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STATE OF MINNESOTA
POLLUTION CONTROL AGENCY

In the Matter of the Proposed Rules
Governing Standards and Abatement
Methods for Lead in Bare Soil on
Playgrounds and Residential Property,
Minn. Rules Pts. 4750.0010 through
4750.0050.

STATEMENT OF NEED
AND REASONABLENESS

I. INTRODUCTION

The Minnesota Legislature delegated the authority to the Minnesota Pollution Control Agency (hereinafter "Agency") to adopt standards and abatement methods for lead in bare soil on playgrounds and residential property.

Minnesota Laws 1990, ch. 533, Sec. 7, subd. 2(b) and 3 (to be codified at Minn. Stat. § 144.878, subd. 2(b) and 3), (hereinafter "the Act").

To promulgate the proposed rules, the Agency shall conduct its proceedings in accordance with the rulemaking requirements of the Administrative Procedure Act, Minn. Stat. ch. 14 (1988). Under Minn. Stat. ch. 14 the Agency engaged in rulemaking is required to make an affirmative presentation of facts establishing the need for and reasonableness of the proposed rule, hence, the purpose of this document.

This Statement of Need and Reasonableness is composed of eight parts. Part I introduces the nature of the proposed rules and the process used to draft the proposed rules. Part II provides the Agency's statutory authority to adopt the proposed rules. Part III discusses the need for the proposed rules. Part IV discusses the reasonableness of the proposed rules. Part V presents the considerations for reducing the impact on small businesses. Part VI discusses how economic factors have been taken into account. Part VII provides the conclusion that the proposed rules are both needed and reasonable. Part VIII

contains a list of exhibits relied on by the Agency to support the proposed rules. The exhibits are available for review at the Agency's offices at 520 Lafayette Road North, St. Paul, Minnesota 55155.

II. STATEMENT OF AGENCY'S STATUTORY AUTHORITY

The Agency's statutory authority to adopt the proposed rules is set forth in Minn. Stat. 1990, ch. 533, sec. 7 subd. 2(b) and 3 (to be codified at Minn. Stat. § 144.878, subd. 2(b) and 3) which provides:

Subd. 2 (b). "By January 31, 1991, the commissioner of the Pollution Control Agency shall adopt standards and abatement methods for lead in bare soil on playgrounds and residential property in a manner to protect public health and the environment."

Subd. 3. "In adopting the rules required by subd. 2, the commissioners of health and the pollution control agency shall provide variance procedures to allow for use of innovative abatement methods. A person who proposes an innovative abatement method must justify the need for the variance and must comply with the standards established in rules adopted under this section."

Under this statute the Agency has the necessary statutory authority to adopt Minn. Rules pts. 4750.0010 to 4750.0030, and Minn. Rules pts. 4750.0040 to 4750.0050 of the proposed rules.

In proposed Minn. Rules pt. 4750.0035, the Agency is referencing existing state rules as they relate to the evaluation and disposal of lead abatement wastes. The 1990 Act does not specifically delegate authority to the Agency to regulate the management and disposal of lead waste materials in this rulemaking. However, the Agency believes that proper disposal of lead containing materials is an essential element of the state's strategy for reducing lead in the environment. In this rulemaking, under the general rulemaking authority of Minn. Stat. § 116.07, subd. 4, the Agency is clarifying the applicability of existing rules as they relate to the disposal of lead containing materials that have been abated.

III. STATEMENT OF NEED

Minn. Stat. ch. 14 (1988) requires the Agency to make an affirmative presentation of facts establishing the need for and reasonableness of the rules as proposed. In general terms, this means that the Agency must set forth the reasons for its proposal 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 appropriate. The need for the proposed rules is discussed below.

Lead, symbol Pb from the Latin plumbum, is one of the ancient metals. Nriagu J., "The Biochemistry of Lead in the Environment" Part A (1978). It has become an intricate part of our modern way of life. Lead is used in solder for food cans and electronic equipment, for making pipes, in automotive and other storage batteries, in gasoline, in craft materials, in paints, artworks and newsprints, in brasswares, in dinnerwares, crystals and plastics, in caulking and soundproofing material for buildings, ships and jet planes, in cable covering of intercontinental communication systems, in ammunition, in certain weights and sinkers for fishing. Lin-Fu J.S., "The Evolution of Childhood Lead Poisoning as a Public Health Problem". In Lead Absorption in Children edited by J. Chisolm and O'Hara. (1982). (Exhibit #7).

Following the Industrial Revolution of the 18th century, the use of lead in the United States has increased rapidly. Id at 1. It brought comfort and convenience to our life style but with no known essential or physiologic role in the human body. Id. Such high use resulted in wide occurrence of lead in our environment. Because of its high resistance to erosion and decay, it became one of the most persistent environmental pollutants. See Nriagu at page 4.

(Exhibit #10)

Today, as an environmental pollutant, lead has awakened the social conscience because of its major impact on young children. When lead is ingested or inhaled by children, it can accumulate in their bodies to levels high enough to cause brain damage, mental deficiency, abdominal pain, anemia and serious behavioral problems. Chisolm, J. "Lead Poisoning" Scientific American. Vol. 224 (2) (1971). See also D. Bellinger, et. al., "Longitudinal Analyses of Prenatal and Postnatal Lead Exposure and Early Cognitive Development". The New England Journal of Medicine, 316, (17) (1987). (Exhibit #4).

