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Animal and Plant Health Inspection Service

Importation of Solid Wood Packing Material

Final Environmental Impact Statement—August 2003

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Executive Summary

In recent years, the United States has faced an increasing threat from harmful invasive alien species (pests and pathogens) found in the solid wood packing material (SWPM) that accompanies shipments in international trade. Wooden pallets, crating, and dunnage can harbor environmentally and economically harmful species that use the wood as host material, feed upon it, or hitch a ride on it. Outbreaks of the Asian longhorned beetle, *Anoplophora glabripennis* (Motschulsky), pine shoot beetle, *Tomicus piniperda* (L.), and the emerald ash borer, *Agrilus planipennis* (Fairmaire), have been traced to importations of SWPM. Coping with the pest risks associated with introduction of these pests of SWPM has become an increasingly important issue with the expansion of international trade.

After the Asian longhorned beetle infestations were traced to SWPM from China, the Animal and Plant Health Inspection Service (APHIS) promulgated two interim rules regulating solid wood packing material from China (September 18, 1998, 63 Federal Register (FR) 50099, Docket No. 98–087–1; amended December 17, 1998, 63 FR 69539, Docket No. 98–087–4). These rules (referred to below as the China Interim Rule) required all SWPM from China, including Hong Kong, to be treated with preservatives, heat treated, or fumigated prior to arrival in the United States (7 Code of Federal Regulations (CFR) 319.40). Although the interceptions of invasive species in SWPM from China and Hong Kong have decreased subsequent to promulgation of the China Interim Rule, interceptions from other parts of the world continue to rise. Because of the potential for serious environmental and economic harm from the continued entry of invasive species associated with SWPM, it is clear that the United States must do something further to diminish the threat.

To further reduce the threat from SWPM, APHIS is proposing to adopt standards that have been published by the Food and Agriculture Organization of the United Nations. These phytosanitary standards are contained in the International Plant Protection Convention's (IPPC) "Guidelines for Regulating Wood Packaging Material in International Trade." The IPPC Guidelines are an attempt to provide effective, equitable, and uniform standards (prescribed treatments, certification procedures, and standardized markings) that all nations could use to mitigate the risk from wood packaging material (or SWPM, in APHIS' terminology). The implementation of the IPPC Guidelines has the potential to result in decreases in the interception of invasive species in

SWPM, similar to the results due to implementation of the China Interim Rule.

This environmental impact statement (EIS) has been prepared to consider the potential environmental impacts of the proposal and alternatives, in accordance with the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. Alternatives considered within this EIS include (1) No Action (no change in the current regulation), (2) Extend the Treatments in the China Interim Rule to all Countries, (3) Adoption of the IPPC Guidelines (the proposed alternative), (4) a Comprehensive Risk Reduction Program, and (5) Substitute Packing Materials Only. Each alternative contains an array of component control methods.

Although each alternative (excluding No Action) has the potential to lower pest risk associated with SWPM, each alternative (including No Action) has the potential for adverse environmental consequences. Generally, those consequences may be considered to be the aggregate of their individual effectivenesses (efficacies) and the direct and indirect impacts (including cumulative impacts) of their component control methods. The No Action alternative would result in the greatest degree of risk from invasive species, with impacts from component control methods that would be expected to increase, as international trade increases. Extension of the treatments in the China Interim Rule to all countries would substantially reduce the pest risk from invasive species, but would have the greatest potential for adverse environmental impact from its component control methods. Adoption of the IPPC Guidelines also would provide substantial reduction of pest risk, with substantial environmental impact from its component control methods. A comprehensive risk reduction program could provide substantial reduction of pest risk, with variable impact from its component control methods, depending upon which methods were selected. Substitute packing materials only (prohibition of SWPM) would achieve the greatest reduction of pest risk with the least environmental impact from its component control methods, but could generate some impacts from the manufacturing process.

The potentially affected environment for this proposed action includes the United States (confronted with threats to its agricultural and environmental ecosystems), the other nations (which would sustain environmental impacts because of measures required by United States import requirements), and the Global Commons (which also could sustain environmental impacts because of measures required by United States import requirements). Of particular concern is the potential effect of

increased use of the fumigant methyl bromide, a chemical that may have the capacity to deplete the atmosphere's ozone layer, which shields life on our planet from the harmful effects of ultraviolet radiation. This potential impact from increased usage is mitigated by the availability of other treatments for SWPM and the phaseout of other ozone-depleting chemicals as well as the phaseout of those uses of methyl bromide other than Quarantine and Preshipment (QPS).

The rationale for proposing to adopt the IPPC Guidelines, rather than selecting one of the other alternatives, involves a number of factors. First, the serious environmental and economic threats impart a degree of urgency to this rulemaking process. Although APHIS is contemplating a long-term resolution to the pest risk problems associated with SWPM, the agency intends to implement an effective mitigation strategy as soon as this approach is determined to be viable. Data are available to support the effectiveness of the treatments approved under the IPPC Guidelines against many pests of concern to APHIS, but efficacy data for other treatment options are lacking. The establishment of a baseline level of phytosanitary protection against these pests and pathogens will determine the need for further refinement of SWPM regulations. There are substantial logistical and operational barriers associated with some of the alternatives, even though they may present lesser environmental impact. Also, APHIS must work within the framework of international agreements to which the United States is a party, including the IPPC. APHIS is committed to developing regulations that reduce the threat of invasive species, yet which promote the harmonization of international regulatory efforts and the facilitation of trade. The development of new regulations, therefore, depends upon technological progress and international negotiations to provide an efficient mechanism for addressing phytosanitary risks associated with SWPM. Thus, APHIS will be considering environmental, economic, scientific, and social factors in its effort to derive an appropriate and effective strategy for the regulation of imported SWPM.

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I. Purpose and Need

A. Introduction

In recent years, the United States has experienced an enormous increase in international trade. Those import shipments have been accompanied by commensurately increasing amounts of untreated solid wood packing material (SWPM) consisting of pallets, crating, and dunnage. SWPM has the potential to harbor environmentally and economically devastating invasive species that may use it as host material, feed upon it, or simply hitch a ride on it. For example, the United States has experienced introductions and costly infestations of the Asian longhorned beetle, *Anoplophora glabripennis* (Motschulsky), and pine shoot beetle, *Tomicus piniperda* (L.), that were traced to importations of SWPM. More recently, an infestation of the the emerald ash borer, *Agrilus planipennis* Fairmaire, has been found in Michigan and Ohio. Between August 1995 and March 1998, 97 percent of the pests intercepted by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) inspectors at U.S. ports and recognized as potential threats to U.S. forest resources were associated with SWPM.

Approximately 52 percent of maritime shipments and 9 percent of air shipments into the United States are accompanied by SWPM. Between 1996 and 1998, pest interceptions associated with SWPM were recorded for 64 different countries of origin. SWPM usually arrives in sealed containers and may not be listed on the shipping manifest, making it difficult for inspectors to select shipments for inspection. With containerized cargo, only 1 to 5 percent of the SWPM may be visible from the opening of the container. In addition, most of the pests may go undetected in a visual inspection, because the insect pests or plant pathogens of concern are often buried in the wood, and are unable to be readily detected, isolated, or identified upon inspection.

Because of the increased risk of pests in SWPM from China (the Asian longhorned beetle infestations were traced to that source), APHIS promulgated two interim rules regulating solid wood packing material from China (September 18, 1998, 63 Federal Register (FR) 50099, Docket No. 98–087–1; amended December 17, 1998, 63 FR 69539, Docket No. 98–087–4). These rules (referred to below as the China Interim Rule) required all SWPM from China, including Hong Kong, to be treated with preservatives, heat-treated, or fumigated prior to arrival in the United States (7 Code of Federal Regulations 319.40). Since then, in calendar years 2000 and 2001, APHIS intercepted more than

700 quarantine pest species in SWPM at 58 ports of entry from points of origin other than China. During this time period, there was an 80 percent reduction in quarantine pest species in SWPM from China. Given the enormous quantity of shipments (in the millions), the negative consequences of the introduction and establishment of invasive species, and the barriers to detecting and efficiently eradicating invasive species at the U.S. ports-of-entry, it is clear that the United States must find a more effective way of protecting its valuable resources.

A variety of methods have been proposed by exporters or government regulatory agencies to reduce the risk of invasive pests in SWPM. Those methods range from intensive inspection programs, through various kinds of controls (e.g., fumigation, heat treatment, and irradiation), to the use of substitute packing materials (prohibition of SWPM). Many of those methods are more efficacious against one type of organism than another, and no single method (with the exception of substitute packing materials, if hitch-hiking pests are not included) appears capable of eliminating the risk from all types of invasive pests. Some of the materials available for control, such as methyl bromide used in fumigations, are believed to be associated with environmental degradation, and their uses are diminishing. Finally, there are a number of issues that must be considered, along with the potential environmental effects of the SWPM alternatives before a regulatory strategy may be developed; these include (1) foremost, the phytosanitary protection of the alternative in mitigating risk; (2) the relative costs of the alternatives/methods; (3) the differing capabilities of exporting nations to comply with quarantine requirements; and (4) the need for harmonization of regulatory efforts among trading partner nations.

The United States is not alone in its recognition of and concern for the risk from imported SWPM. The International Plant Protection Convention (IPPC), under the Food and Agriculture Organization of the United Nations, as a part of its "International Standards for Phytosanitary Measures," has published "Guidelines for Regulating Wood Packaging Material in International Trade" (referred to hereafter as the IPPC Guidelines). The IPPC Guidelines are an attempt to provide effective, equitable, and uniform standards (prescribed treatments, certification procedures, and standardized markings) that all nations could use to mitigate the risk from wood packing material (or SWPM, in APHIS' terminology). As a signatory to the IPPC, the United States had input into the development of the IPPC Guidelines and would be expected to support them. These Guidelines are not static but allow further refinement, as described in annex 3, for future inclusion of effective treatments of SWPM that result from further technological development.

B. Purpose and Need for Action

APHIS is required by virtue of its mission and statutory responsibilities to take action to minimize the potential risk and resultant damage from foreign invasive species to agricultural, forest, and environmental resources of the United States. Accordingly, APHIS is considering alternatives for mitigating, to the extent feasible, the risk associated with the importation of SWPM into the United States. Because of the nature and severity of the risk from SWPM, APHIS is proposing to adopt the IPPC Guidelines while it considers the need for a more long-term and permanent solution to the SWPM problem.

This environmental impact statement (EIS) analyzes concisely and in a broad fashion the alternatives for the mitigation of pest risk from SWPM, including APHIS' preferred alternative, Adoption of the IPPC Guidelines. It has been prepared to satisfy the requirements of the National Environmental Policy Act of 1969 (NEPA), 42 United States Code (U.S.C.) 4321, *et seq*. This EIS also is intended to comply with the requirements of Executive Order 12114, "Environmental Effects Abroad of Major Federal Actions."

APHIS' authority to exclude, eradicate and/or control invasive alien agricultural pests is based on Title IV–Plant Protection Act, 7 U.S.C. 7701 *et seq*., which authorizes the Secretary of Agriculture to take measures to prevent the dissemination of a plant pest that is new to or not known to be widely prevalent or distributed within or throughout the United States. APHIS has been delegated authority to administer this statute and has promulgated Foreign Quarantine Regulations, 7 Code of Federal Regulations (CFR) 319, which regulate the import of commodities.

C. Scope and Focus of the Environmental Impact Statement

APHIS conducted scoping for the EIS between the period August 9, 2002, to September 9, 2002. Oral and written comments received during the scoping period were considered fully by APHIS in the planning of the EIS. Potential issues identified by APHIS at the outset included: new treatment methods, logistical considerations, environmental regulations and constraints, and harmonization of regulatory efforts.

The notice of availability of the draft EIS and comment period were provided (November 15, 2002, 67 FR 69216, Docket No. 02–29052) to ensure review and input to this EIS from the public and other stakeholders.

Public comments on the draft EIS were received for the period extending from this Federal Register notice of availability to December 30, 2002. (Refer to appendix A for a review of the public comments and responses to substantive issues.)

In addition, public comments submitted to the program regarding the proposed rule were reviewed for environmental issues not raised in previous public comments. Most public comments on the proposed rule related to environmental issues had been addressed in previous documentation. One issue was raised in public comment about an alternative that was not directly addressed previously. The respondent indicated that the alternative of requiring heat treatment alone was not evaluated. Although this treatment is not singled out as an alternative, we are not aware that the decisionmaker has settled on any treatment or combination of treatments. It is possible that heat treatment and inspection alone could still be selected under a comprehensive risk reduction program or APHIS' adoption of the IPPC Guidelines. Environmental impacts from the adoption of the IPPC Guidelines using only heat treatment would be limited to those impacts from heat treatments alone. This would preclude any environmental impacts related to use of methyl bromide. The primary impacts from heat treatment (excluding potential efficacy concerns) result from the generation and dissipation of the heat as described under the component method for heat treatment. The limited heat generated by this treatment was determined to not add substantially to the global heat load. The source of heat generation (fossil fuels or electricity) was indicated to involve emissions of some exhaust gases (carbon dioxide and hydrocarbons) known to contribute to global warming, but these emissions were determined to be low relative to those from other sources and their contribution was determined to be insufficient to add measurably to global warming.

The organizational scope of the EIS involves a broad range of program alternatives, many with arrays of component mitigation methods. (Refer to chapter 2 for a more detailed discussion of the alternatives.) The geographical scope of the EIS includes the entire world, in that regulatory treatments (with potential environmental impacts) are being proposed for the importation of SWPM from all nations of the world. This includes potential changes in treatments for countries that are already being regulated (i.e., SWPM from China and Hong Kong). (Refer to chapter 3 for a concise discussion of the affected environment.)

This EIS is intended to serve as a preliminary tool, to be used along with other resources, for the development of an effective strategy for the mitigation of risk from SWPM. Such a strategy is necessary because of

the severity of the risk from SWPM and the corresponding need for prompt action. Despite the urgency for action, the strategy under consideration has the capacity for substantial adverse environmental impacts and thus requires appropriate, comprehensive analysis. Then too, the nature of international trade is such that industry will require substantial lead time before any new restrictions may be enforced—great numbers of shipments will be in transit already and additional treatment requirements likely would require the purchase and installation of new equipment, on a broad scale. Compliance of countries with the results of international negotiations, like the IPPC Guidelines, requires time for implementation. It may seem paradoxical, therefore, that APHIS must develop the new restrictions at an accelerated rate, but must wait an extended period of time before they can be implemented and enforced.

The potential future phytosanitary regulation strategy of APHIS for addressing pest risks associated with SWPM will depend upon the findings of research and monitoring. Although there is data for efficacy in treatments against individual pests of SWPM, there is a lack of monitoring data to indicate how effective those IPPC treatment requirements will work when implemented to provide regulatory phytosanitary protection. The results of ongoing efficacy testing and monitoring will be used to determine the baseline level of phytosanitary protection (including efficacy) against all pest risks associated with SWPM that is achieved through compliance with the IPPC Guidelines. Any unacceptable pest risks revealed to APHIS from this ongoing effort will require development of improved pest risk mitigations. The regulatory process would involve preparation of documentation for any needed improvement/s to the IPPC Guidelines to meet an acceptable level of phytosanitary protection. Supporting data would provide the basis for justification and implementation of proposed revisions to the Guidelines. This information would be submitted by APHIS in a petition for revisions to the SWPM IPPC Guidelines for the consideration and acceptance by member nations of the needed phytosanitary provisions. If revisions to the IPPC Guidelines were approved by the International Community, APHIS would begin the process of formal rulemaking and prepare environmental documentation to assess revised Guidelines and alternatives to those Guidelines. If APHIS were unable to achieve the desired level of phytosanitary protection through revision of the IPPC Guidelines, then APHIS would begin independent rulemaking and environmental documentation to analyze potential impacts of the proposed course of action and reasonable alternatives.

Because there is an immediate need for this rulemaking, APHIS is proposing the adoption of the IPPC Guidelines while it deliberates

separately on the need for any further regulation of SWPM. The framework of need for action is reflected in this unusually concise and subjective EIS. This EIS uses a subjective comparison of the potential impacts of the alternatives, rather than intensive and exhaustive individual analyses of the alternatives. Such a concise and subjective comparison appears more suitable for this rulemaking than an intensive and exhaustive treatment of the alternatives. That is because the absolute quantification of impacts is of lesser importance than the basic need to rank the alternatives relative to their anticipated impacts, so that an informed decision may be made among the alternatives. The important thing is to make sure that an equitable and efficacious solution is provided in a timely fashion to the other nations of the world.

While it is reasonably possible to compare and contrast the environmental effects of some of the alternatives (especially those which have been implemented previously by APHIS), it is more difficult, if not impossible at this time, to identify the array of methods which might be employed within a comprehensive risk reduction strategy, or to predict the proportional use of those methods by the world's SWPM exporting nations. For example, such a regulatory strategy might allow various options for compliance, depending upon such factors as the individual nations' economic status, technological capabilities, and internal policies (especially with respect to pesticide uses). For that reason, it is impossible to predict with certainty the impacts of such an alternative, and much of the analysis of impacts will fall within the realm of "incomplete and unavailable information," as defined under NEPA. To the extent possible, as where it might be surmised that a single method might be used for the policy (e.g., substitute packing materials), a reasonable prediction of cumulative impacts has been made. Any projections for a comprehensive risk reduction strategy can be tempered to consider the phasing out of other methods until the most desired methods prevail. The necessity for extensive negotiations with other countries precludes the ability to establish meaningful timetables for any anticipated changes in regulations of packing materials worldwide.

APHIS will consider this EIS and other relevant resources (including associated assessments cited within the EIS) for the development, proposal, and implementation of its strategy for the mitigation of risk from SWPM. In addition, it will fully consider relevant guidance, such as the IPPC Guidelines, as well as the North American Plant Protection Organization's "Import Requirements for Wood Dunnage and Other Wood Packing Materials into a NAPPO Member Country." APHIS will continue to negotiate for international guidelines that reflect agency phytosanitary policies to protect U.S. agriculture and forests. APHIS may, within a

separate environmental and rulemaking process subsequent to this one, develop, propose, and implement additional strategies for the mitigation of risk from SWPM.

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II. Alternatives

A. Introduction

The Animal and Plant Health Inspection Service (APHIS) analyzed a range of alternatives and their associated component methods in this environmental impact statement (EIS). The alternatives are broad in scope, and represent alternate means for mitigating the risk of pests and pathogens from the importation of solid wood packing material (SWPM). The alternatives include: (1) No Action (no change in the current regulation), (2) Extension of the Treatments in the China Interim Rule to All Countries, (3) Adoption of the IPPC Guidelines, (4) a Comprehensive Risk Reduction Program, and (5) Substitute Packing Materials Only. Each of the alternatives consists of specific component methods for the mitigation of risk from SWPM.

The alternatives represent the most definable choices for further regulatory action by APHIS. They have been framed in a way that facilitates the identification and consideration of specific issues and the choices that will need to be made by APHIS decisionmakers. Additional alternatives could be designed (and may be recommended by interested parties) by varying the mixture of component methods, but there are too many possible combinations to consider all of those individually within the context of this EIS. We have taken the best approach that we can conceive, and that is to identify one of the alternatives (alternative 4, the Comprehensive Risk Reduction Program) to be analyzed as representative of various methods used in combination. This alternative provides the agency with maximum flexibility in its efforts to diminish pest risks from packing materials.

The alternatives and individual component risk mitigation methods have varying degrees of efficacy, and all have the potential to cause adverse environmental consequences. Each of the alternatives is described within this chapter. The component risk mitigation methods are both described and analyzed within this chapter, as well. Chapter 4, "Environmental Consequences," considers the potential efficacies of the alternatives, estimates the direct and indirect effects of their component control methods, and integrates the efficacy information with the potential effects of the component control methods to provide a summary of aggregate consequences for each alternative. (Refer to table 2–1, which follows, for a tabular listing of the alternatives and their component methods.)

Table 2–1. Alternatives and Their Component Methods

Alternatives	Methods							
	Inspection	Heat treatment	Fumigants	Wood preservatives	Irradiation	Controlled atmosphere	Substitute packing materials	Disposal
1. No Action	•	•[1]	•[1]	•[1]				
2. Extension of China Interim Rule	•	•	•	•				
3. Adoption of IPPC Guidelines	•	•	•					
4. Comprehensive Risk Reduction	•	•	•	•	•	•	•	•
5. Substitute Packing Materials Only	•						•	

[1] For China and Hong Kong only.

B. Alternatives Described

Analysis has determined that there are potential environmental consequences for each of the alternatives. Those consequences vary in intensity for each of the alternatives, with the degree of protection they offer from pests and pathogens associated with SWPM, and with the inherent environmental consequences of their component methods. Lack of adequate protection would result in risk to the environment, our agricultural resources, and our economy. Environmental consequences may also result from the use of methods to control plant pests and pathogens, especially the use of chemical methods. The accrual of resources (e.g., metal ores, petrochemicals) and manufacturing of some packing materials from those resources pose some adverse environmental effects as well.

The environmental consequences of efforts to reduce risk from SWPM may be predicted generally and in a comparative fashion, but cannot be quantified with absolute confidence because of many uncertainties regarding: (1) proportional uses of available methods, (2) the degree of compliance to be attained following the implementation of regulatory changes, (3) fluctuations in trade, and (4) changes in pests' prevalence in their countries of origin. Ultimately, this EIS has been designed to make optimum use of the information available at the time of its preparation to

first assess the anticipated impacts of the methods, subsequently make inferences regarding the combinations of methods most likely to be used within the individual alternatives, and eventually compare and contrast those alternatives with regard to their potential impacts.

1. No Action (No Change in the Current Regulation)

The No Action alternative is characterized as no change in the existing regulations regarding the importation of SWPM. At the time of writing, the importation of SWPM is regulated under 7 Code of Federal Regulations (CFR) 319.40, "Logs, Lumber, and Other Unmanufactured Wood Articles." Under 7 CFR 319.40, SWPM is defined as ". . .wood packing materials, other than loose wood packing materials, used or for use with cargo to prevent damage, including, but not limited to, dunnage, crating, pallets, packing blocks, drums, cases, and skids." The regulation does not restrict packing materials made of synthetic or highly processed wood materials (e.g., plywood, oriented strand board, particle board, corrugated paperboard, plastic and resin composites).

APHIS had issued a general permit for the importation of SWPM providing that it is free of bark, and appropriately certified. However, because of the increased risk of pests from China, the China Interim Rule placed additional restrictions on China. SWPM from China or Hong Kong is now required to be heat treated, fumigated, or treated with preservatives, and certified prior to being exported from China or Hong Kong. Thus, the current regulation has two sets of import requirements—one that applies to China and Hong Kong, and another for the rest of the world.

With no change in the regulation, there would be no additional reduction in the pest risk from the introduction of pests and pathogens associated with SWPM. However, the adverse environmental consequences associated with treatments for SWPM coming from China and Hong Kong (e.g., environmental degradation and human health risks from use of preservatives and fumigants), the pest risks, and the use of resources would be expected to increase proportionally with the increase in world trade. (Refer to chapter 4 for a discussion on the anticipated aggregate impacts of this alternative.)

2. Extend Treatments in China Interim Rule to All Countries

This alternative would require all SWPM from all foreign origins to be heat treated, fumigated, or treated with preservatives, and certified prior to being exported from their countries of origin (or exporting countries). It would apply the same SWPM importation requirements that are in the China Interim Rule to all countries of the world.

If this alternative were implemented, there would be a reduction in the pest risk from the introduction of pests and pathogens associated with SWPM. There would also be a commensurate increase in the adverse environmental consequences associated with treatments. The pest risk, adverse environmental consequences associated with treatments, and the use of resources could be expected to increase proportionally with any increase in world trade. (Refer to chapter 4 for a discussion on the anticipated aggregate impacts of this alternative.)

The risks associated with the introduction of pests and pathogens from SWPM would be substantially reduced with the adoption of this alternative. However, it would result in the greatest level of anticipated adverse environmental consequences from component methods because it would require treatments of SWPM from all countries and it would result in the greatest use of methyl bromide. The demand for forest products would continue to increase, but the elevated cost of treatments could promote demand for substitute packing materials with associated demand for raw materials for manufacturing. (Refer to chapter 4 for a discussion on the anticipated aggregate impacts of this alternative.)

3. Adoption of the IPPC Guidelines (Proposed Alternative)

The International Plant Protection Convention (IPPC) dates back to 1952, and is aimed at promoting international cooperation to control and prevent the spread of harmful plant pests. The signing of the 1995 World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures Agreement (SPS agreement) placed more rigorous requirements on international phytosanitary regulations. Phytosanitary regulations are those regulations of imported and exported commodities for the purpose of protecting plant health. These regulations may be enforced domestically by individual countries, regionally by groups of countries, or world-wide based on an international agreement. The SPS agreement indicated that all countries are to base their phytosanitary measures on relevant standards, guidelines, and recommendations developed under the auspices of the IPPC.

If this alternative were implemented, APHIS would adopt the International Plant Protection Convention's "Guidelines for Regulating Wood Packaging Material in International Trade" (IPPC Guidelines). Adoption of the IPPC Guidelines would mean that SWPM imported from all countries to the United States would be required to be heat treated (to a minimum wood core temperature of 56 °C for a minimum of 30 minutes) or fumigated with methyl bromide (treatment schedule per the IPPC Guidelines), and then marked to show that it has been treated. These treatments are slightly less rigorous than the fumigation and heat treatments required under the China Interim Rule. Unlike previous

regulation of SWPM, there is no debarking requirement under the IPPC Guidelines. Any changes in the IPPC Guidelines approved through future negotiations under provisions of annex 3 will be subject to further environmental review and documentation under NEPA.

The adoption of the IPPC Guidelines would result in substantial reduction in risk of introduction of pests and pathogens to the United States from SWPM. Next to alternative 2 (Extend Treatments of the China Interim Rule to All Countries), this alternative would result in the greatest level of anticipated adverse environmental consequences from component methods because it would require treatments of SWPM from all countries and it would result in substantial use of methyl bromide. The demand for forest products would increase under this alternative, but the elevated costs of treatments could promote demand for substitute packing materials with associated demand for raw materials for manufacturing. (Refer to chapter 4 for a discussion on the anticipated aggregate impacts of this alternative.)

4. Comprehensive Risk Reduction Program

The Comprehensive Risk Reduction Program alternative involves a risk mitigation strategy that includes various options for complying with United States import requirements. Our concept of such a program is that it would consist of an array of approved mitigation methods that is more extensive than that contained in either the China Interim Rule or the IPPC Guidelines. In such a program, the complete array of methods might be available to all nations who export to the United States, or different combinations of methods might be allowed for various countries, depending upon the countries' economic and technological capabilities, and their pest status.

Component risk mitigation methods that could be applied in this program differ greatly from one to another in respect to their capability to mitigate pest and disease risk. For example, increased inspection appears to afford the least degree of protection from risk, while selective prohibition (substitute packing materials) seems to afford the greatest degree of protection from pest risk. This alternative would be expected to involve phasing out of those methods that pose high environmental and high pest risk with concurrent phasing in of methods that pose lower environmental risks and lower pest risks. The approval of methods for such an array would be based upon the degree of protection from pests and pathogens that would be acceptable to APHIS. That necessary degree of protection might be attained from the sole use of one of the analyzed component methods, or from a combination of component methods. This could involve establishing a transition period to allow countries and the industry to comply in a timely and methodical manner.

It is not likely that different combinations of methods would be required of various countries, based upon the prevalence of pests within those countries—a determinative process to support such a practice would be herculean in scope and would not be scientifically or economically practical. For this alternative to be practical and worthy of detailed consideration by APHIS, the array of approved treatments for this alternative would have to be applied consistently to all countries.

Likewise, APHIS could apply different combinations of methods to different types of SWPM (e.g., crates, pallets, etc.). This approach could be justified scientifically, but inspection and verification of these different methods applied to different types of SWPM would involve logistical difficulties. For this potential expansion of regulations to be practical and worthy of detailed consideration by APHIS, Customs declarations would need to identify the type of packing material, and markings would need to be applied to the wood identifying the combination of phytosanitary measures applied to mitigate the pest risk associated with that packing material.

The most likely effect of the selection of this alternative and the implementation of an as yet undefined (but effective) array of control methods would be a reduction of pest risk and an increasing level of adverse environmental consequences and use of resources, commensurate with the increase in world trade. Because the environmental consequences of this alternative are highly dependant upon technological development and the results of future trade negotiations to mitigate pest risks, the potential environmental impacts could be dramatically diminished under this alternative. (Refer to chapter 4 for a discussion on the anticipated aggregate impacts of this alternative.)

5. Substitute Packing Materials Only

Requiring the use of substitute packing materials only equates to prohibiting the importation of SWPM from all countries. Countries could use any of the substances that are not restricted under the SWPM regulation (plywood, oriented strand board, particle board, corrugated paperboard, plastic and resin composites) as substitutes for SWPM, or use other materials that are not capable of being hosts for pest or disease organisms (e.g., metal, rubber, or fiberglass).

Prohibition of SWPM would achieve the greatest possible reduction in risk from the introduction of pests and pathogens associated with SWPM—if no SWPM were imported, there could not be any harmful organisms imported with it. This alternative also would achieve the greatest reduction of adverse environmental consequences from the use of control methods (chemical and/or physical). It would result in diminished use of

wood resources, but could result in increased use of other resources (e.g., ores for metal production and petroleum for plastics) and energy for manufacturing processes. The environmental impacts from use of a given substitute packing material would depend upon the ability to replenish the raw materials, the ability to re-use the packing materials, the ability to mitigate adverse impacts from the manufacture of the substitute packing materials, and the ability to recycle damaged packing materials. (Refer to chapter 4 for a discussion on the anticipated aggregate impacts of this alternative.)

C. Component Methods Evaluated

A variety of component methods for reducing the risk of importation of agricultural pests and pathogens associated with SWPM were analyzed for this EIS. The methods vary widely with respect to their efficacies (their capacities to reduce pest and disease risk), their effect on the human environment (human health, nontarget species, and the physical environment), and their effect on the conservation of natural resources.

Methods may have nonpermanent or permanent characteristics. Nonpermanent methods, such as fumigation, may eliminate pests or pathogens in SWPM prior to its use but may show reduced capacity to provide protection against reinfestation by those organisms subsequent to treatment. The temporary effectiveness of fumigation at eliminating pest risk may lead to a need for additional treatment to maintain protection against pest risks in SWPM. Permanent methods, such as chemical preservatives, may eliminate pests or pathogens in SWPM at the time of treatment and prevent reinfestation for long periods following treatment.

It is anticipated that some exporters will prefer to do treatments of containerized cargo that contains SWPM, thereby providing disinfestation of the cargo as well as the SWPM. This presents a number of issues and regulatory concerns over potential environmental effects on the cargo or on its consumption. Compliance with tolerances for food items would then become a part of the consideration of efficacy for treatments such as fumigation.

1. Inspection

a. Description

Inspection involves the visual examination of SWPM in shipments. This may include de-vanning cargo, some destructive examination of pallets or packing material, and submission of specimens to entomologist or pathologist identifiers. Currently, a representative percentage of SWPM is

inspected on the United States borders. The primary intent of inspection is to ensure compliance with the regulations.

The serious adverse consequences associated with noncompliance have resulted in an agency policy that provides a strong deterrent. APHIS has kept importers and shippers informed of the penalties from inadequate compliance. Importers or shippers are subject to civil penalties, criminal fines, jail sentences, and losses of revenue for failure to follow regulations. APHIS has issued permits, executed compliance agreements, and rejected commodities that do not comply with regulatory requirements. APHIS has had the option to refuse entry, require treatment, or require destruction of the SWPM. All of these options are costly to the shipping line and exporter (costs may be passed on to importers), who must assume all costs for the delays and any treatments. These incentives for compliance are being continued through efforts of the Department of Homeland Security (DHS). Thus, there are strong incentives for full compliance of shippers and importers with SWPM regulations.

b. Anticipated Consequences

Monitoring of inspections of SWPM from China and Hong Kong following enforcement of the interim rule in 1998 revealed that proper compliance with the requirements for SWPM were met approximately 98 percent of the time. Based upon that monitoring, one could expect live insects in 0.1 to 0.2 percent of the shipments, lack of treatment in 0.7 to 0.9 percent of the shipments, and incorrect treatments for 0.05 to 0.2 percent of the shipments. Closer inspection of shipments from sources with previous inadequate or noncompliance has been shown to increase likelihood to detect cargo with increased pest risks. Using this cargo information, inspection rates for SWPM by inspectors could be set statistically to meet a desired level of compliance that maximizes exclusion and minimizes the likelihood of plant pest introduction. However, in the absence of any treatment requirements, the frequency of infested SWPM would be anticipated to remain much higher and to pose pest risks that inspection efforts alone could neither contain nor exclude.

Recommendations have been made to APHIS to increase the level of inspection (quantity and intensity of inspections) for SWPM. To increase the level of inspection, especially up to 100 percent inspection, would require substantially more resources and would impede the movement of shipments. The intensity of inspections could also be increased if port personnel were trained in new diagnostic procedures and spent more time on each shipment. DHS could increase user fees in an amount sufficient to support additional personnel and more intensive inspection of SWPM.

However, the amount of material to inspect and the ever-increasing levels of commerce would tend to make increased inspection an expensive and difficult proposition. Inspection alone (even increased inspection) would not diminish the risk of pests and pathogens associated with SWPM, because some control method still would have to be applied to destroy the pests and/or pathogens that are detected. The recent transfer of most inspection services and APHIS inspectors to the Department of Homeland Security adds to the complexity of this issue, in that future efforts will require their concurrence on inspection policy and procedures.

The ability of inspection to exclude pests could be greatly enhanced by requiring additional documentation for each shipment. The documentation could include information about SWPM identifying the country of origin and type of packing material. The use of certification markings of wood required under the IPPC Guidelines for SWPM would provide evidence of proper compliance. The certification markings could be expanded to include evidence of compliance with phytosanitary measures specific to certain origins and types of SWPM. The enhanced documentation and use of expanded certification markings would have to be worked out with DHS. The logistics of these expansions of documentation and certification markings may limit the feasibility for some phytosanitary applications. Based upon similar documentation for all SWPM to that for cargo manifests from China, one could selectively inspect only those shipments for which the likelihood of quarantine pest infestation in SWPM is elevated.

2. Heat Treatment

a. Description

Heat treatment appears to be a viable method for eliminating pests and pathogens in wood and unmanufactured wood products. The efficacy of heat treatment is dependent upon the time and temperature, as well as humidity, of the treatment. Heat treatment with moisture (water or steam) kills pest and disease organisms by coagulating or denaturing the proteins, particularly enzymes. Heat treatment with moisture reduction (kiln drying) relies primarily on an oxidation process, generally using dry heat to reduce the wood's moisture content to 20 percent or less, to kill pest and disease organisms.

Heat treatment standards (required to ensure the efficacy of the treatments) are provided in 7 CFR 319.40–7, which also requires inspection of the heat treatment facilities by the national government of the country where the facilities are located. APHIS' heat treatment requirements now require the core of each regulated article to be raised to at least 71.1 °C and

maintained at that temperature for at least 75 minutes. By contrast, the IPPC Guidelines require a treatment protocol that is somewhat less—56 °C for at least 30 minutes. Heat treatment with moisture reduction is required to reduce the moisture content of the regulated article to 20 percent or less as measured by an electrical conductivity meter.

b. Anticipated Consequences

The environmental impacts of heat treatments relate primarily to the type of heat source that is used. In all cases, the heat from individual treatments is released to the atmosphere and dissipates readily with no anticipated long-term or cumulative effects on global temperatures. Expansion of the frequency of heat treatments to cover pest risks from other parts of the world is not likely to add substantially to the global heat load. However, an additional issue relates to the source of heating for treatments. Heating the SWPM in a compartment may be achieved by an electrical apparatus or by fossil fuel combustion. The amount of emissions released from fossil fuel combustion or generation of electricity for the treatment of SWPM would be far less than the amount released from transportation sources or the generation of electricity for public consumption. All of these releases of carbon dioxide and hydrocarbons from fuel combustion do contribute to global warming. Although no quantitative assessment has analyzed the amount of exhaust gases contributed by quarantine heat treatments, the amounts are relatively low compared to other sources of carbon dioxide and hydrocarbon emissions.

The cost of heat treatment is generally greater than the cost of fumigation with methyl bromide. The costs associated with construction of heat treatment facilities and the use of fossil energy sources to fuel them usually exceed the costs for fumigation (which is frequently done under tarps at ambient air temperatures). Expenses associated with treatment of SWPM are an external cost that shippers desire to minimize. Heat treatment is usually done only for high quality wood and for specific needs that justify the higher treatment costs. Because exporters and shippers try to minimize costs associated with SWPM, there is a strong tendency to prefer methyl bromide fumigation to heat treatment. The low demand for heat treatment facilities and the high costs to set them up have resulted in few of the facilities being built. There are considerable numbers of heat treatment facilities in the United States and other developed countries. This makes heat treatment an economical option, but many countries lack heat treatment facilities or the capital to construct them. Based upon these cost factors, it is anticipated that heat treatment will not expand greatly in the short-term in these countries where there is continuing availability of less expensive alternate methods. The frequency of heat treatment of SWPM is

expected to increase gradually under all of the alternatives that could include this method. The amount of heat and associated gas emissions with heat treatments is less under the IPPC alternative than under an extension of the China Interim Rule. The amount associated with a comprehensive pest risk reduction program would depend upon the degree to which heat treatment would be employed. Based upon the projected cumulative future usages of heat treatments, emissions are not expected to contribute substantially to global warming.

3. Fumigants

a. Description

Fumigation uses chemical gases to kill pest organisms found on or within wood and wood products. The fumigants considered in depth for this EIS include carbonyl sulfide, methyl bromide, phosphine, and sulfuryl fluoride. APHIS is reviewing data and research on the use of other fumigants, but efficacy and environmental data are lacking on the others, and they are not ready for serious consideration. The fumigants analyzed vary considerably in their efficacies, and their effectiveness appears to be enhanced when administered at higher temperatures. The fumigants show varying degrees of effectiveness on pests and pathogens that can be found in SWPM, such as longhorned beetles, powder-post beetles, drywood termites, and fungi. There are a number of environmental considerations associated with the use of fumigants, including human health hazards from toxic gases, potential damage to the Earth's protective ozone layer, and potential damage to some of the commodities that SWPM support in shipments.

(1) Carbonyl Sulfide

Carbonyl sulphide (COS) is a naturally occurring gas that is emitted to the atmosphere from volcanic activity, some combustion processes, and various natural decomposition processes (in marshes, soil, and forests). It is the most common form of sulphur in the atmosphere. It occurs at low levels in many foodstuffs including cheese, grains, and seeds. It is a common byproduct of various industrial combustion processes and of recovery boiler processing of wood pulp.

The use of COS as a fumigant was patented in Australia in 1992. Applications as a fumigant are applied in a manner similar to methyl bromide or phosphine from gas canisters. Tests have shown that it will control a wide range of pests, such as beetles, fruit flies, moths, mites, termites, molds, and nematodes. It has shown good efficacy in tests of grains, legumes, dried fruit, cut flowers, and both hard and soft timbers.

Although carbonyl sulfide shows promise in controlling pests on certain commodities (especially stored products), its efficacy on wood products at commercial application levels has not been conclusively demonstrated, particularly for insect pests and fungi of quarantine significance. Any future decisions by APHIS to allow use of COS to treat SWPM for quarantine certification must be based upon its efficacy against these quarantine pests.

Carbonyl sulfide is a toxic, flammable gas that presents acute inhalation danger to humans. It may cause narcotic effects, and irritate eyes and skin. It has not undergone a complete evaluation and determination by EPA, and data concerning its effects are incomplete.

(2) Methyl Bromide

Methyl bromide (or bromomethane), one of the oldest fumigants, has good penetration properties and is effective against most insects and against fungi. It has been used to fumigate agricultural commodities, grain elevators, mills, ships, clothes, furniture, and greenhouses. The regulation under 7 CFR 319.40–7 requires the fumigated articles and ambient air to be at 5 °C or above throughout fumigation. Specific treatment requirements may be found in schedules T–312 and T–404 of APHIS' Plant Protection and Quarantine (PPQ) Treatment Manual (USDA, APHIS, 1998a). The IPPC Guidelines require a treatment protocol that is somewhat less stringent.

Although methyl bromide has been used a long time as a fumigant and is known to be highly effective, there are a number of environmental concerns regarding its use. Methyl bromide is a highly toxic compound in EPA Toxicity Class I. It is a Restricted Use Pesticide (may be purchased and used only by certified applicators) and its labels must bear the Signal Word "DANGER." It has been identified as an ozone-depleting substance under the terms of the Montreal Protocol and Clean Air Act. The United States Environmental Protection Agency (EPA) is phasing it out of production and use in the United States, except for quarantine and preshipment (QPS) uses, and critical use exemptions. Methyl bromide has other detrimental qualities, including adverse effects on commodities conveyed by SWPM, such as leather and some varieties of fresh produce.

Methyl bromide is currently being used by APHIS under the quarantine exemption provided by the Montreal Protocol and Clean Air Act for the fumigation of SWPM and some commodities. Its future use is subject to further regulations and changing perspectives on its environmental impact.

(3) Phosphine

Phosphine (also known as phosphane, hydrogen phosphide, or phosphorus hydride) is one of the most toxic fumigants known. It is also an industrial gas used in silicon chip manufacture. Phosphine is applied as a fumigant to commodities either from gas cylinders or released by off-gassing from loose solid sources. The solid sources of phosphine are aluminum phosphide or magnesium phosphide, which may be packaged as tablets, pellets, prepacks, in bags, or on plates. High humidity is needed to generate the gas from solid sources. Phosphine is a colorless gas with a garlic-like odor. It is highly penetrative to many commodities, but has somewhat limited penetration of wood. Phosphine gas is produced naturally at low concentrations by decomposition in swamps and sewers.

As a fumigant, phosphine is widely used to kill insects in stored products. It is used in low concentrations, but because it is less effective than other fumigants, must be used in treatments that have long exposure periods. High humidity is needed to generate the gas and temperatures above 4.4 °C are required for satisfactory results. Wood regulation requirements do not provide minimum temperature and humidity conditions for phosphine treatments. Phosphine is highly flammable when in direct contact with liquid (especially water), and is highly penetrative to many commodities. Phosphine formulations are Restricted Use Pesticides because of their acute inhalation toxicity. Phosphine is in EPA Toxicity Class I and its product labels must bear the Signal Word "DANGER."

APHIS has removed phosphine treatment from its PPQ Treatment Manual. Efficacy tests showed the schedule for this fumigant was not effective, so it was removed until additional testing can be completed.

(4) Sulfuryl Fluoride

Sulfuryl fluoride (most common trade name–Vikane) is a colorless, odorless, noncorrosive, and nonflammable compressed-gas fumigant that was developed in the late 1950's as a structural fumigant, primarily for termite control. It is widely used in structures, vehicles, and wood products against a wide range of pests, including: dry wood termites, wood infesting beetles, other insects, and rodents. Sulfuryl fluoride is considered to have excellent penetrability for wood (USDA, APHIS, 1991), with dosages similar to those used for methyl bromide. Wood regulation requirements provide no minimum treatment standard for sulfuryl fluoride. Specific treatment requirements may be found in schedules T404(b)(2) and T404(b)(3) of the PPQ Treatment Manual.

Sulfuryl fluoride is less reactive than methyl bromide. Unlike methyl bromide, sulfuryl fluoride produces no objectionable colors or odors to treated commodities. This fumigant also is effective against other major insect pests of timber such as bark beetles, wood-wasps, longhorn beetles, and powderpost beetles (UNEP, 1998). However, the eggs of many insects are tolerant to even high concentrations of sulfuryl fluoride (USDA, APHIS, 1991). Sulfuryl fluoride is no longer approved by APHIS as a treatment for wood boring beetles because it has difficulty in penetrating insect eggs; many insect eggs still hatch following fumigation. Sulfuryl fluoride treatment should be considered only for hitchhikers and surface feeders, or for brood-tending species of insects such as termites, bees, wasps, and ants (because even if all the eggs are not killed, the hatching larvae will die anyway because of lack of care). This limited use pattern for sulfuryl fluoride minimizes the possible applications for SWPM, which is often infested with wood-boring beetles.

All formulations of sulfuryl fluoride are registered as Restricted Use Pesticides and bear the Signal Word "DANGER" on their labels because of inhalation danger. Sulfuryl fluoride is EPA Toxicity Class I—highly toxic. There are no labeled uses of sulfuryl fluoride on food or feed crops.

(5) Other Fumigants

A number of other fumigants are being studied with relation to their efficacy and environmental consequences as wood product treatments. These include, but are not limited to, methyl iodide, chloropicrin, metam sodium, propargyl bromide, iodinate hydrocarbons, and propylene oxide. These products have varying properties and undetermined environmental consequences, and are not considered ready for implementation at this time.

b. Anticipated Consequences

(1) Carbonyl Sulfide

COS is a colorless gas with rotting egg odor. COS breaks down quickly and has extremely low residue levels. The rapid degradation ensures that bioaccumulation will not occur in living organisms or soil. One of the degradation products, hydrogen sulfide, is extremely toxic. It has minimal effect on durable commodities. It can corrode copper in the presence of contamination with hydrogen sulfide, but commercial fumigations can be made with pure enough COS to prevent this. It can also be corrosive under moist conditions and direct exposure to water should be avoided. COS is

flammable and potential ignition sources should be kept away from the fumigation stack during an application.

Although COS produces a rotting egg odor that warns of its presence, the concentrated nature of gas in fumigation chambers can quickly overwhelm any person with inadequate protective gear. The required protective gear and safety precautions for COS fumigations are comparable to other fumigations. The required use of self-contained breathing apparatus for any workers or supervising authorities within the restricted fumigation area prevents potential adverse respiratory and systemic effects. COS can cause depression and damage to the central nervous system with inadequate personal protection (BOC Gases Australia Limited, 2000). Excess breathing of COS results in formation of hydrogen sulphide in the lungs and adsorption into the blood stream. This lack of protection can lead to asphyxiation in fatalities, but none of these effects should occur with adherence to proper safety precautions.

