COMMENT RESPONSE DOCUMENT

ADDRESSING THE PUBLIC COMMENTS

RECEIVED ON:

REGULATORY IMPACT ASSESSMENT FOR PROPOSED HAZARDOUS WASTE COMBUSTION MACT STANDARDS, DRAFT

November 13, 1995

Economics, Methods, and Risk Analysis Division
Office of Solid Waste
U.S. Environmental Protection Agency

July 1999

Final For Docket

ACKNOWLEDGMENTS

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INTRODUCTION

Background and Purpose of Document

In May 1993, the U.S. Environmental Protection Agency (EPA) introduced a draft Waste Minimization and Combustion Strategy designed to reduce reliance on the combustion of hazardous waste and encourage reduced generation of these wastes. Among the key objectives of the strategy is the reduction of the health and ecological risks posed by the combustion of hazardous waste. As part of this strategy, EPA is developing more stringent performance-based emissions standards based on the "maximum achievable control technology" (MACT) approach. These MACT standards are being promulgated by EPA under authority of the Clean Air Act, as amended (CAA). Three categories of hazardous waste combustion facilities are subject to these revised standards:

- Hazardous waste incinerators, both commercial and on-site;
- Hazardous waste-burning cement kilns; and
- Hazardous waste-burning lightweight aggregate kilns.

EPA proposed MACT standards for these combustion sources on April 19, 1996 (61 FR 17358). Because the proposed rule was projected to result in total national costs greater than $100 million annually, the proposal represented a significant regulatory action, requiring compliance with Executive Order 12866 (EO 12866). A Regulatory Impact Assessment (RIA) was prepared in accordance with EO 12866 to analyze the costs and benefits, as well as economic and distributional impacts of the rule.

Over an extended comment period of four months, EPA received voluminous comments on the proposed rule and supporting documents, including the draft RIA. During this first comment period, EPA also commissioned a peer review of the economic analysis of the rule along with two other technical aspects. EPA invited comment on its peer review through a Notice of Data Availability (NODA), published in the Federal Register on August 23, 1996. To facilitate the review and response to comments, EPA electronically scanned the comments and parsed sections of the comments into the following major subject areas:

- Economics
- Engineering
- Permitting
- Risk Analysis

- Waste Minimization

This "Response-to-Comments" document only addresses public comments that are categorized as "Economics" issues[1] from the above list of subject areas. EPA reviewed these comments and, where necessary, revised methodologies and assumptions employed for the economic assessment of the final rule. Responses to peer review comments are presented in a separate document. Throughout this document, we refer to the 1995 regulatory assessment of the proposed standards (Regulatory Impact Assessment for Proposed Hazardous Waste Combustion MACT Standards, Draft, November 13, 1995) as the "RIA," and to the revised 1999 economic assessment document prepared for the Final Rule (Assessment of The Potential Costs, Benefits, and Other Impacts of The Hazardous Waste Combustion MACT Standards: Final Rule, 1999), as the "*Assessment*."

Organization of Document

This document is organized into three main sections. We first describe the approach for reviewing the public comments and grouping them into topic areas. We then present a summary of the key issues raised by the public commenters, along with our responses. Lastly, we provide detailed responses to specific issues raised by the commenters.

APPROACH TO REVIEWING PUBLIC COMMENTS

We reviewed multiple files containing sections of comments pertaining to economic issues. The comments were identified by docket number and commenter. We obtained the necessary context and supporting data from the EPA RCRA docket where further information was necessary for comment clarification.

In reviewing the public comments, we identified thirteen general topic areas addressed by the commenters, and then categorized each parsed comment into the appropriate topic area. To facilitate our task of responding, and to simplify the presentation in this document, we further grouped comments that raised similar or identical issues and provided a single response to these grouped comments.

[1] While the RIA also includes information and analysis on the other four topic areas, these comments are responded to separately.

SUMMARY OF MAJOR ISSUES AND RESPONSES

This section summarizes our responses to the major issues raised by the public commenters. We identified seven main issues of concern:

1. Revise the baseline and compliance costs to improve their accuracy.

2. The consolidation routine in the economic modeling is an unrealistic representation.

3. Improve the waste minimization analysis to reflect other constraints faced by waste generators. The current analysis is unrealistic and overestimates waste minimization gains.

4. Model waste markets to reflect segmentation across waste types.

5. The baseline costs of waste burning for cement kilns should include the shared joint costs of cement production.

6. Shutdown costs and environmental risks associated with combustion facility closures are not accounted for in the economic analysis.

7. Impacts on generators and fuel blenders are not adequately addressed.

Below we summarize our response to these issues and explain how we addressed them in our revised economic assessment (*Assessment*).

1. Revise the baseline and compliance costs to improve their accuracy.

Baseline and compliance costs have been substantially revised to address numerous public comments. Instead of using a model plant approach for assigning compliance and baseline costs to modeled combustion facilities, EPA estimated costs for the final rulemaking using combustion system-specific parameters. These include: gas flow rate, baseline emissions, APCDs currently in place, total chlorine in feed, stack moisture, and temperature at APCD inlet.

The combustion system-specific baseline and compliance costs will allow for greater accuracy in estimating national costs and predicting which facilities may stop burning hazardous waste in the face of the MACT rule. In addition, the baseline costs include lost clinker production penalties at cement kilns and use updated incinerator capital costs, labor requirements, and ash disposal costs.

2. The consolidation routine in the economic modeling is an unrealistic representation.

For the final economic assessment, EPA has revised the consolidation routine to incorporate capacity constraints that affect the ability of combustion facilities to consolidate wastes into fewer systems at a given facility. We derived maximum capacity rates (tons per year) by using the feed rates in EPA's OSW database (pounds per year) and assuming 8,000 hours per year of operation. Wastes will be consolidated into fewer combustion systems at a single facility to the extent that the capacity constraints allow the systems to absorb the displaced hazardous wastes.

3. Improve the waste minimization analysis to reflect other constraints faced by waste generators. The current analysis is unrealistic and overestimates waste minimization gains.

For the 1999 *Assessment*, we conducted an expanded and significantly improved analysis of waste minimization alternatives. The refined analysis used a more detailed decision framework for evaluating waste minimization investment decisions that captures the full inventory of costs, savings and revenues, including indirect, less tangible items typically omitted from waste minimization analysis, such as liability and corporate image. For each waste minimization alternative that was identified as a viable alternative for currently combusted waste streams, cost curves were developed for a range of waste quantities (because cost varies by waste quantity). These cost curves were then used to determine whether a waste generator would shift from combustion to waste minimization alternatives as combustion prices rise. The detailed analysis is presented in an Appendix to the 1999 *Assessment.* Results from the analysis are also used to inform the elasticity of demand for combustion services (discussed in Chapter 5 of the *Assessment*).

4. Model waste markets to reflect segmentation across waste types.

Instead of using different combustion prices for kilns and incinerators, the pricing approach used in the 1999 *Assessment* assigns different prices to different types of wastes. Waste management prices depend on several factors. These factors include the waste form (solid/liquid/sludge), heat content, method of delivery (e.g., bulk versus drum), and contamination level (e.g., metals or chlorine content). In addition, regulatory constraints (e.g., prohibitions against burning certain types of wastes) and technical constraints (e.g., adverse effects of certain waste streams on cement product quality) also influence combustion prices. Although data limitations prevent us from accounting for all factors, the information on heat content and constituent concentrations from EPA's National Hazardous Waste Constituent Survey (NHWCS) allows us to enhance the characterization of combusted waste. The result from our data analysis of the NHWCS, along with discussions with industry representatives, is seven categories of waste types to which we assign prices.

5. <u>The baseline costs of waste burning for cement kilns should include the shared joint costs of cement production</u>.

EPA does not include cement production costs in the costs of waste burning because these are not part of the incremental costs introduced by hazardous burning at kilns. We believe this assumption is reasonable, given that cement production is the principal activity of cement kilns that burn hazardous waste and given that the same kiln is required for cement production regardless of hazardous waste combustion activities. However, EPA also evaluated whether some marginal kilns may be covering cement production costs with hazardous waste burning revenues; we report these findings in the final 1999 *Assessment.*

6. <u>Shutdown costs and environmental risks associated with combustion facilities exiting the hazardous waste burning market are not accounted for in the economic analysis</u>.

Many of the facilities that are expected to exit the hazardous waste burning market are those that are currently operating significantly below their capacity, which suggests that they may not have been fully recovering their capital costs even in the absence of the MACT standards. The number of combustion facilities expected to exit the market due to the rule is quite small[2]. Therefore, while closure is not costless, we expect the costs due to the rule to be relatively small.

With regard to increased risks from the transport of hazardous wastes that are reallocated to off-site combustion sources; since these facilities are burning small quantities of waste, the incremental health risks will be minimal. In fact, EPA estimates that less than 2 percent of the wastes currently burned at all combustion facilities regulated by the MACT standards will be reallocated due to facility market exits caused by the final standards. A large percentage of the hazardous waste displaced from these facilities will likely be sent to other kilns or incinerators. This is expected to decrease the quantity of fossil fuel used at these facilities and offset the increases at the kilns that stop burning. In the unlikely event that hazardous waste burning cement kiln facilities increase coal burning to compensate for 100 percent of their waste reallocations, the increased coal consumption would represent less than one tenth of one percent (< 0.10 percent) of total 1997 coal used for industrial (excluding utilities) purposes in 1997.

Finally, spills and other accidents caused by trucking hazardous waste, the most common means of shipment for hazardous materials, generally are considered low-probability events, especially relative to the total number of accidents occurring within all transportation overall.

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[2] The final *Addendum* to the *Assessment* presents our estimate of the actual number of facility market exits

7. <u>Impacts on generators and fuel blenders are not adequately addressed</u>.

In the 1999 *Assessment*, EPA considered the costs of the proposed rule to hazardous waste generators and fuel blenders. We determined that hazardous waste generators and fuel blenders would likely see price increases for combusted waste streams, though the magnitude of the price increase will depend on the type of waste and the non-combustion waste management alternatives available for that waste type. In the final *Addendum* document we estimate the price increase faced by generators to range from about $3 to $15 per ton, in response to the final standards.

DETAILED RESPONSES TO COMMENTS

This section provides detailed responses to the public comments pertaining to economic issues. We group our responses into thirteen topic areas itemized below.

(1) General Methodology and Data Presentation

(2) Market Structure and Waste Segmentation

(3) Government Facilities

(4) Cement Kilns

(5) On-Site Incinerators

(6) Benefits

(7) Baseline Issues

(8) Costs (This section covers costs to the environment and negative benefits.)

(9) Cost-Effectiveness

(10) Waste Minimization

(11) Interpretation of Costs and Benefits: Use of the RIA in Developing MACT Standards

(12) Impacts on Generators and Fuel Blenders

(13) Small Business Impacts

Each of the issues to which we respond is identified by the commenter, docket number ("DCN"), and file name of the scanned comment ("subject"), along with a succinct summary of the comment. For comments that raise similar issues, we provide only one summary of the comment and a single response. The entire text of each comment addressed in this response document is available in the RCRA docket for the proposed rulemaking.

(1) General Methodology and Data Presentation

Model Plants Approach

DCN: RCSP000240
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON6
COMMENT: The model plants approach is questionable due to inadequate data sources, incorrect assumptions, omission of important costs associated with the use of HWDF, and unrealistic representation of the hazardous waste market.

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON6
COMMENT: EPA created a number of model plants. Commercial incinerators were categorized in six types of model plants, cement kilns in four and on-site incinerators in twelve. For these model plants, the direct and indirect costs were assigned largely based on estimates provided by trade articles, the OAQPS cost models and industry representatives.

RESPONSE:
For the 1995 RIA, because of the diverse characteristics and large number of regulated combustion units, EPA applied a model plants approach to estimate the baseline costs of hazardous waste burning and to estimate compliance costs for the proposed rule. Twenty-five baseline model plant groups and 127 model plants for compliance costs were developed.

EPA established baseline model plant groups and associated costs by first identifying the key cost components, which include cost of the combustion unit and air pollution control devices already installed, labor, waste storage, waste sampling and analysis, and incinerator ash disposal. After identifying the key cost components to include in the baseline analysis, model plant classifications were developed to characterize the current combustion universe. Model plants were developed for each industry sector, including commercial incinerators, cement kilns, lightweight aggregate kilns, and on-site incinerators. Unit type (*e.g.*, wet kiln versus dry kiln); unit size; and installed APCD train all affected model plant classifications. A number of sources were used to quantify baseline cost components. These included trade publications, engineering cost models, and best engineering judgment. The sources for each are detailed in the Appendix B of the 1995 RIA.

EPA developed model plant assignments for estimating compliance costs by assigning individual combustion units to a model plant category on the basis of current emissions and types of new air pollution control equipment required to comply with the proposed rule. From this assignment of pollution control devices, EPA derived for each option the capital and operating costs that each modeled unit would incur. A detailed discussion of the model plants methodology and results can be found in a separate document produced for EPA.[3]

For the final rule, EPA estimated baseline and compliance costs using combustion system-specific data, rather than using the model plants approach described above. The combustion system-specific baseline and compliance costs will allow for greater accuracy in estimating national costs and predicting which facilities will stop burning hazardous waste in the face of the MACT rule. The baseline costs have been improved to: 1) include lost clinker penalties at cement kilns, and, 2) use a 7 percent interest rate instead of 10 percent. For the final rule, compliance cost estimates are also derived using combustion system-specific information. The key combustion-system specific parameters that affect APCD assignments are: baseline emissions for each combustion system, APCDs currently in place, gas flow rate, total chlorine in feed, stack moisture, and temperature at APCD inlet.

Break-Even Quantity (BEQ) Analysis

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON3

DCN: RCSP000230
COMMENTER: CONTINENTAL CEMENT
SUBJECT: ECON7

DCN: RCSP000231
COMMENTER: GROSSMAN CONSULTING
SUBJECT: ECON7

DCN: RCSP000232
COMMENTER: LONE STAR INDUSTRIES
SUBJECT: ECON7

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[3] Development of Baseline Costs for Hazardous Waste Incineration, prepared for Industrial Economics, Incorporated, prepared by Energy and Environmental Research Corporation, 18 April 1995.

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON7
COMMENT: The BEQ methodology is incorrect. It does not model how a cement kiln makes a decision to switch from alternative fuels to HW. The BEQ analysis should be evaluated for HWDF recycling by cement kilns.

RESPONSE:
The BEQ analysis is not used to determine whether a cement kiln will switch from alternative fuels to hazardous waste derived fuels. Instead, the purpose of the BEQ analysis is to assess the likelihood that facilities currently burning hazardous waste derived fuels will stop burning hazardous waste as a result of increased compliance costs. For cement kilns, the BEQ analysis includes the costs avoided of burning conventional fuel (*i.e.*, HWDF recycling is addressed for cement kilns).

EPA calculated two BEQ measures -- short run and long run. Combustion units will continue to operate in the short-run if they can burn enough waste to cover their variable and fixed O&M costs. In the long run, units must also cover their fixed capital costs as well if they are to continue operating. In both the long and short run, a combustor will not choose to invest in new capital (*i.e.*, pollution control equipment) unless it is confident that it can burn enough waste to cover the cost of that new equipment.

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON7
COMMENT: Assumed shifts to the least-cost alternative may not occur due to the need for certain hazardous waste (*e.g.*, cyanide waste) to be burned in specialized facilities.

RESPONSE:
EPA recognizes that there are limitations to the consolidation scenario. We have identified three facilities (comprised of eight systems) that are burning specialized wastes. We have adjusted revenue and cost estimates accordingly. However, because EPA's waste data are available only at the facility-level, and not at the system-level, we were unable to incorporate consolidation constraints to reflect burning of specialized wastes.

DCN: RCSP000243
COMMENTER: ENVIRONMENTAL TECHNOLOGY COUNCIL (ETC)
SUBJECT: ECON3
COMMENT: The BEQ analysis should be redone.

RESPONSE:
EPA believes that the BEQ analysis adequately evaluates the likelihood that combustion facilities may stop burning in the face of increased costs. For the final *Assessment*, we revised the BEQ analysis to include capacity constraints. We derived maximum capacity rates (tons per year) by using the feed rates in EPA's OSW database (pounds per year) and assuming 8,000 hours per year of operation. (See Response to comment above for an explanation of how the BEQ analysis is used to predict decisions to stop burning hazardous waste.)

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON1
COMMENT: The BEQ analysis should be redone. EPA has overestimated baseline closures due to incorrect baseline estimates.

RESPONSE:
Baseline costs have been revised for the final *Assessment*; these revised estimates are used in the BEQ analysis for the economic analysis of the final rule. (See Response to Model Plants Approach above for a detailed discussion on how the baseline costs for waste burning are being revised.)

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON7
COMMENT: BEQ should be determined using the equation: P*Q = FC + rI + vQ. [Note: We assume that: P=Price; Q=Hazardous Waste Quantity; FC=Fixed Costs; r=rate of return on capital; I=Capital Investment; V=Variable Costs; Q=Hazardous Waste Quantity.] The EPA has not articulated the concepts of return on investment, fixed annual manufacturing overhead and fixed annual selling and administrative expenses in the RIA. It has not discussed which items must be treated as capital costs, or fixed annual costs or variable costs for the purpose of implementing the equation given above. Examination of the data developed by the EPA and the manner in which it was used to predict the closures suggests that the data was not used properly. For example, O&M costs are assumed to be constant within a model class regardless of the size of the incinerator and the amount of waste burned. O&M costs should be a part of the variable costs in the equation given above. Operating costs should vary with the size of the facility.