Studies have shown that the most susceptible groups are ages between 9 months and six years, most notably those who have the habit of eating non-food substances such as peeling paint, soil, and dust from interior walls of deteriorating buildings. Such hand to mouth activity behavior is termed pica, which is common among this age group of children. See Chisolm at 5.

Undoubtedly, childhood lead poisoning is a real problem. It is more frequently detected among poor urban children who live in old, deteriorating buildings or in inner city houses where flaking paint and heavy traffic have contributed to soil lead contamination. However, elevated blood lead levels can be found throughout the population. Minnesota, as far as is known, has the same concerns as have been identified nationally. Mielke, H., et.al. "Soil Dust Lead and Childhood Lead Exposure as a Function of City Size and Community Traffic Flow: The Case for Lead Abatement in Minnesota". In Lead in Soil: Issues and Guidelines. Edited by B. Davies and B. Wixson. Vol. 9 Series 4. (1988). (Exhibit #9).

Children have high blood lead when exposed to high lead concentration media. See Mielke, et.al. at 267. As such, children are excellent bioindicators of available lead sources in the environment. Id. This results from their developmental stage in which they crawl, play on the ground and floor

and eventually place their hands and playthings into their mouths. Id. There is much evidence that such activities result in ingestion of leaded-paint chips, dust and soil. See Chisolm at 22. When subjected to epidemiological studies, results showed that the ratio of stable isotopes of lead in children's blood more closely matched the ratio of stable isotopes of lead found in sources in their immediate environment. Id. at 41. When blood lead data were analyzed and compared with individual sources, it was found that the mean blood lead increased with the increased level of exposure. Id. Based on the foregoing, children accumulate lead in their body when exposed to high lead containing media.

Aware of the long-term effects of exposure to lead, the Minnesota Legislature took a rational means of protecting populations at risk by directing the Commissioner of the Agency to adopt standards for one of the lead sources - bare soil. Soil has been understood to be a potent source of lead exposure and the likelihood of childhood exposure rises with increasing soil lead concentrations. See Mielke, et. al. at 262.

However, even though much is known about the relationship between soil lead concentration and blood lead levels, it is impractical to attain a zero lead level in the environment. What is essential and feasible is that a soil lead standard be established for child-accessible areas in order to reduce the health hazard for children. Citizens of the State need a soil lead standard because it would set in motion societal mechanisms which would make it possible to prevent lead poisoning and thus protect children now and in the future. A soil lead standard is needed because reducing and thus eliminating lead sources is the key to reducing blood lead levels throughout the population, hence, the need for the proposed rules.

IV. STATEMENT OF REASONABLENESS

The Agency is required by Minn. Stat. ch. 14 (1988) to make an affirmative presentation of facts establishing the reasonableness of the proposed rules. Reasonableness is the opposite of arbitrariness or 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 rule as a whole

To carry out its duties in promulgating the proposed rules, the Agency hereby explains what circumstances have created the need for the proposed rules which required administrative action and why the proposed action is an appropriate solution to meet the need.

It has been long held that rules must be reasonable to be valid. To be reasonable, the proposed rules must be within the bounds of reason. Here, the Agency is faced with the state's need for a soil lead standard and abatement methods to protect public health and the environment from lead contamination and human lead poisoning. Responding to the Legislature's mandate, the Agency uses its expertise and rational judgment to accomplish this legitimate purpose. In so doing, the Agency is providing explanations of the evidence it is relying upon and how that evidence connects rationally with the Agency's choice of action. Moreover, the Agency is presenting reasoned determinations using scientific results and applying comments from interested persons and community action groups aimed at abating exposure to lead to justify why the soil standard and abatement methods were selected. Based on the foregoing, the Agency is articulating a rational connection between the facts found and the choice made in promulgating the proposed rules.

B. Reasonableness of individual rules

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

1. Minn. Rules Pt. 4750.0010 Applicability

Minn. Rules pt. 4750.0010 establishes the applicability of the proposed rules. The Minnesota Legislature enacted Minn. Laws, 1990, ch. 533 addressing lead standards and abatement methods in bare soil on playgrounds and residential property to protect the health and environment of the citizens of the State. This part of the proposed rules is needed to provide specific directions and guidelines necessary to attain what is to be achieved by the Act.

Under applicability, the Agency provides that parts 4750.0010 to 4750.0050 apply to any person who is performing or has been ordered to perform abatement of lead in bare soil on residential property. The Agency believes that it is reasonable to apply these rules to any person who performs or has been ordered to perform abatement because each person will have a major role to play for the effectiveness and enforcement of the proposed rules. Without such a provision the effectiveness of the proposed rules would substantially fall short of the legislative mandate. Hence, the Agency's provision of applicability of the rule is reasonable.

2. Minn. Rules Pt. 4750.0015 Definitions

Minn. Rules pt. 4750.0015 provides definitions and meanings of terminologies found in the body of the proposed rules. This part is composed of nine subparts.

In composing definitions of the terms in the proposed rule, the Agency conducted literature research by referring to existing Agency rule, federal and

other state statutes, scientific studies, and other legal materials and dictionaries. Based on these findings, definitions that apply to the proposed rules were developed.