COS can cause skin and eye irritation and cold burns from evaporating liquid, but proper handling of gas cylinders by applicators precludes this exposure. Inhalation of COS at low concentrations causes marked dryness and irritation of the nose and throat. This should be minimized by adherence to entry restrictions within the fumigation area. Inhalation of higher concentrations can cause a temporary loss of smell, severe irritation, headache, nausea, vomiting, and dizziness (BOC Gases Australia Limited, 2000). Narcotic effects associated with these higher exposures are precluded by required safety precautions. A complete evaluation of potential health and environmental risks of COS has not been completed by EPA.

(2) Methyl Bromide

Methyl bromide is one of the oldest and most widely used fumigants for phytosanitary purposes. This fumigant has a long history of use for treatment of logs and other wood articles because of the chemical's high volatility, ability to penetrate most materials, and broad toxicity against a wide variety of plant pests (all life stages of insects, mites, ticks, nematodes including cysts, snails, slugs, and fungi such as oak wilt fungus) (USDA, APHIS, 1991). Currently, APHIS uses only methyl bromide as an authorized fumigant for SWPM and requires its use only on a limited basis (i.e., SWPM from China).

Penetration of methyl bromide into wood is inversely proportional to the moisture content of the article and therefore, it does not penetrate as well into wood with high moisture content (e.g., green logs). Radial diffusion

(against the grain) is many times slower than longitudinal diffusion (along the grain) and therefore, penetration to the center of the wood will not occur as readily as along the length of the log (Michelson, 1964). Cross (1992) found that, in practice, it is difficult to achieve insecticidal doses much beyond a depth of 100 millimeters in green materials using conventional tent fumigation techniques. The removal of bark has been found to facilitate the penetration of the fumigant into the wood (Ricard *et al.*, 1968). A test shipment from New Zealand was fumigated in early 1992 and found to be infested with a blue stain fungus upon arrival in the United States (USDA, FS, 1992). The efficacy data of methyl bromide for many pests and pathogens do not exist (USDA, APHIS, 2000). Although methyl bromide may not be effective against all organisms in wood, agency review of the efficacy of methyl bromide fumigations against pests and diseases in SWPM has been found acceptable for two treatments listed in the APHIS' PPQ Treatment Manual (USDA, APHIS, 1998a).

Methyl bromide is three times heavier than air and diffuses outward and downward readily from the point of release. The release of methyl bromide from a cylinder requires a volatilizer to heat the liquid form of the methyl bromide released from the cylinder to a gaseous state. Fan circulation ensures even distribution and penetration of the methyl bromide within the fumigation chamber or fumigation stack. Monitoring at given intervals throughout the fumigation is necessary to ensure that efficacious concentrations of methyl bromide remain during the required treatment period. After the treatment period, the gas is vented from the treatment chamber to the surrounding atmosphere or, in some cases, can be recaptured with methyl bromide extraction devices. Although residual methyl bromide may be trapped in or bind to treated commodities, the majority of methyl bromide from a fumigation remains as free gas in the fumigation chamber. The amount of methyl bromide vented from a fumigation chamber may vary from 69 to 79 percent of the total applied (UNEP, MBTOC, 1998). Methyl bromide in the atmosphere readily degrades to bromine gas. Methyl bromide residues (bromine) in the stratosphere have a half-life of 1.6 years or less (Mix, 1992).

Methyl bromide is produced naturally by processes in the ocean (Singh *et al.*, 1983; Sturges and Harrison, 1986). Bromine and methyl bromide occur naturally in soils, plants, and food. A level of 50 parts per million (ppm) in humans is considered normal (Hayes and Laws, 1991). Methyl bromide is readily degraded and bioaccumulation in natural systems and living organisms is not expected from any exposures to fumigant from phytosanitary treatments. The removal of bromine and methyl bromide from the atmosphere by oceanic processes and uptake by soils serves as a substantial sink to these compounds (NOAA *et al.*, 1998).

Human health effects from methyl bromide have been described in detail in a chemical background statement prepared for APHIS (LAI, 1992). That document is incorporated by reference into this EIS and the more important information is summarized here.

The mechanism of intoxication of methyl bromide targets several organs including liver, kidneys, adrenals, lungs, thymus, heart and brains (Medinsky *et al.*, 1985; Eustis *et al.*, 1988). Methyl bromide is an alkylating agent, a substance that deactivates enzymes and disrupts nucleic acid synthesis. The actual biochemical mechanism remains unclear, but may be related to irreversible inhibition of sulfylhydryl enzymes (Hayes and Laws, 1991). The central nervous system is the primary focus of toxic effects of methyl bromide (Honma *et al.*, 1985).

Methyl bromide is an odorless, acutely toxic vapor that is readily absorbed through the lungs by inhalation. The reference concentration derived by EPA for general population exposure to methyl bromide was determined to be 0.48 mg/m^3 (EPA, 1992). The American Conference of Governmental Industrial Hygienists (ACGIH, 1990) has established an exposure standard (Threshold Limit Value) of 5 ppm (20 mg/m^3) of methyl bromide for unprotected workers against potential adverse neurotoxic and pulmonary effects. After venting of the fumigation chamber, entry without protective gear is not permitted until methyl bromide concentrations are at least as low as 5 ppm. Other potential routes of exposure are through ingestion and contact with eyes or skin. Most recorded injuries from methyl bromide exposure are the result of fumigation of residential and commercial structures for pests. Preventing acute exposures to methyl bromide is the primary concern. However, the half-life of methyl bromide in human blood is approximately 12 days and as a result, its toxic effects may be delayed and prolonged. With this extended half-life, multiple exposures to methyl bromide from inadequate personal protection can result in cumulative effects to health.

Symptoms of excessive exposure to methyl bromide include headaches, dizziness, nausea, chest and abdominal pain, dry throat, slurred speech, blurred vision, temporary blindness, mental confusion, and sweating. More severe symptoms include lung swelling; hemorrhaging of the brain, heart, and spleen; and severe kidney damage. Fatalities to methyl bromide are generally the result of respiratory failure. Contact with the liquid can cause skin burns and skin irritation, but this exposure can be prevented by proper handling of the gas cylinders. Access within the stack barrier zone during regulatory fumigations is limited to certified personnel wearing self-contained breathing apparatus. Use of proper protective gear in this zone is required until the ambient air concentrations of methyl bromide

decrease to 5 ppm or less during aeration. Adherence to required safety precautions and proper protective clothing as described in the PPQ Treatment Manual (USDA, APHIS, 1998a) preclude these acute adverse effects to humans.

Some chronic and subchronic effects have been determined for ongoing, elevated exposures to methyl bromide. A No Observed Effect Level (NOEL) neurotoxicity was determined to be 55 ppm for 36 week exposure to rodents (Anger *et al.*, 1981). Oncogenicity was negative for rats exposed for 29 months at concentrations up to 90 ppm (EPA, OPP, 1990). Mutagenic potential of methyl bromide is considered to be low by most researchers (Hayes and Laws, 1991). Reproductive and developmental toxicity effects have been observed at higher exposures than would be expected from program fumigations. The maternal NOEL for rats was determined to be 30 ppm and the fetotoxic NOEL was determined to be 3 ppm for constant exposure to methyl bromide (EPA, OPP, 1990). Adherence of workers to required safety precautions and proper protective clothing precludes any adverse chronic health effects.

The toxicity of methyl bromide depends on the exposed organism's respiration rate. Temperature (of air and commodity) is a factor in the organism's respiration rate. A lower temperature lowers the organism's respiration rate, which decreases the susceptibility to the toxicity from methyl bromide. Thus, methyl bromide is most effective against target organisms when the temperature is warm. Fumigants, such as methyl bromide, used to treat commodities such as wood are designed to kill organisms present in the commodity. Other organisms such as wildlife and domestic animals that do not have access to the fumigation chamber are not expected to be adversely affected by fumigations. The aeration vent from a fumigation stack or chamber may regularly release gas at a specific location, which could affect those organisms immediately below the vent. However, methyl bromide gas is anticipated to disperse quickly and few organisms would be expected to reside in close enough proximity to the off-gassing vent to be adversely affected. Most fumigation facilities and stacks are placed on physically disturbed sites that are not preferred habitat for wildlife.

The primary environmental issue related to the potential use of methyl bromide as a fumigant is its capacity to contribute to ozone layer depletion in the global stratosphere. The 1987 Montreal Protocol on Substances That Deplete the Ozone Layer is an international agreement designed to reduce and eventually eliminate the emissions of man-made

ozone-depleting substances. The Montreal Protocol lists methyl bromide as a regulated ozone-depleting substance under Article 2H. The current best estimate of the ozone depletion potential of methyl bromide is 0.4 (NOAA *et al.*, 1998). The United States has signed the Protocol and ratified all amendments except the 1997 Montreal amendments. Phaseout requirements for methyl bromide under the Montreal Protocol mirror those recently set by the EPA under the Clean Air Act (EPA, 1999). Title VI of the Clean Air Act requires that all compounds with an ozone depletion potential of 0.2 or greater be phased out in the United States by the year 2005. Based upon their review of known ozone depletion potential, the EPA has classified methyl bromide as a class I ozone-depleting chemical. The Montreal Protocol maintains an exemption to the phaseout requirements on methyl bromide for quarantine and preshipment uses (QPS). This exempts phaseout of required fumigation uses against regulated pests of SWPM. The intent of this Protocol, however, is to phase out these use patterns or promote the development of effective alternative quarantine treatments, where possible.

The environmental consequences of the cumulative effects of all quarantine uses of methyl bromide were discussed in considerable detail in a previous EIS (USDA, APHIS, 2000). The content and findings of that EIS, as related to potential impacts of methyl bromide quarantine use on ozone depletion from this program, are incorporated by reference into this document and summarized here.

To understand the potential environmental impacts, it is necessary to first consider the function of the stratospheric ozone layer. A primary function of the ozone layer in the stratosphere (a part of the Earth's atmosphere existing between 15 and 35 kilometers above the surface) is to prevent the penetration of ultraviolet (UV) radiation through the atmosphere to the Earth's surface. Releases of halogens such as methyl bromide at the Earth's surface take up to 6 years lag time to fully spread to the stratosphere (NOAA *et al.*, 1998). The half-life of methyl bromide in the atmosphere is only 1.6 years or less (Mix, 1992), so most bromine from fumigations never reaches the stratosphere. Ozone is a compound consisting of three connected oxygen atoms. The ozone layer provides the greatest protection from the harmful effects of exposure to UV-B, a specific category of ultraviolet radiation. Depletion of the ozone layer over Europe and North America reached 6 to 7 percent during the summer/autumn seasons and 12 to 13 percent during the winter/spring seasons of 1998 (NOAA *et al.*, 1998). This level of atmospheric ozone loss resulted in an estimated 8 to 15 percent increase in the amount of UV radiation reaching the surface of the Earth, with other influencing factors like clouds and pollution being constant (Bell *et al.*, 1996). Exposure to

UV-B radiation can cause conditions ranging from minor sunburn to more severe effects such as snowblindness (the formation of temporary cataracts resulting from sunburn within the eye) and destruction of DNA within cells. Exposure to UV-B radiation has been identified as a major factor in the incidence of various types of cancers (UNEP, 1998; Bell *et al.*, 1996). The effects vary with the amount of radiation, the exposure duration, and the exposure frequency. In addition to human health effects, the increased UV-B exposure associated with ozone depletion has adverse impacts to the health of plants and animals. The productivity of agriculture, forestry, and fisheries could be expected to diminish with excess exposure to UV-B (Bell *et al.*, 1996). The physical environment can be affected by increased production of pollutants in smog from the increased UV and more rapid degradation of polymers and related materials used in construction (Bell *et al.*, 1996).

To assess the potential impacts from methyl bromide use on ozone depletion, it is necessary to understand the impact of the current usage on stratospheric ozone levels. Methyl bromide is only one of a number of substances that react with ozone in the atmosphere. The sum of all global production of methyl bromide has been determined to contribute 1 percent to the overall annual stratospheric ozone depletion (NOAA *et al.*, 1998). The primary substances responsible for stratospheric ozone depletion are various chlorofluorocarbons (CFCs) and the regulatory phaseout of the use of CFCs is associated with much greater decreases in stratospheric ozone depletion than could occur with the phaseout of methyl bromide. CFCs have long half-lives in the atmosphere (80 to 100 years), but methyl bromide has a half-life in the stratosphere of only 1.6 years or less (Mix, 1992). The calculated annual global consumption (anthropogenic use) of methyl bromide in 1996 amounted to 63,960 metric tons (MT) (UNEP, 1998). Of this, the United States consumption of methyl bromide accounts for about 33 percent of the total.

Many of the current uses of methyl bromide are being eliminated as part of the mandatory phaseout required to comply with the Montreal Protocol and Clean Air Act. The QPS uses of methyl bromide are not required to be phased out and these usages account for only 28 percent of all uses of methyl bromide worldwide (Thomas, 1999). The comparable QPS usage for consumption in the United States is about 9 percent of the total methyl bromide used (Thomas, 1999). Based upon the anticipated phaseout of the other uses of methyl bromide, continuing QPS uses would contribute about 0.3 percent to annual stratospheric ozone depletion (assuming no reductions in contributions from CFCs or other ozone-depleting substances). The current QPS uses of methyl bromide are expected to continue until economical alternatives are developed to satisfy the pest

elimination requirements. Most of the anticipated new commodities that could require fumigation (other than SWPM) are expected to need only small quantities of methyl bromide which, when vented following fumigation, would not result in any substantial cumulative contribution to ozone depletion. Although the frequency of fumigations of SWPM with methyl bromide would be expected to increase under the No Action alternative commensurately with the anticipated increases in number of shipments associated with the increasing trade, the increases in trade have greatly exceeded the expansion of inspection services and actual increases in fumigations due to pest detection in SWPM have mirrored the increased number of inspections. The only noteworthy recent increase in fumigations with methyl bromide attributed to SWPM relates to the compliance of China with the interim rule regulating SWPM from there. Based upon review of imports records by the Customs Service of the U.S. Department of the Treasury, a risk analysis of ozone depletion potential was prepared for the Proposed Interim Rule for SWPM from China (USDA, APHIS, 1998b). This analysis applied conservative assumptions that from 70 to 100 percent of the cargo packed in SWPM would be fumigated with methyl bromide and that from 80 to 100 percent of the methyl bromide used in fumigations would be released to the atmosphere. The calculated potential usage of methyl bromide resulting from the interim rule was determined to range from 1,040 to 12,565 MT annually. This was determined to constitute a 1.6 to 19 percent increase in annual industrial release of methyl bromide to the atmosphere. Actual methyl bromide non-QPS usage data from China indicate a decrease from 3,267 MT in 1998 to 2,664 MT in 1999 (EPA, 2002a). Although data are not available for QPS usage in China by year, the decrease in non-QPS usage to comply with the Montreal Protocol has partially covered any increases in QPS usage that have occurred. The actual QPS usage is probably considerably less than anticipated from the risk analysis due to the conservative overestimation of the actual amount of SWPM used in cargo and the assumption that heat treatment and other substitute packing materials would not be used. China has used these other methods for shipments and this has lowered the need for methyl bromide treatments.

(3) Phosphine

Unlike other fumigants, phosphine fumigations are of extended duration (3 to 5 days). Like methyl bromide, gas concentrations must be monitored during the fumigation period and good penetration of the phosphine is needed throughout the commodity being treated. Phosphine generated from metallic phosphides is produced slowly and even exposure to phosphine gas from uneven release makes effective treatment difficult. After fumigation of foods and feeds with aluminum phosphide, aeration of

commodities requires 48 hours to ensure that residue tolerances are not exceeded. Decomposition of phosphine gas requires 3 to 5 days. This period is much shorter in moist areas or on acidic soils. Other than the phosphine gas released to the commodities from phosphine solids, there are solid aluminum and magnesium hydroxides left. These solids occur naturally in soil and their environmental degradation is not an issue of concern.

Although phosphine has been used to treat wood products in the past, recent efficacy research indicates that it is ineffective against many wood pests and pathogens. Accordingly, the approved treatments of wood with phosphine have been removed from the PPQ Treatment Manual. Additional testing is underway to determine whether phosphine treatments can be used effectively for any particular wood or for treatment against specific wood pests from certain parts of the world.

The potential primary hazard to human health from wood applications occurs from inhalation exposure to the phosphine gas. Phosphine is not readily adsorbed by the dermal route and proper aeration eliminates residual phosphine on the treated commodity. Phosphine has been placed in category I (highest toxicity category) because of extreme inhalation toxicity from phosphine gas. Acute toxic effects to humans may include fatigue, weakness, nose bleeds, ringing in the ears, nausea, vomiting, chest pressure, stomach upset, diarrhea, thirst, difficulty breathing, liver damage, kidney damage, nervous disorders, and fluid build-up in the lungs (Hayes and Laws, 1991). The maximum annual exposure to hydrogen phosphide (worst case situation) from fumigations was estimated to be exposure to 0 to 10 ppm over a total of 200 hours (Fumigation Service & Supply Inc., 1986). EPA reviewed potential exposure of applicators and concluded that no adverse effects to humans would be expected if precautionary labeling requirements are observed (EPA, OPP, 1985). This review indicated that no adverse acute effects, chronic effects, carcinogenicity, genotoxicity, mutagenicity, and reproductive and developmental toxicity are anticipated with proper safety precautions. The Occupational Safety and Health Administration standard for an 8-hour workday limits the average concentration (time-weighted average) of phosphine in the working area to 0.3 ppm or less (Sullivan and Krieger, 1992). EPA has set a re-entry level without respiratory protection of 0.1 ppm.

(4) Sulfuryl Fluoride

Sulfuryl fluoride is applied as a gas from pressurized cylinders. It is highly phytotoxic to plants and exposure to living plants should be avoided. The gas dissipates readily in the atmosphere and proper aeration following

fumigation is required. The rapid dissipation ensures that all potential exposures are acute. It is a gaseous fluoride that may react with ozone and concerns related to stratospheric ozone depletion should be carefully considered if widespread use of this chemical were anticipated. The limited efficacy relative to insect eggs makes potential use of this fumigant minimal. In addition, sulfuryl fluoride is not registered in many countries (UNEP, MBTOC, 1998) and fumigation with sulfuryl fluoride is more expensive than with methyl bromide (Schmidt, 1996). There are no labeled uses of sulfuryl fluoride on food or feed crops.

Sulfuryl fluoride is a highly toxic fumigant. Contact with the liquid may cause irritation, freezing, and burning of eyes, skin, and mucus membranes. Inhalation may be fatal. Slowed movement, reduced awareness, and slow or garbled speech are possible delayed symptoms of sublethal exposures. Early symptoms of excess exposure are respiratory irritation, pulmonary edema, nausea, central nervous system depression, and abdominal pain (Sine, 1990). Negative test results have been noted for mutagenic and genotoxic testing. Adherence to proper safety precautions and use of proper protective gear preclude any adverse effects to humans from any fumigations with sulfuryl fluoride.

(5) Other Fumigants

A number of other fumigants are either available or being developed for use on wood products. These include, but are not limited to, methyl iodide, chloropicrin, metam sodium, propargyl bromide, iodinate hydrocarbons, and propylene oxide. Some of these chemicals have various adverse effects to commodities, logistical limitations on facility requirements for delivery of fumigant, inadequate efficacy against pests for certain treatments, and other characteristics or properties that limit their usefulness to APHIS programs to treat wood products. None of these fumigants is expected to be ready for implementation within the foreseeable future. A thorough assessment of the environmental consequences of their use in this program at this time would not provide adequate information to assist in a meaningful decision about use potential. Should development of any of these fumigants show promise, their potential will be assessed and environmental documentation prepared to address any potential impacts foreseen from the anticipated use patterns.

4. Wood Preservatives

a. Description

Wood preservative treatments involve the application of chemicals to SWPM to eliminate pests or diseases, to prevent infestation (the most common usage), or to preclude further reinfestation. Although used

primarily against wood-decaying fungi, the chemicals and application methods may vary, depending upon the target pests, the wood species, and the length of time the treatment must remain effective. The chemicals are applied through direct treatment of the surface of the wood, through dipping of the wood in a tank, or through the use of pressure treatments to increase penetration into the wood. This method is permitted as part of the recent regulation of SWPM from China, but wood preservatives are not widely used for treating SWPM.

For surface treatments, 7 CFR 319.40–7 authorizes the use of all EPA-registered surface pesticide treatments for regulated articles imported into the United States. Those chemicals that are reported to be commonly used as wood preservatives and have a reasonable likelihood of being used are listed in table 2–2.

Table 2–2. Chemicals Commonly Used as Wood Preservatives or Surface Treatments

Creosote
Waterborne Preservatives: • Acid copper chromate • Chromated zinc chloride • Alkyl ammonium compound • Inorganic boron • Ammoniacal copper quat
Oil-borne Preservatives: • Pentachlorophenol • Copper naphthenate • Solubilized copper-8-quinolinolate • Bis(tri-–butyltin) oxide • Alkyl ammonium compound
Other Surface Active Pesticide Treatments: • Cypermethrin • Fenvalerate • Permethrin

Nonpressure treatment involves brushing, spraying, dipping, or soaking the wood in the chemical preservative to create a thin protective layer at the wood surface. The material may penetrate the wood to some extent by the capillary action of the wood's cellular structure. Preservatives in use include copper-8-quinolinolate, copper naphthenate, 3-iodo-2-propynyl butyl carbamate, didecyldimethyl ammonium chloride, propiconazole, tebuconazole, carbendazim, chlorpyrifos, and boron. Borate has been used to protect lumber from decay, fungi, and beetles during shipments, but it does not appear to be effective against all life stages of insects and against some fungi.

Pressure treatment involves applying a preservative under combinations of vacuum or pressure to force the chemical more deeply into the wood. Such treatments are used for long-term protection because of their advantages of better quality and uniformity of treatment and the creation of a thicker chemical barrier. Water-based preservatives include chromated copper arsenate (CCA), copper azole, ammoniacal copper quaternary, copper citrate, ammoniacal copper zinc arsenate (ACZA), and boron.

Oil-based preservatives include creosote, pentachlorophenol, copper naphthenate, and copper-8-quinolinolate. Creosote, which has been one of the more commonly used pressure preservatives, protects against fungi, insects, and bacteria.

b. Anticipated Consequences

The chemicals acceptable for treatment of SWPM are limited to those that are registered by the EPA for this intended use. A large number of pesticide products are registered for use on wood. A complete list may be accessed from EPA's online Pesticide Product Information System at the following Internet address: (http://www.epa.gov/opppmsd1/PPISdata/). The available wood preservative chemicals, however, are subject to change as EPA review of technical information results in changes in the regulations. As of 1993, 73 percent of the use of wood preservatives consisted of inorganic arsenicals and the remaining 27 percent consisted of creosote solutions, oil-borne systems, fire retardants, and limited use of surface treatments (Barnes and Murphy, 1995).

EPA recently (February 12, 2002) announced its decision to eliminate many uses of chromated copper arsenate (CCA), one of the most common wood preservatives applied by pressure treatment (EPA, 2002b). The decision was based primarily upon results of a human health risk assessment and voluntary concurrence of the manufacturer with the early health findings. The health risks associated with other registered wood preservative treatments are anticipated to continue to result in decisions to discontinue various applications in the United States. Many of the SWPM treated with pesticides and preservatives commonly used in other countries but not registered by EPA for use in the United States will not be permitted entry to the United States. The anticipated lack of available preservative treatments for wood is expected to limit this potential treatment option in the near future.

Surface treatments are generally not applied to SWPM to eliminate plant pests, because these applications do not generally penetrate wood deeply enough to affect insects and pathogens in the interior. Surface treatments

have been used to protect wood against reinfestation after heat treatment or fumigation, but these surface treatments need to be applied within 48 hours of the initial heat treatment or fumigation. This provides a barrier to infestation, however, the effectiveness of such a chemical barrier often decreases substantially after 30 days without further prophylactic treatment.

Unlike surface applications of pesticides, nonpressure preservative treatments may penetrate 1/8- to 1/4-inch into the wood. Nonpressure treatment consists of brushing, spraying, dipping, or soaking the wood in a treatment solution at atmospheric pressure to create a thin, protective layer at the wood surface (Morrell, 2001a, 2001b). Woods from some tree species such as red oak and many pines are highly permeable, but wood from larch and white oak can not be adequately treated with preservatives (Morrell, 2001a). As with surface treatments, the protective residue dissipates over time and could require additional treatment at 3- to 6-month intervals (Morrell, 1996a).

Pressure treatment involves applying a preservative using combinations of vacuum and pressure to force the chemical more deeply into the wood (Morrell, 2001b). Applying the preservatives by pressure treatments increases the penetration into the wood, but may also negatively alter the wood properties and may decrease commercial value. The pressure treatment of wood is commonly used for products exposed to weather or in contact with the ground (i.e., posts, pilings, poles, and railroad ties). The sapwood of most species is relatively easy to pressure treat, but the heartwood of most species is virtually impossible to penetrate (Morrell, 2001b). Both nonpressure and pressure treatments of wood with greater than 60 percent moisture content result in highly variable penetration and may not provide consistent preservation (Morrell, 2001b).

Pesticides and preservatives are approved by EPA for specific uses on specific wood articles contingent on the ultimate use and destination of the article. Although EPA has great concern for human health risks from residential uses, it is increasing restrictions on industrial uses (including SWPM) of high risk chemicals, such as CCA, previously described. Pesticides and preservatives must be used according to current label instructions. The product label provides exact language detailing application directions, including any use restrictions or special precautions. This includes required protective gear for applications and proper disposal of wastes. Amended label information was published in the Federal Register (51 FR 1334, January 10, 1986) for the three major wood preservative chemicals: pentachlorophenol, creosote, and the inorganic

arsenicals. As noted above, most uses of the arsenicals have undergone intense scrutiny and are no longer available.

Creosote is the oldest wood preservative and protects wood against attack by fungi, insects, and bacteria. Wood treated with creosote has a useful life at least five times longer than untreated wood. Pressure treatment with creosote is the application of choice for wood used in railroad ties. Human health issues associated with potential exposure to creosote have resulted in EPA decisions to impose additional exposure reduction measures (EPA, 1984) and to amend label restrictions (EPA, 1986). Several chemical substances present in creosote are known to have moderate carcinogenic potential. Disposal of creosote-treated wood in a lined landfill presents no environmental problems (Morrell, 2001b), but disposal by burning of such wood produces toxic gases and ash that pose a risk of adverse human health effects. The environmental consequences for disposal of other pressure preservative treatments, particularly the oil-borne preservatives are similar.

Boron and borate treatments have been used to protect lumber from decay, fungi, and beetles during shipment (Amburgey, 1996). Unlike most preservative treatments, borate treatments work best when the wood is kept moist during the diffusion period (Barnes and Murphy, 1995). Borate is not able to penetrate less permeable species (Morrell, 1996a). Although borates are effective at protecting wood from beetles, termites, and brown-rot decay fungi, growth of mold fungi and soft-rot decay fungi is not prevented. Treatments of wood with some water-borne preservatives such as borates do not immobilize the chemical and the compound may leach out of the wood, particularly when moist.

The surface treatments are limited primarily to those pests present on the wood surface. As previously mentioned, these applications serve best as a secondary treatment to provide a barrier to reinfestation after heat treatment or fumigation. The residual action of these compounds is of limited duration (perhaps 30 days), so this protection of the wood is temporary. Many of the surface treatments are conventional pesticides associated with various toxicity issues. The three surface treatment chemicals listed in table 2-2 are synthetic pyrethroid insecticides. Their mode of toxic action is through effects on the sodium channel to stimulate nerves to produce repetitive discharges. Muscle contractions are sustained until a block of the contractions occurs. Nerve paralysis occurs at high levels of exposure (Walker and Keith, 1992). Exposure to handlers of SWPM during the period of residual toxicity of such compounds is an issue of concern. Although dermal toxicity of humans to these compounds may be slight, continual or ongoing exposure to these substances can result

in elevated exposures. Residual exposures could also be an issue for use of some other preservative treatments such as creosote and pentachlorophenol.

5. Irradiation

There are three types of irradiation treatment that have been studied for use on SWPM. These are gamma irradiation, electron beam irradiation, and microwave irradiation. Irradiation works by exposing organisms to lethal quantities of energy. Insects would be more affected than fungi by irradiation methods. The relative efficacies, costs, and logistics of irradiation treatment have not yet been determined, and there are no regulations that specify the conditions or minimum standards for irradiation treatment of SWPM.

Irradiation is being developed by several organizations for phytosanitary applications. Guidelines have been developed for the use of irradiation as a phytosanitary treatment including information on policies, procedures, and requirements for the proper conduct of treatments and consistent maintenance of operations between agencies and countries (NAPPO, 1997). APHIS proposed the use of irradiation as an additional regulatory treatment method for phytosanitary certification of some agricultural commodities (61 FR 24433, May 15, 1996) and prepared an environmental assessment (EA) to analyze the potential environmental impacts of that proposal (USDA, APHIS, 1997). Although the treatment process is similar to that considered for SWPM, the agricultural commodities considered in the EA required dosages that are considerably lower than would be efficacious for wood. Unlike the exposures considered in the EA, including the unique radiolytic products that could be consumed orally, the only potential source of exposure for SWPM treatments would be from stray radiation at the facilities—primarily a concern for workers. The amount of stray radiation would be expected to increase commensurate with the higher dosages for treating wood and any increase in the number of treatments. There have been no more recent advances in developing treatment facilities that would be logistically and economically feasible for treating SWPM. Until this issue is resolved to the satisfaction of the industry, irradiation treatments are unlikely to be considered seriously by manufacturers of SWPM.

a. Description

(1) Gamma Irradiation

Gamma irradiation as a treatment involves exposing the SWPM in an enclosed chamber to the radiation emitted from a radioactive isotope such as cobalt-60 or cesium-137. It has been used to sterilize or kill certain pest

species primarily in commodities other than wood. It is most often used to disinfect or disinfest food products, pharmaceuticals, and medical devices. With irradiation, a target dose and exposure time that will destroy the target organisms are sought. Previous programs have considered irradiation treatment only on a case-by-case basis for each facility or commodity use pattern. Irradiation has not been shown to be effective against a wide range of pests (UNEP, 1998). Fungi are known to be more tolerant of irradiation than insects (Morrell, 1996a). Lethal doses of gamma irradiation to adult ambrosia beetles were determined to range from 73 to 130 krad (USDA, APHIS, 1991). Research was conducted in Russia to support a generic dose for treating logs (Huettel, 1996). This research suggested that a dose of 7 kiloGrays (kGy) is sufficient to cause 100 percent mortality in insects, fungi, and nematodes in logs. A science review panel was established to assess the potential of this work, but these lethal doses are too high to provide an economically practical treatment method (Eichholz *et al.*, 1991; Dwinell, 1996).

(2) Electron Beam Irradiation

Electron beam irradiation is similar to gamma irradiation except that the source of radiation is electrons generated by a machine rather than by radioactive isotopes. Data on the efficacy of this treatment against insect pests and pathogens is quite limited. Agriculture Canada is examining the feasibility of this treatment against the New World pinewood nematode and wood-stain fungi. Obstacles to the use of this method are similar to those for gamma irradiation. Limited information is available about the cost and logistics of setting up treatment facilities. Very little documentation of efficacy against insect pests and pathogens prevent its practical employment for this purpose in the near future.

(3) Microwave Irradiation

The use of microwaves as a treatment method involves exposing wood to ultra-high frequency magnetic fields, which elevate the temperature of any material containing moisture. When exposed to microwaves, dry wood has low dielectric properties and remains cool, but insects in the wood are heated to lethal temperatures. Microwave irradiation may be regarded as a future heat treatment technology, but requires further research before it can be considered a feasible or economic method. Microwave studies performed by Burdette (1976) showed total mortality to anobiid beetles (one type of powderpost beetle) in wood blocks treated with 1500 watts of power at 50 °C. Similar studies with other insects in wood have been efficacious (Thomas and White, 1959; Hightower *et al.*, 1974). However, fungi may not be as susceptible as insects to microwave exposure,

especially in wood with a high moisture content such as green wood (USDA, APHIS, 1991).

b. Anticipated Consequences

(1) Gamma Irradiation

Exposures to high levels of gamma irradiation are known to make paper and fiberboard become brittle. The effects of exposure to gamma irradiation on the wood quality of SWPM is uncertain. This issue may not be important for most wood packing materials, but the overall strength of wood is important to protect the cargo being transported. Although there may be structural changes in the wood quality, irradiation does not change the overall appearance of the wood (Morrell, 1996a).

An environmental assessment (EA) prepared by the U.S. Department of Health and Human Services' Food and Drug Administration (FDA) determined that no adverse environmental effects are anticipated at food processing plants that are designed to irradiate fruits and vegetables (FDA, 1982). The Nuclear Regulatory Commission (NRC) has set stringent environmental protection requirements for any facilities that use radionuclide sources (10 CFR Parts 20, 30, 51, and 71). In addition, there are special carrier requirements for transport of radionuclides set by the U.S. Department of Transportation. Any extraneous radiation emitted from radionuclides is required to be contained within facilities by shielding, as required by the NRC and the Bureau of Radiological Health at FDA. Any irradiation equipment would be designed to release radiation to the SWPM only. Monitoring of radiation at quarantine treatment facilities has demonstrated ambient background radiation levels at property boundaries. The treated wood does not retain any radioactivity from the exposure. Irradiation equipment and levels at approved facilities are checked on a regular basis by the USDA Radiation Safety Staff in accordance with standards set by the NRC. No problems have been associated with the use of irradiation equipment under APHIS permits.

(2) Electron Beam Irradiation

There is very little information available on the efficacy and the potential consequences of electron beam irradiation. Most probably, the principal concern would be for the safety of the treatment personnel and those in proximity with the irradiation equipment. Irradiation equipment would need to be properly designed and constructed, with shielding that is adequate to protect personnel from high voltages and incidental radiation.

(3) Microwave Irradiation

Among the unresolved issues regarding the use of microwaves for wood treatment are the ability of the microwaves to penetrate wood, the effectiveness of microwaves against fungi, and the ability to construct adequate treatment facilities given the large electrical power requirements for this method. Although microwaves control pests on the surface of wood, the depth of penetration of microwaves is low and may not reach borers, particularly in dense pieces of SWPM. The external costs involved in producing the high electrical power requirements to attain sufficient microwave energy to kill wood pathogens may exceed the market value of the commodity being transported. Until adequate efficacy data are available and large treatment facilities are built, the use of microwaves as a risk mitigation method for SWPM can only be viewed as experimental.

6. Controlled Atmosphere

a. Description

Controlled atmosphere is a technique that involves changing the relative concentrations of gases (oxygen, nitrogen, and carbon dioxide) in the atmospheres of enclosures to kill pests within commodities. It frequently involves the use of low oxygen levels (anoxia) and elevated carbon dioxide and nitrogen levels to suffocate pests. Controlled atmosphere is a standard technique for the post-harvest treatment of fruits, vegetables, and stored grains; it can be combined with other methods, including cold treatment and heat treatment, to enhance efficacy for those commodities. Controlled atmosphere appears to be a viable method for disinfesting agricultural produce and commodities that are associated with SWPM. However, its efficacy against deep wood borers and pathogens is relatively untested. APHIS has no approved controlled atmosphere treatment schedule for SWPM and is only beginning to research its potential for SWPM. Controlled atmosphere is not known to be approved for quarantine use by any country.

b. Anticipated Consequences

Although controlled atmosphere treatments are very effective for protection of fresh fruit and grains from damage due to surface pests, there are no studies indicating good control of pests of wood either internally or externally. It is theoretically possible that wood borers or other important wood pests could be eliminated by controlled atmosphere treatment, but this would have to involve long-term control. Many of the wood pests are accustomed to living in low oxygen environment and the long time required for sufficient displacement of oxygen in the wood make this an unlikely option for routine commercial treatments. Use of this method to

treat wood products needs considerable research before it could be considered. Implementation of controlled atmosphere treatments of wood is not expected for any quarantine applications in the foreseeable future, but development of this technology could provide information to assist in a meaningful decision if methods indicate any promising results.

7. Substitute Packing Materials

a. Description

Substitute packing materials would use other materials (e.g., corrugated packaging, plywood, structural wood panels, oriented strand board, particle board, metal, plastic, rubber, or fiberglass) that are not regulated be used as substitutes for SWPM. For our purposes within this EIS, this component method differs from the previously described broader alternative 5 in that this component could be implemented as one component of an alternative, as a part of a broader program that included other treatment methods as well. In other words, it would not be implemented as the sole means of mitigating risk from SWPM. Selection of substitute packing material is possible under all of the alternatives, but this method is specified as part of alternative 4 (Comprehensive Risk Reduction Program) and alternative 5 (Substitute Packing Material Only).

b. Anticipated Consequences

Selectively requiring substitute materials would achieve varying degrees of risk reduction, depending upon how it was applied. Generally, there would be substantially decreased risk from the introduction of pest organisms, diminished use of some resources (wood), and increased use of other resources (ores for metal production and petroleum for plastics)—depending upon the proportional use of this alternative in an overall risk reduction strategy.

The potential environmental consequences of the use of substitute packing materials would vary according to what packing materials are used. Packing materials constructed without wood pose substantially less pest and disease risk than SWPM. Substitute packing materials made of synthetic or highly processed wood such as plywood, oriented strand board, particle board, corrugated paperboard, or plastic and resin composites, generally are not subject to infestation by wood pests or diseases. Although some wood pests may infest plywood and other processed wood packing materials, the frequency of reinfestation of treated or processed wood is known to be low and is unlikely to pose substantial risk of new pest introductions (Dwinell, 2001; Burgess, 2001). Although all packing materials occasionally harbor hitchhiking insects and surface

pests, the biologically inert materials used in substitute packing materials are less likely to harbor such pests.

At present, the market for shipping pallets is dominated by SWPM, which constitutes about 95 percent of the total. SWPM is used in association with 6,000,000 containers that are transported annually in international trade. Wood has certain advantages from the environmental perspective. Renewability gives wood a large advantage over other materials. The manufacture of wood products requires substantially less energy than the production of substitute products. Wood product manufacture results in less greenhouse gas and other air pollutant emissions.

The capability of industry to tool up to manufacture and switch to substitute packing materials for such a shipping volume may limit the feasibility or implementation of a switch over. Substitute packing materials are more expensive than SWPM. Although some substitute packing materials show great promise (i.e., corrugated pallets), other materials have limitations on their use. Substitute packing materials would require a phase-in period to allow the industry of the regulated countries to adapt these materials to the shipping processes. Compliance with international agreements is expected to increase the costs associated with the use of SWPM and this change may make substitute packing materials more competitive in the packing market and indirectly promote use of these other materials.

Plastics presently constitute a small percentage of the market share, and their use has been limited by the lack of a standard pallet size and the requirement for a closed loop system that is not yet feasible to the pallet industry. Packing methods such as slipsheets (flat, solid, fibre sheets with load-bearing area used as a platform for unitizing, handling, storing, and shipping of commodities) are inexpensive, but require a special push-pull attachment for forklifts that is expensive and not easily adaptable to present practices. Corrugated pallets constitute about 2 percent of the current market and could be expanded to as much as 10 percent in the foreseeable future. Plywood and oriented strand board pallets make up about 2 percent of the market share and are useful packing for heavy loads, but these materials are heavy and cumbersome for transport of many commodities. Some packing materials such as particle board are limited in their ability to withstand the conditions that routinely occur during transport.

Inspection under this method would be limited to checking paperwork and verifying that no SWPM was being used. In the event that SWPM was found to be used, the decision could be made to treat the SWPM, deny

entry of the shipment (re-export), or eliminate pest risk from the SWPM through destruction by incineration or deep landfill (6 feet or deeper). This noncompliance probably would occur infrequently due to the resultant costly delays in deliveries, noncompliance fines, and related complications for the shipper. The substitute packing materials alternative would considerably reduce inspection efforts and would largely eliminate pest risks from wood-feeding insects and diseases.

There are environmental concerns relating to the manufacture of substitute packing materials. Some substitute materials would require the harvesting of wood. Resins or plastics may be required to seal and protect wood surfaces. The particulates from cutting and drilling wood products are generally limited to manufacturing workplace areas. The curing of these resins and plastics release volatile organic contaminants to the air. These vapors are generally of short duration in the air and of negligible impact, but may contribute to local air quality problems. The manufacture of packing materials made exclusively of metal, plastic, and various other processed materials would result in the use of unreplenishable natural resources (metal ores and petroleum) with resultant adverse environmental consequences, additional demands on energy resources, and problems associated with disposal of manufacturing materials.

In conclusion, the prohibition of SWPM and the requirement to switch to substitute packing materials would result in substantially less pest and disease risk than any of the other components considered in this EIS. The cost of production of substitute materials would be greater than that of SWPM, but many of the substitutes are more durable and more recyclable. With increased cost of SWPM use due to requisite treatments to lower pest risks, the manufacturing costs of substitute packing materials are likely to become more competitive. The manufacturing processes and uses of raw resources probably would pose negligible environmental effects, and would be offset by the decrease in pest risk. Although drilling, excavation, and extraction of some raw materials used in the manufacturing of substitute packing materials is required, these efforts to obtain raw materials would be primarily directed at supplying other demand. The use of these raw substances in substitute packing would serve only as an extension of the market for these raw materials. There could be a reduced demand on raw wood products (depending upon the substitute materials that would be utilized; substantial use of processed wood may result in little difference in resource use).

8. Disposal

a. Description

Disposal would involve the destruction of SWPM through approved incineration or burial processes. The great amount of SWPM being imported into the United States would make the disposal of all of it unfeasible, so it is likely that the method could only be implemented in combination with other control methods as part of a combined or comprehensive risk mitigation strategy. Disposal would be costly and probably less effective than many of the other component methods.

b. Anticipated Consequences

Although incineration or burial could substantially reduce pest risk, those processes still could result in the release of pest organisms, from improper handling, before or during the course of transportation, incineration, or burial actions. Any disposal activities would need to be conducted by contractor organizations, because of APHIS' limited resources, and could have limited security, depending upon APHIS' ability to monitor operations.

Incineration poses an array of problems, including the low number of approved incinerator facilities, the prohibitions on certain types of burning, the requirements for permits, and the collateral emission of pollutants like carbon dioxide and hydrocarbons. Burial would also pose a number of problems, including a continued pest risk (many insects that burrow through wood are also capable of burrowing through soil), the lack of approved landfill facilities, and the substantial costs of burying the SWPM. Finally, APHIS considers disposal of SWPM to be the least preferred of all the methods, because the action would take place within the United States and the United States would still incur a substantial pest risk. Unlike some of the other methods that involve recycling and re-use of wood, disposal does not take full advantage of the availability of SWPM for use in transport of cargo.

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III. Affected Environment

A. The United States

The environment of the United States that could be affected by new regulations for SWPM includes the human population, nontarget species, and the physical environment—land (including forests), air, and water resources. That environment may be affected in two ways by new regulations for SWPM: first, by the degree to which the regulations meet their objective of protecting forest resources; and second, by the degree to which any required manufacturing and control methods impact environmental components.

Humans and human health may be affected by increased or decreased use of forest resources that are used not only for the production of SWPM, but which are important sources of construction materials, are used as buffers, and are used for ornamental and esthetic purposes. An increasing human population (the U.S. Census projects a U.S. population of 282,798,000 by 2003) will result in greater land use and a corresponding demand for forest products in the coming years. Human health could be affected by some of the required control methods, including fumigation with methyl bromide which has been associated with destruction of the atmospheric ozone layer which protects the earth from harmful ultraviolet radiation. Humans also could be affected by other methods as well, including controlled atmosphere, chemical preservatives, or irradiation, if protective measures were not adequate. In addition, manufacturing processes for some packing materials (wood and substitute) could result in exposures to particulates and gases from forming or curing raw materials.

Humans depend upon trees and forests to fulfill vital biological needs. The generation of life-giving oxygen and the sequestration of carbon are important functions that result from the ecological processes of global nutrient and hydrological cycling and the global atmospheric gas-heat balance (Abramovitz, 1997). All manner of tree and wood products are woven into our daily lives, our culture, and our human ecology. There is an undeniable correlation between the health and abundance of a nations' natural resources and its sociopolitical stability. Correlation does not imply simple cause-and-effect, but ecological stresses inevitably bring about social and political consequences, typically strife, leading to a reinforcing negative feedback loop (Brown, 1995).

The forests of the United States, which contain about 600 species of trees (native and introduced), are remarkable for their abundance and variety. Tree dominated ecosystems and landscapes are obviously more than just trees. Trees contain and sustain tens of thousands of species of terrestrial and aquatic animals and lesser plants, the majority of which truly depend upon forests for their existence. For example, forests provide crucial habitat for probably at least half of both the 100,000 species of insects and the 18,000 species of vascular plants native to North America (Niemelä and Mattson, 1996).

Nontarget species, especially wildlife which use forest resources for food, habitat, and cover, could be affected by changes in forest resources—the availability, diversity, or quantity of those resources. For example, the loss of forest resources and critical habitat has been associated with impacts to endangered species such as the red-cockaded woodpecker, *Picoides (=Dendrocopus) borealis*, and the northern spotted owl, *Strix occidentalis caurina*. Also, nontarget species could be impacted by the establishment of foreign pests or diseases in U.S. forests, or by the reduction of those forests for the production of forest products, including SWPM. The required control methods largely preclude exposures to nontarget species and their habitats are unlikely to be affected by potential treatments. Forests sustain most of the important game species and dozens of threatened and endangered species. Forests also provide the streams and rivers with critically important coarse woody debris (i.e., downed trees) that create crucial biodiversity-generating structure and micro habitats (Naiman and Decamps, 1997).

Land, air, and water also may be affected by the control methods that are employed for SWPM. Although treatments generally would be required to be done outside of the United States, there could be indirect, transboundary effects on the physical environment of the United States from the foreign use of fumigants or wood preservatives, or disruption of United States land resulting from approved disposal methods. Although the IPPC Guidelines would not obligate U.S. manufacturers to treat SWPM, other countries which adopt the IPPC Guidelines would require U.S. compliance with those guidelines if the SWPM were to be exported to those countries.

