

RI Sampling Plan for Follow Up Soil Vapor Surveys

July 20, 2007

CASMALIA SITE REMEDIATION PROJECT

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July 20, 2007

To: Russell Mechem – EPA
Rich Hiett – EPA

Subject: RI Sampling Plan for Follow Up Soil Vapor Surveys

The Casmalia Steering Committee (CSC) submitted a Final *Spring, 2006 Phase II Sampling Memorandum* to EPA on May 25, 2006 that summarized the Phase II RI soil sampling, soil vapor sampling, clay barrier sampling, and piezometer installation work that we had proposed to address agency comments on the Phase I RI work. EPA approved that Plan and the CSC completed that RI sampling in the summer of 2006. That sampling included three “step out” soil vapor probes that were located north of the site (RISVCL-3D, RISVCL-5D, and RISVCL-8D).

This memorandum discusses some follow-up soil vapor sampling the CSC is proposing to complete at the three soil vapor probe locations listed above. The purpose of this proposed follow-up sampling program is to determine if the elevated levels of 1,3 Butadiene measured in these three soil vapor probes was accurate or was an artifact of possible lab interference when using EPA Method TO-15 at the Air Toxics Lab.

The CSC previously identified and discussed this potential analytical interference in an email to EPA dated July 16, 2007. As discussed in that email, studies have indicated that it is difficult to differentiate or properly speciate between 1,3 Butadiene and C3 and C4 organic compounds using the TO-15 Method. This lab interference is discussed in detail in the Newfields Environmental Forensics Lab memo we have attached to this Plan. As shown in Table 4-2 which summarizes the soil vapor sampling results for RISVCL-03, 05, and 08 and their respective stepout sampling locations, these soil vapor samples contained significant concentrations of C3 and C4 compounds which may be creating false 1,3 Butadiene readings in the TO-15 analysis we reported.

This memorandum summarizes the sampling program, sampling locations, expected analytical program for all samples, and refers back to the applicable SOPs, SAP, and QAPP of the revised Final RI/FS Work Plan.

The schedule for the proposed follow up soil vapor probe sampling work is tentatively set for September of this year. We will set exact dates and notify EPA in advance of the work once we have EPA approval to proceed.

Soil Vapor Samples

The CSC will collect soil vapor samples at three locations that were previously sampled in 2006. Those locations include RISVCL-3D, RISVCL-5D, and RISVCL-8D and are generally located

outside the north and east boundary of the site. The locations of all three soil vapor sample locations were shown on revised Figure 4.1-P2 which we have again attached to this memorandum. The CSC and representatives for EPA will walk the previous locations in the field prior to completing the survey work to agree on these final locations.

As we have done for all of the past soil vapor samples, the soil vapor samples will be collected using temporary driven probes that will be advanced to a depth of 7.5 feet (the midpoint of the depth range of 5 to 10 feet). Soil vapor samples will be collected as detailed in SOP 1-9 of the June 3, 2004 revised Final RI/FS Work Plan that uses the guidelines from the advisory on active soil gas investigations prepared by the DTSC and Los Angeles RWQCB (DTSC and LARWQCB, January 2003). The samples will be collected in SUMMA canisters provided by a certified laboratory and will be split at each location so that one of the split samples can be analyzed for VOCs using USEPA Method TO-15 at Air Toxics Lab and the other split sample can be analyzed using a Selective Ion Monitoring or TO-15 SIM method at Newfields Environmental Forensics Lab. As discussed in our July 16, 2007 email to EPA, the Newfields Lab has developed an analytical method that is able to avoid the lab interference that may be the cause of false positives or elevated readings for 1,3 Butadiene in the previous soil vapor samples that the CSC has collected at the site.

The proposed soil vapor work will adhere to the same laboratory requirements for analytical work for this type of sampling as was required by the June 3, 2004 revised Final RI/FS Work Plan (this can be found in Appendix B QAPP of the Work Plan).

The CSC has summarized this additional proposed soil vapor sampling as marked on Table 4.4-Soil Vapor Follow Up attached to this memorandum. As we noted above, the three soil vapor locations will be the same as the previous RI sampling locations completed in 2006. The CSC will confirm the locations and provide all of those coordinates as part of our final reporting of the data. Additional details on soil vapor sampling can also be found in Section A6.5.10 of the SAP (Appendix A) of the June 3, 2005 revised Final RI/FS Work Plan.

