLE ID: 8601416

DATE: 2-13-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 123%, 104%

2-BROMO-1-CHLOROPROPANE: 138%, 109%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600800-016

SAMPLE ID: 8600141

DATE: 2-11-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 101%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602060-02A

SAMPLE ID: 860142

DATE: 2-12-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 102%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602060-036

SAMPLE ID: 860143

DATE: 2-12-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 115%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602000-05D

SAMPLE ID: 8600146

DATE: 2-12-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 116%

EPA 601 · 800147; 800148; 800149; 800150; 800151 OIL & GREASE 800151
EPA 602 800147; 800148; 800149; 800150; 800151 HYDROCARBON FUEL 800151
METALS 800147, 800148; 800149; 800150; 6 TRIP BLANK

RADIAN CORPORATION
AUSTIN

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics Plant 4, Fortworth Tx
Sample Point Description Ground Water

Stream Characteristics:
Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name NEIL ROBINSON Date/Time Sampled 2-11-86 ALL DAY
Amount of Sample Collected (20 Hourly) 4 gal VOA's; (2 two) 1 Qt Mason; (4 four) 500 ml plastic
Sample Description Ground Water (1 one) TRIP BLANK
Store at: ☐ Ambient ☐ 5°C ☐ −10°C ☒ Other 7°C

☒ Caution · No more sample available ☐ Return unused portion of sample ☐ Discard unused portions
Other Instructions · Special Handling · Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic · suspect
☐ Caustic	☐ Peroxide	☐ Radioactive
☐ Other _____		

Sample Allocation/Chain of Possession:
Organization Name RADIAN
Received By _____ Date Received _____ Time _____
Transported By Neil Robinson Lab Sample No. 86 [illegible] 67
Comments _____
Inclusive Dates of Possession 2-11-86

Organization Name RAS
Received By [illegible] Date Received [illegible] Time [illegible]
Transported By Fedex Lab Sample No. [illegible]
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

AA, Furnace Grease, ICP, AA, Hg

FOR W.O. 86-01-240 86-02-031 86-02-041 86-02-060 86-02-067 86-02-079 86-02-087

UNITS ug/ml

PLANT 4 86-01-240 samples 01-09

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2/8/86	.041	.040	103	an dup 01A	<.005	<.005	NC	an sp 01A	<.005	.024	.024	100	prep bl <.005
	idl=.005	.041	.040	103										col bl <.005
		.040	.040	100										
Hg	2/3/86	.0054	.0050	108	dig dup 09A	<.0002	.0003*	NC	dig sp 09A	<.0002	.0028	.0020	140	prep bl .0004*
	idl=.0002	.0040	.0040	100										
Pb	2-11/86	.042	.045	93	an dup 09A	<.002	<.002	NC	an sp 09A	<.002	.019	.024	79	prep bl .002
	idl=.002	.046	.045	102										col bl <.002
Sc	2/9/86	.044	.050	88	an dup 05A	<.003	<.003	NC	an sp 05 A	<.003	.018	.024	75	prep bl <.003
	idl=.003	.044	.050	88					an sp 05 1:10 dilution	<.003	.022	.024	92	col bl <.003
Hg	8/8/86	.0054	.0050	108	dig dup 03A	<.0002	<.0002	NC	dig sp 04 A	<.0002	.0024	.0020	120	<.0002 prep bl
	idl=.0002	.0040	.0040	100										

an dup = analytical duplicate
dig dup = digestion duplicate
i.d.l. = instrument detection limit

an sp = analytical spike
dig sp = digestion spike or matrix

* indicates value is less than 5x instrument detection limit
NC = not calculable

UNITS ug/ml

PLANT 4 86-02-031 samples (01-,02,03,06)-011&Grease 02,03-METALS

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 02 G	<.005	<.005	NC	an. sp 02 G	<.005	.023	.024	96	prep bl <.005
	idl = .005	.040	.040	100										col bl <.005
Hg	2-20-86	.0048	.0050	96	—				dig sp 03 G	<.0002	.0019	.0020	95	prep bl <.0002
	idl = .0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 02 G	.033	.030	9.4	an. sp 02 G	.033	.053	.024	83	prep bl <.002
	idl = .002	.045	.045	100										
Se	2-17-86	.042	.040	105	—				an. sp. 02 G	.003	.021	.024	75	prep bl <.002
	idl = .002	.040	.040	100										col bl <.002
		.039	.040	98										
oil and Grease	2-14-86	197	200	99	—				—					
	idl = 1	197	200	99										
HC	2-26-86	430	415	104										
	idl = 1	208	245	118										

an. sp = analytical spike
dig sp = prediget or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-041 samples 01-06

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 01 E	<.005	<.005	NC	an sp 01 E	<.005	.022	.024	92	prep bl <.005
	idl = .005	.037	.040	93										cal bl <.005
		.035	.040	88										
Hg	2-20-86	.0048	.0050	96	dig dup 06 E	<.0002	.0002*	NC	dig sp 05 E	<.0002	.0022	.0020	110	prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 01 E	<.002	<.002	NC	an sp 01 E 1:10 dilution	<.002	.021	.024	88	prep bl <.002
	idl = .002	.045	.045	100										
		.048	.045	107										
Sc	2-17-86	.042	.040	105	—				an sp 03 E	.003*	.021	.024	75	prep bl <.002
	idl = .002	.039	.040	98										cal bl <.002
oil and grease	2-14-86	197	200	99										
	idl = 1	197	200	99										
HC - idl = 1	2-14-86				an. dup 03	<1	<1	NC						

an sp = analytical spike
dig sp = digestion spike or matrix spike

an dup = analytical duplicate
dig dup = digestion duplicate

idl = instrument det. limit

* indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/gal

PLANT 4 86-02-060 samples 01-05

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	dig dup 01C	.002*	.003*	40	dig sp 03C	.006*	.023	.020	85	prep bl <.002
	idl = .002	.042	.040	105	an dup 03C	.006*	.003*	67	an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Hg	2-20-86	.0048	.0050	96	-				05A	<.0002	.0020	.0020	100	prep bl <.0002
	idl = .0002	.0042	.0040	105										
Pb	2-17-86	.045	.043	105	dig dup 01C	.034	.031	9.1	dig sp 02C	.27	.29	.020	100	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	dig dup 01C	.003*	.002*	40	dig sp 02C	<.002	.005	.010	50	prep bl <.002
	idl = .002	.040	.040	100					an sp 05A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
Oil and Grease	2-14-86	197	200	99	--				—					
	idl = 1	197	200	99										

an sp = analytical spike
dig sp = digestion or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5x instrument detection limit
NC = not calculable

5233

PLANT 4 86-02-067

UNITS ug/l or l

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	—				an sp 03 E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.042	.040	105					1:10 dilution					cal bl <.002
Hg	2-24-86	.0048	.0050	96	—				dig sp 04 E	<.0002	.0020	.0020	100	prep bl <.0002
	2-20-86	.0048	.0050	96										prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.045	.043	105	an dup 04 E	.037	.038	2.7	an sp 03 E	.020	.035	.024	63	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	an dup 01 E	.007*	.007*	0	an sp 04 E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.040	.040						1:10 dilution					cal bl <.002
Oil and Grease	2-14-86	197	200	99										
	idl = 1	197	200	99										

5324

idl = instrument detection limit

an sp = analytical spike
dig sp = digestion or matrix spike

dig = digestion duplicate
an dup = analytical duplicate

* indicates value is less than 5 x instrument detection limit
NC = not calculable

PLANT 4 86-03-079 samples 01 — 04 samples 05, 06, 07-09G, HC UNITS µg/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-21-86	.043	.040	105	an. dup 01A	.011	.010	9.5	an. sp. 01A	.011	.038	.024	113	prep bl <.002
	idl = .002	.042	.040	105	dig dup 01A	.011	.011	0	dig dup 02A	* .007	.026	.020	95	cal bl <.002
		.042	.040	105										<.002 <.002
Hg	2-20-86	.0048	.0050	96	dig dup 01A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0021	.0020	105	prep bl <.0002
	idl = .0002	.0043	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	dig dup 01A	.048	.047	2.1	dig sp 02A	<.0002	.009	.020	45	prep bl <.002
	idl = .002	.043	.043	100					an sp 04A	<.0002	.011	.024	46	cal bl <.002
									an sp 04A 1:10 dilution	<.0002	.027	.024	113	cal bl <.002
Se	2-21-86	.041	.040	103	dig dup 01A	<.002	<.002	NC	dig sp 02A	<.002	<.002	.010	0	prep bl <.002
	idl = .002	.043	.040	108					an sp 04A	<.002	.016	.024	67	cal bl <.002
									an sp 04A 1:10 dilution	<.002	.024	.024	100	
Oil & Grease	3-14-86	191	200	96										
	idl = 1													

an dup = analytical duplicate
an sp = analytical spike
dig dup = pre-digest duplicate
dig sp = pre-digest spike
idl = instrument detection limit
* = value is less than 5 x idl
NC = NOT CALCULABLE

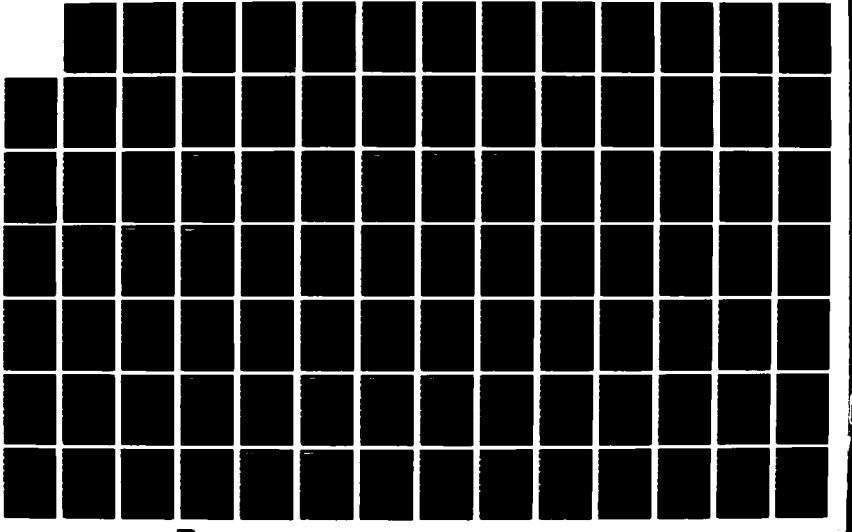
PLANT 4 86-02-087 samples 04,05 (metals) 01,02(04B) 01,02,03(HC) UNITS ~~ug/ml~~

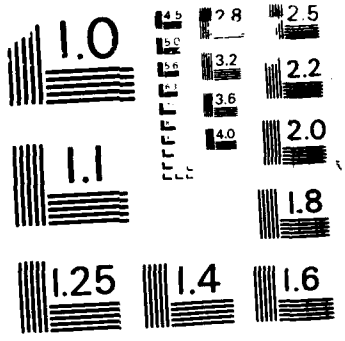
ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-24-86	.036	.040	90	an dup 04A	.038	.038	0	an sp 05A	<.002	.024	.024	100	prep bl <.002
	idl=.002	.036	.040	90										cal bl <.008
		.037	.040	93	-									cal bl <.002
Hg	2-20-86	.0048	.0050	96	-				dig sp 05A	<.0002	.0019	.0020	95	prep bl <.0002
	idl=.0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	-				an sp 05A	<.002	.017	.024	71	prep bl .002*
	idl=.002	.043	.043	100					an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Se	2-21-86	.041	.040	103					an sp 04A	<.002	.015	.024	63	prep bl <.002
	idl=.002	.043	.040	108					an sp 04A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
[illegible]	2-24-86	191	200	96										

an sp=analytical spike dig dup=pre-digest duplicate dig sp=pre-digest spike
[illegible] limit *=value is less then five times the instrument detection limit NC=not calculable

