SIGMA
DEVELOPMENT, INC.

220 East Ryan Road
Oak Creek, WI 53154-4533
414-768-7140
FAX: 414-768-7141

June 20, 2000

Project #6156

Henry Nehls-Lowe, MPH
Epidemiologist
Bureau of Environmental Health
Department of Health and Family Services
1 West Wilson Street
P. O. Box 2659
Madison, Wisconsin 53701-2659

Re: Scope of Work for Air Quality Investigation, Webster Middle School, Milwaukee, Wisconsin

Dear Mr. Nehls-Lowe:

In response to your letter dated May 31, 2000 Sigma Environmental Services, Inc. (Sigma) in cooperation with Christensen Environmental Services (CES), and on behalf of the Village of Whitefish Bay, has prepared this scope of work to complete an air quality investigation at Webster Middle School, located at 6850 North 53rd Street, Milwaukee, Wisconsin. The air sampling and analysis protocol is developed based on our June 12, 2000 meeting with representatives of the Milwaukee Public Schools (MPS), Wisconsin Department of health and Family Services, Milwaukee Health Department and Wisconsin Department of Natural Resources. The purpose of the air quality investigation is to characterize the air in several occupied and unoccupied spaces inside the school building for the presence of chlorinated volatile organic compounds (CVOCs) that may have infiltrated the building from the impacted groundwater identified beneath the school building.

PROPOSED INVESTIGATION ACTIVITIES

The proposed investigation activities have been designed to comply with the Wisconsin Department of Health and Family Services request to, 1) evaluate indoor air quality, with respect to chlorinated solvent vapors, within Webster Middle School (School), and 2) evaluate subsurface soil vapor conditions, at three locations outside of the school building. The following sections describe the scope of work.

Indoor Air Quality Monitoring. Air quality monitoring, for chlorinated solvent vapors, will be performed by Christensen Environmental Services in the three, unfinished ground floor areas of the school. Background\ambient air quality conditions will also be monitored on the first floor and exterior of the building.

The scope of work requires conducting air sampling inside the Webster Middle School and up wind of the school during the early morning hours on July 6, 2000. Nineteen air samples will be collected and analyzed for 61 volatile organic compounds (VOCs) including chlorinated ethanes and chlorinated ethylenes using standard sampling and analytical methods as described below.

- Evacuated six liter SUMMA™ Canisters with particulate filters supplied by the project laboratory (Air Toxics Ltd. in Folsom, California) will be used to collect the 19 air samples. Each sample will be collected over a period of one hour with the air entering the canister through a critical orifice of a flow controller. Flow controllers will be calibrated by the project laboratory before shipping the SUMMA™ Canisters to the project site. A vacuum gauge attached to each flow controller will be used to measure the initial and final vacuum during the sampling and to monitor the rate of sampling of the canister. After sample collection the Summa canisters will be shipped overnight to Air Toxics Ltd. in Folsom, California for analysis. The samples will be analyzed by EPA Method TO-14 with gas chromatography/mass spectrophotometry instrumentation (GC/MS). Limits of detection are < 1 ppbv (parts per billion volume). A summary of the analytes with minimum detection limits is attached (Attachment A).

- The air sample locations inside Webster Middle School and the numbers and types of samples at each location are summarized in Table 1. Please note that three of the indoor air samples (one from each unoccupied area) will be analyzed and a preliminary laboratory report of the results will be submitted within 48 hours of the investigation. A map of the sample locations is attached (Attachment B).

- The two primary HVAC systems servicing the school building will be turned off by MPS personnel at least 24 hours before the air sampling. With the HVAC systems off, a slight negative pressure should occur in the building as a result of the continued operation of the exhaust fans located in school restrooms, and allow air from unoccupied spaces to infiltrate occupied spaces. The air flow patterns will be checked with ventilation smoke tubes to verify the air movement. The temperature and humidity will also be measured at each of the eight sample locations inside the building and at one sample location outside.