RESPONSE:
For the proposed rule, the BEQ analysis was, in fact, determined using the equation specified above. Compliance costs were broken down into fixed and variable costs; the fixed capital costs included a reasonable return on capital of 10 percent. (For the final rule, we use a rate of 7 percent, which is consistent with OMB's Guidance). Overhead and administrative costs were included as part of the baseline costs.

For the final rule, EPA has changed its costing approach from using model plants to applying costs on a combustion system-specific basis. In addition, EPA separated operating and maintenance costs into fixed and variable components. Separating these components provides more accurate estimates of both baseline and compliance costs.

Consolidation Scenarios

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: Because consolidation is not an option for the majority of plants with multiple kilns, it should not be included with the BEQ analysis.

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: Capacity constraints, state permit limitation, production and product quality constraints generally prevent kilns from being able to consolidate HWDF use.

RESPONSE:
For the final *Assessment*, EPA has revised the consolidation routine to incorporate capacity constraints. We derived maximum capacity rates (tons per year) by using the feed rates in EPA's OSW database (pounds per year) and assuming 8,000 hours per year of operation. Wastes will be consolidated into fewer combustion systems at a single facility to the extent that the capacity constraints allow the systems to absorb the displaced hazardous wastes, and assuming no other limitations (e.g., distance to transport waste from one area of the facility to another).

We do not have adequate information to incorporate state permit limitations and production and product quality constraints into the consolidation scenario. However, product quality constraints are implicitly incorporated in the revised BEQ analysis because reductions in clinker production associated with use of hazardous waste derived fuel are incorporated as part of the baseline costs associated with hazardous waste combustion at cement kilns; these increase with the amount of hazardous waste burned at a kiln.

Baseline Operating Profits

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON7
COMMENT: A kiln will decide to burn HW so long as the costs associated with burning HW are less than those associated with burning alternative fuels. SBA states that EPA has not accurately calculated equivalent quantities of HW and conventional fuels based on Btu content, capital investment (in pollution control or other fixed equipment) and fixed costs associated with burning the two fuel options, and the fact that kilns pay for conventional fuels, but receive payment to burn HW. SBA feels that EPA has not articulated cement kilns' decision to burn HW in a like manner.

RESPONSE:
The economic impact analysis does in fact address all of these issues. Capital required for hazardous waste burning in kilns includes: APCD systems, liquid and solid waste storage, liquid and solid waste feed systems, automatic shutdown systems, and CEMs. Cement kiln revenues from hazardous waste burning include conventional fuel cost savings as well as tipping fees charged by the kilns for the service of managing hazardous wastes. Cost savings associated with conventional fuel reductions are calculated by determining the Btu content of the HW burned and the equivalent quantity of conventional fuels necessary for the same amount of energy.

For the 1995 RIA at Proposal, EPA assumed that cement kilns burn hazardous waste derived fuel in place of a mixture of coal and natural gas. This mixture is based on figures from the Portland Cement Alliance's U.S. Cement Industry Fact Sheet, and prices and Btu content are based on data from the Energy Information Administration's Annual Energy Review. The RIA for the proposed rule assumed the conventional fuel mixture to be 85.6 percent coal and 14.4 percent natural gas and the energy content of coal and natural gas to be 22.25 million Btu/ton and 1031 Btu/cf respectively. The 1994 price of coal was $29.51 per ton, and the price of natural gas was $2.99 per 1000cf. The average energy content used for hazardous waste derived fuel burned in cement kilns was 13,111 Btu/lb. for liquids, and 9,733 Btu/lb. for solids and sludges.

The *Assessment* of the Final Rule uses updated figures based on more recent data and information received in the public comments. EPA uses the following revised data for the Final Rule: Conventional fuels mixture: 91.1 percent coal and 8.9 percent natural gas; Energy content of fuels: 22.958 MBtu/ton for coal and 1,029 Btu/cf for natural gas; Conventional fuel prices: $33.05/ton for coal and $3.34/cf for natural gas; Btu content of hazardous waste derived fuel: unchanged.

Estimating the Price Increase for Hazardous Waste Combustion

DCN: RCSP000222
COMMENTER: COALITION FOR RESPONSIBLE WASTE INCINERATION
SUBJECT: ECON1
COMMENT: The most likely price pass through is 100% given that the poor economic health of the hazardous waste combustion industry leaves little margin for providers to absorb any additional costs.

RESPONSE:
Price-pass through is determined by the elasticity of demand for hazardous waste combustion, not by the economic health of the hazardous waste combustion industry. Combustion facilities cannot pass-through 100 percent of incremental costs associated with the rule if their customers have lower-priced substitutes available. For the 1995 analysis at rule proposal, the 25 percent price pass-through was selected as the most realistic increase that customers would be willing to pay before employing waste minimization options and/or choosing alternative waste management options. However, we presented results for 100 percent as well as zero percent price pass-through in the RIA's bounding scenarios.

For the final rule, we re-evaluated the price pass-through analysis by using results from an improved waste minimization assessment. This revised analysis applies a more detailed decision framework for evaluating waste minimization investment decisions. This framework captures the full inventory of costs, savings, and revenues; including indirect, less tangible items typically omitted from waste minimization analysis, such as liability, and corporate image. For each waste minimization alternative that was identified as a viable alternative for currently combusted waste streams, cost curves were developed for a range of waste quantities (because cost varies by waste quantity). These cost curves were then used to determine whether a waste generator would shift from combustion to waste minimization alternatives as combustion prices rise. The analysis finds that the elasticity of demand varies with the starting point of combustion prices. At average combustion prices, demand is relatively inelastic. Thus, we use a price pass-through rate of 75 percent to correspond with this demand elasticity. In the final *Assessment* and *Addendum* documents we present economic impact results at pass-through rates of zero, 25, 75, and 100 percent to bound the analysis.

Assessing Full Social Costs

DCN: RCSP000229
COMMENTER: EASTMAN CHEMICAL
SUBJECT: ECON7

DCN: RCSP000240
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT:ECON7

DCN: RCSP000242
COMMENTER: DUPONT
SUBJECT: ECON7
COMMENT: Lost producer and consumer surpluses not included.

DCN: RCSP000221
COMMENTER: CMA
SUBJECT:ECON1
COMMENT: CMA believes peer review panel's comment that using only compliance costs to determine the cost of the rule is "lunacy" since all firms closing would imply that the rule has no costs, can be applied to Hg as well as D/F.

RESPONSE:
An ideal cost analysis of a proposed regulation requires predicting changes in behavior by all affected parties in response to the regulation, including responses of those directly affected (*e.g.*, commercial incinerators and cement kilns), and those indirectly affected (*e.g.*, generators of hazardous wastes, fuel blenders, hazardous waste transporters, air pollution control manufacturers). To adequately capture all of these responses and interactions among the parties, as well as simultaneous adjustments in all affected markets, a dynamic, general (full) equilibrium analysis should be used. While ideal in concept, this approach has significant data requirements and assumptions, such as demand and supply elasticities. For this reason, EPA decided that use of a partial equilibrium analysis would be the best approach, given existing limitations. To bound the costs, EPA estimated before-tax compliance costs, assuming that all combustion facilities will comply with MACT and install the necessary APCDs, and that these facilities will continue burning the same waste quantities as before the rule. While this is not a true depiction of reality, this approach provides an upper bound on compliance costs, which EPA expects to account for most of the social costs.

EPA also calculates more realistic national compliance cost estimates by allowing combustion facilities to exit the market if their revenues from waste burning do not cover their costs. The commenter explains above that this is "lunacy since all firms closing would imply that the rule has no costs." If all firms were to close in the face of the rule, the compliance costs of the rule would in fact be zero. However, there would still be social costs associated with the rule (although less than the costs of all system compliance).

DCN: RCSP000165
COMMENTER: TENNESSEE DEPT. OF ENVIRONMENT AND CONSERVATION
SUBJECT: ECON6
COMMENT: The economic impact discussion should be included in the preamble which includes how the rule may affect retailers, transporters, manufacturers, local governments, inflation, and unemployment.

RESPONSE:
Results from the economic impact analysis were included in the preamble. While the economic impact analysis did not address all of the issues listed above, for the final *Assessment*, EPA expanded the economic impact analysis by also evaluating employment impacts and the effect of the rule on hazardous waste generators and fuel blenders.

Presentation of Results

DCN: RCSP000165
COMMENTER: TENNESSEE DEPT. OF ENVIRONMENT AND CONSERVATION
SUBJECT: ECON6
COMMENT: Recommends 1) costs be expressed in terms of present value as well as annual cost, 2) number of years included in annual cost be put in parenthesis. Wants costs expressed in both time and dollar terms for facilities and regulators.

RESPONSE:
EPA believes that most people understand the concept of annual cost more easily than that of present value. The cost of time to facilities is included in the cost estimates at Proposal using a 10 percent real rate of return (RIA, 4-8). For the economic analysis of the final rule, we use a rate of 7 percent, which is consistent with OMB's Guidance. Costs are annualized over 10 to 20 years, depending on the APCD equipment[4]. As for the costs to regulators, the *Assessment* for the final rule (1999) evaluates the burden on states associated with revising RCRA programs and reviewing permit modifications.

DCN: RCSP000242
COMMENTER: DUPONT
SUBJECT: ECON7
COMMENT: EPA should estimate nationwide compliance costs without adjusting for unit closures.

RESPONSE:
For the proposed and final rule, EPA estimated compliance costs, with and without adjusting for unit closures. For the proposed rule, please refer to the following exhibits in the Second Addendum to the Regulatory Impact Assessment for Proposed Hazardous Waste Combustion MACT Standards: Exhibit ADD2-16, Total Annual Compliance Costs (Assuming no market exit) and Exhibit ADD2-17, Average Total Annual Compliance Costs Per Unit (Assuming no market exit). For the final rule, please refer to Exhibits 5-5 and 5-6 in the 1999 *Assessment*, and Exhibits ADD-6, ADD-7, and ADD-8 in the final *Addendum* document.

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[4] See: U.S. EPA. July 1999. *Final Technical Support Document for HWC MACT Standards, Volume V: Emission Estimates and Engineering Costs*

DCN: RCSP000240
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7
COMMENT: The EIA does not adequately evaluate the full-range of alternative approaches when issuing MACT standards, as directed by the OMB.

RESPONSE:
At proposal, EPA evaluated all of the regulatory options in the RIA and also evaluated alternative responses by generators of hazardous waste (the regulatory options are described on page 1-3 of the RIA). In addition, EPA assessed a variety of waste management alternatives and waste minimization options that may be utilized as substitute waste management approaches if hazardous waste combustion prices increase enough to make these alternatives economic (see sections 4.1.2 and 4.1.3 of the RIA).

The *Assessment* and *Addendum* documents completed in support of the final rule evaluate the final standards, plus two major regulatory options (MACT floor, and beyond-the-floor ACI). The final standards and options are also evaluated under various scenarios, including: with and without PM CEM costs, alternative price pass-through scenarios, and alternative engineering design levels.

DCN: RCSP000094
COMMENTER: NATIONAL CEMENT
SUBJECT: ECON6
COMMENT: Regional impacts should be addressed.

RESPONSE:
EPA did analyze the regional impacts of the rule (broken down by the 10 EPA Regions). However, because of the small number of facilities in some of the regions, these results could not be included in the RIA for confidentiality reasons.

For the final *Assessment* EPA has evaluated regional impacts associate with hazardous waste reallocations.

DCN: RCSP000113
COMMENTER: HOLMAN, INC.
SUBJECT: SDGEN
COMMENT: Terms such as: risk, cost, "risk/benefit," and "cost-effectiveness" should be clearly defined, and the statutes that require their evaluation or preclude EPA's reliance on them should be identified.

RESPONSE:
The term "cost-effectiveness" is clearly defined in the 1999 *Assessment* (Chapter 8). "Risks" are defined in the Risk Assessment technical support document[5].

Impacts on Competitive Structure

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON1, ECON3
COMMENT: The relative significance of compliance costs is underestimated. More CKs will exit the hazardous waste combustion market than CIs.

RESPONSE:
Compliance costs have been revised for the final *Assessment* document. The model plants approach has been replaced with combustion system-by-combustion system compliance cost estimates. (See Responses to section "Model Plants Approach" above.) The economic *Assessment* for the final rule does in fact estimate a greater number of cement kiln market exits than commercial incinerator exits (incremental to those in the baseline).

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON7
COMMENT: The suggestion that the cost of incineration be compared to generator production costs in order to provide an indication of the demand elasticity for incineration is based on unrealistic assumptions. The existence of waste minimization options and alternatives to combustion as means of waste disposal create the elasticity of demand for combustion.

RESPONSE:
For on-site incinerators, we compare average compliance costs to generator production costs. Because generator costs vary greatly across combustion systems, we provide a wide range for this comparison.

For the final *Assessment* we use a waste minimization analysis to help determine elasticity of demand for combustion. This is covered in Appendix F of the 1999 *Assessment*.

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[5] *Human Health and Ecological Risk Assessment Support to the Development of Technical Standards for Emissions from Combustion Units Burning Hazardous Wastes: Background Document - Final Report*," July 1999.

Other Comments

DCN: RCSP000246
COMMENTER: ROLLINS ENVIRONMENTAL
SUBJECT: ECON7
COMMENT: Increased safety of combustion in incinerators due to more environmentally sound waste acceptance, sampling, and operating practices, and because residues are disposed in secure RCRA regulated landfills needs to be considered in the marginal cost assessment.

RESPONSE:
Hazardous waste not incinerated must be disposed according to full Subtitle C requirements. These requirements are established to ensure protection of human health and the environment. Waste management procedures under full Subtitle C disposal, compared to combustion (meeting the final standards) are both environmentally sound. Incremental costs, therefore, are not adjusted for any perceived increase in safety for waste management by combustion.

Cement kiln dust may benefit from the Bevill exemption thereby lowering the overall disposal costs for these wastes. The final MACT standards will have no impact on this exemption status. The final Assessment document has incorporated a briefly section that examines and compares ash disposal procedures and costs among incinerators, cement kilns, and LWAKs.

DCN: RCSP00237
COMMENTER: U.S. SMALL BUSINESS ADMINISTRATION
SUBJECT: ECON7
COMMENT: The estimated revenues of hazardous waste combustion are based on the estimated hazardous waste volume the facility is likely to combust. These estimates are based on only one set of annual waste combustion data. The yearly variation in the quantity of hazardous waste combusted per facility may be quite large, especially for commercial incinerators. In fact, the available data seems to suggest that several facilities may have been severely underutilized for the specified period. Therefore, to provide an accurate description of the proposed rule's effects on the combustion industry, the Agency needs data spanning several years.

RESPONSE:
While it would be good to get more detailed hazardous waste data per facility over a several-year period, the data which EPA relied on to conduct the economic analysis (Biennial Reporting System) is available on a biennial basis and the most recent available for the RIA at proposal was the 1991 BRS. Given that the hazardous waste combustion market has changed greatly over the years, it would not be that useful to use historic data that are older than 1991. The revised economic assessment completed for the final rule uses 1995 BRS data (the most recent finalized data available at the time of the analysis).

DCN: RCSP000243
COMMENTER: ENVIRONMENTAL TECHNOLOGY COUNCIL
SUBJECT: ECON3
COMMENT: EPA should adjust its economic analysis to account for baseline closures without regard to the MACT rule. Several hazardous waste incinerators have recently closed or consolidated operations, and a number of cement kilns have stopped burning hazardous wastes or begun burning only "clean fuels," even before the MACT standards have been issued.

RESPONSE:
The combustion universe has been updated to reflect the most recent information regarding facility closures, consolidations and cessation of hazardous waste burning. The current universe consists of 18 cement kiln facilities, 5 LWAK facilities, 20 commercial incinerators, and 129 on-site incinerators (111 private on-sites 18 government). In addition, we project future capacity in the combustion industry by assessing the baseline profitability of each system included in the economic impact model. We first determine if the combustion system is covering its short-term costs (which include operating and maintenance costs). We then assess longer term future capacity by evaluating profitability over the capital replacement cycle. We use the future capacity projections so that costs and economic impacts are incremental to the baseline. In other words, if a facility is not currently covering its long-term costs, we do not attribute market exit to the MACT rule because we expect that over the longer term, this facility will exit the market even in the absence of the MACT standards. (To reflect the uncertainty of the data assumptions, we also estimate costs and economic impacts assuming constant capacity.)

DCN: RCSP000120
COMMENTER: INT'L BROTHERHOOD OF BOILERMAKERS, IRON SHIP BUILDERS, BLACKSMITHS, FORGERS, AND HELPERS
SUBJECT: ECON6
COMMENT: Costs and benefits are not evaluated for standards beyond the floor.

RESPONSE:
The 1995 RIA prepared in support of the Proposal, as well as the 1999 *Assessment* and *Addendum* documents prepared in support of the final rule provide estimates of the costs and benefits for beyond the floor standards.

DCN: RCSP000148
COMMENTER: ESSROC
SUBJECT: ECON1

DCN: RCSP000113
COMMENTER: HOLNAM
SUBJECT: ECON3

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3

DCN: RCSP000195
COMMENTER: CENTER FOR EMISSIONS CONTROL
SUBJECT: ECON3
COMMENT: Environmental and economic benefits of using waste-derived fuel not addressed.

