Economic Impact Analysis for the Site Remediation MACT Standard

Draft Report

Prepared for

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This report contains portions of the economic impact analysis report that are related to the industry profile.

SECTION 2
AFFECTED INDUSTRIES AND ENGINEERING COSTS

Section 2 describes the remediation activities affected by the rule and the methods used by the Agency to identify potentially affected industries and calculate engineering compliance cost estimates. The broad nature of the rule results in a large number of potentially affected industries. Because of the difficulty in predicting which industries and companies will actually be affected by the rule when it is implemented, the Agency considers the results to provide an indication of the types of industries that will be affected and the possible distribution of impacts. The economic analysis, which is based on the data described in this section, provides a similarly general overview of the possible distribution of costs with a qualitative discussion of likely market impacts.

2.1 Characterizing the Remediation Activities Affected by the Rule[1]

A site remediation is performed in response to the release or the threat of release of hazardous substances to the air from soil, groundwater, or other environmental media that are contaminated. It involves taking appropriate action to remove, treat, and dispose of the hazardous substances to the extent necessary to protect human health and the environment. The term "cleanup" refers to the activities performed to address the hazardous substance contamination. This term frequently is used interchangeably with the term "remediation."

Site remediations can be performed to address hazardous substance contamination resulting from either past or current human activities. Examples of such activities include accidental releases of chemical substances; undetected leaks in tanks or pipelines; use of incorrectly designed or poorly maintained equipment for managing materials containing hazardous substances; and improper disposal of hazardous substances in surface impoundments, waste piles, or landfills.

For the purpose of implementing the rule, a site remediation is one or more activities or processes used to remove, destroy, degrade, transform, or immobilize organic HAP

[1] This section is based on information in Nizich (2001).

constituents in soils, sediments, groundwater, surface waters, or other types of solid or liquid environmental media. The rule would not apply to site remediations specifically excluded from applicability. The proposed rule would not apply to

- a site remediation involving the cleanup of radioactive mixed waste managed in compliance with all applicable regulations under Atomic Energy Act and Nuclear Waste Policy Act authorities and
- site remediations performed to clean up remediation material containing little or no organic HAPs. The proposed rule would not apply to any facility for which the owner or operator demonstrates that the total annual organic HAP mass content of the remediation material to be cleaned up at the facility site is less than 1 megagram per year (Mg/yr).
- Superfund and RCRA corrective action cleanups will not be part of this source category.

2.2 Potentially Affected Industries

The proposed NESHAP would affect owners and operators of facilities, subject to the exceptions described in Section 2.1, that are major sources of HAP emissions and at which a site remediation is conducted to clean up media or other material contaminated with any of the organic HAP substances listed in the rule. Because of the structure of the rule, a comprehensive list of SIC or NAICS codes cannot be compiled for businesses or facilities potentially regulated by this action. The rule may be applicable to any type of business or facility at which a site remediation is conducted to clean up media contaminated with organic HAPs. For many businesses and facilities subject to the rule, the regulated sources (i.e., the site remediation activities) are not the predominant activity, process, operation, or service conducted at the facility. The Agency is aware of site remediation activities potentially subject to the rule being performed at facilities listed under SIC codes for refuse systems, waste management, business services, miscellaneous services, and nonclassifiable. In addition, site remediation activities are conducted at closed or abandoned facilities. Therefore, the industrial code alone for a given facility does not determine whether the facility is or is not potentially subject to this rule (Nizich, 2001).

For the economic impact analysis, the Agency identified a sample of industries that might be affected by the regulation using the best available data: the 1997 BRS database.

The remainder of Section 2.2 describes the BRS database and the limitations of using these data to identify potentially affected industries and facilities.

2.2.1 The BRS Data

EPA, in partnership with the states, collects information biennially regarding the generation, management, and final disposition of hazardous wastes regulated under RCRA, as amended. The purpose of *The National Biennial RCRA Hazardous Waste Report (Based on 1997 Data)* is to communicate the findings of EPA's 1997 BRS data collection efforts to the public, government agencies, and the regulated community (EPA, 1999a). The report provides:

- an overview of national hazardous waste generation and management practices;
- data on waste-handling practices in the EPA regions, states, and largest facilities nationally, including the quantity of waste generated, managed, shipped and received, and imported and exported between states and the number of generators and managing facilities;
- data on each state's waste handling practices, including overall totals for generation, management, and shipments and receipts, as well as totals for the largest 50 facilities;
- a list of large quantity generators that identifies every hazardous waste generator in the United States that reported itself to be a large quantity generator in 1997; and
- a list of treatment, storage and disposal facilities that identifies every hazardous waste manager in the United States that reported itself to be a treatment, storage, or disposal facility in 1997.

