however, asks for comments on that decision.

In initial analyses (see Multipathway Analysis Background Document available through the docket), EPA modeled potential risks from several types of combustion units, using engineering judgment to make a best estimate for destruction and removal efficiencies for non-hazardous waste combustors. Early comments suggested that the assumptions might have overstated or understated the estimated risks by not reflecting actual practice in industrial boilers or other likely combustion facilities not regulated by Subtitle C. However, initial comparisons indicated that the combustion risk estimates back-calculated to the combustion unit were not often the most significant risk and, therefore, would not be the basis for the limiting exit criteria.

EPA also recognized that there are many issues related to organics that are produced during the combustion process, but are not necessarily originally in the waste. The amount and type of these ''products of incomplete combustion'' are generally believed to be dependent on a number of aspects of the design and operation of a facility, and not easily related to the composition of the wastes fed into the combustion unit. For purposes of this proposal, EPA decided that because of the high degree of uncertainty associated with developing waste concentrations from combustion units, it was not appropriate to use risks from combustion as a factor in deciding what wastes remain under the hazardous waste regulations. Rather, EPA believes there are more appropriate ways to regulate emissions from combustion units through various regulatory authorities, including regulation of a range of units under the Clean Air Act.

EPA, however, asks comment on the appropriateness of this approach. In particular, there may be some constituents (e.g., certain metals that are difficult to capture in pollution control equipment) where a better correlation exists between waste input and potential risk from combustor emissions than for organics that are in the waste and also created as PICs during the combustion process.

b. Fate and Transport

(1) Pathways

In selecting environmental fate and transport pathways to include in the assessment, EPA used as a guide previous rulemakings and other special studies by the Agency that examine numerous pathways. For example, the Agency has used similar risk assessment methodologies in several recent rules including: Wastes from Wood Surface Protection, Final Rule (59 FR 458, January 4, 1994); Standards for Use or Disposal of Sewage Sludge, Final Rule (58 FR 32, February 19, 1993); Corrective Action Management Units, Final Rule (58 FR 29, February 16, 1993); and rulemaking efforts on the Pulp and Paper Industry (56 FR 21802, May 10, 1991 and 58 FR 66078, December 17, 1993).

The sewage sludge and pulp and paper rulemakings in particular examined both human and ecological risk. Other rulemakings under development within the Office of Solid Waste also use non-groundwater risk assessment methodologies including various hazardous waste listing determinations and the dioxin emission rules for hazardous waste combustion units. Most of these assessments rely on several Agency guidance documents issued in recent years. In January 1990, the Agency issued an interim report, Methodology for Assessing Health Risks Associated with Indirect Exposure to Combustor Emissions (EPA/600/6–90/003 and referred to as the Indirect Exposure Document). This document served as the basis for further development of non-groundwater pathway assessments by the Agency. In November 1993, the Agency issued an Addendum to the Indirect Exposure Document that updated and revised portions of the methodology presented in the Indirect Exposure document. In April 1994, OSW issued a draft implementation guidance entitled Implementation Guidance for Conducting Indirect Exposure Analysis at RCRA Combustion Units. In June 1994, the Agency released a review draft of Estimating Exposure to Dioxin-Like Compounds: Volumes I–III (EPA/600/6–88/005C), which presents an extensive and expanded version of the Agency's previous multiple pathway exposure assessments. Finally on November 16, 1994, the Agency issued Draft Soil Screening Guidance (59 FR 59225), which presents a multiple pathway assessment using air, groundwater, and soil pathways for soil screening levels at Superfund sites. The risk assessment presented relies on the methodologies presented in these Agency guidance documents to maintain consistency with previous Agency efforts.

Based on these efforts by the Agency in conducting non-groundwater pathway assessments, comments by reviewers on previous draft versions of the risk assessment, and some screening analyses to identify pathways that are either very similar or unimportant compared to other pathways, the Agency selected the human and ecological exposure pathways presented in Table A–1 (human exposure pathways) of appendix A and Table A–2 (ecological exposure pathway) of appendix A. These exposure pathways are described in greater detail in the Technical Support Document for the Hazardous Waste Identification Rule: Risk Assessment for Human and Ecological Receptors.

Tables A–1 and A–2 presents four columns: column 1 (exposure media), identifies the medium, such as air or soil, to which the receptor is exposed; column 2 (route of exposure), identifies the route, such as inhalation or ingestion, by which a receptor is exposed to the exposure medium; column 3 (type of fate and transport), classifies the pathway by the primary mode of fate and transport of the contaminant to the exposure medium, including direct air, air deposition, air diffusion, groundwater, overland, and soil; and column 4 (exposure scenario), identifies the compartments in the pathway (e.g., source to air to humans), and describes the exposure scenario (e.g., inhalation of volatiles).

The fate and transport pathways examined can be grouped into six types of initial release and movement away from a waste management unit, as follows:

- Direct air pathways—air emissions of volatiles and respirable (PM_{10}) particulates;
- Air deposition pathways—air emissions of particulates that deposit on soil or plant surfaces;
- Air diffusion pathways—air emissions that, while in the vapor phase, diffuse directly into surface water or plants;
- Groundwater—groundwater releases (These are the pathways that link to the separate groundwater fate and transport analysis that then links to the waste management units.);
- Overland pathways—overland transport (i.e., surface runoff and soil erosion) to surface water or transport by soil erosion to off-site fields;
- Soil pathways—on-site soil exposures.

There are three types of pathways not included in the analysis. Pathways involving the use of contaminated water (groundwater and surface water) for irrigation were removed due to modeling difficulties that could not be resolved, however early results indicated these are not the most significant pathways for any of the waste management units. Pathways involving the deposition of contaminated particles directly onto