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**SUMMARY OF PUBLIC COMMENTS**

**ON**

**THE PROPOSED RESEARCH PERMIT FOR INCINERATION AT SEA**

**to**

**U.S. ENVIRONMENTAL PROTECTION AGENCY**

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**by**

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## **I. GENERAL COMMENTS ON OCEAN INCINERATION**

### **1. General perceptions**

The first issue, to the public, is that the environment must be strenuously cared for: past harms should be redeemed and future harms avoided. Public reaction to ocean incineration -- for and against -- overwhelmingly hinged upon whether the commenters perceived greater environmental protection in choosing ocean incineration as a treatment or in rejecting it (216)(331). All agreed that hazardous waste must be handled safely; what commenters disagreed on was whether incineration at sea was a safe alternative.

The range of reasons given in opposition was considerably wider than the range of reasons given in support. In fact, a good part of the opposition to incineration is grounded in concomitant issues such as added risks in transportation (206), the status of other technologies (35), siting (214); possible drinking water contamination (293); or economic disturbance (1280)(1325).

### **2. Alternatives to ocean incineration**

Numerous commenters asked EPA to look for an alternative to incineration (318)(414). They frequently asked that treatment be done on land where it could be better controlled and better watched (3)(6).

Many commenters are disturbed that pursuing this research on ocean incineration will discourage the Agency from investigating other ways to handle hazardous and toxic wastes (927)(1244)(1070). Several suggested that more research should be done on the plasma arc (224), bacterial digestion of PCB's (260); burning in cement kilns (46); and on solidification (1296)(1612).

One commenter summed up the generic opposition to ocean as " a gut feeling that it is wrong. Wrong because it does not fundamentally alter our approach to the toxics dilemma. Wrong because it prejudices EPA's commitment to act in the best interests of our environment." (1274)

Hundreds of commenters, however, pointed to the Nation's inventory of wastes and said that we could not afford to leave this avenue unexamined (1177)(1200)(152)(310)(339)(405).

Many commenters believe the time for wise decision is not yet, that the Agency must first deliver a comprehensive waste reduction, recycling, reuse, and management plan (473).

### **3. General perceptions on environmental effects**

The very existence of PCB's is a threat to the environment according to both supporters and those who oppose ocean incineration (7). Many commenters see not generating wastes in the first place as the logical starting point in hazardous waste management (240). Others observe that this is quite impossible, as one put it "we all drove to this hearing in cars with rubber tires, urethane seats, vinyl..." (906). Some commenters pointed out that even if we could stop producing hazardous wastes, we must still do something about the wastes already in existence (313)(38). Those who favor ocean incineration often see this technology as a means to stop environmental harm by destroying hazardous chemicals, something that cannot be achieved by storage, landfilling, or continually waiting for a new treatment idea (66). Those who oppose ocean incineration give a number of ways that this technology could harm the environment: pollution of the relatively clean ocean (146)(147); further stress to an already polluted ocean (249); air pollution from emissions (263); terrestrial pollution from spills, leaks, and discharges while loading, unloading, transporting, or storing the chemicals (136)(582). In addition, opponents predict widespread economic harm to fishery, tourism, real estate, and property values from actual release and through public perception that the coastal areas have become tainted (278)(64).

### **4. Possible changes in public opinion**

Many commenters indicated that they could change their minds about ocean incineration. Those who supported investigating the technology said they might change their minds if several things happened : failure to adhere to good scientific practice and advice including SAB recommendations (327)(473); insistence upon such a long route of transport (327)(117); and failure to prepare a comprehensive waste management plan (18)(340).

Those who opposed ocean incineration at present could come to support it, they said, if small-scale, laboratory or land based research verified its feasibility (999)(428)(899) or the permittee was not CWM (see all of chapter III).

### **5. Public trust**

Public opinion of EPA and of the proposed permittee played a major role in how many commenters perceive this proposed technology. Public distrust of CWM is strident and it is shared by those who support and oppose ocean incineration alike; chapter three discusses this issue at length.

Many comments also indicate that EPA is sometimes mistrusted and must overcome suspicions that the Agency is not an advocate for the environment (325)(911)(554).

## **II. NEED FOR RESEARCH PERMIT**

### **1. General perceptions**

Many commenters did not address the statutory or legal basis of need. Rather, they looked at ocean incineration against the background of the national problem, the existence of PCB's, and the means for handling them, to judge whether EPA should test incineration at sea. Some commenters considered the national waste disposal problem so great that EPA should explore all alternatives, including ocean incineration (240). In concurring, one commenter saw ocean incineration as an option for treating wastes removed from old waste sites (1247).

Several commenters who thought ocean incineration was unnecessary advised EPA to solve the problem at its source by emphasizing waste reduction (1324). One commenter suggested that EPA has not evaluated the national potential for hazardous waste reduction and therefore cannot guess what the need is for ocean incineration (277). Others pointed out that although waste can be reduced and recycled there will always be some wastes remaining to be disposed of by specialized disposal techniques (329)(338). That other technologies exist does not rule out the need for offshore incineration, according to one commenter; both have plusses and minuses and both are needed (338).

One commenter believed that EPA was using ocean incineration as a substitute for a comprehensive plan (277).

### **2. Benefits of the research**

Several commenters thought that a test burn was the logical next step in evaluating whether ocean incineration was a good alternative. Such a test burn, these commenters indicated, could provide missing information (35)(218)(288)(339)(432). One commenter thought that money spent on research such as the proposed test would produce more long-term benefits than money spent on cleaning up land disposal sites. Another commenter who strongly supported ocean incineration thought the test burn should be done "to quiet the detractors." (15)

Some commenters questioned the value of this particular research permit; some charged it was being used to allay fears rather than gain information and would not resolve many of the questions a research project should answer (272)(899).

### **3. Economic need**

One commenter noted that chemical producers in the States near the loading site were also major employers in the area.

This commenter felt such companies needed the support of an ocean incineration program because the closest land-based incinerator facility was 1,100 miles away, costing firms an average \$3850 in waste shipping charges, as opposed to \$350 if they could ship to the port of Philadelphia (219). Another commenter agreed, saying businesses liked the idea because it was "a cheap way out" (249).

#### **4. Ocean incineration's capacity for handling wastes**

Several commenters questioned whether ocean incineration offered a significant option for the kinds and quantities of wastes produced in the United States. They pointed out that the Nation urgently needs more treatment of solid wastes and sludges, a problem that cannot be solved by ocean incineration because solids and sludges are unsuitable for burning at sea (249). One commenter estimated the ocean incineration technology could be used on no more than 8 percent of the Nation's wastes or 6 percent of Pennsylvania's wastes (473). This commenter thought it "immoral that EPA would claim ocean incineration could offer an answer to Superfund site cleanups because the bulk of Superfund wastes are solids and sludges." Another commenter observed that ocean incineration does not offer a significant solution; it could treat only the .05 to 5 percent of the Nation's wastes that are pumpable, liquid, burnable, and have high BTU ratings (1324).

Another commenter pointed out that the stockpile of PCB's was actually dwindling (since their manufacture is banned) and the wastes most likely to require treatment in the future were municipal sludges and a wide variety of wastes from small generators -- neither of which this commenter surmised could be burned at sea (1261).

Some commenters believe that, regardless of how much waste it could handle, ocean incineration is superfluous (277)(1261). One commenter cited an OPPE study as reporting that only 63 percent of land-based incineration capacity is currently being used (296). Two commenters had surveyed two large waste management firms to ascertain available land-based incineration capacity (1261)(1324). They found one company had one approved facility with excess capacity now, and two similar facilities with more sophisticated emissions control systems that are awaiting approval (1261). The second company responded that it was not running at capacity now and the demand was declining (1261).

According to one commenter, after studying ocean incineration the New Jersey Facility Siting Commission decided the technology was not worth pursuing (558).

## **5. Need for ocean incineration compared to other options**

One commenter suggested that EPA use sections 227.15(a) and (b) of the Ocean Dumping Regulations to identify factors that must be considered in determining need. The needs that this commenter believed EPA has not met include an evaluation of the process that generated the waste in the first place; an evaluation of less polluting materials and processes that could be used; and an evaluation of environmental impacts compared to other land-based alternatives (1324). The same commenter suggested consideration of the chemical dechlorination technology developed by SOHIO as an alternative worth further consideration because it emitted no PCB's into the air or water.

The fact that Europe has used ocean incineration for nearly 20 years was not taken as proof of its value by some commenters.

They said that Europe was phasing out its ocean incineration program (249)(312)(339)(326). Another commenter, however, said that Great Britain had decided to try ocean incineration 7 years ago and was still using it successfully (231). According to this commenter the operation managed by Tinenware County has been so safe (no accidents to date) and so successful that other local government organizations have come to back the practice of ocean incineration. Moreover, Tinenware accepts wastes from all over the United Kingdom. The commenter noted that ocean incineration was among many waste management options evaluated by the county and had proved suitable in a country that is extremely small geographically, densely populated, and supports a wide variety of industries (231).

One commenter stated that the MPRSA requires considering storage until an appropriate technology becomes available, and that option should be counted when assessing the need versus existing capability (1324).

## **6. Practicable alternatives**

Both the London Dumping Convention and the MPRSA discuss alternatives in terms of whether they are "practicable." One commenter gave the definition from MPRSA as "available at reasonable incremental cost and energy expenditures, which need not be competitive with ocean incineration costs taking into account relative environmental effects" (1324). Another commented that EPA had acknowledged its responsibility to the LDC in the Agency's rule on ocean incineration by using the words "every effort should be made to determine the practical availability of alternative land-based treatments, disposal, elimination, or of treatment to render waste less harmful for dumping at sea ...." (1261). This commenter believed that EPA made a great error in allowing a finding that ocean incineration was not more harmful to the environment than land-based alternatives to stand alone as a demonstration of need. The commenter stated that the LDC clearly requires the additional

determination that adequate practicable alternatives do not exist (1261).

Another commenter took up the point of practicability indirectly by chastising people who always seem to be waiting for a better answer while overlooking the current best available technology -- in this case, ocean incineration (338).

### **III. THE APPLICANT**

#### **1. General perceptions**

Chemical Waste Management is well known to the public: commenters frequently referenced news stories and articles in special publications that deal with environmental issues (139)(1620). One commenter claimed that "their history of the pursuit of profit, in brutal disregard of the health of others, has been well documented" (1245). Another commenter, however, discounted this negative publicity by observing that legitimate waste handlers like CWM receive undue and distorted coverage while the real culprits -- the midnight dumpers and illegal profiteers -- go unnoticed (237).

Numerous commenters found CWM's history of fines for violations objectionable; one pointed out that only "increases our fear" of ocean incineration (258). Another offered that CWM's presence "makes an already flawed proposal a threatening one" (1255). Some commenters pointed to the company's history of mismanagement as a serious flaw (249)(265). One equated hiring CWM to hiring a surgeon who had spent millions in malpractice suits (278). A few commenters saw the history of fines as a payoff (303) or evidence of collusion with the Agency (265)(337)(555). Even some supporters of the research object to this company as the permittee (38).

#### **2. History of fines and violations**

Hundreds of commenters brought up CWM's fines over the previous 18 months (10)(16)(159)(247)(303)(316)(473)(561)(1244)(1340). Many believed that CWM's history of violations constituted a "horrible record," that "they are not the ones we want 100 miles offshore 'burning' toxic waste" (986). Many commenters were quite specific about the violations they had heard of (8)(70)(256)(283)(293)(299)(308)(355)(1244)(1340). Some commenters noted that CWM is facing enforcement orders or has been fined or indicted in California, Oregon, Alabama, Colorado, Illinois, and Ohio (1244)(1340). Another commenter indicated that EPA's own national enforcement investigation center has accused CWM of poor management, poor lab practices, lack of concern for safety procedures, incomplete records, discrepancies, and incomplete accounts to investigators (296).

Many commenters concluded that CWM's motives are suspect, that the company is pursuing the test burn because they are sitting on wastes that they want to get rid of easily and cheaply to avoid liability (343)(337): "It's a matter of waste making haste" (337).



Some commenters pointed to Chem Wastes 17-year record of burning wastes at sea without incident in Europe as evidence of the company's reliability (284). Another commenter claimed that the record was not so good and listed several alleged incidents in the company's European operation (227). This commenter asked "if these were not accidents, what were they? Were they deliberate?" (227)

Public mistrust runs deep (227)(244)(49)(304). One commenter responded to an alleged EPA claim that CWM had no violations in the Region by observing that was unimpressive given that "they don't have any facilities in it anyway" (226). Another suggested that perhaps a more reliable company would make this permit application credible to the public (590).

#### **4. Perceptions of EPA's validation of applicant**

Many commenters saw EPA in a negative light by virtue of the Agency's dealings with CWM in the past, especially if the Agency continued a relationship with CWM (308)(309)(491). In addition to the concerns about payoffs and collusion already discussed, some commenters wanted to know why this company was selected (6)(518). Why was this company only fined instead of being shut down, asked one commenter (244).

One commenter called CWM's explanation that the company had paid fines just to bring sites into compliance and put much of the money into trust funds a "whitewash," and charged that "our regulatory agencies afford too many courtesies and considerations to industry until environmental catastrophe happens...It is bitter folly to rely on agencies" (224). Another commenter declared that "if this permission is granted, you have betrayed our trust in you for improper (sic) management of our habitat" (304). After citing several violations for which CWM was assessed "inadequate fines," a speaker asked the hearing officer directly, "Is it indifference to human values or is it simple incompetence that leads to this record of performance?" (308)

One commenter objected to transport by a firm with "such a bad record," monitored by EPA with what the commenter termed "questionable capabilities" (440).

