



environmental monitoring  
s y s t e m s

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## Lead Based Paint Review – 20170327

1. Lead – Blue/Gray Malleable Metal
2. History
  3. One of 7 Metals of Antiquity
  4. Used in Egypt, Roman Empire
  5. Pb (PLUMBUM is Latin) for Lead
6. Uses
  7. Made into Sheets, Rods, Pipes, Containers
  8. Used in Building Trades, Plumbing, Solder
9. Sources in Environment
  10. Lead-Based Paint – Dust/Chips
    11. Lead Paint Max – 1920's
  12. Water- Small Hazard
    13. Avoid – Hot Water for Food, Boiling
  14. Hobbies – Stain Glass, Fishing, Bullets
  15. Gasoline – Contaminated Soil Along Roads
  16. EPA Removed Pb from Gasoline ~1985
  17. Food
    18. Lead Solder in Acidic Foods e.g. Tomatoes
    19. Additive to Wine
    20. Lead in Ethnic Candy Wrappers
  21. Air
    22. Industrial Sites e.g. Battery Manufacturing
    23. Construction Sites
24. Pb Health Effects
  25. Pb Affects ALL Body Systems
    26. Neurobehavioral – Nervous System -Most Important in Children
    27. Needleman Study – Lowest Observed Effects
      28. High IQ Group - no High Lead Children >120 IQ
      29. Overall – High Lead 5 IQ points less than Low Lead group
      30. Low IQ Group = 2X High Lead vs Low Lead Children
    31. Encephalopathy – Brain Swelling
  32. Blood
    33. Low Iron – Anemic
    34. High Blood Pressure
  35. Kidneys – Nephropathy
    36. Pee lead out of the body
  37. Reproductive
    38. Low Libido – Low Sex Drive
    39. Miscarriages
    40. Erectile Dysfunction
  41. Half Life in the Body
    42. Blood – 30-60 Days
    43. Organs – 60-90 Days
    44. Bone – 40 years
45. Screening
  46. High Risk Children 1,2,3,4,5 years old + 1.5 years
  47. Blood Levels – Children
    48. 5 ug/dl = CDC – Reference Value
    49. 15-19 ug/dl = Mildly Lead Poisoned (Two Tests)
    50. 20-49 = Lead Poisoned (One Test)
    51. >70 Medical Emergency – Possibility of Death
  52. Blood Levels – Adults
    53. Planning to have children < 10 ug/dl
    54. NOT Planning to have children <25 ug/dl
  55. Exposure
    56. Children – Home – Ingestion – Hand-to-Mouth
    57. Adults – Work – Inhalation
  58. Environmental Interventions
    59. Isolate Peeling Paint
    60. “White Glove” Clean
    61. Wash hands and Toys Frequently
  62. Identify LBP
    63. XRF - Non-destructive
    64. Paint Chips - LAB - Destructive
    65. Spot (Chemical) Tests
      66. Not Recognized by HUD
  67. LBP Hazards
    68. Accessible (Chewable) Surfaces
    69. Friction Surfaces
    70. Impact Surfaces
  71. LBP Surveys
    72. Federal Inspection – Surface by Surface
    73. Federal Risk Assessment – LBP Hazards
    74. Iowa Inspection
      75. Surface by Surface + LBP Hazards
  76. Personal Protective Equipment
    77. Respirators
      78. Written Respirator Protection Plan
      79. Medical Surveillance Plan
    80. Coveralls, Gloves, Shoes, Hard-hats, etc.
  81. Iowa LBP (e.g.)
    82. # IA LBP Children ~ 3 X National Average
    83. Why - Older Housing (<1950) = ~2X Nat. Avg.
      84. 6<sup>th</sup> in nation in older housing
    85. Need Maintenance – Rural Economy
    86. Lack of Previous LBP Program
  87. Work site Preparation
    88. Relocate Residents
      89. Disturb > 10 Sq. Ft. Interior
      90. Disturb > 50 Sq. Ft. Exterior
      91. If Bathroom not available
    92. 2 Layers – 6 mil plastic
    93. Disturb >2 Sq. Ft.
    94. Warning Signs
    95. Remove or Wrap Furniture
  96. Regulations
    97. Title X–Residential LBP Hazard Reduction Act1992
    98. “Target Housing”
      99. <1978, Not for Elderly or 0 Bedroom
    100. HUD Guidelines – 1995
    101. EPA

