

ATTACHMENT 2

STATE OF MINNESOTA
POLLUTION CONTROL AGENCY

In the Matter of the Proposed Rules
Governing Abrasive Blasting of Lead
Paint on Residential, Child Care, and
School Buildings, Minn. Rules Parts
7005.6010 to 7005.6080.

STATEMENT OF NEED
AND REASONABLENESS

I. INTRODUCTION

The Minnesota Pollution Control Agency (Agency) was directed by the 1990 Minnesota Legislature to adopt rules to restrict abrasive blasting of exterior lead paints on residences in a manner that protects human health and the environment. Minn. Stat. § 144.870, subd. 2 (1990). These proposed rules require testing for lead in paint and the use of containment with sealing of the residence to prevent contamination of the soil and the household interior with lead paint particles during abrasive blasting. Additional provisions apply to notification of residents, protection of neighboring property, and cleanup of waste deposits.

The Agency staff began investigating the effect of abrasive blasting of lead paint in 1986 in response to a petition by the Lead Coalition of September 5, 1984 and the report of the Governor's Task Force on Lead of December 19, 1984. A review of the literature provided little information on the effect of this practice on contamination of residential property or on lead absorption by resident children. Nor was there good information on the incidence or the practices of abrasive blasting of lead paint on houses in Minnesota. In order to gather such information, a questionnaire was prepared and distributed to companies that perform abrasive blasting of residences. The Agency staff met with those companies that reported significant numbers of house contracts. A

field study was then undertaken by Agency staff that measured the increment of lead added to the soil by conventional unregulated abrasive blasting of exterior house paint. The findings of this study were reported as "Sandblasting and Lead Paint", included as Appendix C of the Soil Lead Report to the Minnesota State Legislature of the Agency and the Minnesota Dept. of Health in June 1987 (exhibit 1). At the same time, a review of abrasive blasting regulations of different cities, counties, regions, and states was conducted. A preliminary "Notice of Intent to Solicit Outside Opinion Regarding Proposed Rules Governing Abrasive Blasting" was published in the State Register on October 27, 1986. A copy of this notice was mailed to 43 different companies that do sandblasting of houses. This elicited one response. The report to the legislature, "Sandblasting and Lead Paint", contains the findings of the field study as well as summary reviews of the survey information, regulation, and past research.

As a consequence of the 1986 field study of lead contamination of soil due to sandblasting of house exteriors, recommendations were prepared by Agency staff and distributed to 57 sandblasting companies in Minneapolis, St. Paul, Duluth, Rochester, and St. Cloud in April 1987 (exh. 2). These recommendations contain provisions for testing for lead, notification, containment, and cleanup. Sandblasting companies were asked to carefully apply these provisions whenever paint containing lead was removed from any residence in order to protect public health and to prevent environmental contamination. A follow-up field study was conducted in the summer of 1987 in order to test the effect of implementing these recommendations in preventing contamination of the property (see Statement of Need below). There was a significant reduction in the amount of lead added to the soil due to sandblasting of these test houses.

In July 1987, Agency staff sent a copy of these recommendations to 30 city, county, and state offices of environmental and public health, pollution control, and building inspection with a letter requesting their assistance in promoting the implementation of these provisions. To promote public awareness of this issue, a news release was issued in April 1988 regarding the hazards of lead paint and lead paint removal. It described the study of the effects of sandblasting on soil lead and the development and testing of the recommendations. A copy of the recommendations was offered to homeowners. The news release was sent to 480 print and electronic media around the State. A second copy of the recommendations was distributed to residential sandblasting companies in June 1988 with a letter reporting their effectiveness and encouraging their implementation.

In 1989, the Minnesota Legislature enacted a statute, Minn. Stat. §§ 144.851 to 144.862 (Supp. 1989), that included the requirement that the Minnesota Dept. of Health (MDH) regulate the removal of lead paint from residences by promulgating emergency rules establishing "abatement methods and standards for paint, bare soil, dust, and drinking water from public fountains for cities of the first class." Minn. Stat. § 144.856 (Supp. 1989). The final emergency rule applied only to "...lead abatement contractors performing lead abatement work ordered by boards of health in cities of the first class." 14 State Reg. 1929 (Jan. 29, 1990).

The 1990 Minnesota Legislature repealed most of the 1989 statute, except for the emergency rule. 1990 Minn. Laws ch. 533, § 8. The 1990 statute requires rulemaking by the MPCA and the MDH that will set standards for lead in different media and establish abatement methods for lead paint and lead in soil. Minn. Stat. §§ 144.871-144.878 (1990). A "Notice of Intent to Solicit Outside Information Regarding Proposed New Rules Regarding the Removal of Lead

Paint from Residences, Bridges, and Water Towers" was published in the State Register on May 14, 1990. No responses were received that pertained to residences.

A draft of these proposed rules was discussed at a public meeting of the Agency Board's Air Quality Committee on August 27, 1990. On September 5, 1990, a draft of the abrasive blasting rule was mailed to 14 contractors, three city health departments, and one citizen advocacy group with a letter requesting comment. Four telephone discussions resulted and one written comment was received. A meeting was held on September 26, 1990 with two contractors and their attorney. Subsequent to this meeting, written comments were made by the attorney. Further changes were made to the rule and copies of the revised rule were mailed on November 21, 1990 to four parties on the September mailing list who had made comment on the earlier draft.

II. STATEMENT OF AGENCY'S STATUTORY AUTHORITY

The Agency's statutory authority to adopt the rules is set forth in Minn. Stat., section 116.07, subd.4 (1990) which provides, with respect to air pollution:

Pursuant and subject to the provisions of chapter 14, and the provisions hereof, the pollution control agency may adopt, amend and rescind rules and standards having the force of law relating to any purpose within the provisions of Laws 1969, chapter 1046, for the prevention, abatement, or control of air pollution. Any such rule or standard may be of general application throughout the state, or may be limited as to times, places, circumstances, or conditions in order to make due allowances for variations therein. Without limitation, rules or standards may relate to sources or emissions or air contamination or air pollution, to the quality or composition of such emissions, or to the quality of or composition of the ambient air or outdoor atmosphere or to any other matter relevant to the prevention, abatement, or control of air pollution.

In addition, the legislature has specifically authorized and instructed the Agency to adopt rules relating to abrasive blasting of exterior lead paint from residential property. Minn. Stat. section 144.878, subd. 2 (c) (1990) states:

By January 31, 1991, the commissioner of the pollution control agency shall adopt rules to ensure that removal of exterior lead-based coatings from residential property by abrasive blasting methods is conducted in a manner that protects public health and the environment.

Under these statutes the Agency has the necessary statutory authority to adopt the proposed rules.

III. STATEMENT OF NEED

Minn. Stat. sections 14.14, subd. 2 and 14.23 (1990) require the Agency to make an affirmative presentation of facts establishing the need for and the reasonableness of the proposed rules. In general terms, this means that the Agency must set forth the reasons for proposing rules and the reasons must not be arbitrary or capricious. However, to the extent that need and reasonableness are separate, need has come to mean that a problem exists which requires administrative attention, and reasonableness means that the solution proposed by the Agency is a proper one. The need for the rules is discussed below.

A. Need to Comply with Minn. Stat., section 144.878 (1990).

To comply with the directive of Minn. Stat., section 144.878, subd. 2 (c) (1990) the Agency must adopt rules to regulate abrasive blasting of lead paint on exteriors of residences. By passing section 144.878, subd. 2 (c), the legislature has determined that such rules are needed.

B. Need for Compliance with Current Regulation.

1. State rules and statutes.

a. Air emissions

Minn. Rules pt. 7005.0550 (1989), Preventing Particulate Matter from Becoming Airborne, requires that a person handle, use, transport, or store a material in a manner that prevents avoidable amounts of particulate matter from becoming airborne. Further, it provides that a person shall apply "all such reasonable measures as may be required to prevent particulate matter from becoming airborne" for a number of activities, including when a building is repaired.

Minn. Rules pt. 7005.1120 (1989), Visible Emission Restrictions for New Facilities, prohibits visible emissions of greater than 20% opacity from emission facilities. "Emission facility" is defined as "...any structure, work, equipment, machinery, device, apparatus, or other means whereby an emission is caused to occur." Minn. Rules pt. 7005.0100, subp. 10 (1989).

These rules do not regulate abrasive blasting by name, nor do they mention lead contamination. When they have been cited to regulate abrasive blasting, these rules have been used either reactively, in response to a complaint, or copies of these rules have been provided to contractors as a way to promote the use of containment in abrasive blasting. These general rules are not adequate to prevent lead contamination from abrasive blasting, because they do not specify the procedures that will reduce lead contamination from abrasive blasting of residences. Because these rules are designed to reduce emissions of particulate matter, violations of these rules during abrasive blasting

(i.e. generation of particulate matter) does not necessarily result in lead contamination that presents a risk to human health (if sufficient containment and preventive measures are taken as to lead emissions), nor does compliance with these rules regarding emission of particulate matter ensure that there is no lead contamination of the environment or exposure of the resident population to lead paint particles. Existing MPCA rules were not designed for, and are therefore not sufficient to prevent, lead contamination caused by abrasive blasting. Specific standards are therefore needed to reduce lead contamination from this practice.

b. Soil lead standards

Minn. Stat. sec. 116.52, subd. 2 (1988) provided an interim standard of lead in soil of 1000 parts per million (ppm). This was part of the 1985 legislation that mandated the soil lead study by the Agency and the blood lead study by the Minnesota Dept. of Health. The 1990 Minnesota Legislature repealed the interim standard and mandates that the Agency establish a standard for bare residential soil by January 31, 1991. Minn. Stats. 144.878, subd. 2(b)(1990); 1990 Minn. Laws ch. 533, § 1. In a separate rulemaking, the Agency has proposed a standard of 300 ppm. As reported in the Agency study of the effects of sandblasting lead-painted houses, conventional abrasive blasting, with inadequate and careless use of ground cover, caused mean increases in lead concentration of foundation soils of approximately 6000 ppm. Both the statutory interim soil lead standard and the standard in the proposed rulemaking would easily be violated where unregulated abrasive blasting occurs, particularly for foundation soils, which are frequently unvegetated. On the other hand, the provisions for ground cover and cleanup in the proposed rule should prevent such increases in lead concentrations.

