Louisville Metro Council

Community Affairs, Health, Housing and Education Committee

New Approaches and Tools to Protect Child Brain Health

John Cullen

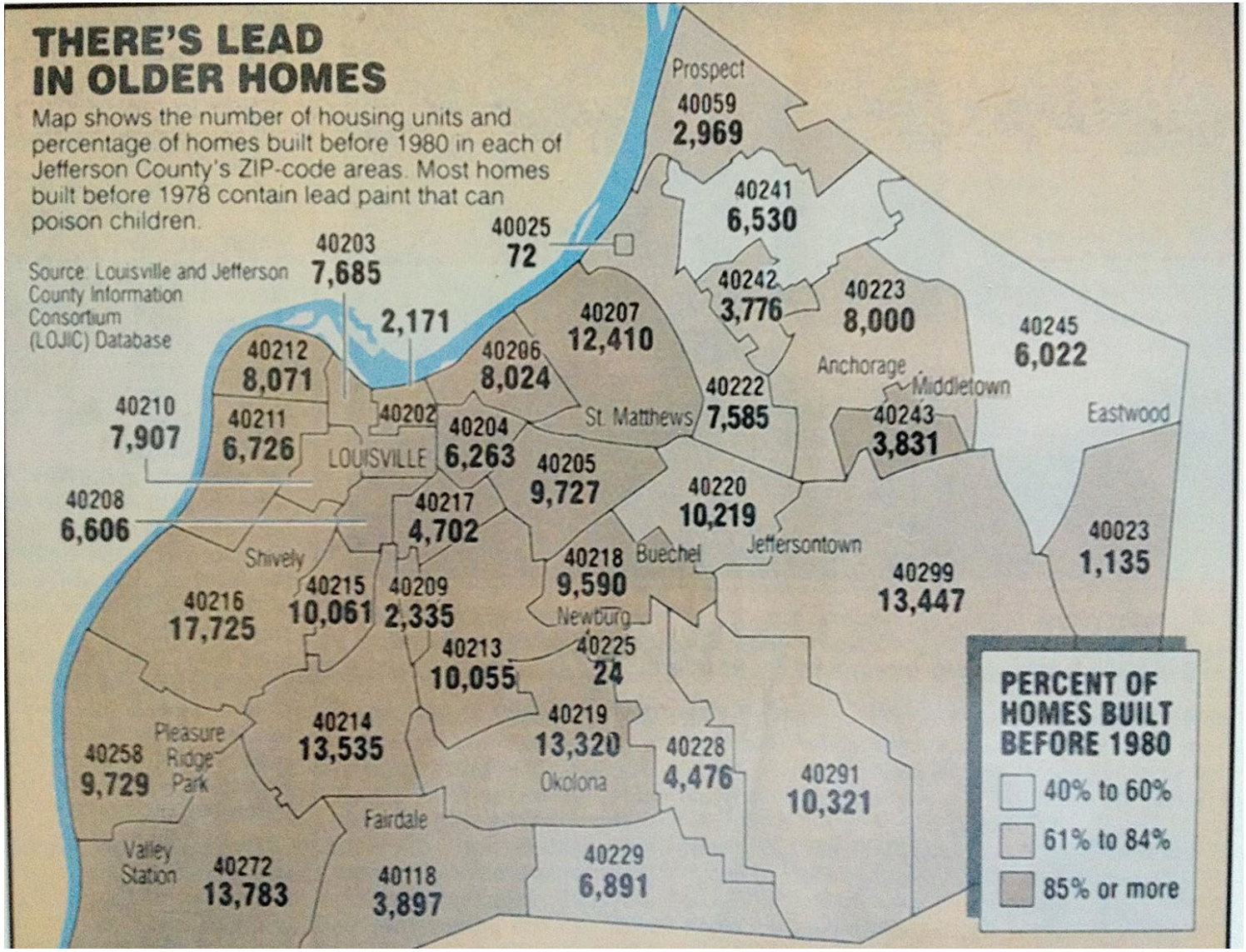
LockUpLead

6/15/22

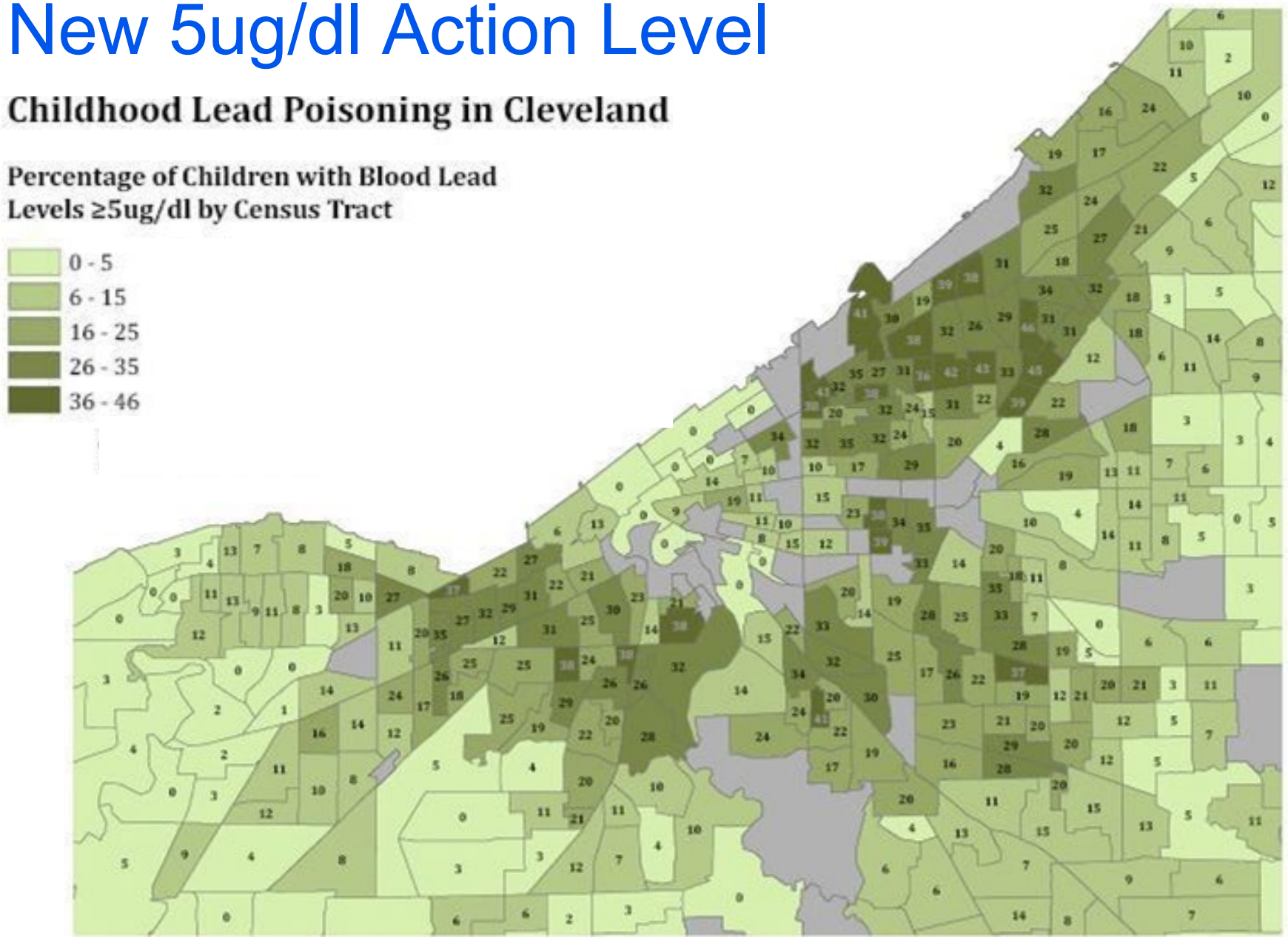
LOCKUP
LEAD™

TRADE MARK
Dutch Boy
WHITE LEAD

Louisville

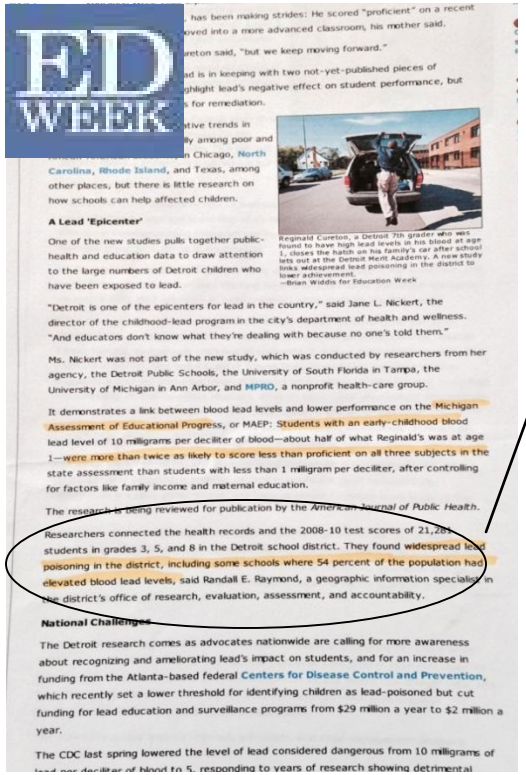

THERE'S LEAD IN OLDER HOMES
Map shows the number of housing units and percentage of homes built before 1980 in each of Jefferson County's ZIP-code areas. Most homes built before 1978 contain lead paint that can poison children.
Source: Louisville and Jefferson County Information Consortium (LOJIC) Database
Prospect
40059
2,969
40241
6,530
40025
72
40203
7,685
2,171
40242
3,776
40223
8,000
40245
6,022
40207
12,410
40206
8,024
Anchorage
Middletown
Eastwood
40212
8,071
40210
7,907
40211
6,726
40202
40204
6,263
LOUISVILLE
St. Matthews
40222
7,585
40243
3,831
40205
9,727
40208
6,606
40217
4,702
40220
10,219
Shively
Buechel
Jeffersontown
40023
1,135
40218
9,590
40299
13,447
40216
17,725
40215
10,061
40209
2,335
Newburg
40213
10,055
40225
24
PERCENT OF HOMES BUILT BEFORE 1980
40% to 60%
61% to 84%
85% or more
40214
13,535
40219
13,320
40228
4,476
40291
10,321
40258
9,729
Pleasure Ridge Park
Okolona
Fairdale
Valley Station
