

# PCB Ballast Disposal

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## Introduction

Lighting retrofit programs cause the accelerated retirement of millions of pre-1979 ballasts which contain polychlorinated biphenyls (PCBs). There are 400 million to 1.6 billion ballasts currently in service in the U.S. and approximately half of these contain PCBs. These ballasts contain in aggregate 10 to 40 million pounds of virtually pure PCB dielectric fluid. Current disposal options (landfilling and whole ballast incineration) for PCB ballasts were inadequate and a better solution was sought.

## Process Development

Over 20,000 ballasts were manually disassembled and broken down into their component parts and weighed. Specialized tools were developed and used to facilitate the demanufacturing process. Ballast manufacturers were consulted in the development of the process.

A representative sampling of the parts was tested in a laboratory for levels of PCB contamination using a modified EPA Method 8080 and a gas chromatograph.

Separately, non-PCB ballasts were also disassembled and tested for PCBs.

## Results

The following observations in the data were made.

Two-thirds of all ballasts are from four-foot fixtures (F40) and weigh 3.5 pounds on average. One-third are from eight-foot fixtures (F96) and weigh 10 pounds on average.

The average weight breakdown of an F40 ballast is as follows:

- capacitor:  $\frac{1}{4}$  pound
- asphalt potting material:  $\frac{1}{2}$  pound

- copper:  $\frac{1}{2}$  pound
- steel: 2 pounds
- wire and paper:  $\frac{1}{4}$  pound

The PCB capacitor contains approximately one ounce of virtually pure PCB dielectric fluid.

Three-quarters of the asphalt potting material for PCB ballasts is contaminated with over 50 ppm of PCBs.

Only 20% of the PCB ballast (the capacitor and asphalt) need be incinerated for permanent destruction of the PCBs.

Over 80% of the PCB ballast can be safely recycled.

Over 20% of the capacitors from non-PCB ballasts contained detectable quantities of PCBs. Further data is being collected.

## Discussion

### Advantages to Recycling

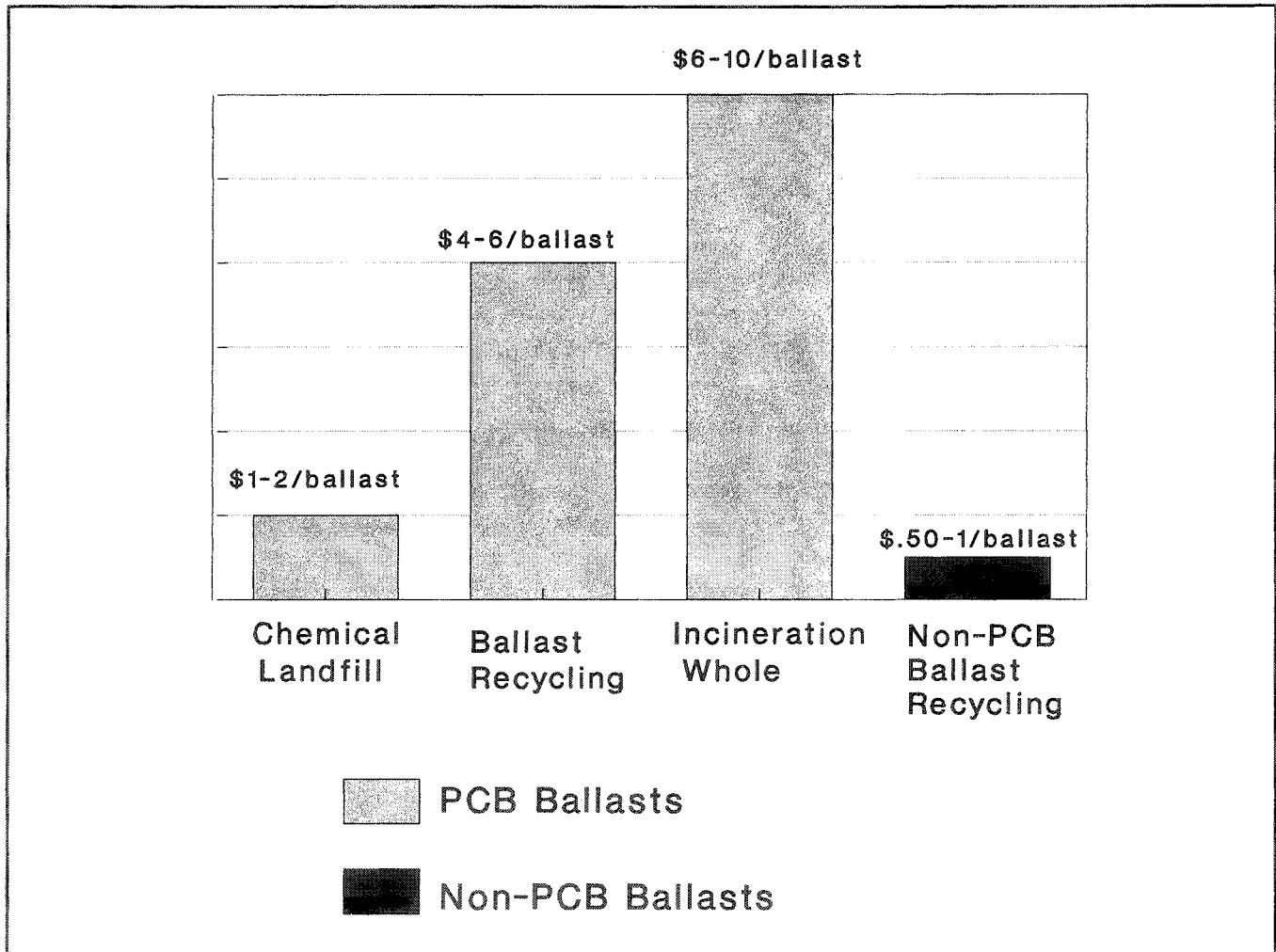
There appear to be several advantages to this recycling approach. First, no PCBs are landfilled compared to conventional disposal methods. This avoids potential Superfund clean-up liabilities in the future.

### PCB Destruction and Lower Cost

Second, the PCB-contaminated material is permanently destroyed by incineration. The other portions of the ballast need not be disposed of, resulting in a dramatic reduction in disposal costs (see Figure 1).

### Resource Recovery

Third, valuable metal resources are recovered and used in lieu of virgin materials.



*Figure 1. Short-Term Cost of Ballast Disposal (excludes environmental cost)*

## Conclusions/Recommendations

We recommend the following to utilities, ESCOs, lighting contractors and building owners who are concerned about PCB ballast disposal.

1. Don't just specify "proper" disposal as it is legal in most states to put PCB ballasts in the trash.
2. Do specify incineration of the PCB-contaminated material over landfilling.
3. Encourage recycling of the remaining ballast components.
4. Budget \$4-\$6 per F40 ballast from four-foot fixtures and \$10-\$15 per F96 ballast from eight-foot fixtures for incineration/recycling of ballasts.
5. Require proof of proper disposal, e.g., a hazardous waste manifest or a certificate of destruction, prior to making final payment.
6. Beware that certain non-PCB ballasts contain trace quantities of PCBs. Non-PCB ballasts can be recycled and disposed of in the same manner as PCB ballasts for a much lower cost.

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## References

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