

***Regulatory Impact Analysis of Lead-Based Paint
Hazard Disclosure Regulation for Residential Renovations***

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EXECUTIVE SUMMARY

Pursuant to Section 1021 of the Residential Lead-Based Paint Hazard Reduction Act (“the Act”) of 1992, which establishes Section 406 of the Toxic Substances Control Act, the U.S. Environmental Protection Agency (EPA) is issuing regulations for the disclosure of information concerning possible lead-based paint hazards in residential property in connection with renovation activities.

This Regulatory Impact Analysis (RIA) examines the potential costs, benefits, and impacts of regulations for the disclosure of possible lead-based paint hazards in connection with renovations performed on residential property. The analysis is presented in five sections: Background and Framework for Analysis; Profile of Sectors Affected; Estimated Costs to Private Parties and Government; Effect of the Lead-Based Paint Hazard Disclosure Rule for Renovations on Small Businesses - Regulatory Flexibility Analysis and; Assessment of Benefits.

BACKGROUND AND FRAMEWORK FOR ANALYSIS

The regulations will apply generally to residential housing built before 1978, unless the housing has no bedrooms, is housing for the elderly or disabled and may not be lived in by a child under the age of six, or has been certified as having no lead-based paint on any surface (in the remainder of this document, “target housing” refers to housing subject to the regulation). These regulations will therefore change current business practices in a large number of residential renovation transactions, imposing compliance costs on certain involved parties.

The regulation establishes requirements governing the transfer of information from paid renovation contractors to the buyers of contractor services. Renovation services that are subject to the rule’s disclosure requirements include:

- Paint removal or disruption, where disruption includes any surface preparation activity involving sanding, scraping, or other such activities that may generate a lead hazard;
- Removal of large structures (e.g., walls, ceilings, large surface replastering, major replumbing), excluding the roof;
- Window replacement; or
- Other renovation activities that disturb more than two square feet of painted surface per component.

Before beginning such work on a unit of target housing, the renovator is required to:

- Provide the owner and occupants of the housing unit with an EPA-approved lead hazard information pamphlet;
- Obtain a signed acknowledgment from the owner and an adult occupant of the housing unit certifying that they have received the pamphlet, *or* provide a certified mail receipt confirming delivery of the pamphlet, *or*, for deliveries to tenants only, provide written certification that the pamphlet was delivered but that signed acceptance of the delivered pamphlet was unavailable; and
- Maintain records for at least three years documenting compliance with the regulation’s notification requirements.

Those parties directly affected by the rule are the renovator, owner, and occupant. EPA found the required activities that give rise to regulatory burden imposed on the affected parties to fall into four categories for cost estimation purposes:

- Start-up costs, which include learning the rule's requirements and establishing compliance procedures;
- Disclosure activities, which refers to the costs resulting from the actual transfer of information and obtaining needed signatures or compiling other documentation of compliance with the regulation;
- Record keeping, which results primarily from the requirement that signed acknowledgments or other documentation of pamphlet delivery be retained by the renovator (in cases where a property manager assumes the responsibilities of distributing the pamphlet, a signed and dated statement detailing the notification procedure employed must also be maintained by the renovator); and
- Materials, which is linked primarily to the disclosure requirement, as the lead hazard information pamphlet must be purchased or photocopied and records of pamphlet delivery must be duplicated. Costs may also be incurred for filing acknowledge statements, though such burden was estimated to be quite modest.

PROFILE OF SECTORS AFFECTED

The requirements of Section 1021 of the Act fall primarily on the renovator of "target housing," which is defined to be any housing constructed prior to 1978, except housing for the elderly or persons with disabilities (unless any child who is less than 6 years of age resides or is expected to reside in such housing), any zero-bedroom dwelling, or housing that has been certified as having no lead-based paint on any surface. Property managers who perform and/or manage repair and renovation work in rental units would also bear responsibilities under the regulation.

To analyze the impacts of the rule, EPA sought data on those industry sectors which the Agency believes constitute the regulated community in connection with this rulemaking. EPA also sought data pertaining to the frequency of occurrence of residential renovation activities. The largest of the affected sectors falls within Standard Industrial Classification (SIC) code 17, Special Trade Contractors. Of the 376,000 establishments in this sector, EPA estimates there to be 199,000 potentially affected by the rule. Also affected are business establishments falling within SIC 15, General Contractors and Operative Builders. EPA estimates 99,000 businesses in this sector to be potentially affected. EPA also sought data on the real estate industry, and estimates there to be 92,000 establishments in SIC 653, Real Estate Agents and Managers and 92,000 establishments in SIC 651, Real Estate Operators and Lessors, which could be affected by the regulation.

Employment data for these industries were obtained for occupations most likely to be involved in the types of renovation activities subject to the regulation. EPA estimates that 180,000 construction contractors and managers and 2.1 million building trade contractors will be affected. In the real estate industry, 243,000 property managers are estimated to be potentially affected.

With regard to transaction volume, EPA estimates that 18.6 million residential renovation activities could be performed for compensation annually on target housing.

ESTIMATED COSTS TO PRIVATE PARTIES AND GOVERNMENT

Exhibit ES.1, *Estimated Total Annual Costs of the Disclosure Rule for Real Estate Renovations*, summarizes the estimated total annual compliance costs to private parties and government associated with the regulation. Private parties incur costs as a result of compliance activities as summarized above. The costs to government include the costs of rule administration.

Estimated Costs to Private Parties

EPA estimated total annual costs to private parties of approximately \$82 million in 1994 dollars (see Exhibit ES.1). These costs were estimated in the four cost categories, as discussed below.

The first category, start-up costs, accounts for about one-sixth of overall annual costs. Factors affecting the magnitude of these costs include the number of renovators or other employees having to familiarize themselves with the regulations, both initially (persons in the existing work force) and over time (new entrants to the affected sectors); the time required to learn the activities which must be undertaken in order to comply; and the hourly compensation of affected employees.

Exhibit ES.1: Estimated Total Annual Costs of the Disclosure Rule for Real Estate Renovations	
Transaction and Cost Category	Estimated Cost (\$1994)
Costs to Private Parties	
Start-Up Costs	\$13.2 million
Disclosure Event Costs	\$57.5 million
Record-Keeping Costs	\$3.7 million
Materials Costs	\$7.8 million
Total Estimated Annual Costs to Private Parties:	\$82.2 million
Costs to Government	
Low Estimate	\$2.4 million
High Estimate	\$4.3 million
Total Estimated Annual Costs:	
Based on Low Estimate of Government Costs	\$84.6 million
Based on High Estimate of Government Costs	\$86.5 million
Source: U.S. Environmental Protection Agency	

As is evident from Exhibit ES.1, disclosure event costs constitute the greatest portion of overall costs. Factors affecting the magnitude of these costs include the frequencies of regulated events (renovation activities); the time involved in performing required activities, such as providing the homeowner and/or residents with the required information and obtaining necessary documentation of compliance; and the hourly compensation of all involved parties.

Record-keeping and materials costs comprise a relatively modest share of overall annual costs. Factors affecting the magnitude of these cost items include the number of affected parties per transaction; the frequency of transactions, the costs of acquiring/duplicating documents, which include the lead hazard information pamphlet and signed acknowledgment statements or other compliance documentation; and costs to maintain documents.

Additional, indirect, costs resulting from actions taken by consumers in response to information, such as possible outlays for lead hazard inspections or abatements, were not quantified. Currently, data and methods limitations do not permit measurement of how the rules may affect behavior.

Exhibit ES.2 presents the per unit compliance costs incurred by the four private parties that the Rule affects. The per unit costs include relevant start-up, disclosure, recordkeeping, and materials for each of the parties. The per unit costs are \$3.71 for renovation contractors and rental property managers, \$0.68 for occupants, and \$0.14 for rental property owners. The total average cost per unit for all private parties is \$4.52.

Exhibit ES. 2: Estimated Annual Per Unit Costs of the Disclosure Rule for Real Estate Renovations	
Transaction and Cost Category	Estimated Cost (\$1994)
Costs to Private Parties	
Renovation Contractors and Rental Property Managers	\$3.71
Occupants	\$0.68
Rental Property Owners	\$0.14
Total Average Per Unit Cost	\$4.52

Estimated Costs to Government

To administer the final regulation, resources will be required to conduct a number of activities, including:

- Inspections;
- Violation case management;
- Establishment and maintenance of cooperative agreements, if applicable;
- Compliance assistance;
- Development of performance measurement criteria; and
- Management.

EPA estimated the total annual cost of these activities would range from \$2.4 million to \$4.3 million, depending on the estimated number of compliance inspections performed annually.

Total Costs to Private Parties and Government

The estimated costs to private parties and the federal government were summed to yield a comprehensive estimate of the total annual costs of the lead-based paint hazard disclosure regulation for real estate renovations. As shown in Exhibit ES.1, EPA estimated that the total annual costs would range from approximately \$85 million to \$86 million (\$1994).

ASSESSMENT OF IMPACTS ON SMALL BUSINESS (REGULATORY FLEXIBILITY ANALYSIS) AND OTHER REGULATORY ANALYTIC REQUIREMENTS

EPA investigated the potential impacts of the rule on small businesses, and prepared a Regulatory Flexibility Analysis (RFA). While a large number of small establishments will be potentially affected by the rule, cost impacts were not found to be of sufficient magnitude to cause undue harm to such establishments. Consequently, EPA did not further modify the regulation based on small business impacts.

In assessing small business impacts, EPA first developed an establishment profile for each major sector. This profile indicated that approximately 80 to 90 percent of all establishments in SICs 15, 17, 651, and 653 fell within the 1-9 employee size class. Thus, a substantial number of small firms are estimated to be potentially affected by the rule.

To measure the cost impacts of the regulation on these small establishments, representative, or model, establishments were designed. These model establishments corresponded to typical establishments, with respect to number of employees and annual transaction volume, in each affected sector. Since transaction activity was reported to vary widely, a range of transaction volume was estimated for each establishment type.

For each model establishment, annual regulatory costs were then calculated and compared to annual labor and overhead costs. Ratios were computed for both high and low estimates of the range of transaction activity. In the case of a multi-trade renovation contractor, regulatory costs were found to represent from 0.04 to 0.09 percent of labor and overhead costs. In the case of a specialty trade contractor, impacts were somewhat higher, ranging from 0.21 to 0.49 percent. An establishment engaged in rental property management was projected to sustain impacts of 0.73 to 1.44 percent.

EPA also considered whether the regulation will impose unfunded mandates on governmental units other than the Federal government and whether the regulation may impose adverse distributional burdens of costs or benefits relative to environmental justice considerations. Although State and Tribal governments may decide to administer and enforce the provisions of this regulation and thus incur costs from its implementation, this decision is optional and thus the resulting cost does not constitute an unfunded mandate. In addition, as a result of meeting the regulation's compliance requirements, state, local, and tribal governments that own or manage rental housing (e.g., public housing authorities) may incur modest costs from the regulation. However, the burden of compliance costs on these governmental units is not likely to be greater than their burden on small businesses, which, in its Regulatory Flexibility Analysis, EPA judged to be not significant.

With regard to environmental equity considerations, EPA concluded that the regulation is not to likely to impose a significant cost burden on businesses that are either owned by low income and minority populations or that employ substantial numbers of low income and/or minority individuals. EPA also considered whether the regulation might result in an adverse distribution of regulatory benefits or costs among low income and/or minority households. Household occupancy data indicate that certain low income and/or minority households live more frequently in housing that contains lead-based paint. Accordingly, these households may be more likely to reap the benefits of the regulation in terms of increased awareness of lead-based paint hazards and expected adoption of practices to prevent or mitigate exposure to lead-based paint hazards accompanying repair and renovation activity. These households may also be more likely to incur the costs of the regulation to the extent they are passed onto consumers. However, EPA judges the costs to be very minor in relation to the total value of housing services in affected housing and as well the regulation's expected benefits.

ASSESSMENT OF BENEFITS

The market imperfection that the rule is intended to correct is the lack of information available to homeowners/tenants regarding the potential health risks accompanying residential renovations. The failure of the marketplace to provide this information means that occupants may not be able to react rationally to avoid or prevent such health risks.

It is expected that the information provided as a result of this rulemaking will lead homeowners and rental property occupants to make better informed decisions regarding purchasing or assenting to renovation services, or specifying that risk-management precautions be undertaken in connection with such activities. In addition, homeowners and rental property occupants may themselves undertake precautions to eliminate or reduce the health risks from lead-based paint. For example, occupants may remove young children or other susceptible persons from the housing unit while the work is being performed, seal off rooms in which work is occurring, or perform abatement activities prior to having repair/renovation work done, thus limiting or eliminating the potential for health hazards. The rule may also prompt rental property owners, due to liability concerns, to act to reduce potential lead-related hazards associated with later renovations performed on their buildings. These precautionary and/or control activities are associated with potential risk-reduction benefits;

however, these indirect benefits are distinguishable from the more direct benefits of the rule, the value of improved information.

EPA notes that the regulation does not require actions to be taken to reduce lead-based paint hazards in residential housing; thus, the extent to which lead exposure falls depends upon how transaction participants respond to the additional information. Currently, data are not available to permit estimation of how transaction participants may value the information, nor was the Agency able to quantify how the rule may affect behavior. It was not possible, therefore, to quantify the expected benefits.

INTRODUCTION

Section 1021 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 amends the Toxic Substances Control Act (TSCA) by adding a new title: Title IV — Lead Exposure Reduction. Under Section 406(b) of Title IV, the Environmental Protection Agency is issuing regulations requiring the disclosure of possible lead-paint hazards in residential property before renovation work may begin. These regulations will apply to most residential property built before 1978 and require that renovators give the owner and adult occupants of a property an EPA-approved *Lead Hazard Information Pamphlet* before beginning renovation work at the property and obtain a signed acknowledgment from the owner and an adult member of the housing unit certifying that they have received the pamphlet *or* provide a certified mail receipt confirming delivery of the pamphlet.

These regulations will impose various costs on the parties involved in renovation transactions and, as well, the federal government. This document presents an analysis of the estimated costs to private parties from compliance with the lead-based paint hazard disclosure regulation for renovations, including an assessment of the rule's likely effects on small businesses. The document also presents an estimate of the costs to government from administering the regulation and qualitatively assesses the rule's likely benefits.

The document includes five chapters and an appendix. The first chapter outlines a framework for understanding the costs of the regulation while the second briefly reviews key economic data regarding the business sectors likely to incur costs as a result of the regulation. The third chapter presents the analysis of the estimated costs of the regulation to private parties and the federal government and the fourth chapter analyzes the costs to private parties in relation to example small businesses in the affected business sectors. The fourth chapter also examines whether the regulation may be expected to impose an unfunded mandate on governmental units other than the Federal government or may result in an adverse distribution of benefits or costs relative to environmental justice criteria. The final chapter discusses the hazards of exposure to lead from lead-based paint, explores the potential benefits stemming from the value recipients place on the information received as per the rule's requirements, and assesses the mechanisms by which the disclosure rule is likely to contribute to a reduction in lead exposure. The appendix lists the data sources for the analysis.

Another part of the Residential Lead-Based Paint Hazard Reduction Act of 1992, Section 1018, establishes disclosure requirements for the transfer (i.e., sales and rentals) of residential property that may contain lead-based paint. The analysis of the disclosure rule for transfers is presented in a separate document, *Regulatory Impact Analysis of Lead-Based Paint Hazard Disclosure Regulation for Real Estate Transfers*. Much of the methodology and data sources for that analysis is the same as that for the disclosure rule for renovations. In some cases, the analyses overlap in the assumptions regarding estimation and allocation of costs because some parties are affected by both rules.

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CHAPTER 1

BACKGROUND AND FRAMEWORK FOR ANALYSIS

Section 1021 of the Residential Lead-Based Paint Hazard Reduction Act of 1992 amends the Toxic Substances Control Act (TSCA) by adding a new title: Title IV — Lead Exposure Reduction. This new part of TSCA in turn contains Section 406(b), which requires the Administrator of the Environmental Protection Agency to promulgate regulations for disclosure of possible lead-based paint hazards in residential property before performance of certain renovation work that is performed for compensation. These regulations will apply generally to residential housing built before 1978 unless the housing contains no bedrooms, is housing for the elderly or disabled *and* may not be lived in by a child under the age of six, or has been certified as having no lead-based paint on any surface (in the remainder of this document, “target housing” refers to housing subject to the regulation). The regulations will change current business practices in renovation transactions and impose costs on involved parties. The costs of the lead hazard disclosure regulations (“disclosure rule”) to private parties will manifest foremost as time requirements: time invested in learning the rule and implementing compliance procedures, time required for disclosure activities, and time for meeting the rule’s record-keeping requirements. In addition, the rule will impose modest materials expenses for documents and storage of transaction records. To provide a basis for analyzing these costs, this chapter reviews the requirements of the law and implementing regulations with regard to renovation work, identifies the affected parties, and summarizes the ways in which those parties may be expected to incur costs as a result of the disclosure rule.