2. Federal standards and guidelines.

a. Air emissions

U.S. EPA in 1978 promulgated a National Ambient Air Quality Standard for lead of 1.5 ug/m^3 , measured as a quarterly average (40 CFR part 50.12). A quarterly ambient air lead monitor takes a 24-hour sample every six days. A violation of this standard would occur if one of these samples exceeded 22.5 ug/m^3 of lead even if the remaining 14 samples were 0 ug/m^3 . It may take two or three days to completely remove the exterior paint from a house by abrasive blasting. No air monitoring by the Agency has been conducted at houses that have been sandblasted. Unpublished data from Dr. Spittler's study, however, indicate that lead concentrations in air due to abrasive blasting of residences can be significantly greater than 1.5 ug/m^3 . U.S. EPA is reviewing the ambient air standard for lead in light of recent health effects studies. In draft recommendations, U.S. EPA staff proposed a monthly averaging period, daily sampling frequency, and lowering the NAAQS to 0.5 ug/m^3 as "...a reasonable lower bound for consideration of a revised [primary] lead standard." Each of these proposed changes would have a more restrictive effect on activities that discharge lead emissions to the air. Certain of the containment provisions in the proposed rule will reduce lead concentrations in the ambient air during abrasive blasting, thereby promoting compliance with the present ambient air quality standard for lead or the more restrictive standard that will be established in the future.

On July 1, 1987, U.S. EPA promulgated a National Ambient Air Quality Standard for particulate matter of 10 microns and smaller (PM10) that replaced the Total Suspended Particulate standard. The PM10 standard is 150 ug/m^3 as a 24 hour average, with no more than one exceedance per year (40 CFR part 50.6). This standard is known to be violated when steel structures are sandblasted

with silica sand without enclosure. Likewise, sandblasting stucco generates much small particulate because of the fracturing of the sand particles in addition to the generation of dust from the substrate. Less fracturing of sand occurs when wood siding is abrasive blasted because the surface is less hard. Nevertheless, monitoring may well measure exceedances of the national standard where abrasive blasting of painted residential exteriors is done without containment or measures for dust abatement. Because such restrictions are incorporated in the proposed rule, the rule will aid in achieving the ambient air quality standard for PM10.

b. Soil lead guideline

A directive from U.S. EPA Office of Solid Waste and Emergency Response of September 7, 1989, "Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund Sites", provides that soils should not exceed a concentration of 500 to 1000 ppm total lead. These numbers are adopted from the recommendation of the U.S. Department of Health and Human Services, Centers for Disease Control, in the January 1985 publication Preventing Lead Poisoning in Young Children. The provisions for ground cover and cleanup of the proposed rule should prevent such increments in lead concentrations. As stated above, unrestricted abrasive blasting causes very large increments of lead added to soil.

C. Need to Prevent Lead Contamination Due to Abrasive Blasting.

Significant contamination of soil is caused by dry abrasive blasting of exterior lead paint as it has been conducted in Minnesota. This is documented by the study conducted by Agency staff and reported as "Sandblasting and Lead Paint" in June 1987 (exh. 1). Soil contamination by different methods of abrasive blasting of houses has been described, but not published, by Dr.

Thomas Spittler of U.S. EPA Region 1. In addition, a study in New Zealand documented soil contamination, contamination of household interiors, and lead absorption by residents. Of 18 houses that were sandblasted, soil contamination extended to six meters from the foundations with the highest lead concentration 11% (110,000 ppm). Concentrations of lead in house dust were 0.24 to 15% and persisted two years later. Of the 16 families in this study, 32% of all individuals and 43% of the children had elevated blood lead. However, only two of the houses were studied before and after paint removal. In 37 other families who were tested for blood lead following sandblasting, 60% of children and 78% of pets were identified with elevated levels of lead. Correspondence and discussion of Agency staff with the researchers in New Zealand have provided information on the open-style construction of housing in that country. This makes residential structures very vulnerable to dust infiltration and very difficult to protect from contamination with lead paint dust during abrasive blasting. Housing stock is very different in Minnesota where, for example, exterior walls are usually insulated. Soil was the only medium sampled in the Agency study, but evidence of contamination of house interiors was observed and documented and it has been reported by Dr. Spittler's study in Massachusetts as well as in the New Zealand studies. Dr. Spittler's study is briefly summarized on page C5 of the report "Sandblasting and Lead Paint" (exh. 1). The proposed rule is needed to prevent dispersal of lead paint particles both to the soil and to house interiors where it can cause lead absorption by residents and children.

There is increasing activity at various levels of the country to address sources of lead in the human environment. Research has identified significant health effects of lead at values well below the Centers for Disease Control guideline of 25 ug/dl of lead in blood. The most serious of these effects are on the central nervous system of infants and children, due to exposure of the

pregnant mother or the individual child, and these impairments to cognitive function are irreversible. Lead also interferes with red blood cell formation and has deleterious effects on the kidneys, the central and peripheral nervous systems, and the reproductive system. Additional effects include reduced birth weight and congenital deformities. U.S. EPA has drafted proposed changes to lead standards of both air and drinking water and is examining other sources of lead in different media. That agency has recently stated that the reduction and prevention of lead exposure is one of its first priorities and is proposing initiatives under the Toxic Substances Control Act to reduce sources of lead in the human environment.

The proposed rule is limited in scope, bearing only on the removal of lead paint by abrasive blasting of certain structures. This present document, therefore, does not intend to present a toxicological or epidemiological review of the health effects of lead. As stated earlier, there has been relatively little study of the environmental or health effects of abrasive blasting of residential structures and these are discussed further in the Agency staff report (exh. 1). There is, on the other hand, a very large number of studies of the human health effects of lead absorption, the sources of lead exposure, and the incidence and distribution of blood lead values in different populations. Two documents that provide comprehensive reviews of this literature are the U.S. EPA Air Quality Criteria for Lead (1986) vols. 1-4 and the Agency for Toxic Substances and Disease Registry (ATSDR) The Nature and Extent of Lead Poisoning in Children in the United States: A Report to Congress (1988). An earlier document that includes a list of important references is the U.S. Department of Health and Human Services, Centers for Disease Control publication Preventing Lead Poisoning in Young Children (1985). These reports provide summary reviews of the scientific literature on lead. The ATSDR report

references publications through 1987. Additional studies published since then have identified significant differences in classroom performance and IQ. test scores at lower levels of lead absorption and have reinforced the need for prevention of these long-term effects by reducing exposure to lead.

The ATSDR report identified paint lead as the most important source of lead exposure and soil and dust lead as second in magnitude of potential exposure, affecting 5.9 to 11.7 million children annually. Lead in soil derives from exterior house paint and air deposition. This report ranked the Minneapolis/St. Paul area 12th in the nation in the number of children under five years old who live in housing built before 1950. Lead in soil and dust are both results of abrasive blasting of lead paint. In the manner that it regulates this activity, the proposed rule is needed to reduce lead concentrations, and the attendant adverse effects on human health in both of these media of lead exposure.

Two other states have regulated abrasive blasting of lead paint in their regulation of lead paint removal. Maryland prohibits open abrasive blasting and allows the use of vacuum blasting of exterior walls [Procedures for Abating Lead-Containing Substances from Buildings, COMAR 26.02.06.03 (1988)]. Massachusetts prohibits dry abrasive blasting, but allows the use of vacuum blasting of exterior walls or abrasive blasting with a "wet-misting technique" [Lead Poisoning Prevention and Control, 105 CMR 460.120 (C)(5) and (D)(2)]. In Massachusetts abrasive blasting was first regulated by emergency rule in July, 1988; permanent rules took effect in June 1989. In addition, Connecticut has issued a draft guidance document for lead abatement which is to used in conjunction with Lead Abatement Regulations, 19a-111-1 through 19a-111-11.

These guidelines allow lead paint removal from exterior surfaces by abrasive blasting only with "a vacuum arrangement". These states have recognized the need to reduce the contamination that unregulated abrasive blasting can cause.

There are two factors that indicate the need for regulating the removal of exterior lead paint by abrasive blasting in Minnesota. It is estimated by building inspectors in Minneapolis and St. Paul health departments that half of the houses in the Twin Cities metropolitan area are structures with wood siding built before 1960. Of these approximately half have walls that have not been covered with vinyl, steel, or aluminum siding. For example, in St. Paul, a city with about 150,000 residential structures, there are as many as 37,500 houses that have lead paint on exterior wood siding. This number would include those houses where such paint has already been removed. Stucco and brick structures can also bear lead paint. There is then a large proportion of the housing stock in the state that bears exterior lead paint. When one house can bear several hundred pounds of lead paint, the magnitude of the risk to the public health when these coatings are removed is significant, if this paint is simply transferred from the house exterior to the soil and surrounding area. This can happen with any method of paint removal if containment and preventive measures are not used. By comparison with manual methods of paint removal, abrasive blasting breaks the paint up into smaller particles and dissipates these over a larger area. For these reasons abrasive blasting can cause significant lead contamination.

The second factor is the incidence of sandblasting of house exteriors in the State. One company recently advertised that it sandblasted "over 65 houses" in a single year. By comparison, the sandblasting companies who responded to the survey conducted by Agency staff in 1986 reported a total of 176 to 186 painted houses sandblasted in the six year period of 1980 to 1985,

59 houses sandblasted in 1985, and they anticipated sandblasting a total of 89 to 91 houses in 1986. "Painted houses" in the questionnaire did not include stucco structures, but only wood and brick walls. At least one contractor admitted, however, that the figures provided were less than actual numbers. There is a relatively large proportion of lead-painted housing in Minnesota and a significant amount of abrasive blasting to remove both lead paint and other coatings from different buildings. The magnitude of this problem can be partly measured by the knowledge of the effects of lead on human health, discussed previously, and the quantities of lead paint on residential structures throughout the State. Regulation of abrasive blasting is needed to control and abate the pollution that results from this practice.

