

CASE STUDY: HVAC RE-ENTRAINMENT: PERCHLORETHYLENE (PCE) FROM ADJACENT DRY CLEANERS EXHAUST

Project Description: Odor Investigation, Retail Bank Branch

Scope of Services: AET was contracted to evaluate an intermittent chemical odor in a bank branch located in a strip shopping center. The bank employees also reported eye and nose irritation when the odor was present.

Know Your Neighbor: The tenant adjacent to the bank was a dry cleaning operation. AET's IAQ specialist immediately detected the sharp, sweet, ether-like odor of perchlorethylene (PCE) upon entering the bank. PCE has an odor threshold as low as 1 ppm.

AET's Investigative Approach/Sampling/Tools:

1. **Direct reading Instrumentation (Photoionization Detector)...** confirmed elevated airborne VOC levels above background levels in the bank retail areas.
2. **Chemical Specific Sampling...** was conducted for airborne PCE utilizing passive dosimeters and thermal absorption tubes.
3. **Odor Pathways...** smoke tube observations found the bank was under positive pressure relative to the outdoors. The perimeter wall between the bank and the dry cleaner was a demising wall (i.e., floor to ceiling) and no openings were observed.
4. **HVAC Inspection...** the fresh air intake for the bank branch was located on the roof. Roof inspection found the intakes less than 10 feet from the discharge stack from the dry cleaner washer/dryer. Smoke tube observations confirmed an odor pathway as well as a prevailing wind condition.

AET's Experience: PCE is a colorless, nonflammable chlorinated solvent comprising 80-85% of the dry cleaning fluids used in the US. Inhalation of PCE vapors can cause ocular and upper respirator irritation (similar symptoms as experienced by the bank employees). PCE exposure can also affect the central nervous systems causing dizziness, fatigue and headaches. NIOSH considers PCE a potential human carcinogen.

OSHA STANDARD	
100 ppm (PEL)	200 ppm (Ceiling)

CONCLUSION: ASHRAE and AIHA guidelines recommend a minimum of 15 feet distance between a fresh air intake and a contaminated exhaust and 30 feet from a dangerous or noxious exhaust. The height of the vent stack at the dry cleaner was extended to achieve the maximum distance obtainable by site conditions. The effectiveness of the ventilation stack extension is monitored by the bank employees and the odor warning properties of PCE compared to PCE concentrations where health affects are reported.

When you need professional industrial hygiene advice email Alan Sutherland, CIH, CHMM at a.sutherland@aetinc.biz or call 610-891-0114. We provide nationwide services; phone consultations are free. Check out the full range of environmental contracting/consulting services on our website www.aetinc.biz.

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