REQUIREMENTS OF THE DISCLOSURE RULE FOR RENOVATIONS

The rule establishes disclosure requirements to be followed by paid contractors in the performance of renovation work on target housing. Renovation services that are subject to the rule include:

- Paint removal or disruption (e.g., floor refinishing, stairs refinishing, modification of painted doors), where disruption includes any surface preparation activity involving sanding, scraping, or other such activities that may generate a lead hazard;
- Removal of large structures (e.g., walls, ceilings, large surface replastering, major replumbing), excluding the roof;
- Window replacement; or
- Other renovation activities that disturb more than two square feet of painted surface per component.

Activities that are explicitly excluded from the rule include:

- Minor repairs and maintenance activities (including minor electrical work and plumbing) that disrupt less than two square feet of painted surface;
- Emergency renovation operations; or
- Renovations in target housing for which a written determination has been made by an inspector (certified pursuant to either Federal regulations at 40 CFR 745.226 or an EPA-authorized State certification program) that lead-based paint is not present on the components affected by the renovation, where the renovator has obtained a copy of the determination.

Before beginning work on a unit of target housing, the renovator is required to:

- Before beginning renovation work, provide the owner(s) and an adult member of the housing unit with a copy of an EPA-approved *Lead Hazard Information Pamphlet* as specified under Section 406 of the Toxic Substances Control Act. EPA has prepared a lead hazard information pamphlet titled “Protect Your Family From Lead in Your Home” that may be used for this purpose. However, renovators may use other information pamphlets provided that they have been approved by EPA for use in the state in which the renovation is being performed.
- Document that the pamphlet was delivered in accordance with the regulation’s requirements. The provision of the pamphlet and the associated documentation of its delivery may be accomplished as follows:
 - Hand delivery: The renovator, or a representative of the renovator, may deliver the pamphlet by hand and obtain a signed, dated acknowledgment that the owner and adult member of the housing unit have received a copy of the pamphlet. The acknowledgment may be included in a renovation contract or may be on a separate piece of paper. This method of delivery and associated documentation will be generally applicable for renovation services to be performed in owner-occupied housing.
 - Certified mail delivery: The pamphlet may be delivered by certified mail, return-receipt requested. In this case, the delivery receipt returned by the postal service to the renovator will serve as documentation of delivery of the pamphlet. This method of delivery may more generally be applicable for renovation services to be performed in rental or multi-unit housing.
 - Certification of delivery without signed acknowledgment: For deliveries to non-owner-occupants (tenants) in which the renovator is not able to obtain a signed acknowledgment of receipt, the renovator may deliver the pamphlet and certify in writing that the pamphlet has been delivered but that a signed acknowledgment could not be obtained. The certification must include the address of the unit, the date and method of delivery of the pamphlet, name of the person delivering the pamphlet, reason for lack of acknowledgment (e.g., no adult present, occupant refuses to sign), the signature of the renovator, and the date of signing the certification.
 - Special notification and documentation provisions for renovation of common areas: For renovations of common areas (i.e., halls, stairways, lobbies, basement or building exterior) of multiple-unit properties (whether rental or owner-occupied), the renovator shall provide the pamphlet to the owner(s) of the target housing and shall obtain a signed, dated certification of delivery or a certified mail receipt for delivery. In addition, the renovator must inform *in writing* an adult occupant of each affected unit of the upcoming renovation activity and must make the lead hazard pamphlet available to any occupant who requests one. The renovator must maintain a record of how the unit occupants were informed and how pamphlets were made available. For properties in which common area renovation services are provided by the property owner or a property management firm, these notification activities may be performed by the property owner or the property management firm.

- Maintain records documenting compliance with the notification and pamphlet distribution requirements for a period of at least three years following completion of the renovation activities. Maintained records are to include: copies of signed, dated acknowledgments of the receipt of pamphlet; certified mail receipts; and/or documentation of notification for common area renovation work. In cases where a certified inspector has determined that lead-based paint is not present in target housing, records documenting such finding must also be retained by the renovator for at least three years.

The legislation and regulation prescribe penalties under TSCA for failure to comply with the disclosure rule requirements.

PRIVATE PARTIES AFFECTED BY THE RULE

The parties that will be affected by the disclosure rule's requirements with respect to renovation are: Renovators — persons or businesses providing renovation services for compensation in target housing; the Owners and Occupants of owner-occupied property; Occupants of rental housing; and Owners of rental housing. A distinction is drawn between owners of rental and owner-occupied housing because the rule affects these parties differently as is discussed below. Under the disclosure rule, renovators and, implicitly, the owners of rental housing bear a responsibility to ensure that the occupants of housing in which renovation services will occur are informed of the possible hazards stemming from renovation work. Thus, these parties bear direct responsibilities under the rule. Occupants of rental housing and owners/occupants of owner-occupied housing must invest time in meeting the disclosure rule's requirements.

COST EFFECTS ON AFFECTED PARTIES

Five general ways were identified in which the disclosure rule is expected to impose costs on the affected parties. In general, the costs of the disclosure rule will be the aggregation of individual cost effects over the number of parties and transactions that are affected by the rule, or the *frequency of cost occurrence*. Below, each of the five cost components is discussed in terms of how the cost component will affect the parties to a renovation transaction and the frequency of its occurrence:

1. Start-up costs. These costs include the time required to learn the disclosure rule's requirements and set up compliance procedures. Start-up costs under the renovation part of the disclosure rule are expected to be incurred by renovators, which may include owners/managers of rental housing, to the extent they perform renovation services in rental target housing. In terms of the frequency of cost events, start-up costs are assumed to be incurred once for the existing stock of persons performing renovation services and thereafter, annually for new entrants to the renovation profession (see *Exhibit 1, Cost Components and Frequency of Occurrence by Affected Party in Renovation Activities*).
2. Disclosure event costs. Parties incurring disclosure event costs include renovators, occupants of owner-occupied and rental housing, and owners of rental property. The time requirements of disclosure will include the time to explain the rule, give the pamphlet to occupants of the subject property, and gain the needed signature(s) of acknowledgment or provide other documentation of compliance. For owner-occupied housing, the signature of acknowledgment is obtained only from the owner/adult occupant of the property and the disclosure events are expected to occur at the time the renovator and the owner-occupant agree on the renovation work to be performed. Thus, for owner-occupied housing, the disclosure requirements will occur once for each performance of renovation work in such housing.

Exhibit 1: Cost Components and Frequency of Occurrence by Affected Party in Renovation Activities		
Cost Component	Affected Party	Frequency of Cost Occurrence
Start-Up Costs	Renovators	Once for current stock of persons providing renovation services; thereafter, annually for new entrants to the affected occupations
Disclosure Event Costs	Renovators	Once for each performance of renovation services in target housing
	Occupants	Once for each performance of renovation services in target housing
	Owners or Property Managers	Once for each performance of renovation services in <i>rental</i> target housing (may include multiple notifications for work to be performed in the common area of a multiple unit property).
Record-Keeping (retaining signed acknowledgments or other compliance documentation)	Renovators	Once for each performance of renovation services or lead-free certification in target housing.
Materials - Pamphlet - Acknowledgments or other documentation - Storage	Renovators	Pamphlets and Storage: One pamphlet is required for each performance of renovation services in <i>owner-occupied</i> target housing; two pamphlets are required for each performance of renovation services in <i>rental</i> target housing (owner and adult occupant). Signed Acknowledgments or other documentation are copied and distributed to involved parties: property owner, renovation contractor, and tenant (if for rental property).

For rental housing, the disclosure requirement will apply to both an adult tenant of the rental unit in which work is to be performed and the owner of the rental housing. Tenants are assumed to be given the pamphlet and informed of the need to sign the acknowledgment at the time the work is scheduled or at the beginning of the work. Alternatively, the renovator may deliver the pamphlet by certified mail and use the signed delivery receipt as documentation of pamphlet delivery or, in the event that a signature cannot be obtained from the tenant, prepare and sign the certification of delivery statement described above. In addition to delivering the pamphlet to the tenant, the renovator will also need to obtain a signature of acknowledgment from the owner of the rental housing. Thus, the frequency of disclosure event costs will be once for both the owner and for the tenant of rental housing for each performance of renovation services in rental housing.

In the case of common area renovations in multiple unit properties, whether rental or condominium, the disclosure costs would include notifying an adult occupant of all affected units before the renovation work and of providing the pamphlet to those occupants who requested it. This function is likely to be performed by the owner or manager of the multiple unit property (see Exhibit 1).

3. Record-keeping costs. The rule imposes specific record-keeping requirements on the involved parties. Record-keeping requirements fall on the providers of renovation services, whether they are independent renovation contractors or providers of renovation services through a property

management firm. The frequency of the record-keeping requirement is expected to be once for each renovation activity/lead-free certification in a unit of target housing. Additional record-keeping responsibilities may fall on owners or managers of multiple unit properties for the performance of work in common areas of those properties (see Exhibit 1).

4. Materials. Materials costs include the costs of the lead hazard information pamphlet, the acknowledgment statements or other documentation (of pamphlet delivery or lead-free status), and any materials requirements for storing such documents. Specific expected requirements per renovation transaction in owner-occupied target housing include one pamphlet, two copies of the signed acknowledgment, and capability of storing the signed acknowledgment. For rental property, these requirements are increased by the addition of the responsibilities for both the owner and tenant(s) of the property (see Exhibit 1).
5. Compliance Monitoring. The disclosure rule may also generate costs in conjunction with compliance monitoring activities undertaken by the responsible agencies. At present, EPA expects to perform both programmed compliance monitoring activities and actions in response to complaints regarding failure of responsible parties (i.e., renovation contractors or rental property owner/managers) to comply with disclosure rule requirements. Compliance monitoring will likely involve EPA performing an on-site compliance audit and will require parties such as renovation contractors to incur costs for the time required to retrieve and copy compliance documents and for photocopying.

The application of the disclosure rule to renovation activities may represent more of a departure from traditional business practices in regard to renovation work in rental housing than in owner-occupied housing. In renovation work on owner-occupied housing, it is normal for explanations and exchange of information to occur before agreeing on the work to be done and the price. It is expected that these events will provide the opportunity for performing the rule's disclosure requirements. In addition, because Owner(s)/ Occupant(s) presumably identify the need for work at their residence, and request and enter the contract for the renovation work, a disclosure requirement should present little difficulty in owner-occupied housing. Because renovation work in rental housing may involve dealing with a party or parties other than the owner of the affected housing, delivering pamphlets and obtaining signed acknowledgments could prove more difficult and costly than for owner-occupied housing. For this reason, EPA included certified mail delivery and certification of pamphlet delivery without an acknowledgment signature as alternate methods for delivering and documenting receipt of the lead hazard information pamphlet.

Similar issues may arise in the performance of work in common areas of multiple unit properties. For this reason, the owner or property manager of a multiple unit property may elect to perform the notification and disclosure responsibility for renovation work in common areas. The property owner or manager may elect this responsibility to reduce the costs that would otherwise be charged by the renovation contractor for performance of the notification and disclosure activity.

Consumers may incur additional, indirect, costs in response to the information provided by the regulation, such as possible outlays for lead hazard inspections or abatements. However, such actions and their associated costs are not required by the regulation. In addition, current data and methods limitations do not permit measurement of how the regulation may affect consumer behavior. For these reasons, such potential cost effects were not considered in this analysis.

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CHAPTER 2

PROFILE OF SECTORS AFFECTED

Renovation Contractors, who are part of two major business sectors — General Contract Construction and the Specialty Building Trades — are expected to bear the principal effects of the lead hazard disclosure rule for renovation activity. Contractors' business practices are directly affected by the rule and thus they are expected to incur the greatest costs of compliance. In addition, because rental property managers and operators often perform renovation work in rental units, businesses in rental property management — Real Estate Agents and Managers, and Real Estate Operators and Lessors — may also incur costs under the disclosure rule. This chapter summarizes economic data and provides a brief review of the current outlook for these business groups.

The economic/financial performance of these business groups is closely linked and, indeed, activity in the real estate sectors is a primary driver of activity and performance in the construction and renovation industries. Because the economic performance of these groups is so intertwined, the following discussion considers the groups together.

DEFINITION OF AFFECTED BUSINESS GROUPS

Renovation contractors are part of two large business sectors: SIC group 15, General Building Contractors and Operative Builders and SIC Group 17, Special Trade Contractors. According to 1992 census data, these sectors had a total of 557,000 establishments, employed 3,833,000 persons, and had a total payroll of \$98,922 million (see *Exhibit 2, Establishment, Employment and Payroll Data for Affected Business Groups*, next page). The actual number of businesses and persons within this industry that would be affected by the disclosure rule is highly uncertain. Many of the building contractors and trades persons are not likely to be involved in residential renovation work. However, reliable data are not available on participation in renovation work. In addition, depending on the definition of renovation activities subject to the rule, some of the buildings trades contractors may not be affected by the rule. The special trade contractors in SIC group 17 include diverse buildings trades: Plumbing, Heating, and Air Conditioning (SIC 171); Painting and Paper Hanging (SIC 172); Electrical Work (SIC 173); Masonry, Stonework, and Plastering (SIC 174); Carpentry and Floor Work (SIC 175); Roofing, Siding, and Sheet Metal Work (SIC 176); Concrete Work (SIC 177); Water Well Drilling (SIC 178); and Miscellaneous Special Trade Contractors (SIC 179). Some of these trades may be affected more than others by the disclosure rule. To illustrate, using a narrower definition of affected employment based on the occupation titles contained in the Occupational Outlook Handbook published by the Bureau of Labor Statistics (BLS), the number of persons directly affected by the disclosure rule may be about 2.27 million. This value is based on the number of occupational positions identified by BLS in 1992 as Construction Contractors and Managers (180,000) and in a set of specialty building trades deemed most likely to be affected by the rule: Carpenters, Carpet Installers, Drywall Workers and Lathers, Glaziers, Insulation Workers, Painters and Paperhangers, Plasterers, and Plumbers (total for these groups, 2,092,000).

Real estate agents/managers and operators/lessors are part of SIC code 61, Real Estate: Real Estate Operators and Lessors, SIC code 651 and Real Estate Agents and Managers, SIC code 653. On the basis of Census Bureau data, in 1990, these two SIC codes had a total of 184,000 establishments, employed 1,112,000 persons, and had a total payroll of \$23,278 million. Again, the number of persons who will be specifically affected by the disclosure rule may be substantially less than these values. In particular, according to BLS data, 243,000 persons were employed as *Property and Real Estate Managers* in 1992 (see Exhibit 2).

Exhibit 2: Establishment, Employment and Payroll Data for Affected Business Groups					
Business Sector	SIC Code(s)	Number of Establishments	Number of Employees	Total Annual Payroll (\$000, 1992)	
General Contract Construction and the Building Trades					
General Contractors and Operative Builders	15	181,000	1,125,000	29,905,767	
Special Trade Contractors	17	376,000	2,708,000	69,016,590	
Real Estate Agents/Managers and Operators/Lessors					
Operators and Lessors	651	92,000	475,000	8,324,133	
Agents and Managers	653	92,000	637,000	14,973,843	
Source: U.S. Department of Commerce, Bureau of the Census, <i>County Business Patterns</i> , 1992.					

TRENDS AND OUTLOOK FOR AFFECTED BUSINESS GROUPS

Because activity in the real estate industries drives performance in the construction and building trades industries, the trends and outlook for the real estate industries are reviewed first followed by a discussion for the construction and building trades industries. During the late 1980s and early 1990s, the real estate industries experienced substantial economic weakness as the result of general weakness in the economy, a spate of overbuilding in commercial real estate generally and residential real estate in some regions, and tightened lending standards for real estate development and purchases. Real property values and transaction volumes generally declined, leading to lower revenues and weaker financial performance in this industry. From about 1991-92 onward, these businesses have recovered as interest rates declined substantially and the economy strengthened in general. Most recently, economic performance in these industries has turned somewhat sluggish as interest rates crept upwards over 1994 and the economy shows signs of weaker growth. Key indicators of real estate industry performance include total housing permits, total sales of existing housing units, and total nonresidential permit value.¹ These data show that activity in the industry generally peaked between 1986 and 1988, declined until 1991 or 1992, and began to show recovery in 1993 and 1994 (see *Exhibit 3, Summary Indicator Data for Performance of Affected Business Groups*, next page). Continued strength in the real estate businesses will largely depend on the strength of growth in the overall economy and the persistence of relatively low interest rates.²

The same factors that caused wide fluctuations in the business performance of the real estate industries in recent years have also affected construction-related businesses. As shown in Exhibit 3, total housing permits and non-residential permit value fell through the late 1980s/early 1990s but began a modest recovery about 1992/93. Residential repair and remodeling work remained more stable during this period, and contractors who specialize in this side of the business may be in better financial condition than those who concentrate in new construction or the non-residential sectors. In nominal dollars, repair and remodeling permit value weathered the recent recession with less of a downturn than that shown for non-residential permit value (see Exhibit 3). On a constant dollar basis (the last two rows of the table), the indication of a recovering industry is apparent as both the value of all new construction and new residential construction increased after 1991. As indicated

¹ Permit value is the estimated cost of construction and improvements activity specified at the time a construction permit is obtained for performing new construction or improvements to an existing property.