A study was conducted in 1987 to test the provisions of the staff recommendations that were developed following the initial study of the effects of sandblasting of lead paint on contamination of soil. In this second study contractors were asked to remove the paint according to the provisions of the recommendations. Soil lead data collected at three houses that were abrasive blasted was compared with that from the six properties that comprised the initial field study. The increments of lead added to the soil at the control and the test houses were compared by analysis of covariance. There was a significant difference in the amount of lead added to the soil using the F-test ($p > 0.0355$). Nevertheless, inadequate containment and cleanup was apparent on parts of these properties and substantial contamination of foundation soils was measured. Continual surveillance by Agency staff that would have assured a more complete test of the efficacy of the provisions of the recommendations was not possible. Staff believe that more careful application of the provisions of the recommendations by the contractor would have resulted in much less contamination of these properties and an even greater difference between the

two sets of data. Staff further believe that, in general, there has not been good compliance with the recommendations among abrasive blasting contractors since then. A number of factors, including the additional cost of proper containment and cleanup, and unfair competition between contractors that do relatively "clean" jobs and those operators who are less careful, act to prevent self-regulation by the industry.

Because recommendations do not have the force of law, it has been necessary in the past to cite State rules regarding air emissions and the interim soil lead standard in order to promote conformity to their provisions. Staff are persuaded that the widespread presence of exterior lead paint on homes in Minnesota and the very serious health and environmental effects of lead exposure require regulation of abrasive blasting when applied in exterior lead paint removal. Recommendations are not adequate to protect soil and housedusts from lead contamination because they do not, in themselves, require compliance by contractors, and they are not enforceable by the MPCA.

IV. STATEMENT OF REASONABLENESS

The Agency is required by Minn. Stat., ch. 14 to make an affirmative presentation of facts establishing the reasonableness of the proposed rules. Reasonableness is the opposite of arbitrariness and capriciousness. It means that there is a rational basis for the Agency's proposed action. The reasonableness of the proposed rules is discussed below.

A. Reasonableness of the Rules as a Whole

The rules as proposed incorporate provisions to prevent lead contamination of both soil and household interiors. The rules require the use of both curtains and ground cover to prevent the dispersal and the deposition of lead

paint particles. House interiors are protected by provisions that require complete sealing of openings to the outside of both the primary structure and neighboring buildings in order to prevent infiltration of lead particulate into residences. Finally, the rules require cleanup of all visible deposits of waste material and proper removal and transport such as to prevent further contamination.

A field study was conducted by Agency staff in the summer of 1987 to test the effect of implementing the provisions of the "Minnesota Pollution Control Agency Staff Recommendations for Sandblasting of Lead-Painted Residential Buildings". The provisions of the proposed rule are derived from these recommendations. As described above, there was a significant difference when these lead concentrations were compared to those in the original study. Despite the fact that conformity to the recommended procedures was somewhat lacking and contamination did occur, the containment and cleanup provisions were demonstrated to reduce soil contamination. It is expected, therefore, that careful implementation of these provisions will be effective in preventing contamination of soil by lead paint.

The proposed rule is directed at preventing contamination of residential, child care, and school properties by lead paint particles as a consequence of dry abrasive blasting. It addresses other methods of abrasive blasting as it provides lesser requirements of containment for vacuum blasting and modified-wet abrasive blasting and it prohibits wet abrasive blasting. The proposed rule allows the contractor to use containment by ground cover and curtains and to use alternative methods of paint removal by abrasive blasting. In order not to discourage the implementation of improvements in current methods and technology, the rule provides that procedures of removal by abrasive blasting and containment that achieve equivalent measures of pollution

control are acceptable if approved in advance by the Agency Commissioner. It is quite likely that current methods and technology may be supplanted by improved applications or equipment.

The rule, as it is proposed, does not prohibit conventional dry abrasive blasting, which is customary among contractors in the State who remove lead paint from the buildings specified. Rather, it requires the use of minimum containment with abrasive blasting and the use of additional containment under circumstances where contamination is more likely. These amounts of containment are more than is customarily used. In addition, it requires thorough cleanup and removal of waste materials to prevent human exposure and to prevent additional contamination of the environment.

As discussed above, this rulemaking is largely based on data collected in the field. Furthermore, the effectiveness of certain of the provisions of the rule has been demonstrated. There has been an effort made to involve the abrasive blasting industry in the course of this investigation and the subsequent rule review process. Information was first obtained by large-distribution questionnaire. Further contact by meetings and in correspondence apprised industry members of our activity and obtained the participation of a number of companies. Subsequent mailings to contractors communicated both our concern for careful practices of lead paint removal and solicited their cooperation.

The intent of the proposed rule is the prevention of lead contamination and subsequent lead exposure and absorption. For abrasive blasting of lead paint to continue on residences, child care, and school buildings without the restrictions embodied in the proposed rule presents a significant risk of immediate or persistent exposure to lead paint particles and serious and long term health effects, particularly for children. The proposed rule will produce long-term benefit in reducing deleterious effects to the public health.

B. Reasonableness of Individual Rules

The following discussion addresses the specific provisions of the proposed rules.

Part 7005.6010, Applicability

This part states that the parts of these rules establish the procedures that a contractor shall follow to test for lead paint prior to abrasive blasting and to remove lead paint by abrasive blasting of the exterior walls of a residential, child care, or school building, or of any building within 100 feet of such buildings or a playground. It is reasonable to state the activities to which this rule applies, so that a person will know if he or she is subject to its provisions. It is reasonable to apply these rules to ~~abrasive blasting of lead paint on these specific buildings and to abrasive~~ abrasive blasting of lead paint within 100 feet of these buildings or a playground in order to protect both interior and exterior components of residential, child care, and school property from lead contamination. The purpose of these rules is to prevent exposure of both adults and children to lead paint dust, but especially children. The distance of 100 feet is reasonable because lead particles have been measured by air sampling at this distance from uncontained dry abrasive blasting of lead paint. This requirement will therefore protect children from lead contamination from abrasive blasting near the locations most likely to be used by children. Such a distance is considered to be protective in most cases and is applied only if the contracted structure itself is not used for human habitation or for occupation by children.

Part 7005.6020, Definitions

Subpart 1. Scope. This subpart states that the definitions set forth in

this part apply only to these proposed rules. It is reasonable to specifically state to which rules these definitions apply, so that persons interpreting the rules may ascertain their meaning and avoid confusion with other definitions set forth in the air pollution control rules.

Subpart 2. "**Abrasive blasting**" is defined as the use of air pressure and an abrasive grit to remove surface coatings. This definition is reasonable because it identifies the methods of paint removal subject to the requirements of this rule and distinguishes these methods of paint removal from other methods of paint removal that are not regulated by this rule.

Subpart 3. "**Acid extraction**" is defined as laboratory analysis of lead concentration according to Method 3050 as described in U.S. EPA publication SW-846. This definition is reasonable because it describes a generally accepted and uniform test method for analysis of lead in exterior building coatings and distinguishes this method of analysis from other methods of analysis that may be used under these rules.

Subpart 4. "**Child care building**" is defined as a building that incorporates a place where children are cared for or supervised at any time of the day or year. It is reasonable to define this term because this is one of the structures for which abrasive blasting is regulated by the rule. It is also reasonable to define this term in order to specify the factors of daily and seasonal use of child care activity and to distinguish this building use from those buildings that are used as day-care facilities only.

Subpart 5. "**Commissioner**" is defined as the commissioner of the Minnesota Pollution Control Agency. It is reasonable to define this term in order to distinguish this office from the commissioners of other agencies and departments in the State, to identify the individual to whom regulated parties

should direct notices required by this rule, and to identify the individual to whom regulated parties should apply to gain approval of alternative test, removal, and containment methods available pursuant to the rule.

Subpart 6. "Contractor" is defined as a person or an organization who, for financial gain, directly performs abrasive blasting or causes abrasive blasting to be performed. It is reasonable to define this term in order to identify the persons or entities responsible for implementing the requirements of this rule.

Subpart 7. "Lead paint" is defined as a coating that contains 0.5% total lead or more as determined by acid extraction or X-ray fluorescence (XRF) laboratory analyzer, or 1 mg/cm² lead or more as determined by XRF hand-held analyzer, or that causes a positive reaction with sodium sulfide solution. It is reasonable to define this term to specify the concentration of lead in a coating required to initiate the notification, containment, and cleanup requirements of this rule. The numerical values of these standards for lead in exterior paint are reasonable because they are generally considered to be low enough to protect public health, but not so low as to incur expense that is unnecessary to achieve this purpose. These standards are considered to be both necessary and sufficient, whereas the use of detection limits, for example, or the present federal standard for lead in house paint of 0.06% would be unreasonable. In addition, these standards conform to standards for lead in paint found in local ordinances and to the standards in the lead paint abatement rules proposed by the Minnesota Dept. of Health. These standards are also found in state rules and local ordinances around the United States.

Subpart 8. "Modified-wet abrasive blasting" is defined as abrasive blasting with the addition of a minimum quantity of water to the air abrasive stream such that dispersal of particulate matter is suppressed with little or no

adherence of waste material to the substrate. It is reasonable to define this term to specify a method of paint removal that may be used as an alternative to open dry abrasive blasting in the where additional containment is required that are conditions specified in part 7005.6050, subpart 4, and in order to distinguish this method of abrasive blasting from other methods such as wet abrasive blasting.

Subpart 9. "Playground" is defined as an area designated for children's play including a school playground, a child care playground, a play area of a public park, or an area that contains permanent play equipment. It is reasonable to define this term because this is an area whereby abrasive blasting within a proximity of 100 feet is regulated by the rule.

Subpart 10. "Residential building" is defined as a single family or multi-unit building that is used or intended for human habitation, including every other structure located within the same lot. It is reasonable to define this term because this is one of the structures for which abrasive blasting is regulated by the rule.