A commenter who said that CWM has demonstrated that it will break rules and therefore, it should not operate out of sight, believed EPA has used CWM's actions in the past to make it appear the Agency was making progress (224). Another speaker believed this test burn was a chance given CWM to bail out following previous failures (265).

"Public trust and confidence is universally recognized as the principal obstacle to public acceptance of siting hazardous waste facilities...we fail to see how the applicant's record engenders public trust and confidence, nor does EPA's

insensitivity reflect well on EPA's understanding of hazardous waste siting" (287).

## **5. Integrity of applicant**

While many commenters were simply shocked that EPA would consider such an applicant as CWM, a few specifically tackled the issue of the permit review process itself and decided environmental compliance is an appropriate consideration in determining the acceptability of the permit applicant (298)(226)(304)(256)(283)(433).

One commenter believed that, whether it is equitable or not, applicants who have been convicted of or are being prosecuted for environmental violations should be denied permits (1261). Integrity should be considered a criterion for receiving a permit, said another (1626).

Several commenters felt that proof of the company's competence was a valid issue in the permitting process and believed that CWM's record did not make it a good candidate for scientific research (433)(518).

One commenter disagreed with EPA's grounds for not reviewing applicant's history in the permitting process, saying that EPA does have the authority to review integrity under the Ocean Dumping Regulations, which explicitly allow a consideration of the applicant's ability to manage a disposal site (296). A commenter who thought EPA might be correct in deciding the law didn't consider an applicant's history a proper criterion, still registered concern that residents near the waste loading site would be affected by a repeat violator (322).

## **6. Applicant's technical capability.**

Aside from matters of social responsibility, several commenters doubted CWM's ability to follow good scientific practices or handle advanced technology (1620)(289)(269). One of the more vehement remarks was that the company basically understood landfills and nothing more, that it was a tough business competitor in a rough market and emphatically not a high tech company (278). Another commenter disagreed, pointing out that CWM practices many hazardous waste disposal technologies including land-based incineration and biological treatment, and is starting a plasma arc (330).

"Chem Waste has proven itself to be an inappropriate candidate to conduct ocean incineration by its failures during previous burns and its lack of skills at the much simpler tasks of waste disposal on land....Chem Waste is categorically not the company to do the research" (283).

Remarking that research depends upon exacting levels of good recordkeeping, one commenter recommended against choosing CWM because the company seemed to be plagued with recordkeeping problems (38). On the contrary, another commenter thought that CWM might do well with the work under the research permit because it would be carefully watched and controlled at all points, but should not be permitted to operate any less well-supervised program such as a commercial operation (318).

#### IV. FINANCIAL RESPONSIBILITY AND LIABILITY ISSUES

##### 1. General comments on the appropriate liability limits

The public tended to think in terms of covering the worst case. Many commenters think the liability limits should be set to cover catastrophic events: a train derailment affecting several cars, a shipwreck with loss of entire cargo, a major spill, or a dump when the life and safety of the crew are at stake (340)(1246)(429).

Many commenters thought that \$60 million was not an adequate demonstration of financial responsibility to cover probable losses if a spill did occur (469)(886)(897). One commenter warned against any plans to reduce the financial responsibility at EPA's discretion as authorized under section 234.10 of the proposed Ocean Incineration Regulation (126). This commenter thought that amount set should be approved by a responsible third party (126). One commenter thought that the permit manager should definitely be involved in setting the amount (469). Another commenter thought that EPA might be considering changing the amount to only \$5 million as required for vessels regulated by CERCLA and objected strongly (911). Several commenters suggested that legislation should be developed to forestall inadequate insurance or difficulties in making claims for damages (1605)(500)(351)(352)(502)(297).

Slight support existed for requiring much lower limits on financial responsibility (472)(1268). One commenter observed that \$60 million is punitively high compared to the requirements for land-based incineration and imposed an arbitrary disincentive to using ocean incineration (1268). This commenter claimed the figure for cleanup costs -- \$10 million -- was inappropriately derived from a worst-case scenario for a clean up in Mobile Bay. Another commenter, however, said the cleanup cost could vary widely: since the waste is only slightly heavier than water but hydrophobic it is uncertain whether a spill would sink or float -- if it sunk the costs would be extremely high, particularly if restoration costs and third party damages are considered in addition to clean up (1255). Some commenters noted that in 1983 special permits, CWM evidently was able to obtain \$350 million in liability insurance coverage (1255)(886).

One of the commenters arguing for lower financial responsibility limits also complained that EPA's high limits did not account for the extreme safety precautions taken in this ocean incineration project (1268). Stating that the risks to human health and safety were 30 to 50 times greater for land incineration than for ocean incineration, this commenter wondered what justified EPA's decision to set financial responsibility 5 times as high as for land incineration.

As for the amount required to cover resource damages, the same commenter asserted that simply imposing the maximum allowable under section 106 (c) of CERCLA was not a responsible approach on EPA's part (1268). The commenter cited Puerto Rico v. Colocotroni in which the court held that the appropriate measure for determining resource damage was the cost of restoring the environment to prespill conditions or the cost of acquiring offsetting resources if restoration were disproportionately expensive. In the case cited, the court rejected claims for the cost of replacing marine organism that would eventually replace themselves.

Finally, one commenter suggested that EPA should have CWM waive its rights to the liability limits imposed by applicable regulations so that higher amounts could be agreed upon (1626).

A few commenters believed that the coverage for Unitank was also too low and suggested it be raised (201).

## **2. What should be covered?**

A consensus developed for covering at least the full amount of emergency cleanup, containment, and recovery (886)(1246)(1262)(3)(340). In addition, commenters also thought other damages should be covered: compensation to the seafood industry for any losses (470); related damages to wetlands, underwater lands, beaches, and other State resources (340); medical bills for citizens exposed to the chemicals (224); an additional \$50 million for environmental cleanup (1264); any damage caused (3)(1261); losses to private citizens (351).

A few commenters realized that claims by third parties and private citizens were not directly addressed and would like this area more clearly stipulated (129). One commenter stated that if only a \$50 million bond were to be required and that was not an actual cash deposit "it would require extraordinary legal effort to get that money." (333) Others said that private citizens, who were not afforded protection from spill losses, would find it extremely difficult to recover; many legal hurdles would have to be overcome (351)(1255). How insurance could be collected from a vessel under a foreign flag, worried another commenter (129).

One commenter noted that setting financial responsibility limits lower than potential claims seriously undermines the principal of "polluter pays" (1255). The costs of a spill might go uncompensated or be paid for by the government once the limits are reached, unfairly subsidizing the polluter (1255).

## **4. Mechanism used to assure financial responsibility**

Most commenters used the term "insurance" to discuss

financial liability, and that mechanism seems to be well regarded; few commenters suggested any other mechanism. One commenter who thought a bond was to be used, wanted to be sure it was backed by cash (333). Another asked that a corporate guarantee with or without insurance be used (1268). An opposing point of view expressed concern that self insurance would not provide the necessary degree of security required by the public for its own safety (1255).

One commenter, recognizing the probable difficulty of obtaining insurance to cover such large amounts, suggested the Federal Government should act as an insurer. The commenter pointed out that since the government does this already for natural disasters such as floods over which we have no control, it should be able to insure an ocean incineration program over which we do have a lot of control (331). Another, claimed that the government was already involved by default -- that when a claim occurred of such magnitude that the company at fault could not cover all costs, the burden then fell on State, local, and Federal governments to recompense damage (1246). One commenter said the insurance industry would not write liability for hazardous waste transport in amounts covering full indemnity (328). If the insurance cannot be obtained in amounts that would cover the real costs of a spill, said one commenter, then we should accept the fact that ocean incineration is not a viable alternative (1261).

One commenter thought insurance could only be obtained in less than \$60 million amounts and not obtainable at all with the provisions that EPA had specified (1268). Another commenter said that extremely high amounts of insurance would have to be provided by the Federal government, with the note that part of the government's responsibility was to avoid permitting unproven technologies that risked such costly environmental damage (328).

A commenter took exception to CWM's assertion that the insurance requirement should be lowered since even \$60 million was difficult to obtain. That problem, said this commenter, should have been resolved beforehand (425).

One commenter suggested an alternative to regular insurance in the form of a corporate guarantee because liability insurance for hazardous waste handling is extremely difficult to obtain and the premiums are so prohibitively high (1268)(472). This guarantee would hinge on Waste Management's financial strength, which would be verified through Waste Management's quarterly reports to the securities and Exchange Commission. If Waste Management's assets were to drop by 50 percent, the company would notify EPA immediately and cease operation until another mechanism for assuring its financial responsibility could be found (472). This commenter pointed out that section 108 (a)(1) of CERCLA expressly authorizes the use of guarantees, surety bonds, and qualification as a self-insurer, and insurance, in any combination to assure financial responsibility. If EPA

insists that part of CWM's obligation be met through insurance, the commenter suggested that the amount of insurance should be limited to \$2 million. The legal basis for this corporate guarantee can be found in U.S. v. Westinghouse , and the commenter paraphrased the wording in this case as a suggested way to draw up a mutually agreeable financial test. The commenter suggested that some insurance would be available through a P&I association (1268).

Another commenter called this proposal "a sham," saying the underwriter had added several unacceptable conditions and exclusions. These included a provision that no claims would be covered while acting as an ocean incinerator; that spills were only covered while in "the designated area"; and that it excluded coverage for noncombustibles. The last provision means that no claims would be covered for the PCB's themselves, the heavy metals in the waste, or for products of incomplete combustion found in the emissions. Further, the policy ends February 20, 1986 (1246).

One commenter submitted a detailed analysis of several possible mechanisms and including an assessment of their availability (1268). The commenter recommended a new financial test to assess a company's ability to pay that could be used under both the self insurance and guarantee mechanisms. This test is based on the "Beaver Index" which the commenter called one of the most accurate predictors of bankruptcy or corporate viability since it measures cash flow -- the ability to generate income to pay bills and remain in business (1268). The formula suggested is:

$$\frac{CF - (FR) * (1-t)}{TL} = \geq 0.1$$

where CF = cash flow from operations (net income + depreciation + depletion + amortization + deferred taxes)

FR = financial responsibility  
t = margin for taxes  
TL = total liabilities

The commenter points out that this formula allows more companies to pass the financial responsibility test but assures that several safety features from the two original options remain intact -- namely a current ratio greater than 1 (assets divided by liabilities), investment grade rating for most recent bonds, tangible net worth of \$10 million or greater, and U.S. assets at least 6 times liability coverage or 90 percent of total assets.

In brief, this commenter's review of all mechanisms follows:

(1) Insurance: An EPA-drafted endorsement would be unacceptable to insurers because it violates several long-honored

insurance practices:

- o requiring the insurer to pay on behalf of the insured even if unallowable claims would be reimbursed by the insured is not acceptable -- the insurance industry operates on the principal of indemnification.

- o the requirement to pay all sums assessed regardless of circumstances is clearly unsound -- no insurance company would pay in the face of overdue premiums, bankruptcy of the insured, or misrepresentations made in obtaining the policy.

- o the coverage could extend beyond areas P&I associations normally handle such as barge operation or interim storage

- o the requirement for service of suit and determination of liability under U.S. law restricts the potential insurers to only one P&I association. P&I associations normally follow British law. P&I associations are the usual means for insuring sea transport and are acceptable to the Coast Guard under section 311 (p) of the Clean Water Act.

(2) Self insurance: The commenter believes ability to pay is a better measure than the 6 times multiple requirement in Options 1 and 2 of RCRA 264.147 (f). The formula is given above.

(3) Guarantees and corporate guarantees: Arguments are the same as those for self insurance with one addition. The commenter believes that EPA should also permit guarantees by third parties.

(4) Surety bonds: These are not viable since they are generally unavailable and prohibitively costly. If a surety bond could be had for this research it would cost \$300,000 to \$600,000 a year. This is a purely administrative cost that does not involve any transfer of risk and is therefore quite unattractive. Moreover, issuers limit the term of coverage so that claims arising more than a year from date of issue would not be effectively covered.

(5) Letter of credit: This would be a last resort. It is a costly option (about \$600,000 for a \$60 million demonstration of financial responsibility). If RCRA language were amended to incorporate indemnification some banks might issue such a letter, otherwise they would not.

## **5. Statutory basis**

See Chapter VI (Legal Issues) for the discussion of the statutory basis for setting the amount of financial responsibility the applicant must demonstrate.



## **V. WASTES AND AMOUNTS TO BE INCINERATED**

### **1. Toxicity and other hazards**

Many commenters objected to burning PCB waste on the grounds that the ocean environment, air, and people along the way should not be subjected to a known toxic and carcinogen (454). Disagreement exists, however, over whether PCB's are more dangerous to burn or to store on land. One commenter believed that PCB's were ideal for the research burn because their carcinogenic threat came about through long exposure: if left in the environment they are extremely harmful, but they are not an acute toxic if inhaled (323). In support, another commenter noted that PCB's are not among the 31 potentially severe inhalation hazards recently listed by the Department of Transportation for special transportation provisions (330).