AD-A190 445 INSTALLATION RESTORATION PROGRAM PHASE 2 5/6
CONFIRMATION/QUANTIFICATION STAG (U) RADIAN CORP
AUSTIN TX DEC 87 F33615-83-D-4001

UNCLASSIFIED F/G 24/7 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

For work orders 8601246
8602031
8602041
8602060
8602067
8602079
8602087

Form VII

Q.C. Report No. 8

INSTRUMENT DETECTION LIMITS AND

LABORATORY CONTROL SAMPLE

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 LCS UNITS ~~ug/l~~ mg/kg

µg/ml (Circle One)

Compound	Required Detection Limits (CRDL)-ug/l	Instrument Detection Limits (IDL)-ug/l ICP/AA	Furnace*	Lab Control Sample True	Found	%R
Metals:						
1. Aluminum	200					
2. Antimony	60					
3. Arsenic	10					
4. Barium	200	<.001				
5. Beryllium	5					
6. Cadmium	5	<.002				
7. Calcium	5000					
8. Chromium	10	<.005				
9. Cobalt	50					
10. Copper	25					
11. Iron	100					
12. Lead	5					
13. Magnesium	5000					
14. Manganese	15					
15. Mercury	0.2					
16. Nickel	40					
17. Potassium	5000					
18. Selenium	5					
19. Silver	10	<.002				
20. Sodium	5000					
21. Thallium	10					
22. Tin	40					
23. Vanadium	50					
24. Zinc	20					
Other:						
		5 327				
Cyanide	10					

* dection limits are given on 8-13 furnace /Hg/040 QA/QC SUMMARY SHEETS

ICP QA/QC DATA

For work orders: 8601240, 8602031, 8602041, 8602060, 8602067, 8602079, 8602087

Form II

Q. C. Report No. 8

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium	1.00	1.01	101	1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium	1.00	1.04	104	1.00	1.05	105	1.04	104	
7. Calcium									
8. Chromium	1.00	1.01	101	1.00	1.02	102	1.02	102	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver	1.00	1.00	100	1.00	1.02	102	1.00	100	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

Form II

Q. C. Report No. 3

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals[4]:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium				1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium				1.00	1.04	104	1.03	103	
7. Calcium									
8. Chromium				1.00	1.00	100	1.01	101	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver				1.00	1.01	101	1.02	102	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

8601240
8602031
8602041
8602060
8602067
8602079
8602087

Form III

Q. C. Report No. 3

BLANKS

LAB NAME Radian CASE NO. PLANT 4

DATE 2-4-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium	<.001	<.001	<.001	<.001	<.001		
5. Beryllium							
6. Cadmium	<.002	<.002	<.002	.002*	.002*		
7. Calcium							
8. Chromium	<.005	<.005	<.005	<.005	<.005		
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver	.006*	.018	.010	.004*	.014		
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

*value is less than 5x idl

8602060
8602067

Form III

Q. C. Report No. 8

BLANKS

(2-4-86)

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 UNITS ug/mL

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium						.005*	
5. Beryllium							
6. Cadmium						<.002	
7. Calcium							
8. Chromium						.012*	
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver						<.002	
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

*value is less than 5x cal

Form VI

Q. C. Report No. 2

DUPLICATES
ANALYTICAL

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4
EPA Sample No.
Lab Sample ID No. 8602067-01
Units ug/ml.

Matrix water.

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		.12	.12	0
5. Beryllium				
6. Cadmium		<.002	<.002	NC
7. Calcium				
8. Chromium		.21	.21	0
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		<.002	<.002	NC
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* Out of Control

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

Form V

Q. C. Report No. 2

SPIKE SAMPLE RECOVERY
ANALYTICAL

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4
EPA Sample No.
Lab Sample ID No. 86-02-06702E
Units ug/ml

Matrix Water

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	-				
3. Arsenic	-				
4. Barium	-	1.46	0.47	1.00	99
5. Beryllium	-				
6. Cadmium	-	0.94	<.002	1.00	94
7. Calcium	-				
8. Chromium	-	0.94	<.005	1.00	94
9. Cobalt	-				
10. Copper	-				
11. Iron	-				
12. Lead	-				
13. Magnesium	-				
14. Manganese	-				
15. Mercury	-				
16. Nickel	-				
17. Potassium	-				
18. Selenium	-				
19. Silver	-	0.98	<.002	1.00	98
20. Sodium	-				
21. Thallium	-				
22. Tin	-				
23. Vanadium	-				
24. Zinc	-				
Other:					
Cyanide	-				

[1] %R = [(SSR - SR)/SA] x 100

"R"- out of control

Comments:

Organics QA/QC 86-02-067

Volatile Organics DETECTION LIMITS

METHOD 601 S6002067-01→-06

COMPOUND	METHOD DETECTION LIMIT ug/l -04,-06	-01	-02
Chloromethane	0.08	20.0	2.0
Bromomethane	1.18	295	29.5
Vinyl Chloride	0.18	30.0	3.0
Chloroethane	0.52	130	13.0
Methylene Chloride	0.25	62.5	6.25
Trichlorofluoromethane	0.10	25.0	2.5
1,1-Dichloroethene	0.13	32.5	3.25
1,1-Dichloroethane	0.07	17.5	1.75
Trans-1,2-Dichloroethene	0.10	25.0	2.5
Chloroform	0.05	12.5	1.25
1,2-Dichloroethane	0.03	7.5	0.75
1,1,1-Trichloroethane	0.03	7.5	0.75
Carbon Tetrachloride	0.12	30.0	3.0
Bromodichloromethane	0.10	25.0	2.5
1,2-Dichloropropane	0.04	10.0	1.0
Trichloroethene	0.12	30.0	3.0
Dibromochloromethane	0.09	22.5	2.25
2-Chloroethylvinyl Ether	0.13	32.5	3.25
Bromoform	0.20	50.0	5.0
Tetrachloroethene	0.03	7.5	0.75
Chlorobenzene	0.25	62.5	6.25
1,3-Dichlorobenzene	0.32	80.0	8.0
1,2-Dichlorobenzene	0.15	37.5	3.75
1,4-Dichlorobenzene	0.24	60.0	6.0

Volatile Organics DETECTION LIMITS

8602067-01→-06

METHOD 601

COMPOUND	-03	-05	METHOD DETECTION LIMIT ug/l
Chloromethane	40.0	800	
Bromomethane	540	11800	
Vinyl Chloride	90.0	1800	
Chloroethane	260	5200	
Methylene Chloride	125	2500	
Trichlorofluoromethane	50.0	1000	
1,1-Dichloroethene	65.0	1300	
1,1-Dichloroethane	35.0	700	
Trans-1,2-Dichloroethene	50.0	1000	
Chloroform	25.0	500	
1,2-Dichloroethane	15.0	300	
1,1,1-Trichloroethane	15.0	300	
Carbon Tetrachloride	60.0	1200	
Bromodichloromethane	50.0	1000	
1,2-Dichloropropane	20.0	400	
Trichloroethene	60.0	1200	
Dibromochloromethane	45.0	900	
2-Chloroethylvinyl Ether	65.0	1300	
Bromoform	100	2000	
Tetrachloroethene	150	300	
Chlorobenzene	125	2500	
1,3-Dichlorobenzene	160	3200	
1,2-Dichlorobenzene	75.0	1500	
1,4-Dichlorobenzene	120	2400	

DETECTION LIMITS

VOLATILE ORGANICS 8602067-01 - -06

METHOD 602

COMPOUND	DETECTION LIMIT ug/l						
	-01,-06	-01,-02	-03	-05			
BENZENE	0.2	5.0	50	200			
TOLUENE	0.2	5.0	50	200			
ETHYLBENZENE	0.2	5.0	50	200			
CHLOROBENZENE	0.2	5.0	50	200			
1,4-DICHLOROBENZENE	0.3	7.5	75	300			
1,3-DICHLOROBENZENE	0.4	10.0	100	400			
1,2-DICHLOROBENZENE	0.4	10.0	100	400			

VOA RESULTS

LAB # System Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/15/86 ANALYST: JSG INSTRUMENT: Bernlotte	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Solvent Blank	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: 2/13/87 ANALYST: CP INSTRUMENT Burdette	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Sysco Burlt
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/21/86 ANALYST: JSG INSTRUMENT: Burlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # REAGENT BLANK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: 4/16 ANALYST: C INSTRUMENT: Bendix	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # 5X3a BLNK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: 2/14/92 ANALYST: LP INSTRUMENT: Hewlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2 Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Roberts Brawl
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/14/86 ANALYST: CJ INSTRUMENT: Durmin	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	NJ	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/13/91 ANALYST: JSC INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # METHOD BLANK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/13/86 ANALYST: CP INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # 8570 BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/13/86 ANALYST: JSC INSTRUMENT: Hewlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Argent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/13/86 ANALYST: CO INSTRUMENT: Garnet	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	NR	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # System Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/12/96 ANALYST: JC INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # Method Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/12/86 ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/14/86

	CERTIFIED VALUE (mg/L)	B / G ANALYZED VALUE	B / G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	8.7 / 9.5	94 / 103
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.6 / 9.3	86 / 93
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	54.2 / 48.2	126 / 112
1,2-Dichloroethane	27.6	23.0 / 37.5	83 / 136
1,1,1-Trichloroethane	14.3	15.0 / 23	105 / 121
Carbon tetrachloride	20.0	19.5 / 20.7	97 / 104
Bromodichloromethane	7.9	8.3 / 9.2	106 / 116
1,2-Dichloropropane	8.0	7.8 / 7.9	98 / 99
Trichloroethene	22.2	20.2 / 24.8	91 / 112
Dibromochloromethane	16.7	15.5 / 16.0	93 / 96
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	9.8 / 10.3	99 / 104
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.2 / 7.8	100 / 95
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/13/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		Q			Q		
TEST METHOD	COMPOUND	-						
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	34.4			112		
	Toluene	4.1	4.9			119		
	Ethylbenzene	11.5	11.8			102		
	P-Xylene	19.1	20.5			108		
	M-Xylene	42.6	44.3			104		
	O-Xylene	10.6	10.6			100		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/15/16 G G

	CERTIFIED VALUE (mg/L)	ANALYZED VALUE	% REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	10.2	110
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	9.4	94
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	64.8	151
1,2-Dichloroethane	27.6	25.9	94
1,1,1-Trichloroethane	14.3	14.7	103
Carbon tetrachloride	20.0	20.1	100
Bromodichloromethane	7.9	9.2	116
1,2-Dichloropropane	8.0	8.1	102
Trichloroethene	22.2	24.0	108
Dibromochloromethane	16.7	14.8	89
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	10.7	108
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.9	109
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/12/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		CP			CP		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	34.8			113		
	Toluene	4.1	4.5			110		
	Ethylbenzene	11.5	11.2			97		
	P-Xylene	19.1	20.8			109		
	M-Xylene	42.6	46.6			109		
	O-Xylene	10.6	10.5			99		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