Subpart 11. "School building" is defined as a building in which is located a public school, as defined in Minnesota Statutes section 120.05, or a nonpublic school, church, or religious organization, or home-school in which a child is provided instruction in compliance with Minnesota Statutes sections 120.101 and 120.102. It is reasonable to define this term because this is one of the structures for which abrasive blasting is regulated by the rule.

Subpart 12. "Sodium sulfide" is defined as a 6 to 8 percent solution of Na_2S compound in water that reacts with lead at concentrations greater than 1.0%. It is reasonable to define this term because the use of this reagent is listed as an acceptable test method for lead in paint. Because it degrades with exposure to both heat and to light, it is necessary to state that the solution used is reactive.

Subpart 13. "Total lead" is defined as the concentration of lead in paint determined by acid extraction or by XRF laboratory analyzer. It is reasonable to define this term in order to distinguish this measure of lead concentration from other measures of lead concentration that are used in this rule.

Subpart 14. "Vacuum blasting" is defined as dry abrasive blasting where the blast nozzle is surrounded by a chamber under negative air pressure that is held against the coated surface. It is reasonable to define this term to specify a method of paint removal that may be used as an alternative to dry abrasive blasting in the conditions specified for additional containment in part 7005.6050, subpart 4; to specify the removal method that may be used to reuse abrasive grit in part 7005.6070, subpart 2, and which is exempt from some of the notification and containment requirements of the rule in part 7005.6080; and to distinguish this method of abrasive blasting from other methods of paint removal.

Subpart 15. "X-ray fluorescence analyzer" is defined as a hand-held portable instrument or a desktop laboratory instrument that measures lead concentration by inflorescence of lead atoms. It is reasonable to define this term because this is one of the methods to analyze lead in paint allowed by the rule and to distinguish this analysis of lead concentration from other measures of lead concentration.

Part 7005.6030, Testing

Subpart 1. This subpart states that the contractor shall test paint for lead concentration before using abrasive blasting to remove paint from the exterior of a residential, child care, or school building, or from any building within 100 feet of such a building or a playground. This is reasonable because of the need to prevent contamination of these properties with lead paint

particles if lead paint is removed by abrasive blasting and testing of the paint coatings is needed to determine if lead paint is present. The test results will determine if the notice, containment, and cleanup requirements of this rule will apply to the use of abrasive blasting.

Subpart 2. This subpart states that the contractor shall test all layers of paint on surfaces from which paint is to be removed including the paint on any addition to the structure or of any separate structure, and the paint of each surface that has been painted or repainted at different times or with different paints. This is reasonable because it is necessary to obtain samples of paint that are representative of all of the coatings to be removed on each structure, to assure either that no lead paint is present on any surface to be abrasive blasted or that protective procedures set forth in the rule are utilized. The rule therefore requires that all layers of paint on each surface that has been painted at different times or with different paints, as well as on separate structures or additions, is tested so that the protective procedures of this rule will be used to contain lead particles removed from any surface that bears lead paint.

Subpart 3. This subpart states that the contractor shall analyze the paint samples for lead concentration, cites the methods that may be used for this analysis, and describes the conditions under which these methods may be used. This is reasonable because it is necessary to specify which methods are acceptable measures of lead in paint and to establish uniform conditions of use of these methods.

Item A. This item states that the contractor shall analyze for total lead using paint samples that contain equal surface areas of all the coatings of the surface that is tested, if acid extraction is used as the method of analysis. This is reasonable because it is important to include at least as much primer

coat as mid and top coats in the sample in order for it to be representative, because primer paint usually contains more lead than the other coats. If there is lead in the paint that is removed, there is usually lead in the primer coat. Use of smaller areas of some layers than of other layers, particularly of the primer layer, would cause inaccurate analysis of total lead concentration in the paint from that surface.

Item B. This item states that the contractor shall use the mean value of at least five separate measurements per surface, if a hand-held XRF analyzer is used as the method of analysis. This is reasonable because readings are easy to obtain with this instrument, and the instrument has some variability in the precision of its readings. Therefore, the mean of five measurements will provide a more accurate result and will reduce the effect of any one reading that is not precise that might be obtained. In addition, this item states that the contractor shall analyze for total lead using paint samples that contain equal surface areas of all the coatings of the surface that is tested, if a laboratory XRF analyzer is used as the method of analysis. This is reasonable because it is important to determine lead concentration from representative samples for the reasons stated in item A for acid extraction analysis.

Item C. This item states that if a negative test result is obtained when sodium sulfide is used as the method of analysis on a sample from a surface painted before 1978, then the contractor shall confirm the absence of lead paint by testing a sample with either acid extraction analysis or XRF analysis. This is reasonable because sodium sulfide indicates a visible reaction with lead only at concentrations above about one percent. False negative tests at concentrations of lead in paint between 0.5% and 1.0% will result because the solution is reported to not detect lead concentrations below 1.0%. Nonetheless, it is reasonable to allow the use of sodium sulfide as a test

method because it provides a simple and economical test, results are obtained very quickly, and positive results verify the presence of lead paint and remove the need for further testing. Also, if there is more than 0.5% lead in paint on a structure, it is very likely that there is more than 1.0% lead concentration in that paint. Sodium sulfide differs from the other tests for lead in paint in that it tests individual coatings of paint rather than measuring the concentration of lead for all the coatings of paint combined in one sample. For a relatively small number of structures, this might cause the paint to be classified as lead paint whereas, with other methods, the use of all coatings may reduce the concentration to less than 0.5%. This discrepancy can be removed by the contractor, however, by verifying test results with acid extraction or XRF analysis if it is suspected that the total lead concentration of the entire sample is less than 0.5%. Because of the Consumer Product Safety Commission regulation prohibiting lead in household paints in 1978, structures painted after that date would generally have little or no lead in the exterior coatings, and a second test is not necessary.

Item D. This item states that the contractor may test for lead concentration using an analysis method not listed in items A through C above only if the commissioner approves the analysis method in writing prior to its use. It further states that the commissioner shall approve an analysis method if the commissioner finds that the precision and accuracy of the method is comparable to the methods in items A and B. It is reasonable to allow for the use of alternative methods of analysis that may be less costly or provide faster results if such methods are adequate to properly characterize the concentration of lead in paint. Such methods may be developed due to the concern for removal of lead paint, which is predicated on the identification of lead concentrations in paint. Analytical methods developed for other purposes

might also be applied to analysis of lead in paint. It is reasonable to allow alternate test methods to be used, so long as they provide results that are as reliable as the methods listed in the rule. This item provides for such use.

Subpart 4. This subpart states that the contractor shall provide a copy of the test results to the building owner or administrator and the adult residents, to the commissioner, and shall retain a copy of the test results for a period of at least five years. This is reasonable because it is important to provide a written record of the lead concentration of the exterior coatings to the property owner or the school administrator and the residents to assure that they are informed of this condition so that they can take appropriate preventative steps. It is reasonable to require the contractor to send the test results also to the commissioner and to retain these records to verify compliance with these rules.

Subpart 5. This subpart states that a contractor may elect to conduct abrasive blasting of a residential, child care, or school building, or of any building within 100 feet of such a building or a playground, without testing to determine the presence and concentration of lead in paint only if the contractor treats the paint as lead paint, so states in the notice, and complies with all other parts of this rule. In this case the contractor shall consider the paint to be lead paint and, in complying with all other parts of this rule, shall make this statement in the notice of part 7005.6040. This exemption is reasonable because the contractor has decided to implement the same measures of pollution control that are set forth in this rule for lead paint whether lead paint is present or not present. It is not necessary to verify the presence and concentration of lead in paint in order to remove the paint in a manner that does not contaminate property. By declining to test the paint, the contractor assumes a responsibility to remove all the paint on that

structure as if it were lead paint. The costs that this may add to the process, where lead paint is not in fact present, will depend on the kind and degree of containment that is necessary and this may be significant. Nevertheless, in some cases, a coating may be judged to be lead paint with a high level of certainty, based on factors of known age and appearance, and testing would then not be needed.

Part 7005.6040, Notification

Subparts 1 and 2. These subparts state that, at least five days before abrasive blasting begins, the contractor shall provide written notice to both the owner or administrator and the adult residents of the building to be abrasive blasted, and the residents or the administrator of any buildings within 50 feet of this building, of the presence of lead paint on the structure, of the days and hours during which abrasive blasting is anticipated, and of the precautions listed in subpart 2, items A, B, C, and D. It is reasonable to notify both the building owner or administrator and the residents of the building and of neighboring buildings because they are the parties most affected by the presence and the removal of lead paint and the parties who can see that the precautions listed in subpart 2 are taken. It is reasonable to notify at least five days prior to abrasive blasting to allow the owner or administrator and the residents to plan for the abrasive blasting and to take the measures listed in items A, B, C, and D. It is reasonable to notify adult residents of buildings within 50 feet of the primary building of the times of abrasive blasting and to take the prevention measures listed in items A, B, C, and D because these measures are relatively simple yet they can prevent significant exposure problems.

Although studies by Agency staff and by Dr. Spittler as well as those conducted in New Zealand show that most deposition of lead paint particles on soil occurs within 40 feet of the walls that are abrasive blasted without vertical containment or windspeed limitation, the use of the pollution control provisions contained in part 7005.6050 and the use of a distance of 50 feet in this subpart will help to protect neighboring property from the dispersal and contamination of smaller size lead paint particles.

Items A and C. These items state that the residents, administrator, and owner shall be advised to close doors, windows, and storm windows and to turn off and to cover air conditioners on the walls to be abrasive blasted and the adjoining walls or on the walls that face the primary structure and the adjoining walls. This is reasonable because closing openings to the outside and covering air conditioning units are simple but effective ways to protect the interior of the residence from infiltration of lead paint particles. It is important to inform the residents not to use air conditioning window units during abrasive blasting because to do so could blow small particle lead into the residence. Because many windows can only be effectively closed from the inside and so could not be closed by the contractor, it is reasonable to ask residents to do this.