Others suggested that less toxic chemicals should be used for the test (501)(316). Estimates of harmful amounts differed, with one commenter stating that PCB's in concentrations of 10 ppm could cause cancer, birth defects, melanomas, and chloracne (243). Another commenter said they were toxic in parts per quadrillion (316).

One commenter said that no chemicals that are hazardous because of corrosivity should be used in this burn because the ship's tanks are made of low-carbon steel (1275).

### **2. Bioaccumulation and bioconcentration**

Whether or not PCB's are slow-acting toxicants or acutely dangerous, several commenters pointed out a related issue that would have long-term effects: the tendency of PCB's to bioaccumulate and to bioconcentrate. One commenter pointed out that a leak into the Delaware could migrate into the Chesapeake Bay via canal, subjecting fisheries and wetlands in both coastal areas to these long-term effects (38).

Several potential effects on marine animals and ultimately man worried commenters. One pointed out that even low concentrations of PCB's in the water could cause considerable harm to fish and the other aquatic organisms that take up a high share of the PCB's (319). Another commenter put the lifetime risk of cancer from eating contaminated fish at 100 times the risk from drinking contaminated water (351). Other commenters stated that contaminated fish are a significant source of breast milk contamination in humans and some birth defects (129)(227). One of these commenters quoted a Senate committee statement that "Second generations are believed to be at a higher risk since fetuses and nursing infants may consume more PCB's per unit of body weight than adults." (227) Another commenter wondered

whether the U.S. Navy Yard in Philadelphia had been consulted on their toxicity findings from flora and fauna samples in the Atlantic Ocean (336). That commenter suggested that traces of PCB's found a thousand miles out from U.S. and European shores might be attributable "to Europe and England's 17 year history of incinerating hazardous wastes at sea." (336)

In the event of a spill, the Coast Guard could not assure adequate cleanup and therefore such chemicals should never be treated in the aquatic environment, stated one commenter (129).

Another commenter noted that, in spills, PCB's sink to the bottom and from there enter the food chain (291). And another observed that PCB's rate of biodegradation is "insignificant" and, therefore, whatever contaminants disappear from the water and local biota could be expected to end up in the bottom sediment (319). Even a small release was counted a threat: "These are the most bioaccumulative substances we produce...the most persistent, the most toxic...." (249)

### **3. Appropriateness of the waste**

Aside from health effects, it is questionable to many people what, exactly, is to be gained from incinerating a waste so unlike most of the wastes we normally treat. A few asked why choose a waste that represented only a small portion of the U.S. waste stream (590)(38)(39). Another commenter suggested that the test was too easy, that the test should run a worst-case sample, not an ideal (590).

Several commenters suggested that the results from this test will be of limited value because the waste is nonrepresentative (274)(296)(428)(1626)(39). The results from this test, claimed one person, will be "limited to the effects of that particular waste and cannot justify a full-scale program." (39) Another asked why this particularly toxic waste was chosen rather than a more representative sample (351). Stating that the Sea-Burn proposal was for a wider range of wastes, this one is for a single type, one commenter questioned whether "the results of the incineration of this waste be sufficiently valuable?" (272).

A more critical concern to one commenter was that by using this relatively simple waste mixture, EPA is ignoring the fact that a complex mixture of hazardous waste, when incinerated, could recombine and reform into more toxic emissions than a single group of PCB's. This commenter believed that EPA "cannot possibly use the results of this burn to justify scientifically an entire ocean incineration program" on the basis of this waste (296).

Another objection to this waste is that by mixing the PCB's into fuel oil, this test could be expected to achieve more complete and easier combustion than might be possible with other

mixtures (247). This commenter stated that if EPA and CWM intended to prove the effectiveness of the incinerator to destroy this waste, many would remain unconvinced. According to the commenter, a clean bill of health would have to come through testing chemicals more difficult to destroy by incineration (247). Others, however, believed that since PCB's were used as fire retardants, they would be difficult to burn (42)(244).

If testing is the objective, suggested one commenter, it would be better done on land with a wider range of wastes (131).

#### **4. Other objections to the waste chosen**

The public sees this chemical as a poor choice for a variety of other reasons. One doubted that local emergency personnel such as policemen and firefighters know how to handle spills and leaks (215).

Some commenters thought that the technology itself was unproven; therefore, this was too dangerous a chemical to experiment with (130)(351). Another recommends afterburners onboard ship to offset the risk of producing dioxins (from an incomplete combustion)(244).

Some commenters objected to the heavy metals allowances (35)(469). One pointed out that if each of the eight metals allowed in up to 500 ppm were actually present in their maximum allowable concentrations, the waste could contain over 4,000 ppm of heavy metals (35). The commenter recommends revising the specifications.

One commenter asked that the "heating value" of the auxiliary fuel be specified in meaningful terms, perhaps by flammability and vapor point (469).

Some commenters requested that States be given complete information on the waste, including whether any were subject to court orders and the results of analyses (35)(274).

One commenter said that all chemicals listed in 40 CFR Part 261 Appendix VIII should have analytical data (1275).

Another commenter said there were difficulties with the detection limits for some waste components (1268). In practice, it is very difficult to detect less 2 ppm of BHC, BCT, and PCT the commenter said, and this limit ought to be raised. As for 2,3,7,8-TCDD, the limit should be 5 ppm the commenter believes because that level can be detected by conventional analytic procedures and is the limit WMI is authorized to handle in its Belgian permit (1268). Using only one incinerator might also

preclude detection of emissions just below the threshold of detectability, another commenter added (469).

The same commenter noted that since virgin fuel oil would be used, there is no need to analyze the content of the auxiliary fuel oil. Another group of components that are not necessary to measure are the metals aluminum, tin, and iron, since there are no limits on the amounts present and therefore no need for this information (1268).

Each tank of waste on the incineration vessel should be uniquely identified and manifested said one commenter (469). Blending of the wastes should be allowed only at points clearly specified by the permit, the same commenter suggested (469).

#### **5. Amount of waste -- Is it research?**

A suspicion that over 700,000 gallons constitutes a commercial burn disguised as research appears frequently (342)(137)(355)(1626). Commenters believed that a "test" is done on a small scale under carefully controlled conditions to minimize and virtually eliminate risk (334). As another commenter observed, a trial burn should be restricted to the smallest amount of hazardous waste sufficient to serve research purposes -- otherwise, the research is as risky as commercial operation (340). The vessel should only carry the amount of waste actually required to conduct the research burn, said another commenter (469).

Many people perceive that the amount of waste to be burned is related to the amount that CWM has to get rid of under an EPA agreement and believe that CWM is getting a special deal: As one commenter charged, "This is not a test situation. This is the real thing....a subterfuge allowing Chem Waste to get rid of a volume of wastes it finds too hot to handle." (337)

#### **6. Other reasons that smaller amounts should be used**

In addition to questioning whether this was really research, a few commenters simply stated that less volume would do (35)(328). A suggestion was to limit the total amount burned based on the most persistent chemicals involved (1277).

Some commenters pointed out that a volume of this magnitude decidedly concentrates the risk and any harm to the environment in one spot (899)(501). As an alternative to incinerating so much at once, another commenter suggested treating small batches at a time (246).

#### **7. The amount is safe**

A commenter offered several calculations that show minimal impacts from this volume of waste. Incineration of the whole load would release a maximum of .013 gallons of PCB's per day, equivalent of 1.55 tablespoons a day (1268).

#### **8. Additional comments in other sections**

Many commenters referred to the appropriateness of the volume indirectly while discussing transportation issues (chapters VII and X), storage (chapter VIII), or the contingency plan (chapter IX). See those chapters as well. Many commenters simply quoted the amount without commenting on whether it was too much or too little for this test.

## VI. LEGAL ISSUES

### 1. Marine Protection, Research, and Sanctuaries Act and the London Dumping Convention

The Marine Protection, Research, and Sanctuaries Act (MPRSA) and P.L. 96-572 regulate U.S. ocean dumping activities (1255). As a signatory nation to the London Dumping Convention, the U.S. is obligated to comply with convention requirements in its domestic regulations.

Many commenters believe that the research burn does not comply with LDC requirements (1324)(1255)(1261). (See the discussion of practicable alternatives in chapter II.) Some commenters argue that EPA has not satisfactorily established that a "need" for ocean incineration of PCB's exists as the LDC requires (296)(306). Need must be established for a research permit (1255).

MPRSA sets several standards for assessing a research permit, including that the dumping is necessary to test new technology or establish the environmental acceptability of the process, said one commenter (1255). This commenter claimed that land-based testing needs to precede ocean testing for the Administrator to demonstrate that ocean testing is necessary. In addition, the Act requires the Administrator to determine whether the test will unreasonably degrade or endanger human health, welfare, amenities, or the marine environment, ecological systems or economic potentialities. The Administrator has not done so, this commenter claimed.

The same commenter noted that the proposed dumping should be scaled to pose minimal adverse impact on human health, the environment, or economic potentialities. The commenter disagrees with EPA's contention that, based on destruction efficiency, little waste will actually enter the environment. The commenter states that PIC's might include substances even more toxic than the original waste stream and that "EPA simply does not know" what the possible impacts are (1255). Finally, the commenter stated that the Administrator must consult with the Secretary of Commerce to determine that the research's potential benefits outweigh the potential harm. No such finding is possible without sound scientific that the environmental impact would be minimal, said the commenter, especially not without preliminary land-based testing (1255).

One commenter maintained that releasing emissions to the marine environment constitutes "dumping" (1324). The LDC prohibits dumping organohalogens at sea unless they are rapidly rendered nontoxic and rapidly rendered harmless by physical/chemical/biological processes in the sea (1255).

( ) Commenter claims that the permit application is incomplete -- it does not provide all the background information on the waste to be incinerated that is required under Special Provision 3 (e) of the proposed permit (1255). This information includes where and how the waste originated, how it has been disposed of previously, a statement of disposal alternatives and recycling possibilities considered, environmental impacts of the proposed dumping, and effects of dumping on the environment, navigation, marine resources, recreation, and other uses of the ocean. Because the applicant has not provided the required information, the application is incomplete and a determination of need cannot be made, the commenter said (1255).

Features of the North Atlantic Incineration Site do not fulfill section 228.4 (d) of the Ocean Dumping Regulations, one commenter claimed. In particular, the proximity of the 106-Mile dump site renders the Incineration Site unsuitable for its proposed purpose -- research -- since waste streams from both sites could comingle (1255). (Additional objections to this site are covered in chapter XII).

The same commenter claimed that section 227.17 requires an environmental impact statement be done on transport and transfer phases of the proposed research, which EPA has not performed (1255).

The commenter also stated that subpart E of the Ocean Dumping Regulations lists a number of ocean uses that must be evaluated. These uses include commercial and recreational activities. The existing environmental impact statement did consider some of these uses, but not all, and therefore is not adequate. The commenter suggests that a supplemental EIS must be done to complete the site assessment (1255).

Section 227 of the Ocean Dumping Regulations also prohibits disposing of organohalogens at sea unless they are rapidly rendered harmless (1324). To date, EPA has not characterized emissions from PCB incineration adequately to determine that stack emissions will be rapidly rendered harmless, says one commenter (1255).

## **2. National Environmental Policy Act of 1969**

One commenter cited the National Environmental Policy Act (NEPA) in drawing the conclusion that an environmental impact study should not be voluntary, that NEPA required it (1255). Many commenters thought an impact study should be done to update the 1981 EIS on the site and to evaluate the effects of the research on the site (320)(271)(273)(1255). The existing EIS does not consider the effects of loading the waste at the port, transporting the waste through the Delaware Bay, or shipping it 140 miles to the site (1255).

### **3. Coastal Zone Management Act**

Regarding the Coastal Zone Management Act coordination with affected states, one commenter supported Maryland's request to review the research burn (1255). Another commenter said that Pennsylvania and Delaware have concurred that it meet consistency requirements with their States' programs and New Jersey has announced that it will follow suit (1268). This commenter opposed Maryland's request and NOAA's decision to grant a review. This commenter objected to NOAA's grounds that states may review on the basis of effects to their coastal zones and that this transport of hazardous waste is a new event that potentially affects Maryland. The disapproving commenter's grounds for opposing this review were that the event was not new: it had been done in Europe and the Gulf of Mexico before. Besides, said the commenter, ICF, Inc. had prepared a local model predicting that the Maryland coast would be little affected if at all.

### **4. Endangered Species Act**

Many commenters believe that the requirements of the Endangered Species Act have not been met (1255)(296). Doubt over the existence of endangered species in the area or passing through it is substantial, and, therefore, EPA should request a formal consultation with the Secretary of Interior (296)(1255). Although the Act exempts Federal Agencies from formal consultation if they determine their activities will not harm endangered species, these commenters said that EPA does not have enough information on the site to make a valid determination that endangered species will not be harmed (1255).

One commenter claims that NOAA's letter decision, based on the destruction efficiency of the incineration and the limited duration of the test, that endangered species will not be affected is unsound. First, the test is being run to prove that a 99.9999 percent destruction efficiency can be achieved. The "expected" DE, therefore is not a reliable factor in determining the effect of the research (1255).

The commenter also worried that whales or turtles surfacing directly behind the incinerator ship could come into direct contact with the emissions plume under some weather conditions (1255).

For additional comments on endangered species, see chapter XII.

### **5. Toxic Substances Control Act (TSCA)**

One commenter is concerned that the proposed research does



not meet the most stringent standards under the Toxic Substances Control Act (TSCA)(1255). The commenter objects to EPA's use of destruction removal efficiency to waive dwell time requirements in the incinerator. Since the research is being conducted to assess destruction efficiency, that measure is not appropriate to justify a waiver of dwell time, the commenter says (1255).