The BRS database provides information on the facility name, location, quantity of waste generated by waste treatment category, SIC code and other useful information. In order to generate estimates of the annual control cost for facilities, it is necessary to have information on the quantity of waste generated at the facility level, and the BRS is the best source of such information.

2.2.2 The Limitations of the BRS Database

Using the 1997 BRS data to identify the affected industries raises a number of issues. Most, if not all, of the remediation projects underway in 1997 will be completed by the year in which the rule takes effect. Thus, the specific companies identified in the 1997 BRS database may or may not incur compliance costs when the rule is implemented. In addition, the BRS data do not include the activities of off-site waste treatment facilities, which will be subject to the rule. However, the Agency anticipates that the off-site treatment facilities that would be subject to the rule will already have the necessary control equipment as a result of complying with other EPA rules. Thus, the Agency believes this rule should impose minimal costs on off-site waste treatment firms. Furthermore, the BRS data identify only large quantity generators, which may exclude many other waste generators.[2] To the extent that large quantity generators are large companies, small businesses may not be adequately represented in this database. Furthermore, the BRS database does not identify which facilities are major sources of HAPS, so it is possible that some of the firms in the BRS that generate waste are not major sources of HAPS and thus would not be subject to the rule. In addition, the database would not include information on firms that are major sources of HAPS but generate small quantities of waste. These firms may still be required to comply with the rule, but would not be identified in the BRS data.

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[2]Facilities must report their activities involving RCRA hazardous waste to BRS if they are either a RCRA-defined LQG or a TSD facility.

Large Quantity Generator: A generator is defined as a Federal LQG if it meets any of the following criteria during the year: [a] the facility generated in one or more months 1,000 kg (2,200 lbs) or more of RCRA hazardous waste; or [b] the facility generated in one or more months, or accumulated at any time, 1 kg (2.2 lbs) of RCRA acute hazardous waste; or [c] the facility generated or accumulated at any time more than 100 kg (220 lbs) of spill cleanup material contaminated with RCRA acute hazardous waste. The wastes that are not to be counted in determining whether a site is a LQG include: (i) RCRA hazardous wastes managed in systems regulated under the Clean Water Act (i.e., wastewater treatment plants) or the Safe Drinking Water Act (i.e., underground injection wells), (ii) wastes that are recycled or reclaimed, and (iii) wastes regulated only by a given state and not by RCRA.

Treatment, Storage, and Disposal Facility: This is a facility that treats, stores, or disposes of hazardous waste. Treatment is any method, technique, or process designed to: (1) change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste; (2) recover energy or material resources from the waste; or (3) render such waste nonhazardous or less hazardous. Storage is the temporary holding of hazardous waste until it is treated, disposed of, or stored elsewhere. Storage methods include use of containers, tanks, and surface impoundments. Disposal is the discharge, deposit, injection, dumping, spilling, leaking, or placing of waste so that it may enter the environment (air, land, or water).

Despite these limitations, the Agency believes the BRS data provide the best coverage of potentially affected firms to conduct the economic impact analysis. As stated above, providing a comprehensive list of affected industries is difficult because of the broad nature of the rule. The National Toxics Inventory (NTI) is a database that can be used to identify major sources of HAP emissions, but it does not contain the information on site remediation activities necessary to calculate control costs. The Agency was unable to match the BRS data with the data on major sources in the NTI. Therefore, it was determined that the BRS database provides the best indication of the industries that might be affected by the rule.

2.3 Control Technologies and Compliance Cost Estimates[3]

The Agency calculated estimated compliance costs for the 490 potentially affected industries. Below, we briefly describe the control technologies identified in the rule and the method used to calculate the compliance costs.

2.3.1 Control Technologies

The proposed rule defines three groups of affected sources, (1) process vents, (2) remediation material management units, and (3) equipment leaks. The affected source for process vents is the entire group of process vents associated with both in situ and ex situ remediation activities. The affected source for remediation material management units is the entire group of tanks, surface impoundments, containers, oil/water separators, and transfer systems used to store, transfer, treat, or otherwise manage remediation material. The affected source for equipment leaks is the entire group of remediation equipment components (pumps, valves, etc.) that contain or contact remediation material having a total HAP concentration equal to or greater than 10 percent by weight, and are intended to operate for 300 hours or more during a calendar year.