RESPONSE:
Cement kiln revenues from hazardous waste burning include conventional fuel cost savings as well as tipping fees charged by the kilns for the service of energy recovery. Cost savings associated with conventional fuel reductions are calculated by determining the Btu content of the HW burned and the equivalent quantity of conventional fuels necessary for the same amount of energy.

For the 1995 RIA at Proposal, EPA assumed that cement kilns burn hazardous waste derived fuel in place of a mixture of coal and natural gas. This mixture is based on figures from the Portland Cement Alliance's U.S. Cement Industry Fact Sheet, and prices and Btu content are based on data from the Energy Information Administration's Annual Energy Review. The RIA for the proposed rule assumed the conventional fuel mixture to be 85.6 percent coal and 14.4 percent natural gas and the energy content of coal and natural gas to be 22.25 MBtu/ton and 1031 Btu/cf respectively. The 1994 price of coal was $29.51 per ton, and the price of natural gas was $2.99 per 1000 cf. The average energy content used for hazardous waste derived fuel burned in cement kilns was 13,111 Btu/lb. for liquids, and 9,733 Btu/lb. for solids and sludges.

The *Assessment* and *Addendum* documents prepared for the Final Rule use updated figures based on more recent data and information received in the public comments. EPA uses the following revised data for the Final Rule: Conventional fuels mixture: 91.1 percent coal and 8.9 percent natural gas; Energy content of fuels: 22.958 MBtu/ton for coal and 1029 Btu/cf for natural gas; Conventional fuel prices: $33.05/ton for coal and $3.34/cf for natural gas; Btu content of hazardous waste derived fuel: unchanged.

We did not quantify environmental benefits of using waste-derived fuel in the 1995 RIA or in the 1999 *Assessment* because EPA believes that environmental impacts (i.e., air emissions) from shifts to conventional fuels (from waste-derived fuels) will be adequately managed by other air regulations under the Clean Air Act.

DCN: RCSP000094
COMMENTER: NATIONAL CEMENT
SUBJECT: ECON7
COMMENT: EIA is incomplete.

RESPONSE:
EPA believes that the 1995 RIA provided adequate information on the costs of the rule, along with economic impacts and distributional concerns (e.g., impacts to small businesses and environmental justice issues). The 1999 *Assessment* and *Addendum* documents prepared for the final rule provide a refined social cost analysis, plus a more comprehensive benefits assessment. The *Assessment* also includes an expanded environmental justice analysis, cost-effectiveness analysis, explicit specification of the baseline, and assessments of the potential for unfunded mandates, regulatory takings, and impacts to Tribal Governments.

(2) Market Structure And Waste Segmentation

DCN: RCSP000244
COMMENTER: SOLITE
SUBJECT: ECON2
COMMENT: EPA's assumption that BIFs have a substantial cost advantage over incinerators does not take into account the possibility that BIFs generally handle different wastestreams, which typically require blending, and is not consistent with the observed price differential between BIFs and incinerators. Solite's experience is that this differential does not typically exist for similar wastestreams.

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON3

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: Assumption that BIFs have a substantial cost advantage over incinerators does not take into account different waste streams that they handle and is inconsistent with the observed price differential.

DCN: RCSP000238
COMMENTER: HOLNAM
SUBJECT: ECON1

DCN: RCSP000222
COMMENTER: COALITION FOR RESPONSIBLE WASTE INCINERATION
SUBJECT: ECON1
COMMENT: BIFs and incinerators provide different services, incur different costs, and therefore charge different prices. These differences should be incorporated into the marginal cost framework.

RESPONSE:
The economic impact analysis assumes that BIFs have a substantial cost advantage over incinerators because no kiln capital costs are included in the baseline cost estimates for cement kilns and lightweight aggregate kilns. The kiln capital costs are not included as part of the waste burning costs because the same kiln is required for cement or aggregate production regardless of hazardous waste combustion activities. Furthermore, cement kiln dust may benefit from the Bevill exemption.

However, the economic impact analysis also takes into account the fact that kilns and incinerators handle different waste streams, charging different combustion prices, and thus generating different revenues on a per-ton basis. Namely, the 1995 economic impact analysis for the proposed rule assumed that kilns charge $80/ton for liquid wastes, $300/ton for sludges, and $680/ton for solids; whereas the analysis assumed that incinerators charge $293/ton for liquids and sludges, and $1,375 for solids. Therefore, the average price charged by incinerators is greater than that charged by kilns.

In the 1999 *Assessment* of the final rule, we use prices based on waste type (rather than combustion system type) to calculate hazardous waste burning revenues. We specify seven different prices for different waste forms (e..g, solids) and by contaminant level. Because kilns tend to handle liquid wastes with lower contaminant levels, kilns charge a lower average price per ton in comparison to the average price charged by incinerators.

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON7

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON3

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON7
COMMENT: EPA's analysis of the HW market is inaccurate. The price pass through is inaccurate due to underestimated costs relative to HWDF prices, inaccurate evaluation of competition for HWDF, and different types of waste combusted by cement kilns and incinerators. The market is incorrectly viewed as a single, unsegmented one.

RESPONSE:
The 1995 economic analysis for the proposed MACT standards used a simplified approach for calculating the price pass-through. In this simplified approach, the price pass-through is the median compliance cost per ton in the combustion sector with the lowest average total costs (baseline plus compliance costs). This approach does, in fact, suggest a single, unsegmented hazardous waste combustion market. As the commenter points out, this representation is not an accurate depiction of reality. However, given that compliance costs per ton do not vary widely between cement kilns and commercial incinerators for most regulatory options, the actual price increase with market segmentation would not be that different than the estimated price increase.

For the final analysis EPA has, in response to commenter's suggestions, adjusted the price increase to account for different types of waste streams being handled by the different combustion sectors. In particular, we determine the price increase for more highly contaminated sludges and solids based on compliance costs faced by commercial incinerators because we assume that incinerators primarily handle these types of wastes. On the other hand, price increases for liquids, and for sludges and solids of lower contaminant levels that can be handled at any commercial facility are based on compliance costs of the combustion sector with the lowest total cost per ton.

DCN: RCSP00237
COMMENTER: U.S. SMALL BUSINESS ADMINISTRATION
SUBJECT: ECON7
COMMENT: The RIA fails to articulate the important characteristics of the industry. Rather than articulating the core operations, so many potential aberrations are mentioned as to make the analysis incomprehensible. For example, even though the understanding of the differences between the types of wastes burned by cement kilns and commercial incinerators is fundamental to the manner in which the amount and types of wastes burned will shift from one sector to the another, they are not discussed in any reasonable way. Similarly, an understanding of types of wastes generated and incinerated by the on-site (or captive) facilities, necessary to determine the shifts that are likely to take place as a result of the regulation, has not been developed. The analysis also suffers from internally inconsistent data and incorrect techniques.

RESPONSE:
The 1995 economic impact analysis assumes that different combustion prices are charged by commercial incinerators and cement kilns. These different prices reflect the fact that kilns burn different types of wastes (higher Btu content, lower levels of contaminants) than commercial incinerators. In the final *Assessment*, we describe these differences more explicitly and calculate hazardous waste burning revenues by waste type, rather than by combustion sector. Seven waste types are specified by form (liquids, solids, sludges) and by contaminant level (e.g., halogens, mercury, lead, cadmium). Information on the contaminant level of waste streams was determined using EPA's 1996 National Hazardous Waste Constituent Survey (NHWCS).

For our analysis of the proposed rule, the types of wastes that are burned in on-site combustion units are described in more detail in Appendix C of the RIA, *Waste Minimization Report.* For the final *Assessment*, we describe the on-site incinerator waste types in Appendix F, Waste Minimization Report. We also identify the generating industries in Chapter 2, "Major Sources of Combusted Hazardous Wastes."

With regard to waste reallocations (diversions) resulting from the MACT standards, the economic impact analysis does not identify the specific facilities to which these wastes will be diverted. Instead, the analysis estimates waste reallocation costs by multiplying tons reallocated by the cost per ton of disposal (commercial incineration price per ton plus transportation cost per ton). In the analysis of the final rule, we further investigate diverted waste streams within geographic regions.
Finally, EPA believes the data applied in the final analysis represent the best available estimates based on proprietary and other limitations. The SBA's concern of "incorrect techniques" is addressed above under the baseline and breakeven discussion.

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(3) Government Facilities

DCN: RCSP000124
COMMENTER: DOE
SUBJECT: ECON7
COMMENT: Government entities operate under additional budget and time constraints.

RESPONSE:
Facilities will have three years from the time of rule promulgation to comply with the MACT standards. This should be sufficient for government entities to submit revised budgets and purchase and install the required control and monitoring equipment. In addition, if the facility utilizes waste minimization opportunities (including environmentally sound recycling), then a one-year extension may be granted by EPA.

DCN: RCSP000233
COMMENTER: DOE
SUBJECT: ECON7
COMMENT: The cost per gram is likely to be even more excessive for the small, on-site incinerators that DOE operates.

DCN: RCSP000124
COMMENTER: DOE
SUBJECT: ECON7
COMMENT: Facilities that handle radioactive mixed waste should be addressed separately.

DCN: RCSP000124
COMMENTER: DOE
SUBJECT: ECON7
COMMENT: The costs to manage DOE's mixed and radioactive waste and costs to manage hazardous waste residues generated by incineration are not addressed. These costs should be considered in determining cost-effectiveness of BTF standards.

RESPONSE:
For the final 1999 *Assessment*, we adjusted baseline and compliance costs for mixed and radioactive waste incinerators. These costs are derived from the technical support document: U.S. EPA. July 1999. *Final Technical Support Document for HWC MACT Standards, Volume V: Emission Estimates and Engineering Costs.*

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(4) Cement Kilns

General Comments

DCN: RCSP000238
COMMENTER: HOLNAM
SUBJECT: ECON3
COMMENT: Should be subcategorized to adequately evaluate alternative approaches.

RESPONSE:
EPA established separate MACT standards for kilns. The final *Assessment* and *Addendum* analyze economic impacts to all source categories under the recommended final standards and two primary options. Various scenarios are examined under each option.

DCN: RCSP000108
COMMENTER: SAFETY-KLEEN CORP
SUBJECT: ECON3
COMMENT: Should consider kiln-specific options for achieving equivalent technology.

RESPONSE:
The engineering cost analysis and the final *Assessment* document analyze control measures on a system-by-system basis.

DCN: RCSP000108
COMMENTER: LONE STAR INDUSTRIES, INC
SUBJECT: ECON7
COMMENT: Should be subcategorized based on process type: 1) preheater and precalciners and 2) all others.

RESPONSE:
Cement kilns with preheaters and precalciners are dry process kilns and their baseline costs reflect this kiln technology. With regards to revenues, since cement kilns with precalciners can more easily handle solid hazardous wastes and since solids command a higher tipping fee than do liquids, the hazardous waste-burning revenues for these kilns tend to be higher than for the other types of kilns.

Kilns with precalciners can more easily handle solid waste because solids can be fed into that kiln at higher temperatures (1,500 degrees Fahrenheit), made possible with the precalciner and pre-heater. Feeding solids at a higher temperature enables the toxics in the solids to get destroyed and to be used for fuel (to support the required kiln temperature increase from 1,500 degrees at one end of the kiln to 2,000 degrees at the other end).

Relationship between Kilns and Fuel Blenders

DCN: RCSP000170, RCSP000241
COMMENTER: CKRC
SUBJECT: ECON3, ECON7, ECON1
COMMENT: EPA estimates of HWDF revenues do not take into account revenue sharing agreements with fuels managers. EPA did not distinguish between plants that act as their own fuels managers and plants that use another party to acquire and blend the fuels.

RESPONSE:
EPA estimates of HWDF revenues do, in fact, take into account revenue sharing agreements with fuel managers to the extent this is reflected in the prices charged by kilns. Cement kiln combustion prices are prices paid by fuel blenders to cement kilns. If the fuel blender is integrated with the cement plant, then this price represents the internal transfer price. This approach is consistent with the costing approach; baseline costs for cement kilns only include the cost of combustion and do not include blending costs.

Joint Costs of Cement Production and Hazardous Waste Disposal

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: EPA's BEQ analysis fails to attribute any of the shared joint costs of cement production and hazardous waste disposal to the HWDF recycling activity. EPA does not have the information on cement plant production costs necessary to perform a plant-wide economic analysis but can partly address the problem of understating impacts by attributing some of the shared costs to the HWDF recycling activity.

DCN: RCSP000230
COMMENTER: CONTINENTAL CEMENT
SUBJECT: ECON7
COMMENT: While the profitability of burning HWDF has not been as great as had been expected, it still plays a significant role in the overall profitability of Continental Cement.
DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON6
COMMENT: It is reasonable for the EPA to assume for analysis purposes that the HWDF operations at cement plants are separate profit centers provided that accurate HWDF-related costs and revenues are appropriately attributed to the HWDF activities.

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON7
COMMENT: As an alternative to analyzing joint production at kilns, for which accurate data is unavailable, EPA could include part of the shared joint costs of cement production and hazardous waste disposal in its cost models for recycling HWDF.

RESPONSE:
While there are shared costs of cement production and hazardous waste disposal (*e.g.*, capital costs of the kiln), the economic impact analysis assumes that only the incremental costs introduced by hazardous waste burning should be used for the cement kiln baseline costs. This is a reasonable assumption, given that cement production is the principal activity of cement kilns that burn hazardous waste, and given that the same kiln is required for cement production regardless of hazardous waste combustion activities. However, EPA also evaluated whether some marginal kilns may be covering cement production costs with HWDF combustion revenues; we report these findings in the 1999 final *Assessment* of potential costs and benefits.

Impacts of Portland Cement MACT

DCN: RCSP000113
COMMENTER: HOLNAM
SUBJECT: ECON6
COMMENT: Business impacts of regulating cement kilns on two different schedules (those that burn HW and those that don't) not addressed.

RESPONSE:
EPA agrees that this regulatory issue needs to be addressed. The MACT standards for non-hazardous-waste burning cement kilns were proposed March 9, 1998. The final rule: *National Emission Standards for Hazardous Air Pollutants for Source Categories; Portland Cement Manufacturing Industry; Final Rule*, was published in the Federal Register on June 14, 1999 (64 **FR** 31898). For the final *Assessment* we have conducted a joint impacts analysis in an effort to estimate economic impacts potentially resulting from the simultaneous implementation of the HWC MACT and the Portland Cement MACT. The results of this analysis are summarized in Chapter 7 of the *Assessment* document and discussed in detail in Appendix J.

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(5) On-Site Incinerators

General Comments

DCN: RCSP000118
COMMENTER: ALLIED SIGNAL
SUBJECT: ECON6
COMMENT: On-site incinerators are at a competitive disadvantage with commercial incinerators because they burn much smaller quantities of waste and cannot pass costs on to generators.

RESPONSE:
On-site incinerators have two options for dealing with the compliance costs. First, on-site combustion units that handle very small quantities of hazardous waste are likely to find it less costly to ship their wastes to an off-site commercial incinerator than to continue burning on-site and comply with the MACT standards. Second, on-site combustion facilities may also be able to pass compliance costs through to customers who buy their products (*e.g.*, chemicals). The percentage of increased costs that can be passed on to the customer will depend on the elasticity of demand for that particular product.

Small On-Sites

DCN: RCSP000119
COMMENTER: GE PLASTICS
SUBJECT: ECON1
COMMENT: Small OIs face higher compliance costs than HWI because costs are distributed across smaller quantities.

DCN: RCSP000119
COMMENTER: GE PLASTICS
SUBJECT: ECON2
COMMENT: Many small OIs will be forced to exit due to significant compliance costs.

RESPONSE:
On-site incinerators have two options for dealing with the compliance costs. First, on-site combustion units that handle very small quantities of hazardous waste are likely to find it less costly to ship their wastes to an off-site commercial incinerator than to remain burning on-site and comply with the MACT standards. Second, on-site combustion facilities may also be able to pass compliance costs through to customers who buy their products (*e.g.*, chemicals). The percentage of increased costs that can be passed on to the customer will depend on the elasticity of demand for that particular product. The Agency does not plan to examine price impacts on secondary products.

DCN: RCSP000128
COMMENTER: CMA
SUBJECT: ECON1
COMMENT: Alternative compliance strategies should be analyzed for small OIs.

RESPONSE:
EPA analyzed an alternative compliance strategy for small on-site incinerators regarding PM continuous emission monitors (CEMs). In this analysis, EPA considered whether an exemption should be granted for small incinerators (i.e., they would not be required to install PM CEMs). This analysis found that requiring PM CEMs for small private on-site systems increases average compliance costs per ton by about 10 percent. PM CEMs were found to increase compliance costs per ton for large private on site systems by an average of 9 percent. The final rule defers the requirement for PM CEMs.

Today's final rule establishes a particulate matter standard of 0.015 gr/dscf for incinerators. An alternative particulate matter standard of 0.03 gr/dscf is offered through a petition process for incinerators that can prove *de minimus* levels of hazardous air pollutant metals in their feedstreams. Part Five, Section Ten of the Preamble to the final rule discusses this alternative.

