



DOE Environmental Management Programs  
in New Mexico:  
Environmental and Economic Impacts

Assessment by Nuclear Watch of New Mexico



The mission of Nuclear Watch of New Mexico is to provide timely and accurate information to the public on nuclear issues in New Mexico and the Southwest. Through the resulting empowerment of effective citizen action, Nuclear Watch of New Mexico seeks to promote both greater safety and environmental protection at regional nuclear facilities and federal policy changes that genuinely encourage international efforts to curb the proliferation of nuclear weapons.

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# An Assessment of the Environmental and Economic Impacts of the DOE Environmental Management Programs in New Mexico

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# An Assessment of the Environmental and Economic Impacts of the DOE Environmental Management Programs in New Mexico

## 1.0 Executive Summary

In August 2001 **Nuclear Watch of New Mexico** (NWNM) was funded by the **Citizens' Monitoring and Technical Assessment** (MTA) **Fund** to conduct an "***Assessment of the Environmental and Economic Impacts of Department of Energy Environmental Management Programs in New Mexico.***"

New Mexico is home to two of the three nuclear weapons laboratories in the United States, Los Alamos and Sandia National Laboratories. New Mexico also hosts the Waste Isolation Pilot Plant, the world's only deep geological disposal site for radioactive transuranic wastes (which are primarily plutonium contaminated wastes resulting from bomb research and production). These three sites were the focus of NWNM's project.

In May 2002, the New Mexico Environment Department (NMED) issued under its Resource and Recovery Act (RCRA) authority a draft "Corrective Action Order" against Los Alamos National Laboratory (LANL). This Order mandates the investigation and compilation by the lab of comprehensive environmental information categorized by different lab Technical Areas, watersheds and groundwater. The bulk of our project on LANL environmental issues turned to analyzing and commenting on the draft Corrective Action Order. Subsequently Bernd Franke and Jay Coghlan collaboratively provided NMED with 19 pages of technical comments, which we believe had a salutary effect in strengthening the November 2002 Final Order. It is our hope that the LANL Order will lead, in time, to State-mandated cleanup. Unfortunately, to date implementation of the Order has been stayed under the threat of DOE lawsuits against NMED.

The purpose of our Waste Isolation Pilot Plant (WIPP) project was to look closely at the Department of Energy's (DOE's) anticipated remote-handled transuranic (RH-TRU) waste program as it pertains to WIPP. [RH-TRU wastes are those too hot for humans to handle.] However, because of the consistently changing nature of the DOE's environmental management program and because of the interlocking nature of those changes, our WIPP project took on a broader scope. Not only did NWNM analyze and comment on the proposed addition of RH-TRU waste disposal, but also analyzed and commented on 22 other proposed additions or changes to WIPP. We believe that we have played a significant role in helping to ensure that the State WIPP RCRA permit remains strong and that the DOE's requested modifications are not just perfunctorily approved by the NMED.

In our economic analysis we found that the outlook for New Mexico remains grim, in large part because of the State's dependence on DOE money, which our congressional leadership continues to encourage. Intra-State economic and social disparity has dramatically increased in recent years, and if current trends continue these disparities will likely grow even wider. According to recent demographic statistics, New Mexico has the highest national rate of resi-

dents living in poverty, the second highest percentage of residents lacking health insurance, second highest rate of violent deaths among teens, third highest rate of violent crimes and reported sexual assaults, and sixth highest rate of teen pregnancies. New Mexico is at the bottom when it comes to teacher salaries and the socioeconomic conditions for raising children well. The bottom line of our economic study is that the DOE has overstated its beneficial economic impact on New Mexico by approximately two-fold, thereby misleading the public and lawmakers.

## 2.0 Introduction

In August 2001 **Nuclear Watch of New Mexico** (NWNM) was funded by the **Citizens Monitoring and Technical Assessment Fund** to conduct an “**Assessment of the Environmental and Economic Impacts of Department of Energy Environmental Management Programs in New Mexico.**” As stated in our proposal to the Fund:

The aim of this project is to provide the citizens of New Mexico with a statewide environmental and economic assessment of the impacts of Department of Energy (DOE) environmental management programs on New Mexico. We believe that this assessment is significant because 1) such an aggregated and two-prong approach has never been attempted; 2) New Mexico is arguably the key state in the nuclear weapons complex; 3) the further expansion of nuclear weapons programs in this State is being planned; and 4) it is imperative that there be a better informed state citizenry so that better environmental and public protection is assured and cleanup programs more efficiently completed. Some of the project’s objectives are to rank environmental threats, influence future permitting processes, provide a macroeconomic picture of DOE EM activities, and to give citizens useful tools for formulating public comment.

To substantially aid in meeting those objectives NWNM engaged two outstanding experts: Lloyd (Jeff) Dumas, Professor of Economics and Political Economy at the University of Texas at Dallas; and Bernd Franke, Biologist and the Scientific Director for the Institut für Energie und Umweltforschung (Institute for Energy and Environmental Research) in Heidelberg, Germany, who frequently travels to New Mexico.

As brief background, there are three major DOE facilities in New Mexico: the Los Alamos National Laboratory (LANL), the Sandia National Laboratory and the Waste Isolation Pilot Plant. The laboratories in this State are two of the three nuclear weapons design labs in the U.S. Each has an annual budget of around \$2 billion. Each lab also has intractable environmental problems caused by past contamination (especially LANL) even while their cleanup budgets are being cut. Both labs are also currently generating yet more waste from expanding nuclear weapons research, development and production programs. The Waste Isolation Pilot Plant (WIPP), located near Carlsbad in southeast New Mexico, is the world’s first and only deep underground disposal site for radioactive transuranic (TRU) wastes. [In simple terms, transuranic means heavier than uranium, which in turn effectively means plutonium. Hence WIPP’s mission is to dispose of radioactive wastes from past and present bomb making.] Finally, because of the presence of these facilities and the relative poverty of New Mexico, the DOE claims to have an immense beneficial economic impact on our State. NWNM staff mem-

ber Colin King worked closely with Professor Dumas in our analysis of those claims. NWNM staff members Jay Coghlan worked closely with Mr. Franke on Los Alamos and Sandia environmental issues and Geoff Petrie with Mr. Franke on WIPP issues.

## 2.1 September 11 Project Impacts

Shortly after project startup the tragic 9/11 attacks occurred. This event seriously impacted project implementation. In addition to the shock of the attacks, NWNM staff efforts were immediately diverted into playing a small role in defusing some suggestions of possible nuclear retaliation. However, the attacks also had a long-lasting effect on our project that continues to this day.

After 9/11, DOE severely restricted previously available public documents on environmental management issues at all of its facilities. This caused us great alarm both in principle (past secrecy led to widespread contamination) and in project implementation. One of our major thrusts was to be analysis of the pending draft of the renewed LANL Resource Conservation and Recovery Act (RCRA) permit, which governs the lab's handling, treatment and disposal of hazardous and mixed (i.e., hazardous and radioactive) wastes. Our problem was that the voluminous body of the expired LANL permit was available only on the Lab's web site. In response, and in order to help preserve public access to DOE environmental management documents, Colin King and Geoff Petrie compiled a comprehensive, nation-wide list of the status of DOE environmental management web sites, which they continually updated throughout the duration of the project (<http://www.nukewatch.org/facts/nwd/DOEweb.html>). This first product of our project was widely viewed on our web site and referenced in media articles nationwide. From this unexpected beginning we proceeded to implement the project as planned, albeit in a somewhat impeded manner.

## 3.0 Project Overview

### 3.1 The New Mexico Environment Department Corrective Action Orders

Ironically the New Mexico Environment Department (NMED), the permitter and regulator of the LANL RCRA permit, never did issue a draft during the time period of our project (it is now four years late). What NMED did issue under its RCRA authority was a May 2002 draft "Corrective Action Order" against LANL that mandates the compilation by the lab of comprehensive environmental information categorized by Technical Areas, watersheds and groundwater. This Order is far from perfect as it does not mandate actual cleanup. It is our hope that the Order will lead to required cleanup once sufficient information is acquired that would enable intelligent cleanup decisions. Thus, the bulk of our project efforts related to environmental management issues at LANL turned to analyzing and commenting upon the draft Corrective Action Order. It should also be noted that the NMED Order's "Findings of Fact," through its extensive recitation of past suspected contaminant releases, effectively preempted one of our stated objectives to prioritize the need for future cleanup sites.

Bernd Franke and Jay Coghlan collaboratively provided NMED with 19 pages of technical comment, which we believe had a salutary effect in strengthening the November 2002 Final LANL Order. Franke and Coghlan then repeated this effort by providing 13 pages of technical comment for a similar draft NMED Corrective Action Order against Sandia. Our overall point in

both sets of comments was to express support for the NMED's proscribed human health risk standard of  $10^{-5}$ , meaning that contaminants may not result in more than one projected fatal cancer in a population of 100,000. However, we questioned how the Environment Department should properly arrive at that level of risk. The pivotal issue is the future designation of land-use scenarios. For example, to declare that contaminated lands would be used only for future industrial use (which assumes 8-hour daily human occupation) would allow a much higher degree of contamination. NWNM and Mr. Franke argued that future residential and/or agricultural land use scenarios should be the determining standard, one that would help stringently protect the environment and posterity. Enclosed in this report are our comments on the LANL Corrective Action Order and our "Talking Points" (an easy-to-read summary) on the same.

### 3.2 The Waste Isolation Pilot Plant

The original purpose of our Waste Isolation Pilot Plant (WIPP) project was to look closely at the DOE's anticipated remote-handled transuranic (RH-TRU) waste disposal program as it pertained to WIPP. [RH-TRU wastes are those too hot for humans to handle.] However, because of the consistently changing nature of the DOE's environmental management program and the interlocking nature of those changes, our WIPP project took on a broader scope.

WIPP operates under a Resource Conservation and Recovery Act (RCRA) permit in the State of New Mexico because TRU wastes are mixed with hazardous wastes, for which Congress delegated regulatory authority to the states. In order for changes to be made to WIPP a permit modification request (PMR) must be submitted by DOE to the New Mexico Environment Department (NMED). The New Mexico Hazardous Waste Act sets forth three specific classifications for PMRs, which are:

- Class 1: Minor modifications that do not substantially alter the permit conditions.
- Class 1\*: Pronounced Class 1 star, it is a sub-classification to the Class 1. Class 1\* PMRs must be approved by the NMED Secretary before changes are implemented.
- Class 2: Modifications that typically allow DOE to respond to changes in types of waste, technological advancements, and new regulations. There is required public notice of the PMR and a 60-day public comment period.
- Class 3: Major modifications that substantially alter the facility or its operation. NMED may determine that a formal public hearing will be held. There is required public notice of the PMR and a 60-day public comment period.

NWNM's first and foremost interest in WIPP is to make certain that the facility maintains a high level of safety and protection of human health and the environment, which we have made our mission to emphasize at all times through the public permit process. We believe that we have played a significant role in helping to ensure that the State WIPP RCRA permit remains strong and that the DOE's requested modifications are not just perfunctorily approved by the NMED.

The following is a summary of the PMRs that NWNM analyzed (our comments for 3.2.1, 3.2.2, 3.2.4 and 3.2.6 are enclosed). To see all our comments, please go to our web site, specifically <http://www.nukewatch.org/wipp>



3.2.1 On June 6, 2001 DOE submitted a Class 3 PMR to NMED with four individual items:

1. *Waste Confirmation at the WIPP Facility*, 2. *Additional Storage Capacity and Additional Container Storage Locations*, 3. *Increase Storage Time*, and 4. *Prohibited Items*.

Our analysis concluded as follows:

1. The PMR went against WIPP's legislated mission because it sought to change the facility from a disposal-only site to a disposal, waste confirmation and storage site.
2. The potential for accidents at WIPP was dramatically increased as the PMR sought permission to open drums for waste confirmation. Further this was directly contrary to the long-made DOE promise to the State to "Start clean, stay clean."
3. The PMR sought to increase the amount of waste allowable for aboveground storage and the time period in which it could be stored.
4. The PMR stated that the driving force for this application was cost savings. However, DOE did not give data to justify this claim.
5. The PMR provided for the cessation of NMED's audit and surveillance programs. This was an unacceptable option as State audits and surveillance are necessary precautions for protecting human health and the environment.

NMED issued a notice of deficiency (NOD) on June 19, 2002 and DOE withdrew the PMR on January 14, 2003 without addressing the NOD. (Our comments enclosed.)

3.2.2 On August 28, 2001 DOE submitted a Class 2 PMR to NMED with three individual items:

1. *Using Composite Headspace Gas Data and Compositing up to 20 Samples*, 2. *Establishing Safety Conditions for Visual Examination of Waste Containers*, and 3. *Taking Samples of Headspace Gas through Existing Filter Vent Holes*.

Our analyses of the respective items concluded as follows:

1. The PMR did not show that the proposed change of methodology for composite sampling was protective of human health and the environment. Because of lack of DOE-supplied data the PMR did not meet the requirements of 40 CFR 264.13 (which requires that an owner/operator of a hazardous waste facility must obtain a detailed chemical and physical analysis of a representative sample of the wastes) and 40 CFR 264.31 (facilities must be designed and operated to minimize the possibility of a fire, explosion, or release of hazardous constituents to the environment). Additionally, the PMR did not protect the environment or human health since it did not demonstrate that all tentatively identified compounds would be identified and reported and that headspace gas sampling would be performed according to the permit.
2. The PMR did not protect public health or the environment, as there was no evidence to show that visual examination of drums would be carried out in accordance with the permit.
3. The PMR was incomplete due to inadequate documentation and insufficient rationale.

NMED approved 1 and 3 but denied 2. (Our comments enclosed.)

3.2.3 On June 10, 2002 DOE submitted a Class 1\* PMR: Removal of Booster Fans.

Our analysis concluded that the PMR was incomplete as it had no stated justification and the supporting documentation did not make clear why the PMR was necessary.

NMED rejected the PMR.

3.2.4 On June 28, 2002 DOE submitted seven Class 2 modifications and one Class 3 modification.

The Class 2's were: 1. *Addition of New Mexico Hazardous Waste Number*, 2. *Characterizing Repackaged Homogenous Solids as Retrievably Stored Waste with Regard to Solids Sampling*, 3. *Classified Information Record Keeping and Audit Requirements*, 4. *Addition of HalfPACTs*, 5. *Use of Radiography for Newly Generated Waste*, 6. *Add Waste Containers*, and 7. *Update of the Waste Analysis Plan and Associated Documents with Emphasis on Data Management Requirements*.

Our analyses of the respective items concluded as follows:

1. The PMR made no mention of the studies done on hydrofluoric acid contaminated waste. Without this data or information no analysis could be made on DOE's work. Furthermore, the PMR attempted to introduce prohibited corrosive substances to WIPP without adequate justification. The PMR was incomplete and a potential danger to human health and the environment.
2. It was not fully justified. In an attempt to rectify confusion within the permit it created even more. The PMR was incomplete.
3. It was inappropriately classified as a Class 2 modification and should have been classified as a Class 3. The PMR was incomplete.
4. The PMR did not describe when HalfPACTs would be used as new shipping containers. There was no contingency plan offered for the event of a damaged HalfPACT. The PMR was incomplete and a potential danger to human health and the environment.
5. In the same vein as item 2, its need was not properly justified. The PMR claimed that it was attempting to create more efficiency and flexibility, however this was not made clear within the document. It was incomplete and a potential danger to human health and the environment.
6. There were a host of problems with this PMR. DOE did not go into any depth explaining the new characterization process for these new containers or why new containers were required. Furthermore, the PMR was inappropriately classified as a Class 2 modification, when it should have been submitted under the more stringent expectations of a Class 3.
7. Programmatic efficiency was used as the primary justification. The PMR left many questions unanswered, such as how DOE would prevent computer hacking, handle increased staff workload and justify the rationale for removing a number of quality control measures. The PMR also attempted to make major, unwar-

ranted changes to the permit, again without justification. The PMR was incomplete and potentially harmful to human health and the environment.

NMED approved items 1 through 6 on November 25, 2002. NMED modified its classification of item 7 from a Class 2 to a Class 3 and will be issuing a Notice of Deficiency (NOD). (Our comments enclosed.)

The Class 3 PMR was: *Addition of Remote Handled Transuranic Waste.*

Our analysis concluded as follows:

There is a fundamental lack of “acceptable knowledge” (AK), that is existing records, of RH-TRU wastes in the DOE complex, and there remains many questions concerning its adequacy. However, these facts were ignored and DOE insisted on the use of AK as the primary method of characterization. The RH-TRU waste acceptance plan and quality assurance objectives were woefully inadequate. The PMR did not describe how DOE would deal with problematic drums in any detail. The PMR did not adequately justify why DOE would not test for volatile organic compounds within RH-TRU wastes as part of the characterization procedure. A number of the referenced documents within the PMR were not included and made it difficult, if not impossible, to find and double check the citations within the PMR. The PMR was deficient in documenting the radionuclide inventory of the RH-TRU. It was also deficient in documenting the estimated concentration of cellulose, plastics and rubber in the RH-TRU waste and the breakdown of constituents within those materials. The calculations regarding the VOC emission rates were not properly documented and were incomplete and not conservative. Finally, the PMR was deficient with respect to Quality Assurance/Quality Control procedures.

NMED issued a Notice of Deficiency for the RH TRU permit modification request, to which DOE responded. However, NMED found that response to be deficient as well, and issued yet another Notice of Deficiency.

In our analysis of the RH-TRU permit modification request NWNM worked in conjunction with Bernd Franke of the Institut für Energie und Umweltforschung (Institute for Energy and Environmental Research). Bernd Franke’s report, and our comments, are enclosed.

3.2.5 On October 7, 2002 DOE submitted a Class 2 PMR: Amended Panel Closure. NMED reclassified the PMR as a Class 3.

Our analysis concluded that:

The PMR failed to supply a full engineering analysis of 1) the current Panel Closure System, and 2) the proposed WIPP Panel Closure system with consideration of a major ceiling collapse or waste deflagration and detonation. The PMR should have provided the report of the design review committee. The PMR must provide a more thorough explanation as to why the Salado Mass Concrete would not function properly as the current explanation is insufficient. The PMR made no explanation as to why the previously approved panel closure schedule needed to be changed.

NMED is still considering this PMR.

3.2.6 On May 13, 2003 DOE submitted a PMR with five Class 2 items and one Class 3 item. The Class 2 items are: 1. *Packaging-Specific Drum Age Criteria for New Approved Waste Containers*, 2. *Removal of Booster Fans*, 3. *LANL Sealed Sources Waste Stream Headspace Gas Sampling and Analysis Requirements*, 4. *Removal of Formaldehyde as a Required Analytical Parameter for LANL*, and 5. *Add New Hazardous Waste Numbers*.

Our analyses of the respective items concluded as follows:

1. The PMR was inappropriately classified as a Class 2 modification and should have been a Class 3. Inappropriate assumptions were made regarding the Drum Age Criteria.
2. Questions remaining from the original submission of this PMR were still left unanswered, such as the need for airflow reversal in the event of a fire.
3. LANL's AK is notorious for being inadequate. As the rationale for this PMR was based on the lab's AK it was inappropriate and incomplete. Although waste has been deemed by DOE to be a "national security risk," there is no mention of escorts for this waste during transportation. Finally, much of the sealed sources are non-military wastes and therefore are prohibited from WIPP.
4. Much like item 3, this PMR assumed that LANL's AK was problem free. This is simply not the case and hence this PMR was deficient.
5. This PMR was inadequately justified.

