FTC&H **Fax**

Total Pages Including Cover Page: 13

Sanicem

TO:	Ms. Diane Kavanaugh Vetort - MDEQ-AQD		
FAX:	734-432-~~1429~~ 1278	**TELEPHONE:**	734-432-1254
FROM:	Lindsey Smith		
FAX:	616-464-3992	**TELEPHONE:**	616-464-3732
DATE:	January 28, 2004	**PROJECT NO.:**	G01426
RE:	Former Sanicem Landfill, Auburn Hills, Michigan		

US EPA RECORDS CENTER REGION 5
469800

If any part of this fax is missing or not clearly received, please contact Lora Ratliff.

Diane,

As you requested in your telephone conference with Jackie Linck and Bob Zwald on January 28, 2004, I am submitting the analytical results from the air sample taken at the former Sanicem landfill, the emissions calculations, and the SCREEN 3 model results.

Dispersion modeling with SCREEN3 was performed to predict the impact of toxic air contaminants on ambient air quality. Table 1 attached summarizes the Emission Calculations and indicates the Screening Levels as listed in the MDEQ *Michigan Air Toxics System Initial Threshold Screening Level/Initial Risk Screening Level (ITSL/IRSL) Toxics Screening Level Query*. Because the soil vapor extraction system stack is the only discharge point at the stationary source, the predicted ambient impact for Furan was compared to the Secondary Risk Screening Level (SRSL).

If you have any questions, feel free to call myself at the number listed above or Jackie Linck at (616) 464-3736.

cc: Bob Zwald - FTC&H

RECEIVED
JAN 29 2004
AIR QUALITY DIV.
SEMI OFFICE

R:\01426\FAX COVER TO AQD.DOC

FISHBECK, THOMPSON, CARR & HUBER, INC. Engineers • Scientists • Architects
1515 Arboretum Drive, SE, Grand Rapids, MI 49546 Telephone: 616-575-3824

Nick 517373 4921

Table 1 – Emission Calculations from Analytical Data
Permit to Install Application for Soil Vapor Extraction Process
Former Sanicem Landfill, Auburn Hills, Michigan