3/13/84

	CERTIFIED VALUE (mg/L)	ANALYZED VALUE B/G	% REC B/G
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	9.0 / 10.4	98 / 113
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	9.8 / 10.1	98 / 101
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	50.8 / 52.2	118 / 101
1,2-Dichloroethane	27.6	22.7 / 25.2	82 / 91
1,1,1-Trichloroethane	14.3	14.4 / 15.1	100 / 106
Carbon tetrachloride	20.0	20.5 / 20.9	102 / 105
Bromodichloromethane	7.9	8.4 / 8.0	107 / 102
1,2-Dichloropropane	8.0	8.2 / 8.5	103 / 106
Trichloroethene	22.2	21.2 / 24.6	95 / 110
Dibromochloromethane	16.7	15.8 / 13.5	94 / 81
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	8.3 / 9.5	84 / 96
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.7 / 8.6	107 / 105
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

RADIAN
CORPORATION

SPIKE RECOVERY

EPA Method 602
Volatile Organics

4/13/86
RP
D

SAMPLE # 8602067-04C
UNITS PLANT 4
8601 50

COMPOUND	SSR	SR	SA	%R
Benzene	38.8		30.7	126
Toluene	6.00	0.59	4.1	132
Ethyl benzene	12.9		11.5	112
1,4-Dichlorobenzene				
1,3-Dichlorobenzene				
1,2-Dichlorobenzene				
O-Xylene	9.5		10.6	90
M-Xylene	58.7		42.6	138
P-Xylene	22.7		19.1	119
Chlorobenzene				

SSR = Spiked Sample Result
SR = Sample Result
SA = Spike Added

RADIAN
CORPORATION

DUPLICATE ANALYSIS

EPA METHOD 602
VOLATILE ORGANICS

SAMPLE # 86020107-00A
UNITS ug/l
TRIP BLANK

COMPOUND	RUN#1	RUN#2	RPD
Benzene			
Toluene	2.50	1.17	72.5
Ethyl benzene			
1,4-Dichlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
O-Xylene			
M-Xylene			
P-Xylene			
Chlorobenzene			

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600267-01A

SAMPLE ID: 8600147

DATE: 2-13-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 111%

2-BROMO-1-CHLOROPROPANE: 130%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602067-03A

SAMPLE ID: 860148

DATE: 2-14-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 92%

2-BROMO-1-CHLOROPROPANE: 105%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602067-03A

SAMPLE ID: 8600129

DATE: 2-13-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 102%

2-BROMO-1-CHLOROPROPANE: 114%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8600207-04A

SAMPLE ID: 860150

DATE: 2-14-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 88%

2-BROMO-1-CHLOROPROPANE: 80%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602007-05A

SAMPLE ID: 8/00151

DATE: 2-14-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 127%

2-BROMO-1-CHLOROPROPANE: 158%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602067-C6A

SAMPLE ID: TRIP BLANK

DATE: 2-13-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 121%

2-BROMO-1-CHLOROPROPANE: 109%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602067-01C

SAMPLE ID: 800147

DATE: 2-12-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 89%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602067-02C

SAMPLE ID: 860148

DATE: 2-12-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 298% *

* poor baseline
(layer of solvent on top with oil interspersed in the water)

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602007-03C

SAMPLE ID: 860149

DATE: 2-12-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 113%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602007-04C

SAMPLE ID: 860150

DATE: 2-12-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 105%

RADIAN CORPORATION

SURROGATE RECOVERIES

LAB #: 8600807-05C

SAMPLE ID: 860151

DATE: 2-13-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 90%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602067-06A

SAMPLE ID: TRIP BLANK

DATE: 2-13-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 98%, 103%

SAM 86020 70

RADIAN CORPORATION

10395 OLD PLACERVILLE ROAD
SACRAMENTO, CALIFORNIA 95827

CHAIN OF CUSTODY RECORD

FIELD SECTION

CLIENT NAME General Dynamics PROJECT ADDRESS Fortworth Texas Plant 4 AFB
(Number Street City Zip)

SAMPLED BY NEIL ROBINSON CONTAINERS OBTAINED FROM I-Chem
(Name (PRINT) Organization)

PRESERVATIVE USED NONE STORAGE TEMPERATURE ☐ Ambient ☒ 4° C ☐ -10° C Other ____

☒ HAZARDOUS ☐ NON-HAZARDOUS SPECIAL HANDLING INSTRUCTIONS ____

FIELD REMARKS Total Eight 1000 ml DK Glass Bottles

COLLECTORS SAMPLE NO.	DATE	COMP.	GRAB	TYPE (soil, H_2O)	FIELD DATA	STATION LOCATION (grid, depth, etc.)	NO. OF CONTAINERS	ANALYSIS REQUIRED		REMARKS
860147			X	H_2O		—		EPA	625	trip check ✓
860148			X	H_2O		—		EPA	625	" " ✓
860149			X	H_2O		—		EPA	625	" " ✓
860150			X	H_2O		—		EPA	625	" " ✓

Released by	Organization	Date/Time	Received by	Organization	Date/Time
Neil Robinson	RADIAN	2-1486	Wanda L. Brown		2/12/86 9:15

LABORATORY SECTION

TEMPERATURE RECEIVED 4°C FEDX AIRBILL # 321175201 HAND DELIVERED ____

ANALYSIS RECORD

TYPE OF ANALYSIS	PERFORMED BY (Signed)	DATE OF ANALYSIS	RECORDED (LAB BOOK NO.)	COMMENTS

Original (Page 1) Laboratory (Page 2) Samples (Page 3)

86 02-075

EPA601 - 860158, 860157, 860156, 860152, 860153, 860154, 860155
EPA602 - 860158, 860157, 860156, 860152, 860153, 860154, 860155

RADIAN CORPORATION

AUSTIN

CHAIN OF CUSTODY RECORD

EPA601 - FIELD BLANK
EPA602 - FIELD BLANK

TRIP BLANK

Field Sample No. _____

Company Sampled/Address General Dynamics - Forth Worth, Plant 4
Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____
Visual Observations/Comments NOTE: TRIP ~~HAS~~ BUBBLE

Collector's Name A. Morrill Date/Time Sampled 2-12-86
Amount of Sample Collected (28) 40 ml glass ; TRIP BLANK (2) FIELD BLANKS
Sample Description Ground Water
Store at: ☐ Ambient ☐ 5°C ☐ -10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions
Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive
☐ Other _____		

Sample Allocation/Chain of Possession:

Organization Name Radian Corp.
Received By _____ Date Received _____ Time _____
Transported By Arthur Morrill Lab Sample No. _____
Comments _____
Inclusive Dates of Possession 2-12-86

Organization Name RTS
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

RADIAN CORPORATION

P-23
HM-101

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics Plant 4
Sample Point Description P-23, HM-101

Stream Characteristics:
Temperature — Flow — pH 6-7
Visual Observations/Comments _____

Collector's Name TKW Date/Time Sampled 4-18-86
Amount of Sample Collected _____
Sample Description 4 1 Liter amber glass, 4 1 Liter plastic, 2 40 ml voa-vial
Store at: ☐ Ambient ☑ 5°C ☐ −10°C ☐ Other _____

☑ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions - Special Handling - Hazards potentially hazardous
Analyze for Metals, EPA 601, 602, 625 compounds
Analyze trip blanks (2) for 601 & 602

☐ Hazardous sample (see below) ☐ Non-hazardous sample

☐ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☐ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:
Organization Name RAS
Received By Mike Myers Date Received 4 22 86 Time 0900
Transported By TKW Lab Sample No. _____
Comments 2 liters to SAC for 625
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Work order: EECC2075

Volatile Organics DETECTION LIMITS

METHOD GC1 COMPOUND	-07 thru -09 -01, -05	-01, -03	METHOD DETECTION LIMIT ug/L -04
Chloromethane	0.08	80.0	8.0
Bromomethane	1.18	1180	118
Vinyl Chloride	0.18	180	18
Chloroethane	0.52	520	52
Methylene Chloride	0.25	250	25
Trichlorofluoromethane	0.10	100	10
1,1-Dichloroethene	0.13	130	13
1,1-Dichloroethane	0.07	70	7.0
Trans-1,2-Dichloroethene	0.10	100	10
Chloroform	0.05	50	5.0
1,2-Dichloroethane	0.03	30	3.0
1,1,1-Trichloroethane	0.03	30	3.0
Carbon Tetrachloride	0.12	120	12.0
Bromodichloromethane	0.10	100	10.0
1,2-Dichloropropane	0.04	40	4.0
Trichloroethene	0.12	120	12.0
Dibromochloromethane	0.09	90	9.0
2-Chloroethylvinyl Ether	0.13	130	13.0
Bromoform	0.20	200	20.0
Tetrachloroethene	0.03	30	3.0
Chlorobenzene	0.25	250	25.0
1,3-Dichlorobenzene	0.32	320	32.0
1,2-Dichlorobenzene	0.15	150	15.0
1,4-Dichlorobenzene	0.24	240	24.0

work order: E6C2C75

Volatile Organics

DETECTION LIMITS

METHOD 6C1 COMPOUND	-C6		
			METHOD DETECTION LIMIT ug/L
Chloromethane	40		
Bromomethane	4720		
Vinyl Chloride	90		
Chloroethane	200		
Methylene Chloride	125		
Trichlorofluoromethane	50		
1,1-Dichloroethene	65		
1,1-Dichloroethane	35		
Trans-1,2-Dichloroethene	50		
Chloroform	25		
1,2-Dichloroethane	15		
1,1,1-Trichloroethane	15		
Carbon Tetrachloride	60		
Bromodichloromethane	50		
1,2-Dichloropropane	20		
Trichloroethene	60		
Dibromochloromethane	45		
2-Chloroethylvinyl Ether	65		
Bromoform	100		
Tetrachloroethene	15		
Chlorobenzene	125		
1,3-Dichlorobenzene	160		
1,2-Dichlorobenzene	75		
1,4-Dichlorobenzene	120		

Work Order: 86C2075

Detection Limits

Volatile Organics

Method 602

Compound	Detection Limit -01,-05 -07-09	-02,-03	-04	-06	UG/L
Benzene	0.2	200	10	20	
Toluene	0.2	200	10	20	
Ethylbenzene	0.2	200	10	20	
1,4-Dichlorobenzene	0.3	300	15	30	
1,3-Dichlorobenzene	0.4	400	20	40	
1,2-Dichlorobenzene	0.4	400	20	40	
Chlorobenze	0.2	200	10	20	

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/15/61 ANALYST: CL INSTRUMENT: Hewlett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # METHOD BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/15/86 ANALYST: INSTRUMENT: Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/17/21 ANALYST: C INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/17/86 ANALYST: CL INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/14/86 ANALYST: JSC INSTRUMENT: Chrom	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/14/86 ANALYST: CP INSTRUMENT: Varian	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 4/14/86 ANALYST: BC INSTRUMENT: Bernadette	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	NP	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane			
Trans-1,3-Dichloropropene			
Trichloroethene			
Dibromochloromethane			
1,1,2-Trichlorethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

SURROGATE RECOVERIES:

601
Bromochloromethane
2-Bromo-1-Chloropropane
1,4-Dichlorobutane

602
a,a,a,-Trifluorotoluene

VOA RESULTS

LAB # REAGENT BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/14/86 ANALYST: CP INSTRUMENT Bamstead	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/4/82 ANALYST: JK INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	NO
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/14/91 ANALYST: CO INSTRUMENT: Rdm
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/13/86 ANALYST: JS 6 INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # METHOD BLANK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/13/86 ANALYST: CI INSTRUMENT: Olain
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	NP
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/17/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		C			C		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	35.2			115		
	Toluene	4.1	4.8			119		
	Ethylbenzene	11.5	11.9			103		
	P-Xylene	19.1	20.7			109		
	M-Xylene	42.6	48.6			114		
	O-Xylene	10.6	8.8			83		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/15/86