B. Other Nations and the Global Commons

The environments (the human population, nontarget species, and the physical environment) of the other nations and the global commons (Antarctica, the high seas and deep seabed, the atmosphere, and outer space) also may be affected by changes in regulations for SWPM. In

general, those effects probably would be more pronounced in other nations, because the SWPM treatments are required to be accomplished and certified in the exporting countries, rather than in the United States. Also, the effects on forests may be exacerbated in some underdeveloped countries where forest resources are not plentiful, but where there is substantial economic advantage to the exportation of manufactured products—hence greater incentive to use SWPM. This issue is limited primarily to only a few countries that lack sustainable forest practices or depend upon other countries that do not practice sustainable forestry.

Human health may be at greater risk in countries where adequate safeguards or protection measures do not exist for treatment methods or manufacturing processes for packing materials. Cultural or educational disadvantages, or problems with communication in some countries also could result in the inability to recognize health risks associated with treatment methods. Government infrastructure may not exist to provide adequate safeguards for workers and the public who may be affected by fumigation, or other kinds of treatments.

Nontarget species, and especially endangered species, could face great risks from the loss of cover and habitat resulting from the exploitation of forest resources. The individual species' status, diminishing forest resources, and lack of adequate government infrastructure to promote the conservation of endangered species, could combine to result in substantial risk to the endangered species of other countries. The extent to which SWPM demand would affect these resources (relative to other demands for wood) is unclear, but demand for wood in some countries with limited forest resources would be more likely to affect exploitation of the limited forests to meet increasing demand including the packing needs for trade.

Some of the SWPM treatment methods and packing material manufacturing processes would have the potential for contamination and adverse impacts on the physical environment of the other countries and the global commons. In particular, the use of methyl bromide in fumigations could result in damage to the stratospheric ozone layer and contribute to increased ultraviolet radiation received over large areas of the earth. These transboundary effects would not necessarily be felt in the country that employed the treatment methods, but could be manifested on multiple other countries or areas that are not under the specific control of any sovereign nation.

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IV. Environmental Consequences

All of the alternatives have potential consequences to the human environment resulting from their capacities to protect the environment from pest risk (their efficacies) and from the specific effects from use of the component risk abatement methods. This chapter presents the likely direct and indirect environmental consequences of potential program alternatives for regulation of solid wood packing material (SWPM). There is also a discussion of potential aggregate environmental consequences. This includes environmental effects resulting from the sum of impacts from all methods used in the alternative as well as cumulative impacts of other reasonably foreseeable actions taken by APHIS and by other agencies, individuals, and organizations. The descriptions of direct, indirect, and aggregate effects of each alternative are combined to provide a summary characterization that may be used to readily compare the consequences of the different alternatives. Finally, a concluding part of this chapter discusses special considerations such as compliance with other environmental statutes, logistical considerations, regulatory issues, and other program-specific concerns.

A. Program Alternatives

1. No Action

a. Capacity for Pest Mitigation

The historical justification for the No Action alternative (defined as the existing regulations) has been the demonstrated ability of the regulations to exclude pests of quarantine significance from the United States. Inspections and the ability of inspectors to detect and treat wood infested with pests of quarantine significance have been effective at excluding invasive species that threaten native trees and forest resources of the United States. With increasing international trade, the number of quarantine pest interceptions has increased dramatically. However, the frequency and number of inspections has not increased commensurate with the increased trade or with the increases in cargo accompanied by SWPM entering the United States. Increased inspection would result in some reduction of pest risk—with the reduction dependent upon the resources that could be brought to bear on the process. The complexity and time required for inspection of the SWPM in large shipments of unwieldy cargo make thorough inspection impractical, if not impossible. Resource and staffing limitations already strain the capability of inspectors to thoroughly monitor cargo for compliance with present regulations.

The unprecedented increase in world trade within the last 15 years has resulted in steadily more frequent detections of quarantine pests in SWPM and more frequent introductions of wood pest species that existing quarantine measures previously had excluded. Between 1995 and 1998, 97 percent of the quarantine pests intercepted at U.S. ports were recognized as potential threats to forest resources. In particular, the Asian longhorned beetle (*Anoplophora glabripennis*), the pine shoot beetle (*Tomicus piniperda*), and the emerald ash borer (*Agrilus planipennis*) are introduced species that have recently spread to the United States through untreated wood. The limitations of inspection alone to exclude quarantine pests from SWPM became evident in 1998 when interceptions of quarantine wood pests from China accounted for 40 percent of all interceptions. After the China Interim Rule, interceptions from China decreased to only about 5 percent of all interceptions by the year 2000. However, interceptions of quarantine pests in SWPM from origins other than China continued to increase with the expansion of trade. Just as phytosanitary regulations prior to the China Interim Rule were not designed to handle the elevated pest risks of SWPM associated with the expansion of trade with China, present phytosanitary regulations are inadequate to exclude quarantine pests of SWPM from other origins.

A draft pest risk assessment for importation of SWPM into the United States was prepared in August 2000 (USDA, APHIS and USDA, FS, 2000). Most of the organisms reviewed in the pest risk assessment were determined to pose high pest risk. Those organisms identified as having high pest risk were described as unlikely to be excluded from the United States solely through inspections and associated interdiction actions at ports of entry. Based upon this, the pest risk assessors concluded that more stringent importation requirements should be applied, regardless of country of origin. In addition, they suggested that effective mitigation measures could greatly reduce the risk of introducing destructive exotic forest pests. In the absence of such measures, pests like Asian longhorned beetle can be expected to pose an ongoing threat to the survival and health of forests in the United States.

The present pest risks from current regulations of SWPM can be expected to continue to increase commensurate with increasing use of SWPM in world trade. Other than regulations of SWPM from specific origins (e.g., China and Hong Kong), program decisions to treat SWPM are made for individual shipments based upon inspection results. The effectiveness of these inspections at detecting pest risk is an important factor in prevention of pest risks under the No Action alternative. It is clear that the regulations made in the China Interim Rule dramatically lowered the potential pest risk from that origin. However, the potential pest risks from SWPM of

other origins can be expected to continue to pose increased likelihood of pest introduction and associated damage to forest resources in the United States.

Although all three treatment methods specified under the China Interim Rule mitigate pest risks in SWPM, the efficacy against specific pests varies. Wood preservative treatments involve the application of chemicals to regulated SWPM to prevent plant pest infestation, reinfestation after other treatments, or, in some quarantine cases, to eliminate pests that are present. Some preservatives, such as creosote, offer continual protection against pest infestation but other preservatives may lose efficacy over time due to leaching (e.g., boron) or degradation (surface treatment agents such as permethrin). Heat-treated wood (without moisture reduction) that is still green is much more prone to reinfestation than is kiln dried lumber (dry heat), but all heat treated articles must be handled and stored to protect those articles from pest infestation after treatment. Fungal infestations of wood are considered the most difficult to eliminate (Morrell, 1996a), but the use of heat to eliminate pests represents one of the most certain approaches to minimizing the risk of pest introductions from SWPM (Morrell, 1995). Fumigation with methyl bromide has been used for many years to treat logs and other wood articles because of the chemical's high volatility, ability to penetrate most materials, and broad toxicity against a wide variety of plant pests (all life stages of insects, mites, ticks, nematodes including cysts, snails, slugs, and fungi such as oak wilt fungus) (USDA, APHIS, 1991). The ability of methyl bromide to penetrate into wood has been a limitation to efficacy. This is particularly true for wood with high moisture content (e.g., green logs). Cross (1992) found that, in practice, it is difficult to achieve an efficacious insecticidal dose much beyond a depth of 100 millimeters in green materials using conventional tent fumigation techniques. The removal of bark has been found to facilitate the penetration of the fumigant into the wood (Ricard *et al.*, 1968). A test shipment of wood from New Zealand fumigated with methyl bromide in early 1992 was found to be infested with a blue stain fungus (quarantine significant fungus) upon arrival in the United States (USDA, FS, 1992). The efficacy data of methyl bromide for many pests and pathogens does not exist (USDA, APHIS, and USDA, FS, 2000). Although methyl bromide may not be effective against all organisms in wood, agency review of the efficacy of methyl bromide fumigations against pests and diseases in SWPM has been found acceptable for two treatments listed in the APHIS' Plant Protection and Quarantine (PPQ) Treatment Manual (USDA, APHIS, 1998a). Although each of the three treatment methods has limitations to their efficacy, research indicates that most quarantine pests and diseases of concern are adequately eliminated by these treatments.

b. Consequences of Component Methods

The component methods under the No Action alternative include inspection, heat treatment, fumigation with methyl bromide, and treatment with chemical preservatives. Other than occasional damage to the SWPM being checked, program inspection techniques pose no adverse consequences to the human environment. The environmental consequences of the treatment methods are more substantial and will be presented in greater detail. Treatments are required for pest mitigation of SWPM from China and Hong Kong as specified in the China Interim Rule. Decisions to treat SWPM from other origins are dependent upon detection of quarantine pests in the wood by inspection techniques. These treatment decisions are made on a case-by-case basis at the ports and the number of such treatments per year (427 in 2001) is small compared to the annual number of required treatments under the China Interim Rule (~342,000).

Although the SWPM from China or Hong Kong may be treated by one of three methods specified under the China Interim Rule, the actual practice of shippers has been to favor the more convenient and more economical treatments. This practice has limited the actual environmental effects from the China Interim Rule to those resulting from heat treatment or fumigation. The use of chemical preservatives has been very limited under the China Interim Rule and this is not expected to change. The primary factors contributing to the lack of use of chemical preservatives are the higher cost of these treatments (relative to heat treatments and fumigations), the toxicity and health risks associated with residual chemical in the wood, the decreasing availability of most preservative chemicals (due to voluntary phaseout or lack of reregistration), and issues related to safe handling and disposal of SWPM treated with preservatives. Although there are many environmental and health issues associated with preservative treatment of SWPM, the anticipated continuing lack of use of this method is expected to preclude adverse impacts to human health, nontarget species, and environmental quality.

Heat treatments have been used to treat SWPM by some shippers. The present cost is somewhat higher than fumigation with methyl bromide, but the gradually increasing cost of fumigations may make this a more economical treatment in the future. The industry standard in the United States for treatment of softwood SWPM is heat treatment to eliminate pine wood nematode. Heat treatments may be impractical for large volumes of wood or thick pieces of wood without elaborate sensoring (Morrell, 1995; UNEP, 1998). This method is anticipated to be used for smaller loads of SWPM, but with improvements in technology may be adaptable for larger volumes. China is constructing new heat

treatment facilities to help meet compliance with SWPM regulations. The generation of heat needed for these treatments may be achieved through electrical units or combustion units. This may involve the local release of hydrocarbons (combustion units) or other energy-related emissions (source of electrical power). Any environmental issues associated with the heat source are expected to be temporary and not substantial. The strict supervision and contained nature of the treatment facilities are expected to preclude adverse effects to human health of workers or the general public. The only organisms expected to have mortality and treatment-related adverse effects are those present within the wood to be treated. Proper disposal of hot water from steam and hot water vats at the facilities is not expected to affect local soil or water quality.

Fumigation with methyl bromide has been the predominant quarantine treatment of SWPM throughout the world. However, the United States and European Union (EU) countries are making substantial use of heat treatments. The selection has favored fumigation in underdeveloped countries due to the convenience and economical nature of this method. Methyl bromide is the only fumigant authorized by APHIS for SWPM at ports and in the China Interim Rule. Although APHIS is investigating the use of other potential fumigants, the status of research and development suggest that no other fumigants are likely in the immediate future. Although the frequency of port fumigations of SWPM with methyl bromide would be expected to increase under the No Action alternative commensurately with the anticipated increases in number of shipments associated with the increasing trade, the increases in trade have greatly exceeded the expansion of inspection services and there have been negligible increases in fumigations due to pest detection in SWPM. As was mentioned in the paragraph on inspection, the greatest use of treatments (i.e., mostly methyl bromide fumigation) under the No Action alternative is for treatments of SWPM under the China Interim Rule. Based upon the fact that the majority of the potential environmental consequences of this treatment under the No Action alternative will relate to increased use of methyl bromide in compliance with the China Interim Rule, any statements about methyl bromide usage under this alternative will relate to present and anticipated usage in compliance with the China Interim Rule.

Human health effects from methyl bromide have been described in detail in a chemical background statement prepared for APHIS (LAI, 1992). That document is incorporated by reference into this EIS and the more important information is summarized here. Methyl bromide is an alkylating agent, a substance that deactivates enzymes and disrupts nucleic acid synthesis. The actual biochemical mechanism remains unclear, but

may be related to irreversible inhibition of sulfylhydryl enzymes (Hayes and Laws, 1991). The central nervous system is the primary focus of toxic effects of methyl bromide (Honma *et al.*, 1985). The mechanism of intoxication of methyl bromide targets several organs including liver, kidneys, adrenals, lungs, thymus, heart and brains (Medinsky *et al.*, 1985; Eustis *et al.*, 1988). Methyl bromide is an odorless, acutely toxic vapor that is readily absorbed through the lungs by inhalation. The primary health issue of concern to workers is potential adverse neurotoxic and pulmonary effects. Recorded fatalities to methyl bromide are generally the result of respiratory failure. Contact with the liquid can cause skin burns and skin irritation, but this exposure can be prevented by proper handling of the gas cylinders. Preventing acute exposures to methyl bromide is the primary concern. Access within the stack barrier zone during regulatory fumigations is limited to certified personnel wearing self-contained breathing apparatus. Use of proper protective gear in this zone is required until the ambient air concentrations of methyl bromide decrease to 5 ppm or less during aeration. Adherence to required safety precautions and proper protective clothing, as described in the PPQ Treatment Manual (USDA, APHIS, 1998a), preclude any direct acute or chronic adverse health effects to humans.

Fumigants, such as methyl bromide, used to treat commodities such as wood will kill any exposed organisms present in the treated commodity. Other organisms such as wildlife and domestic animals that do not have access to the fumigation chamber are not expected to be adversely affected by fumigations. The aeration vent from a fumigation stack or chamber may regularly release gas at a specific location, which could affect those organisms immediately below the vent. However, methyl bromide gas is anticipated to disperse quickly and few organisms would be expected to reside in close enough proximity to the off-gassing vent to be adversely affected. Most fumigation facilities and stacks are placed on physically disturbed sites that are not preferred habitat for wildlife.

The primary environmental quality issue related to the potential use of methyl bromide as a fumigant is its capacity to contribute to ozone layer depletion in the global stratosphere. The current best estimate of the ozone depletion potential of methyl bromide is 0.4 (NOAA *et al.*, 1998). However, more recent studies (using n-propyl bromide) would suggest a lower value for ozone depletion potential (0.03 to 0.1) (UNEP/WMO, 2002). Title VI of the Clean Air Act requires that all compounds with an ozone depletion potential of 0.2 or greater be phased out in the United States by the year 2005. Based upon their review of known ozone depletion potential, the U.S. Environmental Protection Agency (EPA) has classified methyl bromide as a class I ozone depleting chemical. Phaseout

requirements have been set for methyl bromide by EPA under the Clean Air Act (EPA, 1999) in compliance with agreements made under the Montreal Protocol on Substances that Deplete the Ozone Layer. An exemption to the phaseout requirements on methyl bromide has been maintained for quarantine and preshipment uses (QPS). This exempts phaseout of required fumigation uses against regulated pests of SWPM. The intent of this Protocol, however, is to phase out these use patterns or promote the development of effective alternative quarantine treatments, where possible.

The primary function of the ozone layer in the stratosphere (a part of the Earth's atmosphere existing between 15 and 35 kilometers above the surface) is to prevent the penetration of ultraviolet (UV) radiation through the atmosphere to the Earth's surface. Recent decreases in the level of atmospheric ozone have resulted in an estimated 8 to 15 percent increase in the amount of UV radiation reaching the surface of the Earth, with other influencing factors like clouds and pollution being constant (Bell *et al.*, 1996). Exposure to UV-B radiation can cause conditions ranging from minor sunburn to more severe effects such as snowblindness (the formation of temporary cataracts resulting from sunburn within the eye) and destruction of DNA within cells. Exposure to UV-B radiation has been identified as a major factor in the incidence of various types of cancers (UNEP, 1998; Bell *et al.*, 1996). The effects vary with the amount of radiation, the exposure duration, and the exposure frequency. In addition to human health effects, the increased UV-B exposure associated with ozone depletion has adverse impacts to the health of plants and animals. The productivity of agriculture, forestry, and fisheries could be expected to diminish with excess exposure to UV-B (Bell *et al.*, 1996). The physical environment can be affected by increased production of pollutants in smog from the increased UV radiation and more rapid degradation of polymers and related materials used in construction (Bell *et al.*, 1996).

To assess the relative impacts from methyl bromide use on ozone depletion, it is necessary to understand the impact of the current usage on stratospheric ozone levels. Methyl bromide is only one of a number of substances that react with ozone in the atmosphere. The sum of all global production of methyl bromide has been determined to contribute 1 percent to the overall annual stratospheric ozone depletion (NOAA *et al.*, 1998). The primary substances responsible for stratospheric ozone depletion are various chlorofluorocarbons (CFCs) and the regulatory phaseout of the use of CFCs is associated with much greater decreases in stratospheric ozone depletion than could occur with the phaseout of methyl bromide.

The calculated annual global consumption (anthropogenic use) of methyl bromide in 1996 amounted to 63,960 metric tons (MT)(UNEP, 1998). Many of the current uses of methyl bromide are being eliminated as part of the mandatory phaseout required to comply with the Montreal Protocol and Clean Air Act. The QPS uses of methyl bromide are not required to be phased out and these usages account for only 28 percent of all uses of methyl bromide worldwide (Thomas, 1999). The comparable QPS usage for consumption in the United States is about 9 percent of the total methyl bromide used (Thomas, 1999). Based upon the anticipated phaseout of the other uses of methyl bromide, continuing QPS uses would contribute about 0.3 percent to annual stratospheric ozone depletion (assuming no reductions in contributions from CFCs or other ozone depleting substances). The current QPS uses of methyl bromide are expected to continue until economical alternatives are developed to satisfy the pest elimination requirements.

A risk analysis of ozone depletion potential was prepared for compliance with regulations of SWPM under the China Interim Rule (USDA, APHIS, 1998b). This analysis applied conservative assumptions that projected potential usage of methyl bromide resulting from the China Interim Rule was determined to range from 1,040 to 12,565 MT annually. This was determined to constitute a 1.6 to 19-percent increase in the annual release of methyl bromide to the atmosphere. Actual methyl bromide non-QPS usage data from China indicate a decrease from 3,267 MT in 1998 to 2,664 MT in 1999 (EPA, 2002). Although data are not available for QPS usage in China by year, the decrease in non-QPS usage to comply with the Montreal Protocol has partially covered any increases in QPS usage that have occurred. The actual QPS usage from the China Interim Rule is known to be considerably less than anticipated from the risk analysis due to the analysis assumption that loaded cargo with SWPM would be fumigated rather than fumigation of SWPM prior to cargo loading. It is known that most shippers fumigate SWPM prior to cargo loading to lower costs, avoid agricultural commodity tolerance issues, and to prevent damage to sensitive commodities. In addition, other treatment methods (heat treatment) and substitute packing materials for shipments have been used by China for some cargo and this has lowered their need for methyl bromide treatments. Based upon the more realistic scenario of fumigation of SWPM prior to cargo loading, the projected potential usage of methyl bromide would not exceed 630 MT annually or a 1-percent increase in the annual release of methyl bromide to the atmosphere. This amount of methyl bromide contributes no more than 0.01 percent to the overall annual stratospheric ozone depletion. This contribution is relatively small compared to other ozone depleting chemicals and to the possible

quarantine treatments for SWPM worldwide being considered in some other alternatives.

c. Aggregate Consequences

The most substantial aggregate consequences of the No Action alternative are related to pest risk issues and cumulative effects of methyl bromide. Aggregate consequences include those adverse effects resulting from combined program actions under the alternative, from program actions combined with non-program actions, and from program actions combined with any reasonably foreseeable future actions (Federal or non-Federal).

Continuing the existing regulations for SWPM would ensure that the present pest risks from countries (other than China and Hong Kong) will increase commensurate with increases in trade. The draft pest risk assessment for importation of SWPM into the United States (USDA, APHIS and USDA, FS, 2000) found that most of the organisms reviewed in their pest risk assessment were determined to pose high pest risk and those organisms are described as unlikely to be excluded from the United States solely through inspections and associated interdiction actions at ports of entry. In the absence of more stringent pest mitigation measures, pests like Asian longhorned beetle can be expected to pose an ongoing and increasing threat to the survival and health of forests in the United States. The potential damage to forests and forest resources from these pest species would be much greater than the potential damage from the other alternatives.

Preservative treatments are not expected to occur very frequently under the No Action alternative. The reasonably foreseeable program and non-program use is expected to pose negligible effects. Likewise, heat treatments are only expected to be used moderately for SWPM with negligible cumulative risks from combustion products and disposal of hot water.

The environmental consequences of the cumulative effects of all quarantine uses of methyl bromide were discussed in considerable detail in a previous EIS (USDA, APHIS, 2002). The content and findings of that EIS as related to potential impacts of methyl bromide quarantine use on ozone depletion from this program are incorporated by reference into this document and summarized here. Most of the anticipated new commodities that could require fumigation (other than SWPM) are expected to need only small quantities of methyl bromide which, when vented following fumigation, would not result in any substantial cumulative contribution to ozone depletion. Based upon a total overall annual contribution to

stratospheric ozone depletion of no more than 0.01 percent, the aggregate effects would appear inconsequential. The recent dramatic increases in trade with China are the basis for the need to fumigate SWPM and this trade is expected to continue. It is less clear to what extent trade will continue to expand in the future. The increased need for methyl bromide treatments is expected to mirror the increased trade with China under this alternative. Although the amount of trade with China has been steady since the increases in trade prior to the China Interim Rule, it is possible that trade and associated treatments may increase again. It seems unlikely that the cumulative effects of methyl bromide on annual stratospheric ozone depletion under the No Action alternative will increase greatly for the foreseeable future and any increases would be considerably less than the inconsequential depletion (0.01 percent) resulting from the present level of trade. The phaseout of CFCs and other ozone-depleting chemicals is anticipated to result in much more evident effects on recovery of stratospheric ozone than any ongoing inconsequential depletion from the No Action alternative.

2. Extend Treatments in China Interim Rule to All Countries

Extension of the treatments in the China Interim Rule to all countries would ease the burden on inspection or would redirect inspection to checking paperwork and verifying treatments. This alternative continues the same treatments as under the No Action alternative. Some information about these treatments may be repeated as it applies to this alternative, but most statements about treatments will be directed to any changes in context or intensity resulting from the potential extension of the China Interim Rule.

a. Capacity for Pest Mitigation

Unlike the No Action alternative which depended primarily upon inspection to detect and exclude pest risks (except for China and Hong Kong), pest mitigation under the extended treatments of the China Interim Rule depends primarily upon compliance with required treatments and efficacy of the treatment methods. This alternative requires less direct inspection of SWPM and more review of compliance than the No Action alternative.

The ability of inspection to verify compliance with required treatments under this alternative is limited by the available documentation. This alternative would lack the certification markings of wood required under the International Plant Protection Convention (IPPC) Guidelines for SWPM, but would require documentation of treatment. Although some treatments could be verified by specific tests (e.g., kiln dried SWPM can be verified by an electrical conductivity meter), most treatments lack a

quick, reliable test for indicating treatment or lack thereof. Therefore, the documentation and spot checking of SWPM is important to verify pest mitigation treatments. Based upon the availability of similar documentation for all SWPM to that provided for cargo manifests from China, one could selectively inspect only those shipments for which the likelihood of quarantine pest infestation in SWPM is elevated. Monitoring of inspections of SWPM from China and Hong Kong within a year following the passage of the interim rule in 1998 revealed that proper compliance with the requirements for SWPM were met approximately 98 percent of the time. Based upon the results of this monitoring study, one could expect live insects in 0.1 to 0.2 percent of the shipments, lack of treatment in 0.7 to 0.9 percent of the shipments, and incorrect treatments for 0.05 to 0.2 percent of the shipments. Closer inspection of shipments from sources with previous inadequate or noncompliance has been shown to increase likelihood to detect cargo with increased pest risks. Using this cargo information, inspection rates for SWPM by inspectors can be set statistically to meet a desired level of compliance that maximizes exclusion and minimizes the likelihood of plant pest introduction. However, excluding the effects of applicable treatment requirements, the frequency of infested SWPM would be anticipated to remain much higher and to pose pest risks that inspection efforts alone could neither contain nor exclude.

The primary intent of inspection is to mitigate pest risk by ensuring compliance with the regulations. The high potential risks from damaging pests associated with noncompliance make it APHIS policy to provide a strong deterrent. Therefore, APHIS keeps importers and shippers informed of the penalties from inadequate compliance. The importer or shipper could be subject to administrative penalties, criminal fines, jail sentences, and loss of revenue due to APHIS' rejection of commodities, permit applications, and/or compliance agreements. A major tool for APHIS is the option to refuse entry, require treatment, or require destruction of the SWPM. All of these options are costly to the shipping line and exporter, who must assume all costs for the delays and any treatments. This offers strong incentive for their full compliance with SWPM regulations.

A thorough discussion of the efficacy of different treatment methods was provided under the No Action alternative as those treatments related to the China Interim Rule and most of that information will not be repeated here. The pest risk potential from the application of the China requirements to all SWPM worldwide would be considerably less than the pest risk potential under the No Action alternative. The decrease in frequency of interceptions of quarantine wood pests from China by APHIS following

the China Interim Rule (40 percent before to 5 percent after) would suggest that the associated treatment requirements (in spite of some noncompliance) resulted in an 80 percent reduction in pest risks. Comparable reduction would be expected if applied to regulation of all SWPM worldwide. Although this reduction of pest risks is desirable relative to the No Action alternative, the inability of these treatment methods to eliminate all wood pests present in SWPM would result in greater pest risk than the alternative use of only substitute packing materials. The primary pest risk issue under this alternative is the extent to which the treatments of SWPM are effective at eliminating pests and diseases.

Although all three treatments are effective at eliminating pest risk in SWPM, each method has limitations as described in the Environmental Consequences chapter for the No Action alternative. Despite proven efficacy, the use of chemical preservatives has not been used widely under the China Interim Rule. Likewise, chemical preservatives are not expected to be widely used for SWPM treatments under this alternative due to health and environmental issues related to handling and disposal of treated SWPM. Of the various treatment methods available for SWPM, the heat treatments are the most efficacious of the treatments against potential pest risks. Although heat treatments are very efficient at eliminating pest risk within wood of thin diameters, penetration of heat to core temperatures hot enough to kill pests in thick wood is more problematic. Therefore, heat treatments are expected to be limited to smaller, more easily treated wood articles or high value articles (Morrell, 1996b). Likewise, elimination of some pest and disease risks in thick wood may not be successful (UNEP, 1998; Morrell, 1995). Although reinfestation of heat-treated SWPM is possible, most studies have indicated that this is unlikely, particularly with kiln dried wood. The primary issue of concern under this alternative is the effectiveness of the heat treatment guidelines. The prescribed heat treatment under this alternative sets a required minimum core temperature of 71.1 °C for at least 75 minutes. Although not all pests are capable of being killed by such treatments, application of these requirements will eliminate most pest risks and may provide more thorough treatment than the IPPC Guidelines. Methyl bromide treatments do penetrate wood well, but may not eliminate all pest and pathogen risks present (USDA, APHIS, 2002). One of the limitations of fumigations with methyl bromide was found to be the inability to eliminate risk from bluestain fungi in some wood packing (USDA, FS, 1992). As with heat treatments, fumigation requirements are more stringent under this alternative than under the IPPC Guidelines. The treatments using methods in the China Interim Rule are expected to be at least as efficacious as those under the IPPC Guidelines,

but thorough research comparing the differences in concentration, time, and temperature have not been completed.

Notwithstanding these treatment limitations, the draft pest risk assessment of SWPM (USDA, APHIS and USDA, FS, 2000) concluded that more stringent importation requirements should be applied and that effective mitigation measures, including effective treatments, could greatly reduce the risk of introducing destructive exotic forest pests. The application of the China regulations to all SWPM would make the potential pest risks from SWPM consistent from all origins, that is, comparable pest risks would be eliminated by these treatment requirements. Those pest organisms and disease vectors of wood not effectively treated by fumigation with methyl bromide or heat treatment would continue to pose potential risk of introduction and damage to trees in the United States. In particular, some of the deep wood-borers, fungi, rots, and wilts will continue to be problematic for abatement of pest risk. However, the longer and more intense exposures of SWPM compared to the exposures under the IPPC Guidelines would be expected to make treatments more effective at eliminating potential pest risks.

b. Consequences of Component Methods

The consequences of the component methods of this alternative have been discussed under the No Action alternative and that information will not be repeated here except as it relates to application of the China regulations to all SWPM. Although the potential consequences of using preservative chemical treatments are considerable, the anticipated health and environmental risks are expected to be minimal due to the lack of use of these treatments. Heat treatments and fumigations with methyl bromide are expected to be the primary treatment methods. The only environmental issues associated with the actual heat treatments relate to the emission from the heat source (combustion products) and disposal of hot water. Effects from these emissions and by-products of heat treatment are expected to be localized, temporary, and not of substantial intensity.

The primary environmental quality issue relates to the greater frequencies and quantities of methyl bromide used in fumigation under this alternative. This alternative extends the treatments of the China Interim Rule to all SWPM worldwide. These treatments are more stringent than those required under the IPPC Guidelines and are projected to involve the greatest usage of methyl bromide of any alternative being considered. The potential contribution from these fumigations of SWPM with methyl bromide to cumulative ozone depletion depends upon how much SWPM is to be fumigated relative to other available alternate methods. For example,

if most SWPM is either heat treated or replaced by other packing materials, then the potential contribution from methyl bromide fumigation could be very small.

Applying the same conservative analytical approach described in the No Action alternative to all SWPM worldwide would result in commensurately greater amounts of methyl bromide consumption and release. The additional usage of methyl bromide is expected to range from as low as 427 MT per year to as high as 5,145 MT per year. This annual usage amounts to an increase in anthropogenic release of methyl bromide from 0.7 to 8 percent. Although this is a potentially substantial increase in methyl bromide use, the associated annual ozone depletion would only amount to an additional increase of 0.007 to 0.08 percent. This ultimately could result in a 1.2 percent effect on the restoration of the ozone layer. Although this usage is still a relatively small contribution (relative to chlorofluorocarbons) to overall ozone depletion, this approach does not assist in fulfilling the intent of the Montreal Protocol to gradually phase out these QPS uses of methyl bromide.

A recent approach being developed to mitigate the potential effects of methyl bromide on ozone depletion is through the use of recapture system devices to collect methyl bromide from fumigation chambers before the gas is emitted into the atmosphere. This system can be designed for program fumigations, but there are high setup costs and modest maintenance costs involved.

A conservative estimate of the amount of methyl bromide recovered by the recapture system from each fumigation is 75 to 80 percent of the total fumigant applied (McAllister, 2000). This recovery compares favorably with the average amount of methyl bromide vented to the atmosphere from a fumigation that has been estimated to be from 69 to79 percent of the total applied (UNEP, MBTOC, 1998).

The recapture system is currently being used for some port fumigations of agricultural commodities in California and Texas. Several other ports are considering installation of recapture systems. Any required installation of recapture systems for all domestic fumigation facilities would be costly and is not expected in the immediate future. This recapture technology could be applied to quarantine fumigations of SWPM in other countries, but there are logistical considerations and there may be regulatory restrictions that make this development unlikely within the immediate future.

c. Aggregate Consequences

As was true with the No Action alternative, the most substantial aggregate consequences for this alternative relate to pest risk issues and the cumulative effects of methyl bromide. Preservative treatments are expected to be used infrequently and that limited use is projected to pose negligible adverse effects. The exhaust emissions from heat treatment sources and disposal of excess hot water from heat treatment poses only local effects of negligible impact. The heat from individual heat treatments is released to the atmosphere and dissipates readily with no long-term or cumulative effects on global temperatures. Expansion of the frequency of heat treatments to cover pest risks from other parts of the world is not anticipated to add substantially to the global heat load.

Extension of the China Interim Rule to all SWPM worldwide does ensure long-term exclusion of most wood pests of quarantine concern from the United States. This prevents the potential damage to forest and forest resources likely to occur under the No Action alternative. However, some of the deep wood-borers, fungi, rots, and wilts could continue to be problematic for abatement of pest risk. The alternative that would ensure the most complete protection against these species is the use of substitute packing materials.

As stated previously, the cumulative impacts of methyl bromide usage have been described in considerable detail in a previous EIS designed specifically to address issues related to impacts on the ozone layer (USDA, APHIS, 2002). The sum of all global production of methyl bromide has been determined to contribute 1 percent to the overall annual stratospheric ozone depletion (NOAA *et al*., 1998). Most stratospheric ozone depletion is presently contributed by chlorofluorocarbons that are being phased out. The additional methyl bromide usage expected under this alternative ranges from 427 MT to 5,145 MT per year.

Disregarding any phaseout of ozone-depleting chemicals, the additional annual contribution of methyl bromide to ozone depletion from SWPM treatment worldwide at China Interim Rule rates would be expected to range from 0.007 to 0.08 percent (ultimately a 1.2 percent effect on the restoration of the ozone layer). Most anticipated QPS usages of methyl bromide (other than the SWPM rule being considered) are small and contribute negligible potential effects to ozone depletion. The gradual phaseout of non-QPS use patterns of methyl bromide will decrease ozone depletion. Critical usages that will be allowed under the EPA regulations have yet to be designated. Although QPS usages (such as quarantine treatments of SWPM) are exempted from phaseout under the Montreal

Protocol and Clean Air Act, the primary intent of the Montreal Protocol is to phase out uses of ozone-depleting chemicals such as methyl bromide and promote the development of effective alternative materials, where possible. This alternative involves the most usage of methyl bromide and does the least to assist in achieving the goals of the Montreal Protocol.

3. Adoption of IPPC Guidelines (Proposed Alternative)

Adoption of the IPPC Guidelines decreases the need for inspection by providing the required IPPC markings as evidence of treatments to mitigate pest risks. Unlike the previous two alternatives, the IPPC Guidelines do not include chemical preservative applications to SWPM as an acceptable phytosanitary treatment, so human health and environmental consequences related to chemical preservatives do not apply to this alternative. In addition, the IPPC Guidelines do not require debarking of SWPM as required under previous regulation of SWPM. Debarking was determined not to further reduce pest risk substantially when either methyl bromide or heat treatment was performed consistent with the IPPC Guidelines. Some information about the treatment methods may be repeated here as it relates to common issues, but most statements about treatments will be directed to any changes in context or intensity resulting from the adoption of the IPPC Guidelines.

a. Capacity for Pest Mitigation

The ability of inspection to exclude quarantine pests of SWPM could be greatly enhanced by the additional markings required with each shipment under the IPPC Guidelines. Unlike previous alternatives, the IPPC Guidelines require specific markings on treated wood which would greatly assist with treatment verification. As with the alternative extending the China Interim Rule, this alternative facilitates selective inspection of only those shipments for which the likelihood of quarantine pest infestation in SWPM is elevated. Likewise, it is reasonable to project approximately 98 percent compliance for all countries as was determined by monitoring of the China Interim Rule compliance. Closer inspection of shipments from sources with previous inadequate or noncompliance could be done to increase likelihood of detecting cargo with increased pest risks. Using this information, inspection rates for SWPM by inspectors could be set statistically to meet a desired level of compliance that maximizes exclusion and minimizes the likelihood of plant pest introduction. In the absence of any of the required treatments under this alternative, the frequency of infested SWPM would be anticipated to remain high and to pose pest risks that inspection efforts alone could neither contain nor exclude.

The pest risk potential from SWPM from the adoption of the IPPC Guidelines would be considerably less than the pest risk potential under the No Action alternative. The lack of a debarking requirement under the IPPC Guidelines would normally be associated with greater pest risk, but the required treatments (heat or methyl bromide fumigation) should eliminate those pests of concern in and under bark. The primary pest risk issue under this alternative is the extent to which the treatments of SWPM are effective at eliminating pests and diseases. Although both treatments are effective at eliminating pest risk in SWPM, each method has limitations as described in the environmental consequences chapter for the No Action alternative. The primary issue relates to penetration of the heat or fumigant to the site of the pest within the wood. Methyl bromide treatments do penetrate wood well, but may not eliminate all pest risks present (USDA, APHIS, 2002). Although the IPPC Guidelines acknowledge that not all pests are capable of being killed by such treatments, they allow fumigation decisions by the NPPOs to be made on a case-by-case basis, providing a scientifically based pest risk assessment is done.

Although an extension of the China Interim Rule (alternative 2) can be projected to provide an 80 percent reduction in pest risks (based upon monitoring), there are no compliance and monitoring data from implementation of the IPPC Guideline treatments from which to make projections. APHIS has reviewed the IPPC treatment reference documents that are used as the basis for acceptance of present treatments under the IPPC Guidelines, appendix F. A link ("Reference Documents used for listing the Treatments in ISPM # 15") to this list of references used in the IPPC decisionmaking process is provided on the PPQ webpage at http://webdev.aphis.usda.gov/ppq/swp/approved_guideline.html. This efficacy data suggest that the treatments under the IPPC Guidelines are efficacious against at least 95 percent of the pests intercepted by APHIS in 2000–2001. Preliminary tests by APHIS reinforce this view. APHIS continues to review phytosanitary protection measures for SWPM. Efficacy testing is underway in Canada and early findings have revealed more effective pest risk reduction than had been anticipated, especially for fungi. Ongoing monitoring of SWPM will demonstrate the ability of the IPPC Guidelines to meet the pest risk reduction standards that APHIS currently expects.

The prescribed heat treatment under the IPPC Guidelines involves heating the wood to a minimum core temperature of 56 °C for at least 30 minutes. As with fumigation, these heat treatment Guidelines are less stringent than the China SWPM regulations that require heat treatments to attain a minimum core temperature of 71.1 °C for at least 75 minutes. The IPPC

Guidelines target only certain pests. Some pest species may survive such treatments due to a higher thermal tolerance. The Guidelines allow heat treatment decisions by the NPPOs to be made on a case-by-case basis, with appropriate justification. Initial testing of those treatments contained in the IPPC Guidelines indicates that those applications provide adequate mitigation of the pest risks of greatest concern to APHIS. If other pests of concern can be shown to be effectively eliminated by additional or more stringent treatments, those treatments may be added to the Guidelines.

Notwithstanding these treatment limitations, the pest risk assessment of SWPM (USDA, APHIS and USDA, FS, 2000) concluded that more stringent importation requirements should be applied and that effective mitigation measures including effective treatments could greatly reduce the risk of introducing destructive exotic forest pests. The adoption of the IPPC Guidelines would make the potential pest risks consistent from all origins, that is, comparable pest risks would be eliminated by these treatment requirements. Those pest organisms and disease vectors of wood not effectively treated by fumigation with methyl bromide or heat treatment would continue to pose potential risk of introduction and damage to trees in the United States. As with the extension of the China Interim Rule, some of the deep wood-borers, fungi, rots, and wilts could continue to be problematic for abatement of pest risk under the IPPC Guidelines.

b. Consequences of Component Methods

A thorough discussion of the environmental consequences of heat treatments and fumigations with methyl bromide was provided under the previous alternatives and that information will not be repeated here except as it relates to compliance with the IPPC Guidelines. As with the previous alternatives, the only environmental issues associated with the actual heat treatments relate to the emission from the heat source (combustion products) and disposal of hot water. Effects from these emissions and by-products of heat treatment are expected to be localized, temporary, and not of substantial intensity.

The greater frequencies and quantities of methyl bromide used in fumigation under this alternative would be expected to contribute to ozone depletion more than under the No Action alternative, but duration of intense exposure of SWPM to methyl bromide under this alternative is not as great as under the alternative extending the China Interim Rule. The lower exposures under this alternative compared to the China Interim Rule would allow less use of methyl bromide to meet the IPPC Guidelines. The projected additional annual usage of methyl bromide under adoption of the

IPPC Guidelines could range from 384 MT to 4,630 MT per year. This usage pattern would be expected to contribute additional ozone depletion of 0.006 to 0.072 percent (ultimately a 1-percent effect on the restoration of the ozone layer). Although this usage is a relatively small contribution to overall ozone depletion relative to that posed by CFCs, this approach does not assist in fulfilling the intent of the Montreal Protocol to gradually phase out these QPS uses of methyl bromide. The limitations of effective alternate treatments under the IPPC Guidelines are comparable to those described in the previous sections on environmental effects of other alternatives. Future application of those methods to lower the releases of methyl bromide to the atmosphere are contingent upon improvements in the costs and various logistical issues.

c. Aggregate Consequences

The aggregate consequences of adoption of the IPPC Guidelines are similar to those from the extension of the China Interim Rule to all SWPM worldwide. Emissions and other effects from heat treatments pose negligible local and global risks. The most substantial aggregate consequences relate to potential pest risk and the cumulative effects of methyl bromide.

Adoption of the IPPC Guidelines ensures long-term exclusion of most wood pests of quarantine concern from the United States. The lack of required debarking and the less stringent treatment requirements than those under the extension of the China Interim Rule alternative may make the pest risk higher under the IPPC Guidelines, but efficacy testing has not indicated higher risk for those quarantine pests of greatest concern to APHIS and those pests which are targeted by the IPPC Guidelines. The IPPC Guidelines prevent the potential damage to forest and forest resources most likely to occur under the No Action alternative. However, as with the extension of the China Interim Rule, some of the deep wood-borers, fungi, rots, and wilts would continue to be problematic for abatement of pest risk.

Using the same approach for calculation of the usage rates in IPPC Guidelines as previous alternatives, a similar pattern emerges. The fumigation rate is slightly lower under the IPPC Guidelines than under the China Interim Rule and, therefore, the projected usage is commensurately lower. Based upon actual fumigation of SWPM before loading, the additional methyl bromide usage from the IPPC Guidelines would be expected to result in additional methyl bromide usage from 384 MT to 4,630 MT per year. This usage indicates that the additional annual contribution of methyl bromide to ozone depletion from SWPM treatment

at IPPC Guidelines' rates would be expected to range from 0.006 to 0.072 percent (ultimately a 1-percent effect on the restoration of the ozone layer). As was true with China Interim Rule rates, the cumulative impacts associated with the IPPC Guidelines' rates must take into account other uses. The gradual phaseout of non-QPS use patterns will decrease ozone depletion, but the critical usages that will be allowed have yet to be designated. Thus, the impact of the critical uses on the ozone layer can not be assessed. The lower usage of methyl bromide under the IPPC Guidelines does indicate less potential for cumulative impacts than the usage of methyl bromide under the China Interim Rule rates, but the differences are very slight. As with the China Interim Rule cumulative analysis, most anticipated QPS usages (other than the SWPM rule being considered) are small and contribute negligible potential effects to ozone depletion. Although usage under this alternative provides a relatively small contribution to overall cumulative ozone depletion, selection of this alternative does not assist in fulfilling the intent of the Montreal Protocol to gradually phase out these QPS uses of methyl bromide. This alternative involves less use of methyl bromide than the extension of China Interim Rule, but the potential differences in effects on stratospheric ozone between the two alternatives are minimal.

4. Comprehensive Risk Reduction Program

Many of the environmental effects from the methods and treatments used in a comprehensive risk reduction program (e.g., heat treatment and methyl bromide fumigation) have already been described and that information will not be repeated here. Information about potential environmental effects of other methods to reduce pest risk in SWPM will be presented in this section based upon the extent to which research is completed or underway. As with the other alternatives, a brief discussion of potential pest risk and issues related to effectiveness of inspection is included.

a. Capacity for Pest Mitigation

Inspections under a comprehensive risk reduction program would be complicated by a number of factors. Without specific documentation of type of SWPM, origin, and type of treatment, this work could be difficult. Markings in compliance with the IPPC Guidelines and physical evidence of treatment would be useful. Treatments such as irradiation that leave no visible evidence could be difficult to verify. The inspection would be most effective with documentation of the methods used to mitigate pest risk of the SWPM used in each shipment. This would allow the inspector to assess the effectiveness and know what potential risk reduction to expect. However, this approach would require considerable adjustments to current cargo documentation for SWPM and these adjustments may not be readily adaptable to shippers, customs records, and trade regulations. If proposed

methods were consistent worldwide for all SWPM, the issue of type of SWPM would not be critical to inspection. However, it has been shown that the pest risk from some types of SWPM and some origins can be effectively eliminated by certain treatment methods that do not have efficacy against pests in other types of SWPM and from other origins due to differences in the type of pest risks present. This could pose many difficulties for inspectors who are working to exclude pest risk from SWPM. None of these logistical issues is insurmountable, but inspection under this alternative would be expected to require more involvement and more attention of the officers to specific details.

The pest risk potential from the application of a comprehensive risk reduction program to all SWPM would be considerably less than the pest risk potential under the No Action alternative. The primary pest risk issue under this alternative is the extent to which the selected methods are effective at eliminating pests and diseases. Although all treatments are effective at eliminating pest risk in SWPM, each method has limitations on efficacy and applicability. The use of substitute packing material eliminates pest risks associated with SWPM, but the logistics of converting over to the use of only these materials is not feasible at present. Implementation of any requirements to use only substitute packing materials is likely to require an amount of time for the industry and manufacturers to comply. Notwithstanding the limitations of these methods, the draft pest risk assessment of SWPM (USDA, APHIS and USDA, FS, 2000) concluded that more stringent importation requirements should be applied and that effective mitigation measures including effective treatments could greatly reduce the risk of introducing destructive exotic forest pests. Although APHIS could analyze the risks associated with different types and different origins of SWPM, selective mitigation of only SWPM of high risk would involve substantial inspection and enforcement efforts. This effort alone would greatly exceed available inspection resources and would still only protect against the highest pest risks. However, the consistent application of specific treatments to all SWPM would provide comparable protection from pest risks for all origins. This would ensure that comparable pest risks would be eliminated worldwide, but it would not protect against some of the pests that are more tolerant of the present treatments of SWPM. Those pest organisms and disease vectors of wood not effectively treated by these methods would continue to pose potential risk of introduction and damage to trees in the United States. In particular, some of the deep wood-borers, fungi, rots, and wilts could continue to be problematic for abatement of pest risk. However, the comprehensive risk reduction approach would provide the maximum flexibility to select methods and treatments that are the most effective at eliminating all potential pest risks. This could include the

gradual phasing out of SWPM and the phasing in of substitute packing materials.