² See the summary financial outlook for the homebuilding and real estate investment industries in Value Line Investment Survey, April 21, 1995, page 873 and, May 5, 1995, page 1171.

above for the real estate sectors, economic recovery for the construction and building trades industries appears to have begun in 1992 and has clearly continued until 1994.

Exhibit 3: Summary Indicator Data for Performance of Affected Business Groups								
	Year							
	1987	1988	1989	1990	1991	1992	1993	1994
Housing Permits (000) [†]	1,534	1,455	1,338	1,104	945	1,105	1,214	1,363
Sales, Existing Housing (000) [†]	3,807	3,901	3,752	3,594	3,575	3,811	4,203	4,404
Nonresidential Permit Value (\$000,000) [†]	51,551	54,773	51,536	45,775	34,107	32,825	36,464	40,136
Residential Repair and Remodeling Permit Value (\$000,000) [†]	11,661	12,640	13,409	13,436	13,420	13,865	13,519	13,234
Non-Residential Repair and Remodeling Permit Value (\$000,000) [†]	22,565	24,516	26,230	26,601	25,276	25,743	27,159	29,359
Value of New Construction (\$000,000,000, 1987) [‡]	419	415	410	398	360	387	398	406
Value of New Residential Construction (\$000,000,000, 1987) [‡]	195	190	181	164	141	165	176	184
Sources:								
† National Association of Home Builders, 1995.								
‡ U.S. Department of Commerce, Bureau of the Census, various publications. Census data values are in constant 1987 dollars.								

According to Department of Commerce analysts, the overall economic/financial outlook for the construction and building trades industries is for continuing improvement, though at only a modest pace in part because of the continuing over supply of commercial buildings. Remodeling and repair construction will increase substantially if interest rates remain moderate (source: *U.S. Industrial Outlook, 1995*, U.S. Department of Commerce, January 1995).

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CHAPTER 3

ESTIMATED COSTS TO PRIVATE PARTIES AND GOVERNMENT

The costs of the lead-based paint hazard disclosure rule for real estate renovations include costs to the private parties that are affected by the rule, as outlined in Chapter 1, and the costs to the federal government for administering the regulation. This chapter assesses both cost categories and is organized in three major sections. The first, and longest, section of the chapter addresses the costs to private parties while the second section reviews the expected costs to the federal government for administering the regulation. The final section summarizes the aggregate findings for the costs to both private parties and the federal government.

COSTS TO PRIVATE PARTIES OF COMPLYING WITH THE DISCLOSURE REGULATION FOR REAL ESTATE RENOVATIONS

The costs to private parties of the lead-based paint hazard disclosure rule for renovations were analyzed in accord with the framework outlined in Chapter 1. Before presenting the cost estimates, the following sections first review general considerations in analyzing the costs, and the methods and sources for gathering data for the analysis. Following these discussions, the chapter presents the estimated compliance costs for renovation transactions, including a summary of the calculations leading to the cost values. The next section of the chapter contains a sensitivity analysis in which the values for important, but uncertain, factors in the analysis are varied to understand their effect on the expected cost of the disclosure rule. The final section of the chapter presents a brief analysis of the costs of compliance and monitoring activities.

As noted in Chapter 1, consumers may incur additional, indirect, costs in response to the information provided by the regulation, such as possible outlays for lead hazard inspections or abatements. However, such actions and their associated costs are not required by the regulation. In addition, current data and methods limitations do not permit measurement of how the regulation may affect consumer behavior. For these reasons, such potential cost effects were not considered in this analysis.

Structure of Cost Analysis

The aggregate costs of compliance were estimated for four components of cost: Start-Up, Disclosure Event, Record-Keeping, and Materials. Within this framework, costs were estimated in terms of the incremental time and materials required for compliance with the disclosure rule aggregated over the estimated number of transaction events and/or persons affected by the rule. The incremental time requirements were valued on the basis of the loaded labor cost of the affected individuals if the time required for compliance is part of the person's occupation. If the time required for compliance is not part of the person's occupation, the time was valued on the basis of an estimated after-tax income to the person in the assumption that the personal time spent in compliance displaces the opportunity to work and earn additional income. Materials costs were estimated as the out-of-pocket costs for purchasing the material required — for example, the cost of the Lead Hazard Pamphlet or the copies of the signed acknowledgment documents.

In summary, the elements in the calculation of the aggregate cost for a time-related cost component include the time spent per person or event, the number of affected people or events, and the value of time. The general formula for the cost of a time-related event is as follows:

$$\text{Cost of Time-Related Event} = \frac{\text{time}}{\text{event}} \times \frac{\text{cost}}{\text{time}} \times \text{number of events}$$

Similarly, the elements of a materials cost are the number of materials required per event, the number of events, and the cost of the material. For example,

$$\text{Cost of Copies} = \frac{\text{copies}}{\text{event}} \times \frac{\text{cost}}{\text{copy}} \times \text{number of events}$$

Costs were aggregated to yield an estimated *annual* cost of compliance. In this aggregation, the cost of time-related events was treated differently depending on whether the cost is a recurring event based on the volume of affected transactions or is a one-time start-up cost for affected parties. For cases where costs are incurred in the course of a transaction — for example, the disclosure event associated with renovation — the estimated cost per transaction event is simply multiplied times the number of events per year to yield the estimated annual cost. Alternatively, in those cases in which parties incur a one-time start-up cost as part of their business (e.g., renovation contractors and rental property managers), the cost is annualized over the expected tenure of those persons in their profession. The choice of an appropriate discount rate for annualizing start-up costs will depend in part on whether these costs displace current consumption *or* displace investment and capital formation. For this regulation, EPA expects that start-up costs would likely be passed on to consumers of renovation activities and are therefore more likely to displace current consumption than to reduce capital formation. On this basis, the discount rate used for annualizing the cost of start-up activities is a *displacement-of-consumption* rate of *three* percent. In addition, a sensitivity analysis presented later in this chapter contains cost values calculated using a higher, *displacement-of-investment* rate of *seven* percent. Because non-recurring outlays are a relatively small component of the total costs imposed by the disclosure rule, the increase in cost from using the higher seven percent rate is small and amounts to less than two percent of the total estimated costs for the rule.

An additional element of the analysis of start-up costs involves the recognition that the start-up costs to members of the affected occupations occur at one-level in the first year of compliance with the rule and at another level thereafter. Specifically, the *existing* stock of persons in the various occupations affected by the rule — renovation contractors and rental property managers — is assumed to learn the rule and establish compliance procedures in the first year of the rule and these costs are annualized in the manner described above. However, additional start-up costs would be incurred by the new entrants to these business groups: new renovation contractors and property managers will have to learn the disclosure rule. Although the new entrants to these businesses will only be a small percentage of the existing stock, some costs will still be incurred in each year for this start-up activity. This element of start-up cost was analyzed in the following manner:

1. An estimated number of entrants to the affected occupational categories was obtained from the Bureau of Labor Statistics (BLS). The measure provided by BLS takes into account both the growth in total positions in an occupation and the movement of persons out of the occupation creating a need for new entrants. The value obtained from BLS is the average annual number of new entrants in each affected occupation over the period 1992-2005.
2. The annual start-up cost for new entrants to the affected professions was calculated as follows:

$$\text{Annual Start-Up Costs for Entrants} = \text{entrants} \times \frac{\text{hours}}{\text{start-up}} \times \frac{\text{cost}}{\text{hour}}$$

These costs were assumed to occur in the first year of the regulation and each year thereafter.

Sources of Data

The data used in this study were obtained from literature searches and personal communication with representatives of the affected parties. Important sources of data for the analysis include federal publications by the Bureau of Labor Statistics, Bureau of the Census, and International Trade Administration. In addition, data were obtained from publications of various industry associations and trade groups. Much of the data concerning the estimated time requirements for compliance and frequency of events was obtained through personal communication with independent sales and rental agents, property managers, mortgage lenders, and real estate lawyers. A complete list of the literature sources and the sources of personal communication is presented in Appendix A.

Almost all of the data acquired from independent businesses — renovation contractors and rental property managers — came from persons and companies based in Massachusetts. Since 1988, Massachusetts has had a lead-based paint disclosure rule for residential real estate that is similar to the federal rule. Because affected parties in Massachusetts have worked with this rule for several years, their insights into how the new federal rule would likely affect transactions and impose costs were believed to provide a sound basis for estimating the costs of the federal rule.

Many data items were required for the cost analysis and much of the data is used in more than one calculation. The data that were used to calculate the costs for the three affected transactions, along with the sources for each value is summarized in the exhibits on the following pages. *Exhibit 4, Summary of Data Items and Values for Affected Parties and Events Used in Analysis of Lead-Paint Hazard Disclosure Rule for Renovation*, summarizes data in four categories:

1. *Data Items Concerning the Number of Affected Parties or Persons.* These data pertain to the number of parties and persons that will incur start-up costs under the rule. The starting source for most of these values was the Bureau of Labor Statistics *Occupational Projections and Training Data* and associated BLS publications. An effort was made to use an occupational definition that coincides as closely as possible with the occupation that is expected to incur costs as the result of the rule. However, because data are not available on the number of persons within an occupation who are specifically involved with *residential* renovation or rental management, these numbers necessarily have a degree of uncertainty. The primary analysis in this report is based on the number of occupational positions identified by the Bureau of Labor Statistics for the following employment categories: Construction Contractors and Managers; and, within the specialty building trades, Carpenters, Carpet Installers, Drywall Workers and Lathers, Glaziers, Insulation Workers, Painters and Paperhangers, Plasterers, and Plumbers. These specialty trades are expected to be involved in the renovation activities that are covered by the regulation. However, it is possible that additional employment categories might be involved in renovation activities that are subject to the rule. Because of this uncertainty regarding the number of persons who will be subject to the rule as renovation contractors, the sensitivity analysis presented later in the chapter considers a broader occupation base for estimating the costs of the disclosure rule.

Similar issues affect estimation of the number of renovation and building contractor establishments likely to be subject to the regulation. The primary analysis in this report is based on the number of establishments in SIC 151, General Building Contractors, and, within the specialty building trades, in SIC groups 171-2, 1742-43, 175-6, 1793, and 1796, which include: Plumbing, heating, and air conditioning; Painting and paper hanging; Plastering, drywall, and insulation; Terrazzo, tile, marble, mosaic work; Carpentry and floor work; Roofing, siding, and sheet metal work; Glass and glazing work; and Installing building equipment not elsewhere classified. An alternative, broader definition of affected establishments is also used in the sensitivity analysis.

Exhibit 4: Summary of Data Items and Values for Affected Parties and Events Used in Analysis of Lead-Paint Hazard Disclosure Rule for Renovation		
Data Item	Value for Cost Analysis	Basis for Value/Source
<i>Data Items Concerning Number of Affected Parties or Persons</i>		
Number of Businesses and Persons Providing Renovation Services in Target Housing:	Total Establishments: 298,000 Total Employees: 2,272,000 Total Entrants: 102,000	Sum of values from below.
General Contractors for Residential Construction	Establishments: 99,000 Affected Employees: 180,000 Annual Entrants: 9,000	Number of establishments, SIC code 151 (General Building Contractors), 1992, <i>County Business Patterns</i> (CBP), Bureau of the Census, 1994. Estimated number of Construction Contractors and Managers, 1992, and annual entrants from <i>Occupational Projections and Training Data</i> (OPTD), Bureau of Labor Statistics, May 1994.
Building Trades Contractors	Establishments: 199,000 Affected Employees: 2,092,000 Annual Entrants: 93,000	Number of establishments, SIC codes in selected building trades (see text), 1992, from CBP, 1994. Estimated employment, 1992, and annual entrants in selected building trades (see text) from OPTD, 1994.
Number of Property Managers for Rental Target Housing	Affected employees: 243,000 Annual Entrants: 10,000	Estimated number of Property and Real Estate Managers, 1992, from OPTD, 1994
<i>Data Items Concerning Number of Transactions and Events that Impose a Cost</i>		
Owner-Occupied Housing Units Built Before 1979	46,416,000	From 1991 American Housing Survey data, provided by HUD.
Pre-1979 Zero-Bedroom Owner-Occupied Housing with No Children Occupants	74,000	Estimated from 1991 American Housing Survey data, provided by HUD.
Number of <i>Target</i> Owner-Occupied Housing Units	46,342,000	Estimate based on total pre-1979 owner-occupied units less zero-bedroom units not subject to rule.
Rental Housing Units Built Before 1979	26,837,000	From 1991 American Housing Survey data, provided by HUD.
Pre-1979 Zero-Bedroom Rental Housing with No Children Occupants	1,061,000	Estimated from 1991 American Housing Survey data, provided by HUD.
Number of <i>Target</i> Rental Housing Units	25,776,000	Estimate based on total pre-1979 rental units less zero-bedroom units not subject to rule.
Annual Number of Paid Renovation Events in Target Housing	18,550,000	Estimate from Census data on the dollar outlay for renovation improvements subject to regulation, 1992 (<i>Expenditures for Residential Improvements and Repairs</i> , 1994) divided by unit costs for renovation activities from <i>Profile of the Remodeler</i> , National Association of Home Builders
Annual Number of Renovation Events in Owner-Occupied Target Housing	12,217,000	Same as above but using data for owner-occupied housing.
Annual Number of Renovation Events in Rental Target Housing	6,333,000	Same as above but using data for rental housing.

Exhibit 4: Summary of Data Items and Values for Affected Parties and Events Used in Analysis of Lead-Paint Hazard Disclosure Rule for Renovation (continued)		
Data Item	Value for Cost Analysis	Basis for Value/Source
<i>Data Items Concerning Cost of Time for Compliance-Related Activities</i>		
Renovators	\$14.78, plus fringe and overhead at 64 percent, yields unit hourly cost of \$24.24	Average hourly earnings for December 1994, Construction category, from <i>Employment and Earnings</i> (EE), Bureau of Labor Statistics, January 1995. Fringe and overhead rate taken from CAIR burden analysis (EPA).
Real Estate Lessors and Property Managers	\$12.02, plus 64 percent fringe and overhead, yields unit hourly cost of \$19.71	Average hourly earnings, December 1994, Finance, Insurance and Real Estate category, from EE, January 1995.
Personal Time (time spent by property owners or tenants apart from their normal compensated occupation)	\$11.28, less 27.65 percent for income tax and FICA withholding, yields unit hourly value of \$8.16	Average hourly earnings for December 1994, total private employment, less allowance for income tax and FICA withholding, EE, January 1995.
<i>Data Items Concerning Cost of Materials for Compliance-Related Activities</i>		
Lead Hazard Pamphlet	\$0.24 per pamphlet.	16 pages, printed front and back, folded sheet format (i.e., four 8.5 x 11 sheets per document) (discount office supply bulk copying price, May 1995).
Filing Materials	\$0.004 per sheet of paper	A 4-drawer, 26-inch deep filing cabinet is estimated to hold about 25,000 sheets of paper and to cost \$100 (discount office supply price, May 1995), yielding a filing cost per sheet of \$0.004.
Cost of Signed Acknowledgments.	\$0.04 per page	Signed Acknowledgments or other documentation are required as part of the renovation transactions. Copying costs are calculated at \$0.04 per page (discount office supply price, May 1995).

2. *Data Items Concerning the Number of Transactions and Events that Impose a Cost.* These data pertain to the annual number of renovation events in owner-occupied and rental target housing and thus provide the basis for calculating the number of times a particular compliance-related activity must occur in each year. The numbers of target housing units, both owner-occupied and rental, were estimated from 1991 National Housing Survey data on the number of owner-occupied and rental units built before 1979. These values were reduced by the estimated number of zero-bedroom units with no children occupants (also from 1991 National Housing Survey data) to yield the estimated number of target owner-occupied units, 46,342,000, and rental housing units, 25,776,000. Paid renovation activities in these units will be subject to the disclosure rule.

The number of annual renovation events in both owner-occupied and rental housing is based on estimates of the value of compensated renovation work subject to the regulation and the unit cost of those renovation activities. Specifically, the Census Bureau publication *Expenditures for Residential Improvements and Repairs (Expenditures)* provides estimates of the outlays for residential improvements and repairs in owner-occupied and rental housing, and in several relevant job categories. Total 1992 expenditures for *improvements*, and *maintenance and repair* in residential properties were assembled from *Expenditures* for owner-occupied properties and rental properties for selected job categories deemed relevant to the analysis: (1) Heating and Central Air Conditioning; (2) Plumbing; (3) Painting; (4) Siding; (5) Interior Restructuring; and (5) Other. These amounts were adjusted to provide an estimate of the annual value of renovation activities *subject to regulation* by: considering whether the *maintenance and repair* or *improvements* job categories (or *both*) would likely be subject to regulation; reducing owner-occupant outlays by the estimated amount for “do-it-yourself” work (based on *Expenditures* data); and reducing renovation outlays to reflect only pre-79 residential property (79 percent of rental units; 77 percent of owner-occupied units). The results of

this calculation are summarized in the top section of *Exhibit 5, Estimated Number of Renovation Events Subject to Regulation*.