Subpart 1 introduces to any person affected by the proposed rule the meaning of the terms for purposes of parts 4750.0100 to 4750.0050. It is necessary to provide such language in the rule to promote common understanding of the terms and their meanings. The Agency believes that this means of presentation is reasonable because it instills a sense of fairness which is essential to enhance compliance without undue burden as to the meaning of the terms. Therefore, the Agency's inclusion of subpart 1 in the proposed rule is reasonable.

Subpart 2 defines Agency as the Minnesota Pollution Control Agency. An "Agency" definition is needed to avoid confusion with other governmental agencies. The Act requires both the Minnesota Department of Health and the Minnesota Pollution Control Agency to adopt rules on lead prevention. It is necessary that the public and other interested parties know that the Minnesota Pollution Control Agency is the Agency that is responsible for the proposed rules on soil lead. The definition provided in this proposed rule is based on Minn. Stat. § 116.02 (1988).

Subpart 3 provides a definition for abatement contractor. This subpart states that abatement contractor has the meaning given in Minn. Stat. § 144.871, subd. 3. Under the statute, "Abatement Contractor" means any person hired by a property owner or resident to perform abatement. It is necessary to define abatement contractor in the proposed rules because abatement contractors have roles and responsibilities in lead abatement. To insure proper reduction of lead sources, anyone planning to undertake lead abatement in a residential property must consider various factors in selecting an abatement strategy. One

of the factors to consider is the need for skilled labor. Abatement contractors generally fall under this category in undertaking abatement work. Defining abatement contractor in the proposed rules distinguishes them from homeowners and other persons who conduct abatement activity but are not required to have wide experience in demolition and renovation skills. Alternatively, abatement contractors are required to have the above mentioned skills and are also subject to federal, state and local regulations necessary for proper performance.

The Agency believes that defining abatement contractor as stated under the statute is reasonable because it parallels the Legislative intent of providing an effective approach to lead abatement.

Bare soil is defined in subpart 4 because it is one of the major elements addressed by the Act. Based on the Act's provision, the proposed rules shall apply only to bare soil areas on playgrounds and residential properties. Furthermore, bare soil is referred to by public health officials and citizen's groups as areas where young children may play with soil and thus contaminate their hands with lead which may eventually be ingested. Because what constitutes soil can be interpreted in a number of ways, a definition is needed for common understanding of the term. The proposed rule defines bare soil as an outdoor area of one square foot or more where soil is visible because of lack of grass cover or other type of cover that would prevent soil from being exposed. The Agency believes that this is a reasonable definition because it will provide useful information in addressing soil lead contamination and eventually in developing a soil lead abatement strategy.

In line with this analysis, the Agency established that a one square foot area where soil is visible is considered to be bare soil. There is no question that children generally spend their time outdoors during play activities. As

such there is a high probability that they may come in contact with bare soil. Unfortunately, specific data as to the exact area of bare soil that will attract children the most is not available. However, references on this matter were generally based on observation of random selection and the fact that children instinctively pick up soil followed by ingestion through hand to mouth activity. It was this concern which prompted the Agency to define bare soil area as an area of one square foot where soil is visible. Under the existing scenario, the Agency believes that a child is attracted by a bare soil that is visible and easily accessible. Undoubtedly, children with their inherent curiosity are attracted or allured to those spotty areas of bare soil. This analysis is comparable to "Attractive Nuisance Doctrine" where a person created a condition upon his premises which attract children to come there to play. Such instrumentality, in this case a bare soil area, must reasonably attract children to come and play. Children generally play where there is dirt. Also, continuous playing will kill the grass so that bare soil areas are indicative of where children play. Hence, the Agency's definition of bare soil is reasonable.

Subpart 5 provides a definition for board of health. The proposed rules need to define board of health because the Act states that the "boards of health shall conduct assessments to determine sources of lead contamination in the residence of children and pregnant women whose blood lead levels exceed 25 micrograms per deciliter (ug/dl)". See Minn. Laws 1990, ch. 533, sec. 2, subd. 6. (Exhibit #1) In conjunction with the Act, the proposed rules in part 4750.0030 apply to any property owner who has been ordered by a board of health to abate bare soil.

The Act defines board of health as an administrative authority established under Minn. Stat. §§ 145A.03 or 145A.07. The Agency is providing the same definition in the proposed rules. The Agency believes that it is reasonable to

provide a definition consistent with the Act because the Legislature has specific intent regarding the applicability of the board of health to protect public health and the environment.

Subpart 6 defines commissioner. The Act provides that lead standards and abatement methods be promulgated by two State governmental agencies, the Agency and Minnesota Department of Health. Both agencies are headed by their respective commissioners. For purposes of the soil lead standards and abatement methods, Commissioner is defined as the Commissioner of the Agency in the proposed rules to avoid confusion. Therefore, it is reasonable to define commissioner.

Subpart 7 defines hazardous waste. Under the proposed Minn. Rules pt. 4750.0035, a property owner must comply with the requirements for hazardous waste disposal if the waste material generated during abatement work is hazardous waste. Anticipating questions as to what constitute hazardous waste, the Agency defines hazardous waste to clarify that a specific requirement has to be satisfied for waste abatement materials classified as hazardous waste. The Agency believes that the definition for hazardous waste is reasonable because it is consistent with the definition provided under Minn. Stat. § 115B.02, subd. 9.

