OSWER Policy Directive #9527.00-1A

530SW86008

GUIDANCE MANUAL FOR
RESEARCH, DEVELOPMENT, AND DEMONSTRATION PERMITS
UNDER 40 CFR SECTION 270.65

EPA/530-SW-86-008

July 1986

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Office Of Solid Waste
Permits and State Programs Division
Washington, DC 20460

FOREWORD

This guidance manual has been prepared by EPA's Office of Solid Waste to assist permit applicants and EPA Regional and State permit writers in preparing and processing research, development and demonstration (RD&D) permits. The overall objective of the RD&D permit program is to accelerate the permitting of experimental and innovative hazardous waste treatment alternatives to land disposal in a manner that is fully protective of human health and the environment.

RD&D permits will allow testing of new and modified technologies and processes at lab-scale, pilot-scale, and full-scale. The level of detail required for permit applications will be decided on a case-by-case basis, depending on a combination of site-specific factors such as facility size, type and quantity of waste, duration of operation, potential for health and environmental damage, and qualifications of the persons who will operate and manage the RD&D facility. However, to allow flexibility in testing experimental units, RD&D permits will be tailored to the scope of the research. Also, information needed for delisting petitions will be specified early in the permitting process when one of the research objectives is to prove that the residues resulting from treatment are non-hazardous wastes.

The Agency anticipates that RD&D permits will play a key role in providing information on the feasibility and efficiency of technologies and processes that minimize the quantity and toxicity of hazardous wastes requiring land disposal. This information should be useful in accelerating the issuance of full RCRA permits when the demonstrated technologies and processes are ready for commercial use.

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ACKNOWLEDGEMENTS

This document was prepared by the Permits Branch in the Office of Solid Waste. The principal EPA authors were Nancy Pomerleau and Arthur Glazer. The authors wish to acknowledge the assistance of Headquarters and Regional staff whose efforts led to the completion of this manual. Special thanks are given to Ken Gray, Mike Northridge, Bob Tonetti, Denise Hawkins, Marc Turgeon, Irene Horner, Jim Cummings, Clyde Dial, and C.C. Lee for providing timely reviews, excellent technical advice and legal interpretations.

EXECUTIVE SUMMARY

Section 3005(g) of RCRA, which is codified in 40 CFR §270.65, allows EPA to issue research, development, and demonstration permits (RD&D). A primary purpose of RD&D permits is to develop safe alternatives to land disposal of hazardous wastes. RD&D permits will allow the testing and demonstration of innovative and experimental treatment technologies and processes which are not yet subject to experimental activity standards under RCRA Parts 264 or 266.

To expedite permit issuance, the permitting authority may modify or waive the permit application and issuance requirements of RCRA, except for the financial responsibility requirements and the procedures for public participation. RD&D permits must also include terms and conditions that assure protection of human health and the environment. Moreover, the permit term is limited to one year of operation and may be renewed three times. Also, the corrective action requirements for releases from solid waste management units do not apply to RD&D facilities.

EPA will issue RD&D permits until States apply for and receive authorization to issue these permits. However, if a State is authorized to issue general RCRA permits for the technology involved in the RD&D experiment (e.g., treatment in a tank or incinerators), they must determine whether to issue a full RCRA permit or defer to EPA to process an RD&D permit. EPA will not issue an RD&D permit if an authorized State chooses to issue a full RCRA permit for experimental activities. When EPA issues an RD&D permit, a State or locality may impose additional requirements on the facility under State law or local ordinance.

To expedite the review of RD&D proposals, EPA encourages permit applicants to summarize the research in a letter before attempting to prepare a permit application. This letter should (1) state the purpose of the research, (2) explain why the research is experimental and innovative, and (3) summarize the research objectives. The permitting authority will generally review the proposal within 30 days of receipt to tentatively determine if it is eligible for an RD&D permit and to identify additional information needed to prepare a complete application.

The level of detail in RD&D permit applications will be determined by a combination of site-specific factors such as facility size, type and quantity of waste, duration of experimental activity, potential for health or environmental damage, and the applicant's staff experience and qualifications.

Any anticipated or potential operating or equipment changes to the facility should be included in the permit to preclude the need for permit modifications.

The Office of Solid Waste in Washington, DC maintains a clearinghouse of information on the type of RD&D technologies and processes and the results of permitted activities. This information is available to any persons upon request and should be useful to both permit applicants and permit writers when the demonstrated technology or process is considered for commercial use.

1. INTRODUCTION

1.1 Purpose of this Manual

This guidance manual is intended to aid both permit applicants and permit writers. It provides guidance in preparing permit applications and in drafting permit conditions for research, development, and demonstration permits (RD&D), pursuant to the requirements of Section 3005(g) of the Resource Conservation and Recovery Act (RCRA), which has been codified in 40 CFR Section 270.65.

Because each RD&D proposal is unique, this manual provides a general framework for evaluating these proposals and issuing the RD&D permits; it does not provide a rigid set of procedures and application requirements for all types of RD&D proposals. To take advantage of the flexibility allowed in issuing RD&D permits, each proposal must be reviewed individually to determine the appropriate types of information and level of detail that will be required from the applicant to establish conditions in the permit.

1.2 The RD&D Permit Provision

Subtitle C of the Resource Conservation and Recovery Act (RCRA) (Public Law 94-580) requires the U.S. Environmental Protection Agency to develop regulations for issuing permits for the treatment, storage, and disposal of any hazardous waste that is identified or listed under the Subtitle. The Hazardous and Solid Waste Amendments of 1984 (HSWA) (Public Law 98-616) amended Section 3005 of RCRA to give the Agency new permit authority under Section 3005(g) to issue research, development, and demonstration (RD&D) permits for innovative and experimental hazardous waste treatment technologies or processes. The Agency has codified this new authority in 40 CFR §270.65 of its regulations (50 FR 28752-3, July 15, 1985). The purpose of RD&D permits is to aid the development of safe alternatives to land disposal of hazardous wastes by allowing applicants to conduct experimental testing or demonstration of new hazardous waste treatment technologies or processes by modifying or waiving most of the RCRA permit application and procedural requirements.

The statute and §270.65(a) authorize the Administrator to issue permits to any activities which use an innovative and experimental hazardous waste treatment technology or process. These activities may involve technologies which could be permitted under 40 CFR Part 264 or 266 or technologies or processes which are not yet subject to RCRA Part 264 or 266 regulations.

However, if permit standards for an innovative and experimental activity are promulgated, those standards may apply in lieu of §270.65.

The statute in §3005(g)(1) and the regulations in 40 CFR §270.65(a) generally provide the substantive standards for RD&D permits; permits are to include terms and conditions as will "assure protection of human health and the environment". Under this new authority, EPA may select any appropriate requirements that assure adequate protection and EPA may establish permit conditions without separately establishing regulations to implement such criteria. However, where appropriate, the Agency will apply the substantive requirements of 40 CFR Parts 264 and 266. In addition, EPA is directed by Congress to include two specific substantive requirements in RD&D permits: the types and quantities of hazardous waste and financial responsibility requirements.

The statute in §3005(g)(2) and 40 CFR §270.65(b) address the procedures for issuing RD&D permits. They provide that the Administrator may "modify or waive permit application and permit issuance requirements established in the Administrator's general permit regulations", however, the statute precludes a waiver of public participation procedures. Therefore, the procedural requirements of Parts 270 and 124 will apply to processing the permit application unless EPA waives such requirements on a case-by-case basis. The Agency may modify or waive these requirements (except for public participation procedures), for the purpose of expediting the review and issuance of permits for innovative and experimental activities under this section. The statute and the regulation also provide limits on the term of RD&D permits and provide the Agency with the authority to terminate these permits. A copy of 40 CFR §270.65 is included in Appendix 1.

1.3 Relationship to the Corrective Action Provision

The corrective action requirements for releases of hazardous waste or constituents from solid waste management units, as provided for in the new RCRA §3004(u), added by HSWA, do not apply to owners or operators seeking an RD&D permit under §3005(g).

EPA believes that Congress did not intend RD&D permits to address continuing releases of hazardous waste or constituents from solid waste management units. In establishing the separate, new authority under §3005(g) to permit RD&D activities, Congress distinguished this authority from other RCRA permitting authorities for treatment, storage, and disposal activities under §3005(c). The legislative history also makes clear that continuing releases were to be addressed for any treatment, storage,

or disposal facility seeking a permit under §3005(c) (129 Cong. Rec., H11129, daily ed., October 3, 1984); moreover, Congress intended the RD&D permit process to expedite review and issuance of such permits. In §3005(g), EPA was therefore directed to issue permits for the RD&D activity and was not directed to address other activities or releases in these permits.

1.4 Treatment Activities Excluded from RCRA Permitting

Persons engaged in treatment activities listed in 40 CFR §§270.1(c)(2), 270.1(c)(3), and §264.1(g) are not required to obtain a RCRA permit when treating hazardous wastes. The most significant of these activities, in terms of the RD&D permit program, include: (1) a small quantity generator of less than 100kg of hazardous waste in a calendar month who is conditionally exempt from most of the RCRA regulations, pursuant to §261.5 (51 FR 10146-10178, March 24, 1986), and who is using a technology or process on-site to treat his own hazardous wastes (providing the facility is permitted, licensed, or registered by a State to manage industrial or municipal solid waste); (2) a person who owns or operates a facility to conduct laboratory or bench-scale testing of hazardous wastes solely to determine its characteristics or composition (§261.4(d)); [Note that laboratory, bench-scale, or pilot-scale tesing of commercial chemicals in "synthetic mixtures" is not regulated by RCRA because these mixtures are not considered hazardous wastes]; (3) the owner or operator of a facility managing recyclable materials, as defined in §264.1(g)(2) to the extent that the waste in the experimental unit is exempted as a recyclable material; or (4) owners or operators of elementary neutralization units or wastewater treatment units (i.e., tanks) as defined in §260.10. In this last case, a generator with a unit meeting the definition of a "wastewater treatment unit" and who adds a wastewater treatment unit to the process, such as a sludge dryer, will continue to be exempt from RCRA permitting, even if the wastewater treatment unit is intended for a temporary demonstration to a potential client.

1.5 Construction Prior to Permitting

RCRA §3005(a), as amended by the Hazardous and Solid Waste Amendments of 1984, requires owners and operators of all hazardous waste treatment, storage, and disposal facilities to obtain a RCRA permit prior to constructing a RCRA facility, including RD&D facilities. Since the RD&D provisions of RCRA §3005(g)(2) and 40 CFR §270.65(b) only allow EPA to modify or waive the permit application and procedural requirements of 40 CFR Parts 270 and 124, not the statutory requirements of RCRA, a RCRA permit is required before the facility can be constructed.