	Certified Value (mg/L)	G Analyzed Value	G % Rec
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	10.1	110
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	7.9	79
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	62.1	144
1,2-Dichloroethane	27.6	23.7	86
1,1,1-Trichloroethane	14.3	13.4	94
Carbon tetrachloride	20.0	16.4	82
Bromodichloromethane	7.9	8.5	107
1,2-Dichloropropane	8.0	7.8	98
Trichloroethene	22.2	22.6	102
Dibromochloromethane	16.7	13.8	83
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	9.8	99
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.8	107
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/14/86

	CERTIFIED VALUE (mg/L)	ANALYZED VALUE B / G	% REC B / G
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	8.7 / 9.5	94 / 103
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.6 / 9.3	86 / 93
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	54.2 / 48.2	126 / 112
1,2-Dichloroethane	27.6	23.0 / 37.5	83 / 136
1,1,1-Trichloroethane	14.3	15.0 / 23	105 / 121
Carbon tetrachloride	20.0	19.5 / 20.7	97 / 104
Bromodichloromethane	7.9	8.3 / 9.2	106 / 116
1,2-Dichloropropane	8.0	7.8 / 7.9	98 / 99
Trichloroethene	22.2	20.2 / 24.8	91 / 112
Dibromochloromethane	16.7	15.5 / 16.0	93 / 96
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	9.8 / 10.3	99 / 104
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.2 / 7.8	100 / 95
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/13/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		Q			Q		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	34.4			112		
	Toluene	4.1	4.9			119		
	Ethylbenzene	11.5	11.8			102		
	P-Xylene	19.1	20.5			108		
	M-Xylene	42.6	44.3			104		
	O-Xylene	10.6	10.6			100		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/14/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		CP			CP		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	35.6			116		
	Toluene	4.1	4.6			111		
	Ethylbenzene	11.5	11.4			99		
	P-Xylene	19.1	20.6			108		
	M-Xylene	42.6	55.5			130		
	O-Xylene	10.6	8.8			83		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

RADIAN
CORPORATION

SPIKE RECOVERY 2/15/86 CLG

EPA METHOD 601 Volatile Organics	860275-07A PLANT 4 860158							
COMPOUNDS	SSR	SR	SA	%R	SSR	SR	SA	%R
Chloromethane								
Bromomethane								
Vinyl chloride								
Chloroethane								
Methylene chloride	9.0		9.2	98				
Trichlorofluoromethane								
1,1-Dichloroethene	7.3		10.0	73				
1,1-Dichloroethane								
trans-1,2-Dichloroethene	5.2		5.4	97				
Chloroform	65.6		43.0	153				
1,2-Dichloroethane	24.3		27.6	88				
1,1,1-Trichloroethane	15.3	3.31	14.3	107				
Carbon Tetrachloride	21.0		20.0	105				
Bromodichloroemethane	9.0		7.9	113				
1,2-Dichloropropane	8.5		8.0	106				
Trichloroethene	24.0		22.2	108				
Dibromochloromethane	15.3		16.7	92				
1,1,2-Trichloroethane								
cis-1,2-Dichloropropene								
2-Chlorethylvinyl ether								
Bromoform	10.7		9.9	108				
1,1,2,2-Tetrachloreothane			10.0					
Tetrachlorethylene			6.2					
Chlorobenzene	10.3		8.2	126				
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								

SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

RADIAN
CORPORATION

SPIKE RECOVERY

EPA Method 602
Volatile Organics

SAMPLE # 8602075-01
UNITS PLANT 4
86152

-1136
NP
D

COMPOUND	SSR	SR	SA	%R
Benzene	41.9		30.7	136
Toluene	5.74		4.1	140
Ethyl benzene	11.1		11.5	96
1,4-Dichlorobenzene				
1,3-Dichlorobenzene				
1,2-Dichlorobenzene				
O-Xylene	12.5		10.6	118
M-Xylene	44.2		42.6	104
P-Xylene	20.0		19.1	104
Chlorobenzene				

SSR = Spiked Sample Result
SR = Sample Result
SA = Spike Added

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C152C75-C1A

SAMPLE ID: E6C152

DATE: 2-14-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 96%

2-BROMO-1-CHLOROPROPANE: 95%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C2075-C2A

SAMPLE ID: E6C153

DATE: 2-14-E6

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 98%, 107%

2-BROMO-1-CHLOROPROPANE: 110%, 123%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC3075-C3A

SAMPLE ID: EGC154

DATE: 2-14-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 100%

2-BROMO-1-CHLOROPROPANE: 108%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C2C75-C4A

SAMPLE ID: E6CC155

DATE: 2-14-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 108%

2-BROMO-1-CHLOROPROPANE: 137%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C3C75-C5A

SAMPLE ID: E6C156

DATE: 2-14-E6

INSTRUMENT: 2

601/8010

BROMOCHLOROMETHANE: 100%

2-BROMO-1-CHLOROPROPANE: 121%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C2075-C6A

SAMPLE ID: E6C157

DATE: 2-14-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 114%

2-BROMO-1-CHLOROPROPANE: 118%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EGC2075-07A

SAMPLE ID: SGC158

DATE: 2-15-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 97%

2-BROMO-1-CHLOROPROPANE: 104%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EECC2C75-C8A

SAMPLE ID: field blank

DATE: 2-15-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 96%

2-BROMO-1-CHLOROPROPANE: 96%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6L2075-18A

SAMPLE ID: trip blank

DATE: 2-14-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 106%

2-BROMO-1-CHLOROPROPANE: 100%

602/802

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C3075-01C

SAMPLE ID: E6C152

DATE: 2-17-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 98%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EECX275-C2C

SAMPLE ID: EECI53

DATE: 2-14-EE

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 104%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C2075-C3C

SAMPLE ID: E6C154

DATE: 2-13-E6

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 107%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: EEC2C75-C4C

SAMPLE ID: E4C155

DATE: 2-14-E6

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 10E%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6003075-C5C

SAMPLE ID: SCC156

DATE: 2-17-56

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 165%, 166%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6G2C75-CGC

SAMPLE ID: E6C157

DATE: 2-13-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 104%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6CA675-C70

SAMPLE ID: E6C158

DATE: 2-17-E6

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 107%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E6C2275-CSB

SAMPLE ID: field blank

DATE: 2-14-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 103%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: E662075-C91A

SAMPLE ID: trip blank

DATE: 2-14-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/802

a,a,a-TRIFLUOROTOLUENE: 98%

Work order: 8602075-02A

Sample ID: 860153

RADIAN CORPORATION

DUPLICATE ANALYSIS

EPA Method 601 Volatile Organics						
COMPOUND ug/L	RUN#1	RUN#2	RPD	RUN#1	RUN#2	RPD
Chloromethane						
Bromomethane						
Vinyl chloride	968	1114	14			
Chloroethane						
Methylene chloride						
Trichlorofluoromethane						
1,1-Dichloroethene						
1,1-Dichloroethane						
trans-1,2-Dichloroethene	26206	29709	13			
Chloroform						
1,2-Dichloroethane						
1,1,1-Trichloroethane						
Carbon Tetrachloride						
Bromodichloroemethane						
1,2-Dichloropropane						
Trichloroethene	2274	3351	39			
Dibromochloromethane						
1,1,2-Trichloroethane						
cis-1,2-Dichloropropene						
2-Chloroethylvinyl ether						
Bromoform						
1,1,2,2-Tetrachloreothane						
Tetrachlorethylene	150	237	45			
Chlorobenzene						
1,3-Dichlorobenzene						
1,2-Dichlorobenzene						
1,4-Dichlorobenzene						

DID NOT CONFIRM

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN
CORPORATION

DUPLICATE ANALYSIS

Sample ID: 8601560

EPA METHOD 602

VOLATILE ORGANICS

SAMPLE # 8602075-05C

UNITS ug/L

COMPOUND	RUN#1	RUN#2	RPD
Benzene			
Toluene	1.43	1.07	29
Ethyl benzene			
1,4-Dichlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
O-Xylene			
M-Xylene			
P-Xylene			
Chlorobenzene			

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

(W.O. # 8602078

RADIAN CORPORATION

10395 OLD PLACERVILLE ROAD
SACRAMENTO, CALIFORNIA 95827

CHAIN OF CUSTODY RECORD

FIELD SECTION

CLIENT NAME General Dynamics PROJECT ADDRESS 4S AIR FORCE, PLANT 4, FT. WORTH
(Number, Street, City, Zip)

SAMPLED BY ARTHUR MORRILL (Name PRINT) RADIAN (Organization) CONTAINERS OBTAINED FROM I-CHEM

PRESERVATIVE USED NONE STORAGE TEMPERATURE ☐ Ambient ☒ 4° C ☐ -10° C Other ____

☒ HAZARDOUS ☐ NON-HAZARDOUS SPECIAL HANDLING INSTRUCTIONS ____

FIELD REMARKS ____

COLLECTORS SAMPLE NO.	DATE	COMP.	GRAB	TYPE (soil, H_2O)	FIELD DATA	STATION LOCATION (grid, depth, etc.)	NO. OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
860152	2/12		X	H_2O		HM-5	2		
860153	2/12		X	H_2O		DRAIN PIPE	2		
860154	2/12		X	H_2O		French Drain 1	2		
860155	2/12		X	H_2O		French Drain 2	2		

Released by	Organization	Date/Time	Received by	Organization	Date/Time
Arthur Morrill	Radian	12 FEB. 86	C Ramsey	RAS	2/13/86 9:55

LABORATORY SECTION

TEMPERATURE RECEIVED ____ FEDX AIRBILL# ____ HAND DELIVERED ____

ANALYSIS RECORD

TYPE OF ANALYSIS	PERFORMED BY (Signed)	DATE OF ANALYSIS	RECORDED (LAB BOOK NO.)	COMMENTS

12.85.22220

Original (Page 1) Laboratory (Page 2) Samples (Page 3)

RADIAN CORPORATION
Austin

Hydrocarbons – 860156, 860158, 860157
Oil and Grease – 860156, 860158, 860157

CHAIN OF CUSTODY RECORD

Metals – 860152, 860153, 860154, 860155

Field Sample No. _____

Company Sampled/Address General Dynamics, Fort Worth, Plant 4
Sample Point Description Ground Water

Stream Characteristics:
Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name Arthur Morrell Date/Time Sampled 2-12-86
Amount of Sample Collected (6) MASON JARS, (4) 500 ml plastic
Sample Description _____
Store at: ☐ Ambient ☐ 5°C ☐ – 10°C ☒ Other 4°C

☒ Caution · No more sample available ☐ Return unused portion of sample ☐ Discard unused portions
Other Instructions · Special Handling · Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic · suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:
Organization Name Radian Corp
Received By _____ Date Received _____ Time _____
Transported By Arthur Morrell Lab Sample No. 86-02-079
Comments _____
Inclusive Dates of Possession 2-12-86

Organization Name MS
Received By [illegible] Date Received 2-13-86 Time 1100
Transported By [illegible] Lab Sample No. [illegible]
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

