LEAD-BASED PAINT CONVERSION TECHNOLOGY

Fort Ord Case Study

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Stan Cook, Fort Ord Reuse Authority
Overview

- Discussion of Problems and Needs Associated With LBP – Specific issues at Fort Ord
- Lead-Based Paint Conversion Technology
- Application at Fort Ord
- Successes/Lessons Learned
Problem and Need at DOD Facilities

Problem

- Previous DOD LBP building deconstruction demonstration projects have generated costs of $12-$20/square foot
- When applied to facility specific requirements, state-wide requirements and on a national scale, these costs have been determined to be unreasonable
- Potential future liability

Need

- A compliant, economic, technological solution: conversion of LBP to a material that can meet non-hazardous leachability standards
Specific Issues at Fort Ord (Cont.)

- FY 2002 Road construction project
- Required demolition of 26 buildings
- Construction contract, Demolition subcontract, LBP stabilization subcontract
Specific Issues at Fort Ord (Cont.)

- Future redevelopment plans
- Project is the size of the City of San Francisco or Washington DC. (approximately 45 sq. miles)
- $75 million worth of Building Removal standing in the way of $6 Billion worth of new construction.
- Building Removal is “up-front” and requires up-front capital.
- Up-front cost savings have tremendous impact on the future success of the project.
Specific Issues at Fort Ord (Cont.)

- LBP working group formed in 1998
- Concerned with disposal of lead contaminants
- Review technologies and disposal options
- Members:
  - US EPA Region 9
  - California EPA
  - California Dept. of Toxic Substance Control
  - USACE Construction and Engineering Research Laboratory (CERL)
  - Fort Ord Reuse Authority
LBP Conversion Tech

- Well understood and deployed lead/phosphate chemistry
- Converts lead to insoluble lead-phosphate mineral
- Provides alternatives to disposal in a hazardous waste landfill
- Patented
LBP Conversion Tech

- Latex Based Application
  - Roll on
  - Spray

- Permanent application and weather durable

- Immediate conversion and little curing beyond latex drying time
EcoBond LBP™ Technology

MT² provides the coating product
- Treatability analysis
- Expertise and oversight of application

Application of EcoBond LBP can be performed by painting subcontractors
EcoBond-LBP™

- A low cost and highly effective coating and lead treatment, applied in a simple to use paint formula
  - Chemical conversion of LBP lead into a new highly stable non-leaching lead mineral
  - Transforms LBP into a non-hazardous material that passes stringent RCRA testing criteria including TCLP, SPLP and STLC
  - Applied through a number of inexpensive methods including spraying, brushing or rolling
  - Can be applied as a routine preventive maintenance (non-regulated) coating
Pre-Demolition Coating

- **Objective:** Short-term management and handling of demolition materials and reduced lead exposure to workers, air, soil and groundwater.

- **Application:** Standard surface preparation, apply by brush, roller or spray.

- **Results:** Removed and/or demolished materials are can be disposed in a local/regional C&D landfill at a savings of over $100 per ton.
Objective: Long-term encapsulation, elimination of future hazardous materials, reduces lead exposure to workers, air, soil and groundwater.

Application: Standard surface preparation, brush, roller or spray, cover with standard paints as desired.

Results: LBP isolated from further exposure.
## Treatability Results

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>RCRA Standard</th>
<th>Pre EcoBond LBPTM Lead Levels</th>
<th>Post EcoBond LBPTM Lead Levels</th>
<th>Meeting EPA Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Based Paint</td>
<td>5</td>
<td>32.1</td>
<td>0.9</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>43.6</td>
<td>1.0</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>72.3</td>
<td>2.4</td>
<td>Pass</td>
</tr>
</tbody>
</table>
Application at Fort Ord

- EcoBond™ Applied with standard spraying equipment

Application of EcoBond™

EcoBond™ coated buildings (awaiting demolition)
Application at Fort Ord

Treatment results

Ft. Ord Sample Number

Pb TCLP Concentrations, mg/L.
Application at Fort Ord

- Twenty six buildings in initial phase of demolition
- 2000 tons of building debris generated (Approximately 4000 cy.)
Removing Treated Siding

04/17/2002
Materials disposed of at Beatty, Nevada as a non-hazardous waste. Approximately = $50/cy verses Federal Hazardous = $270/cy

Stabilized lead dust emissions during removal – use approved by local Air Board.

Cost effective stabilization of LBP allowed cost effective separation of hazardous waste stream form recyclable waste stream. (Reduction of disposal costs.)
Success at Ft. Ord

- MT² deployed EcoBond LBP™ conversion technology during the first phase of building demolition (26 buildings & 2000 tons of building debris)
  - Application of EcoBond LBP™ allowed the building debris to be disposed of as a non-RCRA hazardous waste.
  - This produced a savings of $500,000 if this building material had been disposed of as a hazardous waste.
  - The project was completed with the oversight of the federal, State of California, and local regulatory agencies
  - Independent evaluation of the LBP stabilization technology by CERL and Unisphere Inc.
- The projected savings for demolition and disposal of the remaining Fort Ord buildings is estimated at over $10 million
# Price Comparison

## Typical LBP Method Price Comparison

<table>
<thead>
<tr>
<th>Standard Methods</th>
<th>EcoBond LBP™ Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Stripper</td>
<td>Grit Blast with EcoBond LBP™ Additive</td>
</tr>
<tr>
<td>Abrasive Blasting</td>
<td>EcoBond LBP™ Coating</td>
</tr>
<tr>
<td>Encapsulation</td>
<td></td>
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<tr>
<td><strong>Cost</strong></td>
<td><strong>Cost</strong></td>
</tr>
<tr>
<td>$5-$8/ft²</td>
<td>$1-$1.50/ft²</td>
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<tr>
<td>$2-$4/ft²</td>
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</tr>
<tr>
<td>$2-$3/ft²</td>
<td>$0.50-$0.80 ft²</td>
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</tbody>
</table>
Ft Ord – Lessons for Success

- Coordination and working with agencies and owners prior to initiating site activities
- Requires upfront planning - include in the bid specifications
- Opportunity to use local contractors
- Expect some hesitation while owners, agencies and contractors gain familiarity with a new product
Ft Ord – Lessons for Success

- Access to actual Fort Ord materials for conducting treatability studies prior to the field implementation was essential given the higher lead concentration ranges.

- Shared access to FORA generated characterization (XRF, TCLP, Totals) building component data.

- Ability to work as a “team” with PARC Environmental, Granite Construction and FORA.
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