- 102. Training & Certifications
  - 103. March 1, 2000 Individuals
  - 104. September 15, 2000 - Firms
- 105. Real Estate Disclosure
  - 106. Sale or Rent
  - 107. December 6, 1996
- 108. Notification before Renovation
  - 109. June 1, 1999
  - 110. > 7days but < 60 Days
  - 111. Pamphlet
  - 112. Written Acknowledgment
- 113. Renovation, Repair & Painting (RRP)
  - 114. Effective April 22, 2010
  - 115. >2.0 Sq. Ft. Inside, 20 Sq. Ft. Outside
  - 116. Require Certified Renovators
  - 117. Require Certified Firms
  - 118. Pamphlet – Renovate Right
  - 119. Written Acknowledgment
  - 120. Maintain Records 3-Years
- 121. HUD Assisted Properties
  - 122. September 15, 2000
  - 123. >2.0 Sq. Ft. Inside, 20 Sq. Ft. Outside
  - 124. Clearance Test after Repairs
- 125. General
  - 126. LBP Inspection NOT Required
  - 127. LBP Repairs NOT Required
  - 128. No Landlord Retaliation
  - 129. No Bias against Families with Children
- 130. Worker Protection
  - 131. OSHA Requirements
    - 132. Written Compliance Plans
    - 133. Competent person
    - 134. Exposure Assessments
    - 135. Task Related Triggers
    - 136. Engineering & Work Practice Controls
    - 137. Respiratory Protection Plan
    - 138. Medical Surveillance
    - 139. PPE
    - 140. Record Keeping
- 141. Lead Hazard Control
  - 142. Interim Controls - Temporary
    - 143. Clean
    - 144. Fix Moisture Sources
    - 145. Paint Film Stabilization
    - 146. Wet Scrape and Paint, etc.
  - 147. Abatement =Permanent > 20 Years
  - 148. Component Removal and Replacement
  - 149. Encapsulation
  - 150. Enclosure
  - 151. Paint Removal
    - 152. Chemical Stripping or Heat Gun
- 153. Prohibited Practices
  - 154. Open Flame Burning
  - 155. Dry Scraping or Sanding
  - 156. Methylene Chloride Strippers
  - 157. Abrasive Machines with NO HEPA
  - 158. Uncontained Hydro-blasting
  - 159. Heat Guns > 1,100 Degrees F

- 160. Cleaning
  - 161. Clean Wet, Clean Smart, Clean Well
  - 162. WET WIPE, WET RINSE, Throw Away
  - 163. HEPA VAC, WET WASH, HEPA WASH
  - 164. Work Top to Bottom, Back To Exit
- 165. Clearance Testing
  - 166. Visual Examination
    - 167. No Paint Chips, No Dust
    - 168. Sample 4 Rooms
      - 169.1 Floor
      - 170.1 Window Sill (Stool)
      - 171.1 Window Trough (Well)
      - 172. Plus 1 per 2,000 sq. ft. common areas
      - 173. 1 Sample within 10 feet outside containment
- 174. Composites
  - 175. Paint Chip – up to 5 sub-samples
  - 176. Standard/#sub samples
  - 177. Dust Wipe – up to 4 sub samples
  - 178. Clearance Sample divide by ½ # sub-samples
  - 179. Soil – up to 10 subsamples

**LEAD EXPOSURE LIMITS**

- PAINT 90ppm – CPSC (20100526)
  - 1.0mg/cm<sup>2</sup> or 0.5% or 5,000ppm - HUD
- DUST <40 ug/ft<sup>2</sup> - EPA Clearance for Floors
  - <250ug/ ft<sup>2</sup> - EPA Clearance for Window Sills
  - <400ug/ ft<sup>2</sup> –EPA Clearance for Window Wells
- NEW Effective 20170401
- DUST <10 ug/ ft<sup>2</sup> - HUD Clearance Action Level for Floors
  - <40 ug/ ft<sup>2</sup> – HUD Clearance Action Level for Porch Floors
  - <100ug/ ft<sup>2</sup> - HUD Clearance Action Level for Window Sills
  - <100ug/ ft<sup>2</sup> –HUD Clearance Action Level for Window Wells
- SOIL 500-1000ppm EPA Superfund Limit
  - 400ppm - High Contact Play Areas {Communicate}
  - 1200ppm - Other Residential Yard Areas {Average}
  - 5000ppm - Require Permanent Abatement
  - 200ppm – EPA Replacement Soil
- AIR 0.15ug/m<sup>3</sup> - EPA National Air Quality Standard (Quarterly)
  - 30ug/m<sup>3</sup> - OSHA Action Level (8 Hour Avg.)
  - 50ug/m<sup>3</sup> - OSHA Exposure Limit
- BLOOD 5ug/dl (CDC) CDC Reference Value for children
  - EBL/EIBL 2X15-19 ug/dl or 1>20 ug/dl
  - 40ug/dl (OSHA) Permissible Blood Lead Level
  - 50ug/dl (OSHA) Worker Removal - Lead Level
- WATER - 15ppb (ug/liter) AVG, no single source >20ppb
- GASOLINE - 0.1 g/gallon
- CERAMIC OR POTTERY GLAZES – FDA - AOAC Method 973.32
  - 3ppm Leachate – Plates, Saucers and other Flatware
  - 2ppm Leachate – Small Hollowware – (Cereal Bowls)
  - 1ppm Leachate – Large Hollowware
  - 0.5ppm Leachate – Cups, Mugs and Pitchers
- HAZARDOUS WASTE – Other Metals – Leachable TCLP
  - Arsenic (As) - 5ppm                      Lead (Pb) – 5ppm
  - Barium (Ba) – 100ppm                      Mercury (Hg) - 0.2ppm
  - Cadmium (Cd) – 1ppm                      Selenium (Se) – 1ppm
  - Chromium (Cr) – 5ppm                      Silver (Ag) – 5ppm
- CLEARANCE TESTING (Dust Wipes)
  - Visual Examination - No Paint Chips, No Dust
  - Sample 4 Rooms
    - 1 Floor + 1 Window Sill (Stool) +
    - 1 Window Trough (Well) +
    - 1 per 2,000 sq. ft. common areas +
    - 1 Sample within 10 feet outside containment
- EPA Recognized Swabs (Nationally Available)
  - Lead Check ® Swabs
  - D-Lead® Test Kits