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Los Alamos

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DATE: August 24, 1989
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Mr. James R. Anderson
Acting Area Manager
U.S. Department of Energy
Los Alamos Area Office
Los Alamos, NM 87544

LANL REC'D '89

Dear Mr. Anderson:

Enclosed are the Los Alamos National Laboratory's comments on the record of the public hearing on the Department of Energy's (DOE) draft hazardous waste permit. These comments are our response to the statements made at the July 18-20 hearing and reflected in the written record.

In order to be accepted by the Environmental Improvement Division (EID) for consideration, these comments must be at their office by close of business on August 24, 1989.

Sincerely,

Allen J. Tiedman
Associate Director
for Operations

AJT:mc

Enclosures: a/s

Cy: J. Puckett, HSE-DO, MS K491
K. Hargis, (HSE8-89-493), HSE-8, MS K490
S. Brown, LC-GENERAL, MS A187
CRM-4 (2), MS A150
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SUPPLEMENTARY COMMENTS OF THE DEPARTMENT OF ENERGY AND THE UNIVERSITY OF CALIFORNIA ON DRAFT PERMIT #NM0890010515-1

The Department of Energy and the University of California request that these additional comments and information be made a part of the record of the proceedings on draft permit #NM0890010515-1. These comments address only issues which are relevant to the Environmental Improvement Division's (EID) decision on whether to issue the above referenced permit. EID staff and legal counsel acknowledged at the hearing that many of the comments received at that time, while reflective of public concern, were not relevant or were outside EID's jurisdiction.

At the hearing EID submitted for the record a document entitled, EID July 19, 1989 Statement Responding to Particular Concerns Expressed by Members of the Public Regarding the LANL Mixed Waste Incinerator. This document makes clear that the permit under review deals only with the treatment of chemical waste. Concerns dealing with the treatment of radioactive or mixed waste are not relevant to this proceeding and may not be considered by EID unless they directly relate to the storage or treatment of chemical wastes. For this reason, these supplementary comments address only issues relevant to the draft permit.

The great majority of public comments at the hearing related to concerns about the operation of the controlled air incinerator. LANL believes that the following additional comments and information will help to answer these concerns.

1) Continuous Monitoring of Stack Emissions:

40 CFR 264.345 requires continuous monitoring of Carbon Monoxide (CO) in stack exhaust gas. In addition, the NMEID Draft Permit and the CAI TSCA (PCB) permit require continuous monitoring of Oxygen (O_2) in the secondary combustion chamber during RCRA or TSCA operations. LANL also continuously monitors for Carbon Dioxide (CO_2) in the exhaust gas. (see transcript p. 105, 360)

Adequacy of CO Monitoring as an Indicator of Destruction Efficiency

EPA-sponsored and private research has shown that destruction and removal efficiency (DRE) cannot be correlated to levels of CO in flue gas, but that some correlation exists between CO levels and products of incomplete combustion (PICs) and total unburned hydrocarbons.[1-10] Studies have shown that when CO emissions are below 100 ppm, PIC emissions are always low (although the converse may not always be true). EPA, in its 12/29/87 Draft Incinerator Amendments, has accepted the need to establish permit CO limits at levels exceeding those demonstrated during trial burns to avoid numerous waste feed cutoffs due to CO exceedances. It is their finding that, in doing so, DREs will not be reduced below regulatory requirements and that PIC emissions will not vary significantly thereby, as they do not increase linearly at such low CO levels. EPA itself has therefore proposed a CO level of 100 ppm as a conservative indicator of low levels of PIC emissions and as being indicative of good combustion efficiency.[1]

EPA has found short-term CO excursions to be typical of incinerator operation (e.g., at times when burner firing rates are adjusted) and that establishment of a "never-to-exceed limit would impede incinerator operation while providing little reduction in health risk."[1] That exactly this type of situation can occur is readily apparent from a study of the trial burn CO recording chart. EPA has therefore proposed an alternative format in which dual CO levels are established, one at the 100 ppm range for timed cutoff, and a higher level of 1000 ppm for instantaneous cutoff.