Exhibit 5: Estimated Number of Renovation Events Subject to Regulation						
Adjusted Value of Improvements in Owner-Occupied and Rental Property Subject to Regulation (\$millions)						
	Owner-Occupied			Rental		
	Maint. & Repair	Improvements	Total	Maint & Repair	Improvements	Total
Heating and Central Air Conditioning	0	2,436	2,436	0	632	632
Plumbing	0	1,790	1,790	0	0	0
Painting (No value for Improvements)	3,705	0	3,705	3,936	0	3,936
Siding	72	601	673	470	490	960
Interior Restructuring (No value for Maint. & Repair)	0	2,419	2,419	0	0	0
Other	3,556	19,012	22,568	3,869	5,403	9,271
Total	7,333	26,258	33,591	8,274	6,525	14,798
Source: <i>Expenditures for Residential Improvements and Repairs: 1992</i> , Bureau of the Census, 1995.						
1. Owner-Occupied Values reflect percentage of total owner-occupied outlays to contractors or for purchase of materials for contractor work: 78.3 percent for maintenance & repair, 82.3 percent for improvements.						
2. Both owner-occupied and rental values reflect estimated regulatory coverage for maintenance and repair and improvement activities. <i>Maintenance & Repair</i> values for Heating and Central Air Conditioning and Plumbing were excluded from the analysis for owner-occupied and rental units (such activities are expected to be below the scale that would be subject to regulation). <i>Improvements</i> values were excluded from the analysis for Plumbing and Interior Restructuring for rental units (such activities are expected to occur when units are vacant). One-half of the <i>Maintenance & Repair</i> values for Other were excluded for both owner-occupied and rental units.						
3. Owner-occupied and rental values are adjusted to reflect only units built before 1979.						
Unit Cost of Renovation Events						
	Owner-Occupied			Rental		
	Maint. & Repair	Improvements		Maint & Repair	Improvements	
Heating\Air Conditioning	\$ 941	\$ 2,102		\$ 941	\$ 2,102	
Plumbing	\$ 976	\$ 5,156		\$ 976	\$ 5,156	
Painting	\$ 2,372			\$ 2,372		
Siding	\$ 2,527	\$ 5,646		\$ 2,527	\$ 5,646	
Interior Restructuring		\$ 7,933			\$ 7,933	
Other	\$ 1,764	\$ 2,833		\$ 1,764	\$ 2,833	
Estimated from job cost data contained in <i>Profile of the Remodeler</i> , National Association of Home Builders, 1992.						
Estimated Number of Renovation Events Subject to Regulation						
	Owner-Occupied			Rental		
	Maint. & Repair	Improvements	Total	Maint & Repair	Improvements	Total
Heating\Air Conditioning	0	1,158,920	1,158,920	0	300,616	300,616
Plumbing	0	347,108	347,108	0	0	0
Painting	1,562,152	0	1,562,152	1,659,174	0	1,659,174
Siding	28,362	106,436	134,798	185,815	86,800	272,615
Interior Restructuring	0	304,913	304,913	0	0	0
Other	2,016,250	6,712,078	8,728,328	2,193,643	1,907,347	4,100,990
Total	3,606,763	8,629,455	12,236,219	4,038,632	2,294,764	6,333,396
Calculated by dividing unit costs into the annual dollar outlay for activities estimated subject to regulation.						

To calculate the number of renovation events subject to regulation, EPA divided the estimated annual values of renovation activity — as specified for each combination of job category and whether the

activities are for maintenance and repair, or improvement — by an estimated unit cost per renovation event. The estimated unit costs per renovation event were developed from data contained in *Profile of the Remodeler* (National Association of Home Builders, 1992, referred to below as *Remodeler*) and reflect the assignment of remodeler job cost categories and relative job frequency information as contained in the NAHB document to the different improvement and repair outlay categories contained in *Expenditures*. The resulting estimated numbers of renovation events for each job category were summed to yield the total estimated numbers of renovation events subject to regulation: 12.2 million in owner-occupied properties; 6.3 million in rental properties; for total of 18.6 million events per year (see Exhibit 5). These values are recognized as being quite uncertain, particularly as a result of limitations in matching the remodeler job cost categories from *Remodeler* and the improvement and repair outlay categories from *Expenditures*. Because of the uncertainty surrounding the values of paid renovation events in target housing, the sensitivity analysis presented later in this chapter tests the effect on aggregate compliance costs of using higher values for the number of events.

EPA also notes, as specified in the regulation, that units that have been found by a certified inspector to be free of lead-based paint on all surfaces will be exempt from the disclosure requirement. As a result, over time, the number of units and number of renovation events subject to the disclosure requirement should decline. As addressed in this analysis, it is assumed that this exemption will only have a meaningful effect for rental properties: a rental property owner who knows that units have been certified as lead-free will be able to avoid pamphlet distribution and notification activities.³ Thus, an owner of a such property has an incentive to retain documentation of such certification, which then may be presented to the renovator (or, in the case of a property management organization, maintained on site). Using data developed for the analysis of regulations to be issued under Section 402 of the Toxic Substances Control Act, EPA estimated that about 56,000 lead-paint inspections would be undertaken annually in rental property that would otherwise be subject to the disclosure rule. Approximately 21 percent of these units are expected to be certified lead-free and thus will reduce the stock of units that are subject to the renovation rule.⁴ Thus, in each year following the disclosure rule's effectiveness date, the stock of units subject to the regulation will be reduced by about 11,700 units merely as a result of finding units that are free of lead-based paint and certifying them as such. In turn, using the implicit estimated annual frequency of renovation events in rental housing (24.57 percent), EPA estimates that the number of renovation events in rental property otherwise subject to the disclosure rule will decline by about 2,900 transactions annually as the result of the finding and certification process. To illustrate the potential consequence of this reduction in the number of renovation events subject to regulation, EPA also analyzed the cost of the rule after the assumed passage of ten years and with the consequent accumulated reduction of about 29,000 transactions in the number of renovation transactions annually subject to the regulation.

A number of other mechanisms would also lead to fewer renovation events being subject to the disclosure rule over time, including: creation of lead-free units through abatement activity and loss of units with lead-based paint through demolition or other destruction. However, these mechanisms

³ An owner-occupant may also know that a unit is lead-free; however, the incentive to maintain the required documentation may not be as great, as the owner-occupant bears no responsibilities under the rule in either case. To the extent that renovators are able to obtain documentation of lead-free certifications for owner-occupied dwellings, cost will be overstated for such units by an amount equal to the cost to perform disclosure activities (recordkeeping will still be required).

⁴ Estimate of percentage of rental units constructed 1979 or earlier and not containing lead-based paint taken from *Comprehensive and Workable Plan for the Abatement of Lead-Based Paint in Privately Owned Housing: Report to Congress*, U.S. Department of Housing and Urban Development, 1990. See Table 3-2 on page 3-7. This estimate relies on the sampling protocol used in the *Comprehensive and Workable Plan*, and is assumed to be valid for this analysis.

will likely have less effect than the “finding and certification” mechanism and are not reflected in the analysis.

3. Data Items Concerning the Cost of Time for Compliance-Related Activities. As noted above, the cost of time for compliance-related activities was calculated on the basis of the loaded labor cost of the affected individuals if the time required for compliance is part of the person’s occupation. Hourly income data for the affected occupations for 1994 were taken from the Employment and Earnings report published by the Bureau of Labor Statistics (BLS). The estimated time values for persons affected by the rule as part of their occupation include an allowance for fringe and overhead costs. The total fringe and overhead markup used in these analyses is 64 percent: 40 percent for fringe benefits and 17 percent for overhead ($1.40 \times 1.17 = 1.64$).⁵ Time that is not part of the person’s occupation was valued on the basis of the hourly income for all private employment as reported by BLS: \$11.28 at December 1994. This value was reduced by 27.65 percent to account for income tax and FICA payments. (Because data were not available to develop estimates of personal time representative of each type of transaction participant (property owners, occupants), an overall average was judged suitable for the purposes of this analysis.)
4. Data Items Concerning the Cost of Materials for Compliance-Related Activities. Materials costs were estimated as the out-of-pocket costs for purchasing the materials required for compliance and include three items: (1) the cost of the lead hazard information pamphlets; (2) the cost for the acknowledgment statements or other materials to document compliance; and (3) the cost of document storage. EPA did not include in this analysis any cost for *developing* a Lead Hazard Information Pamphlet because EPA has prepared an acceptable pamphlet.
 - Lead Hazard Information Pamphlet: EPA has prepared a Lead Hazard Information Pamphlet, *Protect Your Family From Lead in Your Home*, that may be used to meet the information pamphlet requirement. The U.S. Government Printing Office (GPO) estimates that this 16-page document, printed front and back in three colors, in a half-standard page size format, will be available to the public at a price of \$0.52 per copy. As noted in Chapter 1, the regulation permits use of other lead hazard information materials if EPA has approved their use. In addition, affected parties may copy or print the EPA-approved document as needed. Thus, transaction participants may be able to obtain or reproduce the document at a lower cost than from GPO. For this analysis, EPA assumed a document cost of \$0.24 per copy.
 - Acknowledgment statements or other materials to document compliance: EPA assumes that the acknowledge statement or other documentation material will require no more than one sheet of paper per transaction. For this analysis, EPA assumed that affected parties would incur a document copying cost of \$0.04 per statement.
 - Document Storage: In all instances, the costs of document storage are assumed to be part of an existing filing system. As a result, the only materials costs for filing compliance-related documents are the cost of the filing cabinet. A 4-drawer, 26-inch deep filing cabinet costing about \$100 (discount office supply price, May 1995), is estimated to hold approximately 25,000 sheets. Thus, the incremental filing cost per copy was estimated at \$0.004 (see Exhibit 4).

Exhibit 6, Summary of Time Requirements for Time-Related Cost Components in Analysis of Lead-Paint Hazard Disclosure Rule, summarizes the estimated amounts of time incurred by affected parties in complying

⁵ The fringe and overhead cost multiples are based on previous analyses of information burden analyses undertaken by the Regulatory Impacts Branch, Office of Pollution Prevention and Toxics.

with rule requirements. These estimates are based on conversations with persons in the occupations that will be affected by the disclosure rule. Because these estimates are uncertain and play an important role in determining the overall expected cost of the rule, the estimates were varied for the sensitivity analysis presented at the end of this chapter.

The last of these data compendium exhibits, *Exhibit 7, Number of Years for Annualization of Start-Up Costs*, lists the lengths of time used for annualizing start-up costs by the various affected occupations. These values are based on occupational tenure data obtained from the Bureau of Labor Statistics.

Exhibit 6: Summary of Time Requirements for Time-Related Cost Components in Analysis of Lead-Paint Hazard Disclosure Rule for Renovation				
Affected Party	Cost Component			Basis for Estimates
	Start-Up	Disclosure Event	Record-Keeping	
Renovators	1 hour	5 minutes to deal with occupants; 1 minute to deal with owner of rental housing	0.5 minutes	Discussions with renovation contractors, building trades groups, and rental property owners and managers
Owners or Managers of Rental Housing when Performing Renovation Work	0.5 hour	5 minutes to deal with occupants	0.5 minutes	
Occupants (owner-occupied or rental housing)	None	5 minutes	None	
Owners or Managers of Rental Housing when the Purchaser of Renovation Work	See Above	1 minute	0.5 minutes	

Exhibit 7: Number of Years for Annualization of Start-Up Costs	
Occupation of Affected Party	Years
Renovators	6
Property Managers	6
Source: U.S. Dept. of Labor, Bureau of Labor Statistics	

Analysis of Costs for Renovation Transactions

As outlined in Chapter 1, the parties affected by the disclosure rule for renovations are the renovators, including renovation contractors and rental property managers who perform renovation work in rental units; the owners, both of owner-occupied housing and rental units; and the occupants. *Exhibit 8, Cost Analysis for Renovations*, summarizes the cost calculations for renovation transactions as a result of the rule. These costs are discussed for each of the four cost components below.

Start-Up Costs

The start-up costs include the time required to learn the rule and the time to set up compliance procedures. The parties assumed to incur these costs include renovation contractors and rental property managers who perform and/or manage repair and renovation work in rental units they manage. On the basis of conversations with renovation contractors, the time for contractors to learn the rule was estimated at about 1 hour. In all likelihood, rental property managers will be exposed to the general requirements of the lead-based paint hazard disclosure rule in the context of the rule for real estate transfers as it applies to rental transactions in target

housing. In the analysis of the disclosure rule for *real estate transfers*, rental property managers are credited with 1 hour of start-up cost time. To prevent double counting of the costs of compliance with the two separate lead-based paint hazard disclosure regulations — *real estate transfers* and *real estate renovations* — the analysis of start-up costs for *renovation* includes an incremental allowance of 0.5 hour for rental property managers to learn and implement those aspects of the rule that apply to renovation work performed in target rental property under their management (see Exhibit 6).

Exhibit 4 shows the number of general contractor personnel (180,000) and the total number of specialty trades persons in trades expected to be subject to the rule (2,092,000), which combine to make up the total number of renovators (2,272,000). Multiplying this total number of renovators by the 1 hour of time to learn the rule, and by the value of their time yields the total start-up cost incurred to renovators. Similarly, the start-up cost for rental property managers is calculated as the product of the one-half hour of time, the number of rental property managers, 243,000, and the value of their time as rental property managers.

Because the value of this start-up time is retained as long as renovation contractors and property managers remain in their occupations, the start-up costs were annualized according to the expected tenure in each occupation as discussed above at an interest rate of three percent. Also, as described above, the start-up costs incurred by new entrants to these occupations were also included as an annual cost in this analysis. On the basis of these values, the estimated annual start-up costs sum to \$13.2 million (see Exhibit 8).

Disclosure Event Costs

For renovation, the cost of disclosure includes the time costs for the renovator to: (1) provide the owner and occupants residing in the unit with a copy of the Lead Hazard Pamphlet; and (2) obtain a signed, dated acknowledgment from the owner and/or adult occupant of household(s) residing in the housing unit *or* prepare other documentation of compliance with the regulation.

The analysis considers two types of renovation activity, which have different requirements for disclosure:

1. Renovation of owner-occupied housing in which the owner and occupants of the property are assumed to be in the same household. In this case, the disclosure event is assumed to occur only once for each renovation transaction and involves the renovation contractor and the owner(s)/occupant(s) of the subject housing. It is assumed that the disclosure process in renovations of owner-occupied property will be included in some pre-existing process that involves signing an agreement or contract. On the basis of conversations with persons likely to be affected by the rule, the estimated disclosure time for an owner-occupied unit is 5 minutes (or 0.083 hours) (see Exhibit 6). This time requirement is incurred by both the renovator and the owner-occupant(s).
2. Renovation of a rental unit in which the owner and occupants are assumed to be separate parties. In this case, the disclosure event is assumed to occur twice: once involving the renovation contractor and the tenant(s) occupying the property, and a second time involving the renovation contractor and the rental property owner. As described above, the Lead Hazard Pamphlet may be provided to tenants by more than one method. The most simple method would follow the procedure outlined above in which the renovation contractor, property manager, or property owner would hand-deliver the pamphlet to the adult occupant of the property and gain the signature of acknowledgment at the same time. However, in recognition that this mechanism may be cumbersome for some work situations, the regulation permits certified mail return-receipt-requested as an alternative mechanism for delivering the Lead Hazard Pamphlet and documenting its receipt by an adult occupant.