CAS #	Compound	Analytical Result (ng/L)	Stack Flow Rate (cfm)	Emissions (g/hr)	Emissions (lb/hr)	Monthly Emissions (lb/month)	Model Impact (µg/m³/lb/hr)	Predicted Ambient Impact (µg/m³)	Screening Level (µg/m³)	Averaging Time	Basis	% of Screening Level
74-82-8	Methane	11,124,744	250	4.73E+03	1.04E+01	7751	--	---	---	---	--	---
7664-41-7	Ammonia	278	250	1.18E-01	2.60E-04	0.194	230.92	0.060	100	24 hr	ITSL	0.06%
630-08-0	Carbon Monoxide	4,352	250	1.85E+00	4.08E-03	3.032	404.11	1.647	10260	8 hr	ITSL	0.02%
							577.3	2.353	39900	1 hr	ITSL	0.01%
115-07-1	Propylene	1,374	250	5.84E-01	1.29E-03	0.957	230.92	0.297	1500	24 hr	ITSL	0.02%
	Total VOC	*150,000*	*250*	*6.37E+01*	*1.40E-01*	*104.5*	---	---	---	---	--	---
75-71-8	Dichlorodifluoromethane	8,500	250	3.61E+00	7.96E-03	5.922	404.11	3.217	49500	8 hr	ITSL	0.01%
75-09-2	Methylene Chloride	97	250	4.12E-02	9.08E-05	0.068	46.18	0.0042	2	annual	IRSL	0.21%
							46.18	0.0042	20	annual	SRSL	0.02%
156-59-2	cis 1,2-Dichloroethene	14	250	5.95E-03	1.31E-05	0.010	230.92	0.0030	35	24 hr	ITSL	0.01%
71-43-2	Benzene	20	250	8.50E-03	1.87E-05	0.014	230.92	0.0043	30	24 hr	ITSL	0.01%
							46.18	0.0009	0.1	annual	IRSL	0.86%
							46.18	0.0009	1	annual	SRSL	0.09%
79-01-6	Trichloroethylene	23	250	9.77E-03	2.15E-05	0.016	46.18	0.0010	0.6	annual	IRSL	0.17%
							46.18	0.0010	6	annual	SRSL	0.02%
108-88-3	Toluene	82	250	3.48E-02	7.66E-05	0.057	230.92	0.018	400	24 hr	ITSL	0.004%
127-18-4	Tetrachloroethene	27	250	1.15E-02	2.53E-05	0.019	46.18	0.0012	1.7	annual	IRSL	0.07%
							46.18	0.0012	17	annual	SRSL	0.01%
108-90-7	Chlorobenzene	12	250	5.10E-03	1.12E-05	0.008	230.92	0.0026	70	24 hr	ITSL	0.004%
100-41-4	Ethylbenzene	230	250	9.77E-02	2.15E-04	0.160	230.92	0.050	1000	24 hr	ITSL	0.005%
							46.18	0.010	3	annual	IRSL	0.33%
							46.18	0.010	30	annual	SRSL	0.03%
108-42-3	m,p-Xylene	280	250	1.19E-01	2.62E-04	0.195	230.92	0.061	100	24 hr	ITSL	0.06%
95-47-6	o-Xylene	350	250	1.49E-01	3.28E-04	0.244	230.92	0.076	100	24 hr	ITSL	0.08%
100-42-5	Styrene	27	250	1.15E-02	2.53E-05	0.019	230.92	0.006	1000	24 hr	ITSL	0.00%
							46.18	0.0012	1.7	annual	IRSL	0.07%
							46.18	0.0012	17	annual	SRSL	0.01%
98-82-8	Isopropylbenzene	96	250	4.08E-02	8.99E-05	0.067	230.92	0.021	400	24 hr	ITSL	0.01%
103-65-1	n-Propylbenzene	29	250	1.23E-02	2.72E-05	0.020	46.18	0.0013	20	annual	ITSL	0.01%
108-67-8	1,3,5-Trimethylbenzene	78	250	3.31E-02	7.30E-05	0.054	404.11	0.030	1230	8 hr	ITSL	0.002%
95-36-3	1,2,4-Trimethylbenzene	35	250	1.49E-02	3.28E-05	0.024	404.11	0.013	1230	8 hr	ITSL	0.001%
99-87-6	p-Isopropyltoluene	120	250	5.10E-02	1.12E-04	0.084						
106-46-7	1,4-Dichlorobenzene	110	250	4.67E-02	1.03E-04	0.077	230.92	0.024	800	24 hr	ITSL	0.003%
							46.18	0.0048	0.14	annual	IRSL	3.40%
							46.18	0.0048	1.4	annual	SRSL	0.34%
104-51-8	n-Butylbenzene	7	250	2.97E-03	6.55E-06	0.005						
106-97-8	C4 (Butane)	930	250	3.95E-01	8.71E-04	0.648	404.11	0.352	19000	8 hr	ITSL	0.002%
	C3-C5 Hydrocarbon	3,500	250	1.49E+00	3.28E-03	2.438						
	C4-C6 Hydrocarbon	700	250	2.97E-01	6.55E-04	0.488						
109-66-0	C5 (Pentane)	960	250	4.08E-01	8.99E-04	0.669	404.11	0.363	17700	8 hr	ITSL	0.002%
110-00-9	Furan	14	250	5.95E-03	1.31E-05	0.010	230.92	0.0030	4	24 hr	ITSL	0.08%
							46.18	0.00061	0.0002	annual	IRSL	303%
							46.18	0.00061	0.002	annual	SRSL	30.3%
107-83-5	2-Methylpentane	120	250	5.10E-02	1.12E-04	0.084	404.11	0.045	17600	8 hr	ITSL	0.0003%
	C5-C7 Hydrocarbon	92	250	3.91E-02	8.62E-05	0.064						
592-41-6	1-Hexene	160	250	6.80E-02	1.50E-04	0.111						
110-54-3	C6 (Hexane)	290	250	1.23E-01	2.72E-04	0.202	230.92	0.063	200	24 hr	ITSL	0.03%
96-37-7	Methylcyclopentane	120	250	5.10E-02	1.12E-04	0.084						
	C6-C8 Hydrocarbon (16.0 min)	110	250	4.67E-02	1.03E-04	0.077						

Table 1 – Emission Calculations from Analytical Data
Permit to Install Application for Soil Vapor Extraction Process
Former Sanicem Landfill, Auburn Hills, Michigan