The Class 3 PMR was *Construction and Use of Hazardous Waste Disposal Units*. Our conclusion was that there was simply no demonstrated need for this PMR and it was incomplete.

NMED is now processing these PMRs. (Our comments enclosed.)

### 3.3 DOE Economic Impacts In New Mexico

In our economic analyses we found that the outlook for New Mexico remains grim, in large part because of the State's dependence on DOE money, which our congressional leadership continues to encourage. Intra-state economic and social disparity has dramatically increased in recent years, and if current trends continue these disparities will likely grow even wider. According to recent demographic statistics, New Mexico has the highest national rate of poverty, the second highest percentage of residents lacking health insurance, second highest rate of violent deaths among teens, third highest rate of violent crimes and reported sexual assaults, and sixth highest rate of teen pregnancies. New Mexico is at the bottom when it comes to teacher salaries and the socioeconomic conditions for raising children well.

Over the past four decades important economic measurements in New Mexico have fallen further behind relative to all other states. According to U.S. Census Bureau data, New Mexico was 37<sup>th</sup> in per capita income in 1959, 41<sup>st</sup> in 1969, 42<sup>nd</sup> in 1979, and 41<sup>st</sup> in 1989. For the last census in 2000, New Mexico was 44<sup>th</sup> in per capita income. Considering the decades-old technological capabilities located in New Mexico and the much-vaunted DOE presence, this downward trend is striking. Combined with other vital statistics for the State, this trend is downright

depressing. In order to understand, and hopefully rectify, the poor condition New Mexicans find themselves in today, we must realistically understand the economic forces in New Mexico.

The DOE is one of the largest players in New Mexico's economic landscape and has had a massive presence in both the northern and central regions of the State for more than a half-century. No one, not DOE, the State, or any other federal or civilian entities has attempted to accurately portray the DOE's role in the New Mexican economy. The question remains: is there an overall positive impact, or a negative impact? In our project Lloyd Jeff Dumas, Professor of Economics and Political Economy at the University of Texas at Dallas, and Colin King, NWNM Research Director, sketched a picture of what is clearly beginning to look like New Mexico's over-dependence on federal funds, particularly DOE spending. NWNM contends that New Mexico's substantial reliance on DOE funding is harming the State by suppressing diversified economic growth.

Our project's study by Professor Dumas (enclosed) examines the veracity of economic data generated by DOE and its subsequent claims based upon that data. Initial attempts to examine the DOE's original modeling tools were blocked by DOE when it claimed that they no longer existed. Whether this was an initial oversight or outright obfuscation, this turned out not to be true. Through persistence NWNM was able to obtain the economic modeling software through a Freedom of Information Act request, but they were received too late to incorporate into the results of the study. As an alternative, Professor Dumas undertook a rigorous comparison of DOE's claims with the results and conclusions from existing studies of regions with similar characteristics (such as population and amount of federal spending). These reports all came to a common conclusion: the private sector tends to yield economic multipliers in the range of 1.5 to 2.0, substantially higher than the public sector (i.e., government). This is in stark contrast to the DOE's claimed multipliers of 2.4 to 3.5 for Fiscal Year 1998, which DOE has continued to publicize in all subsequent years. The bottom line of our study is that the DOE has overstated its beneficial economic impact on New Mexico by approximately two-fold, thereby misleading the public and lawmakers.

Some preliminary conclusions can be made about the DOE's environmental management (EM) program's impact in the State and what appears to be the cost of cleanup for New Mexicans. Given its generally small size, in terms of funding and staffing at the two national labs, it is unlikely that EM programs will provide a dependable source of local procurement for businesses. This will be particularly true at Los Alamos, whose reputation for procurement in the immediate region is dismal. Further, because of their small budgets (under \$10 million for Sandia) there is very little room for innovative and groundbreaking environmental research, the key elements needed for technology spin-offs. Though the ultimate direct impact to southeastern New Mexico from WIPP is yet to be determined, given the life expectancy of the facility any observer can quickly determine that any positive impact will not last for long as the facility prepares for closure within the next few decades.

DOE environmental management issues also directly cost the State government, and therefore the average New Mexican taxpayer. For example, in 2002 the New Mexico Environment Department Hazardous Waste Bureau alone spent more than \$897,479 on Los Alamos cleanup and environmental management issues. In return LANL paid only \$37,150 in permitting fees. These costs will likely skyrocket as the Los Alamos and Sandia Labs and their respective managers (the University of California and Lockheed Martin) pursue their legal challenges against NMED's Corrective Action Orders and New Mexico's authority to regulate cleanup.

Everyone knows the simple rule: if you make something, there will be waste. Yet, for decades the Department and its predecessors dumped the waste byproducts of the Cold War into the canyons, streams, and mesas in and around Los Alamos and at the Sandia National Laboratories. After an initial flurry of funding for the cleanup of these wastes in the early 1990s the labs' environmental restoration budgets have steadily declined year after year. Today, funding for core nuclear weapons programs within the DOE complex is the second highest ever, exceeded only in 1985 during President Regan's spectacular military buildup. However, that funding increase has not translated into a reciprocal increase in environmental cleanup programs.

If properly funded, environmental cleanup programs, combined with renewable energy research and development programs, have the potential to dramatically stimulate the New Mexican economy. Federal funding for research and development in both categories would provide a healthy environment for technology spin-offs and cooperative research and development agreements with small startup industries in the State. Despite this fact, DOE, the New Mexican congressional delegation and the State government have failed to capitalize on the unparalleled federal research capacity in New Mexico. A look at the numbers shows just how far away decisionmakers are from securing a healthy, self-sustaining, New Mexican economic future. For more, please see the enclosed *Overview of Programs at the Los Alamos and Sandia National Laboratories*.

## 4.0 General Conclusions and Recommendations

### 4.1 New Mexico Environment Department Corrective Action Orders

- The NMED's overall risk target of  $10^{-5}$  (meaning that there would be one projected cancer fatality in a population of 100,000) for the sum of all radioactive and non-radioactive pollutants is reasonable. However, the Draft Orders contained major inconsistencies and were too vague in certain key issues.
- The proposed target risk level allows that it could be exhausted by a single pollutant, which is not standard practice. We recommended that the target risk for individual pollutants (whether radioactive or non-radioactive) should be  $10^{-6}$  and that the target risk level from all pollutants combined should not exceed  $10^{-5}$ .
- NMED did not address the issue of collective dose, which is a measure of the overall potential harm of residual contamination to the entire population. We recommended that NMED establish a collective dose target risk for radioactive and non-radioactive pollutants.
- We further recommended that NMED should employ the most restrictive future land-use scenario (residential or agricultural) for all radioactive and hazardous substances.
- We recommended that NMED use the stricter EPA Region 6 risk value for PCB (0.22 mg/kg) rather than its own more relaxed default cleanup criterion (1 mg/kg). We further recommended that a preliminary screening criterion for perchlorate contamination (which is an increasing concern at LANL) should be set at 1 part per billion.
- We recommended that the NMED's Orders should provide for a process of continuing revision as more environmental and health information becomes available.
- The Draft Orders lacked an unambiguous definition for the event of the "technical infeasibility" of a cleanup project. This could provide large loopholes

whereby the labs could avoid environmental restoration. We recommended that NMED define precise and numerical criteria for “technical infeasibility.”

## 4.2 The Waste Isolation Pilot Plant

- The majority of DOE’s Permit Modification Requests were incomplete or raised questions over the adequate protection of human health and the environment. Our overarching recommendation was that all future PMRs make protection of human health and the environment the number one priority.
- We recommended that DOE produce complete and credible modification requests. This would conserve taxpayer dollars if DOE did not have to withdraw and then resubmit repeated modification requests.
- We recommended that DOE work more closely with stakeholders and NMED to refine the permitting process.
- The legislated mission of WIPP is as a disposal site for only transuranic wastes. We found that the majority of PMRs have attempted to change WIPP’s mission. We recommended that in the future DOE not try to change WIPP’s congressionally-mandated mission.
- The Remote-Handled Transuranic Waste PMR was grossly inadequate. We recommended that instead of wasting taxpayers money, DOE withdraw the PMR and resubmit it once NMED and stakeholders agreed that the PMR is ready for submission.
- DOE regularly claims that operational efficiency and cost savings are the primary drivers of submitted PMRs. However, DOE rarely gives details as justification. We recommended that DOE produce complete and credible modification requests with full justifications.
- We recommended that DOE produce a priority list for its future permit modification proposals and share this list with NMED and stakeholders. This will allow DOE, NMED and stakeholders to work more closely together on permit modification requests and pressure DOE to remain on task and stay on its mission.

## 5.3 DOE Economic Impacts In New Mexico

- Nuclear Watch’s analyses of DOE’s FY98 economic claims indicated that DOE has grossly overstated its economic impact. DOE claims an overall economic multiplier of 3.39, which means that for every dollar DOE spends another \$2.39 is generated in the New Mexican economy. Our conservative estimate puts the overall DOE multiplier in the range of 1.5 to 2.0. This would readjust DOE’s aggregate economic impact down to the \$4 to \$6 billion range, or as much as \$6 billion lower than DOE’s claim. Personal income would drop from DOE’s claimed \$2.89 billion to a more realistic \$1.63 to \$2.42 billion. Employment would drop from DOE’s claimed 72,453 jobs down to a more realistic 27,289 to 40,418 jobs.
- These readjustments are based on independent analyses conducted by economists at universities, government agencies and private institutions. They all came to the common conclusion that private sector businesses and nonmilitary government programs yield economic multipliers in the range of 1.5 to 2.0. An earlier study demonstrated that federal defense facilities, such as national labs or military bases, produced a yet lower economic multiplier in the 1.25 to 1.5 range.
- As further illustration of the improbability of DOE’s claims, a benchmark

called the Hachman Index (used to measure supply and demand) assigns an aggregate figure of 0.44 for New Mexico. To generalize, this means that for every dollar spent in New Mexico, \$0.56 ultimately leaves the State because New Mexico lacks an extensive production capability for consumer goods. In its calculations DOE assumed that 90% of its money stayed in the State (which is extremely unlikely given the Index) and that that money went on to produce an overall economic multiplier effect of 3.39.

- Further, the great economic benefit of the DOE presence would be made circumstantially evident by a history of large expenditures for in-State procurement of materials and supplies and numerous business spinoffs from DOE facilities. Historically, neither of these has been the case, indicating that DOE has not been a robust platform for State economic development.
- DOE does not adjust its claimed economic benefits to compensate for any fiscal burdens on the State due to the DOE presence, such as environmental regulation.
- By overwhelmingly investing in nuclear weapons research, development, and production programs, DOE is detracting from needed research and development of renewable energy technologies. That development would be of clear economic and national security benefit to New Mexico and the Nation.

## 5.0 Future Analyses

The above overview summarizes the results of our project achieved with the support of the Citizens Monitoring and Technical Assessment Fund. We do, however, regard this as an ongoing project. In future environmental analyses Nuclear Watch of New Mexico hopes to:

- Comment on the environmental information that the Los Alamos and Sandia Labs are required under their respective Corrective Action Orders to supply to the NMED. The overarching aim of our future comments will be to encourage the NMED to mandate actual cleanup at the labs.
- Pressure NMED to issue the long delayed LANL RCRA permit, with subsequent comment and participation by NWNM in the permit process. Again, our overarching aim is to help encourage State-mandated cleanup, and
- Monitor State oversight of WIPP through review and comment on future permit modification requests. Our overarching aim is to ensure the safety and protection of human health and the environment and to prevent the unwarranted expansion of WIPP's original mission.

In future economic analyses, we hope to:

- Document past and future infrastructure costs that the State must bear, such as those related to environmental oversight, regulatory compliance, public education and State highways;
- Calculate DOE's total economic contribution to New Mexico as a percentage of gross state product;
- Collect information on DOE technology spin-off rates and local/national procurement figures for the three New Mexico sites; and
- Tabulate in-State and out-of-state procurement figures in order to determine how much DOE money actually stays in New Mexico.



These are prerequisites for achieving the overall goal of our economic analyses, which is to calculate a realistic net figure for the DOE's annual economic contribution to New Mexico. Following that, the New Mexican public can then better gauge the true economic benefits of the massive DOE presence in this State.

# 6.0.A

## Enclosures A

### The NMED Corrective Action Orders

Talking Points on the NMED's Corrective Action Order Against LANL

NWNM/Franke Comments on the LANL CAO

## Talking Points on the NMED's Corrective Action Order against LANL

- On November 26, 2002, the New Mexico Environment Department's (NMED's) Hazardous Waste Bureau released a final "Corrective Action Order" mandating the Los Alamos National Laboratory (LANL) to fulfill a very comprehensive investigation of soil contamination and potential groundwater contamination. At the same time NMED issued a "Finding of Substantial and Imminent Endangerment" because of the environmental risks posed by past lab activities.
- The following (among other things) prompted NMED's Finding and Order:
  - Endless delays by LANL to voluntarily complete and furnish to NMED agreed upon reports and data.
  - A 33% drop over three years in funding for LANL's Environmental Restoration Program.
  - A chronic tendency by LANL to tackle the easiest cleanup projects (and thereby claim public relations success) while avoiding the more intractable cleanup jobs.
  - The prospect of potential contaminant migration in the aftermath of the Cerro Grande Fire, which could have been preemptively avoided had the lab effectively cleaned up in the past.
  - Increasing evidence of groundwater contamination, which until six years ago the lab completely dismissed as even being a possibility.
- **What's wrong with the Order?**
  - It is more than a decade late in coming.
  - Most importantly, it does not mandate actual cleanup at the lab. It is, in effect, a glorified information request, albeit very comprehensive and with binding legal weight.
  - There are no provisions that require NMED to consider public comment.
  - NMED can often be dysfunctional. Top level positions are subject to political appointment. NMED is chronically underfunded and understaffed.
  - It is not yet concretely known whether ex-DOE Secretary Gov. Richardson will encourage or impede implementation and enforcement of the Order (however, initial indications are favorable). The Order could also be negatively impacted by unanticipated actions by the State legislature or the federal congressional delegation.
  - Before leaving office, former NMED Secretary Pete Maggiore signed New Mexico onto a fairly vague "Letter of Intent" formulated by DOE. NMED maintains that the Letter doesn't really bind it to anything substantive. However, it is clear that DOE thinks that it binds NMED (and is acting accordingly) to what the lab's plan of (non)cleanup is. In contrast, the present NMED Secretary Ron Curry has described LANL's cleanup plan as "not relevant" from the Department's regulatory perspective.
  - Future cleanup depends on future designations of declared "land use" at the lab. That will be a big issue unto itself. There are also truck-size loopholes, such as when cleanup is "technically or economically infeasible."
  - If DOE and University of California (LANL's manager) lawsuits against the Order and Finding (see below) prevail, it could seriously rollback the authority of all states over DOE sites.
- **What's right with the Order?**
  - It is the first truly significant sign of a more aggressive regulatory attitude by the NMED against LANL.
  - The Order proscribes that future cleanup will be completed to bring human health risks down to a risk factor of  $10^{-5}$  (one potential fatal cancer in a population of 100,000), which is pretty stringent. However, as a cautionary note, that risk level has everything to do with future designated land use. The Order assumes a "resi-

dential standard” as a default, but obviously that is not what the lab will argue for.

- Environmental organizations always have inherent limits to their power and influence. It is critical that we, in effect, get others to do our work, especially entities that are invested with some authority by law. Despite the lack of proscribed public process NMED appears to be pretty accessible to input on the Order.

- If the Order survives the pitfalls described above it probably will lead to State-mandated cleanup, either through subsequent orders and/or the pending renewal of LANL's Resource Conservation and Recovery Act permit.

- We shouldn't have to wait too long to see where this Order is really headed. It requires LANL to submit detailed information on a nasty hazardous/radioactive waste dump called Material Disposal Area (MDA) C at Technical Area-50. There is presently a 120 day court-ordered stay on the Order, set to expire in mid-May. MDA C deliverables should be forthcoming as soon as mid-July and act as a good test of the future course of the Order.

- The Order has led to an increasingly adversarial relationship between DOE/LANL and NMED. That is arguably to the good.

- If NMED prevails against the DOE/UC lawsuits that will then be good national legal precedent.

- In a heavy-handed response to the Order and Finding, DOE and UC have filed six legal proceedings in federal and State courts to overturn the Finding and to obtain a stay against the Order. Moreover, they are making sweeping arguments that, if successful, would rollback the State's authority to a time when the DOE was almost completely self-regulating.

- The most notable issue is that LANL is arguing that NMED has no jurisdictional authority over “mixed” wastes, that is wastes that are both hazardous and radioactive. Hazardous wastes, as defined by law, are essentially non-radioactive wastes that are carcinogenic or otherwise harmful to human health and the environment. Radioactive wastes are, of course, also carcinogenic and potentially harmful, but the Atomic Energy Act grants almost sole jurisdiction over those wastes to the DOE. Jurisdiction over hazardous wastes was granted by the Resource Conservation and Recovery Act to the EPA, which in turn delegated authority to the states. In 1994 Congress expanded authority over hazardous wastes to also include mixed wastes. It is essentially this evolution of the states' authority to regulate mixed wastes at DOE sites that LANL is now seeking to overturn (and with a virtually unlimited war chest supplied by taxpayers).

### **Nukewatch Priorities Vis à Vis the LANL Corrective Action Order**

- Our top priority to begin with is to see to it that NMED fully implements and enforces its Corrective Action Order against Los Alamos National Laboratory.

- A directly related priority is to support/pressure NMED from caving in and to fight the good fight while fending off the DOE/UC legal challenges.

- Another priority is to guard against any political interference against the implementation and enforcement of the Order.

- Our ultimate priority is to see to it that this Order actually leads to real, State-mandated cleanup at the lab. More specifically, we need to make sure that the lab's idea of “accelerated cleanup” (i.e., cap and cover and walk away from comprehensive cleanup) is trumped by the State.

--Jay Coghlan



July 31, 2002

Mr. James P. Bearzi, Chief  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303  
Ref: Los Alamos National Laboratory Facility Order

Dear Mr. Bearzi:

**Nuclear Watch of New Mexico** (“NWNM”) respectfully submits these comments on the New Mexico Environment Department’s (“NMED”) Draft Los Alamos National Laboratory (LANL) Corrective Action Order of May 2, 2002. Thank you for the opportunity to comment. We also salute you, your staff and NMED as whole for initiating this Order. We believe that it has tremendous potential, so long as NMED remains resolute behind the Order’s apparent intent to induce genuine comprehensive cleanup at LANL.

These comments are formatted in sequential alignment with the draft Order, beginning with the Determination. Quotes from the draft Order are italicized. Some general comment follows the section by section comments.

Determination of an Imminent and Substantial Endangerment to Health and the Environment: NMED largely grounds its release of the draft CAO upon its Determination of an Imminent and Substantial Endangerment against LANL. NWNM supports that finding. Being the amateurish wannabe lawyers that we are, we believe that finding is on a solid legal basis and that the DOE/LANL/UC challenges claiming that it is not are, in fact, unsupported. We commend NMED on its finding.