Exhibit 8: Cost Analysis For Renovation Transactions (all dollar values at 1994)						
<i>Cost Component: Start-Up Costs</i>						
Party Incurring Cost	Persons Affected	Hours/ Person	Cost/ Hour	Cost/ Person	Total Cost	Annualized Cost
Costs for Existing Stock of Persons in Affected Occupations						
<i>These costs occur one time only at the first year of the rule and are annualized over a 6-year period.</i>						
Renovation Contractors	2,272,000	1.0	\$24.24	\$24.24	\$55,071,462	\$10,166,054
Rental Property Managers	243,000	0.5	\$19.71	\$9.86	\$2,395,105	\$442,130
Costs for New Entrants to Affected Occupations						
<i>These costs occur annually and are not annualized.</i>						
Renovation Contractors	102,000	1.0	\$24.24	\$24.24	\$2,472,398	\$2,472,398
Rental Property Managers	10,000	0.5	\$19.71	\$9.86	\$98,564	\$98,564
Total, Start-Up Costs:					\$13,179,147	
<i>Cost Component: Disclosure Event Costs</i>						
Party Incurring Cost	Total Renovations	Hours/ Event	Cost/ Hour	Cost/ Event	Events/ Renovation	Annual Cost
Renovators or Property Managers, Dealing With:						
- Owner-Occupants	12,217,000	0.083	\$24.24	\$2.02	1	\$24,677,526
- Rental Property Owner	6,333,000	0.017	\$24.24	\$0.40	1	\$2,558,448
- Tenant-Occupants	6,333,000	0.083	\$24.24	\$2.02	1	\$12,792,238
- Certified Mail Costs for 1/4 of Tenant Occupant Notifications	6,333,000			\$2.53	0.25	\$4,005,622
Occupants	18,550,000	0.083	\$8.16	\$0.68	1	\$12,615,670
Rental Property Owners	6,333,000	0.017	\$8.16	\$0.14	1	\$861,402
Total, Disclosure Event Costs:					\$57,510,905	
<i>Cost Component: Record-Keeping Costs</i>						
Party Incurring Cost	Total Renovations	Hours/ Event	Cost/ Hour	Total Hours	Events/ Renovation	Annual Cost
Renovation Contractors or Rental Property Managers	18,550,000	0.0083	\$24.24	154,583	1	\$3,746,976
Total, Record-Keeping Costs:					\$3,746,976	
<i>Cost Component: Materials Costs</i>						
Party Incurring Cost and Material	Total Renovations	Material Units/ Renovation	Total Unit Items	Cost/ Material Unit	Materials Cost by Category	Annual Cost
Renovators or Property Managers, Dealing With Owner-Occupants						
- Disclosure & Acknowledgment Pages	12,217,000	2	24,434,000	\$0.040	\$977,360	
- Lead Hazard Pamphlets	12,217,000	1	12,217,000	\$0.240	\$2,932,080	
- Filing Material Costs	12,217,000	1	12,217,000	\$0.004	\$48,868	
Total Materials Cost to Renovators/Property Managers, Dealing With Owner-Occupant					\$3,958,308	\$3,958,308
Renovators or Property Managers, Dealing With Rental Property Owner						
- Disclosure & Acknowledgment Pages	6,333,000	3	18,999,000	\$0.040	\$759,960	
- Lead Hazard Pamphlets	6,333,000	2	6,333,000	\$0.240	\$1,519,920	
- Filing Material Costs	6,333,000	1	6,333,000	\$0.004	\$25,332	
Total Materials Cost to Renovators/Property Managers, Dealing With Property Owner					\$2,305,212	\$3,825,132
Total, Materials Costs:					\$7,783,440	
Total Annual Costs for Sales:					\$82,220,468	
Source: U.S. Environmental Protection Agency						

For this analysis, two possible delivery scenarios were constructed. The first assumes that the pamphlet can be delivered and required signatures obtained as part of pre-existing procedures for notifying tenants of work to be in the apartment. On the basis of phone contacts with attorney general's offices in several states, it was judged that states are likely to have some law requiring notification to tenants before a property owner or the owner's authorized agent may enter an

apartment. Assuming that this notification requirement is universal, it is possible to assume there is a pre-existing mechanism by which the tenant can be notified and given the Lead Hazard Pamphlet. A possible scenario might be for the owner to include a copy of the Lead Hazard Pamphlet and the acknowledgment form with a written notification of the work that is to be done and the date. The tenant(s) could then leave the signed acknowledgment for the renovator to pick up at the time of the renovation. In this scenario, the disclosure process is piggy-backed onto a pre-existing process, thus reducing the incremental cost of disclosure. In this analysis, this scenario is assumed to apply in 75 percent of delivery situations for rental units. The time allowance for disclosure to tenants is estimated to be 5 minutes (or 0.083 hours).

A second scenario considered in the analysis assumes that the renovation contractor, property manager, or property owner will use certified mail for delivery in 25 percent of delivery situations. In this case, the time allowance on the part of the delivery party is the same as for the hand delivery outlined above; however, an additional cost of \$2.53 per renovation event is assumed to be incurred for use of the certified mail service. Thus, for this 25 percent of delivery cases, the cost of delivery is more than doubled.

Other scenarios, that are expected to occur less frequently but that, based on conversations with rental property managers, may occur are when: no pre-existing mechanism exists for the pamphlet to be given to the tenant and a special trip must be made to present the tenant with the pamphlet and get a signature; or when an adult tenant is not present or refuses to sign the acknowledgment. The regulation provides alternative methods for delivering and documenting delivery of the pamphlet in these cases. While these latter scenarios would raise the costs incurred in complying with the rule, the analysis assumes the two scenarios above to provide an adequate representation of the costs that will generally be incurred by the delivering party.

Because of the frequency of renovation events in a portfolio of rental properties, it is assumed that the disclosure time to the owner of the rental property is only 1 minute (or 0.017 hours).

The total time of disclosure is calculated by multiplying the disclosure time for each party by the number of renovation events affecting the party: 12,217,000 events in owner-occupied target housing and 6,333,000 events in rental target housing. The total cost of disclosure is calculated as the total disclosure time for each party multiplied by the estimated values of time for the involved parties *plus* the additional allowance for use of certified mail in 25 percent of the renovation events in rental units (see Exhibit 4 and Exhibit 8). The total estimated cost for the disclosure events in renovation transactions is \$57.5 million.

As discussed in Chapter 1, EPA also notes that special notification and documentation provisions apply to renovation work in common areas of multi-unit housing. Specifically, the renovator must notify the *owner* of the target housing by providing a pamphlet and obtaining a signed, dated certification of delivery or a certified mail receipt for delivery. In addition, however, the renovator must provide written notice of the upcoming common area renovation to each affected unit and must make the lead hazard pamphlet available to any unit occupant who requests one. EPA notes that these additional provisions for unit occupants — particularly the potential need to distribute additional copies of the lead hazard pamphlet — could require a renovator to incur additional disclosure event costs beyond those covered in the foregoing analysis. However, EPA expects these costs to be negligible for the following reasons:

First, when common area renovations occur, EPA assumes that renovators or property managers will often modify existing notification procedures (e.g., distributing flyers in advance of the common area work) by adding a paragraph informing occupants that an upcoming renovation may disturb lead-based paint and that the lead hazard pamphlet is available to them upon request. The additional notification costs thus become negligible.

Second, renovators are required to provide additional pamphlet copies only if requested by unit occupants. EPA assumes that unit occupants will request pamphlets only infrequently. Property managers and renovators are expected to reduce the need to distribute additional pamphlet copies by posting a copy in the common area.

Third, common area renovations are expected to be a small fraction of the total number of renovation events subject to regulation and the aggregate effect of any additional cost for common area notifications will correspondingly be minimal.

Record-Keeping Costs

The record-keeping requirements of the disclosure rule state that the renovator is required to maintain: (1) a signed acknowledgment from the owner and an adult member of the housing unit certifying that they have received the pamphlet *or* (2) a certified mail receipt(s) for delivery of the pamphlet. The renovator is required to maintain these records for a minimum of three years following the renovation work. The record-keeping requirement causes the renovator to spend time in filing the documents. In all likelihood, some type of filing system already exists for the renovation contractor or property manager. What is significant then is the amount of time that is directly attributed to the disclosure rule. From conversations with persons likely to be affected by the rule, the time required for filing the disclosure statements or certified mail receipt(s) *with the other transaction-related paper work* is estimated at a few minutes. However, the filing time that may be reasonably attributed to the disclosure rule itself should be very small or approximately 0.5 minutes (or 0.0083 hours) per event.

The total amount of time devoted to record-keeping is calculated from the total number of renovation events covered under the rule (see Exhibit 4), the incremental filing time attributable to the rule, and the value of time for the affected parties. Record-keeping costs for renovation transactions are estimated at \$3.7 million (see Exhibit 8).

Materials Costs

For renovations, the materials costs include the cost of the Lead Hazard Pamphlet, the cost of the acknowledgment statements or other compliance documentation, and materials requirements for storing the signed documents as specified by the rule's record-keeping requirements.

As noted in Exhibit 4, the Lead Hazard Pamphlet is expected to cost about \$0.24 per copy. Multiplying the \$0.24 per copy times the number of copies in each of the two transaction categories yields the estimated annual cost of Lead Hazard Pamphlets for renovations (See Exhibit 8). For renovation events in owner-occupied property, one copy of the pamphlet is assumed to be required for the owner-occupant of the target housing unit. However, for renovation events in rental property, the tenant must also be given the pamphlet: thus, two copies of the pamphlet are assumed to be required for these renovation events.

It is assumed that one copy of the signed acknowledgment statement or other compliance documentation is required for each of the participants in a renovation transaction.⁶ Thus, for renovation events in owner-occupied property, two copies are required: one for the renovation contractor and one for the owner-occupant of the target housing unit. For renovation events in rental property, an additional party, the tenant, is involved and the three copies of the signed acknowledgment are assumed to be required: one each for the renovation

⁶The proposed rule permits the renovation contractor to include the acknowledgment statement in the renovation contract instead of on a separate piece of paper, if desired. If contractors elect this option, there may be no additional paper and copying requirement beyond that which would have occurred in any event as part of the renovation transaction. The assumption in this analysis that the acknowledgment statement would be on a separate page and would require additional copying is therefore conservative and may overstate the costs of this aspect of the rule.

contractor, the owner of the rental property, and the tenant of the target housing unit. Thus, the total number of copies of acknowledgment statements required for renovation transactions is two *times* the number of renovations in target owner-occupied housing *plus* three *times* the number of renovations in target rental housing. The total number of copies of the acknowledgment statement is multiplied times the assumed document cost of \$0.04 per copy to yield the estimated cost of signed acknowledgment copies for compliance with the disclosure rule.

Renovators are required to keep the signed acknowledgment statements for at least three years and are assumed to incur storage costs of filing at \$0.004 per renovation event (see Exhibit 4).

The total cost of materials is calculated by summing: the number of copies multiplied by the cost per copy; the number of pamphlets multiplied by the cost per pamphlet; and the number of signed acknowledgments by the cost of filing, yielding an estimated materials costs for renovation transactions of \$7.8 million (see Exhibit 8).

Total Annual Cost to Private Parties for Renovation Transactions

Combining the estimated cost values for the four components yields a total estimated annual cost to private parties of \$82.2 million (\$1994) (see Exhibit 8). With approximately 18.6 million transactions expected to be affected by the rule annually, this cost amounts to about \$4.35 per affected transaction. Using the reduced number of renovation events expected to be subject to regulation after finding and certifying additional lead-free units over a ten-year period, these costs fall slightly to \$82.1 million.

Sensitivity Analysis of Costs to Private Parties

Three variables were identified for use in a sensitivity analysis because of the level of uncertainty surrounding the values used in the analysis and the likely magnitude of change in the overall cost of the rule resulting from changes in the value of the variables. These variables are: Time for Compliance (e.g., Start-Up Time, Disclosure Time, Record-Keeping Time), the number of Affected Renovation Contractors, and the Annual Number of Target Renovations. In addition, an alternative value for a fourth variable — the discount rate used for annualizing Start-Up Costs — was also considered in the sensitivity analysis.

The primary values for Compliance Times (see Exhibit 6) are based on ranges reported in conversations with affected parties, and are intended to represent a reasonable average time required to complete the various compliance activities. However, it is recognized that these values are “soft” estimates. To provide a more conservative cost analysis, these times per event were doubled for the sensitivity analysis. That is, start-up times were increased from one hour to two hours; disclosure event times were increased from 5 minutes to 10 minutes; and record-keeping times were increased from 0.5 minute to 1 minute.

The primary value for the number of Affected Renovation Contractors is based on the trades assessed as likely to be affected by the rule, and employment statistics taken from the Bureau of Labor Statistics (BLS) (see Exhibit 4). Several factors complicate the estimation of this variable. First, even though an occupational title may be clearly affected by the rule, the total number of employees listed may overstate the number of employees actually affected by the rule. One reason is that some members of a trade may never work on residential housing. Another reason is that only those individuals that deal directly with the customer will likely need to learn the rule. Second, although some trades are less likely to be affected, it is still possible that the individuals in these trades will perform some work that is subject to the rule and thus will have to incur start-up costs

To give a higher and more conservative estimate for the total number of affected contractors, the definition of affected trades was broadened to include several additional occupational titles listed under the BLS title

for Construction Trades. As a result, the number of affected renovation contractors increases from 2,272,000 to 2,770,000.

The primary values for the Annual Number of Target Renovations are based on specific assumptions about the inclusion of certain renovation job categories in the analysis. As an alternative case, several additional job categories were assumed to be subject to the rule, including: for owner-occupied properties, plumbing in the maintenance and repair category; and for rental properties, plumbing in the maintenance and repair category and plumbing and interior restructuring in the improvements category. As a result, the total annual number of renovation events increases from 18.6 million to 22.3 million.

As discussed earlier in this chapter, Start-Up Costs were annualized using a three-percent discount rate, which is based on the expectation that the costs incurred by affected firms and individuals for learning the regulation's requirements and implementing compliance procedures will displace current consumption instead of investment and capital formation. As an alternative to this assumption, EPA considered for the sensitivity analysis the effect of using a higher discount rate of 7 percent, which is based on the real opportunity cost of capital to society as recommended by the Office of Management and Budget.

Exhibit 9, Sensitivity Analysis of the Cost of the Disclosure Rule for Renovations, summarizes the effects on compliance costs of using the alternative values in the sensitivity analysis. The cost effects are reported both as an absolute increase and the percentage increase in total annual cost. The greatest impact on compliance cost results from the increase in *time for compliance*. Three of the four cost components are linearly related to this variable, so that the doubling of time for compliance nearly doubles the annual compliance cost. Compliance costs increase by 85.7 percent or \$70.4 million to \$152.7 million. Because three of the four cost components are also linearly related to *number of renovation events*, the impact on compliance cost from the change in this variable is also substantial: annual compliance cost increases by 17.4 percent or an absolute increase of \$14.3 million from \$82.2 million to \$96.5 million. Even though the *number of affected renovation contractors* is substantially increased in the sensitivity analysis, the effect on total cost is much less than proportional because only one of the four cost categories, Start-Up Costs, changes with the number of contractors. Increasing the number of contractors subject to the rule increases total annual compliance cost by 4.4 percent, or by \$3.6 million, to \$85.8 million. Using the higher 7 percent *discount rate for annualizing start-up costs* has a relatively small effect on total annual costs: total costs increase by 1.8 percent, or \$1.45 million, to \$83.7 million.

Compliance Monitoring Costs to Private Parties

The procedure, scope and frequency of compliance monitoring activities for the disclosure rule remain somewhat uncertain. At present, EPA expects to perform both programmed compliance monitoring activities and actions in response to complaints regarding failure of responsible parties to comply with disclosure rule requirements. Although substantial uncertainty surrounds the annual number of compliance monitoring events, it is possible to estimate the unit costs for a hypothetical compliance monitoring event.

The hypothetical compliance monitoring event assumes that EPA will conduct an on-site compliance audit of parties that have been identified as possibly not complying with the disclosure rule. The audit would involve reviewing documentation for a sample of renovation events that are estimated to be subject to the rule. For estimating the costs of the hypothetical compliance monitoring event, EPA assumed that the auditor would work with a clerk for the audited party to retrieve and review the compliance documents for a sample of 10 transactions. If the review of the sample transactions indicated that the audited party had failed to comply with the disclosure rule requirements, then the auditor would undertake a more thorough review of transactions that are subject to the rule. However, this analysis does not consider the costs of this more thorough review.

Exhibit 9: Sensitivity Analysis of the Total Annual Cost of the Disclosure Rule for Renovations					
Variable	Primary Value	Alternative Value	Cost Impact		Uncertainty Issue
			Absolute Change	Percent Change	
Time for Compliance - Start-Up: Renov. Contractors Prop. Managers - Disclosure: with rental property owner all others - Record-Keeping:	1 hr. 0.5 hr. 0.5 min. 5 min. 1 min.	2 hr. 1 hr. 1 min. 10 min. 2 min.	\$70,431,000	85.7%	Primary value based on “soft” estimate of range of values.
Number of Renovation Contractors	2,272,000	2,770,000	\$3,591,000	4.4%	Primary value based on narrower definition of affected specialty building trades
Annual Number of Renovation Events in Target Property: - Owner-Occupied: - Rental: - Total Events:	12,217,000 6,333,000 18,550,000	14,267,000 7,989,000 22,256,000	\$14,287,000	17.4%	Primary value based on renovation event categories defined as subject to the rule. Alternative case is somewhat broader.
Discount Rate for Annualizing Start-Up Costs	3 percent	7 percent	\$1,448,060	1.8%	Whether start-up outlays displace consumption or capital formation

The activities involved in compliance monitoring therefore include: locating and retrieving the compliance documents for each of the ten transactions; making copies; and re-filing the originals. The cost of compliance includes *Cost of Time* and *Cost of Materials*:

- **Cost of Time.** About 1 hour is estimated as the time for retrieving, copying, and re-filing the original compliance documents (i.e., the signed and dated acknowledgment statements or other compliance documentation). For the labor cost of this activity, EPA used an hourly labor rate for persons in the “Financial Records Processing” occupational category. The total unit hourly cost of \$15.42 (including the 64 percent allowance for fringe and overhead) is based on the average weekly earnings in 1994 for persons in the “Financial Records Processing” occupational category (*Employment and Earnings*, Bureau of Labor Statistics, January 1995). Thus, at one hour of effort, the cost of time is estimated at \$15.42.
- **Cost of Materials.** Materials costs includes the cost of copies (10 transactions x 1 page per transaction x \$0.04 per page), which amounts to \$0.40.