CAS #	Compound	Analytical Result (ng/L)	Stack Flow Rate (cfm)	Emissions (g/hr)	Emissions (lb/hr)	Monthly Emissions (lb/month)	Model Impact (µg/m³/lb/hr)	Predicted Ambient Impact (µg/m³)	Screening Level (µg/m³)	Averaging Time	Basis	% of Screening Level
110-82-7	Cyclohexane	150	250	6.37E-02	1.40E-04	0.105	230.92	0.032	6000	24 hr	ITSL	0.001%
	C6-C8 Hydrocarbon (16.4 min)	130	250	5.52E-02	1.22E-04	0.091						
142-82-5	C7 (Heptane)	470	250	2.00E-01	4.40E-04	0.327	404.11	0.178	3500	8 hr	ITSL	0.01%
	C6-C8 Hydrocarbon (18.7 min)	430	250	1.83E-01	4.03E-04	0.300						
	C7-C9 Hydrocarbon (19.8 min)	540	250	2.29E-01	5.06E-04	0.376						
	C7-C9 Hydrocarbon (20.2 min)	520	250	2.21E-01	4.87E-04	0.362						
	C7-C9 Hydrocarbon (20.7 min)	480	250	2.04E-01	4.49E-04	0.334						
111-65-9	C8 (Octane)	1,100	250	4.67E-01	1.03E-03	0.766						
	C7-C9 Hydrocarbon (21.1 min)	140	250	5.95E-02	1.31E-04	0.098						
	C7-C9 Hydrocarbon (21.7 min)	190	250	8.07E-02	1.78E-04	0.132						
	C7-C9 Hydrocarbon (22.0 min)	330	250	1.40E-01	3.09E-04	0.230						
	C7-C9 Hydrocarbon (22.3 min)	220	250	9.34E-02	2.06E-04	0.153						
	C7-C9 Hydrocarbon (22.5 min)	120	250	5.10E-02	1.12E-04	0.084						
	C8-C10 Hydrocarbon (22.7 min)	670	250	2.85E-01	6.27E-04	0.467						
	C8-C10 Hydrocarbon (22.8 min)	520	250	2.21E-01	4.87E-04	0.362						
	C8-C10 Hydrocarbon (23.0 min)	390	250	1.66E-01	3.66E-04	0.272						
	C8-C10 Hydrocarbon (23.2 min)	1,200	250	5.10E-01	1.12E-03	0.836						
	C8-C10 Hydrocarbon (24.4 min)	2,200	250	9.34E-01	2.06E-03	1.533						
	C8-C10 Hydrocarbon (25.5 min)	1,400	250	5.95E-01	1.31E-03	0.975						
	C9-C11 Hydrocarbon (25.8 min)	3,500	250	1.48E+00	3.28E-03	2.438						
	C9-C11 Hydrocarbon (25.9 min)	1,300	250	5.52E-01	1.22E-03	0.906						
80-56-8	n-Pinene	6,900	250	2.93E+00	6.46E-03	4.807	404.11	2.611	1120	8 hr	ITSL	0.23%
	C9-C11 Hydrocarbon (26.4 min)	2,400	250	1.02E+00	2.25E-03	1.672						
	C9-C11 Hydrocarbon (26.8 min)	1,900	250	8.07E-01	1.78E-03	1.324						
	C9-C11 Hydrocarbon (26.9 min)	1,100	250	4.67E-01	1.03E-03	0.766						
124-18-5	C10 (Decane)	4,200	250	1.78E+00	3.93E-03	2.926						
	A substituted cyclohexane	5,000	250	2.12E+00	4.68E-03	3.483						
3777-69-3	2-Pentyl furan	5,000	250	2.12E+00	4.68E-03	3.483						
	C10-C12 Hydrocarbon (28.6 min)	4,500	250	1.91E+00	4.21E-03	3.135						
	C10-C12 Hydrocarbon (28.7 min)	2,200	250	9.34E-01	2.06E-03	1.533						
	C10-C12 Hydrocarbon (28.9 min)	2,200	250	9.34E-01	2.06E-03	1.533						
	C10-C12 Hydrocarbon (29.1 min)	7,100	250	3.02E+00	6.66E-03	4.947						
	C10-C12 Hydrocarbon (29.6 min)	1,000	250	4.25E-01	9.36E-04	0.697						
108-95-2	Phenol	1,100	250	4.67E-01	1.03E-03	0.766	577.30	0.595	600	1 hr	ITSL	0.10%
	C10-C12 Hydrocarbon (29.8 min)	1,200	250	5.10E-01	1.12E-03	0.836						
91-17-8	Decahydronaphthalene	1,000	250	4.25E-01	9.36E-04	0.697						
	2-Methyl Decahydronaphthalene	310	250	1.32E-01	2.90E-04	0.216						
	C10-C12 Hydrocarbon (31.6 min)	450	250	1.91E-01	4.21E-04	0.314						

ng/L - nano gram per liter
g/hr - gram per hour
lb/hr - pound per hour
µg/m³/lb/hr - micrograms per cubic meter per pound per hour
L/hr - liter per hour
g/lb - gram per pound

A nano gram per liter is equivalent to a micro gram per cubic meter, ng/L = µg/m³
Analytical Result: Taken from analytical report. Per conversation with Prism lab director Randall Fike, calculated value was used when given. For methane, ammonia, carbon monoxide, and propylene
ng/L was calculated from parts per million (ppm) result using the formula: ng/L = µg/m³ = [(ppm)(MW) / (24.45)] X 1000
Flow Rate in L/hr = 250 ft³/min * 60 min/1 hr * 28.3168467 L/1 ft³ = 424753 L/hr
Emissions in g/hr were calculated by dividing analytical result by 10^9 and multiplying by flow rate, 424753 L/hr.
Emissions in lb/hr were calculated by dividing g/hr by 453.59 g/lb.
Monthly emissions are based on operating 24 hours per day, 31 days per month.
Model impact is given by SCREEN3 results based on averaging time for screening level.
Potential Ambient Impact is determined by multiplying the model impact by actual lb/hr emissions.

pati prism analytical technologies, inc.