EPA recognizes that some RD&D facilities will consist of using existing buildings or structures, such as commercial, private, or government laboratories to demonstrate and/or develop laboratory-scale, bench-scale, or pilot-scale hazardous waste treatment technologies or processes inside or outside of the building. Furthermore, in many cases, the treatment units intended for testing under an RD&D permit may already be installed and/or operated with non-hazardous wastes at the facility prior to applying for an RD&D permit. These types of situations do not violate the RCRA construction ban.

Moreover, EPA believes that RD&D permit applicants can procure, manufacture, and assemble RD&D "units", such as mobile treatment units (MTU), at the proposed treatment site before obtaining the RD&D permit. However, although these units can be prefabricated and transported to the proposed RD&D treatment site, construction of the site itself, such as pouring concrete foundations, connecting the MTU to physical structures on-site; and pre-testing the unit with hazardous wastes cannot occur until the RD&D permit is issued (see RCRA §1004(2) for the definition of "construction").

1.6 Authority to Issue RD&D Permits

When EPA administers the RD&D permit program, permit applicants should send their eligibility proposals (see section 3.2) or permit applications (see section 4.2) directly to the EPA Regional Office (see Appendix 2). The Regional Office will determine if the RD&D project meets the criteria of an RD&D permit (see section 2 of this manual) and then they will forward a copy to the State to allow them to determine if any State authorities apply. External to the Federal RD&D permit, a State or locality may impose additional, non-RCRA requirements on the RD&D facility under State law or local ordinance.

States may not issue RCRA RD&D permits until they are explicitly authorized by EPA. However, if a State has been authorized to issue general (non-RD&D) RCRA permits for the technology involved in the RD&D experiment (e.g., treatment in a tank or incineration), the State must determine whether it will issue a RCRA permit for the proposed experiment. If the State has authority to issue a RCRA permit and decides to do so, EPA will not issue a Federal RD&D permit (see also section 3.1). On the other hand, if the State decides not to issue a full RCRA permit, EPA will proceed to issue an RD&D permit. In this case, the State Hazardous Waste Agency (see Appendix 3) should send a letter to the Regional EPA Hazardous Waste Division Director acknowledging that they will defer issuing a full RCRA permit to the Federal government.

EPA encourages States to seek authorization to issue RD&D permits to develop and demonstrate non-land disposal treatment technologies and processes. Under RCRA §3009, State programs may be more stringent than the Federal program.

2. CRITERIA FOR RESEARCH, DEVELOPMENT, AND DEMONSTRATION PERMITS

The Agency expects that RD&D proposals will include a variety of demonstration and experimental activities such as small-scale original research, state-of-the-art technologies and processes, and modifications of existing technologies or processes, which may have been used for treating non-hazardous wastes or other hazardous wastes. Furthermore, the Agency recognizes that RD&D facilities will involve testing of one or more technologies or processes at laboratory-scale, bench-scale, pilot-scale, and/or full-scale. At a minimum, RD&D permits will allow research, development, and demonstration with units that either have never been used commercially or where the permit applicant intends to refine, develop, or improve performance, or demonstrate cost-efficiency of commercially demonstrated technologies or processes (providing these demonstrations are experimental and innovative).

Although the term "innovative and experimental" is not defined in §270.65, the legislative history of this provision provides criteria that the Agency will use in evaluating RD&D proposals. Congress clearly intended that RD&D permits be used for: (1) the purpose of generating new information to evaluate the technical or economic feasibility of an innovative and experimental waste management technology, process, method, or device; (2) treating hazardous waste in a unit or device made primarily from non-earthen materials; (3) treating limited quantities of waste at a scale of operation necessary to conduct the experiment; and, (4) operation for a period of time necessary to adequately prove the feasibility of the technology or process.

2.1 Purpose of the Experimental Operation

The purpose of RD&D facilities must be to gather new data about the technical and/or economic feasibility of innovative and experimental treatment technologies, processes, methods, devices, or equipment systems for the development of sound treatment practices. Processes or devices that would not qualify for an RD&D permit are those where (1) the same unit or an identical unit has already demonstrated the feasibility or infeasibility of the unit to treat the same type of waste stream(s), of similar chemical composition, under the same or similar types of operating conditions and (2) the primary purpose of the RD&D activities is to produce revenue by treating hazardous wastes on a commercial basis or to treat wastes generated on-site.

The following examples illustrate the type of activities that would qualify for RD&D permits under §270.65:

Example 1: New Technologies or Processes - The construction and demonstration of a pilot-scale unit to demonstrate the technical and economic feasibility, and performance capability of a new hazardous waste treatment technology, process, or system. (If this demonstration is successful, a larger unit or prototype may also be permitted as RD&D, providing that the permittee can demonstrate that this larger unit is needed to further identify the technical capabilities of the unit.)

Example 2: Tailoring Existing Technologies - Equipment vendors often custom-design treatment equipment (e.g., tanks, incinerators) based on site-specific design needs and operating conditions. The vendor may need to test the equipment on a pilot-scale using samples of the customer's hazardous wastes to determine the reliability or effectiveness of the custom-built equipment.

Example 3: Improving Existing Technologies - A manufacturer or user of a particular commercial treatment process may want to improve the efficiency of the process, refine its performance capabilities, or reduce the concentration or presence of emissions, by constructing a pilot-scale version of the treatment unit to operate under experimental conditions.

2.2 Treatment of Hazardous Waste in Units or Devices Made Primarily From Non-earthen Materials

RD&D units may be either stationary or mobile treatment units. The term "non-earthen materials" means that projects involving the placement of hazardous waste directly into or onto the land or water (e.g., by land treatment 1/ or placement of waste in surface impoundments, landfills, and piles) are not eligible for RD&D permits because these were considered disposal by Congress (129 Cong. Rec., H8160, October 6, 1983).

RD&D research can occur outdoors, providing that the experiments are conducted in controlled vessels, such as drums or tanks, made primarily from non-earthen materials such as glass, metal, plastic or ceramic. Experiments must be conducted using these types of materials to ensure against leaks and potential damage to the environment.

1/ Land treatment facilities are defined in §260.10 and involve the application of hazardous waste to soil. Although RD&D permits do not apply to land treatment, an owner or operator can apply for a RCRA permit for land treatment demonstrations under §270.63. (see also §264.272.) Also, biologicial, photo-degradation and other processes that occur in land treatment can be done in enclosed environments (e.g., in tanks) under RD&D permits.

Although RD&D permits are intended for treatment of hazardous waste, the storage of hazardous waste at an RD&D facility, incident to the treatment, is permitted under the RD&D permit as well (see section 2.3 for limitations). If an RD&D unit or process is used to store or treat hazardous waste for any reason other than the hazardous waste management experiment, then these activities must be permitted, and operated, in accordance with all applicable sections of 40 CFR Parts 264 and 270.

2.3 Scale of Operation

RD&D permits may only provide for the receipt and treatment of those types and quantities of hazardous waste necessary to determine the cost-effectiveness, efficiency, and performance capabilities of the technology or process and the effects of such technology or process on health and the environment (§270.65(a)(2)). Because each RD&D project is unique, the types and quantities of hazardous waste used for the RD&D experiment will be determined on a case-by-case basis. This decision will be made by considering the applicant's view of the necessary types and quantities of wastes, Agency judgement, and the limits suggested by the legislative history to §3005(g). Full-scale facilities may be permitted as RD&D; however, the permit must limit the quantities of hazardous waste and the time of experimental testing, as appropriate, to validate the RD&D technology or process, according to the objectives of the research.

The legislative history for RD&D permits suggested guidance to assure a reasonable scale for demonstrating the technical and economic feasibility of experimental technologies and processes (129 Cong. Rec. H8160-61, October 6, 1983). This guidance, as specified below, is well below the scale of most commercial hazardous waste treatment operations:

1. Treatment of a maximum of 15,000 kilograms of hazardous waste per month for experimental purposes;

2. Storage of a maximum of 15,000 kilograms of hazardous waste at any time intended for experimental purposes;

3. Treatment of a maximum of 400 kilograms of hazardous waste per hour in any experiment.

The permitting authority will generally apply this guidance, but may modify these quantities on a case-by-case basis. The legislative history makes clear that EPA may authorize the treatment of greater or lesser quantities of hazardous waste. If the permit applicant intends to exceed these limits, he should justify the need to test larger quanti-

ties in order to adequately perform the test and to gather the required information.

2.4 Amount of Time to Conduct the Experiment

Because an RD&D permit is intended to develop and test a technology or process, it is inherent in RD&D activities that such a test is temporary, or short-term, in relation to the commercial use of the process. By statute, RD&D permits are limited to a permit term of one year, which is defined as 365 days of actual operation 2/; this timeframe is in addition to the time needed to construct the facility after the permit is issued (§270.65(a)(1)). The permit may be renewed three times, each time for a period of up to 365 operating days. The permitting authority will establish the duration of permits on a case-by-case basis, and will include this timeframe as a permit condition.

2/ The Agency interprets one operating day as any fraction of a calendar day when conducting the experiment. For example, if the permittee spends 2 hours operating the RD&D equipment and/or related laboratory testing, then these 2 hours equal one operating day. The permittee may be required to keep an operating log at the facility to record the hours of operation. Alternatively, the permit authority may impose a calendar limit, in lieu of operating days, on a case-by-case basis.

3. THE PERMITTING PROCEDURE INCLUDING PUBLIC PARTICIPATION

3.1 Submitting the Permit Application

Permit applicants should contact the EPA Regional Office, which serves the area where the RD&D project will occur (see Appendix 2), to determine whether EPA or the State has the authority to issue RCRA RD&D permits. When the EPA Regional Office manages the RD&D program, they will determine if the applicant's proposal meets the criteria of an RD&D permit, as discussed in Section 2 of this manual, and then they will forward a copy to the State to determine what role the State will take in processing the application. States may recommend conditions for inclusion in the Federal RD&D permit, if consistent with the RCRA requirements.

Until States receive authorization to issue RD&D permits, States may require a full RCRA permit if the proposed experimental activity will involve treatment in units which are regulated under Parts 264 or 266, and for which the State is authorized. In this case, EPA will not issue an RD&D permit (see also section 1.6 of this manual).

3.2 Eligibility Determination of the Research Proposal

To expedite eligibility determinations of research projects and to minimize delays in processing permit applications, the permit applicant could send a letter to the permitting authority that briefly describes the proposed experimental activity. (This recommendation is optional and does not preclude the applicant from submitting a detailed application in the first instance, following the guidance in section 4.2 of this manual.) The letter should address the following: (1) purpose of the research, (2) explanation as to why the proposed activity is experimental or innovative (reference other similar or approved technologies or processes for treating hazardous or non-hazardous waste and how the proposal differs from these), and (3) description of the research (the level of detail will vary depending on the type and scope of the research).