Subpart 8 defines playgrounds. Studies have found that young children ingest soil lead from play areas during normal daily play activities. For this reason, bare soil on playgrounds became a focus of the Act as a potential source of lead intake. However, playgrounds can have a broad range of meaning. A playground may be in public parks, in schools and in open fields where both adults and children play. It is necessary to define playgrounds in the proposed rule to provide a distinction as to which type of playground is regulated.

A playground is defined in the proposed rule as an area used for outdoor games, recreation and amusement which may contain swings, seesaws, slides and other means for children's recreation and play.

Playgrounds in public parks and in schools are excluded in the definition because soil lead studies conducted by Mielke in Soil Lead Report to the Minnesota Legislature (1987), showed that public parks have essentially low lead levels and are not considered to be a soil lead hazard to children. This is attributed to lack of flaking paints from deteriorated buildings as compared to playground on residential property. Id.

The Agency believes that the definition of playground in the proposed rule is reasonable because it directs attention to play areas and vacant areas around the house where young children are likely to play with highly contaminated lead soil. This in turn provides enough information to direct assessment by local boards of health. Therefore, it is reasonable to define playgrounds as areas situated on open areas and vacant lots.

Subpart 9 defines residential property. Studies have demonstrated that exposure to lead occurs in homes painted with lead-based paint. Research has shown that residential property is a major source of human lead poisoning and for this reason the Minnesota Legislature recognized that there is a strong need to protect the populations at risk from lead poisoning at their place of abode. There is a need to define residential property to inform all parties and the public what comprises a residence in terms of lead contamination. In the proposed rule, residential property is defined as real property that contains a house or a building or other structure used or intended for human habitation. It also includes open areas on the real property such as gardens, walkways and pathways. Industrial, commercial and other types of non-residential property are not regulated under these rules. The applicability of the rules is limited

to activities occurring on residential property. The agency believes that this is reasonable because the application of the rules is based on the assessments which will be conducted by boards of health. The Act specifies that these assessments are to be conducted at specific types of residential property. The Agency believes that this is a reasonable definition because it collectively covers areas in residential property that have the potential for soil lead exposure. Additionally, this definition addresses the areas that the Act is intending to protect. Therefore, the definition is reasonable because it will lead to effective reduction of lead exposure.

3. Minn. Rules Pt. 4750.0020 Bare Soil Standard

Numerous studies have provided reasonably reliable evidence of the relationship between soil and blood lead among populations at risk. Mielke citing Hammond showed that children of young age are the most sensitive to lead. They absorb and retain about fifty percent (50%) of the lead ingested, compared to an absorption and retention of eight percent (8%) for adults. Along with these findings, the U.S. Second National Health and Nutrition Examination Survey, a survey of lead levels in a large sample of the general public, revealed that there is a peak value of lead among children occurring at 2 to 3 years of age followed by a decline until early adolescence. Duggan, M.J., M.J. Inskip. "Childhood Exposure to Lead in Surface Dust". Public Health Rev. 13 (1985). (Exhibit #5).

Great gains in understanding and control of lead poisoning have been made clinically through the efforts of public health officials and pediatricians. Responding to the national concern regarding lead adverse effects, the Centers for Disease Control (CDC) released a "Statement on Preventing Lead Poisoning in Young Children" in 1985. CDC defined an elevated blood lead level as a whole blood concentration of 25 micrograms per deciliter (ug/dl). Lead toxicity is

defined as a blood lead level of 25 ug/dl in conjunction with erythrocyte protoporphyrin level of 35 ug/dl. The American Academy of Pediatricians concurs in these definitions.

Combined with the extent of possible exposures, the nature of the high risk groups, the combination of social and environmental factors and the costs of failure to set standards, the Minnesota legislature addressed the issue of lead in the State. Through the Act, the legislature addressed four lead pathways - lead in paint, dust, soil and drinking water and set the elevated blood lead level at 25 ug/dl. See Minn. Laws 1990, ch. 533.

Given the acceptable total exposure in terms of an elevated blood lead, the Agency is mandated to adopt rules which set a soil lead standard and methods for bare soil abatement. Complying with the Act, the Agency is hereby proposing a soil lead standard at 300 parts per million.

In setting up the standard for soil lead, the Agency based its proposed number on the biokinetic model referred to by many scientists and experts on the study of lead in the environment. This biokinetic model for blood lead is expressed in terms of blood lead level in children as a function of soil lead exposure. Other sources of lead exposure such as paint, water, dust, air and food are also taken into consideration so that the interpretation of the soil lead model requires information about all other pathways. Based on this model, the relationship between blood lead and soil lead appears approximately linear at blood lead levels below 25 ug/dl.

The blood lead slope estimate as shown by most studies is about 2 ug/dl per 1,000 parts per million soil lead, but may be as high as 7 ug/dl per 1,000 parts per million soil lead. Marcus, A., J. Cohen. "Modeling The Blood Lead-Soil Lead Relationship". In Lead in Soil: Issues and Guidelines. Davies, B. & B. Wixson (eds) (1988). (Exhibit #8).