The progress of LANL cleanup is dismal (for example, please recall the 1997 DOE Inspector General’s audit that found that out of some \$360 million spent by the lab for cleanup by 1995 only roughly 20% had gone to actual cleanup). The Cerro Grande Fire accentuated the imminent and substantial endangerment, which could have been largely pre-empted had there been effective lab cleanup in the past. Finally, the persistent pattern of declining funding for lab cleanup naturally causes grave and reasonable doubts that the lab would ever embark upon comprehensive cleanup.

Frankly put, the DOE/LANL/UC challenges appear ill conceived and insubstantial. For example, UC’s “Complaint for Declaratory Relief and for Review of Administrative Action” makes the claim that “The AEA [Atomic Energy Act] provides DOE with the exclusive authority to regulate all pure radioactive waste and the radioactive portion of any waste mixture.” This is, to put it charitably, an extravagant (even radical) claim. As much as we think it a “root of all evils,” we don’t dispute DOE’s legal claim over jurisdiction over “purely” radioactive wastes. But for UC to categorically assert that it (as LANL’s manager) also has sole jurisdiction

over mixed radioactive waste flies in the face of the relevant portions of the Resource and Recovery Conservation Act and the Federal Facilities Compliance Act. In sum, we strongly support and urge NMED to vigorously work to fend off UC's legal challenge which, were it successful, would not only inevitably block the Order itself but also provide precedent to rollback hard won environmental laws. We further comment that UC's challenge is in and of itself illustrative of that institution's regressive (perhaps even "colonial") attitudes, attitudes that we suspect it wouldn't dare so blatantly express in its own parent state. In short, we strongly urge NMED to vigorously fight off UC's unmerited challenge while simultaneously proceeding with the issuance of the final Order.

Section I. Introduction: NWNM applauds NMED for its issuance of the draft CAO. The Department, in our view, deserves much credit for finally doing something meaningful, aggressive, comprehensive and forward looking in its regulatory enforcement role over LANL. We salute the Secretary and his staff for having done so - - they all deserve much credit. We want to emphatically state our praise.

Our concerns with the draft CAO lie not so much within the Order as much as they lie outside in directly related developments, for example the Letter of Intent co-signed with DOE setting forth certain agreed upon "accelerated cleanup" principles and LANL's Performance Management Plan. These are a crucial part of our comments that we strongly argue that NMED should not summarily reject just because they could be narrowly interpreted as lying outside the bounds of relevant comment. It is NMED who made these comments relevant through its decision to enter into an agreement with DOE, and hence they should be seriously considered and responded to.

Our most critical general observations of the CAO itself are two:

1) **The Order should have been issued more than a decade ago.** This is an obvious fact that current NMED officials freely acknowledge, hence we feel no need to belabor it here. However, the fact should be held in mind throughout the entire Order process (and accordingly in any integrated permit issues) that time is of the essence and that much time has already been lost. There should be much zeal on the part of NMED to finalize the Order and to then vigorously implement and enforce it as needed. Furthermore, now that NMED has decided to put itself in the driver's seat (where it should have been all along) and given that LANL/UC/DOE have decided to contest that by seeking to overthrow the order in order, NMED should remain resolute. And that is with a departmental sense of conviction that should and must survive any changes in state administration.

2) Our second critical general concern is that **this Order mandates no actual corrective measures, that is to say cleanup**, another obvious fact which again current NMED officials freely acknowledge. Instead, this Order is essentially a glorified information request by NMED of LANL, albeit with the virtue of real legal weight. However, NWNM refrains from wholesale condemnation of this Order because of its lack of mandated cleanup precisely because we believe that this Order can lead to genuine and comprehensive cleanup if the Department stays zealous about it. This leads us to strongly support this Order generally while awaiting exactly how it unfolds. Unfortunately, the matter of how exactly this Order manifests (and by extension future cleanup at the lab as well) will be largely influenced and determined by issues outside of the Order, some of which we attempt to address in these comments. But we restate here that we strongly support this Order, so long as NMED remains zealous in both implementing it and protecting it from DOE/LANAL/UC challenge while using it as a platform for proceeding directly into real cleanup. Again, time is of the essence.

## Section II: Findings of Fact and Conclusions of Law .

II.A. Findings of Fact: NWNM concurs with all of the facts presented therein. It is a good, and even damning, summary of the status of cleanup and various environmental affairs at LANL. We note that all the facts presented have to do with the Respondents and NMED. We suggest that it could possibly be worthwhile noting that declining LANL cleanup budgets led NMED to doubt that all of the noted deficiencies and lab cleanup in general could ever be rectified for the foreseeable future.

### II. B Conclusions of Law:

Conclusion # 10: We strongly support NMED's assertion that "*Such monitoring and reporting [of radionuclide contaminants] is necessary for the Department to properly implement the regulation of hazardous wastes constituents, and other solid wastes pursuant to the HWA and the Hazardous Waste Regulations. United States v. New Mexico, 32 F. 3d 494 (10<sup>th</sup> Circuit 1994).*" DOE is notorious for its lack of knowledge about the characterization of its own wastes, including admissions to that very effect in legally required NEPA documents (see, for example, the 1997 DOE Waste Management Programmatic Environmental Impact Statement (whose preparation had to be enforced by citizen litigation to begin with)). Additionally, there have been many waste characterization issues concerning the New Mexico State Waste Isolation Pilot Plant permit. Experience has taught that DOE must be forced to properly characterize its waste to begin with, hence the justification for NMED to require monitoring and reporting of radionuclide contaminants is legally justifiable. We also concur that the case law cited above strongly buttresses this argument (interestingly NWNM personnel played an originating role in that case law, but that is another story).

Conclusion #11: NMED appropriately asserts its jurisdictional authority over DOE and LANL through the provisions of the Resource and Recovery Conservation Act and the Hazardous Waste Act. NMED should also note its jurisdictional authority invested by the Federal Facilities Compliance Act.

Section III. A Purposes: The draft Order states that its purposes are

*3) to identify and evaluate alternatives for corrective action measures to cleanup contaminants in the environment, and to prevent or mitigate the migration of hazardous wastes or hazardous constituents at or from the Facility, and 4) to implement such corrective measures.*

Purposes #3 and 4 are not backed up by Order Section XII Compliance Schedule Table (which we consider to be where "the rubber hits the road") with the possible partial exception of Corrective Action Measures Studies. This leaves us with critical general questions that we feel NMED should answer. Does NMED contemplate this Order to be a "work in progress" which will be continually added to or, alternatively, will there be subsequent Orders that mandate actual corrective action measures? And to what extent will the pending renewed LANL RCRA permit incorporate corrective action measures. Please clarify.

Section III. C Jurisdiction: Again, NWNM believes that the Federal Facilities Compliance Act should be referenced as appropriate.

Section III. G Work Plans and Schedules: It is essential as well that NMED is expeditious in its review and approval/disapproval of work plans and schedules. Directly related to this, it is also essential that NMED secures its resource base so that it can be expeditious.

Section III. J Availability of Information: *“the Respondents shall, within a reasonable time after a request from any authorized representative of the Department, furnish information to the Department relating to hazardous wastes that are or have been managed at the Facility.”* Given LANL’s past chronic delays, if not outright obfuscation, in providing environmental information and reports, NWNM strongly recommends that precise times be mandated rather than “a reasonable time.”

Section III. Enforcement: As previously implied, NWNM supports NMED in vigorous enforcement as needed.

Section III. N Relationship to Work Completed: It is important that NMED gets the lab to inventory what might be satisfactory work already completed in order to save taxpayers money and to effectively accelerate genuine cleanup at LANL. At the same time, it obviously holds true that NMED must investigate and soundly judge for itself whether or not previously work is satisfactory, and to reject it if it isn’t.

Section III.O Integration with Permit: *Subsequent to the issuance of this Order, the Department may renew the Hazardous Waste Facility permit issued to the Respondents for the Facility under the HWA, and such permit may incorporate the requirements of this Order. The requirements of this Order shall not terminate upon issuance of such permit.*

NWNM strongly believes that in the final Order NMED needs to better explain and clarify exactly how and where the Order, possible future Orders and future permits may or may not intersect (particularly the pending renewed LANL RCRA permit).

Section IV. Facility Investigation: To what extent will the reports and information generated be available to the public? What are the mechanisms for that? Obviously we regard access to significant information to be very important and clearly in the public’s interest. We suggest the use of both NMED’s and LANL’s web sites. The public has been largely denied access to the latter web site following 9.11. We argue that public access should be restored in the environmental arena.

Section IV A. 3.b Groundwater Monitoring Plan: NWNM concurs with NMED’s requirement of an interim groundwater monitoring plan within 90 days. We are pleased that this should end the incessant delays to such a plan.

Section IV A. 3.d Background Investigation: Care needs to be exercised here that indeed “naturally occurring” metals and radionuclides are determined for background concentrations and not contaminants induced by the lab. We also strongly recommend that LANL should be required to determine what proportion of groundwater tritium contamination might be reactor-produced vs. accelerator-produced. As NMED knows, this determination would help to clarify its jurisdictional authority over tritium contamination at the lab since accelerator-produced jurisdiction is not exempted by the Atomic Energy Act.



Section IV A. 3.e. Monitoring Wells and Piezometers: It is important that split sampling with NMED upon demand should be reiterated here (the Order generally states that need elsewhere).

Section IV A. 3.f Springs: ditto

Section IV A. 4 Sediment Investigation: ditto. We also applaud the focus in this section on post-Cerro Grande Fire effects.

Section IV B.1.c Historical Investigation [of Canyon Watersheds]: NWNM believes the list of requirements to be excellent. We strongly recommend as an addition that LANL should be required to determine what proportion of tritium contamination might be reactor-produced vs. accelerator-produced. As NMED knows, this determination would help to clarify its jurisdictional authority over tritium contamination at the lab since accelerator-produced jurisdiction is not exempted by the Atomic Energy Act.

#### Section IV.C Technical Area Investigations

Area G: We applaud NMED's concerted focus on TA-54 and Area G in particular. NMED should know that during discovery for its Clean Air Act lawsuit Concerned Citizens for Nuclear Safety obtained extensive inventory summaries of wastes disposed of at Area G. This included reactor rods, activated targets from the Los Alamos Meson Physics Facility (now LANSCE) and "classified shapes." In short, Area G is far from being the "low-level" radioactive waste dump that LANL pretends it to be.

Additionally, the Order should require closure plans for Area G, and also explain how Area G issues may intersect between it and the pending renewed LANL RCRA permit.

Section IV. C. b [TA-21] Historical Investigation: We applaud NMED's concerted focus on TA-21. Since TA-21 has two long operating tritium facilities NWNM believes it would be prudent for NMED to require that LANL determine what proportion of tritium contamination might be reactor-produced vs. accelerator-produced. NMED would then have to approve or disapprove of that determination and require another, if necessary.

Section IV. C. 3 Technical Area 50, MDA C: There are clearly a number of important TA-50 environmental issues not narrowly defined to MDA C (this is not to disparage NMED's efforts with respect to TA-50 MDA C). It has been long known that TA-50's Radioactive Liquid Waste Treatment Facility (RLWTF) has operated without a state permit while at the same time its discharged effluent chronically exceeded State nitrate discharge levels and DOE Derived Concentration Guidelines for radionuclides. A process for finally issuing a state permit for the RLWTF was initiated some four years ago, but for whatever reason, was aborted. As far as we know, the RLWTF still operates without a State discharge permit. This Order should address the need for that permit. Additionally, that permit should incorporate a remediation plan for the RLWTF's rather notorious past discharges that have resulted in extensive contamination of Mortandad Canyon's perched aquifers (which are nominally State protected). And, as already previously mentioned a number of times, LANL should be required to determine what proportion of tritium contamination might be reactor-produced vs. accelerator-produced.

Section IV. C.4 Technical Area 49: NWNM applauds NMED for finally addressing environmental restoration issues at TA-49 (God knows that LANL was never going to do it by itself). Given that in the early 1960's LANL conducted explosive hydronuclear tests that deposited an estimated 88 pounds of plutonium and other radioactive/hazardous materials in shafts this will no doubt prove a difficult test case as to how NMED will mandate environmental restoration at the lab. We will be especially curious as to whether LANL might attempt to take advantage of cost and feasibility escape clauses (loopholes in our view) incorporated in the Order for this particular situation. Whereas NWNM is not prepared to categorically reject the need for such provisions, we strongly and will continually argue for the most judicious granting of them by NMED.

Section IV. C. 5 Technical Area 10: NWNM applauds NMED for addressing environmental restoration issues at TA-10.

Section V Investigations for Other SWMUs and AOCs: NWNM wants to strongly support NMED's efforts with respect to the Technical Areas already addressed in the draft Order and at least partially commented upon herein. However, it is obvious that there are many other Technical Areas that need to be addressed. For example, we find it curious that Technical Area-16 is not immediately addressed in the draft order and strongly argue that it should be. Our rationale is given the EPA's past finding of high explosives contamination at deep groundwater levels exceeding its safe drinking water advisories that TA-16 should definitely be at or near the top of the list that NMED is tackling. Also, by way of example, other Technical Areas of great concern to us are TA-3 (the most densely populated TA and locale of the Chemical and Metallurgical Research and Sigma facilities)

and TA-55 (the site for plutonium processing and fabrication activities since the mid-1970's). We argue that the final Order should specifically address TA-16 while, at a minimum, explain how other critical TA's will be addressed in the future (if not outright addressed in the final Order). And, again, we argue that the final Order should explain how issues pertaining to these Technical Area may or may not intersect with the pending renewed LANL RCRA permit.

Section V. D. Newly Discovered Releases form SWMUs or AOCs: Given potential post-Cerro Grande Fire effects, NWNM recommends that NMED pay particular attention to and mandate action as needed for stormwater runoff flows that could possibly induce contaminant migration.

Section V.G Interim Measures: NMED must know of present RCRA violations, a list of which we have repeatedly requested and been denied. The alternative that NMED simply does not know is unacceptable since that would indicate that the regulator has indeed been truly asleep at the wheel. NWNM strongly recommends that interim measures for known RCRA violations be incorporated into the final Order so that it is genuinely meaningful and points towards real and tangible remediation.

As described in our consultant's comments under Section VIII there may be evidence that EPA 's Preliminary Remediation Goals for radionuclides may be exceeded in certain LANL locations. NMED should look into this possibility, reach a preliminary judgment on the presence or not of hazardous and/or mixed wastes and order interim measures as needed in order "to reduce or prevent migration of contaminants or human and environmental exposures t contaminants while long range corrective action remedies are evaluated and implemented."

Section VI. On-Going Investigations: No substantial comment. We do compliment NMED in the apparent thoroughness of its draft requirements.

Section VII.C.1 RISK ANALYSIS General: *“The Respondents shall attain the cleanup goals outlined in Section VIII of this Order...”* Section VIII in the draft Order is too vague in a number of cases. Please see our comments under that Section.

Section VII.C.2.a Conceptual Site Model: *“For human health considerations, the conceptual site model shall include residential land use as the future land use for all risk assessments. Site-specific future land use may be included, provided that written approval to consider a site-specific land use has been obtained from the Department prior to inclusion in the risk assessment”.* NWNM strongly endorses the application of residential land use as the standard for corrective action measures, with certain caveats (please see our Section VIII. Comments). The escape clause for consideration for “site-specific future land use” could be a gigantic loophole, one that DOE/LANL/UC will be sure to exploit. In our view, in order to protect posterity and the environment, the standard of residential land use should be universally applied at LANL (with due allowance for possible agricultural uses as well).

The prospect of possible consideration of other site-specific future land uses raises a host of process questions. How is the public to be informed of that possibility? How is the decision to be made, simply in an agreement between LANL and the NMED? How might this intersect with the LANL RCRA permit process, which does have clear public process requirements? These are critical questions that we believe the final Order must address.

Section VII.C.2.b Risk Screening Levels: Please see our relevant comments under Section VIII.

Section VII. D. 3 Cleanup Standards: Please see comments on Section VIII.

Section VII. D.4. Remedy Evaluation Criteria: *“[F]actors shall be balanced in proposing a preferred [remediation] alternative... A remedy that reduces risks with little long-term management, and that has proven effective under similar conditions, shall be preferred.”* This in many ways strikes at the heart of what the quality of future cleanup will be at LANL. What DOE/LANL/UC want is clearly known, must concretely demonstrated by the June 2002 LANL draft Performance Management Plan (PMP). That document is heavily reliant on DOE’s so-called Long Term Environmental Stewardship program. In fact, the PMP calls for the termination of all DOE Environmental Management activities by 2015: “All required post-remedy monitoring and maintenance will be transitioned from EM to the site landlord, the National Nuclear Security Administration (NNSA), through the Long Term Environmental Stewardship program.” (PMP, p. ii - iv). This is, of course, after DOE/LANL/UC have met lab “cleanup” according to their own terms, which incorporates such self-serving assumptions such as that groundwater treatment will not be needed and “cap and cover” as the presumptive remedy for MDAs. As part of the final Order, in NWNM’s opinion, NMED should require DOE/LANL/UC to detail its Long Term Stewardship program plan for the lab, as that plan will arguably directly impact “cleanup.” Currently, DOE/LANL/UC is pinning its hopes of avoiding comprehensive cleanup on a program that has no substance and is entirely rhetorical in nature. NWNM asserts that the DOE/LANL/UC approach to future lab cleanup is directly contrary to the draft Order’s purpose as expressed in this section, and the final Order should take aggressive measures to eliminate those differences. While other factors may have to be “balanced,” our paramount concern is genuine remedial activities that actually reduce risk to human health and the environment.

The draft Order further states “a remedy that can be implemented quickly and easily, and poses fewer and lesser difficulties, shall be preferred.” That is fine as a balancing factor, but can indeed be a slippery slope that plays into the hands of DOE/LANL/UC. To take it to the extreme for the sake of discussion, were “implementability” to be the overriding factor in the selection of remedies then NMED might as well sign onto and endorse LANL’s Performance Management Plan, which is mostly a do nothing plan easy to implement. In the final Order, NWNM suggests that ease of implementability be relegated to a lower level as a criterion.

“A remedy that is less costly, but does not sacrifice protection of health and the environment, shall be preferred”. Again, this is a slippery slope, one that we suspect DOE/LANL/UC will attempt to exploit as an excuse for not cleaning up. Cost should be relegated to a lower level as a criterion.

Section VII. D.5 Approval of Corrective measures Evaluation Report: NWNM wants to know what access to these reports the public will have.

Section VII. D.6 Relationship to Corrective Action Requirements: “*The Corrective Measures Evaluation shall serve as a Corrective Measures Study for the purposes of RCRA compliance.*” Again, the final order should better explain the relationship between the Order and the pending renewed LANL RCRA permit.

Section VII.E.2 Corrective Measures Implementation Plan: What role or opportunity to comment will the public have in NMED’s final selection of remedies?

Section VII.E.4 Community Relations Plan: The Respondents should be required to place relevant documents on the LANL ES&H web site. What is NMED’s community relations plan for ongoing public involvement during the implementation of the final Order in all of its aspects?