AA, Oil and Grease, HC QA/QC DATA

FOR W.O. 86-01-240 86-02-031 86-02-041 86-02-060 86-02-067 86-02-079 86-02-087

UNITS ug/ml

PLANT 4 86-01-240 samples 01-09

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2/8/86	.041	.040	103	an dup 01A	<.005	<.005	NC	an sp 01A	<.005	.024	.024	100	prep bl <.005
	idl=.005	.041	.040	103										cal bl <.005
		.040	.040	100										
Hg	2/3/86	.0054	.0050	108	dig dup 09A	<.0002	.0003*	NC	dig sp 09A	<.0002	.0028	.0020	140	prep bl .0004*
	idl=.0002	.0040	.0040	100										
Pb	2-11/86	.042	.045	93	an dup 09A	<.002	<.002	NC	an sp 09A	<.002	.019	.024	79	prep bl .002
	idl=.002	.046	.045	102										cal bl <.002
Sc	2/9/86	.044	.050	88	an dup 05A	<.003	<.003	NC	an sp 05A	<.003	.018	.024	75	prep bl <.003
	idl=.003	.044	.050	88					an sp 05 1:10 dilution	<.003	.022	.024	92	cal bl <.003
Hg	2/8/86	.0054	.0050	108	dig dup 03A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0024	.0020	120	<.0002 prep bl
	idl=.0002	.0040	.0040	100										

an dup = analytical duplicate
dig dup = digestion duplicate
i.d.l. = instrument detection limit

an sp = analytical spike
dig sp = digestion spike or matrix

* indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-031 samples (01-,02,03,06)-Oil & Grease 02,03-METALS

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 02 G	<.005	<.005	NC	an. sp 02 G	<.005	.023	.024	96	prep bl <.005
	idl = .005	.040	.040	100										cal bl <.005
Hg	2-20-86	.0048	.0050	96	—				dig sp 03 G	<.0002	.0019	.0020	95	prep bl <.0002
	idl = .0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 02 G	.033	.030	9.4	an. sp 02 G	.033	.053	.024	83	prep bl <.002
	idl = .002	.045	.045	100										
Se	2-17-86	.042	.040	105	—				an. sp. 02 G	.003	.021	.024	75	prep bl <.002
	idl = .002	.040	.040	100										cal bl <.002
		.039	.040	98										
Oil and Grease	2-14-86	197	200	99	—				—					
	idl = 1	197	200	99										
HC	2-26-86	430	415	104										
	idl = 1	208	245	118										

an. sp = analytical spike
dig sp = digestion or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

+ indicates value is less than 5x instrument detection limit

NC = not calculable

5419

UNITS ug/ml

PLANT 4 86-02-041 samples 01-06

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 01 E	<.005	<.005	NC	an sp 01 E	<.005	.022	.024	92	prep bl <.005
	idl = .005	.037	.040	93										cal bl <.005
		.035	.040	88										
Hg	2-20-86	.0048	.0050	96	dig dup 06 E	<.0002	.0002*	NC	dig sp 05 E	<.0002	.0022	.0020	110	prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 01 E	<.002	<.002	NC	an sp 01 E 1:10 dilution	<.002	.021	.024	88	prep bl <.002
	idl = .002	.045	.045	100										
Cr		.048	.045	107										
Se	2-17-86	.042	.040	105	—				an sp 03 E	.003*	.021	.024	75	prep bl <.002
	idl = .002	.039	.040	98										cal bl <.002
oil and grease	2-14-86	197	200	99										
	idl = 1	197	200	99										
HC - idl = 1	2-14-86				an dup 03	<1	<1	NC						

an sp = analytical spike
dig sp = digestion spike or matrix spike

an dup = analytical duplicate
dig dup = digestion duplicate

idl = instrument det. limit

* indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-060 samples 01-05

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	dig dup 01C	.002*	.003*	40	dig sp 02C	.006*	.023	.020	85	prep bl <.002
	idl = .002	.042	.040	105	an. dup 03C	.006*	.003*	67	an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Hg	2-20-86	.0048	.0050	96	–				05A	<.0002	.0020	.0020	100	prep bl <.0002
	idl = .0002	.0042	.0040	105										
Pb	2-17-86	.045	.043	105	dig dup 01C	.034	.031	9.1	dig sp 02C	.27	.29	.020	100	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	dig dup 01C	.003*	.002*	40	dig sp 02C	<.002	.005	.010	50	prep bl <.002
	idl = .002	.040	.040	100					an sp 05A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
Oil and Grease	2-14-86	197	200	99	–				–					
	idl = 1	197	200	99										

an sp = analytical spike
dig sp = digestion or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5x instrument detection limit

NC = not calculable

PLANT 4 86-02-067

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	—				an sp 03E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.042	.040	105					1:10 dilution					cal bl <.002
Hg	2-24-86	.0048	.0050	96	—				dig sp 04E	<.0002	.0020	.0020	100	prep bl <.0002
	2-20-86	.0048	.0050	96										prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.045	.043	105	an dup 04E	.037	.038	2.7	an sp 03E	.020	.035	.024	63	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	an dup 01E	.007*	.007*	0	an sp 04E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.040	.040						1:10 dilution					cal bl <.002
Oil and Grease	2-14-86	197	200	99										
	idl = 1	197	200	99										

idl = instrument detection limit

an sp = analytical spike

dig sp = digestion or matrix spike

dig = digestion duplicate

an dup = analytical duplicate

* indicates value is less than 5 x instrument detection limit

NC = not calculable

PLANT 4 86-02-079 samples 01 – 04 samples 05, 06, 07-076, HC UNITS µg/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-21-86	.042	.040	105	an. dup 01A	.011	.010	9.5	an. sp. 01A	.011	.038	.024	113	prep bl <.002
	idl = .002	.042	.040	105	dig dup 01A	.011	.011	0	dig dup 02A	* .007	.026	.020	95	cal bl <.002
		.042	.040	105										<.002 <.002
Hg	2-20-86	.0048	.0050	96	dig dup 01A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0021	.0020	105	prep bl <.0002
	idl=.0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	dig dup 01A	.048	.047	2.1	dig sp 02A	<.0002	.009	.020	45	prep bl <.002
	idl = .002	.043	.043	100					an sp 04A	<.0002	.011	.024	46	cal bl <.002
									an sp 04A	<.0002	.027	.024	113	cal bl <.002
									1:10 dilution					
Se	2-21-86	.041	.040	103	dig dup 01A	<.002	<.002	NC	dig sp 02A	<.002	<.002	.010	0	prep bl <.002
	idl = .002	.043	.040	108					an sp 04A	<.002	.016	.024	67	cal bl <.002
									an sp 04A 1:10 dilution	<.002	.024	.024	100	
oil & Grease	3-14-86	191	200	96										
	idl = 1													

an dup = analytical duplicate
an sp = analytical spike
dig dup = pre-digest duplicate
dig sp = pre-digest spike
idl = instrument detection limit
* = value is less than 5 x idl
NC = NOT CALCULABLE

EPA 220

PLANT 4 86-02-087 samples 04, 05 (metals) 01, 02 (O&G) 01, 02, 03 (HC) UNITS ~~ug/ml~~

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-24-86	.036	.040	90	an dup 04A	.038	.038	0	an sp 05A	<.002	.024	.024	100	prep bl <.002
	idl=.002	.036	.040	90										cal bl <.008
		.037	.040	93	-									cal bl <.002
Hg	2-20-86	.0048	.0050	96	-				dig sp 05A	<.0002	.0019	.0020	95	prep bl <.0002
	idl=.0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	-				an sp 05A	<.002	.017	.024	71	prep bl .002*
Cl	idl=.002	.043	.043	100					an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Se	2-21-86	.041	.040	103					an sp 04A	<.002	.015	.024	63	prep bl <.002
	idl=.002	.043	.040	108					an sp 04A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
oil and grease	3-14-86	191	200	96										
	idl=1													

an dup=analytical duplicate an sp=analytical spike dig dup=pre-digest duplicate dig sp=pre-digest spike
idl = instrument detection limit *=value is less then five times the instrument detection limit NC=not calculable

For work orders 8601240
8602031
8602041
8602060
8602067
8602079
8602087

Form VII

Q.C. Report No. 2

INSTRUMENT DETECTION LIMITS AND

LABORATORY CONTROL SAMPLE

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 LCS UNITS ~~ug/L~~ mg/kg

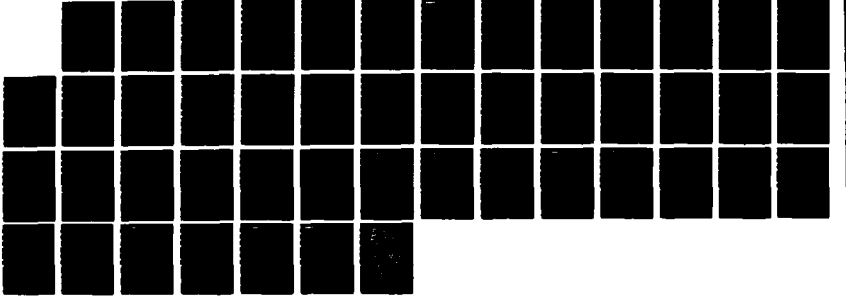
µg/ml (Circle One)

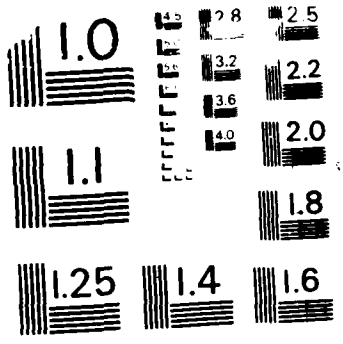
Compound	Required Detection Limits (CRDL)-ug/l	Instrument Detection Limits (IDL)-ug/l ICP/AA	Furnace*	Lab Control Sample True	Found	%R
Metals:						
1. Aluminum	200					
2. Antimony	60					
3. Arsenic	10					
4. Barium	200	<.001				
5. Beryllium	5					
6. Cadmium	5	<.002				
7. Calcium	5000					
8. Chromium	10	<.005				
9. Cobalt	50					
10. Copper	25					
11. Iron	100					
12. Lead	5					
13. Magnesium	5000					
14. Manganese	15					
15. Mercury	0.2					
16. Nickel	40					
17. Potassium	5000					
18. Selenium	5					
19. Silver	10	<.002				
20. Sodium	5000					
21. Thallium	10					
22. Tin	40					
23. Vanadium	50					
24. Zinc	20					
Other:						
		5 422				
Cyanide	10					

* dection limits are given on 3-13 furnace /Hg/ORG QA/QC SUMMARY

AD-A190 445 INSTALLATION RESTORATION PROGRAM PHASE 2 6/6
CONFIRMATION/QUANTIFICATION STAG (U) RADIAN CORP
AUSTIN TX DEC 87 F31615-83-D-4001

UNCLASSIFIED F/G 24/7 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS - 1963

ICP QA/QC DATA

For work orders: 8601240, 8602031, 8602041, 8602060, 8602067, 8602079, 8602087

Form II

Q. C. Report No. 2

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals[5]:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium	1.00	1.01	101	1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium	1.00	1.04	104	1.00	1.05	105	1.04	104	
7. Calcium									
8. Chromium	1.00	1.01	101	1.00	1.02	102	1.02	102	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver	1.00	1.00	100	1.00	1.02	102	1.00	100	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

Form II

Q. C. Report No. 3

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals[4]:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium				1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium				1.00	1.04	104	1.03	103	
7. Calcium									
8. Chromium				1.00	1.00	100	1.01	101	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver				1.00	1.01	101	1.02	102	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

8601240
8602031
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8602087

Form III

Q. C. Report No. 2

BLANKS

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium	<.001	<.001	<.001	<.001	<.001		
5. Beryllium							
6. Cadmium	<.002	<.002	<.002	.002*	.002*		
7. Calcium							
8. Chromium	<.005	<.005	<.005	<.005	<.005		
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver	.006*	.018	.010	.009*	.014		
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

*value is less than 5x ida

8602079
8602087

Form III

Q. C. Report No. 2

BLANKS

LAB NAME Radian

DATE 3-4-86

(2-18-86)

CASE NO. PLANT 4

UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium						.005*	
5. Beryllium							
6. Cadmium						<.002	
7. Calcium							
8. Chromium						<.005	
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver						<.002	
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

* value is less than 5x idl

Form V

Q. C. Report No. 8

SPIKE SAMPLE RECOVERY

predigest

LAB NAME Radian

CASE NO. PLANT 4

EPA Sample No.