40272
13,783
40118
3,897
40229
6,891

New 5ug/dl Action Level



Widespread Poisoning

Researchers connected the health records and the 2008-10 test scores of 21,281 students in grades 3, 5, and 8 in the Detroit school district. They found widespread lead poisoning in the district, including some schools where 54 percent of the population had elevated blood lead levels, said Randall E. Raymond, a geographic information specialist in the district's office of research, evaluation, assessment, and accountability.



has been making strides: He scored "proficient" on a recent
oved into a more advanced classroom, his mother said.
reton said, "but we keep moving forward."
d is in keeping with two not-yet-published pieces of
ghlight lead's negative effect on student performance, but
s for remediation.
tive trends in
ly among poor and
n Chicago, North
Carolina, Rhode Island, and Texas, among
other places, but there is little research on
how schools can help affected children.

Reginald Cureton, a Detroit 7th grader who was found to have high lead levels in his blood at age 1, closes the hatch on his family's car after school lets out at the Detroit Merit Academy. A new study links widespread lead poisoning in the district to lower achievement.
—Brian Widdis for Education Week

A Lead 'Epicenter'

One of the new studies pulls together public-health and education data to draw attention to the large numbers of Detroit children who have been exposed to lead.

"Detroit is one of the epicenters for lead in the country," said Jane L. Nickert, the director of the childhood-lead program in the city's department of health and wellness. "And educators don't know what they're dealing with because no one's told them."

Ms. Nickert was not part of the new study, which was conducted by researchers from her agency, the Detroit Public Schools, the University of South Florida in Tampa, the University of Michigan in Ann Arbor, and MPRO, a nonprofit health-care group.

It demonstrates a link between blood lead levels and lower performance on the Michigan Assessment of Educational Progress, or MAEP: Students with an early-childhood blood lead level of 10 milligrams per deciliter of blood—about half of what Reginald's was at age 1—were more than twice as likely to score less than proficient on all three subjects in the state assessment than students with less than 1 milligram per deciliter, after controlling for factors like family income and maternal education.

The research is being reviewed for publication by the *American Journal of Public Health*.