Section VIII. Cleanup and Screening Levels: In many respects NWNM regards Section VIII as the most important section in the Order, perhaps the one most determinative of future cleanup at LANL. We generally strongly support the selected target risk level of  $10^{-5}$  (however, see our important caveats below). We do think it is an eminently defensible position that NMED selected the middle ground between the EPA’s recommended range of  $10^{-4}$  to  $10^{-6}$  for lifetime excess cancer risk. Having said that, we are fearful that the  $10^{-5}$  risk factor will be completely skewed by a struggle to begin in the near future over the application of residential vs. industrial standards in the determination of environmental restoration remedies at LANL. We argue in the strongest possible terms that in order to ensure genuine protection for human health and the ecology that NMED must vigorously pursue the application of residential standards at LANL. At the same time, agricultural scenarios also need to be seriously considered as well. This is also eminently defensible given that the lab has been in existence for less than sixty years, while agricultural use in the general has been in existence for at least a 1,000 years. Even LANL, too, will pass someday, and NMED needs to strongly protect the environment for the future unpredictable needs of posterity. Section VIII in the final Order needs to more strongly reiterate the statement made in Section VII.2. a that “the conceptual site model shall use residential land use as the future land use for all risk assessments.” This needs to move far beyond the merely conceptual level. It is already known that DOE/LANL/UC are making the self-serving critical assumption that industrial standards will be used.

The remainder of our comments in this Section were prepared by our consultant Mr. Bernd Franke of the Institut für Energie und Umweltforschung (Institute for Energy and Environmental Research) of Heidelberg, Germany. His comments are also relevant to other sections as specifically and previously noted.

**1. NMED selected a reasonable cleanup target risk level of  $10^{-5}$  for individuals that is equivalent to about 0.2 mrem/year committed effective dose equivalent (CEDE) using current risk factors by the U.S. Environmental Protection Agency (EPA) for radioactive contaminants. It should be appended by establishing an annual dose limit of 1 mrem/year CEDE.**

In Section VIII, NMED selected a reasonable cleanup target risk level. The risk level can be translated into annual radiation exposure over lifetime. The risk factor for low dose rate for cancer morbidity is  $7.6 \times 10^{-7}$  (EPA-1994). Based on this value, the lifetime risk of  $10^{-5}$  is equivalent to an exposure of about 0.2 mrem/year CEDE. It is prudent to use a low risk level to account for uncertainties in the characterization of contaminated areas and associated risks and in order to be consistent with cleanup risk targets used elsewhere in the US. The risk level is compatible with the “*de minimis*” dose limit of 1 mrem/year CEDE that is used as a target dose for clearance of radioactive materials in international regulations (IAEA-2002, EC-1996). This dose equivalent is necessary because a limit for the maximum annual dose of 1 mrem/year will result in the average dose over lifetime-years to be much smaller than 1 mrem/year. This will likely be in the range of 0.2 mrem/year. While the target risk is reasonable, we recommend appending this by limiting the maximum annual dose to 1 mrem/year CEDE.

**2. NMED should adopt EPA’s screening level of  $10^{-6}$  risk from single pollutants in addition to a total target risk to individuals of  $10^{-5}$ .**

NMED deviated from the EPA procedures by allowing that a single pollutant could exhaust the target risk level of  $10^{-5}$ . According to EPA, even a single pollutant exceeding the screening level calculated at the  $10^{-6}$  risk level may need to be investigated in further detail. NMED’s soil cleanup levels for 133 elements and compounds are based on a target total risk of  $10^{-5}$  for carcinogenic substances. The NMED approach to using the EPA screening factors multiplied by 10 would allow areas with only a single pollutant identified at a risk level of less than  $10^{-5}$  to avoid further detailed consideration.

NMED’s suggested use of the target risk is not consistent. While the target risk for non-radioactive carcinogens is  $10^{-5}$ , radionuclide concentrations in soil have to be compared to EPA’s preliminary remediation goals for radionuclides in soil that reflect a  $10^{-6}$  target risk. NMED claims: “*Comparison of individual radionuclide concentrations to the EPA preliminary remediation goals assures that the total excess risk from radionuclides will not exceed the Department total excess risk goal of  $10^{-5}$ .*”

This claim would only be assured if there is no risk from non-radioactive pollutants and if there are less than 10 different radionuclides.

To alleviate this shortcoming, we recommend that the target risk for individual pollutants (whether radioactive or non-radioactive) should be  $10^{-6}$  and that the target risk level from all pollutants combined should not exceed  $10^{-5}$ .

### **3. NMED should establish a collective dose target risk for radioactive and non-radioactive pollutants.**

The focus of the NMED approach is on individual risks. While it is important to limit the risk to a given individual, care should be exercised to limit the overall potential harm to human health because in radiation protection (and likewise for non-radioactive carcinogens), adverse health effects down to very low levels are wisely assumed. A useful approach to reflect this is to limit the cumulative population exposure of populations, in addition to the risk to individuals.

This is done, for example, in the current regulation for the release of radioactive materials (such as metals) from regulatory control (usually termed “clearance” if the concentration of radionuclides is below a certain level). For example, the European Commission has instituted levels which are supposed to ensure that the radiation dose to the maximally exposed individual does not exceed 1 mrem/yr CEDE. In order to avoid the possibility that this practice could lead to widespread low-level contamination, the European Commission established a population dose limit of 100 person-rem per year from an activity (EC-1996). [In this context, “activity” is a defined act of clearance in the country.] In other words, since the maximum dose from clearance of radioactive materials to an individual is 1 mrem/year, the overall goal is to limit the number of people exposed in the entire country.

One may (and should) argue about the appropriate population risk target. In the worst case, reuse of contaminated property may result in exposures to many individuals. NMED could, for example, set a target collective risk over the next 500 years from all cleanup operations in New Mexico. We recommend that the potential hazards associated with the reuse of Los Alamos National Laboratory (LANL) property should be determined in the course of cleanup activities, also accounting for continuing operations at LANL.

### **4. NMED should select the most restrictive usage scenario (residential, agricultural or other) for all substances under review. NMED should provide cleanup values for the agricultural scenario for non-radioactive pollutants.**

The Draft LANL Order Section VIII.B.1 specifies for non-radioactive carcinogens, and only “residential soil” as specified in EPA Region VI Human Health Medium Specific Screening Levels (HHMSSL). These include the following scenarios (NMED-2000)

- Residential soil (with and without dermal exposure)
- Industrial indoor worker (without dermal exposure)
- Industrial outdoor worker (with and without dermal exposure)
- Groundwater

With regard to radioactive carcinogens, NMED does not set cleanup levels but rather refers to “reporting levels”. The reporting levels are the preliminary remediation goals (PRG) for radionuclides in soil for which EPA uses a variety of scenarios that include the following:

- Residential soil
- Agricultural soil
- Indoor worker soil
- Outdoor worker soil
- Groundwater

The fact that NMED did not setup cleanup levels for radionuclides while arguing that data be presented for the “agricultural soil” scenario, while at the same time cleanup values are established by NMED for non-radioactive carcinogens that do not include the “agricultural soil” scenario is a striking inconsistency in NMED’s approach to the LANL site.

Because NMED’s cleanup levels for non-radioactive pollutants do not contain values for “agricultural soil”, it is more than likely that this results in the selection of “residential soil” for radioactive pollutants. This is unacceptable on several grounds:

It is inappropriate to ignore the “agricultural soil” scenario for non-radioactive pollutants.

Out of 845 radionuclides for which PRG values have been established by EPA, the “residential soil” scenario yields the strictest values in only 24 cases (2.8%). In contrast to this, the “agricultural soil” scenario represents the strictest values in 809 cases (95.7%). In the remainder 12 cases (1.5%), the strictest standard for groundwater protection (Dilution Attenuation Factor, DAF=1) yields the strictest PRG values.

Based on the foregoing, the “agricultural use” is often the most restrictive scenario; the likely selection of “residential use” as a scenario would thus prejudice cleanup strategies and ignore the most conservative approach.

A detailed analysis for radionuclides that are commonly reported for the LANL site (strontium-90, cesium-137, plutonium-238, plutonium-239 and americium-241) is provided in Figures 1 through 5. The charts provide a comparison of the maximum and the mean concentrations measured in on-site soil in the year 1998, the values selected by LANL as the “Regional Reference Level” (LANL-1999). Also shown are EPA PRG values for the “residential soil” and “agricultural soil” scenarios as well as the soil clearance values in the current German radiation protection guideline (StrSchV-2001).

Figures 1 and 2, for example, indicate that the current concentrations of strontium-90 and cesium-137 found in onsite soil at LANL as well the “Regional Reference Level” exceed EPA’s PRG for residential soil. Is it likely that NMED will require cleanup under these circumstances? If it does not in the case of strontium-90 and cesium-137, how then can NMED justify cleanup of other radionuclides down to comparable risk levels?

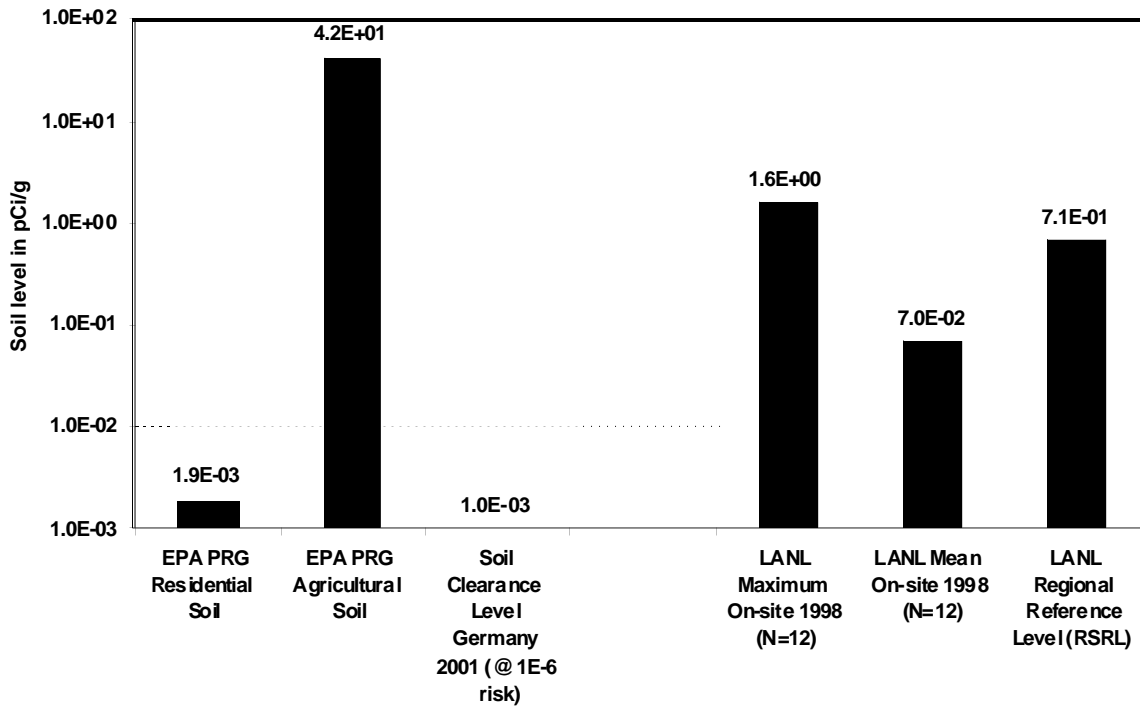


Figure 1. Comparison of remediation goals for strontium-90 in soil with soil levels reported by LANL

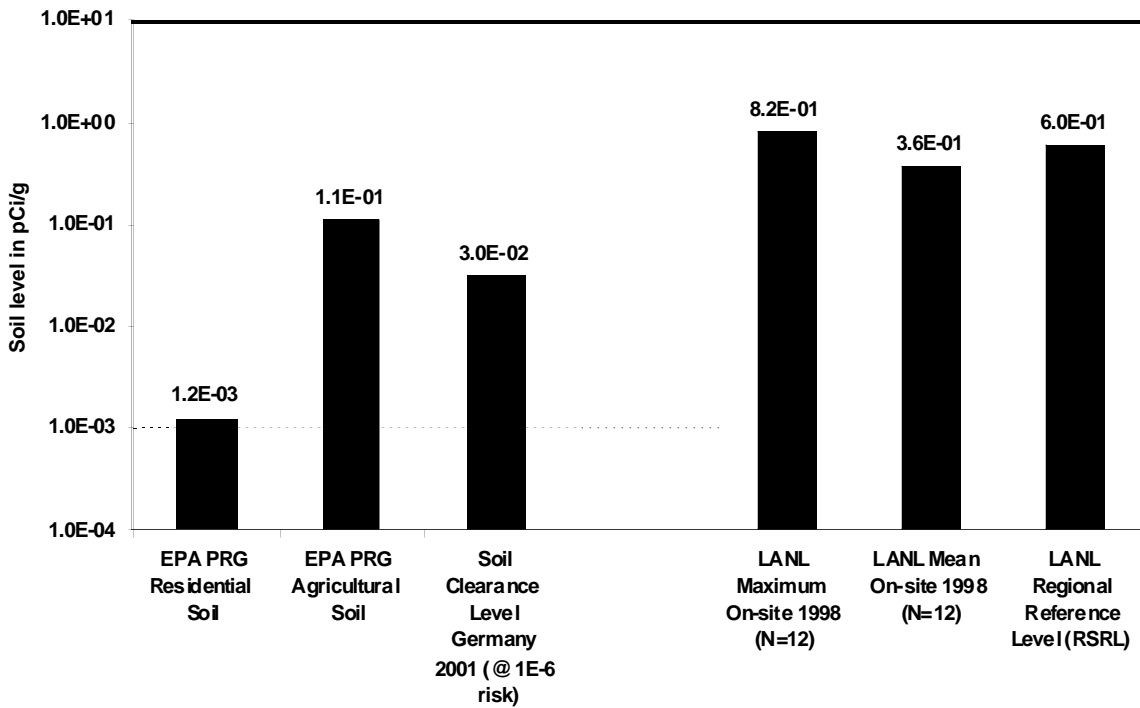


Figure 2. Comparison of remediation goals for cesium-137 in soil with soil levels reported by LANL



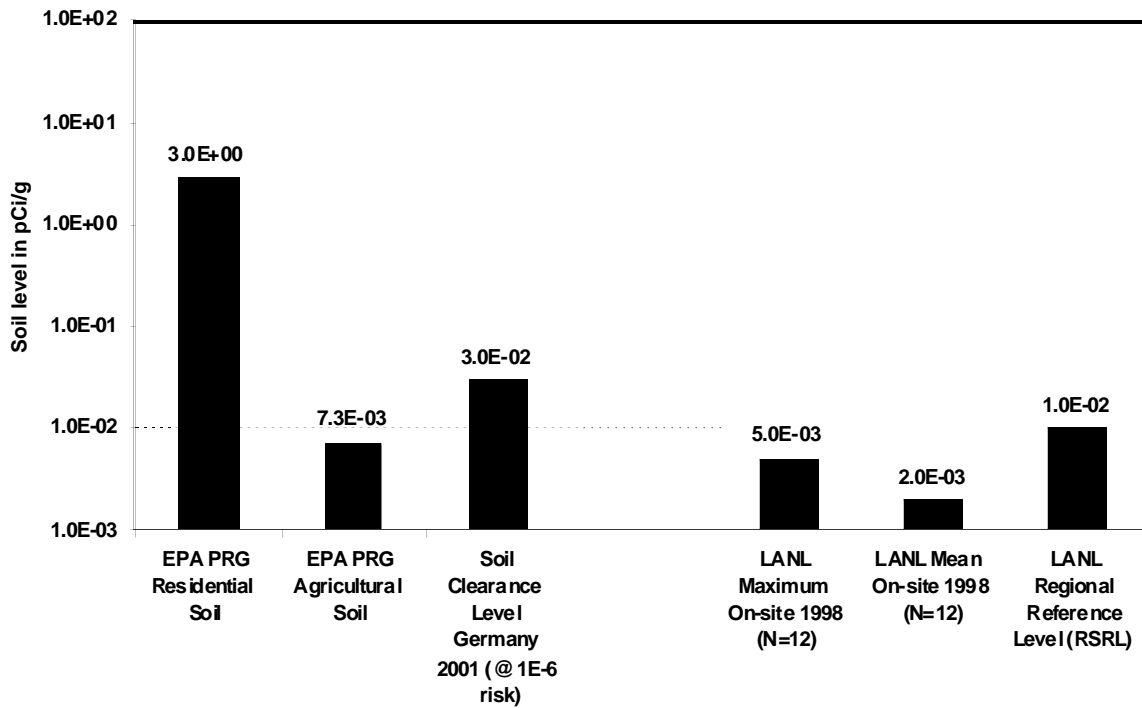


Figure 3. Comparison of remediation goals for plutonium-238 in soil with soil levels reported by LANL

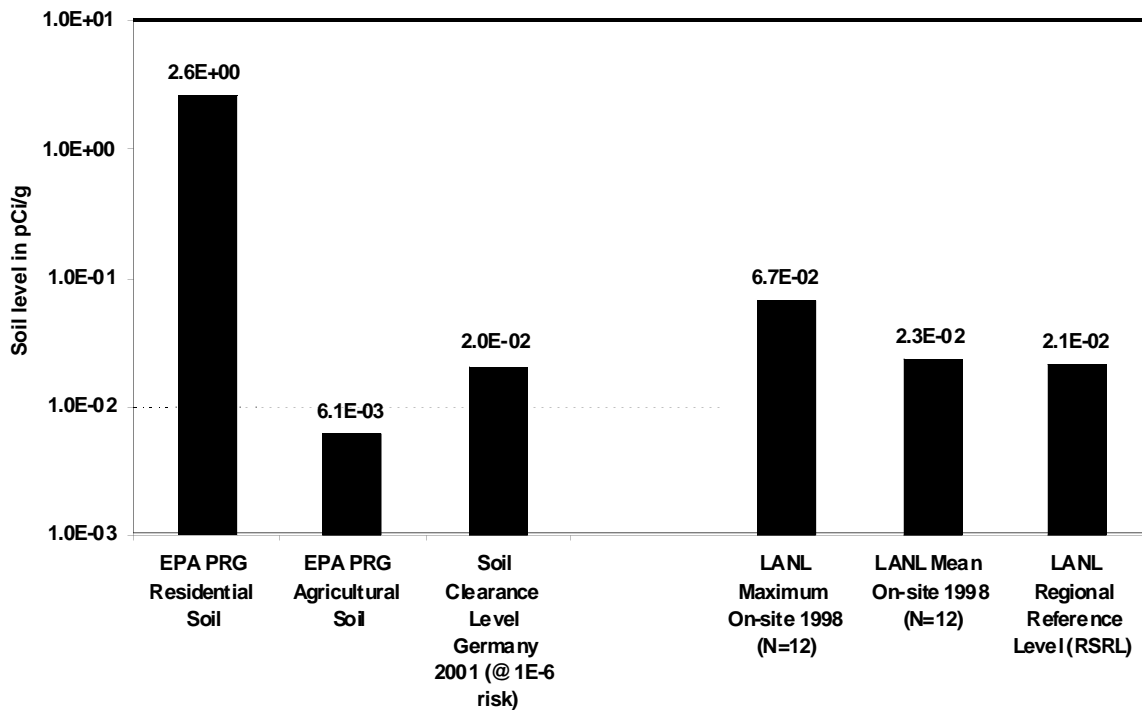


Figure 4. Comparison of remediation goals for plutonium-239 in soil with soil levels reported by LANL

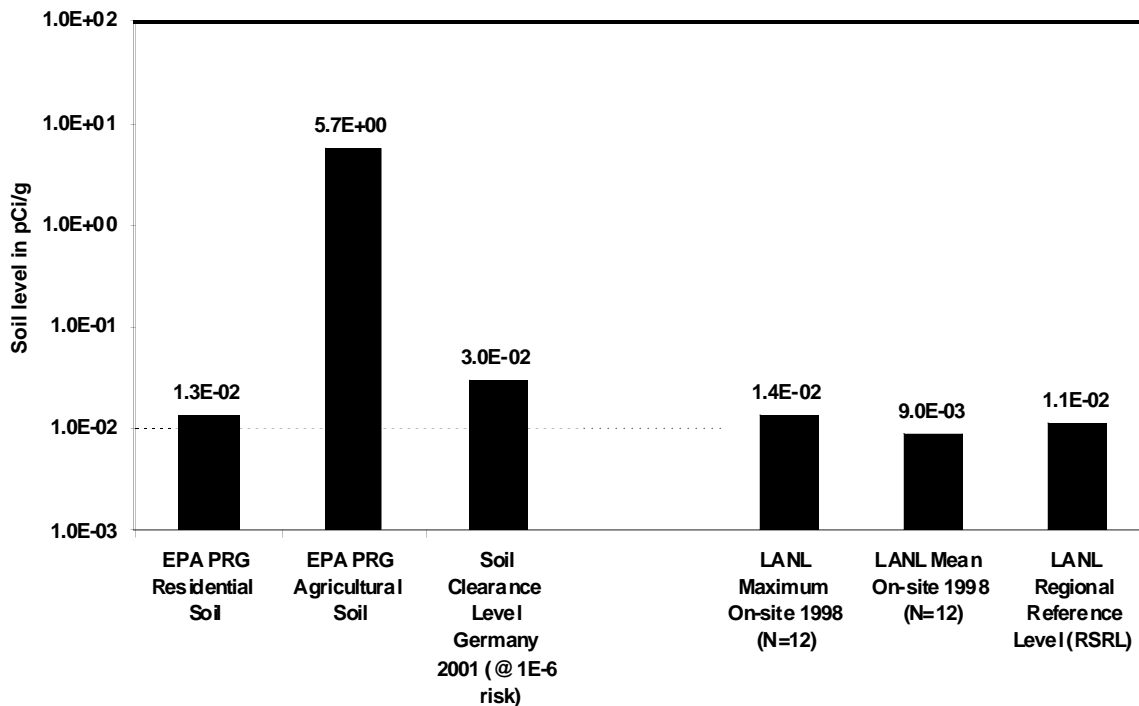


Figure 5. Comparison of remediation goals for americium-241 in soil with soil levels reported by LANL

NMED’s Draft Order should contain an outline of the rationale that will be used to resolve such “conflicts in the making”. The comparison of values in Figures 1 through 5 also indicate that the “agricultural soil” scenario yields the lowest PRG values for plutonium-238 and plutonium-239. It also shows that the soil clearance values in the current German radiation protection guideline are stricter than the limiting EPA scenario only in the case of strontium-90.