LANL's proposal of a two-tier, 100 ppm timed and 500 ppm instantaneous cutoff permit condition for CO monitoring is consistent with this approach, while being more conservative than the EPA's own proposed 1000 ppm instantaneous cutoff limit as well as the hourly rolling average concept, proposed by EPA as an alternate monitoring technique.

In addition to continuous strip chart recording of process parameters required by the RCRA permit, manual and electronic data acquisition are employed to archive process data. This data is retained for EPA and NMEID inspection. Per permit conditions, EPA and/or NMEID may inspect monitoring records at any time. No capability currently exists or is planned for direct electronic transmission of monitoring data in real time to NMEID or EPA. Establishment of such a system at LANL's expense would provide no more data than is currently available through site inspection of monitoring records. NMEID undoubtedly does not have the staffing to assign personnel to monitor such transmissions continuously, nor does LANL expect to operate the CAI in a continuous manner. A better option might be for LANL to send hard copies of run data following incinerator campaigns, or to invite NMEID personnel on site to observe operations.

2) Description of Incinerator

General and detailed descriptions of the incinerator have already been provided or made part of the public record during the permit hearing. See:

a) Part B Application, Appendix J and J-1;
b) LALP-89-30 (CAI Brochure handed out at hearing--placed into record as Robinson Exhibit #1)

3) Previous Disposal of Ash

The CAI has completed approximately 3000 hours of operational time in the past 10 years. Approximately half of this time has consisted of test runs, without the burning of any real or simulated waste materials (for system checkout, refractory curing, etc.). The majority of materials that have been burned in the CAI have not been actual wastes, but instead have been simulated wastes composed of reagent chemicals for test burn purposes (e.g., RCRA Trial Burn, Army & Navy Smoke and Flare compound test burns, Fission Activation Product test burn, EPA PCB study, etc). Exceptions are the TRU contaminated PCBs and other TRU waste, the scintillation vial (pseudocumene or 1,2,4-trimethylbenzene) waste, and some materials contaminated with methanol (upon which the interim status request was based).

Liquids, which have represented a substantial portion of the materials burned in the CAI, typically leave little or no ash residues. Of the ash residues which were produced from various incineration campaigns, ash was typically removed from the lower chamber following each campaign. Ashes qualifying as TRU waste were sent to TA-55, where they were solidified along with evaporator bottoms from TA-55 processing operations. These materials are currently stored with other TRU wastes at TA-54, pending ultimate disposal (at WIPP or a similar facility). Non-TRU ashes, whether resulting from radioactive or non-radioactive real or simulated waste incineration, have been handled as low level or potential mixed waste. Consequently, these ashes have been sent to the mixed waste landfill at Area G. No ash has been disposed of at that site since the last operation of the CAI for scintillation vial destruction in the Spring of 1987. Some of the ashes resulting from simulated Navy Smoke compound incineration were apparently sent to Aberdeen, MD (at Navy request).

4) Trial Burn Description and Justification

The Trial Burn has been described in the Trial Burn Plan of the Part B Application and in the "Final Report on the RCRA Trial Burn of the Los Alamos Controlled Air Incinerator", submitted to the NMEID in March 1987.

The purpose of a Trial Burn is to establish the set of operating conditions under which an incinerator will be permitted under RCRA to operate. This is done by feeding a real or simulated chemical waste to the incinerator and sampling and analyzing the exhaust gas to determine

a) Destruction and removal efficiency (DRE) of the chemical species fed to the incinerator,
b) Particulate emissions, and
c) HCl emissions and removal efficiency.

In addition, operating parameters such as chamber temperature, waste feed rate, oxygen and carbon monoxide level in exhaust gas, scrubber liquid pH, venturi pressure drop, and other process parameters were monitored during sampling periods to correlate performance with incinerator operating conditions. Permitted operating requirements and conditions are then based on the operating conditions demonstrated during periods of successful performance.