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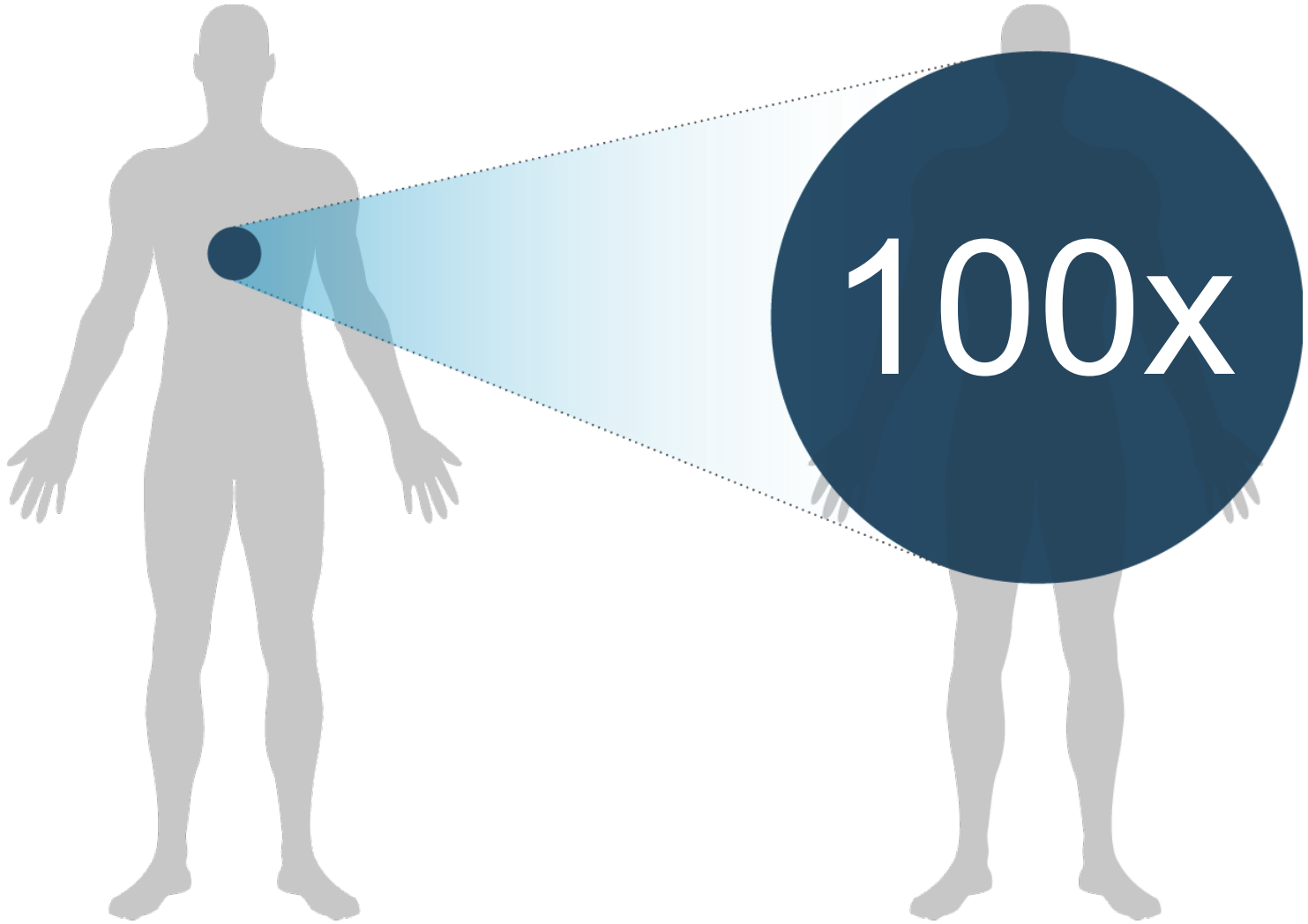
National Challenges

The Detroit research comes as advocates nationwide are calling for more awareness about recognizing and ameliorating lead's impact on students, and for an increase in funding from the Atlanta-based federal Centers for Disease Control and Prevention, which recently set a lower threshold for identifying children as lead-poisoned but cut funding for lead education and surveillance programs from $29 million a year to $2 million a year.

The CDC last spring lowered the level of lead considered dangerous from 10 milligrams of

Lead levels in the body 100 times higher



Natural average, prior to lead paint

Average levels today

Paradigm Shift (tech & reg)

Abatement vs **Safe Lead Practices**

Traditional solutions

Traditional solutions

Traditional solutions

LockUpLead solution

LockUpLead solution

LOCKUP
LEAD™

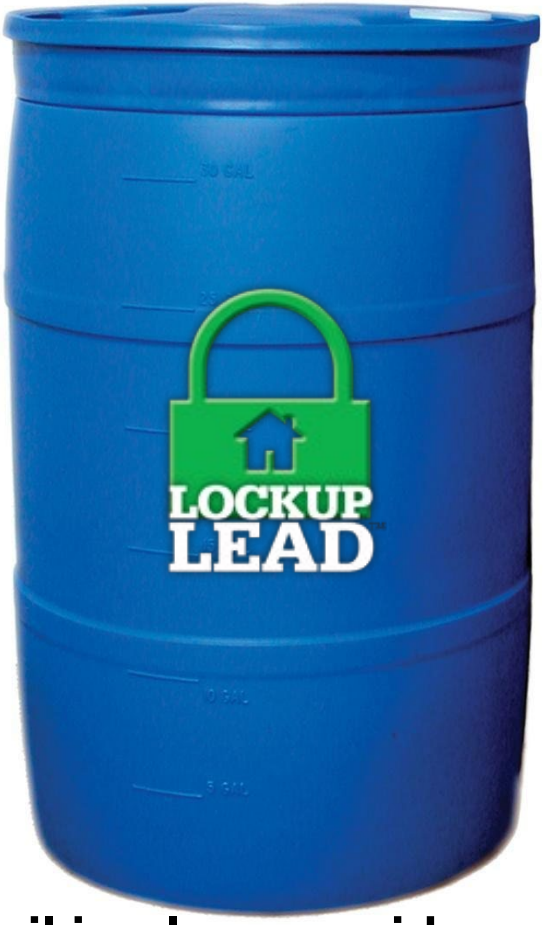
- **Technology neutralizes toxic lead compounds upon contact. Products for cleaning, painting, soil, testing.**

- **Proven by USEPA to convert lead compounds on a molecular level to be 99.5% less bioaccessible**

- **Safe for all users, cost is 1% of other methods**

- **Lead tester spray turns red, showing poisonous lead -- perfect for health departments and families**