Documentation

The CSC will document the additional or follow-up soil vapor sampling using the same procedures and requirements as were required by the June 3, 2004 revised Final RI/FS Work Plan and the previous Fall 2005 Phase II RI Sampling memorandums.

The project documentation requirements of the RI/FS Work Plan are specifically discussed in Section 11.2 of the Work Plan. All data collected during the Phase II RI sampling will be added to the electronic database and copies of that database will be provided to EPA as part of the RI Report.

Field Supervision and Coordination with EPA

The CSC expects that the proposed soil vapor sampling will be performed by GeoSyntec (Robbie Ettinger). As required, the CSC's Project Coordinator will also provide supervision of GeoSyntec while they are in the field.

In all cases we will notify EPA's on site representative of our plans to conduct the sampling at least

48 hours in advance of beginning the work. The CSC will coordinate any field work with EPA using the same guidelines that are discussed in Section 11 of the June RI/FS Work Plan that we had established for the Phase I RI work. That coordination specifically includes the requirements to coordinate with EPA as discussed in Section 11.3 of the Work Plan (and in Section A6.1 of the Sampling Analysis Plan or Appendix A of the Work Plan) and to hold daily status meetings as discussed in Section 11.5 of the Work Plan. In addition, the CSC will continue to use the management of change procedures that we had agreed with EPA prior to beginning the Phase I RI work (please see Section 11.7 of the Work Plan). Any change in sampling procedures or analytical reporting that were documented in an approved RICH form for Phase I RI sampling will also apply to the Phase II RI sampling.

Regards,

Corey Bertelsen
Casmalia Project Coordinator

Attachments

Table 4.4- Soil Vapor Follow Up
Table 4.2 Soil Vapor Stepout Sample Results
Figure 4.1-P2-rev.05.25.06
Newfields Memorandum

cc Jim Dragna – BM
Glenn Anderson – Chevron
Dave Roberson - ExxonMobil
Dan Niles – RWQCB
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TABLE 4-4- Soil Vapor Follow Up Sampling

Area	Approximate # Samples			Approx. Boring Depth	VOC	Poor Purging Organics	Pest/PCB	Herb	PCB Congeners	AV/SEM	TOC/FOC	Mod Appx IX	Dioxin/Furans(2)	Hydraulic Conductivity	Comments
	# Loc's	# per Loc'n	Total												
Capped Landfills Area															
Soil Vapor Sampling															
Sample ID	3	1	3	7.5											
	Nothing	Existing	Type												
RIS/VCL-5D	TBD	TBD	TTYPE1		X										Samples will be split and sent to Air Toxics for TO-15 and Newfields for TO-15 SIM
RIS/VCL-5D	TBD	TBD	TTYPE1		X										Samples will be split and sent to Air Toxics for TO-15 and Newfields for TO-15 SIM
RIS/VCL-5D	TBD	TBD	TTYPE1		X										Samples will be split and sent to Air Toxics for TO-15 and Newfields for TO-15 SIM

Sample Depth / Sample Collection Notes:

Anticipated sampling methods -

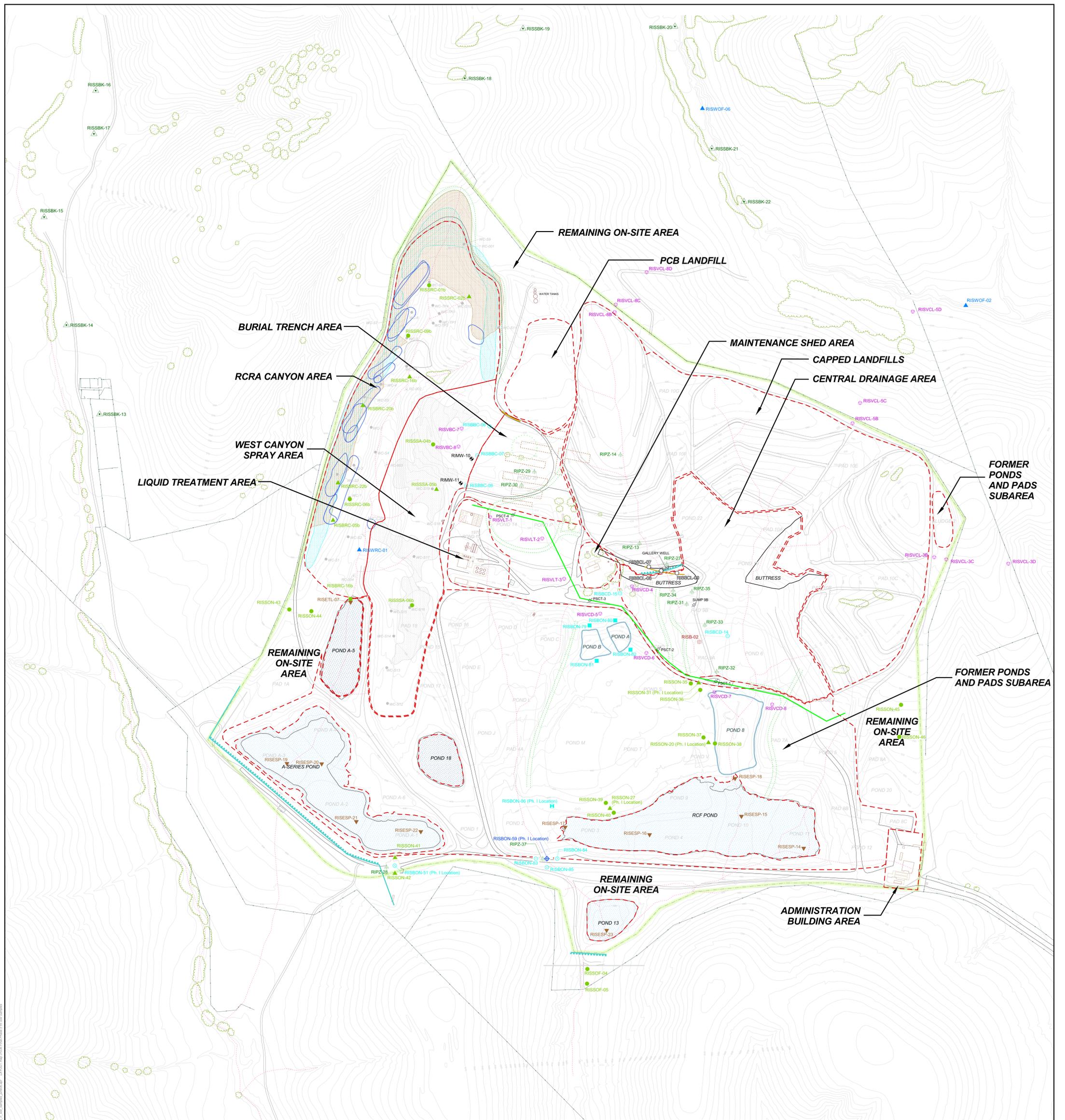
Type 1 Samples: Direct Push Rig

Table 4-2
Soil Vapor Sample Results for RISCVL-03, 05, 08 and Stepout Locations

COMPOUND NAME	RISVCL-03	RISVCL-03B	RISVCL-03C	RISVCL-03D	RISVCL-05	RISVCL-05B	RISVCL-05C		RISVCL-05D
	09/20/04	11/11/05	11/14/05	7/31/06	09/20/04	11/11/05	11/14/05		7/31/06
Sample Type	Primary Sample	Field Duplicate	Primary Sample						
1,1,1-Trichloroethane	<2.6	<10	<31	<44	<4.3	<24	<33	<34	<1.8
1,1,2,2-Tetrachloroethane				<56					<2.3
1,1,2-Trichloroethane	<2.6	<10	<31	<44	<4.3	<24	<33	<34	<1.8
1,1-Dichloroethane	<1.9	<7.7	<23	<33	<3.2	<18	<25	<25	<1.4
1,1-Dichloroethene	<1.8	<7.6	<23	<32	<3.1	<17	<24	<25	<1.3
1,2,4-Trichlorobenzene				<300					<12
1,2,4-Trimethylbenzene	<2.3	34	<28	<40	<3.9	47	29	<31	11
1,2-Dibromoethane (EDB)				<63					<2.6
1,2-Dichloroethane				<33					<1.4
1,2-Dichloropropane	<2.2	<8.8	<26	<38	<3.6	<20	<28	<29	<1.6
1,3,5-Trimethylbenzene				<40					2.4
1,3-Butadiene	22	63	<63	<90	76	120	<68	<69	15
1,3-Dichlorobenzene				<49					<2.0
1,4-Dichlorobenzene				<49					<2.0
1,4-Dioxane				<150					<6.0
2-Butanone (Methyl Ethyl Ketone)	2200	1900	3800	490	2300	1900	3700	4900	300
2-Hexanone	970	220	290	<170	730	190	250	300	71
2-Propanol	620	<19	<70	<100	820	<43	<75	<77	33
3-Chloropropene				<130					<5.2
4-Ethyltoluene				<200					<8.2
4-Methyl-2-pentanone	19	<7.8	<120	<170	<16	<18	<120	<130	<6.9
Acetone	4500	280	340	5300	7200	420	330	430	2800
alpha-Chlorotoluene				<42					<1.7
