1. **OVERVIEW**

The purpose of this document is to outline a consistent response for Facilities Management staff when responding to an indoor air quality complaint.

2. **ROLES & RESPONSIBILITIES**

Occupational Health, Safety and Environment will respond to all complaints related to indoor air quality. OHSE is equipped with instrumentation for measuring four of the ASHRAE basic parameters with regard to indoor office air: carbon dioxide, carbon monoxide, relative humidity and temperature. OHSE Consultants may also assess any occupant process activities and related byproducts that may be of concern. All findings are available in a documented report and shared with the complainants.

Facilities Management will be involved when matters related to infrastructure such as building envelope, HVAC or plumbing arise. These include concerns about building temperature, humidity, and air circulation, and odours arising from plumbing fixtures or ventilation ducts (e.g. sewer gas, exhaust fumes, etc.). Visual mould complaints also fall within Facilities Management’s responsibilities.

For issues directly related to a project, the Project Officer will work with the site contractor, and potentially an external consultant (e.g. designers, mechanical engineers, hygienists), to identify and address the occupant concerns.

3. **INVESTIGATION**

All complaints regarding potential indoor air quality concerns (e.g. odours, heat, etc.) are documented into the FAMIS work order system for assignment to appropriate trades staff. Resource Coordinators and Facilities front office staff should acquire as much information as possible when taking the initial complaint. At times, these complaints may come directly from OHSE.

A preliminary site visit of the space should be initiated as soon as possible to review the conditions. If a walk-through inspection identifies an obvious cause, which has a clearly defined solution, no formal investigation documentation is required. Simply identify work time and corrective actions taken on the assigned work order.

However, for those indoor air quality issues that appear to have no evidence or clearly identifiable cause, detailed documented investigation is required by Facilities Management staff. The efforts will be coordinated by the Manager of Energy Systems (or designate), with assistance from the EHS Coordinator (to allow for a consistent customer service window). Both parties will ensure that relevant communications are shared with OHSE to keep all stakeholders apprised of the situation.

To provide:

1) Compliance with WorkSafeBC regulation;

2) Consistency within and by Facilities Management investigating indoor air quality complaints; and
3) Reduction of duplicated efforts and lost production time by the department

Checklists have been generated for the respective divisions, to review their infrastructure/trade specialties, when handling an indoor air quality investigation.

See Appendix A for guidance checklists.

4. PROTOCOL REVIEW

The Indoor Air Quality Investigation Standard will be reviewed annually by:

- FMGT Management;
- EHS Coordinator for FMGT; and
- Facilities Management Joint Health & Safety Committee

The EHS Coordinator, in conjunction with FMGT management will review the standard forthwith, in situations where the standard, as implemented, may not protect workers or be in non-compliance with legislative requirements.

5. DOCUMENTATION

At the termination of an investigation, all documentation arising from an indoor air quality investigation should be forwarded to the EHS Coordinator for record keeping and reference.

6. LEGISLATION & RESOURCES

WorkSafe BC Occupational Health and Safety Regulation (BC Reg. 296/97), Part 4.70-4.80

Publications:

- WorkSafeBC Indoor Air Quality: A Guide for Building Owners, Managers and Occupants
- EPA: Building Air Quality: A Guide for Building Owners, Managers and Occupants
- University of Victoria: Occupational Health, Safety & Environment, Indoor Air Quality
### APPENDIX A

#### Janitorial Division

<table>
<thead>
<tr>
<th>Items</th>
<th>Comments</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning service standards being met</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialty cleaning in space (e.g. carpet cleaning)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pest control product application</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in products recently</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper use and storage of cleaning materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trash disposed of regularly, bins cleaned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spills from occupants identified in area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pets noted in space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other observations by janitorial staff</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Plumbing Division (Plumbing Infrastructure/Gas)

<table>
<thead>
<tr>
<th>Items</th>
<th>Comments</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malfunctioning equipment?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piping in/through space, no condensation or leaks?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review roof drains as possible sources of leaks?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor drain traps wet or sealable?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In vicinity of washroom—recent issues, current condition?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standing water in adjacent/related spaces?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any water leaks or flooding ever reported in this area? When?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any fuel oil or natural gas odour detected? Gas meter used?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review sinks—blockages? Improper disposal (e.g. organic matter down sink)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaking roof? Penetration into space? (Consider catch umbrella on metal roofs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does water pond on the roof close to any air inlets? (if water ponds, ensure no evidence of organic growth which could generate toxins and enter the air inlet)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are any air inlets within 2 m of a plumbing vent? (consider extending the vent or relocating air inlet)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Carpentry Division (Building Envelope/Materials)

<table>
<thead>
<tr>
<th>Items</th>
<th>Comments</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there signs of moisture staining on any interior surfaces? Or walls associated with exterior of building?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there any signs of paint peeling on interior surface?  This could indicated excessive moisture in past.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any visible mould growth on any interior surface?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any recent addition or application of caulks, sealants, coatings, adhesives, building fabrics?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any new pressed woods in vicinity (formaldehyde)?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mechanical Division

HVAC Checklist- Short Form (WorkSafeBC publication) – next page
HVAC Checklist - Short Form

Building Name: ______________________________  Address: ______________________________

Completed by: ______________________________  Date: __________  File Number: ______________

Sections 2, 4 and 6 and Appendix B discuss the relationships between the HVAC system and indoor air quality.