The choice of carbon tetrachloride (CCl_4) and trichloroethylene (TCE), which are the two difficult-to-incinerate chemical compounds used for the Trial Burn demonstration, was based on accepted Trial Burn practice and guidance from both EPA and NMEID. EPA has established an incinerability ranking for chemical compounds based on heats of combustion. Choice of CCL_4 and TCE followed the accepted Trial Burn procedure of choosing low heat of combustion compounds under the rationale that demonstration of effective destruction of such compounds is valid proof of equivalent or greater destruction of compounds having higher heats of combustion. It is for this reason that EPA does not require a wide spectrum of chemical waste feeds for Trial Burn performance tests, and why choice of a single or a few

compounds for the test is accepted as demonstrating performance for compounds higher in heat of combustion on the incinerability ranking list. This performance was proven during the Trial Burn.

Per the RCRA permit, LANL will be required to conduct verification Trial Burns every five years or every 8000 hours of operation, whichever comes first.

Sampling and analysis were performed by independent contract firm and laboratories (Clean Air Engineering, Controls for Environmental Pollution). The sampling contractor performed CO, ORSAT (O_2, CO_2), Modified EPA Method 5 (particulate, HCl), and VOST (volatile organic sampling train) sampling and during the Trial Burn. Their monitoring instruments were calibrated prior to, and periodically during, the performance test.

LANL hired an independent contractor, Kaiser Engineering, to review the modified air pollution control system to determine the effect of the modifications on the operational reliability and efficiency of the unit and its expected performance with regard to the RCRA permit limits. The report concludes that the modified system is much more operationally reliable, greatly improved in its ability to remove air pollutants, and easily capable of meeting the RCRA requirements, even under worst-case conditions. A copy of the report is provided for the record.

5) California Particulate Standards

The New Mexico Environmental Improvement Division and the U.S. EPA Region VI are the only regulatory bodies which have authority over hazardous waste incinerator permitting in the State of New Mexico. LANL is in compliance with the applicable guidelines of these regulatory agencies (HWMR-5 and 40 CFR 264, Subpart O). For information purposes only, LANL has researched the California Particulate Standards.

State of California particulate standards for hazardous waste incinerators are established by 40 CFR 264, Subpart O and the following:

> California Administrative Code, Title 22: Social Security, Division 4, Environmental Health, Section 67453, Performance Standards for Permitted Facilities, Subsection D, and
>
> California Air Resources Board, Stationary Sources Division, Toxic Pollutants Branch; District Permit Guidelines for Hazardous Waste Incinerators, Guideline Document December 1985.

The standard for hazardous waste incinerators is 0.08 gr/dscf, the same as in New Mexico.

The California PM-2 submicron particulate limit which Mr. Horan references (p. 146 of transcript) is misleading. This standard is derived from a California Air Resources Board (CARB) evaluation of the performance of air pollution control devices for use on resource recovery (municipal waste incineration) facilities entitled "Air

Pollution Control at Resource Recovery Facilities" (May 24, 1984). The report does issue particulate emission guidance to each of California's 43 independent districts, based on a best available control technology (BACT) study of the projected performance capabilities of fabric filter (baghouse) types of particulate control. This guidance states that, as of the date of the report, fabric filters should be able to control particulate emissions from municipal waste incinerators to:

a) 0.01 gr/dscf for total particulate matter;

b) 0.008 gr/dscf for less than 2 micron particulate.

The report goes on to mention that fabric filters have "greater than 99% collection efficiency" and that, typically, particles of 2-3 microns tend to "bleed" through the filter. In contrast, HEPA filter collection efficiencies are tested and certified at greater than 99.97% for 0.3 micron particles, and thus exceed those of baghouse units.

The CARB report and its recommendations are intended to establish particulate emission guidelines for California air pollution control districts in siting new resource recovery facilities (municipal waste incinerators). They are not, per se, directed at hazardous waste incinerators, nor are hazardous waste incinerators within the state of California, or any incinerator facilities, municipal or otherwise, located outside the State of California subject to these guidelines.

Particulate emissions during the Trial Burn at LANL varied between 0.0066 and 0.024 gr/dscf, corrected to 7% oxygen. There is evidence that this was an inflated representation of actual process particulate emissions, resulting from entrainment of iron-based particulate in the offgas ductwork prior to the EPA Method 5 sample train.