DCN: RCSP000118
COMMENTER: ALLIED-SIGNAL
SUBJECT: ECON1

DCN: RCSP000117
COMMENTER: GENERAL ELECTRIC
SUBJECT: ECON7

DCN: RCSP000118
COMMENTER: DEPT. OF THE NAVY
SUBJECT: ECON1
COMMENT: On-site incinerators generally pose less risk because they handle smaller, less complex waste streams, and have more predictable and uniform emissions. For this reason many of the expensive APCDs and CEMs are not cost-effective for the proposed BTF standard. On-site incinerators should be subcategorized with alternate control standards and monitoring requirements.

RESPONSE:
While small on-site incinerators have the same regulatory standards as other incinerators (*e.g.*, commercial incinerators or large on-site units), the required control technologies for achieving these standards will be different from (and less costly than) those required for larger incinerators.

In general, small on-site incinerators (in aggregate) pose lower human health risks than large on-site incinerators, due to the lower emission levels from small incinerators. For example, long-term exposure to particulate matter (PM) from large on-site incinerators is associated with about one premature death per year, while exposure to PM from small on-sites does not contribute appreciably to any cases of premature death. (For a more detailed discussion on human health risks associated with emissions from combustion facilities, see: *Human Health and Ecological Risk Assessment Support to the Development of Technical Standards for Emissions from Combustion Units Burning Hazardous Wastes: Background Document - Final Report*," July 1999)

DCN: RCSP000136
COMMENTER: MOLTEN METAL TECHNOLOGY
SUBJECT: ECON6
COMMENT: Alternative regulatory scheme for small on-sites is unjustified and discourages pollution prevention and waste minimization.

RESPONSE:
The MACT standards are the same for all sizes of on-site incinerators and all sizes of commercial incinerators. Disincentives for pollution prevention and waste minimization are not anticipated based on facility size.

DCN: RCSP000119
COMMENTER: GE PLASTICS
SUBJECT: ECON2, ECON1
COMMENT: CEMs for small OIs are not cost-effective and go against 504(b) and 112(n)(7) of CAA.

RESPONSE:
EPA analyzed an alternative compliance strategy for small on-site incinerators regarding PM continuous emission monitors (CEMs). In this analysis, EPA considered whether an exemption should be granted for small incinerators (i.e., they would not be required to install PM CEMs). This analysis found that requiring PM CEMs for small private on-site systems increases total annual compliance costs by about 17 percent. PM CEMs were found to increase total annual compliance costs for large private on site systems by an average of 8 percent. On a per ton basis, these estimates were found to be 10 and 9 percent, respectively, for small vs. large private on-sites. The final rule defers the PM CEMs requirement.

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON 1

DCN: RCSP000242
COMMENTER: DUPONT
SUBJECT: ECON1
COMMENT: Small incinerators will face a much higher increase in cost per ton and large commercial incinerators will gain a substantial cost advantage.

RESPONSE:
The increase in the cost per ton of hazardous waste burned is largely a factor of capacity utilization in a given combustion system. While general compliance costs are lower for small incinerators relative to large incinerators, the cost differential is not sufficient to make up for the difference in tons of waste burned. Since small incinerators burn a significantly smaller quantity of waste than large commercial incinerators, it is true that the rule will result in a higher cost per ton increase for small incinerators.

DCN: RCSP000119
COMMENTER: GE PLASTICS

DCN: RCSP000142
COMMENTER: MONSANTO
SUBJECT: ECON1
COMMENT: Non-air environmental impacts of small on-site incinerators are not addressed in the RIA.

RESPONSE:
The *Addendum* to the final *Assessment* estimates that the final standards may result in no more than 14,000 tons of hazardous waste per year reallocated from all on-site incinerators (small plus large). The Agency has analyzed cost impacts associated with this waste reallocation and finds that total transportation and disposal costs for the reallocated waste from captive units are projected to be no more than $200,000 per year. These findings are presented in more detail in the *Addendum* document and the Appendix to the *Addendum*.

Non-air environmental impacts associated with the final standards such as water impacts, solid waste impacts, energy and natural gas usage, and other energy impacts are examined in the *Addendum* to the final *Assessment*. This assessment projects increased water usage, increased quantities of solid waste for disposal, and generally increased energy usage resulting from facilities meeting the final standards.

Non-air environmental impacts related to waste reallocation, such as increased risk of spillage from additional trucking, increased handing risk, etc., have not been examined in detail, but they are expected to be minimal. While such increased risk is feasible, the total annual quantity of waste reallocated (incremental to projected baseline closures) from such facilities represents about 0.4 percent of total annual hazardous waste combustion. Moreover, spills and other accidents caused by trucking hazardous waste, the most common means of shipment for hazardous materials, generally are considered low-probability events, especially relative to the total number of accidents occurring within all transportation (For more information on this topic, please see: Transportation Research Board, National Academy of Sciences, *Transportation of Hazardous Materials: Toward a National Strategy* (Volume I), 1983 and Abkowitz, M., A. Eiger, and S. Srinivasan, *Assessing the Releases and Costs Associated with Truck Transport of Hazardous Waste*, 1984).

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(6) Benefits

General Comments

DCN: RCSP000229
COMMENTER: EASTMAN CHEMICAL
SUBJECT: ECON7

DCN: RCSP000240
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON7

DCN: RCSP000242
COMMENTER: DUPONT
SUBJECT: ECON7
COMMENT: Vaguely stated at best.

RESPONSE:
EPA agrees that the benefits of the rule need to be evaluated and presented more thoroughly. In the 1999 *Assessment* and *Addendum* for the final rule, we use results from an extensive multi-pathway risk assessment to develop human health and ecological benefit estimates. We do not include property value benefits due to limitations of the benefits transfer approach and because property value benefits likely overlap with human health and ecological benefits (including property value benefits would likely result in double-counting). For the human health analysis, we estimate benefits from cancer and non-cancer risk reductions. We monetize cancer risk reduction estimates by applying the value of a statistical life (VSL) to the risk reduction expected to result from the MACT standards. The VSL is based on an individual's willingness to accept (WTA) increases in mortality risk.[6] Because there are many different estimates of VSL in the economic literature, we estimate the reduced mortality benefits using a range of VSL estimates from 26 policy-relevant value-of-life studies.

We assign monetary values to non-cancer benefits using a direct-cost approach which focuses on the expenditures averted by decreasing the occurrence of an illness or other health effect. While the WTP approach used for valuing the cancer risk reductions is conceptually superior to the direct cost approach, measurement difficulties, such as estimating the severity of various illnesses precludes us from using this approach here. Direct cost measures are expected to understate true benefits because they do not include cost of pain, suffering, and time lost.

The expanded 1999 benefits analysis also describes individual health risk reductions for subsistence farmers and fishermen. Because we do not have population data for the most sensitive sub-populations, we can only describe individual risk results, and cannot make statements concerning the total number of people that may experience health benefits associated with the MACT standards (nor is it appropriate to monetize these benefits).

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[6] We use the VSL approach for the MACT benefits assessment instead of applying estimates of the Value of a Statistical Life Year (which values the number of life years lost as the result of premature mortality) because, while we have age stratified cancer incidence data for the local populations near incinerators, we do not have such data for cancer incidence from nationwide consumption of dioxin-contaminated foods.

Health Risks from Mercury Emissions

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON7
COMMENT: Summary of Comment Presented Below:

Mercury emissions from hazardous waste cement kilns appear not to cause any significant local health risks. Mercury emissions from such a source might pose risks either locally in the vicinity of the plant, and/or more broadly through longer range transport. If such a kiln's mercury emissions did cause significant local health risks, the commenter would expect to see these risks reflected in fish consumption advisories for mercury in the vicinity of the kiln. EPA states that fish consumption is the primary means by which mercury poses health risks, and cites numerous fish consumption advisories as evidence of the severity of the problem. The commenter cites a June 11, 1996 statement made by the EPA Administrator upon release of the (then) most recent national compilation of fish advisories which indicates that a major concern regarding the fish advisories update is the number of advisories posted due to contamination from chemicals like mercury, which is responsible for more fish consumption advisories than any other contaminant and that is why EPA has taken the most aggressive actions ever taken to sharply limit mercury and other contaminants from their primary source, incinerators.

The commenter says EPA's data for 1995 for all pollutants shows 47 states having fish advisories, covering 1,740 water bodies. For mercury specifically, 35 states have advisories, covering 1,308 water bodies. Given this high frequency with which states appear to detect risks from mercury and respond by establishing fish advisories for specific water bodies, the commenter believes that an absence of any fish consumption advisories for mercury in the vicinity of a point source of mercury would suggest that the source does not cause significant local health risks. The commenter, therefore, investigated whether any fish advisories for mercury have been established in the vicinity of hazardous waste burning cement kilns.

The conclusion from this investigation is that there are only two out of twenty cement plants that burn hazardous waste for which fish advisories have been established for mercury contamination in specific water bodies within 50 km of the plant. The commenter notes that 50 km is a high-end maximum radial distance within which a point source of mercury might exert significant "local" impacts and that EPA's modeling of risks for the proposed rule extends for only a 20 km radius around each facility. These two plants are near each other in South Carolina and the state has established mercury advisories for several rivers and lakes within 15 - 50 km of these plants. However, conversations with state and USGS experts indicate
the reason for these mercury advisories is the unusual "blackwater" (low pH, high

organic matter) conditions in the surface water in the coastal plain area which greatly facilitates methylation of mercury. The concentrations of total mercury in air and water are quite low. The primary source of the mercury is considered general atmospheric deposition from global and national sources, particularly fossil fuel combustion. No specific local anthropogenic point sources or natural sources are thought to be important. The commenter concludes that the two cement plants are not responsible for the mercury fish advisories in their vicinity. Therefore, there are no hazardous waste burning cement kilns with mercury fish advisories for specific water bodies within a 50 km radius. This indicates that mercury emissions from these cement kilns cause no significant local health risks. So, mercury emissions from hazardous waste cement kilns should be of concern only insofar as they contribute to aggregate national mercury loadings. The desirability of control requirements for mercury emissions from such kilns should thus be evaluated relative to the amount and cost-effectiveness of the reductions in mercury emissions that might be obtainable from other domestic anthropogenic sources.

RESPONSE:

The states and Native American tribes have primary responsibility for protecting their residents from the health risks of consuming contaminated noncommercially caught fish and wildlife. They do this by issuing consumption advisories for the general population, including recreational and subsistence fishers, as well as for sensitive subpopulations(such as pregnant women, nursing mothers, and children). States and tribes typically issue five major types of advisories and bans. These advisories inform the public that high concentrations of chemical contaminants have been found in local fish and wildlife and include recommendations to limit or avoid consumption of certain fish and wildlife species from specific waterbodies or waterbody types. The number of advisories for mercury increased to 1,782 in 40 states in 1997. Eleven states have statewide advisories for mercury (i.e., advisories posted on every freshwater lake and/or river in that state). These include Indiana, Michigan, Missouri, and Ohio, all of which are states where hazardous waste burning cement kilns are located. Another five states have state-wide advisories for mercury in their coastal waters. These include Alabama and Texas, which are also states where hazardous waste burning cement kilns are located. A statewide advisory is issued to warn the public of the potential for widespread contamination of certain species of fish in certain types of waterbodies (e.g., lakes, rivers and streams, or coastal waters) or certain species of wildlife (e.g., moose or waterfowl). In such a case, the state may have found a level of contamination of a specific pollutant in a particular fish or wildlife species over a relatively wide geographic area that warrants advising the public of the situation. Because mercury can be transported over long distances, such widespread contamination may be due to a variety of sources, including sources in adjoining states such as Arkansas, Louisiana, Kansas, and Pennsylvania where there are cement kilns that burn hazardous waste. When combined with South Carolina, where water body specific advisories have been issued, it is apparent that mercury fish advisories are in effect in every state in which hazardous waste burning cement kilns are located or an adjoining state. EPA believes it is reasonable to conclude that mercury emissions from these kilns make some contribution to mercury contamination in the surface waters of these states.

DCN: RCSP000084
COMMENTER: LOUISIANA DEQ
SUBJECT: ECON6

DCN: RCSP000084
COMMENTER: OFFICE OF AIR QUALITY AND RADIATION PROTECTION
SUBJECT: ECON6
COMMENT: Mercury should be addressed in the Risk Assessment Support. Additional regulations are not justified by evidence.

RESPONSE:
Results for mercury are presented in the final risk assessment[7]. Please see Section V.

Property Value Analysis

DCN: RCSP000141
COMMENTER: ELI LILLY
SUBJECT: ECON7
COMMENT: Skeptical of property value benefits analysis.

RESPONSE:
The property value analysis in the 1995 RIA utilized a benefits transfer approach. The limitations of the benefits transfer are clearly stated in the RIA. It should be pointed out that the analysis in the draft RIA was intended as a *screening* analysis to "assess the potential magnitude of property value effects caused by the presence of hazardous waste combustors" (RIA, 5-16). The results of the analysis simply demonstrate that such benefits may be substantial. EPA believes that using results from the municipal waste incinerator study in the benefits transfer does not provide the most accurate estimates for the proposed rule, and therefore EPA examined alternative approaches to quantify shifts in property values. The 1999 economic *Assessment* of the final rule omits the examination of property values as part of the benefits analysis.

In the 1999 *Assessment* of the final rule, we use results from an extensive multi-pathway risk assessment to develop human health and ecological benefit estimates. We do not include property value benefits due to limitations of the benefits transfer approach and because property value benefits likely overlap with human health and ecological benefits (including property value benefits would likely result in double-counting). For the human health analysis, we estimate benefits from cancer and non-cancer risk reductions. We monetize cancer risk reduction estimates by applying the value of

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[7] *Human Health and Ecological Risk Assessment Support to the Development of Technical Standards for Emissions from Combustion Units Burning Hazardous Wastes: Background Document - Final Report*," July 1999.

a statistical life (VSL) to the risk reduction expected to result from the MACT standards. The VSL is based on an individual's willingness to accept (WTA) increases in mortality risk.[8] Because there are many different estimates of VSL in the economic literature, we estimate the reduced mortality benefits using a range of VSL estimates from 26 policy-relevant value-of-life studies.

We assign monetary values to non-cancer benefits using a direct-cost approach which focuses on the expenditures averted by decreasing the occurrence of an illness or other health effect. While the WTP approach used for valuing the cancer risk reductions is conceptually superior to the direct cost approach, measurement difficulties, such as estimating the severity of various illnesses precludes us from using this approach here. Direct cost measures are expected to understate true benefits because they do not include cost of pain, suffering, and time lost.

The expanded 1999 benefits analysis also describes individual health risk reductions for subsistence farmers and fishermen. Because we do not have population data for the most sensitive sub-populations, we can only describe individual risk results, and cannot make statements concerning the total number of people that may experience health benefits associated with the MACT standards (nor is it appropriate to monetize these benefits).

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(7) Baseline Issues

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON7
COMMENT: The baseline data used by the EPA is grossly inaccurate, especially in the case of on-site incinerators and has lead to serious inaccuracies in cost and plant closure estimates.

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON1
COMMENT: Inflated because assume that incinerators burn much less than their capacity.

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[8] We use the VSL approach for the MACT benefits assessment instead of applying estimates of the Value of a Statistical Life Year (which values the number of life years lost as the result of premature mortality) because, while we have age stratified cancer incidence data for the local populations near incinerators, we do not have such data for cancer incidence from nationwide consumption of dioxin-contaminated foods.

RESPONSE:
EPA significantly revised the baseline database for the final rulemaking. The revised database considers and incorporates public comments on previous versions of the database and summarizes emissions data and ancillary information on hazardous waste combustors that was primarily extracted from trial burn reports and Certification of Compliance test reports. Ancillary information in the database includes general facility information (e.g., location), process operating data (e.g., waste, fuel, and raw material compositions and feed rates), and facility equipment design and operational information (e.g., air pollution control device temperatures). For the final rule, baseline costs reflect actual capacity utilizations. EPA separated baseline costs into fixed and variable components and then computed total variable costs using actual tons burned.

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: Cement kilns baseline net profits inaccurate - revenues and saving on conventional fuels are lower than estimated and baseline costs are higher.

RESPONSE:
Baseline costs, combustion prices, and conventional fuel prices have all been reevaluated and updated with the most current data available for the final 1999 *Assessment* and *Addendum*.

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: Savings on conventional fuels inaccurate. Estimates provided.

RESPONSE:
Conventional fuels prices have been updated to reflect the most recent data available from the Energy Information Administration. The *Assessment* and *Addendum* for the Final Rule use updated figures based on more recent data and information received in the public comments. EPA will use the following revised data for the Final Rule: Conventional fuels mixture: 91.1 percent coal and 8.9 percent natural gas; Energy content of fuels: 22.958 million Btu/ton for coal and 1029 Btu/cf for natural gas; Conventional fuel prices: $33.05/ton for coal and $3.34/cf for natural gas; Btu content of hazardous waste derived fuel: unchanged.

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON6
COMMENT: The following baseline costs incurred by cement kilns were omitted: 1) fuels marketing, acquisition, blending and preparation costs, and 2) production penalties or increased production costs due to using HWDF (decreased clinker yield, additional heat consumption needed when using HWDF, and increased kiln downtime).

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3

DCN: RCSP000147
COMMENTER: CONTINENTAL CEMENT
SUBJECT: ECON7
COMMENT: Production penalty costs or increased production costs for plants using HWDF in place of conventional fuels not included in analysis.

RESPONSE:
EPA has evaluated the costs associated with HWDF use and has included: costs of lost clinker production due to increased equipment wear leading to more kilns downtime and the lower heating values, higher moisture, and less ash production of hazardous waste compared to coal; increased electricity usage; and auxiliary fuel requirements.

