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NEIGHBORHOOD DYNAMICS AND PRICE EFFECTS OF SUPERFUND SITE CLEAN-UP

The existence of hazardous waste sites is an important problem in many older, built-out urban areas. Several authors have shown that property values around these sites are depressed, and are usually surrounded by undesirable neighborhoods. The reasons for this collocation are relatively straightforward: hazardous waste sites are unpleasant neighbors, so properties in the adjoining areas must sell for less. This combination of low prices and dirty environment attracts residents who value clean environments less, usually because they are poor. The problems with large concentrations of poor residents are well documented, and these concentrations further lower property values.

Local governments have looked to hazardous waste site clean-up as a way to improve property values. Clean-ups of Superfund sites are performed under the guidance of the Environmental Protection Agency, through its authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The costs of such remediation activity have been widely publicized and easily accounted, but the benefits have been harder to quantify. Of considerable interest to local governments is the effect of clean-up activity on local property values, since property taxes are these governments' main revenue source. Increases in property values are also of academic interest, since they

are the primary measure that urban and environmental economists use in quantifying the benefits of such remediation.

Most estimates of the Superfund site price effect use data on house sales collected before the clean-up activity has finished and estimate a price effect based on these data. From this estimate, a benefit to clean-up cost can be computed. This estimate may be biased, however, if unobserved characteristics of the area (which would not change following clean-up activity) also affect prices. Some studies correct for this by examining how property values *change* when clean-ups occur. These studies are preferable, since they offer both a better estimate of the price effect of an existing site, and a direct measure of the benefit of site remediation.

We contend that these standard measures of this price effect are not appropriate because the clean-up of a site will also induce neighborhood change. Because different families may be more willing to live in an area after remediation, they will out-bid the area's original residents for the homes near the site, and thus the composition of the neighborhood will change. Since neighborhood composition has been shown to have strong effects on real estate prices, such neighborhood transition will create indirect

effects of the site remediation. Similar indirect effects will exist because of reinvestment in the area surrounding the clean-up site.

Census data is used to investigate the effect of site remediation on median housing values, housing stock characteristics and neighborhood composition. We compute the direct, or “pure,” price effect of the clean-up, and find that cleaning up a Superfund site directly increases home values by 2 to 5 percent. This is consistent with the rest of the literature. However, we are able to go further and compute the indirect effects, which we find to be quite substantial. As much as 50 percent of the total effect of an EPA clean-up comes through the indirect channels: induced neighborhood transition and housing reinvestment or construction.

These results have several important implications. First, they inform our interpretation of the environmental justice of the process by which poor residents are exposed to hazardous wastes. In our most flexible models, we show that after clean-ups, richer families tend to move into the remediated areas, pushing the poorer original residents out, possibly to other dirty areas. This shows that targeting environmental remediation towards favored groups will be at least partially offset by these groups sorting out of the area that has been cleaned-up. If the original poor residents are mostly renters, the clean-up will have benefited them very little or even hurt them by forcing them to undertake costly moves.

Second, the results offer a better understanding of the likely results of environmental remediation on the surrounding areas. Remediation not only makes the area more desirable (thus raising home values), but also induces further investment and immigration of more “desirable” populations. Both of these induced effects will further increase home values. These indirect effects are substantively important. At least some portion of this reinvestment and relocation will probably come at the expense of other areas, so the indirect effects should be used only cautiously in cost-benefit analysis. However, local governments interested in the likely effect on property value (and property tax receipts) will care less about these offsetting effect in other areas.

Our approach is to observe census block groups in 1990 and 2000, noting which block groups were in the vicinity of a Superfund site clean-up. We are able to estimate a system of equations (as opposed to the simpler one-equation models used in much of the literature) taking into account the causal feedback between housing values, housing stock investment, neighborhood composition and EPA clean-ups. From these

estimates, it is possible to compute both consistent estimates of the “pure” price effect of the clean-up, and the indirect effects. Most of the literature focuses on the pure effect.

With our system of equations approach, we are able to go further and compute the indirect effects. As noted above these effects are found to be quite substantial. The indirect effects are also quite stable across model specifications.

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