The permitting authority will generally review the proposal within 30 days of receipt to tentatively determine if it is eligible for an RD&D permit. (This 30-day time-frame is not a statutory or regulatory requirement and may take longer if complicated judgements are involved). In some cases, additional information may be needed before EPA can make a preliminary determination. The applicant will be notified, by letter, to specify any additional information necessary to prepare a complete RD&D permit application. The applicant should be

prepared to meet with the permitting authority, if necessary, to discuss the proposal. When a proposal is not eligible for an RD&D permit, the permitting authority will advise the applicant of this tentative determination by letter, specifying the reasons.

Applicants should expect to follow the procedures of Part 124 for permit application and issuance. Applicants may request a waiver of RCRA requirements to expedite permit issuance; the permitting authority may waive application requirements and permitting procedures after consulting with the applicant or on its own initiative. Section 124.3 of 40 CFR governs submission of permit aplications and requires a completeness review before the application is processed.

3.3 Draft Permit

A draft RD&D permit will be issued only when the permit application is determined to be complete. An RD&D permit application will be considered "complete" when the permitting authority receives all the information requested during any meetings and in correspondance with the applicant. The permitting authority will strive to issue the draft permit within 60 days after making this completeness determination. In some cases, the draft permit can be written in a couple of weeks when a research project involves laboratory-scale or bench-scale testing of small quantities of hazardous waste for a limited number of days.

The permitting authority will issue a draft permit (or tentative decision to deny the permit, 40 CFR §124.61) for a public review and comment period of 45 days. A statement of basis (§124.7) or a fact sheet (§124.8) will be prepared with the draft permit for review during the public comment period and will provide a justification for issuing the RD&D permit or the tentative denial. The permitting authority will send this information to the permit applicant and to any other person on request.

The public will be asked to review the draft permit and comment on whether the proposed activity is appropriate for RD&D permitting under §270.65 and whether the proposed permit conditions are adequate to protect human health and the environment. A final decision on the permit will be made only after the public comments received by the permitting authority have been analyzed and any concerns that were raised during this public comment period have been addressed.

3.4 Public Participation

Section 270.65(b) specifically provides that the Agency may not waive or modify the public participation procedures. These procedures are codified in 40 CFR Part 124 and generally require:

1. Public notice of draft permits (or notice of intent to deny an application) that allow at least 45 days for public comment [§124.10(b)(1)]. Notice is to be published in major local newspapers, broadcast over local radio stations, and delivered to local government offices and state agencies.

2. Opportunity to request a public hearing, if no hearing has already been scheduled (§124.11). A public hearing must be held whenever there is notice of opposition to a draft permit, under §124.12(a)(3). The hearing is to be held at a location convenient to the population nearest to the proposed facility. Notice of a public hearing shall be given at least 30 days prior to the hearing. Public notice of the hearing may be given at the same time as public notice of the draft permit and the two notices may be combined (§124.10(b)(2)).

It should be noted that the public comment period can be extended beyond 45 days "if any data information or arguments submitted during the public comment period...appear to raise substantial new questions concerning a permit..."(§124.14(a)). If an applicant anticipates public opposition to the RD&D proposal, which might delay permit issuance, he should involve potential opponents early in the permit application process to identify their concerns and issues so that these can be addressed at the outset and not delay the issuance of the permit. In general, it is helpful to schedule a public hearing during the public comment period for the draft permit, to further identify and address public concerns. Permit applicants can participate at the public hearing by responding to questions from citizens about the nature of the research and/or by presenting a discussion of the RD&D project.

3.5 Effective Date of the Permit

The Agency intends to follow the procedures in §124.15 in establishing the effective date of an RD&D permit. This provision requires the Agency to issue a final permit decision after the close of the public comment period [§124.10(b)] and to notify the permit applicant and each person who submitted written comments or requested a notice of the final permit decision. The effective date of the permit will generally be 30 days after this notice is served, unless:

(1) a later date is specified in the decision and is included as a permit condition;

(2) review is requested under §124.19 or an evidentiary hearing is requested under §124.74; or

(3) no comments requested a change in the draft permit, in which case, the permit shall become effective immediately upon issuance [§124.15(b)].

EPA may waive this 30-day period in appropriate circumstances to expedite permit issuance (e.g., contracts between applicants and clients).

4. THE PERMIT APPLICATION

4.1 Scope of the Application

To expedite the permitting of RD&D facilities, the permitting authority may modify or waive the RCRA permit application requirements established in 40 CFR Part 270. EPA will not waive the regulations regarding financial responsibility in Part 264, Subpart H and the procedures in 40 CFR Part 124 regarding public participation. In determining which requirements are to be modified or waived, the permitting authority must ensure there will be adequate protection of human health and the environment.

The applicant should consider the following questions, as applicable, as a basis for preparing his application:

1. What is the purpose of the project (e.g., experimental research or demonstration); What is the experimental design (e.g. variables to be tested, ranges for these variables, anticipated results); and, what monitoring and record-keeping will be done to document the success or failure of the project in terms of operating data and emissions data?

2. What are the minimum quantities of hazardous waste and operating time needed to meet the RD&D objectives?

3. Using best engineering judgement, what are the emissions expected during operation? How will these emissions be monitored? What criteria will be used for modifying or suspending operations if permit operating conditions should be exceeded?

4. What sampling and analytical procedures will be used to validate the feasibility or infeasibility of the experimental project?

5. Are the research personnel technically familiar with the type of research in order to respond to emergency situations in the event of experimental failure and to monitor and analyze experimental operations?

6. What type of emergency response procedures will be used to protect public safety and public health in the event of a fire, spill, or explosion during experimental testing?

7. How will the facility be closed after the research is completed? (e.g., will the treatment units be decontaminated and will the residues be removed from the site?)

8. What amount of funds will be needed to properly close the facility and what type of insurance will be used during the operation of the facility?

4.2 General Application Information

The level of detail and type of information required in an application will vary because each RD&D proposal is unique. Factors such as facility size, type and quantity of waste, duration of experimental testing, potential for leaks and emissions and for environmental damage will be used as the basis for determining the required level of detail. For example, persons who intend to conduct laboratory-scale or bench-scale testing using small quantities of wastes for a short period of time (e.g., a couple of weeks) may only need to submit a brief application. A more detailed application would be required from applicants with little hazardous waste experience, who propose to handle a broad variety and quantity of wastes (e.g., 10,000 kg/month) over a relatively long period of time, such as a year, in a pilot-scale or full-scale unit that has never been demonstrated with hazardous wastes.

The following permit application information will apply to most RD&D activities, and may be modified, as appropriate, according to the scope and intent of the research (see appendix 4 for a suggested permit application checklist):

1. Name and address of the proposed facility;

2. Name, address, and telephone number of the owner and operator of the proposed facility;

3. Purpose of the research, development, and/or demonstration project;

4. Explanation as to why the proposed activity is experimental and innovative (explain how this differs from other related technologies or processes that have either been permitted under RCRA or have been demonstrated with non-hazardous wastes, such as municipal sludges);

5. General description of the proposed activity. The level of detail needed will vary depending on the type and nature of the proposal. (For example, for proposals involving a single process or a modification to an

existing technology, a short discussion may be sufficient. For proposals involving several or more inter-related units or connections to other treatment, storage, or disposal units, applicants may need to include a process flow diagram or schematic drawing to illustrate the proposed activity.);

6. Type (e.g., EPA identification number or general waste description such as, halogenated organic solvents) and quantity of hazardous wastes intended for treatment;

7. Estimated time of operation for the experimental activities;

8. Any information on the anticipated performance of the unit (e.g., characterization of any residues expected from treatment or anticipated emissions during treatment, such as gases, particulates, hydrocarbons, NOx, SOx, odor);

9. Brief description of performance data (if any) that have been previously gathered on the operation of the unit (e.g., treatment of solid wastes, other hazardous wastes, or commercial chemicals);

10. A sampling plan and quality assurance plan, including sampling frequency, procedures and equipment;

11. A safety plan which describes steps taken in case of fires, spills, or explosions and the names and qualifications of persons operating and managing the research;

12. A closure plan to describe how the treated and untreated hazardous waste and the RD&D unit(s) will be managed after the research is completed; and,

13. Liability coverage, cost estimate for closure, and a demonstration of financial assurance for closure.

The permitting authority will use standards in 40 CFR Part 264, Subparts B, C, D, E, G and H (general facility standards, preparedness and prevention, emergency response procedures, manifesting, closure, and financial responsibility) as a guide to define general requirements for individual RD&D permits. Other requirements of Subparts I, J, and O (containers, tanks, and incinerators) will be used on a case-by-case basis as a guide to define additional information items, depending upon the type of proposed technology or process and the need to store the hazardous wastes.

Some applicants may be asked to provide other information outside Part 264 in order for the permitting authority to assure protection of human health and the environment. Appendix 5 provides a list of EPA publications that applicants may find useful in developing their applications and in developing their own operating procedures for the facility.

The permitting authority will not require a Part A application for RD&D permits, but will instead rely on the information submitted in the application or other submittals from the applicant to provide a general description of the proposed activity. Moreover, each application for an RD&D permit will be assigned an EPA identification number. This number must be used on all reports and other correspondance with the Agency, and on all forms, labels, and other paperwork required for managing hazardous waste.

Sections 4.3-4.10 of this manual provide examples of the types of information that may be required from individual RD&D applicants. As noted above, the level of detail required will vary from application to application.

4.3 Facility Description

In addition to a general description of the facility, it may be necessary, on a case-by-case basis, to provide a rationale for the proposed design capacity of each operating unit (including storage areas) or descriptions of any proposed secondary containment systems to control emissions or releases (e.g., berms, sump pumps, scrubbers, waste-feed cut-off valves).

4.4 Waste Analysis

Some applicants may be required to provide a chemical and/or physical analysis of the wastes intended for the RD&D activity and/or indicate the analytical procedures that were or will be used for determining this information. Where standard procedures such as EPA #SW-846 are used, applicants only need to provide the title or reference number of the procedure. Waste analyses may be conducted by the generator of the hazardous waste, or by an independent laboratory and not necessarily by the permit applicant.

Applicants who intend to treat many different hazardous wastes may find it useful to develop a formal plan describing their sampling procedures and analytical methods for determining the type and concentration of waste constituents before, during, and after treatment, including the statistical methods for calculating the data. (These applicants may wish to refer to the EPA guidance manual entitled, Waste Analysis Plans, Chapter 3, "Preparing a Waste Analysis Plan" (referenced in Appendix 5 of this manual.)

4.5 Handling Incompatible Wastes

Permit applicants who intend to treat or store ignitable or reactive waste, or mix incompatible hazardous wastes or a hazardous waste that is incompatible with other materials as a function of their experimental testing, should describe procedures to prevent reactions which might:

- Generate extreme heat or pressure, fire or explosions, or violent reactions;
- Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;
- Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions; or,
- Damage the structural integrity of the unit or facility.