For this hypothetical case, the cost to affected parties is therefore estimated at \$15.82 per compliance monitoring event or \$1.58 for each of the ten transactions assumed to be audited.

Whether the total costs to private parties for compliance monitoring activities will add substantially to the total costs of regulatory compliance will depend on the volume of compliance monitoring events undertaken annually by EPA. To illustrate, to cause a one percent increase (\$822,000) in the estimated total annual cost

of compliance for real estate renovations (\$82.2 million in 1994 dollars), EPA would have to monitor approximately 520,000 transactions or about 2.8 percent of the 18.6 million renovation events estimated to be subject to the rule annually. If each compliance monitoring event involved 10 transactions, as specified in the hypothetical case above, EPA would therefore need to conduct 52,000 audits. As discussed in the next section, EPA currently anticipates that the compliance and monitoring activity will involve substantially fewer audits — 500-1,000 per year — than would be required to achieve a one percent increase in the total costs of regulatory compliance. Accordingly, the costs borne by affected private parties for compliance monitoring activities are not likely to add substantially to the total costs of complying with the disclosure rule for real estate renovations.

COSTS TO GOVERNMENT FOR ADMINISTERING THE DISCLOSURE REGULATION FOR REAL ESTATE RENOVATIONS

To ensure compliance with the final regulation, resources will be required to conduct a number of activities, including:

- Inspections;
- Violation case management;
- Establishment and maintenance of cooperative agreements, if applicable;
- Compliance assistance;
- Development of performance measurement criteria; and
- Management.

In estimating the magnitude of the resource requirements associated with these activities, EPA took into account its overall program needs; that is, rules which provide for the disclosure of information at the time of real estate transfers and rules which establish standards for conducting lead-based paint activities (e.g., risk assessment, abatement) are also under development, and resource commitments made to satisfy one program goal may also serve to satisfy similar needs associated with an alternate goal. Nevertheless, to the extent that overall resource requirements could be apportioned to achieving the goals of the rules for information disclosure prior to residential remodeling or renovation activities, the estimates which follow are intended to represent costs to the government solely for the purposes of ensuring compliance with those rules.

Estimates in this section are based on preliminary recommendations of and discussions held by EPA enforcement and compliance personnel and draw on experiences in other program areas (e.g., PCBs, asbestos, pesticides, and EPCRA).

Inspection and Case Management Costs

To most accurately project costs associated with these activities, the frequency of inspections and resultant rate of violations is required. Because these rules are to form part of a new program, it is at this time unknown what level of effort will be deemed appropriate. For illustrative purposes, an inspection rate ranging between 500-1,000 per year (10-20 per state) is incorporated into this analysis, resulting in an estimated federal personnel increase of 25-50 full-time equivalent positions (FTEs), or an average of 2.5-5.0 FTEs per EPA region. In addition, a 0.5 FTE increase in headquarters staffing is assumed to be required to permit national coordination of inspector training, inspection and case development guidance, and compliance monitoring strategy development.

Performance Measurement and Management

It is assumed that 5.0 FTE (0.5 per EPA region) will be necessary to perform tracking and management of program activities so that appropriate measures of success may be developed. While these resources are assumed to be constant on an annual basis in this analysis, more effort may be required up-front to assess alternative strategies.

Compliance Assistance

Compliance assistance activities involve outreach to inform and educate the regulated community. Such activities may be undertaken at both the EPA headquarters and regional offices. As explained above in connection with inspection and case management activities, the level of effort required is unknown. For the purposes of this analysis, it is assumed that FTE increases of 0.5 for headquarters and 1.0 for regional offices (0.1 per EPA region) will be necessary to ensure that the regulated community is aware of the requirements of the information disclosure rules and is kept abreast of any policy or interpretive modifications as the program matures.

Total Costs to Government

Total costs were estimated by summing the assumed FTE needs for each major activity area described above and multiplying the total by the estimated annual cost per FTE.

Total FTE requirements =

$$(25.0+0.5) + 5.0 + 1.5 = \underline{32} \text{ (low)}$$

$$(50.0+0.5) + 5.0 + 1.5 = \underline{57} \text{ (high)}$$

Cost/FTE =

$$(\$68,861 + \$82,954)/2 = \underline{\$75,908}^7$$

TOTAL COST = \$2,429,056 (low) - \$4,326,756 (high)

This range represents the upper-end estimate of intramural Agency resource requirements, given the inspection frequencies specified above. It is assumed that extramural resource needs will also be identified, to allow for the addition of Senior Environmental Employment (SEE) inspectors. Total costs may, therefore, exceed the estimates presented above, though tradeoffs between intramural and extramural resources could result in overall costs in fact falling within the range developed.

To the extent that states choose to establish and administer programs to carry out the requirements of Section 406 of TSCA Title IV, the costs estimated above to EPA would be reduced. Overall costs incurred by government would be largely the same, however, because functions described above as being performed by federal personnel would be taken on by state programs. Some additional federal burden could be attributable to periodic monitoring of state program effectiveness, though such costs were not estimated. It is anticipated that such federal costs would be highly dependent on how the state plans themselves are set up and managed.

⁷ Average of the fully-loaded wage rates for GS-12 and GS-13 employees, \$1994.

TOTAL COSTS TO PRIVATE PARTIES AND GOVERNMENT OF THE DISCLOSURE REGULATION FOR REAL ESTATE RENOVATIONS

The estimated costs to private parties and the federal government were summed to yield a comprehensive estimate of the total annual costs of the lead-based paint hazard disclosure regulation for real estate renovations. *Exhibit 10, Estimated Total Annual Costs of the Disclosure Rule for Real Estate Renovations*, summarizes this calculation.

The estimated total annual costs range from \$84.6 million, based on the low estimate of government administrative costs, to \$86.5 million, based on the high estimate of government administrative costs.

Exhibit 10: Estimated Total Annual Costs of the Disclosure Rule for Real Estate Renovations	
Cost Category	Estimated Cost (1994 dollars)
Total Annual Costs to Private Parties: *	\$82.2 million
Costs to Government	
Low Estimate (lower annual inspection rate)	\$2.4 million
High Estimate (higher annual inspection rate)	\$4.3 million
Total Annual Costs *	
Based on Low Estimate of Government Costs	\$84.6 million
Based on High Estimate of Government Costs	\$86.5 million
*Using the reduced number of renovation events expected to be subject to regulation after finding and certifying additional lead-free units over a ten-year period, the annual costs to private parties fall to \$82.1 million (\$1994). Total costs, including costs to government, also decline by \$0.1 million for each of the cases presented.	
Source: U.S. Environmental Protection Agency	

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CHAPTER 4

ASSESSMENT OF IMPACTS ON SMALL BUSINESS (REGULATORY FLEXIBILITY ANALYSIS) AND OTHER REGULATORY ANALYTIC REQUIREMENTS

In this chapter, EPA assesses the effects of the regulation on small businesses, as specified by the Regulatory Flexibility Act. In addition, the chapter assesses the possible effects of the regulation in light of other regulatory analytic considerations, namely whether the regulation will impose unfunded mandates on governmental units other than the Federal government and whether the regulation may impose adverse distributional burdens of costs or benefits relative to environmental justice considerations.

EPA investigated the potential impacts of the rule on small businesses, and has prepared a Regulatory Flexibility Analysis (RFA), in accordance with EPA guidelines. While a large number of small establishments will be potentially affected by the rule, cost impacts were not found to be of sufficient magnitude to cause undue harm to such establishments. Consequently, EPA did not further modify the regulation based on small business impact considerations. The first three sections of the chapter present the RFA. The first section provides a brief introduction regarding EPA's approach in considering and analyzing small business impacts. The next section reviews the participation of small businesses in the affected industries, while the third section uses compliance cost estimates from the previous chapter together with example information on small business operations and cost to illustrate the rule's likely effects on small businesses.

The fourth and fifth sections of the chapter deal respectively with the issues of unfunded mandates and environmental justice.

BACKGROUND AND APPROACH TO THE REGULATORY FLEXIBILITY ANALYSIS

In formulating an approach for performing an RFA, certain preliminary steps are recommended. First, statutory authority to consider regulatory options should be established. EPA has determined that, under the Lead-Based Paint Hazard Reduction Act of 1992, the Agency has discretion in prescribing record-keeping requirements to facilitate enforcement of regulations promulgated pursuant to the Act. Thus, in the event that regulatory burdens should prove too severe for smaller establishments, the Agency could seek to tailor its record-keeping provisions to mitigate such impacts. However, as demonstrated in the RFA, cost impacts were not estimated to be of sufficient magnitude to justify the formulation of regulatory alternatives. In fact, small businesses were found to constitute the majority of affected establishments; consequently, the final regulation reflects the government's concern for small business in that all provisions were carefully crafted to minimize impacts on all regulated entities.

EPA also considered how it would define a small business concern for the purposes of this regulatory action. EPA has considered businesses employing 1 to 10 workers as small entities, and this definition is both appropriate and very likely consistent with the level of economic activity recognized in 13 CFR part 121 for businesses in sectors affected by the rule (\$7 to \$17 million annual revenues). Thus, EPA is not seeking to establish alternative definitions of small entities in connection with this rulemaking.

In light of these preliminary observations and EPA's finding of only modest economic impacts, this RFA includes a profile of affected businesses, segmented by employment size class, and a financial analysis in which regulatory costs are measured against labor and overhead expenses for a "typical" small establishment in each affected sector.

ROLE OF SMALL BUSINESSES IN AFFECTED INDUSTRIES

Two business groups were identified as bearing the primary responsibilities for compliance with the renovation disclosure rule's requirements: General Contractors and Operative Builders (SIC code 15) and

Specialty Trade Contractors (SIC code 17). In addition, two more groups — Real Estate Operators and Lessors (SIC code 651) and Real Estate Agents and Managers (SIC code 653) — were also identified as being affected by the rule because of their role in performing renovation and repair work in rental properties that they own or manage. All four business groups are comprised of predominantly “small business entities.” As such, the costs of complying with the disclosure rule will largely fall on small businesses.

As shown in *Exhibit 11, Small Business Participation in Affected Business Sectors*, all four of the affected SIC groups are dominated by small establishments as defined on the basis of number of employees. Using Bureau of the Census data for 1990, Exhibit 11 summarizes the number of establishments, number of employees and annual payroll for establishments of different employment size classes. For all four business groups, 60 percent or more of the establishments fall in the smallest employment size classification — 1-4 employees — and more than 90 percent of establishments have fewer than 20 employees. Thus, by any reasonable standard, the vast preponderance of establishments in these business groups are small businesses.

Small businesses also account for a sizable share of total employment in these business groups. In the general and specialty trade contractor groups (SIC 15 and 17), establishments with less than 20 employees account for 46 percent of total employment. Among the four groups, the Real Estate Operators and Lessors group (SIC 651) has the greatest share of total employment from establishments with less than 20 employees at 58 percent. The Real Estate Agents and Managers group (SIC 653) accounts for the smallest share of employment in facilities with fewer than 20 employees, though at the still substantial share of 44 percent.

ASSESSMENT OF EFFECTS ON SMALL BUSINESSES

To assess the effect of the disclosure rule for renovations on small businesses, the cost estimates presented in Chapter 3 were applied to example small establishments in the renovation contractor and rental property ownership and management businesses. By comparing the costs imposed by the rule to the estimated *pre-compliance* costs for example small business establishments, it is possible to gain insight into the likely significance of effects on small businesses. If the disclosure rule’s costs are substantial in relation to establishments’ existing costs — five percent or more — then the disclosure rule may be found to impose a significant cost burden on small businesses. Conversely, compliance costs that are less than five percent of existing costs should be able to be managed more easily.

For this analysis, example small business establishments were structured in terms of number of employees, and gross annual cost of employment and overhead. The choice of number of employees for the example establishments is somewhat arbitrary but falls within the range of small businesses and further reflects information obtained in conversations with representatives of businesses likely to be affected by the rule. Unit hourly costs of employment and overhead are the same values as those on which the aggregate cost estimates presented in Chapter 3 are based. The estimated annual costs of compliance for the example businesses require three components:

1. Cost estimates from Chapter 3 of the unit values for both the start-up costs (per employee with disclosure rule responsibilities) and the unit costs per affected transaction.

Exhibit 11: Small Business Participation in Affected Business Sectors, 1992						
Establishments, Employment and Payroll by Employment Size Class						
Data Item	Total	Employment Size Class (number of employees)				
		1-4	5-9	10-19	20-49	50 or more
<u>General Contractors and Operative Builders (SIC code 15)</u>						
Number Establishments	181,026	126,915	29,848	14,462	7,159	2,642
Number Employees	1,124,863	196,807	193,358	191,213	210,901	332,584
Annual Payroll (\$000)	29,905,767	4,991,419	4,093,266	4,603,354	5,803,067	10,414,661
Payroll per Establishment	165,202	39,329	137,137	318,307	810,597	3,941,961
Payroll per Employee	26,586	25,362	21,169	24,074	27,516	31,314
Percent of Total						
- Number Establishments	100.00%	70.11%	16.49%	7.99%	3.95%	1.46%
- Number Employees	100.00%	17.50%	17.19%	17.00%	18.75%	29.57%
Cumulative Percentage						
- Number Establishments		70.11%	86.60%	94.59%	98.54%	100.00%
- Number Employees		14.30%	29.70%	45.75%	64.92%	100.00%
<u>Special Trade Contractors (SIC code 17)</u>						
Number Establishments	375,651	239,227	69,395	39,344	20,694	6,991
Number Employees	2,707,645	387,055	455,202	524,571	609,310	731,507
Annual Payroll (\$000)	69,016,590	9,029,277	9,440,367	12,386,568	16,212,251	21,948,127
Payroll per Establishment	79,611	20,865	58,985	117,003	280,423	1,489,724
Payroll per Employee	11,045	12,896	8,992	8,775	9,524	14,237
Percent of Total						
- Number Establishments	100.00%	63.68%	18.47%	10.47%	5.51%	1.86%
- Number Employees	100.00%	14.29%	16.81%	19.37%	22.50%	27.02%
Cumulative Percentage						
- Number Establishments		59.64%	79.40%	91.01%	97.54%	100.00%
- Number Employees		12.16%	27.47%	45.77%	68.49%	100.00%
<u>Real Estate Operators and Lessors (SIC code 651)</u>						
Number Establishments	91,607	68,629	13,809	5,663	2,475	1,031
Number Employees	474,751	113,634	88,951	74,106	74,041	124,019
Annual Payroll (\$000)	8,324,133	1,900,863	1,506,028	1,352,557	1,358,370	2,206,315
Payroll per Establishment	90,868	27,698	109,061	238,841	548,836	2,139,976
Payroll per Employee	17,534	16,728	16,931	18,252	18,346	17,790
Percent of Total						
- Number Establishments	100.00%	74.92%	15.07%	6.18%	2.70%	1.13%
- Number Employees	100.00%	23.94%	18.74%	15.61%	15.60%	26.12%
Cumulative Percentage						
- Number Establishments		74.92%	89.99%	96.17%	98.87%	100.00%
- Number Employees		23.94%	42.67%	58.28%	73.88%	100.00%
<u>Real Estate Agents and Managers (SIC code 653)</u>						
Number Establishments	92,086	66,863	13,253	6,428	3,713	1,829
Number Employees	637,222	108,286	85,775	85,203	111,179	246,779
Annual Payroll (\$000)	14,973,843	2,499,336	2,010,964	2,071,816	2,596,775	5,794,952
Payroll per Establishment	162,607	37,380	151,737	322,311	699,374	3,168,372
Payroll per Employee	23,499	23,081	23,445	24,316	23,357	23,482
Percent of Total						
- Number Establishments	100.00%	72.61%	14.39%	6.98%	4.03%	1.99%
- Number Employees	100.00%	16.99%	13.46%	13.37%	17.45%	38.73%
Cumulative Percentage						
- Number Establishments		72.61%	87.00%	93.98%	98.01%	100.00%
- Number Employees		16.99%	30.45%	43.83%	61.27%	100.00%

Source: U.S. Department of Commerce, Bureau of the Census, *County Business Patterns, 1990*, January 1993.