Inspection of the carbon steel induced draft (ID) blowers following the Trial Burn showed that they were fairly extensively corroded. High moisture content and residual chlorides in the offgas were undoubtedly responsible for this corrosion. This assessment is supported by analysis of the offgas particulate collected during Trial Burn EPA Method 5 sampling. This particulate showed high levels of iron, and analysis of the corrosion scale from within the ID blowers indicated the presence of chlorides.

These findings are consistent with the theory that entrainment of fine particulates from the corroded blowers, which were located downstream of the offgas treatment system components and upstream of the offgas sample system ductwork, was responsible for higher than normal particulate readings. The upstream offgas treatment components in place during the Trial Burn were predominantly of non-ferrous construction (fiberglass reinforced polyester) and would not have contributed to iron-based particulate formation. The HEPA filter plenum and carbon bed adsorber shell (which were of steel construction) were located upstream of the final HEPA filters, which would have effectively attenuated any particulates formed from corrosion mechanisms to levels below those actually seen downstream of the ID blowers.

The ID blower condition is not surprising considering that the blowers had been in service since the mid-1970's. We have taken steps to correct this problem by replacing these blowers, which should help to reduce particulate emissions accordingly. Nevertheless, our measured particulates were well within the present hazardous waste incinerator guidelines of 0.08 gr/dscf cited in 40 CFR 264.343(c).

6) Potential Radioactive Effects (p. 180)

Effective destruction of chemical compounds is a function of temperature, the amount of oxygen available to promote combustion, adequate gas mixing and residence time. The radioactive constituents in mixed wastes have no known or demonstrable effect on efficiency of chemical destruction.

Damage or impairment of the incinerator due to exposure to radioactivity is not a valid concern. Although conditions of high neutron flux or gamma energy (such as in a reactor environment) can cause materials damage (such as embrittlement of metals), the CAI will not see appreciable levels of this type of radioactivity. The plutonium contaminating the radioactive and mixed waste emits primarily alpha activity, which is not a materials concern.

7) Revised EA

There is a 1973 EIS on the CAI and the TA-50-37 facility (see transcript p. 111). No revised EA has been prepared for the CAI based either on past or ongoing equipment modifications or to incorporate changes in intended operation.

8) Particulate Sampling

Particulate sampling during the Trial Burn was taken in accordance with the procedures specified and described in 40 CFR 60, Appendix A, Method 5: "Determination of Particulate Emissions from Stationary Sources." Sampling was performed by the sampling contractor, Clean Air Engineering of Palatine, Illinois.

9) Paul Robinson's Emission Calculations

Mr.Robinson's statement regarding a 99.99% destruction of a 100 pound/hour feed resulting in a potential release of approximately 5 grams/hour of residual is essentially correct. However, his attempt to relate this 5 gram/hour of potential chemical emissions to 180 milligrams/cubic meter (0.08 grains/dscf) of particulate emissions is equivalent to mixing apples and oranges. The 99.99% requirement is for destruction of incoming chemical feed POHCs (principal organic hazardous constituents). The 180 mg/m^3 relates to allowable particulate emissions. The two are not the same.

LANL would like to correct for the record statements made by Kelly Crossman, under questioning by Paul Robinson (p. 291 & 292 of transcript) Mr. Crossman mistakenly says that LANL chose carbon monoxide as a difficult to incinerate compound, #4 on the EPA incinerability list of hard to incinerate compounds. This should be carbon tetrachloride. Also, on p.274 of the transcript Kelly Crossman

says that dioxin-type wastes which require a 99.9999% DRE will not be burned in the CAI under the permit. F027 wastes (tetra-, pentachlorophenols) are considered dioxin contaminated in the manufacturing process and are also considered to be dioxin precursors when incinerated. These wastes require a 99.9999% DRE. LANL has, per 40 CFR 264, demonstrated 99.9999% DRE capability and has applied to burn these types of waste, both in the Part A and in discussions with Mr. Crossman which led to the establishment of a 125 pound/hr solid feed limitation, specifically related to F027 incineration.

The CAI has burned pentachlorophenol in the past with no evidence of dioxin or furans in the offgas above the analytical detectible limit.

