

Benjamin M. LaPointe, CHMM
Assessment/Remediation Manager
Metric Environmental, LLC.
benjaminl@metricenv.com

Commercial/Industrial Site Assessment & Remediation

LEAD IN SOIL

I. WHY? PURPOSE OF LEAD SOIL SAMPLING AT COMMERCIAL/INDUSTRIAL PROPERTIES

- ✘ Assess potential long-term exposure threats to human health or the environment
- ✘ Assess redevelopment feasibility of current/former commercial/industrial sites
- ✘ Assess anticipated work site exposure conditions (immediate exposure threats)
- ✘ Develop budgets and scopes of anticipated improvement projects
- ✘ Assess potential adverse affects to market value of a real-estate property

II. WHEN IS LEAD SOIL SAMPLING WARRANTED?



SUSPECT SPILLS/RELEASES

- ✘ Enforcement Program (IDEM LUST, State Cleanup, EPA Superfund)
- ✘ Voluntary Assessment (IDEM VRP)
- ✘ Sampling is typically focused on concerns specific to the suspected spill/release

II. When is Lead Soil Sampling Warranted

UNDERGROUND STORAGE TANK CLOSURES



RECOGNIZED ENVIRONMENTAL CONDITION(S)

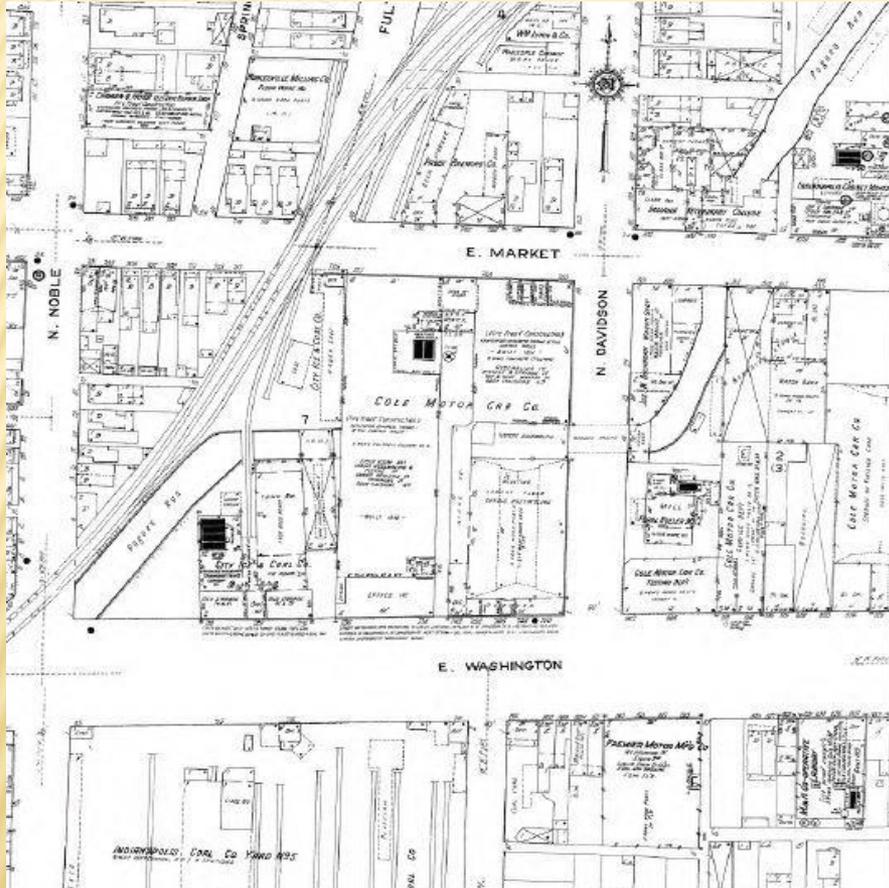
- ✘ Identified by an *Environmental Professional* while conducting a Phase I ASTM E1527-13 environmental site assessment (ESA).
- ✘ Further assessment by means of soil sampling may warranted as part of due diligence investigation prior to a land transaction or proposed redevelopment.

