



Interim Report on the Investigation into Health Concerns Among Occupants of the Bennington State Office Building

Executive Summary

In early June 2006 the Vermont Department of Health (VDH) initiated an investigation of health concerns among occupants of the Bennington State Office Building. The primary health concern was identified as sarcoidosis - a disease of unknown cause characterized by inflammation in one or more organs. Results from a health survey found higher than expected rates of sarcoidosis, asthma, and asthma-like symptoms among current building occupants. A visual inspection found evidence of past water damage and environmental sampling found evidence of fungi and endotoxin.

Recommendations include a diagnostic work-up of the building and remediation, if necessary. While these are being conducted, occupants should be relocated. In addition, both prior to and six months following reoccupancy, employees should again be offered medical screening and asked to complete a health survey.

Introduction

In early June 2006 the Vermont Department of Health (VDH) initiated an investigation of health concerns among occupants of the Bennington State Office Building. The primary health concern was identified as sarcoidosis - a disease of unknown cause characterized by inflammation in one or more organs.

As of early October 2006, the investigation has included the following: 1) interviewing persons reported as having a diagnosis of sarcoidosis; 2) conducting a visual inspection of the building; 3) administering a written health survey to current occupants; 4) conducting environmental sampling and testing; 5) conducting medical screening tests on current occupants; 6) administering a written health survey to former occupants; and 7) confirming the diagnosis of sarcoidosis.

What follows is an interim report on the results of the interviews of persons reported as having a diagnosis of sarcoidosis, the result of the health survey of current occupants as well as the results of the environmental sampling and testing. The results presented here on the environmental sampling and testing are based on the analysis and interpretation by VDH investigators. An additional report on the environmental sampling and testing will be prepared by the contractor hired to conduct this part of the investigation.

This report also includes recommendations to protect and monitor the health of building occupants, identify environmental hazards and remediate these hazards (if any). Results of additional aspects of this investigation will be reported as they become available.

Section 1. Results of the health survey – current building occupants

This section presents the percentage of individuals who reported a particular symptom or complaint. The percentage is calculated as the number who reported a particular condition divided by the total number of individuals who responded to that question. The questions are numbered to match the numbering of the health questionnaire. The questionnaire that was given to building occupants is attached to this report as a reference (Appendix A). The participation rate of the health survey was 77.2% (105/136).

Table 1.1 Demographics and Frequencies of self-reported symptoms

Condition	%(number reporting/total)
4. Sex	
Male	37.1% (39/105)
Female	63.9% (66/105)
5. Race	
White	97.1% (102/105)
Non-White	2.9% (3/105)
8.1 Wheezing – last 12 months	40.4% (42/104)
8.2 Wheezing – last 4 weeks	26.0% (27/104)
9.1 Awakened breathing attack – 12 mos	15.2% (16/105)
9.2 Awakened breathing attack – 4 weeks	9.5% (10/105)
10.1 Shortness of breath – 12 months	43.3% (45/104)
10.2 Shortness of breath – 4 weeks	34.6% (36/104)
11.1 Coughing attacks – 12 months	49.0% (49/100)
11.2 Coughing attacks – 4 weeks	31.0% (31/100)
12.1 Chest tightness – 12 months	29.9% (29/97)
12.2 Chest tightness – 4 weeks	19.6% (19/97)
13.1 SOB with light exertion – 12 months	43.4% (43/99)
13.2 SOB with light exertion – 4 weeks	33.3% (33/99)
14.1 Rash – 12 months	21.8% (22/101)
14.2 Rash – 4 weeks	11.9% (12/101)

Note: Not all data sum to total number due to some participants not answering all questions. Not all building occupants participated in the survey. There was a 77% participation rate.

Table 1.1 Demographics and Frequencies of self-reported symptoms
Continued

Condition	%(number reporting/total)
15.1 Fever and chills – 12 months	23.1% (24/104)
15.2 Fever and chills – 4 weeks	5.8% (6/104)
16.1 Flu-like achiness/achy joints – 12 mo	47.1% (49/104)
16.2 Flu-like achiness/achy joints – 4 wks	30.8% (32/104)
17.1 Tiredness, fatigue, drows – 12 mo	63.5% (66/104)
17.2 Tiredness, fatigue, drows – 4 weeks	58.7% (61/104)
18.1 Headache – 12 months	73.1% (76/104)
18.2 Headache – 4 weeks	51.9% (54/104)
19.1 Stuffy, itchy, runny nose – 12 months	72.0% (72/100)
19.2 Stuffy, itchy, runny nose – 4 weeks	50.0% (50/100)
20.1 Sneezing – 12 months	65.0% (65/100)
20.2 Sneezing – 4 weeks	56.0% (56/100)
21.1 Dry or itchy skin – 12 months	41.0% (41/100)
21.2 Dry or itchy skin – 4 weeks	8.0% (8/100)
22.1 Watery, itchy eyes – 12 months	49.0% (49/100)
22.2 Watery, itchy eyes – 4 weeks	41.0% (41/100)
23.1 Sore or dry throat – 12 months	54.8% (57/104)
23.2 Sore or dry throat – 4 weeks	36.5% (38/104)
24.1 Sinusitis – 12 months	42.3% (44/104)
24.2 Sinusitis – 4 weeks	30.8% (32/104)
25.1 Stiffness in back, neck – 12 months	66.0% (68/103)
25.2 Stiffness in back, neck – 4 weeks	63.1% (65/103)
26.1 Numbness in hands/wrists – 12 mo	26.3% (26/99)
26.2 Numbness in hands/wrists – 4 weeks	22.2% (22/99)
27.1 Tension or nervousness – 12 months	59.0% (59/100)
27.2 Tension or nervousness – 4 weeks	48.0% (48/100)
28.1 Dizziness or lightheaded – 12 month	44.0% (44/100)
28.2 Dizziness or lightheaded – 4 weeks	25.0% (25/100)
29.1 Felt Depression – 12 months	35.0% (35/100)
29.2 Felt Depression – 4 weeks	19.0% (19/100)

Note: Not all data sum to total number due to some participants not answering all questions. Not all building occupants participated in the survey. There was a 77% participation rate.