Given the unique nature of the site remediation source category, the extent of information currently available to the Agency, and the complexities of gathering additional meaningful information, we decided to forgo statistically computing an emission limitation or identifying a specific control technology that represents the MACT floor for site remediations. The MACT floor for existing affected sources is some level of air emission control beyond no controls. Because the provisions of section 112 allow the Agency to select

[3]This section draws from Nizich (2001) and Zerbonia (2001).

MACT for a source category that is more stringent than the MACT floor (provided that the control level selected is technically achievable and that we consider the cost of achieving the emissions reductions, any non-air quality health and environmental impacts, and energy requirements associated with the selected control level (CAA section 112 (d) (2)), we chose to select the MACT technology directly.

To select a MACT technology from alternatives beyond the MACT floor for each affected source, we looked at the types of air emission controls required under national air standards for sources similar to those sources that potentially may be associated with site remediations. These air standards are NESHAP for other source categories, particularly the Off-Site Waste and Recovery Operations (OSWRO) NESHAP (EPA, 1994) under 40 CFR 63 subpart DD, and the air standards for RCRA hazardous waste treatment, disposal, and recovery facilities under subparts AA, BB, and CC in 40 CFR parts 264 and 2654. The control levels established by the emission limitation and work practices proposed in the rule are being implemented at existing sources subject to these similar rules demonstrate that the control levels are technically achievable (Nizich, 2001).

2.3.2 Control Cost Estimates

According to the nationwide emission and control cost estimates memorandum (Zerbonia, 2001), in estimating nationwide HAP emissions from site remediation sources, the 1997 BRS database was used to estimate the quantity of remediation wastes generated by various regulatory categories (e.g., Superfund Remedial actions or RCRA Corrective Actions), the physical form of the remediation wastes generated (e.g., inorganic liquids, organic solids, or organic sludges), and the quantities and methods used to manage and treat the remediation wastes on-site (e.g., incineration, aqueous organic treatment, or stabilization). The 1997 BRS data were used to represent nationwide baseline conditions for site remediations activities. A comparison of the total quantity of remediation-derived wastes reported in the BRS database for the years 1993, 1995, and 1997 showed that the total quantity of remediation waste treated on-site for these years remained about the same, approximately 22 million tons.

The estimation of control costs for site remediation activities was based on the methodology developed for the OSWRO NESHAP (EPA, 1994). Using this methodology, overall control cost factors were developed to estimate the costs of applying controls to the various remediation waste management and treatment system units (e.g., tanks, air and steam

strippers, and process vents) based on the model unit type used to characterize the remediation activity. Separate cost factors were developed for each of the different waste management model units based on the "form" of the waste stream. Waste form codes were assigned according to the waste description code reported for the waste stream. The total annual cost for the control requirement is $15.2 million.

2.3.3 Monitoring, Inspection, Recordkeeping, and Reporting Costs

According to the nationwide emission and control cost estimates memorandum (Zerbonia, 2001), the annual monitoring, inspections, recordkeeping, and reporting (MIRR) costs were calculated based on the number of site remediation emission sources or system types and the cost factors for MIRR source types, expressed as annual cost per emission source. The engineering analysis used data obtained from EPA's 1997 BRS database to characterize the number of emission sources within remediation waste treatment category or system type that would be required to apply controls. The cost factors used were those developed for the OSWRO NESHAP; the methodology and derivation of the MIRR cost factors are discussed in Appendix E of the OSWRO NESHAP BID, September 8, 1994. To estimate MIRR costs the Agency had to determine the type of on-site process systems used to manage or treat the wastes (i.e., treatment methods). This information was obtained from Section II, Box D of Form GM. The total annual cost for MIRR is $0.2 million.

2.3.4 Formatting Engineering Cost Estimates for Economic Analysis

The total quantity of waste generated and total annual compliance costs were estimated for all the treatment categories (see Tables 3 and 7 of the control cost estimates memorandum [Zerbonia, 2001]). Using this information, the Agency calculated the average annual control cost per ton of waste generated in each treatment category. The BRS database lists the quantity of waste generated by facility by treatment category. Multiplying the average control cost for each treatment category by the number of tons of waste generated by a facility for each treatment category and summing over all the treatment categories for each facility yields an estimate of the annual compliance cost for the facility. Aggregating the estimated facility compliance costs over SIC codes produces an estimate of the annual compliance cost for each SIC code in the BRS data. The annual control cost estimates by SIC code and by facility are only approximations based on average costs for each waste stream as calculated by the Agency. However, they should provide a basis for a general assessment of the impact of the proposed regulation.