DATE 3-4-86

Lab Sample ID No. 8602079-03

Units ug/ml

Matrix water predigest

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	"				
3. Arsenic	"				
4. Barium	"	1.84	.068	2.00	89
5. Beryllium	"				
6. Cadmium	"	.036	<.002	.050	72
7. Calcium	"				
8. Chromium	"	.17	.006*	.20	82
9. Cobalt	"				
10. Copper	"				
11. Iron	"				
12. Lead	"				
13. Magnesium	"				
14. Manganese	"				
15. Mercury	"				
16. Nickel	"				
17. Potassium	"				
18. Selenium	"				
19. Silver	"	.20	<.002	.25	80
20. Sodium	"				
21. Thallium	"				
22. Tin	"				
23. Vanadium	"				
24. Zinc	"				
Other:					
Cyanide	"				

[1] %R = [(SSR - SR)/SA] x 100

"R"- out of control

Comments: * value is less than 5x idl

5 427

RADIAN CORPORATION

AUSTIN

EPA 601 860159, 860160, 860162, 860163
EPA 602 860159, 860160, 860162, 860163
OIL & GREASE 860159, 860160
HYDROCARBON FUEL 860161, 860160, 860159

METALS 860162, 860163

FIELD BLANKS - EPA 601 EPA 602

CHAIN OF CUSTODY RECORD

Field Sample No. _____

Company Sampled/Address General Dynamics - Fort Worth, Plant 4
Sample Point Description Ground Water

Stream Characteristics:

Temperature _____ Flow _____ pH _____
Visual Observations/Comments _____

Collector's Name N. Robinson, A. Morrill Date/Time Sampled 2-13-86
Amount of Sample Collected FIVE MASON JARS, TWO 500 ml plastic, EIGHTEEN 40 ml glass
Sample Description Ground Water
Store at: ☐ Ambient ☐ 5°C ☐ – 10°C ☒ Other 4°C

☒ Caution - No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions - Special Handling - Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic - suspect
☐ Caustic	☐ Peroxide	☐ Radioactive

☐ Other _____

Sample Allocation/Chain of Possession:

Organization Name Radian Corp
Received By _____ Date Received _____ Time _____
Transported By Arthur Morrill Lab Sample No. _____
Comments _____
Inclusive Dates of Possession 2-13-86

Organization Name RAS
Received By _____ Date Received _____ Time _____
Transported By Fed Ex Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

Organization Name _____
Received By _____ Date Received _____ Time _____
Transported By _____ Lab Sample No. _____
Comments _____
Inclusive Dates of Possession _____

AA, Oil and Grease, HC RATE QC DATA

FOR W.O. 86-01-240 86-02-031 86-02-041 86-02-060 86-02-067 86-02-079 86-02-097

UNITS ug/ml

PLANT 4 86-01-240 samples 01-09

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2/8/86	.041	.040	103	an dup 01A	<.005	<.005	NC	an sp 01A	<.005	.024	.024	100	prep bl <.005
	idl=.005	.041	.040	103										cal bl <.005
		.040	.040	100										
Hg	2/3/86	.0054	.0050	108	dig dup 09A	<.0002	.0003*	NC	dig sp 09A	<.0002	.0028	.0020	140	prep bl .0004*
	idl=.0002	.0040	.0040	100										
Pb	2-11/86	.042	.045	93	an dup 09A	<.002	<.002	NC	an sp 09A	<.002	.019	.024	79	prep bl .002
	idl=.002	.046	.045	102										cal bl <.002
Sc	2/9/86	.044	.050	88	an dup 05A	<.003	<.003	NC	an sp 05A	<.003	.018	.024	75	prep bl <.003
	idl=.003	.044	.050	88					an sp 05 1:10 dilution	<.003	.022	.024	92	cal bl <.003
Hg	2/8/86	.0054	.0050	108	dig dup 03A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0024	.0020	120	<.0002 prep bl
	idl=.0002	.0040	.0040	100										

an dup = analytical duplicate
dig dup = digestion duplicate
i.d.l. = instrument detection limit

an sp = analytical spike
dig sp = digestion spike or matrix

* indicates value is less than 5x instrument detection limit
NC = not calculable

UNITS ug/l

PLANT 4 86-02-031 samples (01-, 02, 03, 06) - Oil & Grease 02, 03 - METALS

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 02 G	<.005	<.005	NC	an. sp 02 G	+005	.023	.024	96	prep bl <.005
	idl = .005	.040	.040	100										cal bl <.005
Hg	2-20-86	.0048	.0050	96	—				dig sp 03 G	<.0002	.0019	.0020	95	prep bl <.0002
	idl = .0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 02 G	.033	.030	9.4	an. sp 02 G	.033	.053	.024	83	prep bl <.002
	idl = .002	.045	.045	100										
5														
430 Se	2-17-86	.042	.040	105	—				an. sp. 02 G	.003	.021	.024	75	prep bl <.002
	idl = .002	.040	.040	100										cal bl <.002
		.039	.040	98										
oil and Grease	2-14-86	197	200	99	—				—					
	idl = 1	197	200	99										
HC	2-26-86	430	415	104										
	idl = 1	208	245	118										

an. sp = analytical spike
dig sp = prediget or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

+ indicates value is less than 5x instrument detection limit

NC = not calculable

UNITS ug/ml

PLANT 4 86-02-041 samples 01-06

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-19-86	.039	.040	98	an dup 01 E	<.005	<.005	NC	an sp 01 E	<.005	.022	.024	92	prep bl <.005
	idl = .005	.037	.040	93										cal bl <.005
		.035	.040	88										
Hg	2-20-86	.0048	.0050	96	dig dup 06 E	<.0002	.0002*	NC	dig sp 05 E	<.0002	.0022	.0020	110	prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.044	.045	98	an dup 01 E	<.002	<.002	NC	an sp 01 E 1:10 dilution	<.002	.021	.024	88	prep bl <.002
	idl = .002	.045	.045	100										
		.048	.045	107										
Sc	2-17-86	.042	.040	105	–				an sp 03 E	.003*	.021	.024	75	prep bl <.002
	idl = .002	.039	.040	98										cal bl <.002
oil and grease	2-14-86	197	200	99										
	idl = 1	197	200	99										
HC - idl = 1	2-14-86				an dup 03	<1	<1	NC						

* indicates value is less than 5x instrument detection limit

an sp = analytical spike
dig sp = digestion spike or matrix spike

an dup = analytical duplicate
dig dup = digestion duplicate

idl = instrument det. limit

NC = not calculable

5431

UNITS ug/gal

PLANT 4 86-02-060 samples 01-05

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	dig dup 01C	.002*	.003*	40	dig sp 03C	.006*	.023	.020	85	prep bl <.002
	idl = .002	.042	.040	105	an. dup 03C	.006*	.003*	67	an sp 05A 1:10 dil	<.002	.024	.024	100	cal bl <.002
Hg	2-20-86	.0048	.0050	96	–				05A	<.0002	.0020	.0020	100	prep bl <.0002
	idl = .0002	.0042	.0040	105										
Pb	2-17-86	.045	.043	105	dig dup 01C	.034	.031	9.1	dig sp 02C	.27	.29	.020	100	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	dig dup 01C	.003*	.002*	40	dig sp 02C	<.002	.005	.010	50	prep bl <.002
	idl = .002	.040	.040	100					an sp 05A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
Oil and Grease	2-14-86	197	200	99	–				–					
	idl = 1	197	200	99										

an sp = analytical spike
dig sp = digestion or matrix spike
idl = instrument detection limit

an dup = analytical duplicate
dig dup = digestion duplicate

* indicates value is less than 5x instrument detection limit
NC = not calculable

PLANT 4 86-02-067

UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-15-86	.029	.027	107	—				an sp 03E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.042	.040	105					1:10 dilution					cal bl <.002
Hg	2-24-86	.0048	.0050	96	—				dig sp 04E	<.0002	.0020	.0020	100	prep bl <.0002
	2-20-86	.0048	.0050	96										prep bl <.0002
	idl = .0002	.0044	.0040	110										
		.0044	.0040	110										
Pb	2-17-86	.045	.043	105	an dup 04E	.037	.038	2.7	an sp 03E	.020	.035	.024	63	prep bl .004
	idl = .002	.049	.043	114										cal bl <.002
Se	2-17-86	.042	.040	105	an dup 01E	.007*	.007*	0	an sp 04E	<.002	.021	.024	88	prep bl <.002
	idl = .002	.040	.040						1:10 dilution					cal bl <.002
Oil and Grease	2-14-86	197	200	99										
	idl = 1	197	200	99										

5433

idl = instrument detection limit

an sp = analytical spike

dig sp = digestion or matrix spike

dig = digestion duplicate

an dup = analytical duplicate

* indicates value is less than 5 x instrument detection limit

NC = not calculable

PLANT 4 86-02-079 samples 01 – 04 samples 05, 06, 07-09G, HC UNITS µg/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-21-86	.043	.040	105	an. dup 01A	.011	.010	9.5	an s.p. 01A	.011	.038	.024	113	prep bl <.002
	idl = .002	.042	.040	105	dig dup 01A	.011	.011	0	dig dup 02A	* .007	.026	.020	95	cal bl <.002
		.042	.040	105										<.002 <.002
Hg	2-20-86	.0048	.0050	96	dig dup 01A	<.0002	<.0002	NC	dig sp 04A	<.0002	.0021	.0020	105	prep bl <.0002
	idl=.0002	.0043	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	dig dup 01A	.048	.047	2.1	dig sp 02A	<.0002	.009	.020	45	prep bl <.002
Cr	idl = .002	.043	.043	100					an sp 04A	<.0002	.011	.024	46	cal bl <.002
434									an sp 04A 1:10 dilution	<.0002	.027	.024	113	cal bl <.002
Se	2-21-86	.041	.040	103	dig dup 01A	<.002	<.002	NC	dig sp 03A	<.002	<.002	.010	0	prep bl <.002
	idl = .002	.043	.040	108					an sp 04A	<.002	.016	.024	67	cal bl <.002
									an sp 04A 1:10 dilution	<.002	.024	.024	100	
Oil & Grease	3-14-86	191	200	96										
	idl = 1													

an dup = analytical duplicate dig dup = pre-digest duplicate idl = instrument detection limit NC = NOT CALCULABLE
an sp = analytical spike dig sp = pre-digest spike * = value is less than 5 x idl