- Estimated fraction of employment in a small business with responsibilities under the disclosure rule. This value is needed to assign start-up costs to the example business. The values for the fraction of

employment with disclosure rule responsibilities were estimated from conversations with representatives of businesses likely to be affected by the disclosure rule.

3. Estimated number of transactions per year that would be subject to the disclosure rule. The volume of affected transactions is the most important variable affecting the estimated cost to a business from compliance with the disclosure rule. The values for the numbers of transactions per year were estimated from data obtained from the National Association of Home Builders and conversations with representatives of businesses likely to be affected by the rule.

The example establishments are not meant to be rigorously defined representative models of establishments operating in the affected business groups. However, they are meant to serve as credible illustrations of the cost impacts of the disclosure rule on small businesses.

Example establishments for assessment of the disclosure rule for renovations were defined and analyzed for three organizations:

1. A 5-person renovation contractor (multi-trade);
2. A 5-person specialty trade contractor; and
3. A 10-person rental property management organization.

The definition of the organizations and related analytic findings are discussed below for each organization.

Multi-Trade Renovation Contractor

From conversations with multi-trade renovation contractors, it was determined that a 5-person organization was reasonable for illustrating a small, multi-trade general contractor/home renovation organization. Gross annual pre-compliance labor and overhead costs were calculated as the product of the number of persons (5), the average hourly earnings with overhead for persons in construction businesses (\$24.24, see Exhibit 4), and an assumed 2,080 hours per year. The resulting value of \$252,000 per year is compared with the estimated annual costs of compliance to provide insight into the significance of disclosure rule compliance costs to small businesses (*Exhibit 12, Illustration of Effects of Disclosure Rule for Renovations on Small Businesses*, summarizes the calculations leading to the estimated costs to the example real estate organizations.).

Conversations with renovation contractors also indicated that typically one-third or fewer of the people in the organization would be involved in sales/contract negotiation activities and thus would have direct responsibility for knowing and performing the disclosure rule's requirements. For this analysis, it was assumed that 2 persons in the 5-person organization would need to learn the disclosure rule's requirements and thus at the start-up cost of \$24.24 per person, the total cost would be \$48 (see Exhibit 12). As discussed in Chapter 3, the start-up cost would be expected to generate value for more than one year and in the analysis of aggregate costs of the rule, the start-up cost was annualized over a several year timeframe. However, to be conservative in assessing the effect of disclosure rule costs on small businesses, the start-up cost is not annualized but treated as a direct cash outlay occurring in the year that serves as the basis of the analysis. In this regard, the example analysis may be interpreted as representing the *first-year* of compliance with the rule.

The critical item for the analysis is the number of renovation transactions that would be expected to be subject to the disclosure rule. Information on the likely number of transactions that a 5-person organization might perform over a year was obtained from two sources: (1) data from the National Association of Home Builders (NAHB) report referenced in Chapter 3 and (2) conversations with renovation contractors. In *Profile of the Remodeler* (1992), NAHB summarizes results from a survey of 299 residential remodeling contractors for

business activities in 1990. Information obtained in the survey includes the number and value of different kinds of renovation jobs undertaken by the organizations surveyed. On average, 33 residential multi-trade jobs were undertaken by respondents at a total revenue value of \$312,062 or \$8,972 per job. Conversations with renovation contractors suggest that the \$312,000 revenue and 33 jobs would be within the reasonable range of performance for a 5-person organization. However, contractors also indicated that the number of jobs performed by a 5-person multi-trade contractor would vary widely depending on the mix of work. For example, it would not be unreasonable for a small organization to perform as few as 15 higher valued jobs (e.g., \$25,000 or more) or as many as 50 or 60 lower-valued jobs. For this analysis, a range of 15 to 60 transactions, which brackets the NAHB value, was used for illustrating the effects of the disclosure rule. Because of the possibility that an organization might operate in an area in which virtually all jobs would involve target housing, no reduction was made to the number of transactions to account for the possibility that renovation work would fall outside the disclosure rule's requirements. In addition, no adjustment was taken for the possibility that some renovation jobs, even if in target housing, might not be subject to the disclosure rule. Both of these assumptions are conservative in that they may exaggerate the number of transactions actually subject to the disclosure rule that the example small business organization would undertake.

Exhibit 12: Illustration of Effects of Disclosure Rule for Renovation on Small Businesses							
Organization	Number Persons	Number with Disclosure Responsibility	Costs to Organization		Number of Disclosure Event Transactions		
			Start-Up, per person	All other, per event	Low Estimate	High Estimate	
Renovation Contractor (multi-trade)	5	2	24.24	2.78	15	60	
Specialty Trade Contractor	5	5	24.24	2.78	150	400	
Rental Property Manager	10	10	9.86	3.86	750	1,500	

Organization	First-Year Compliance Costs					Estimated Labor and Overhead Cost, pre-Regulation	Compliance Cost as a Percentage of Labor and Overhead Costs	
	First Year Start-Up	Transaction Costs		Total First-Year Compliance Cost			Low	High
		Low	High	Low	High			
Renovation Contractor (multi-trade)	\$48	\$42	\$167	\$90	\$215	\$252,000	0.04%	0.09%
Specialty Trade Contractor	\$121	\$417	\$1,112	\$538	\$1,233	\$252,000	0.21%	0.49%
Rental Property Manager	\$99	\$2,897	\$5,794	\$2,996	\$5,893	\$410,000	0.73%	1.44%

Source: U.S. Environmental Protection Agency

Costs per transaction were calculated from the rule's estimated costs to renovation contractors as presented in Chapter 3. Specifically, the unit transaction costs *to renovation contractors* were summed separately for interactions with owner-occupants and tenants/rental property owners over each of the three cost categories: disclosure event, record-keeping, and materials. This calculation yielded unit transaction costs of \$2.55 for renovators dealing with owner-occupants and \$3.23 for renovators dealing with tenants and rental property owners. These values were then combined on the basis of relative frequency of transaction type to yield an average compliance cost per event of \$2.78. The product of the number of transactions and the unit cost yields the gross annual cost of transactions to the organization, or \$42 at the low estimate of number of transactions and \$167 at the high estimate. Summing the start-up costs and the transaction costs yields total compliance cost estimates of \$90 and \$215 for the low and high estimates of number of transactions, respectively (see Exhibit 12).

To gauge the effect of these costs on the example small business, the gross costs were divided by the estimated annual labor and overhead costs for the organization, \$252,000. For both the low and high number of transaction values, annual compliance costs are less than one percent of the estimated annual labor and overhead costs for the organization. Specifically, at the high estimate for number of transactions, compliance costs were 0.09 percent of annual labor and overhead costs, and, at the low estimate for number of transactions, 0.04 percent (see Exhibit 12).

Specialty Trade Contractor

From conversations with contractors, it was determined that a 5-person organization would also provide a reasonable illustration of a specialty trade contractor (e.g., a carpentry or painting organization). As above, gross annual pre-compliance labor and overhead costs were calculated as the product of the number of persons (5), average hourly earnings (\$24.24), and assumed 2,080 hours per year with a resulting value of \$252,000 (see Exhibit 12).⁸ Because specialty trade jobs often involve only one worker, it was assumed that all persons in the organization would need to learn the disclosure rule's requirements and thus the start-up cost per person of \$24.24 is assumed to be incurred for 5 persons, for a total start-up cost of \$121 (see Exhibit 12).

Because the average value of jobs for specialty trade work is generally lower than that for the larger, multi-trade jobs, the annual number of transactions for the example small organization should also be greater than for the multi-trade contractor example. Specifically, the NAHB survey of renovation contractors regarding specialty-trade jobs indicated that, on average, respondent organizations performed 158 jobs annually at a total revenue value of \$201,829 or \$1,222 per job. Conversations with contractors again indicated that the number of jobs performed annually could vary widely but that the 158 jobs and \$202,000 of annual revenue would be within the reasonable range of performance for a 5-person organization. For this analysis, a range of 150 to 400 jobs annually was used as the basis for the analysis of the 5-person specialty trade organization. This range brackets the average number of transactions per organization reported in the NAHB survey.

Using the same average unit cost per renovation transaction, \$2.78, as specified for multi-trade contractors, the estimated range of annual *transaction*-related costs for the specialty trade contractor is \$417 to \$1,112. Summing the start-up and transaction costs yields total compliance cost estimates of \$538 and \$1,233, for the low and high estimates of number of transactions, respectively. Because of the lower average value per transaction and thus the higher volume of transactions, the specialty trade contractor's costs are higher as a percentage of labor and overhead costs than the costs estimated for the general contractor organization. Specifically, annual compliance costs as a percentage of labor and overhead costs range from 0.21 percent for the low estimate of number of transactions to 0.49 percent for the high estimate (see Exhibit 12).

Rental Property Management Organization

A 10-person organization was structured for illustrating the effects of the disclosure rule for renovations on rental property management operations. At the average labor and overhead cost of \$19.71 per hour, the gross annual pre-compliance labor and overhead costs for 10 persons were calculated as \$410,000 (see Exhibit 12). From conversations with property management firms, it was determined that, in a 10-person organization, perhaps 6 or 7 persons might be involved in rental property renovation and repair work. However, because other persons in the organization might be involved in scheduling work or in answering questions from tenants about the lead hazard disclosure rule, it was assumed that all 10 persons would need to learn the disclosure

⁸ The structure of calculations for both the specialty trade contractors and rental property managers parallels that discussed above for general contractor organizations. Accordingly, the discussion for the additional example organizations is briefer in describing the structure of calculations.

rule's requirements. As discussed in Chapter 3, it is likely that persons in a rental property management firm would encounter the lead-based paint hazard disclosure rule in the context of both the renovation and transfers disclosure requirements. As a result, the time allowance for the start-up activity was assumed to be only one-half hour per person. Accordingly, the start-up cost of \$9.86 per person ($\19.71×0.5 hour) is assumed to be incurred for 10 persons, for a total start-up cost of \$99 (see Exhibit 12).

A property management firm typically performs a large variety of apartment renovation and general maintenance work. General maintenance and janitorial work would not be subject to the disclosure rule requirements. However, much of the apartment renovation work — which ranges from relatively small, short duration jobs (e.g., minor “handy-man” type plumbing and carpentry repairs) to repainting of a complete apartment or putting in a new kitchen or bathroom — is likely to be subject to the disclosure rule. From conversations with property management firms, the number of renovation jobs that might be performed by a 6-7 person maintenance crew (within the 10-person organization) would vary widely depending on the age and condition of properties under management. An additional compounding factor in gauging how many jobs might be subject to the disclosure rule is that much of the more extensive renovation work, such as apartment repainting or putting in new kitchen and bath equipment, tends to occur between tenancies while the apartment is vacant. Still, in comparison with both the general and specialty contractor organizations discussed above, it is expected that a greater number of jobs per worker per year is likely to be subject to the disclosure rule. For this analysis, it was assumed that the rental property management firm would perform between 750 and 1,500 jobs per year that would be subject to the disclosure rule. This range of numbers is quite uncertain but, from conversations with property management firms, it is expected to include the likely number of renovation events that would be performed by a 6-7 person maintenance crew over the course of a year.

The unit cost per renovation transaction for rental property management was calculated in a similar manner to the value for renovation and specialty trade contractors but with two differences. First, the calculation includes the cost of using certified mail for 25 percent of the pamphlet deliveries to rental property occupants. Second, the cost reflects only the unit costs of dealing with tenants and rental property owners (which are higher than the costs of dealing with owner-occupants) because this will be the predominant type of transaction for many property management firms. Using the resulting value of \$3.86 per renovation transaction event, the estimated range of annual *transaction*-related costs is \$2,897 to \$5,794. Summing the start-up and transaction costs yields total compliance cost estimates of \$2,996 and \$5,893, for the low and high estimates of number of renovation jobs, respectively. These costs amount to 0.73 percent and 1.44 percent of annual labor and overhead costs for the low and high number of jobs, respectively (see Exhibit 12). Because of the relatively large number of low value jobs performed by a property management firm, the burden of compliance costs on organization labor and overhead costs is greater than for both the general contractor and specialty trade example organizations.

UNFUNDED MANDATES

In accordance with the Unfunded Mandates Reform Act of 1995, EPA considered whether the regulation will impose additional burdens on governmental entities other than the Federal government. For this review, EPA considered two ways in which the regulation might impose an unfunded mandate on non-Federal governmental units. EPA judges neither to be significant.

The first and potentially more costly way in which the regulation could impose costs on non-Federal governmental units concerns a provision of the regulation that *permits* State and Tribal governments to implement the regulation within their jurisdictions. Specifically, State and Tribal governments may apply to EPA for authority to administer the standards, regulations, and requirements established under the regulation. EPA may approve such an application only after finding that the State or Tribal program is at least as protective of human health and the environment as the Federal program and that it provides adequate enforcement. For a program to be approved, it must contain regulations or procedures that contain the

following: (1) requirements for distribution of an approved lead hazard information pamphlet before renovations performed for compensation in target housing commence; and (2) provisions for the adequate enforcement of the above program. In providing an approved lead hazard information pamphlet, the State or Tribe may either distribute: (1) the lead hazard information pamphlet developed by EPA, under section 406(a) of TSCA, entitled “Protect Your Family From Lead In Your Home”, or (2) an alternative pamphlet or package of lead hazard information that has been approved by EPA. Although assumption of this authority could be costly to State and Tribal governments, EPA does not judge this provision to be an unfunded mandate. Because the regulation does not require State or Tribal governments to seek the authority to administer and enforce the regulation’s requirements, any possible burden on such governmental units would be incurred as a result of a decision by those governmental units and is therefore not an unfunded mandate of the regulation.

The second way in which the regulation may impose costs on non-Federal governmental units concerns the possibility that Local, Tribal or State governments may own and operate rental housing that would be subject to the regulation’s disclosure requirements for renovation activities. Non-Federal government housing agencies (e.g., public housing authorities that own and operate low income housing and housing for the elderly) will face the same compliance requirements as private concerns in managing renovation work in *target* rental property. The costs of such compliance activities by non-federal government agencies are included in the estimates of total annual compliance cost presented in Chapter 3. Although such agencies *must* incur these costs if renovation work is performed in target rental property, EPA does not judge the costs to constitute a significant economic burden. In particular, EPA does not expect the regulation’s compliance requirements to be more burdensome to such agencies than to small businesses. The Regulatory Flexibility Analysis presented above shows the cost burden of the regulation to be slight even for small businesses. Accordingly, EPA judges that the regulation’s compliance requirements will not pose a significant economic burden to non-Federal governmental units.

ENVIRONMENTAL JUSTICE

EPA also assessed whether the regulation may yield adverse results relative to the policy criterion of environmental justice. In particular, EPA considered whether the regulation could result in an adverse distribution of costs or benefits to low income and/or minority individuals and households. EPA considered two possible ways in which the regulation might result in an adverse distribution of benefits or costs within such groups:

1. Possible imposition of a significant economic burden on affected businesses that are owned by low income and/or minority individuals or that employ substantial numbers of low income and/or minority individuals.
2. A possible distribution of costs or benefits among consumers that results in a disproportionately large share of costs falling on low income and/or minority households or a disproportionately small share of benefits accruing to these households.

With regard to the first issue — possible imposition of a significant burden on businesses that are owned by low income and/or minority individuals or that employ substantial numbers of low income and/or minority individuals — EPA reviewed data on the participation of minority individuals in the affected businesses.⁹ As summarized in *Exhibit 13, Minority Ownership of Businesses in Affected Industry Groups*, data from the Bureau of the Census indicate that members of minority populations own substantial numbers and percentages

⁹ EPA also sought data on the ownership of businesses in affected industry groups by low income individuals; however, such data were not available. Data were also not available on minority employment in the affected industry groups.

of establishments in the affected industry groups: for example, *all minorities* are reported to own 14 percent of general building contractor establishments, 38 percent of specialty trade establishments, and 47 percent of real estate establishments. Minority owned businesses also account for a smaller but still significant share of the total revenue of business establishments in the affected industry groups. Thus, the regulation has the potential to affect a substantial number of businesses that are owned by minorities.

Although the regulation may affect a substantial number of minority-owned businesses, EPA nevertheless concludes that the regulation will not impose a significant burden on minority-owned businesses, on businesses that are owned by minority individuals, or on businesses that employ substantial numbers of low income and/or minority individuals. The basis for this conclusion is EPA's analysis presented earlier in this chapter that the regulation is not expected to result in a significant cost burden on *small* businesses. Given this finding, EPA further concludes that the regulation will not impose a significant cost burden on other businesses — small or large — that may be owned by low income and/or minority individuals or that may employ substantial numbers of low income and/or minority individuals.

