Chapter

13

NON-WATER QUALITY IMPACTS

Sections 304(b) and 306 of the Clean Water Act provide that non-water quality environmental impacts are among the factors EPA must consider in establishing effluent limitations guidelines and standards. These impacts are the environmental consequences not directly associated with wastewater that may be associated with the regulatory options considered. For this rule, EPA evaluated the potential effect of the selected options on air emissions, solid waste generation, and energy consumption.

This section quantifies the non-water quality impacts associated with the options considered for the final rule. Cost estimates for the impacts, and the methods used to estimate these costs, are discussed in Chapter 11 of this document. In all cases, the costs associated with non-water quality impacts were included in EPA's cost estimates used in the economic evaluation of the promulgated limitations and standards.

AIR POLLUTION *13.1*

CWT facilities receive and produce wastewaters that contain significant concentrations of organic compounds, some of which are listed in Title 3 of the Clean Air Act Amendments (CAAA) of 1990. These wastewaters often pass through a series of collection and treatment units. These units are open to the atmosphere and allow wastewater containing organic compounds to contact ambient air. Atmospheric exposure of the organic-containing wastewater may result in significant water-to-air transfers of volatile organic compounds (VOCs).

The primary sources of VOCs in the CWT industry are the wastes treated in the oils and the organics subcategory. In general, CWT facilities have not installed air or wastewater treatment technologies designed to control the release of VOCs to the atmosphere. Additionally, most CWT facilities do not employ best management practices designed to control VOC emissions (such as covering their treatment tanks). Therefore, as soon as these VOC-containing oil and organic subcategory wastewaters contact ambient air, volatilization will begin to occur.

Thus, volatilization of VOCs and HAPs from wastewater may begin immediately on receipt, as the wastewater enters the CWT facility, or as the wastewater is discharged from the process unit. Emissions can also occur from wastewater collection units such as process drains, manholes, trenches, sumps, junction boxes, and from wastewater treatment units such as screens, settling basins, equalization basins, biological aeration basins, dissolved air flotation systems, chemical precipitation systems, air or steam strippers lacking air emission control devices, and any other units where the wastewater is in contact with the air. In some cases, volatilization will begin at the facility and continue as the wastewaters are discharged to the local river or POTW.

As discussed in 1999 proposal, EPA considered including air stripping in the technology basis for the final limitations and standards, but rejected it because it would not have resulted in significantly different limitations. Because this rule would not allow any less stringent control of VOCs than is currently in place at most CWT facilities, EPA does not

project any net increase in air emissions from volatilization of organic pollutants due to the Agency's final action. As such, no adverse air impacts are expected to occur as a result of these regulations.

Table 13-1 provides information on incremental VOC emissions resulting from implementation of the proposed rule at CWT oils and organics facilities. EPA has not provided information for the metals subcategory, but concluded these emissions would be negligible. For this analysis, EPA defined a volatile pollutant as described in Chapter 7 and calculated volatile pollutant baseline and post-compliance loadings and reductions as described in Chapter 12. EPA additionally assumed that 80% of the volatile pollutant reduction would be due to volatilization. EPA selected 80% based on an assessment of information developed during the development of OCPSF guidelines (see pages 275-285 of the October 1987 "Development Document for Effluent Limitations Guidelines and Standards for the OCPSF Point Source Category (EPA 440/1-87/009)). In EPA's view, the information presented in Table 13-1 represents a "worst-case" scenario in terms of incremental volatile air emissions, since the analysis assumes no volatilization of pollutants at baseline. As explained earlier, EPA found that the majority of these pollutants are already being volatilized in the absence of additional treatment technologies.

Table 13-1 also shows that, for this worst-case scenario, the sum of the annual VOC air emissions at CWT facilities would not exceed 400 tons of HAPs. Under the Clean Air Act, major sources of pollution by HAPs are defined as having either: (1) a total emission of 25 tons/year or higher for the total HAPs from all emission points at a facility; or (2) an emission of 10 tons/year or higher from all emission points at a facility. Based on these criteria, incremental air emissions from this worst-case scenario analysis of the final BPT/BAT/PSES organics subcategory options would cause three facilities to be classified as major sources. For the oils and metals subcategories, EPA does not project any major sources due to incremental removals. Since EPA concluded that the three organics subcategory CWT facilities classified as major sources would be classified as such in the absence of the implementation of the final rule, EPA has determined that air emission impacts from the selected options are acceptable.