Table 1.2 Frequencies of diagnosed conditions and other questions

Condition	%(number reporting/total)
30.1 Pneumonia – 12 months	2.9% (3/103)
30.2 Pneumonia – 4 week	0.97% (1/103)
31.1 Cold or flu – 12 months	62.5% (63/104)
31.2 Cold or flu – 4 weeks	12.5% (13/104)
32.1 Ever diagnosed with asthma	20.2% (21/104)
32.2 Do you still have asthma	15.4% (16/104)
33.2 Ever diagnosed with sarcoidosis	1.0% (1/104)
34.1 Ever diagnosed with HP	0% (0/104)
35.1 Ever diagnosed with migraines	23.1% (24/104)
36.1 Ever diagnosed with eczema	15.2% (15/99)
37.1 Ever diagnosed with hay fever	11.1% (11/99)
38.1 Ever diagnosed with allergy to dust	17.2% (17/99)
39.1 Ever diagnosed with allergy to molds	16.2% (16/99)
42. Mold or mildew in the home – 12 mo	11.1% (11/99)
43. Moldy musty odors in home – 12 mo	12.1% (12/99)
44. Water damage in the home – 12 mo	6.1% (6/99)
45.1 Have you ever smoked regularly?	49.0% (49/100)
45.2 Are you a current smoker?	16.0% (16/100)
46.2 Think symptoms are from building	69.4% (68/98)
47. Worried workplace is making you sick	65.6% (63/96)

Note: Not all data sum to total number due to some participants not answering all questions. Not all building occupants participated in the survey. There was a 77% participation rate.

Table 1.3 In the last 4 weeks you were at work, how often have you experienced each of the following environmental conditions?

CONDITIONS	A. Not in the last 4 weeks	B. 1-3 days in the last 4 weeks	C. 1-3 days per wk in the last 4 weeks	D. Every or almost every work day
Too much air movement	85.7% (90/105)	3.8% (4/105)	5.7% (6/105)	4.8% (5/105)
Too little air movement	12.4% (13/105)	10.5% (11/105)	15.2% (16/105)	61.9% (65/105)
Temperature too hot	13.5% (14/104)	27.9% (29/104)	29.8% (31/104)	28.8% (30/104)
Temperature too cold	55.0% (55/100)	10.0% (10/100)	23.0% (23/100)	12.0% (12/100)
Air too humid	25.7% (26/101)	19.8% (20/101)	26.7% (27/101)	27.7% (28/101)
Air too dry	67.3% (68/101)	10.9% (11/101)	8.9% (9/101)	12.9% (13/101)
Musty or moldy odor	53.0% (53/100)	18.0% (18/100)	11.0% (11/100)	18.0% (18/100)
Unpleasant chemical odors	51.0% (52/102)	27.5% (28/102)	12.7% (13/102)	8.8% (9/102)
Other unpleasant odors (e.g., body odor, food odor, perfume)	56.4% (57/101)	20.8% (21/101)	8.9% (9/101)	13.9% (14/101)

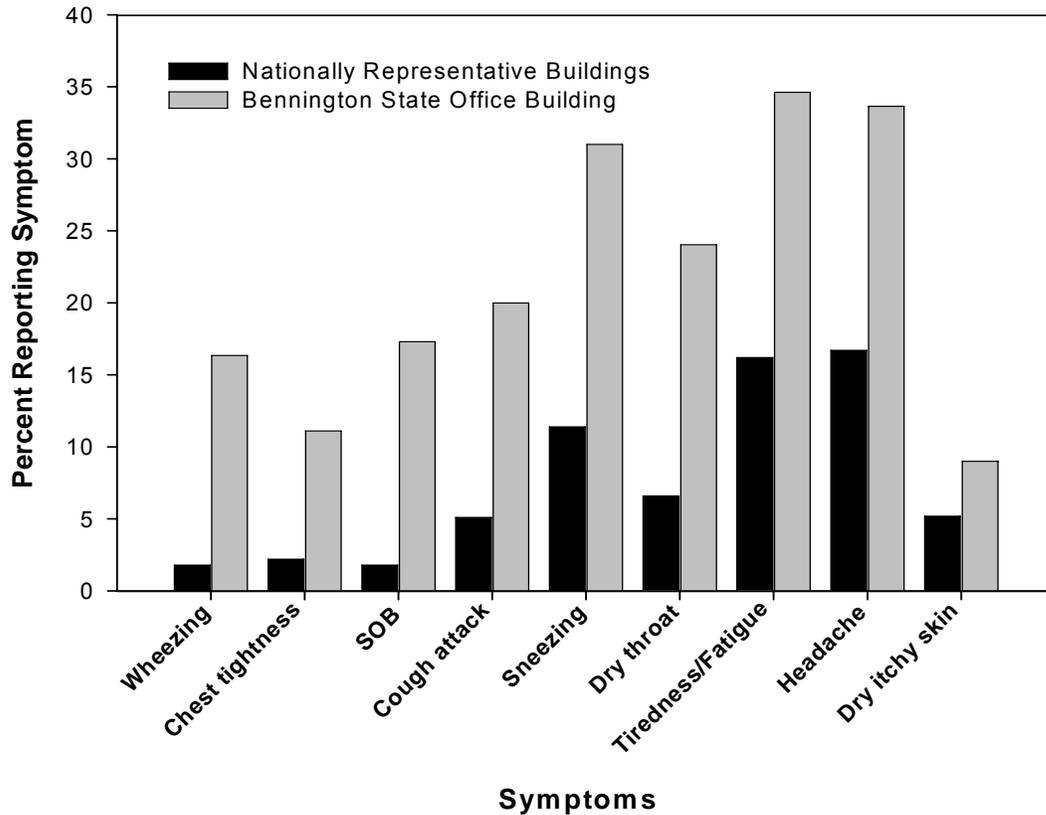
Note: Data are percent reporting condition of those who responded.

Section 2. Comparison of the Bennington state office building with nationally representative US buildings and the general US population

2.1 Comparison to US buildings

The results from the Bennington state office building occupants were compared to 100 office buildings studied by the U.S. Environmental Protection Agency (EPA) from 1994-1998. These 100 buildings were selected at random to be representative of the nation's office building stock. Some of the questions asked of the Bennington state office building occupants were exactly the same questions asked of occupants in the EPA study. Figure 2.1 presents the difference in reporting between these two populations. The values presented are among respondents who reported experiencing the symptom in the preceding 4 weeks and felt that their symptoms were better away from the building. Respondents in the Bennington building show elevated rates of both respiratory and non-respiratory symptoms. The differences observed between the two populations are statistically significant for every condition in Figure 2.1 except for dry itchy skin.

