

INDOOR AIR QUALITY MONITORING & ASSESSMENT PPT

- Prepared by Perfect Pollucon Services (2021)

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Why is preliminary assessment required ?

- ▶ To understand the current indoor air quality problems in industry
- ▶ To develop a database on :
 - building structure
 - ventilation system
 - potential sources
 - factors influencing indoor air quality
- ▶ Taking necessary action to reduce poor indoor air quality
- ▶ Planning for future to reduce indoor air pollution



How is it carried out ?

The process of conducting preliminary assessment can be divided into four steps :

- Background assessment
- A walkthrough evaluation
- Personal interviews
- Environmental monitoring



1) Background Assessment



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Purpose of background assessment

The intent of the background assessment shall be to obtain the following information :

- When was the building constructed?
- Building type?
- Ventilation system
- Previous problems
- Previous investigations and their results
- Recent renovations



Questions to be answered during background assessment

- Do you have a complete description of the HVAC system and its operation?
- Details such as original plans and specifications, changes to original system, commissioning reports, testing and balancing reports are needed as a minimum.
- Do you have operating instructions, and maintenance and calibration records for components of HVAC system?



More questions for background assessment

- Do you have a list of locations where architectural or engineering modifications have been done?
- Do you have a list of locations where indoor quality complaints have been reported in past?
- The frequency of complaints at these locations will help in solving the problem.
- Do you have a list of new occupancy areas added since the original design?
- Do you have a list of new areas served by HVAC system?



2) Walk-through Evaluation



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What is a walk-through evaluation ?

- ▶ It is needed to obtain any additional background information not obtained during the Background Assessment
 - Architectural plans
 - Engineering reports
 - Previous environmental assessments
- ▶ A critical inspection of the ventilation system is carried out in order to thoroughly characterize the building with respect to potential sources and microbial contaminants



3) Personal Interviews



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Purpose of Personal Interviews

- ▶ Necessary to better characterize the building population
- ▶ To determine the nature of the symptoms and complaints reported
- ▶ Critical in determining the magnitude of the problem, especially, if the problem is widespread throughout the building
- ▶ A symptom form prepared by NIOSH maybe used
- ▶ A simplified form can always be prepared and used if detailed information is not required



4) Environmental Monitoring



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Environmental Monitoring

- ▶ On-site environmental monitoring is needed to confirm or to rule out a number of problem source possibilities identified from the prior three steps
- ▶ Most common instruments used in this step are
 - Detector tubes for carbon dioxide
 - Psychrometers for measuring temperature and humidity
 - Detector tubes for suspected chemicals in the building
 - Smoke tubes for determining air movement



Steps in Indoor Air Quality Monitoring

Steps involved in Air Testing Service:

- ▶ Collecting air samples from the site
- ▶ Battery operated instruments for real-time measurements of Temperature, Humidity, Wind direction, Wind speed, PM2.5, PM10, CO, CO2, NOx, etc.
- ▶ Monitoring human exposure to harmful pollutants
- ▶ Detection & measurement of harmful gases in air from the collected sample
- ▶ Provide solutions to further improve Air quality in Companies



Preliminary Evaluation

- ▶ The findings are compared against health related parameters
 - OSHA guidelines
 - ACGIH recommended Threshold Limit Values(TLVs)
 - NIOSH recommended Exposure Limits(RELs)
 - EPA's Ambient Air quality Standards
 - ASHRAE guidelines
- ▶ Necessary action is proposed to curb the problem of poor indoor air quality



Conclusions and Follow-up Assessments



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Summary

- ▶ Make a log of employee complaints
- ▶ Assess the ventilation system for the building, including temperature and humidity factors
- ▶ Identify and evaluate sources of contamination
- ▶ Correct identified deficiencies and control or eliminate identified sources of contaminants
- ▶ Monitor complaints after remedial action has been taken