By using the model, the contribution of soil lead to total blood lead levels can be calculated based on the proposed 300 parts per million bare soil standard:

- (a) - The blood lead level established by the Act is 25 ug/dl
- Biokinetic model slope is 2 ug/dl per 1,000 parts per million soil lead
- Thus at the proposed 300 parts per million soil lead standard:

$$2 \text{ ug/dl} \times \frac{300}{1000} = 0.6 \text{ ug/dl blood lead}$$

Therefore, using a 300 parts per million soil lead standard, there is a soil lead contribution of 0.6 ug/dl blood lead.

When calculated at maximum level of 7 ug/dl per 1,000 parts per million soil lead the contribution of soil lead to total blood lead levels is:

$$(b) \quad 7 \text{ ug/dl} \times \frac{300}{1000} = 2.1 \text{ ug/dl blood lead}$$

This means that a standard of 300 parts per million soil lead will still provide a reasonable degree of protection of human health, even when ingestion of soil is only one of several sources of lead exposure. Ingestion of soil at maximum level of 300 parts per million even considering a blood lead estimate of 7 ug/dl, will only raise the blood lead level to 2.1 ug/dl, far below the Legislature's established intervention level of 25 ug/dl.

Based on the foregoing, the Agency believes that a bare soil standard of 300 parts per million is reasonable because it reflects a reasonable proportion of the amount of lead which is ingested from soil as opposed to lead ingested from other sources such as paint and dust. Additionally, it is supported by research by scientists such as Chaney, Bornschein and Cohen, that a proper regulatory evaluation must consider the "most-exposed, most susceptible

populations". That population is composed of children who live in painted, deteriorating buildings and who play regularly in lead rich soil around the house. These children would most likely ingest soil and absorb high lead concentrations. As illustrated by the calculation on soil lead contribution to blood lead, the Agency is setting a bare soil standard that would protect children who play regularly in lead soil in the urban environment:

Finally, a 300 parts per million soil lead standard corresponds with the recommended guidelines advocated by the lead in soil task force of the Society for Environmental Geochemistry and Health, edited by Dr. Bobby Wixson of Clemson University and Professor Brian Davies of the University of Bradford, England.

Therefore, it is reasonable for the Agency to set the soil lead standard at 300 parts per million.

4. Minn. Rules Pt. 4750.0030 Abatement Methods For Bare Soil

This part establishes abatement methods for bare soil on playgrounds and residential property. This part is divided into four subparts. Subpart 1 establishes applicability; subpart 2 illustrates abatement methods; subpart 3 addresses abatement implementation, and subpart 4 establishes abatement priority.

As stated above, subpart 1 provides that abatement methods shall apply to any property owner who has been ordered by the board of health to abate soil lead on bare soil if it exceeds the standard established in the proposed rules. Identifying the applicability of this rule is reasonable to identify who is responsible for answering the need for lead abatement requirements to reduce lead poisoning.

The Agency believes that it is reasonable to identify the property owners as the responsible party because they have control and authority over the management of their property. When the property is rental property, there is

a duty on the owners to provide a habitable environment. The Agency believes that the responsibility for applying abatement methods for bare soil is on property owners and that this is reasonable because it will reduce soil-derived lead as a source of exposure after high lead levels are identified.

Subpart 2 provides that any property owner who is required to undertake abatement of bare soil shall implement any one of the procedures established from items A to C. The Agency's intent here is to encourage compliance through the establishment of a reasonable abatement method. Because soil lead contamination varies from property to property, providing a selection of abatement methods will result in more effective soil lead reduction and less of a burden to property owners.

The Agency believes that soil lead abatement method from A to C is reasonable because it addresses the problems encountered by property owners in reducing soil lead sources. Due to the different degrees of soil lead contamination, it is reasonable that the proposed rules provide for different methods of soil abatement.

Subpart 2, item A, provides that bare soil shall be rototilled and the resulting area shall be covered with sod or other material that will prevent the bare soil from being exposed.

Studies have shown that soil in inner-city urban areas is lead enriched by automotive emissions and exterior lead paint of houses. Lead is immobile in soil and will persist in surface soils until corrective action is taken. Therefore, it is reasonable to require that property owners rototill the bare soil area before application of cover material, such as sod or other materials, in order to distribute the lead so that it is not concentrated on the soil surface.

The Agency believes that this method is reasonable because it is less expensive than excavation and removal. Additionally, if the soil lead exceeds 300 parts per million but less than 1,000 parts per million, the subsequent mixture through rototilling would move the lead from the soil surface and therefore make it less available for children's ingestion.

Subpart 2 item B requires the removal of soil if the bare soil area contains 1,000 parts per million soil lead and the replacement of that soil with soil that does not contain more than 25 parts per million lead.

Generally, in a severely contaminated residential soil, the recommendation is to establish a complete barrier between the children and soil. However, if this method is not effective, complete removal of the contaminated soil and replacement of that soil with soil having a low lead content is the best alternative. In this case, removed soil must be replaced with soil containing no more than 25 parts per million lead. The Agency requires the property owners to remove soil that contains 1,000 parts per million lead because it will be extremely hazardous to children.