Benzene	2.6	39	23	42	31	66	<20	<20	22
Bromodichloromethane				<270					<11
Bromoform				<420					<17
Bromomethane	<1.8	<7.4	<22	<32	10	<17	<24	<24	<1.3
Carbon Disulfide	<7.3	7	<89	<130	23	<14	<95	<98	8.8
Carbon Tetrachloride	<2.9	<12	<36	<51	<5	<28	<38	<40	<2.1
Chlorobenzene				<38					<1.5
Chloroethane	<1.2	<5	<15	<22	5.4	<12	<16	<16	<0.89
Chloroform	<2.3	<9.3	<28	<40	<3.8	<21	<30	<31	3.8
Chloromethane	2.7	<16	<12	<17	55	<36	<13	<13	2.8
cis-1,2-Dichloroethene	<1.8	<7.6	<22	<32	<3.1	<17	<24	<25	<1.3
cis-1,3-Dichloropropene				<37					<1.5
Cyclohexane	<8	8.5	<98	<140	<14	19	<100	<110	<5.8
Dibromochloromethane				<350					<14
Ethanol	250	63	83	120	420	100	120	120	100
Ethyl Benzene	<2	15	<25	<35	<3.4	24	<26	<27	8.1
Freon 11	7.3	<11	<32	<46	<4.4	<24	<34	<35	<1.9
Freon 113	21	<15	<44	<63	62	5700	<47	<48	<2.6
Heptane	40	39	<120	<170	50	80	<120	<130	23
Hexachlorobutadiene				<440					<18
Hexane	30	90	<100	<140	50	170	<110	<110	18
m,p-Xylene	<2	61	25	<35	5.6	88	31	28	30
Methyl tert-butyl ether				<150					<6.0
Methylene Chloride	<3.2	<6.6	<40	<57	<5.5	<15	<42	<44	2.5
o-Xylene	<2	26	<25	<35	<3.4	41	<26	<27	9.4
Styrene	<2	<8.1	<24	<35	<3.4	<19	<26	<27	1.6
Tetrachloroethene	3.6	<13	<39	<55	7.9	<30	<42	<42	4.1
Tetrahydrofuran	<6.9	<5.6	<84	<120	<12	<13	<90	<92	<5.0
Toluene	2.4	62	26	38	19	100	<23	<24	30
trans-1,3-Dichloropropene				<37					<1.5
Trichloroethene	<2.5	<10	<31	<44	<4.2	<24	<33	<34	<1.8
Vinyl Acetate				<140					<5.9
Vinyl Chloride	<1.2	5.1	<14	<21	<2	<11	<16	<16	<0.86

