

ROBERT N. SAWYER, M.D.

OUTLINE: ASSESSMENT

1. ASSESSMENT CONSIDERATIONS

LOCATION	POPULATION BEHAVIOR
ACCESSIBILITY	CONTROL ALTERNATIVES
CONDITION	PRIORITY
OTHER FACTORS	COST

2. CLASSIFICATION OF MATERIALS

FRIABILITY	FRIABLE NONFRIABLE INTERPRETATIONS
APPLICATION	SURFACE TREATMENTS THERMAL SYSTEM INSULATION OTHER MATERIALS REPLACEMENT WASTE
QUANTITATION	SQUARE FEET, METERS LINEAL FEET, METERS UNITS

3. SAMPLING AND ANALYSIS

SAMPLING	APPLICATION REGULATIONS PATTERN	METHOD LABELLING CUSTODY
ANALYSIS	METHODOLOGY <i>-labelling</i> LABORATORY (RTI) QAP SYSTEM - EPA supported	
DISPOSITION	RETENTION DOCUMENTATION	

*asbestos in
28 states - schools**Platized light micros*

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4. MATERIAL ANALYSIS METHODOLOGIES
- bi-refringence 2 common to crystalline mat*
of extensions dispersion staining - amplify
(1) (2)
- sheet of lite* POLARIZED LIGHT MICROSCOPY (PLM)
- X-RAY DIFFRACTION (XRD) - *can't define shape like PLM*
- quartz type* MICROPARTICULATE TECHNOLOGY - *bulk analysis - uses TEM*
- look @ fibers + ID as certain type
- Ref: Rohl RN, Langer AM, Wylie AG, Mineral Characterization of Asbestos-Containing Spray Finishes. EPA: A Guidance Document, Part 1.
5. POLARIZED LIGHT MICROSCOPE (PLM) AND X-RAY DIFFRACTION
6. RTI QUALITY ASSURANCE PROGRAM [GAP] - *Voluntary program - like CAP*
 RESEARCH TRIANGLE INSTITUTE *come up to perform ratio*
 RESEARCH TRIANGLE PARK
 NORTH CAROLINA 27709.
 TELEPHONE: 800-334-8571
7. DUST SAMPLING METHODOLOGIES - *cellulose acetate filter 12 LPM SR -*
Prob - relate to airborne by SEM
8. COMMON ASSESSMENT METHODS
- AIR SAMPLING
 - RATING SYSTEMS
 - MATRIX METHOD
 - EPA GUIDANCE DOCUMENTS
 - CONSULTATIONS
9. BASIC ASSESSMENT PROBLEMS
- NO DEFINITIVE EXPOSURE STANDARD
 - MEASUREMENT PROBLEMS
 - MISINFORMATION
10. AIR SAMPLING METHODOLOGIES
- light micro - optics - phase contrast*
- (1) PHASE CONTRAST MICROSCOPY - *ORM - OSHA reference method*
 P&CAM 239, 7400, ORM OSHA 1910.1001
 OSHA 1926.58 *ct. particles - no ID*
- (2) *OPTICAL TECHNIQUES* SCANNING ELECTRON MICROSCOPY (SEM) - *2 methods*
particles as asbestos
- (3) TRANSMISSION ELECTRON MICROSCOPY (TEM) - *ultimate tool for particles*
EPA provisional methodology *10 particles as asbestos + types*

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11. COMPARISON OF AIR SAMPLING METHODOLOGIES

	PCM	SEM	TEM
Standard protocols	P&CAM 239 P&CAM 7400 ORM	None accepted	EPA <i>Yamabe method</i> provisional
Laboratory assessment	Proficiency Analytical Testing (PAT)	None	None
Cost range, per sample	\$25-50	\$50-300	\$200-600
Availability	Most available	Less available than PCM	Less available than PCM
Time, preparation/analysis	1 hour	4 hours	4-24 hours
Time, turn-around	6 hours	6-24 hours	2-7 days
Sensitivity: <i>holo sm see</i> best typical	<i>OSNA 24</i> 0.15 um 0.25 um	0.05 um 0.20 um	0.0002 um 0.0025 um <i>definitive tool</i>
Specificity	Not specific for asbestos <i>tell you what fiber is 3:1 ratio</i>	More specific than PCM but not definitive for asbestos (SEM with EDXA) <i>to 1 um → can do X-ray techniques</i>	Definitive for asbestos (Level III-TEM with EDXA & SAED) <i>direct transfer method - TEM</i>
Collection filters	0.8-1.2 um cellulose ester	0.4-0.8 um polycarbonate best, 0.8 um cellulose ester also used	0.4 um polycarbonate, or 0.8 um cellulose ester if organic contaminants present