This description may be based on references to published scientific or engineering literature, data from laboratory or bench-scale tests or the results of treatment under similar operating conditions.

4.6 Monitoring, Inspection, and Emergency Procedures

To minimize the potential for uncontrolled releases of hazardous wastes during testing, and to ensure a proper response to emergency situations, permit applicants should, as necessary, have a set of monitoring and inspection procedures for the facility, as well as emergency response procedures.

Applicants should provide the permitting authority with a summary of their procedures for inspecting the condition of experimental treatment units, and safety and emergency equipment. For proposals involving hazardous waste storage areas, monitoring equipment (e.g., temperature controls, pressure valves), security devices (e.g., alarms, warning lights), or secondary containment devices, a summary of the procedures for inspecting these items should also be provided. The frequency and level of detail of inspections selected by applicants should be commensurate with the type of proposed experimental activity, operating conditions, and the type and quantities of hazardous wastes undergoing treatment.

Applicants should, if necessary, also identify the procedures and remedial actions for responding to a fire, explosion, or any unplanned sudden or non-sudden release of hazardous wastes, resulting from experimental activities, and the procedures for

cleaning-up leaks, spills and other releases.

It is recommended that applicants incorporate the emergency procedures into a safety plan that can be distributed to all staff and local officials responsible for handling emergency situations at the facility. The safety plan should, if necessary, identify the type and quantity of hazardous wastes and the location of storage areas and experimental treatment units. This plan should list names, addresses and telephone numbers (office and home) of all persons designated to act as emergency coordinators 24-hours a day. The plan should include inspection procedures to indicate the frequency of inspections and the type of remedial actions that will be taken if a problem is discovered. The plan should also describe any arrangements agreed to by local police and fire departments, hospitals, contractors, and State and local response teams that will be responsible for coordinating emergency services.

Applicants may wish to refer to the EPA publication #SW-968, Permit Appliants' Guidance Manual for the General Facility Standards of 40 CFR Part 264, October 1983, Chapter 5.6, "Preparedness and Prevention", for examples of inspection checklists and, 40 CFR Part 264, Subpart D, "Contingency Plan and Emergency Procedures", as guidance in developing monitoring, inspection, and emergency response procedures.

4.7 Reporting and Recordkeeping

Because each RD&D activity is unique, the permit writer and permit applicant should mutually determine the appropriate recordkeeping and reporting requirements that will provide sufficient monitoring data about the operating efficiency of the RD&D activity. The timeframes for reporting this information and level of detail required will depend on the proposed operating time and the type of RD&D activity. Reports might discuss operational problems and characterize emission data (e.g., particulates, gases), if the permitting authority believes this information is necessary to ensure protection of human health and the environment. Reports should be signed as described in Section 4.11 of this manual.

In working with applicants to define recordkeeping and reporting requirements, the permitting authority may recommend or condition permits to include proper sampling, analytical and recordkeeping procedures, if appropriate. Applicants who intend to apply for a full RCRA operating permit based on a "successful" RD&D activity, should ensure that these procedures meet routinely acceptable research practices, otherwise the permitting authority may not accept their results as sufficient information to permit the new technology or process for

commercial operation (e.g., all test plans should meet EPA Quality Assurance Guidelines).

The Agency encourages permittees to submit information to the permitting authority that summarizes the feasibility or infeasibility of the RD&D activities. This information will be shared with EPA Headquarters staff and the Office of Research and Development in Cincinnati, Ohio to assist the Agency in developing permit standards and analytical methods for new technologies and processes and to assist the Agency's research efforts on hazardous waste management technologies and practices.

4.8 Personnel Qualifications

Applicants should ensure that the personnel responsible for conducting and managing the experimental testing are technically competent to handle potential operational problems and to properly evaluate and document the experimental results. Applicants may be required to provide copies of resumes, certificates from specialized hazardous waste emergency response training courses, documentation of on-the-job training, or other background information about the principal staff that demonstrates their technical qualifications to manage the RD&D facility.

The principal research personnel, because of their education, training, and/or experience, should (1) appreciate the health and environmental risks associated with the hazardous waste which is being treated, (2) understand the appropriate methods of conducting scientific experimentation, analysis, or research to minimize such risks, (3) be familiar with the RCRA procedures related to the storage, treatment, and disposal of the hazardous waste as may be required within the scope of conducting the research, development, and demonstration activity, and (4) be able to effectively handle accidents and emergency situations.

It is recommended that permit applicants refer to 40 CFR §264.16(a)(3) as a guide in developing and, if appropriate, choosing suitable hazardous waste training programs for its employees, if appropriate.

4.9 Closure

In order for the permitting authority to ensure compliance with the RCRA financial responsibility requirements, applicants for RD&D permits must submit a closure plan and a cost estimate for closure. The closure requirements of 40 CFR §§264.111 through 264.115 (closure performance standard; closure plan; time allowed for closure; disposal and decontamination of equipment, structures, and soils; and certification of closure)

should be addressed, as appropriate, for the type of experimental proposal. Some of the specific requirements may need to be modified for RD&D facilities on a case-by-case basis. For example, the deadlines for advance notification of closure activities in §264.112 may be unnecessarily long given the relatively short duration of some RD&D activities (see section 5.5 of this manual for a discussion of the notification requirements.)

4.9.1 Closure Plan

Closure plans must be approved by the permitting authority and will become a condition of the permit. The closure performance standard of §264.111, which is a general standard to protect human health and the environment, should be met through the conditions in the closure plan.

The closure plan should basically discuss the procedures for closing the RD&D facility (either partially or completely) at any point during its intended active life, and procedures for handling the hazardous wastes (§264.112). The extent of detail in the closure plan will depend upon the type of RD&D facility, but it should include, at least:

1. A description of how the facility or unit will be partially closed, if applicable, and finally closed, (§264.112(b)(1) and (2));

2. An estimate of the maximum quantity of wastes in storage and in treatment at any time during the active life of the facility, and the procedures for the planned ultimate disposition of all hazardous wastes and contaminated materials and equipment, (§264.112(b)(3));

3. The procedures and methods for decontaminating all hazardous waste equipment and storage areas, if appropriate. (During closure, the owner or operator must remove or decontaminate all hazardous waste residues, and contaminated containment system components, equipment, structures, and soils, (if applicable) and manage them as hazardous wastes. However, the permittee is not necessarily required to dismantle the RD&D equipment. Soil decontamination should be addressed if there is a potential for leaks to the ground.)(§264.112(b)(4));

4. A description of environmental monitoring and protection activities (such as run-off control) that will be conducted during closure, if applicable (§264.112(b)(5)); and,

5. A schedule for closure activities. Those applicants who use a trust fund for financial assurance for closure must specify the expected date of closure in the closure plan. Due to the relatively short duration of certain RD&D operations, it may be desirable to require other RD&D applicants to also specify the expected date of closure. (§264.112(b)(6) and (7)).

Other RCRA facilities are required to make modifications to closure plans at least 60 days prior to a planned change in design or operations, and within 60 days after an unexpected event which affects the closure plan, (or within 30 days if the unexpected event occurs during closure). These deadlines may be inappropriate given the short duration of many RD&D activities, and more appropriate, shorter timeframes should be considered.

A copy of the approved closure plan including all revisions is not required to be kept at the facility, but should be available to the permitting authority upon request, until closure is completed and certified. The permitting authority has the discretion to determine if changes to the facility's RD&D closure plan should be considered as a major or minor modification.

4.10 Financial Responsibility

Financial responsibility is a substantive permit requirement that Congress specifically mandated to be included in an RD&D permit (§§3005(g)(2)). This provision indicates the concern of Congress that financial responsibility be demonstrated for permits dealing with experiments of new and innovative technology.

The RD&D permit applicant must address two different financial responsibility requirements: financial assurance for closure (40 CFR §§264.141-143) and liability coverage for sudden accidental occurrences (40 CFR §§264.147 and 151). It should be noted that the Federal government and State governments are exempt from the Subpart H financial requirements (§264.140(c)) if they own or operate the facility. When one party (the owner or operator) is an exempted party because it is a State or Federal entity, then any other private sector party may not need to comply with the financial responsibility requirements. The State or Federal government may, however, require the private sector party to demonstrate financial responsibility by means of a contractual agreement.

4.10.1 Financial Assurance for Closure

The permit applicant must have a detailed written estimate

of the maximum cost of closing the facility (§264.142) and establish financial assurance based on the estimate (§264.143).

The permit applicant may use any of the Subpart H mechanisms to demonstrate financial assurance for closure. RCRA §3005 (g)(1)(C) lists possible requirements that the Administrator may find necessary to impose on RD&D facilities, including "insurance or bonding" and "financial responsibility." This listing does not limit the mechanisms available to an RD&D applicant; any of the mechanisms outlined in §264.143 may be used 3/.

Financial assurance for closure must be demonstrated at least 60 days before the date on which hazardous waste is first expected to be received at a new RD&D facility for treatment or storage (§264.143). An owner or operator of a RCRA permitted facility or a RCRA interim status facility applying for an RD&D permit may be able to use existing financial mechanisms, provided both the cost estimate and the amount of financial assurance are modified to take into account the RD&D activity. For further information, see the guidance manual entitled, Financial Assurance for Closure and Post-Closure Care, referenced in Appendix 5.

4.10.2 Liability Coverage for Sudden Accidental Occurrences

The permit applicant of an RD&D facility must demonstrate financial responsibility for bodily injury and property damage to third parties caused by sudden accidental occurrences arising from operations at the facility (40 CFR §264.147). The permit applicant must maintain liability coverage for sudden accidental occurrences in accordance with 40 CFR 264.147(a).

A permit applicant may demonstrate the required coverage either by passing a financial test or by having liability insurance. Again, the RD&D permit applicant should demonstrate the required liability coverage at least 60 days before the date on which hazardous waste is first expected to be received at a

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3/ Utilizing one of the mechanisms, the closure trust fund, would require that payments into the trust fund be made annually by the owner or operator over the term of the initial RD&D permit or over the remaining operating life of the facility, whichever is shorter (see §264.143(a)(3)). The maximum operating life for an RD&D facility is 365 operating days. The legislative history makes a distinction however, between operating time and calendar time. Accordingly, the phrase "remaining operating life" should be interpreted as the calendar time period up to, and including, the final day of operation involving hazardous waste, for purposes of determining the pay-in period for RD&D facility closure trust funds.

new RD&D facility for treatment or storage (§264.147(a)(1)(i) and (f)(4)). An owner or operator of a RCRA permitted facility or an interim status facility applying for an RD&D permit at that facility is already required to have liability coverage, but may need to modify the existing liability coverage to include the RD&D activity. For further information, refer to the guidance manual entitled, Liability Coverage, referenced in Appendix 5. The Regional Administrator may also require the permit applicant to provide liability coverage for nonsudden accidental occurrences for RD&D facilities, if he determines that such coverage is necessary to protect human health and the environment (40 CFR §264.147(d)).