Although this rule is not based on technology that uses air stripping with emissions control to abate the release of volatile pollutants, EPA encourages all facilities which accept waste containing volatile pollutants to incorporate air stripping with overhead recovery or destruction into their wastewater treatment systems. Additionally, EPA also notes that CWT sources of hazardous air pollutants are subject to maximum achievable control technology (MACT) as promulgated for off-site waste and recovery operations on July 1, 1996 (61 FR 34140) as 40 CFR Part 63.

Finally, EPA notes that the increased energy requirements discussed in Section 13.3 may result in increased emissions of combustion byproducts associated with energy production. Given the relatively small projected increases in energy use, however, EPA does not anticipate that this effect would be significant.

Table 13-1. Projected Air Emissions at CWT Facilities

Subcategory	VOCs Emitted (tons/yr)	Priority VOCs Emitted (tons/yr)	Number of Projected MACT* Facilities	Major Constituents
Oils	69	32	0	Toluene
Organics	329	323	3	Methylene Chloride and Toluene

* MACT requires 25 tons of volatile emissions for a facility to be a major source or 10 tons of a single pollutant at a single facility.

SOLID WASTE *13.2*

Solid waste will be generated due to a number of the treatment technologies selected as the basis for this rule. These wastes include sludge from biological treatment systems, chemical precipitation and clarification systems, and gravity separation and dissolved air flotation systems. EPA estimated costs for off-site disposal in Subtitle C and D landfills of the solid wastes generated due to the implementation of the technologies selected as the basis of the final CWT limitations and standards. These costs were included in the economic evaluation of the selected technologies.

To estimate the incremental sludge generated from the selected options, EPA subtracted the volume of sludge currently being generated by the CWT facilities from the estimated volume of sludge that would be generated after implementation of the options. EPA calculated the volume of sludge currently being generated by CWT facilities for all sludge-generating technologies currently being operated at CWT facilities. EPA then calculated the volume of sludge that would be generated by CWT facilities after implementation of the final rule. Table 13-2 presents the estimated increase in volumes of filter cake generated by CWT facilities that would result from implementation of the promulgated limitations and standards.

The precipitation and subsequent separation processes selected as the technology basis for the metals subcategory will produce a metal-rich filter cake. In most instances, the resulting filter cake will require disposal in Subtitle C and D landfills. EPA estimates that the annual increase in filter cake generated by the metals subcategory facilities will be 3.7 million gallons. In evaluating the economic impact of sludge disposal, EPA assumed that all of the sludge generated would be disposed in a landfill. This assumption does not take into consideration the fact that an undetermined portion of the generated filter cake may be recovered in secondary metals manufacturing processes rather than being disposed in a landfill.

The dissolved air flotation system and additional gravity separation step selected as the technology basis for the oils subcategory will produce a metal-rich filter press cake that requires disposal. This filter cake may be either disposed in Subtitle C and D landfills or in some cases through incineration. EPA estimates that the annual increase in filter cake generated by the oils subcategory facilities will be 22.7 million gallons. These estimates are based on implementation of option 8 technology for indirect dischargers (PSES) and option 9 for direct dischargers (BPT/BAT). EPA applied a scale-up factor to include the estimated volume of filter cake generated by the NOA non-respondents. In evaluating the economic impact of sludge disposal, EPA assumed that all of the sludge generated would be disposed in a landfill.

Finally, the biological treatment selected as the technology basis for the organics subcategory will produce a filter cake that consists primarily

of biosolids and requires disposal. This filter cake can be disposed by a variety of means including disposal at Subtitle C and Subtitle D landfills, incineration, composting, and land application. However, contaminants contained in the sludges may limit the use of composting and land application. EPA estimates that the annual increase in filter cake generated by the organics subcategory facilities will be 4.3 million gallons. In evaluating the economic impact of sludge disposal, EPA assumed that all of the sludge generated would be disposed in a landfill.