Phase I ESAs can be conducted for various purposes:

- ✘ Prospected land transactions (i.e. CERCLA limited liability protections of bona fide prospective purchaser)
- ✘ Public Assessments (Brownfield assessment grants, public land seizures/acquisitions)
- ✘ Proposed improvement projects/easements
- ✘ Redevelopment financing and property value assessments

II. When is Lead Soil Sampling Warranted

RECOGNIZED ENVIRONMENTAL CONDITIONS



1914

Fire Insurance Map



2015

Aerial Photograph

III. SOURCES OF ELEVATED LEAD IN SOIL

III. SOURCES OF ELEVATED LEAD IN SOIL

Wide range of current and historical industrial and commercial type facilities.

- ✘ Landfills
- ✘ Petroleum facilities (filling stations/refineries/bulk plants)
- ✘ Underground storage tanks
- ✘ Coal facilities/coal ash
- ✘ Paint/coating manufacturing
- ✘ Battery industries/recycling
- ✘ Junk yards



III. SOURCES OF ELEVATED LEAD IN SOIL

- ✘ Metal foundries
- ✘ Metal works facilities
- ✘ Metal recycling facilities
- ✘ Munitions
- ✘ Rail yards
- ✘ Other manufacturing (rubber/plastics, colorants, electronics, water repellents, etc.)



IV. SAMPLING OF SOILS FOR LEAD AT COMMERCIAL/INDUSTRIAL PROPERTIES (PHASE II)

WHO? WHAT QUALIFICATIONS ARE REQUIRED?

- ✘ Training consistent with the requirements of 29 CFR 1910.120(e) to work in contaminated areas (i.e. OSHA Hazwopper-40 Hour certification)
- ✘ Possess sufficient training and experience necessary to properly and responsibly collect & handle the sample, prevent cross-contamination, implement proper equipment decontamination, and necessary site safety controls.

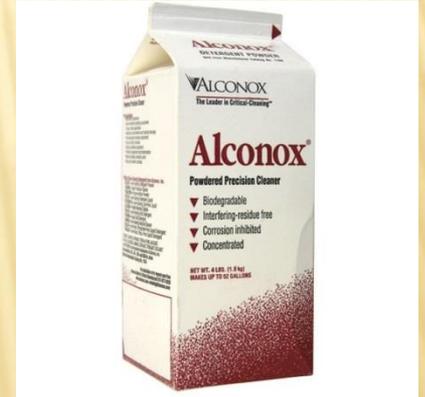
SAMPLING TECHNIQUES

- ✘ Sample Trowel
- ✘ Hand Probe
- ✘ Direct Push Probing
- ✘ Sediment Samplers (Petite Ponar[®])



SAMPLE HANDLING

- ✘ Prevent cross-contamination
- ✘ Equipment decontamination
- ✘ Equipment blanks
- ✘ Chain of custody
- ✘ Laboratory analysis: Lead and lead compounds
(US EPA SW-846 Method 6010)



V. WHAT IF LEAD IS FOUND IN SOIL SAMPLES?

NATURAL/BACKGROUND?

- ✘ Lead is a naturally occurring heavy metal in soils.
- ✘ Typically natural concentrations of lead in Indiana range up to 40 mg/kg (USGS).
- ✘ A recent IDEM study conducted in Terre Haute demonstrated that anthropogenic background concentrations of lead are as high as 370 mg/kg (median of 35 mg/kg).
- ✘ Suspect release?