The commenter also believes that the Vulcanus should use a scrubber as TSCA requires for incinerators under section 761,70 (a)(9). (1255)

## **6. Resource Conservation and Recovery Act (RCRA)**

Many commenters referred to RCRA regulations in the discussion of financial responsibility requirements. See chapter IV for those comments.

One commenter listed several RCRA regulations that apply to the proposed research burn and suggested that these sections be incorporated to the permit (1255). Part 264 of RCRA specifically states that "these part 264 regulations do apply to treatment or storage of hazardous waste before it is loaded to an ocean vessel for incineration or disposal at sea," the commenter noted. The EPA should assess what sections apply to any permit it issues under the Ocean Dumping Regulations and incorporate them, but for this permit the commenter suggested the sections 264.11 -- Identification Number; 264.71 -- Use of Manifest System; 264.72 -- Manifest Discrepancies; 264.73 (a) and (b) Operating Record; and 264.76 -- Unmanifested Waste Report.

The commenter also suggests that ocean incineration vessels should use the same air pollution control devices required under RCRA for land-based incinerators (1255).

## **7. Permit revocation or changes**

Since the purpose of this project is research, the failure of some conditions would totally negate the usefulness of the burn and should trigger a permit revocation one commenter stated (1255). Failure to keep adequate records or any condition that would result in not meeting research objectives should cause the permit to be revoked (1255). This commenter added that the performance standards had been set to safeguard human health and the environment and therefore must absolutely be followed "to the letter." Another commenter was bothered that the permit appeared to allow the permittee to judge whether changes in conditions called for a reworking of the permit (469). If EPA is to be the judge, the permit should state so clearly the commenter thought (469).

## VII. LAND TRANSPORTATION

### 1. Spill risk

Many commenters are alarmed about the possibility of a spill enroute from Alabama to the Unitank terminal; they see it an immediate and direct threat to their lives, their health, their prosperity, and the environment (16)(30)(43)(47)(126)(352)(370)(911)(1244)(1258)(1262)(1277)(1336)(1340). Commenters point out that the risk of a spill multiplies with each transfer of the waste and every step that requires additional handling (204)(340)(491)(466)(38). This risk also rises with the length of the route (337).

Both rail and truck transport are risky to many commenters: one stated that both rail and vehicle convoys are "frequently" involved in spills (342). One commenter said over 10,000 hazardous waste spills occurred last year (38). Train derailment is the more pronounced worry with the commenters (204)(575)(1244)(17). One observed that an aging rail infrastructure cannot support hazardous waste traffic through residential area safely (42). One commenter cited NOAA statistics for the Philadelphia area during the last ten years (201). These figures indicated 256 significant pollution incidents, including 17 spills of 10,000 gallons or more (201). Most of the spills occurred via truck, but, between 1977 and 1983, 131 significant rail incidents occurred; 17 of those were derailments and corresponding leaks (201). Several commenters underscored the imminence of this threat with the note that a derailment of five cars did in fact occur just outside the Unitank terminal on Feb. 3, 1986 (575)(1257)(1244)(1257). Another commenter, however, pointed out that Unitank itself had safely handled 200 million gallons of bulk liquids and 10,000 rail cars per year (1268).

A commenter noted that CWM had eight specially designed rail cars for carrying this waste that included superior safety features such as 11/16 inch steel shell instead of 9/16 inch, double shelf couplers to reduce switching accidents, steel head shelves to strengthen the ends of cars against puncture, thermal insulation that reduced the risk to contents from an outside fire, and no bottom valves that can be damaged or tampered with and result in a spill (341).

The rail carrier is suspect to some members of the public. CSX is not trusted by locals already, alleged one commenter (332). Another commenter claimed that CSX would not be the carrier, Seaboard would be (341). In response to that, a commenter stated that it was one and the same: Seaboard is part of CSX, because CSX is a holding company formed by the merger of the Seaboard and Chessie Systems; and further, CSX's record is very poor. This commenter alleged that CSX accounts for 9.8

percent of all Class I Railroad miles, yet is responsible for 21 percent of the cars damaged in accidents and 38 percent of the people who had to be evacuated because of rail accidents (344).

Regarding truck safety, one commenter stated that the truck haul would be used only from the Emelle site to rail, completely within the State of Alabama, and would not constitute a grave risk because CWM's safety record is excellent: only .42 incidents per million miles. By comparison, said this commenter, DOT reports an average of 1.21 accidents per million miles for motor carriers (341).

Land based incineration is seen as bringing shorter routes and therefore running less risk of a spill (1284)(1291)(1298).

### **3. Length of the haul**

Many commenters questioned why take waste so far, when plenty is to be had nearby, and why bypass closer ports (334)(368)(989). If removing the waste from Emelle is the object, it seemed more logical to some that a closer port should have been picked (8)(342). Shipping the wastes from Emelle to Philadelphia is surely not economical, one commenter noted, estimating that this plan would require 120 tank loads traveling more than 1,000 miles each for a cost of at least \$360,000; taking the same volume of wastes to a Gulf port would cost about \$72,000 (985). Two commenters thought it would be quite advisable for EPA to give some study to more sensible options (350)(353).

The length of the haul appears to increase the danger of an accident in the eyes of the public (561). It also seems unnecessary to those commenters who believe that a more appropriate expenditure of effort would be to promote portable technologies such as a chemical conversion process developed by SOHIO that can be taken directly to the site (42)(337).

### **4. Routing**

Strong public objection exists to taking the hazardous wastes through some of the most densely populated areas of the United States (8)(20)(29)(45)(988). Residents in Philadelphia and surrounding communities promised to fight this plan (464)(1257)(506). Other residents noted that their streets were narrow, old, and in bad repair, and that a spill could occur in areas least equipped to handle emergencies (44)(415)(997). Possible truck transport in the area seemed extremely dangerous to some; one commenter pointed out that travel on I-95 will face tremendous traffic on a route already plagued with spills (24). A commenter pointed out that CWM's backup plan for transportation if rail did not work out would take the wastes via truck along the Schuylkill Expressway; this route is under

construction and will be for some time to come -- stopping in emergencies could be impossible since whole stretches allow no place to pull over. Getting emergency response or repair equipment in would be exceedingly difficult (201).

#### **4. Do a risk assessment first**

Several commenters thought it either irresponsible that the Emelle to Philadelphia route was chosen without a formal risk assessment preceding it, or that a risk assessment would reveal the folly of this plan (131)(38)(18)(435). EPA should do a comprehensive multimedia review including planning for the worst-case accident, said one commenter (435). Endorsement of ocean incineration hinged upon safe transportation said another commenter (50).

#### **5. Logistics**

The proposed method of transport inherently increased risk, said one commenter. Plans to move two rail cars at a time would result in 14-16 trips from Alabama to the Unitank terminal. According to EPA's own Science Advisory Board, noted this commenter, the risk of transportation accidents would be raised because risk increases with frequency (38).

Coordination is another problem (332). Working out emergency response maneuvers and responsibilities with local authorities and sharing information were extremely important concerns to several commenters who also expressed concern that State and local agencies were not substantively involved in planning (332)(204)(268)(274). One commenter wondered what precautions would be taken to notify local emergency response teams (204). One commenter claimed that Delaware County was not made privy to any analysis that "assures us that any course of action can be taken without having these products go through the Delaware Valley - Philadelphia region" (268). Another commenter requested that State and local authorities be given control of the storage and transportation of hazardous materials within their jurisdictions because "the Federal government is not close enough to the danger to be concerned...The people need input into matters affecting their health, safety, and welfare." (322)

#### **6. Risk amelioration**

Many commenters suggested that transportation is a major obstacle to public acceptance of ocean incineration (131). The principal recommendation for reducing risk was to reduce the transport (1261). Commenters advised shipping the waste to a closer port (322). One commenter said it would be better for each State to handle its own wastes and not import those of others (274). Other commenters favored land-based incineration

with its shorter transportation routes (415) or bringing portable incinerators directly to the waste site (1340)(1244).

Another frequent suggestion is that hazardous wastes be moved through areas of low population density (45)(361). Some commenters also suggested that a thorough risk assessment should including establishing procedures for cleanup and recovery should be done before the waste is hauled (38)(18).

These comments are in addition to those already noted under the section on spill risk.

## VIII. STORAGE AND LOADING AREA: PORT OF PHILADELPHIA

### 1. Spill risk

The feasibility of a spill at the storage site or in the port itself is counted very high (30)(265)(276)(320)(575). Many object to the risk they say storage and loading will impose upon residents and resources (43)(44). Commenters estimate that the harm of a spill in the Delaware estuary would be very widespread and would put the whole area in jeopardy (6)(28)(435). Travel to the open waters of the Atlantic would also pass down the New Jersey coastline and put it at risk (273).

One commenter had asked the Coast Guard what the response time would be to a spill at the Allegheny Wharf and learned by a letter response that it would be immediate, the Coast Guard would be on site (19). Even so, said another commenter, the Coast Guard has allegedly said that the risk of a spill can be reduced, but it can never be eliminated (129).

One commenter suggests the Philadelphia Fire Department, Police Department, Licenses and Inspections, Water Department, and Health Department should be added to the list of agencies to be notified in CWM's contingency plan (201). Also, this commenter suggests a copy of the Vulcanus II plan should be given to the fire department in case a fire should occur in the Delaware River; the fire and water departments should be notified when the ship is loaded or offloaded (201).

Since the traffic in the area's streets is extremely congested, another commenter was concerned that firefighting equipment might be delayed coming overland and wondered what would happen in the event of a fire (224).

A few commenters find the safety measures to prevent collisions and spills in the port too burdensome, particularly the moving safety zone and diversion of oncoming ships (410)(14). The section on port activity in this chapter elaborates on these comments.

### 2. Site Characteristics

Particular features of the port area especially concern many people. Some commenters pointed out that the terminal lies in a 100-year floodplain and one called this location illegal (129).

The area abounds with chemical manufacturers, which one commenter believes is the reason for unusually high cancer rates through frequent exposures (8). Certainly this industry is the source of complaints about odor problems (245). A resident of Mayfair noted frequent problems from the Allied chemical plant

(267). The problems are not minor, they are extreme disturbances to area residents and in some minds EPA's regulatory changes are at fault (990)(253)(243). Several commenters cited past Unitank practices such as loading acrylates when the odor control and ventilation system was inoperative (36)(258)(206)(8)(206). One commenter elaborated, saying the company was aware of the problem, loaded the chemical, paid the fine, and apologized, but residents did not think that a company that place demurrage costs above public health was a good company (8).

The Unitank terminal is one of many hazardous waste storage sites in the Philadelphia area. One commenter said the area had 270 sites: 84 of them in the Bridesburg, Port Richmond, Juanita, Fishtown, Tacony, Frankford, Mayfair, and Wissinoming sections. One of these is a Superfund site, 4 are landfills, and 11 are RCRA sites. The area also has 57 hazardous waste generators according to this commenter (215).

Many commenters referred to the area's unusually high cancer rates (233)(243)(245)(250)(254)(258). One noted that "our children have a high incidence of leukemia." (277) Another said that most senior citizens in the area have emphysema and lung ailments and more children than usual have asthma and allergies (232). One commenter submitted area surveys and cancer mortality figures that showed a mortality rate in the year 1977-1978 of 507 deaths per 100,000 population; the expected rate would have been 380 deaths (8). This commenter pointed out that the area's average annual mortality rate was 349 deaths per 100,000 population compared to the citywide rate of 262. Among the supporting documents this commenter submitted, a map showed the cancer rates by city tract. On this map, two tracts near the Unitank terminal register averages of 353 deaths per 100,000 and 698 deaths per 100,000.

### 3. Port traffic and activity

While many commenters expressed worries about safety, others observed that the proposed moving safety zone would be extremely disruptive to port activity (8)(221)(410). These commenters pointed out that on the estuary, every vessel in the Vulcanus' path would have to pull over and wait. One of the commenters said that since commercial vessels operate on extremely tight schedules and the delays would prove very costly: the port handled 2,821 oceangoing vessels in 1985 -- ships expecting delays would most likely divert (410). If interruptions to commercial traffic were to become routine, said another commenter, shippers would begin to go elsewhere (8).

One commenter pointed out that more, and purer hazardous chemicals routinely pass through the Port of Philadelphia, among them naphthalene, liquid petroleum gas, ethyl acrylate, butadene, carbon tetrachloride, and ethylene dichloride (285). Another commenter said that even a full year's routine operation

of an incineration ship would not equal what moved through U.S. ports in a 2-week period (279). In rebuttal, a third commenter claimed it was illogical to say that because the Delaware River and Port of Philadelphia ship hazardous chemicals that Delaware should accept waste with its long-term and severe environmental consequences (340).

#### **4. Drinking water contamination**

Threats to drinking water supplies from spills or leaks bother several commenters (8)(244)(265)(453)(19). One commenter is concerned because the Unitank terminal is only 5 miles upstream from the Northeast sewage treatment plant and discharges from the plant are carried to the Baxter (Torresdale) plant where they can enter the city's drinking water (8). Other possible routes for the wastes to enter city drinking water supplies are via the terminal's sewer line to the Northeast treatment plant and directly from a spill into the Delaware since the dock is only 1 mile downstream from the sewage treatment plant (8). Another commenter requested information from the Coast Guard and was advised that a spill at Allegheny Wharf would not reach the Torresdale water supply; although the spill would move toward Torresdale during low flow, the ebb would move the spill further downstream so the whole mass would travel cyclically downstream, away from Torresdale and never reach closer than 2 miles from Torresdale (19).