Item B. This item states that the owner, administrator, or adult residents of the neighboring building shall be advised to completely seal from the outside with adhesive tape the outermost window or storm window to the window frame and the outermost door or storm door to the door frame and other openings to the exterior on the walls facing the structure to be abrasive blasted and the walls that adjoin these walls. The distance within which this prevention would be conducted is 50 feet from the building to be abrasive blasted.

It is reasonable to advise the owner of rental property or of a child care center, or the administrator of a school, or the adult residents who are homeowners or renters, to seal the windows and doors and other openings on the walls of the neighboring building because, in most cases, these measures are neither costly nor time consuming and these parties will have a large interest in protecting the interior of these buildings from lead contamination. In addition, the contractor would want to obtain permission from these parties in order to conduct the sealing of openings to the exterior and the notice will inform these parties why this is needed. As provided in part 7005.6050, the contractor is required to seal these parts if it is not done by the parties cited. It is reasonable to seal the walls that face the abrasive blasting and the walls that adjoin these walls because these are in closest proximity and the most subject to infiltration of paint particles. It is not required to seal all walls of the neighboring structures because the opposite wall, farthest from the contracted building, would not receive visible deposits and because the containment provisions in part 7005.6050 prohibit visible emissions to this distance. The reason for sealing the doors to the door frames and the windows to the window frames is to cover the space between these components where infiltration is likely. The reason for specifying that the tape be applied from the outside rather than the inside of the door or window is to prevent contamination of the window frame or inside window well or of the door frame or door sill from where the lead particles can be easily transported into the residence.

Item D. This item states that the residents shall be advised to remove all children's toys and play equipment and all pets and their houses and food and water bowls from the premises near the building or from property adjacent to the primary property, or to cover play equipment that cannot be moved. This is

reasonable because these are simple ways to prevent exposure of children by deposition of paint particles on toys and play equipment and exposure of domestic animals by inhalation or ingestion or by deposition in living space.

Subparts 1 and 3. These subparts require that the contractor notify the commissioner, at least five days before abrasive blasting begins, of the items listed in subpart 3 (location and description of building, the scheduled time of abrasive blasting, test results, name and address of contractor, etc.). It is reasonable to require notice of these items to the commissioner because without such notice, the commissioner will only be informed of abrasive blasting incidents by complaints received, will not know where abrasive blasting is being conducted, and therefore will not be able to conduct inspections to verify compliance with these rules.

Part 7005.6050, Containment

Subpart 1. This subpart states that the contractor shall apply containment, using the methods required by this part, before using abrasive blasting to remove a coating of lead paint from the exterior of a residential, child care, or school building, or from any building within 100 feet of such a building or a playground. This is reasonable because of the need to prevent contamination of the property with lead paint particles if lead paint is removed by abrasive blasting. Neither abrasive blasting nor any other method of removal should be used as a means of removing lead paint from the exterior walls and transferring it to the soil or to other components of the property where it can cause increased exposure of residents, children, or students to lead.

The purpose of containment is to prevent contamination, and it is a more effective method of protecting the property than cleanup that is conducted following abrasive blasting that is unconfined. For example, the use of an

impermeable tarpaulin, that has no holes and that is weighted along the edges, will protect the underlying soil from any contamination from abrasive blasting of lead paint. If this soil, however, were contaminated by lead-containing particles, either by not being protected by ground cover or by the careless use or handling of ground cover during any time in the course of paint removal or following paint removal, then the only recourse to restore this soil to the condition prior to abrasive blasting is to either vacuum the surface of the soil or to remove the surface soil. Only the most thorough cleanup can achieve the level of cleanliness provided by containment. For this reason, containment that is used to protect both the interior and exterior of the property is also less costly than the cleanup that would be necessary, following unconfined abrasive blasting, in order to achieve the level of cleanliness comparable to that provided by containment. The proposed rule requires both containment during abrasive blasting and cleanup after abrasive blasting to assure that any material that is not collected by the containment is not allowed to remain in the environment.

By comparison to other methods of removal of exterior lead paint, abrasive blasting removes all the lead paint from the walls of the house. This is important for consideration of issues of public health and exposure to lead paint. This rule does not propose to prohibit the use of abrasive blasting to remove lead paint, but it does prescribe methods of containment and cleanup that, if carefully implemented, should be effective in preventing the contamination of the property. Without any containment, the effect of dry abrasive blasting is to transform surfaces of paint that are largely intact into pieces of paint of various size distribution and to transfer these to the surrounding area. When a residence, child care, or school building is abrasive blasted, some of these smaller particles can directly enter the building if

measures are not taken to prevent this. Without the use of ground cover, serious contamination of a large area of soil will result. This presents both a direct risk to the health of those children that play outdoors and a permanent store of lead paint dust that can be transported into the residence, child care, or school building. In these places such particles can cause chronic exposure to children who, by their behavior, are subject to significant ingestion and, by their physiology, are subject to greater absorption and to greater injury than older persons. Indoor contamination by small particulate is very difficult to remove and decontamination can be very expensive.

This subpart also states that alternative methods of removal by abrasive blasting or of containment that are demonstrated to be of equivalent or greater effect in preventing contamination of soil or housedust are acceptable as alternatives to the methods cited in this part, if they are first approved in writing by the Commissioner. This is reasonable because development and application of new methods or technology or new application of existing methods or technology will occur in this industry due to increasing concern about lead in the environment and due to federal, state, and local regulation. Those applications that achieve the desired effect of pollution prevention should not be prevented by this rule nor should this rule be an impediment to the development, implementation, and evaluation of the efficacy of such applications. This is also reasonable because certain unique circumstances may prevent use of all methods required by this part, and alternatives may need to be implemented for unique situations. This proposed rule places the burden on the contractor to show that alternative methods are equivalent to the procedures set forth in the rule, as required by Minn. Stat. § 144.878, subd. 3 (1990). It is reasonable that departures from the methods set forth in the rule be justified by the person requesting the departure.

Total containment or total enclosure during abrasive blasting is not required by this rule. These terms would require careful definition and, in the steel structures industry, this is done in terms of percent "containment efficiency". To establish performance standards for percentage containment efficiency would be cumbersome to both the contractor and regulator alike, because it would require measurement of numerical values and significant commitment of time. More important, in terms of public health, is the effect that total containment or total enclosure would have in terms of property contamination. If total enclosure were implemented, it would mean that an enclosure to confine the work area would be erected next to the wall of the building. This enclosed space would have three walls and, as the fourth side, the wall of the house itself. To conduct abrasive blasting in such an enclosure would have two effects. Abrasive blasting of painted surfaces is usually done at a blast pressure of about 100 psi. The increased air pressure that would result in this space would force air into the walls of house (especially walls of wood siding) and through any openings into the living space. This air would carry small particles of lead paint. The second and related function of such a method of containment would be to greatly increase the concentration of lead particulate in the air of the enclosed space, so that the infiltration and contamination of the interior of the building would be exacerbated. If the top of this enclosure were also covered, both the air pressure and the concentration of particulate matter would increase. If the top were left open, the dispersal of contaminated material to the property outside the enclosure would increase somewhat with the increased elevation of the point of release for areas of the lower wall that is abrasive blasted. It is most important, to protect resident children from lead absorption, that the surfaces inside the home not be contaminated with lead paint dust.

Subpart 2. This subpart states that the contractor shall fully close and completely seal from the outside with adhesive tape the outermost window or storm window to the window frame, the outermost door or storm door to the door frame, and other openings to the exterior on the wall to be abrasive blasted and the two adjoining walls, before abrasive blasting begins, if the building is a residential, child care, or school building. Further, the contractor shall cover and seal the air conditioning units with impervious plastic. It is reasonable to close and seal openings to the outside in order to protect the interior of the residential, child care, or school building from infiltration of lead paint particles that contaminate housedust and present long-term risk of lead exposure to residents and children. If window air conditioner units are contaminated with lead paint particles, they will blow the small particles into the residence, child care, or school building.

This subpart further states that before abrasive blasting begins the contractor shall fully close and completely seal from the outside with adhesive tape those same openings to the outside, and the air conditioning units, of any wall and the adjoining walls of a neighboring residential, child care, or school building that is within a distance of a wall to be abrasive blasted that is less than the distance of ground cover required by subpart 3. These distances are 25 feet for a one story building, 35 feet for a two story building, 45 feet for a three story structure, and so on. It is reasonable to apply the distance of ground cover to the requirement for sealing neighboring buildings because this distance is also used as the standard for implementing additional containment to prevent wind dispersion in subpart 4. If a neighboring building is within this distance, therefore, it is reasonable to require that it be sealed in order to prevent the contamination by smaller paint particles that may disperse to this distance. Dispersal of visible emissions beyond this distance is prohibited by subpart 4.

In part 7005.6040, the contractor is required to advise in writing the owner, administrator, or adult residents of a neighboring building within 50 feet of a structure to be abrasive blasted to close and seal windows and doors and openings to the exterior. It is reasonable to require the contractor to protect the neighboring property from the consequences of paint removal activity, if this is not done by the neighboring parties, because of the importance of preventing contamination of households with lead paint dust. If the owner, administrator, or resident has sealed the listed openings, it is reasonable to not require the contractor to duplicate this effort.

Subpart 3. This subpart states that the contractor shall cover the ground beneath the wall to be abrasive blasted with impermeable tarpaulins before abrasive blasting begins and that these shall be laid as close as possible to the building foundation and shall overlap by at least 1-1/2 feet. This subpart further states that for a one story building, the contractor shall cover the ground to a distance at least 25 feet in all directions of the point of blasting, including the ground below each adjoining wall, and that ten feet in tarpaulin cover shall be added for each story above the first floor. Lastly, this subpart states that the contractor shall anchor the tarpaulins at the foundation and along the overlapping edges to prevent separation.