IDEM REMEDIATION CLOSURE GUIDE

2016 Lead & Lead Compounds Screening Levels (SLs)

- ✘ Soil Migration to Groundwater SL (270 mg/kg)
- ✘ Residential Direct Contact Exposure SL (400 mg/kg)
- ✘ Commercial/Industrial SL (800 mg/kg)
- ✘ Excavation Direct Contact SL (1000 mg/kg)

SOIL MIGRATION TO GROUNDWATER SL (270 mg/kg)

- ✘ Soils with lead concentrations ≤ 270 mg/kg may be considered “uncontaminated” per the IDEM Uncontaminated Soil Policy [WASTE-0064-NPD].
- ✘ Areas of karst features, wetlands, and floodways is considered uncontaminated only with no detectable human introduced concentrations.
- ✘ Lead present ≥ 270 mg/kg cannot be used as clean fill and displaced offsite other than a municipal landfill, and
- ✘ Contained-in Letter issued by IDEM required for disposal as non-hazardous waste

SUSPECT RELEASE OR SPILL?

- ✘ IDEM Office of Land Quality (OLQ) must be contacted by the responsible party per the IDEM Spill Rule (327 IAC 2-6).
- ✘ IDEM OLQ 24-hour hotline:
(888) 233-7745

RESIDENTIAL DIRECT CONTACT SL (400 mg/kg)

- ✘ Long-term exposure screening threshold
- ✘ Applies to some commercial properties (daycares, schools)
- ✘ Remedial action may be warranted by responsible parties
- ✘ Soil waste with lead \geq RDCSL is considered hazardous waste unless:
 - + disposed at a municipal landfill, and
 - + Soil is not characteristically toxic, and
 - + Contained-in Letter obtained for disposal

CHARACTERISTICALLY TOXIC?

- ✘ Toxicity Characteristic Leaching Procedure (TCLP) analysis is required to determine that soil is not characteristically toxic.
- ✘ Lead TCLP ≥ 5 mg/L = RCRA hazardous waste (waste code D008)



COM/IND DIRECT CONTACT SL (800 mg/kg)

- ✘ Long-term exposure screening threshold – typical commercial/industrial work place
- ✘ Remedial action may be warranted by the responsible party
- ✘ Soil waste generated with lead concentrations ≥ 800 mg/kg is a RCRA hazardous waste
- ✘ RCRA hazardous waste must be disposed at a hazardous waste disposal facility



V. What if Lead is Found in Soil Samples?

EXCAVATION DIRECT CONTACT SL (1000 mg/kg)

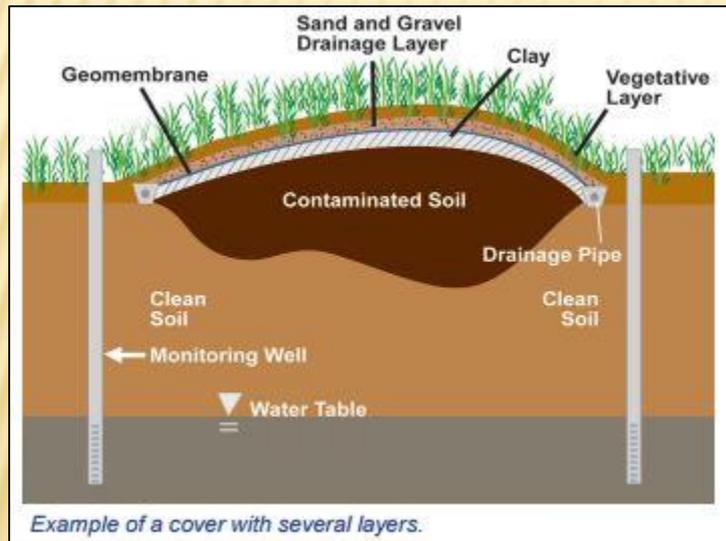
- ✘ Remedial action may be warranted by the responsible party
- ✘ Worker immediate exposure screening threshold
- ✘ Proper steps to mitigate exposure necessary



VI. REMEDIATION (PHASE III)

IV. REMEDIATION METHODS

- ✘ Impacted soil removal and replacement
- ✘ Soil capping – can be as simple as a layer of soil and grass cover.
- ✘ Other methods (i.e. electrokinetic, phytoremediation)



QUESTIONS?



Benjamin M. LaPointe, CHMM
Assessment/Remediation Manager
Metric Environmental, LLC.
benjaminl@metricenv.com