Instant Lead Test Kit



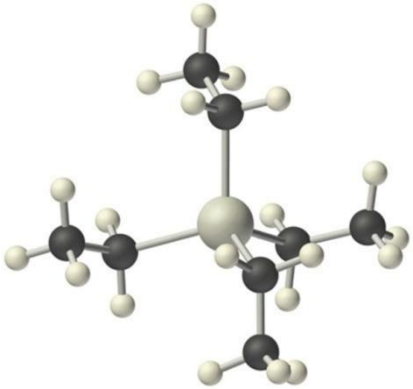
Cleaner and dust suppressant to detoxify and immobilize

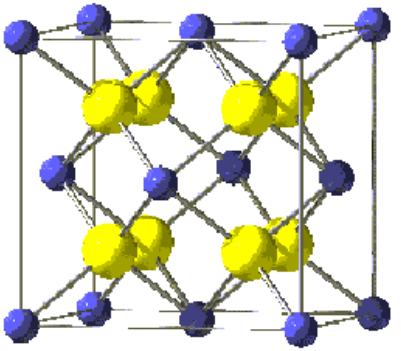
Detoxify soil in place, avoid removal costs

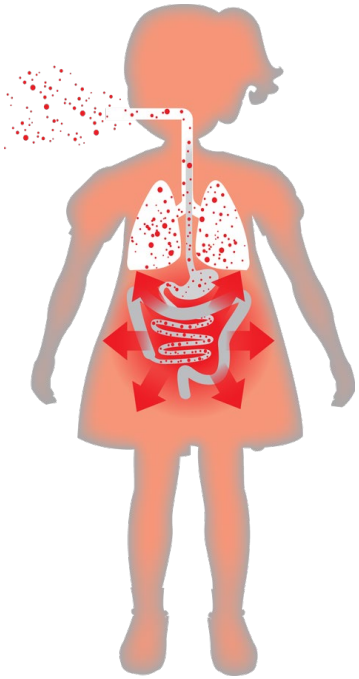
Not all lead is created equal

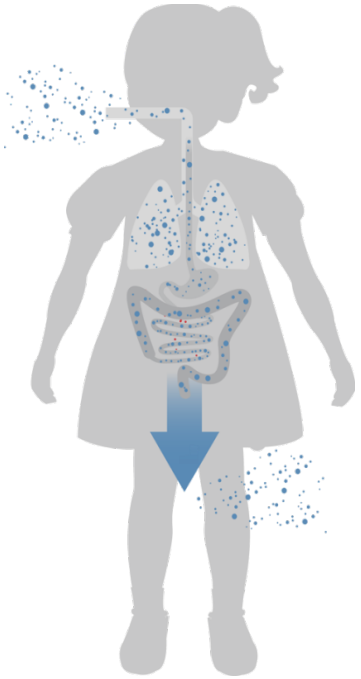
Absorbed into body

Not absorbed into body







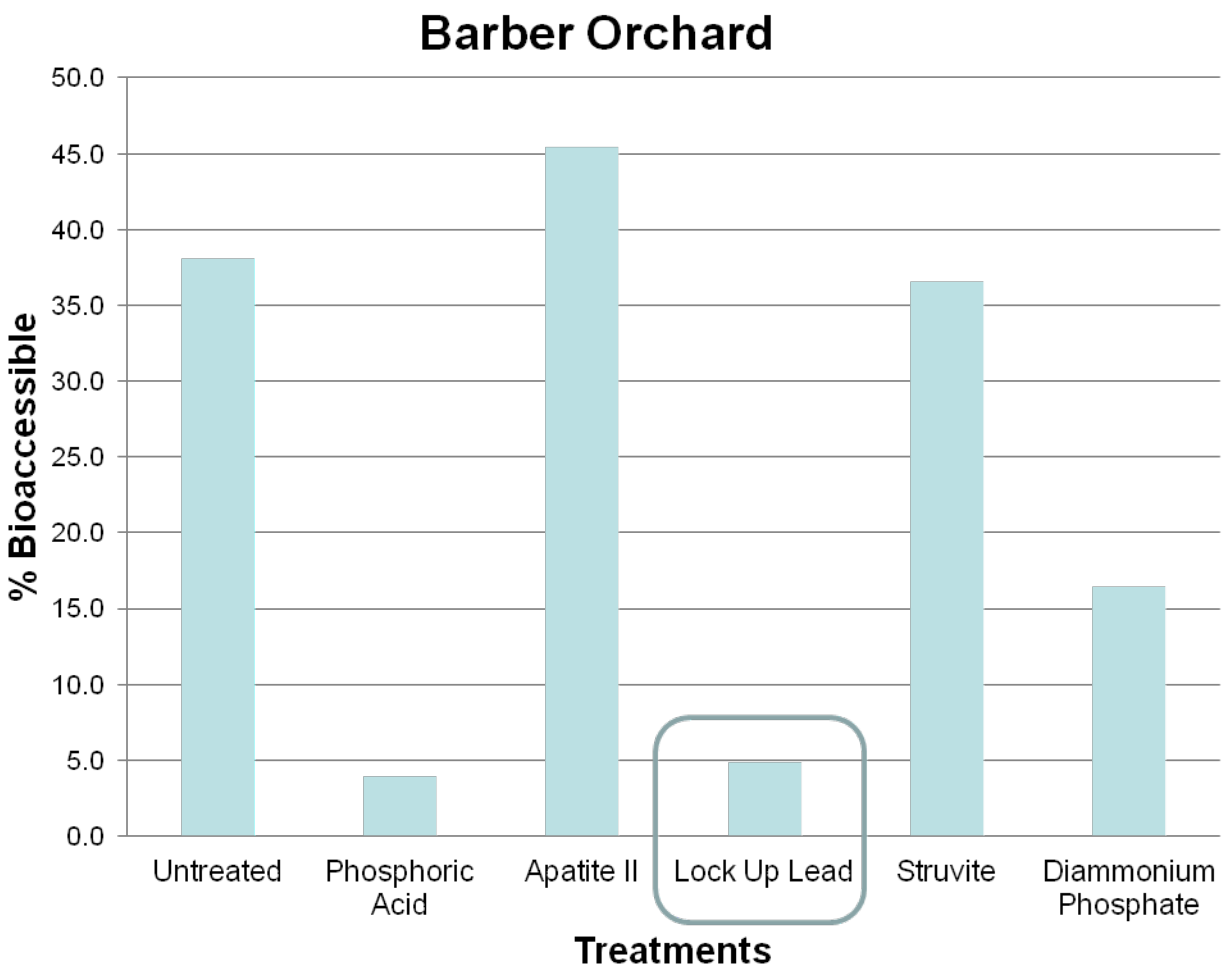


USEPA Evaluation

- Tested competing technologies in variety of soils
- Including this neighborhood with 2500 ppm lead

information provided by USEPA

USEPA Evaluation



LockUpLead reduced the toxicity of the soil by over 87%, rendering it under the USEPA limit.

Treating in place with LockUpLead avoids disturbance and hazardous waste handling and costs about 3% to 4% of “dig and haul” method.

information provided by USEPA

USEPA Evaluation of LockUpLead

- The residential soil lead standard is 400 mg/kg or parts per million
- Barber Orchard soil contains 2500 mg/kg, thus requiring remediation
- Bioavailability-based risk assessment for site clean up allows increasing the 400 mg/kg soil lead standard if significant reductions in bioavailability are demonstrated
- For the Barber Orchard treated soils, Lock Up Lead results show that only 4.9% of the Pb in the treated soil is bioaccessible and 87.3% less bioaccessible than the untreated soil
- Total Barber Orchard Concentration (2500 mg/kg) X Reduction Factor (100% - 87.3% = 12.7%) = **Effective Bioavailability Corrected Concentration (317.5 mg/kg) → Lower than the 400 mg/kg residential standard**
- Conclusion: Phosphate amendments can be a cost-effective remediation strategy for large scale sites and impacted urban soils