#### **5. Facility record**

Some commenters complained that the Unitank terminal had been the source of problems in the past (36)(258)(8)(256)(258). One commenter claimed the facility had periodic releases of nauseating odors (258).

Others praised Unitank for being one of the best managed facilities on the East Coast (239)(284)(235)(338). Commenters claimed that Unitank had operated 30 years without incident in handling bulk chemicals (239)(1323). The design of the facility and the contingency plan impressed one of these commenters as making the chance for a spill extremely remote (1323).

#### **6. Siting decisions**

Why this area was chosen or why it should not be chosen came up several times. The reasons submitted in favor of the siting included that the facility is the only one certified to handle PCB's under RCRA on the East Coast (320); that Philadelphia was convenient to the North Atlantic incineration site and offered an excellent chemical handler to store and load the wastes (290).



Those who opposed this siting had a variety of reasons. Some thought that no decision should have been rendered until an environmental impact statement including a study of transportation could be completed and could show a positive impact (201)(1255). One commenter noted that the site seemed to be chosen because it was a convenient point for loading the incineration vessel, which is not an adequate reason (469). Another thought the choice of a freshwater port seemed a poor one, and asked whether even a double hulled vessel could not be intruded by another vessel or a river object (985). Were other ports contemplated, particularly Wilmington? asked another commenter (322). One commenter stated that the area could not afford further air pollution (210). And one commenter said that the financial gain to the companies involved did not consider the loss to area residents in the form of lowered property values, property losses, and rising insurance rates (259). The area, said one commenter, has a long history of chemical spills, leaks, and explosions (17). Another commenter that a site such as this in or over an aquifer is not acceptable (1277). In addition to these, the sections above discuss interruptions to port activity, threats to the drinking water, and the risk of a spill.

## **7. Safety measures**

One commenter stated that the permit should be strengthened to read that the permit manager "must" deny authority for loading, not "may," if the wastes do not meet the permit requirements (1255). This commenter also thought that the permit did not make divisions of responsibilities between the EPA and the Coast Guard adequately clear -- who is in charge at this stage? (1255).

At the loading to incineration vessel, one commenter pointed out that a containment boom would be in place to hold any spill that might occur (19). A commenter said that the material would be analyzed by EPA and piped directly to the vessel via a dedicated pipe used exclusively for this project. This pipe would be tested at two times the operating pressure before use (235).

Another commenter listed several safety measures in use at the terminal: dikes, above-ground storage, valves and collection system to prevent pillage when transfer lines are disconnected, above-ground piping to the storage area, fire prevention and control systems, onsite security personnel and secure fencing, and trained personnel (338).

One commenter observed that the waste should not even come to port until after all pilot research was completed and all "fixed facilities" were approved (469).

## **8. Local Opposition**

In addition to specific issues, several commenters went on record mainly to say they oppose this plan (463)(352). One commenter claimed to have collected 8,193 signatures (269). A commonly expressed sentiment was that the residents of the area had had quite enough abuse already with heavy industry nearby, and abnormally high cancer rates, (221)(222)(233)(247). One commenter summed up the local pride at stake, saying that the communities had already been working very hard to become better places to live, "Please honor the wishes of our community" by withdrawing the permit application. (996) In the same vein, other commenters noted that any harm caused by this test would undo years of work by local residents on cleaning up the Delaware River and revitalizing the communities (255)(332)(998).

## **IX. CONTINGENCY PLAN**

### **1. Adequacy of planning**

The public response to CWM's contingency plan ranged from the commenter who had reviewed the plan and termed it "quite thorough" (35) to the commenter who called the plan "completely empty of any satisfactory precautions" (216). Several commenters thought that no contingency plan had been prepared or revealed to the public (38)(274)(280)(466)(588).

Commenters had several suggestions what should go into an adequate contingency plan: an evacuation plan for residents and vacationers (216)(223)280); advance coordination and identification of responsibilities with state and local governments (201)(351); notification to the seafood industry (470); planning for the worst case scenario (271)(467); routes, schedules, and procedures (201); extending the moving safety zone beyond the Delaware memorial bridge (273).

One commenter objected to using the Philadelphia Subregional Oil and Hazardous Substance Contingency Plan, which was prepared in October 1983, because it was outdated and asked that this be updated before the research burn went into effect (273). An additional suggestion from another commenter was that the contingency plan itself should be open to public review and comment (1255). This commenter also believed that estimated response times, remedial equipment on the vessel, the most probable areas of grounding or collisions, sensitive environmental areas and how they would be protected should be part of the formal contingency plan. Further, the permit and contingency plan should reference all applicable Coast Guard regulations for reporting spills (1255).

One commenter believed that the proposed cleanup firms should be approved by the EPA and Coast Guard (1261).

### **2. Personnel and equipment**

The readiness and competence of those who would be called upon in an emergency is a very important issue to many commenters. Those who saw some burden falling upon local agencies such as the fire and police departments doubted their ability to handle this kind of emergency (351)(353)(1258). Several commenters are also firmly convinced that the Coast Guard does not have the resources to clean up a spill and therefore believe the research burn is a poor idea altogether (301)(327)(328)(425)(440)(473)(1255). CWM listed equipment and materials that can be used for spill cleanup, but one commenter thought this was not convincing assurance that cleanup could be achieved (319).

### **3. Effectiveness of a Cleanup Operation**

Many commenters who believed that a spill would be impossible to contain or retrieve cited a lack of technology (307)(297)(474)(574)(1047).

The waste's specific gravity of 1.03 would cause it to sink and adhere to sediment particles, making cleanup increasingly difficult, said some commenters (35). Even a requirement to give the Coast Guard verbal notice of a jettisoning in life threatening situations would not solve the problem, said one commenter, because a situation like that would probably happen in a storm when it would be impossible to contain an oil slick (425). Another commenter pointed out that a captain can dump his load when his ship and the lives of his crew are in danger (474).

Another commenter suggested jettisoning to save the crew, especially if they were in the water or in lifeboats would be at even greater risk of exposure to the PCB's. Vessel could possibly be salvaged later and even if the tanks were cracked, it is likely less harm would be done by leaks at the bottom of the ocean (469). This commenter suggested that planning include large pipes for offloading the waste in an emergency (469).

### **4. Response time**

Whether cleanup crews can get to work fast enough concerns the public (223). One commenter referred to a spill of only 250 gallons that took 1 week to assess, 2 weeks to bring in equipment and 6 weeks to finish -- this was too slow the commenter suggested (319). This commenter also noted that 8 percent of the PCB's were left in the river. Another commenter said the problem is the distance equipment must move (320). When the Grand Eagle spill occurred, the closest oil skimmer vessels were hundreds of miles away -- also too slow for responding to PCB's (320).

## **X. TRANSPORTATION TO OCEAN SITE**

### **1. The risk of a spill on water**

Numerous commenters believe the risk of a spill somewhere in the ocean is formidable. Several thought the ocean environment too hostile for the prolonged stay this test would require (334)(474). As one person put it, "we are familiar with our neighbor, the North Atlantic Ocean, and we have found her to be unforgiving of human error." (55) Some commenters thought that the ship's motion during the incineration would only increase the possibility of an accidental release; the chances for human and mechanical error increase dramatically at sea (1261).

Some commenters quoted an estimate that 70 percent of all spills occur in coastal waters (38)(351)(352)(353). One commenter observed that strong tidal currents at the entrance of the C&D canal in the Delaware Bay are a particularly hazardous area (12). Navigational errors seemed a likely source of mishap to several commenters (1000)(1607)(1264)(265). Many commenters pointed out that the Delaware River's shoals are notorious and have always made this watercourse particularly difficult to navigate (55)(160)(265)(361)(326)(467)(1607).

Many commenters also believe the traffic in the Delaware River and Bay add to the risk of a spill (24)(321)(268)(278). One commenter asked why EPA would choose one of the longest and most densely populated rivers on the East Coast (322). Another found the safety measures outweighed the risk, however, and suggested that EPA delete the moving safety zone from the plan, stating that daylight travel with good visibility, tug escort, and a pilot was adequate and would be less disruptive to other traffic (1323). Another commenter noted the safety plan follows a model that has worked well before in populated areas for carrying liquified natural gas (331).

Most commenters believed the risk was too great to recommend routing PCB's down the Delaware to the 140 mile site (899)(911)(1336)(318)(278)(33)(204)(586)(499).

Shore residents recall a number of spills and leaks and, therefore, perceive that any vessel faces considerable risk of an accident (1261)(336)(433). One commenter cited 1983 figures from the Coast Guard: 392 incidents releasing 1,745,000 gallons and over 2 million tons of hazardous chemicals into navigable waters (296).

Several commenters quoted a figure they attributed to EPA that given the safety measures and ship design the odds of an accident to the incinerator ship are 1 per 12,000 operating years and the odds of a major accident causing contents to be spilled from three or more cargo tanks are 1 per 24,000 operating years

(279)(284). One commenter perceived this figure to be so ridiculous that it was insulting to the public's intelligence (227). Two commenters pointed out that probabilities, even extremely remote ones, are small comfort because a spill could happen anytime, anywhere; there is no way to foretell when that chance will come up (296)(1276).

## **2. Spill effects**

Commenters agreed that even one spill would devastate the coastal area's economic base which depends on tourism and recreation (1276)(280)(281)(5)(130)(351)(370).

Possible harm to benthic species that feed on the bottom where area spills and particulates would eventually settle concerns one commenter (1249). Marine and migratory animals and birdlife are also at risk some commenters believe (1249)(160)(1340).

A spill that entered marshlands and resided only 1 month before being cleaned up would devastate these productive habitats one commenter observed.

Other possible adverse effect that greatly worry residents along the Delaware River concern human health; one is the possibility of drinking water contamination (247)(265)(42). The other is the threat of PCB's entering the food chain, which is significant to this area that both enjoys and lives on its seafood (307)(1249)(316)(42)(244).

The spill need not be large to cause harm believes one commenter because only 1 part per billion of PCB's could affect photosynthesis and the ocean's ability to regenerate oxygen (375). Another surface effect that concerns one commenter is the significant risk of harm to the ocean's microlayer (129).

How far a spill would spread is an open question in the public mind. The commenter who said "everything spills along New Jersey's coast if it sinks or cracks" sums up the feelings of many that this threat is likely to be realized anywhere (71). One commenter, in a more specific vein, said that the North Atlantic has about a dozen or more Gulf Stream frontal eddies at any given time. These eddies occur in the incineration site about 20 percent of the time and "are capable of picking up pollutants such as toxic wastes or oil and carrying them to the continental shelf." Predicting their route is "mostly guess work" and they could also carry pollutants back to shore (27). Another commenter noted that a sudden, easily detectable spill might not be the greatest risk, that slow-acting effects might tell us this research burn was a mistake 10-20 years after the fact (130). One commenter observed that man's contaminants "come back to us no matter how far out to sea we put them" (307).

A commenter predicted that the Chesapeake Bay could be contaminated also by this venture (12).

Area residents feel quite strongly about the ocean and coastal resources. One commenter looking at the risks, no matter how remote, stated "ocean incineration is not compatible with the essence of this area." That sentiment is backed up by many who depend on fishery for a living and are alarmed at the threat to their way of life; many commenters opposed introducing chemicals like PCB near fisheries (558)(561)(563)(565)(348)(985)(470)(496)(1047). One commenter stating that fishing contributed \$500 million to the New Jersey economy each year said "we have committed ourselves both financially and morally to this profession and we refuse to sit back and watch this relatively 'pure' employment be destroyed" (499).

## **XI. ENVIRONMENTAL IMPACT STATEMENT**

### **1. General comments**

Most commenters considered an environment impact statement (EIS) essential to carrying out the proposed research (201)(206)(322)(325)(326)(334)(271)(435)(567). One commenter "formally demanded" that an impact study be undertaken. Although an EIS has been prepared for the North Atlantic test Site, many commenters felt that the EIS prepared for ocean incineration in 1982 was not current enough (300)(126)(558)(226). Some questioned whether more recent technology had been evaluated (337)(567)(126)(558)(226). One commenter felt that the 1982 EIS did not sufficiently address many questions that should be studied before proceeding with a test burn (295). Another commenter called for an EIS to be prepared -- but only after the proposed research burn was carried out (331).

One commenter supported EPA's decision to forego an EIS for the proposed research on at-sea incineration of hazardous wastes and claimed that an impact statement for ocean incineration was not required, but voluntary (1268). In contrast, another commenter cited a U.S. Supreme Court decision which called the environmental impact statement the "only outward sign that environmental values and consequences have been considered" (1255).

### **2. Transport and transfer**

Among the greatest concerns for studying the impacts of the proposed research was that the consequences of a spill during either land transport to and through Philadelphia, storage at port, transfer to ship, or transport through the Delaware River and Bay needed to be assessed (283)(201)(226)(227)(296). One commenter considered that without an EIS on the transport and transfer phase, no analysis of risk -- aesthetic, recreational, or economic -- could be determined, especially for beaches only 140 miles from the test site and even closer to the transport route (1255). According to another: "The risks inherent in the transport of hazardous materials on land or at sea are well known. It is critical that EPA consider and provide the public with an analysis of the specific risks to the Port Richmond area, Delaware Bay and Atlantic coast in a worst case analysis" (393).