TABLE 1
AIR SAMPLE LOCATIONS, NUMBERS AND TYPES OF SAMPLES

Space	Location	Number of Samples, Description, and Type
Unoccupied	UF6, North Unpaved Area	1 sample at southwest corner at ground level * 2 samples near central portion, one at ground level and one at breathing zone 1 sample near thermoplastic and treated wood at ground level
Unoccupied	UF1, West Unpaved Area	1 sample near north wall at ground level * 1 sample at the middle of the area at breathing zone 1 sample near south wall at ground level
Unoccupied	UF44, South Unpaved Area	2 samples near east wall, one at ground level and one at breathing zone * 1 sample near west wall at ground level
Occupied	Room 44 on Ground Floor	2 samples near west wall, one within ceiling plenum and one at breathing zone 1 sample at the center of the room at breathing zone
Occupied	Room 7D on Ground Floor	1 sample at the center of the room at ground level
Occupied	Corridor G-5 on Ground Floor	1 sample near the center of the room at ground level
Occupied	Room 100 on First Floor	1 sample at the center of the room at ground level
Occupied	Corridor1-2 on First Floor	1 sample at the center of the room at ground level
Outside	Upwind of the school building	2 samples at ground level (locations not shown on the map)

Note: * denotes rush sample analysis within 48 hours.

Subsurface Vapor Study. A subsurface soil vapor study will be performed to determine the potential for the generation and migration of vapors from the dissolved phase in the groundwater, to the vapor phase in the underlying unsaturated soils. Sigma will install three,1

inch diameter, permanent soil vapor probes, along the north, west and southern sides of School (adjacent to the unfinished areas UF 6, UF 1 and UF 44). The vapor probes will be installed using the GeoProbe™ soil boring method with one soil gas sample collected from each location from a depth interval of eight to ten feet below ground surface. The soil vapor samples will be collected in a laboratory supplied SUMMA™ Canister and submitted for laboratory analysis of volatile organic compounds using EPA Method TO14. At the request of the Wisconsin Department of Natural Resources, the PVC vapor probes will be completed as permanent wells, with bolt down, flush mount protective covers.

Data Evaluation and Reporting. The project will be coordinated with Milwaukee Public Schools representatives, and implemented based on discussions with Wisconsin Division of Public Health officials. The results of the subsurface vapor and indoor air monitoring study will be evaluated to identify potential concerns regarding subsurface vapor migration and will be presented in a letter report.

Three of the indoor air samples (one from each unoccupied area) will be analyzed and a preliminary laboratory report of the results will be submitted within 48 hours of the investigation. The remaining 19 air samples will be analyzed and a final report submitted within three weeks of the on-site sampling activities. The final report will include the sample conditions, sample methods, and the laboratory analytical report.

Please do not hesitate to call us at 414-768-7144 if you have any questions.

Sincerely,

SIGMA ENVIRONMENTAL SERVICES, INC.

Randy Boness (MS)

Randy E. Boness, P.G.
Senior Project Manager

Mafizul Islam, P.E.
Senior Project Engineer

cc (w/ attachments): Ed Henschel / Village of Whitefish Bay
Dennis L. Fisher / Meissner Tierney, et. al.
Terri Linder / City of Milwaukee Health Department
Andrew Boettcher / DNR SE Regional Office
Pat O'Donnel / MPS
Peggy Christensen / CES

I:\WHITEFSH\6156\airmon.pro.wpd

Attachment A

AIR TOXICS LTD.