4.11 Signatories to the Permit Application and Reports

All RD&D permit applications and required reports must be signed in accordance with the requirements of 40 CFR §270.11. Signatories 4/ are defined in §270.11(a) as:

(1) For a corporation; by a responsible corporate officer;
(2) For a partnership or sole proprietorship; by a general partner or the proprietor, respectively; or
(3) For a municipality, State, Federal, or other public agency; by either a principal executive officer or ranking elected official.

If there is a change in personnel responsible for the overall operation of the RD&D facility, the permitting authority should be notified prior to or together with any reports, information, or applications to be signed (§270.11(c)).

The certification statement for RD&D permit applications, as provided in §270.11(d), is:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the

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4/ In the case of permit applications submitted by the Department of Defense (DoD), the signatory is defined as the Installation Commander, with the rank of Colonel or higher, if the installation employs more than 250 persons and the authority to sign permit applications has been assigned or delegated to the Installation Commander in accordance with applicable DoD procedures. (EPA policy memorandum dated January 25, 1985, "Signatories to Department of Defense Permit Applications".)

> system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Reports may be signed by the same person who signed the permit application, or by a duly authorized representative (§270.11(b)).

4.12 Confidential Business Information

Any information submitted by the permit applicant to the permitting authority may be claimed as confidential in accordance with EPA regulations at 40 CFR §2.203(b). Any such claim must be asserted at the time of submission by stamping the words "Confidential Business Information" on each page containing such information. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2, "Public Information"; it may be released to the extent relevant to a RCRA permit proceeding as authorized under 40 CFR §2.305(g).

4.13 Delisting

If, as part of the research, the permit applicant intends to prove that the residues resulting from treatment are non-hazardous, he should inform the permitting authority of this when he submits his application. In this way, the permitting authority can work with the applicant to define the type of data and analyses on the residues needed to submit a delisting petition. The RD&D permit can include a condition that defines this information or the permit authority can write a separate letter to the permit applicant that also defines this information.

Although the permit authority may specify delisting criteria, the permittee will not be exempt from the delisting petition requirements of §260.22 if the hazardous wastes intended for treatment are listed in 40 CFR Part 261, Subpart D. If the permit applicant intends to submit a delisting petition (either during or after the term of the permit), his demonstration should include, but is not limited to:

(1) a complete listing of raw materials, intermediate products, by-products and final products, divided into three separate lists:

- all those materials that are used or produced in the

processes at the plant or facility generating the waste;

- of those materials identified above, those that are discharged into or likely to be present in the waste, as well as the approximate quantities used or produced; and,

- of those materials identified above, those that the applicant does not believe are discharged into or likely to be present in the waste, and the basis for this belief, or

(2) representative analytical data for all constituents listed in Appendix VIII of Part 261 that are likely to be present in the waste, as well as the basis for not analyzing for the other Appendix VIII toxic constituents (see Petitions to Delist Hazardous Wastes: A Guidance Manual, EPA/530-SW-85-003, April 1985, p. 25). The demonstration must also include:

(i) representative samples for total and leachable (inorganics) listed constituents; the hazardous waste characteristics, including reactive cyanide and sulfide; and total oil and grease;

(ii) process descriptions and schematics of production processes and wastewater treatment;

(iii) identification of maximum waste generation rates on a monthly and annual basis;

(iv) detailed sampling descriptions including sampling and analytical methods used, equipment used, and dates of sampling and analyses;

(v) proper QA/QC including method of standard additions for inorganics and surrogate spiking for organics;

(vi) historical description of waste management practices, identifying all active and inactive disposal sites (pre and post RCRA); and,

(vii) where on-site management in impoundments, pits, drying beds, piles or landfills is used and process does not create a new treatment residue, RCRA approved groundwater monitoring must be in place, and groundwater data for at least one year must be submitted. (This particular requirement may not be appropriate for RD&D facilities).

Permit applicants should refer to 40 CFR 260.22 as well as the Guidance Manual cited above, for additional technical and adminstrative requirements. Until the Agency publishes its

decision in the Federal Register on whether the residues are considered non-hazardous, the permittee must store, treat or dispose of these residues at either a RCRA interim status or RCRA permitted facility, which is authorized to manage these wastes. The RD&D permit satisfies this requirement, but cannot authorize indefinite or extended storage of the residues after the RD&D experiments have been completed.

5. PERMIT TERMS AND CONDITIONS

Although the Agency may modify or waive the permit issuance requirements in 40 CFR Part 270, research, development, and demonstration permits will be issued only after EPA has reviewed the proposed treatment technology or process to determine eligibility and established minimum requirements to assure protection of human health and the environment.

5.1 Permit Conditions

5.1.1 Standard Conditions

To define the permittee's general responsibilities, the permitting authority will incorporate the conditions delineated in 40 CFR §270.30, "Conditions applicable to all permits," into all RD&D permits either expressly or by reference, except in cases where it is clear that some of these conditions may not apply due to the duration of the permit or type of experiment (e.g., duty to reapply). The conditions in §270.30 are:

(a) Duty to comply with the conditions of the permit.

(b) Duty to reapply if the permittee wishes to continue the RD&D activity beyond the expiration date of the permit.

(c) Need to halt or reduce activity is not a defense in an enforcement action.

(d) Duty to minimize releases to the environment and protect human health and the environment in the event of noncompliance with the permit conditions.

(e) Proper operation and maintenance.

(f) The permit may be modified, revoked and reissued, or terminated for cause.

(g) Property rights are not conveyed by the permit.

(h) Duty to provide information that is requested by the Agency.

(i) Inspection and entry by Agency personnel.

(j) Monitoring and records (these will be defined on a case-by-case basis for each facility.)

(k) Signatory requirements for applications, reports and information.

(l) Reporting requirements (these will be defined on a case-by-case basis for each facility.)

Also, the following permit condition, which is derived from §270.65(c), should be included in all RD&D permits - Protection of Human Health and the Environment - The Regional Administrator may order an immediate termination of all operations under this permit at any time he determines that termination is necessary to protect human health and the environment.

The permitting authority also has the authority to establish additional permit conditions on a case-by-case basis (§270.65(a)(3)), to protect human health and the environment and to require testing and providing of information with respect to the operation of the facility. Permit conditions will be tailored to the proposed activity and will reflect the information submitted in the permit application. Because each proposal is unique, the type of permit conditions and the level of detail in each permit will vary depending upon the type and quantity of hazardous wastes, the treatment process or technology, and the duration of the experiment.

RD&D permits should be entitled, "United States Environmental Protection Agency Research, Development, and Demonstration Hazardous Waste Treatment Permit." (The word "storage" does not need to be specified in the title; however, the storage of hazardous wastes incident to the RD&D activities must be addressed in the permit.) Any references to the RD&D experiment should use the term, "Hazardous Waste Research, Development, and Demonstration Activity" instead of "hazardous waste management facility", as is currently used in other RCRA permits.

5.1.2 General Conditions

The permit will also contain general conditions regarding the operation of the facility (e.g., research plan, waste analyses, QA/QC plan, safety plan, closure plan, and financial responsibility). These conditions will be based on information in the permit application (see section 4 of this manual) or other information and will generally be included as attachments in the permit. The general conditions will also include any recordkeeping and reporting information as determined between the permitting authority and permit applicant or as deemed necessary to protect public health (see section 4.7 of this manual).

5.2 Permit Transfers

A permit may be transferred by the permittee to a new owner or operator only if the permit is modified or revoked and reissued (under §270.41(b)(2)) or a minor modification is made under §270.42(d), to identify the new permittee and incorporate other appropriate requirements.

5.3 Term of the Permit

The term of RD&D permits is limited to a maximum of one year of operation §270.65(a)(1), which is defined as 365 days of actual operation using hazardous waste (see also section 2.4 of this manual); it does not refer to calendar days when treatment of hazardous waste is not occurring, to periods of construction, or to operation using materials other than hazardous waste. The permitting authority may also issue a permit for less than one operating year or even limit the permit to one calendar year or less, where appropriate. In determining the term of the permit, the applicant and the permitting authority will be guided by the amount of time that is reasonably necessary to provide information that will demonstrate the technical feasibility of the RD&D technology or process. This timeframe will be included as a permit condition.

5.4 Waivers, Modifications, Termination and Renewal

Because of the experimental nature of RD&D activities, there is a high potential for permit modifications once the activity is underway. To minimize the need for modification that might interrupt the experimental activities, the permit applicant should attempt to identify all potential alterations or additions to the experimental facility or units, which will affect the performance of the technology or process (e.g., addition of equipment, flow rates, range of operating conditions); particularly those that might be considered a "major modification" under the requirements of §270.41. The permitting authority will use this information to develop permit conditions that are flexible enough to allow for these alterations or additions and to minimize the need for permit modifications.

For example, if the permit applicant intends to treat a variety of waste streams from different generators, the permit may specify the type of hazardous waste (§270.65 (a)(2)) (e.g., organic sludges or halogenated solvents and type of analyses (in the waste analysis plan)), rather than the specific EPA hazardous waste identification number, to preclude a need for a major permit modification when the generator changes. In the case of an incinerator, the permit should specify the range of operating parameters (e.g., temperature, residence

time, angle of kiln, flowrates) to allow flexibility in the experiment. For example, a permit condition could allow a temperature range of 1500-2000 F, a residence time of 30-60 minutes, and a flowrate of 5-30 gallons/minute. The permit applicant could then experiment within these ranges to determine the optimum parameters needed to meet the performance criteria of §264.343.

If the standards or regulations on which the permit is based are changed when the Agency promulgates amended standards or new regulations or if there is a judicial decision after the permit is issued, the permitting authority may modify the terms and conditions in the RD&D permit, providing the permittee agrees to the changes or requests a permit modification (§270.41(a)(3)). Also, if the permitting authority becomes aware of new information about the experimental technology or process, which might have an effect on human health and the environment due to emissions or releases, he may modify the permit under §270.41(a)(2).

5.4.1 Terminating the Permit

The permitting authority may terminate an RD&D permit in one of two ways. First, §270.65(c) allows the permitting authority to terminate all operations at the experimental facility at any time if human health or the environment is endangered. In this case, the permitting authority would issue an administrative order unless more expedient action is required. Second, following the permit procedures of Part 124, the permitting authority may terminate the permit if the permittee does not comply with the conditions of the permit, or misrepresents any relevant information at any time, or did not disclose fully all relevant facts during the permit issuance process (§270.43(a)(1) and (2)). The Regional Administrator, State Director, or any interested person (including the permittee) can request the permit to be terminated on these grounds. The requests must be in writing and include the facts or reasons to support the request (40 CFR §124.5(a)).