In conclusion, the NMED Draft Order is too unspecific with regard to PRG values. The Order should select the most restrictive usage scenario (residential, agricultural or other) for all substances under review. NMED should further present a rationale to deal with the existing data situation in light of the fact that EPA’s existing PRG values are already exceeded, not only for on-site locations but for regional reference values as well.

**5. The cleanup levels for Polychlorinated Biphenyls (PCBs) of 1 mg/kg is not strict enough and should be lowered to 0.22 mg/kg. A preliminary screening criterion for perchlorates should be set to 1 part per billion.**

NMED has established a default cleanup criterion of 1 mg/kg for PCBs. In contrast, the EPA Region 6 value for PCB is 0.22 mg/kg, based on a risk target of  $10^{-6}$ . We recommend using EPA’s stricter value because it reflects the above-mentioned concept of limiting the risk from individual pollutants and is more protective of human and ecological health.

NMED did not set a soil cleanup level for perchlorates, which is not satisfactory given that this is a growing issue at LANL. We are concerned over the possible delays that may occur if EPA does not determine perchlorate soil cleanup levels in a timely fashion. Can NMED, in the Final Order, estimate a date in which EPA will have

determined perchlorate soil cleanup levels? If it can be foreseen that EPA will be long delayed in doing so, the Final Order should set forth as provisional standard.

While the EPA has not yet set a drinking-water standard for perchlorates, NMED has adopted the EPA provisional drinking water equivalent of 1 µg/L or 1 part per billion. We endorse this stringent standard and encourage NMED to make this its permanent standard.

**6. The degree of knowledge regarding the risks from radioactive and non-radioactive pollutants should be documented; target values should be continually revised as more information becomes available.**

An overall issue with respect to setting appropriate cleanup standards is the fact that knowledge of exposure data and risk factors is constantly increasing. What appears to be a conservative assumption today may be regarded as too optimistic tomorrow. Setting cleanup standards involves judgment of the effects on generations to come. NMED should outline the updating process of risk information.

**7. NMED's Draft Order lacks unambiguous definitions for "goals cannot be achieved" (VII.D.3), "implementability" (VII.D.4.b.iv) and "technical infeasibility" of cleanup (VIII.E).**

The "LANL Draft Order" stipulates that "if the cleanup standards or goals cannot be achieved, approved risk-based cleanup goals established by a risk analysis" shall be selected as a corrective measure. (VII.D.3) And that "The remedy shall be evaluated for its implementability..." (VII.D.4.b.iv). The Draft Order further states that "*If attainment of the established cleanup level is demonstrated to be technically infeasible, the Respondents may perform a risk-based evaluation to establish alternative cleanup levels for specific media at individual corrective action units.*" (VIII.E) These provisions are too vague in nature and open the door for substantial arbitrariness in their application because of the lack of clear and unambiguous definitions. At which point is it impossible to achieve a cleanup standard or goal? What are the limits of implementation? And at what point is attainment "technically" infeasible rather than simply "too expensive"?

We strongly recommend that NMED define a precise and numerical decision criteria process for the above. As a general principle, we further state that in the approval process for future corrective measures NMED must err on the side of ensuring genuine environmental restoration and the needed technical means to get there. NMED should be very skeptical of any economic arguments that the Respondents might raise while seeking approval of alternative methods given the lab's rapid budget growth in other programs while cleanup funding declines.

**8. The NMED position paper on human and ecological risk assessment referred to in section VIII.E is deficient. NMED should consider the agricultural use scenario and require a thorough uncertainty analysis.**

If a "risk-based evaluation" is conducted, the Draft LANL Order defines that it should be in accordance with the Department's "Human Health Risk Position Paper Assessing Human Health Risks Posed by Chemicals: Screening Level Risk Assessment (March 2000)," while using the equations in the Department's Technical Background Document for Development of Soil Screening Levels.

The quoted document is deficient because it limits the pathway analysis to residential and industrial usage scenarios. Section 6 of the position paper is entitled “Analysis of uncertainties” and merely specifies that the major areas of uncertainty be “discussed”. Given the fact that NMED’s cleanup levels as well as the PRG values were selected in a deterministic way, there is a significant degree of uncertainty that needs to be properly quantified.

We recommend that Section VIII.E and the position paper be revised to address these shortcomings. There will likely be a significant uncertainty due to sampling and analysis as well as the variability in model parameters. We recommend that NMED’s Draft Order require a mandatory full-scope uncertainty analysis of the risk posed by non-radioactive and radioactive pollutants. NMED’s Draft Order should require a mandatory full uncertainty analysis of the risk posed by non-radioactive and radioactive pollutants.

### **Summary**

While NMED’s overall risk target of  $10^{-5}$  for the sum of all radioactive and non-radioactive pollutants is a reasonable one, the Draft LANL Order contains major inconsistencies and is too vague in a number of cases that were reviewed by us:

NMED’s target risk levels allow that the target risk could be exhausted by a single pollutant, which is not standard practice. We recommend that the target risk for individual pollutants (whether radioactive or non-radioactive) should be  $10^{-6}$  and that the target risk level from all pollutants combined should not exceed  $10^{-5}$ . We recommend appending this by limiting the maximum annual dose to 1 mrem/year CEDE.

NMED does not address the issue of collective dose that is a measure of the overall potential harm of residual contamination to the entire population potentially at risk. We recommend that NMED establish a collective dose target risk for radioactive and non-radioactive pollutants.

NMED should provide cleanup values for the agricultural scenario for non-radioactive pollutants.

The NMED Draft Order is too unspecific with regard to PRG values. We recommend that the most restrictive usage scenario (residential, agricultural or other) for all substances under review be selected. Further, NMED should present a course of action to deal with the existing data situation in light of the fact that EPA’s existing PRG values are already exceeded for some radionuclides.

NMED has established a default cleanup criterion of 1 mg/kg for PCBs. In contrast, the EPA Region 6 value for PCB is 0.22 mg/kg. We recommend using the stricter EPA value because it reflects limiting the risk from individual pollutants and is more protective of human and ecological health.

A preliminary screening criterion for perchlorates should be set to 1 part per billion.

The knowledge of the risks from radioactive and non-radioactive pollutants is constantly changing. We recommend that NMED’s Draft Order should reflect this and provide for a process of continuing revision as more information becomes available.

NMED’s Draft Order lacks unambiguous definitions for “goals cannot be achieved”, “implementability” and “technical infeasibility” of cleanup. We recommend that NMED define a precise and numerical decision criteria process for the above.

There will likely be significant uncertainty due to sampling and analysis as well as the variability in model parameters. We recommend that NMED’s Draft Order require a mandatory full-scope uncertainty analysis of the risk posed by non-radioactive and radioactive pollutants.

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- USEPA-2001. U.S. Environmental Protection Agency (2001). User's Guide: Radionuclide Carcinogenicity for the HEAST Radionuclide Table said that they are generally unwilling to extend milestones just to accommodate lower funding levels by DOE.

- End of Mr. Franke's Comments -

Section IX. Investigations and Sampling Methods and Procedures: No substantial comment. NWNM again compliments NMED on its apparent thoroughness.

Section X. Monitoring Well Construction Requirements: No substantial comment. NWNM again compliments NMED on its apparent thoroughness.

Section X. Reporting Requirements: What will be the public's access to critical information, reports and documents, such as risk assessment and corrective action reports, the type of future land use scenarios used, actual screening values used, uncertainty analyses and conclusions and recommendations? How may all of the above be used or incorporated into the LANL RCRA permit renewal process? What is the quality assurance process for both LANL's preparation of the requested information and NMED's review and approval of it?

Section XII. Compliance Schedules Tables: The May 2002 GAO Report "Waste Cleanup: Status and Implications of DOE's Compliance Agreements" states:

Thus far, regulators [across the country] have generally been willing to negotiate extensions when DOE found itself unable to complete a milestone on time, approving about 93 percent of DOE's requests for milestone changes... However, regulators said that they were generally unwilling to extend milestones just to accommodate lower funding levels by DOE.

Obviously the situation is different here in New Mexico which, to date, has not had such a comprehensive Order with milestones until now. However, we believe that this Order was issued, at least in substantial part, precisely because NMED had witnessed a pattern of serious decline to environmental restoration funding in this state. In effect, NMED was put into a position by DOE of choosing whether or not it would accommodate lower funding levels (and this after the Cerro Grande Fire to boot!). We say out of principle that there should be zero tolerance for missed milestones (other than *force majeure*) to begin with, but especially so in light of the past declining funding pattern. We recommend zero tolerance even in light of the fact that through this Order there is a probability of increased funding.

A further reason for zero tolerance of missing milestones is that cleanup schedule slippages are endemic to DOE cleanup programs. As the June 2002 DOE Inspector General's Audit Report "Environmental Management Performance Measures" states:

At the 40 cleanup sites still open at the end of FY 2001, the average time to complete cleanup work changed from 11 years in 1998 to 17 years in 2001. These slippages have resulted in an increased duration of 6 years, or 55 percent, with schedule slippages occurring at 32 of the remaining 40 cleanup sites.

This is a situation which NWNM asserts will only grow worse as DOE hits the more intractable problems, which LANL has many. Furthermore, NMED should bear in mind the obvious fact that LANL is and will remain a National Nuclear Security Administration (NNSA) site. The point here is that clearly the NNSA will not have environmental restoration as its highest priority, even as expanded nuclear weapons operations at LANL will increase the volumes of hazardous and radioactive wastes being produced. Finally, NMED and the lab simply need to make up for lost cleanup time. For all of these reasons NWNM urges NMED in the strongest terms to not tolerate missed milestones, but instead to enforce them vigorously with appropriate penalties as needed.

Under the Canyon Watershed Sampling Schedule the final Order should have a requirement for sampling stormwater runoff. The number of samples needed for an adequate statistical analysis should be determined by NMED (and is obviously subject to weather). The samples should be split with NMED.

- End Of Section by Section Comment -

### **Some General Comments**

NWNM again applauds NMED's Determination of Imminent and Substantial Endangerment. Of course, the people who know best what tangible dangers there might be would be LANL personnel. The final Order should incorporate measures that would protect any whistleblowers that might come forward with valuable information.

In our view, NMED should be well aware of other states' Orders, what worked, what didn't and what may be applicable to this Order. We advise NMED that the May 2002 GAO Report "Waste Cleanup: Status and Implications of DOE's Compliance Agreements" has an excellent list by state of Orders and Consent Decrees issued against DOE. The GAO Report also notes that DOE HQ has made no attempt to calculate the costs of compliance with existing regulatory orders and consent decrees by site. While not advising that this should be part of the Order itself, NMED should nevertheless pressure DOE/LANL/UC into calculating projected costs

for complying with the Order so that future compliance can be better assured with a sound fiscal basis.

NWNM finds it ironic that there is much attention being paid by DOE/LANL/UC to “Quick to WIPP,” that is to say the transport of monitored and stored transuranic wastes from TA-54 to WIPP. At the same time, there is complete silence on their part concerning the probable larger volumes of transuranic wastes buried across the site. NWNM recommends that the final Order should require continually updated aggregated inventories of waste by their waste type classification, as data is acquired.

One major omission that we find pervading the draft Order is spelled out quality assurance procedures for both those required of DOE/LANL/UC in the fulfillment of data requests, reports, etc. and those for NMED in its review and approval process. We think this subject to be of sufficient stature that it merits having its own section in the final order, at least for DOE/LANL/UC. We don’t necessarily think that NMED needs to order itself in the final Order, but nevertheless NMED should self-examine this issue.

NMED should also examine its resource base for supporting the ongoing implementation of this Order and the means whereby it succeeds in consolidating that resource base. [We are not suggesting that self-examination should occur within the final Order, but nevertheless strongly note that it needs urgent redress.] The conventional adage is that the means don’t always justify the ends. To be less cryptic, what we mean here is that NMED should be very leery of “snake oil” proposals by DOE/LANL/UC to accelerate “cleanup,” in which the feds attempt to lure struggling state environment departments into accepting certain premises that will inevitably compromise the course of future genuine cleanup. To cut to the quick, NMED is already culpable by having cosigned onto the now somewhat infamous Letter of Intent in the hopes of obtaining both greater cleanup funding for New Mexico and its own resource base (both of which are legitimate concerns but can obviously lead to potentially compromising situations).

It is certainly easier now to say that NMED should have never signed that Letter of Intent in light of the Senate Energy and Water Subcommittee’s stinging rebuke of DOE’s so-called Accelerated Cleanup Account. Not only were appropriations denied for that account, the subcommittee allocated all of DOE’s proposed “expedited cleanup” funds directly to the individual sites and expressly barred the DOE Asst. Secretary for Environmental Management from discretionary reallocations. Moreover, the two primary signatories (the DOE Asst. Secretary and the present NMED Secretary) to that Letter of Intent may soon be gone. The point of all of this is that NMED should examine the currency and validity of the Letter of Intent and possibly rule it as invalid and inoperative. NWNM contends that the Letter of Intent was a contract of sorts between DOE and NMED. In the plausible event that Congress as a whole accepts the subcommittee’s recommendation then DOE will not be fulfilling that contract as planned. Therefore, NMED should not feel obligated to remain in a position whereby it could possibly be compromised by that ill-advised instrument. Again, NWNM is not suggesting that these deliberations internal to NMED should place within the framework of the Order. Still, we most strongly urge that they do indeed take place.

- End of Comments -

Respectfully submitted,

Jay Coghlan, Director

July 31, 2002

6.0.B

## Attachment B

### The Waste Isolation Pilot Plant

Selected NWNM/Franke Comments on DOE Permit Modification Requests





September 27, 2001

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Comments by Nuclear Watch of New Mexico

### **On the Proposed Class 3 Modifications to the Waste Isolation Pilot Plant Hazardous Waste Permit**

**Nuclear Watch of New Mexico** strongly opposes the proposed modifications to the Waste Isolation Pilot Plant (*WIPP*) Hazardous Waste Permit and strongly recommends that the New Mexico Environment Department (*NMED*) deny the Class 3 modifications submitted by the U.S. Department of Energy (DOE) on June 6, 2001.

The following reasons support our recommendation to deny the application:

#### ***Waste Confirmation at the WIPP Facility (Item 1)*** ***Prohibited Items (Item 4)***

The DOE has always maintained that it would never open a drum of waste at the WIPP in order to prevent contaminating the site (in their own words they said, WIPP would start clean and stay clean. ) However, with this modification, Carlsbad Field Office (*CBFO*) has completely abandoned this central tenet. On-site waste confirmation will entirely change the WIPP's mission from a disposal-only facility to a disposal, storage, and a characterization site (although DOE refuses to acknowledge this fundamental change in mission.)

DOE's justification for introducing waste confirmation to the WIPP mission is one of simple economics and lacks safety considerations for the site and the people that will be affected by these changes to the permit. The DOE states in its application that the original concept in the permit was for small-quantity sites (*SQS*) to trans-ship their waste to large-quantity sites (*LQS*) for characterization and confirmation. Alternatively, *SQS*s that could not ship their waste to *LQS*s would have had certified DOE contractors come to them to characterize and confirm their waste. DOE now states that this is no longer an economic or efficient option since the method stated above did not come to its expected fruition. The DOE does not give any quantitative data to suggest that the economics of this method is such that this is actually the case. In addition, the DOE is ignoring the safety and legal issues when they state in their conclusion: In short, the economic assumptions that shaped an important part of the waste analysis framework in the existing HWFP [*Hazardous Waste Facility Permit*] have proven to be invalid. Who has this been proven by, and where is the data that supports this? By focusing on the economic issues, they have ignored the safety issues.

In the beginning of the application the DOE claimed that the modification request was simply to

address the financial concerns of the SQSs. DOE later explains that if the WIPP is given the ability to do on-site waste confirmation they would give the option to LQSs to only do characterization (and not confirmation) before waste is shipped to the WIPP. This changes their fundamental stance in mid-application. No longer is it only a simple economic issue for the SQSs, it is now an option for LQSs to do only half the job before they send their waste to the WIPP.

There are inherent flaws in DOE's argument for on-site waste confirmation, the most significant being the concept of Acceptable Knowledge (*AK*). First of all, DOE has a notorious record with respect to waste inventories characterization and record keeping, to which they have admitted in legal documents. It would be naive of the NMED to assume that DOE's performance would somehow be considerably better with respect to just the WIPP destined waste. Nevertheless, DOE states that through the use of AK (which is currently in effect at all sites doing characterization) any WIPP waste stream with the proper AK will be characterized under that AK and then shipped to the WIPP for confirmation. By not confirming AK-characterized waste before shipment to the WIPP, they will be uncertain as to what waste really is on the roads. Only after these shipments arrive at the site will the people who are affected by transportation of this waste, let alone the WIPP itself, find out what is actually in the drums of waste through the WIPP confirmation process.

