Executive Summary: Wood Harvest/Hybrid Deconstruction Study
March 26-April 2, 2010

Background The mission of the Cedar Rapids/Linn County Solid Waste Agency (Agency) is to manage waste generated in Linn County in an environmentally responsible manner. To that end, Agency staff resolved to investigate diverting flood house debris from land filling. Because flood houses have challenges (e.g. mold) that non-flood structures do not typically have – the Agency decided to pursue harvesting wood for fuel rather than salvaging materials for re-use.

A type of hybrid deconstruction was applied to three Cedar Rapids houses that were flooded in 2008—two on the southeast side and one on the northwest side.

Study Goals The Agency engaged contractors to deconstruct three Cedar Rapids flood houses in a way that would 1) capture wood materials that meet the Agency's wood fuel specifications and 2) compete in time and cost with demolition. The latter is especially important because reimbursement from FEMA is based on the cost of demolition and the City is determined to get the structures down as soon as possible.

Study Outcome Regarding the goals of the study:

1) From 47-95% of wood was captured, depending on the house. The amount of wood that was harvested hinged on several factors:

- the way the house was constructed
- presence of lead based paint and/or treated wood
- load contamination. Two wood loads were rejected by biomass facility personnel. In their judgment, the loads contained too much non-wood material, such as insulation.

2) Cost and time exceeded that of demolition, but not excessively. On average, demolition takes one day while study houses took a day and a half. The difference in cost ranged from several hundred to several thousand dollars, depending on the house. However, given the right circumstances and work crew, the study illustrated that the reasons for this can be overcome.

Large equipment used in the study included (l-r) excavator, skid loader with fork, and man lift.

Recommendations The study revealed that with certain conditions hybrid deconstruction/wood harvesting could compete with demolition in time and cost. In brief, the conditions include:

- Experienced crew, especially the excavator operator. By the third house, the crew predictably progressed but, like any new business activity, experience is key to efficiency.

- Structures in close proximity, preferably blocks of consecutive houses. The three houses were in different parts of town. For obvious reasons, efficiencies are gained if structures are close.
- Additional recycling opportunities including local outlets for rough-sawn lumber and asphalt roofing shingles. In some areas of the country these materials are a commodity.
- Additional deconstruction incentives such as lower – or zero—tipping fees for biomass/wood products.
- Less restrictive specifications by the fuel end user, i.e., acceptance of treated wood and wood with lead-based paint as well as greater tolerance for contamination (such as small pieces of drywall, insulation, etc.) Lab tests indicated that the wood material that was captured did not meet the specifications of the fuel end user currently under contract with the Agency.

Next Step

A larger project will not be possible until the conditions described above are addressed. Among other things, an end user that is able to burn the wood that flood houses generate would need to be found.

Series of photos showing deconstruction of one of the study houses from which 95% of the wood was captured. Unfortunately, the wood did not meet the specifications of the biomass plant that is currently under contract with the Agency.