Blending costs are not included in the baseline costs because we assume that fuel blending is a separate activity, distinct from hazardous waste combustion at the kiln (*i.e.*, tipping fees charged by kilns reflect the price charged to fuel blenders, not generators). In other words, fuel blending services can be more accurately understood to affect prices in that kilns receive lower revenues from blenders for a ton of waste than they would if they took wastes directly from generators. One possible limitation of this assumption is if the prices charged by cement kiln blenders are not arms-length transactions. In such a case, we would expect above normal profits in the fuel blending sector.

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: Costs as a percentage of revenues should not take fuel savings into account. If EPA continues to include fuel savings, then costs associated with using HWDF should also be included.

RESPONSE:
EPA has evaluated the costs associated with using HWDF and has included costs of the following: lost clinker production due to increased equipment wear leading to more kilns downtime and the lower heating values, higher moisture, and less ash production of hazardous waste compared to coal; increased electricity usage; and auxiliary fuel requirements.

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON7
COMMENT: The role of O&M costs was not fully taken into account and incorrectly assumed to be constant among plants.

RESPONSE:
In the economic analysis of the rule, baseline O&M costs were broken down into fixed and variable costs. For the 1995 RIA at Proposal, both baseline and compliance O&M costs were evaluated using the model plants approach. For the final 1999 *Assessment*, both baseline and compliance O&M costs are broken down into fixed and variable components; the model plants approach has been replaced with system-by-system cost estimates for greater accuracy (See the response under the "Model Plants Approach" section). Fixed O&M costs include the following: operating and supervisory labor, equipment maintenance and materials, overhead, administrative, property tax, and insurance. Variable O&M costs include: acid gas absorbing or mercury or PCDD/PCDF adsorbing sorbent usage, water injection requirements for gas cooling, electricity for fan, solid waste disposal, and auxiliary fuel requirements.

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(8) Costs

Downtime Costs

DCN: RCSP000118
COMMENTER: ALLIED-SIGNAL
SUBJECT: ECON1
COMMENT: Estimate CEM malfunctions could result in 10-20% production downtime.

DCN: RCSP000118
COMMENTER: ALLIED-SIGNAL
SUBJECT: ECON7
COMMENT: CEM malfunctions could result in 10-20% production downtime. Downtime costs are underestimated; they extend beyond lost sales for Allied-Signal to the lost sales for Allied-Signal's customers. Many of Allied-Signal's customers do not retain a second supplier.

DCN: RCSP000097
COMMENTER: VULCAN CHEMICALS
SUBJECT: ECON6

DCN: RCSP000141
COMMENTER: ELI LILLY
SUBJECT: ECON7
COMMENT: EPA should incorporate the concept of minimum data availability to allow for unanticipated downtime.

DCN: RCSP000097
COMMENTER: VULCAN CHEMICALS
SUBJECT: ECON6
COMMENT: CEM and CMS devices should be allowed to be off-line for up to 10% of time/month provided that alternative measurements will give reasonable assurances that the unit is always in control.

RESPONSE:
With regard to estimating costs for PM CEMs, EPA worked under the assumption that the length of allowable CEM downtimes would be increased. For this reason, no incremental production downtimes are expected. Therefore, only a single CEM system will be required for each source (i.e., no redundancy is built into the cost estimates). EPA anticipates that PM CEMs will function reliably such that shutdowns will be infrequent. Moreover, during CEM downtimes, sources may still be able to demonstrate compliance with the PM standard through other means.

Facility Closure and Waste Reallocation Costs

DCN: RCSP000119
COMMENTER: GE PLASTICS
SUBJECT: ECON1

DCN: RCSP000142
COMMENTER: MONSANTO
SUBJECT: ECON1
COMMENT: Shutdown costs and environmental risks due to transportation of HW during shutdown not accounted for.

RESPONSE:
Many of the facilities that are expected to close are those that are currently operating significantly below their capacity, which suggests that they may not have been fully recovering their capital costs even in the absence of the MACT standards. The number of combustion facilities expected to exit the market due to the rule is quite small. Therefore, while closure is not costless, we expect the costs and changes in profits due to the rule to be relatively small.

With regard to increased risk from transportation of hazardous wastes, since these facilities are burning small quantities of waste, the incremental health risks will be minimal. In fact, EPA estimates that less than 1.5 percent of the wastes currently burned at combustion all facilities regulated by the proposed MACT standards will be reallocated due to facility closure (includes baseline closures). Moreover, spills and other accidents caused by trucking hazardous waste, the most common means of shipment for hazardous materials, generally are considered low-probability events, especially relative to the total number of accidents occurring within all transportation overall (For more information on this topic, please see: Transportation Research Board, National Academy of Sciences, *Transportation of Hazardous Materials: Toward a National Strategy* (Volume I), 1983 and Abkowitz, M., A. Eiger, and S. Srinivasan, *Assessing the Releases and Costs Associated with Truck Transport of Hazardous Waste*, 1984).

DCN: RCSP000244
COMMENTER: SOLITE
SUBJECT: ECON2

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT:
COMMENT: The costs of facilities that are forced to stop burning hazardous waste are not included in the economic impact analysis. The following market exit costs should be considered: closure costs, cost of writing down non-depreciated assets, and lost HWDF profits.

RESPONSE:
Many of the facilities that are expected to close are those that are currently operating significantly below their capacity, which suggests that they may not have been fully recovering their capital costs even in the absence of the MACT standards. The number of combustion facilities expected to exit the market due to the rule is quite small. Therefore, while closure is not costless, we expect the costs and changes in profits due to the rule will be relatively small.

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: The costs of diverting wastes to inferior disposal methods such as landfills or municipal waste combustors are not considered. Some small quantity generators might react by"diluting" their waste through quicker "cycling" of solvents, making these wastes suitable for landfills, but also resulting in greater quantities of waste. Increased energy use (and associated emissions) and environmental impacts will result from the waste minimization and treatment measures employed as alternatives to combustion of wastes.

DCN: RCSP000147
COMMENTER: CONTINENTAL CEMENT
SUBJECT: ECON6

DCN: RCSP000240
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON6
COMMENT: Higher prices will cause small generators to divert HW to the solid waste management system or less optimal forms of waste disposal that RCRA was designed to eliminate.

DCN: RCSP000108
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7

DCN: RCSP000193
COMMENTER: PERMA-FIX ENVIRONMENTAL
SUBJECT: ECON7
COMMENT: Some waste will be diverted to less optimal disposal methods and out of the Subtitle C system.

RESPONSE:
EPA believes that its enforcement efforts should limit the degree to which regulated wastes are diluted and/or diverted to illegal disposal options (non-RCRA regulated landfills, municipal incinerators).

With regards to diverting to Subtitle C landfills, the price for combustion services after MACT implementation is likely to continue to be less expensive than full Subtitle C disposal. EPA's Land Disposal Restrictions (LDRs) require that some waste streams cannot be sent directly to landfills and must first be treated to a level designed to meet BDAT standards. Thus, for regulated hazardous waste, we believe that it is incorrect to compare the cost of combustion with the cost of landfilling.

The Agency has examined historical price patterns and found that the price of combustion services has been considerably higher in past years, and has been declining in recent years. We have not identified any direct correlation between the higher prices of past years and generators (conditionally exempt small quantity making use of these services, or large quantity) using less environmentally desirable disposal options. Furthermore, the current cost differential between Subtitle C and Subtitle D disposal practices is significant. The incremental price impact due to this rule is projected to be considerably smaller than this current cost differential. This incremental impact alone is not likely to stimulate conditionally exempt small quantity generators, currently sending their waste to combustion facilities, to redirect this waste to Subtitle D disposal.

DCN: RCSP000142
COMMENTER: MONSANTO
SUBJECT: ECON1

DCN: RCSP000084
COMMENTER: LOUISIANA DEQ
SUBJECT: ECON1

DCN: RCSP000042
COMMENTER: OFFICE OF AIR QUALITY AND RADIATION PROTECTION
SUBJECT: ECON6.
COMMENT: Non-air quality health and environmental impacts are not estimated (*e.g.*, transportation risks when waste is diverted off-site).

DCN: RCSP000089
COMMENTER: TNRCC
SUBJECT: ECON1
COMMENT: The costs and liabilities from shifting from on-site to off-site treatment are not addressed.

RESPONSE:
EPA has assessed the costs associated with reallocation of hazardous wastes. Waste reallocation costs for on-site incinerators include transportation and commercial incineration costs. These costs are included in the estimated compliance costs, as presented in the RIA at proposal and in the 1999 *Addendum to* the rule.

EPA did not evaluate the risks associated with transporting diverted wastes because less than 1.5 percent of the waste currently burned at all combustion facilities regulated by the final MACT standards will be reallocated due to facility market exits.

DCN: RCSP000124
COMMENTER: DOE
SUBJECT: ECON6
COMMENT: The costs of managing incinerator hazardous waste residues are not included.

RESPONSE:
These costs are included in the variable operating and maintenance compliance cost estimates.

DCN: RCSP000205
COMMENTER: TEXAS CHEMICAL COUNCIL
SUBJECT: WM1
COMMENT: On-site closures may result in increased risks associated with on-site storage, transportation, and storage at the alternative disposal facility.

RESPONSE:
While a few facilities may decide to stop burning in the face of the final Combustion MACT Standards, our analysis indicates that these facilities currently manage small quantities of hazardous waste. EPA estimates that less than 1.5 percent of the waste currently burned at combustion facilities regulated by the final MACT standards will be reallocated due to facility market exits. Because waste quantities reallocated are small, the analysis of risks associated with waste reallocations was not a high priority. Furthermore, we believe that any potential incremental risks associated with transportation and/or management of these reallocated wastes are not likely to be significant.

While on-site storage may increase at facilities that stop burning waste in response to the final MACT standards, this storage must occur in regulated units. Furthermore, the duration of this storage is limited by either 40 CFR §262.34(a) or RCRA §3004(j) (storage prohibition).

DCN: RCSP000119
COMMENTER: GE PLASTICS
SUBJECT: ECON1
COMMENT: Small OIs should not have to install additional controls to meet the floor since it will force many to close.

DCN: RCSP00158
COMMENTER: ASH GROVE CEMENT COMPANY
SUBJECT: GEN1
COMMENT: Ash Grove is convinced that the proposed standards would increase further the cost of regulatory compliance with little benefit to the environment, and would negatively impact the financial returns at the Chanute and Foreman plants, thereby putting the HWDF operations at those locations in jeopardy.

DCN: RCSP000128
COMMENTER: CMA
SUBJECT: ECON1
COMMENT: The proposed rule will cause many incinerators to close.

RESPONSE:
The Congress of the United States of America, in §112(d) of the Clean Air Act, has mandated standards based on MACT to control emissions of HAPs. EPA, through the Combustion MACT final rule, is carrying out its obligation to implement this legislation. Regrettably, the cost of compliance may result in some combustion facilities making the decision to cease burning hazardous waste. These impacts are clearly identified in the 1995 RIA and the 1999 *Assessment*.

Testing and Monitoring Costs

DCN: RCSP000124
COMMENTER: DOE
SUBJECT: ECON2
COMMENT: DOE's additionally high costs for test burns and compliance monitoring due to the handling of radioactive waste should be addressed in the economic impact analysis.

RESPONSE:
For the 1999 *Assessment*, we adjusted testing and monitoring costs for incinerators that handle radioactive wastes. These adjustments were derived from the July 1999 Final Technical Support Document for HWC MACT Standards, and are incorporated into the final analysis.

DCN: RCSP000094
COMMENTER: NATIONAL CEMENT
SUBJECT: ECON6

DCN: RCSP000114
COMMENTER: COALITION FOR RESPONSIBLE WASTE INCINERATION
SUBJECT: ECON6

DCN: RCSP000183
COMMENTER: 3M
SUBJECT: ECON6

DCN: RCSP000127
COMMENTER: CIBA-GEIGY
SUBJECT: ECON7
COMMENT: Data gathering (including sophisticated data acquisition systems) and reporting requirement costs are not addressed.

RESPONSE:
Monitoring and reporting costs are included in the operating and maintenance compliance cost estimates.

Incinerators

DCN: RCSP000118
COMMENTER: ALLIED SIGNAL
SUBJECT: ECON2

DCN: RCSP000119
COMMENTER: GE PLASTICS
SUBJECT: ECON6
COMMENT: Analysis does not appropriately assess the difference between impacts on CIs and OIs and incorrectly assumes that OIs will not be overly burdened and can remain competitive with CIs.

RESPONSE:
Baseline and compliance costs were developed separately for on-site incinerators. For more detailed baseline cost information developed for the Proposal, see the *Baseline Cost Report* in Appendix B of the 1995 RIA. For more detailed compliance cost information used in the 1995 RIA, see the *Cost Estimates for Air Pollution Control Device (APCD) Requirements for Existing Facilities to Meet Proposed MACT Standards for the Floor and Above the Floor Options for Cement Kilns, Lightweight Aggregate Kilns, and Incinerators*, prepared for U.S. EPA, Office of Solid Waste, prepared by Energy and Environmental Research Corporation, April 1, 1995. For more detailed baseline and compliance cost estimates to support the final rulemaking see: *Revised Estimation of Baseline Costs for Hazardous Waste Combustors for Final MACT Rule*, prepared for U.S. EPA, Office of Solid Waste, prepared by Energy and Environmental Research Corporation, August 20, 1998 and *Final Technical Support Document for HWC MACT Standards, Volume V: Emission Estimates and Engineering Costs*, prepared for U.S. EPA, Office of Solid Waste, prepared by Energy and Environmental Research Corporation, July 1999.

DCN: RCSP000124
COMMENTER: DOE
SUBJECT: ECON2
COMMENT: Issues dealing with costs for new incinerators.

RESPONSE: The 1999 *Assessment* explicitly provides compliance cost estimates for new incinerators.

Cement Kilns

DCN: RCSP000113
COMMENTER: HOLNAM
SUBJECT: ECON7
COMMENT: Objects to the high costs faced by CKs.

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: CKRC gathered data on HW operations, revenues, costs, fuels, and responses to rule.

RESPONSE:
EPA evaluated CKRC's data and has utilized some of their data to revise the cost analyses.

DCN: RCSP000243
COMMENTER: ENVIRONMENTAL TECHNOLOGY COUNCIL
SUBJECT: ECON3
COMMENT: Lower prices charged because HW used for energy value in CKs. This should be included in analysis.

RESPONSE:
The lower prices charged by cement kilns were included in the analysis. For the analysis of the Proposed rule, EPA used the following prices for kilns: $80 for liquids, $360 for sludges, and $740 for solids. The prices charged by incinerators that were used in the 1995 RIA are: $293 for liquids and sludges and $1375 for solids. Prices (per ton) used in the 1999 *Assessment* of the final rule are: $20 for comparable fuels, $70 for liquids with suspended solids, $301 for more highly contaminated liquids, $320-$630 for sludges (depending on the contaminant level), and $683-$1,281 for solids (depending on the contaminant level) [see Exhibit 3-1 in the *Assessment* document]. Because kilns tend to accept liquids with lower contaminant levels, kilns command lower average costs per ton of hazardous waste relative to commercial incinerators.

Costs Omitted from the Analysis

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: Should consider energy costs for cement kilns, environmental and health costs due to disposal by commercial incinerators, energy costs from alternative means of treatment/disposal, and market exit costs for cement kilns.

RESPONSE:
As some cement kilns stop burning hazardous waste, they will need to increase their conventional energy purchases. We qualitatively discuss this issue in the 1999 *Assessment* of the final rule.

DCN: RCSP000107
COMMENTER: AMERICAN PORTLAND CEMENT ALLIANCE
SUBJECT: ECON4
COMMENT: ACI technology will increase the amount of CKD wasted and the associated waste disposal costs.

RESPONSE:
Compliance costs incorporate waste disposal costs associated with each technology. These costs were determined using best engineering judgment based on available information (See: *Final Technical Support Document for HWC MACT Standards, Volume V: Emission Estimates and Engineering Costs*, prepared for U.S. EPA, Office of Solid Waste, prepared by Energy and Environmental Research Corporation, July 1999).

DCN: RCSP000097
COMMENTER: VULCAN CHEMICALS
SUBJECT: ECON7
COMMENT: Cost-benefit analysis is flawed. Proposed rule will further expand the current burdensome and expensive RCRA permitting, record keeping, and reporting.

RESPONSE:
The cost-benefit analysis has been refined and expanded in the 1999 final *Assessment*. Incremental permitting, record keeping, and reporting requirements are included in the cost estimates.

DCN: RCSP000124
COMMENTER: DOE
SUBJECT: ECON1
COMMENT: DOE will incur additional costs due to the fact that they handle radioactive materials. Testing equipment will need to be handled, treated and/or replaced. Some CEMs may need to be modified slightly to be accurate in a radionuclide environment.

RESPONSE:
For the 1999 *Assessment*, we adjusted baseline and compliance costs for mixed and radioactive waste incinerators. These adjustments were derived from the July 1999, Final Technical Support Document for HWC MACT Standards, and are incorporated into the final analysis.

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DCN: RCSP000108
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7

DCN: RCSP000258
COMMENTER: HOLNAM
SUBJECT: ECON1
COMMENT: The cost of the rule to fuel blenders is not included in the analysis.