In addition to this problem with transportation to the WIPP, the DOE gives almost no explanation of what they are to do in the event that prohibited waste arrives at WIPP. DOE states that it will notify NMED of the receipt of prohibited waste within ten days, and that it will work with the generating site of that prohibited waste (or other storage sites) in order to have the prohibited waste removed from the WIPP site. This, however, is unacceptable. Even the consideration that prohibited items will be sent to the WIPP makes it clear that characterization and confirmation should be done at the generator/storage site and that therefore the application should be denied. Add this to the fact that prohibited waste must be sent back to the generating site or a storage site, and hence having the same waste on the roads multiple times and increasing the cost of dealing with this waste, demonstrates a double standard within DOE's economic argument that it is claiming to be the driving factor of this application. Or, in the worst case, once significant amounts of prohibited wastes arrive at the WIPP, there could be irresistible political pressure on the State to allow those to be buried as well. This proverbial camel's nose-under the tent should not be allowed by NMED to even begin.

A final note on the centralized confirmation aspect to the DOE's application is their claim that by allowing confirmation at the WIPP, NMED's audit and surveillance program at storage and generating sites would decrease and eventually cease. These audits and surveillances are of the utmost importance and must continue, without them DOE would be regulating themselves.

By confirming waste from SQSs and LQSs the WIPP is no longer just a disposal site but will become a characterization site as well. Through on-site confirmation DOE will be forced to open drums of waste, something that it has always said it would not do. This is a fundamental change in mission, and is sufficient basis alone for denying their permit modification application.

***Additional Storage Capacity and Additional Container Storage Locations (Item 2)  
Increase Storage Time (Item 3)***

The DOE application requests an additional amount of above ground waste storage space. They state that with the introduction of waste confirmation they are concerned that without the additional space their efficiency for handling waste will be impacted. However, it makes no mention of the safety issues involved with the additional waste stored above ground.

It goes without saying that by adding additional space to store waste above ground they seek to increase the amount of waste that will be above ground as well. This will increase the likelihood of potential accidents that may occur.

In addition to this concern about the potential increase in accidents, the DOE offers no evidence to suggest that additional storage space is required. Once again the DOE has made statements that should not be taken on faith alone. There is no data given to show why they are concerned about efficiency, nor is there any data offered to show why there is no greater accident potential.

Furthermore, aside from having more waste above ground, the DOE is applying to increase the time that waste may be held above ground from 60 days to one full year. This again is a request without the appropriate explanation. They state that in order to meet the following time constraints:

- the drum age criterion (*DAC*) of 142 days;
- to perform confirmation of analysis of 30 days;
- to complete data verification of 30-90 days;
- to certify that the waste meets all Permit required criteria before disposal of 30 days;
- and unforeseen equipment downtime of 30 days;

an increase of 305 days is necessary. Regardless of the fact that the *DAC* could be met by holding waste at the generating or storage site for the necessary time period, the concept of having waste above ground for a year introduces the accident concerns yet again! It is only a matter of common sense that increasing the amount of waste above ground and increasing the time allotted to it above ground will inevitably increase the potential for accidents and the release of waste at the WIPP! By allowing an increase in the amounts of and time for above ground waste the WIPP will become a surface storage site for the DOE and not be simply a disposal site as per its stated and permitted mission.

In conclusion, **Nuclear Watch of New Mexico** recommends that the New Mexico Environment Department deny the Proposed Class 3 Modification to the WIPP Permit because:

1. The proposed modification goes entirely against the WIPP mission. Through this modification the WIPP will no longer be a disposal only site, they will become a disposal, confirmation, and storage site.
2. The option to open a drum of waste at WIPP is inconsistent with the recorded intent of the DOE: Start clean, stay clean. Allowing the WIPP to open drums of waste at their site will go against what they have been saying all along.
3. The new potential of accidents from opening waste drums, to increasing the amount of waste allowable above ground, to extending the amount of time that waste is allowed to be stored above ground is increased dramatically. The DOE's application gives no data or information as to why this should not be foreseen as a result to their modification.
4. The DOE states time and time again throughout their application that the driving force for this application is economics, but they give no data to support this claim. While they state that one of their objectives is to maintain safety of their workers and the environment around the WIPP site, there is no data to support that there will be no increase in danger to the environment or the workers at the WIPP.
5. The DOE states that this modification will eventually allow the audit and surveillance programs of the NMED to cease. This is an unacceptable option as these audits and sur-

veillances are necessary and must be maintained.

Additionally, with the change of the world on September 11th, 2001, we must be increasingly concerned that WIPP will be a target of terrorism, and transportation being a key issue when it comes to security and safety. With the proposed modifications we will see an increase of transportation and in turn an increase in vulnerability. By keeping the shipments at their current rate, the public will have a lesser concern on their hands with respect to the safety of the shipments. In fact, it would behoove DOE to consider increasing security of the current shipments as opposed to increasing the shipments of waste coming to the WIPP and away from the WIPP.

One final note: The President of the United States will soon be making a recommendation as to the Yucca Mountain site. If by some chance Yucca Mountain is rejected, as it should be, and this proposed modification is accepted we would be looking at a site that holds a precedent of its ability to periodically change its mission. This must be considered while making a decision as to the current application or we could well have high-level waste disposal at the WIPP.

It is for the reasons stated in this document that **Nuclear Watch of New Mexico** strongly recommends that the New Mexico Environment Department deny this proposed modification to the WIPP Permit.

Please deny the modification!

Sincerely,

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November 2, 2001

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Dear Mr. Zappe,

**Nuclear Watch of New Mexico** (NWNM) offers these comments regarding the Class 2 permit modification to the Waste Isolation Pilot Plant permit requested by DOE on August 28, 2001 and then revised on September 28, 2001 to change headspace gas analysis, change the visual examination (VE) requirements, and change the procedure for headspace gas sampling.

NWNM strongly opposes this modification request and urges the New Mexico Environment Department to deny it.

Regulations under the New Mexico Hazardous Waste Act (20 NMAC 4.1.900, incorporating 40 CFR 270.42(b)(7)) provides that the NMED may deny any Class 2 modification for any of the following reasons:

1. the modification request is incomplete;
2. the modification does not comply with other regulations covering the operating standards for hazardous waste storage and disposal facilities; or
3. the conditions of the modification fail to protect human health and the environment

In this current Class 2 permit modification request, as seen in others in the past, the permittees have submitted this modification request while it remains incomplete, shows little concern for the safety of human health or the environment, nor does it comply with the above regulations. For these reasons the NMED should deny this permit modification.

### **Item 1**

#### **Using Composite Headspace Gas Data and Compositing up to 20 Samples**

This proposed modification to the WIPP permit is in a word ridiculous. Even someone with a limited background in laboratory research can see that DOE's intended change in headspace gas compositing is lacking logic and, more importantly, is dangerous.

By changing their current practices from five 5 ml sample composition in a 25 ml syringe to twenty 12.5 ml sample composition in a 250 ml SUMMA<sup>®</sup> canister, they are introducing variables which they apparently cannot comprehend. While the current method of headspace gas composition is flawed, the suggested modification is even more so.

For example: As the practice currently stands, by taking a 5 ml sample from five different drums and compositing them in a 25 ml syringe, they are still running the risk of missing potential problems. Let us assume for a moment that four of the five drums from which they take a sample have no problems with respect to volatile organic compounds (VOCs) or tentatively identified compounds (TICs). But for arguments sake, let us imagine that the fifth drum which they take their sample from has a high level of both. In the current procedure, they would find one of two things:

1. The sampling comes up high, but no action is taken because the numbers state that they are still within regulation standards; or
2. They decide that this sample is of concern because of the high numbers and they are forced to look at the drums in more depth before they proceed with the certification of the waste.

Ideally it is the second of the two that DOE will embark upon, for if their goal is for human health and environmental safety then they would. In addition to that, because of the limited number of composited samples they would be able to narrow their field of concern to only five drums! However, with the proposed modification to this compositing, the DOE would more than likely not have that choice.

Take for example nearly the same scenario. 19 out of 20 drums have little if any VOCs or TICs. The sampling is performed on the twentieth drum which, unbeknownst to them, has very high levels of both. By compositing 20 drums their results would show that the composited sample has numbers compliant to the permit requirements. However, this is not the case, and the twentieth drum is actually unacceptable to be buried. In this case, the second option, as shown above, would not be considered simply because no anomalies are discovered through this sort of compositing and sampling. Added to this is the fact that if some sort of anomaly is found they will be forced to assess 20 drums as opposed to only five in the current regulations. This increase of 15 more drums must certainly factor into concern for human health and safety of the environment, in addition to the additive cost factor to these extra drums that they must sample once again!

Outside of this common sense method of contesting this proposed permit modification, NWNM also notes that the DOE states that this modification request will improve both efficiency and safety at the generating/storage sites. This justification for the requested modification is inadequate because any modification should be based on the safety of WIPP, the disposal site. Without any proven benefits to the health and environment of New Mexicans the justification for this proposed modification is not in the least adequate.

Furthermore, DOE's information submitted in Attachment B of the modification request is based only on comparisons of the headspace gas sampling at INEEL and Rocky Flats, but this proposed modification would be applied to all sites. The very limited analysis of wastes at INEEL and Rocky Flats is not adequate to show that it is comprehensive for the wastes at those two sites.

The permittees have not shown that the changed methods of composite sampling are protective to human health and the environment. Because of this lack of data in their submission they are not meeting the requirements of 40 CFR 264.13 or the requirements of 40 CFR 264.31. Additionally, the request does not protect the environment or human health since they do not demonstrate that all TICs will be identified and reported and that headspace gas sampling will be performed according to the permit.

## **Item 2 Establishing Safety Conditions for Visual Examination (VE) of Waste Containers**

In this modification the request to change the procedures for VE of waste containers should be denied because the request is incomplete, does not protect human health and the environment, and it does not comply with regulations.

In this portion of the modification request DOE shows no justification for any change to the permit as it stands. As the proposed modification currently stands, the DOE shows no evidence that the current permit is inadequate without this modification. In fact, the examination of drums which radiography has shown to contain unusual items or conditions provides an important assessment of radiography and should be performed as often as needed instead of removed.

The documentation provided by DOE shows that only one drum has spawned this need for a modification of the permit. This is outrageous. In addition to this ridiculous lack of evidence there is no evidence that the drum was subject to VE and that any worker was in danger just because of this one drum. This shows how this modification request is without any justification. This requested modification continues to show that it is not complete again and again. It does not explain why out of more than 11,000 drums that have been characterized under the current permit why only one drum is reason to change the permit. NWNM believes that one drum out of more than 11,000 drums from Rocky Flats is not anywhere near sufficient reason to modify the permit.

By changing the permit with respect to VE, the DOE will have modified the permit so that containers will no longer be subjected to VE on a randomly sampled basis. In fact the case will now be that DOE will be able to exclude drums that have been randomly selected for VE. This is a change that is entirely against important safety aspects of the Waste Analysis Plan, i.e., requirements for verification of radiography. NWNM notes that historically DOE has always been weak in its implementation of quality assurance practices.

Additionally, this request does not protect public health or the environment since there is no evidence to suggest that VE will be carried out in accordance with the permit.

## **Item 3**

### **Taking Samples of Headspace Gas through Existing Filter Vent Holes**

Once again, this modification request should be denied because it is incomplete, does not comply with regulations, and it does not protect public health or the environment.

The basis for this modification request is to provide an extra headspace gas sampling method. However, the discussion indicates that the reason for this modification request is simply a matter of the pipe overpack containers (POC) found at Rocky Flats.

The POC is a problem that DOE has brought upon itself. The development of the POC was to assist in the transportation of highly radioactive residues from Rocky Flats to WIPP. This container and the wastes that are being shipped in it are not specifically discussed within the permit application. As a result the public has not had the opportunity to fully analyze all aspects of the POC. This modification request is not complete by virtue of the fact that it does not contain the necessary documentation to show the public what the implications of the use of POCs are. Additionally, DOE shows no reason why there are concerns over the current method of headspace gas sampling with the POC.

Finally, this requested modification would not only affect the POCs, this new method of headspace gas sampling would be implemented on all containers. DOE has not offered any data on what the implications would be if this method of headspace gas sampling would be performed on other containers, not just the POCs. In absence of additional data, this requested permit modification shows inadequate justification and a haphazard approach to permit modification. There is no way to tell what the implications may be on characterization.

In one last note, NWNM has observed that this proposed Class 2 permit modification is simply one to create DOE efficiency in order to get waste to WIPP at a faster rate, ignoring the environmental and health risks along the way. Obviously the NMED cannot approve this permit modification because of this reason.

It is because of the above stated reasons that this modification request should be denied.

Thank you for your consideration of these comments.

Sincerely,

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October 3, 2002

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**Regarding: Waste Isolation Pilot Plant Permit Modification Requests**

- Item 1: Addition of New Mexico Hazardous Waste Number**
- Item 2: Characterizing Re-Packaged Homogenous Solids as Retrievably Stored Waste with Regard to Solids Sampling**
- Item 3: Classified Information Record Keeping and Audit Requirements**
- Item 4: Addition of HalfPACTs**
- Item 5: Use of Radiography for Newly Generated Waste**

Dear Mr. Zappe,

**Nuclear Watch of New Mexico** (NWNM) requests that the New Mexico Environment Department (NMED) deny the above mentioned permit modification requests.

As you know, regulations under the New Mexico Hazardous Waste Act (20 NMAC 4.1.900 incorporating 40 CFR §270.42(b)(7)) provides that NMED may deny any Class 2 permit modification request for the following reasons:

- the modification request is incomplete;
- the modification request does not comply with other regulations covering operating standards for hazardous waste storage and disposal facilities; or
- the conditions of the modification fail to protect human health and the environment

NWNM is strongly opposed to these modifications as they are a threat to human health and the environment, and they are technically incomplete.

The following reasons will support our request to deny.

**Item 1: Addition of New Mexico Hazardous Waste Number**

As the permit modification request (PMR) states, the permittees submitted the same modification request to NMED on June 6<sup>th</sup>, 2002. This original PMR was denied by NMED because of insufficient information, but once again the permittees have not rectified this issue of completeness in this PMR.

There is no mention of the studies done on the hydrofluoric acid (HF) contaminated waste. While this may not be required in the actual permit, the permittees should certainly have included the studies they have performed on this waste in the PMR. Without this data and information, the public is given no reason why we should assume that the permittees facts are correct. This and this alone should be sufficient for NMED to deny this item, however there is more.

Corrosives are a banned substance at the Waste Isolation Pilot Plant (WIPP). While the permittees claim that they have found a way to remove the corrosive nature of HF, the potential danger to human health and the environment is far too great to get only 100m<sup>3</sup> of waste to WIPP. NWNM also notes that the main reason why the permittees wish to send this waste to WIPP is because of the Idaho National Engineering and Environmental Laboratory (INEEL). INEEL is notorious for their inability to abide by the permit. They have used inappropriate verification and confirmation tools (i.e., the WAGS system), and they have illegally shipped waste to WIPP because of this, among other violations. INEEL is not the site that we should be making concessions for. They are a danger to the WIPP site already, without giving them the opportunity to send corrosives to WIPP.

NMED must deny this PMR. The PMR is technically incomplete; it is a potential danger to human health and the environment, and because of the permittees wish to allow a previously banned substance into WIPP this should be a Class 3 PMR, not a Class 2. If NMED does approve this PMR, it must prohibit INEEL from using only acceptable knowledge (AK) when characterizing and sending this waste. NMED must have INEEL do visual examination (VE) and testing of this waste prior to shipping to ensure that the waste is non-corrosive. If this PMR is approved, it should be for only the 100m<sup>3</sup> of waste that the permittees claim INEEL currently has to dispose of. If any other site in the DOE complex wishes to send HF contaminated waste, NMED should require the permittees to submit a PMR for that particular site.

## **Item 2: Characterizing Re-Packaged Homogenous Solids as Retrievably Stored Waste with Regard to Solids Sampling**

“The proposed modification will allow generator/storage sites throughout the DOE complex more *flexibility* in selecting the *most efficient* approach to performing some waste analysis tasks.” (page A-21, emphasis added) While “flexibility” and “efficiency” may be on the forefront of the permittees concerns, this is not what makes a permit modification appropriate for approval. In fact, with this statement, the permittees assist NMED in reasons to deny this PMR.

Once again this PMR is incomplete. While the permittees claim that their intent is two fold, one to assist in adding more flexibility to generating/storage sites within the Department of Energy (DOE) complex, and two, to correct errors/confusion within the WIPP Permit, their explanation is woefully lacking. While the permittees believe that their PMR will reduce confusion, their explanation is actually more obfuscating than not.

In addition to this, the PMR does not clearly explain why this change is needed. Again, while flexibility and efficiency (i.e., cost savings) may be the priority of the permittees, it is not what makes for an approvable permit modification request. Because of this lack of explanation there is clearly a need for

more data, explanation and justification before this PMR can be considered complete. NMED must deny this PMR.

This lack of information also contributes to NWNM's concerns over human health and the environment. To allow newly-generated/re-packaged waste to be characterized in the same light as retrievable stored waste goes against the logic of the original WIPP Permit and may affect human health and the environment in an adverse way. To give the permittees the opportunity to reduce their characterization standards for re-packaged waste is unacceptable and dangerous. Again, the lack of reasoning within the PMR speaks volumes of the fact that not even the permittees have looked into this sufficiently and hence all the possible contingencies have not been accounted for. Even if there is a remote chance that this PMR could adversely affect health and the environment, NMED should deny this PMR.

### **Item 3: Classified Information Record Keeping and Audit Requirements**

This PMR should be denied outright because it is incomplete and it is detrimental to human health and the environment. If NMED does not deny this PMR, then NMED should reclassify this PMR as a Class 3, for it certainly does not fall under the purview of a Class 2 PMR.

In several stakeholder meetings, the permittees were unable to define how much waste would be classified and fall under the requirements of this PMR. Without a substantial investigation on how much classified waste is in the DOE complex, there is the opportunity for the permittees to be disingenuous on what waste can be deemed "classified." Even with NMED personnel having clearance to view the information that will be classified, NWNM is well aware that NMED is under staffed and the opportunity for something to slip by is a serious possibility.

This PMR also limits the opportunity for stakeholders to maintain a watchful eye on WIPP. This is unacceptable because, as NMED is well aware of, stakeholders have played a valuable role in making certain that WIPP stays true to its own mission.

Additionally, there is no mention of what would clearly be necessary changes to the Permit in the case of a spill. While this contingency may be unlikely, what is to occur if an accident takes place and there is a spill of the waste being transported? When the cleanup crew is sent to the spill site, will they all have to have Q clearance before they are allowed onto the contaminated site? Again, while this is an unlikely scenario, it clearly begs for need to deny this PMR, as the permittees make no mention of changes in their accident protocol.

The need for this PMR is not made clear. There is no discussion as to the pros and cons of the alternatives and hence no rationale as to why this is the only way to deal with their current need to bury classified waste at WIPP.

This lack of information creates an incomplete document and therefore requires that this PMR must be denied.