Since the goal is to prevent lead from being transferred from any source such as soil, replacement of soil removed with soil containing no more than 25 parts per million lead will make lead inaccessible to children. See Chaney at 123. Under no circumstances should a child with an identified source of lead poisoning continue to be exposed to the lead hazard that would further jeopardize the condition. Therefore, soil which has been removed shall be replaced with relatively clean soil. The soil lead contribution of such replacement in terms of blood lead is 0.002 ug/dl. This 25 parts per million soil lead concentration would limit lead to such a level that the most susceptible child with pica would be protected from soil lead poisoning.

Therefore, the Agency believes that it is reasonable to require the replacement of removed soil with soil containing no more than 25 parts per million lead to prevent recontamination of the property.

Subpart 2, item C establishes that any alternative procedures proposed to items A or B be incorporated in the variance. The important objective of soil lead abatement is to guarantee that an effective barrier is erected between the lead and the human environment. Under items A and B, the Agency has proposed abatement methods considered to be effective in reducing soil lead. In some circumstances, property owners may present alternative methods that may be as effective and less costly than the abatement methods in the proposed rules.

In viewing the property owner's options for alternative abatement proposals, in light of the requirements of the proposed rules, the Agency believes that it is reasonable to address such alternatives in the variance. Because of the complexity of any soil lead abatement procedure, a thorough procedural requirement for a variance, as stated in the proposed rules, is reasonable. Any use of alternative methods must be explained and the rationale for the decision must be set forth to assure the Agency and the public that the alternative method is effective. Hence, the Agency's provision of incorporating alternative abatement methods in the variance is reasonable.

Subpart 3 provides that any property owner who is required to undertake abatement of bare soil shall follow the procedures in items A to C.

There is a need to provide this provision in the proposed rule because the goal of an abatement project is to provide an environment relatively free of lead contamination. Any effort to either cover or remove contaminated soil is not effective if items A to C are not properly addressed. Post abatement clean up must be done with care to prevent exposure to lead as a result of the abatement process. The point here is that the actual abatement can generate a

lot of dust and airborne soil particulates that could be breathed in. Also a fresh dirt pile can attract children. Undoubtedly, there is a need to minimize this exposure during the abatement itself.

The Agency believes that such a provision is reasonable because recontamination is possible if post abatement activity is not conducted with due care.

Subpart 3, item A states that children must be prevented from coming in contact with soil being disrupted during an abatement project.

During lead soil removal, stringent precautions have to be taken by workers and residents, especially children, to avoid exposure to the soil being disturbed by the abatement activities. Children should not be allowed in areas where soil removal is being performed because lead can be carried by their shoes, hands, and clothing into the house and thus further expose them to lead. Therefore, it is reasonable that children be prevented from coming into contact with soil at an abatement project.

Subpart 3, item B states that soil that is removed must be either properly stored or taken off the property and disposed of at the end of each day.

As discussed above, it is important that residents not be subjected to additional lead exposure during the course of the abatement process. It is necessary that all contaminated soil be put in plastic bags, sealed and properly disposed. This is to prevent accidents where spillage and exposure may occur. Therefore, it is reasonable that soil removed either be stored or taken off the property and be disposed at the end of the day.

Subpart 4 provides that if soil abatement is done in conjunction with other abatement processes, it must be done after any exterior paint abatement but before interior dust abatement.

Studies have shown that an intervention strategy involving control of all paint, soil and dust sources can lead to significant reductions in lead. However, it is important that all sources of lead be addressed. Because lead in dust from soil abatement accumulates inside the house, blood lead would not necessarily be reduced if the proper abatement strategy is not followed. There is no question that during residential paint abatement most paint chips and particles will settle on the ground adjacent to the building. This in turn will result in an increase in soil lead accessible to children. To reduce this risk, it is proper to abate the contaminated soil after exterior paint abatement to avoid recontamination by paint chips and particles deposited in the soil.

Additionally, studies have also revealed that abatement of exterior walls and soil creates dust containing lead that ends up inside the house. It is therefore essential that soil abatement be performed before interior abatement and after outside paint abatement in order to attain maximum reduction of environmental lead. It is reasonable for the Agency's rules to establish this priority of abatement activities to ensure the effectiveness of the rules and the reduction of lead in the residential environment.

5. Minn. Rules Pt. 4750.0035 Disposal of Waste Materials From Abatement Projects

Subpart 1 provides that leaded debris from windows, doors, walls or any debris defined as demolition debris may be deposited in a demolition landfill.

The State of Minnesota is concerned with the safe and proper disposal of leaded debris from abatement processes. Such debris must be stored, collected, transferred, transported and disposed of in a manner consistent with the requirements for demolition debris disposal. The Agency is responsible for enforcement of solid waste rules governing demolition debris and encourages the cooperation of municipalities which may adopt local laws, ordinances or

regulations. Therefore, subpart 1 is a reasonable reference to existing rules and will insure that lead debris is not disposed in any manner whereby lead can be reintroduced into the environment.

Subpart 2 requires that a homeowner comply with the requirements of Minnesota's hazardous waste rules to determine whether other wastes from an abatement project are hazardous wastes. These wastes of concern are paint chips, solvents or paint stripping materials, and vacuum filters and accumulated dusts from abatement activities in residential interiors. It is reasonable to examine these wastes more stringently than demolition wastes because the Agency believes that, in general, these wastes are found to have higher concentration of lead and may also contain other potentially toxic constituents. Because these wastes represent a more significant environmental concern than demolition wastes it is reasonable to subject them to a more stringent level of evaluation and subsequent management.