Analytical Report

Client: FTC&H
Project: Brown-Sanicem LF G01426
Location: Auburn Hills
Sampled By: APA

C.O.C. No.: 8974
Samples Received: 01/21/2004
Report Date: 01/22/2004

TB002-MS Air Scan Analysis: All results are reported in ng/L

A scan was made for all compounds contained in the attached Air Survey analysis List (TB503, Rev. 10, Quantitative A & B and Semiquantitative). All compounds detected are listed below:

Page 1 of 5

Client Sample ID: Effluent
Laboratory ID: 8974 - 1
Date Sampled: 01/20
Date Analyzed: 01/21 Volume: 5. L

Detection Limits

Quantitative List A:	2 ng/L
Quantitative List B:	- ng/L
Semiquantitative List:	50 ng/L

Compound	Calculated Result	Actual Result	Comments
Note:			Quantitative List B is not included in a TB002-MS analysis
Total VOC's	150,000	75K-300K	Total volatile organic compounds calculated based on internal standard ratio. Does not include C1, C2, or methanol.
Dichlorodifluoromethane		8500	Freon 12 ppb 1700 MW 120 CAS 75-71-8
Methylene Chloride		97	Dichloromethane ppb 28 MW 84 CAS 75-09-2
cis 1,2-Dichloroethene		14	cis 1,2-DCE ppb 3.5 MW 96 CAS 156-59-2
Benzene		20	Cyclohexatriene ppb 6.2 MW 78 CAS 71-43-2
Trichloroethene		23	TCE ppb 4.3 MW 130 CAS 79-01-6
Toluene		82	Methyl benzene ppb 21 MW 92 CAS 108-88-3
Tetrachloroethene		27	PCE ppb 4.0 MW 164 CAS 127-18-4
Chlorobenzene		12	ppb 2.6 MW 112 CAS 108-90 7
Ethylbenzene		230	ppb 52 MW 106 CAS 100-41-4

1200 N. Fancher • Mt. Pleasant, MI 48858 • (989) 772-5088 • Fax (989) 772-6870

Client Sample ID: Effluent
Laboratory ID: 8974 - 1
Date Sampled: 01/20
Date Analyzed: 01/21 Volume: 5. L

Detection Limits

Quantitative List A:	2 ng/L
Quantitative List B:	- ng/L
Semiquantitative List:	50 ng/L

Compound	Calculated Result	Actual Result	Comments
m,p-Xylene		280	m,p-Dimethylbenzene ppb 64 MW 106 CAS 106-42-3
o-Xylene		350	o-Dimethylbenzene ppb 79 MW 106 CAS 95-47-6
Styrene		27	Vinylbenzene ppb 6.2 MW 104 CAS 100-42-5
Isopropylbenzene		96	Cumene ppb 19 MW 120 CAS 98-82-8
n-Propylbenzene		29	ppb 5.8 MW 120 CAS 103-65-1
1,3,5-Trimethylbenzene		78	ppb 16 MW 120 CAS 108-67-8
1,2,4-Trimethylbenzene		35	ppb 7.0 MW 120 CAS 95-36-3
p-Isopropyltoluene		120	4-Methyl isopropyl benzene ppb 22 MW 134 CAS 99-87-6
1,4-Dichlorobenzene		110	ppb 18 MW 146 CAS 106-46-7
n-Butylbenzene		7	ppb 1.3 MW 134 CAS 104-51-8
C 4	930	460-1900	Butane ppb 360 MW 58 CAS 106-97-8
C3-C5 Hydrocarbon	3500	1700-7000	5.3 min
C4-C6 Hydrocarbon	700	350-1400	8.9 min
C 5	960	480-2000	Pentane ppb 320 MW 72 CAS 109-66-0
Furan	14	7-28	ppb 4.9 MW 68 CAS 110-00-9
2-Methylpentane	120	60-240	ppb 33 MW 86 CAS 107-83-5
C5-C7 Hydrocarbon	92	46-190	12.5 min
1-Hexene	160	80-320	ppb 47 MW 84 CAS 592-41-6
C 6	290	140-580	Hexane ppb 81 MW 86 CAS 110-54-3
Methylcyclopentane	120	60-240	ppb 33 MW 84 CAS 96-37-7

Client Sample ID: Effluent
Laboratory ID: 8974 -1
Date Sampled: 01/20
Date Analyzed: 01/21 Volume: 5. L

Detection Limits

Quantitative List A:	2 ng/L
Quantitative List B:	- ng/L
Semiquantitative List:	50 ng/L