Figure 2.1 Bennington Building Compared to 100 Nationally Representative US Buildings

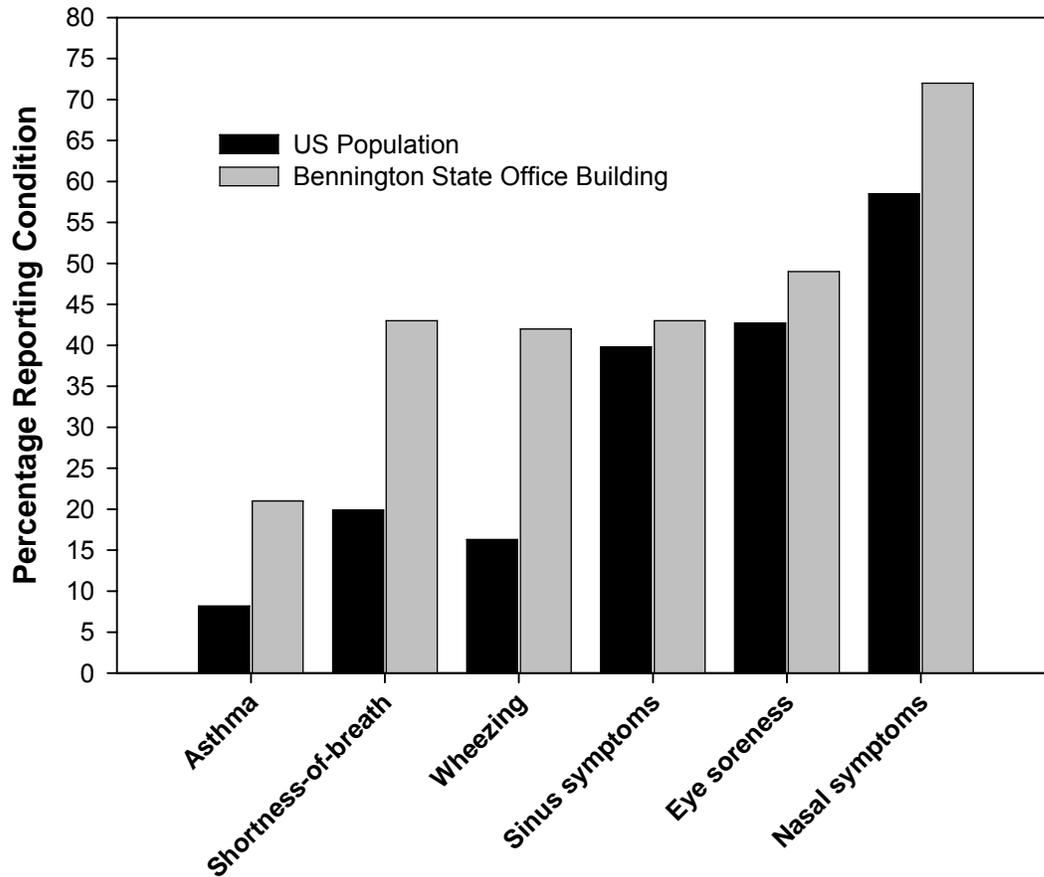


Note: Comparisons are among building occupants who experienced symptom in the last 4 weeks and stated feeling better when away from the building. Comparison data are from EPA study referenced in section 2.1.

2.2 Comparison to US population

The results from the Bennington state office building occupants were compared to the National Health and Nutrition Examination Survey (NHANES). NHANES is a health survey of a nationally representative sample of about 5,000 persons each year. Figure 2.2 presents the differences in reporting between these two populations and reflects symptoms that occurred within the last 12 months. Respondents in the Bennington building show significantly elevated rates of asthma, shortness of breath and wheezing, compared to NHANES (Figure 2.2). Other symptom reporting was elevated but did not reach a level of statistical significance.

Figure 2.2 Bennington Building Compared to the General US Population



Note: Data are compared to US population data (NHANES III) and are adjusted for age, sex, race and smoking status.

2.3 Elevated rates of sarcoidosis in occupants of the Bennington state office building

The VDH received reports of six building occupants with a diagnosis of sarcoidosis. This includes both former and current occupants. Based on these six cases alone, the estimated prevalence of sarcoidosis among building occupants (both current and former) is 1,000–1,400 cases per 100,000 persons. In comparison, the estimated prevalence of sarcoidosis among the U.S. white population is 10–12 cases per 100,000 persons. Based on these estimates, building occupants have a rate of sarcoidosis that is 100 times higher than what would be expected.

The investigation into the cases of sarcoidosis continues. This includes confirming the diagnosis among the six reported cases and determining estimates of the prevalence among Vermonters. However, this is unlikely to change the conclusion that building occupants have experienced higher than expected rates of sarcoidosis.

2.4 Elevated rates of self-report respiratory illness in occupants of the Bennington state office building

Building occupants reported elevated rates of asthma, adult-onset asthma and asthma-like symptoms. The percentage of building occupants who reported ever being diagnosed with asthma was 20% (21/104). The percentage of building occupants who reported currently having asthma was 15% (16/104). The latter represents a 60% higher self-reported prevalence of asthma among building occupants in comparison to all Vermonters and a 30% higher prevalence in comparison to residents of Bennington County.

The prevalence of adult-onset asthma was determined to be 15% (16/105). Fifty-six percent (9/16) of these self-reported diagnoses occurred after occupants began working in the building. Considering the length of time occupants worked in the building, this correlates to a 3.5 fold increased risk of developing asthma after building occupancy.

Building occupants were 2.6 times more likely to report wheezing or whistling in their chest compared to the U.S. population. Among 17-39 year old building occupants, shortness of breath was 3.2 times more commonly reported than among the U.S. population of this same age group.

The investigation into asthma and asthma-like symptoms continues. This includes an analysis of data from pulmonary function testing recently offered by the National Institute for Occupational Safety and Health (NIOSH). Such testing was done to help

validate the results of the health survey. These data are currently being compiled and will provide a more accurate reflection of the overall respiratory health of the occupants of the Bennington state office building.

Section 3. Internal comparisons of Bennington building – older section vs. newer section

An analysis to determine whether differences between symptom reporting differed within the building was undertaken. The goal was to identify whether employees in certain portions of the building reported greater levels of illness. A number of comparisons were performed; however the most significant differences were observed when the comparison groups were the original 1977 first story structure and the newer 3-story addition (Figure 3.1). Occupants of the older section had statistically significant higher rates of reporting of several symptoms (table 3.1).