It is reasonable to require that the soil be protected from contamination by lead paint particles to protect children from long-term exposure due to direct contact with the paint particles and to prevent contamination of the household interior by movement from the exterior soil surfaces into the residence. Complete covering with impermeable ground cover is the most effective way of protecting the soil and it requires less time than cleanup of these unprotected surfaces. The provisions of overlap and anchoring of the ground covers are simple but effective measures to prevent contamination

between the tarpaulins and along the foundation of the structure where the blast pressure on the lower walls causes displacement of unweighted covers. The minimum distance of 25 feet of ground cover is derived from the MPCA study of soil contamination due to abrasive blasting of lead paint (exh. 1). In that study, it was found that the greatest increments of lead added to soil were nearest the walls of the house and that the concentrations declined rapidly with distance from the house. Measures of lead in air or in abrasive dust deposited on vegetation or the soil surface were not part of this study however. Air samples and measurements of deposition on clean soil were part of Dr. Spittler's study, however, which did find some concentrations of lead in the air at a distance of about 40 feet when uncontained dry abrasive blasting was used. The distances of ground cover that are required are to contain deposits from such dispersal. Because dispersal increases with height, it is reasonable to require additional ground cover for higher structures to provide equivalent protection where the upper walls of the building are abrasive blasted. The minimum distance of 25 feet is the same distance used in the MPCA staff recommendations, but the addition of ten feet per story without limit is greater than the added distance of five feet per story to a maximum of 40 feet that is cited in the staff recommendations.

Subpart 4. This subpart states that if dispersal or deposition of visible particulate matter occurs beyond the ground cover, then the contractor shall immediately cease abrasive blasting until the contractor either adds additional ground cover or uses a curtain or curtains or other containment to reduce the distance of visible particle dispersal to equal the distance of the ground covers, or unless modified-wet abrasive blasting or vacuum blasting is used to remove the lead paint. Either visible emissions in the air or visible deposits on the ground at a distance from the source greater than the distance of the

ground cover are sufficient to indicate the need for additional containment, or the need to use modified-wet abrasive or vacuum blasting, or the need to not begin or to cease abrasive blasting.

The need for additional containment will be due to the effects of windspeed and wind direction. It is reasonable to require the use of additional ground cover and the use of curtains to restrict the dispersal of lead paint particles where windspeed and wind direction increase the dispersal of these particles. As reported above, large increases of lead were found to be added to soil near the walls of houses that were abrasive blasted. Relatively small amounts were measured at distances beyond 25 feet. In many cases, the soil near the foundations was significantly contaminated with lead before abrasive blasting began, apparently due to the erosion of the wall paint over time. In a number of cases, visible paint particles were found in these soils. Contaminated foundation soils and the attribution of this phenomenon to exterior lead paint are also reported in the literature. However, it is not necessary to add to this concentration of lead when the paint is removed from the walls and it is desirable that no increment of lead be added to the soil by this process. Visible amounts of dust are dispersed from residential abrasive blasting at distances that increase with air movement. Because the constituents of this dust have not been determined by particle size and origin, it is not known what amount of paint dust is present with the abrasive dust and the dust derived from the particular substrate. Nevertheless, one might expect the presence of some amount of paint particulate in this dust and this is documented by Spittler's study. The smallest particles of paint will disperse the farthest and there is substantial evidence in the literature that paint dust is a significant source of exposure to lead, especially for young children. In this case, the exposure pathway for this dust would be from

exterior paint to exterior soil to interior dust, with absorption by children from two sources, both directly, by ingestion of exterior paint particles and indirectly, by ingestion of contaminated household dust.

It is reasonable to allow the use of curtains either with minimum ground cover or with additional ground cover, as stated in this subpart, if their use achieves the purpose of restricting dispersal to the distance of the ground cover. Staff believe that the most effective use of curtains by the contractor would be to first position a curtain or curtains upwind of the work area and perpendicular to the direction of the wind followed, if necessary, by a second curtain on the downwind side of the work area, also perpendicular to the direction of the wind. The primary function of curtains is to act as a wind break to reduce the velocity of air movement in the work area. For this reason, the first use of curtains should be on the upwind side of the work area. This purpose would also be served by the use of additional curtains on the downwind side where dust that passes through the material will precipitate more readily. A second function of this type of containment is to act as a physical barrier to the movement of particles. It is reasonable to allow the use of permeable material as curtains because it serves the function of reducing dispersal but, because it provides less resistance to wind than impermeable material, it is easier to erect and maintain in place at effective height. The use of either impermeable or woven material for curtains will serve the purpose of containment but, if woven mesh is used, the larger dimension of the interstice should not be so great as to circumvent either of the functions of curtain use. For example, according to manufacturer's claims, material with the larger dimension of the interstice equal to one millimeter will reduce air movement by 65 to 70%. Fabric with interstices larger than this will have a reduced capability of physically impeding smaller particles.

The staff recommendations for abrasive blasting of residential structures from 1987 suggested that the curtains extend to a height four feet above the point of paint removal to achieve the best effect. Such specifications are not part of this rule. Rather the contractor is allowed the use of alternatives of different containment and methods of removal to best address the effects of windspeed and wind direction on the dispersal of lead paint particles, so long as the contractor uses one or more of the listed methods and the method or methods used has the result of preventing air emissions and deposits of particulate matter beyond the ground cover.

The use of modified-wet abrasive blasting or vacuum blasting is reasonable as methods of removal under the conditions of windspeed and wind direction of this subpart, because each method will reduce the dispersal of visible emissions. Modified-wet abrasive blasting is defined in part 7005.6020 as a method that performs in this manner. If one is not suppressing the dispersal of particulate matter, therefore, one is not using modified-wet abrasive blasting. Modified-wet abrasive blasting achieves this effect by the use of minimal amounts of water which add density and volume to the particles of different size. This method was part of the MPCA staff recommendations of 1987. Further discussion of this method of abrasive blasting is found in part 7005.6070 below. Vacuum blasting is discussed further in part 7005.6080.

7005.6060, Cleanup

Subpart 1. This subpart states that the contractor shall recover and remove all blasting debris (used abrasive; wood, brick, or stucco dust; and paint particles) at the end of each workday from the roof and the roof gutters while ground covers are in place beneath the gutters; from the ground covers in such a way as not to deposit any blasting debris on the ground; and from all soil,

grass, walkways, porches, patios, steps, outside window wells and door wells, shrub and flower beds, and any other places surrounding the building that was abrasive blasted and any neighboring building(s), so that no visible deposits remain. It is reasonable to require the daily removal of blasting debris in order to prevent dispersal of debris when the site is unattended, and to prevent exposure to children who may enter the area after the work shift or on weekends.

It is reasonable to require the daily removal of all blasting debris from the roof and the roof gutters to prevent this material from being washed off the roof and carried to the soil by rain. The contractor may, of course, prevent this material from depositing on the roof and gutters by impermeable tarpaulins. In this case, compliance with this subpart would be met if these roof and gutter coverings were carefully rolled up or folded up each day, whether or not they remained on the roof. If such containment is not used, however, then these areas would require cleanup. If the contractor were to sweep the debris from the roof and sweep the material from the gutter down the drain pipe, the contractor would then have to empty the drain pipe. Ground cover in place will help to protect the property from contamination during this process. It is reasonable to require the daily removal of debris from the ground covers in a careful manner so that this material is not deposited on the ground after its deposition on the ground has first been prevented.

It is reasonable to require a thorough cleanup of all visible deposits of abrasive blasting debris from the primary property and neighboring property and to enumerate property components for cleanup because of the importance of removing all contamination caused by the removal of the lead paint. Specifically listing areas of the property will direct the attention of the contractor to those sites which, based on observation, are subject to serious

contamination. It is reasonable to state, however, that no visible deposits of blasting debris can remain in any place on either property in order to not exclude any areas of deposition from cleanup that are not listed and to encourage the careful and effective use of containment to prevent such contamination. As stated in part 7005.6050 above, containment is the most effective means of protecting property and, consequently, the public health. The amount of time and effort and money spent in cleanup will be inversely related to these amounts spent in prevention. Because it is more difficult to recover abrasive blasting particulate than to first contain it, the more containment is done, the more cost-effective the entire process of paint removal will be. Nevertheless, there will be an escape of some contaminated material and this material must be cleaned up.

Subpart 2. This subpart states that the contractor may remove the blasting debris by manual means or by vacuum, but shall not use an air pressure stream or a water stream which redistributes, but does not remove, the blasting debris. Air pressure can, however, be used to remove particles from exterior walls of both the primary property and the neighboring structures if the ground covers are in place and before the seals of adhesive tape are removed. It is reasonable to limit the use of air pressure in the cleanup because, although it can be used to redistribute deposits of contaminated material, it is only changing a heterogeneous pattern of distribution to a more uniform pattern of deposition by reentraining and precipitating the particulate matter. This does not constitute removal of contamination. Likewise, it is reasonable to prohibit the use of water streams to remove visible deposits. These will clean off hard surfaces by run-off but will only transport the contaminated material to soil. The manual use of a broom and a means of picking up the swept material is not prohibited, but vacuum removal is the most efficient method of

cleanup and may sometimes be the only means to remove all visible deposits to satisfy the requirements of subpart 1.

It is reasonable to allow air pressure cleaning of the walls only while ground cover remains beneath the walls and while the structure remains sealed because this material will be contained by these measures. These particles would interfere with the adhesion of new coatings applied to the primary structure and unless they are removed from this building and the neighboring buildings they will remain until wind or precipitation removes them to the soil. To use water to clean off these surfaces will contaminate the soil and containment of contaminated water is very difficult.

Subpart 3. This subpart states that the contractor shall remove and transport blasting debris from the property in such a way as to prevent any deposition of blasting debris on the property, the right-of-way, the walkway, or the roadway. It is reasonable to require the contractor to remove and transport the contaminated material that has been contained and recovered from the property so that this material does not escape and contaminate the private property or the public property over which it must be moved, defeating the purpose of the rule.