(1) Pest Mitigation from Fumigation Treatments

There are a number of fumigants (other than methyl bromide) available or being developed for use in treatment of wood or wood products. Most of these fumigants are not expected to be ready for implementation within the foreseeable future. These include, but are not limited to, methyl iodide, chloropicrin, metam sodium, propargyl bromide, iodinate hydrocarbons, and propylene oxide. A thorough assessment of the environmental consequences of these fumigants at this time would not provide adequate information to assist in a meaningful decision about their potential use. Should future development of any of these fumigants show promise, their potential will be assessed and environmental documentation prepared to address any potential impacts foreseen from the anticipated use patterns. There is, however, adequate information available to discuss the potential use of some fumigants such as phosphine, sulfuryl fluoride, and COS.

Although phosphine has been used to treat wood products in the past, recent efficacy research indicates that it is ineffective against many wood pests and pathogens. Accordingly, the approved treatments of wood with phosphine have been removed from the PPQ Treatment Manual. Additional testing is underway to determine whether phosphine treatments can be used effectively for any particular wood or for treatment against specific wood pests from certain parts of the world.

Sulfuryl fluoride has been used primarily against termites in wooden structures and could be used effectively against insects that form colonies. Sulfuryl fluoride is considered to have excellent penetrability into wood (USDA, APHIS, 1991), with dosages similar to methyl bromide. Sulfuryl fluoride is less reactive than methyl bromide and produces no objectionable colors or odors to treated commodities. This fumigant is also effective against other major insect pests of timber such as bark beetles, wood-wasps, longhorned beetles, and powderpost beetles (UNEP, 1998). Unfortunately, eggs of many insects are tolerant to even high concentrations of sulfuryl fluoride (USDA, APHIS, 1991). This inability to penetrate eggs of insects has resulted in elimination of the use of sulfuryl fluoride against all wood-boring beetles from the PPQ Treatment Manual. However, sulfuryl fluoride is still authorized for applications to wood for control of hitchhikers, surface-feeders, and any brood-tending species of insects such as termites, bees, wasps, and ants. This limited use pattern for sulfuryl fluoride minimizes the possible applications for

SWPM, which is often infested with wood-boring beetles whose egg stages could survive fumigation with sulfuryl fluoride.

Applications of carbonyl sulphide (COS) as a fumigant are applied in a manner similar to methyl bromide or phosphine from gas canisters. Tests have shown that it will control a wide range of pests such as beetles, fruit flies, moths, mites, termites, molds, and nematodes. It has shown good efficacy in tests of grains, legumes, dried fruit, cut flowers, and both hard and soft timbers. It has, however, not been tested against some insect pests and most fungi of quarantine significance in wood. Any future decisions by APHIS to allow use of COS to treat SWPM for quarantine certification will be based upon its efficacy against these quarantine pests.

(2) Pest Mitigation from Controlled Atmosphere Treatments

Another treatment method with possible future applications is the use of controlled atmospheres. Controlled atmosphere treatments involve modifying the level of oxygen, nitrogen, and carbon dioxide to control pests present within the commodity. The displacement of oxygen results in asphyxiation of the exposed pests. Although controlled atmosphere treatments are very effective for protection of fresh fruit and grains from damage due to surface pests, there are no studies indicating good control of pests of wood either internally or externally. It is theoretically possible that wood borers or other important wood pests could be eliminated by controlled atmosphere treatment, but this would have to involve long-term control. Many of the wood pests are accustomed to living in low oxygen environments and the long time required for sufficient displacement of oxygen in the wood make this an unlikely option for routine commercial treatments. Use of this method to treat wood products needs considerable research before it could be considered. Implementation of controlled atmosphere treatments of wood is not expected for any quarantine applications in the foreseeable future, but development of this technology could provide information to assist in a meaningful decision if methods indicate any promising results.

(3) Pest Mitigation from Irradiation Treatments

Irradiation is a method of treatment that is under ongoing investigation for potential uses. The potential efficacy and potential environmental consequences vary with the source of radiation used. The three types of irradiation methods under consideration include gamma irradiation, electron beam irradiation, and microwave irradiation. None of these methods is considered ready for application to quarantine treatments of SWPM at present.

Gamma irradiation as a treatment involves exposing the SWPM in an enclosed chamber to the radiation emitted from a radioactive isotope such as cobalt-60 or cesium-137. It has been used to sterilize or kill certain pest species primarily in commodities other than wood. It is most often used to disinfect or disinfest food products, pharmaceuticals, and medical devices. With irradiation, a target dose and exposure time that will destroy the target organisms are sought. Previous programs have considered irradiation treatment only on a case-by-case basis for each facility or commodity use pattern. Irradiation has not been shown to be effective against a wide range of pest insects (UNEP, 1998). Lethal doses of gamma irradiation to adult ambrosia beetles were determined to range from 73 to 130 krad (USDA, APHIS, 1991). Fungi are known to be more tolerant of irradiation than beetles (Morrell, 1996a). Research was conducted in Russia to support a generic dose for treating logs (Huettel, 1996). This research suggested that a dose of 7 kiloGrays (kGy) is sufficient to cause 100 percent mortality in insects, fungi, and nematodes in logs. A science review panel was established to assess the potential of this work, but these lethal doses are considered too high to provide an economically practical treatment method (Eichholz *et al.*, 1991; Dwinell, 1996).

Electron beam irradiation is similar to gamma irradiation except that the source of radiation is electrons generated by a machine rather than by radioactive isotopes. Data on the efficacy of this treatment against insect pests and pathogens is quite limited. Agriculture Canada is examining the feasibility of this treatment against the New World pinewood nematode and wood-stain fungi. Obstacles to the use of this method are similar to those for gamma irradiation. Limited information is available about the cost and logistics of setting up treatment facilities. Very little documentation of efficacy against insect pests and pathogens prevent its practical employment for this purpose.

The use of microwaves as a treatment method involves exposing wood to ultra-high frequency magnetic fields, which elevate the temperature of any material containing moisture. When exposed to microwaves, dry wood has low dielectric properties and remains cool, but insects in the wood are heated to lethal temperatures. Microwave could be regarded as an alternate heat treatment technology. Microwave studies performed by Burdette (1976) showed total mortality to anobiid beetles in wood blocks treated with 1500 watts of power at 50 °C. Similar studies with other insects in wood have been efficacious (Thomas and White, 1959; Hightower *et al.*, 1974). However, fungi may not be as susceptible as insects to microwave exposure, especially in wood with a high moisture content such as green wood (USDA, APHIS, 1991). Although

microwaves control pests on the surface of wood, the depth of penetration of microwaves is low and may not reach borers, particularly in dense pieces of SWPM. Until adequate efficacy data are available and large treatment facilities are built, the use of microwaves as a pest mitigation method for SWPM can only be viewed as experimental.

(4) Pest Mitigation from Disposal of SWPM

There are a number of means of disposal of SWPM. The decision to select a given method of disposal would have to be made on a case-specific and site-specific basis. The greatest difficulty with the use of disposal methods is that any untreated SWPM arriving at a port of entry could still contain the quarantine pests or diseases that were present at the point of origin, and the containment of this pest risk to prevent introduction from the port of entry would be logistically difficult. For wood with pests and diseases that have slow spread or containable spread, disposal through incineration or other processing may pose acceptable pest risk. Disposal through burial may be effective if the depth is sufficient to prevent emergence of any pest or disease organisms.

b. Consequences of Component Methods

Considerable information about the potential consequences of preservative treatments, heat treatments, and fumigations with methyl bromide have been provided under the previous alternatives. Since a comprehensive risk reduction program will use a combination of methods and it is unclear exactly how frequently specific methods will be selected, the potential environmental consequences could vary considerably. The low use of preservative chemicals is expected to remain minimal under this alternative and impacts are anticipated to be negligible. The amount of heat treatment and fumigation with methyl bromide would most likely vary from the amount of each method under the No Action alternative to the amount under the extension of the China Interim Rule worldwide. If economical, alternate treatments to methyl bromide were developed, then the amount of fumigation with methyl bromide could actually decrease. The potential replacement of SWPM with substitute packing materials would eliminate many of the environmental consequences, but would increase environmental consequences related to raw material extraction, manufacturing processes, and disposal. The potential range of environmental consequences for each of these treatment methods is considerable.

(1) Environmental Consequences of Fumigations and Controlled Atmosphere

The consequences of other fumigants and controlled atmospheres that may be used to treat SWPM vary and are described below by individual compound. All require more research or development before their use could be considered adequate for regulatory quarantine treatments of SWPM. The completed research is expected to limit the foreseeable use patterns on SWPM to phosphine, sulfuryl fluoride, and COS. Therefore, the discussions of fumigants under this alternative will be limited to these compounds.

The potential primary hazard to human health from phosphine applications to wood products occurs from inhalation exposure to the phosphine gas. Phosphine has been placed in category I (highest toxicity category) because of the extreme inhalation toxicity from this route of exposure. EPA has reviewed potential exposure of applicators and concluded that no adverse effects to humans would be expected if precautionary labeling requirements are observed (EPA, OPP, 1985). EPA has set a re-entry level without respiratory protection of 0.1 ppm. Proper application and disposal of phosphine also precludes adverse effects to nontarget wildlife and environmental quality.

Sulfuryl fluoride is applied as a gas from pressurized cylinders. It is highly phytotoxic to plants and exposure to living plants should be avoided. The gas dissipates readily in the atmosphere and proper aeration following fumigation is required. It is a gaseous fluoride that may react with ozone and concerns related to stratospheric ozone depletion should be carefully considered if widespread use of this chemical were anticipated. Sulfuryl fluoride is a highly toxic fumigant to humans. Contact with the liquid may cause irritation, freezing, and burning of eyes, skin, and mucus membranes. Inhalation may be fatal. Slowed movement, reduced awareness, and slow or garbled speech are possible delayed symptoms of sublethal exposures. Adherence to proper safety precautions and use of proper protective gear preclude any adverse effects to humans from any fumigations with sulfuryl fluoride.

COS breaks down quickly and has extremely low residue levels. The rapid degradation ensures that bioaccumulation will not occur in living organisms or soil. One of the degradation products, hydrogen sulfide, is extremely toxic. The required use of self-contained breathing apparatus for any workers or supervising authorities within the restricted fumigation area prevents potential adverse respiratory and systemic effects. COS can cause depression and damage to the central nervous system with

inadequate personal protection (BOC Gases Australia Limited, 2000). A complete evaluation of potential health and environmental risks of COS has not been completed by EPA.

Controlled atmospheres may have some potential use patterns for SWPM, but their limitations have not yet been clarified. The primary concern with using controlled atmospheres is the potential for asphyxiation of humans and nontarget wildlife from the gases present that displace oxygen. This treatment method would be expected to require similar safety precautions and protective measures to those applied to fumigations. Aeration of enclosures after completion of controlled atmosphere treatments would be necessary to avoid adverse human health effects.

(2) Environmental Consequences of Irradiation Treatments

Exposures to high levels of gamma irradiation are known to make paper and fiberboard become brittle. The effects of exposure to gamma irradiation on the wood quality of SWPM is less certain. This issue may not be important for most wood packing materials, but the overall strength of wood is important to protect the cargo being transported. Although there may be structural changes in the wood quality, irradiation does not change the overall appearance of the wood (Morrell, 1996a), so there is no visible means to confirm or deny completion of an irradiation treatment.

An environmental assessment (EA) prepared by the U.S. Department of Health and Human Services' Food and Drug Administration (FDA) determined that no adverse environmental effects are anticipated at food processing plants that are designed to irradiate fruits and vegetables (FDA, 1982). The Nuclear Regulatory Commission (NRC) has set stringent environmental protection requirements for any facilities that use radionuclide sources (10 CFR Parts 20, 30, 51, and 71). In addition, there are special carrier requirements for transport of radionuclides set by the U.S. Department of Transportation. Any extraneous radiation emitted from radionuclides is required to be contained within facilities by shielding, as required by the NRC and the Bureau of Radiological Health at FDA. Any irradiation equipment would be designed to release radiation to the SWPM only. Monitoring of radiation at quarantine treatment facilities has demonstrated ambient background radiation levels at property boundaries. The treated wood does not retain any radioactivity from the exposure. Irradiation equipment and levels at approved facilities are checked on a regular basis by the USDA Radiation Safety Staff in accordance with standards set by the NRC. No problems have been associated with the use of irradiation equipment under APHIS permits.

Irradiation is being developed by several organizations for potential phytosanitary applications. Guidelines have been developed for the use of irradiation as a phytosanitary treatment including information on policies, procedures, and requirements for the proper conduct of treatments and consistent maintenance of operations between agencies and countries (NAPPO, 1997). APHIS proposed the use of irradiation as an additional regulatory treatment method for phytosanitary certification of some agricultural commodities (61 FR 24433, May 15, 1996; 65 FR 34113, May 26, 2000; and 67 FR 11610, March 15, 2002) and prepared an environmental assessment (EA) to analyze the potential environmental impacts of this proposal (USDA, APHIS, 1997). Although the treatment process is similar to that considered for SWPM, the agricultural commodities considered in the EA required dosages that are considerably lower than would be efficacious for wood. Unlike the exposures considered in the EA which includes the unique radiolytic products that could be consumed orally, the only potential source of exposure for SWPM treatments would be from stray radiation at the facilities which is primarily a concern for workers. The amount of stray radiation would be expected to increase commensurate with the higher dosages for treating wood. There have been no further advances in developing treatment facilities that would be logistically and economically feasible for treating SWPM. Until this issue is resolved to the satisfaction of the industry, irradiation treatments are unlikely to be considered seriously by manufacturers of SWPM.

There are a number of unresolved issues regarding the use of microwaves for wood treatment. The limited ability of the microwaves to penetrate wood, the effectiveness of microwaves against fungi, and the ability to construct adequate treatment facilities given the large electrical power requirements for this method are all issues of concern. The external costs involved in producing the high electrical power requirements to attain sufficient microwave energy to kill wood pathogens may exceed the market value of the commodity being transported. As with the other irradiation methods, worker protection through adequate shielding from microwaves must be demonstrated before this treatment could be approved.

(3) Environmental Consequences of SWPM Disposal

If the SWPM has undergone chemical treatment with preservatives, there are several hazards to consider. Any residues remaining on the wood will degrade or be released to various environmental media. Small quantities of boron and other water-soluble preservatives that wash off from treated wood are not likely to pose noteworthy problems upon disposal. These

substances would not be expected to enter water following disposal and any residual preservative would be expected to degrade or be diluted to innocuous concentrations. The toxicity of some synthetic organic and oil-borne preservatives require more care in the selection of a method of disposal. Disposal of creosote-treated wood in a lined landfill presents no environmental problems (Morrell, 2001b), but disposal by burning of such wood produces toxic gases and ash that pose a risk of adverse human health effects. Many of the oil-borne preservatives on SWPM could pose substantial health hazards from incomplete incineration. Disposal of SWPM treated with some persistent preservatives can result in high concentrations and contamination of landfills.

Hydrocarbon gases released from incineration of small quantities of untreated SWPM would most likely pose minimal environmental risks, but incineration of larger quantities could pose local air quality concerns. This issue would have to be addressed in a site-specific EA.

The environmental consequences of processing SWPM depend upon the condition of the wood (treated or untreated) and what is being done. Any residual processing effluents or contaminated materials could require special handling or detoxification to eliminate potential hazards. This would have to be addressed as part of the review and environmental documentation for the process being contemplated.

c. Aggregate Consequences

The aggregate environmental consequences of a comprehensive risk reduction program are difficult to predict and could vary to the extent that different methods are used to treat SWPM. Many of the methods are in various phases of research and development that do not provide adequate basis for any final decisions about program usage. To the extent that a comprehensive risk reduction program could require efficacious treatments of SWPM or substitute packing materials in a manner that eliminates pest risks that currently exist, this approach would be very useful. The logistics of implementing new pest mitigation methods could require a phase-in period with commensurate delays in pest risk reduction. Considerable work remains to be done before organization of a workable comprehensive risk reduction program could be instituted.

Aggregate consequences resulting from the use of specific pest mitigation methods would need to be considered. As with the other alternatives, methods involving heat treatments would not be expected to pose substantial cumulative effects on global warming. The cumulative impacts of methyl bromide usage under a comprehensive risk reduction program

are difficult to predict and would depend upon the extent to which fumigation with methyl bromide was selected over other treatment methods and the rates of methyl bromide to be used in those fumigations. It is likely that the amount of methyl bromide usage and cumulative effects on ozone depletion would not exceed those under an extension of the China Interim Rule; however, the actual program decisions would set the rates and duration of the fumigations that meet the risk reduction requirements. Likewise, the potential use of sulfuryl fluoride as a regulatory quarantine treatment of SWPM could pose some risk of ozone depletion potential, but applications of sulfuryl fluoride are expected to be more limited and of lesser global impact. Other limited use fumigants, such as phosphine and COS, are not expected to pose any notable aggregate environmental consequences. The contained nature of controlled atmospheres and irradiation treatments are not expected to pose adverse environmental consequences other than temporary local effects. Environmental effects from disposal methods may have long-term implications (landfill) or ongoing implications (incineration) commensurate with quantities of SWPM handled. Landfill and incineration disposal of SWPM are best applied on a case-by-case basis to preclude any potential aggregate effects to local air quality or land contamination. To the extent that SWPM can be recycled without risk of reinfestation from quarantine pest, the use of incineration and landfill disposal can be delayed. Use of substitute packing materials could decrease cumulative consequences of other methods such as those anticipated from fumigation of SWPM with methyl bromide. It is, however, less clear what the aggregate environmental effects would be from mass manufacturing of these substitute packing materials.

5. Substitute Packing Materials Only

The logical response to address the issue of methyl bromide use relative to ozone depletion potential is to promote the use of alternate phytosanitary methods (such as substitute packing materials) to deal with SWPM used in international trade. Although there are no restrictions on the use of substitute packing materials, there are certain issues that must first be addressed before any new regulations could be promulgated. The World Trade Organization (WTO) has established certain agreements to ensure that all member nations (including the United States) apply trade policies that are harmonious with and equitable to all nations. The WTO's Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) sets out certain provisions for nations to provide protection against disease and pest risks in trade commodities. Paragraph 6 in Article 5 of this agreement stipulates that any phytosanitary measures taken by member nations should not be more trade-restrictive than required to achieve the needed level of protection, taking into account technical and economic feasibility. This stipulation is clarified by identifying a measure as not

more trade-restrictive than required if there are no other reasonably available measures that achieve the appropriate level of protection and those available measures are not significantly less restrictive to trade.

Heat treatment and fumigation with methyl bromide are both highly efficacious. Fumigation with methyl bromide is the most economical way to treat SWPM for most quarantine pest risks. This is particularly true in countries that lack heat treatment facilities or the available capital to invest in the construction of these facilities. Unfortunately, other phytosanitary options for addressing pest risks in packing materials either pose greater pest risk (inadequate phytosanitary protection) or their greater cost and logistical problems contribute to restrictions on applicability to world trade. Substitution of other packing materials is an available alternative that eliminates pest risks associated with wood, but the costs of most materials exceed the likely costs of SWPM that is either heat treated or fumigated with methyl bromide. Restrictions placed upon acceptable packing materials may not satisfy the current provisions of the SPS Agreement because they would not meet the "not significantly less restrictive to trade" requirement. However, new technological developments may ultimately provide substitute packing materials that lack the economic and logistical limitations to trade that currently exist. That development could provide adequate justification to negotiate appropriate changes to the phytosanitary standards.

a. Capacity for Pest Mitigation

Inspection under this alternative would be limited to checking paperwork and verifying that no SWPM was being used. In the event that SWPM was found to be used, the decision could be made to treat the SWPM, deny entry of the shipment (re-export), or eliminate pest risk from the SWPM through destruction by incineration or deep landfill (6 feet or deeper). This noncompliance probably would occur infrequently due to the resultant costly delays in deliveries, noncompliance fines, and related complications for the shipper. The noncompliance issue was discussed in greater detail in the environmental consequences section for the alternative analyzing application of the China Interim Rule. The substitute packing materials alternative would considerably reduce inspection efforts and would largely eliminate pest risks from wood-feeding insects and diseases.

The potential environmental consequences of the use of substitute packing materials would vary according to the packing materials used. Packing materials not consisting of wood pose substantially less pest and disease risk than SWPM. Substitute packing materials made of synthetic or highly processed wood such as plywood, oriented strand board, particle board,

corrugated paperboard, or plastic and resin composites, generally are not subject to infestation by wood pests or diseases. Although some wood pests may infest plywood and other processed wood packing materials, the frequency of reinfestation of treated or processed wood is known to be low and is unlikely to pose substantial risk of new pest introductions (Dwinell, 2001; Burgess, 2001). Although all packing materials occasionally may have hitchhiking insects and surface pests present, the frequency and numbers of those pests are unlikely to pose substantial risks of introduction.

b. Consequences of Component Methods

There are environmental concerns relating to the manufacture of the substitute packing materials. Some substitute materials require the harvesting of wood, and resins or plastics may be required to seal and protect wood surfaces. The particulates from cutting and drilling wood products are generally limited to manufacturing workplace areas. The curing of the resins and plastics in some substitute packing materials release volatile organic contaminants to the air. These vapors are generally of short duration in the air and of negligible impact, but may contribute to local or indoor air quality problems. Some of these volatile organics, such as formaldehyde, released in enclosed spaces (rooms of buildings) have been associated with allergic and hypersensitivity reactions. The manufacture of packing materials made exclusively of metal, plastic, and various other processed materials could result in the use of unreplenishable natural resources (metal ores and petroleum) with resultant adverse environmental consequences. The extraction and refining of these natural resources to make them suitable for the manufacturing process has potential environmental consequences for air, soil, and water quality. Some of the industrial manufacturing processes (e.g., metal packing materials) involve heating and associated combustion processes that release hydrocarbons. These consequences of the substitute packing material manufacturing processes are expected to be temporary or localized.

c. Aggregate Consequences

At present, the market for shipping pallets is dominated by SWPM, which constitutes about 95 percent of the total. SWPM is used in association with 6,000,000 containers that are transported annually in international trade. Wood has certain advantages from the environmental perspective. Renewability gives wood a large advantage over other materials. The manufacture of wood products requires substantially less energy than the production of substitute products. Wood product manufacture results in

less greenhouse gas and other air pollutant emissions (APA—the Engineered Wood Association, 2003).

Industry's inability to quickly tool up to manufacture and switch to substitute packing materials for such a shipping volume may impede or limit the implementation of a switchover. Substitute packing materials are more expensive than SWPM. Although some substitute packing materials show great promise (i.e., corrugated pallets), other materials have limitations on their use. Substitute packing materials would require a phase-in period to allow the industry of the regulated countries to adapt to the usage of these materials in the shipping process. Compliance with international agreements is expected to increase the costs associated with the use of SWPM and this change may make substitute packing materials more competitive in the packing market and indirectly may promote use of these other packing materials.

Plastics presently constitute a small percentage of the market share, and their use has been limited by the lack of a standard pallet size and the requirement for a closed loop system that is not yet feasible to the pallet industry. Packing methods such as slipsheets (flat, solid, fibre sheets with load-bearing area used as a platform for unitizing, handling, storing, and shipping of commodities) are inexpensive, but require a special push-pull attachment for forklifts that is expensive and not easily adaptable to present practices. Corrugated pallets constitute about 2 percent of the current market and could be expanded to as much as 10 percent in the foreseeable future. Plywood and oriented strand board pallets make up about 2 percent of the market share and are useful packing for heavy loads, but these materials are heavy and cumbersome for transport of many commodities. Some packing materials, such as particle board, are limited in their ability to withstand the conditions that routinely occur during transport.

Based upon the present use pattern, the demand for substitute packing material may increase, but is unlikely to be the predominant packing material for the foreseeable future. Any aggregate effects from changes to substitute packing materials are not expected to be substantial and are expected to be limited to the site of manufacture and the immediately surrounding environs.

From an environmental perspective, any choice between the materials (wood or alternate materials) that can be used as packing materials should consider at least three processes that are associated with the materials: replenishment, re-use, and recycling. Replenishment applies only to wood, which in a sustainable agriculture system, can be replanted and harvested

many times from the same locations. Nonwood packing materials are made from materials (e.g., ores) which are not renewable, although some like aluminum (the most abundant metal on earth) are very plentiful. The extraction and refining of the ores and petrochemicals used in the manufacturing of substitute packing materials involve processes with various environmental consequences to air, soil, and water quality.

Packing materials of all composition (wood, metal, plastics, fiberglass, etc.) may be re-used. Because metals such as steel and aluminum are stronger than wood and less vulnerable to rot, they potentially can be re-used more times than wood. Repair of wood packing materials involves simple component replacement and fastening on the replaced part. This re-use of wood packing materials is considerably more cost-effective and of lower environmental impact than most recycling practices.

Recycling involves the intentional breakdown and reformulation of products. All types of packing materials may be recycled, to varying degrees. Solid wood which has been damaged may be recycled and reformulated into products like particle board, which can be used again as a packing material. There are limitations, however, to the amount of times wood can be recycled before it is no longer usable. Metals such as steel and aluminum may be crushed and resmelted for use almost indefinitely. Industry's overall recycling rate for steel is estimated to be 64 percent (Steel Recycling Institution, 2002). Plastics (including polyethylenes, polypropylenes, and polyvinyl chlorides) also may be broken down and reformulated for use again as packing materials. For example, in 1994, over 1 billion pounds of plastics were recycled. That figure has dramatically increased as new technologies, markets, and collection systems are developed. Plastic packaging, which constitutes less than 4 percent of all municipal solid waste by weight, also can be disposed of safely in landfills. Given their high energy content, when plastics are incinerated they help the waste mix burn more efficiently, enhancing waste-to-energy conversion and leaving less ash for disposal (The Society of the Plastics Industry, 2001). The recycling of fiberglass is of considerable interest to the boat industry in the United States, but it appears that there are, at present, substantial barriers to a cost-effective implementation. There are additional characteristics, such as weight, durability, disposal requirements, electrical conductivity, and cost, which make one material more desirable than another for specific purposes, and which may also influence the degree to which they may be replenished, re-used, or recycled.

In conclusion, the requirement to switch to substitute packing materials would result in substantially less pest and disease risk than any of the other

components considered in this EIS. The cost of production of substitute materials would be greater than that of SWPM, but many of the substitutes are more durable and more recyclable. The manufacturing processes and uses of raw resources probably would pose some environmental effects, which probably would be offset by the decrease in pest risks. There could be reduced demand on raw wood products (depending upon the substitute materials that would be utilized, substantial use of processed wood may result in little difference in resource use).

B. Special Considerations

1. Applicable Environmental Statutes

a. APHIS Environmental Compliance

In the planning and implementation of its programs and actions, APHIS complies with a variety of environmental statutes and regulations. Most of those statutes and regulations have the underlying objective of forcing Federal managers to consider comprehensively the environmental consequences of their actions before making any firm decisions. In addition, the statutes and regulations provide guidance in the procedures that must be followed, the analytical process itself, and the ways of obtaining public involvement. This EIS is prepared specifically to meet the needs of the National Environmental Policy Act of 1969 (NEPA) 42 United States Code (U.S.C.) 4321, *et seq*.

APHIS strives to comply with environmental regulations and statutes as an integral part of the decisionmaking process to identify and consider available alternatives that lead to more successful programs. NEPA is the origin of current APHIS environmental policy. It requires each Federal agency to publish regulations implementing its procedural requirements. APHIS originally published the "APHIS Guidelines Concerning Implementation of NEPA Procedures" (44 FR 50381–50384, August 28, 1979). Subsequently, it published the APHIS "National Environmental Policy Act Implementing Procedures" (7 CFR. 372), which superseded its earlier guidelines. APHIS bases its current procedures on NEPA; the Council on Environmental Quality's "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act," 40 CFR 1500, *et seq.*; the U.S. Department of Agriculture's "NEPA Regulations," 7 CFR 1b, 3100; and the APHIS "National Environmental Policy Act Implementing Procedures."

b. The National Environmental Policy Act

NEPA requires Federal agencies to consider potential environmental consequences in their planning and decisionmaking processes. It requires them to prepare detailed statements (EISs) for major Federal actions which significantly affect the quality of the human environment. These statements must consider the environmental impact of the proposed action, adverse effects which cannot be avoided should the proposal be implemented, alternatives to the proposed action, the relationship between local and short-term uses of the human environment, and the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitments of resources necessary to implement the action. NEPA provided the basis for many other statutes and environmental regulations within the United States.

NEPA established the President's Council on Environmental Quality, which published regulations for the implementation of NEPA that became effective in 1979. Those regulations were designed to standardize the process that Federal agencies must use to analyze their proposed actions. Those regulations have been the models for the NEPA implementing regulations that have been promulgated by Federal agencies.

c. Endangered Species Act

The Endangered Species Act of 1973 (ESA), 16 U.S.C. 4332 *et seq.*, was passed to provide for a Federal mechanism to protect endangered and threatened species. This act provides for an analysis of the impact of Federal programs upon listed species. Under ESA, animal and plant species must be specifically listed in order to gain protection. Federal agencies proposing programs which could have an effect on listed or proposed endangered and threatened species prepare biological assessments for those species. Those biological assessments analyze potential effects and describe any protective measures the agencies will employ to protect the species. A consultation process in compliance with section 7 of the ESA is employed as needed. Such consultation is important to APHIS' environmental process and then becomes an integral part of the proposed program.

d. Executive Order 12114—Environmental Effects Abroad of Major Actions

Executive Order (EO) 12114, "Environmental Effects Abroad of Major Federal Actions," was written to require Federal officials to become informed of pertinent environmental considerations and take them into

account, along with other national policy considerations, when making decisions on certain kinds of Federal actions (generally those that would have significant effects outside the jurisdiction of the United States). The executive order specifically covers major Federal actions that significantly affect (1) the global commons (environment outside the jurisdiction of any nation), (2) the environment of nations not participating in or involved in that action, (3) the environment of a foreign nation by providing to that nation a product that is toxic or radioactive and prohibited or regulated in the United States, and (4) natural or ecological resources of global importance designated by the President.

EO 12114 (section 2–4) specifies the kinds of documents to be used for each class of action above. Types of documents include environmental impact statements (generic, program, or specific), bilateral or multilateral environmental studies, or concise reviews (including environmental assessments, summary environmental analyses, or other appropriate documents). EO 12114, for some actions, stipulates the preparation of NEPA-type documents; however, NEPA procedures do not apply. Although EO 12114 states that nothing contained in it invalidates any existing regulations of an agency under NEPA and other environmental laws, it explicitly states that it ". . . represents the United States government's exclusive and complete determination of the procedural and other actions to be taken by Federal agencies to further the purpose of NEPA, with respect to the environment outside the United States, its territories and possessions" (section 1–1). Because of its specificity on the type of document to be prepared (based on class of action), it should be regarded as the exclusive procedural guidance for that determination.

e. Executive Order 12898—Environmental Justice

EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," focuses Federal attention on the environmental and human health conditions of minority and low-income communities, and promotes community access to public information and public participation in matters relating to human health or the environment. The document requires Federal agencies to conduct their programs, policies, and activities that substantially affect human health or the environment in a manner so as not to exclude persons and populations from participation in or benefitting from such programs. It also enforces existing statutes to prevent minority and low-income communities from being subjected to disproportionately high and adverse human health or environmental effects.

f. Executive Order 13045—Protection of Children from Environmental Health Risks and Safety Risks

EO 13045, "Protection of Children from Environmental Health Risks and Safety Risks," acknowledges that children may suffer disproportionately from environmental health and safety risks because of their developmental stage, greater metabolic activity levels, and behavior patterns, as compared to adults. The EO (to the extent permitted by law and appropriate, and consistent with the agency's mission) requires each Federal agency to identify, assess, and address environmental health risks and safety risks that may disproportionately affect children. It also established a task force, requires the coordination of research and integration of collected data, gives guidelines for the analysis of effects, and directed the establishment of an "Interagency Forum on Child and Family Statistics.

g. Miscellaneous Federal Environmental Statutes

APHIS complies with a number of other environmental acts, statutes, and regulations. These include the Migratory Bird Treaty Act; Bald and Golden Eagle Act; Federal Insecticide, Fungicide, and Rodenticide Act; Toxic Substances Control Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation, and Liability Act of 1980; Clean Air Act; Clean Water Act; and the Food Quality Protection Act. Environmental compliance with these statutes is required to be verified before any program rulemaking or action is undertaken.

h. State Environmental Statutes

The States all have various environmental statutes and regulations. Many of the regulations and regulatory organizations that enforce them are direct parallels of the Federal regulations and regulatory organizations. California, for example, has the California Environmental Quality Act and has formed the California Environmental Protection Agency. For parallel programs and initiatives, APHIS works with State and/or other Federal agencies. APHIS will rely on its State cooperators to identify applicable State environmental regulations, take the lead for their procedures, and ensure full compliance with State laws.

2. Special Concerns

A number of special concerns have evolved with regard to this proposed rulemaking. They include the protection of endangered species; the special requirements for analysis in compliance with EO 12114; and the health and safety of minorities, low-income populations, and children.

a. Endangered Species

APHIS has considered the potential effects on endangered species and has concluded that there will be no adverse effects on endangered and threatened species or their critical habitats as a consequence of program treatments. The additional protection provided to forest resources as a result of the exclusion of invasive species, or as a result of reduced harvesting of forest products if substitute packing materials were required, would be expected to enhance the protection of endangered species.

b. Analysis in Compliance with Executive Order 12114

The actions that would be implemented as a consequence of this rulemaking would occur within the United States and also in foreign countries. It is apparent that EO 12114 applies because the treatments that would be required in foreign countries require the use of products (pesticides) that are strictly regulated in the United States. EO 12114 stipulates the kinds of documents that may be prepared under these circumstances, and an EIS, such as this document, is appropriate. This EIS, thus, has been prepared in compliance with EO 12114 and constitutes an EO 12114 analysis.

c. Health and Safety of Minorities, Low-income Populations, and Children

Each of the alternatives was analyzed for its ability to affect minority and low-income populations, and children. Although each of the alternatives could have implications for some individuals, none of the alternatives were found to pose disproportionately high or adverse human health or environmental effects to any specific minority or low-income group, or to children. The packing materials are generally at ports of entry or other locations where children are unlikely to be. The potential program quarantine treatments are in secured facilities with access limited to workers with proper protective clothing. The greatest potential for exposures to humans occurs with preservative treatments that are not being used currently because of cost and concern with potential health issues.

3. Logistical Considera-tions

Implementation of each of the program alternatives involves specific planning to ensure that the pest risk mitigations can be employed in a timely manner and that monitoring of the efficacy and compliance can be readily accomplished. The frequent use of low-quality wood for SWPM has resulted in greater likelihood that pests of quarantine significance are present and that some mitigation of that pest risk may be necessary to exclude those pests.

Inspections of SWPM for compliance and efficacy can be difficult with the limited available documentation. The total amount of inspection possible with the current labor force is estimated to be approximately 1 percent of the total number of cargo entries. This means that most potentially infested SWPM with associated cargo is unlikely to be inspected. Selecting for inspection of only those cargo shipments that are most likely to be infested is difficult. Visual inspections of wood packing, particularly in large containers, may not reveal internal infestation of fungi, wood borers, and termites. Entries on customs manifests may not always indicate the presence of SWPM or documentation of specific quarantine treatments may not be provided. The ability to verify compliance with required quarantine treatments is vital to exclusion of pest risks. Although some treatments (e.g., wood preservative and some heat treatments) may change the appearance of SWPM, other treatment may have no effect on the appearance (e.g., fumigations, irradiation, and controlled atmospheres). Markings on treated wood are helpful, but all treated SWPM must be marked to be of optimal use to inspection. Tests (such as electrical conductivity for kiln dried SWPM) for verification of treatment are not available for most quarantine methods and may not indicate reinfestation potential. Although adequate initial treatment may make reinfestation less likely to occur, there is generally no residual control (except with some preservative treatments). Each of these issues require inspections to adjust efforts to exclude potential pest risks that may not be evident from available documents.

Emissions of methyl bromide from quarantine fumigations of SWPM may be decreased by the use of recapture systems. However, the use of recapture systems requires adequate availability of the components of the recapture system and the ability to recharge the canisters that collect the residues of methyl bromide. The suppliers of recapture systems and the servicers of used canisters could not readily meet the potential need for a major conversion of all quarantine fumigations to include gas recapture technology. In addition, the present costs of recapture systems are uneconomical for most SWPM manufacturers and shippers.

Although heat treatment and fumigation with methyl bromide control most pests of quarantine concern in SWPM, there are some deep wood-borers, fungi, rots, and wilts that will continue to be problematic for abatement of pest risk. Heat treatment may be impractical for large volumes of wood or thick pieces of wood without elaborate heat sensors. The effectiveness of methyl bromide is less than that of heat treatment for pests that occur deep in wood. None of the treatment methods have been shown to effectively eliminate all pests. The differences in overall efficacy of the heat treatments and fumigations with methyl bromide for the IPPC Guidelines,

as compared to the those from extension of the China Interim Rule, are unclear and any important differences may not be elucidated by the limited testing completed prior to any implementation. The use of the more effective and long-residual wood preservatives such as creosote can involve human exposure to undesirably high amounts of chemical. Many of the treatment methods require more research and development of effective methods. In particular, the uses of controlled atmospheres, irradiation treatments, and most fumigation chemicals are not ready for implementation due to inadequate control, incomplete efficacy data, issues of concern related to safety, issues related to lack of adequate facilities or supplies, and the lack of an economical means of fulfilling the treatment requirements.

The disposal of SWPM involves several logistical concerns. The availability of acceptable landfill space or an incineration facility limit this method. Transport of the SWPM to these locations must be designed to preclude escape of any quarantine pests present. The use of chemical preservatives on some SWPM can create landfill contamination concerns and incineration emission concerns.

At present, the market for shipping pallets is dominated by SWPM, which constitutes about 95 percent of the total. The use of substitute packing materials could increase as manufacturers tool up to produce more of these packing materials. However, the current projections indicate that the increase in use of substitute packing materials could constitute no more than 10 to 15 percent of the total market in the next several years. This makes it unlikely that substitute packing materials alone will be used in the packaging of cargo.

4. Harmonization of Regulatory Efforts

In addition to considering the efficacies and environmental consequences of alternative courses of action, APHIS is obligated to work within applicable international agreements and protocols in its effort to develop an appropriate regulatory strategy for imported SWPM. Some of the agreements focus on the environment and protection of resources (e.g., the Montreal Protocol and the IPPC), while others focus on the facilitation of international trade (e.g., the General Agreement on Trade and Tariffs and the North American Free Trade Agreement). Although various agreements may have different primary purposes (environmental protection or trade facilitation), their objectives are not necessarily mutually exclusive.

The overall motivation of a group or organization would tend to influence its perspective on what alternative would be the most appropriate for APHIS' regulatory strategy. Industry and trade organizations that have commented to APHIS appear to favor the preferred alternative, adoption of

the IPPC Guidelines, citing the need for effective, logistically possible measures to mitigate the risk from invasive species in SWPM. The Canadian Food Inspection Agency has also urged APHIS to adopt the IPPC Guidelines, citing significant advantages for global trade and pest prevention, and, thus, acknowledging cooperation between the United States, Canada, and Mexico. Environmental interest groups and concerned individuals, on the other hand, have acknowledged in their comments the need to mitigate the risk from invasive species in SWPM, but favor alternative 5, substitute packing materials only, because they believe it has the least adverse environmental impact. All of those perspectives appear correct and everyone seems to agree on the need to do something about SWPM, but differs on what it is that should be done.

Following are concise descriptions of the aforementioned international agreements, and some aspects of how they may affect APHIS' regulatory strategy for SWPM.

a. The Montreal Protocol

The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer was designed to reduce and eventually eliminate emissions of anthropogenic ozone-depleting substances. The agreement was developed in response to evidence that human-made substances, particularly chlorofluorocarbons, were damaging the stratospheric ozone layer that protects life on earth from excessive ultraviolet radiation. The United States has signed the Protocol, which originally came into effect on January 1, 1989, when 29 countries and the European Economic Community (EEC) ratified it.

Although the Montreal Protocol exempts phytosanitary uses of methyl bromide for QPS purposes, there are valid concerns about methyl bromide's continued availability. The cumulative impacts of methyl bromide use were analyzed previously in APHIS' "Rule for the Importation of Unmanufactured Wood Articles From Mexico With Consideration for Cumulative Impact of Methyl Bromide Use." Although the emissions from the QPS uses of methyl bromide are minuscule in comparison to the emissions of other agents and gases released in natural processes, the United States is subject to the reduction requirements of the Montreal Protocol and phaseout requirements for methyl bromide that have been set by EPA under the Clean Air Act. It is clear that an alternative for methyl bromide is needed for a long-term strategy.

b. The International Plant Protection Convention

The IPPC dates from 1951, and was designed to promote international cooperation for controlling and preventing the spread of harmful plant pests. In 1995, the WTO's "Agreement on the Application of Sanitary and Phytosanitary Measures" (SPS Agreement) specifically recognized the standards, guidelines, and recommendations developed by the IPPC. The WTO mediates trade-related disputes and seeks international harmonization of SPS measures through the IPPC Secretariat and two other international standards-setting organizations. Thus, the IPPC influences both environmental protection and trade facilitation.

The most recent revision of the IPPC was presented for adoption on November 17, 1997, and was formally adopted by President George W. Bush on September 5, 2001. Under the IPPC, measures imposed by a country against regulated pests are acceptable if such measures are (1) transparent (clear to all signatory nations), (2) technically justified, and (3) no more restrictive than measures imposed domestically. APHIS would be expected to give serious consideration to adopting the IPPC Guidelines that apply to SWPM, or show just cause why a deviation was required.

c. The General Agreement on Tariffs and Trade

The General Agreement on Tariffs and Trade (GATT) was designed to reduce and eliminate barriers to trade, investment and services among its signatory countries. Since its implementation in 1947, GATT has been administered by the International Trade Organization, then the GATT (de facto name organization), and now the WTO. The recent negotiations for the agreement were completed in the 1986–1994 Uruguay Round and led to the creation of the WTO in 1995.

A common complaint among nations is the imposition of unreasonable phytosanitary restrictions that are thought to be nothing more than deliberate barriers to fair trade. GATT has focused on the reduction of trade barriers through the elimination of unjustified sanitary and phytosanitary restrictions on agricultural trade, without impairing the right of individual nations to establish and apply appropriate measures to protect public health and control plant and animal pests and diseases. The IPPC Guidelines are designed to conform with the design and objectives of GATT.

d. The North American Free Trade Agreement

The North American Free Trade Agreement (NAFTA) is an agreement among the United States, Canada, and Mexico to create a free trade zone by reducing and eliminating barriers to trade, investment, and services. The U.S. Congress ratified NAFTA in 1993. The requirements for sanitary and phytosanitary regulations under NAFTA are similar to those under GATT, except for requirements imposed by side agreements. One of those side agreements, the North American Agreement on Environmental Cooperation is a trilateral side agreement to NAFTA (also among the United States, Canada, and Mexico) which established the Commission for Environmental Cooperation (CEC), whose primary function is the consideration and development of recommendations relating to environmental issues. In particular, one of CEC's missions is to develop an Executive Agreement to be signed by the heads of the three countries which would set standards and requirements for transboundary environmental impact assessments (TEIA). Current drafts of that agreement will require notification and assessment for proposed actions that involve the use of pesticides (except for emergency actions to preserve human, animal or plant life) regardless of their proximities to the international borders. In general, the IPPC Guidelines appear to conform with the design and objectives of NAFTA.

Appendix A. Summary of Public Comments on the Draft Environmental Impact Statement

I. Introduction

The Animal and Plant Health Inspection Service (APHIS) thanks all who reviewed the "Importation of Solid Wood Packing Material Draft Environmental Impact Statement—October 2002" (draft EIS) and provided their comments via e-mail responses, the mail, or orally at meetings. APHIS welcomes public involvement and considers public perspectives in its decision processes. During the scoping period, APHIS requested and received oral and written comments that were considered in the planning for the draft EIS. Public meetings were held in Washington, DC, on September 3, 2002, and in Long Beach, CA, on September 5, 2002. Scoping comments are available for public review at the U.S. Department of Agriculture, Animal and Plant Health Inspection Service Reading Room, 14th Street and Independence Avenue, SW., Room 1141, South Building, Washington, DC, 20250.

The U.S. Environmental Protection Service (EPA) published the notice of availability for the draft EIS in the Federal Register on November 15, 2002. The official comment period ended December 30, 2002. All comments received, including late submissions, have been reviewed.

Despite the broad scope of the draft EIS, few comments were received in response to the request for comments. There was minimal attendance at scoping meetings, and only 27 formal comments on the draft EIS (9 e-mail responses, 16 mailed letters, and 2 faxed letters) were received. All comments are available for review at the APHIS Reading Room and are reproduced in part 3 of this appendix.

Because the information received in the comments was voluminous and many issues of concern were repetitive, it would have been impractical to try to respond on a point-by-point basis to each of the comment letters. Therefore, comments from respondents are summarized, as provided in 40 CFR 1503.4. This appendix concisely summarizes the public comments and provides responses to the major issues contained within those comments. Other changes were made within the final document to clarify points and address other issues. Respondents' complete and corrected addresses have been added to the Distribution List, appendix D.