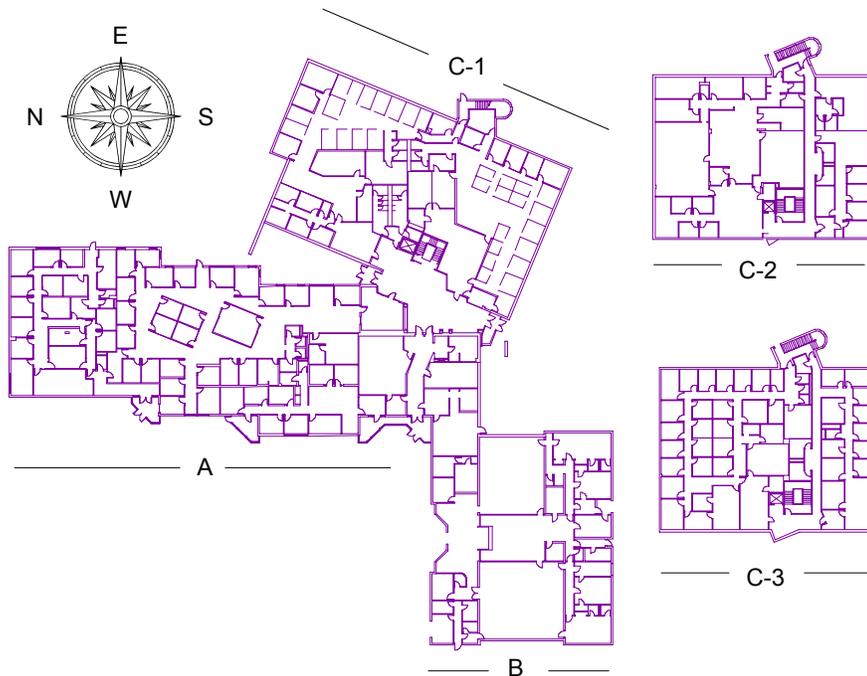


Figure 3.1 Building floor plan. Sections A, and B are the original 1977 structure and referred to as “older section”. Section C-1, the first story structure and C-2 and C-3, the second and third stories located above section C-1, are referred to in the analysis as the “newer section”.

Table 3.1 Symptom Reporting by building location			
<u>Symptom</u>	<u>Old section</u>	<u>New section</u>	<u>Odds Ratio</u>
Male	37.0%(17/46)	31.4%(16/51)	1.3
Wheezing	42.2%(19/45)	37.3%(19/51)	1.2
Awakening	10.9%(5/46)	17.7%(9/51)	0.57
Shortness of breath	55.6%(25/45)	29.4%(15/51)	3.0
Cough	46.3%(19/41)	51.0%(26/51)	0.83
Chest Tightness	40.0%(16/40)	23.5%(12/51)	2.2
SOB on exertion	57.5%(23/40)	29.4%(15/51)	3.2
Rash	23.8%(10/42)	17.7%(9/51)	1.5
Fever	24.4%(11/45)	21.6%(11/51)	1.2
Flu-like symptoms	64.4%(29/45)	37.3%(19/51)	3.1
Tiredness/fatigue	71.1%(32/45)	56.9%(29/51)	1.9
Headache	77.8%(35/45)	70.6%(36/51)	1.5
Nasal symptoms	82.9%(34/41)	64.7%(33/51)	2.6
Sneezing	70.7%(29/41)	58.8%(30/51)	1.7
Itchy skin	53.7%(22/41)	33.3%(17/51)	2.3
Itchy eyes	61.0%(25/41)	41.2%(21/51)	2.2
Dry throat	64.4%(29/45)	49.0%(25/51)	1.9
Sinusitis	44.4%(20/45)	41.2%(21/51)	1.1
Back pain	84.1%(37/44)	47.1%(24/51)	5.9
Hand pain	31.7%(13/41)	22.0%(11/50)	1.6
Tension	61.0%(25/41)	54.9%(28/51)	1.3
Dizziness	53.7%(22/41)	39.2%(20/51)	1.8
Depression	41.5%(17/41)	31.4%(16/51)	1.5
Cold/flu	60.0%(27/45)	70.6%(36/51)	0.63
Asthma	24.4%(11/45)	15.7%(8/51)	1.7
Migraine	25.0%(11/44)	25.5%(13/51)	0.97
Ever smoker	46.3%(19/41)	49.0%(25/51)	0.90
Worried building making them sick	70.5%(31/44)	69.6%(32/46)	1.0

Note: Symptom reporting in last 12 months. SOB, shortness of breath. Gray shading indicates statistical significance. Odds ratios interpreted as the number of times increased or decreased the factor is between the older section compared to the newer section, e.g., respondents in the older section are 3 times (odds ratio) more likely to report shortness of breath within the last 12 months compared to occupants of the newer section.

Section 4. Conclusions of health survey

Building occupants report higher rates of sarcoidosis, asthma, and asthma-like symptoms than expected. The rate of asthma and asthma-like symptoms are elevated throughout the building. Occupants of the older section have higher symptom reporting than the newer section.

Section 5. Environmental Sampling

A visual inspection of the building was conducted. This inspection identified evidence of past water damage. Based on this, the Health Department recommended to the consultant that the following environmental samples be collected: vacuum samples for fungi and endotoxin; wipe samples for beryllium, lead, and permethrin; and instant and seven-day measurements of carbon dioxide, carbon monoxide, relative humidity, temperature, and particulate matter. Water samples were collected by VDH staff and analyzed at the VDH Laboratory.

5.1 Results of Vacuum Samples

Vacuum samples for fungi and endotoxin were collected based on recommendation from NIOSH investigators. NIOSH has reported a relationship between levels of fungi and endotoxin in floor dust and building-related symptoms. These samples were collected from a 2 by 2 meter section of carpet in 12 locations throughout the building. The results are listed in Table 5.1.

