

A HAZARDOUS WASTE SITING EXPERIENCE

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Summary

This article describes experiences in attempting to conduct hazardous waste research at the pilot scale and the difficulties in finding an acceptable setting for the research. A description of events leading up to and the selection of the site for the USEPA Combustion Research Facility is presented.

Introduction

There are few environmental issues likely to draw more attention than the attempts to site new integrated waste management facilities in the United States today. However, this was not always the case, in a report prepared under U.S. Environmental Protection Agency (USEPA) sponsorship in 1973 the authors state that from the results of a national survey "The social climate for establishment of a national disposal site (NDS) system was positive. Most respondents expressed a favorable attitude toward the NDS concept" [1]. The report, part of a Congressional mandate in Section 212 of Public Law 91-512 required a feasibility study dealing with three aspects of NDS: (a) technical, (b) economic, and (c) social. At that time the social trends favored the NDS concept by 67.9% of those sampled. Additionally, 60% of those surveyed favored an NDS in their county.

Since that early work was reported, many negative feelings have surfaced regarding hazardous waste disposal sites by almost all communities that might be selected for such an operation. In a report dated June 1979, the Institute of Environmental Research concludes that, "The credibility of the agency and consequently of its information, has been undermined by their inability to establish their trustworthiness to compliment their expertise" [2]. In a report entitled "A systematic approach to siting waste management facilities" the authors found a similar concern by those surveyed in that 67.5% responded that they had diminished faith in the regulatory agency over past enforcement efforts [3].

Not the least of factors to be included in the general decay of public trust and confidence during this period was the incident at Three Mile Island (TMI). This has probably caused the greatest impact albeit negative, on both

public officials and technologists that could have happened in the U.S. Combine the negative effects of TMI with the almost daily reporting of yet another past disposal site causing some form of environmental insult coupled with adverse local health effects and the problem of siting new facilities becomes even more difficult.

Recent articles addressing public attitudes concerning hazardous waste treatment facility siting offer an array of reasons for the problem [4-6] and ways of improving community acceptance [4]. One recent article goes so far as to maintain that the attention to the siting problem is misplaced [7]. Perhaps it is, but when, as the author indicates, confidence in government information falls it does not quickly recover. Many assertions are made as to what is the real problem in siting but no proven solutions are offered. When discussing the siting problem with colleagues from other parts of the world and asking them how they sited major integrated waste management facilities this author was informed that perhaps they (the foreign country in question) were less democratic than the U.S. In other words the government officials chose the site and informed the local citizens of the choice.

Our neighbors to the north in Canada, and especially the Province of Alberta, have recently concluded a five year program of site selection and public involvement. What follows is the sequence of events that led up to and was involved in the siting, presentation of information and eventual construction of the USEPA Combustion Research Facility (CRF) in Jefferson, Arkansas. It is not a prescription for success, it only describes the approach taken to site the CRF. What is thought to be important is honesty, integrity, depth of knowledge in the field, openness with the public and press, a sincere effort to respond to all citizen input and a professional commitment for preserving the environment and making the water and air safe for human consumption. There are no guarantees of success but by working together we can protect the environment and our health.

Historical perspective

In 1975, the EPA published the results of a major research program entitled "Determination of incinerator operating conditions necessary for safe disposal of pesticides" [8]. This report presented the results of a number of incineration tests covering several pesticide formulations and molecular structures. At that time, it represented the Agency's first attempt to define safe operating conditions for the thermal destruction of hazardous substances, in this case pesticides. Further, under the authority granted the Agency by the Resource Conservation and Recovery Act of 1976 (RCRA), the Agency used this report along with other documents [9] to establish the incineration conditions that are required for the incineration of hazardous wastes as listed in appropriate Federal Register publications [10, 11].

During the regulatory development exercise, it became apparent that there were few data that would suffice to provide support for such regula-

tions and that a major research and development effort would have to be undertaken to provide that data. This program was planned to consist of two major efforts: (a) a laboratory research program to provide basic data on the thermal stability of specific hazardous compounds, and (b) an extensive series of full-scale test burns using existing equipment and facilities.

As this program moved forward, it became apparent that there were significant differences observed in the large-scale experiments from those derived in the laboratory studies. This matter has been treated elsewhere [12]; suffice it to say here that the differences are thought to arise from the simplifications that have been made in the incineration conditions maintained in the laboratory-scale experiments.

It was decided that what was needed was an intermediate-scale study that would more nearly approximate the thermal and chemical conditions that exist in full-scale technology, but at the same time be close enough to the laboratory studies so as to provide a bridge between the two. In July of 1978, a research contract was awarded to conduct parametric investigations of a pilot-scale hazardous waste incinerator. The program was originally scheduled to rent the technology at the manufacturer's facility and have contract personnel conduct the necessary experiments on an intermittent basis so as not to disrupt activities of the manufacturer. Unfortunately, this procedure was found to be unsatisfactory for a number of reasons including the inability of the manufacturer to make the equipment available. Eventually, the EPA authorized the contractor to purchase the incinerator and move it to a suitable site at which the experiments would be carried out.

The contractor found a suitable isolated site that was zoned for industrial research and development and that was within commuting distance from his office and laboratories. Permits were received from the state with the admonition not to be concerned with local officials as they did not normally concern themselves with such items. All agreements were drawn up and modifications to the site initiated, when local citizens became concerned and effectively blocked the continuation of the program. A very vital lesson in communication was learned and subsequently reported on in the literature [13].