5.4.2 Permit Renewal

RD&D permits may be renewed three times, each time for a maximum period of 365 days of actual operation. The permit renewal notification requirement for RCRA facilities is 180 days (40 CFR §270.10(h)) before the permit expires. However, this timeframe may be inappropriate for the owner or operator of an RD&D facility, particularly if the permit term is less than one year.

The permitting authority will evaluate each permit application individually to determine the most appropriate amount of

time for notification and will specify this time period as a permit condition. Notices should generally not be less than 90 days to allow the Agency sufficient time to review the request, conduct an inspection of the facility, review experimental data, and provide an opportunity for public notice, if necessary. This notification should explain the reasons for a renewal, summarize the analytical results of the experimental activities to date, and identify any problems encountered in meeting the research objectives.

Before approving a renewal, the permitting authority may inspect the RD&D facility and review the operating records, experimental data, and any proposed experimental design and operating changes to determine if new or revised permit conditions are warranted.

The decision to renew an RD&D permit will be based on factors such as the test results from treatment, the need for more data from the experimental activities, methods and operation, any violations of permit conditions, enforcement actions (e.g., judicial decrees or RCRA Section 3008 compliance orders), and potential effects on human health and the environment.

5.5 Closure Procedures

The regulations for RCRA facilities set forth timeframes for various closure activities. For example, §264.112(d) requires the owner or operator to notify the Regional Administrator at least 45 days prior to beginning closure activities for non-disposal units. In addition, §264.113(b) requires that all closure activities will be completed in accordance with the approved closure plan and within 180 days after receiving the final volume of hazardous wastes. These timeframes may be inappropriate for RD&D facilities, which may operate less than one year. In such cases, more appropriate, shorter timeframes should be considered.

Another timeframe in the regulations, §264.113(a), requires the owner or operator of a RCRA facility to treat or dispose of all hazardous wastes within 90 days after receiving the final volume of hazardous wastes. The Regional Administrator may extend this timeframe for RD&D facilities to allow the owner or operator to treat or remove all hazardous wastes from the site within 90 days after completing all experimental activities, providing the owner or operator has taken and will continue to take all steps to prevent threats to human health and the environment. (Note that these timeframe requirements would not apply if the permit is terminated, or if a judicial decree or compliance order under RCRA §3008 requires the owner

or operator to close or to cease receiving wastes.)

The Agency recognizes that removing hazardous wastes as quickly as possible can avoid potential threats to human health and the environment. Thus, owners or operators are allowed to remove hazardous wastes and to decontaminate and dismantle equipment at any time prior to notification of partial or final closure, provided that these activities are in accordance with the permit conditions in the approved closure plan.

Closure should be certified by the owner or operator and an independent registered professional engineer in accordance with the requirements of §264.115. The professional engineer (e.g., civil, chemical, mechanical, environmental, or sanitary) should be qualified to certify closure. Certification should be submitted by registered mail within 60 days after completing closure.

APPENDIX 1

RESEARCH, DEVELOPMENT, AND DEMONSTRATION PERMITS

40 CFR §270.65

(50 FR 28752, July 15, 1985)

§ 270.65 Research, development, and demonstration permits.

(a) The Administrator may issue a research, development, and demonstration permit for any hazardous waste treatment facility which proposes to utilize an innovative and experimental hazardous waste treatment technology or process for which permit standards for such experimental activity have not been promulgated under Part 264 or 265. Any such permit shall include such terms and conditions as will assure protection of human health and the environment. Such permits:

(1) Shall provide for the construction of such facilities as necessary, and for operation of the facility for not longer than one year unless renewed as provided in paragraph (d) of this section, and

(2) Shall provide for the receipt and treatment by the facility of only those types and quantities of hazardous waste which the Administrator deems necessary for purposes of determining the efficacy and performance capabilities of the technology or process and the effects of such technology or process on human health and the environment, and

(3) Shall include such requirements as the Administrator deems necessary to protect human health and the environment (including, but not limited to, requirements regarding monitoring, operation, financial responsibility, closure, and remedial action), and such requirements as the Administrator deems necessary regarding testing and providing of information to the Administrator with respect to the operation of the facility.

(b) For the purpose of expediting review and issuance of permits under this section, the Administrator may, consistent with the protection of human health and the environment, modify or waive permit application and permit issuance requirements in Parts 124 and 270 except that there may be no modification or waiver of regulations regarding financial responsibility (including insurance) or of procedures regarding public participation.

(c) The Administrator may order an immediate termination of all operations at the facility at any time he determines that termination is necessary to protect human health and the environment.

(d) Any permit issued under this section may be renewed not more than three times. Each such renewal shall be for a period of not more than 1 year.

APPENDIX 2

MAILING ADDRESSES FOR

U.S. EPA REGIONAL HAZARDOUS WASTE DIVISION DIRECTORS

MAILING ADDRESSES FOR U.S. EPA REGIONAL HAZARDOUS WASTE DIVISION DIRECTORS

Region	Name/Address
I	Director, Waste Management Division (HHA) U.S. EPA-Region I JFK Federal Building Boston, MA 02203
II	Director, Air and Waste Management Division (2AWM-SW,Room 1000) U.S. EPA-Region II 26 Federal Plaza New York, NY 10278
III	Director, Hazardous Waste Management Division (3HW00) U.S. EPA-Region III 841 Chestnut Street Philadelphia, PA 19107
IV	Director, Air and Hazardous Materials Division U.S. EPA-Region IV 345 Courtland St., N.E. Atlanta, GA 30365
V	Director, Waste Management Division (5H13) U.S. EPA-Region V 230 South Dearborn Street Chicago, IL 60604

MAILING ADDRESSES FOR EPA REGIONAL HAZARDOUS WASTE DIVISION DIRECTORS

Region	Name/Address
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VII	Director, Waste Management Division U.S. EPA-Region VII 726 Minnesota Avenue Kansas City, KS 66101
VIII	Director, Air and Hazardous Materials Division U.S. EPA-Region VIII One Denver Place Suite 1300 999, 18th Street Denver, CO 80202
IX	Director, Toxics & Waste Management Division (T-1) U.S. EPA-Region IX 215 Fremont Street San Francisco, CA 94105
X	Director, Hazardous Waste Division (529) U.S. EPA-Region X 1200 Sixth Avenue Seattle, WA 98101

APPENDIX 3

MAILING ADDRESSES FOR

STATE SOLID AND HAZARDOUS WASTE AGENCIES

STATE SOLID AND HAZARDOUS WASTE AGENCIES
U.S. Environmental Protection Agency
Office of Solid Waste
April 1, 1986

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AMERICAN SAMOA

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Sherman E. Roodzant, Chairman
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APPENDIX 4

SUGGESTED PERMIT APPLICATION CHECKLIST FOR TREATMENT TECHNOLOGIES AND PROCESSES

SUGGESTED PERMIT APPLICATION CHECKLIST FOR TREATMENT TECHNOLOGIES OR PROCESSES

	Submitted	To Be Submitted At Later Date[1]	Not Applicable
1. Waste Description			
A. Type/quantity	_____	_____	_____
	_____	_____	_____
B. Physical/chemical description	_____	_____	_____
2. Process Engineering			
A. General description	_____	_____	_____
° flow diagram	_____	_____	_____
° schematic	_____	_____	_____
B. Waste feed system	_____	_____	_____
C. Pollution control system	_____	_____	_____
D. Operating parameters	_____	_____	_____
3. Research Plan			
A. Objective statement/ experimental design	_____	_____	_____
B. Operating parameters to be monitored and frequency	_____	_____	_____
C. Environmental parameters to be monitored and frequency	_____	_____	_____
D. Sampling and analytical methods	_____	_____	_____
E. Equipment inspection procedures and frequency	_____	_____	_____
4. QA/QC Plan [2]			
A. Calibration procedures and frequency	_____	_____	_____
B. Internal quality control checks	_____	_____	_____

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[1] A section of the permit should be reserved for the revised submittal and the deficiency should be noted in the application.

[2] The need for and type of QA/QC, including the level of detail, will depend on the applicant's research objectives.

SUGGESTED PERMIT APPLICATION CHECKLIST FOR TREATMENT TECHNOLOGIES OR PROCESSES

	Submitted	To Be Submitted At Later Date[1]	Not Applicable
5. Data reporting/ recordkeeping	_____	_____	_____
6. Safety Plan			
A. Emergency response procedures	_____	_____	_____
B. Personnel qualifications or training	_____	_____	_____
7. Closure Plan			
A. Procedures to close	_____	_____	_____
B. Date/schedule	_____	_____	_____
C. Disposition of residues	_____	_____	_____
D. Quantity of waste	_____	_____	_____
E. Procedures to decontaminate equipment	_____	_____	_____
F. Time to close	_____	_____	_____
8. Financial Responsibility			
A. Financial assurance for closure	_____	_____	_____
B. Liability coverage	_____	_____	_____
9. Signatories			
A. Owner/address	_____	_____	_____
B. Operator/address	_____	_____	_____

APPENDIX 5

TECHNICAL ASSISTANCE DOCUMENTS

PUBLICATIONS

The following EPA documents have some relevance to the permitting of RD&D facilities; for any individual permit, these documents may have greater or lesser relevance.

Test Methods for Evaluating Solid Wastes, #SW-846. Order from GPO (No. 055-002-81001-2, $55.00 for a 2-year subscription).

A Method for Determining the Compatibility of Hazardous Wastes #EPA-600/2-80-076. Order from NTIS (No. PB80-221005, $15.00).

Financial Assurance for Closure and Post-Closure Care: Requirements for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities--A Guidance Manual, #SW-955. Order from NTIS (No. PB-237595, $21.00).

Closure and Post-Closure of Hazardous Waste Treatment, Storage, and Disposal Facilities Under Interim Status Standards (40 CFR, Subpart G), Draft Guidance, #SW-912, 1981. Available in EPA Regional libraries for photocopying. A revised manual will be published in July 1986 for Parts 264 and 265, Subpart G.

Liability Coverage: Requirements for Owners or Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities--A Guidance Manual, #SW-961, November 1982. Order from NTIS (No. PB82-144675, $11.50).

Petitions to Delist Hazardous Wastes: A Guidance Manual, EPA/530-SW-85-003, April 1985.

RCRA Personnel Training Guidance Manual, September, 1980. Order from RCRA Docket ($15.00).

Waste Analysis Plans--A Guidance Manual, #EPA/530-SW-84-012, October 1984.

Permit Applicants' Guidance Manual for the General Facility Standards of 40 CFR 264, #SW-968, 1983.

Permit Applicants' Guidance Manual for Hazardous Waste Land Treatment, Storage, and Disposal Facilities, EPA #530/SW-84-004, May 1984. Order from the Government Printing Office, #GPO-055-000-00240-1.

