

2005 FEB -2 P 1: 53

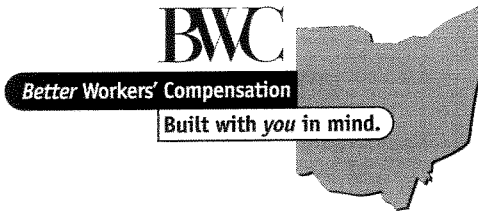
OFFICE OF
ADMINISTRATIVE SERVICES

INDOOR AIR QUALITY SURVEY

prepared
for

**OHIO DEPARTMENT OF NATURAL RESOURCES
1930 BELCHER DRIVE, D1
COLUMBUS, OHIO 43224-1387**

**MS. LINDA SUTHERLAND
HUMAN RELATIONS MANAGER**



Bob Taft
Governor

James Conrad
Administrator/CEO

The Ohio Bureau of Workers' Compensation
Employer Service Department
30 W. Spring Street, L-12
Columbus, Ohio 43215-2256

Telephone: 614-752-4538
Fax: 614-728-9389

January 31, 2005

Ms. Linda Sutherland
Ohio Department of Natural Resources
Human Resources Manager
1930 Belcher Drive, D1
Columbus, OH 43224-1387

Dear Ms. Sutherland:

Enclosed is a report resulting from an indoor air quality survey performed at your facility on January 25, 2005. Buildings F, G, and H were selected for analysis on this date.

SCOPE AND OBJECTIVE

The purpose of this survey was to measure the general air quality in each building. It was reported that associates have experienced repeated symptoms of headache, sinus irritation, and respiratory related issues.

On the survey, sampling units were used that periodically monitor the carbon dioxide, carbon monoxide, temperature, and relative humidity level. I will report this data and explain relevance to indoor quality.

The scope of the investigation was limited to buildings F, G, and H and the air handling units serving these buildings. Services related to biological monitoring are not included in the scope of this investigation.

AIR HANDLING UNIT

The air intakes for buildings F, G and H are located on the roofs of each building. These buildings are served by a common boiler and chiller system located in a separate building. The heating, ventilation, and air conditioning (HVAC) system has no provision for humidity control. A spot check of the rooftop unit on building H showed no evidence of mold growth in the drip pan areas. I did observe some scale in the drip pan which I recommend that you remove during your next service cycle. Ultraviolet lights were operational and located inside the HVAC unit. Service notes indicated that the air filters were replaced in August of 2004.

GENERAL AIR QUALITY

Results indicate that the relative humidity in all three buildings tested was low (< 30%) on the day of the survey. There may be a relationship between low relative humidity levels and mild discomfort in the eyes, nose and throat. There may also be a relationship between low relative humidity and mild headaches. As noted before, there is no provision for humidity control with your current HVAC system. All other general air quality indicators were good.

In Building G, nineteen people who are normally present at this office were away at an offsite meeting on the day of the survey. This may influence your carbon dioxide readings. I recommend that we re-sample Building G when the building has a normal occupancy load. An explanation of the general air quality parameters follows:

Carbon dioxide

Carbon dioxide is a surrogate indicator of general air quality. Comfort criteria with respect to human bioeffluents are likely to be satisfied if the ventilation results in indoor carbon dioxide concentrations that are less than 700 parts per million (ppm) above the outdoor air concentration (which averaged approximately 420 parts per million on 1/25/2005). When the concentration of carbon dioxide in air exceeds this level (approx. 1125 ppm), it indicates that not enough fresh air is entering the building. Carbon dioxide readings in your buildings were within acceptable limits.

Carbon monoxide

Carbon monoxide is a byproduct of combustion and is not desired in the indoor air environment. Carbon monoxide was not detected in the survey area at a level that would pose a threat to human health.

Temperature and Relative Humidity

The recommended limits for temperature and relative humidity are taken from the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) reference standard 55-1992, "Thermal Environmental Conditions for Human Occupancy." The table below outlines the recommended limits.

| | Summer limits | Winter limits |
|------------------------|--|---------------|
| Temperature (°F) | 73-79 | 68-76 |
| Humidity levels (% RH) | Not to exceed 60% relative humidity or drop below a dew point of 36°F (just under 30% relative humidity) | |

Relative humidity was maintained between 21 and 24 percent in the buildings. Temperature readings were maintained between 69 and 73 degrees Fahrenheit in the area measured.

Comments

I noticed a ceiling tile in the technical services area of building H-3 that had been painted. If the paint was applied to cover water damage the ceiling tile should be replaced. I also noticed water stained ceiling tile in Building G in the wildlife area and in room 300. Water damaged ceiling tile should be replaced because these tile are more prone to support mold growth.

The information that follows in this report documents the instrument readings obtained during our survey. I encourage you to share the contents of the entire report with your employees.