Exhibit 13: Minority Ownership of Businesses in Affected Industry Groups (1992)									
Number of Establishments									
Industry Group (SIC code)	Total	Black		Hispanic		Other Minorities**		All Minorities	
15 - General Building Contractors	168,407	6,023	3.6%	12,636	7.5%	5,320	3.2%	23,979	14.2%
17 - Special Trade Contractors	367,263	36,057	9.8%	82,351	22.4%	20,951	5.7%	139,359	37.9%
65 - Real Estate*	220,645	24,187	11.0%	33,291	15.1%	46,157	20.9%	103,635	47.0%
Revenue (\$ million)									
Industry Group (SIC code)	Total	Black		Hispanic		Other Minorities**		All Minorities	
15 - General Building Contractors	220,231	840	0.4%	2,205	1.0%	3,933	1.8%	6,978	3.2%
17 - Special Trade Contractors	220,325	1,466	0.7%	3,435	1.6%	1,305	0.6%	6,205	2.8%
65 - Real Estate*	132,454	1,553	1.2%	2,002	1.5%	4,694	3.5%	8,249	6.2%
Percentages are the percent of total establishments or revenue in establishments that are owned by the indicated minority group.									
*Figures include all of SIC group 65 except for SIC code 6552 and thus include a larger industry than the affected industry group as defined in Chapter 2. This data is not available on the 3-digit SIC level.									
** This group includes Asians and Pacific Islanders, American Indians, and Alaska Natives.									
<i>Source: Economic Census, 1992, Bureau of the Census</i>									

For the second issue — the share of benefits and/or costs that accrue to low income and/or minority households — EPA reviewed information on the occurrence of lead-based paint in households according to household income and racial stock. As reported in the regulatory impact analysis for another EPA regulation concerning abatement of lead-based paint hazards, both low income and African-American households live more frequently in housing that contains lead-based paint in deteriorated condition than do other population subgroups as defined on the basis of household income or racial composition.¹⁰ Accordingly, these groups are more likely to be affected adversely by the hazards of deteriorated lead-based paint than other population subgroups. Whether these household occupancy and hazard exposure patterns will result a differential pattern of benefits and costs under the regulation will depend, among other factors, on the frequency of repair and renovation activity in low income and/or minority occupied housing that would be subject to the regulation's disclosure requirements. At this time, EPA does not have data on the frequency of such activities among these

¹⁰ See TSCA Title IV, Sections 402(a) and 404: Target Housing and Child-Occupied Facilities, Final Rule Regulatory Impact Analysis, U.S. Environmental Protection Agency, August 1996, Chapter 9.

households. However, EPA notes that the disproportionate occupancy by low income and African-American households of housing containing lead-based paint, and particularly, lead-based paint that is in deteriorated condition, *may* mean that these households stand to reap a greater share of the regulation's expected benefits. These benefits include increased awareness of lead-based paint hazards and expected adoption of practices to prevent or mitigate exposure to lead-based paint hazards accompanying repair and renovation activity.

EPA also notes that, to the extent the regulation's compliance costs are passed on more frequently to the occupants of housing containing lead-based paint and therefore to these population subgroups, they may also bear a disproportionate share of the regulation's costs. However, EPA believes that the regulation's costs are very minor in relation to the total value of housing services in affected housing and as well the regulation's expected benefits. To illustrate this point, EPA calculated that the average additional cost per affected renovation event is about \$4.35 and that the expected frequency of affected renovation event in target housing is about 0.26 renovation events per year (see Chapter 3, above). On this basis and assuming that all the costs of the regulation are passed onto consumers, the expected additional cost per year to a household living in target housing is about \$1.12. Even if the frequency of affected renovation events in low income and minority households is quadruple the expected frequency in target housing, the annual cost would be less than \$5. EPA does not judge these costs to present a significant burden in relation to either the value of affected housing services or the expected benefits from the regulation.

CHAPTER 5

ASSESSMENT OF BENEFITS

The lead hazard disclosure rule for residential renovation is expected to yield benefits by leading owners of residential property to make better, i.e., more informed, decisions regarding renovation and remodeling activities, thereby enabling them to reduce their exposure to the health hazards of lead-based paint. Because of uncertainty regarding how households will respond to the information provided by the lead hazard disclosure requirements, it is not possible to quantify these benefits, either in terms of direct benefits of efficiency gains from improved decision making or in terms of indirect, avoided adverse health effects. In lieu of a quantitative assessment, this chapter assesses qualitatively how the disclosure rule is expected to benefit households that would otherwise be exposed to health hazards from lead-based paint. To aid in understanding these benefits, the chapter first reviews the market imperfection present in renovation transactions regarding lead-based paint hazards and then outlines the mechanisms of exposure to lead from lead-based paint and the associated health effects. The third section describes how the disclosure rule is expected to achieve benefits.

UNDERSTANDING THE MARKET IMPERFECTION

The market imperfection that the lead hazard disclosure rule for residential renovation aims to correct is that the performance of renovation work in target housing may expose occupants to health risks from lead-based paint hazards without their knowledge or consent. In the case of a homeowner purchasing the renovation services, the imperfection does not involve a so-called third-party effect. That is, no party other than the homeowner makes the decision to purchase the renovation service and thus possibly incur the risk from lead-based paint hazards. However, when the renovation work involves a rental housing unit, the exposure to risk may result from the decisions and actions of a third party, namely the property owner. In either case, the failure of the marketplace to inform occupants of a possible lead-based paint hazard may prevent occupants from reacting rationally to the health risks that may accompany the renovation work. The disclosure rule attempts to remedy this imperfection by requiring that renovation contractors and/or rental property owners inform occupants of target housing units of the possible presence of lead-based paint and the hazards that may accompany renovation work. As a result, homeowners and rental property occupants will have better information on which to base decisions regarding whether to purchase or assent to renovation services, whether to specify risk-management precautions to be undertaken by the renovation contractor, and whether to undertake other precautionary actions in conjunction with or after the renovation work.

Under the disclosure rule, rental property owners are also informed of the possible presence of lead-based paint and the associated risks to which tenants may be exposed during renovation work. The provision of this information to rental property owners will permit the property owner to make better informed decisions about the purchase of renovation services and possible abatement or other lead hazard management actions in the housing units that they own.

EXPOSURE TO LEAD FROM LEAD-BASED PAINT AND RELATED ADVERSE HEALTH EFFECTS

The reason that the lack of information in residential renovation is of sufficient concern to warrant intervention in the market process is that exposure to lead from lead-based paint presents significant health risks. The documented health risks of exposure to lead include reduced intelligence in children, and increased probability of hypertension, stroke, heart disease and premature death in adults. The costs stemming from these health risks are born both by individuals who are affected by exposure to lead, and by society at large through increased health care and educational costs and losses in the economic productivity of affected individuals. This section reviews the mechanisms by which residents may be exposed to lead from lead-based paint in a household and summarizes information on the known health risks from exposure to lead.

The presence of lead-based paint in a housing unit presents a health risk because of the possibility that residents will take lead into their bodies. The mechanisms of bodily intake include inhalation and ingestion of paint dust and debris containing lead-based paint residue. Lead-based paint residue enters the environment in and around housing units in several ways, including flaking and chipping of paint from deteriorated paint surfaces, and formation of lead-containing dusts from the normal wear and tear of painted surfaces. Because of the friction and abrasion of normal usage, window and doors, in particular, contribute to formation of lead-containing dusts that may be ingested or inhaled. Renovation work presents special risks because the cutting, scraping, sanding and other surface disruption activities in renovation contribute to formation of lead-containing dusts or may stir up lead-containing dust already present in the housing unit.

Among household members, young children are generally considered at higher risk of lead intake because of the frequency of hand-to-mouth activity and the likelihood of their inhaling dusts from floors and window wells. Young children may also chew paint from otherwise intact surfaces that are within their reach such as window sills and doors. The intake of lead-containing materials by children is not only a risk inside a housing unit but also outside as paint dusts, both from normal deterioration and preparation work for exterior painting, may contaminate the soils in children's play areas. Adults and older children are also subject to the risk of lead intake through inhalation of dusts, preparation and eating of foods without proper washing of hands, and preparation of foods in areas where lead-containing dusts have accumulated.

Numerous studies, including several by the U.S. Environmental Protection Agency (EPA), have documented the adverse human health effects associated with exposure to lead. In a pioneering study, Schwartz *et al.* quantified a number of health benefits that would result from reductions in lead content of gasoline. The work was extended by EPA's analysis of lead in drinking water and by an EPA-funded study of alternative lead National Ambient Air Quality Standards. Although uncertainty remains as to the full extent of the health impacts, these studies have all shown that lead has significant adverse effects on humans. In addition, recent studies suggest that there is virtually no entirely "safe" threshold for exposure to lead. The documented human health effects associated with lead exposure include the following:

For Men: hypertension; cancer; heart disease, stroke, and premature death.

For Women: possible hypertension, heart disease, stroke and death; cancer; fetal effects from maternal exposure, including diminished childhood IQ, premature birth, and reduced birth weight; and possible increases in infant mortality resulting from maternal exposure.

For Children: reduced intelligence; interference with growth; impaired hearing; behavioral changes; interference with peripheral nervous system development; metabolic effects, impaired heme synthesis, and anemia; and cancer.

Within these population groups, EPA has identified two groups that are believed to be at particular risk from the hazards of lead-based paint: children less than seven years of age and pregnant women. Infants and young children are at particular risk because of the greater likelihood of intake of lead-contaminated dusts or paint debris in a housing unit containing lead-based paint, and the relatively low levels of lead intake that cause adverse health effects. Pregnant women are considered a high risk population primarily as a surrogate for the fetus. Exposure to lead before or during pregnancy may have severe effects on fetal development, including miscarriage.

These health effects are costly to both the affected individuals and society because of the pain and suffering associated with the adverse health effects, increased health care costs, increased education expenses for

children, and lower economic performance associated with less productive individuals and lost work days from morbidity and premature mortality.

BENEFITS OF THE DISCLOSURE RULE

The lead-based paint hazard disclosure rule requires that information about the possible presence of lead-based paint and its associated hazards be given to occupants of housing units in which renovation work is to be undertaken if the housing units are likely to contain lead-based paint. It is expected that this information will lead the owners and occupants of target housing to modify their behavior in a way that will reduce health risks from lead-based paint and thus achieve benefits to society. However, the extent to which these benefits will occur depends on how transaction participants value and respond to the additional information. The regulation does not require housing occupants or rental property owners to modify their behavior; rather it provides them additional information on which to make decisions regarding purchase and consent to renovation work, and on possible actions to avoid or minimize the hazards from lead-based paint that may accompany renovation work. Currently, data are not available to permit estimation of how transaction participants are likely to modify their behavior in response to the information disclosed as a result of the lead hazard disclosure rule. Accordingly, it is not possible to quantify the rule's expected contribution to efficiency gains or indirect, risk-reduction benefits. However, it is possible to assess the likely mechanisms of personal and market response to the information provided by the disclosure rule and thus understand how the disclosure rule is expected to benefit households that would otherwise be exposed to health hazards from lead-based paint.

Response mechanisms by which the disclosure rule would be expected to generate direct/indirect benefits include the following:

- Because of the information provided by the disclosure rule, occupants of target housing in which renovation work is to be performed may specify that the renovation contractor observe risk management precautions in the course of their work or may themselves undertake precautions to eliminate or reduce the health risks from lead-based paint. For example, occupants may specify that contractors avoid dry scraping and sanding during painting preparation, or that rooms in which work is occurring be sealed off during the course of work and be cleaned carefully upon completion of the work. Alternatively or in addition, occupants may undertake some of these actions themselves or may remove young children or other susceptible persons from the housing unit while the work is being performed. In a perhaps less likely but still plausible response, the housing occupants may choose to purchase abatement services before or in conjunction with the renovation work. Such actions would be expected to reduce directly the likelihood that residents of the household would be exposed to lead. Some precautionary actions, such as avoidance of dry sanding and scraping work, may also benefit renovation workers by reducing their exposure to lead paint hazards.
- As a result of the lead hazard information provided during renovation, households may respond by undertaking abatement or adopting other risk management activities short of abatement *independent of the renovation work*. If abatement is purchased, these risk management actions may require substantial monetary outlays. However, even if abatement is not undertaken, less expensive and even low cost measures may substantially reduce the risk from exposure to lead in lead-based paint. For example, maintenance of painted surfaces and regular, careful cleaning of areas in which lead-based paint debris or dust accumulates can reduce health risks. The reduction in these health risks, whether by abatement or other precautionary activity, would generate benefits as a result of the disclosure rule.
- Upon being informed of the possible presence of lead-based paint and its associated hazards in their rental units, rental property owners may decide to perform abatement work in these units.

A key reason that rental property owners might undertake such actions would be to avoid the possible liability and financial risks from tenants receiving harmful exposures to lead in their property. If rental property owners perform abatement work or undertake other precautionary actions to maintain surfaces painted with lead-based paint, then rental housing occupants would benefit by reduced risk from the hazards of lead-based paint.

- Another possible effect involves possible responses by renovation contractors independent of any action by housing occupants or rental property owners. Because of the disclosure rule, renovation contractors themselves may become better aware of the possible presence of lead-based paint and its hazards. As a result, contractors may adopt procedures to prevent formation of lead-containing dusts during renovation work. Such actions might benefit both the housing unit occupants and the renovation workers by reducing exposure to the hazards of lead-based paint.

While it is not possible to estimate the quantitative extent of these responses, it is certain that the disclosure rule will provide the information base that would be expected to yield such personal and market responses.

METHODOLOGICAL OPTIONS FOR PREDICTING RESPONSE TO INFORMATION PRODUCTS

As noted above, EPA has not quantified the estimated benefits of the rule. An information base and the associated accepted analytic methods necessary to predict consumer reaction to information products on lead-based paint hazards are not readily available; thus, quantifying the expected benefits of this rule would be extremely difficult. Given the high level of uncertainty associated with the results from such a quantitative analysis, and given the prescriptive nature of Section 406 of the Act, EPA believes that the information provided in the qualitative analysis presented above served to inform decision-making in this case.

Nevertheless, it may be useful to briefly review certain approaches currently evolving and which may be seen as a starting point in an effort to expand the level of understanding of how information products may be “valued” and used to modify behavior. In this instance, the information products are: (1) the knowledge that the housing unit may contain lead-based paint and (2) a lead hazard information pamphlet describing the health risks from exposure to lead and steps that may be taken to avert or reduce those risks. This information is provided to the owners and/or adult occupants of target housing on which a renovation is to be performed.

At least three approaches might be used to estimate the value of these information products. First, the “value” of information to the public might be developed via a contingent valuation type study. Such a study would seek to obtain a dollar equivalent representing the amount a recipient of the information would be willing to pay to acquire it. Since many members of the public may not be fully aware of the reasons behind the distribution of the information, the methodology would need to ensure that all respondents are provided with adequate background materials on the intended purpose of the information so that a more meaningful response can be made.

A second approach for estimating the value of the information would be to estimate transaction costs to buyers and renters of obtaining similar information from currently available sources, to the extent it is available. By providing the information directly, the rule would save users of the information the trouble and costs of obtaining comparable information through their own effort. These benefits accrue to individuals who would have sought out the information anyway or who find the information of some value but would not have spent the time and/or money to acquire it through available sources because of the transaction costs.

While this approach may permit the development of an estimate representing the costs to individuals seeking similar information, actual costs to duplicate the information provided under the rule would be considerably

higher. This is because the information pamphlet provided by EPA will have been thoroughly researched and will have undergone peer and public review; thus, the quality of information provided by EPA would be expected to exceed that collected by an individual property owner or occupant.

Since it is expected that information provided to the public will lead many recipients to modify their behavior, a third approach to estimate the benefits of the regulation would be to assess the potential outcomes of the provision of information. One approach to studying behavioral impacts would be to examine behavioral changes in response to similar types of information dissemination events. These behavioral changes could then be evaluated to assess the extent to which beneficial impacts may be expected.

Such a study would be highly complex, since many factors may contribute to an individual's decision-making process. Thus, any research method designed to study the impacts of information alone would need to carefully account for numerous confounding variables. For example, under this rule, information may cause property owners and occupants to modify their behavior in a way that may reduce health risks from exposure to lead-based paint dust or debris. However, changes in behavior, such as increased lead-paint abatement activities, may be influenced by a wide range of factors other than the information provided pursuant to this rule. Therefore, under this approach, it is extremely difficult to estimate the benefits of reduced health risks that would accrue as a result of this rule. Further, any estimate of benefits based on the outcome of behavioral change assumes that the information provided under the rule is accurate to the best of our current knowledge. However, if the information understates risks, property owners and occupants may take fewer actions than would be optimal. On the other hand, if the information provided by this rule turns out to overstate the true risks of lead-based paint in the home, some individuals may take actions that they otherwise would not have taken, leading to a suboptimal outcome.

Additionally, actions taken in response to new information will involve costs. To assess the net benefits to society from these actions, these costs would have to be estimated and subtracted from the expected benefits associated with the actions.

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APPENDIX A: DATA SOURCES

Data sources include text materials and information received through telephone conversations or written communication.

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