However, it is important to note that under the hazardous waste rules a homeowner is not regulated as a hazardous waste generator. Although the Agency encourages the disposal of all household hazardous waste at special collections, there is no requirement to evaluate household wastes for hazardous characteristics and household wastes can be disposed of in the household trash. This means that a homeowner who generates lead waste by conducting abatement activities on his or her own is not a hazardous waste generator, regardless of the concentration of lead or solvent in that waste. However, the Agency recognizes that in the actual application of the proposed rules, it may be that the homeowner is not the person generating the wastes and the wastes may, in fact, be regulated as hazardous waste.

A person who generates paint chips or solvent wastes in a business relationship, such as an abatement contractor or landlord, is a hazardous waste generator, just the same as if he or she generates solvent wastes from cleaning housepainting brushes. He or she is in this case subject to full regulation under the hazardous waste rules and must evaluate the wastes. If they are hazardous, they must be disposed of at an approved hazardous waste facility.

If abatement wastes are tested and do not fail the hazardous waste criteria, they can then be disposed as solid waste, either in mixed municipal trash or at a demolition landfill.

Subpart 3 extends this restriction on the management of abatement wastes to include soils excavated as a result of abatement activities. The Agency believes that if removed soils fail the hazardous waste criteria it is reasonable to regulate them in the same manner as any other hazardous wastes.

Subparts 1 to 3 of the proposed rules do not establish any new requirements for waste management but instead reasonably refer to existing state rules which establish the responsibility of the waste generator.

6. Minn. Rules Pt. 4750.0040 Abatement Contractor Duties

Minn. Rules pt. 4750.0040 provides for abatement contractor duties. This part states that in the event a property owner who is required to undertake abatement of bare soil hires an abatement contractor to conduct soil lead abatement, the abatement contractor shall comply with the requirements of Minn. Rules pts. 4750.0300 and 4750.0035.

After considering proper abatement methods necessary to reduce soil lead contamination, property owners may opt to hire abatement contractors to perform abatement work rather than perform abatement themselves. Hiring abatement contractors is considered an appropriate abatement strategy especially where soil removal with the use of heavy machinery is the most effective method of

lead remediation. In view of the long term health effects of lead abatement activities, the abatement contractor's duties must be addressed in the proposed rules. In this case, abatement contractors have responsibilities in ensuring that the abatement requirements established in Minn. Rules pts. 4750.0030 and 4750.0035 are met.

The Agency believes that inclusion of abatement contractor duties in the proposed rule is reasonable because it is consistent with the requirements provided in the Housing and Urban Development Guidelines for Lead Abatement. The end result is a significant reduction of lead in soil that is accessible to children and hence a decrease in their blood lead levels.

7. Minn. Rules Pt. 4750.0050 Variance

Minn. Rules pt. 4750.0050 provides for a variance as expressed by Minn. Laws 1990, ch. 533, sec. 7, subd. 3. The Agency intends to satisfy the legislative mandate specifically recognizing the possibility of variance.

Subpart 1 incorporates existing procedures in order to obtain a variance. This subpart states that a property owner who is required to undertake abatement of bare soil may apply for a variance from the requirements of Minn. Rules pt. 4750.0030 to allow for use of innovative abatement methods. This subpart further states that the property owner who applies for a variance shall comply with the requirements of Minn. Rules pt. 7000.0700 in applying for the variance. The procedural requirements include application for a variance, notice and comment and opportunity to be heard. To apply for a variance, the applicant must write to the commissioner identifying himself or herself, provide a statement of the location of the property to be abated and provide a complete plan for abatement. Whatever the commissioner's findings, the applicant shall be notified promptly, such notice and comments shall be posted within 30 days.

Subpart 2 establishes that the property owner who applies for a variance has the burden of proof in order to establish criteria that the variance should be granted. In this respect, before undue hardship can be found to exist, the applicant for a variance carries the burden of establishing the criteria by a preponderance of the evidence that a denial of a variance would cause undue hardship or be unreasonable. Related to a determination of undue hardship are the efforts which the property owner has made to bring abatement methods into compliance under Minn. Rules pt. 4750.0030. However, where it was held that the owner of the property refused to consider the requirements for abatement methods with fair and reasonable considerations, he or she would not be suffering from undue hardship.

Subpart 3 establishes the criteria for granting of the variance request. The Agency shall grant the variance request if the property owner establishes that after completion of an innovative abatement method, no person shall come in contact with bare soil that exceeds the standard. Under this provision, an applicant for a variance shall prove to the Agency that his or her alternative method is as effective as the proposed rules. Furthermore, the innovative abatement method shall protect public health in order for a variance to be granted. In this instance, the Agency, recognizing the legislative mandate shall grant a variance. However, if the effectiveness of the alternative procedure or the health impacts are suspect, even though there is a cost savings, a variance shall not be granted.

Taking into consideration all of the above factors, the Agency believes that the variance procedures, burden of proof, and granting of variance request provisions in the proposed rules are reasonable because they provide fairness and opportunity for property owners to be heard, undue hardship is addressed,

and the need to protect public health is upheld. The Agency will grant such variance request if it finds that the request is reasonable, would not impinge on the public health, and is in accordance with the Act's intent and purpose.