information provided by USEPA

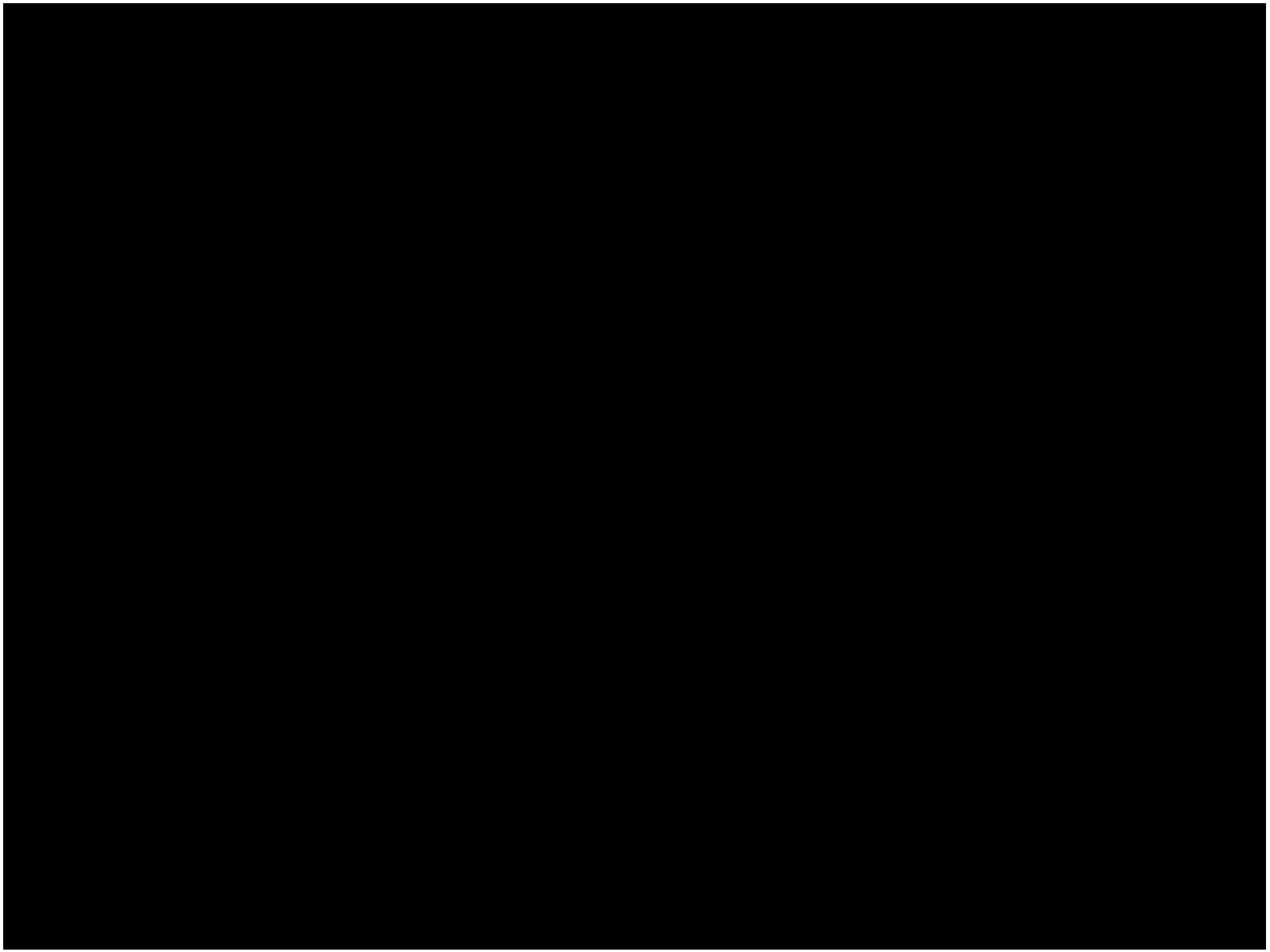
USEPA Evaluation of LockUpLead

Toxic Lead (Pb) compounds + LockUpLead → $Pb_5(PO_4)_3Cl$

LockUpLead technology forms pyromophite, a form of lead that is nonhazardous waste and has greatly reduced bioaccessibility.

information provided by USEPA

Interim Controls anyone can use



Partners & Projects

Case Study: Lead Safe Louisville, HUD Grantee

Results: 1500 more homes tested, under $7/home. Over 360 families received home lead cleaner, under $14/home

Case Study: Vacant Property, Codes Dept.

Results: ***Workers were trained in lead-safe practices***
Eliminated vacant property hazards impacting 140 homes
New funding source, new partners

Cost: ***Avg $920 per vacant property, including treating soil around perimeter of home.***