RESPONSE:
Fuel blenders are not sources of hazardous waste incineration and thus are not part of the regulated community under this final rule. However, in the 1999 *Assessment* document we discuss potential impacts to fuel blenders in the context of the small entity analysis.

DCN: RCSP000085
COMMENTER: SIERRA CLUB
SUBJECT: ECON7
COMMENT: Property damage costs due to increases in acid gas emissions not assessed. These include damage to individual and/or public properties and property protected under the National Historic Preservation Act of 1966.

RESPONSE:
We assume the commenter is referring to the potential for increased coal consumption in response to waste reallocations from facilities exiting the hazardous waste market. The incremental impact from waste reallocation (all sources) is projected to represent no more than 1.5 percent of the total annual quantity of hazardous waste currently incinerated. In the unlikely event that hazardous waste burning facilities increase coal burning to compensate for 100 percent of all waste reallocations, this increased coal consumption would represent less than one tenth of one percent (< 0.10 percent) of the total 1997 coal usage for industrial (excluding utilities) purposes.

Potential acid gas emissions from HWCs include NO_x, SO_x, HCl, and HF. NO_x and SO_x are "criteria" air pollutants, are not CAA Title III air toxics, are controlled through regional ambient air "attainment" standards, and thus are not directly addressed by the HWC MACT rule. HCl, a CAA Title III HAP, is directly addressed by the MACT standards. HF, also a Title III HAP, is not directly addressed by the MACT standards since it is not typically emitted at significant levels from HWCs (also, note that wet scrubbing typically required for HCl control is highly efficient at controlling HF).

The HWC MACT standards will likely reduce total acid gas emissions from all three source categories of HWCs. NO_x emissions may increase by a small amount from incinerators due to the use of add-on afterburners for controlling CO and/or HCs for a couple of facilities. NO_x emissions may also increase somewhat from cement kilns that stop burning hazardous waste (certain studies have shown that NO_x emissions are lower when burning hazardous waste as compared with baseline coal). SO_x emissions from cement kilns and lightweight aggregate kilns will also increase from those kilns that stop burning hazardous waste since coal generally has a higher sulfur content compared with hazardous waste. But the reallocated wastes may be accepted by another kiln currently burning coal, thus decreasing the amount of coal burned at this source. However, HCl, SO_x, and HF emissions will

all decrease significantly from current allowable levels from units that continue to burn hazardous wastes due to the new HWC MACT standards for HCl. SO_x and HF emissions will also be indirectly reduced through the use of wet and dry scrubbing add-on retrofit APCDs that are required to meet the total chlorine (HCl/Cl_2) MACT standard (since wet and dry scrubbers simultaneously remove the acid gases of HCl, HF, and SO_x). This assumes that the MACT standards for HCl are more stringent than that for the current RCRA BIF or incinerator regulations (emissions at the MACT floor will be lower than emissions at the current baseline).

DCN: RCSP000086
COMMENTER: UTILITY SOLID WASTE ACTIVITIES GROUP
SUBJECT: ECON7

DCN: RCSP000086
COMMENTER: EDISON ELECTRIC INSTITUTE
SUBJECT: ECON7

DCN: RCSP000086
COMMENTER: AMERICAN PUBLIC POWER ASSOC.
SUBJECT: ECON7

DCN: RCSP000086
COMMENTER: NATIONAL RURAL ELECTRIC COOP. ASSOC.
SUBJECT: ECON7
COMMENT: Potential costs to quick oil change operators with the elimination of the used oil mixture rule.

RESPONSE:
EPA is not evaluating this provision in the Hazardous Waste Combustion MACT *Assessment* because it is not directly relevant to this rulemaking.

DCN: RCSP000223
COMMENTER: CHLORINE CHEMISTRY COUNCIL
SUBJECT: ECON1
COMMENT: The costs to operators of mixed waste incinerators not considered. These include retrofitting and costs associated with the increased quantity of waste subject to the LDRs.

RESPONSE:
For the 1999 *Assessment*, we adjusted baseline and compliance costs for mixed and radioactive waste incinerators. These adjustments were derived from the July 1999, Final Technical Support Document for HWC MACT Standards, and are incorporated into the final analysis.

DCN: RCSP000165
COMMENTER: TENNESSEE DEPT. OF ENVIRONMENT AND CONSERVATION
SUBJECT: ECON6
COMMENT: Following costs should be addressed: compliance testing, AWFCO upgrades, AWFCO reporting/enforcement, release vent reporting/enforcement, risk analysis studies, reissuing of current permits to incorporate subpart EEE closures of facilities, costs to regulatory facilities to implement changes, and costs to state and local regulatory agencies. Costs to state and local governments might include: increased illegal disposals and subsequent remediation, increased complexity on permitting and inspection programs, increased testing frequencies, closure costs, monitoring additional reporting and records, and reissuing current permits.

RESPONSE:
Compliance testing and permitting costs are included in both the 1995 RIA and the 1999 *Assessment*. The cost to state and local regulatory agencies for reissuing current permits are also included in the final 1999 *Assessment* document.

Environmental Costs - Negative Benefits

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON7
COMMENT: Emissions of NOx and SOx may increase as kilns lessen their utilization of HWDF in favor of conventional fuel due to the burden of the proposed MACT standards.

RESPONSE:
The final 1999 *Assessment* includes a section discussing this issue.

DCN: RCSP000092
COMMENTER: SYSTECH ENVIRONMENTAL
SUBJECT: ECON7
COMMENT: Concern for greater environmental damage as incinerators burn more waste and cement kilns use fossil fuels and emit their own pollution.

RESPONSE:
The final 1999 *Assessment* includes a section discussing this issue.

DCN: RCSP000139
COMMENTER: FIRST MISSISSIPPI CORP
SUBJECT: ECON7
COMMENT: EPA has not considered the fact that OIs recover most of the heat generated in the form of steam. If forced to stop burning hazardous waste, this energy would need to be derived from conventional fuels which burn less efficiently and create additional emissions. Additional emissions will be released loading and unloading wastes for off-site disposal, and truck emissions during transport.

RESPONSE:
We recognize that the HWC MACT Final Rule may impact countless facets of the hazardous waste incineration market. The final 1999 *Assessment* has been expanded and refined to incorporate numerous issues. The final *Assessment* does not, however, examine potential cost and environmental impacts associated with on-site incinerators substituting conventional fuels for hazardous waste.

Our final analysis indicates that a maximum of approximately 13,600 tons of hazardous waste may be reallocated each year (incremental to the baseline) from on-site incinerators currently burning hazardous waste. This represents about 0.4 percent of the total hazardous waste currently burned each year. Substituting all this waste with coal (unlikely) would increase total national coal usage by about 0.0015 percent over the 1997 level. Any increased emissions or environmental risks resulting from such a change would be negligible on a national level.

DCN: RCSP000085
COMMENTER: SIERRA CLUB - OKLAHOMA CHAPTER
SUBJECT: ECON7
COMMENT: Costs associated with the anticipated environmental damage and an accounting of how those costs will be recovered should be quantified.

RESPONSE:
We assume the commenter is referring to the potential for increased coal consumption in response to waste reallocations from facilities exiting the hazardous waste market. The incremental impact from waste reallocation from all sources is projected to represent no more than 1.5 percent of the total annual quantity of hazardous waste currently incinerated. In the unlikely event that facilities increase coal burning to compensate for 100 percent of this reallocation, the increased coal consumption would represent less than one tenth of one percent (< 0.10 percent) of total 1997 coal used for industrial (excluding utilities) purposes in 1997. Any incremental increase in property damage from this additional coal usage is likely to be negligible.

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: Cost-effectiveness and cost-benefit analysis should consider energy cost and environmental and health costs associated with shifting to incineration disposal. Also, EPA should assess additional energy cost, associated emissions and risk due to shifting of disposal method.

DCN: RCSP000240
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7
COMMENT: A thorough analysis of benefits will have to balance the potential for risk reduction from reduced HWC emissions with the potential for increased risks from the management of small generator waste outside of the Subtitle C system.

DCN: RCSP000084
COMMENTER: LOUISIANA DEQ
SUBJECT: ECON6

COMMENTER: OFFICE OF AIR QUALITY AND RADIATION PROTECTION
SUBJECT: ECON6
COMMENT: Health risks vs. health benefits should be compared, not just economic costs vs. health benefits.

DCN: RCSP000094
COMMENTER: NATIONAL CEMENT COMPANY OF CALIFORNIA
SUBJECT: ECON7
COMMENT: EPA should evaluate the following secondary impacts of the rule: 1) the decreased CO level in cement kilns will increase NO emissions, potentially increasing smog; 2) required APCD inlet gas temperature decrease will reduce stack emissions temperature which will result in less dispersion of pollutants from the stack, thereby exposing populations living close to the facility to increased levels of pollutants; 3) increased use of fossil fuel for kilns that stop burning HWDF will increase CO2 emissions, thereby increasing greenhouse gas emissions; 4) increased chance of exposure due to transportation of wastes over greater distances; and 5) decreased disposal capacity and increased prices could lead to illegal dumping of hazardous wastes.

RESPONSE:
1 & 2)The 1995 RIA did not assess the degree to which health risks could possibly increase. EPA believes that the potential for increased health risks associated with waste reallocations is insignificant, with respect to the risk reductions associated with emission reductions. The final *Assessment* has incorporated a qualitative discussion of this issue.

3) The incremental impact from waste reallocation from all sources is projected to represent no more than 1.5 percent of the total annual quantity of hazardous waste currently incinerated. In the unlikely event that facilities increase coal burning to compensate for 100 percent of this reallocation, the increased coal consumption would represent less than one tenth of one percent (< 0.10 percent) of total 1997 coal used for industrial (excluding utilities) purposes in 1997. Any incremental increase in property damage from this additional coal usage is likely to be negligible.

4) Spills and other accidents caused by trucking hazardous waste, the most common means of shipment for hazardous materials, generally are considered low-probability events, especially relative to the total number of accidents occurring within all transportation overall.

5) Our economic analysis indicates adequate alternative practical capacity to handle all reallocated wastes.

DCN: RCSP000143
COMMENTER GOSSMAN CONSULTING INC
SUBJECT: ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: Risks from implementing the rule not considered

Additionally, the EPA has been remiss in that they have made no examination nor considered the added risk to health and the environment due to the implementation of the regulation itself. Such consideration is required by 42 USC Section 7412(d)(2), "...the Administrator, taking into consideration ... non-air quality health and environmental impacts..... Such consideration, aside from any legal issue, is also required by common sense and ethics.

RESPONSE:

While the primary environmental impact of the MACT standards are improvements in air quality resulting from emissions reductions at combustion facilities, other non-air environmental impacts may also result from the rule. Control of dioxins/furans requires temperature control at some combustion systems. The use of rapid quench systems that control for temperature is expected to result in increased annual water consumption of 407 million gallons at incinerators, 845 million gallons at cement kilns, and 141 million gallons at LWAKs for the Final MACT Standards. Facilities that install controls to meet particulate matter standards will generate about 6,500 tons of additional solid waste per year requiring disposal. As combustion facilities operate additional air pollution control devices to meet MACT standards, they will consume additional electricity -- approximately 95 million kilowatt hours per year. An additional 383,000 MBtu per year of natural gas will also be used at facilities that require afterburners or reheaters as a result of the MACT rule.

Kilns that stop burning hazardous waste to avoid complying with the HWC MACT standards will need to replace their hazardous waste derived fuel with alternative fuels -- mostly coal. However, a large percentage of the hazardous waste displaced from these facilities will likely be sent to other kilns or incinerators. This is expected to decrease the quantity of fossil fuel used at these facilities and offset the increases at the kilns that stop burning. Overall, therefore, we expect no significant net change in energy use (and corresponding criteria pollutants due to coal usage) associated with waste re-allocations.

We did not value these impacts because we expect the incremental environmental costs will be small relative to the total compliance costs of the rule. In addition, as a result of the combustion price increases stimulated by today's rule, generators may reduce the toxicity of wastes currently combusted, or use waste management alternatives such as solvent recycling.

The final *Addendum* document addresses non-air environmental impacts.

DCN: RCSP00085
COMMENTER SIERRA CLUB - OKLAHOMA CHAPTER
SUBJECT: ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: The issue of the replacement of a sensitive species by a tolerant species may result in no functional change in the aquatic system. However, the loss of a sport fish population would reduce the value to society of the aquatic system. Put more bluntly, both the recreational value and the community economic benefit (food and beverage. lodging, equipment purchases, gasoline sales) associated with recreational fishing are lost when a day on the lake yields a bucket of dioxin- resistant lamprey instead of a string of dioxin-sensitive trout.

RESPONSE:
The Agency is sensitive to ecological concerns and corresponding economic benefits associated with recreational fishing. The Agency's ecological risk analysis conducted in support of the final rule finds that, "fish are probably the most likely vertebrate receptors to elicit adverse effects from dioxin/furan exposures." While direct risks to freshwater fish were not evaluated due to lack of suitable data, the risk analysis indicates that, at the final dioxin/furan (D/F) standards: "Food web modeling of uptake through fish to representative mammals did not indicate the potential for adverse effects." The Agency, therefore, believes that the final D/F standards for all source categories reflect ecologically safe levels for "dioxin-sensitive" trout. The economic value of the sport fishing industry is expected to be protected under the standards established by the HWC MACT final rule. Furthermore, the ecological risk findings suggest that subsistence and sustenance fishers will also be protected as a result of the final standards.

DCN RCSP00085
COMMENTER SIERRA CLUB - OKLAHOMA CHAPTER
SUBJECT: ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: We recommend that EPA describe the manner in which costs associated with destruction of fisheries, wildlife, critical habitat, and natural resources will be recovered under this proposed rule as well as costs associated with recovery efforts to rehabilitate damaged habitat and fauna.

RESPONSE:
The Agency does not believe that the final rule will result in destruction of fisheries, wildlife, critical habitat, or natural resources. The commenter may be concerned with the projected waste reallocation from hazardous waste burning cement kilns, and the potential for increased coal usage as a substitute for this diverted hazardous waste. The Agency's *Assessment* indicates that waste reallocations from cement kilns , as a result of the final standards, may represent no more than a maximum of about 3 percent of the total quantity of hazardous waste currently burned by these facilities. Capacity currently exists in the cement kiln hazardous waste burning sector to absorb this quantity, thereby offsetting any potential increased coal usage at the effected facilities. However, if we assume that this entire waste quantity is replaced by coal, with no offset, the increased coal usage would represent

approximately 0.003 *percent* of total 1997 U.S. coal usage. An incremental change in nationwide coal usage of this degree is not likely to result in destruction of fisheries, wildlife, critical habitat, or natural resources. Subsistence and sustenance fishers, therefore, are not likely to experience negative impacts on a nationwide basis, as a result any potential incremental increase in coal usage in response to the final standards.

DCN: RCSP00085
COMMENTER SIERRA CLUB - OKLAHOMA CHAPTER
SUBJECT: ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: We request that EPA provide an estimate of the economic impact resulting from loss of fisheries which provide subsistence and sustenance fishing as well as the economic benefits which are associated with recreational fishing. We request that EPA detail how these costs will be recovered.

RESPONSE:
The commenter is requested to review the responses to the two questions above for a response to this comment.

DCN: RCSP00097
COMMENTER: VULCAN CHEMICALS
SUBJECT: ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: The suggested technology for D/F reduction results in a significant increase in hazardous waste.

RESPONSE:
The demand for hazardous waste incineration services has been relatively constant in recent years and is expected to remain relatively constant in the near future. Furthermore, the waste minimization analysis conducted in support of the final standards indicates that the demand for hazardous waste incineration services is relatively inelastic within the current and projected price range. The commenter may be referring to projected waste reallocations in response to the final combustion MACT standards. The high-end estimate indicates that approximately 1.3 percent of the total quantity of incinerated hazardous waste from all sources may be reallocated as a result of the final standards. This is not an "increase in hazardous waste," simply a reallocation to alternative management sources. Furthermore, the percentage contribution the D/F control technology contributes to the total quantity diverted is not known.

For the final standards the Agency projects that D/F may be controlled through two procedures, implemented separately or in combination. These are: temperature control of existing "dry" PM control device, and, activated carbon injection or carbon beds. Temperature controls are not anticipated to result in any increase in waste generation from the incineration process. Activated carbon injection or carbon beds may be necessary only for additional controls. For effective activated carbon injection applications, the flue gas temperature must be below 400^0F. The Agency is not aware how this process, if necessary to meet final D/F standards, will result in a significant increase in hazardous waste.

DCN: RCSP00094
COMMENTER NATIONAL CEMENT COMPANY OF CALIFORNIA
SUBJECT: ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: EPA's MACT standard may result in several adverse secondary environmental consequences. First, EPA's proposed MCT standards will result in a decrease in CO levels in cement kilns. As a consequence, NO emissions from cement kilns will increase, potentially resulting in increased smog.

RESPONSE:
The Agency recognizes that the higher burn temperatures necessary to maintain CO levels may stimulate increased NO_x. These impacts are likely to be negligible, however, and be far outweighed by the aggregate benefits (both quantified and non-quantified) of the final standards.

DCN: RCSP00094
COMMENTER NATIONAL CEMENT COMPANY OF CALIFORNIA
SUBJECT: ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: EPA has predicted that some cement kilns will cease using hazardous waste as a supplemental fuel as a result of the MACT standards. When these cement kilns use fossil fuel for thermal energy and their waste capacity is diverted to commercial incinerators, a net increase in $C0_2$ emissions will result, which is in contradiction to EPA's stated goal of reducing greenhouse gas emissions.