Method : TO-14-S

Compound	Det. Limit (ppbv)
Freon 12	0.10
Freon 114	0.10
Chloromethane	0.10
Vinyl Chloride	0.10
Bromomethane	0.10
Chloroethane	0.10
Freon 11	0.10
1,1-Dichloroethene	0.10
Freon 113	0.10
Methylene Chloride	0.10
1,1-Dichloroethane	0.10
cis-1,2-Dichloroethene	0.10
Chloroform	0.10
1,1,1-Trichloroethane	0.10
Carbon Tetrachloride	0.10
Benzene	0.10
1,2-Dichloroethane	0.10
Trichloroethene	0.10
1,2-Dichloropropane	0.10
cis-1,3-Dichloropropene	0.10
Toluene	0.10
trans-1,3-Dichloropropene	0.10
1,1,2-Trichloroethane	0.10
Tetrachloroethene	0.10
Ethylene Dibromide	0.10
Chlorobenzene	0.10
Ethyl Benzene	0.10
m,p-Xylene	0.10
o-Xylene	0.10
Styrene	0.10
1,1,2,2-Tetrachloroethane	0.10
1,3,5-Trimethylbenzene	0.10
1,2,4-Trimethylbenzene	0.10
1,3-Dichlorobenzene	0.10
1,4-Dichlorobenzene	0.10
Chlorotoluene	0.10
1,2-Dichlorobenzene	0.10
1,2,4-Trichlorobenzene	0.10
Hexachlorobutadiene	0.50
Propylene	0.50
1,3-Butadiene	0.50
Acetone	0.50
Carbon Disulfide	0.50
2-Propanol	0.50
trans-1,2-Dichloroethene	0.50
Vinyl Acetate	