Benefits on-site and also adjacent homes

Case Study: Public Museum Historic Renovation

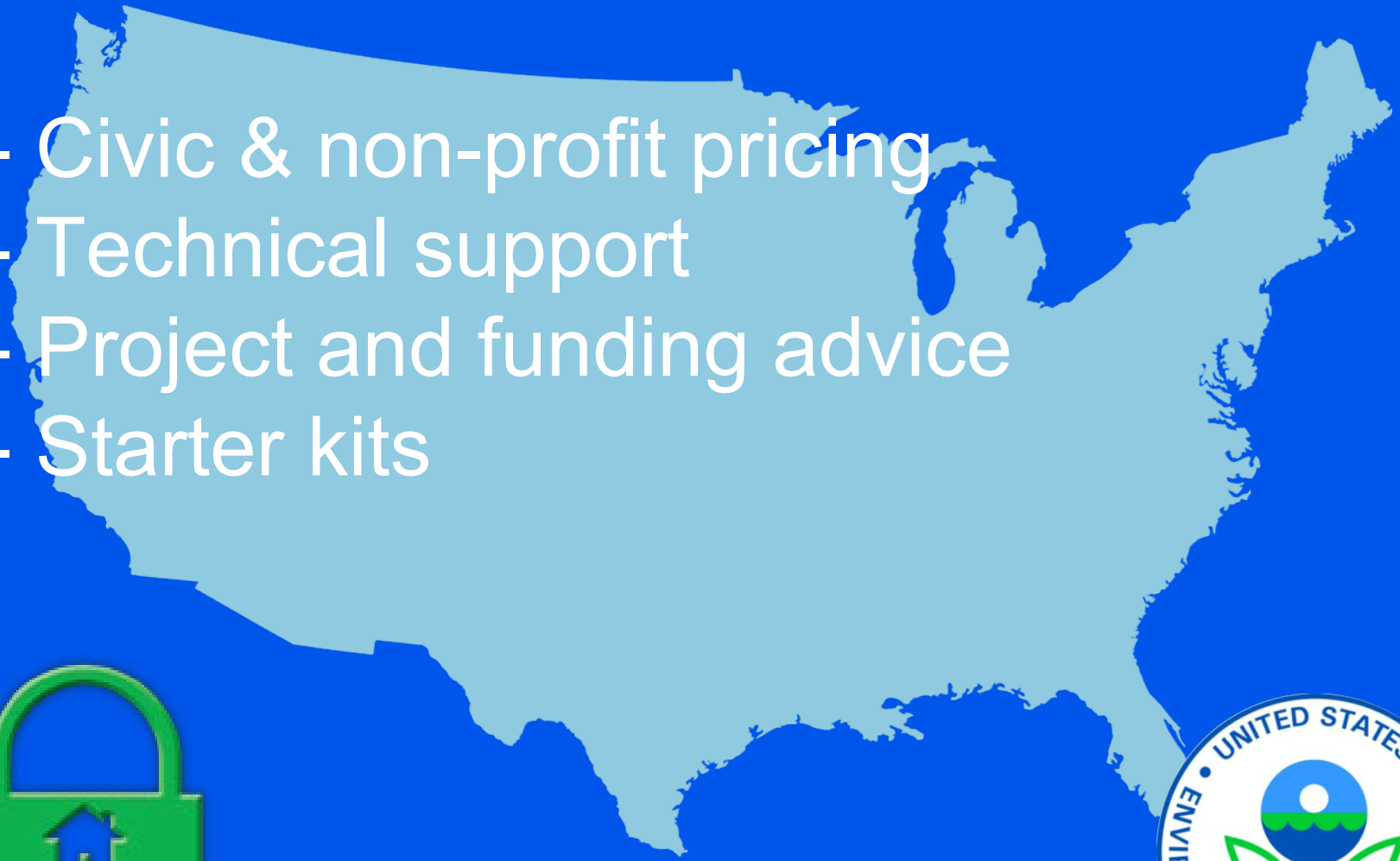
Results: ***dust treated and immobilized to reduce worker exposure, public liability, risk of lawsuits, reduce hazardous waste and avoid dust during disposal, transport***

Case Study: Community Garden

Results: ***upcoming project will reduce elevated lead hazards below regulatory limit without soil excavation, which would normally cost $30-$75 per square foot***

Cost: ***About $1 per square foot for community garden with nonprofit pricing.***

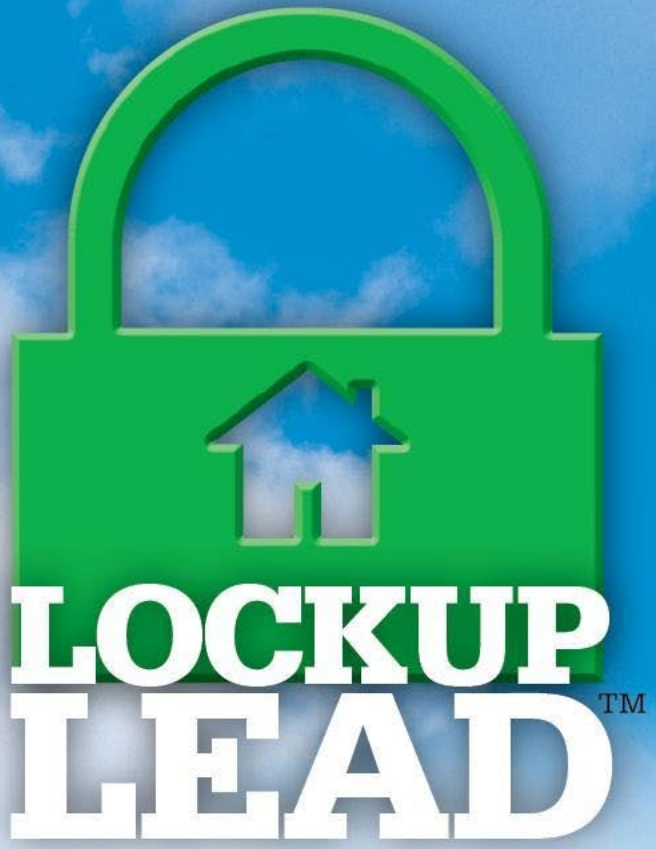
Lead Safe Neighborhoods Program



- Civic & non-profit pricing
- Technical support
- Project and funding advice
- Starter kits

LOCKUP LEAD™

UNITED STATES • ENVIRONMENTAL PROTECTION AGENCY •



Tough on Lead Dust. *Gentle on Your Family.™*

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