National site search

In September 1979, after the two siting failures, the author was charged by the Agency to find an acceptable site, on Government-owned land, in a sparsely populated area, preferably where the local citizens had previous experiences with hazardous materials for the incinerator and to conduct the research at that site. An analysis of the earlier siting failures strongly suggested that the public would never accept the concept of this type of research being carried out in anything suggesting a makeshift facility. What was required would be a fully dedicated facility specifically designed for incineration research and for the handling of hazardous materials. As an essential first step in the search for suitable facilities, it was required that the criteria

for such a laboratory facility be carefully outlined and a general layout for the facility be designed. The essential criteria were defined as follows: (a) the laboratory must be staffed and equipped so as to be capable of on-site analyses of both the incoming candidate waste streams and of all effluent streams from the facility; (b) the operations should be entirely professional and the resulting data made available to the interested public; (c) safety of the operating personnel, the facility, and the surrounding area must be the first considerations in all operations; and (d) since recently published data [14] indicate that the products of incomplete combustion (PIC's) may, in many cases be significantly more hazardous than the components of the waste that require the latter to be classified as hazardous, the laboratories must be of a quality to allow the safe handling of toxic materials including carcinogens.

With these criteria in hand a site search was undertaken. The approach was, in every case, begun by a search of available Government space (this was selected as a criterion since thereby it would be possible to avoid zoning problems) followed by direct contact with the responsible authorities at the available sites. In most cases, very little enthusiasm was exhibited so that no further action was necessary. Eventually, the National Center for Toxicological Research (NCTR) in Jefferson, Arkansas, suggested that they could and would make space available. The author visited the decision officials, was well received, and observed that the site was ideal for the proposed facility. Specifically, NCTR is located on the northern boundary of the Pine Bluff Arsenal on a good all-weather road in a location that is sparsely populated and served by a community that is well conditioned to understand the danger inherent in the handling of explosive and toxic materials (the Arsenal is the national depot of chemical weapons for the Army).

Preparation for permit of operations

With the approval in principle by the management of NCTR, preparations were begun to obtain the approval of the state and local officials that would be concerned and to properly inform the public of the planned facility [15]. Previous experience had shown that the latter element of the informational program was at least as critical as the former. The steps taken were the following:

- (1) Confer with and inform the cognizant USEPA Regional Administrator and staff of the proposed facility and its mission.
- (2) Confer with and inform the highest state officials of the proposed facility and its planned mission.

When these individuals were satisfied with the general notion and indicated that they would actively support the facility, the next series of steps were taken. Specifically, these consisted of the following:

- (3) A series of meetings with the Arkansas Department of Pollution Control and Ecology (DPCE) were held covering the general concept of the facility, its mode of operations, and the nature of the staff. These

meetings finally led to an application for the construction permit and the assurance that, if there were no public objections, the operating permits would be forthcoming.

- (4) A series of meetings were held with state officials and agencies that would be impacted by the facility. This included the health, police, and transportation departments among others.
- (5) A series of meetings were held with local officials and with the members of the state legislature who represented the area that would be most immediately impacted by the facility.
- (6) Civic groups were offered the opportunity for informal (or for that matter, formal) presentations on the planned facility and its mandate.
- (7) State industrial organizations were considered important in this informational program since they were concerned with hazardous waste disposal problems, maintained important informational services for the state officials, and could be expected to serve as sources of test materials in the active phase of the research program.

The format of the individual informational meetings was, of course, tailored for the specific group to be addressed. There were, however, many features of each of these meetings that were common. In order to be assured that all parties were aware of the magnitude of the hazardous waste disposal problem in the United States, a slide show using selected examples of the poor practices used in the past and the consequences that all too often have accompanied such practices was presented by Agency officials. After this introduction, the detailed program proposed for the Combustion Research Facility (CRF) was discussed. In each meeting, sufficient time was allotted for questions from the concerned audience. In some cases, for example with the DPCE of Arkansas, there were a number of meetings, most of which were working sessions wherein the specific requirements for permitting the facility and its operations were discussed and finally incorporated into the construction permit and into the protocol for the operation of the facility.

During the extensive series of informational meetings and briefings, the media were informed, in detail, by both press conferences and detailed handouts that carefully and fully described the proposed program. Further, the national congressional delegation was kept informed by frequent letters that described the promotional activities that were underway.

The culmination of this activity was a public meeting in Pine Bluff, Arkansas, at which the public was afforded the opportunity to present their questions and possible concerns. The meeting was chaired by the Director of DPCE supported by responsible staff from the Agency, and from the EPA contractor. The attendance at the meeting was approximately equally divided between media persons and the technical and administrative officials there to defend the program. The informational program that had been conducted had apparently answered questions and there was no public concern expressed. Shortly after this meeting, the State of Arkansas issued a construction permit for the facility [18].

Epilogue

Even though efforts began in the fall of 1979, it was not certain until July 1982, when the EPA took title to the CRF that the program would succeed. Following all the aforementioned events the EPA was required by RCRA regulations to apply for a full Part B incinerator permit. This process took approximately one year and was officially issued to the CRF by the Arkansas Department of Pollution Control and Ecology who has responsibility for issuing incinerator Part B permits, in July 1984, making it one of the first facilities in the United States to hold a full Part B RCRA incinerator permit.

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