12) Response to Paul Robinson's Testimony

The only corrosion damage was to the carbon steel induced draft fans, downstream of the pollution control system and HEPA filters. Pollution control efficiencies and operation was not affected. Corrosion damage was due primarily to water damage from condensation in the blowers, and some chloride attack. These blowers have been replaced (see #5 above).

Modifications to the incinerator, other than replacement of the ID blowers, were not made necessary as a result of corrosion damage. At no time did LANL decide, nor was it necessary, to suspend chemical operations due to some other alleged system damage, nor was the decision to return to burning primarily TRU waste in the CAI a result of such corrosion damage.

The Part A is an accurate characterization of the possible chemicals which may be incinerated (p. 418).

Results of the Trial Burn are not nullified by any system modifications, as alleged by Robinson, nor is a second Trial Burn a foregone conclusion (p. 418, 430). LANL contracted with Kaiser Engineering to perform an independent engineering assessment of the potential effects of these modifications. Their assessment was that the modifications will not result in a degradation of the CAI's performance or its ability to meet RCRA performance criteria--to the contrary, system performance should be improved by those modifications. In addition, they find that the modifications should enhance the system's corrosion resistance (p. 418). EID staff have previously stated that LANL would not be required to re-perform a Trial Burn due to post Trial Burn modifications of which EID has been notified. These modifications are detailed in Appendix J-1 of the Part B Application.

His reference (p. 422) to "...the new source performance standard list, which can be found at page five dash five of the application for solid waste fired boiler..." is incorrect. This list, Table 3 is "...for applicable criteria pollutants, as well as organic compounds and heavy metals of interest." To construe this as a new source performance standard list is incorrect. Monitoring stack emissions for these pollutants is not required by the state or federal govenment. If there is a need to set standards for any of these pollutants they should be set to protect human health and the

environment independent of the emissions from the incinerators. Monitoring requirements not related to any emission, performance, or ambient standards and are not needed in the permit and are not authorized by the law or regulations.

Of the list of 18 provided by Paul Robinson (p.423), only three are demonstrated technologies in terms of continuous monitoring (oxides of nitrogen NO_x, sulfur dioxide, and carbon monoxide). Most of the others could be monitored in a performance test, but some could be expensive.

LANL may measure most or all of these pollutants during a performance test so there are data for comparison to other incinerators, but it should not properly be made a requirement of the permit. Monitoring for sulfur dioxide as an indicator of scrubber efficiency would not be reasonable as a permit condition. There are continuous monitors for hydrogen chloride, but LANL believes that their use is primarily confined to the demonstration stage.

Mr. Robinson confuses HEPA partilculate removal efficiencies with chemical DRE (see #9 above). The two are not interchangeable. F027 waste is not PCBs. (p. 431)

13) Reliability of HEPA Filters

A LANL staff member has prepared a critique of the paper by Joseph Goldfield on HEPA filters submitted for the record. The critique is attached for inclusion in the record.

Additional Comments on Module VIII

1) The introduction to this section should be revised to reflect that based on special permit conditions findings additional studies will be conducted as appropriate. Any additional studies will be defined/scheduled in the Installation Workplan and approved by the Administrative Authority. The text provided below should be inserted under H. (2) RFI Workplan (LANL Installation RI/FS Workplan. TASK I.A.1.h. should be deleted because the Laboratory does not have reasonable access to the described map. The requirements above will ensure that the Administrative Authority has an adequate understanding of the installation-wide geologic setting and hydrologic characteristics affecting the occurence, movement, and interaction of surface and subsurface water with a view toward contaminants. Additionally, springs, faults, gravel deposits, alluvium, and pumice deposits can be provided with TASK.I.A.1.c.

2) The following text should be inserted under R. Scope of Work for a RCRA Facility Investigation (RFI) and S. Scope of Work for a RCRA Corrective Measure Study (CMS), respectively.