Another commenter mentioned "that the possibility of a spill is the most significant potential hazard associated with ocean incineration and that 70 percent of ocean incineration spills are expected to occur in highly populated coastal areas" (326).

Other commenters cited examples from the draft EIS for the North Atlantic Site and public officials' statements that serious public health hazards including contaminated drinking water would



result from an accidental spill "in commercial or recreational coastal areas..." (38)(226). "Given the known threats posed by PCB's..." (38) and "...despite EPA's recognition of this problem and its catastrophic potential, that agency has steadfastly refused to prepare an EIS addressing these risks involved in the loading and transit of incineration vessels up and down the Delaware River and Bay, nor has any other Federal agency agreed to undertake this duty which we feel is a clearly mandated duty under Federal law" (320).

The recent history of spills in the area gave commenters further reason to want an EIS for the transport and transfer phase (334). To some commenters, the Grand Eagle oil tanker spill off of Claymont, DE, underscored the importance of assessing transportation risks and impacts and showed that human error can still be the major contributing factor to a maritime catastrophe (320). Other commenters also voiced concern that accidents and malfunctions needed to be studied for their possible effects on life and livelihoods (159)(559). The proposed port of Philadelphia was of concern to several commenters (201)(227)(226)(336). One questioned why no comparative impact statements were prepared on several ports and waterways to determine "the least environmentally sensitive resources and the least likelihood of accident" (340).

Commenters also thought it important to assess the sensitivity of the Bay marine life and long-term effects on the marine life including endangered species, and people (276)(306)(471)(473)(4325)(422)(328)(498)(567). Several commenters suggested that unknown byproducts of the burn, if ingested by fish, would find their way into the food chain thus affecting humans, too (278)(227)(277).

Commenters expressed two other concerns for an EIS on long-term effects. One commenter mentioned that an EPA scientist had "expressed concern that the Agency did not perform a cancer risk assessment of potential danger to the ship's crew or to residents from possible sea life contamination when proposing the Gulf Coast test burn" (227). The other point was that the proposed test site for the burn is "contiguous or very close" to the 106-Mile dump site already in existence. The commenter felt that, "the whole question of the impact of those two sites being next to each other" was another item for study in an EIS (295).

### **3. Legal requirements for an EIS**

Some disagreement surrounded the issue of EPA's legal requirement to prepare an environmental impact statement on the effect of a spill on Delaware Bay and other aspects of the proposed research. The major arguments referred to the National Environmental Policy Act (NEPA) of 1969, which requires Federal agencies to prepare environmental impact statements for all "major Federal actions significantly affecting the quality of the

human environment." One commenter stated that the proposed Research Permit does not constitute such an action "as a matter of fact." Furthermore, EPA has implied exemption from the EIS requirement because the agency's procedures and mandates are the "'functional equivalent'" of an EIS if all environmental factors are given adequate attention (1268). Giving the same NEPA requirement as the basis for argument, another commenter felt that the proposed burn will undoubtedly affect the quality of the human environment, and therefore an EIS is required (1255). That commenter went on to say that any ocean dumping permit "is customarily issued with an EIS," and that the North Atlantic Site EIS, since it does not consider the loading at port and transport of the wastes, is insufficient to satisfy the requirement. Opposing that argument, the former commenter (1268I) cited court precedents for waiving the necessity of an EIS, paraphrasing the decision that when an agency with "environmental expertise" undertakes extensive procedures that include public participation, formal adherence to NEPA is not required. Citing a U.S. Supreme Court decision calling for an EIS as "the only outward sign that environmental values and consequences have been considered," the latter commenter (1255) stated that an EIS served the broad purpose of understanding the environmental risks in the proposed situation. EPA's failure to prepare an EIS on transport and transfer phase leads one to question EPA's commitment to NEPA principles.

Several other commenters were concerned with EPA's legal responsibility to prepare an EIS. One commenter called the EIS a "duty which we feel is clearly mandated under Federal law," going on to say that a state could "withhold certifying coastal zone consistency for the commercial operations of incinerator vessels. I might add that this is a necessary prerequisite to the procurement of any permit for commercial operations." That commenter also would consider bringing suit under the NEPA to "compel the EPA to do their Federally mandated duty" (320). Another commenter felt that the EIS as prepared in 1982 on ocean incineration was "legally inadequate and a more comprehensive environmental impact statement is legally required" (226).

Another commenter referred to EPA regulations that state that "the purpose of an EIS is to ensure that information on the environment is available to public officials and citizens before decisions are made. However, EPA has never issued an EIS on the environmental effect of this particular research burn" (296). This commenter gave additional legal arguments for the issuance of an EIS: "...the International Treaty and Ocean Dumping Act require EPA to consider the effect of ocean disposal on our health and marine environment. However, the research burn as presently designed, cannot possibly provide EPA with the appropriate information..." An EIS would entail collecting the necessary baseline data to evaluate the proposed research adequately (296).

## **XII. NORTH ATLANTIC INCINERATION SITE**

### **1. General perceptions**

Commenters overwhelmingly opposed the selection of the North Atlantic Incineration Site. Most who addressed the issue of the site live in the coastal States and perceive the Atlantic Ocean, even a site far offshore, to be part of their immediate environment and the source of their livelihood (490)(135)(356)(1066)(133)(134)(1276). Several commenters recommended choosing a site farther from densely populated areas that would be less likely to harm tourism and fishery (469)(493)(140)(424)(370). Some commenters worried that any mishaps at the site would most likely happen in the summer when tourism was at its peak (370)(140).

Other commenters fear that EPA might use the results of this test as the basis for approving the North Atlantic Incineration Site for commercial incineration (318)(1066).

### **2. Endangered species and other marine fauna**

In this category, most commenters perceived a need to protect endangered species, primarily sperm whales, that inhabit of travel through the area (318)(558)(316)(297)((278)(282)(1072)(450)(425)(1371)(1336). Some commenters argued for a clear scientific or biological opinion on the effect of incineration on endangered species (296). One commenter said that the National Marine Fisheries Service (NMFS) had already determined that "some and perhaps all of the North Atlantic incineration site may be a high use area for endangered sperm whale and other marine animals" (296). This commenter added that studies from the University of Rhode Island reached the same conclusion about the site area. Another commenter listed three reason why the EPA would be making an erroneous decision in assuming that the proposed research would not affect any endangered species:

(1) The effectiveness of the incinerator technology has not yet been determined;

(2) The impact of emissions on the marine environment, mammals, and birds is unknown; and

(3) Marine life at the site is not well documented (1255).

Since the effects of ocean incineration on endangered species is still an open question, some commenters say, EPA must request a formal consultation with the NMFS under the Endangered Species Act (1255)(296).

One commenter added that the site selection has the greatest potential effect on seasonally migratory and pelagic birds that could fly directly into the incinerator plumes or be affected by as yet undetermined toxic emissions (1255). Whales and turtles could also suffer direct contact with incinerator plumes or spills, this commenter said (1255). Furthermore, the commenter claimed, EPA's reports of "apparently low abundance of life at the site" indicates inadequate documentation for unsystematically undertaken sitings. Another commenter felt that to get the necessary information on endangered species using the site a monthly or bimonthly inspection of the area over at least a 1 year period would be necessary (282).

Commenters' objection to the site as a critical habitat for sea life encompassed other fish and animals besides endangered species. Some commenters felt misled by the information from EPA on one hand that the site contained no important marine life and other sources like the NMFS that claimed that the area attracts tuna, marlin, and swordfish as well as endangered species (6)(276).

Another commenter stated that the area was at the edge of the Gulfstream and the continental shelf and that "migratory fish ... travel up and down the edge of the Gulfstream, "and since they also come within 20 miles of shore, could carry contamination toward the shore with them (278).

### **3. Lack of information on the site**

Many commenters felt that information on the site was lacking or contradictory; several requested more "site-specific" information in the form of an updated EIS on the site. Several commenters asked what criteria had formed the basis for choosing the North Atlantic site (466)(467C)(271C)(272L); others wanted to know what alternatives, if any, had been investigated (985)(134)(1079)(1251). One commenter suggested "that other sites further out to sea be investigated." (985).

In the same vein, other commenters called for more baseline information on the site (3)(296)(428)(558)(282)(352)(428)(1255)(334). Of those, one position stated was that "baseline and impact studies are an essential part of any research burn" (3). Some commenters pointed out that site-specific baseline data was prerequisite to sound conclusion from any research there (1255)(3).

The closeness of the North Atlantic Incineration Site to the 106-Mile Waste Disposal Site also disturbed several commenters. The extrapolation of baseline studies for the 106-Mile site did not satisfy the commenters wanting specific baseline data for the incineration site (3)(282). Commenters also questioned whether the two sites' proximity would make monitoring efforts at the new site difficult or even impossible once emissions and residues of

both sites enter ocean and wind currents (296)(1255). Another commenter said that since ocean currents move predominantly to the southwest, chemical wastes in these sites could be transported through one another (1255). One commenter questioned the suitability of the site -- because it was at sea -- to the proposed research believing that the "often chaotic" nature of the ocean made it "not a good, controlled environment" in which to run tests (1245).

Commenters objecting to the site selection also claimed that, besides the lack of information, several bodies of contradictory information exist (428)(276)(296). Commenters repeatedly cited the National Marine Fisheries Service as the source of information that EPA is mistaken in its assertion that the incidence of marine life is low at the proposed site (1255)(296)(6) and at the 106-mile site (276).

Some commenters requested pertinent information from burns in the Gulf of Mexico (3)(6). One commenter asked, "Is the problem that factual monitoring is extremely difficult in tidal waters?"(6) The other asked, "How many burns have been conducted in the Gulf of Mexico to date? There are a number of conflicting versions of the chronology given by various members of the EPA. When you refer to the burn at Johnston Atoll, do you mean one burn or a series of burns?" (3)

#### **4. Possible human exposure**

One commenter warned that EPA's reliance on prevailing westerly winds at the site to keep emissions from shore ignored easterly and northeasterly wind patterns known to blow heavy gusts onto shore and that atmospheric models estimating the dispersion rates of toxic emissions have not been verified (1255). This commenter continued that the Science Advisory Board "concurred with the possibility" that concentrated emissions, "including acid deposition from HCl emissions" could be carried onshore (1255). Other commenters expressed concerns that residual toxins emitted at the site, becoming fugitive emissions, could have long-term toxic effects both at sea and on shore (1045E)(12S).

"The potential exposure of fishermen to airborne contaminants, especially hydrochloric acid, during and immediately after a burn" concerned some commenters (334). One stated that "Many commercial long line fishermen fish out beyond the continental shelf for swordfish, tuna and billfish and have their gear set in this type of an area for 24 to 48 hours. What types of methodology will...inform these fishermen that a burn will be occurring?" (334) Another commenter was concerned for the safety of those on other ships and suggested that the vessel be required to maintain a "buffer zone" at the edge of the site so that all fallout and the incineration plume remain within the site boundaries (469).

Still another commenter said that despite assurances that the area was away from fisheries the possibility of eventual fish contamination existed, along with the likelihood that people would ingest contaminated fish (204).

##### **5. Support for the selection of the North Atlantic Incineration Site**

The comments in favor of the site selection were concise. One commenter said the ocean "is a strong, large, and very forgiving medium. And our experience with oil spills proves that over and over again." (331) Another commenter said that, "the Mid-Atlantic region should not become the incinerator for the nation's liquid organic wastes..." but did not oppose the use of the site 140 miles off the coast (329). The third commenter supporting the site selection believed that the potential impacts on endangered or threatened species at the site have been adequately assessed by EPA and that "the proposed activity will not affect endangered or threatened species under NMFS jurisdiction." (1268) The commenter went on to say that the NMFS has concurred with the EPA on this point.

### **XIII. SAMPLING**

#### **1. General perceptions**

Overall, commenters question the validity, adequacy, and efficiency of sampling procedures and equipment (299)(18)(297)(30)(1262)(4)(319)(5)(123)(1274). As one commenter stated, the credibility of the research depends upon who draws the sample, what the flow of the "sealed envelope" will be, and who chooses and pays the company in charge of the sampling (3). Another commenter expressed great uneasiness regarding the vagueness of the permit terminology and recommended deleting phrases such as "should be," "needs to," and "can be" and substituting less ambiguous wording such as "shall be." (1626) Another commenter suggested that shutdown conditions be studied separately from data acquired during operation (469).

Many commenters said that research testing would be far better done in a laboratory, controlled environment that used sea water and species indigenous to the North Atlantic (5)(13)(415)(1255). Several commenters noted reservations about the equipment to be used: for instance, some commenters rated the collection efficiency of the microlayer sampling equipment to be so low that what would be collected could not justifiably pass for representative samples (4)(35).

Raw data from the research should be made available to the public, one commenter suggested (469).

#### **2. Emissions**

One commenter stated that additions to the plume for tracking purposes could actually defeat the adequacy of the sampling because the tracer chemical, SF<sub>6</sub>, could add an unnecessary toxic to the plume (1268). Another commenter thought SF<sub>6</sub> might not follow the lightest compounds in the emissions (469). Another commenter said that CO, CO<sub>2</sub>, metallic oxides, silicate ash, organic compounds, and PIC's from erratic plumes would be subject to a wide ranges, hence open to interpretive abuse (1276).