Table 13-3 presents the percentage of the national volume of hazardous and non-hazardous waste sent to landfills represented by the increase for each regulatory option. The information presented in this table represents the tonnage of waste accepted by landfills in 1992 and was based on information collected during the development of the proposed Landfills Point Source Category (see pages 3-32 of the January 1998 "Development Document for Proposed Effluent Limitations Guidelines and Standards for the Landfills Point Source Category" (EPA-821-R-97-022)). EPA has concluded that the disposal of these filter cakes and/or sludges will not have an adverse effect on the environment or result in the release of pollutants in the filter cake to other media. EPA made this conclusion for two reasons. First, EPA estimates that the additional solid wastes disposed in landfills as a result of this regulation will be less than 0.19% of the annual tonnage of waste currently disposed in landfills. Second, the disposal of these wastes into controlled Subtitle C and D landfills is strictly regulated by the RCRA program.

Table 13-2. Projected Incremental Filter Cake Generation at CWT Facilities

CWT Subcategory	Option	Filter Cake Generated (million gal/yr)					
		Hazardous			Non-Hazardous		
		Indirect	Direct	Total	Indirect	Direct	Total
Metals	4	0.80	1.68	2.48	0.40	0.83	1.23
Oils	8	10.04	-	10.04	12.28	-	12.28
	9	-	0	0	-	0.36	0.36
Organics	4	2.89	0	2.89	1.42	0	1.42
Total	-	13.73	1.68	15.41	14.1	1.19	15.29

Table 13-3. National Volume of Hazardous and Non-hazardous Waste Sent to Landfills

CWT Subcategory	Option	Percentage of Annual Tonnage of Waste Disposed in National Landfills	
		Hazardous	Non-hazardous
Metals	4	0.032	0.004
Oils	8	0.093	0.028
	9	0	0.001
Organics	4	0.024	0.003
Total		0.149	0.036

ENERGY REQUIREMENTS *13.3*

EPA estimates that the attainment of BPT, BCT, BAT, and PSES will increase energy consumption by a small increment over present industry use. With the exception of the oils subcategory, the projected increase in energy consumption is primarily due to the incorporation of components such as power pumps, mixers, blowers, and controls. For the metals subcategory, EPA projects an increased energy usage of 3.5 million kilowatt hours per year and, for the organics subcategory, an increased energy usage of 0.5 million-kilowatt hours per year. For the oils subcategory, however, the main energy requirement in today's rule is for the operation of dissolved air flotation units. Dissolved air flotation units require air sparging to help separate the waste stream. For the oils subcategory, EPA projects an increased energy usage of 3.4 million kilowatt hours per year. Overall, an increase of 7.5 million kilowatt-hours per year would be required for today's regulation which equates to 4210 barrels of oil per day. In 1996, the United States consumed 18.3 million barrels of oil per day.

LABOR REQUIREMENTS *13.4*

The installation of new wastewater treatment equipment along with improvements in the operation of existing equipment for compliance with the proposed limitations and standards would result in increased operating labor requirements for CWT facilities. It is estimated that compliance with the CWT regulations would result in industry-wide employment gains. Table 13-5 presents the estimated increase in labor requirements for the CWT industry.

Table 13-4. Projected Energy Requirements for CWT Facilities

CWT Subcategory	Option	Energy Usage (kwh/yr)		
		Indirect Dischargers	Direct Dischargers	Total
Metals	4	1,805,369	1,551,195	3,356,564
Cyanide Waste Pretreatment	2	129,000	18,046	147,046
Oils	8	3,336,584	-	3,336,584
	9	-	137,061	137,061
Organics	4	505,175	24,069	529,244
Total	-	5,776,128	1,730,371	7,506,499

Table 13-5. Projected Labor Requirements for CWT Facilities

CWT Subcategory	Option	Operating Labor Requirements					
		Indirect Dischargers		Direct Dischargers		Total	
		(Hours/yr)	(Men/yr)	(Hours/yr)	(Men/yr)	(Hours/yr)	(Men/yr)
Metals	4	85,448	42.7	27,105	13.6	112,553	56.3
Cyanide Waste Pretreatment	2	16,425	8.2	2,190	1.1	18,615	9.3
Oils	8	57,825	25.9	-	-	57,825	25.9
	9	-	-	2,496	1.2	2,496	1.2
Organics	4	29,042	14.5	936	0.5	29,978	15
Total	-	188,740	91.3	32,727	16.4	221,467	107.7