PUBLICATIONS (continued)

Addressees for ordering the documents listed above:

Government Printing Office
Washington, D.C. 20402
202/783-3238

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
703/487-4650

RCRA Docket
U.S. EPA (WH-565)
Washington, D.C. 20460
202/382-4672

SAFETY PUBLICATIONS

The following list of publications deals primarily with laboratory safety. The list is by no means complete. The products, procedures, or companies mentioned in these documents are not endorsed by the Agency.

Delvin, W. L. "Process for Controlling Accidents in Chemical Laboratories." Report from the American Chemical Society Symposium on the chemistry of Engine Combustion Deposits, Atlanta, GA, March 29, 1981. DOE Report No. CONF-810308-9.

Forrey, A. W. "Waste Management and Laboratory Safety". Clinical Chemistry, Vol. 30, No. 4 (1984), p. 1090.

Lawrence Berkeley Laboratories. Rules and Procedures for the Design and Operation of Hazardous Research Equipment. Berkeley, CA: University of California at Berkeley, Dec., 1978.

National Research Council. Prudent Practices for Handling Hazardous Chemicals in Laboratories. Report No. ISBN-0-309-03128-1. Washington, D.C.: National Research Council, 1981.

National Technical Information Service. Safety in the Chemical Industry. Bibliography compiled from the Engineering Index Data Base. Springfield, VA: National Technical Information Service, May, 1984.

Walters, D. B.. "The Theory and Practice of Chemical Health and Safety in the Laboratory." Abstracts of Papers of the American Chemical Society, 187 (April, 1984), p. 1.

Catalogs containing laboratory safety equipment are available from companies such as Lab Safety Supply, Fisher Scientific, and Scientific Products.

APPENDIX 6

ANSWERS TO FREQUENTLY ASKED QUESTIONS ABOUT THE RD&D PERMIT PROGRAM

ANSWERS TO FREQUENTLY ASKED QUESTIONS ABOUT THE RD&D PERMIT PROGRAM

AUTHORIZED STATES

1. Should Federal RD&D permits be issued in States which are now authorized to issue RCRA permits, if the proposed activity will occur in units which are regulated under the State's hazardous waste program?

Yes, if the State hazardous waste agency sends a letter to the Regional EPA Hazardous Waste Division Director acknowledging that they will defer issuing a RCRA permit to the Federal government. However, States may ban RD&D activities or require a full RCRA permit for any RD&D activities, because Section 3009 of HSWA allows a State to be authorized for a more stringent RD&D program than EPA's. In this case, the EPA would not issue a Federal RD&D permit.

SCALE OF FACILITIES

2. Is there a minimum size of RD&D activity (e.g., lab-scale or bench-scale) that doesn't require an RD&D permit?

No. All hazardous waste treatment activities require a RCRA permit unless they are exempted from RCRA permitting under §270.1(c)(2) (see section 1.4 for a discussion of these exclusions).

3. Can full-scale facilities be permitted as RD&D?

Yes, however the permit must limit the quantities of hazardous waste and time of experimental testing to the minimum necessary to validate the RD&D technology or process. Moreover, the permit applicant should justify the need to construct a full-scale facility that would exceed the suggested maximum of 15,000 kg/month (see section 2.3 of this manual).

INTERIM STATUS

4. How can the permit writer determine whether an RD&D proposal qualifies as a change under interim status or should be permitted as RD&D?

All RD&D projects must be evaluated on a case-by-case basis according to the criteria specified in Section 2 of this manual. RD&D activities may be authorized under interim status without a permit if necessary to meet the waste minimization requirements for generators under Part 262 (50 FR 28744, July 15, 1985). Note however, that the cost of adding the

technology or process unit must not exceed 50% of the cost of building an entirely new facility; this includes all the existing structures and land at the hazardous waste facility at today's construction costs (see §270.72(e)).

5. Does the owner or operator of an interim status facility lose interim status when a unit is permitted as RD&D?

No, if the RD&D permit is a partial facility permit under §270.1(c)(4) and is only being issued to the RD&D unit. Interim status will terminate when the facility owner or operator is issued a full RCRA permit for the facility, including any units permitted as RD&D (§270.73(a)).

RCRA PERMITTED FACILITIES

6. Does the owner or operator of a fully permitted RCRA facility need to obtain an RD&D permit to conduct research on a technology or process, which is not currently addressed in his permit?

The Agency may find it expedient to issue a separate RD&D permit under §3005(g) to govern the experimental activities or the Agency may amend the existing RCRA operating permit, inserting provisions to address the experimental activity.

7. Can more than one RD&D permit be issued concurrently to the same facility?

No. EPA will amend any outstanding RCRA permit to incorporate RD&D provisions.

8. If the permittee wants to test more than one unit, whether or not the units are similar or modified, is a permit required for each unit?

One RD&D permit can authorize testing of several different, and unrelated technologies or processes. The permit applicant must specify as clearly as possible all experimental processes to minimize the need for permit modifications. The permit applicant should identify, to the extent possible, all potential alterations or additions to their experimental equipment and this information should be covered in the permit. Given the uncertainty of actual operating efficiencies with RD&D activities, permit conditions should cover all potential activities.

THERMAL TREATMENT UNITS

9. How does the dioxin rule of January 14, 1985 apply to RD&D permits?

The performance standards of 40 CFR, Part 264, Subpart O for incinerating or thermally treating dioxin waste may be applied on a case-by-case basis for RD&D thermal treatment units, where appropriate. However, these requirements should be used as a basis for developing permit conditions to monitor the emissions to assure protection of human health and the environment. Any parameters different from the §264.343 requirements for the destruction and removal efficiency (DRE), principal organic hazardous constituents (POHC's), hydrochloric acid (HCl), and particulates should be substantiated with alternative monitoring methods, identification of the constituents intended for analysis, and an explanation as to how these alternative methods will ensure protection of human health and the environment.

10. Will the Agency provide technical guidance for processes not covered in 40 CFR Parts 264 and 266?

Not in this guidance manual. However, the permitting authority and permit applicants may request technical assistance from the Office of Research and Development, Alternative Technologies Division in Cincinnati (see Appendix 7) to: (1) recommend appropriate sampling and monitoring procedures and analyses, including relevant QA/QC procedures, (2) recommend pollution control devices (e.g., after-burners) and monitoring parameters and procedures, as appropriate to protect public health and the environment, and (3) evaluate the potential technical merits of a proposal based on any available performance data about the unit treating hazardous or nonhazardous waste.

IDENTIFICATION NUMBERS

11. Should the permit applicant submit a §3010 notification form to receive an identification number?

No. This form is, in general, only applicable when the hazardous waste listings under RCRA Section 3001 are revised; an identification number can be assigned without using this form. The information requested on the form is the same information required of all RD&D permit applicants.

12. If a hazardous waste treatment, storage, or disposal facility (interim status or permitted) applies for and receives an RD&D permit for RD&D units, can the same facility identification number be used for both facilities?

Yes.

RESIDUES FROM TREATMENT

13. May an RD&D permittee who receives hazardous waste from a generator who does not have a RCRA permit (e.g., small quanitity generator, as defined in §261.5) return the unused or reduced part of the waste to that generator when the RD&D experiments are completed?

No. Although the permitting authority can modify or waive permit application and permit issuance requirements to accelerate the permitting of RD&D facilities, there is no authority to modify or waive the requirements pertaining to shipping hazardous waste from an RD&D facility. Waste shipped from an RD&D facility must be manifested and go to a RCRA facility with interim status or a RCRA permit (§263.20(d)). The RD&D facility could arrange for the generator's transporter to pick up the unused and reduced portions of waste and take it to a RCRA "designated facility", such as the facility commonly used by the generator or by another facility.

CERCLA

14. Can RD&D technologies and processes be tested at a CERCLA site?

Yes, but a RCRA permit is not required. On-site remedial actions must attain or exceed applicable or relevant and appropriate RCRA standards (50 FR 47946-48, November 20, 1985), which are determined on a case-by-case basis.

15. Can RD&D permits, which are intended for off-site treatment of CERCLA wastes, be issued within one to two months of receiving the RD&D permit application?

No. RD&D permits must allow 45-days for public notice and comment (RCRA §7004(b)(2) and §124.10(b)(1)) rendering it unlikely that a two month deadline can be met. However, the permit applicant and permit writer should develop a schedule for processing the RD&D permit as expeditiously as possible, after determining that the proposal qualifies for an RD&D permit.

CLOSURE

16. Should detailed closure plans be required for all RD&D facilities?

No. Closure plans should basically address how and when the facility will be closed and how the treated wastes will be handled (see section 4.9.1 of this manual for further clarification on closure plans).

17. Must the closure performance standard of §264.111 be met by all RD&D facilities?

Yes. The performance standard embodied in §264.111 is a general standard which should be met through the conditions in the closure plan to ensure protection of human health and the environment.

18. When a permittee, who is testing more than one unit, completes testing with one unit, he may want to decontaminate, dispose or sell it, and then continue similar experiments. Is this considered partial closure of an RD&D facility?

Yes. Decontaminating and disposing or selling one machine, when other equipment is still operating, should be considered partial closure of the RD&D facility. Since an RD&D facility is required to have a closure plan, the permit should address procedures to partially close. Permittees should be required to decontaminate equipment which will be sold. The procedures for decontamination should be specified in the permit.

PUBLIC NOTICE AND COMMENT

19. Should a fact sheet or a statement of basis (§124.8) be used for public notice with the draft permit?

The permitting authority has the discretion to require either the fact sheet or a statement of basis. A fact sheet may be preferable for RD&D experiments when the permitting authority wants to provide a more detailed description of the RD&D facility, particularly when the permit is substantially less stringent than a full RCRA permit. Fact sheets are more comprehensive than a statement of basis.

20. Should the permitting authority combine the 45-day public notice and comment period with the 30-day public hearing into a single timeframe?

Yes. This will help expedite permit issuance if a request for a hearing is expected.

DATA REPORTING/CLEARINGHOUSE

21. How much reporting information should be required from permittees, and who should accept this information and in what form?

The permit applicant and permitting authority should decide on the type of monitoring and recordkeeping information appropriate to the type and scope of the RD&D project. In some cases, when large quantities of different waste streams are

being tested (e.g., 7,000 kg/month) in more than one unit, it may be advisable to keep an operating log to record the operating changes vs. unit performance. Applicants who intend to ultimately apply for a full RCRA permit to commercially use full-scale versions of the RD&D units, should consider using acceptable QA/QC procedures for sampling and analysis. Any required reporting or recordkeeping requirements should be conditions in the permit, including who should maintain the information (e.g., the records are maintained at the facility for review by the permitting authority).