MECHANICAL ROOM

■ Clean and dry? __________________________  Stored refuse or chemicals? __________________________

■ Describe items in need of attention __________________________________________________________

MAJOR MECHANICAL EQUIPMENT

■ Preventive maintenance (PM) plan in use? __________________________

Control System

■ Type __________________________________________

■ System operation __________________________________________

■ Date of last calibration __________________________

Boilers

■ Rated Btu input __________  Condition __________________________________________

■ Combustion air: is there at least one square inch free area per 2,000 Btu input? __________________________

■ Fuel or combustion odors __________________________________________

Cooling Tower

■ Clean? no leaks or overflow? ______________  Slime or algae growth? __________________________

■ Eliminator performance __________________________________________

■ Biocide treatment working? (list type of biocide) __________________________________________

■ Spill containment plan implemented? ______________  Dirt separator working? __________________________

Chillers

■ Refrigerant leaks? __________________________________________

■ Evidence of condensation problems? __________________________________________

■ Waste oil and refrigerant properly stored and disposed of? __________________________________________
HVAC Checklist - Short Form

Building Name: ___________________________ Address: ___________________________

Completed by: ___________________________ Date: __________ File Number: ___________

AIR HANDLING UNIT

- Unit identification ____________________ Area served ___________________________

Outdoor Air Intake, Mixing Plenum, and Damper

- Outdoor air intake location ___________________________
- Nearby contaminant sources? (describe) ___________________________
- Bird screen in place and unobstructed? ___________________________
- Design total cfm ________ outdoor air (O.A.) cfm ________ date last tested and balanced ________
- Minimum % O.A. (damper setting) ________ Minimum cfm O.A. \( \frac{\text{total cfm} \times \text{minimum \% O.A.}}{100} \) ________
- Current O.A. damper setting (date, time, and HVAC operating mode) ___________________________
- Damper control sequence (describe) ___________________________
- Condition of dampers and controls (note date) ___________________________

Fans

- Control sequence ___________________________
- Condition (note date) ___________________________

- Indicated temperatures
  - supply air ______ mixed air ______ return air ______ outdoor air ______

- Actual temperatures
  - supply air ______ mixed air ______ return air ______ outdoor air ______

Coils

- Heating fluid discharge temperature ________ \( \Delta T \) ______ cooling fluid discharge temperature ________ \( \Delta T \) ______

- Controls (describe) ___________________________
- Condition (note date) ___________________________

Humidifier

- Type ___________________________ if biocide is used, note type ___________________________

- Condition (no overflow, drains trapped, all nozzles working?) ___________________________

- No slime, visible growth, or mineral deposits? ___________________________
HVAC Checklist - Short Form

Building Name: ___________________________ Address: ___________________________
Completed by: ___________________________ Date: _________ File Number: ____________

DISTRIBUTION SYSTEM

<table>
<thead>
<tr>
<th>Zone/ Room</th>
<th>System Type</th>
<th>Supply Air</th>
<th></th>
<th>Return Air</th>
<th></th>
<th>Power Exhaust</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ducted/ unducted</td>
<td>cfm*</td>
<td>ducted/ unducted</td>
<td>cfm*</td>
<td>cfm* control serves (e.g. toilet)</td>
</tr>
</tbody>
</table>

Condition of distribution system and terminal equipment (note locations of problems)

- Adequate access for maintenance? ____________________________________________
- Ducts and coils clean and obstructed? ________________________________________
- Air paths unobstructed? supply ______ return ______ transfer ______ exhaust ______ make-up ______
- Note locations of blocked air paths, diffusers, or grilles ______________________
- Any unintentional openings into plenums? ______________________________________
- Controls operating properly? ________________________________________________
- Air volume correct? ________________________________________________________
- Drain pans clean? Any visible growth or odors? ________________________________

Filters

<table>
<thead>
<tr>
<th>Location</th>
<th>Type/Rating</th>
<th>Size</th>
<th>Date Last Changed</th>
<th>Condition (give date)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>193 Indoor Air Quality Forms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**HVAC Checklist - Short Form**

**OCCUPIED SPACE**

**Thermostat types**

<table>
<thead>
<tr>
<th>Zone/ Room</th>
<th>Thermostat Location</th>
<th>What Does Thermostat Control? (e.g., radiator, AHU-3)</th>
<th>Setpoints</th>
<th>Measured Temperature</th>
<th>Day/ Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Summer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Winter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Humidistats/Dehumidistats type**

<table>
<thead>
<tr>
<th>Zone/ Room</th>
<th>Humidistat/ Dehumidistat Location</th>
<th>What Does It Control?</th>
<th>Setpoints (%RH)</th>
<th>Measured Temperature</th>
<th>Day/ Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Potential problems (note location)
- Thermal comfort or air circulation (drafts, obstructed airflow, stagnant air, overcrowding, poor thermostat location)
- Malfunctioning equipment
- Major sources of odors or contaminants (e.g., poor sanitation, incompatible uses of space)