Many commenters emphasized that the sampling procedures for emissions are not adequate to determine what kinds of emissions are released or where they will move (985)(283)(274)(415)(1275)(39)(28)(3)(899)(1248)(1276)(1626)(1340). This is an important omission to many commenters who believe that it is essential for this research to identify both the quantities and the toxicities of all emissions species and to establish analytical methods that are sensitive to toxicologically active levels of these substances (899). Using only one incinerator could make detection of some emissions impossible, one commenter believed

(469). Others say that since toxic byproducts and possibly uncombusted wastes could be emitted, careful monitoring and analysis of the emissions is the scientifically responsible approach to this research (1276)(28)(428)(283).

Some commenters argue that unrecognized compounds could be released before the high temperature required for destruction is reached (28). Others believe that the high temperatures will cause misleading results or sensor failure (469)(985). One commenter pointed out that the sampling transverse for land-based incinerators are downstack of the scrubbers where temperatures range from 140 to 200 degrees F. In this test, sampling will be done where exhaust gas temperatures can exceed 2,000 degrees F (985). Another commenter submitted literature on an incinerator from Environment Canada which appears to indicate that supposedly destroyed chemicals can recombine or form new products as they cool (1248).

Some commenters noted that the emissions tests will not adequately measure airborne metals (39)(1275)(1255). One commenter noted that every metal in the waste would exit through emissions, but perhaps in different chemical forms that could affect their solubility and bioavailability (1255).

One commenter stated that EPA was mixing an effort to issue 10 year permits with carrying out research that should come first and suggested that EPA should obtain certification of further research strategy from OTA (1343).

### 3. Air

One commenter found the lack of definite commitment in the permit documents to taking upper air measurements of temperature and humidity during the "minimum of two ascents per day" unacceptable and requested that this be reworded to unambiguously require measuring temperature and humidity (995). Another commenter suggested that EPA should at least assess the meteorological effects on atmospheric transport (1255).

### 4. Water

One commenter said that if a seawater trap were subjected to bubbling a stream of incinerator stack exhaust through the water, recooled, readjusted to normal pH and salinity, and then analyzed, the results would be false (4). This method, said the commenter, will actually reject rather than collect unburned hazardous organics. The reasons the commenter gave for this result were that bubbling removes organics from seawater; these organics are what attracts hydrophobic chemicals like PCB's. Also the effluents will lower the pH to less than 2, which will enhance lipid and humic material removal, and decrease PCB solubility. The chlorine introduced will cause some organics to



be removed by "salting out" and further decrease PCB solubility. Finally, if the water trap temperatures are high, partial pressures and evaporation will increase and consequently decrease the solution concentrations of hydrophobic molecules (4).

In contrast, notes this commenter, the oceanic microlayer with its rich organics and lipid content is a natural collector for uncombusted or partly combusted organic wastes (4).

Another commenter noted that grab sampling would not be a wise choice for this experiment since vertical and seasonal movements of water are complex and the true picture depends upon understanding these movements and sampling in appropriate locations (1255).

#### **4. Biota and bioassays**

One commenter suggested that studies of caged animals at sea might be a useful means to study water column effects of emissions on marine animals (1255). Others suggested a controlled lab experiment would be more reliable (5)(415). Another commenter said that tissues should be analyzed even though the duration of PCB exposures may be too short to obtain any useful results (899).

Another commenter noted that the proposed bioassays are only the most basic of biological tests (1276). The tests also will not assess genetic damage or human cancer, one commenter noted (899). A commenter stated that one to three tests on a few marine organisms cannot assess important life cycle effects and, further, address too narrow a habitat (1276). The organisms used should be carefully considered, another commenter stated, because laboratory species tend to be especially hardy and a more accurate test would employ indigenous species from the incineration area (1626).

Past research has been seriously flawed in its failure to collect samples under all conditions, one commenter said (39). This research should include a careful plan to collect samples under optimum conditions as usual, but also during upsets or rough sea conditions (390).

Studying long-term effects is extremely important to many commenters who object to the short-lived nature of the research on marine biota (1249)(28)(39). One commenter said that bioaccumulation, which is not addressed in this research, is a key factor in assessing long-term impacts (1249).

Numerous commenters believed that special attention should be paid to effects on the oceans microlayer; these comments are discussed in Chapter XIV on research design.

#### **6. Combustion efficiency, destruction efficiency, and flow**

One commenter objected to plans to measure combustion efficiency and flow on just the first two days of the burn and suggested they be measured throughout the burn (1255). For this purpose, full traverse sampling should be done, the commenter said, to determine whether any points of low CE exist during varied operating conditions (1255).

Before this project begins, destruction efficiency should be better established under more stable land-based conditions, one commenter noted (1255).

#### **XIV: RESEARCH DESIGN AND ANALYSES**

##### **1. General perceptions**

Many commenters believe that more preparation is necessary before a large-scale ocean incineration test is begun and recommend pausing to organize this research project better (298)(316)(140)(422)(144)(518)(445)(1255).

Commenters pointed to several facets of this research burn that they said were not adequately backed up with good data, credible analyses, or validated test-scale research (283)(1255). Some commenters observed that collecting sufficient baseline data on the research site is prerequisite to interpreting data collected from the research (283)(1255). Other commenters warned that research results could be obscured unless possible interactions and synergetic effects between the North Atlantic Incineration Site and the 106-mile dumping site were assessed before the research burn was carried out (466)(467)(271).

Several commenters doubted that the expected 99.9999 percent destruction rate for PCB's by ocean incineration was reasonably well established either in theory or by any previous burns (517)(298)(286)(986). One commenter stated that past tests had been inconclusive on this point (987). Another commenter asked that a land-based test burn of PCB's in Arkansas and a dockside burn of fuel oil be completed before the ocean incineration project, as scheduled, to protect citizens near the ocean incineration site (286). Another commenter warned that dockside or land models might not adequately characterize how the incineration process would behave under the rough sea conditions, however (469).

The public believes we lack some pertinent information that should be collected before carrying out the research burn; one such item is a better understanding of the wind and oceanic drift patterns that might carry pollutants (490).

##### **2. Microlayer**

Some commenters are concerned that microlayer effects will not be sufficiently studied (260)(351)(353)(1255). One commenter stated that this first few millionths of an inch of water at the surface just below the sea-air interface differs significantly from the surface water just below; in particular it is enriched with dissolved lipids, organic carbons, chlorophyll, phytoplankton, and bacteria (260). This commenter is especially concerned that nonpolar pollutants will become concentrated in the microlayer because of its high lipid content (260). Another commenter warned that incomplete combustion products can fall on the ocean's surface layer and significantly affect the basis of

the marine food chain (435). One commenter stated that commercially important fish travel through the area and fluke and lobster reside in the area, therefore microlayer pollution could significantly harm marine larvae and eggs, affecting commercial fishery as a result (1255).

### **3. Effects on biota**

One commenter pointed out that the distribution of fish and larvae in offshore waters and at the incineration site is not well documented, therefore EPA should determine what is present and potentially affected by the test burn (1249). Another commenter believes effects on biota are not adequately addressed in the research design -- the bioassays concentrate on too few organisms, in too narrow a habitat, for too short a span (1276). This commenter states that it would require large doses of compounds to immediately harm marine organisms; the more likely harm is bioaccumulation, entry to the food chain, and other long-term effects that are not designated for study. Many other commenters also question whether PCB's will enter the food chain, bioaccumulate, or bioconcentrate (70). Another commenter suggested that indigenous benthic and water column biota should be carefully studied for impacts, perhaps via caged animal experiments (1255). Monitoring should be done downstream from the site (1255).

One commenter claimed that the research design shows a lack of concern for air-breathing animals (469). Some commenters are disturbed that long-term effects are not being addressed and that possible carcinogenic effects are largely ignored in both the background information and in the test itself (12)(286)(370)(561)(469).

One commenter found efforts to assess exposures inadequate, pointing out that exposures are difficult to assess since pollutant pathways are quite varied and the reactions vary according to the organism (12). Data to date, said this commenter, are the result of individual judgement or unverified computer models.

### **4. Emissions**

The public is especially critical of the research burn's likely emissions and how they will be handled. Many commenters note that the emissions can carry newly formed toxics that are even more dangerous than the original waste (241)(139)(316)(353). One commenter points out that a criterion for burning PCB's under MPRSA is that the emissions be harmless or rapidly rendered harmless, a condition this commenter says is not met in the research burn (1324). In addition to the known possibilities, some commenters object to this research on the grounds that we do not even know what may come out of the stack (12)(1255). One

commenter points out that even though previous burns have shown enzyme induction in marine animals -- possibly indicating polychlorinated dibenzofurans -- and elevated levels of cytochrome P-450 in livers, this test fails to consider such substances (1255). Further, commenters give several reasons that this test may not resolve what is truly emitted: analysis is very difficult to perform in the stack's high exit temperatures (12); differences might show up if parameters were measured on more than one temperature zone (985); testing procedures are inadequate (296)(352); testing at sea is more difficult to carry out than on land and therefore more questionable (888)(1245); plumes are not constant and measurements may not represent the true picture (1276); DE measures only some preselected compounds (12)(1255). Much better control would be offered in a land-based research burn some commenters point out (1245)(1276). One commenter observed that even though we are not sure what might come out of the stack, toxics will surely be emitted (1323). Those that are hydrophilic and hydrophobic will seek fatty tissue in the environment. Such chemicals cannot be broken down or eliminated once they enter the body, this commenter added (1323).

Emissions of hydrochloric acid are unnecessarily high to many commenters who recommend that scrubbers be required as on land-based incineration(353)(329)(985)(590). A commenter who disagrees pointed out that scrubbers do not control toxics, do a poor job at heavy metals removal, and only control hydrochloric acid which isn't even necessary on the ocean environment since the alkaline waters will soon buffer the acid (330). One commenter observed that the permit does not state the frequency of HCl monitoring (350) A commenter who supports scrubbers finds the potential HCl emissions significant (985). If the waste is 10 percent PCB's, the burn would emit 625#/hr of HCl; at 30 percent PCB's this would rise to 1,865 #/hr (985). Another commenter estimates that one incinerator ship could raise acid deposition in New England by .3 percent; a fleet of incinerator ships would certainly present a likely target for control the commenter observes (350). Nor is it a foregone conclusion that the sea will be the receptor of HCl emissions some commenters point out (985)(350). These commenters believe that the emissions can easily be carried to land.

Emissions should also be sampled away from the incinerator stack one commenter noted (469).

## **5. Materials and methods**

Some commenters object to a lack of validated testing and assessment procedures (352)(502)(12)(435). They note that EPA has not pretested the methodology and equipment that CWM will use and say EPA should carry out preliminary trials of chemical analyses to demonstrate the accuracy before proceeding with the

research burn (296). Several commenters ask that EPA adhere to advice of the SAB (286)(228).

Another commenter says plume impact modeling is not described in the working document (985). Another commenter says that EPA's decision to track the plume horizontally, but not vertically constitutes a frivolous approach to this test (228).

## **6. Models and theoretical bases**

The fate and transport models are suspect, says one commenter, because they were developed for land-based incinerators with very little field verification (1261). These are necessarily inaccurate for oceanic conditions (1261). The same commenter gives another example of a flawed model in the research assumption on waste dilution that claims mixing to a 20 m depth in 4 hours. The commenter notes that, first, the waste will be biologically concentrated and held in the microlayer and, second, some areas experience upwelling that can entrain surface waters, which reduces the depth of thermocline, thus making less water available for dilution.

Other commenters question destruction efficiency as a valid concept to measure results since it considers only selected chemicals and does not analyze everything that comes out of the stack (1255)(12). Nor are the analytical methodologies to be used in this research validated for the test conditions or the emissions matrix one commenter also noted (12). The working document is also not specific about how verification would be performed said one commenter (1255). This commenter wondered how EPA proposed to establish DE and observed that it was unlikely that DE could be correctly calculated from CE. The commenter also requested that DE reflect a complete analysis of all organics and PIC's from the stack, an aggregate analysis of the chemical mixture released to the environment, and the consequences of flame-outs and other interruptions (1255).

One commenter claimed that the Agency had misrepresented the success of DE and CE in a past burn despite the fact that severe technical difficulties, particularly vibrations, had prevented any valid data from being collected (1323).

## **7. Research objectives**

Several commenters believe that the test will not achieve its stated purpose of testing ocean incineration as a viable and safe hazardous waste management technology.

One commenter notes that EPA is not addressing cumulative impacts of the fat soluble pollutants on the marine environment, and therefore will not know whether the long-term effect is safe

or harmful (1255)(1626). Many commenters fault this experiment for its failure to investigate long-term effects on biota (12).

Another commenter finds the experiment's shortcomings even more basic -- it goes in the wrong direction entirely: Surely, this commenter says, the point should not be how little additional harm we do to the ocean, rather we should concentrate on reversing past contamination (358). Many commenters think the narrow scope of this research will add to our understanding of some processes but fails to offer valid support for a full-scale incineration program (327). Many of these objections rest upon the waste chosen and were discussed in Chapter V. Another commenter thinks the test may not prove much because the DE may, be unverifiable (318).

One commenter thought that none of the research's five stated objectives could be met as the research is now designed (1255). The first objective -- public participation -- was thwarted by EPA's failure to release critical information until after the February 15, 1986, comment period closed (1255) (note: this period was subsequently extended). This commenter charged that the Agency failed to collect the extent of toxicity data via testing that it had publicly stated it would pursue at the time of the Draft Strategy in October 1984 and, furthermore, failed to summarize and turn over to the public what little information it did collect.