12. AIR SAMPLING: PROBLEMS

FIBER AERODYNAMICS

TECHNOLOGIES OF MEASUREMENT

- air sample snapshot of moving particle

Matrix concept - 3-D

- ① mat type
priority
access
- ② condition/damage - thermal insulation
- ③ quantities - freq clim in surveys

↓
how much accessible - meters, feet
Matrix meth gives

mat type
access, cond. .. quan
compreh. inventory
work req.
cost estim
stratify

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13. USES OF AIR SAMPLING

- ① ASSESSMENT OF CONTAMINATION PCM, TEM → takes big study
 ② DOCUMENTATION OF CONTROL FIBERS PCM, TEM
 ③ MONITORING DURING ABATEMENT PCM - OSHA req. - controlled area
 ④ PERSONNEL MONITORING (OSHA) - PCM → requirement = OPM - 7400 in ac
 ⑤ ACCEPTANCE OF REMOVAL PCM, TEM → the way

14. RATING SYSTEM CHARACTERISTICS - numerical

QUANTITATION	DATA COLLECTION COMMUNICATION PRIORITY RANKING
ESTIMATION	FACTORS CONTAMINATION POTENTIAL
ADVANTAGES	PREDICTIVE AIR DATA DEFICIENCIES
LIMITATIONS	SUBJECTIVE EVALUATION OBSERVER VARIABILITY

15. MATRIX CONCEPT (BASIC)

use on
one mat at a
time - ea material
assessed by computer

PRIORITY FACTORS

STRUCTURAL LOCATION
USER CHARACTERISTICS
REGULATORY, LEGAL
OTHER CONSIDERATIONS

CONDITION/DAMAGE

INTACT TO SEVERE
AND SCOPE OF WORK

SIM - Survey - inspect sample
inventory - data acquisition
compliance
matrix - stratific
- consider cost estimate
much @ once - communicate

16. CLASSIFICATION BY APPLICATION

ARCHITECTURAL DEFINITION

SURVEY PARAMETERS

CONTAMINATION POTENTIAL - accessibility

INVOLVED POPULATIONS

CONTROL METHODS AND COST

17. MATRIX ASSESSMENT EXAMPLES: THERMAL SYSTEM INSULATION

18. EPA GUIDANCE DOCUMENTS

VOL 1 + II ORANGE BOOKS 1979 (1984) - produced under TAP

BLUE BOOK

1983 - complement abt. in schools - now EPA in school

PURPLE BOOK

1985 - son of blue book

↓ in effect for EPA guidance

No regulatory intent

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Law
in
OCT.
1986

← ANERA - Congress unhappy w blue book 76.3
- emergency response act.

① school buildings

② time schedule on EPA by Congress

③ Negotiated rulemaking - create reqs for ash
- removal mandated under some specif in schools

④ Hammer provision

- If EPA no meet, Congress set own rules
- requires study of other bldgs

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19. SIGNIFICANCE OF PURPLE BOOK CHANGES

COMMITTEE MEMBERSHIP - included non-EPA selected members
 DOCUMENT ORGANIZATION - easier
 STATEMENT ON PRESENCE of asbestos in bldg - not necessary
 MANAGEMENT APPROACH - polit importance
 TEM CLEARANCE in removal operation

House Approp
Comm

20. REMOVAL DECISIONS:

WHETHER IRRELEVANT - NESHAPS say will remove bldg!
 WHEN - critical PRIORITY SYSTEM
 CONDITIONS CONTROLS

21. REMOVALS: SOLE PURPOSE VS INTEGRATED

22. EPA REGULATIONS CHRONOLOGY

40 CFR PART 61 - NESHAPS 1973 } elim installation friable
 AMENDMENTS 1978 } asbestos
 40 CFR PART 763 1982 - Asbestos in schools - look for friable
 SEIU PETITION AND HEARINGS 1984 should be done for all bldgs, notify
 40 CFR 763 SUBPART G 1985 - People protection - apply OSHA
 req to Munic. + govt workers

26. OSHA REGULATIONS CHRONOLOGY

29 CFR 1910.93a(1001) Steiger 1972
 PROGRAM DIRECTIVE #300-16 1978
 EMERGENCY TEMPORARY STANDARD 1983
 AMENDED GENERAL STANDARD 1986
 29 CFR 1910.1001
 CONSTRUCTION INDUSTRY STANDARD 1986 - OSHA told to do in 1972
 29 CFR 1926.58 - now in effect

27. CHRONOLOGY OF PEL CHANGES

Year	Regulation	TWA	ceiling	Unit
1972	1910.93a	5.0	10.0	Fibers per cubic centimeter of air
1972	1910.93a(1001)	2.0	5.0	
1975	PROPOSED	0.5	5.0	
1977	NIOSH PROPOSED	0.1	0.5	
1983	ETS	0.5	5.0	
1986	1926.58	0.2		

— no ceiling limit!

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