Subpart 4. This subpart states that the contractor shall dispose of the waste material from abrasive blasting as required by Minn. Rules chapter 7045 regarding hazardous waste or by Minn. Rules chapter 7035 regarding solid waste, whichever applies. The determination of the nature of the generated waste is the responsibility of the contractor, as is the final disposition of the waste material. As a waste material generated by a business, both testing and disposal are subject to state and federal waste disposal regulations.

7005.6070, Restrictions

Subpart 1. This subpart states that a contractor shall not use wet abrasive blasting to remove lead paint, but may use modified-wet abrasive blasting, if the contractor complies with all parts of this rule. It is reasonable not to allow a means of abrasive blasting with water for removal of lead paint, except as modified-wet abrasive blasting, because of the effect of larger amounts of water relative to the proportion of air and abrasive in the abrasive stream. These methods of abrasive blasting are generically known as "wet abrasive blasting" and their effect is to increase the potential for contamination of the property. Although the use of water does suppress the dispersal of dust in abrasive blasting, too much water causes the spent abrasive to adhere to the walls of the house, whatever the exterior type. There are two ways that this contaminated material can be removed. One can wash the walls with a water stream either while the material is wet or after it dries. This will cause serious soil contamination due either to run-off from the ground cover or direct deposition of the water on unprotected soil. To prevent this by containing the water would be very difficult and to clean up wet deposition on the soil would, in many cases, require removal of the soil surface. The second method would be to use manual brushing or air pressure to remove the material after it dries on the walls. According to Dr. Spittler, manual removal is very difficult and time consuming and reentrains a large amount of dust. Air pressure would more quickly remove the material from the walls, but would generate a greater amount of dust than would a manual method. Modified-wet abrasive blasting is defined in the rule and is the only method of water-added abrasive blasting allowed by the rule because it restricts the amount of water used to such an amount as will abate dust from abrasive

blasting, but will not cause abrasive material to adhere to the substrate. In addition, this restriction, which prohibits use of a larger volume of water will prevent direct contamination of soil by run-off from the ground covers or hard surfaces on the property.

Subpart 2. This subpart states that a contractor shall not reuse or recycle abrasive for abrasive blasting of lead paint unless the abrasive is cleaned prior to reuse by a dust collector that removes the lead paint particles or unless the abrasive is used only for vacuum blasting conducted as required in part 7005.6080. This restriction is reasonable because using again an abrasive that contains lead paint particles will cause those particles to be broken into smaller particles. Generally, the smaller the size of a particle, the more difficult it is to confine and recover the particle. This leads to ~~more contamination than that due to larger size paint particles.~~ The reduction in size to dust particles will promote both the infiltration by air and the physical transport of the lead paint that is removed, into the residence, school, or child care building where it can present a serious risk to children who occupy that building. It would not be reasonable, when all effort is directed at preventing contamination due to abrasive blasting of lead paint, to allow waste material which has been contained on ground cover to then again be "uncontained". A second reason for such a prohibition is that the reuse of a contaminated abrasive will cause a higher concentration of lead in the air as lead paint particles from both the substrate and the abrasive are entrained and distributed due to the air pressure and turbulence of abrasive blasting.

The exemption allowed for vacuum blasting is reasonable because this method is a "closed" system that separates the abrasive from the removed coating and that has no substantial emissions either from the workhead or from the dust collector and separator, when it is properly used. A method of cleaning the

abrasive by a dust collector that removes the lead paint particles achieves the same effect and is exempted from this prohibition. Allowing the reuse of either silica sand or the more costly and harder "recyclable" abrasives that are either cleaned or that are used for vacuum blasting will both reduce the cost of abrasive and significantly reduce the volume of generated waste and the cost of its disposal.

Subpart 3. This subpart states that the contractor shall make a reasonable effort to prevent children under the age of ten years from entering the area within 50 feet of abrasive blasting while it is occurring and until cleanup as required by part 7005.6060 is completed. It is reasonable to require the contractor to attempt to restrict access of children to 50 feet from abrasive blasting of lead paint while it is on-going in order to protect them from ~~exposure to lead paint particles from direct inhalation and from exposure by~~ primary and secondary ingestion of particles in the nose and mouth and those deposited on skin and clothing. The restriction of children to the area outside 50 feet of the walls that have been abrasive blasted, but before the completion of cleanup, is reasonable in order to prevent exposure by the secondary ingestion of deposited paint particles.

The restriction of access by children under the age of ten years is reasonable because children under the age of six are most susceptible to exposure and to the most serious health effects of lead absorption. The age-group of children between six and ten years old, though somewhat less at risk, are still subject to greater exposure and greater deleterious health effects than are older people. It is reasonable to require immediate cessation of abrasive blasting when a child comes within 50 feet of this activity, until the child leaves or is removed from the danger of exposure to lead contamination, in order to protect the child.

Subpart 4. This subpart states that the contractor shall post its name and telephone number in letters and numbers at least four inches high on a vehicle at the property or on a sign posted on the property from the commencement of abrasive blasting until completion of the contractor's work at the building. It is reasonable to require the contractor to identify itself by both name and telephone number on a sign or on a vehicle in order to readily identify the party responsible for the removal of lead paint. It is not customary for abrasive blasting contractors in the metropolitan areas of the state to post such information. Consequently it is more difficult for the public or for government officials to determine this information in order to initiate or respond to complaints. This provision will have the effect of encouraging the contractor to act responsibly and to be accountable for its activity. On the other hand, if the contractor complies with the requirements of this rule, there should be little incentive for it to desire anonymity in any part of the process of lead paint removal.

7005.6080, Vacuum blasting

Subpart 1. This subpart states that a contractor who uses vacuum blasting as the method of removing lead paint from all parts of the structure, and who does so by holding the workhead of the unit at all times against the substrate, and if all parts of the vacuum blasting equipment are in such condition as to prevent emissions of particulate matter, and if no other method of abrasive blasting is used, then this contractor is exempted, for that building only, from the requirements cited in subpart 2.

Subpart 2. This subpart states that contractors described in subpart 1 are exempt from the requirement in part 7005.6040 subpart 1, Notice required, and subpart 2, Contents of notice, of notifying the adult residents of any building within 50 feet of the building to be abrasive blasted, and is exempted from the requirements in part 7005.6050 subpart 1, Containment required, and subpart 4, additional containment required. In addition, the contractor is exempted from part 7005.6050 subpart 2, Sealing the residence, child care, or school building, except that portion of subpart 2 that requires sealing of the building that will be abrasive blasted, and the requirement of part 7005.6050 subpart 3, Ground cover, is reduced to a minimum of 15 feet in all directions of the point of blasting without increase according to the height of the structure.

These exemptions for vacuum blasting are reasonable because this method of abrasive blasting recaptures virtually all particles of paint and abrasive when the workhead is held in continuous contact with the substrate during blasting, when the brushes that contact the substrate are replaced before wear allows the escape of abrasive and paint particles from vacuum recovery, and if the dust collector, filters, and hoses are maintained in good condition. Although manufacturers of vacuum blasting equipment provide an assortment of configurations of brushes to fit different areas of paint removal, it is possible that the use of this method on wood shakes or on lap siding may allow a space to occur when paint is removed where the shakes meet or overlap or where the boards overlap that will cause some material to escape despite the maintenance of continuous contact with the substrate as required in this part. For this reason, and to prevent accidental loss of paint particles when contact is broken, it is reasonable to require sealing of the building on which vacuum blasting is being conducted, and a minimum area of ground cover below the work area of 15 feet in all directions of the point of blasting.

It is reasonable to not exempt vacuum blasting from part 7005.6060, Cleanup, because it is very important to remove all visible deposits of abrasive debris regardless of the method of paint removal that is employed. This part would apply, of course, to any deposits including accidental spills and discharges which may result from any method of removal.

V. SMALL BUSINESS CONSIDERATIONS IN RULEMAKING

Minn. Stat., section 14.115, subd. 2 (1990) requires the Agency, when proposing rules which affect small businesses, to consider the following methods for reducing the impact on small businesses:

- (a) the establishment of less stringent compliance or reporting requirements for small businesses;
- (b) the establishment of less stringent schedules or deadlines for compliance or reporting requirements for small businesses;
- (c) the consolidation or simplification of compliance or reporting requirements for small businesses;
- (d) the establishment of performance standards for small businesses to replace design or operational standards required in the rule; and
- (e) the exemption of small businesses from any or all requirements of the rule.

"Small business" means a business entity, including farming and other agricultural operations and its affiliates, that (a) is independently owned and operated, (b) is not dominant in its field, and (c) employs fewer than 50 full-time employees or has gross annual sales of less than \$4,000,000. Minn. Stat., section 14.115, subd. 1 (1990).

Abrasive blasting of residential structures in Minnesota is done by contractors or sub-contractors who are all small businesses, according to the above criteria. The proposed rule will therefore affect small businesses, but it will affect only small businesses. Although there are larger and smaller contractors in the abrasive blasting business, this rule will not impart competitive advantage to a company that is not a small business.

The only reporting requirements in the proposed rule are the notifications to the residents, owner, or administrator of the building, and to the commissioner. There are no schedules of compliance in the proposed rule. Performance standards are, however, included in the rule in both part 7005.6050, Containment, and part 7005.6060, Cleanup. It is the purpose of the rule to remediate the effects on the public health and the environment of the practice of abrasive blasting of lead paint. Because small businesses are the regulated parties of the proposed rule, to exempt small businesses from any provision of this rule would be contrary to the statutory objective that is the basis of the proposed rule.

VI. CONSIDERATION OF ECONOMIC FACTORS

In exercising its powers, the Agency is required by Minn. Stat. section 116.07, subd. 6 (1990) to give due consideration to economic factors. The statute provides:

In exercising all its powers the Pollution Control Agency shall give due consideration to the establishment, maintenance, operation and expansion of business, commerce, trade, industry, traffic, and other economic factors and other material matters affecting the feasibility and practicability of any proposed action, including, but not limited to, the burden on a municipality of any tax which may result therefrom, and shall take or provide for such action as may be reasonable, feasible, and practical under the circumstances.