It was a pleasure to meet with your associates. The courtesy extended to me during my visit to the Ohio Department of Natural Resources was greatly appreciated. If you have any questions regarding this report or need additional assistance, please do not hesitate to contact me at 614-562-5573.

Sincerely,

Jim Scholl, CIH
Certified Industrial Hygienist

Date Of Determination: January 25, 2005
Surveyor: James F. Scholl, Certified Industrial Hygienist

Methodology: Readings were taken with a Q-Track Plus Model 8554 instrument. This unit was calibrated prior to performing the survey.

AIR SAMPLING RESULTS

| SITE SAMPLED | TIME SAMPLED | DEGREES FAHRENHEIT | CARBON DIOXIDE CONCENTRATION IN PARTS PER MILLION | CARBON MONOXIDE CONCENTRATION IN PARTS PER MILLION | PERCENT RELATIVE HUMIDITY |
|-----------------------------|--------------|--------------------|---|--|---------------------------|
| Outside Air | 7:00 AM | 28 | 460 | 0 | No Reading |
| | 1:30 PM | No Reading | 375 | No Reading | No Reading |
| Wildlife Call Center G-1 | 7:26 AM | 69 | 474 | 0 | 23 |
| | 11:07 AM | 72 | 480 | 1 | 22 |
| | 1:28 PM | 72 | 462 | 0 | 22 |
| | 3:40 PM | 72 | 518 | 0 | 24 |
| Wildlife Fiscal Revenue G-2 | 7:28 AM | 71 | 480 | 1 | 23 |
| | 11:05 AM | 72 | 482 | 1 | 22 |
| | 1:39 PM | 73 | 437 | 1 | 22 |
| | 3:46 PM | 72 | 549 | 1 | 22 |
| Wildlife Accts. Payable G-2 | 7:32 AM | 71 | 480 | 1 | 26 |
| | 11:00 AM | 71 | 520 | 1 | 25 |
| | 1:35 PM | 72 | 510 | 0 | 20 |
| | 3:42 PM | 72 | 537 | 0 | 24 |
| Wildlife Admin. G-3 | 7:42 AM | 71 | 460 | 1 | 24 |
| | 10:47 AM | 71 | 468 | 0 | 23 |
| | 1:46 PM | 73 | 411 | 1 | 21 |
| | 3:50 PM | 72 | 472 | 1 | 22 |
| Wildlife Admin. G-3-RM 300 | 10:55 AM | 71 | 468 | 1 | No Reading |
| | 1:50 PM | 71 | 413 | 1 | 24 |

The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) publishes a criteria document (ASHRAE 62-1999) titled Ventilation for Acceptable Indoor Air Quality. In this document they state that comfort criteria with respect to human bioeffluents are likely to be satisfied if the ventilation results in indoor carbon dioxide concentrations less than 700 parts per million (ppm) above the outdoor air concentration. This document includes Table 1 documenting outdoor air standards set by the EPA. Carbon monoxide levels should never exceed 35 ppm when averaged over a 1 hour period. The ASHRAE document states that relative humidity levels should be maintained between 30 and 60 percent.

The CO2 sensor has an accuracy of +/- 3% of the reading plus 50 ppm at 25 degrees Centigrade. The carbon dioxide sensor has an accuracy of +/- 3% of the reading or 3 ppm whichever is greater. The instrument was calibrated prior to performing the survey.

Date Of Determination: January 25, 20050
 Surveyor: James F. Scholl, Certified Industrial Hygienist

Methodology: Readings were taken with a Q-Track Plus Model 8554 instrument. This unit was calibrated prior to performing the survey.

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|-------------------------|--------------|--------------------|---|--|---------------------------|
| Recycling/Fiscal F-2/NW | 7:55 AM | 71 | 520 | 1 | 22 |
| | 11:17 AM | 71 | 536 | 0 | 22 |
| | 2:25 PM | 73 | 628 | 0 | 22 |
| | 4:00 PM | 73 | 480 | 0 | 22 |
| Tech. Chief H-1 | 8:04 AM | 71 | 557 | 1 | 24 |
| | 11:23 AM | 72 | 491 | 0 | 22 |
| | 2:30 PM | 72 | 542 | 0 | 26 |
| | 4:05 PM | 71 | 521 | 0 | 23 |
| H-3 Tech. Services | 8:10 AM | 73 | 672 | 1 | 22 |
| | 11:30 AM | 73 | 472 | 1 | 22 |
| | 2:35 PM | 73 | 542 | 0 | 22 |
| | 4:08 PM | 72 | 544 | 1 | 24 |
| Permit H-3 | 8:20 AM | 73 | 606 | 1 | 26 |
| | 11:33 AM | 73 | 534 | 1 | 24 |
| | 2:42 PM | 73 | 557 | 1 | 22 |
| | 4:10 PM | 73 | 567 | 1 | 22 |

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