Furthermore, without additional explanation NWNM can see a variety of reasons why this PMR adversely affects human health and the environment. Using our hypothetical scenario of an accident, if

there is no change as to how WIPP would deal with this situation then we can see how lost time could endanger everything around that spill. There is also cause for concern if this classified approach to waste disposal is abused and waste is inappropriately dumped at WIPP.

National security has never been so blatantly used as a reason for a PMR by the permittees. This PMR must be denied as it currently stands, as the scope of it changes far too many items in the WIPP Permit. Even if NMED were to reclassify this PMR as a Class 3, NMED will need to deny it as it is incomplete and a danger to health and the environment.

#### **Item 4: Addition of HalfPACTs**

Once again, this PMR is incomplete, and NMED should deny it. The permittees give no reason to show under what circumstances the HalfPACT will be used. This should be in the PMR as we should know when a TRUPACT-II will be used and when a HalfPACT will be used. In addition to this, the permittees should show documentation of when they have had trouble shipping with the TRUPACT-II. It is inappropriate for the permittees to create a PMR simply to have a wish fulfilled, rather than a need.

The permittees also do not address any plan to deal with the contingency of leaky drums within the HalfPACT. We have recently seen this lack of consideration with respect to the TRUPACT-II, as an INEEL shipment had to be returned to INEEL after contamination was found. The permittees must produce a plan to deal with this potential problem before the HalfPACT is to be used. Again, NWNM believes that this is an incomplete PMR and is a threat to health and the environment and hence NMED must deny this.

#### **Item 5: Use of Radiography for Newly Generated Waste**

This PMR item is very similar to item 2 in the fact that it is incomplete and the permittees basis for this PMR is for “flexibility” and “efficiency” rather than quality. Even if efficiency was a reason to allow for a PMR to be approved, which it is not, there are simply no reasons offered by the permittees as to why this is the case. “Generator/storage sites have identified circumstances when post-packaging confirmation of AK using radiography instead of verifying AK at the time of packaging is more efficient.” (A-95) This is the extent of their reasoning. This is not enough to allow this PMR to be approved. NMED must deny this PMR.

NWNM has always believed that DOE’s AK of its waste in the DOE complex is poor. To reduce its procedures for verification of AK, without supporting reasons as to why this is not the case, the permittees open up the opportunity to adversely affect human health and the environment. The permittees also have not fully justified why this PMR needs to be implemented. There is simply no serious explanation as to why this should be approved.

In conclusion, **Nuclear Watch of New Mexico** recommends that Addition of New Mexico Hazardous Waste Number, Characterizing Re-Packaged Homogenous Solids as Retrievably Stored Waste with Regard to Solids Sampling, Classified Information Record Keeping and Audit Requirements, Addition of HalfPACTs and Use of Radiography for Newly Generated Waste should be denied. These PMRs are

incomplete, they are a danger to human health and the environment and some constitute a substantial change in the mission of the Waste Isolation Pilot Plant.

Since WIPP has opened, NWNM has consistently stated that the permittees continue to submit incomplete permit modification request and the permittees continue to say that they will correct this problem. However, this series of PMRs again shows that there is no intent by the permittees to change their procedures and they continue to waste the time and money of the New Mexico Environment Department, our organization, other organizations who watch over WIPP, and the taxpayers. In our eyes, this is simply unacceptable. In addition to this, the permittees continue to put the almighty dollar ahead of human health and the environment as opposed to what is best for the safe cleanup of the DOE complex. Again, this is unacceptable. While the permittees may believe that since WIPP is open, it may change its mission on a whim, or waste the time and money of the taxpaying public, but they cannot. NMED must deny these PMRs and show the permittees that their attempts to endanger the public and the environment will not be allowed.

Thank you for your careful consideration of our comments.

Sincerely,

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October 3, 2002

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**Regarding: Waste Isolation Pilot Plant Permit Modification Request – Add Waste Containers**

Dear Mr. Zappe,

**Nuclear Watch of New Mexico** (NWNM) requests that the New Mexico Environment Department (NMED) deny the above mentioned permit modification request.

As you know, regulations under the New Mexico Hazardous Waste Act (20 NMAC 4.1.900 incorporating 40 CFR §270.42(b)(7)) provides that NMED may deny any Class 2 permit modification request for the following reasons:

the modification request is incomplete;  
the modification request does not comply with other regulations covering operating standards for hazardous waste storage and disposal facilities; or  
the conditions of the modification fail to protect human health and the environment

NWNM is strongly opposed to this modification as it is a threat to human health and the environment, and it is technically incomplete.

The following reasons will support our request to deny.

The permittees give remarkably little information on why this permit modification request (PMR) is necessary. The permittees are attempting to instigate a massive number of changes to the Waste Isolation Pilot Plant's (WIPP) Permit, but leave many questions unanswered.

With the changes in the use of the 85-gallon overpack, the ten-drum overpack, and the introduction of the 100-gallon drum the permittees leave little room for error. The permittees make no mention as to what their response will be if an overpack is required for these drums. By using these drums as a direct load, there is no contingency in place if a problem is found. Where is the permittees' plan if an overpack is needed for a ten-drum direct load, or for the other drums?

In addition to this, there is no mention of why these additions are necessary. In fact, the permittees even suggest that there are problems with their own PMR by stating that the 85-gallon drum is not

authorized as a shipping container in the TRUPACT-II Authorized Methods for Payload Control (TRAMPAC). How can the permittees assume that the TRAMPAC will be revised according to their own requirements? While reasons why these additions need to be made is not necessary in the Permit itself, these reasons certainly should be in the PMR as to allow the public the opportunity to understand the permittees' logic and give the public the ability to assess the PMR appropriately. The permittees do not seem to understand that when they submit incomplete PMRs they are cheating themselves out of the opportunity to have their PMR approved!

Furthermore, it is common sense to assume that many of the characterization, confirmation and verification techniques will become more difficult with the addition of these waste containers. One such problem that seems clear is the use of radiography on the 100-gallon drums. Again the permittees do not deal with this issue in any way.

The permittees do not deal with how these drums will be used if the HalfPACT PMR they have submitted is approved. Are the permittees planning on submitting another PMR if the HalfPACT PMR is approved? Please note: As stated in other comments, NWNM is strongly opposed to the HalfPACT PMR.

By not addressing the concerns of radiography and how overpacking would be dealt with, the permittees have not addressed the possible adverse affect that this PMR would have on human health and the environment. In fact, there is simply no mention of the environment and health in the PMR except to state that there is no impact. This is unacceptable. Because of this lack of documentation, NMED must deny this PMR.

Finally, there are a number of reasons why this PMR should be denied outright, but if NMED decides not to do so, they should reclassify this PMR as a Class 3. First, this PMR deals with far too many aspects of the WIPP Permit to not fall under the purview of a Class 3 PMR. Second, there are a number of issues at stake with respect to the Waste Handling Building (WHB). The permittees claim that this PMR should be considered a Class 2 PMR as it falls under 40 CFR 240.42 Appendix 1 F.2.a "Modification of a container unit without increasing the capacity of the unit." However, it appears that this is contradicting 40 CFR 240.42 Appendix 1 F.1.a "Resulting in greater than 25% increase in the facility's container storage capacity..." The permittees have not explained how the addition of these containers will be accounted for in the WHB and clearly there will be the possibility of exceeding the WHB's capacity. If this is the case, and there is currently no way to tell as the permittees do not address this, then this PMR would have to be a Class 3 as any change to the WIPP Permit that falls under 40 CFR 240.42 Appendix 1 F.1.a is required to be a Class 3.

In conclusion, **Nuclear Watch of New Mexico** recommends that the New Mexico Environment Department deny the WIPP permit modification request to Add Waste Containers. This PMR is technically incomplete, is a threat to human health and the environment, and is incorrectly classified.

Once again, the permittees are attempting to change the WIPP Permit without providing substantial reasoning as to why. Time and time again the permittees have stated that they will work to create useable permit modification requests. This is yet another example of their continued submittal of incomplete, improperly classified and unusable PMRs! NMED has more than enough reason to deny this

PMR and should also remind the permittees of their past promises not to submit something that barely passes for a permit modification request.

Thank you for your careful consideration of our comments.

Sincerely,

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**Regarding: Update of the Waste Analysis Plan and Associated Documents with Emphasis on Data Management Requirements**

Dear Mr. Zappe,

**Nuclear Watch of New Mexico** (NWNM) was pleased when we found out that the New Mexico Environment Department (NMED) had decided to change the classification of this permit modification request (PMR) from the clearly incorrect Class 2 to a Class 3. However, NWNM believes, as it did while this PMR was still a Class 2, that the Data Management PMR should be denied.

As you know, the New Mexico Hazardous Waste Act (20 NMAC 4.1.900, incorporating 40 CFR 270.42(c)(6)), provides that NMED may deny a Class 3 modification.

NWNM is strongly opposed to this modification as it is a threat to human health and the environment, and it is technically incomplete.

The following reasons will support our request to deny.

There are an extraordinary number of issues at stake in this PMR, however the permittees have taken the approach that less is more. None of the items within this PMR are dealt with sufficiently to convince us that this is a safe modification. We will go through these items individually.

**1. Add the option for electronic data review, validation, and verification**

Efficiency, once again, is the permittees key reason for why they are looking to make this change. As NWNM has stated a number of times, while the permittees may consider efficiency to be enough for a PMR, we know that it is not. Furthermore, even if efficiency were a defining factor, the permittees do not address how this PMR creates greater efficiency.

NWNM is very concerned over the increased responsibilities of the Independent Technical Reviewer. By removing the Technical Supervisor, Quality Assurance (QA) Officer, Site Project QA Officer and Site Project Manager (SPM) in their duties to review, verify and validate, the permittees are putting all their eggs in one basket. As the permit currently stands there are a series of "double-checks" that potentially prevent errors. To rely almost solely on their electronic method the permittees are playing a dangerous game.

Also, there is no mention on how the permittees plan to prevent electronic attacks on their new elec-

tronic method. “Hacking” continues to become a greater threat throughout the DOE complex and a recent DOE IG report stated that while DOE has made some strides toward better “cyber-security” they are still extremely poor. If a person were able to break into the WIPP system they could possibly bring shipments to a complete halt as well as endanger human health and the environment. In fact, in a conversation with a coder that was involved with the design of this system, he mentioned that there had been one person who had been able to hack into the system while they were testing its security. This is unacceptable, and the fact that the PMR does not address this issue in any way suggests that the permittees have not considered this in the least.

This item does not deal with health and the environment in any way. With the lack of double-checks and the possibility of hacking it could create a very dangerous impact on human health and the environment. None of this is addressed in this PMR.

## **2. Revise reviewer responsibilities**

This item further emphasizes our concerns of overburdening the Independent Technical Reviewer. By increasing the responsibilities of the Independent Technical Reviewer through the additions from the electronic data review and now the responsibilities of the Site Project QA Officer, the Independent Technical Reviewer’s responsibilities are far too great. In fact, NWNM is concerned that with these new responsibilities the “independence” of the Independent Technical Reviewer will be at stake. This is clearly unacceptable.

By overburdening the Independent Technical Reviewer there is an increased opportunity of endangering human health and the environment, and hence is inappropriate in a PMR.

## **3. Eliminate the Waste Stream Characterization Package**

This is yet another example of the fact that efficiency, while the permittees believe is a legitimate rationale for a PMR, is not good enough as an explanation. There is simply no good reason why the permittees need to eliminate the waste stream characterization package. Without this explanation this is incomplete and should not be approved.

## **4. Eliminate quarterly repeat of data review, validation, and verification**

The argument against this item is very similar to item 3. There is little to no justification as to why the permittees require this change. “Wants” do not justify a change in the WIPP Permit, and the permittees have given no reason as to why they need this change. It is incomplete because of this reason and therefore should be denied.

## **5. Clarify data management inconsistencies**

This item opens the opportunity for errors, much like item 1 does. By removing the currently required double/triple/quadruple-checks of data management there is room for error. In fact, NWNM has to question why the permittees wish to change this as the text in their own permit modification request shows that they are finding inconsistencies in their data management through this method! Why would the permittees remove something that would allow them to manage quality in a greater capacity? Considering that text does not sufficiently explain the permittees justification it is incomplete. In addition to this, this change would allow more room for error and hence be a danger to human health and the environment. This must not be approved.

## **6. Reorganize data management portions of Attachment B and Attachment B3**

The permittees claim that the need for this change is because the WIPP Permit is confusing to them. While we have seen that the permittees find their permit difficult to abide by, and hence possibly confusing to them, their claim that portions of the permit are redundant is not enough of a reason to change the permit in such a massive way. This item is incomplete, as they have no real explanation as to why these changes need to be made. Again, it is want versus need. The way the permit currently stands, it forces WIPP to check their data. The permittees may not want to check their data, but they need to. These changes in this item must not be approved.

## **7. Add the option for use of barcodes in lieu of sample tags or labels**

It goes beyond comprehension why the permittees would rather have stripes as opposed to actual text to show what drums contain. How is it that a worker would know immediately what a drum contains if all they have is a barcode? While the idea of barcodes is potentially a good change, it is not a good change to use barcodes in lieu of labels or sample tags. If sample tags or labels were to remain, then the addition of the barcodes would be acceptable. However, all workers should also be required to double-check the barcode with the sample tag or the label. This item is also incomplete as there is no information as to what process would be used to prevent errors in the barcodes, nor how the workers would identify what the barcodes mean. This item also endangers human health and the environment, for if a worker is unable to identify what is contained in a drum then there is a danger to their health and to the environment. This item must be denied.

## **8. Add the option for use of electronic rather than hard copies of records**

The permittees have given poor reasons as to why this is required. To hold an archive of information on hard copy is more than appropriate. The permittees claim that through the exclusive use of electronic records they will not be required to manage as much paper, we feel that this is not a reason to remove hard copy. Falling back on the argument mentioned under item 1, NWNM is concerned about the security of DOE's computers and the possibility of having their electronic records removed intentionally or accidentally is something that can be avoided by continuing to maintain hard copy. This is again an incomplete and potentially harmful item.

## **9. Associated changes, such as referencing information rather than repeating it**

This item concerns us greatly. The permittees are notorious for their inability to proofread and edit their own documents. In fact the permittees prove our very point in one of the PMRs that they have submitted. In the first PMR, the permittees' Item 5 is entitled: "Use of Radiography *fro* Newly Generated Waste." We believe that the permittees actually meant to write "for" as opposed to the slang term used for a circa 1970's hairstyle called the Afro. While this typo is amusing, there are other cases in which the permittees have made typos and suggested changes to the permit that are potentially dangerous and simply wrong. The permittees' suggested changes should not be approved as their past has shown that they are incapable of performing the task that they are required to. Additionally, this item is not sufficiently justified in the PMR to explain why it is required. No reasonable explanation means that it is incomplete.

In conclusion, **Nuclear Watch of New Mexico** requests that the New Mexico Environment Department deny this permit modification request outright. As these items are not individual modification unto

themselves NMED is not required to deny each individually. However, if NMED decides to approve this PMR then we request that public hearings take place.

This PMR is quite possibly the worst of the bunch that the permittees have submitted for this review period. The danger to health and the environment and the lack of supporting data/justification throughout this document is simply atrocious. In many ways we felt as though we had become a broken record by stating time and time again that one item after another was incomplete. The permittees have stated in the past that they will work to make the permit modification process better, but they have actually done the exact opposite. Never before have the permittees submitted such an extensive and poorly written number of permit modifications and NWNM can only speculate as to why. These modification requests constitute a serious attempt by the permittees to change the mission of WIPP and put the dollar ahead of human health and the environment. Furthermore, with WIPP becoming a contender in the review for the next pit production facility, we can only assume that they are attempting to pre-emptively ready the site for this extraordinarily dangerous addition. WIPP is endangering New Mexico enough as it is without doing potentially more harm with these modifications. Please deny this modification.

Thank you for your careful consideration of these comments.

Sincerely,

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October 31, 2002

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**Regarding: Remote Handled Transuranic Waste**

Dear Mr. Zappe,

**Nuclear Watch of New Mexico** (NWNM) believes that the Remote Handled Transuranic Waste (RH TRU) permit modification request (PMR) should be denied.

As you know, the New Mexico Hazardous Waste Act (20 NMAC 4.1.900, incorporating 40 CFR 270.42(c)(6)), provides that the New Mexico Environment Department (NMED) may deny a Class 3 modification.

NWNM is strongly opposed to this modification as it is a threat to human health and the environment, and it is technically incomplete.

The following reasons will support our request to deny.

To begin, NWNM is greatly concerned over the lack of sound knowledge of the RH TRU waste inventory in the Department of Energy nuclear complex. This lack of substantial knowledge leaves us to believe that there will be problems with the characterization that the permittees are planning to use, and that they may have underestimated a number of key factors to their plan. It appears that the permittees are taking a "see as we go" approach to characterizing the RH TRU inventory, and while this may be acceptable to the permittees this is unacceptable to NWNM.

By stating that 95% of the RH waste has to be packaged or repackaged, the permittees have attempted to make the public feel better about their waste characterization, or rather the lack thereof. Quite the contrary has occurred, however, and we believe that their characterization plan is woefully inadequate and requires much more than what the permittees have offered through their quality assurance objectives (QAOs): precision, accuracy, completeness, comparability and representativeness.

These QAOS appear to be the heart of the permittees RH TRU waste analysis plan (RH WAP). This says a great deal about the RH WAP and clearly there is a need to expand the RH WAP to avoid any pitfalls that may be inherent to the RH WAP and the QAOS. However, in this matter, the problems with the RH TRU characterization, RH WAP and the QAOS are currently too great due to their vague nature and incompleteness. Because of this NMED must deny this PMR.

In addition, the permittees have avoided dealing with a number of items that should be of concern. The permittees state that if by chance there is a problem with a RH TRU drum they would then deal with it in the same way they deal with contact handled (CH) TRU waste – they would overpack it. Nowhere in the PMR do the permittees explain this process, nor do the permittees state what they will use for overpacking RH TRU! This is a tremendous oversight on the permittees' part. Of course the permittees believe that because they must package or repackage nearly all of the RH TRU waste that the chances of a problematic RH container is unlikely. However, this gives the permittees no right to completely ignore the issue. Clearly this shows how the permittees have again created a technically deficient permit modification. Therefore, NMED should deny this PMR.

Added to this is the problem of actually detecting a problematic shipment. As we have recently seen, a shipment of CH TRU waste from the Idaho National Engineering and Environmental Laboratory (INEEL) made it all the way to WIPP only to be sent back because of radiation in the TRUPACT-II! While the permittees explain that if a problem is found with a RH shipment it will be detected in the hot cell and the shipment dealt with accordingly (i.e., overpacked, sent back to the generating site, etc.). While this may be all that the permittees are able to accomplish considering worker safety and as low as reasonably achievable (ALARA) standards, NWNM has not seen any documentation to suggest that this is the only method of accepting RH TRU at WIPP. NWNM is concerned that the hot cell is the only place to detect problems with waste shipments. It would be appropriate to find additional measures for detecting problems.

Furthermore, we have concerns with the permittees' decision not to sample volatile organic compounds (VOCs). While NWNM is fully aware of the need for worker safety, we are concerned that too little is being done to avoid dangerous situations at WIPP. Nowhere in the PMR do the permittees go into detail on the matter of remote headspace gas sampling. Why is this an infeasible approach? RH TRU is clearly more radioactive and hence potentially more dangerous than CH TRU. For these reasons it seems appropriate to do everything possible to make certain that RH TRU goes through just as much of a screening process as CH TRU, and preferably more.