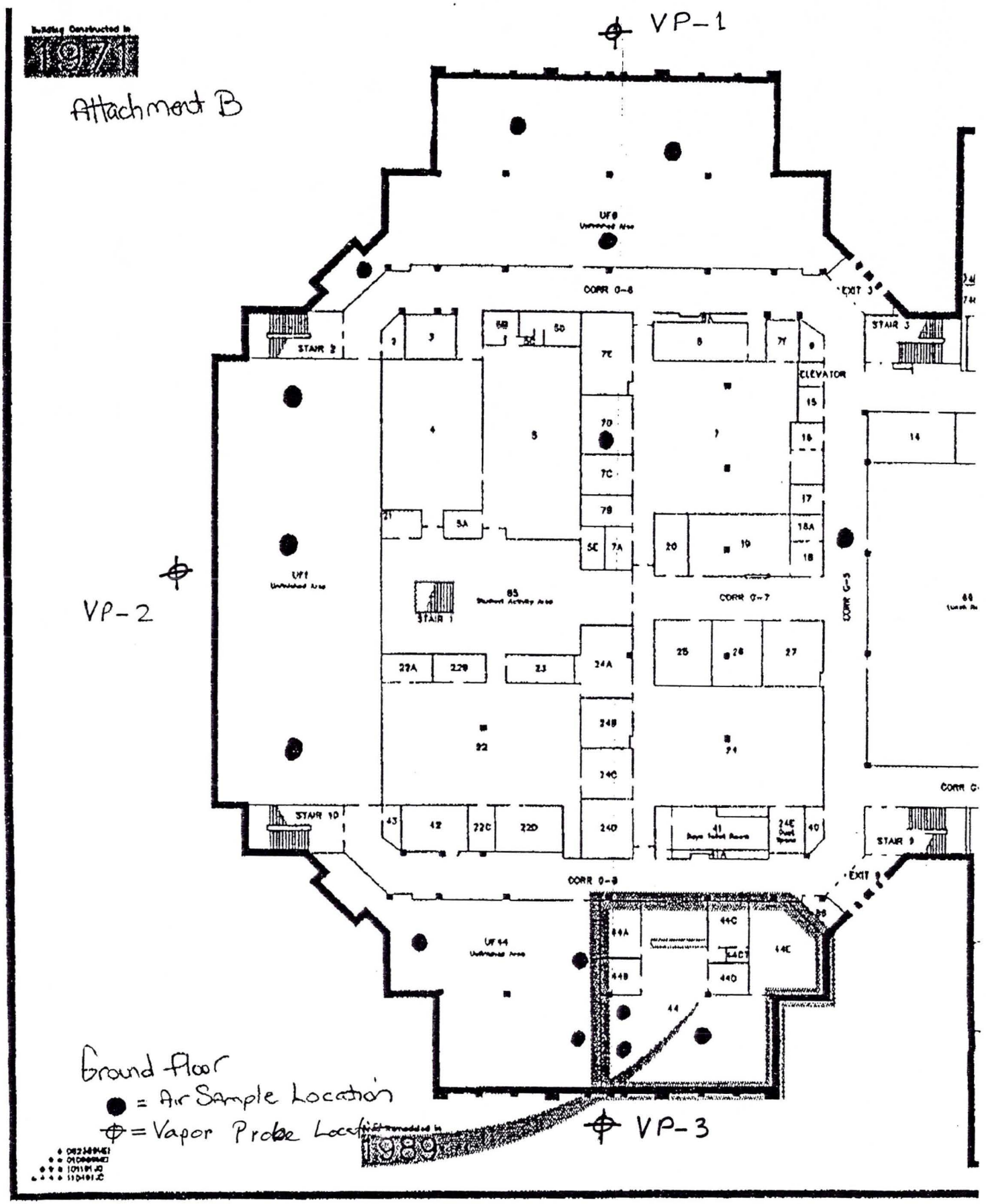
Attachment A

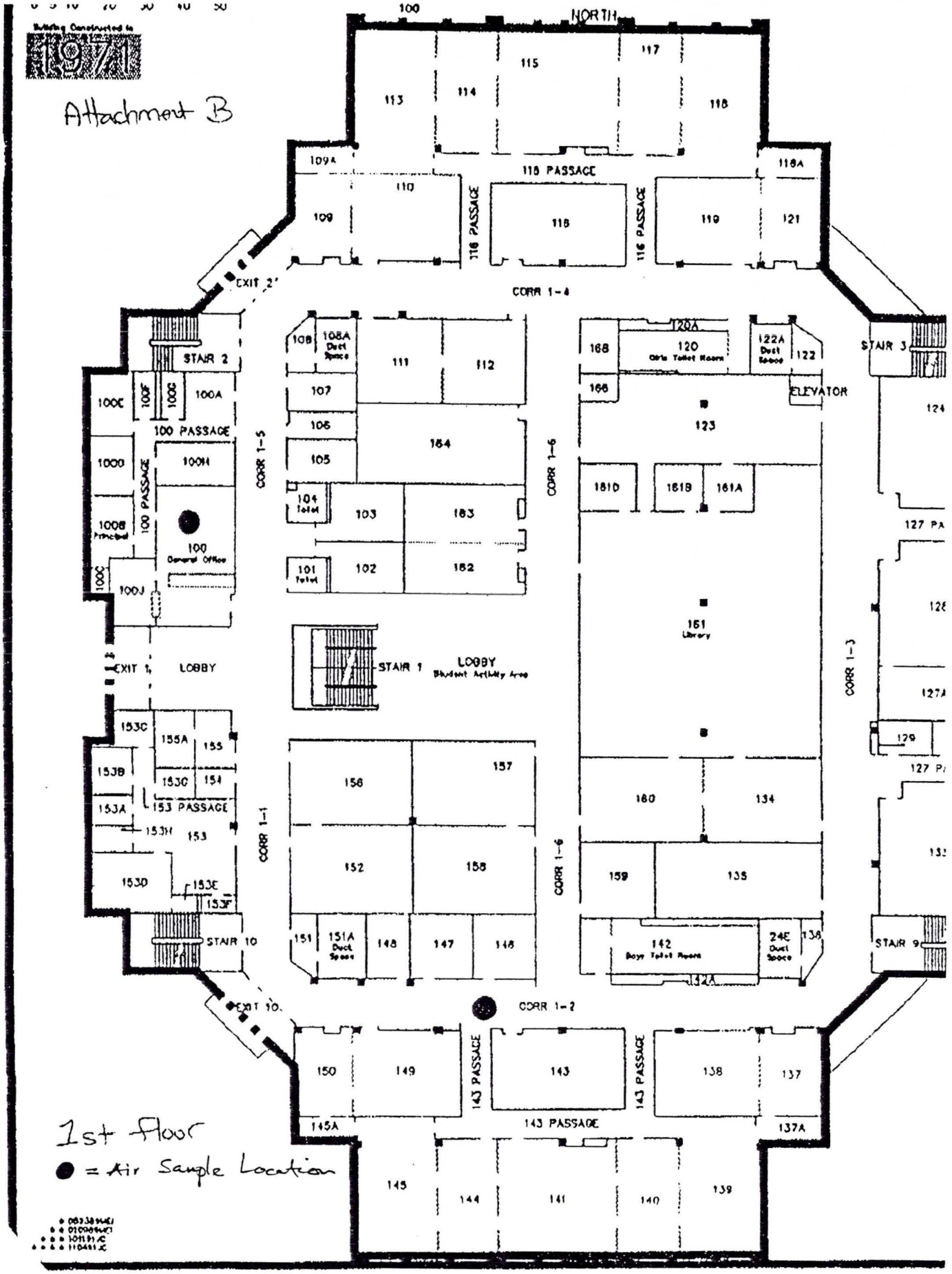
AIR TOXICS LTD.