The effect in cost of the proposed rule on any one contractor will depend on the customary practices of that contractor. For those who currently seal structures and use ground cover according to the 1987 staff recommendations, these costs will be reduced. The largest expenses will be the capital costs of purchasing curtains and equipment that removes lead paint by alternative methods of abrasive blasting, and these are not obligatory. The proposed rule allows latitude to the contractor in both the use of containment and in the use of alternative methods of paint removal. In addition, procedures of containment and methods of removal by abrasive blasting that achieve equivalent measures of pollution control can be approved by the commissioner as stated in part 7005.6050. This can also have the effect of limiting the cost of these provisions to the contractor.

The additional costs due to the proposed rule are estimated below for each of the methods of abrasive blasting cited in the rule. The estimates of cost of equipment and materials are not anticipated to be less than actual costs. For example, it is assumed that contractors currently have tarpaulins adequate to cover an area of 25ft x 50ft, the minimum ground cover necessary for a single story structure. Contractors may already have tarpaulins available that would cover an area larger than this because the recommendations cited this as a minimum amount and recommended additional coverage for structures greater than one story. Also, vacuum blasting reduces both the quantity of abrasive used and the volume of waste material that is generated for disposal as a consequence of the cleaning and recycling of the abrasive grit. These savings are not reflected in the capital expense of vacuum blasting equipment shown below.

Additional Costs of Dry Abrasive Blasting

	one story structure	two story structure	three story structure
<u>Materials</u>			
tarpsaulins (nylon- reinforced plastic)	current use (min. 1250 ft2) \$-0-	1200 ft2 (min. 2450 ft2) \$83.00	2800 ft2 (min. 4050 ft2) \$193.00
adhesive tape (2 " width)	1 roll \$2.00	2 rolls \$4.00	2 rolls \$4.00
curtains (2) 1 mm mesh (30' x 25')(a)	12 ft hgt \$510.00 (b)	20 ft hgt \$510.00 (b)	28 ft hgt \$510.00 (b)
scaffolds (2) (wood) (metal) (a)	\$30.00 (\$50.00) (b)	\$40.00 (\$60.00) (b)	\$50.00 (\$70.00) (b)
	\$32.00 + capital expenditure	\$127.00 + capital expenditure	\$247.00 + capital expenditure
<u>Labor</u>			
ground cover (tarpsaulins)	+ 1/2 hr.	+ 1 hr.	+ 2 hrs.
sealing (adhesive tape)	+ 1 hr.	+ 2 hrs.	+ 3 hrs.
curtains and scaffold (a)	+ 3 hrs.	+ 4 hrs.	+ 5 hrs.
	+ 4 1/2 hrs.	+ 7 hrs.	+ 10 hrs.
@ \$20.00/hr (c)	\$90.00	\$140.00	\$190.00
total additional cost	\$122.00 + capital expenditure	\$267.00 + capital expenditure	\$437.00 + capital expenditure

(a) the use of curtains and scaffolding is not necessary if additional ground cover is used or if modified-wet abrasive blasting or vacuum blasting is used.

(b) capital expenditure

(c) includes hourly wage, workers compensation, social security, and unemployment insurance.

Additional Costs of Alternative Methods of Paint Removal
(Modified-Wet Abrasive Blasting)

	one story structure	two story structure	three story structure
<u>Equipment & Materials</u>			
taraulins (nylon-reinforced plastic) (a)	current use (min. 1250 ft2) \$-0-	1200 ft2 (min. 2450 ft2) \$83.00	2800 ft2 (min. 4050 ft2) \$193.00
adhesive tape (2 " width)(a)	1 roll \$2.00	2 rolls \$4.00	2 rolls \$4.00
water ring (with multiple jets)	\$88.00 - \$120.00(b)	\$88.00 - \$120.00(b)	\$88.00 - \$120.00(b)
	\$2.00 + capital expenditure	\$87.00 + capital expenditure	\$197.00 + capital expenditure
<u>Labor</u>			
ground cover (taraulins) (a)	+ 1/2 hr.	+ 1 hr.	+ 2 hrs.
sealing (adhesive tape) (a)	+ 1 hr.	+ 2 hrs.	+ 3 hrs.
modified-wet blasting	+ 2 hrs.	+ 4 hrs.	+ 6 hrs.
	+ 3 1/2 hrs.	+ 7 hrs.	+ 11 hrs.
@ \$20.00/hr (c)	= \$70.00	= \$140.00	= \$220.00
total additional cost	\$72.00 + capital expenditure	\$227.00 + capital expenditure	\$417.00 + capital expenditure

(a) same as above (additional costs of dry abrasive blasting)

(b) capital expenditure

(c) includes hourly wage, workers compensation, social security, and unemployment insurance.

Additional Costs of Alternative Methods of Paint Removal
(Vacuum Blasting)

	one story structure	two story structure	three story structure
<u>Equipment & Materials</u>			
tarpaulins (nylon-reinforced plastic)	less than or equal to current use (min. 450 ft ²) \$-0-	(min. 450 ft ²) \$-0-	(min. 450 ft ²) \$-0-
adhesive tape (2 " width)(a)	1 roll \$2.00	2 rolls \$4.00	2 rolls \$4.00
vacuum blast (with 3 in. pattern)	\$3058 (b)	\$3058 (b)	\$3058 (b)
	\$2.00 + capital expenditure	\$4.00 + capital expenditure	\$4.00 + capital expenditure
<u>Labor</u>			
ground cover (tarpaulins) (a)	+ 0 hrs.	+ 0 hrs.	+ 0 hrs.
sealing (adhesive tape) (a)	+ 1 hrs	+ 2 hrs.	+ 3 hrs.
vacuum blasting	+ 6 hrs.	+ 10 hrs.	+ 16 hrs.
@ \$20.00/hr (c)	+ 7 hrs. = \$140.00	+ 12 hrs. = \$240.00	+ 19 hrs. = \$380.00
total additional cost	\$142.00 + capital expenditure	\$244.00 + capital expenditure	\$384.00 + capital expenditure

(a) same as additional costs of dry abrasive blasting (above)

(b) capital expenditure

(c) includes hourly wage, workers compensation, social security, and unemployment insurance.

Against these considerations one must measure the costs of lead poisoning to the victims and their families and also to the larger society. Direct costs of absorption of lead paint particles would include medical intervention and treatment in the case of acute poisoning and the cost of screening and prevention in cases of subclinical poisoning. Acute lead poisoning due to unregulated abrasive blasting of residential property has not been identified in Minnesota and it is most likely not a prevalent condition. As stated in the introduction above, however, such outcomes were commonplace and well documented in New Zealand. Because of different house construction and perhaps because of the preventive practices of at least some contractors, it is more probable that conventional abrasive blasting of lead paint would result in levels of lead in children that are less than acute.

Children with lead poisoning are identified by blood tests. Although lead poisoning due to lead paint removal has been identified in the state, there has been no screening program to determine this incidence. If such tests were routinely done both before and after lead paint removal by any method, including abrasive blasting, more individuals may be found who have been poisoned. The incidence of asymptomatic or subclinical levels of lead in the body is much greater in children than absorption of lead to a level that exhibits ill effects. A child who is exposed to lead paint particles as a consequence of abrasive blasting of exterior paint will more likely experience these levels of absorption and, where contamination of the household interior or of the outside property occurs, such exposure will be chronic.

Children are treated by chelation for concentrations of lead in the blood that are several times greater than those demonstrated to impair cognitive function and cause other physical effects. The effects of lead poisoning on learning ability and intelligence generate additional costs to society of

remedial education. Because this learning disability is irreversible, the costs of special education are cumulative over the student life of the child. An assessment of the material benefits that accrue due to the prevention of lead absorption must also consider the lost future earnings of the affected individual. It should be pointed out that because lead is an element that is toxic in all its forms, it does not degrade with time into a less harmful substance. For this reason, contamination by lead paint particles is a condition that has the potential to affect the current residents or occupants of the structure as well as all those who come after them.

The rule as proposed will incur additional costs of the contractors and these will be billed to the property owner. The proposed rule does not prohibit conventional dry abrasive blasting, but rather adds responsibilities of pollution control to the contractor. The additional costs are necessary and reasonable in order for abrasive blasting to be used to remove exterior lead paint, especially when compared to the significant costs in property damage and physical and mental health that are to be prevented by the promulgation of the proposed rule.

VII. LIST OF WITNESSES AND EXHIBITS

A. Witnesses

In support of the need for and reasonableness of the proposed rules, J. David Thornton, John Seltz, and Gordon Anderson, Air Quality Division, Program Development, will testify on behalf of the MPCA.

B. Exhibits

In support of the need for and reasonableness of the proposed rules, the following exhibits will be entered into the hearing record by the Agency:

Exhibit No.

Document

1

Sandblasting and Lead Paint
(Appendix C of the Soil Lead Report
to the Minnesota State Legislature,
June 1987)

2

Minnesota Pollution Control Agency Staff
Recommendations for Sandblasting of
Lead-Painted Residential Buildings
(March 10, 1987 and April 15,
1988)

C. References

Agency for Toxic Substances and Disease Registry. (July 1988) The Nature and
Extent of Lead Poisoning in Children in the United States: A Report to
Congress. Public Health Service, U.S. Dept. of Health and Human Services.

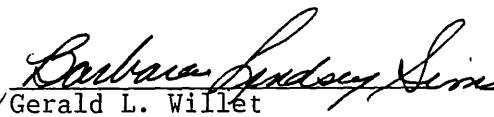
Centers for Disease Control. (January 1985) Preventing Lead Poisoning in Young
Children: A Statement by the Centers for Disease Control. U.S. Dept. of
Health and Human Services.

U.S. Environmental Protection Agency. (1986) Air Quality Criteria for Lead. U.S.
Office of Health and Environmental Assessment, Environmental Criteria and
Assessment Office.

VIII. CONCLUSION

Based on the foregoing, the proposed Minnesota Rules, parts 7005.6010 to
7005.6080, are both needed and reasonable.

12-18-90, 1990

for 
Gerald L. Willet
Commissioner