II. Summarization of Comments and Responses

The diversity of perspectives expressed in the public comments indicates a wide difference in viewpoint among the respondents. All respondents to the draft EIS acknowledged the high pest risks associated with the continued use of untreated SWPM (No Action alternative). In accordance with personal and organizational preference, some support was expressed for all

alternatives except for the No Action alternative. Comments on the draft were received from EPA and the U.S. Department of the Interior (DOI). EPA assigned the draft EIS a "lack of objections" rating. DOI stated that APHIS is taking a prudent approach toward protecting resources in the United States by selecting adoption of the IPPC Guidelines as the preferred alternative for the short term. Acknowledging the clear and pressing need for APHIS to address this pest risk issue, each comment letter expressed perspectives on the most effective course for agency action. Most letters expressed preference for one of three alternatives: Adoption of the IPPC Guidelines, implementation of the Comprehensive Risk Reduction Program (particularly as applied to a gradual phaseout of SWPM and phase-in of substitute packing material), or the required use of Substitute Packing Materials Only. Although at least one respondent expressed interest in country-by-country regulation of packing materials, most comment letters preferred that APHIS apply universal regulations to packing materials. One respondent expressed support for the alternative to extend the treatments applied in the China Interim Rule. Many respondents would like the regulations being promulgated by APHIS to ease the burden for industry compliance with packing regulations by harmonization with the rules of other countries who trade with the United States.

Different respondents provided different perspectives on the completeness and adequacy of the draft EIS to address environmental impacts and related issues associated with each alternative. Their responses related primarily to their viewpoint about which alternative best fulfills the reduction of pest risks while minimizing potential environmental impacts. Although one respondent suggested that APHIS prepare a supplemental draft EIS, the substantive issues raised in that comment letter were discussed in considerable detail in the first draft and are further clarified in this section addressing those points and in the text of the final EIS. Based upon the lack of issues that are new or different from those already considered in the draft EIS and upon the clear need for agency action to address the high pest risks associated with untreated SWPM, APHIS has decided to proceed with preparation of the final EIS. This effort is undertaken with the recognition that there are critical factors relating to efficacy of treatments, monitoring of cargo, and various technological and logistical issues that may result in the need to revise this EIS or comprehensively review its findings. As with any decision-guiding document, this EIS is designed to adequately cover the substantive issues until changes in those critical factors require the agency to revisit their previous findings.

Issue 1: Several comment letters expressed the impression that the identification of a preferred alternative in the draft EIS limits agency consideration of other alternatives in their decisions. The National Environmental Policy Act (NEPA) process is designed to assist in agency decisionmaking before implementing actions that have the potential to impact the environment. The information provided within this EIS is only one resource that APHIS will use to make the decision about the ultimate selection of the program alternative. In addition to environmental effects, the agency must consider many other factors. In particular, APHIS considers the findings of scientific analyses, the economic assessment, the logistics of implementing a specific course of action, the potential international negotiations involved, and any trade implications for the United States and other countries. Review of these other issues by the APHIS decisionmaker

may or may not provide justification for selection of the specific alternatives analyzed within this EIS. The final record of decision made by APHIS may or may not select to implement the identified preferred alternative, depending upon the outcome of the overall agency review. None of the alternatives have been ruled out, but some alternatives (e.g., No Action) may not meet the agency need to alleviate the elevated pest risk associated with SWPM. The information provided in the EIS is designed to ensure that the potential environmental impacts of each alternative are sufficiently documented to allow the decisionmaker to make an informed program decision. Although the EIS may mention some other technical issues for each alternative as related to the economic, logistical, and trade issues, the APHIS decisionmakers rely upon the EIS and the other sources mentioned above to guide their final record of decision. The decisionmaker must take into consideration all alternatives described within this EIS.

Issue 2: Some respondents expressed misunderstanding about the definition of the alternatives and how they relate to the decisionmaking process.

Each alternative was designed to facilitate the recognition and consideration of specific issues and the choices that will need to be made by the APHIS decisionmaker. The No Action alternative represents the "status quo," and selection of that alternative would involve no change in the present regulations. It is clear both from the comment letters and scientific analyses that this alternative does not provide an acceptable resolution of the pest risks associated with SWPM. Each of the other alternatives had some supportive letters and suggested how APHIS should implement those alternatives.

Although APHIS has adopted the 1995 convention for the IPPC, the international guidelines (i.e., for wood packaging material) developed through negotiations under this treaty are subject to decisions by each member country before any of those guidelines could be adopted as regulations. Any adoption of IPPC Guidelines by APHIS (alternative 3) is subject to the rulemaking process and any provisions of those Guidelines are not enforced until a formal agency decision is made. (Refer to page 4 of chapter 1.)

One respondent questioned why an alternative for substitute packing materials would be considered in an EIS addressing importation of SWPM. The primary objective of this EIS is to assess the range of reasonable approaches to reduce the pest risks associated with SWPM. The prohibition of SWPM (Substitute Packing Materials Only alternative) eliminates the pest risks associated with this packing material and is, therefore, a reasonable alternative to consider in fulfillment of this objective. An ideal alternative meets the objective in a manner that is environmentally safe, cost-effective, and logistically sound. NEPA, in 40 CFR §1502.14(f), states that agencies shall include appropriate mitigation measures not already included in the proposed action or alternative. Depending upon their perspective, the comment letters either supported or refuted the fitness of the Substitute Packing Materials Only alternative in regards to the issues of costs, logistics, and environmental stewardship. Although some respondents have expressed concern about the potential adverse economic impacts of this alternative and the long-term risk reduction program alternative on the packing material industry, those economic issues

would be analyzed as part of the economic assessment rather than the EIS being prepared for the decisionmaker. The wide differences in perspective among respondents on the draft EIS as to the ability of the packing industry to switch to packing materials other than SWPM provide no clear consensus on the relative ability to implement such an alternative.

Several comment letters suggested that APHIS consider an alternative that involved phasing out SWPM over a period of years. Analysis of this approach to regulation of SWPM was provided in the draft EIS as one of the risk reduction methods under alternative 4—the Comprehensive Risk Reduction Program alternative. This alternative allows for reductions in SWPM and phasing in of substitute packing materials. The alternative description on page 11 of the draft EIS describes selective prohibition of SWPM as one risk reduction option available under this alternative. The aggregate consequences on page 72 of the draft EIS address the use of substitute packing materials to eliminate pest risk and the logistics requiring a phase-in to implement this as a new pest mitigation method. The Comprehensive Risk Reduction Program alternative provides APHIS with the flexibility to consider potential long-term solutions and approaches to phasing out SWPM.

Issue 3: There was concern that the selection of certain alternatives would limit APHIS' ability to apply more stringent regulations of SWPM if the efficacy provided insufficient protection.

Some respondents expressed concern that adoption of the IPPC Guidelines by APHIS (preferred alternative) would place rigid barriers to limit more stringent regulation of wood packing materials to preclude pest risks. NEPA, in 40 CFR § 1502.14(e) states that agencies shall identify their preferred alternative or alternatives in the EIS. The IPPC Guidelines for approved measures for wood packaging material can be revised to provide an appropriate level of phytosanitary protection. The ability to revise the Guidelines depends upon justification for implementation based upon demonstrated pest risk reduction. Any proposed revisions to these Guidelines are subject to international negotiations (see annex 3 of the IPPC Guidelines). The selection of any given alternative by the program would be expected to lead to implementation and monitoring of its effectiveness against the SWPM pests of concern. The results from any program decision to regulate all SWPM would be monitored to assess effectiveness in a manner similar to the monitoring of SWPM treatment compliance under the China Interim Rule. Depending upon the results of that monitoring, APHIS could then decide whether there is a need to revise the regulations to further alleviate any unacceptable pest risks. Should such revision become necessary, it would be contingent upon APHIS to address relevant issues or to supplement this EIS by analyzing the more stringent pest risk reduction techniques anticipated to satisfy NEPA. This process to fulfill NEPA compliance would be expected to occur concurrently with any international negotiations needed to revise the IPPC Guidelines or to provide justification for promulgating more stringent regulations than exist under the present Guidelines. Likewise, the ongoing assessment of different methodologies for their effectiveness may indicate that certain techniques lack sufficient efficacy against specific pests of concern. This could lead to revisions of the regulations to ensure that the methods provide an acceptable level of protection.

Regulatory decisions by APHIS regarding pest risk reduction in SWPM are expected to change as more complete information about efficacy and pest exclusion are determined.

Issue 4: Some respondents expressed concern that the Comprehensive Risk Reduction Program alternative did not specify any time period for phasing out SWPM and phasing in substitute packing materials.

Any decision to designate a specific time for completion of actions is made by the decisionmaker after review of an economic assessment, the logistics of implementation of a specific course of action, the potential international negotiations involved, and any trade implications for the United States and other countries. No program decision has been made as to what constitutes an acceptable time period for implementation for a regulatory rule of this magnitude. The logistical issues of phasing in substitute packing material were discussed briefly in the draft EIS on pages 37–39 and 83. It is difficult for APHIS to specify a time period when the present ability of substitute packing manufacturers to supply the market indicates a need for extended growth of the industry. The compliance time is particularly difficult to project when the new regulations are specifically directed to address packing materials from foreign countries whose industries may be less able to adjust readily to proposed changes. Also, any decisions made by APHIS to improve phytosanitary measures against pests in packing materials require international negotiations with other countries to ensure their ability and concurrence with the measures being considered. This negotiating process is subject to extended revisions of acceptable measures. The time required for international negotiations is difficult to project with any degree of accuracy. Although some comments were received in response to the Advanced Notice of Proposed Rulemaking (January 20, 1999, 64 Federal Register 12:3049–3052) supporting the phasing out of SWPM, the respondents did not provide any substantive information that could contribute to establishing a specific time period for compliance changes.

Issue 5: There are differences of opinion among the respondents as to the level of protection provided against pests of SWPM by the different alternatives. Some expressed the desire for APHIS to specify the level of efficacy that is acceptable to mitigate pest risks in SWPM.

The process of pest exclusion by APHIS has been developing and continues to develop with advances in technology, increased efficacy testing, and increased availability of better exclusion methods. Although some respondents are convinced that the preferred alternative (Adoption of the IPPC Guidelines) provides good protection against pests of SWPM, others contend that implementation of those Guidelines will not eliminate enough of the high pest risks in SWPM. Others suggested that the more stringent treatments of the China Interim Rule should be extended because of their higher efficacy against pests of SWPM. One commenter suggested that heat treatment of SWPM at the temperature and time requirements of the China Interim Rule is the only acceptable approach due to greater efficacy. Others indicated that the limited decreases in pest risk from the more stringent treatments would not justify the increased burden to the packing industry. Some respondents expressed concern that selection of the Comprehensive Risk Reduction Program alternative could either continue the high pest risks from SWPM without

timely action to eliminate those pests or imposed undue burden to shippers and packing manufacturers from selective prohibition of SWPM. Other respondents indicated that selection of any prohibition of SWPM, whether immediate or gradual, would place undue burden on the shippers and the packing industry to comply. Some respondents are convinced that APHIS should restrict the permitted packaging to only substitute packing materials.

There are clear differences of opinion among the respondents regarding what level of regulation is necessary to protect against the pest risks in SWPM. Although APHIS could stipulate an "efficacy target," the level of control needed to exclude pests will vary by species. According to section 402 of the Plant Protection Act of 2000, APHIS would be expected to reduce plant risks to the extent practicable, while exercising responsibility to facilitate exports, imports, and interstate commerce. The EIS discusses the limitations of each alternative and the limited data available for the specific treatment methods. Although some respondents have suggested that APHIS impose a "zero pest risk" standard for wood pests, there always will be hitchhiking pests on packing material. Needless to say, each of the action alternatives provides better protection against pests than the No Action alternative. The alternatives promoting substitute packing materials (Comprehensive Risk Reduction Program alternative and Substitute Packing Materials Only alternative) do provide lower pest risks than the other alternatives. The reference documents used as the basis for acceptance of the IPPC Guidelines are provided in a link from the APHIS webpage at http://webdev.aphis.usda.gov/ppa/swp/approved_guidelines.html. Preliminary analysis by APHIS and more extensive efficacy tests in Canada suggest greater pest risk reduction than had been anticipated for the treatments in the IPPC Guidelines. Ongoing monitoring and further testing are expected to establish a baseline for pest risk reduction provided by the IPPC Guidelines. This should indicate the ability of this approach to meet phytosanitary protection expectations. APHIS recognizes that pest risk is too high under the No Action alternative, but it is evident from the public comments that there are considerable differences of opinion about what alternatives constitute an adequate lowering of pest risk. APHIS has reviewed information about the levels of protection provided by each of the alternatives and the decisionmaker selecting an alternative will consider the extent to which APHIS can mitigate the high pest risks from untreated pest risks from untreated SWPM.

Issue 6: Some respondents are concerned that agency selection of the preferred alternative would provide only a temporary resolution of the issue of pest risk in packing materials.

Some respondents expressed opposition to adoption of the IPPC Guidelines on the grounds that it would only delay resolution of the issue of pest risk in packing materials. The concern was that any delay in elimination of SWPM would pose unacceptable risks to forests in the United States. Some of these comment letters also were opposed to options that involved gradual phasing out of SWPM (as discussed in the Comprehensive Risk Reduction Program alternative of the final EIS) because these approaches do not provide immediate protection against those invasive forest pests and diseases that could be introduced with the continued use of SWPM in the interim periods. The draft EIS considered this issue carefully and addressed the logistical issues that would be involved in immediate elimination of all pest risks except hitchhiking insects. The ability of the

substitute packing material industry to supply packing for all transport was determined to require time and capital input. These logistical limitations were discussed on pages 37–39 and 83 of the draft EIS. The level of protection provided under the IPPC Guidelines may not eliminate all pest risks, but it is clearly an improvement over the current regulations. Although APHIS is considering further mitigation of pest risks from SWPM to protect forests, the ability to implement a new rule is best achieved through international cooperation and the development of logistical means to accomplish the pest risk reduction goal. While proposed regulations may be implemented, new regulations are possible in the future due to continuing advances and improvements of mitigation strategies associated with SWPM pest risks. These issues are likely to guide future efforts to reduce those pest risks of greatest concern.

Issue 7: Some respondents suggested that APHIS should expand its consideration of wood preservative as a viable treatment option of SWPM.

The draft EIS (pages 28 to 32) addressed the use of wood preservatives as part of its consideration for use under alternatives 1, 2, and 4. The use of preservatives under the China Interim Rule has been very limited compared to heat treatment (which is expanding) and fumigation with methyl bromide. In addition to the concerns about health effects, several other issues limit the consideration of preservatives. Some preservatives, like borate, are less toxic but have other limitations. The efficacy of borate against pests and diseases in SWPM is limited by wood penetration and moisture. Excess moisture can result in leaching of the borate from the wood and loss of efficacy. The physical and chemical qualities of preservatives that may affect treatments are important issues to consider. Unlike the quarantine exemption provided under the Montreal Protocol to allow for methyl bromide use, there are no exemptions for loss of registration of preservatives due to environmental and human health concerns. The costs of treatments of SWPM with preservatives has probably been a major factor in the lack of their application under the China Interim Rule, but high environmental and human health risks associated with their usage has most likely been the primary factor in their limited use. APHIS is continuing to seek effective treatments of SWPM that pose less risk to human health and the environment. Any preservative that APHIS finds to provide an adequate level of protection with low risks to human health and the environment can be considered as part of the three alternatives that include this treatment method. Treatments with preservatives may also be incorporated into the IPPC Guidelines if adequately documented and accepted by the international community.

Issue 8: There were differences of opinion among the comment letters about the projections of potential usage of methyl bromide and the overall risk to stratospheric ozone from use in fumigations of SWPM for the different alternatives. Although some respondents thought that the risks from methyl bromide described in the draft EIS were accurate, the perspectives in the responses ranged from vastly understating to vastly overstating the usage and risk.

The projections for usage of methyl bromide in the draft and final EIS are based upon ongoing review of actual usage data. The initial analyses prepared for potential methyl bromide usage under the China Interim Rule (USDA, APHIS, 1998b) had intentionally made certain

assumptions about the usage that were based upon the limited available time for the exporters and shippers to prepare. Those analyses considered the fumigation of SWPM with loaded cargo rather than fumigation of SWPM before loading. This issue was discussed on page 52 of the draft EIS and in the Mexican Unmanufactured Wood EIS (USDA, APHIS, 2002). Although there was probably some initial fumigation of SWPM with loaded cargo by the exporters and shippers, this approach to SWPM treatments did not continue. The shippers and exporters from China began fumigating all SWPM prior to loading. This approach to fumigating SWPM was taken for at least three reasons. The cost savings to the shippers and exporters from less use of methyl bromide in fumigations of SWPM prior to loading were substantial. In addition to costs, there were two other issues that affected the decisions regarding time of treatment. Many agricultural commodities do not have a tolerance for the bromine residues that would be imparted to the commodity from fumigation with methyl bromide. This approach to fumigation would have made these agricultural commodities illegal for human consumption in the United States and could make some unsafe to eat. Also, certain commodities (e.g., leather goods and some electronic parts) react with bromine upon exposure and these commodities can be damaged or develop bad odors from exposure to methyl bromide from fumigation. Since the China Interim Rule, there has been more time for shippers and exporters to prepare for any changes imposed based upon the IPPC Guidelines, and it is reasonable to expect that their approach will be to load cargo after the SWPM has been pre-fumigated as China did primarily because of the three reasons cited above.

As was indicated by the respondents, one can proceed to analyze any number of scenarios for usage of methyl bromide in fumigations. If one were to base projected methyl bromide usage on the standard approach being taken by wood packing materials manufacturers in the United States to comply with wood requirements for the treatment of pine wood nematode, there would be virtually no fumigation with methyl bromide and virtually all treatments would be heat treatments. This approach is, in fact, likely for much of the SWPM treatment in the United States and in the European Union (EU). This would certainly be a best case scenario from the standpoint of protection of the stratospheric ozone, but it is not particularly realistic. Many underdeveloped countries who trade with the United States lack the capital and resources to establish adequate heat treatment facilities. These countries are likely to depend upon the least expensive method available, which is usually fumigation with methyl bromide. Likewise, one could project the decline in projected methyl bromide use following a gradual conversion to only substitute packing materials. As was explained previously, the packing materials industry requires time to convert to substitute packing materials and there is no way to realistically analyze a decrease in methyl bromide usage from such a conversion. Suffice it to say, any alternatives to fumigation of SWPM with methyl bromide are desirable and would assist in the efforts for recovery of the protective stratospheric ozone levels.

The various scenarios in the EIS assume that all SWPM will be fumigated with methyl bromide (that is, it is assumed that none of the SWPM will be heat treated, treated with preservatives, or replaced by substitute packing materials) prior to loading, as was explained above. This assumption for the scenarios is based upon the approach known to be taken by shippers and

exporters in China, but disregards the decreases in methyl bromide usage resulting from transition to other methods. There are efforts to increase the number of heat treatment facilities in China, and efforts such as this are not addressed in the EIS. Any future implementation of other treatment methods or other packing materials would be difficult to analyze and any effect of this implementation on the extent of decreases in methyl bromide use would be speculative and not meaningful to the decisionmaker. Therefore, the analysis made in the EIS errs by overstating the potential usage of methyl bromide (all SWPM treated) without unrealistically including the fumigation of SWPM with loaded cargo.

There were considerable differences in perspectives taken by respondents about these projections of methyl bromide usage and the risks to stratospheric ozone from the projections. Although the projections may somewhat overstate or understate the methyl bromide usage, the primary intent is to provide sufficient information for an informed decision. The analysis does not take lightly the issue of potential ozone depletion and does point out the relative potential implications of decisions to select different alternatives. The analysis presents a realistic, if not overly conservative, approach to potential impact on the stratospheric ozone that considers carefully how the international packing industry could comply with each alternative.

Issue 9: Some respondents indicated that the EIS should consider further the reciprocal effects of the IPPC Guidelines on heat treatment and methyl bromide fumigation of exports when other nations require the United States to treat in the same manner as would be required by APHIS regulations for imports to the United States.

The IPPC Guidelines are intended to achieve international harmonization on phytosanitary measures. Standards and guidelines described within the IPPC document are globally approved measures that are intended to substantially reduce the risk of pest spread. Although the rule being addressed in the EIS would apply only to the IPPC Guidelines for foreign countries exporting to the United States, it is appropriate to consider the issue of reciprocity, in that many of the countries could require comparable regulations on SWPM from the United States. In fact, the United States is developing an approach to ensure verification of methyl bromide fumigation of SWPM to be exported as required under section 5.1 of the IPPC Guidelines.

As previously explained, the standard approach being taken by wood packing materials manufacturers in the United States to comply with wood requirements for the treatment of pine wood nematode has been to apply heat treatments. The SWPM that complies in this manner consists of softwoods that supply about one-fourth of the present SWPM market, but not all softwood SWPM goes to the EU and China. This softwood packing material usage in SWPM would involve virtually no fumigation with methyl bromide. It is less clear how reciprocal requirements could affect the hardwood packing materials industry's relative preference for heat treatment over fumigation. Although the SWPM industry has readily accepted heat treatment for softwood materials to comply with requests from China and the EU to lower potential pest risks, the response to hardwood SWPM treatments could differ. Some manufacturers are likely to apply heat treatment because they already have operating facilities for softwood packing

materials. There was some concern about the effect of heat treatment on packing material durability. A recent study at Virginia Tech determined that the lower temperature of heat treatments recommended in the IPPC Guidelines has negligible effects on the usability of hardwoods for SWPM. The hardwood industry is incorporating the results of this analysis into their approved treatment methods. Consequently, heat treatment of hardwoods as a phytosanitary treatment for SWPM is expected to grow. The imports and associated SWPM entering the United States in any given year exceed the exports that leave, so any environmental effects from the treatments in the United States would be expected to be less than those from those countries. Until there is a verification process established to monitor methyl bromide fumigations of SWPM for exports, the amount of heat treatment relative to methyl bromide fumigation used to treat hardwood SWPM by manufacturers in the United States will be uncertain. Any attempt at quantification of such usage or associated effects would not provide a meaningful assessment for the decisionmaker. Certainly, the selection of heat treatments and substitute packing materials would contribute to less need for fumigation with methyl bromide and less delay in the rate of recovery of the stratospheric ozone layer.

Issue 10: Some respondents suggested that the adverse environmental impacts on the forests from the use of solid wood as a packing material were overstated.

The draft EIS pointed out that manufacture of SWPM involves the processing of wood into pallets and other wood packaging and that increasing trade has resulted in increased demand for wood. The wood used by U.S. manufacturers of SWPM comes primarily from sustainable forests in the United States and is managed as a renewable resource. There is also sustainable management of forests in the EU and some other developed countries. However, a disadvantage for some foreign countries is the lack of management of forests for ongoing sustainable yields. The regulations being considered in this EIS would directly affect only packing materials for imports from foreign countries.

The SWPM manufacturers generally use low quality wood which results in less unused wood but potentially increases pest risk. Because trees produced in temperate areas outside North America are affected by and can harbor a wide variety of pests and diseases that are nonindigenous to this continent, special care is required to ensure that imported wood and wood products are pest-free. The introduction of nonindigenous species can be detrimental to U.S. forest production, recreation, and urban forest resources. Extensive tree death by nonindigenous organisms can have serious impacts on ecosystems and has clearly been shown to reduce biodiversity.

Many manufacturers of SWPM in these foreign countries seek to minimize packing costs (externalities to their export business) by using wood that is inexpensive and readily available. The demand for wood in some underdeveloped countries has resulted in considerable exploitation of this renewable resource and in adverse impacts to the forests and forest soils, particularly in rainforests and other tropical locations. Although the increase in trade may not be the sole factor for the adverse effects to forests and forest soils in underdeveloped countries that lack sustainable forest management practices, it is part of the cumulative stress on the trees and

natural ecosystems in these countries. The draft EIS made no attempt to quantify the increased demand for wood (or other raw materials) under the alternatives or the potential impact on forests in foreign countries from that demand. However, the EIS considers potential impacts from increased demand on wood. Any assessment of the impacts resulting from the increased demand on resources is inherently uncertain because the suppliers of SWPM or wood used in substitute packing materials are not restricted to countries with sustainable forest management and their wood sources for manufacture of SWPM may originate at locations far from the SWPM assembly factory. For example, China has recently decided to manage its forests for sustainability and import wood from Russia for SWPM and domestic uses.

Issue 11: Some comment letters expressed the opinion that the adverse environmental impacts from manufacture of substitute packing materials were either overstated or understated.

As with the preceding issue, there are differences of opinion as to the relative environmental impact from using substitute packing materials. Some respondents are of the perspective that environmental impacts and associated pest risks from use of SWPM are much greater than from use of substitute packing materials. Others perceive that the environmental impacts and associated hitchhiker pest risks from use of substitute packing materials exceed those impacts and risks from use of SWPM.

The discussion of adverse environmental impacts from the manufacture of packing materials in the EIS is intended to provide a balanced presentation of potential impacts for SWPM and substitute packing materials. The overall pest risk is lower for substitute packing materials than for SWPM, but the relative environmental impacts are less clear. The substitute packing material manufacturing processes and the methods for obtaining the raw resources for that manufacture result in many different impacts, depending upon the type of substitute packing material. The environmental impacts from manufacture of each packing material would be expected to vary, and direct comparison of the relative environmental impacts may not be meaningful when comparing metals, plastics, corrugated packing materials, and other nonsolid wood packing materials. The relative market share could provide more information about potential impacts, but direct comparison to SWPM would not be meaningful. The efforts to mitigate pest risk for SWPM do involve treatments with associated environmental impacts, but these impacts do not compare directly to issues related to by-products of the manufacturing of substitute packing materials or processes to extract or refine raw resources. If one takes the view that pest risk reduction is the most important impact to eliminate, then substitute packing material is clearly the better choice. If air pollution and adverse impacts to resources are the most important environmental issue to minimize, one must weigh issues related to fumigation and relative wood harvesting against obtaining resources, refining, and manufacturing processes used to produce substitute packing materials. The raw resources used in manufacture of some substitute packing materials may consist of harvested forest products that have been processed. It is beyond the scope of this EIS to do a direct comparison of each substitute packing material to SWPM and would not provide meaningful information for the decision to be made for this EIS. However,

the primary environmental issues are discussed qualitatively to allow the decisionmaker to consider the relative advantages and disadvantages of each packing material and alternative.

Issue 12: There was some disagreement among comment letters about the relative ability to recycle SWPM relative to the ability to recycle substitute packing materials for further use.

Some respondents expressed the perspective that SWPM was more readily recyclable than substitute packing materials. Other respondents described the more efficient recycling of substitute packing materials. All types of packing materials may be recycled to varying degrees (page 76 of the draft EIS). Repair of damaged wooden pallets involves simple component replacement and may be more efficient than repair of some damaged substitute packing materials (particularly some plastic and metal materials) for port operational situations. However, some substitute packing materials (e.g., corrugated packing material or strandboard) can be readily repaired or components replaced. Wooden packing materials may be chipped and recycled, metal packing materials may be smelted again, and plastics can be recycled. The relative ability to recycle or re-use these materials is variable and the demand for the recycled product (whether it be packing material or other use) may influence the perspective of the shipper who must cope with worn or damaged packing materials. Use of each of the materials has certain inherent limitations. The durability, ability to recycle, and environmental impacts from the recycling process may favor certain packing materials, but relative costs are likely to influence decisions also. The draft EIS does not conclude that any specific packing material is superior from an environmental perspective, but points the reader to the general limitations of each material. This allows any decision to be guided by the range of available packing materials and their advantages and disadvantages.

III. Comment Letters

All Comment Letters submitted to APHIS are reproduced on the subsequent pages.

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gwsherman1@mmm.com on 12/27/2002 05:47:44 PM

To: raymond.b.nosbaum@aphis.usda.gov
cc:
Subject: Comments on EIS for rulemaking associated with the importation of SWPM

Dear Mr. Nosbaum,

3M would like to thank APHIS for the opportunity to comment on the EIS for rulemaking associated with the importation of solid wood packing material and any subsequent, associated proposed rulemakings.

In general, we would like to comment that 3M, and several similar international manufacturers who import SWPM into the U.S.*, strongly support the harmonization of global regulatory efforts and therefore are supportive of APHIS' stance on adopting the IPPC Guidelines as the proposed, albeit temporary, alternative.

We also support APHIS' continued research of the Comprehensive Risk Reduction Program which may incorporate combinations of several of the current compliance alternatives as some methods of compliance are more cost-effective in some areas of the world than in others.

Comment on all sections referring to "Substitute Packing Materials" - It would appear to be implied that if an importer chooses to use Substitute Packing Materials, those materials would automatically be exempt from any SWPM rule and therefore, a special section addressing such materials should not be needed in the final rule. However, for the purposes of the EIS, it may be needed.

*based on feedback at Chemical Packaging Committee (CPC) meetings which is a sub-committee of the Intl Org of Pkg Professionals (IOPP).

Thank you again and happy holidays.
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AMERICAN FOREST & PAPER ASSOCIATION

GROWING WITH AMERICA SINCE 1861

December 30, 2002

Mr. Raymond B. Nosbaum
Senior Regulatory Coordinator
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

Re: AF&PA Comments on the APHIS draft environmental impact statement for importation of solid wood packing material

Dear Mr. Nosbaum

The American Forest and Paper Association (AF&PA) is pleased to provide its views on the Draft Environmental Impact Statement with regards to the importation of solid wood packing material. AF&PA is the national trade association of the forest, pulp, paper and paperboard and wood products industry. This vital national industry accounts for 6 percent of total U.S. manufacturing output. The industry employs approximately 1.5 million people, with an annual estimated payroll of $50 billion, and sales in excess of $250 billion.

The wood products industry has a significant stake in the development of a regulatory scheme for wood packing material (WPM). WPM is used in the shipment of most commercial product around the world and, as such, any regulations on WPM will significantly impact the U.S. softwood and hardwood lumber industry. It is estimated that over 50% of the $2.0 trillion worth of goods that entered or left the United States in 2000 were in wood containers or on some type of wooden platform (e.g. pallets). Currently there are an estimated 2 billion pallets in use in the United States. Over 91% of all pallets purchased in the United States in 1999 were wooden pallets. 15% of total U.S. lumber production goes into pallet manufacturing. For hardwood lumber, the container and pallet industry uses approximately 4.53 billion board feet per year, which represents nearly 40% of U.S. hardwood lumber production. For softwood lumber, the pallet industry uses approximately 1.79 billion board feet per year. Nearly 7,000 U.S. facilities produce pallets nationwide.

More importantly, the pallet and packaging industries are a vital destination for low-grade wood. If not used in pallet manufacturing this value-added commodity would not be produced and the low grade wood would go to waste resulting in rippling economic effects in the form of mill closures and employment losses.

Recommendation to Adopt the IPPC Guidelines

AF&PA acknowledges the growing number of pest infestation cases that have been traced back to untreated wood packaging material. As the draft EIS states, the International Plant Protection Convention (IPPC) has accelerated the development of global measures to minimize the pest risk and potential for environmental and economic harm associated with untreated WPM. AF&PA supported passage of the IPPC standard earlier this year and recommends that these standards be adopted by the U.S. government. Of utmost importance to the forest products industry is the adoption of these guidelines so as to protect America's healthy, productive and vitally important forest resource base.

We believe that the IPPC standard is the best option compared to the other EIS alternatives presented including: 1) no change in the current regulation; 2) extension of the treatments/regulations applied to imports from China to all countries; 3) comprehensive risk reduction program; 4) prohibition of WPM. The additional options offered are not an entirely effective means to minimize pest risk (no change), are trade restrictive or would be logistically difficult to manage and implement. AF&PA supports the APHIS position stated in the EIS that the measures contained within the IPPC standard are sufficient and do provide a substantial amount of assurance against pest risk. This is based on IPPC guidelines that indicate that the approved measures provide adequate mitigation of the pest risks that are of greatest concern to APHIS.

Finally, the IPPC standard will ensure that the U.S. is in conformance with international trade rules aimed at harmonizing regulations to prevent the infestation, establishment and spread of exotic and invasive species. As a result of the proliferation of standards, which are not consistent around the world, WPM exporters have been forced to manage inventories of pallets by destination, which is a logistical problem. Many companies now have to weigh the cost of using various pallet specifications on a country-by-country basis versus setting one standard and sticking to it.

Heat Treatment

The current heat treatment measures required under the IPPC standard specify a time and temperature combination of 56°C for 30 minutes. We would be extremely concerned if APHIS advocated an increase in this time and temperature. Any requirement that exceeded the current heat treatment specifications would virtually eliminate hardwood producers from this market and cause significant economic disruption due to the major reliance of hardwood producers on this manufacturing sector. And, while this regulation specifically addresses imports, international trade rules require reciprocal actions by trading partners, meaning that any requirement(s) that apply to imported product must also apply to our own domestic manufacturers – unless there is scientific justification that proves otherwise. Again, as stated in the EIS, the measures contained

within the IPPC standard are sufficient and do provide a substantial amount of assurance against pest risk.

Methyl Bromide

APHIS indicates in the preferred option that allowing methyl bromide treatment would result in substantial use of this fumigant. However, as discussed in the EIS, worldwide quarantine and pre-shipment (QPS) uses of methyl bromide account for only 28 percent of all uses while U.S. QPS methyl bromide use accounts for 9 percent of total use. The EIS also states that with the phase-out of methyl bromide for other uses, continuing QPS uses would contribute about 0.3 percent to annual stratospheric ozone depletion. Even this figure is likely to be an overestimate and conservative given that pallets can also be heat treated and thereby a substitute for methyl bromide use.

Increased Demand for Wood

AF&PA is seriously concerned about inaccurate statements made in the EIS that assume that an increased demand for wood products translates into negative environmental effects. While it is uncertain that the preferred IPPC option will result in an increase in demand for wood products given that other substitute materials can be used, **the negative environmental effects assertion is not supported by facts.** The U.S. forest products industry has committed to the practice of sustainable forestry on its own lands and promoting sustainable forestry practices on non-industrial private forest lands. We would be pleased to supply documented proof that America's private forest lands are on the continuous pathway to sustainable management.

Furthermore, in order to conduct an adequate assessment of any adverse environmental impacts with the use of forest products, there also must be a comparison of substitute materials that would take the place of wood-based packing material. On those terms, the results are crystal clear. By any water quality, air pollution or energy use environmental measure, wood products are clearly environmental performance leaders. It takes between 33 and 47 percent less energy to produce a wood product than a similar product made from competing materials such as concrete and steel, and produces less carbon dioxide emissions. Additionally, in the conversion of trees to manufactured product, there is little if any solid waste to dispose of in landfills. Every part of the tree is used in producing the solid or engineered wood product, wood chips for use in paper manufacturing and renewable biomass energy that displaces fossil fuels.

Ban on Wood Packing Material Option

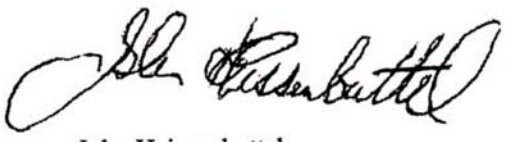
Of the five alternatives discussed in the draft EIS, the prohibition on use of WPM is clearly the most disruptive and economically-crippling option to an industry that has made significant strides in improving environmental performance. As discussed above, this option is not the most environmentally-friendly and overall life-cycle impacts show far greater deleterious impacts from using non-wood based substitute materials. Further, selection of this alternative would be flawed given that the draft EIA contains no analysis for public review and comment of the environmental impacts associated with increased use of substitute packing materials such as plastic. Before any potential decision to adopt this option could be contemplated, AF&PA

members believe an extensive environmental impact assessment and analysis would need to be conducted on plastics and other non-wood substitutes.

As a final thought on this option, the opinion stated on page 74 of the draft EIS reads: "Restrictions placed upon acceptable packing materials would not satisfy the provisions of the SPS Agreement because they would not meet the "not significantly less restrictive to trade" requirement." The Sanitary and Phytosanitary (SPS) Measures require that nations' regulations should not be more trade-restrictive than required to achieve the needed level of protection. As the APHIS EIS outlines, the IPPC option provides the necessary level of protection against the most significant, threatening and damaging pests to the nation's forests. An outright ban on the use of WPM, in favor of substitute materials, without credible and proven scientific justification would violate the WTO rules.

AF&PA appreciates the opportunity to provide comments on the draft EIS. We would like to offer our continued support to U.S. officials working on this standard and are happy to help whenever possible. Please do not hesitate to contact any of our industry experts for further guidance or information on this issue.

Sincerely,



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2 January, 2003

Raymond B. Nosbaum
USDA APHIS PPQ
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

Re: SWPM DEIS

Dear Mr. Nosbaum,

On 24 December, 2002, American Lands Alliance, Natural Resources Defense Council, Union of Concerned Scientists, and other organizations and individuals submitted comments on the USDA APHIS Importation of Solid Wood Packing Material Draft Environmental Impact Statement (DEIS), released in October 2002.

Due to a communications error, Friends of the Earth was inadvertently omitted from the list of the organizations endorsing these comments. I ask that you hereby add Friends of the Earth to the list of such organizations. The individual contact at FoE is Dr. Brent Blackwelder, President.

Friends of the Earth is located at 1025 Vermont Avenue, N.W. Washington, D.C. 20005.

Thank you for your assistance on this matter.

Yours truly,

Faith Thompson Campbell

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24 December, 2002

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Dear Mr. Nosbaum,

The undersigned organizations and individuals appreciate the opportunity to comment on the USDA APHIS Importation of Solid Wood Packing Material Draft Environmental Impact Statement (DEIS), released in October 2002.

We find that the DEIS adequately describes the risk to United States' forests arising from insects and other pests that might be associated with packaging made from wood that is shipped from virtually all trading partners and the inadequacy of current phytosanitary measures sufficiently to minimize that risk.

However, the DEIS has major deficiencies, including failure to analyze an alternative that is significantly different and more effective than the alternatives analyzed; and confused and biased presentation of data crucial to decision-making.

The DEIS analyzed five alternatives:
1) no action/no change in current regulations
2) extending treatments required for China to all countries
3) adopting IPPC standard
4) a comprehensive risk reduction program
5) prohibiting SWPM, allowing only substitute materials

This analysis found that the fifth alternative, prohibiting packaging made from solid wood (*e.g.*, boards) and allowing only packaging made from substitute materials, would both provide the best protection against introduced forest pests and cause the fewest environmental impacts. Nevertheless, the agency has selected the third alternative, adopting the IPPC standard, as the preferred alternative.

Failure to Analyze A Significant Alternative

The DEIS did not analyze a sixth alternative proposed by American Lands Alliance and others during the scoping process. That alternative called for phasing in a prohibition of solid-wood packaging over a period of years. By ignoring the option of phasing-in the requirement that shippers convert to non-solid-wood alternatives, the DEIS exaggerates several of the economic and policy difficulties associated with relying on packaging made from alternative materials. APHIS says it will continue to study more effective approaches, but it provides no timetable.

APHIS' failure to analyze the alternative of phasing out solid-wood packaging is particularly difficult to understand given that, in an Advance Notice of Proposed Rulemaking (ANPR) published on January 20, 1999 (Federal Register Volume 64, Number 12), APHIS' third option "would be to prohibit the importation of SWPM in any form and from any country. ..." APHIS contemplated allowing alternative packing material made from "processed wood (e.g., particle board, plywood, press board) and nonwood materials (e.g., plastic). APHIS went on to say, "The advantages of this option are that it would provide

the greatest protection against pest risk and could eventually result in decreased use of methyl bromide. A disadvantage of this option is that it could have an undesirable effect on international trade. *This effect could be mitigated by a phase-in period* to allow shippers to adjust to the prohibition, and, during this time, heat treatment, treatment with preservatives, fumigation, or other effective alternative treatments could be required before SWPM could be imported." [emphasis added]

In the ANPR, APHIS explicitly asked for public comment addressing several questions, including:

* What would be the economic, environmental, or other effects of prohibiting the importation of SWPM from any country, including disruption in trade and potential delays in shipping, effects of alternative materials on the environment, etc.?

* One advantage of wood dunnage is that it is biodegradable. What would be the environmental effects, if any, of requiring that nonbiodegradable material be substituted for wood dunnage?

* If importation of SWPM into the United States were to be prohibited, or if treatment of some kind were to be required for all SWPM imported into the United States, would the shipping industry need a phase-in period to allow time to adapt? If yes, how long?

Imbalances and Unfair Comparisons in Analyzing Data

In discussing the potential environmental impacts associated with heat treatment and fumigation using methyl bromide, the DEIS swings between, on the one hand, claiming that they are highly effective and, on the other hand, describing their failings and the absence of scientific studies confirming their efficacy. The result is that in portions of the document, the DEIS leaves the impression that any alternative relying on heat treatment or fumigation is more effective than can be justified by the data. The FEIS must be consistent in describing the strengths and weaknesses of these methods.

For example, in discussing APHIS' preferred alternative, heat treatment or methyl bromide fumigation pursuant to the international standard developed by the International Plant Protection Convention (IPPC), the DEIS claims this measure will ensure longterm exclusion of most wood pests that APHIS considers to threaten our forests. However, this discussion omits reference to the questionable efficacy, admitted elsewhere in the document, of both heat treatment and methyl bromide fumigation performed in accordance with the specifications contained in the IPPC standard. These omissions seriously bias the DEIS' its analysis of the preferred alternative..

Elsewhere in the DEIS, APHIS concedes that scientists have significant doubts about the efficacy of *both* heat treatment and methyl bromide in killing pests deep inside wood, especially in the larger blocks of wood that are used as dunnage (oddly shaped blocks of wood used to brace cargo). These doubts have serious implications since APHIS interception data, not discussed in the DEIS but available from published studies, show that significant numbers of pests are found in dunnage.

A second example of biased presentation of the data occurs in the discussion of the alternative requiring conversion to non-solid-wood packaging. The DEIS assesses this alternative as though it were to be imposed immediately, with no phase-out period. In its 1999 ANPR, APHIS identified the option of a phase-out of solid wood packging, with interim reliance on heat treatment or methyl bromide fumigation. American Lands proposed this option again in our scoping comments. Thus, the DEIS should have analyzed option of a planned phase-out, under which exporters, shippers, and the manufacturers of packaging would have advance notice of a deadline for terminating use of solid wood packaging and

what types of alternative packaging must be adopted.

Our proposed alternative would allow all parties to work toward this goal in an orderly way. APHIS' proposal to continue working toward some undefined "long-term strategy" will only sow confusion and expose our forests to additional introductions before APHIS even starts the clock on the inevitable substantial lead time for adopting new technologies.

A fourth example of biased presentation of the data occurs in the discussion of the potential environmental impacts arising from reliance on methyl bromide fumigation. APHIS ignored considerable additional information when it drafted this DEIS. An earlier APHIS FEIS[1] purported to provide a cumulative analysis of the impacts of all existing and anticipated U.S. uses of methyl bromide. While there are issues with respect to the completeness and clarity of this earlier FEIS, the information contained in the document makes clear that adoption of the IPPC standard could significantly increase global use of methyl bromide for quarantine and pre-shipment (QPS) purposes by much greater amounts than suggested in the present DEIS..

APHIS played a leading role in negotiation of the IPPC standard. In so doing, it presumably hoped that all countries party to the IPPC would apply this standard in trade among themselves. Thus, the standard has the potential to result in fumigation of wood packaging shipped not just to the United States, but to a myriad of other countries, as well. Has APHIS ever prepared an analysis under the National Environmental Policy Act (NEPA) of the full environmental implications arising from widespread adoption of the IPPC standard? In our reading, neither the September FEIS nor the present DEIS examines impacts from possible increases in total global uses of methyl bromide that would result from fumigation of wood packaging travelling between, *inter alia*, China and Europe. APHIS can partially fill this void now by analyzing not just the releases deriving from our trading partners' fumigation of SWPM destined to enter the United States, but also the additional methyl bromide releases emanating from U.S. exporters' use of methyl bromide to fumigate SWPM destined for our trading partners.

In assessing the potential increase in methyl bromide use, two alternative scenarios can be posited. In the first scenario, SWPM is fumigated *after* items have been placed in crates or on pallets and loaded into containers. This scenario appears highly reasonable given that fumigation will probably be done at centralized facilities, such as at ports, while goods are often packaged and loaded into containers at the numerous production sites. Another reason this practice appears more likely is that the SWPM must be treated shortly before each use since methyl bromide fumigation does not prevent pests from reinfestating the wood after treatment.

An alternative, far less realistic, scenario assumes that materials used to make SWPM are fumigated before the trade goods are loaded into the crates or onto the pallets. The choice of scenario has an enormous effect on the results of the analysis.

According to the FEIS released in September, the total annual worldwide methyl bromide releases in response to the U.S.' adopting the IPPC standard could reach as high as 102,893 metric tons under the assumption that SWPM would be fumigated *after* commodities have been loaded. In the current DEIS,

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[1]USDA APHIS 2002. Rule for the Importation of Unmanufactured Wood Articles from Mexico, With Consideration for Cumulative Impact of Methyl Bromide Use Final Environmental Impact Statement — September 2002

APHIS asserts that total annual worldwide methyl bromide releases in response to the U.S.' adopting the IPPC standard would be one-twentieth of this figure under the optimistic assumption that materials used to make SWPM products are treated before the packaging is assembled. This latter practice would result in releases of up to 5,145 metric tons.

In the DEIS currently open to comment, APHIS arbitrarily chose to include only the latter estimates, based on the unrealistic assumption that *all* SWPM would be treated before the packaging is assembled. This is not acceptable. The DEIS must examine impacts from the full range of methyl bromide use.

Table 1[2] compares the higher number from both the conservative and optimistic assumptions to various U.S. and world methyl bromide consumption estimates. Note that in 2001, total U.S. consumption of methyl bromide for all uses was somewhat under 12,000 metric tons. Total U.S. use for quarantine purposes in 1999 was only 254 metric tons. Even under the optimistic assumptions, U.S. adoption of the IPPC standard could result in worldwide consumption of methyl bromide for quarantine purposes in response to APHIS' rules that are twenty times this recent level. Under the more conservative assumption (that the SWPM was treated after loading), worldwide consumption of methyl bromide for quarantine purposes in response to APHIS' rules would be more than 400 times larger. In fact, the 102,893 metric ton figure is more than twice the figure for *all* methyl bromide use world-wide in 1999 (49,000 metric tons).