2.4 Summary of Estimated Control Costs for Potentially Affected Industries

Using the BRS database, of the 490 industries (by SIC) potentially affected by the rule, four SIC codes generated more than 500 waste streams per code, 28 SIC codes generated more than 100 waste streams per code, 48 SIC codes generated more than 50 waste streams per code, 84 SIC codes generated more than 25 waste streams per code, and 190 SIC codes generated 10 or more waste streams per code. Major industry sectors that are engaged in site remediation activities include industrial organic chemical manufacturing; petroleum refining; waste management (refuse); plating and polishing; aircraft; and semiconductors to list a few.

Using the methodology described above, the Agency estimates approximately 18 percent of the 490 potentially affected industries identified in the 1997 BRS database might have faced additional control costs associated with HAP and VOC emission reductions if the proposed MACT standards had been implemented in 1997. According to the nationwide emission and control cost estimates memorandum (Zerbonia, 2001), total control costs for this rule are estimated to be $15.4 million. Table 2-1 presents the total compliance costs for each SIC code and the number of potentially affected facilities. The Agency also examined the distribution of costs across firms with the BRS database. In Table 2-2, we report cost data for the top 15 facilities and all the other facilities by predicted remediation cost. The top 15 facilities with the highest costs account for over 60 percent of the total national compliance cost estimate.

Table 2-1. Total Annual Control Costs (TACC) for Site Remediation MACT by Industry: 1997 BRS Data Set

SIC Code	Description	Total Annual Control Costs[a]	Number of Facilities
1311	Crude petroleum and natural gas	$10	1
1711	Plumbing, heating, and air-conditioning special trade contractors	$28,167	1
2079	Shortening and cooking oils	$4	1
2491	Wood preserving	$440,515	6
2542	Partitions and fixtures, except wood	$1,768	1
2679	Converted paper products, n.e.c.	$70,433	1
2782	Blankbooks and looseleaf binders	$71	2
2812	Alkalies and chlorine	$1,214,712	8
2816	Inorganic pigments	$258,360	2
2819	Industrial inorganic chemicals, n.e.c.	$1,189,461	8
2821	Plastics materials and resins	$106,297	15
2822	Synthetic rubber	$29,449	5
2833	Medicinals and botanicals	$841	2
2861	Gum and wood chemicals	$3	1
2865	Cyclic crudes and intermediates	$6,841	3
2869	Industrial organic chemicals, n.e.c.	$2,573,354	47
2879	Agricultural chemicals, n.e.c.	$1,962	5
2892	Explosives	$3	4
2899	Chemical preparations, n.e.c.	$1,370	2
2911	Petroleum refining	$291,409	7
3053	Gaskets, packing and sealing devices	$796	1
3069	Fabricated rubber products, n.e.c.	$269	2
3264	Porcelain electrical supplies	$465	1
3296	Mineral wool	$4	1
3312	Blast furnaces and steel mills	$373	2
3315	Steel wire and related products	$19,593	2
3334	Primary aluminum	$367,262	2
3341	Secondary nonferrous metals	$221,907	3
3351	Copper rolling and drawing	$1,306,227	1

(continued)

Table 2-1. Total Annual Control Costs (TACC) for Site Remediation MACT by Industry: 1997 BRS Data Set (continued)