22. What type of information should a permittee provide that summarizes the effectiveness of the RD&D activities?

As stated in question #21, the type of monitoring information will be determined during the permit issuance process. The Agency is interested in those results of RD&D testing that may be useful in drafting permit conditions for the experimental unit when the owner or operator applies for a full RCRA permit to commercially use the unit. Also, analytical information on the chemical and physical composition of the treated residues can be useful in making "delisting" decisions.

If permittees decide to share their experimental test results, one copy should be forwarded to: U.S. Environmental Protection Agency, Office of Solid Waste (WH-563), ATTN: Arthur Glazer, 401 M St., S.W., Washington, DC 20460. This information will be shared with both EPA Headquarters and Regional staff to assist them in developing permit standards and analytical methods for new treatment technologies and processes, and to assist the Agency's research efforts. There is no prescribed form for submitting this information but the permittee might consider including the following:

1. Name, address, and telephone number of the company;

2. Name and telephone number of the person who is most knowledgeable about the test results;

3. Description of the unit(s), including any pollution control equipment;

4. Summary of the optimum performance capabilities of the unit(s), according to the types and quantities of hazardous wastes treated (includes a chemical and/or physical characterization of emissions, if appropriate and of residues); and,

5. Summary of QA/QC procedures.

23. How will the Agency nationally track information about RD&D permit applications, RD&D permits, and RD&D test results?

The Agency intends to maintain a "clearinghouse" to record all of this information for purposes of maintaining abstracts that summarize the type of RD&D activities considered for permitting (see Appendix 8). This information is available to anyone upon request and will provide both permit writers and permit applicants with general information about the type of technologies and processes, type and quantity of wastes, and the name(s) of persons to contact for specific technical information about the results of experiments. Persons interested in this information may call Nancy Pomerleau at (202) 382-4500, Office of Solid Waste, Washington, DC.

RESEARCH FACILITIES

24. Can RD&D permits be issued to a private, government, or independent research facility to test multiple and/or unrelated hazardous waste treatment technologies and processes?

Yes. RD&D permits must specify the type and quantity of hazardous wastes, require liability coverage, and include terms and conditions to protect human health and the environment.

The Agency recognizes that some research facilities, such as government-owned laboratories or State or private university laboratories may want to test a variety of laboratory-scale and/or bench-scale technologies and processes during the term of the permit. In these cases, the applicant must clearly explain how the public health and the environment will be protected when the technologies and processes are tested. The description of the RD&D activity must be general enough to cover the variety of experimental activities, but specific enough for the permitting authority to ensure that the activities are in fact innovative and experimental. This issue must be resolved for each applicant. For example, the applicant should address the issue of monitoring and analyzing the emissions from the unit or laboratory building where the experiments will be conducted, if appropriate. Also, the applicant should describe his general emergency response procedures in the event of a fire, spill, or explosion at the facility during testing. Lastly, since the permit term is limited to operating days, either an operating log or a fixed permit term of one calendar year should be considered.

The Agency is currently developing a regulation to permit laboratory facilities. Until this regulation is promulgated, these facilities will be permitted under §270.65.

APPENDIX 7

TELEPHONE DIRECTORY FOR THE
OFFICE OF RESEARCH AND DEVELOPMENT
ALTERNATIVE TECHNOLOGIES DIVISION
76 West St. Clair
Cincinnati, Ohio 45268

AND

OFFICE OF ENVIRONMENTAL ENGINEERING
AND TECHNOLOGY
401 M Street, S.W.
Washington, DC 20460

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Research and Development

ALTERNATIVE TECHNOLOGIES DIVISION
Clyde J. Dial, Director (FTS/684-7528)

THERMAL DESTRUCTION BRANCH
E. Timothy Oppelt, Chief (FTS/684-7696)

CHEMICAL AND BIOLOGICAL DETOXIFICATION BRANCH
Albert J. Klee, Chief (FTS/684-7493)

THERMAL DESTRUCTION OF HAZARDOUS MATERIALS		FTS No.†
Conventional and "At Sea" Incineration	Donald Oberacker	684-7407
Disposal of Hazardous Waste in Kilns	Edward L. Katz	684-7663
Non-Flame Thermal Destruction	Myron Malanchuk Robert Mournighan	684-7881 684-7408
Disposal of Hazardous Waste in Boilers	Ivars J. Licis	684-7520
Innovative Technologies	Harry M. Freeman C. C. Lee	684-7529 684-7520
Engineering Analysis, Plasma Arc and Data Base	C. C. Lee	684-7520
Microspray Burners	Louis H. Garcia	684-7881
Turbulent Flame Reactor and Control Temperature Tower	Laurel J. Staley	684-7881
COMBUSTION RESEARCH FACILITY (Jefferson, Arkansas)	Robert Mournighan	684-7430 542-4355 (501/541-4355)
CENTER HILL FACILITY (Cincinnati, Ohio)	George L. Huffman	684-7881

† The commercial number is (513)569-xxxx.

HAZARDOUS WASTE TREATMENT		FTS No.†
Air Emissions from Treatment, Storage and Disposal Facilities	Benjamin Blaney	684-7519
Existing Treatment	Robert A. Olexsey	684-7717
	Harry M. Freeman	684-7529
	Ronald J. Turner	684-7775
	Douglas W. Grosse	684-2621
	H. Paul Warner	684-7795
Physical/Chemical Separation of Aqueous Wastes	S. Garry Howell	684-7756
	Mark J. Stutsman	684-7776
	John F. Martin	684-7758
	Donald L. Wilson	684-7510
Physical/Chemical Treatment of Soils and Sediments	Charles J. Rogers	684-7757
	Alfred Kornel	684-7421
Biological Detoxification	Pasquale Sferra	684-7618
	John A. Glaser	684-7562
Emerging Technologies for Chemical Detoxification of Hazardous Wastes	Charles J. Rogers	684-7757
	Alfred Kornel	684-7421
	Donald L. Wilson	684-7510
Pesticide Disposal	Brian A. Westfall	684-7755
Metals Removal	S. Garry Howell	684-7756
	T. David Ferguson	684-7518
	John F. Martin	684-7758
Hazardous Waste Minimization, Reuse	Harry M. Freeman	684-7529
OIL SHALE	Edward R. Bates	684-7774
RD&D PERMIT COORDINATION	T. David Ferguson	684-7518

† The commercial number is (513)569-xxxx.

OFFICE OF ENVIRONMENTAL ENGINEERING AND TECHNOLOGY, Washington, DC

		FTS No.†
Superfund Program	H. Ray Thacker	382-5747
Alternative Technologies	Paul des Rosiers*	382-2722
Dioxin Wastes	Paul des Rosiers*	382-2722

† The commercial number is (202) 382-xxxx.

* Chairman, Dioxin Disposal Advisory Group.

APPENDIX 8

SUMMARY FORM FOR RESEARCH, DEVELOPMENT, AND DEMONSTRATION PERMIT APPLICATIONS PURSUANT TO 40 CFR §270.65

1. Name of proposed technology or process.

2. Objective of the research.

3. Description of the research, including the type and quantity of hazardous waste.

4. EPA identification number (if assigned).

5. Name and location of the proposed facility.

6. Name and address of the owner.

7. Name and address of the operator.

8. Name and telephone number of the Regional person responsible for processing the application.

9. Date the application was received.

10. Approved ☐ If approved, indicate expected date to public notice the draft permit.

    Denied ☐ If denied, indicate the reasons for denial.

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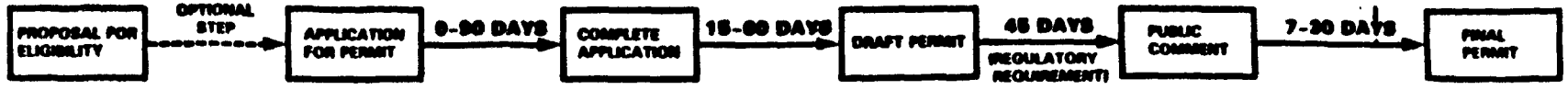
* These summaries should be forwarded to: U.S. Environmental Protection Agency, Office of Solid Waste (WH-563), ATTN: Arthur Glazer, Program Manager, 401 M St., S.W., Washington, DC 20460; they will be used to form the basis of a clearinghouse to track RD&D technologies and processes.

APPENDIX 9

RESEARCH, DEVELOPMENT, AND DEMONSTRATION PERMIT PROCESS

RCRA RESEARCH, DEVELOPMENT, AND DEMONSTRATION PERMIT PROCESS



- PURPOSE OF RESEARCH
- EXPLANATION WHY THE RESEARCH IS EXPERIMENTAL AND INNOVATIVE
- GENERAL DESCRIPTION OF THE RESEARCH

1. PURPOSE OF RESEARCH
2. EXPLANATION WHY THE RESEARCH IS EXPERIMENTAL AND INNOVATIVE
3. DESCRIPTION OF THE FACILITY*
4. TYPE AND QUANTITY OF HAZARDOUS WASTES
5. ESTIMATED TIMEFRAME TO CONDUCT RESEARCH ACTIVITIES
6. INFORMATION ON ANTICIPATED PERFORMANCE OF THE UNIT(S)*
7. SAMPLING AND MONITORING PLAN INCLUDING QA/QC*
8. NAME AND QUALIFICATIONS OF RESEARCH PERSONNEL
9. SAFETY PLAN*
10. CLOSURE PLAN
11. CLOSURE COST AND LIABILITY INSURANCE

*LEVEL OF DETAIL AND APPLICABILITY DEPENDS ON THE TYPE OF RESEARCH AND SITE-SPECIFIC FACTORS

- APPLICANT HAS PROVIDED ALL REQUIRED INFORMATION

- TENTATIVE DECISION TO ISSUE OR DENY THE PERMIT
- FACT SHEET SUMMARIZING THE PERMIT OBJECTIVE AND PERMIT CONDITIONS

STANDARD CONDITIONS

- PERMITTEE'S GENERAL RESPONSIBILITIES
- REPORTS AND NOTIFICATIONS
- DOCUMENTS TO BE MAINTAINED AT THE FACILITY

SITE SPECIFIC CONDITIONS

- FACILITY DESIGN
- TYPE AND QUANTITY OF WASTE
- RESEARCH PLAN
- PERSONNEL QUALIFICATIONS
- EMERGENCY RESPONSE PROCEDURES
- RECORDKEEPING
- CLOSURE PROCEDURES
- CLOSURE COST AND LIABILITY INSURANCE
- OTHER CONDITIONS, AS NECESSARY TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT

- WILL INCLUDE PUBLIC HEARING IF REQUESTED BY CITIZENS, EPA, OR PERMIT APPLICANT

- SAME INFORMATION AND CONDITIONS FROM DRAFT PERMIT PLUS CHANGES RESULTING FROM PUBLIC COMMENTS
- TERM OF THE PERMIT (MAXIMUM 365 DAYS OF OPERATION)**

**RENEWABLE FOR 3 ADDITIONAL 1-YEAR INCREMENTS