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[2]Sources for Table 1: a) CMR 1994. Methyl Bromide Production and Consumption Estimates. Chemical Marketing Reporter, January 1994, p. 37.
b) EPA 2001. Methyl Bromide Production, Import, Export, and Consumption Data. Allowance and Post Phase-out Tracking System. U.S. Environmental Protection Agency, Stratospheric Protection Division, Washington D.C. August 2001; U.S. Census 2001. U.S. Exports o Domestic and Foreign Merchandise by Country of Destination. 1991, 1995-2000 Methyl Bromide Exports. Foreign Trade Statistics. U.S. Census Bureau.
c) EPA 2001; EPA 2002. Methyl Bromide Production, Import, Export, and Consumption Data. Allowance and Post Phase-out Tracking System. U.S. Environmental Protection Agency, Global Programs Division, Washington D.C. August 2002.
d) UNEP 1995. 1994 Report of the Methyl Bromide Technical Options Committee. Montreal Protocol on Substances that Deplete the Ozone Layer, United Nations Environmental Protection, Kenya, 1994. UNEP 1998. 1998 Assessment of Alternatives to Methyl Bromide. Report of the Methyl Bromide Technical Options Committee. Methyl Bromide Technical Options Committee (MBTOC). ICF 2001. Methyl Bromide Use Background Document. Memorandum prepared for the U.S. Environmental Protection Agency, Stratospheric Protection Division. ICF Incorporated, Washington, D.C. November 16, 2001; UNEP/TEAP 2002. Report of the 2002 TEAP Replenishment Task Force, Technology and Economic Assessment Panel. Volume 2. Assessment of the Funding Requirement for the Replenishment of the Multilateral Fund for the Period 2003-2005. April 2002.

Table 1. U.S. and World Methyl Bromide Consumption

		High APHIS estimate 102,893 MT	Low APHIS estimate 5,145 MT
Description of Methyl Bromide Use	MB consumption, in Metric Tons (MT)	High MB estimate as percentage of this use	Low MB estimate as percentage of this use
1991 U.S. Base Year allowable consumption	25,490[a]	404%	20%
2001 Total U.S. consumption	11,788[b]	873%	44%
1999 U.S. quarantine consumption	254[c]	40,509%	2,025%
1999 total worldwide consumption	49,022[d]	210%	10%

It should be remembered that one reason that quarantine and preshipment uses of methyl bromide were exempted from the phase-out requirements of the Montreal Protocol on Ozone-Depleting Substances was that quarantine uses were then a minor use and were expected to remain so. As the figures cited above clearly show, adoption of the IPPC standard by the U.S. and other countries will invalidate that assumption. If one quarantine use can result in tripling total global use of the chemical, it becomes necessary to consider restrictions on QPS uses to protect the stratospheric ozone layer. Suggestions to this effect have already been made by parties.

The need to avoid a wholesale expansion of QPS uses of methyl bromide thus becomes another reason to move quickly to phase out solid wood as packaging for international shipments. Converting to packaging made from alternative materials is the only route that achieves all three national goals at stake in this rulemaking: accommodating rising trade volumes, protecting forests from exotic pests, and protecting the stratospheric ozone layer.

APHIS' failure to address the issue of methyl bromide releases in a more straightforward way is particularly disappointing in light of APHIS' previous promises. Thus, in proposing to require treatment of SWPM from China (Federal Register: September 18, 1998, Volume 63, Number 181), APHIS said:

> ... We are currently preparing an advance notice of proposed rulemaking to seek information and develop regulatory options on the general problem of imported SWPM from all countries *and the particular problem of how to respond to the scheduled discontinued use, both domestically and overseas, of methyl bromide fumigation for imported wood products*, in accordance with the Clean Air Act's and Montreal Protocol's phase-out schedules. ... APHIS considers this interim rule to be the first step towards better exclusion of pest risks from SWPM. APHIS will initiate an interagency review in order to develop an advance notice of proposed rulemaking that will identify various options for amending existing regulations for importing SWPM from all foreign countries to further improve exclusion procedures and protect forest resources, *while at*

> *the same time minimizing the further use of methyl bromide in order to protect the stratospheric ozone layer.* APHIS intends to implement this interim rule until APHIS has completed the rulemaking process described above for improved measures for mitigating the pest risk of SWPM from all sources. During the period this interim rule is in effect, APHIS will work with China to obtain information on actions China has taken to comply with the interim rule, including the use of methyl bromide and other pesticides. If the amount of methyl bromide used in China is greater than expected, *or if the interim rule remains in effect longer than 2 years, additional environmental analysis may be necessary.* We will consider comments received on the advance notice of proposed rulemaking, as well as on this interim rule, in developing any proposed or final rule changing the requirements for importing SWPM. [emphasis added]

Further, in the aforementioned Advance Notice of Proposed Rulemaking, published January 20, 1999 (Federal Register Volume 64, Number 12), APHIS "specifically [requested] public comment on ... *alternative treatments to methyl bromide* that could be used to reduce the risk of SWPM introducing exotic plant pests, ..." [emphasis added]

The agency went on to say,

> "*.... Any potential increase in the use of methyl bromide is of concern* because of the associated risk of increased ozone depletion, which results in increased ultraviolet radiation at the Earth's surface. Under the Montreal Protocol, the United States and other signatories have agreed to a phaseout of the use of methyl bromide by developed countries by the year 2005, but there is an exemption for methyl bromide used for quarantine purposes. In the absence of any agreed upon international controls on the use of methyl bromide for quarantine purposes, use of methyl bromide for these purposes may not only continue, but could increase. This makes it all the more critical that we find a long-term solution to the problem of how best to manage the pest risk associated with imported SWPM. *We are intent on minimizing the use of methyl bromide* in order to protect the stratospheric ozone layer, and we are seeking options that will accomplish this objective." [emphasis added]

Contradictions

The DEIS also contains several internal contradictions.

The most important such contradiction concerns the fundamental question of efficacy: will the proposed treatments protect forests adequately from introduced pests? The DEIS asserts that applying the IPPC measure will ensure longterm exclusion of most wood pests that APHIS considers to threaten our forests. However, the DEIS also states, to the contrary, that some deep wood-borers, fungi, rots, and wilts may not be killed by the treatments specified in the IPPC standard. Furthermore, the DEIS also states, "The limited efficacy data may require considerable research effort to ensure that the IPPC Guidelines meet the pest risk standards that APHIS currently expects."

A second contradiction with regards to efficacy concerns the role of debarking wood before further

treatment. The DEIS asserts that debarking of SWPM was "determined" not to further reduce risk substantially when applying the IPPC standard. However, it is widely acknowledged -- and conceded in the DEIS -- that debarking improves methyl bromide's penetration into the wood. Such penetration is essential to killing deep-wood pests. As noted earlier, scientists already are concerned that the chemical does not penetrate wood sufficiently well to kill deep-wood pests. Under these circumstances, the statement in the DEIS that heat or methyl bromide treatments should kill most pests in or under bark is beside the point. We remain concerned about the effect that bark will have on the ability of methyl bromide fumigation to kill deep-wood pests. It is this issue that needs further analysis in the EIS (beyond the simple statement that one reason the second alternative is more protective is that it does require debarking).

Missing Information

Information is missing from the DEIS that is crucial to decision-making on how best to minimize threat to U.S. forests from introduced pests.

First, the DEIS never specifies APHIS' efficacy target — called, in international trade or phytosanitary terminology, level of protection. It makes only vague references to "...the pest risk standards that APHIS currently expects."

The U.S. District Court for the Eastern District of California has found that APHIS violated the Administrative Procedures Act when it issued a regulation (pertaining to importation of citrus from Argentina) without specifying a "negligible risk" threshold for each of the four pests associated with the commodity. [3]

Decision-makers and the public cannot determine which of the alternative pest-mitigation strategies adequately meets U.S.' plant protection goals if they do not know what those goals are.

While the DEIS specifies no efficacy target, in some earlier, related, rulemakings, APHIS did specify a risk level of 3 - 5 percent.[4] A risk level of 3 - 5 percent is actually quite high, more than 10 times higher

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[3]Harlan Land Co., Limoneira Company, Pecht Ranch, R7 Enterprises; and U.S. Citrus Science Council vs. U.S. Department of Agriculture, Daniel Glickman, Secretary of Agriculture; and Craig A. Reed, Administrator, Animal and Plant Health Inspection Services [sic]
In The United States District Court for the Eastern District of California
CV-F-00-6106 REC/LJO
Order Granting Plaintiffs' Motion for Summary Judgment, Denying Defendants' Motion for Summary Judgment, Suspending Argentine Citrus Rule and Remanding to APHIS
Filed September 27, 2001

[4]United States Department of Agriculture Animal and Plant Health Inspection Service. 1998. Importation of Logs, Lumber, and Other Unmanufactured Wood Articles. Final Supplement to the Environmental Impact Statement, May 1998.

than the risk of dying from cancer if you smoke cigarettes.[5] American Lands pointed out in its scoping comments the importance of the DEIS including a discussion of the environmental repercussions of adopting this or any other efficacy target or level of protection.

Furthermore, stating a stringent efficacy target (level of protection) is key to overcoming another of the alleged deficiencies in the fifth alternative. Under the World Trade Organization's Agreement on the Application of Sanitary and Phytosanitary Standards (SPS Agreement), APHIS may impose more restrictive or expensive phytosanitary measures if those measures are necessary to attain the country's chosen level of protection.

Second, the DEIS never identifies *which* pests APHIS considers to threaten our forests. The IPPC standard lists some pests as likely to be "practically eliminated" by the IPPC measures; these include insects in the Anobiidae, Bostrichidae, Buprestidae, Cerambycidae, Curculionidae, Isoptera, Lyctidae (with some exceptions for heat treatment), Oedemeridae, Scolytidae, Siricidae. Also the nematode *Bursaphelenchus xyolphilus*. However, the DEIS does not provide either this or any other list. The absence of a list is important given the contradictory statements that some deep wood-borers may survive some of the treatments analyzed. Several of the families specified above contain species that live deep in wood. The authors of the IPPC guideline don't even claim efficacy against fungi, rots, and wilts -- although Eric Allen of the Canadian Forestry Service has found in preliminary studies that most are killed by the IPPC heat treatment (pers. comm.). Again, decision-makers and the public cannot determine which of the alternative pest-mitigation strategies is adequate under the current situation of vague and mutually contradictory assertions about the efficacy of various treatments.

We appreciate this opportunity to comment on the draft environmental impact statement. We look forward to continuing to work with APHIS to ensure that effective regulations are adopted that will protect America's forests from exotic pests and diseases.

Yours truly,

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United States Department of Agriculture. Animal and Plant Health Inspection Service. 1998. Proposed Interim Rule on Solid Wood Packing Material from China. Environmental Assessment. September 1998.

[5]Botkin, D. Ecological Risk Issues Associated with Forest Biotechnology. Biotech Branches Out: A Look at the Opportunities and Impacts of Forest Biotechnology. The Pew Initiative on Food and Biotechnology. December 4 - 5, 2001. Atlanta, GA.

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A P A
The Engineered Wood Association

Edward G. Elias
Director, International Marketing Division

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December 30, 2002

Mr. Raymond B. Nosbaum, Senior Regulatory Coordinator
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

Re: Comments on the APHIS draft environmental impact statement for importation of solid wood packing material

Mr. Nosbaum:

APA-The Engineered Wood Association offers the following comments relative to the draft Environmental Impact Statement (EIS) on the Importation of Solid Wood Packing Material – October 2002.

- APA supports the US governmental adoption of the International Plant Protection Convention (IPPC) phytosanitary standards for regulating wood packaging material when compared with the other EIS proposed alternatives. The IPPC option provides the necessary level of protection against the most significant and damaging pests to the US forests, while at the same time not severely restricting international trade.
- APA is, however, concerned about repeated EIS assertions cautioning that an increased demand for wood products used in packaging may result in negative environmental effects. First, the US wood products industry is committed to a practice of sustainable forest management on its own lands and promotion of the sustainable forest practices on non-industrial private forestland. The United Nations Food and Agricultural Organization *State of World Forests-2000* reports that over the past decade North American forest cover has expanded by nearly 10 million acres and this during a time of increased market demand. Secondly, when reviewing life cycle costs, wood products result in 33%-47% less energy to produce than competing materials such as plastic. Finally, the production of wooden pallet components results in less carbon dioxide emissions than those of competitive materials.

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- APA also supports the alternative listing of structural wood panels as substitute packaging materials and argues that the use of these products will not further environmental concerns. Pallets constructed of structural wood panels have been shown to require fewer repairs and, with an average life span of seven years versus 1½ years for traditional pallets, do not have to be replaced as often.
- The EIS alternative prohibiting the use of any wood packaging material would be economically crippling to an industry that is dedicated to sustained environmental performance. Additionally, within the EIS there is no definitive environmental review of the plastic (a petroleum-based non-renewable material) or the steel industries as substitute products.

Background

- In 2000, an estimated $2 trillion worth of goods entered or left the United States. Over half of these products were shipped on some type of wood packaging platform.
- An estimated two billion pallets are currently in operation in the United States. In 1999, 91% of the pallets purchased in the United States were wooden pallets. Of these pallets, 3-4% were constructed utilizing structural wood panels.
- Fifteen percent of the total US lumber and 2% of the structural wood panel production goes into packaging manufacture. The materials handling industry consumes an estimated 4.53 billion board feet of hardwood lumber, 1.79 billion board feet of softwood lumber, and 805 million square feet (3/8-inch basis) of structural wood panels.

APA appreciates the opportunity to comment on the draft Environmental Impact Statement. Please do not hesitate to contact us for any further information.

Sincerely,

Edward G. Ellis

EGE:lpk

cc: Michael Hicks, CMP/FAS/USDA
Scott Reynolds, FFPD/FAS/USDA
Chris Twarok, ITA/USDOC
Tom Westcot, FFPD/FAS/USDA

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December 10, 2002

Raymond B. Nosbaum
Senior Regulatory Coordinator
USDA/APHIS/PPQ
4700 River Road
Unit 141, Room 4C31
Riverdale, Maryland 20737

Dear Mr. Nosbaum:

These comments refer to the "Importation of Solid Wood Packing Material, Draft Environmental Impact Statement -- October 2002."

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) on proposed regulations regarding importation of solid wood packing material.

CHEP's primary business is renting reusable pallets and plastic containers. The company provides supply chain solutions to some of the world's largest companies in the consumer goods, produce, meat, home improvement and automotive industries. Our pallets are distinctively painted, bear the CHEP logo and are readily identifiable. Our conspicuously marked pallets and containers remain property of CHEP as they move repeatedly through the distribution chain. We are committed to be a world leader in the proper stewardship of our natural resources and have found our high quality and highly durable pallets are environmentally superior to disposable pallets.

CHEP supports efforts to harmonize worldwide standards that stop the transport of invasive species in solid wood packing material. We are pleased that APHIS has selected alternative number three (adoption of the IPPC Guidelines) as its preferred alternative in the DEIS. We agree with the agencies' conclusions that adoption of the IPPC Guidelines will provide substantial reduction of pest risk from solid wood packing material, while at the same time allowing the United States to operate in harmony with the rest of the international community. Adoption of the IPPC Guidelines will decrease the threat of invasive species entering the United States through solid wood packing material, while at the same time allowing our nation to continue to be a leader in international trade and commerce.

Although CHEP supports adoption of alternative three in the DEIS, we do want to raise a number of issues of concern in the document. First, we are troubled by language in the DEIS which implies that although APHIS is recommending adoption of the IPPC Guidelines, the agency continues to consider a more long-term and permanent solution to this issue. One of the most important aspects of the IPPC Guidelines is that they will provide a worldwide standard that is consistent and understandable for nations across the globe. Currently, CHEP operates in 38 nations around the world and transports pallets across many national borders. We urge APHIS to enact final regulations that will follow the standards outlined in the IPPC Guidelines and permanently enforce those rules without frequent changes in the future. Although we understand that the IPPC standard provides flexibility, particularly in the area of new treatment options, we would strongly oppose efforts to enact the IPPC Guidelines and then replace those rules with new regulations after a few years. Providing a stable and consistent regulatory environment for solid wood packing material is the best way to comprehensively address the threat of invasive species in wooden pallets.

We would also encourage APHIS to adopt the benchmark for heat treatment (56 degrees centigrade for 30 minutes) outlined in the IPPC Guidelines, rather than other heat treatment methods that call for treating pallets at a higher temperature for longer periods of time. CHEP strongly supports heat treatment of pallets and will use this option as our preferred method of treating our pallets to comply with the new regulations. However, we do not believe there is a need to raise the temperature or timeframe for treating pallets outlined in the IPPC Guidelines. We feel that the 56C/30 minute standard adequately addresses this matter.

Finally, we would also like to raise our objections to any effort to mandate the use of non-wood material in the importation of goods into the United States, as outlined in alternative number five of the DEIS. Although CHEP continues to work on development of a plastic pallet, we believe efforts to mandate the use of substitute materials is both impractical and unwise. The costs of such an action to consumers and the subsequent confusion and delay that would follow clearly show that alternative number five is both unworkable and unreasonable.

Thank you once again for giving CHEP this opportunity to comment on the DEIS and this important subject. We stand ready to explore these issues further with APHIS, and remain committed to environmentally superior performance while providing our customers with economically superior service.

Sincerely,

Daniel T. Naatz
Director of Government and Regulatory Affairs
CHEP

COMMITTEE FOR IDAHO'S
HIGH DESERT
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To Whom It May Concern,

The Committee for the High Desert (formerly Committee for Idaho's High Desert) would like to submit comments concerning APHIS's amending of regulations that prevent the introduction/infestation of pests. CHD believes that APHIS should fully consider alternatives that do not harm the Earth and its resources.

CHD agrees with American Lands Alliance in that shippers should be using alternative materials for packaging. This will help eliminate the risk of new exposures to pests. There will not be a need for treatment of toxic chemicals that are harmful to the environment. The durability of the alternatives will outlast wood products.

CHD believes that importers should pay a yearly or scheduled fee to help cover the costs of pest-prevention. If all importers were made to pay a fee for their shipments it may help in the education of wood packaging and the alternatives.

CHD also believes that APHIS should adopt the "0 risk" target for the United States. This will ensure that the shippers move to a more environmentally safe way of shipping materials into the United States. If everyone has to make the same changes they are more likely to participate than boycott.

CHD believes that APHIS should incorporate a steep fining system for shippers who violate any of the regulations that help stop pests from entering the United States. Those who are caught should be fined and banned from shipping into the United States for a certain amount of time. When they are allowed to begin shipping again there should be frequent and unscheduled visits.

CHD supports APHIS in creating stronger regulations to fight new pests that are entering the United States every day.

Sincerely,

Hilarie Engle

Hilarie Engle
Conservation Associate

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20 December 2002

Raymond B. Nosbaum
Senior Regulatory Coordinator
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 141
Riverdale, MD 20737

Dear Mr. Nosbaum,

Defenders of Wildlife would like to take the opportunity to comment on the draft environmental impact statement, "Importation of Solid Wood Packing Material (SWPM)," dated October 2002. Defenders of Wildlife is a non-profit, science-based, conservation organization with roughly one million members and supporters, dedicated to the protection of native wild animals and plants in their native communities.

In reviewing the draft statement, this submission focuses on:

1. Option 3 – IPPC Guidelines: the favored option supported by APHIS; and
2. Option 5 – Substitute Packing Materials.

This analysis highlights the problems identified with the guidelines of the International Plant Protection Convention (IPPC), particularly with regard to the use of methyl bromide. Recognizing that this draft environmental impact statement (DEIS) is a short-term response in what is intended to be a long-term strategy, we support use of the IPPC standard as an interim measure as requirements for alternative packing materials are phased in (modified option 5). Finally, we provide some commentary regarding how such an approach accords with international law, including obligations under the World Trade Organization (WTO), the IPPC and the Montreal Protocol.

Option 3: IPPC Guidelines

Option 3 of the DEIS and the IPPC "Guidelines for Regulating Wood Packaging Material in International Trade" allow for heat treatment or methyl bromide fumigation. Given the acknowledgement that heat treatment costs are generally higher than use of methyl bromide (DEIS, 15), this assessment will focus on methyl bromide under the assumption that the cheaper option will generally be the preferred option.

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The environmental and human health impacts associated with methyl bromide are well documented (DEIS, 20-26), and it is recognized as a toxic, ozone-depleting substance.[1] Destruction of the ozone layer leads to increased exposure of plants and animals to type B ultraviolet radiation, which is associated with cancers, cell damage, decreased crop yields, decreased fish production, immune suppression, and eye damage.[2] The DEIS itself states that "Next to Alternative 2..., this alternative would result in the greatest level of anticipated adverse environmental consequences from component methods..." (DEIS, 10) The DEIS fails to factor in such additional environmental costs, a point which will be revisited below. It also acknowledges that methyl bromide is not 100% effective, especially with regard to radial diffusion and wood with high moisture content. The statement even highlights cases where pests and pathogens were found on fumigated shipments (DEIS, 20-1). The DEIS also does not indicate the threshold or potential level of effectiveness of the treatment.

Support for a measure which has definite negative environmental and health impacts and questionable efficacy is unwise. Both the Montreal Protocol and the U.S. Clean Air Act call for the phase-out of methyl bromide and the search for potential substitutes. Instead of developing regulations that would continue to support the production, use and problematic disposal of dangerous fumigants, APHIS should encourage the development of alternative measures, which would include wood substitutes.

Option 5: Substitute Packing Materials

The DEIS states that the proposed regulations are a short-term solution, while also acknowledging the time lag in their implementation: "It may seem paradoxical, therefore, that APHIS must develop the new restrictions at an accelerated rate, but must wait an extended period of time before they can be implemented and enforced." (DEIS, 4) Such recognition suggests the need to consider the long-term strategy at the present moment without creating further delays in the process, during which time invasive pests and pathogens can continue entering the U.S.

In looking at alternatives, the DEIS states that "Substitute packing materials only (prohibition of SWPM) would achieve the greatest reduction of pest risk, with the least environmental impact from its component control methods." (DEIS, iv) This solution is optimal as it reduces the potential for introducing pests to virtually zero, and further does not entail the same environmental and health hazards as methyl bromide. Such processed packing materials are a viable option to fumigation that should be supported within the APHIS guidelines.

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[1] Please note that the following statement in the Executive Summary, "the fumigant methyl bromide, a chemical that *may* have a role in the depletion of the ozone layer," (DEIS, iv, emphasis added) is directly belied by the in depth discussion of the ozone-depleting nature of methyl bromide under the Montreal Protocol and the US Clean Air Act (DEIS, 23). This mischaracterization could misguide the reader by down-playing the environmental impacts of methyl bromide and should be redressed.

[2] Methyl bromide is listed as a Class 1 ozone depleter (the most destructive category) under the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, to which the United States is a party. The Montreal Protocol calls for phaseout of non-critical uses of methyl bromide by 2005.

While currently less than 5% of the market, a program phasing in alternatives to SWPM could be highly effective in making their production more economical and increasing their market share. As noted in the DEIS, such materials could also promote the re-use and recycling of such materials. Use of alternative materials that are more durable than softwood would allow for their multiple re-use and a reduction in demand for raw wood products. The fact that many of these alternative materials (e.g., steel, aluminum, plastic) can be recycled for other purposes also contributes to a more environmentally sustainable solution.

Legal Commentary

Noting that APHIS must work within the context of international agreements to which the US is a party, the DEIS supports Option 3 and rejects Option 5 on alternative materials, citing provisions within the WTO's Agreement on Sanitary and Phytosanitary Measures. The DEIS states that "Restrictions placed upon acceptable packing materials would not satisfy the provisions of the SPS Agreement because they would not meet the 'not significantly less restrictive to trade' requirement." (DEIS, 74)[3] However, the DEIS fails to provide further detail on how it arrived at this conclusion with specific regard to levels of trade-restrictiveness, the needed level of protection and economic feasibility. Further, the DEIS also fails to look at other areas of the SPS Agreement and the IPPC guidelines allowing for stricter regulations.

In assessing the different options for SWPM, the immediate cost of treatment should not serve as the bottom line. The DEIS does not account for additional costs, including mitigating ozone depleting processes, addressing health impacts and covering eradication, control and replacement costs as suggested in SPS Article 5.3.[4] For example, in the case of the Asian long-horned beetle, a serious pest species that entered the United States via SWPM, the USDA has felled over 10,000 trees and has proposed a $365 million eradication program. Estimates regarding the replacement cost of the felled trees exceed $600 billion.[5] Such downstream costs, which are born by the U.S. taxpayer, must be considered in any assessment of economic feasibility.

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[3] Article 5.6 of the SPS Agreement specifically states that "measures taken by member nations should not be more trade-restrictive than required to achieve the needed level of protection, taking into account technical and economic feasibility."

[4] SPS Article 5.3 states that "In assessing the risk to animal or plant life or health and determining the measure to be applied for achieving the appropriate level of sanitary or phytosanitary protection from such risk, Members shall take into account as relevant economic factors: the potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease; the costs of control or eradication in the territory of the importing Member; and the relative cost-effectiveness of alternative approaches to limiting risks."

[5] See Nowak, D.J., J.E. Pasek, R.A. Sequeira, D.E. Crane, and V.C. Mastro. "Potential effect of *Anoplophora glabripennis* (Coleoptera: Cerambycidae) on Urban Trees in the United States." *Journal of Economic Entomology*. 94 (2001):116-122.

Both the SPS Agreement and the IPPC Guidelines recognize that countries may take stricter measures than those included in international standards if there is scientific or technical justification.[6] Adequate justification is provided by evidence that:

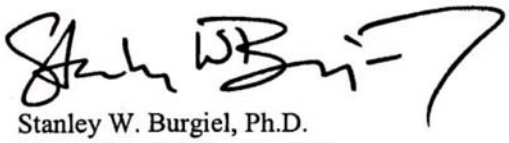
- methyl bromide fumigation is not totally effective;
- pests and pathogens on methyl bromide-treated SWPM have been documented entering the U.S.; and
- invasions with severe environmental impacts, such as the Asian longhorned beetle, have already occurred.

Use of alternative SWPM would not serve as a disguised barrier to trade given the need to minimize the risk of introductions. It would also not arbitrarily or unjustifiably discriminate against other WTO Members as all SWPM manufacturers would have equal opportunity to transition to other processed materials.

Other precedents exist with regard to protecting natural resources from potential harm. New Zealand's biosecurity legislation is arguably the strongest and most stringent in the world, yet it has not been questioned under WTO rules. Similarly, in other areas the U.S. has supported the use of new technologies to protect natural resources, most specifically with regard to turtle excluder devices in shrimp harvesting and appropriate fishing practices to reduce dolphin mortality in catching tuna. The remaining hardwood trees in the U.S. should be protected with equal care.

Finally, the Montreal Protocol, to which the US is a party, and the U.S. Clean Air Act call for the phase-out of ozone depleting substances, such as methyl bromide. The Montreal Protocol includes a timetable for phasing out non-essential uses of methyl bromide by 2005. Use of methyl bromide to treat SWPM should not be deemed as essential, as more environmentally friendly and effective options exist to reduce the risk of invasives. By establishing a long term strategy to replace such fumigation practices with alternative SWPM materials, the U.S. would be supporting its international commitments under multilateral environmental agreements and providing a model and incentive for the rest of the world community.

Sincerely,



Stanley W. Burgiel, Ph.D.
International Policy Analyst
Defenders of Wildlife

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[6] SPS Article 3.3 states "Members may introduce or maintain sanitary or phytosanitary measures which result in a higher level of sanitary or phytosanitary protection than would be achieved by measures based on the relevant international standards, guidelines or recommendations, if there is a scientific justification, or as a consequence of the level of sanitary or phytosanitary protection a Member determines to be appropriate in accordance with the relevant provisions of paragraphs 1 through 8 of Article 5." Additionally, the IPPC Guidelines state "requiring Phytosanitary measures beyond an approved measure as described in this standard also requires technical justification" (paragraph 1).

E. Alan Cameron
Professor Emeritus of Entomology

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Importation of Solid Wood Packing Material – Draft Environmental Impact Statement – October 2002
COMMENTS

Executive Summary -

· Experience has shown far too many instances of false certification of compliance for shipments originating from China under the 'China Interim Rule.'

· It is time for APHIS for once to exhibit leadership on the world scene. The Executive Summary freely acknowledges that 'IPPC Guidelines...would provide *substantial reduction* of pest risk, *with substantial environmental impact* from its component control methods…' whereas 'Substitute packing materials only…would achieve **the greatest reduction** of pest risk, *with the least environmental impact* from its component control methods.' [Emphasis mine.]

Chapter I -

· Materials used for SWPM normally consist of lower grade woods, with that grade often determined because of evidence of insect and/or disease activity. Such material is inherently high risk.

· At least three major pests with the potential for devastating damage have been introduced, and establishment recognized, within the last decade; there remains the promise of many more. There is an urgent need to minimize and preferably eliminate such risk before the next major problem occurs – which will probably be within several years. The high risk pathway has been documented; risk is very high. It is urgent that the required changes are implemented now to shut down this means of further introductions.

· Containerized shipping has made possible the rapid movement of imported goods, including SWPM, from ports of entry to destinations throughout the United States. This dramatically increases the likelihood that more exotic pests will penetrate our borders, and dramatically raises the probability that they will encounter suitable host material, and environment, for establishment. No longer is it only port environments that provide the first opportunity for colonization.

· APHIS, by mission and statutory responsibility, must act to minimize potential risk and damage. Consigning the immediate need to regulate SWPM to a long-term study will assure the loss of this problem in a miasma of politics and bureaucracy for decades. There is need for true

leadership now, not next year or next decade. IPPC Guidelines already exist, and with this nation as a signatory – there is nothing new here. In fact, *this Draft EIS is a document which proposes to maintain the status quo*, not advance our capacity to protect our resources.

· Proposing to study restrictions further will, in the meantime, require costly implementation of a whole set of interim measures, with inherent lag times and costs, by the international community of nations, as is acknowledged. If APHIS, under the scenario it advocates, eventually does determine to do what it should do now, there will be a second round of costly changes imposed on the international community. At least one round of interim steps could be eliminated if APHIS would demonstrate leadership now instead of hoping that such leadership will emerge at some time in the future. This Draft EIS is, in fact, a justification for doing nothing, while initiating long term studies of what should be done. The irony is that APHIS has already identified what should be done. Implicitly it acknowledges that leadership to make difficult and perhaps unpopular decisions is wanting.

Chapter II -

· Over a decade ago, raw wood shipments from the former Soviet Union countries began to enter west coast ports in alarming volumes; very quickly this facilitated introduction of the Asian gypsy moth. At an international meeting, the first North American Forest Insect Work Conference, in Denver, CO, in 1991, literally hundreds of forest entomologists, pest managers, and others with similar interests, representing state and federal government agencies, private enterprise, and the academic community, recognized the imminent threat of introduction of a large number of additional insect and disease pests. Overwhelmingly, if not unanimously, by resolution they urged federal action to mitigate or eliminate this threat to our forest resources. While raw wood and SWPM are not identical, many if not all of the identified threatening species could as easily gain entrance via SWPM. We should not be reinventing the same wheel over a decade later – especially having seen the introduction of at least three major additional pests in that time. The time for enacting vigorous and effective measures to protect our resources is long past. It needs to be done now, not decades hence.

· Commendation is due for dismissing the 'Comprehensive Risk Reduction Program' alternative. As clearly identified, this would be a nightmare to develop, and would lack credibility from the start.

· IPPC heat treatment protocols do not even meet current APHIS requirements for China interim rule. Since the China interim rule is assumed to be based on experimental assessment of minimum requirements, this is an irreducible minimum if it is to be effective. To reduce this puts in place an acknowledged ineffective and therefore unacceptable standard.

· As a general comment, more stringent U.S. standards could possibly work in favor of domestic producers through diminution of economic advantages of offshore manufacturers who would have to cope with increased packaging costs as they use substitute packing materials.

· IPPC Guidelines for methyl bromide treatment are also less stringent than current demands. With the same logic as above, this is one more example of an acknowledged ineffective and therefore unacceptable standard. The offset of reduced use of methyl bromide because treatment requirements are less (Chapter IV, p. 63), compared with an increased likelihood of importation of exotic pests because of less effective treatments, is an unacceptable trade-off.

· The document articulates an ill-conceived decision to INCREASE the use of methyl bromide in the face of a desired phase out by 2005. The exemption noted for QPS is clearly intended to

be temporary, and presumably to permit continued use in existing use patterns while alternatives are developed, not to be the subject of a mandated increase in use.

· The logic used (page 24) to justify use of methyl bromide, a material targeted for elimination from use, is inconsistent when juxtaposed with reasons NOT to use preservatives (4b, para. 2, p. 30) because one of these (preservatives) has been eliminated from use and others are anticipated to be eliminated.

· Offsetting uses of methyl bromide (p. 26) do not address the underlying need to eliminate the use of this material.

· Industry will never voluntarily move to substitute packing materials. The onus is on APHIS to mandate such a move. Whenever industry is faced with an unavoidable need to change, it can and will do so with amazing speed, kicking and screaming – and lobbying its governmental representatives furiously all the while – to meet the new needs. The sheer volume of international trade demands minimization to the greatest degree possible of opportunities for accidental introduction of insect and disease pests. Substitute packing materials are the only alternative now available to meet the challenges. The anticipated consequences articulated argue persuasively for a rapid shift to such materials regardless of political and industry pressures to the contrary.

Chapter IV –

· WTO agreements, as are any negotiated agreements, are no more than what one interprets them to be. If substitute packing materials are required of all shipments originating offshore, there is equitable treatment of all trading partners. Methyl bromide fumigation does not provide '…the needed level of protection…' unless the U.S. is willing to accept the reality that numbers of new and very damaging – both economically and environmentally – exotic pests will continue to be introduced on a regular basis. If continues introductions are, in fact, acceptable, one must question the judgment and the commitment of those officials who articulate such a policy.

Conclusion -

The ultimate argument against the acceptance of the Draft EIS is that it does not propose the best solution to the recognized serious challenge it addresses. Leadership by APHIS as a regulatory agency in a nationally and internationally vital area is lacking. Rather, far too much weight is given, although not explicitly acknowledged, to anticipated objections from both industry and political pressure groups in a decision to recommend reliance on methyl bromide fumigation as the primary tool to protect our resources. At reduced (from current standards for China) rates, and thus with the reasonable expectation of reduced efficacy, in fact existing regulations are suffering dilution. The decision which is clearly needed is simply being put off for another round of study and draft statements following the next one or two or ten introductions of exotic pests. Valuable time is being lost; numbers of additional serious pests will gain entrance; unnecessary expenditure of resources will be required to address emergency situations that should never happen; the nation will suffer additional irretrievable losses.

This Draft EIS should be rejected, and a new Draft prepared which proposes the use of substitute packing materials in international trade to address the threat we currently face through the widespread use of SWPM in international commerce.

To:

Raymond B. Nosbaum, Senior Regulatory Advisor
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Riverdale, MD 20737

December 20, 2002

Subject: Request for Public Comment "Importation of Solid Wood Packing Material -- Draft Environmental Impact Statement -- October, 2002"

References:

1. "International Standards for Phytosanitary Measures -- Guidelines for Regulating Wood Packing Material used in the Transport of Commodities" (March 2002) Web Link: http://www.aphis.usda.gov/ppq/pim/standards/WoodPack_rev1fin.pdf

2. Previous comments submitted by the EIPS task group on Sept. 12, 2002.

Background: The following comments are provided on behalf of the **Electronics Industry Pallet Specification (EIPS) Task Group** (http://packaging.hp.com/eips) which is a technical subcommittee of the Institute of Packaging Professionals (http://www.iopp.net). The EIPS team's vision is to create a common specification for pallets used in the computer industry's global supply chain. This specification will ultimately affect our suppliers, our customers and potentially many others. Implementation of the specification will result in unitized loads which are dimensionally consistent, environmentally sound, free of pest migration issues, and economical which will ensure free flow of goods globally. To this end, we endorse and have adopted the technical requirements of the International Plant Protection Convention (IPPC) standard (ISPM 15). **The EIPS team reiterates its recommendation that USDA/APHIS adopt ISPM 15 as the permanent US standard.**

The EIPS Team presently includes but is not limited to representatives of the following Companies and Universities.

Companies (Shippers):
IBM Corporation
Hewlett-Packard (including Compaq)
Agilent Technologies, Inc.
Intel Corporation
Celestica, Inc.
Dell Computer Corp.
Cisco Systems, Inc.
Lexmark International, Inc.

Universities (Technical Advisors):
Virginia Tech University
Michigan State University
Clemson University
San Jose State University
Univ. of Nebraska, Lincoln

Detailed Comments:

We congratulate the authors of the draft environmental impact statement on the completion of this important and complex document. We applaud the summary recommendation to adopt the IPPC guidelines as the US Standard. However, we also have the following concerns....

1) Excerpt from page 3: "...APHIS is proposing to adopt the IPPC Guidelines while it considers a more long-term and permanent solution to the SWPM problem". The underlined portion of this statement is our primary concern. One reason we strongly endorsed the IPPC Guideline was because we understood that the standard would be the final requirement. If so, it would effectively put an end to the "moving target" problem we have been suffering from over the last several years. It is critical that we arrive at a common global solution to the Solid Wood Packing Material (SWPM) problem. The IPPC Guidelines were created and scrutinized in great detail by many nations for the purpose of achieving that goal. We believe that the IPPC Guidelines, if enforced and implemented globally as intended, will be the best overall permanent solution. Global enterprises cannot effectively revamp entire supply networks only to have the requirements modified yet again. Our concern is a new US Standard that immediately implies a pending later revision to it undermines expedient implementation of the Standard.
2) Because our companies are strongly opposed to using ozone depleting substances, despite the exemption for quarantine purposes, we believe heat treatment will expand significantly. However, many wood suppliers are hesitant to invest in heat treatment facilities and capacity until they are absolutely certain that it will be required. That is another reason why messages indicating that the IPPC Guidelines are not the final solution create concern. It is true that we wish to minimize the cost of SWPM but we also must do so in a manner that is least disruptive to the environment overall.
3) We appreciate the detailed analysis of alternative mitigation methods and we support continued development of alternative technologies such as less corrosive and less ozone depleting fumigants (such as Sulfuryl Fluoride) and alternative heating technologies such as microwave irradiation. These appear to show promise for treating SWPM in an environmentally sound and economical manner.
4) Excerpt from Page 59: "Adoption of the IPPC Guidelines decreases the need for inspection by providing documentation and evidence of treatments to mitigate pest risks." Please clarify what was meant by 'providing documentation' in that sentence. We understand that there will be no required documentation accompanying the shipments; just the standard IPPC markings on the materials meeting PPO requirements. We reiterate that a requirement for government issued paper certifications to accompany shipments hinders global commerce.

EIPS urges the USDA/APHIS to provide global leadership by fully supporting and enforcing IPPC ISPM-15 Standard as the permanent US Standard. This will create a clear path for implementation and influence other countries also interested in pest

mitigation regulations to accept IPPC. Adoption of ISPM-15 by the USDA will effectively and quickly help solve pest mitigation issues.

We hasten to add that even with full global adoption of the IPPC standard, there will be considerable increase in the use of non-regulated alternatives which the EIS clearly states results in the best overall pest risk mitigation. Thus, many of the advantages of non-SWPM solutions will be achieved even if they are not mandated by US regulations.

In summary, don't allow this opportunity to pass; please settle this issue once and for all. Throw APHIS' full and unqualified support behind the IPPC Guidelines so that we can too.

Again, on behalf of the entire EIPS team, thank you for this opportunity to participate on this very important matter.

Warmest Personal Regards,

Robert T. Sanders
Chairman, EIPS Task Group and
IBM Corporate Packaging Program Manager
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Cc : EIPS Team Members
Patrick Farrey, Institute of Packaging Professionals
Susan Tuttle, IBM Governmental Affairs

December 30, 2002

Raymond B. Nosbaum
Senior Regulatory Coordinator
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 141
Riverdale, MD 20737

Dear Mr. Nosbaum:

Thank you for the opportunity to review the draft environmental impact statement for the importation of solid wood packing material into the United States. FAS/Forest and Fishery Products Division (FAS/FFPD) would like to offer the following comments based upon our review of "Importation of Solid Wood Packing Material, Draft Environmental Impact Statement – October 2002."

As you are well aware, the Guidelines were developed over a two-year period with significant input from forest owners, the business community, scientific experts, and plant health officials from around the world, and are intended to significantly reduce the pest risk associated with solid wood packing material, yet allow for the continued use of wooden pallets and containers in the movement of goods. FAS/FFPD fully supports APHIS' proposal to adopt the International Plant Protection Convention's "Guidelines for Regulating Wood Packing Material in International Trade" as a mechanism to address the pest risk associated with the importation of solid wood packing material into the United States.

Regarding APHIS' analysis of the environmental impact that would result from each of the alternatives, we are not aware of any research that would support the repeated assertions that adverse environmental consequences would flow from the increased use of (or demand for) forest products, nor the assertion that the environmental effects associated with the use of substitute packing material would be offset by the environmental benefit resulting from the reduced demand for wood products. From an environmental point of view, there is nothing inherently bad with using (or increasing the demand for) forest products, as long as the forests that serve as the source of those products are managed in a sustainable manner. Furthermore, life cycle assessments done to date would suggest that there are higher environmental costs associated with the use of non-wood substitutes. The assertions found on pages 9, 10, 11, 12, 38, 39, 42, 75, and 77 that imply the use of (or increased demand for) forest products is bad from an environmental point of view should be eliminated, unless those assertions can be substantiated.

APHIS has indicated that it "intends within a separate environmental and rulemaking process subsequent to this one, to develop, propose, and implement a final and permanent

strategy for the mitigation of risks from solid wood packing material." We believe that such an action could be premature and would encourage APHIS to analyze the effectiveness of the Guidelines before initiating any new rulemaking process, given the time and effort that went into the development of the Guidelines.

Sincerely,

C. Michael Hicks

C. Michael Hicks
Coordinator, Trade Policy
Forest and Fishery Products Division
Foreign Agricultural Service

INTERNATIONAL PAPER

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December 30, 2002

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Senior Regulatory Coordinator
Plant Protection and Quarantine
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U.S. Department of Agriculture
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

Re: ISAC-10 Comments on the APHIS draft environmental impact statement for importation of solid wood packing material

Dear Mr. Nosbaum

The Industry Sector Advisory Committee for Lumber and Wood Products (ISAC-10) is pleased to provide its views on the Draft Environmental Impact Statement with regards to the importation of solid wood packing material.

The wood products industry has a significant stake in the development of a regulatory scheme for wood packing material (WPM). WPM is used in the shipment of most commercial product around the world and, as such, any regulations on WPM will significantly impact the U.S. softwood and hardwood lumber industry. It is estimated that over 50% of the $2.0 trillion worth of goods that entered or left the United States in 2000 were in wood containers or on some type of wooden platform (e.g. pallets). Currently there are an estimated 2 billion pallets in use in the United States. Over 91% of all pallets purchased in the United States in 1999 were wooden pallets. 15% of total U.S. lumber production goes into pallet manufacturing. For hardwood lumber, the container and pallet industry uses approximately 4.53 billion board feet per year, which represents nearly 40% of U.S. hardwood lumber production. For softwood lumber, the pallet industry uses approximately 1.79 billion board feet per year. Nearly 7,000 U.S. facilities produce pallets nationwide.

More importantly, the pallet and packaging industries are a vital destination for low-grade wood. If not used in pallet manufacturing this value-added commodity would not be produced and the low grade wood would go to waste resulting in rippling economic effects in the form of mill closures and employment losses.

ISAC-10 Comments on APHIS Draft
December 30, 2002

Recommendation to Adopt the IPPC Guidelines

ISAC-10 acknowledges the growing number of pest infestation cases that have been traced back to untreated wood packaging material. As the draft EIS states, the International Plant Protection Convention (IPPC) has accelerated the development of global measures to minimize the pest risk and potential for environmental and economic harm associated with untreated WPM. ISAC-10 supported passage of the IPPC standard earlier this year and recommends that these standards be adopted by the U.S. government.

We believe that the IPPC standard is the best option compared to the other EIS alternatives presented including: 1) no change in the current regulation; 2) extension of the treatments/ regulations applied to imports from China to all countries; 3) comprehensive risk reduction program; 4) prohibition of WPM. The additional options offered are not an entirely effective means to minimize pest risk (no change), are trade restrictive or would be logistically difficult to manage and implement. ISAC-10 supports the APHIS position stated in the EIS that the measures contained within the IPPC standard are sufficient and do provide a substantial amount of assurance against pest risk. This is based on IPPC guidelines that indicate that the approved measures provide adequate mitigation of the pest risks that are of greatest concern to APHIS.

Finally, the IPPC standard will ensure that the U.S. is in conformance with international trade rules aimed at harmonizing regulations to prevent the infestation, establishment and spread of exotic and invasive species. As a result of the proliferation of standards, which are not consistent around the world, WPM exporters have been forced to manage inventories of pallets by destination, which is a logistical problem. Many companies now have to weigh the cost of using various pallet specifications on a country-by-country basis versus setting one standard and sticking to it.

Heat treatment

The current heat treatment measures required under the IPPC standard specify a time and temperature combination of 56°C for 30 minutes. We would be extremely concerned if APHIS advocated an increase in this time and temperature. Any requirement that exceeded the current heat treatment specifications would virtually eliminate hardwood producers from this market and cause significant economic disruption due to the major reliance of hardwood producers on this manufacturing sector. And, while this regulation specifically addresses imports, international trade rules require reciprocal actions by trading partners, meaning that any requirement(s) that apply to imported product must also apply to our own domestic manufacturers – unless there is scientific justification that proves otherwise. Again, as stated in the EIS, the measures contained within the IPPC standard are sufficient and do provide a substantial amount of assurance against pest risk.

