

USEPA Evaluation of LockUpLead



On September 8, 2013, USEPA researchers publicly released the Results of their evaluation of technologies to treat toxic lead.

LockUpLead technology was included in the evaluation, and singled out for its performance, ease of use, and its performance in maintaining soil quality and nontoxic nature.

The phosphoric acid treatment resulted in poor soil conditions, hardening the soil, and was much more difficult to work with and not recommended by USEPA researchers.

USEPA Superfund Site

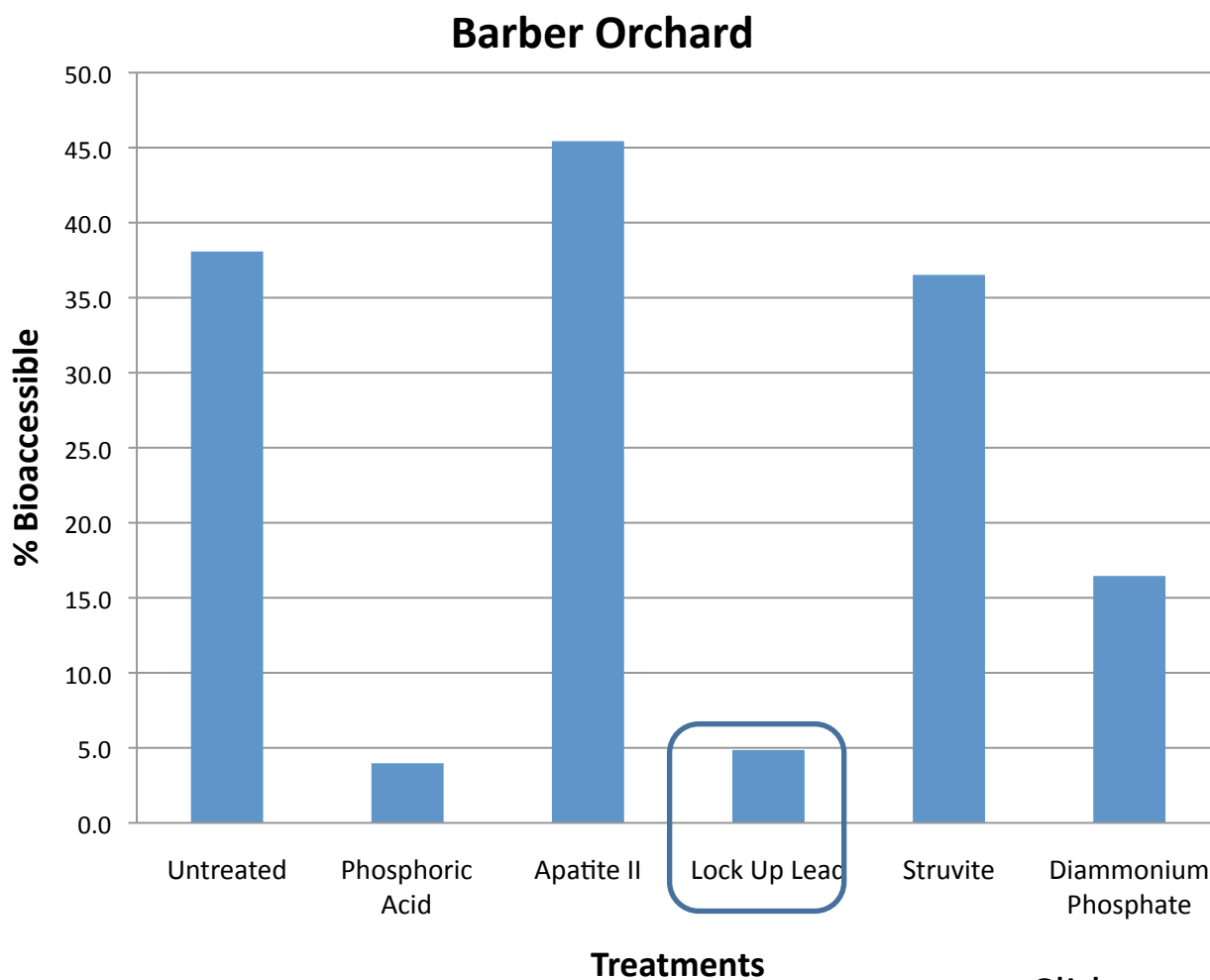


- Large historic orchard sold for a housing development. The previous owners used lead arsenical pesticides to control pests.
- Home building halted to remove the top 1 foot of soil (2500 ppm lead) and replace with clean soil. Costs quickly doubled leaving the site with large piles of contaminated soil and no clean soil to cover disturbed areas.



Slide provided by USEPA,
author: Kirk Scheckel, Senior Scientist

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 only 2% to 4% of “dig and haul” method.

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- The USEPA 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

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"Lock Up Lead was reacted with four lead (Pb) contaminated soils to demonstrate immobilization effectiveness. LockUpLead was mixed with the soils at a 3% application rate (P_2O_5) and allowed to react for 3 months. In-vitro bioaccessibility tests are employed as an analogue to in-vivo animal bioavailability data. Shown above are the reductions in Pb in-vitro bioaccessibility of Lock Up Lead treated soils in comparison with non-treated soils. Rates of reduction ranged from 49 to 99.5%." K. Scheckel, PhD. USEPA

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

LockUpLead is now being specified by public utilities and city governments for renovation and demolition of structures with lead paint. With EPA soil evaluation now complete, LockUpLead is available for in-place treatment of contaminated soils.