RESPONSE:
The quantity of hazardous waste diverted from cement kilns as a result of the final standards is projected to represent about 1.2 to 2.9 percent of the total quantity currently combusted by kilns. The analysis presented in the final *Assessment* and *Addendum* indicates there is sufficient capacity in the cement kiln sector alone to absorb this quantity, thereby offsetting any increased coal usage at effected facilities. However, even if the maximum potential quantity of diverted waste is 100 percent substituted with coal, the increased coal usage would represent approximately 0.004 *percent* of total 1997 U.S. coal usage.

DCN: RCSP00136
COMMENTER: MOLTEN METAL TECHNOLOGY
SUBJECT: ECON7 JUSTIFICATION OF PROPOSED STANDARDS
COMMENT: Need to assess demographics; environmental justice further. A principal purpose of Executive Order 12898 is to ensure adequate protection of low income populations. In this regard, it is important to note EPA did not even assess the demographics of populations located near onsite incinerators, which comprise the vast majority of units covered by this rulemaking. See 61 FR 17479 (April 19, 1996). An increasing body of research has confirmed claims by environmental justice leaders that toxic pollution disproportionately affects their communities. According to a recent analysis of 64 empirical studies on environmental impacts on communities, racial disparities were found more frequently than income disparities. [Footnote 52: Benjamin A. Goldman, Not Just Prosperity: Achieving Sustainability with Environmental Justice, National Wildlife Federation Corporate Conservation Council, February, 1994.] The research also shows that racial disparities were found for a whole range of environmental hazards, including air pollution, pesticide exposure and the proximity to certain types of facilities. The 64 major studies on environmental disparities revealed that: - All but one of the studies found environmental disparities either by race or income, with racial disparities greater than income disparities in terms of environmental impact. - People of color are twice as likely as white people to live in communities with a commercial hazardous waste management facility, and three times as likely to live in a community with multiple facilities or one of the largest hazardous waste landfills in the country. - People of color were 60 percent more likely than whites to live in counties that ranked among the top 2 percent for concentrations of various industrial hazards such as smokestacks, incinerators, and hazardous waste facilities. - Cancer and many other diseases are highly correlated geographically with concentrations of industrial activity. The poorest black children are exposed to neurologically-damaging levels of lead at nearly twice the rate of the poorest whites, and the disparity increases with income. Similarly, EPA's Environmental Equity Workgroup issued a report (Environmental Equity: Reducing Risk of All Communities), which concluded that racial minorities and low-income people were disproportionately exposed to lead, selected air pollutants, hazardous waste facilities, contaminated fish and agricultural pesticides in the workplace. [Footnote 53: United States EPA, Environmental Equity: Reducing Risk for All Communities, June 1992.] A more recent study confirmed the following environmental inequities: The percentage of minorities living in communities with commercial hazardous waste sites rose from 25 percent in 1980 to almost 31 percent in 1993; Minorities are 47 percent more likely than others to live near hazardous waste facilities [Footnote 54: Center for Policy Alternatives, "Toxic Wastes and Waste Revisited: An update of the 1987 Report on the Racial and Socioeconomic Characteristics of Communities with Hazardous Waste Sites," 1995.] The effects of pollution and environmental hazards on people of color, the poor, and the working class have been overlooked by environmental policy makers for too long. Strategies and implementation plans are a step in the right direction, but need to be carried out

through federal policy and regulation. The proposed hazardous waste combustion rule does not adequately take into consideration the serious environmental justice problems that presently exist in towns and cities throughout the nation.

RESPONSE:
We have expanded and refined our Environmental Justice Analysis for the final Assessment. Using the population exposure approach, the Combustion MACT final standards may result in significant health and environmental benefits to minority and low income populations. The commenter is requested to review chapter seven on the final *Assessment* document. Appendix H of this document presents further data tables supporting our conclusions.

DCN RCSP00119
COMMENTER GENERAL ELECTRIC COMPANY
SUBJECT ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: Second, this high level of market exit would also result in much greater quantities of hazardous wastes being transported from manufacturing facilities to off-site incinerators. EPA has not taken into account the significant environmental risks associated with this increase in hazardous waste transportation.

RESPONSE:
The analysis conducted for the final *Addendum* finds that total waste reallocations from private on-site incinerators may represent no more than 1.0 percent of the total quantity of hazardous waste currently burned at these facilities. This level of incremental increase in waste shipments to off-site facilities is not expected to result in significant environmental risks.

DCN: RCSP00107
COMMENTER: AMERICAN PORTLAND CEMENT ALLIANCE
SUBJECT: ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: The Agency has failed to take into account secondary environmental impacts for ACI technology. EPA has failed to address highly relevant environmental concerns arising from the additional waste generated from the use of ACI technology. The cement industry has sought to significantly reduce the wasting of CKD over the past several years through such practices as in-process recycling and developing markets for the beneficial use of CKD. These environmentally beneficial activities might have to be significantly restricted if EPA requires MACT standards based on ACI technology. In addition, the wasting of CKD that otherwise would have been used as raw material results in additional fugitive dust, fuel consumption and mobile source emissions associated with increased mining activity. Additional raw material grinding will require a greater use of electricity per ton of product. The increased use of raw materials and the required changes in the process will serve to increase the consumption of thermal energy, causing higher emissions of criteria pollutants and

greenhouse gases. These significant environmental impacts must be taken into account in the BTF analysis. In promulgating the HON rule, the Agency developed and analyzed secondary environmental impact factors associated with a particular control technology, including increased energy requirements and secondary air pollutant emissions. See "Secondary Environmental Impact Factors Used In The Framework For Steam Stripping Wastewater," Memorandum from Radian Corp. to the EPA (February 1, 1994). That analysis is missing here.

RESPONSE:
The final standards do not include the beyond-the-floor ACI levels. The final *Assessment* document includes a general qualitative discussion of potential secondary environmental impacts.

DCN: RCSP00108
COMMENTER: SAFETY-KLEEN CORP.
SUBJECT: ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: EPA cannot consider risk reduction benefits of this rule under RCRA without also examining the increased risk that this rule is likely to cause. Given the very low baseline risks posed by cement kilns operating under the BIF standards, EPA's rule provides very limited risk reduction benefits. Therefore, the unintended increase in emissions from the increase in combustion of CESQG wastes in space heaters and non-RCRA boilers and industrial furnaces could potentially off-set any risk reduction gains. The exposure pathways and emission profiles of these devices when burning hazardous waste have been much less studied than regulated cement kilns. Further analysis must be conducted by the Agency to address these risk trade-offs. Again, the results of this analysis should be part of a comprehensive reproposal of the MACT standards to allow the public a meaningful opportunity to comment.

RESPONSE:
The reduction in risk associated with the final standards are thoroughly discussed in the risk assessment prepared in support of this action. Benefits associated with the reduced risks are examined and, where possible, monetized in the final *Assessment*. This analysis is presented in chapter six of the final *Assessment* document.

The Regulatory Flexibility Analysis (RFA) presented in the final *Assessment* document indicates that the total quantity of hazardous waste shipped from generators categorized in small business dominated industries (SBDI's) represents about 5.5 percent of the total quantity of all combusted waste, and about 11 percent of the total quantity managed by off-site commercial facilities. Hazardous waste burning cement kilns and commercial incinerators receive approximately 12 percent and 9 percent, respectively, of their total waste quantity from SBDI generators. We have no data to indicate what portion of this quantity, if any, may be managed in space heaters, non-RCRA boilers, or industrial furnaces as a result of the final standards. There is little evidence to suggest that the higher prices of past years encouraged generators to use less environmentally desirable waste

management options. As a result, the Agency believes that the marginal price changes that may result from the final Combustion MACT standards are not likely to motivate conditionally exempt small quantity generators to significantly alter their waste management patterns.

DCN: RCSP00170
COMMENTER: CEMENT KILN RECYCLING COALITION
SUBJECT: ECON7 EVALUATION OF NEGATIVE IMPACTS OF PROPOSED RULE
COMMENT: EPA Fails To Consider The Health And Environmental Consequences Of Shifting Market Share. Every ton of HWDF that is diverted from cement kilns to incinerators results in increased health and environmental risks. When a cement kiln utilizes a ton of hazardous waste derived fuel, it substitutes the HWDF for coal which can have higher emissions of some pollutants such as SO_2 and NO_X, and mercury. When a ton of HWDF is diverted from a cement kiln to a commercial incinerator, the cement kiln will make up the energy loss with coal in order to continue making cement. The end result is that there will still be emissions from the waste materials being destroyed at the commercial incinerator plus the emissions from the cement plant using coal instead of HWDF for energy recovery. Thus, the environment is worse off because of the additional SO_2, NO_X, CO_2 mercury and other MACT - regulated HAP emissions from the cement plan burning coal instead of HWDF, as well as being worse off because of the health and safety risks associated with mining coal, which can be significant compared to the health risks that EPA seeks to avoid in the MACT regulation. These increased environmental and health risks are described in more detail elsewhere in these comments.

RESPONSE:
Kilns that stop burning hazardous waste to avoid complying with the HWC MACT standards will need to replace their hazardous waste derived fuel with alternative fuels -- mostly coal. However, a large percentage of the hazardous waste displaced from these facilities will likely be sent to other kilns or incinerators. This is expected to decrease the quantity of fossil fuel used at these facilities and offset the increases at the kilns that stop burning. Overall, therefore, we expect no significant net change in energy use (and corresponding criteria pollutants due to coal usage) associated with waste re-allocations.

General Cost Comments

DCN: RCSP000229
COMMENTER: EASTMAN CHEMICAL
SUBJECT: ECON7

DCN: RCSP000240
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7

DCN: RCSP000241
COMMENTER: CKRC
SUBJECT: ECON7

DCN: RCSP000242
COMMENTER: DUPONT
SUBJECT: ECON7
COMMENT: Underestimated.

DCN: RCSP000147
COMMENTER: CONTINENTAL CEMENT
SUBJECT: ECON3
COMMENT: Cost analysis in no way portrays the costs that the industry will incur.

DCN: RCSP000141
COMMENTER: ELI LILLY
SUBJECT: ECON6
COMMENT: Economic impact analysis is "flawed and misleading." Costs are higher than estimated.

DCN: RCSP000128
COMMENTER: CMA
SUBJECT: ECON7

DCN: RCSP000118
COMMENTER: ALLIED-SIGNAL
SUBJECT: ECON1

DCN: RCSP000152
COMMENTER: SHELL OIL
SUBJECT: ECON2
COMMENT: Underestimated for small units.

DCN: RCSP000010
COMMENTER: LAIDLAW ENVIRONMENTAL
SUBJECT: ECON6
COMMENT: Cost in terms of money and time for facilities and regulators is high and an unnecessary burden.

DCN: RCSP000117
COMMENTER: DEPT. OF NAVY
SUBJECT: ECON7
COMMENT: Commenter discusses the high costs of compliance.

RESPONSE:
EPA has revised the cost estimates for the final rule, such that retrofit costs are assigned using a combustion system-specific costing approach. This detailed costing method has improved the cost estimates.

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(9) Cost-Effectiveness

DCN: RCSP000107
COMMENTER: AMERICAN PORTLAND CEMENT
SUBJECT: ECON4
COMMENT: Nation-wide cost of a technology is not a true indicator of the cost of a proposed standard. Rather, the incremental cost per unit of pollutant justifies the health and environmental benefits to be achieved and is a more accurate indicator of the true cost of the proposed standard.

RESPONSE:
The 1999 *Addendum* document provides cost-effectiveness measures which describe the incremental cost per incremental emission reductions. The methodology for this analysis is presented in the 1999 *Assessment* document. Further detailed cost-effectiveness results are presented in the July 1999, *Final Technical Support Document for HWC MACT Standards, Volume V - Emission Estimates and Engineering Costs*.

DCN: RCSP000180
COMMENTER: DUPONT
SUBJECT: ECON1
COMMENT: Costs should be calculated in terms of emissions reduced, not waste feed.

RESPONSE:
Cost-effectiveness measures were calculated in terms of emissions reduced, not waste feed reductions. (See response above for a more detailed discussion of the costing approach.)

DCN: RCSP000119
COMMENTER: GE PLASTICS
SUBJECT: ECON1

DCN: RCSP000142
COMMENTER: MONSANTO
SUBJECT: ECON1
COMMENT: Cost-effectiveness has not been appropriately analyzed for small OIs. The cost-effectiveness of the rule is much higher for small OIs than for the incinerator sector as a whole. BTF standards are not cost-effective for small OIs.

RESPONSE:
EPA did not provide separate cost-effectiveness results for small on-site incinerators because they are being regulated in the same way as large on-site incinerators, and thus we group them in a single category in the *Assessment, Addendum,* and the *Final Technical Support Document for HWC MACT Standards*.

DCN: RCSP000136
COMMENTER: MOLTEN METAL TECHNOLOGY
SUBJECT: ECON6
COMMENT: The BTF cost-effectiveness does not consider reductions in waste feed beyond the MACT floor, alone or in conjunction with improved engineering controls.

RESPONSE:
Significant effort was dedicated toward evaluating the feasibility of waste feed controls during the development of the proposed and final rule. However, due to uncertainties surrounding the feasibility and cost of waste feed reduction, EPA calculated cost-effectiveness measures using the cost of end-of-pipe controls to provide high-end (i.e., potential overcosting) and defensible estimates.

DCN: RCSP000085
COMMENTER: SIERRA CLUB
SUBJECT: ECON7
COMMENT: A revised analysis should be conducted for all industry options for HWIS, HWCKS, and HWAKS.

RESPONSE:
EPA developed and evaluated a new set of options which address many of the issues raised in the public comments.

DCN: RCSP000191
COMMENTER: NO AFFILIATION
SUBJECT: ECON7
COMMENT: Cost-effectiveness has no validity if a trigger cost is not defined.

RESPONSE:
Section 112(d)(2) of the Clean Air Act, as amended outlines the intention of MACT standards:

> "Emission standards ... shall require the maximum degree of reductions in emissions of hazardous air pollutants subject to this section (including a prohibition on such emissions, where achievable) that the Administrator, taking into consideration the cost of achieving such emission reductions, non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing units in the category or subcategory to which the emission standards apply."

Analyzing cost-effectiveness (cost per unit reduction of HAP emissions) is a useful tool for comparing regulatory options designed to meet these two criteria. EPA used cost-effectiveness to compare the relative costs associated with incremental increases in emission stringency. EPA has not established specific "thresholds" or "trigger costs" to make policy determinations because such tests would mask the complexities and uncertainties of cost-effectiveness metrics.

DCN: RCSP000107
COMMENTER: AMERICAN PORTLAND CEMENT ALLIANCE
SUBJECT: ECON4

DCN: RCSP000097
COMMENTER: VULCAN CHEMICAL
SUBJECT: ECON6

DCN: RCSP000125
COMMENTER: UTILITY AIR REGULATORY GROUP
SUBJECT: ECON6
COMMENT: Cannot determine cost-effectiveness of mercury reductions until report to Congress on health benefits on reduced mercury emissions is completed.

RESPONSE: "Cost-effectiveness," as applied in this analysis simply measures the cost per unit reduction of emissions, not per risk reduction. Therefore, cost-effectiveness does not depend on conclusions from the Mercury Report to Congress. However, the conclusions from the Mercury Report to Congress will help EPA to determine if the technology-determined minimum standards will be sufficient in reducing health risks. This however, will not affect the reported cost-effectiveness measures.

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON3
COMMENT: Aggregate emissions from cement kilns and commercial incinerators will increase when waste is diverted from kilns to incinerators because kilns will need to burn more conventional fuels, thereby further decreasing the cost-effectiveness of this rule. This will more than off-set the benefits described in the RIA and should be addressed in the rule.

RESPONSE:
Cement kilns that reallocate all wastes to commercial incinerators will still have to comply with environmental regulations (the Portland Cement MACT). Incinerators will also need to meet the same emission requirements, even if they burn more hazardous waste. Thus, waste reallocations are not anticipated to result in an appreciable increase in emissions, even if conventional fuel usage increases.

DCN: RCSP000229
COMMENTER: EASTMAN CHEMICAL COMPANY
SUBJECT: ECON7
COMMENT: EPA considers cost-effectiveness as a benefit/cost measure, which in this current context it cannot since there is no quantification of benefits.

RESPONSE:
The cost-effectiveness analysis is not presented as an attempt to quantify benefits. Throughout the section, the term "cost-effectiveness measure" is used rather than "benefit measure."

The cost-effectiveness measure is a useful tool for EPA policy makers. This measure can be used to identify emissions that are most expensive to control. In addition, expenditures per ton of emissions reduction across various regulatory options can be compared to help select the most suitable option.

DCN: RCSP000097
COMMENTER: VULCAN CHEMICALS
SUBJECT: ECON1

DCN: RCSP000180
COMMENTER: DUPONT
SUBJECT: ECON1

DCN: RCSP000128
COMMENTER: CMA
SUBJECT: ECON1
COMMENT: BTF standards not cost justified.

DCN: RCSP000166
COMMENTER: GOODYEAR TIRE AND RUBBER COMPANY
SUBJECT: ECON2
COMMENT: Metals and HCL/CL2 standards regardless of finding detectable levels in waste feed is not cost-justifiable.