PLANT 4 86-02-087 samples 04,05 (metals) 01,02(O&G) 01,02,03(HC) UNITS ug/ml

ELEMENT	ANALYSIS DATE	QC DATA			DUPLICATE ANALYSIS				SPIKE RECOVERY					BLANKS
		FOUND VALUE	TRUE VALUE	%R	SAMP#	SAMP	DUPL	RPD	SAMP#	SR	SSR	SA	%R	
As	2-24-86	.036	.040	90	an dup 04A	.038	.038	0	an sp 05A	<.002	.024	.024	100	prep bl <.002
	idl=.002	.036	.040	90										cal bl <.008
		.037	.040	93	–									cal bl <.002
Hg	2-20-86	.0048	.0050	96	–				dig sp 05A	<.0002	.0019	.0020	95	prep bl <.0007
	idl=.0002	.0042	.0040	105										
		.0044	.0040	110										
Pb	2-21-86	.042	.043	98	–				an sp 05A	<.002	.017	.024	71	prep bl .002*
	idl=.002	.043	.043	100					an sp 05A 1:10dil	<.002	.024	.024	100	cal bl <.002
Se	2-21-86	.041	.040	103					an sp 04A	<.002	.015	.024	63	prep bl <.002
	idl=.002	.043	.040	108					an sp 04A 1:10 dilution	<.002	.023	.024	96	cal bl <.002
oil and grease	3-14-86	191	200	96										
	idl=1													

an dup=analytical duplicate an sp=analytical spike dig dup=pre-digest duplicate dig sp=pre-digest spike
idl = instrument detection limit *=value is less then five times the instrument detection limit NC=not calculable

for work orders 860124
860203
860204
860206
860206
860207
860208

Form VII

Q.C. Report No. 2

INSTRUMENT DETECTION LIMITS AND

LABORATORY CONTROL SAMPLE

LAB NAME Radian CASE NO. PLANT 4

DATE 3-4-86 LCS UNITS ~~ug/L~~ mg/kg

µg/ml (Circle One)

Compound	Required Detection Limits (CRDL)-ug/l	Instrument Detection Limits (IDL)-ug/l ICP/AA	Furnace*	Lab Control Sample True	Found	%R
Metals:						
1. Aluminum	200					
2. Antimony	60					
3. Arsenic	10					
4. Barium	200	<.001				
5. Beryllium	5					
6. Cadmium	5	<.003				
7. Calcium	5000					
8. Chromium	10	<.005				
9. Cobalt	50					
10. Copper	25					
11. Iron	100					
12. Lead	5					
13. Magnesium	5000					
14. Manganese	15					
15. Mercury	0.2					
16. Nickel	40					
17. Potassium	5000					
18. Selenium	5					
19. Silver	10	<.003				
20. Sodium	5000					
21. Thallium	10					
22. Tin	40					
23. Vanadium	50					
24. Zinc	20					
Other:						
Cyanide	10					

5 436

* dection limits are given on Furnace/Hg/OHG QA/QC SUMMARY SHEET. 8-13

ICP QA/QC DATA

For work orders: 8601240, 8602031, 8602041, 8602060, 8602067, 8602079, 8602087

Form II

Q. C. Report No. 8

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS ug/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals[4]:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium	100	1.01	101	1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium	1.00	1.04	104	1.00	1.05	105	1.04	104	
7. Calcium									
8. Chromium	1.00	1.01	101	1.00	1.02	102	1.02	102	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver	1.00	1.00	100	1.00	1.02	102	1.00	100	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

Form II

Q. C. Report No. 3

INITIAL AND CONTINUING CALIBRATION VERIFICATION[3]

LAB NAME Radian CASE NO. PLANT 4

SOW NO.

DATE 3-4-86 UNITS mg/ml

Compound	Initial Calib.[1]			Continuing Calibration[2]					
Metals:	True Value	Found	%R	True Value	Found	%R	Found	%R	Method[4]
1. Aluminum									
2. Antimony									
3. Arsenic									
4. Barium				1.00	1.01	101	1.01	101	
5. Beryllium									
6. Cadmium				1.00	1.04	104	1.03	103	
7. Calcium									
8. Chromium				1.00	1.00	100	1.01	101	
9. Cobalt									
10. Copper									
11. Iron									
12. Lead									
13. Magnesium									
14. Manganese									
15. Mercury									
16. Nickel									
17. Potassium									
18. Selenium									
19. Silver				1.00	1.01	101	1.02	102	
20. Sodium									
21. Thallium									
22. Tin									
23. Vanadium									
24. Zinc									
Other:									
Cyanide									

[1] Initial Calibration Source _____ [2] Continuing Calibration Source _____

[3] Control Limits: Mercury and Tin 80-120; All Other Compounds 90-110

[4] Indicate Analytical Method Used: P - ICP/Flame AA; F - Furnace

8601240
8602031
8602041
8602060
8602067
8602079
8602087

Form III

Q. C. Report No. 3

BLANKS

LAB NAME Radian CASE NO. PLANT 4

DATE 7-4-86 UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium	<.001	<.001	<.001	<.001	<.001		
5. Beryllium							
6. Cadmium	<.002	<.002	<.002	.002*	.002*		
7. Calcium							
8. Chromium	<.005	<.005	<.005	<.005	<.005		
9. Cobalt							
10. Copper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver	.006*	.018	.010	.009*	.014		
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

*value is less than 5x ial

8602079
8602087

Form III

Q. C. Report No. 3

BLANKS

LAB NAME Radian (2-18-86)

CASE NO. PLANT 4

DATE 3-4-86

UNITS ug/ml

Matrix water

Preparation Compound	Initial Calibration Blank Value	Continuing Calibration Blank Value 1	2	3	4	Preparation Blank 1	2
Metals:							
1. Aluminum							
2. Antimony							
3. Arsenic							
4. Barium						.005*	
5. Beryllium							
6. Cadmium						<.002	
7. Calcium							
8. Chromium						<.005	
9. Cobalt							
10. Cooper							
11. Iron							
12. Lead							
13. Magnesium							
14. Manganese							
15. Mercury							
16. Nickel							
17. Potassium							
18. Selenium							
19. Silver						<.002	
20. Sodium							
21. Thallium							
22. Tin							
23. Vanadium							
24. Zinc							
Other:							
Cyanide							

* value is less than 5x idl

5 440

Form VI

Q. C. Report No. 2

DUPLICATES
PRE-DIGEST

LAB NAME Radian

DATE 2-4-86

CASE NO. PLANT 4
EPA Sample No.
Lab Sample ID No. 860208704A
Units ug/ml digestio

Matrix water

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		.11	.11	0
5. Beryllium				
6. Cadmium		<.002	<.002	NC
7. Calcium				
8. Chromium		.016*	.016*	0
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		.004*	.005*	22
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* Out of Control

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

* value is less than 5 x idl

Form VI

Q. C. Report No. 2

DUPLICATES
ANALYTICAL

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4
EPA Sample No.
Lab Sample ID No. 8602087-04A
Units ug/ml

Matrix water.

analytical

Compound	Control Limit[1]	Sample(S)	Duplicate(D)	RPD[2]
Metals:				
1. Aluminum				
2. Antimony				
3. Arsenic				
4. Barium		.11	.11	0
5. Beryllium				
6. Cadmium		<.002	<.002	NC
7. Calcium				
8. Chromium		.016*	.016*	0
9. Cobalt				
10. Copper				
11. Iron				
12. Lead				
13. Magnesium				
14. Manganese				
15. Mercury				
16. Nickel				
17. Potassium				
18. Selenium				
19. Silver		.004*	<.002	NC
20. Sodium				
21. Thallium				
22. Tin				
23. Vanadium				
24. Zinc				
Other:				
Cyanide				

* ~~Out of Control~~

To be added at a later date.

[2] RPD = [|S - D|/((S + D)/2)] x 100

[1] - Non calculable RPD due to value(s) less than CRDL

* value is less than 5 x IDL

Form V

Q. C. Report No. 2

SPIKE SAMPLE RECOVERY

LAB NAME Radian

DATE 3-4-86

CASE NO. PLANT 4

EPA Sample No.

Lab Sample ID No. 86-02-087-05

Units ug/ml

Matrix water

Compound	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	Spiked Added (SA)	%R[1]
Metals:					
1. Aluminum	75-125				
2. Antimony	-				
3. Arsenic	-				
4. Barium	-	1.06	0.087	1.00	97
5. Beryllium	-				
6. Cadmium	-	0.94	<.002	1.00	94
7. Calcium	-				
8. Chromium	-	0.96	<.005	1.00	96
9. Cobalt	-				
10. Copper	-				
11. Iron	-				
12. Lead	-				
13. Magnesium	-				
14. Manganese	-				
15. Mercury	-				
16. Nickel	-				
17. Potassium	-				
18. Selenium	-				
19. Silver	-	0.98	<.002	1.00	98
20. Sodium	-				
21. Thallium	-				
22. Tin	-				
23. Vanadium	-				
24. Zinc	-				
Other:					
Cyanide	-				

[1] %R = [(SSR - SR)/SA] x 100

"R"- out of control

Comments:

Organics QA / QC 8602-087

8602087-01, -02, -04 → -06

Volatile Organics DETECTION LIMITS

METHOD 601 COMPOUND	-01, -02 -04, -06	-05	METHOD DETECTION LIMIT ug/l
Chloromethane	0.08	0.8	
Bromomethane	1.18	11.8	
Vinyl Chloride	0.18	1.8	
Chloroethane	0.52	5.2	
Methylene Chloride	0.25	2.5	
Trichlorofluoromethane	0.10	1.0	
1,1-Dichloroethene	0.13	1.3	
1,1-Dichloroethane	0.07	0.7	
Trans-1,2-Dichloroethene	0.10	1.0	
Chloroform	0.05	0.5	
1,2-Dichloroethane	0.03	0.3	
1,1,1-Trichloroethane	0.03	0.3	
Carbon Tetrachloride	0.12	1.2	
Bromodichloromethane	0.10	1.0	
1,2-Dichloropropane	0.04	0.4	
Trichloroethene	0.12	1.2	
Dibromochloromethane	0.09	0.9	
2-Chloroethylvinyl Ether	0.13	1.3	
Bromoform	0.20	2.0	
Tetrachloroethene	0.03	0.3	
Chlorobenzene	0.25	2.5	
1,3-Dichlorobenzene	0.32	3.2	
1,2-Dichlorobenzene	0.15	1.5	
1,4-Dichlorobenzene	0.24	2.4	

8602087-01,-02,-04→-06

DETECTION LIMITS

VOLATILE ORGANICS

METHOD 624

COMPOUND	DETECTION LIMIT ug/l -01,-02 -04→-06						
BENZENE	0.2						
TOLUENE	0.2						
ETHYLBENZENE	0.2						
CHLOROBENZENE	0.2						
1,4-DICHLOROBENZENE	0.3						
1,3-DICHLOROBENZENE	0.4						
1,2-DICHLOROBENZENE	0.4						

VOA RESULTS

LAB # System Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/14/92 ANALYST: JSG INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	ND
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # REAGENT BLANK	
CLIENT NAME	
SAMPLE ID	

EPA METHOD 601	DATE: ANALYST: INSTRUMENT:	EPA METHOD 602	DATE: 2/14/86 ANALYST: CJ INSTRUMENT: Delta
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane		Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # System Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/15/06 ANALYST: CO INSTRUMENT: Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	NP	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/15/2L ANALYST: C INSTRUMENT: Hermes	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	NP	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # SYSTEM BLANK
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/14/96 ANALYST: JSC INSTRUMENT: Bernadette	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	NO	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