V. SMALL BUSINESS CONSIDERATIONS IN RULEMAKING

Minn. Stat. § 14.115, subd. 2 (1988), requires the Agency when proposing rules which may 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.

The proposed rules may affect small businesses as defined in Minn. Stat. § 14.115 (1988). As a result, the Agency has considered the above-listed methods for reducing the impact of the rule on small businesses.

The proposed soil lead rule came about because studies of urban communities, especially in the inner cities of Minneapolis and St. Paul, showed that children are suffering from increased blood lead and lead poisoning. As a result, the State Legislature authorized the Agency to promulgate rules establishing soil standards and abatement methods to reduce the hazard from soil.

The Agency in promulgating the proposed rules considered the impacts on small businesses, such as owners of dwelling units and small abatement

contractors. At the present time, the Agency believes that the proposed rules will have an impact on these businesses because it will increase costs due to soil abatement. The Agency and the legislature have addressed that impact by providing for the use of variance procedures to allow for innovative abatement methods which may reduce the cost of abatement. However, after analyzing the economic considerations, as listed from (a) to (e), the Agency cannot otherwise fulfill the legislative mandate to reduce the risk of lead exposure while still establishing less stringent compliance requirements, lessening performance standards, and simplifying compliance and reporting for small businesses.

There is no question that there will be an economic impact on property owners in terms of handling and disposing of contaminated materials. However, the rules for these procedures should not be relaxed for small businesses, because proper management will determine the success of abatement. The Agency cannot compromise the overall standards by relaxing operational rules for small businesses. Therefore, the position taken by the Agency is reasonable for small businesses because providing less stringent standards would mean a reduction in the protection of human health and the environment.

VI. CONSIDERATION OF ECONOMIC FACTORS

In exercising its powers, the Agency is required by Minn. Stat. § 116.07, subd. 6 (1988) 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 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.

In proposing the rules governing standards and abatement methods for lead in bare soil on playgrounds and residential property in a manner to protect public health and the environment, the Agency has given due consideration to available information as to any economic impacts the proposed rules would have.

At present, the Agency believes that the proposed rules may have an economic effect on property owners who either reside on the property or who rent properties. When a person with a high elevated blood lead resides on the property, the owner will be ordered to abate bare soil that exceeds the soil lead standard. To comply with the rules, the owner's cost of maintenance are expected to increase.

To illustrate this situation, an estimation based on the 1987 Soil Lead Report to the Minnesota State Legislature, submitted by the Minnesota Pollution Control Agency and the Minnesota Department of Health, was used as a model. Much of the discussion in estimating cost revolves around a direct cost to property owners for response actions taken on their property to minimize the amount of lead contamination in their soils. What is apparent, though, is that direct costs vary greatly depending upon the soil lead standard, the amount of contamination, the ease or difficulty in landscaping at each residence, the amount of work which can be done by the owner versus the amount contracted, and the location within the State.

The report further stated that the per site cost estimate to bring a typical metropolitan area residence with about 6,000 square feet average size into compliance would range from an estimate of \$1,150 for a 100 parts per million soil lead standard to \$380 for a 500 parts per million soil lead standard. These costs are based on estimates supplied by landscapers in the

metropolitan area. The average cost as of June 1987 is about \$0.30 per square foot for soil removal, replacement with clean fill and resodding. Recently, this cost estimate may have gone up to about \$0.35 per square foot.

Applying the procedures for cost estimation established in the report, the calculation to abate an average lot size of 6,000 square feet at 300 parts per million soil lead standard is as follows:

Average city lot size	=	6,000 square feet
Average house size	=	900 square feet
Surrounding soil to abate	=	6,000 - 900 = 5,100 square feet

However, based on the report's assumption, only 50 percent of the average lot size would exceed the 300 parts per million soil lead standard. To obtain the area in square feet of the average city lot size that needs abatement the estimation is:

$5,100 \text{ square feet} \times 50\% = 2,550$

The per house cost estimate to abate is:

$2,550 \text{ square feet} \times \$0.35 \text{ per square foot cost} =$
\$893 per house to abate soil

The above analysis shows the individual house cost to abate the surrounding soil that exceeds the 300 parts per million soil lead standard. The estimated cost for a property owner to abate soil lead is \$893 for an average city lot. The cost covers removal, transportation, and replacement of soil as well as resodding.

Similar estimation procedures could be applied to estimate cost to a landlord to abate a multi-unit rental property. Because of the size of the building in proportion to the average lot size, a much smaller surrounding soil area would be the only feature that would differentiate it from a single residential house. However, the basic scheme of calculation would be the same.

Furthermore, for a rental property the landlord might decide to recover the cost of abatement and maintenance from the renters. This means that the landlord would have to raise the rent. Conversely, if the landlord cannot increase the rent the landlord will have to absorb abatement costs. This would be an economic impact of the proposed rules to the landlord who rents property. The agency recognized such impact in developing the proposed rules, but the benefits conferred to society by reduced soil lead contamination outweigh the costs associated with abating lead contaminated soils.

VII. CONCLUSION

Based on the foregoing, the proposed Minn. Rules pts. 4750.0010 to 4750.0050 are both needed and reasonable.