The same commenter said the second objective -- characterizing emissions for a specific waste feed -- was poorly fulfilled by choosing a waste of such stable BTU content. The test, as a result, could only justify subsequent burning of wastes with equal or higher BTU ratings. Further the test should be run on a pilot scale -- which 700,000 gallons is not (1255).

Lack of testing for fat soluble contents, failure to measure HCl emissions impacts, failure to collect adequate background data, failure to perform preliminary effects research, the use of inappropriate and nonindigenous test species, and the proposed use of only one incinerator (which could lead to emissions below detectable levels that might be detectable if three stacks were used) all destroy the possibility of achieving objective 3 -- a toxicity determination through lab analyses (1255).

Short term sampling of a "one-time event" precludes successfully reaching the fourth objective -- determining toxicity through field measurements -- said the same commenter (1255).

Finally, the fifth objective -- to develop and begin verifying transport models -- could not be met based on weaknesses in past research efforts that are once again poorly addressed or ignored in the present research, the commenter said (1255). The commenter also pointed out that transport model

verification does not require incinerating PCB's at all. It could be achieved with any nontoxic, isotopically stable tracer (1255).



## **XV. PERFORMANCE STANDARDS**

### **1. Destruction efficiency**

Some commenters feel that destruction efficiency is an inadequate measure to assure that the incineration does not release excessive PCB's to the environment -- Chapter 14 already discussed its limitations for assessing the full range of chemicals emitted. Another objection, however, is that even 99.9999 percent destruction allows some PCB's to enter the environment. One commenter calculated that, even if perfect 99.9999 percent destruction achieved, one-fifth of a quart of PCB's could still enter the environment (311). This commenter says that amount is not insignificant because of PCB's bioconcentrative tendencies. The first organism might ingest only trace amounts, but by the stage in the food chain where larvae feed off of single celled organism, this concentration could be 10 ppb, the next feeder would be at 100 ppb. At the top of the food chain predator fish like tuna and bluefish would be at ranges beyond safety for human consumption (311). Several commenters noted that the SAB has called destruction efficiency a "scientifically inadequate" measure (351). Others do not think DE can even be measured with accuracy (272). If any inefficiency is permitted, asks one commenter, how can we possibly preclude the production of dioxins in the burn process (129)? Many commenters echo a concern about production of dioxins and other organic compounds that will be produced but not identified (249).

One commenter points out that even a short-lived upset will lower the DE temporarily (327). Further, says another commenter, the automatic shutoff has a four second delay during which wastes will continue to pour into the incinerator, at best (1354)(469)(1248). Commenters ask how often this can be allowed to happen in 25 hours or during the entire period before the experiment would be cancelled (469)(1248). One commenter questions whether the 4-second delay itself is even likely to materialize because the controlling equipment will be subject to excessive stress from the incinerator heat (1354). Another commenter believes that the action of a pitching boat will certainly interfere with DE (249). As a check on DE, one commenter suggests that baseline data be taken on the Delaware estuary and the burn site for later comparison (340). Another commenter wrote to express concern over the controversy on incinerator efficiency and index of incinerability (3).

Some commenters believe that the destruction efficiency can and should be monitored continuously (1354)(469). Finally one commenter notes that destruction efficiencies were derived by an ad hoc process and developed under ideal condition; for real operation the target efficiency should be even higher to allow a cushion for lowered efficiencies during upsets (1354).

Another commenter pointed out that it would be wasteful to burn fuel at a 95.95 percent CE (plus or minus .05 percent) for a full 24-hour period before starting the waste feed. Surely a full hour at the required CE should suffice this commenter said (1268).

## **2. Environmental performance standards**

The elements of environmental performance standards -- HCl emissions and harm to the environment -- were already discussed in the chapter on research design since the thrust of comments was that these issues need rethinking altogether, and did not deal with how the standards would be carried out in operation.

## **XVI. INCINERATOR OPERATING STANDARDS**

### **1. Incinerator temperatures**

Some commenters question whether it will be possible to maintain the required 2,400 degree temperature under sea-going conditions (298). Some feel that gauge readings for temperature and other controls will be affected by the test conditions -- pitching in the rolling seas (595). One commenter notes that the automatic waste feed will shutdown the operation when the temperature does drop to 1,100 degrees in the wall (330).

One commenter claims that incinerator ships as a class do not meet as high a temperature requirement as land-based incinerators and that is an illegal exception that has never been published in the Federal register or reviewed (129). This commenter calls incinerators aboard the Vulcanus only little better than powerplant incinerators, which are adequate only for dilute PCB incineration.

One commenter notes that conservative practice would require locating the thermocouple to control temperature at the point where the lowest temperature to be used to calculate residence time would be recorded (1354).

### **2. Residence and dwell time**

One commenter says the Vulcanus residence time offers low-quality incineration that is environmentally risky (129). The commenter quotes section 761.40 of the PCB regulations at 1,200 plus or minus 100 degrees for 2 seconds, or 1,600 plus or minus 100 degrees C for 1 1/2 seconds.

Another commenter suggested that the volume of wastes below the burner center line and above the upper level thermocouple should not be included in residence time calculations (1275).

Another commenter notes that the literature on residence times show that less than 0.1 second residence can yield thermal destruction under laboratory conditions and that this would destruct PCB's in operation as well, provided the mixture were correct and the waste reached the flame front or remained for much longer times. These conditions would be assured, the commenter said, in a plug-flow incinerator design with a nonflame afterburner (1354). The Vulcanus, this commenter points out, does not have such a design and cannot accommodate an afterburner. This commenter faults others who have described the Vulcanus system as having a laminar flow, which it does not. The commenter insists that afterburners are necessary to ensure that all wastes in the stream are adequately treated to achieve destruction.

Another commenter observed that under TSCA regulations a waiver on dwell time relies on the destruction removal efficiency as the primary measure of performance. Since this burn states that establishing DRE is one of its objectives, it is not valid to use DRE to justify a waiver for residence time requirements (1255). The commenter added that the scientific community differs over the significance of residence time and a waiver is not warranted on the strength of current data in any case (1255).

### **3. Automatic recording and automatic shutoff**

One commenter notes that even automatic shutdown and recording devices are never truly tamperproof, that throughout industry such devices are routinely turned off to save trouble (324). Moreover, what is recorded can be inaccurate because of rolling and pitching from the ship (327)(595). Another suggested that an indication of pump condition be part of the automatic shut-off system (1275).

One commenter asked that a manual override be allowed because the CO concentration of less than 100 ppm would be exceeded for short periods such as when waste feed is initiated and an automatic shutdown would delay the process unnecessarily (1268). Flame-outs should not trigger a shutdown as long as at least one of the three burners is lit, this commenter said (1268).

As for the speed of shutdown, one commenter believes that a 4-second delay is unnecessary; TSCA regulations would require immediate shutdown, which is technically possible because an automatic shutoff coupled to the temperature reading would be triggered immediately by electric relay (1255). Another commenter, however, objected to requiring shutdown time "on the order of" 4 seconds and asked that the permit require shutdown within 4 seconds (469).

### **4. Waste feed and feed rate**

One commenter said that the 10.5 cubic meter per hour feed rate is inconsistent with the engineering details of operating at 177 million BTU's per hour with a fuel of specific gravity 1.03 yielding 13,900 BTU's per pound (1275). The feed rate is automatically recorded by a tamper resistant or tamper detectable device, one commenter noted.

One commenter noted that rotary cup burners such as the Vulcanus are not the best means of atomize liquids into incinerators (1354).

One commenter worried that waste fed to the incinerator in the 4 seconds before a shutdown might be more concentrated and asked how this would affect calculations of efficiency (469).

## **5. Smoke and plume**

The condition that no "black" smoke be allowed is not acceptable to several commenters (469). One says color should not be the control, but content -- only waster vapor should be visible (1277). Another suggested that ambiguity over shades of gray could be eliminated by allowing only "white smoke."

Since plume length would vary according to conditions, one commenter suggested that radio broadcasts to nearby traffic warn ships to stay further away than 3 nautical miles (469).

## **6. Vibrations and systems monitoring**

A special provision of the permit allows the shiprider to shut down the burn if vibrations can endanger the integrity of the incinerator system, tank, or, ship, one commenter noted. This should be extended to require a shut down if vibrations interfered with burn efficiency as well, the commenter said (1255).

The same commenter considered daily inspections for fugitive emissions too infrequent and asked that the shiprider inspect the entire system for leaks and fugitive emissions and record status more frequently (1255).

## **XVII. MONITORING**

### **1. General perceptions**

Nearly all commenters agree -- monitoring the activities under this permit is necessary (368)(297)(206)(1255)(342). Hundreds of commenters don't believe it can be done effectively, however (1012)(289)(300)(991)(1266)(1500)(1605).

Some of these commenters pointed out that enforcement of the monitoring and other research protocols are not adequately provided for in the permit (1255)(1262). Many commenters cited a lack of good monitoring in past test burns and in hazardous waste disposal in general as the basis of their doubts that this project would be well monitored (1023)(322)(249)(474)(313). One such commenter said that EPA did not monitor well on land, often taking readings of emissions upwind of stacks (324). A few commenters specifically requested that someone not from EPA or from CWM be onboard the Vulcanus as an additional guarantee that the experiment would be conducted correctly (342)(331). Another commenter emphasized that personnel who are authorized to inspect the equipment should be allowed to "inspect and test" since inspection implies looking only (469). One commenter wanted the absolute power to halt the burn vested in this independent observer (331). Some commenters, however, do believe that past monitoring efforts have been effective (302)(275).

### **2. Citizen oversight**

Several commenters requested that monitoring data be made available to the public (340)(297)(319). One commenter pointed out that MPRSA had its own freedom of information provision for public access to information (330). Some commenters said that the monitoring of the 6-mile sludge dump site off the coast of New Jersey had not capably ensured that the barge released loads in the designated area; they doubted monitoring would be better handled 140 miles from shore (474)(313). In fact, said one commenter, most violations were reported by fishermen, not the authorities (313). Given this, many commenters believe that the public-spirited citizen is an invaluable watchdog, and they ask how these citizens will now be assured that the official monitoring is indeed factual since the site will be beyond their watch (276)(1248)(327)(296).

### **3. Shipriders**

Numerous commenters support using shipriders (3224)(595)(284). Many, however, either interpret the permit to mean that only one EPA shiprider will travel with the incineration vessel or ask that the permit specifically state at least three

shipriders to ensure that someone will be awake and fresh around the clock for the full 19-day burn (340)(1626)(1255). One also requested three Coast Guard shipriders as well (1255). Some commenters fear that staff cuts, budget difficulties, or other problems may lead to inadequate coverage (1054)(1263)(324)(224). Shiprider training should be specified in the permit, said one commenter (1626); so should the criteria for selection, said another (1255). Another commenter claims that the burn site is too far away, even a shiprider could not assure compliance (1621). And, under no circumstances, said this commenter, should the permittee become involved in the monitoring process (1621).

Some commenters would like the shiprider's authority specifically spelled out in the permit and to state that the shiprider has ultimate authority for the research burn and will shut it down if all conditions are not being met (1255).

### **3. Monitoring devices**

One commenter suggests that the flow rate should be measured by bona fide flow measuring devices and not calculated from tank soundings (1275). This commenter also points out that any devices should pass standard EPA tests given in 40 CFR Part 60, Appendix D and located per their performance specification tests.

Some commenters are concerned about the accuracy of monitoring devices and indicate that equipment should be calibrated before the cruise (1255); one commenter specifically states that devices should also be calibrated after use as well as before to assure no shifts have occurred (1277).

A commenter points out that monitoring devices will have tamper-proof or tamper-resistant controls (1268). This commenter believes that a shutdown should not be invoked merely because of "any indication that the devices are not providing accurate readings," and suggests that it would be better to require a shutdown if there is a "failure of the monitoring devices."

One commenter explained the tamper-proof system: the incinerators would be monitored continuously by sensors for temperature, oxygen, and carbon monoxide. This information would be recorded automatically on a floppy disk; the disk drive would be locked and only the shiprider would have the key (330). Skepticism exists over how tamper-proof the devices might be, however (469). One commenter asks that these devices be under constant supervision of an independent entity (1255).

One commenter also recommends hourly monitoring for time, date, wind speed and direction, vessel position, and vessel course and speed (1268). Another suggested that data should be recorded more frequently than once every 3 minutes and that rolling and pitching of the vessel also be recorded (469).

Permit wording that allows the principal shiprider to authorize continued burning even if all the permit conditions are not met is "the most glaring loophole of all" in this permit one commenter believes (296). Some commenters ask that certain failures be placed outside the principal shiprider's discretion and constitute a mandatory shutdown (296)(1255).

#### **4. Coast Guard involvement**

One commenter requested that more than one Coast Guard shiprider be a definite requirement for this research, not an option (1255). Another commenter said that a Coast Guard shiprider would be on board (345). A commenter wished to affirm that the Coast Guard would check the ship and incinerator soundness before the cruise (1255). This inspection should include all three incinerators, said another commenter (469).

Although the right to make unannounced inspections might sound like a good precaution said one commenter, how could they be carried out since the Vulcanus could detect Coast Guard boats or airplanes well before arrival? (224).

Coast Guard regulations will apply to loading and offloading operations, one commenter noted (284).