Compound	Calculated Result	Actual Result	Comments
C6-C8 Hydrocarbon	110	55-220	16.0 min
Cyclohexane	150	75-300	ppb 44 MW 84 CAS 110-82-7
C6-C8 Hydrocarbon	130	65-260	16.4 min
C 7	470	230-940	Heptane ppb 110 MW 100 CAS 142-82-5
C6-C8 Hydrocarbon	430	210-860	18.7 min; probably a substituted cyclohexane
C7-C9 Hydrocarbon	540	270-1100	19.8 min
C7-C9 Hydrocarbon	520	260-1100	20.2 min
C7-C9 Hydrocarbon	480	240-960	20.7 min; a substituted cyclohexane
C 8	1100	550-2200	Octane ppb 240 MW 114 CAS 111-65-9
C7-C9 Hydrocarbon	140	70-280	21.1 min; a substituted cyclohexane
C7-C9 Hydrocarbon	190	95-380	21.7 min; a substituted cyclohexane
C7-C9 Hydrocarbon	330	160-660	22.0 min
C7-C9 Hydrocarbon	220	110-440	22.3 min
C7-C9 Hydrocarbon	120	60-240	22.5 min; a substituted cyclohexane
C8-C10 Hydrocarbon	670	330-1400	22.7 min; a substituted cyclohexane
C8-C10 Hydrocarbon	520	260-1100	22.8 min; a substituted cyclohexane
C8-C10 Hydrocarbon	390	190-780	23.0 min
Note:			Due to heavy loading, the detection limit is increased to 1,000 ng/L from 23.0 through 31.0 min,
C8-C10 Hydrocarbon	1200	600-2400	23.2 min

pat prism analytical technologies, inc.

Analytical Report

Client:	**FTC&H**	**C.O.C. No.:**	**8974**
Project:	**Brown-Sanicom LF G01426**	**Samples Received:**	**01/21/2004**
Location:	**Auburn Hills**	**Report Date:**	**01/26/2004**
Sampled By:	**APA**		

TB002-IR Air Scan Analysis: **All results are reported in ppmv**

A scan was made for all compounds contained in the attached Air Survey analysis List (TB503, Rev. 10, Quantitative A & B and Semiquantitative). All compounds detected are listed below:

Client Sample ID:	Effluent		
Laboratory ID:	8974 - 2		
Date Sampled:	01/20		
Date Analyzed:	01/21	Volume:	1.3 L

Detection Limits

Quantitative List A:	- ppmv
Quantitative List B:	0.5 ppmv
Semiquantitative List:	- ppmv

Compound	Calculated Result	Actual Result	Comments
Note:			Only Quantitative List B is included in an AS002-IR or TB002-IR analysis
Methane		17.000	Methyl hydride MW 16 CAS 74-82-8
Ammonia		0.4	NH3 MW 17 CAS 7664-41-7
Carbon monoxide		3.8	CO MW 28 CAS 630-08-0
Propylene		0.8	Propene MW 42 CAS 115-07-1
Carbon dioxide		2.1 %	CO2; results reported as percent MW 44 CAS 124-38-9
Water		0.37%	H2O; results reported as percent MW 18 CAS 7732-18-5

These results have been reviewed and approved by the Laboratory Director.

Randall S. Ilke, Ph.D.

1200 N. Fancher • Mt. Pleasant, MI 48858 • (989) 772-5088 • Fax (989) 772-5870

Client Sample ID: Effluent
Laboratory ID: 8974 - 1
Date Sampled: 01/20
Date Analyzed: 01/21 Volume: 5. L

Detection Limits

Quantitative List A:	2 ng/L
Quantitative List B:	- ng/L
Semiquantitative List:	50 ng/L

Compound	Calculated Result	Actual Result	Comments
Decahydronaphthalene	1000	500-2000	ppb 180 MW 138 CAS 91-17-8
2-Methyl decahydronaphthalene	310	150-620	ppb 49
C10-C12 Hydrocarbon	450	220-900	31.6 min; contains oxygen, probably an alcohol

These results have been reviewed and approved by the Laboratory Director.

Randall S. Fike, Ph.D.

prism analytical technologies, inc.