Methyl Bromide

APHIS indicates in the preferred option that allowing methyl bromide treatment would result in substantial use of this fumigant. However, as discussed in the EIS, worldwide quarantine and pre-shipment (QPS) uses of methyl bromide account for only 28 percent of all uses while U.S. QPS methyl bromide use accounts for 9 percent of total use. The EIS also states that with the phase-out of methyl bromide for other uses, continuing QPS uses would contribute about 0.3 percent to annual stratospheric ozone depletion. Even this figure is likely to be an overestimate and conservative given that pallets can also be heat treated and thereby a substitute for methyl bromide use.

Increased Demand for Wood

ISAC-10 is seriously concerned about inaccurate statements made in the EIS that assume that an increased demand for wood products translates into negative environmental effects. While it is uncertain that the preferred IPPC option will result in an increase in demand for wood products given that other substitute materials can be used, **the negative environmental effects assertion is not supported by facts.** The U.S. forest products industry has committed to the practice of sustainable forestry on its own lands and promoting sustainable forestry practices on non-industrial private forest lands. We would be pleased to supply documented proof that America's private forest lands are on the continuous pathway to sustainable management.

Furthermore, in order to conduct an adequate assessment of any adverse environmental impacts with the use of forest products, there also must be a comparison of substitute materials that would take the place of wood-based packing material. On those terms, the results are crystal clear. By any water quality, air pollution or energy use environmental measure, wood products are clearly environmental performance leaders. It takes between 33 and 47 percent less energy to produce a wood product than a similar product made from competing materials such as concrete and steel, and produces less carbon dioxide emissions. Additionally, in the conversion of trees to manufactured product, there is little if any solid waste to dispose of in landfills. Every part of the tree is used in producing the solid or engineered wood product, wood chips for use in paper manufacturing and renewable biomass energy that displaces fossil fuels.

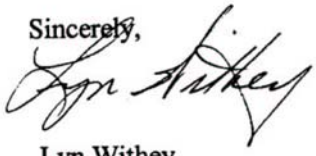
Ban on Wood Packing Material Option

Of the five alternatives discussed in the draft EIS, the prohibition on use of WPM is clearly the most disruptive and economically-crippling option to an industry that has made significant strides in improving environmental performance. As discussed above, this option is not the most environmentally-friendly and overall life-cycle impacts show far greater deleterious impacts from using non-wood based substitute materials. Further, selection of this alternative would be flawed given that the draft EIA contains no analysis for public review and comment of the environmental impacts associated with increased use of substitute packing materials such as plastic.

As a final thought on this option, the opinion stated on page 74 of the draft EIS reads: "Restrictions placed upon acceptable packing materials would not satisfy the provisions of the SPS Agreement because they would not meet the "not significantly less restrictive to trade" requirement." The Sanitary and Phytosanitary (SPS) Measures require that nations' regulations should not be more trade-restrictive than required to achieve the needed level of protection. As the APHIS EIS outlines, the IPPC option provides the necessary level of protection against the most significant, threatening and damaging pests to the nation's forests. An outright ban on the use of WPM, in favor of substitute materials, without credible and proven scientific justification would violate the WTO rules.

ISAC-10 appreciates the opportunity to provide comments on the draft EIS. We would like to offer our continued support to U.S. officials working on this standard and are happy to help whenever possible. Please do not hesitate to contact any of our industry experts for further guidance or information on this issue.

Sincerely,



Lyn Withey
Chair, ISAC-10

cc: David Brooks, USTR
Alan Greene, PPQ/APHIS/USDA
Michael Hicks, CMP/FAS/USDA
Narcy Klag, PPQ/APHIS/USDA
Franklin Lee, CMP/FAS/USDA
Scott Reynolds, FFPD/FAS/USDA
Beverly Simmons, ITP/FAS/USDA
Bill Snell, PPQ/APHIS/USDA
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Tom Westcot, FFPD/FAS/USDA

"PAUL HANSEN" <phansen@iwla.org> on 12/17/2002 01:24:40 PM L3. 12

To: <regulations@aphis.usda.gov>
cc: "Jim Mosher" <jmosher@iwla.org>, "JEFF FLEMING" <JFleming@iwla.org>

Subject: Comments

Comments of the Izaak Walton League of America

The USDA Plant Health Inspection Service (APHIS)
DEIS on Regulations to limit the importation of harmful invasive pests and diseases on wood used for pallets, crates and containers
Due by Dec 30, 2002.

As you know, the introduction of many invasive species such as the gypsy moth, emerald ash borer, and asian longhorn beetle are having a serious impact on forests and the economy in the U.S. The major vector for the introduction of these species, and others, are imported crates, pallets and other kinds of packaging made from untreated green whole wood.

The Izaak Walton League of American believes that there is a simple and cost-effective way to shut down the vector by which these horrible tree diseases are introduced into the Unitied State -- by requiring that all wood imported as pallets and crates etc. to be constructed entirely from Oriented Stand Board (OSB) or other low cost, engineered wood products. The high heat required to make these products sanitizes the wood and assures that no disease species can survive.

The APHIS preferred alternative, fumigation with methyl bromide, may not eliminate all pests, may be applied incorrectly, and has high environmental costs. Even more disadvantageous is the fact that this method makes compliance almost impossible to enforce because it is not visually apparent if the wood has been treated. If OSB use is required, any dockworker or casual observer will be able to know instantly if the imported crate or pallet is legal and safe. We believe that this method would also provide significant cost advantages, since no treatment of the wood product is required, and OSB products that might have visual imperfections making them unsuitable for other commercial application could be used.

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Raymond B. Nosbaum
USDA APHIS PPQ
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

Dear Mr. Nosbaum,

Please accept these comments on the USDA APHIS Importation of Solid Wood Packing Material Draft Environmental Impact Statement (DEIS), released in October 2002.

I support alternative 5.

Exotic pests are costing taxpayers millions of dollars. For example, the cost of controlling gypsy moths in Oregon and Washington from 1985 to 1995 was more than $50 million (from *Summary of Current Status of Exotic Species in Oregon* by OSU professors Stevan J. Arnold and Jill Anthony).

Some of the exotics in Oregon are:

- Gypsy moth. An insect. Prefers hardwood trees, such as oak.
- Sudden oak death syndrome. Caused by *Phytophthora ramorum*, an exotic fungus. It also attacks rhododendrons, madrone, evergreen huckleberry, and possibly Douglas fir —all found in Oregon.
- Dogwood anthracnose disease. Caused by an exotic fungus. Attacks the Pacific dogwood, which is found in the understory of Pacific Northwest forests.
- Port-Orford-Cedar root disease. Caused by *Phytophthora lateralis*, an exotic algal fungus. Attacks the roots of the Port Orford Cedar, which is found only along the Pacific coast of southern Oregon and northern California.
- White pine blister rust. Caused by *Cronartium ribicola*, an exotic fungus. Attacks coniferous forests.

I do not support the IPPO standard for wood packaging. The IPPO standard calls for heating the wood to 56 degrees C for 30 minutes and fumigation with methyl bromide. Methyl bromide is a toxic chemical that damages the Stratospheric ozone layer.

The most effective way to prevent insects from hiding in packaging is to manufacture it from alternative materials rather than from boards or other types of solid wood. Forest pests cannot live in packaging made from fiberboards, plastic, metal, or fiberglass. This type of packaging does not need to be treated using heat or toxic chemicals, so money is saved and environmental impacts reduced. The USDA's inspectors can easily verify that the packaging meets regulatory requirements.

Packaging made from alternative materials is already available from suppliers around the world, but shippers will need time to obtain adequate supplies. During the phase-in period, when APHIS must rely on less effective treatments, the agency should increase its inspections of wood packaging entering the country, aggressively penalize violators, and build up surveillance programs to detect quickly forest pests that enter the country.

Sincerely,

Joanne Vinton

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December 24,2002

Raymond B. Nosbaum
USDA APHIS PPQ
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

Dear Mr. Nosbaum:

I wish to comment on the USDA APHIS Importation of Solid Wood Packing Material Draft Environmental Impact Statement (DEIS), released in October, 2002.

I am a lifetime member and past president of the Lane County Master Gardeners. Our organization works with the Extension Service to help people with their gardening problems. Over the years, we have seen a lot of invasive plant and animal species enter our area, sometimes as a result of a very small number of accidentally introduced pests. For this reason, I am very concerned about the danger of wood-boring insects and other pests being introduced through solid wood packing materials (SWPM).

The DEIS lists five possible alternatives in responding to this problem:
1) no action/no change in current regulations
2) extending treatments required for China to all countries
3) adopting International Plant Protection Convention (IPPC) standards
4) a comprehensive risk reduction program
5) prohibiting SWPM, allowing only substitute materials

The analysis of these alternatives found that the fifth alternative, prohibiting SWPM and allowing only packaging from substitute materials, would provide the best protection. However, APHIS chose the third option, adopting the IPPC standard, as the preferred alternative.

I do not believe that the third option would give adequate protection against invasive wood-boring insects. Furthermore, it has the potential of dramatically increasing worldwide use of methyl bromide, which would damage the ozone layer and increase the amount of ultraviolet radiation reaching the earth. Instead of the third option, I believe that you should choose the fifth option, or else choose a sixth option, which was not mentioned in the DEIS, but which was proposed by the American Lands Alliance and others during the scoping process. This alternative consists of phasing in a prohibition of SWPM over a period of years.

I do not believe that adopting the IPPC standard will provide sufficient protection for our forests. In the DEIS, APHIS mentions that scientists have significant doubts about both heat treatment and methyl bromide for killing pests deep inside wood, especially in larger blocks of wood used to brace cargo. The DEIS even states that some deep wood-borers, fungi, rots, and wilts may not be killed by the treatments specified in the IPPC standard. It also states that "the limited efficacy data may require considerable research effort to ensure that the IPPC Guidelines meet the pest risk standards that APHIS currently expects".

In addition to offering insufficient protection, adoption of the IPPC standard would greatly increase the world's use of methyl bromide. In the DEIS, APHIS estimated that adoption of the IPPC standards would result in total annual worldwide methyl bromide releases of up to 5,145 tons. However, this figure was reached under the assumption that materials used for SWPM would be fumigated before the packaging is assembled. An FEIS released in September 2002 (Rule for the Importation of Unmanufactured Wood Articles From Mexico, With Consideration for Cumulative Impact of Methyl Bromide Use) stated that releases of methyl bromide could reach up to 102,893 metric tons if the SWPM is fumigated after commodities are loaded. This figure is probably the more accurate one. Fumigation after packaging is more likely to be used than pre-assembly fumigation, since it provides more protection against re-infestation, and can be done in centralized locations, rather than in scattered production sites. The DEIS does not take into account what would happen in such a case. However, the impacts need to be examined. The 102,893 figure is more than double the 49,000 metric tons used world-wide in 1999. Such a dramatic increase in methyl bromide use would undoubtedly have a significant effect on the ozone layer.

Given the inadequacy of the IPPC standard both for protecting our forests from invasive pests and for protecting the integrity of the ozone layer, APHIS should choose a different option. The best of the five options in the DEIS is the fifth one, the prohibition of SWPM. In fact, this is the alternative that APHIS has determined to be the best in terms of protecting against forest pests and causing the fewest environmental impacts. Since an immediate ban on SWPM would be very difficult for the shipping industry to deal with, APHIS should choose the sixth alternative suggested by the American Lands Alliance and others, that of phasing in a prohibition of SWPM over a period of years.

Although this option was not presented in the DEIS, it did appear in an Advance Notice of Proposed Rulemaking (ANPR) published on January 20, 1999 (Federal Register Volume 64, Number 12). The third option in this document was to "prohibit the importation of SWPM in any form and from any country". The report noted the advantages of this option for pest control and decreased use of methyl bromide, but noted that "it could have an undesirable effect on international trade".

However, it went on to say that "this effect could be mitigated by a phase-in period to allow shippers to adjust to the prohibition, and, during this time, heat treatment, treatment with preservatives, fumigation, or other effective alternative treatments could be required before SWPM could be imported".

The DEIS states that APHIS will continue working towards an undefined "long-term strategy". But undefined strategies with undefined deadlines tend not to get accomplished. It would be much better both to define the strategy and set a deadline for its implementation. Since the most effective strategy that APHIS has considered is a ban on SWPM, that is the long-term goal for which they should aim. If that goal is stated, and a realistic timeline arrived at, then the shipping industry can start to make realistic preparations.

Thus, my recommendation to APHIS is to set a long-term goal of banning SWPM, and to meanwhile set a realistic timetable for phasing in this ban. This option provides our best hope of protecting our forests from exotic pests and minimizing damage to the ozone layer, while accommodating the needs of our trading partners and the shipping industry.

Thank you for the opportunity to comment on this matter.

Sincerely

Carol Feinberg-McBrian

Carol Feinberg-McBrian

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National Hardwood Lumber Association

INTEGRITY-SERVICE SINCE 1898

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December 17, 2002

Raymond B. Nosbaum, Senior Regulatory Coordinator
USDA/APHIS/PPQ
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

Dear Mr. Nosbaum:

The National Hardwood Lumber Association has reviewed the draft environmental impact statement for rulemaking associated with the importation of solid wood packing material. All comments are in regards to the following section:

Importation of Solid Wood Packing Materials
Draft Environmental Impact Statement—October 2002

IV. Environmental Consequences
A. Program Alternatives
5. Substitute Packing Materials Only (Prohibition of SWPM)
c. Aggregate Consequences

In the conclusion to aggregate consequences for "Substitute Packing Materials Only" (p.77), the author leads the reader with undefined values for "environmental effects" and "environmental benefits." The author's opinion is that "manufacturing processes and uses of raw resources [non-wood] probably would pose some environmental effects, which probably would be offset by the environmental benefit resulting from a reduced demand on raw wood products." These biased comments ("probably") have assessed a cost for unknown "environmental effects" that is equaled to or less than the "benefit" associated with reduced raw wood use. There is no merit to this statement.

Benefits are relegated to persons. To whose benefit is substituting roughly 95% of current pallet raw materials for non-renewable, cost-ineffective alternatives? There is no mention of the "environmental effects" of obtaining additional non-wood materials (from earth excavations and extractions) in order to transition from 5% of the current pallet market to 100%. While recycling is an option, one cannot recycle what is not yet available.

The author makes note of increased durability and ability to recycle wood alternatives. Recycling wooden pallet components is a simple process of breaking

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existing pallets apart and creating new pallets using the remaining sound pieces. This practice is considerably more cost effective than most recycling practices for non-wood alternatives.

In addition, no mention is made of pallet repair. Many non-wood pallets cannot be repaired without being broken down and reformed (recycled), while wooden pallet repair consists of simple component replacement and fastening.

Thank you for sending an advanced copy of the draft EIS. NHLA appreciates the opportunity to review and comment on the issue.

The National Hardwood Lumber Association, established in 1898, represents 1800 firms that manufacture and use hardwood lumber.

Sincerely,

Paul Houghland C.A.E.
Executive Manager

no extra cc/ CRay 16

NATURAL RESOURCES DEFENSE COUNCIL

December 24, 2002

Mr. Raymond B. Nosbaum
USDA APHIS PPQ
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

Re: Draft Environmental Impact Statement for Importation of Solid Wood Packaging Material (Oct. 2002)

Dear Mr. Nosbaum:

The Natural Resources Defense Council (NRDC) has joined in the comments of the American Lands Alliance and other organizations and individuals on the USDA APHIS Importation of Solid Wood Packing Material Draft Environmental Impact Statement (DEIS), released in October 2002. NRDC submits these additional comments to supplement that joint submission.

The Draft EIS does not meet the minimum legal standards for environmental impact statements for at least three reasons. First, it does not present a comprehensive, accurate, and understandable assessment of the risk to the ozone layer from the huge increase in methyl bromide use that is likely to result from the "preferred alternative" identified in the draft. Second, the draft does not adequately assess whether methyl bromide treatment actually provides effective protection against the presence of destructive alien pest species in solid wood packaging material. Third, the draft does not examine the alternative of *phasing out* solid wood packaging material over a period of years; instead it looked only at the alternative of an immediate ban on such packaging.

NRDC believes that a fair and thorough examination of these issues would result in these conclusions:

- That the alternative of relying on heat or methyl bromide treatment is not fully effective at controlling the risk of invasive pest infestations, and is less effective than the alternative of phasing out solid wood packaging material (SWPM).
- That alternative of relying treatment by heat or methyl bromide would result in a huge increase in methyl bromide use, posing an unacceptable additional risk of damage to the stratospheric ozone layer and of deaths and illnesses to American citizens and to others – risks that are unnecessary in light of the option of phasing out SWPM.
- That a reasonable schedule for phasing out SWPM over several years would provide ample opportunity for producers and users of packaging material to switch to alternative materials at insignificant cost increases and without disruption to international trade.

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- That a phase-out of SWPM over several years, accompanied by heat or methyl bromide treatment during the phase-out period, would more effectively protect U.S. forests from invasive pest infestations while minimizing damage to the ozone layer and without significant economic impact.

The remainder of these comments amplify several of the points made in the American Lands comments.

1. Underestimation of Methyl Bromide Emissions

Methyl bromide is a potent ozone-depleting chemical. It has the highest ozone depletion potential of any compound still in use (except for small amounts of CFCs allowed for medical purposes). It is scheduled for phase-out in both developed and developing countries under the Montreal Protocol on Substances that Deplete the Ozone Layer. The United States is a party to the Montreal Protocol and to its amendments concerning methyl bromide.

Quarantine and pre-shipment uses of methyl bromide were exempted from the Protocol's phase-out of this chemical on the basis that those uses were relatively small and not likely to grow significantly. The proposal to require heat or methyl bromide treatment of SWPM, however, threatens to cause a huge world-wide expansion in quarantine use of methyl bromide.

The Final EIS on importation of logs from Mexico, issued in September of this year, purported to include an assessment of the increase in world-wide methyl bromide use that would occur if the U.S. required all SWPM coming into this country to be treated with heat or methyl bromide. If there is a requirement upon exporting nations to treat all SWPM with heat or methyl bromide, the most reasonable assumptions are (1) that methyl bromide will predominate over heat treatment, and (2) most methyl bromide treatment will occur at central points, such as port facilities, after goods are packaged in wood crates or onto wood pallets.[1] Under that scenario, the FEIS estimated that methyl bromide use treatment of SWPM could rise to nearly 103,000 metric tons.

By comparison, total 1999 world-wide consumption of methyl bromide *for all purposes* was 49,000 tons. Total consumption in the U.S. – the world's largest present user – for

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[1] The September FEIS asserts, without any documentation, that "treatment" – it is not clear whether than means heat treatment or methyl bromide treatment – "appears" to be occurring in China prior to goods' being packaged in SWPM. This is not consistent with information that is available to us. Our understanding is that methyl bromide treatment is the dominant treatment being used in China. Further, it is our understanding that most methyl bromide fumigation is occurring in centralized facilities at ports after goods are packaged. For example, one method of treatment is to fumigate whole shipping containers after goods have been placed inside, in their packaging, for export shipment.

Further, there would be significant problems verifying whether wood packaging material was treated, with either heat or methyl bromide, at decentralized locations in advance of goods' being packaged. Since methyl bromide treatment does not change the appearance of wood material or leave a readily detectable residue, how could APHIS verify that wood packaging had indeed been treated upstream?

all uses in 1999 was somewhat under 12,000 metric tons. And total U.S. use for quarantine purposes in 1999 was only 254 metric tons.

In other words, the September FEIS projects that this single quarantine requirement for SWPM could increase use of methyl bromide by *more than double* total world-wide use, *more than 8 times* total U.S. use and by *more than 420 times* U.S. use for quarantine purposes.

This is huge!

Unaccountably, the draft EIS now under review leaves out this most likely scenario for fumigation in central points after products are packaged. Instead it presents only a much smaller estimated increase based on the unrealistic assumption that SWPM will be fumigated in decentralized locations before it is assembled into crating, pallets, etc., and before goods are packaged in it. Even these unreasonable assumptions lead to a major increase in methyl bromide use.

Further, it is not clear from these documents – either the September final EIS or the current draft EIS – whether these estimates account only for methyl bromide use for SWPM-packaged products being imported into the U.S., or whether they also account for (1) methyl bromide use for such products shipped between other countries and (2) methyl bromide use for such products shipped from the U.S. to other countries. This must be clarified and new estimates must be prepared as appropriate.

It is worth emphasizing that the rationale for exempting quarantine and pre-shipment uses of methyl bromide from the Montreal Protocol's phase-out requirement – and the domestic phase-out requirements of the Clean Air Act – was that these uses were minor in comparison to total methyl bromide consumption and were not expected to grow substantially. A requirement for heat or methyl bromide treatment of SWPM will result in a phenomenal increase in methyl bromide use totally out of proportion to the original premises of the Montreal Protocol parties at the time of the adoption of the methyl bromide phase-out amendments.

Were this rule to go forward, a number of parties to the Protocol would be likely to seek re-opening of this issue and further amendment of the Protocol to protect against this increase in methyl bromide use. They would be supported in this matter by environmental nongovernmental organizations world-wide.

Given the ready availability of a safe and more effective alternative – the phase-out of SWPM – the proposed increase in reliance on methyl bromide for quarantine purposes is totally unreasonable.

2. Failure to Assess the Phase-Out Option

The DEIS fails to assess the alternative of a reasonable phase-out schedule for SWPM, with interim reliance on heat or fumigation. Instead the DEIS presented only the option

of a ban on SWPM, with no assessment of the practicality and cost of a phased switch to alternative packaging materials on a scheduled basis, culminating in a complete phase-out of SWPM.

The absence of this alternative is all the more striking in view of APHIS's 1999 advance notice, which specifically identified a phase-out of SWPM as a solution that would be assessed. The 1999 notice identified APHIS's third option: "to prohibit the importation of SWPM in any form and from any country. ..." APHIS contemplated allowing alternative packing material made from "processed wood (e.g., particle board, plywood, press board) and nonwood materials (e.g., plastic). APHIS went on to say, "The advantages of this option are that *it would provide the greatest protection against pest risk and could eventually result in decreased use of methyl bromide.* A disadvantage of this option is that it could have an undesirable effect on international trade. *This effect could be mitigated by a phase-in period* to allow shippers to adjust to the prohibition, and, during this time, heat treatment, treatment with preservatives, fumigation, or other effective alternative treatments could be required before SWPM could be imported." [emphasis added]

In the ANPR, APHIS explicitly asked for public comment addressing several questions, including:

- What would be the economic, environmental, or other effects of prohibiting the importation of SWPM from any country, including disruption in trade and potential delays in shipping, effects of alternative materials on the environment, etc.?

- One advantage of wood dunnage is that it is biodegradable. What would be the environmental effects, if any, of requiring that nonbiodegradable material be substituted for wood dunnage?

- If importation of SWPM into the United States were to be prohibited, or if treatment of some kind were to be required for all SWPM imported into the United States, would the shipping industry need a phase-in period to allow time to adapt? If yes, how long?

In scoping comments on the DEIS, American Lands specifically identified the option of a SWPM phase-out as a measure to be assessed in the EIS process. Like the 1999 APHIS notice, American Lands noted that this option would both better protect against the risk of pest infestations and better protect the stratospheric ozone layer.

The DEIS does not assess this option. It parrots previous concerns that a sudden ban in SWPM might have effects on international trade, but it ignores APHIS's own 1999 finding that such effects "could be mitigated by a phase-in period to allow shippers to adjust to the prohibition."

A rational assessment of these issues would examine alternative phase-out schedules, looking at the practicality and cost of switching to alternative packaging materials over

the alternative schedules, as well as the amounts of methyl bromide that would be used over such schedules.

NRDC believes that a several year phase-out period would be sufficient to permit the necessary change in packaging practices at minimal cost and without disruption to international trade. By way of comparison, we note that ozone-depleting chemicals themselves have typically been phased-out in 10 years or less.

NRDC also notes that this alternative would more completely protect against the risks of pest infestation and avoid a huge step backwards in the still-incomplete effort to protect the ozone layer.

* * *

Given the importance and magnitude of the omissions and errors in this DEIS, NRDC requests that APHIS prepare a supplemental draft statement – prior to issuing a final EIS – addressing the issues identified in these comments and those of American Lands. In particular, the supplemental draft is needed to provide an initial assessment of the missing phase-out option and an opportunity for all participants and stakeholders to comment on that assessment.

As already noted, NRDC has joined in, and endorses, the comments of American Lands. Thank you for the opportunity to comment.

Sincerely,

David D. Doniger
Policy Director and Senior Attorney
Climate Center
Natural Resources Defense Council

Jane Hogan <jnhogan@moonstar.com> on 12/05/2002 08:56:11 PM

To: raymond.b.nosbaum@aphis.usda.gov
cc:
Subject: Importation of SWPM - Draft EIS - October 2002

Dear Ray:

I enjoyed meeting you this week and do thank you for coming to Keysville to give such a thorough presentation of the IPPC Guidelines for SWPM. Your spelling out both timetable and requirements for hardwood pallet manufacturers and sawmills was most helpful.

In way of comment on the Draft EIS - October, 2002, for Importation of SWPM, I support the APHIS choice of Alternative 3 to adopt the IPPC Guidelines. Use of these Guidelines integrates the United States with the international community. Their use is the only practical and economic choice to ensure the free flow of trade.

Furthermore, as a member of the hardwood industry I oppose Alternative 5 of using substitute materials, because it is both economically and environmentally unsound. It would create havoc with the lumber industry and its significant contribution to our gross national product and employment. It also would create a pallet shortage severely detrimental to our trade. Such a shortage might easily last beyond the near term because substitute material like plastic costs more than wood and is not

readily repairable.

Contrary to the opinions of those claiming to be environmentalists, wood is far more environmentally friendly than any substitute material like plastic. Plastic consumes a non-renewable resource, whereas wood is infinitely renewable and produced primarily by solar energy in the forest. According to Dr. James Bowyer, Professor of Forestry at the University of Minnesota, "...wood is renewable, recyclable, biodegradable and far more energy efficient in its manufacture and use than are products made from steel, aluminum, plastic or concrete." [Evergreen (magazine), Winter, 2000, p.30]

Furthermore, the manufacture of these substitute materials requires use of fossil fuels emitting high levels of carbon dioxide, whereas growing forests absorb carbon dioxide. Mature forests with slow growth must be harvested to make way for rapidly growing trees that continue to provide a carbon sink. Without harvest, there is little growth, only carbon dioxide emission from fire or from decay that follows mortality.

The environmentalist claim that Alternative 5 will help save forests is also fallacious, because urbanization, not timber harvesting, is the greatest cause of forest loss. 1997 USFS figures show that over 71% of forestland in the entire United States is privately owned. When the vast Forest Service lands in the West which produce little timber are discounted, the Draft USFS RPA Assessment 2002 shows private ownership approaching 90% in the East and South.

When these private owners lack the economic incentive to keep their land in trees, they sell to developers. Contradictory as it may seem, if we want to save our trees we must use their products. Alternative 5 would indeed prevent pests from traveling in wood, but it is economically and environmentally unsound.

To conclude, Alternative 3 is the superior choice for now and for the future. The IPPC Guidelines will achieve pest control and the free market will determine product choice.

This ends my formal comment. I'm glad we met, thank you again for coming, and hope the snow didn't catch you all too badly today.

Sincerely,
Jane Hogan
Ontario Hardwood Co., Inc.
190 West Ontario Road
Keysville, VA 23947

Nancy Osterbauer <nosterba@oda.state.or.us> on 12/30/2002 04:30:04 PM

To: raymond.b.nosbaum@aphis.usda.gov
cc:
Subject: comments on draft EIS for SWPM

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30 December, 2002

Importation of Solid Wood Packing Material Draft Environmental Impact Statement - October 2002
Raymond B. Nosbaum, Senior Regulatory Coordinator
USDA/APHIS?PPQ
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

Thank you for the opportunity to provide input on the Importation of Solid Wood Packing Materials (SWPM) Draft Environmental Impact Statement (EIS) - October 2002. As stated previously in the USDA APHIS's and Forest Service's joint Pest Risk Assessment for Importation of SWPM into the United States, nearly all (97%) interceptions of quarantine-significant tree pests have been associated with SWPM. The risks presented by the SWPM pathway must be minimized to ensure protection of our native forests. This is of particular importance to the Pacific Northwest due to our numerous timber and tree-related industries. A thoroughly researched and well-analyzed EIS will help ensure that the final regulations meet the goal of protecting U.S. forests, agriculture, and the environment. APHIS has proposed accepting the IPPC guidelines for regulation of SWPM. Comments on the advantages and disadvantages of the mitigation treatments proposed in the IPPC guidelines, particularly methyl bromide fumigation, follow.

Fumigation with Methyl Bromide. Fumigation has some major disadvantages: it cannot be verified at a later date, does not prevent reinfestation, and does not penetrate to the center of thick boards or timbers. Its advantages include ease of application and relatively low cost. Methyl bromide is a potent ozone-depleting chemical subject to the strictures of the Montreal Protocol. It is scheduled to be phased out of existence in the near future, making it a temporary treatment option rather than a permanent one. As discussed in the EIS, increased use of methyl bromide would be detrimental to the ozone layer.

Currently, APHIS accepts two fumigation treatment schedules; the T312 and the T404 schedules. The T312 schedule is effective against pathogens and pests found near the wood surface while the T404 schedule is effective against insect pests found near the wood surface. Neither is effective against deeper pests and pathogens. The methyl bromide fumigation schedule listed in the IPPC standards (proposed rule) is less efficacious than schedules T312 and T404. It would not effectively mitigate the pest risk associated with SWPM, particularly for deep-seated pests such as the Asian long-horned beetle (*Anoplophora glabripennis*).

Heat Treatment (with or without moisture reduction). Heat treatment without moisture reduction has similar disadvantages to fumigation. It cannot be verified at a later date and heat treated wood that is still green is subject to reinfestation. Whereas fumigation only affects pests and pathogens on or near the wood's surface, heat treatment can destroy pests and pathogens found deep within the wood. Kiln-drying (heat treatment with moisture reduction) would be preferable to heat treatment alone. In contrast to heat-treated lumber, kiln-dried lumber is rarely reinfested after treatment. Also, moisture reduction can be verified with a hand-held moisture conductivity meter.

The federal schedule of 71.1fC for 75 minutes measured at the core is effective against pests and pathogens found deep within the wood and on or near the wood's surface. The proposed IPPC standard of 56fC for 30 minutes measured at the core is effective against pests found on or near the wood's surface (e.g., *Bursaphylenchus xylophilus*) , but is less effective against deeper-seated pests (Newbill and Morrell, 1991, For. Prod. J. 41:31-33).

Other Treatment Options. In this draft EIS, APHIS has effectively introduced and discussed several alternative treatment options including irradiation, other fumigants, and the use of controlled atmospheres or alternative packing materials. However, one alternative treatment that we believe deserves further consideration is the use of wood preservatives. Wood preservatives have both fungicidal and insecticidal properties. Thus, treatment of wood with a preservative or long-term protectant would be effective against many pests and pathogens. Efficacy is dependent on proper execution of the treatment and upon the wood being pest- and pathogen-free prior to treatment. While many preservatives contain compounds that are hazardous to workers (*e.g.* carcinogenic) and to the environment, a few, in particular borate compounds, are relatively non-toxic, inexpensive, and environmentally safe. Treatment with a preservative can be verified by a chemical test and preservative-treated wood generally lasts longer than untreated wood. This treatment option has reportedly been used effectively by Chinese exporters. However, it is not available in the proposed IPPC guidelines.

In this draft EIS, APHIS addresses five treatment options, listing the proposed IPPC guidelines as its preferred alternative. However, the IPPC guidelines were developed with specific pests of quarantine significance to the European Union in mind. The proposed fumigation and heat treatment schedules in the IPPC guidelines would not be effective against many of the deep-seated plant pests and pathogens described in the SWPM pest risk assessment. A better alternative would be to extend the China interim rule to all countries. As described in the EIS, both the IPPC guidelines and China interim rule share similar environmental risks. However, the China interim rule provides greater protection against the introduction of exotic pests. It also provides more treatment options for exporting countries.

Please, carefully explore all of the risks associated with methyl bromide. The treatment is not effective against deep-seated pests and pathogens, can be dangerous to applicators and inspectors, does not protect wood from reinfestation, and depletes the ozone layer. Because of its ozone-depleting properties, methyl bromide is being phased out of existence throughout the world. Obviously, any treatment is better than no treatment. However, given the status of methyl bromide and the dangers associated with it, fumigation with methyl bromide would be better used as a tool for regulators dealing with infested materials only.

Thank you for the opportunity to contribute to the development of the EIS. If you would like clarification on any of these issues, please contact me.

Sincerely,

Nancy K. Osterbauer, Ph.D.
Survey Plant Pathologist

December 23, 2002

Raymond B. Nosbaum
USDA / APHIS / PPQ
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

OREGON
STATE
UNIVERSITY

I am responding to Importation of Solid Wood Packing Material, Draft Environmental Impact Statement - October 2002.

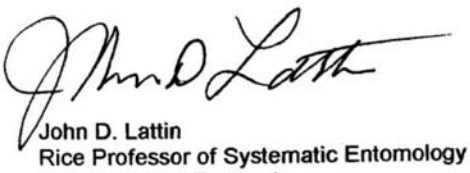
First, I would like to say that this is the fourth year such a report has been sent for review. In each case, the reports were sent at least 3 weeks after the comment start date and received about 6 days later. In each case, response had to be back in Washington by December 30! In each case, the reports have been sent out to arrive in the holiday season, a sure way to reduce comment on any report. This is an unacceptable procedure when you pretend to seek comment. Immediate changes should put into place to make such methods absolutely prohibited. The idea seems to have been: get it off my desk so I can leave on holiday and ruin this same season for others. It has been such a common practice that it could hardly be put down to "accidental". Having responded to such reports for 15 years, I can tell you that such recurring events have given your organization a very bad name.

This report spends many pages to cover a subject that has been covered many times before. Excessive verbage has been spent on fumigation with materials soon to be prohibited (methyl bromide). Further, it has been shown many times that this compound does not penetrate far enough to eliminate many organisms inside the wood. The compound also creates serious health problems - problems indicated but largely ignored. Heat treatment is the only method of assuring pest-free material. This has been known for a long time but often side-stepped in favor of options that are not effective.

The risks of introduction of non-indigenous organisms is potentially very high. We have examples of successful accidental introduction and establishment occurring every year. Our natural resources are simply too valuable to be placed at excessive risk. APHIS is supposed to be the major line of defense but far too often warps their efforts towards worrying about how business would be affected than about the consequences. It is clear that SW PM is an important issue, representing as it does 95% of the use in shipping.

Your statement about endangered species is simply wrong. You show no proof on the validity of your opinion. Having spent many years studying th impact of exotic species on native organisms, I can assure you that your statement "...and has concluded that there will be no adverse effects on endangered and threatened species or their critical habitats as a consequence of program treatments" is wrong. If the treatments are not effective, do you seriously believe it is still alright and not a threat to sensitive species? The literature is full of proof of damage.

In short, I find this report much like most of the others examined - excessive verbage with little or no proof to back up the statements. As usual, it is very short on real biological knowledge and proof - hardly the way to approach such problems.



OREGON
STATE
UNIVERSITY

John D. Lattin
Rice Professor of Systematic Entomology (retired)
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Oregon State University
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PACKAGING UNLIMITED

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December 27, 2002

Raymond B. Nosbaum Senior Regulatory Coordinator
USDA/APHIS/PPQ
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

Substitute Packing Material as a Solution to the Infestation Issue with Solid Wood Packing Material

After reviewing and discussing the contents of the Environmental Impact Statement of October 2002 the Importation of Solid Wood Packing Material there are a number of concerns and observations that need clarification. It appears that due to the lack of information and knowledge about alternative products and materials the statement buries itself in detailing how solid wood products can redeem themselves in order to remain useful as a packing material.

What is really astounding is the methods that were identified to purify the solid wood material are costly to administer and unhealthy to the environment and to individuals applying the process. They are not only unhealthy and costly but they don't guarantee the thoroughness and the longevity of eliminating the infestation of pests. The report goes on to consider the need for added inspectors at the ports but that will be expensive and not conclusive. The report also states that importers or shippers are subject to civil penalties, criminal fines, jail sentences, and losses of revenue for failure to follow regulations. However it was explained to Packaging Unlimited that the manufactures of the wood material are to be held responsible rather than the users of the material. This, in our opinion is not the most effective method of administering the regulations. Unless the user of the material along with the manufacturers are held accountable the ultimate compliance agreements are not complete. The user of the material must hold the manufacturer accountable for the product that he presents. Without this accountability it will be too easy to point fingers and ignore the proper responsibility in accordance to the regulations.

It has been estimated that there are over 4500 manufactures of pallet and solid wood products in the United States. It is hard to believe that all of these companies without the concerned surveillance of their customers will conscientiously govern themselves in the administration of the regulations. However if they know that they may jeopardize a business relationship along with facing civil fines and jail sentences it may create a more ardent attitude in fulfilling their obligation.

After reviewing all of the proposed material on purifying the solid wood products there appears to be a solution that addresses all of the concerns. That solution is the recognition and the substitution of alternative materials. On page 37 of the statement it states: "also, Although some substitute packing materials show great promise (i.e., corrugated pallets), there may be limitations on there use..." This observation causes some concern as to how APHIS collected the information to make such a statement and to draw such a conclusion. Corrugated pallets as we know them and produce them are available today and they have been independently tested and they perform like a wood pallet. Corrugated pallets have and are being used in Europe and Asia without facing any limitations. Currently in the United States they are getting a wider acceptance and they are performing to the satisfaction of many users. This is being accomplished without the dangers being presented to the environment and to the personal health issues. Companies who aren't concerned about the manufacturers circumventing the rules and regulations that will be imposed by the regulatory agencies are also using them.

Over the years the corrugated industry has attempted to present a corrugated pallet that could compete and compare to its wooden counterpart. The culture of material handling presented conditions that limited the acceptance of the corrugated pallet. Today, there have been strides taken that has improved the product so that now there are rackable corrugated pallets that compare to wooden pallets. These pallets along with plastic are making inroads into the pallet world. They eliminate the need for stamping each pallet, signifying that they conform to the new standards and all of the environmental issues that have been raised are of no concern. Health issues, involving individual association, connected with the implementation of fumigation are eliminated. The additional costs associated with the increased need of paper work to track the SWPM and the need for increase inspection can be minimized. In considering all of the benefits of alternative or substitute packing material one has to wonder why more attention is not given to this area.

The corrugated industry over the years is no stranger to the environmentally concerned world. The industry with its paper mills have long been the object of scrutiny by the EPA. The industry didn't ignore its responsibility, but it spent millions to live up to its obligations. Now it is seeing a government policy recognizing a problem and in its attempt to solve the problem, promoting environmentally dangerous solutions as its remedy. The corrugated industry has a vast sea of products that can be brought to bear on this issue. The products are competitive, durable and capable of offering an alternative to the solutions in the report. It would be a solution that would be long lasting and universal.

As a member of the industry I would welcome the opportunity to bring all of the forces that our industry has to bear on the infestation issue. The industry is made up of some of the giants of American Companies, They not only have a selfish interest in the program but also a cultural humanistic, and patriotic concern in finding a solution to this crisis. As you know the very product that is being attacked, forest products, is the heart and soul of our industry.

I realize that the agency cannot promote our product. However, all we are looking for is communication that recognize that there are products available that can short cut the need for all of the intrusion of fumigation and heat treatment of wood.

We would like to sit down at your convenience and continue our discussion of our products and discuss ways of giving recognition to products that can remedy the problem of infestation through SWPM.

Sincerely,

Bob Faller

Bob Faller

Smurfit-Stone
Container Division

Mr. John Payne
Acting Director
Plant Health Programs, Plant Protection & Quarantine
U.S. Dept. of Agriculture
Riverdale, MD 20737

December 16, 2002

Re: One Successful Solution to SWPM

Dear Mr. Payne:

I have reviewed the Importation of Solid Wood Packing Material Draft Environmental Impact Statement-October 2002, and wish to tell a success story of an alternative shipping method, to mitigate risk from SWPM.

For over sixteen (16) months, the U.S. Department of Defense/DLA/Defense Depot Susquehanna Pennsylvania has used our P2 Pack (brochure enclosed). This bulk box and corrugated pallet has solved many shipping and distribution challenges, i.e. European Union Regulations, safety, environmental, ergonomic and recycling.

It is my pleasure, as the co-inventor of this unique product, to share this innovative shipping system with you. Smurfit-Stone Container manufactures Cordeck throughout the world. This fact demonstrates our commitment to this alternative method of shipping. The P2 Pack is protected under U.S. Patent No. 5,934,474.

Please take a moment and review the enclosed brochures. Because of the uniqueness and functionality, DSCP has awarded Smurfit-Stone a five (5) year MILSTIP requirements contract (SP 0500-02-D-0124). Tim Keller is the technical point of contact at DSCP, if you would have any technical questions. This allows other departments, distribution centers and agencies to order the products (P2 Pack and Cordeck). Just last month, we received release orders from Afghanistan, Kuwait and Germany. The distribution center in Tracy, California, has seen the pack, and is interested in ordering several different sizes to enhance and solve some packaging challenges.

Perhaps you are aware of a shipping, and/or distribution center that may benefit from this economical solution.

Thank you for your time. I am looking forward to your reply.

Respectfully submitted,

Richard Owen
Smurfit-Stone Container Corporation
Williamsport, PA 17701
(570) 398-7292, Extension 110

RO/cs
Enclosures

Smurfit-Stone Container Corporation
2940 Reach Road, P.O. Box 3097 Williamsport, Pennsylvania 17701 phone 570-323-8673 fax 570-323-6107

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Raymond B. Nosbaum
USDA APHIS PPQ
4700 River Road, Unit 141, Room 4C31
Riverdale, MD 20737

The Nature Conservancy appreciates the opportunity to comment on the USDA APHIS Importation of Solid Wood Packing Material Draft Environmental Impact Statement (DEIS), released in October 2002.

We find that the DEIS adequately describes the risk to United States' forests arising from insects and other pests that might be associated with packaging made from wood that is shipped from virtually all trading partners and the inadequacy of current phytosanitary measures sufficiently to minimize that risk.

However, the DEIS has major deficiencies, including failure to analyze an alternative that is significantly different and more effective than the alternatives analyzed; and confused and biased presentation of data crucial to decision-making.

The DEIS analyzed five alternatives:
1) no action/no change in current regulations
2) extending treatments required for China to all countries
3) adopting IPPC standard
4) a comprehensive risk reduction program
5) prohibiting SWPM, allowing only substitute materials

This analysis found that the fifth alternative, prohibiting packaging made from solid wood (*e.g.*, boards) and allowing only packaging made from substitute materials, would both provide the best protection against introduced forest pests and cause the fewest environmental impacts. Nevertheless, the agency has selected the third alternative, adopting the IPPC standard, as the preferred alternative.

The DEIS did not analyze a sixth alternative proposed by American Lands Alliance and others during the scoping process. That alternative called for phasing in a prohibition of solid-wood packaging over a period of years. By ignoring the option of phasing-in the requirement that shippers convert to non-solid-wood alternatives, the DEIS exaggerates several of the economic and policy difficulties associated with relying on packaging made from alternative materials. APHIS says it will continue to study more effective approaches, but it provides no timetable.

APHIS' failure to analyze the alternative of phasing out solid-wood packaging is particularly difficult to understand given that, in an Advance Notice of Proposed Rulemaking (ANPR) published on January 20, 1999 (Federal Register Volume 64, Number 12), APHIS' third option "would be to prohibit the importation of SWPM in any form and from any country." APHIS contemplated allowing alternative packing material made from "processed wood (e.g., particle board, plywood, press board) and nonwood materials (e.g., plastic). APHIS went on to say, "The advantages of this option are that it would provide the greatest protection against pest risk and could eventually result in decreased use of methyl bromide. A disadvantage of this option is that it could have an undesirable effect on international trade. *This effect could be mitigated by a phase-in period* to allow shippers to adjust to the prohibition, and, during this time, heat treatment, treatment with preservatives, fumigation, or other effective alternative treatments could be required before SWPM could be imported." [emphasis added]

We would like to bring to your attention the more thorough analysis prepared and submitted by Dr. Faith Campbell of the American Lands Alliance of the questions posed in the Federal Register notice. We believe the points raised by this analysis should be given serious consideration by APHIS as you move forward with SWPM regulations. We share concerns in the selection of the preferred alternative and encourage APHIS managers to more thoroughly assess the environmental consequences of this alternative.

We appreciate this opportunity to comment on the draft environmental impact statement. We look forward to continuing to work with APHIS to ensure that effective regulations are adopted that will protect America's forests from exotic pests and diseases.

Sincerely,

Elizabeth Select

for Ann M. Bartuska, Ph.D.
Executive Director, Invasive Species Initiative
The Nature Conservancy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JAN 3 2003

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

Mr. Raymond B. Nosbaum
Senior Regulatory Coordinator
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 141
Riverdale, MD 20737-1236

Subject: Importation of Solid Wood Packing Material
Draft Environmental Impact Statement

Dear Mr. Nosbaum:

The U.S. Environmental Protection Agency (USEPA) has reviewed the Draft Environmental Impact Statement (DEIS) for "*Importation of Solid Wood Packing Material*" (CEQ # 020464) prepared by the Animal and Plant Health Inspection Service (APHIS). Our review is provided under the National Environmental Policy Act (NEPA), Council on Environmental Policy (CEQ) regulations (40 CFR Sections 1500 - 1508) and Section 309 of the Clean Air Act.

The DEIS was prepared because APHIS is proposing to adopt phytosanitary standards published by the Food and Agriculture Organization of the United Nations. These standards are contained in the International Plant Protection Convention's (IPPC) "Guidelines for Regulating Wood Packaging Material in International Trade." The IPPC Guidelines would provide effective, equitable, and uniform standards that all nations would use to mitigate the risk from entry of invasive alien species (pests and pathogens) found in solid wood packaging material that accompanies international trade shipments.