Table 4-2
Soil Vapor Sample Results for RISCVL-03, 05, 08 and Stepout Locations

COMPOUND NAME	RISVCL-08 08/17/04	RISVCL-08B 11/11/05		RISVCL-08C 11/14/05	RISVCL-08D 7/31/06
	Primary Sample	Primary Sample	Lab Duplicate	Primary Sample	Primary Sample
1,1,1-Trichloroethane	<2.6	<23	<18	<59	<1.8
1,1,2,2-Tetrachloroethane					<2.2
1,1,2-Trichloroethane	<2.6	<23	<18	<59	<1.8
1,1-Dichloroethane	<2	<17	<14	<44	<1.3
1,1-Dichloroethene	<1.9	120	110	<43	<1.3
1,2,4-Trichlorobenzene					<12
1,2,4-Trimethylbenzene	7.9	33	28	<54	14
1,2-Dibromoethane (EDB)					<2.5
1,2-Dichloroethane					<1.3
1,2-Dichloropropane	<2.2	<19	<16	<50	<1.5
1,3,5-Trimethylbenzene					4.4
1,3-Butadiene	15	47	40	<120	18
1,3-Dichlorobenzene					<1.9
1,4-Dichlorobenzene					<1.9
1,4-Dioxane					6
2-Butanone (Methyl Ethyl Ketone)	250	1000	950	8000	340
2-Hexanone	43	<69	69	610	70
2-Propanol	21	<41	<33	<130	38
3-Chloropropene					<5.0
4-Ethyltoluene					<7.9
4-Methyl-2-pentanone	<10	<17	<14	<220	<6.6
Acetone	2000	340	320	460	2400
alpha-Chlorotoluene					<1.7
Benzene	5	<13	13	<35	49
Bromodichloromethane					<11
Bromoform					<17
Bromomethane	<1.9	<16	<13	<42	<1.2
Carbon Disulfide	<7.6	<13	<10	<170	5.2
Carbon Tetrachloride	<3	<26	<21	<68	<2.0
Chlorobenzene					<1.5
Chloroethane	<1.3	<11	<8.9	<29	<0.85
Chloroform	<2.4	<20	<16	<53	2.6
Chloromethane	13	<35	<28	<22	6.7
cis-1,2-Dichloroethene	<1.9	<17	<13	<43	<1.3
cis-1,3-Dichloropropene					<1.5
Cyclohexane	<8.4	350	330	<190	<5.5
Dibromochloromethane					<14
Ethanol	61	100	95	180	140
Ethyl Benzene	<2.1	<18	<14	<47	11
Freon 11	250	7400	7100	<61	<1.8
Freon 113	700	8700	8200	280	<2.5
Heptane	12	100	100	<220	72
Hexachlorobutadiene					<17
Hexane	35	660	610	<190	18
m,p-Xylene	3.2	45	42	71	41
Methyl tert-butyl ether					<5.8
Methylene Chloride	<3.4	<14	<12	<76	2.6
o-Xylene	2.8	18	17	<47	18
Styrene	<2.1	<18	<14	<46	2.8
Tetrachloroethene	<3.3	<28	<23	<74	7.4
Tetrahydrofuran	<7.2	<12	<9.9	<160	<4.7
Toluene	6.1	40	40	<41	49
trans-1,3-Dichloropropene					<1.5
Trichloroethene	<2.6	<22	<18	<58	3.7
Vinyl Acetate					<5.7
Vinyl Chloride	440	4000	3700	<28	<0.82



Explanation

- | | | | |
|---|---|---|--|
| <ul style="list-style-type: none"> Soil Sample Locations ● Soil Vapor (Type 1) ● Surface Soil (Type 2) ● Surface and Shallow Soil (Type 3) ● Surface and Medium Soil (Type 5) ● Deep Soil (Type 6) ● NAPL (Type 7) ● Sediment (Type 8a/8b) ● Surface Water (Type 9) ● Piezometer (Type 10) ● Background Soil | <ul style="list-style-type: none"> ○ PIS Landfill Clay Barrier Samples ○ Geologic Boring ○ Monitoring Well <p>Other Site Features</p> <ul style="list-style-type: none"> ○ Liquids Extraction Well ○ Historical Soil Samples ○ Casmaia Site Boundary ○ Study Area Boundary ○ Perimeter Source Control Trench (Brenly & Lyman, 1989) ○ Perimeter Control Trench (Brenly & Lyman, 1989) | <ul style="list-style-type: none"> ○ Terraces and Surface Impoundments (Based on 10/06/83 & 07/05/84 Photos) ○ Burial Trench Location (Woodward Clyde (Figure A21-1-1, 1988)) ○ Clay Barrier/Extraction Trench (Figure 21-1 Woodward-Clyde, 1988) ○ PIS Landfill Clay Barrier (1981 Photograph) ○ PCB Landfill Clay Barrier (Woodward Clyde, 1988) ○ Historical Natural Drainage (Based on 1956 Photo, 1974 and 1974 Topographic Maps, and Figures 21-2 and 21-3 Woodward-Clyde, 1988) ○ Historical Features | <ul style="list-style-type: none"> ○ Road Remnants ○ Fence ○ Oil Field Waste Spreading Area (Woodward Clyde (Figure A21-1-1, 1988)) ○ Oil Field Waste Spreading Area (Based on 1983, 1983/86 Photos) ○ 1983 Spray Area ○ Stormwater Pond ○ Treated Liquid Impoundment |
|---|---|---|--|

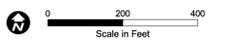


Figure 4.1-Phase II
Final Phase II RI Soil Samples
 Casmaia Site Remedial Investigation
 May 25, 2006

Source: Topographic base map provided by Pacific Engineering, Inc. from aerial survey dated March 4, 2004.