RESPONSE:
MACT standards were designed so that: (i) the absolute minimum standards are not based on costs but rather technology; and (ii) the costs associated with going beyond-the-floor are justified when necessary for the protection of human health and environment. In this case, EPA believes the standards are necessary for health and environmental reasons.

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(10) Waste Minimization

DCN: RCSP000230
COMMENTER: CONTINENTAL CEMENT COMPANY
SUBJECT: ECON7
COMMENT: Unless EPA can provide evidence that net annual O&M costs associated with waste minimization efforts are likely to be small, it should caveat the payback analysis in the strongest possible terms.

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON6
COMMENT: Waste minimization gains overestimated. Without waste minimization, small generators will have to incur higher costs or use less environmentally beneficial methods of disposal.

DCN: RCSP000237
COMMENTER: SBA
SUBJECT: ECON7
COMMENT: Will have great difficulty implementing waste minimization procedures due to resource constraints.

DCN: RCSP000102
COMMENTER: National Association of Chemical Recyclers
SUBJECT: WM1
COMMENT: It appears that EPA is trying to use waste minimization as justification for the rule. Waste minimization should not be the justification for the rule, and furthermore, the proposed rule will discourage waste minimization. Many generators are reusing solvents and other chemicals to the point where they can no longer be reclaimed or economically recycled and increased prices may result in increased disposal of hazardous waste using disposal methods that are farther down the RCRA hierarchy than energy recovery and combustion.

RESPONSE:
The payback analysis used in the 1995 RIA is used as a *simplified* approach for estimating possible waste quantities for which waste minimization and waste management alternatives are available and appear economic. For the 1999 *Assessment,* we conducted an expanded and significantly improved analysis of waste minimization alternatives. This analysis used a more detailed decision framework for evaluating waste minimization investment decisions that captures the full inventory of costs, savings and revenues, including indirect, less tangible items typically omitted from waste minimization analysis, such as liability and corporate image. For each waste minimization alternative that was identified as a viable alternative for currently combusted waste streams, cost curves were developed for a range of waste quantities (because cost varies by waste quantity). These cost curves were then used to determine whether a waste generator would shift from combustion to waste minimization alternatives as combustion prices rise. The detailed analysis is presented in an Appendix to the 1999 *Assessment.* Results from the analysis are also used to inform the elasticity of demand for combustion services (discussed in Chapter 5 of the *Assessment).*

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(11) Interpretation of Costs and Benefits: Use of the RIA/*Assessment* in Developing MACT Standards

DCN: RCSP000130
COMMENTER: ENVIRONMENTAL TECHNOLOGY COUNCIL
SUBJECT: ECON7
COMMENT: Economic impacts have been overestimated and industry should have no difficulty complying.

RESPONSE:
EPA believes that the economic impact estimates are unbiased and that while most combustion facilities should be able to comply and remain profitable operations, some facilities may necessarily stop burning waste, which will be diverted to the more efficient facilities.

DCN: RCSP00180
COMMENTER: E.I. DUPONT DE NEMOURS AND CO. INC.
SUBJECT: GEN1
COMMENT: Du Pont facilities combusting hazardous waste in the U.S. are part of our commitment to safely manage the hazardous waste that we generate. These incinerators are operated in accordance with EPA and state regulations which establish a rigorous set of safeguards to protect human health and the environment. Imposition of the additional regulatory controls proposed in this rule would force DuPont to invest $100 million with little environmental benefit.

DCN: RCSP000108
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON3
COMMENT: Cost benefit analysis not clear. Hides high cost of the rules.

DCN: RCSP00170
COMMENTER: CEMENT KILN RECYCLING COALITION (CKRC)
SUBJECT: GEN2
COMMENT: These standards will cost far more to achieve than can be deemed justifiable under any rational approach. In fact, this proposal is far more costly than any other regulation EPA has issued under these authorities. For example, the proposed rule would impose dioxin controls on cement kilns costing over $1.5 million per gram of reduction, which is 300 times more expensive than the Agency required in the municipal waste combustor MACT rule.

RESPONSE:
The Congress of the United States of America, in §112(d) of the Clean Air Act, has mandated standards based on MACT to control emissions of HAPs. EPA, through the Combustion MACT final rule, is carrying out its obligation to implement this legislation. Under the final rule, the control of dioxin emitted from cement kilns is projected to cost approximately $900,000 per gram removed (baseline to final MACT floor standard).

DCN: RCSP000097
COMMENTER: VULCAN CHEMICALS
SUBJECT: ECON7

DCN: RCSP000124
COMMENTER: DOE
SUBJECT:ECON7
COMMENT: OMB cost-benefit guidelines were not followed. Management of hazardous waste residues generated by incineration and the increased costs associated with the management of those wastes were not addressed.

RESPONSE:
EPA followed OMB and Agency guidance in preparation of the final *Assessment* support document. These guidance procedures were followed to the extent data, scheduling, and budgetary limitations allowed. The 1999 *Assessment* and *Addendum* documents incorporate hazardous waste residue management costs.

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(12) Impacts on Generators And Fuel Blenders

DCN: RCSP000108
COMMENTER: SAFETY-KLEEN
SUBJECT: GEN1
COMMENT: The result of imposing unnecessarily stringent standards will be to dramatically reduce the hazardous waste management capacity of cement kilns in the United States and increase the costs of waste management for waste generators, particularly thousands of small generators.

RESPONSE:
EPA expects that the MACT standards will cause only a small percentage of cement kilns to stop burning hazardous wastes. Furthermore, our analysis indicates that those systems that are likely to exit the combustion market tend to burn small amounts of hazardous waste. Therefore, EPA believes that the standards will not significantly affect the hazardous waste management capacity of cement kilns.

In the 1995 RIA, EPA considered the costs of the proposed rule to hazardous waste generators. It was determined that hazardous waste generators would likely see price increases for combusted waste streams, though the magnitude of the price increase is difficult to estimate and varies by the type of waste. EPA determined that generators of clean solvents and clean waters would face lower price increases due to the availability of non-combustion alternatives, while generators of sludges and solids could face more substantial increases.

The economic impact of the rule on small generators (as defined by the Small Business Administration) is discussed in the next response below.

DCN: RCSP000108
COMMENTER: SAFETY-KLEEN
SUBJECT: SDGEN
COMMENT: The burdens on small generators will be great as cement kilns close and combustion capacity shrinks. Alternative options are limited and most are less desirable from an environmental perspective.

DCN: RCSP000108
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON3

DCN: RCSP000102
COMMENTER: NATIONAL ASSOCIATION OF CHEMICAL RECYCLERS
SUBJECT: ECON7

DCN: RSCP000113
COMMENTER: HOLNAM
SUBJECT: ECON3

DCN: RCSP000121
COMMENTER: VOGUE CLEANER
SUBJECT: ECON3

DCN: RCSP000195
COMMENTER: CENTER FOR EMISSIONS CONTROL
SUBJECT: ECON3

DCN: RCSP000201
COMMENTER: MAYO CLINIC
SUBJECT: ECON7
COMMENT: Decreased capacity as well as compliance costs will increase prices charged, significantly affecting small generators.

DCN: RCSP000108
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7
COMMENT: Failed to estimate adequately the impacts of the proposed rule on significantly affected segments (*i.e.*, small generators).

RESPONSE:
In accordance with the Regulatory Flexibility Act of 1986, EPA evaluated the impact of the proposed rule on "small entities." As part of its analysis, EPA determined that the rule is unlikely to affect small businesses. With the passage of the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, however, EPA conducted an updated Regulatory Flexibility Analysis (RFA) to evaluate the impact of the proposed rule on small entities. SBREFA only requires the RFA to focus on the facilities directly impacted by the rule (*i.e.*, combustors). However, in the spirit of SBREFA, EPA also assessed indirect impacts (small generators) in the analysis conducted for the final rule.

The approach for assessing economic impacts on small business generators is based on EPA's draft

guidance for implementing the Regulatory Flexibility Act as amended by SBREFA. The guidance describes a general process for determining whether a rule will have an adverse impact on small entities. This process involves determining whether the rule will have a "significant economic impact" on a "substantial number" of small entities.

To determine the economic impact on generators, EPA first identified those generators that may be affected by the rule. Given the large number of generators who would be affected by the rule, it was necessary to conduct an initial, broad screening analysis to identify small business generators that might face significant impacts. For each industry identified, we then compared the average cost increase of waste management through combustion with the average sales for small businesses in the industry. The results of this screening analysis were used to identify industry groups or specific facilities where further analysis was appropriate. The commenter is requested to review the RFA conducted in support of the final rule for a complete understanding of the methodology, data, findings, and limitations associated with this analysis. This may be found in Appendix G of the final *Assessment* document.

With regards to diverting to Subtitle C landfills, the price for combustion services after MACT implementation is likely to continue to be less expensive than full Subtitle C disposal. EPA's Land Disposal Restrictions (LDRs) require that some RCRA regulated waste streams cannot be sent directly to landfills and must first be treated to a level designed to meet BDAT standards. Furthermore, the Agency has examined historical price patterns and found that the price of combustion services has been considerably higher in past years, and has been declining in recent years. We have not identified any direct correlation between the higher prices of past years and generators who are currently sending their wastes for combustion (conditionally exempt small quantity, or large quantity), using less environmentally desirable disposal options.

Finally, the current cost differential between Subtitle C and Subtitle D disposal practices is significant. The incremental price impact due to this rule is considerably smaller than this current cost differential. This incremental impact alone is not likely to stimulate conditionally exempt small quantity generators, currently sending their waste to combustion facilities, to redirect this waste to Subtitle D disposal.

DCN: RCSP000171
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON1
COMMENT: Impact on fuel blenders will be significant.

RESPONSE:
Fuel blenders are not directly regulated by today's final action. However, we have examined impacts to fuel blenders in the context of our small entity analysis. This analysis is presented in Appendix G to the final *Assessment* document. While fuel blenders will likely face increased tipping fees charged by kilns, fuel blenders may also be able to increase the prices they charge to generators.

DCN: RCSP000206
COMMENTER: INTERNATIONAL FABRICARE INSTITUTE
SUBJECT: ECON4

DCN: RCSP000094
COMMENTER: NATIONAL CEMENT
SUBJECT: ECON6

DCN: RCSP000108
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7

DCN: RCSP000108
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7
COMMENT: Prices will also rise for facilities sending waste for recycling since some of the residues need to be combusted.

RESPONSE:
EPA believes the rule will not cause the burning of residues to have a significant adverse impact on recycling facilities for two reasons. First, the price increase for combusting residue wastes is expected to be relatively small. Moreover, residues comprise a small fraction of the total wastes managed at recycling facilities. Finally, market forecasts project an increase in solvent recycling, a development which should offset minor additional costs faced by recycling facilities.

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(13) Small Business Impacts

DCN: RCSP000113
COMMENTER: HOLNAM
SUBJECT: ECON3

DCN: RCSP000121
COMMENTER: VOGUE CLEANER
SUBJECT: ECON3
COMMENT: Should evaluate how the rule will affect small business and use SBREFA to set standards for cement kilns.

DCN: RCSP000113
COMMENTER: HOLNAM
SUBJECT: ECON6

DCN: RCSP000113
COMMENTER: VOGUE CLEANER
SUBJECT: ECON6

DCN: RCSP000121
COMMENTER: NATIONAL ASSOCIATION OF CHEMICAL RECYCLERS
SUBJECT: ECON6

DCN: RCSP000108
COMMENTER: SAFETY-KLEEN
SUBJECT: ECON7
COMMENT: Small business impacts should be fully evaluated.

DCN: RCSP000170
COMMENTER: CKRC
SUBJECT: ECON7

DCN: RCSP000193
COMMENTER: PERMA-FIX ENVIRONMENTAL SERVICES
SUBJECT: ECON7
COMMENT: Significant adverse effects to small businesses have been overlooked.

DCN: RCSP000195
COMMENTER: CENTER FOR EMISSIONS CONTROL
SUBJECT: ECON1
COMMENT: Small businesses using chlorinated solvents will be affected.

RESPONSE:
In accordance with the Regulatory Flexibility Act of 1986, EPA evaluated the impact of the proposed rule on "small entities." As part of its analysis, EPA determined that the rule is unlikely to affect small businesses. With the passage of the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, however, EPA conducted an updated Regulatory Flexibility Analysis (RFA) to evaluate the impact of the proposed rule on small entities. While SBREFA only requires the RFA to focus on the facilities directly impacted by the rule (*i.e.*, combustors), for the final rule EPA also assessed indirect impacts (small generators).

The approach for assessing economic impacts on small business generators is based on EPA's draft guidance for implementing the Regulatory Flexibility Act as amended by SBREFA. The guidance describes a general process for determining whether a rule will have an adverse impact on small entities. This process involves determining whether the rule will have a "significant economic impact" on a "substantial number" of small entities (EPA SBREFA Guidance, 1997).

To determine the economic impact on generators, EPA first identified those generators that may be affected by the rule. Given the large number of generators who would be affected by the rule, it was necessary to conduct an initial, broad screening analysis to identify small business generators that might face significant impacts. For each industry identified, we then compared the average cost increase of waste management through combustion with the average sales for small businesses in the industry. The results of this screening analysis were used to identify industry groups or specific facilities where further analysis was appropriate. The commenter is requested to review the RFA conducted in support of the final rule for a complete understanding of the methodology, data, findings, and limitations associated with this analysis. This may be found in Appendix G of the final *Assessment* document.

With regards to adverse impacts on small businesses that use chlorinated solvents, EPA believes that, in general, price increases for waste stream combustion should be relatively small. Furthermore, although emission limits on chlorine will be made more stringent in the rule, industry surveys note that facilities manage less chlorinated solvents every year, probably due to the ban on chlorofluorocarbons.

DESCRIPTION OF SUBJECT CODES

ECON1:	Incinerators: MACT floor and BTF cost impacts
ECON2:	Incinerators - MACT new cost impacts
ECON3:	Cement Kilns - MACT floor cost impacts
ECON4:	Cement Kilns - MACT new cost impacts
ECON 5:	Light Weight Aggregate Kilns (LWAKs) - MACT new cost impacts
ECON6:	Analytical and Regulatory requirements
ECON7:	Economics: General, not elsewhere classified
SDGEN:	Description of Hazardous Waste Incinerators
WM1:	Relationship of The Proposal to the Waste Minimization National Plan
GEN1:	Description of Commenter's Interest
GEN2:	Requests for Delay/Withdrawal of Rule

LIST OF ACRONYMS

ACFM	Actual Cubic Feet per Minute
APCD	Air Pollution Control Device
ATTIC	Alternative Technology Information Center
BDAT	Best Demonstrated Available Technology
BEQ	Breakeven Quantity
BIF	Boiler or Industrial Furnace
BRS	Biennial Reporting System
BTF	Beyond the Floor
CAA	Clean Air Act
CEM	Continuous Emissions Monitoring
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CETRED	Combustion Emissions Technical Resources Document
CIF	Cost, Insurance and Freight
CFR	Code of Federal Regulations
CK	Cement Kiln
CKD	Cement Kiln Dust
CKRC	Cement Kiln Recycling Coalition
Cl_2	Chlorine
CO	Carbon Monoxide
CRF	Capital Recovery Factor
CWA	Clean Water Act
D/F	Dioxin/Furan
DOM	Design, Operation, and Maintenance
DPRA	DPRA, Incorporated
DRE	Destruction and Removal Efficiency
EER	Energy and Environmental Research Corporation
EPA	Environmental Protection Agency
ESPs	Electrostatic Precipitators
GDP	Gross Domestic Product
GPM	Gallons per Minute
HAP	Hazardous Air Pollutant
HBL	Health Benchmark Level
HC	Hydrocarbons
HCl	Hydrochloric Acid
Hg	Mercury
HQ	Hazard Quotient
HSWA	Hazardous and Solid Waste Amendments
HWC	Hazardous Waste Combustion
HWIR	Hazardous Waste Identification Rule
ICR	Information Collection Request

LIST OF ACRONYMS
(continued)

IWS	Ionizing Wet Scrubbers
LDR	Land Disposal Restrictions
LVM	Low Volatile Metals
LWA	Lightweight Aggregate
LWAK	Lightweight Aggregate Kilns
MACT	Maximum Achievable Control Technology
MTEC	Maximum Theoretical Emissions Concentration
NACR	National Association of Chemical Recyclers
NHWCS	National Hazardous Waste Constituent Survey
NSPS	New Source Performance Standards
O&M	Operating and Maintenance
OAQPS	Office of Air Quality Planning and Standards
OMB	Office of Management and Budget
OSW	Office of Solid Waste
PCDD	Polychlorinated Dibenzo-P-Dioxins
PCDF	Polychlorinated Dibenzo Furans
PCI	Pollution Control Industries
PIC	Products of Incomplete Combustion
PM	Particulate Matter
POTW	Publicly Owned Treatment Work
PSPD	Permits and State Programs Division
RCRA	Resource Conservation and Recovery Act
RFA	Regulatory Flexibility Act
RIA	Regulatory Impact Assessment
SBA	Small Business Administration
SQB	Small Quantity Burner
SVM	Semi-Volatile Metals
TCl	Total Chlorine
TEQ	Dioxin/Furan Toxic Equivalents
THC	Total Hydrocarbons
UMRA	Unfunded Mandates Reform Act
VISITT	Vendor Information System for Innovative Treatment Technologies