Technical Bulletin
503 Rev 10

Semiquantitative List

Acetophenone
Acrolein
Acrylonitrile
Allyl alcohol (2-Propenol)
Allyl chloride
Benzaldehyde
Benzonitrile
Benzothiazole
Benzylalcohol
Benzylchloride
Biphenyl
1-Borneol
4-Bromo-1-butene
2-Bromo-1-chloropropane
Bromochloroacetonitrile
2-Bromochlorobenzene
3-Bromochlorobenzene
4-Bromochlorobenzene
Bromochlorofluoromethane
Bromoethene (Vinyl bromide)
Butanal
Iso-Butanol
2-Butanal
2-Butoxyethanol
2-Butoxyethylacetate
1-Butoxy-2-propanol
Di-n-Butylether
sec-Butylethylbenzene
2-n-Butylfuran
C 3
C 4
C 5
C 6
C 7
C 8
C 9
C 10
C 11
C 12
C 13
C 14
Camphene
Carbon disulfide
3-Carene
1-Chloro-1,1-difluoroethane
2-Chloroethylvinylether
1-Chloro-1-fluoroethene
Chlorotrifluoroethene
o-Cresol
m-Cresol
p-Cresol
Crotonaldehyde (trans-2-Butenal)
Cyclohexanone
Cyclopentanone
Decahydronaphthalene
Docanal
2,5-Dibromotoluene
1,4-Dichloro-2-butene (cis)
1,4-Dichloro-2-butene (trans)
1,1-Dichloro-1-fluoroethane
Dichlorofluoromethane
1,2-Dichlorotetrafluoroethane (CFC-114)
Diethyl ether
Diethylbenzene #
Diethyl disulfide
N,N-Diethylformamide
1,1-Dimethoxy-2-butene
1,1-Dimethoxyheptane
1,1-Dimethoxyhexane
Dimethoxymethane
1,1-Dimethoxynonane
1,1-Dimethoxyoctane
1,2-Dimethoxypropane
Dimethyl amine
N,N-Dimethylcyclohexanamine
1,1-Dimethylcyclohexane
Dimethylester of pentanodioic acid
Dimethyl ether
1,1-Dimethylethoxybenzene
Dimethyl disulfide
2,4-Dimethylfuran
2,3-Dimethylphenol
2,5-Dimethylphenol
Dimethyl sulfide
2,5-Dimethylfuran
2,6-Dimethyl-4-heptanone (Diisobutyl Ketone)
1,4-Dioxane
Dodecanal (Lauryl aldehyde)
1-Dodecanol (Lauryl alcohol)
1-Dodecene
Epichlorohydrin
4-Ethenylcyclohexene
Ethylacetate
Ethylcyclohexane
2-Ethyl-1-hexanol
Ethylmethylacrylate
2-Ethyl-4-methyl-1,3-dioxolane
Eucalyptol
Fenchone
5-Furaldehyde
Heptanal
Hexachloroethane
Hexanal
1-Hexanol
1-Hexene
3-Hexene
Iodomethane
Isobornylacetate
Isobutanol (2-Methyl-1-propanol)
Di-isopropyl ether
1-Isopulegol
Limonene
Linalool
Menthol
Methacrylate
Methoxybenzene
1-Methoxycyclohexene
2-Methoxyphenol
1-Methoxy-2-propanol
2-Methoxy-1-propanol
1-Methoxy-4-(2-propenyl)benzene
2-(1-Methoxy)propylacetate
Methylacrylate
Methylbenzoate
2-Methylbutanal
3-Methylbutanal
Methylbutylbenzene
Methylcyclohexane
Methylcyclopentane
1-Methylethylacetate
Bis (1-Methylethyl) benzene
Methylethylbenzene #
Methylethylsulfide
2-Methylfuran
Methylisothiocyanate
Methylmethacrylate
Methylnaphthalene #
3-Methylocetane
2-Methyl-1-propene
Methyl salicylate
2-(Methylthio)-butane
Methylthiophene
Myrcene
MTBE (Methyl tert butyl ether)
Nonanal
Octanal
Pentachloroethane
1,3-Pentadiene
Pentamethylheptane
1-Pentanol
1-Pentylacetate
2-Pentylfuran
Phenol
2-Picoline
α-Pinene
β-Pinene
Propanal
n-Propylacetate
n-Propylamine
Propylcyclohexane
2-Propylfuran
Pulegone
α-Terpinene
γ-Terpinene
Tetrahydrofuran
1,1,2-Trichloro-1,2,2-trifluoroethane
1,1,1-Trichloro-2-propane
Trichlorobenzene #
Triethylamine
Triethylbenzene #
1,3,5-Triisopropylbenzene
1,2,3-Trimethylbenzene
Trimethylcyclohexane
3,3,5-Trimethylcyclohexanone
Trimethylethylbenzene #
2,2,4-Trimethylpentane
Trimethylsilane
Trimethylsilanol
Valeraldehyde (Pentanal)

Isomers of

Contact plant for compounds not contained in this list.

For more information call or write:
prism analytical technologies, inc.
• 1200 N. Fancher • Mt. Pleasant, MI 48858
• 989-772-5088 • FAX: 989-772-5870
• E-MAIL: prism@pati-air.com

```
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****************************************
     *** REGULATORY (Default) ***
   PERFORMING CAVITY CALCULATIONS
  WITH ORIGINAL SCREEN CAVITY MODEL
          (BRODE, 1988)
****************************************


 *** CAVITY CALCULATION - 1 ***        *** CAVITY CALCULATION - 2 ***
  CONC (UG/M**3)       =    0.000        CONC (UG/M**3)       =    0.000
  CRIT WS @10M (M/S) =    99.99        CRIT WS @10M (M/S) =    99.99
  CRIT WS @ HS (M/S) =    99.99        CRIT WS @ HS (M/S) =    99.99
  DILUTION WS (M/S)  =    99.99        DILUTION WS (M/S)  =    99.99
  CAVITY HT (M)      =     3.50        CAVITY HT (M)      =     2.73
  CAVITY LENGTH (M)  =     6.33        CAVITY LENGTH (M)  =     3.41
  ALONGWIND DIM (M)  =     2.44        ALONGWIND DIM (M)  =     4.88

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S.  CONC SET = 0.0

****************************************
      END OF CAVITY CALCULATIONS
****************************************


     ****************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     ****************************************

 CALCULATION          MAX CONC     DIST TO   TERRAIN
  PROCEDURE          (UG/M**3)     MAX (M)    HT (M)
--------------      -----------   -------    -------
SIMPLE TERRAIN        577.3          25.        0.
```