Method : TO-14-S

Compound	Det. Limit (ppbv)
2-Butanone (Methyl Ethyl Ketone)	0.50
Hexane	0.50
Tetrahydrofuran	0.50
Cyclohexane	0.50
1,4-Dioxane	0.50
Bromodichloromethane	0.50
4-Methyl-2-pentanone	0.50
2-Hexanone	0.50
Dibromochloromethane	0.50
Bromoform	0.50
4-Ethyltoluene	0.50
Ethanol	0.50
Methyl tert Butyl Ether	0.50
Heptane	0.50

Surrogate	Method Limits
1,2-Dichloroethane-d4	70-130
Toluene-d8	70-130
4-Bromofluorobenzene	70-130


Building Constructed in
1971
Attachment B
VP-1
VP-2
VP-3
UF8
CORR G-8
EXIT 3
STAIR 2
STAIR 3
ELEVATOR
UF1
85
CORR G-7
CORR G-3
STAIR 1
UF14
CORR G-9
STAIR 10
STAIR 9
EXIT 9
Remodeled in
1989
Ground floor
● = Air Sample Location
⊕ = Vapor Probe Location


Building Constructed in
1971
Attachment B
NORTH
100
115
117
113
114
118
109A
118 PASSAGE
118A
110
109
116 PASSAGE
118
116 PASSAGE
119
121
EXIT 2
CORR 1-4
STAIR 2
108
108A Duct Space
111
112
120A
120 Girls Toilet Room
122A Duct Space
122
168
166
ELEVATOR
STAIR 3
107
106
105
164
123
100C
100F
100G
100A
100 PASSAGE
100D
100H
100 PASSAGE
CORR 1-5
CORR 1-6
161D
161B
161A
100B Principal
104 Toilet
103
163
100 General Office
100C
100J
101 Toilet
102
162
161 Library
CORR 1-3
EXIT 1
LOBBY
STAIR 1
LOBBY Student Activity Area
153C
155A
155
153B
153D
154
153A
153 PASSAGE
153H
153
153D
153E
153F
CORR 1-1
156
157
160
134
152
158
159
135
STAIR 10
151
151A Duct Space
148
147
146
142 Boys Toilet Room
24E Duct Space
136
132A
STAIR 9
EXIT 10
CORR 1-2
150
149
143 PASSAGE
143
143 PASSAGE
138
137
145A
143 PASSAGE
137A
145
144
141
140
139
1st floor
● = Air Sample Location