SIC Code	Description	Total Annual Control Costs[a]	Number of Facilities
3354	Aluminum extruded products	$578,779	6
3357	Nonferrous wire drawing and insulating	$85	2
3364	Nonferrous die-casting, except aluminum	$23,700	1
3441	Fabricated structural metal	$2	1
3443	Fabricated plate work, boiler shops	$5	1
3452	Bolts, nuts, rivets, and washers	$3	1
3471	Plating and polishing	$41,658	6
3482	Small arms ammunition	$476	1
3483	Ammunition, except small arms, n.e.c.	$151	4
3484	Small arms	$58,088	1
3489	Ordnance and accessories, n.e.c.	$6,744	2
3499	Fabricated metal products, n.e.c.	$2,202	1
3511	Turbines and turbine generator sets	$398	1
3546	Power-driven handtools	$58,276	1
3555	Printing trades machinery	$88	1
3561	Pumps and pumping equipment	$325	1
3568	Power transmission equipment, n.e.c.	$1,390	1
3571	Electronic computers	$21,662	2
3577	Computer peripheral equipment, n.e.c.	$51,144	1
3579	Office machines, n.e.c.	$381,942	3
3581	Automatic merchandising machines	$57,741	1
3621	Motors and generators	$1,077	1
3663	Radio and TV communications equipment	$1,779	1
3671	Electron tubes	$13	1
3672	Printed circuit boards	$16,675	2
3674	Semiconductors and related devices	$630,489	5
3678	Electronic connectors	$2	1
3679	Electronic components, n.e.c	$376,631	3
3694	Engine electrical equipment	$37,561	1
3714	Motor vehicle parts and accessories	$14,968	4

(continued)

Table 2-1. Total Annual Control Costs (TACC) for Site Remediation MACT by Industry: 1997 BRS Data Set (continued)

SIC Code	Description	Total Annual Control Costs[a]	Number of Facilities
3721	Aircraft	$201,013	2
3724	Aircraft engines and engine parts	$17,698	4
3728	Aircraft parts and equipment, n.e.c.	$258,903	1
3743	Railroad equipment	$869	1
3764	Space propulsion units and parts	$10,492	1
3795	Tanks and tank components	$79,616	2
3861	Photographic equipment and supplies	$199,087	6
3873	Watches, clocks, and watchcases	$8,168	1
4011	Railroads, line-hauling operations	$165	1
4221	Farm product warehousing and storage facilities	$18	1
4226	Other special warehousing and storage	$9,266	2
4613	Pipeline transportation of refined petroleum products	$45,283	3
4789	Transportation services, n.e.c.	$33,283	1
4813	Other telephone	$2,876	248
4911	Electric services	$4,151	3
4925	Mixed manufactured, or liquefied petroleum gas production and/or distribution	$6,071	1
4953	Refuse systems	$373,908	22
5093	Recyclable materials	$1	1
5169	Chemicals and allied products, n.e.c.	$2,166	5
5171	Petroleum bulk stations and terminals	$81,547	3
5541	Gasoline service stations	$1,204	2
6512	Operators of nonresidential buildings	$133,396	1
7389	Business services, n.e.c.	$4,655	2
8221	Colleges, universities, and professional schools	$22,955	2
8731	Commercial physical and biological research	$8,943	5
8733	Noncommercial research organizations	$4	1
9224	Fire Protection	$108,708	3

(continued)

Table 2-1. Total Annual Control Costs (TACC) for Site Remediation MACT by Industry: 1997 BRS Data Set (continued)

SIC Code	Description	Total Annual Control Costs[a]	Number of Facilities
9511	Air and water resource and solid waste management	$4,888	6
9711	National security	$153,344	5
9999	Nonclassifiable establishments	$1,333,677	27
	Other[b]	201,279	43
	Subtotal	13,803,608	601
	In situ waste treatment	1,587,334	NA
	Total	15,390,942	601

[a] $1997. EPA adjusted the $2000 estimates using a cost factor (0.9753) developed from the Chemical Engineering Composite Plant Cost Index.

[b] Includes facilities without SIC codes and industries with compliance costs <$1.00.

Table 2-2. Total Annual Control Costs (TACC) for On-Site Treatment by Site Name: 1997 BRS Data Set

Site Name	Total Annual Control Costs[a]
National Copper Products Inc.	$1,306,227
Occidental Chemical Corporation	$1,208,420
BP Chemicals Inc.	$1,162,668
EI Dupont-Chambers Works	$955,730
Aluminum Company of America	$919,845
Vulcan Materials Company	$850,659
Motorola	$629,398
Occidental Chemical Corporation	$473,852
BF Goodrich	$462,245
Southern Wood Piedmont	$402,192
Xerox Corporation	$381,942
Lockheed Martin Corporation	$367,404
BDP Company/Division of Carrier Corporation	$281,779
Hamilton Standard Division of UTC	$258,903
Union Oil Company of California	$241,333
Other	$3,901,011
Subtotal	$13,803,608
In situ waste treatment	$1,587,334
Total	$15,390,942

[a] $1997. EPA adjusted the $2000 estimates using a cost factor (0.9753) developed from the Chemical Engineering Composite Plant Cost Index.

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