8hr = 577.3 * 0.7 = 404.1 μg/m3

24 hr = 577.3 * 0.4 = 230.9 μg/m3

annual = 577.3 * 0.08 = 46.18 μg/m3

01/26/04
15:53:07

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Brown Road Landfill

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	0.126000
STACK HEIGHT (M)	=	4.2672
STK INSIDE DIAM (M)	=	0.1016
STK EXIT VELOCITY (M/S)	=	14.5547
STK GAS EXIT TEMP (K)	=	294.2611
AMBIENT AIR TEMP (K)	=	293.1500
RECEPTOR HEIGHT (M)	=	0.0000
URBAN/RURAL OPTION	=	RURAL
BUILDING HEIGHT (M)	=	2.4384
MIN HORIZ BLDG DIM (M)	=	2.4384
MAX HORIZ BLDG DIM (M)	=	4.8768

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
A NON-REGULATORY ANEMOMETER HEIGHT (HANE) OF 10.1 METERS WAS ENTERED.

BUOY. FLUX = 0.001 M**4/S**3; MOM. FLUX = 0.545 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	UHANE (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	0.000	1	1.0	1.0	320.0	8.70	0.74	0.64	NO
100.	333.0	6	2.5	2.5	10000.0	6.05	4.10	4.22	HS
200.	224.9	5	1.0	1.0	10000.0	8.41	11.69	6.35	NO
300.	231.6	6	1.0	1.0	10000.0	8.04	11.28	5.73	NO
400.	202.9	6	1.0	1.0	10000.0	8.04	14.68	7.13	NO
500.	167.7	6	1.0	1.0	10000.0	8.04	18.00	8.46	NO
600.	137.7	6	1.0	1.0	10000.0	8.04	21.26	9.75	NO
700.	114.1	6	1.0	1.0	10000.0	8.04	24.48	10.98	NO
800.	96.44	6	1.0	1.0	10000.0	8.04	27.66	12.02	NO
900.	82.64	6	1.0	1.0	10000.0	8.04	30.79	13.03	NO
1000.	71.67	6	1.0	1.0	10000.0	8.04	33.90	13.99	NO
1100.	63.05	6	1.0	1.0	10000.0	8.04	36.98	14.86	NO
1200.	55.99	6	1.0	1.0	10000.0	8.04	40.03	15.69	NO
1300.	50.12	6	1.0	1.0	10000.0	8.04	43.06	16.51	NO
1400.	45.19	6	1.0	1.0	10000.0	8.04	46.06	17.29	NO
1500.	41.01	6	1.0	1.0	10000.0	8.04	49.04	18.06	NO
1600.	37.42	6	1.0	1.0	10000.0	8.04	52.01	18.81	NO
1700.	34.31	6	1.0	1.0	10000.0	8.04	54.95	19.54	NO
1800.	31.61	6	1.0	1.0	10000.0	8.04	57.88	20.26	NO
1900.	29.24	6	1.0	1.0	10000.0	8.04	60.79	20.96	NO
2000.	27.15	6	1.0	1.0	10000.0	8.04	63.68	21.65	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

25.	577.3	6	3.0	3.0	10000.0	5.75	1.24	2.99	HS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED

pati prism analytical technologies, inc.

Technical Bulletin
503 Rev 10

AIR SURVEY ANALYSES
List of Compounds

Method	Method Detection Limits		
	Quantitative A	Quantitative B	Semiquantitative
TDT Air Scan® AS002	250 ng	5-20 µg	100-250 ng
High Sensitivity TDT Air Scan	10 ng	5-20 µg	5-10 ng
Canister Air Scan SC002	200 ng/L	1,500 ng/L	100 - 200 ng/L
Tedlar Bag Air Scan TB002	200 ng/L	1,500 ng/L	100 - 200 ng/L

Quantitative List A

Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
Carbon Tetrachloride
Chlorobenzene
Chlorodibromoethane
Chloroform
2-Chlorotoluene
4-Chlorotoluene
1,2-Dibromo-3-chloropropane
Dibromomethane
1,2-Dibromoethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
1,2-Dichloroethene (cis)
1,2-Dichloroethene (trans)
1,2-Dichloropropane
1,3-Dichloropropane
2,2-Dichloropropane
1,1-Dichloropropene
1,2-Dichloropropene
1,3-Dichloropropene (cis)
1,3-Dichloropropene (trans)
Ethylbenzene
Hexachlorobutadiene
Isopropylbenzene
p-Isopropyltoluene
Methylene Chloride
Naphthalene
n-Propylbenzene
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethene
Toluene
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichlorofluoromethane
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl Chloride
m & p-Xylene
o-Xylene