The DEIS considers the potential environmental impacts of the proposal to adopt phytosanitary standards and alternatives to adoption of these standards including: (1) no action, (2) extension of the treatments in the China Interim Rule to all countries, (3) adoption of the IPPC Guidelines, (4) a comprehensive risk reduction program, and (5) substitute packaging material only. Each alternative contains an array of component control methods.

We note that APHIS acknowledges that research is needed to identify and develop alternative treatments because the Montreal Protocol is going to end most uses of methyl bromide, a phytosanitary treatment allowed under the IPPC Guidelines, and we encourage APHIS to begin looking for alternatives as soon as possible.

EPA has no objections to this draft EIS and APHIS's proposal to adopt the IPPC Guidelines. Accordingly, we have assigned a Lack of Objections (LO) rating to the DEIS. Enclosed is a summary of EPA's rating system.

We appreciate the opportunity to review the Draft EIS on the "*Importation of Solid Wood Packing Material.*" If you have any questions, please call me at (202) 564-5400 or the staff contact for this project, Arthur Totten at (202) 564-7164.

Sincerely,

Anne Norton Miller
Director
Office of Federal Activities

Enclosure

EPA's Criteria for Sec. 309 Review of Impact Statements

Rating Environmental Impacts:

LO--Lack of Objections

EC--Environmental Concerns--Impacts identified that should be avoided. Mitigation measures may be required.

EO--Environmental Objections--Significant impacts identified. Corrective measures may require substantial changes to the proposed action or consideration of another alternative, including any that was either previously unaddressed or eliminated from the study, or the no-action alternative). Reasons can include:

- o violation of a federal environmental standard;
- o violation of the federal agency's own environmental standard;
- o violation of an EPA policy declaration;
- o potential for significant environmental degradation; or,
- o precedent-setting for future actions that collectively could result in significant environmental impacts.

EU--Environmentally Unsatisfactory--Impacts identified are so severe that the action must not proceed as proposed. If these deficiencies are not corrected in the final EIS, EPA may refer the EIS to CEQ Reasons, in addition to impacts identified, can include:

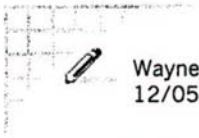
- o substantial violation of a federal environmental standard;
- o severity, duration, or geographical extent of impacts that warrants special attention; or,
- o national importance, due to threat to national environmental resources or policies.

Rating Adequacy of the Impact Statement:

1 (Adequate)--No further information is required for review.

2 (Insufficient Information)--Either more information is needed for review, or other alternatives should be evaluated. The identified additional information or analysis should be included in the final EIS.

3 (Inadequate)--Seriously lacking in information or analysis to address potentially significant environmental impacts. The draft EIS does not meet NEPA and/or Section 309 requirements. If not revised or supplemented and provided again as a draft EIS for public comment, EPA may refer the EIS to CEQ.



Wayne D Burnett
12/05/2002 12:20 PM

To: RAYMOND.B.NOSBAUM@APHIS.USDA.GOV
cc:
Subject: Comment to draft EIS for the Importation of Solid Wood Packing Material

Under the Section IV. A.5. Substitute Packing Materials Only (Prohibition of SWPM) on page 74 of the draft first full paragraph, it is mentioned that "Fumigation with methyl bromide is highly efficacious and is the most economical way to treat SWPM for most quarantine pest risks" It should be noted here that heat treatment is also highly efficacious and is an economical way to treat SWPM for most quarantine pest risks.

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NATIONAL WOODEN PALLET AND CONTAINER ASSOCIATION

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January 8, 2003

Dr. Richard L. Dunkle, Deputy Administrator,
APHIS, Plant Protection and Quarantine Program
1400 Independence Avenue, S.W.
Room 302E
Washington, D.C. 20250

Dear Dr. Dunkle:

The National Wooden Pallet and Container Association has been assured in a number of meetings with APHIS officials that this agency intends to adopt the regulatory guidelines established by the U.N. Food and Agriculture Organization's International Plant Protection Convention (IPPC). Based on those many assertions, our members are making significant capital investments in preparing to comply with IPPC regulations.

Our concern is with language contained in the Draft Environmental Impact Statement (EIS), submitted as part of the regulatory review process. It supports a long-term objective that would eliminate the use of wood packaging materials for international shipments into the U.S.

If such a long-term goal were achieved, it would not only wipe out the wood packaging industry, it would be in conflict with the intentions of the U.N. group that developed the IPPC and negotiated the successful agreement of the guidelines among 118 nations. The Food and Agriculture Organization of the U.N. achieved this in accordance with the World Trade Organization's goal of harmonizing all aspects of international trade policies to assure the free flow of commerce unimpeded by unfair, unbalanced or unworkable barriers.

If the U.S. moves toward requiring alternative materials, it is sure to invite our trading partners to respond in kind. Such actions are clearly outside the spirit of the harmonization efforts of the World Trade Organization and the IPPC. It would be discreditable for the U.S. to take the lead on policies that step away from global efforts to bring fairness to international trading practices.

NWPCA members are not prepared to see their entire industry destroyed by regulatory mandate; Nor can their customers, U.S. manufacturers, sustain the exorbitant rise in transport costs this policy would create. It is, in fact, these kinds of regulatory prohibitions and added costs that are driving manufacturers to move their facilities out of the country. Ultimately, it is the American worker and our already weakened economy that would suffer from such a course of action.

Wooden pallets comprise 93% of the entire world pallet market. Our members use low-quality lumber that would likely be discarded if it were not for wood packaging usage. Further, the wood waste produced in making pallets, and the material from pallets no longer able to be repaired is turned into useful, marketable products such as playground mulch and wood stove

pellets. While analyzing pest eradication approaches, the EIS failed to consider the fact that wood is reusable, repairable, recyclable and made from a renewable resource. Wood, unlike the alternative materials that would replace it, is biodegradable.

Because the U.S. has a trade deficit, we have more pallets coming into the country than going out. This is fine if they are wood because our recyclers pick up the discarded pallets, sort, repair and reuse them. Were alternative materials to be required as a transport platform, America would need substantially more landfill space as plastic and metal pallets, that have outlived their usefulness, pile high. That is not an environmentally responsible policy.

The public issuance of this draft statement has already had negative impact on our industry. Product manufacturers are confused as to whether or not they can continue to use wood packaging for international shipments. Pallet manufacturers are confused about the U.S. commitment to the IPPC. This confusion has already created a disadvantage for the wood packaging industry as product manufacturers explore the option of using costly and environmentally harmful alternatives. Some of the statements of major concern are in the attached appendix.

NWPCA has worked closely with APHIS on a number of important issues related to pest eradication in wood packaging materials. We are currently working collaboratively with your agency on the development of a fumigation certification program for exports.

NWPCA is pursuing innovative, workable solutions to the pest-related challenges inherent in wood packaging, and have recently made proposals to the Pallet Foundation for additional funding to expand and accelerate these efforts. The Pallet Foundation is a separate organization that funds research on issues of significance to the industry. Our research goal in this area is to develop effective pest elimination options that are both economical for our members and environmentally friendly. We believe APHIS should share this long-term goal.

Sincerely,

Bruce Scholnick
President and CEO

Copies to: Bobby R. Acord, Administrator, U.S. Department of Agriculture, APHIS
John D. Graham, Administrator, Office of Management & Budget, Office of Information and Regulatory Affairs
Robert L. Griffin, Secretariat, Food and Agriculture Organization, International Plant Protection Convention
William Hawks, Undersecretary of Agriculture for Marketing
Grant D. Aldonas, Undersecretary for International Trade, U.S. Dept. of Commerce
Tom Sullivan, Chief Counsel, Small Business Administration, Office of Advocacy
Wilmer E. Snell, Director, Europe, Africa, Australia, New Zealand, USDA, APHIS

APPENDIX

Draft Environmental Impact Statement, APHIS, Department of Agriculture

"APHIS is proposing to adopt the IPPC Guidelines while it considers a more long-term and permanent solution to the SWPM problem." (Page 3)

"This EIS uses a subjective comparison of the potential impacts of the alternatives, rather than intensive and exhaustive individual analyses of the alternatives... That is because the absolute quantification of impacts is of lesser importance than the basic need to rank the alternatives relative to their anticipated impacts, so that an informed decision may be made from them." (Page 4)

"...Selective prohibition (substitute packing materials) seems to afford the greatest degree of protection from risk." (Page 11)

"If no [solid wood packing material] were imported, there could not be any harmful organisms imported with it. This alternative also would achieve the greatest reduction of adverse environmental consequences from the use of control methods (chemical and/or physical). It would result in diminished use of wood resources..." (Page 12).

"Metals such as steel and aluminum may be crushed and resmelted for use almost indefinitely." (Page 76)

"Plastics (including polyethylenes, polypropylenes and polyvinyl chlorides) also may be broken down and reformulated for use again as packing materials." (Page 76)

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

JAN 31 2003

In Reply Refer To:
ER 02/1100

Mr. Raymond B. Nosbaum
Senior Regulatory Coordinator
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 141
Riverdale, Maryland 20737

Dear Mr. Nosbaum:

The Department of the Interior has reviewed the Draft Environmental Impact Statement (EIS) for Importation of Solid Wood Packing Material and provides the following comments for your consideration.

The Department's U.S. Fish and Wildlife Service (FWS) has a substantial stake in protecting the country's fish and wildlife resources from pests that can be carried by wood packaging materials because of the potential harm such pests may have on our trust resources and the habitats they depend upon. The Draft EIS for solid wood packing material is well written and protective of fish and wildlife resources. The information on pests including the Asian longhorned beetle, for which a costly eradication campaign is underway in the northern States, appears to be quite accurate. It is consistent with information from recent research reported in scientific publications such as *Science* (American Association for the Advancement of Science) and *Bioscience* (American Institute of Biological Sciences).

The Animal and Plant Health Inspection Service is taking a prudent approach toward protecting resources in the United States by adopting the International Plant Protection Convention's recently-developed "Guidelines for Regulating Wood Packaging Material in International Trade" as the preferred alternative for the short term.

We appreciate the opportunity to review the subject Draft EIS. Please contact Dr. Benjamin N. Tuggle, Chief, Division of Federal Program Activities, FWS, at (703) 358-2161 or Ken Havran in the Office of Environmental Policy and Compliance at (202) 208-7116 if you have any questions concerning these comments.

Sincerely,

Willie R. Taylor
Director
Office of Environmental Policy
and Compliance

27

United States Senate

WASHINGTON, DC 20510

December 23, 2002

35-4211933
APHIS

The Honorable Ann M. Veneman
Secretary of Agriculture
U.S. Department of Agriculture
1400 Independence Avenue, S.W.
Washington, D.C. 20250

Dear Madam Secretary:

Our states have faced serious economic and environmental threats from exotic pests, such as the Asian long-horned beetle and the emerald ash borer, that have come into our country through wood packaging. Although we applaud the USDA Animal and Plant Health Inspection Service's efforts to promulgate stronger regulations to prevent additional introductions of pests from wood packaging used for imports, we have several concerns about the preferred alternative in the November 2002 Draft Environmental Impact Statement.

Overall, we are concerned that the available technologies to treat wood packaging have not been shown to be effective against the full range of pests. Treating the wood with heat or chemicals will not prevent the wood packaging from being re-infested after treatment. Furthermore, it will be extremely difficult for USDA inspectors to verify that the treatments were done properly. Meanwhile, determining whether the packaging is actually pest-free will remain as difficult as it currently is.

One of the proposed treatments, fumigation using methyl bromide, is not only less effective, but also raises particular concerns because of the potential environmental and public health impacts. Fumigation using methyl bromide could double current annual worldwide levels of methyl bromide use. As you know, the United States has made a commitment to phasing out this ozone-depleting chemical under the Montreal Protocol.

As an alternative, we would encourage USDA to work with importers to use more packaging made from alternative materials, including fiberboards, plastic, metal, or fiberglass. Forest pests cannot live in packaging made from these materials, eliminating the need to treat the packaging with heat or toxic chemicals. Not only will this approach save money and reduce the associated environmental impacts, but it also allows USDA inspectors to easily verify that the packaging meets regulatory requirements and is pest-free.

We also strongly believe that the agency needs to increase its inspections of wood packaging entering the country, aggressively penalize violators, and build up surveillance programs to detect quickly forest pests that enter the country. We encourage APHIS to provide financial assistance to developing countries and other incentives to stimulate more rapid adoption of alternative materials.

We thank you in advance for taking these concerns and recommendations into consideration as you finalize the EIS and look to future rulemaking on this important issue. If your staff has any questions, please have them contact Susanne Fleek (Senator Leahy) at (202) 224-4242 or Mike Buchwald (Senator Feinstein) at (202) 224-2745.

Sincerely,

Patrick Leahy

Patrick Leahy

Carl Levin

Hillary Rodham Clinton

Charles Schumer

Barbara Boxer

Barbara Boxer

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Environmental Impact Statement (EIS) Responsibility: Project Manager for the draft EIS—overall responsibility for the draft EIS, coordination of associated efforts, and team management. Wrote chapters 1–4, and 6; reviewed chapter 5.

David A. Bergsten
Biological Scientist
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M.P.H. Disease Control
Ph.D. Toxicology

Background: Biological Scientist in ES with expertise in environmental toxicology, chemical fate, and pesticide research. More than 14 years experience with APHIS including environmental protection, field, and port inspection experience. Experience in preparing environmental documentation for other major APHIS programs, in compliance with Federal statutes.

EIS Responsibility: Project manager for the final EIS—wrote parts of chapter 2 and the majority of chapter 4. Reviewed and contributed to

other chapters and to the appendices. Responsible for coordination and team management on final documentation

Elizabeth E. Nelson
Environment Protection Specialist
B.S. Biology

Background: Environmental Protection Specialist in ES. Three years of service with APHIS. Experience in environmental compliance, especially those associated with the Endangered Species Act, in the context of trade agreements, pest management, and pesticide regulations. Provides assistance on environmental documentation teams and participates in preparing and reviewing written analyses.

EIS Responsibility: EIS Analyst—contributed to the preparation of the final EIS.

Betsey Coakley
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Background: Over 13 years service with APHIS, with administrative and clerical experience with Plant Protection and Quarantine, and Policy and Program Development. Currently serving as Writer/Editor with ES.

EIS Responsibility: EIS Editor—desktop publishing of the EIS (including editing, format, and document security).

Appendix C. Cooperation, Review, and Consultation

The following individuals have cooperated in the development of this environmental impact statement (EIS), were consulted on critical issues that have been addressed in this EIS, or reviewed draft sections of the EIS. The expertise and concerns of these individuals were considered during the development of this EIS. There may be some aspects of the EIS or its incorporated analyses which are not endorsed by all of the cooperators and consultants.

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Appendix F. "Guidelines For Regulating Wood Packaging Material in International Trade"

The original Guidelines are provided on the subsequent pages. The "Marking for Approved Measures" in Annex II is currently under revision. Other parts of the Guidelines may also be amended in the future, pending further international negotiations.

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INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

GUIDELINES FOR REGULATING WOOD PACKAGING MATERIAL IN INTERNATIONAL TRADE

Secretariat of the International Plant Protection Convention
Food and Agriculture Organization of the United Nations
Rome, 2002

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

CONTENTS

Endorsement

International standards for phytosanitary measures are prepared by the Secretariat of the International Plant Protection Convention as part of the United Nations Food and Agriculture Organization's global programme of policy and technical assistance in plant quarantine. This programme makes available to FAO Members and other interested parties these standards, guidelines and recommendations to achieve international harmonization of phytosanitary measures, with the aim to facilitate trade and avoid the use of unjustifiable measures as barriers to trade.

This standard was endorsed by the Interim Commission on Phytosanitary Measures in March 2002.

Jacques Diouf
Director-General
Food and Agriculture Organization of the United Nations

Application

International standards for phytosanitary measures (ISPMs) are adopted by contracting parties to the IPPC, and by FAO Members that are not contracting parties, through the Interim Commission on Phytosanitary Measures. ISPMs are the standards, guidelines and recommendations recognized as the basis for phytosanitary measures applied by Members of the World Trade Organization under the Agreement on the Application of Sanitary and Phytosanitary Measures. Non-contracting parties to the IPPC are encouraged to observe these standards.

Review and amendment

International standards for phytosanitary measures are subject to periodic review and amendment. The next review date for this standard is 2004, or such other date as may be agreed upon by the Commission on Phytosanitary Measures.

Standards will be updated and republished as necessary. Standard holders should ensure that the current edition of this standard is being used.

Distribution

International standards for phytosanitary measures are distributed by the Secretariat of the International Plant Protection Convention to all FAO Members, plus the Executive/Technical Secretariats of the Regional Plant Protection Organizations:

- Asia and Pacific Plant Protection Commission
- Caribbean Plant Protection Commission
- Comité Regional de Sanidad Vegetal para el Cono Sur
- Comunidad Andina
- European and Mediterranean Plant Protection Organization
- Inter-African Phytosanitary Council
- North American Plant Protection Organization
- Organismo Internacional Regional de Sanidad Agropecuaria
- Pacific Plant Protection Organization.

INTRODUCTION

SCOPE

This standard describes phytosanitary measures to reduce the risk of introduction and/or spread of quarantine pests associated with wood packaging material (including dunnage), made of coniferous and non-coniferous raw wood, in use in international trade.

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DEFINITIONS AND ABBREVIATIONS

bark-free wood	Wood from which all bark excluding the vascular cambium, ingrown bark around knots, and bark pockets between rings of annual growth has been removed [ISPM Pub. No. 15, 2002]
chemical pressure impregnation	Treatment of wood with a chemical preservative through a process of pressure in accordance with an officially recognized technical specification [ISPM Pub. No. 15, 2002]
certificate	An official document which attests to the phytosanitary status of any consignment affected by phytosanitary regulations [FAO, 1990]
commodity	A type of plant, plant product, or other article being moved for trade or other purpose [FAO, 1990; revised ICPM, 2001]
consignment	A quantity of plants, plant products and/or other articles being moved from one country to another and covered, when required, by a single phytosanitary certificate (a consignment may be composed of one or more commodities or lots) [FAO, 1990; revised ICPM, 2001]
debarking	Removal of bark from round wood (debarking does not necessarily make the wood bark-free) [FAO, 1990]
dunnage	Wood packaging material used to secure or support a commodity but which does not remain associated with the commodity [FAO, 1990; revised ISPM Pub. No. 15, 2002]
emergency action	A prompt phytosanitary action undertaken in a new or unexpected phytosanitary situation [ICPM, 2001]

emergency measure	A phytosanitary regulation or procedure established as a matter of urgency in a new or unexpected phytosanitary situation. An emergency measure may or may not be a provisional measure [ICPM, 2001]
free from (of a consignment, field, or place of production)	Without pests (or a specific pest) in numbers or quantities that can be detected by the application of phytosanitary procedures [FAO, 1990; revised FAO, 1995; CEPM, 1999]
fumigation	Treatment with a chemical agent that reaches the commodity wholly or primarily in a gaseous state [FAO, 1990; revised FAO, 1995]
heat treatment	The process in which a commodity is heated until it reaches a minimum temperature for a minimum period of time according to an officially recognized technical specification [ISPM Pub. No. 15, 2002]
infestation (of a commodity)	Presence in a commodity of a living pest of the plant or plant product concerned. Infestation includes infection [CEPM, 1997; revised CEPM, 1999]
interception (of a pest)	The detection of a pest during inspection or testing of an imported consignment [FAO, 1990; revised CEPM, 1996]
kiln-drying	A process in which wood is dried in a closed chamber using heat and/or humidity control to achieve a required moisture content [ISPM Pub. No. 15, 2002]
mark	An official stamp or brand, internationally recognized, applied to a regulated article to attest its phytosanitary status [ISPM Pub. No. 15, 2002]
NPPO	National Plant Protection Organization [FAO, 1990; ICPM, 2001]
official	Established, authorized or performed by a National Plant Protection Organization [FAO, 1990]
Pest Risk Analysis	The process of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the strength of any phytosanitary measures to be taken against it [FAO, 1990; revised IPPC, 1997]
phytosanitary action	An official operation, such as inspection, testing, surveillance or treatment, undertaken to implement phytosanitary regulations or procedures [ICPM, 2001]
phytosanitary measure (agreed interpretation)	Any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests [FAO, 1995; revised IPPC, 1997; ISC, 2001]

The agreed interpretation of the term phytosanitary measure accounts for the relationship of phytosanitary measures to regulated non-quarantine pests. This relationship is not adequately reflected in the definition found in Article II of the IPPC (1997).

phytosanitary procedure	Any officially prescribed method for implementing phytosanitary regulations including the performance of inspections, tests, surveillance or treatments in connection with regulated pests [FAO, 1990; revised FAO, 1995; CEPM, 1999; ICPM, 2001]
phytosanitary regulation	Official rule to prevent the introduction and/or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests, including establishment of procedures for phytosanitary certification [FAO, 1990; revised FAO, 1995; CEPM, 1999; ICPM, 2001]
plant products	Unmanufactured material of plant origin (including grain) and those manufactured products that, by their nature or that of their processing, may create a risk for the introduction and spread of pests [FAO, 1990; revised IPPC, 1997; formerly Plant product]
PRA	Pest risk analysis [FAO, 1995]
processed wood material	Products that are a composite of wood constructed using glue, heat and pressure, or any combination thereof [ISPM Pub. No. 15, 2002]
quarantine pest	A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled [FAO, 1990; revised FAO, 1995; IPPC, 1997]
raw wood	Wood which has not undergone processing or treatment [ISPM Pub. No. 15, 2002]
regulated article	Any plant, plant product, storage place, packaging, conveyance, container, soil and any other organism, object or material capable of harbouring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved [CEPM, 1996; revised CEPM, 1999; ICPM, 2001]
test	Official examination, other than visual, to determine if pests are present or to identify pests [FAO, 1990]
treatment	Officially authorized procedure for the killing or removal of pests or rendering pests infertile [FAO, 1990; revised FAO, 1995; ISPM Pub. No. 15, 2002]
wood	A commodity class for round wood, sawn wood, wood chips or dunnage, with or without bark [FAO, 1990; revised ICPM, 2001]
wood packaging material	Wood or wood products (excluding paper products) used in supporting, protecting or carrying a commodity (includes dunnage) [ISPM Pub. No. 15, 2002]

OUTLINE OF REQUIREMENTS

Wood packaging material made of unprocessed raw wood is a pathway for the introduction and spread of pests. Because the origin of wood packaging material is often difficult to determine, globally approved measures that significantly reduce the risk of pest spread are described. NPPOs are encouraged to accept wood packaging material that has been subjected to an approved measure without further requirements. Such wood packaging material includes dunnage, but excludes processed wood packaging material.

Procedures to verify that an approved measure, including the application of a globally recognized mark, has been applied should be in place in both exporting and importing countries. Other measures agreed to under a bilateral arrangement are also considered in this standard. Wood packaging material that does not comply with the requirements of this standard should be disposed of in an approved manner.

REGULATORY REQUIREMENTS

1. Basis for Regulating

Wood packaging material is frequently made of raw wood that may not have undergone sufficient processing or treatment to remove or kill pests and therefore becomes a pathway for the introduction and spread of pests. Furthermore, wood packaging material is very often re-used, recycled or re-manufactured (in that packaging received with an imported consignment may be re-used to accompany another consignment for export). The true origin of any piece of wood packaging material is difficult to determine and thus its phytosanitary status cannot be ascertained. Therefore the normal process of undertaking risk analysis to determine if measures are necessary and the strength of such measures is frequently not possible for wood packaging material because its origin and phytosanitary status may not be known. For this reason, this standard describes globally accepted measures that are approved and that may be applied to wood packaging material by all countries to practically eliminate the risk for most quarantine pests and significantly reduce the risk from a number of other pests that may be associated with that material.

Countries should have technical justification for requiring the application of the approved measures as described in this standard for imported wood packaging material. Requiring phytosanitary measures beyond an approved measure as described in this standard also requires technical justification.

2. Regulated Wood Packaging Material

These guidelines are for coniferous and non-coniferous raw wood packaging material that may serve as a pathway for plant pests posing a threat mainly to living trees. They cover wood packaging material such as pallets, dunnage, crating, packing blocks, drums, cases, load boards, pallet collars, and skids which can be present in almost any imported consignment, including consignments which would not normally be the target of phytosanitary inspection.

Wood packaging made wholly of wood-based products such as plywood, particle board, oriented strand board or veneer that have been created using glue, heat and pressure or a combination thereof should be considered sufficiently processed to have eliminated the risk associated with the raw wood. It is unlikely to be infested by raw wood pests during its use and therefore should not be regulated for these pests.

Wood packaging material such as veneer peeler cores[1], sawdust, wood wool, and shavings, and raw wood cut into thin[2] pieces may not be pathways for introduction of quarantine pests and should not be regulated unless technically justified.

3. Measures for Wood Packaging Material

3.1 Approved measures

Any treatment, process, or a combination of these that is significantly effective against most pests should be considered effective in mitigating pest risks associated with

[1] Veneer peeler cores are a by-product of veneer production involving high temperatures and comprising the center of a log remaining after the peeling process.

[2] Thin wood is considered to be 6mm thickness or less according to the Customs Harmonized Commodity Description and Coding System (the Harmonized System or HS).

wood packaging material used in transport. The choice of a measure for wood packaging material is based on consideration of:

- the range of pests that may be affected
- the efficacy of the measure
- the technical and/or commercial feasibility.

Approved measures should be accepted by all NPPOs as the basis for authorizing the entry of wood packaging material without further requirements except where it is determined through interceptions and/or PRA that specific quarantine pests associated with certain types of wood packaging material from specific sources require more rigorous measures.

Approved measures are specified in Annex I.

Wood packaging material subjected to these approved measures should display a specified mark shown in Annex II.

The use of marks addresses the operational difficulties associated with the verification of compliance with treatment for wood packaging material. A universally recognized, non-language specific mark facilitates verification during inspection at the point of export, at the point of entry or elsewhere.

References for supporting documentation on approved measures are available from the IPPC Secretariat.

3.2 Measures pending approval

Other treatments or processes for wood packaging material will be approved when it can be demonstrated that they provide an appropriate level of phytosanitary protection (Annex III). The currently measures identified in Annex I continue to be under review, and new research may point, for example, to other temperature/time combinations. New measures may also reduce risk by changing the character of the wood packaging material. NPPOs should be aware that measures may be added or changed and should have sufficiently flexible import requirements for wood packaging to accommodate changes as they are approved.

3.3 Other measures

NPPOs may accept any measures other than those listed in Annex I by arrangement with their trading partners, especially in cases where the measures listed in Annex I cannot be applied or verified in the exporting country. Such measures should be technically justified and respect the principles of transparency, non-discrimination and equivalence.

The NPPOs of importing countries should consider other arrangements for wood packaging material associated with exports from any country (or particular source) where evidence is provided which demonstrates that the pest risk is adequately managed or absent (e.g. areas with similar phytosanitary situations or pest free areas).

Certain movements of wood packaging material (e.g. tropical hardwoods associated with exports to temperate countries) may be considered by the importing NPPO not to carry a phytosanitary risk and thus can be exempted from measures.

Subject to technical justification, countries may require that imported wood packaging material subjected to an approved measure be made from debarked wood and display a mark as shown in Annex II.

3.4 Review of measures

The approved measures specified in Annex I and the list of measures under consideration in Annex III should be reviewed based on new information provided to the Secretariat by NPPOs. This standard should be amended appropriately by the ICPM.

OPERATIONAL REQUIREMENTS

To meet the objective of preventing the spread of pests, both exporting and importing countries should verify that the requirements of this standard have been met.

4. Dunnage

Ideally, dunnage should also be marked in accordance with Annex II of this standard as having been subjected to an approved measure. If not, it requires special consideration and should, as a minimum, be made from bark-free wood that is free from pests and signs of live pests. Otherwise it should be refused entry or immediately disposed of in authorized manner (see section 6).

5. Procedures Used Prior to Export

5.1 Compliance checks on procedures applied prior to export

The NPPO of the exporting country has responsibility for ensuring that systems for exports meet the requirements set out in this standard. It includes monitoring certification and marking systems that verify compliance, and establishing inspection procedures (see also ISPM Pub. No. 7: *Export certification system*), registration or accreditation and auditing of commercial companies that apply the measures, etc.

5.2 Transit arrangements

Where consignments moving in transit have exposed wood packaging material that has not met the requirements for approved measures, the NPPOs of the transit countries may require measures in addition to those of the importing country to ensure that wood packaging material does not present an unacceptable risk.

6. Procedures upon Import

The regulation of wood packaging material requires that NPPOs have policies and procedures for other aspects of their responsibilities related to wood packaging material.

Since wood packaging materials are associated with almost all shipments, including those not normally the target of phytosanitary inspections, cooperation with agencies, organizations, etc. not normally involved with meeting phytosanitary export conditions or import requirements is important. For example, cooperation with Customs organizations should be reviewed to ensure effectiveness in detecting potential non-compliance of wood packaging material. Cooperation with the producers of wood packaging material also needs to be developed.

6.1 Measures for non-compliance at point of entry

Where wood packaging material does not carry the required mark, action may be taken unless other bilateral arrangements are in place. This action may take the form of treatment, disposal or refused entry. The NPPO of the exporting country may be notified (see ISPM Pub. No. 13: *Guidelines on notification of non-compliance and emergency action*). Where the wood packaging material does carry the required mark, and evidence of live pests is found, action can be taken. These actions may take the form of treatment, disposal or refused entry. The NPPO of the exporting country should be notified in cases where live pests are found, and may be notified in other cases (see ISPM Pub. No. 13: *Guidelines on notification of non-compliance and emergency action).*

6.2 Disposal

Disposal of wood packaging material is a risk management option that may be used by the NPPO of the importing country upon arrival of the wood packaging material where treatment is not available or desirable. The following methods are recommended for the disposal of wood packaging material where this is required. Wood packaging material that requires emergency action should be appropriately safeguarded prior to treatment or disposal to prevent escape of any pest between the time of the detection of the pest posing the threat and the time of treatment or disposal.

Incineration
Complete burning

Burial
Deep burial in sites approved by appropriate authorities. (Note: not a suitable disposal option for wood infested with termites). The depth of the burial may depend on climatic conditions and the pest, but is recommended to be at least 1 metre. The material should be covered immediately after burial and should remain buried.

Processing
Chipping and further processing in a manner approved by the NPPO of the importing country for the elimination of pests of concern (e.g. manufacture of oriented strand board).

Other methods
Procedures endorsed by the NPPO as effective for the pests of concern.

The methods should be applied with the least possible delay.

ANNEX I

APPROVED MEASURES ASSOCIATED WITH WOOD PACKAGING MATERIAL

Heat treatment (HT)

Wood packaging material should be heated in accordance with a specific time-temperature schedule that achieves a minimum wood core temperature of 56°C for a minimum of 30 minutes[3].

Kiln-drying (KD), chemical pressure impregnation (CPI), or other treatments may be considered HT treatments to the extent that these meet the HT specifications. For example, CPI may meet the HT specification through the use of steam, hot water, or dry heat.

Heat treatment is indicated by the mark HT. (see Annex II)

Methyl bromide (MB) fumigation for wood packaging material

The wood packaging material should be fumigated with methyl bromide. The treatment is indicated by the mark MB. The minimum standard for methyl bromide fumigation treatment for wood packaging material is as follows:

Temperature	**Dosage rate**	**Minimum concentration (g/m^3) at:**			
		0.5hrs.	**2hrs.**	**4hrs.**	**16hrs.**
21°C or above	48	36	24	17	14
16°C or above	56	42	28	20	17
11°C or above	64	48	32	22	19

The minimum temperature should not be less than 10^0C and the minimum exposure time should be 16 hours.[4]

List of most significant pests targeted by HT and MB

Members of the following pest groups associated with wood packaging material are practically eliminated by HT and MB treatment in accordance with the specifications listed above:

Pest group
Insects
Anobiidae
Bostrichidae
Buprestidae
Cerambycidae
Curculionidae
Isoptera
Lyctidae (with some exceptions for HT)
Oedemeridae
Scolytidae
Siricidae
Nematodes
Bursaphelenchus xylophilus

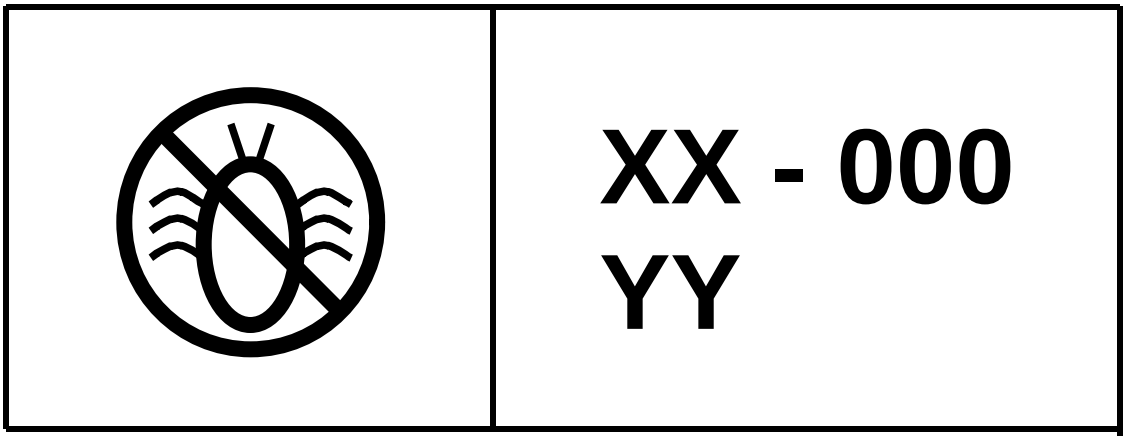
[3] A minimum core temperature of 56° C for a minimum of 30 min. is chosen in consideration of the wide range of pests for which this combination is documented to be lethal and a commercially feasible treatment. Although it is recognized that some pests are known to have a higher thermal tolerance, quarantine pests in this category are managed by NPPOs on a case by case basis.

[4] Certain countries require that the minimum commodity temp should be higher

ANNEX II

MARKING FOR APPROVED MEASURES

The mark shown below is to certify that the wood packaging material that bears the mark has been subjected to an approved measure.



The mark should at minimum include the:

- symbol
- ISO two letter country code followed by a unique number assigned by the NPPO to the producer of the wood packaging material, who is responsible for ensuring appropriate wood is used and properly marked
- IPPC abbreviation according to Annex I for the approved measure used (e.g. HT, MB).

NPPOs, producers or suppliers may at their discretion add control numbers or other information used for identifying specific lots. Where debarking is required the letters DB should be added to the abbreviation of the approved measure. Other information may also be included provided it is not confusing, misleading, or deceptive.

Markings should be:

- according to the model shown here
- legible
- permanent and not transferable
- placed in a visible location, preferably on at least two opposite sides of the article being certified.

The use of red or orange should be avoided since these colors are used in the labeling of dangerous goods.

Recycled, remanufactured or repaired wood packaging material should be re-certified and re-marked. All components of such material should have been treated.

Shippers should be encouraged to use appropriately marked wood for dunnage.

ANNEX III

MEASURES BEING CONSIDERED FOR APPROVAL UNDER THIS STANDARD

Treatments[5] being considered and which may be approved when appropriate data becomes available, include but are not limited to:

Fumigation
Phosphine
Sulfuryl fluoride
Carbonyl sulphide

CPI
High-pressure/vacuum process
Double vacuum process
Hot and cold open tank process
Sap displacement method

Irradiation
Gamma radiation
X-rays
Microwaves
Infra red
Electron beam treatment

Controlled atmosphere

[5] Certain treatments such as phosphine fumigation and some CPI treatments are generally believed to be very effective but at present lack experimental data concerning efficacy which would allow them to be approved measures. This present lack of data is specifically in relation to the elimination of raw wood pests present at the time of application of the treatment.

For further information on international standards, guidelines and recommendations concerning phytosanitary measures, and the complete list of current publications, please contact the:

SECRETARIAT OF THE INTERNATIONAL PLANT PROTECTION CONVENTION

By mail: IPPC Secretariat
Plant Protection Service
Food and Agriculture Organization of the United Nations (FAO)
Viale delle Terme di Caracalla
00100 Rome, Italy
Fax: +39-06-570.56347
E-mail: ippc@fao.org
Website: http://www.ippc.int

INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES (ISPMS)

New Revised Text of the International Plant Protection Convention, 1997. FAO, Rome.
ISPM Pub. No. 1: *Principles of plant quarantine as related to international trade*, 1995. FAO, Rome.
ISPM Pub. No. 2: *Guidelines for pest risk analysis*, 1996. FAO, Rome.
ISPM Pub. No. 3: *Code of conduct for the import and release of exotic biological control agents*, 1996. FAO, Rome.
ISPM Pub. No. 4: *Requirements for the establishment of pest free areas*, 1996. FAO, Rome.
ISPM Pub. No. 5: *Glossary of phytosanitary terms*, 1999. FAO, Rome.
Glossary Supplement No. 1: *Guidelines on the interpretation and application of the concept of official control for regulated pests*, 2001. FAO, Rome.
ISPM Pub. No. 6: *Guidelines for surveillance*, 1997. FAO, Rome.
ISPM Pub. No. 7: *Export certification system*, 1997. FAO, Rome.
ISPM Pub. No. 8: *Determination of pest status in an area*, 1998. FAO, Rome.
ISPM Pub. No. 9: *Guidelines for pest eradication programmes*, 1998. FAO, Rome.
ISPM Pub. No. 10: *Requirements for the establishment of pest free places of production and pest free production sites*, 1999. FAO, Rome.
ISPM Pub. No. 11: *Pest risk analysis for quarantine pests*, 2001. FAO, Rome.
ISPM Pub. No. 12: *Guidelines for phytosanitary certificates*, 2001. FAO, Rome.
ISPM Pub. No. 13: *Guidelines for the notification of non-compliance and emergency action*, 2001. FAO, Rome.
ISPM Pub. No. 14: *The use of integrated measures in a systems approach for pest risk management*, 2002. FAO, Rome.
ISPM Pub. No. 15: *Guidelines for regulating wood packaging material in international trade*, 2002. FAO, Rome.
ISPM Pub. No. 16: *Regulated non-quarantine pests: concept and application*, 2002. FAO, Rome.
ISPM Pub. No. 17: *Pest reporting*, 2002. FAO, Rome.

Appendix G. Acronyms and Glossary

A

ACGIH — American Conference of Governmental Industrial Hygienists

APHIS — Animal and Plant Health Inspection Service, United States Department of Agriculture

ARS — Agricultural Research Service, United States Department of Agriculture

B

Biodiversity — Genetic variability of species and variability of environmental processes within a given geographical area or ecological community.

C

CEC — Commission for Environmental Cooperation

CEQ — Council on Environmental Quality

CFC's — Chlorofluorocarbons

CFR — Code of Federal Regulations

Chlorofluoro-carbons — Organic chemical substances containing chlorine and fluorine.

cm — Centimeters

Controlled atmosphere — Treatment of commodity to asphyxiate (suffocate) parts by displacement of oxygen.

Cumulative impact or effects — ". . . the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." (40 CFR 1508.7).

D

Debarking — The process of removing bark from logs and other regulated wood articles, including dunnage.

E

EA — Environmental assessment

Ecosystem — A functioning natural unit including the biological species present, the physical environment (soil, water, air), and relationships among the components present.

EEC — European Economic Community

EIS — Environmental impact statement

Electron beam irradiation — A form of radiation that has experimentally been used to treat wood; the radiation is generated by machine rather than from a radioactive isotope.

Entry — The physical arrival of a pest organism at a particular port or location.

EO — Executive Order

EPA — Environmental Protection Agency

Established — A permanent infestation of a pest organism in a given area.

Establishment — Perpetuation, for the foreseeable future, of a pest within an area after introduction.

EU — European Union

F

FAO — Food and Agriculture Organization, United Nations

FIFRA — Federal Insecticide, Fungicide, and Rodenticide Act

Frass — Excretory products from insects.

FS — USDA, Forest Service

Fumigant — The gaseous state of a toxic chemical which, when released and dispersed to a commodity, is designed to kill any pests found on or within the commodity.

Fumigation — The act of releasing or dispersing a gaseous or aerosol compound (fumigant) to eliminate pest risk.

Fumigation chamber — Enclosed structure where commodities are treated with gaseous or aerosol compound to eliminate pest risk.

G

Gamma irradiation — A nonchemical treatment method that has been used to sterilize or kill certain pest species by exposure to specific wavelengths of light rays and is a method that is most often used to treat commodities other than wood.

GATT — General Agreement on Trade and Tariffs; an international agreement designed to reduce and eliminate barriers to trade, investment, and services among its signatory countries.

Global warming/global climate change — The process by which energy distribution within the atmosphere affects temperature and climate worldwide.

Grams per cubic meter (g/m^3) — Measurement of fumigant concentration in air.

Gray — In irradiation treatments, an amount of energy (1 joule or 1,000 ergs) absorbed from a radiation-producing source per kilogram of matter; 1 Gray equals 100 rads.

Greenhouse gases/effect — Any one of several chemicals present in air that store and retain heat and may cause warming of air temperatures (effect).

H

Harmonization — Process of making Federal regulations consistent and compatible with other Federal regulations, International treaties and agreements, and related trade initiatives.

Heat treatment — Regulatory quarantine action of applying high temperature to a commodity to eliminate pest risk.

Hectare Unit of area measure equal to 2.471 acres.

I

Introduction The intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.

IPM Integrated Pest Management; an approach to pest control that involves consideration to all practical chemical and nonchemical methods.

IPPC International Plant Protection Convention

Irradiation Regulatory treatment which exposes a commodity to light rays resulting in elimination of pest risk.

ITO International Trade Organization

K

Kiln drying A process for heating and drying wood in an enclosed facility. The specific procedures are described in the Dry Kiln Operators Manual.

M

m^3 Cubic meters

MBTOC Methyl Bromide Technical Options Committee

Microwave treatment Exposing wood to ultra-high frequency magnetic fields that elevate the temperature of any material containing moisture.

Mitigation Measures taken to avoid or reduce adverse impacts on the environment; or measures taken to avoid or reduce the likelihood of pest presence or survival in a commodity.

MT Metric tons

N

NAFTA North American Free Trade Agreement

NEPA National Environmental Policy Act

NOEL — No Observed Effect Level; the highest dose level at which there are no observable differences between the test and control populations.

Nonquarantine pest — An undesirable organism not officially controlled but of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed.

O

ODP — Ozone depleting potential (under stratospheric ozone layer).

ODS — Ozone depleting substance; literally, a substance which acts to reduce the amount of ozone in the atmosphere.

Ozone — A compound consisting of three connected oxygen atoms found in two layers of the atmosphere, the stratosphere and the troposphere.

P

Phytosanitary measures — Any legislation, regulation, or official procedure having the purpose to prevent the introduction and/or spread of pests.

Phytotoxicity — The ability of a chemical to adversely affect plant growth or survival.

Plant pest — "Any living stage of any insects, mites, nematodes, slugs, snails, protozoa, or other invertebrate animals, bacteria, fungi, other parasitic plants or reproductive parts of parasitic plants, noxious weeds, viruses, or any organism similar to or allied with any of the foregoing, or any infectious substances, which can injure or cause disease or damage in any plants, parts of plants, or any products of plants." (7 CFR 319.40–1).

PPM — Parts per million

PPQ — Plant Protection and Quarantine, Animal and Plant Health Inspection Service, United States Department of Agriculture

Q

QPS — Quarantine and preshipment

Quarantine pest An undesirable organism, officially controlled and of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed.

R

Rad In irradiation treatments, an amount of energy absorbed from a radiation producing source per kilogram of matter; one rad equals 1/100 Gray.

Recapture system The part of fumigation equipment designed to remove methyl bromide when treatment is completed. Equipment consists of an intake from fumigation chamber, an extraction unit, and an outflow for the purified air.

Regeneration facility An industrial plant designed to remove bromine residues from carbon absorption modules to allow future use in recapture systems of methyl bromide.

Regulated article "The following articles, if they are unprocessed or have received only primary processing: logs; lumber; any whole tree; any cut tree or any portion of a tree, not solely consisting of leaves, flowers, fruits, buds, or seeds; bark; cork; laths; hog fuel; sawdust; painted raw wood products; excelsior (wood wool); wood chips; wood mulch; wood shavings; pickets; stakes; shingles; solid wood packing materials; humus; compost; and litter." (7 CFR 319.40–1).

Regulated non-quarantine pest A nonquarantine pest whose presence in plants for planting affects the intended use of those plants with an economically unacceptable impact and which is therefore regulated within the territory of the importing contracting party.

Regulated pest A quarantine pest and/or a regulated nonquarantine pest.

RfC Reference concentration

S

Solid wood packing material (SWPM) Wood packing materials other than loose wood packing materials, used or for use with cargo to prevent damage, including, but not limited to, dunnage, crating, pallets, packing blocks, drums, crating, and skids.

Sessile Animals that are slow moving or sedentary.

SPS	Sanitary and phytosanitary regulations/standards.
Stratosphere	The upper portion of the atmosphere, in which temperature varies very little with changing altitude and clouds are rare.
Substitute packing materials	Cargo packing materials other than SWPM, including, but not limited to plywood, oriented strand board, particle board, corrugated paperboard, plastic and resin composites, plastic, and metal.
SWPM	Solid wood packing materials

T

TEIA	Transboundary environmental impact assessments
Trace gas	An aerosol present at low concentration that is barely detectable.

U

UN	United Nations
UNEP	United Nations Environment Programme
USDA	United States Department of Agriculture
UV	Ultraviolet radiation

V

Volatilizer	Heating unit to convert methyl bromide liquid to a gaseous form.

W

WHO	World Health Organization
WMO	World Meteorological Organization
Wood preservative treatment	Application of liquid chemicals by surface coating, dipping, or pressure treatment of wood to prevent or eliminate pest infestation.

Wood packaging material	IPPC term that is interchangeable with APHIS' solid wood packing material (SWPM).
WTO	World Trade Organization

Appendix H. Index

U

W