VOA RESULTS

LAB # Reagent Blank
CLIENT NAME
SAMPLE ID

EPA METHOD 601	DATE: 2/14/86 ANALYST: CL INSTRUMENT: Bundett	EPA METHOD 602	DATE: ANALYST: INSTRUMENT:
COMPOUND	CONCENTRATION (ug/L)	COMPOUND	CONCENTRATION (ug/L)
Chloromethane	ND	Benzene	
Bromomethane		Toluene	
Vinyl Chloride		Ethyl benzene	
Chloroethane		Chlorobenzene	
Methylene chloride		1,4-Dichlorobenzene	
Trichlorofluromethane		1,3-Dichlorobenzene	
1,1-Dichlorethene		1,2-Dichlorobenzene	
1,1-Dichlorethane		P-Xylene	
Trans-1,2-Dichloroethene		M-Xylene	
Chloroform		O-Xylene	
1,2-Dichlorethane			
1,1,1-Trichlorethane			
Carbon tetrachloride			
Bromodichlormethane			
1,2-Dichloropropane		SURROGATE RECOVERIES:	
Trans-1,3-Dichloropropene		601	
Trichloroethene		Bromochloromethane	
Dibromochloromethane		2-Bromo-1-Chloropropane	
1,1,2-Trichlorethane		1,4-Dichlorobutane	
cis-1,3-Dichloropropene		602	
2-Chloroethylvinyl ether		a,a,a,-Trifluorotoluene	
Bromoform			
1,1,2,2-Tetrachlorethane			
Tetrachlorethylene			
Chlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

RAS GC LAB

DATE: 2/14/86		SPIKED VALUE (ug/L)	ANALYZED VALUE (ug/L)			% RECOVERY		
	INSTRUMENT		D			D		
	ANALYST		CJ			CJ		
TEST METHOD	COMPOUND							
EPA 601	Chloromethane	16.2						
	Chloroethane	28.1						
	Methylene Chloride	26.3						
	1,1-Dichloroethylene	45.0						
	Trans-1,2-Dichloroethylene	12.5						
	Carbon Tetrachloride	60.0						
	Dichlorobromomethane	40.0						
	1,1,2-Trichloroethane	33.8						
EPA 602	Benzene	30.7	35.6			116		
	Toluene	4.1	4.6			111		
	Ethylbenzene	11.5	11.4			99		
	P-Xylene	19.1	20.6			108		
	M-Xylene	42.6	55.5			130		
	O-Xylene	10.6	8.8			83		
EPA 608		(ug/g)		(ug/g)				
	Aroclor 1242	58.7						
	Aroclor 1260	56.8						

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/15/86

	CERTIFIED VALUE (mg/L)	G ANALYZED VALUE	G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	10.1	110
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	7.9	79
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	62.1	144
1,2-Dichloroethane	27.6	23.7	86
1,1,1-Trichloroethane	14.3	13.4	94
Carbon tetrachloride	20.0	16.4	82
Bromodichloromethane	7.9	8.5	107
1,2-Dichloropropane	8.0	7.8	98
Trichloroethene	22.2	22.6	102
Dibromochloromethane	16.7	13.8	83
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	9.8	99
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.8	107
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

DAILY QUALITY CONTROL

EPA QC WP 483 Conc 2 + EPA QC WP 781 Conc 3

2/14/86

	CERTIFIED VALUE (mg/L)	B / G ANALYZED VALUE	B / G % REC
Chloromethane			
Bromomethane			
Vinyl chloride			
Chloroethane			
Methylene chloride	9.2	8.7 / 9.5	94 / 103
Trichlorofluoromethane			
1,1-Dichloroethene	10.0	8.6 / 9.3	86 / 93
1,1-Dichloroethane			
trans-1,2-Dichloroethene	5.4		
Chloroform	43.0	54.2 / 48.2	126 / 112
1,2-Dichloroethane	27.6	23.0 / 37.5	83 / 136
1,1,1-Trichloroethane	14.3	15.0 / 23	105 / 121
Carbon tetrachloride	20.0	19.5 / 20.7	97 / 104
Bromodichloromethane	7.9	8.3 / 9.2	106 / 116
1,2-Dichloropropane	8.0	7.8 / 7.9	98 / 99
Trichloroethene	22.2	20.2 / 24.8	91 / 112
Dibromochloromethane	16.7	15.5 / 16.0	93 / 96
1,1,2-Trichloroethane			
cis-1,3-Dichloropropene			
2-Chloroethylvinyl ether			
Bromoform	9.9	9.8 / 10.3	99 / 104
1,1,2,2-Tetrachloroethane	10.0		
Tetrachloroethylene	6.2		
Chlorobenzene	8.2	8.2 / 7.8	100 / 95
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
1,4-Dichlorobenzene			

RADIAN
CORPORATION

SPIKE RECOVERY

EPA METHOD 601 Volatile Organics	86 U2087-06A Plant Field Blank				2/15/86 PP G			
COMPOUNDS	SSR	SR	SA	%R	SSR	SR	SA	%R
Chloromethane								
Bromomethane								
Vinyl chloride								
Chloroethane								
Methylene chloride	9.0		9.8	98				
Trichlorofluoromethane								
1,1-Dichloroethene	7.7		10.0	77				
1,1-Dichloroethane								
trans-1,2-Dichloroethene	5.5		5.4	102				
Chloroform	65.5		43.0	152				
1,2-Dichloroethane	25.5		27.6	92				
1,1,1-Trichloroethane	15.6		14.3	109				
Carbon Tetrachloride	22.1		20.0	110				
Bromodichloroemethane	9.5		7.9	120				
1,2-Dichloropropane	9.3		8.0	117				
Trichloroethene	26.3		22.2	119				
Dibromochloromethane	17.4		16.7	104				
1,1,2-Trichloroethane								
cis-1,2-Dichloropropene								
2-Chlorethylvinyl ether								
Bromoform	11.0		9.9	111				
1,1,2,2-Tetrachloroethane			120					
Tetrachlorethylene			6.2					
Chlorobenzene	11.1		8.2	135				
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								

SSR = Spiked Sample Result

SR = Sample Result

SA = Spike Added

RADIAN
CORPORATION

DUPLICATE ANALYSIS

860159

EPA METHOD 602
VOLATILE ORGANICS

SAMPLE # 8602087-01E
UNITS ug/l

COMPOUND	RUN#1	RUN#2	RPD
Benzene			
Toluene	1.79	1.76	1.7
Ethyl benzene			
1,4-Dichlorobenzene			
1,3-Dichlorobenzene			
1,2-Dichlorobenzene			
O-Xylene			
M-Xylene			
P-Xylene			
Chlorobenzene			

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN CORPORATION

8602087-05B
8601163

DUPLICATE ANALYSIS

EPA Method 601 Volatile Organics						
COMPOUND ug/l	RUN#1	RUN#2	RPD	RUN#1	RUN#2	RPD
Chloromethane						
Bromomethane						
Vinyl chloride						
Chloroethane						
Methylene chloride						
Trichlorofluoromethane						
1,1-Dichloroethene						
1,1-Dichloroethane						
trans-1,2-Dichloroethene						
Chloroform						
1,2-Dichloroethane						
1,1,1-Trichloroethane						
Carbon Tetrachloride						
Bromodichloroemethane						
1,2-Dichloropropane						
Trichloroethene	177	176	0.56			
Dibromochloromethane						
1,1,2-Trichloroethane						
cis-1,2-Dichloropropene						
2-Chloroethylvinyl ether						
Bromoform						
1,1,2,2-Tetrachloreothane						
Tetrachlorethylene						
Chlorobenzene						
1,3-Dichlorobenzene						
1,2-Dichlorobenzene						
1,4-Dichlorobenzene						

$$RPD = \frac{|R_1 - R_2|}{(R_1 + R_2)/2} \times 100$$

RPD= Relative Percent Difference

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602087-01C

SAMPLE ID: 800159

DATE: 2-14-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 96%

2-BROMO-1-CHLOROPROPANE: 107%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602087-02C

SAMPLE ID: 860160

DATE: 2-14-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 106%

2-BROMO-1-CHLOROPROPANE: 106%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8002087-04B

SAMPLE ID: 8C0162

DATE: 2-14-86

INSTRUMENT: B

601/8010

BROMOCHLOROMETHANE: 114%

2-BROMO-1-CHLOROPROPANE: 110%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602087-05B

SAMPLE ID: 8601103

DATE: 2-15-86

INSTRUMENT: G

601/8010

BROMOCHLOROMETHANE: 91%, 88%

2-BROMO-1-CHLOROPROPANE: 122%, 108%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602087-CCA

SAMPLE ID: TRIP BLANK

DATE: 2-15-86

INSTRUMENT: A

601/8010

BROMOCHLOROMETHANE: 93%

2-BROMO-1-CHLOROPROPANE: 99%

602/8020

a,a,a-TRIFLUOROTOLUENE: _____

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602087-01E

SAMPLE ID: 800159

DATE: 2-14-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 116%, 101%

RADIAN CORPORATION

SURROGATE RECOVERIES

LAB #: 8602087-05E

SAMPLE ID: 8600160

DATE: 2-14-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 110%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602087-04D

SAMPLE ID: 8601602

DATE: 2-14-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 97%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8602087-05D

SAMPLE ID: 8601163

DATE: 2-14-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 107%

RADIAN
CORPORATION

SURROGATE RECOVERIES

LAB #: 8002087-06B

SAMPLE ID: FIELD BLANK

DATE: 2-14-86

INSTRUMENT: D

601/8010

BROMOCHLOROMETHANE: _____

2-BROMO-1-CHLOROPROPANE: _____

602/8020

a,a,a-TRIFLUOROTOLUENE: 105%

SACTO

RADIAN CORPORATION

EPA 625 860163, 860162 **CHAIN OF CUSTODY RECORD**

Field Sample No. _____

Company Sampled/Address General Dynamics, Ft. Worth, Plant 4

Sample Point Description Groundwater

Stream Characteristics:

Temperature _____ Flow _____ pH _____

Visual Observations/Comments _____

Collector's Name Wendy Johnson Date/Time Sampled 2-13-86

Amount of Sample Collected ~~three~~ 1000ml glass

Sample Description Groundwater

Store at: ☐ Ambient ☐ 5°C ☐ −10°C ☒ Other 4° C

☒ Caution · No more sample available ☐ Return unused portion of sample ☐ Discard unused portions

Other Instructions · Special Handling · Hazards _____

☒ Hazardous sample (see below) ☐ Non-hazardous sample

☒ Toxic	☐ Skin irritant	☐ Flammable (FP< 40°C)
☐ Pyrophoric	☐ Lachrymator	☐ Shock sensitive
☐ Acidic	☐ Biological	☒ Carcinogenic · suspect
☐ Caustic	☐ Peroxide	☐ Radioactive
☐ Other _____		

Sample Allocation/Chain of Possession:

Organization Name Radian

Received By _____ Date Received _____ Time _____

Transported By Wendy Johnson Lab Sample No. 86-02-091

Comments _____

Inclusive Dates of Possession 2-13-86

Organization Name Radian Analytical Services

Received By C. Rasmussen Date Received 2-14-86 Time 10:20

Transported By Federal Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

Organization Name _____

Received By _____ Date Received _____ Time _____

Transported By _____ Lab Sample No. _____

Comments _____

Inclusive Dates of Possession _____

END

DATE

FILMED

4-88

DTIC