The LANL Installation RI/FS Workplan (as part of the RFI Task I.A.) will include an overview of the installation-wide Los Alamos hydrogeological environment. This overview shall be a summary description of the major features and conceptual interrelationships of the hydrogeological environment at Los Alamos. It should address the regional and installation-wide geologic setting and hydrologic characteristics affecting the occurence, movement, and interaction of surface and subsurface water with a view toward understanding

potential pathways for transport of contaminants. This overview shall provide a guide and referencing to appropriate maps submitted with the installation workplan and to appropriate detailed information in the significant geologic and hydrologic reports and studies listed and summarized in the task "Identification and Summary of Previous Studies" required under Section B. Special Permit Conditions. The overview shall be reviewed and updated as appropriate annually (as part of the Installation Workplan update) to incorporate the major findings with installation-wide significance from studies conducted under either the Special Permit Conditions or the Task/Site RI/FS investigations.

3) In response to concerns raised at the hearing, LANL is proposing to undertake an expanded community relations plan as described below.

COMMUNITY RELATIONS PLAN

RCRD Facility Investigation (RFI)

The permittee shall prepare a Community Relations Plan (CRP) as part of the RFI Workplan which allows for public participation in the RFI process. The CRP will include:

Establish and maintain an active mailing list of interested parties;

Informal meetings, including briefings and workshops as appropriate, with the public and local officials before and during the RFI process, which includes activities associated withsthe RFI Workplan and RFI report;

News releases, fact sheets, and publicly available quarterly progress reports that explain the progress and conclusions of the RFI;

Updates of materials in the information repository and public reading room; and

Public tours and briefings to inform and to listen informally to public concerns and answer individual questions.

Corrective Measures Study

The permittee shall prepare a Community Relations Plan (CRP) as part of the Corrective Measure Study (CMS) Plan which allows for public participation in the CMS process. The CRP will include:

Establish and maintain a active mailing list of interested parties;

Informal meetings, including briefings and workshops as appropriate, with the public and local officials before and during the CMS process which includes activities associated with the CMS Plan and the CMS report;

News releases, fact sheets, and publicly available quarterly progress reports that explain the progress and conclusions of the CMS;

Updates of materials in the information repository and public reading room; and

Public tours and briefings to inform and to listen informally to public concerns and answer individual questions.

References:

(1) USEPA, "Draft Incinerator Amendments," 12/29/87.

(2) Shiva Garg, "Guidance on CO Emission Limits from Hazardous Waste Incinerators," USEPA Office of Solid Waste, Waste Treatment Branch WH565A, Washington, DC, 20460.

(3) D. Hall, et al., "Thermal decomposition of a Twelve-Component Organic Mixture'" Hazardous Waste and Hazardous Materials, 1985.

(4) L.J. Staley, "Carbon Monoxide and DRE: How Well Do They Correlate?," in Proceedings of the 11th Annual Research Symposium-Incineration and Treatment of Hazardous Waste, EPA/600/9-85/028, September, 1985.

(5) Timothy Oppelt, "Incineration of Hazardous Waste-A Critical Review," Journal of the Air Pollution Control Association, Vol. 37, No.5, May, 1987, pp. 557-586.

(6) L.J. Staley, et al., "Incinerator Operating Parameters Which Correlate With Performance," Project Summary, Hazardous Waste Engineering Research Laboratory, EPA/600/S2-86/091, February, 1987.

(7) Stacey Daniels, et al., "Significance of Major Gaseous Species in Combustion and Destruction of Hazardous Waste Constituents," presented at the 1985 Annual Meeting of the American Institute of Chemical Engineers, Chicago, Illinois, November, 1985.

(8) Rachel La Fond, et al., "Evaluation of Continuous Performance Monitoring Techniques for Hazardous Waste Incinerators," Journal of the Air Pollution Control Association, Vol. 35, No.6, June, 1985, pp.658-665.

(9) "Scientist Questions Use of Carbon Monoxide for Monitoring Waste Incineration Emissions," Environment Reporter, Bureau of National Affairs, October 4, 1985.

(10) S.L. Daniels, et al., "Experience in Continuous Monitoring of a Large Rotary-Kiln Incinerator for CO, CO_2, and O_2," presented at the 78th Annual Meeting of the Air Pollution Control Association, Detroit, Michigan, June, 1985.