Table 5.1 Fungi and Endotoxin levels from carpet vacuum dust samples

<u>Location</u>	<u>Fungi</u>		<u>Endotoxin</u>	
	<u>CFU/G</u>	<u>CFU/M²</u>	<u>EU/G</u>	<u>EU/M²</u>
Vocational Rehab RM 14	1,770	480	16,000	4,300
Economic Services RM 35	8,780	4,670	13,000	7,000
Economic Services RM 56	19,300	3,050	26,000	4,200
District Court Clerk's Office	27,200	3,470	130,000	17,000
Probation and Parole RM 95	30,100	25,800	2,300	17,000
Probation and Parole RM 75	34,700	10,240	42,000	12,000
Dept of Labor RM 143 Center	16,700	5,000	34,000	10,000
Family Court Rm 210	18,400	2,120	21,000	2,400
State's Attorney RM 356	22,900	5,780	21,000	5,200
Office of Child Services RM 237	26,400	5,250	55,000	11,000
Family Services RM 324	28,300	11,070	38,000	15,000
New Dept of Correction RM 123	580,000	178,300	44,000	14,000

Note: CFU, colony forming unit; EU, endotoxin unit.

Interpretation of these results requires a reference scale. Experts have not reached consensus on a reference standard. Two standards are presented here, though both have limitations.

P & K Laboratories (the private laboratory which ran the analysis on the samples) suggest a scale that includes five categories: very high (greater than 10 million CFU/G); high (1 million to <10 million CFU/G); moderate (100,000 to <1 million CFU/G); low moderate (5,000 to <100,000 CFU/G); and low (below 5,000 CFU/G). These categories are higher than other published categories and without correlation to symptom reporting.

NIOSH investigators suggest three categories: high (2200 to 7800 CFU/M²); moderate (1400 to 2100 CFU/M²); and low (600 to 1200 CFU/M²). These categories are lower than other published categories but are based on symptom reporting (the high category was shown to be associated with wheeze, chest tightness, and shortness of

breath in a single building they investigated). If the P & K scale is used levels of fungi in this building are low to low moderate; if the NIOSH scale is used levels of fungi are moderate to high.

Endotoxin is produced by gram-negative bacteria. Endotoxin has been associated with a variety of respiratory symptoms and complaints within indoor environments. NIOSH investigators suggest three categories based on an association with symptom reporting: high (4100 to 10,400 EU/M²); medium (1800 to 3300 EU/M²); and low (700 to 1200 EU/M²). This is not the only scale but the high category has been correlated with wheeze, chest tightness, and shortness of breath. Using this NIOSH scale, levels of endotoxin in this building are high for all but one sample.

Fungi and endotoxin were sampled based on recommendations from NIOSH who reported a relationship between levels in floor dust and building-related symptoms. If the NIOSH scale is used the fungi and endotoxin levels are moderate to high. This could contribute to symptoms reporting. However, there are limitations in the vacuum sampling for fungi and endotoxin – small number of samples, variability of levels, and lack of standard comparison.

5.2 Results of Wipe Samples

Wipe sample results for beryllium, lead, and permethrin were collected from the inside of vent covers in six locations. Beryllium was sampled for because beryllium exposure causes a disease very similar to sarcoidosis. Lead was sampled because surrounding industries in Bennington have historically released lead in their stack emissions which could be drawn into the building by the air handler. Permethrin, a pesticide, was sampled for based on an incident several years ago which caused overspray to be drawn sucked into the air handler. Results of the wipe samples are listed in table 5.2.

Table 5.2 Wipe Samples

<u>Location</u>	<u>Beryllium mcg/ft²</u>	<u>Lead mcg/ft²</u>	<u>Permethrin mcg/ft²</u>
Probation and Parole RM 90	<0.015	17	<14
Economic Services RM 46	<0.015	5.4	<14
Vocational Rehab RM 16	<0.015	4.2	<14
Family Court Rm 210	<0.015	62	30
Office of Child Services RM 237	<0.015	38	<17
State's Attorney RM 354	<0.015	39	<17

Note: Beryllium Reporting Limit 0.015 mcg, Lead Reporting Limit 0.750 mcg, Permethrin Reporting Limit 1.5 mcg

Beryllium was below the level of detection in all samples collected. Lead was detected in all samples but only one was above 40 mcg/ft², the EPA lead standard for floor dust in children's play areas. Though this level was above 40 mcg/ft² it is below the EPA lead dust standard of 250 mcg/ft² for window sills in children's play areas. The EPA standards are more protective than the OSHA permissible exposure limit of 0.05 mg/m³.

Permethrin was below the level of detection in all but one sample. The slightly elevated level was detected on the same sample as the elevated lead sample. Permethrin is a pyrethroid type pesticide and can have health effects. Permethrin can persist for long periods in the absence of sunlight. At this level and with no direct exposure pathway, permethrin should not pose a health risk to individuals in the building.

Section 5.3 Results of Instant and Seven-Day Measurements of Carbon Dioxide, Carbon Monoxide, Relative Humidity, Temperature, and Particulate Matter

Instant and seven-day measurements of carbon dioxide (CO₂), carbon monoxide (CO), relative humidity (Rh), temperature, and particulate matter are used to assess the adequacy of the ventilation system and comfort parameters. American Society of

Heating, Refrigeration, Air-Conditioner Engineers (ASHRAE) publishes guidelines for indoor air quality.

To maintain a comfortable indoor environment CO₂ should not exceed 1000 ppm. Breathing produces CO₂ and if overcrowding or under-ventilation occurs levels can be found above 1000 ppm. Although some levels on some locations approached 1000 ppm, no measurements were above this level.

Carbon monoxide is an odorless, colorless, deadly gas that is produced during combustion. It is standard to assess CO levels on any indoor air inspection. CO was 2 ppm or below in all samples, which poses no health risk.

Relative humidity (Rh) and temperature are both comfort parameters. Generally Rh should be between 40% and 80%. If levels fall below 40% the air appears dry and can be irritating to the upper respiratory system. Rh above 80% is consistent with mold growth. Rh remained between the described range throughout the sampling process. Temperature comfort ranges vary. During the sampling period the temperature rose above 80 degrees in a number of locations.

The OSHA permissible exposure level for total particulate matter, based on a 8-hour workday, is a time-weighted average of 15 mg/m³. No particulate levels exceeded 0.45 mg/m³. There were isolated spikes but on average the levels did not exceed 0.1 mg/m³.

Section 5.4 Results of water testing

Drinking water samples from taps on each of the three floors in the building were taken by the Health Department on Sept. 11 to test for an array of inorganic chemicals and volatile organic compounds at the Health Department Laboratory. The tests were

conducted to determine if the pipes that run the Bennington water supply into the building are contaminating drinking water.