Quantitative List B

Acetaldehyde*
Acetone* (2-propanone)
Acetonitrile*
Butadiene*
1-Butanol*
2-Butanone*
n-Butylacetate*
Chlorodifluoromethane*
Cyclohexane*
Cyclohexene*
Cyclopentene*
1,2-Dichlorotetrafluoroethane*
1,1-Dimethyl hydrazine
Ethyl-3-ethoxypropionate
Ethyl lactate
Ethyl vinyl ether
Ethanol*
Formaldehyde
Furan*
2-Heptanone*
Isobutane
Isobutyl acetate*
Isobutyl ketone*
Isobutylene
Isoprene
Isopropanol* (2-propanol)
Methanol
Methyl acetate*
Methyl ethyl ketone* (MEK)
Methyl formate
Methyl vinyl ether
Methyl vinyl ketone
3-Methyl-1-butene
2-Methyl-1-pentene
2-Methyl-2-butene
4-Methyl-2-pentanone* (MIBK)
2-Methyl-2-pentene
4-Methyl-2-pentene
2-Methylpentane
3-Methylpentane
Nitroethane
Nitromethane
2-Pentanone*
1-Pentene
2-Pentene
Propane
n-Propanol*
Propionaldehyde
Propylene
m-Pyrol
Vinyl acetate*
Vinylidene chloride

Acetylene‡
Ammonia‡
Boron trichloride‡
Boron trifluoride‡
Carbon dioxide‡
Carbon monoxide‡
Carbon tetrafluoride‡
Carbon fluoride‡
Diborane‡
Dichlorosilane‡
Difluoromethane‡
Ethane‡
Ethylene‡
Hexafluoroethane‡
Hexafluoropropylene‡
Hydrobromic acid‡
Hydrochloric acid‡
Hydrofluoric acid‡
Hydrogen cyanide‡
Hydroiodic acid‡
Methane‡
Nitric acid‡
Nitric oxide‡
Nitrogen dioxide‡
Nitrogen trifluoride‡
Nitrous acid‡
Nitrous oxide‡
Pentafluoroethane‡
Perfluorobutane‡
Perfluoropentane‡
Perfluoropropane‡
Oxygen difluoride‡
Silane‡
Silicon tetrafluoride‡
Sulfur dioxide‡
Sulfur hexafluoride‡
Tetrachlorosilane‡
1,1,1,2-Tetrafluoroethane‡
Tetramethyl silane‡
Trichlorosilane‡
Trifluoromethane‡
Tungsten hexafluoride‡
Water‡

Notes
* At levels below the detection limit for Quantitative List B, this compound is reported as part of the Semiquantitative List
‡ Canister or Tedlar Bag methods only

Client Sample ID: Effluent
Laboratory ID: 8974 - 1
Date Sampled: 01/20
Date Analyzed: 01/21 Volume: 5. L

Detection Limits

Quantitative List A:	2 ng/L
Quantitative List B:	- ng/L
Semiquantitative List:	50 ng/L

Compound	Calculated Result	Actual Result	Comments
C8-C10 Hydrocarbon	2200	1100-4400	24.4 min
C8-C10 Hydrocarbon	1400	700-2800	25.5 min; a substituted cyclohexane
C9-C11 Hydrocarbon	3500	1700-7000	25.8 min
C9-C11 Hydrocarbon	1300	650-2600	25.9 min; a substituted cyclohexane
a-Pinene	6900	3400-14000	2-Pinene ppb 1200 MW 136 CAS 80-56-8
C9-C11 Hydrocarbon	2400	1200-4800	26.4 min
C9-C11 Hydrocarbon	1900	950-3800	26.8 min
C9-C11 Hydrocarbon	1100	550-2200	26.9 min; a substituted cyclohexane
C10	4200	2100-8400	Decane ppb 710 MW 142 CAS 124-18-5
A substituted cyclohexane	5000	2500-10000	27.4 min; overlapped with 2-pentyl furan; the cited compound represents about 50% of the reported value
2-Pentyl furan	5000	2500-10000	Overlapped with a substituted cyclohexane; the cited compound represents about 50% of the reported value ppb 870 MW 138 CAS 3777-69-3
C10-C12 Hydrocarbon	4500	2200-9000	28.6 min; a substituted cyclohexane
C10-C12 Hydrocarbon	2200	1100-4400	28.7 min
C10-C12 Hydrocarbon	2200	1100-4400	28.9 min
C10-C12 Hydrocarbon	7100	3500-15000	29.1 min; a substituted cyclohexane
C10-C12 Hydrocarbon	1000	500-2000	29.6 min
Phenol	1100	550-2200	Hydroxy benzene ppb 290 MW 94 CAS 108-95-2
C10-C12 Hydrocarbon	1200	600-2400	29.8 min