Test for the full array of Volatile Organic Compounds (VOCs) – 58 different compounds that evaporate or “off-gas” at room temperature – are completed. Testing for inorganic chemicals is still underway. The only VOCs detected in testing were chloroform and bromodichloromethane, well within the Maximum Contaminant Level set by EPA’s Safe Drinking Water Standard. These are both expected byproducts of chlorination used to disinfect drinking water, and their presence reflects Bennington’s chlorinated water supply.

5.4 Conclusion of Sampling

In 2004, the Institute of Medicine stated that there is sufficient evidence to conclude that building dampness and presence of mold in damp indoor environments is associated with nasal and throat symptoms, wheeze, cough and asthma symptoms in sensitized individuals; suggestive evidence of the association with shortness of breath and development of asthma; and inadequate or insufficient evidence of the association with skin symptoms and fatigue.

Published findings of association between indoor environments and respiratory disease are inconsistent. However, when studies show an association, there are signs of dampness and presence of visible mold. The exact cause of lower respiratory disease in damp and water damaged building is unknown. In this context no amount of environmental sampling beyond evidence of dampness or water damage will determine if a health risk is present.

In this investigation, the visual inspection and the presence of fungi and endotoxin are consistent with damp building materials. However, we do not have conclusive

evidence that there is ongoing dampness in the building. To assess the presence of health risk these data need to be correlated with the health survey.

The consultant hired to perform the environmental sampling will issue their own report based on their interpretation of the results.

Section 6. Final Conclusions and Recommendations

Higher than expected rates of sarcoidosis, asthma, and asthma-like symptoms were found. The visual inspection found evidence of past water damage and the environmental sampling found evidence of fungi and endotoxin. Recommendations include a diagnostic work-up of the building and remediation, if necessary.

Section 6.1 Specific Recommendations

1. Hire a consulting firm that can rapidly complete building diagnostics and develop performance specifications for contractors renovating the building. Ensure the contractors meet the performance specifications.
2. Relocate all employees during building diagnostics and renovation.
3. Offer repeat medical screening including health survey and pulmonary function testing prior to building reoccupation.
4. Offer repeat medical screening including health survey and pulmonary function testing six months after building reoccupation.

APPENDIX A.
Bennington Health Survey Questionnaire



DEPARTMENT OF HEALTH

Division of Health Surveillance [phone] 802-863-7240
Infectious Disease Epidemiology [vt] 800-640-4374
108 Cherry Street – PO Box 70 [fax] 802-865-7701
Burlington, VT 05402-0070
www.HealthyVermonters.info

Agency of Human Services

200 Veterans Memorial Drive
Bennington, VT

The Vermont Health Department (VDH) is investigating health complaints that may be related to your workplace. The purpose of this questionnaire is to better understand the types of health complaints among building occupants. **We are asking all individuals who currently work at 200 Veterans Memorial Drive for at least 20 hours per week and who are at least 18 years of age to participate.** The questionnaire should take approximately 25 minutes to complete. We will ask you questions about your health and work history. You will receive a copy of the final report prepared by the health department.

The Vermont Department of Health will keep private all investigation records that identify you. Your results will be separated from your personal identifying information. After the data have been analyzed, your personal information will be destroyed. All records will be kept in locked cabinets accessible only to authorized VDH personnel. The information you provide VDH will be used for the purposes of identifying potential health issues in the building. No individual will be identified in any resulting reports. Management will not see your individual responses.

Your participation is entirely voluntary. However, it is important for a large percentage of building occupants to complete the questionnaire in order for this investigation to be successful. You don't have to respond to any questions that you don't feel comfortable answering. In addition, we might contact you again to participate in a follow-up study. If so, we will again obtain your consent and your participation will be voluntary.

This questionnaire is not intended to provide diagnostic information. We encourage you to see your physician if you have health concerns.

If you have questions about this investigation, please contact Dr. Lynn Blevins at 802-863-7240. If you choose to participate, please complete the attached questionnaire and drop it in the box in the back of the room. Please keep this top sheet for your records. We greatly appreciate your time and consideration.

By completing this questionnaire, you indicate your consent to participate in this investigation.

Thank you for your participation.

Bennington Questionnaire—August 2006

PERSONAL DATA SHEET

I. Demographics

1. Today's date: ___/___/2006
Month Day

2. Name: _____
First MI Last

3. Date of Birth: ___/___/____
Month Day Year

4. Gender: 1. ___ Male
2. ___ Female

5. Race (Please choose all that apply):
1. ___ American Indian or Alaska Native
2. ___ Asian
3. ___ Black or African American
4. ___ Native Hawaiian or Other Pacific Islander
5. ___ White

6. Ethnicity (Please choose one):
1. ___ Hispanic or Latino
2. ___ Not Hispanic or Latino

7. My office/cubicle/suite number is: _____

This page will be separated and destroyed after data analysis.

II. Health History

8.1 In the past 12 months have you had wheezing or whistling in your chest? 1. Yes ___ 2. No ___

IF YES:

8.2 Have you had wheezing or whistling in your chest one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

8.3 When you were away from the building was the wheezing or whistling:
1. Same ___ 2. Worse ___ 3. Better ___

8.4 In what month and year did you first have wheezing or whistling in your chest? ___ / ___
Month Year

9.1 In the past 12 months have you been awakened by an attack of breathing difficulty? 1. Yes ___ 2. No ___

IF YES:

9.2 Have you been awakened by an attack of breathing difficulty one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

9.3 When you were away from the building (e.g., vacations, weekends) was the awakening by attacks of breathing difficulty: 1. Same ___ 2. Worse ___ 3. Better ___

9.4 In what month and year were you first awakened by an attack of breathing difficulty? ___ / ___
Month Year

10.1 In the past 12 months have you had shortness of breath? 1. Yes ___ 2. No ___

IF YES:

10.2 Have you had shortness of breath one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

10.3 When you were away from the building was the shortness of breath:
1. Same ___ 2. Worse ___ 3. Better ___

10.4 In what month and year did you first have shortness of breath? ___ / ___
Month Year

11.1 **In the past 12 months have you had coughing attacks?** 1. Yes ___ 2. No ___

IF YES:

11.2 Have you had coughing attacks one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

11.3 When you were away from the building were the coughing attacks:
1. Same ___ 2. Worse ___ 3. Better ___

11.4 In what month and year did you first have coughing attacks? _____ / _____
Month Year

12.1 **In the past 12 months have you had chest tightness?** 1. Yes ___ 2. No ___

IF YES:

12.2 Have you had chest tightness one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

12.3 When you were away from the building was the chest tightness:
1. Same ___ 2. Worse ___ 3. Better ___

12.4 In what month and year did you first have chest tightness? _____ / _____
Month Year

13.1 **In the past 12 months have you had shortness of breath when hurrying on level ground or walking up a slight hill?** 1. Yes ___ 2. No ___

IF YES:

13.2 Have you had shortness of breath when hurrying on level ground or walking up a slight hill one or more times per week in the past 4 weeks? 1. Yes ___ 2. No ___

13.3 When you were away from the building was the shortness of breath:
1. Same ___ 2. Worse ___ 3. Better ___

13.4 In what month and year did you first have this shortness of breath? _____ / _____
Month Year

14.1 **In the past 12 months have you had unexplained rash?** 1. Yes ___ 2. No ___

IF YES:

14.2 Have you had an unexplained rash one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

14.3 When you were away from the building was the rash:
1. Same ___ 2. Worse ___ 3. Better ___

14.4 In what month and year did you first have a rash? _____ / _____
Month Year

15.1 **In the past 12 months have you had episodes of fever and chills?** 1. Yes ___ 2. No ___

IF YES:

15.2 Have you had episodes of fever and chills one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

15.3 When you were away from the building were these episodes of fever and chills:
1. Same ___ 2. Worse ___ 3. Better ___

15.4 In what month and year did you first have episodes of fever and chills? ___ / ___
Month Year

16.1 **In the past 12 months have you had episodes of flu-like achiness or achy joints?** 1. Yes ___ 2. No ___

IF YES:

16.2 Have you had episodes of flu-like achiness or achy joints one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

16.3 When you were away from the building was the flu-like achiness or achy joints:
1. Same ___ 2. Worse ___ 3. Better ___

16.4 In what month and year did you first have episodes of flu-like achiness or achy joints? ___ / ___
Month Year

17.1 **In the past 12 months have you had unusual tiredness, fatigue, or drowsiness?** 1. Yes ___ 2. No ___

IF YES:

17.2 Have you had unusual tiredness, fatigue, or drowsiness one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

17.3 When you were away from the building was the unusual tiredness, fatigue, or drowsiness:
1. Same ___ 2. Worse ___ 3. Better ___

17.4 In what month and year did you first have unusual tiredness, fatigue, or drowsiness? ___ / ___
Month Year

18.1 **In the past 12 months have you had headaches?** 1. Yes ___ 2. No ___

IF YES:

18.2 Have you had headaches one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

18.3 When you were away from the building were the headaches:
1. Same ___ 2. Worse ___ 3. Better ___

19.1 In the past 12 months have you had any episodes of stuffy, itchy or runny nose? 1. Yes ___ 2. No ___

IF YES:

19.2	Have you had any episodes of stuffy, itchy or runny nose one or more times per week in the last 4 weeks	1. Yes ___ 2. No ___
19.3	When you were <u>away</u> from the building were the episodes of stuffy, itchy or runny nose:	1. Same ___ 2. Worse ___ 3. Better ___

20.1 In the past 12 months have you had sneezing? 1. Yes ___ 2. No ___

IF YES:

20.2	Have you had sneezing one or more times per week in the last 4 weeks?	1. Yes ___ 2. No ___
20.3	When you were <u>away</u> from the building was the sneezing:	1. Same ___ 2. Worse ___ 3. Better ___

21.1 In the past 12 months have you had dry or itchy skin? 1. Yes ___ 2. No ___

IF YES:

21.2	Have you had dry or itchy skin one or more times per week in the last 4 weeks?	1. Yes ___ 2. No ___
21.3	When you were <u>away</u> from the building was the dry or itchy skin:	1. Same ___ 2. Worse ___ 3. Better ___
21.4	In what month and year did you first have dry itchy skin?	___ / ___ Month Year

22.1 In the past 12 months have you had any episodes of watery, itchy eyes? 1. Yes ___ 2. No ___

IF YES:

22.2	Have you had any episodes of watery, itchy eyes one or more times per week in the last 4 weeks?	1. Yes ___ 2. No ___
22.3	When you are <u>away</u> from the building were the episodes of watery, itchy eyes:	1. Same ___ 2. Worse ___ 3. Better ___
22.4	In what month and year did you first have episodes of watery, itchy eyes?	___ / ___ Month Year

23.1 **In the past 12 months have you had a sore or dry throat?** 1. Yes ___ 2. No ___

IF YES:

23.2 Have you had a sore or dry throat one or more times per week in the last 4 weeks? 1. Yes ___ 2. No ___

23.3 When you are away from the building was the sore or dry throat:
1. Same ___ 2. Worse ___ 3. Better ___

23.4 In what month and year did you first have a sore or dry throat:
_____/_____
Month Year

24.1 **In the past 12 months have you had sinusitis or sinus problems?** 1. Yes ___ 2. No ___

IF YES:

24.2 Have you had sinusitis or sinus problems in the last 4 weeks? 1. Yes ___ 2. No ___

24.3 How many episodes of sinusitis or sinus problems have you had in the last 12 months? _____ Episodes

24.4 When you were away from the building were the sinusitis or sinus problems:
1. Same ___ 2. Worse ___ 3. Better ___

24.5 In what month and year did you first have sinusitis or sinus problems?
_____/_____
Month Year

25.1 **In the past 12 months have you had pain or stiffness in the back, shoulders or neck?** 1. Yes ___ 2. No ___

IF YES:

25.2 Have you had pain or stiffness in the back, shoulders or neck in the last 4 weeks? 1. Yes ___ 2. No ___

25.3 When you were away from the building was the pain or stiffness in the back, shoulders or neck:
1. Same ___ 2. Worse ___ 3. Better ___

25.4 In what month and year did you first have pain or stiffness in the back, shoulders or neck?
_____/_____
Month Year

26.1 **In the past 12 months have you had numbness in your hands or wrists?** 1. Yes ___ 2. No ___

IF YES:

26.2	Have you had numbness in your hands or wrists in the last 4 weeks?	1. Yes ___ 2. No ___
26.3	When you were <u>away</u> from the building was the numbness in your hands or wrists: 1.Same ___ 2.Worse ___ 3.Better ___	
26.4	In what month and year did you first have numbness in your hands or wrists?	___ / ___ Month Year

27.1 **In the past 12 months have you had tension, irritability, or nervousness?** 1. Yes ___ 2. No ___

IF YES:

27.2	Have you had tension, irritability, or nervousness one or more times per week in the last 4 weeks?	1. Yes ___ 2. No ___
27.3	When you were <u>away</u> from the building was the tension, irritability, or nervousness: 1.Same ___ 2.Worse ___ 3.Better ___	
27.4	In what month and year did you first have tension, irritability, or nervousness?	___ / ___ Month Year

28.1 **In the past 12 months have you had dizziness or lightheadedness?** 1. Yes ___ 2. No ___

IF YES:

28.2	Have you had dizziness or lightheadedness one or more times per week in the last 4 weeks?	1. Yes ___ 2. No ___
28.3	When you were <u>away</u> from the building was the dizziness or lightheadedness: 1.Same ___ 2.Worse ___ 3.Better ___	
28.4	In what month and year did you first have dizziness or lightheadedness?	___ / ___ Month Year

29.1 **In the past 12 months have you felt depressed?** 1. Yes ___ 2. No ___

IF YES:

29.2	Have you felt depressed one or more times per week in the last 4 weeks?	1. Yes ___ 2. No ___
29.3	When you were <u>away</u> from the building was the feeling of depression: 1.Same ___ 2.Worse ___ 3.Better ___	
29.4	In what month and year did you first feel depressed?	___ / ___ Month Year

30.1 **In the past 12 months have you had pneumonia?** 1. Yes ___ 2. No ___

IF YES:

30.2 Have you had pneumonia in the last 4 weeks? 1. Yes ___ 2. No ___

30.3 How many times have you had pneumonia in the last 12 months? _____ Times

31.1 **In the past 12 months have you had a cold or flu?** 1. Yes ___ 2. No ___

IF YES:

31.2 Have you had a cold or flu in the last 4 weeks? 1. Yes ___ 2. No ___

31.3 How many times have you had a cold or flu in the last 12 months? _____ Times

32.1 **Has a health care provider ever told you that you have asthma?** 1. Yes ___ 2. No ___

IF YES:

32.2 Date of asthma diagnosis: _____ / _____
Month Year

32.3 Do you still have asthma? 1. Yes ___ 2. No ___

33.1 **Has a health care provider ever told you that you have sarcoidosis?** 1. Yes ___ 2. No ___

IF YES:

33.2 Date of sarcoidosis diagnosis: _____ / _____
Month Year

34.1 **Has a health care provider ever told you that you have hypersensitivity pneumonitis?** 1. Yes ___ 2. No ___

IF YES:

34.2 Date of hypersensitivity pneumonitis diagnosis: _____ / _____
Month Year

35.1 **Has a health care provider ever told you that you have migraines?** 1. Yes ___ 2. No ___

IF YES:

35.2 Date of migraine diagnosis: _____ / _____
Month Year

36.1 **Has a health care provider ever told you that you have eczema?** 1. Yes ___ 2. No ___

IF YES:

36.2 Date of eczema diagnosis: _____ / _____ / _____
Month Year

37.1 **Has a health care provider ever told you that you have hay fever?** 1. Yes ___ 2. No ___

IF YES:

37.2 Date of hay fever diagnosis: _____ / _____ / _____
Month Year

38.1 **Has a health care provider ever told you that you have allergy to dust?** 1. Yes ___ 2. No ___

IF YES:

38.2 Date of allergy to dust diagnosis: _____ / _____ / _____
Month Year

39.1 **Has a health care provider ever told you that you have allergy to molds?** 1. Yes ___ 2. No ___

IF YES:

39.2 Date of allergy to molds diagnosis: _____ / _____ / _____
Month Year

40. In the past 12 months, how many days have you missed work because of respiratory health problems? _____ Days

41. In the past 12 months, how many days have you missed work because of health problems other than respiratory? _____ Days

42. In the past 12 months, has there been mold or mildew on any surfaces (other than food) inside your home? 1. Yes ___ 2. No ___

43. In the past 12 months, have you smelled moldy or musty odors inside your home? 1. Yes ___ 2. No ___

44. In the past 12 months, has there been water damage to your home or its contents, for example from broken pipes, leaks, or floods? 1. Yes ___ 2. No ___

45.1 **Have you ever smoked cigarettes regularly?** 1. Yes ___ 2. No ___

IF YES:

45.2 Do you still smoke cigarettes? 1. Yes ___ 2. No ___

46.1 **Have you had symptoms that you think may be related to the building?** 1. Yes ___ 2. No ___

IF YES:

46.2 Briefly describe these symptoms

46.3 In what month and year did the symptoms begin?
(if you've listed >1 symptom, please indicate the earliest date they began) ___ / ___
Month Year

47. Are you worried or anxious that your workplace is making you sick? 1. Yes ___ 2. No ___

III. Work History

48. In what month and year did you start working at 200 Veterans Memorial Drive? ___ / ___
Month Year

49. On average, how many hours a week do you work in this building? ___ hours per week

50. In what department of section do you spend the majority of your time?

1. ___ Municipal court building
2. ___ Vocational Rehab
3. ___ Economic Services
4. ___ Department of Corrections first floor (**one-story building**)
5. ___ Department of Corrections first floor (**three-story building**)
6. ___ Department of Labor
7. ___ Department of Family Services Child Support
8. ___ Family Court section
9. ___ Intensive Substance Abuse Program
10. ___ State Attorney's section
11. ___ Family Services section
12. ___ Other (specify) _____

51. What best describes your job category?

___ Managerial / Supervisory

___ Non-supervisory Professional

___ Clerical / Administrative

___ Building Maintenance

___ Other (please specify) _____

52. In the **LAST FOUR WEEKS YOU WERE AT WORK**, how often have you experienced each of the following environmental conditions while working in this building?

CONDITIONS	CHECK ONE RESPONSE FOR EACH CONDITION			
	A. Not in the last 4 weeks	B. 1-3 days in the last 4 weeks	C. 1-3 days per <i>week</i> in the last 4 weeks	D. Every or almost every work day
52.1 Too much air movement				
52.2 Too little air movement				
52.3 Temperature too hot				
52.4 Temperature too cold				
52.5 Air too humid				
52.6 Air too dry				
52.7 Musty or moldy odor				
52.8 Unpleasant chemical odors				
52.9 Other unpleasant odors (e.g., body odor, food odor, perfume)				

53. Please use the space below to discuss any aspects of the building environment or employee health that you would like to share?

THANK YOU FOR YOUR PARTICIPATION.