Another point of concern for NWNM is the lack of supporting documentation for this PMR. While the permittees supplied several supplements for the PMR, many of the references in those supplements could not be found. Ironically, the Transuranic Waste Baseline Inventory Report, DOE/CAO-95-1121, Revision 3 (one of the most cited reports in the PMR) was not found by us during a thorough Internet search. If the permittees are going to cite references in their documents, and of course they should, they should make those references as accessible as their PMRs. This lack of documentation makes it impossible for the public to confirm or deny the permittees' claims throughout the PMR. This is further evidence that the PMR is incomplete.

Perhaps the permittees have bitten off more than they can chew with their intent to dispose of remote handled transuranic waste. While the Department of Energy (DOE) intends to proceed with its accelerated "cleanup" program, NWNM has yet to see how WIPP as a whole is operating satisfactorily. Through this purported accelerated cleanup, DOE is claiming faster, cheaper, better cleanup, but NWNM sees an emphasis on cheaper and faster, not necessarily better. The fact of the matter is that WIPP has not maintained its deadlines to date for their throughput and now expects to be able to deliver an even faster cleanup deadline, including RH TRU. This seems improbable at best. It may be in

the best interest of the permittees, the Environment Department, and the public at large that WIPP keep working on CH TRU waste until they can get that part of their permitted mission right. Once the permittees better perfect that part of their mission, only then should the permittees consider submitting an RH TRU PMR. In fact, by that time, perhaps the permittees may understand the difference between a PMR that is complete and does not endanger human health or the environment, and an incomplete one like this.

NWNM has had the opportunity to have Bernd Franke, Scientific Director of IFEU-Institut für Energie- und Umweltforschung, (Institute for Energy and Environmental Research) of Heidelberg, Germany look over the RH TRU PMR. His comments follow:

**1. The permit modification request is deficient in documenting the radionuclide inventory of the RH TRU.**

Supplement 1 of the permit modification request contains a list of estimated stored activity in Ci in the RH TRU waste. Table 4 indicates that the total activity is estimated to be 662,000 Ci; the TRU inventory is estimated to be 3,880 Ci. Because the permit limits the overall inventory, the accuracy in the estimated activity is an important issue. The draft permit modification does not contain verifiable documentation as to the measurements and calculations that form the basis for the inventory estimate.

**2. The permit modification request is deficient with respect to the documentation of the estimated concentration of cellulose, plastics and rubber in the RH TRU waste.**

Table 6 in Supplement 1 of the permit modification request contains estimated ranges of concentrations in cellulose, plastics and rubber. The ranges are large (e.g. Batelle Columbus Laboratories, Ohio: 0 kg/m<sup>3</sup> to 1,430 kg/m<sup>3</sup> with an average of 117 kg/m<sup>3</sup>). The reported accuracy to three digits is dubious, the exact same range and average are reported for waste from the Bettis Atomic Power Laboratory, Pennsylvania. To have the same precise range and average for the waste from these two sources is highly unlikely. The exact knowledge of the amount of plastics and rubber in the RH TRU waste materials is essential for the estimate of VOC releases. Because of this, the permit modification request is severely deficient in this respect. The calculations on page 7 of supplement 3 assume a total cellulose, plastics and rubber mass in RH inventory of  $2.7187 \times 10^5$  kg quoting the Transuranic Waste Baseline Inventory Report, Revision 3 as the source. Given the expected volume of 1,972 m<sup>3</sup> of RH TRU waste (Supplement 1, Table 1), the average concentration of cellulose, plastics and rubber can be calculated to be 138 kg/m<sup>3</sup>. That number does not fit with the averages reported in Table 6 which are all less than 138 kg/m<sup>3</sup>.

**3. The permit modification request is deficient with respect to the breakdown of materials in the category of cellulose, plastics and rubber in the RH TRU waste.**

The exact breakdown of materials in the category of cellulose, plastics and rubber is essential to determine the releases of VOC and HCl from radiolysis in the RH TRU waste. The permit modification request does not contain any information in this respect. An important issue is the amount of PVC in

the waste because radiolysis can cause the production of HCl, which can cause corrosion of the waste containers. The permit modification request does not contain any information with regard to the amount of PVC or other chlorinated compounds in the RH TRU waste.

At matters stand today, granting the permit modification in this way will not provide adequate assurance that corrosive wastes are not contained in the RH TRU waste containers.

**4. The calculations regarding the VOC emission rates in Supplement 3 are not properly documented; they are incomplete and not conservative.**

Supplement 3 of the permit modification presents a summary of calculations. The basis of the calculations is only partially documented. The following information is lacking:

Basis of values for the mass of cellulose, plastics and rubber in comparison to data in Supplement 1 (see above)

Rationale for assuming an average inventory of equivalent cellulose in RH inventory

An uncertainty evaluation of the calculations

A calculation of the production of benzene

An analysis of the generation of HCl due to hydrolysis and the impact on RH TRU waste with regard to the corrosivity criterion.

The calculations themselves are not conservative. An average value for cellulose was used in the calculations. While the average concentration is 138 kg/m<sup>3</sup>, the reported concentration of cellulose in RH TRU waste are up to 1,430 kg/m<sup>3</sup>, based on data provided in Table 6 of Supplement 1. It is quite possible that average concentration in the canisters in one room will contain cellulose that exceeds the value assumed in the calculations.

In addition, the assumption of a steady-state VOC generation rate is not in agreement with the nature of gas generation which is non-uniform and can peak at certain times. Thus, the room emission rates are expected to vary from year to year. The permit modification request should include an uncertainty analysis to this effect.

As matters stand today, granting the permit modification in this way will not assure that the VOC concentrations in the rooms where RH TRU waste containers are stored will remain below the set limits.

**5. The waste characterization is not acceptable.**

The permit modification request does not include a requirement to perform radiographic or visual examination on 100% of the containers. This is not acceptable. Past experience has shown that the visual examination and real-time radiography (RTR) have not always been adequately performed. In fact, some materials banned from WIPP (e.g. sealed containers greater than 4 liters) were not identified by RTR.

If all RH TRU waste is not fully characterized in this way, materials which are banned from WIPP may actually be accepted. In this respect, the permit modification request does provide reasonable proof



that the proposed waste characterization process is substantially identical with that for CH TRU waste.

**6. The permit modification request is deficient with respect to QA/QC procedures.**

The permit modification request does not contain a section dealing with the QA/QC procedures in connection with the data on RH TRU waste. A detailed set of QA/QC procedures should be prepared as part of the permit modification request describing the steps of data verification, chain-of-custody, performance auditing of all components and instrumentation used in managing RH TRU at WIPP.

Heidelberg, October 30, 2002  
Bernd Franke

In summary, this permit modification request is technically incomplete in a number of ways:

Reference materials were difficult, and in some ways impossible to come by  
No explanation of the overpack method  
There is no section dealing with quality assurance or quality control  
The section on waste characterization is insufficient  
VOC calculations are improperly documented  
Documentation in the category of cellulose, plastics and rubber was insufficient  
The radionuclide inventory was deficient  
Among others

With these deficiencies it is clear that human health and the environment has not been adequately accounted for and therefore endangers it.

It is for these reasons that **Nuclear Watch of New Mexico** requests that the New Mexico Environment Department deny this permit modification request.

Thank you for your consideration of our comments.

Sincerely,

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July 15, 2003

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**Regarding Waste Isolation Pilot Plant Permit Modification Requests**

- Item 1 – Packaging-Specific Drum Age Criteria for New Approved Waste Containers
- Item 2 – Removal of Booster Fans
- Item 3 – LANL Sealed Sources Waste Stream Headspace Gas Sampling and Analysis Requirements
- Item 4 – Removal of Formaldehyde as a Required Analytical Parameter for LANL
- Item 5 – Add New Hazardous Waste Numbers

Dear Mr. Zappe,

Nuclear Watch of New Mexico (NWNM) **opposes** the proposed modifications to the Waste Isolation Pilot Plant's (WIPP) Hazardous Waste Facility Permit (HWFP). NWNM believes that these requests are incomplete and therefore do not allow for the most comprehensive analysis that the public and the New Mexico Environment Department (NMED) is entitled to. Furthermore, because of the lack of information within the permit modification requests (PMR) NWNM believes that there is insufficient justification for a number of these modifications. NWNM **strongly recommends** that NMED **deny** these modifications.

As you know, regulations under the New Mexico Hazardous Waste Act (20 NMAC 4.1.900 incorporating 40 CFR §270.42(b)(7)) provides that it may deny any Class 2 permit modification request (PMR) for the following reasons:

1. the modification request is incomplete;
2. the modification request does not comply with other regulations covering operating standards for hazardous waste storage and disposal facilities; or
3. the conditions of the modification fail to protect human health and the environment

The following stated reasons justify NWNM's recommendation to deny the PMRs.

**Packaging-Specific Drum Age Criteria for New Approved Waste Containers**

This modification makes a number of assumptions on the drum age criteria (DAC) for the newly approved 85-gallon, 100-gallon and ten drum overpacks. One such assumption deals with the use of the 100-gallon drums and the Advanced Mixed Waste Treatment

Facility. DOE states that 55-gallon drums that are to be compacted and then placed in 100-gallon drums will be expected to meet the 55-gallon drum DAC prior to being crushed. This is inappropriate, as crushing the 55-gallon drum the closed system model will be nonexistent, as is required by the current DAC.

NWNM believes that this PMR has been inappropriately classified as a Class 2. Only through a Class 3 process may all the questions and concerns be answered. Through a Class 3 process, human health and the environment will be most fairly protected and DOE will be able to properly prove that its DAC model is not filled with assumptions. Until this PMR is reclassified as a Class 3, NWNM believes that this PMR should be denied.

### **Removal of Booster Fans**

DOE has submitted this PMR for a second time. Its first attempt was through a Class 1\*, which DOE withdrew. Unfortunately, not all questions related to the Class 1\* PMR have been answered in this Class 2 PMR. While NWNM wants and expects the best for human health and the environment, and while DOE states that one of the reasons it is requesting to remove the booster fans is due to a potential human health issue, we still believe that this PMR is incomplete.

DOE explains that in the early 1990's the booster fans may be used to assist in the event of a fire through airflow reversal mode. DOE now believes that this is not the case, and that using the airflow reversal mode may actually do more harm than good. The immediate question that comes to mind is: why is DOE required to use the airflow reversal mode at all? DOE does not state that this is an automated program that will happen in the case of a fire, and it does not state that there is no way to deactivate the fans from going into airflow reversal mode. What is the problem with leaving the fans where they are? What is DOE going to use the space for? There are a host of questions that have not been answered and until they are this PMR should be denied.

### **LANL Sealed Sources Waste Stream Headspace Gas Sampling and Analysis Requirements**

The irony of this PMR is due to the fact that Los Alamos National Laboratory (LANL) has a poor acceptable knowledge (AK) history, and that this PMR is based on LANL's AK. Furthermore, DOE is implementing the use of National Security as a reason for a PMR, something that NWNM is very leery of.

How many problems in the past has LANL had with AK? Is there a documented record of this? If not, then one should be produced, and if so, then it should be produced within the modification request.

How many other sites within the DOE complex store sealed sources? When will WIPP be expecting to accept sealed sources from these other sites? When the additional sites are prepared to send sealed sources to WIPP, will DOE be expected to submit another

Class 2 PMR? NWNM firmly believes that these additional sites should not be approved to dump sealed sources at WIPP through a Class 1 PMR.

Will there be a “double-checking” of LANL’s classification and characterization of the sealed sources waste? If so, who will be doing that checking? Again, NWNM firmly believes that LANL should be required to have additional checks in place to make certain that the sealed sources waste is what it believes it is, and this should be so stated in the HWFP.

As sealed sources waste is a National Security risk, will DOE be escorting the shipping trucks from LANL to WIPP? It is inappropriate for DOE to state that this is a National Security risk without putting the proper security in place during shipping. This is clearly an issue of human health and the environment.

DOE should also state how much of the sealed sources waste at LANL is or is not defense related waste, as any non-military sealed sources waste would be prohibited at WIPP. NMED should be made truly certain that this is the case, and that fail-safes are in place to prevent prohibited sealed sources waste from coming to WIPP.

NWNM believes that this is not a properly classified request. NMED should deny this as a Class 2 PMR and require DOE to resubmit this PMR as a Class 3.

### **Removal of Formaldehyde as a Required Analytical Parameter for LANL**

As is the case for the sealed sources modification request, this PMR assumes that LANL’s AK is problem free. Furthermore, DOE does not clearly justify this modification. Why is it that this is required in the first place? How much money will be saved? How does this assist the DOE cleanup program? Does this increase worker safety? None of these questions are answered.

In addition to the above questions, none of the documentation that is provided in the PMR directly shows that there is no formaldehyde in the LANL wastes. As a result this is an incomplete modification and may negatively impact human health and the environment.

Again, this is an incomplete modification, and until DOE answers a number of questions NWNM requests that it be denied.

### **Add New Hazardous Waste Numbers**

NWNM believes that DOE has not adequately justified this PMR. As in the case of the DAC PMR, there are many assumptions that have not been properly explained.

While DOE states that the new hazardous waste numbers (HWN) are from experiments and research done at the Rocky Flats Environmental Technology Site (RFETS), the PMR does not limit the additional HWNs to just RFETS. NWNM believes that this PMR is

too broad in its scope to truly maintain the safety of human health and the environment. This PMR gives carte blanche to all the DOE sites that will be shipping waste to WIPP with these HWNs. This is unacceptable, as no real analysis has been done outside of RFETS. Of course, this is under the assumption that RFETS's analysis of its own waste is correct, something that NWNM does not believe to be true

This PMR should be denied, as it is incomplete and also potentially harmful to human health and the environment.

Mr. Zappe, NWNM believes that none of the submitted PMRs should be approved by NMED. We believe that the above explanations cover only the tip of the iceberg and there are a host of other issues with these PMRs that should be corrected before NMED approves any of these modification requests.

We thank you for your careful consideration of these comments.

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# 6.0.C

## Enclosures C

### DOE Economic Impacts in New Mexico

Talking Points: DOE's Economic Claims Are Seriously Exaggerated

The Dumas Report: Economic Multiplier and the Economic Impact of DOE Spending in New Mexico

An Overview of Programs at Los Alamos and Sandia National Laboratories:  
Why Cleanup and Renewable Energy R&D Lose Out

## DOE's Economic Claims Are Seriously Exaggerated

- According to the U.S. Census Bureau, New Mexico was the 37<sup>th</sup> state in per capita income in 1959, 41<sup>st</sup> in 1969, 42<sup>nd</sup> in 1979, 41<sup>st</sup> in 1989 and 44<sup>th</sup> in 1999. This overall decline and numerous socioeconomic indicators that consistently place New Mexico near or at the bottom call into question the broad economic directions that this State is taking.
- Governor Richardson and Senator Domenici have suggested that a partnership between the State and the Department of Energy (DOE's) two national laboratories in New Mexico could help spur economic development. Would this really be true? Are the economic benefits of the massive DOE presence in this State<sup>1</sup> as great as have been claimed year after year? An analysis by Nuclear Watch of New Mexico clearly indicates no.
- In the last economic study<sup>2</sup> that DOE performed in 1999 it claimed that its aggregate economic impact on New Mexico in FY98 was \$10.24 billion. This figure includes direct funding for the Los Alamos and Sandia National Laboratories, the Waste Isolation Pilot Plant, and a couple of small environmental remediation sites (the Gnome and Gas Buggy nuclear test sites), plus an assumed economic multiplier adjustment of 3.39.
- DOE's economic multiplier claims that for every dollar DOE spent in New Mexico, that same dollar generated an additional \$2.39 in the New Mexican economy (for example, in gas stations, grocery stores, etc.). In the intervening years similar claims, unsupported by updated studies, have been repeatedly made by DOE when the Department's new annual budget is released every Spring.
- For 1998 DOE also claimed that it created \$2.89 billion in personal income, including the income earned by individuals directly employed by the DOE. The underlying multiplier for this claim is 2.39, indicating that for every dollar DOE spent in salaries, an additional \$1.39 was generated for other wage earners.
- For 1998 DOE claimed that it created 72,453 jobs, including those positions directly employed at the DOE facilities (approximately 20,000 people). The underlying multiplier for this claim is 3.58, meaning that for every DOE job an additional 2.58 jobs were created throughout the entire State's economy.
- Nuclear Watch's analysis<sup>3</sup> of DOE's FY98 economic claims indicate that DOE has grossly overstated its economic impact. Our conservative estimate puts all of the above DOE multipliers in the range of 1.5 to 2.0. This would readjust DOE's aggregate economic impact down to the \$4 to \$6 billion range, or as much as \$6 billion lower than DOE's claim. Personal income would drop from DOE's claimed \$2.89 billion to a more realistic \$1.63 to \$2.42 billion. Employment would drop from DOE's claimed 72,453 down to a more realistic 27,289 to 40,418 jobs.
- These adjustments are based on independent analyses conducted by economists at universities, government agencies and private institutions. These include the State of Nevada, University of Oklahoma, and KPMG Peat Marwick (one of the most respected regional planning firms) who analyzed the Intel Plant in Rio Rancho, New Mexico. These independent analyses all came to the common conclusion that businesses in the private sector and nonmilitary government programs yield economic multipliers in the range of 1.5 to 2.0. An earlier study demonstrated that federal defense facilities, such as national labs or military bases, produced a yet lower economic multiplier in the 1.25 to 1.5 range.<sup>4</sup>

- The range of 1.5 to 2.0 for the private sector and nonmilitary government activities is used by Economics Professor Lloyd Dumas and Colin King of Nuclear Watch for these readjustments. Therefore the readjustments made are actually a best-case scenario for DOE given that a degree of conservativeness is built in by not using the lower rate for federal military facilities.
- As further illustration of the improbability of DOE's claims, a benchmark called the Hachman Index (used to measure supply and demand) assigns an aggregate figure of 0.44 for New Mexico. To generalize, this means that for every dollar spent from all sources in New Mexico, \$0.56 ultimately leaves the State because New Mexico lacks the production capability of many of the things that New Mexicans consume, such as manufactured goods (computers, cars, etc.) and food and medical supplies. In its calculation of claimed economic multiplier benefits DOE determined that 90% of its money stayed in the State (which is extremely unlikely given the Index) and that that money went on to produce an overall economic multiplier effect of 3.39.
- Further, the great economic benefit of the DOE presence would be made circumstantially evident by a history of large expenditures for in-State procurement of materials and supplies and numerous business spinoffs from DOE facilities. Neither of these has been historically the case, indicating that DOE has not been a robust platform for State economic development.
- Finally, DOE does not adjust its claimed economic benefits to compensate for any fiscal burdens on the State caused by the DOE presence. First of all, it should be noted that LANL does not pay gross receipts taxes to the State because the University of California (its manager) is an "educational, nonprofit" institution (on the other hand, Sandia Labs does since it is managed by the private corporation Lockheed Martin). If LANL paid its estimated \$60 million in gross receipts taxes it would go to the general State Treasury, which in turn funds the public education system, highways, etc. Thus, it can be argued that the State, in effect, subsidizes LANL. A more direct example of a financial burden is that the New Mexico Environment Department's Hazardous Waste Bureau spent nearly \$900,000 in attempting to regulate LANL in 2002 alone, while at the same time LANL paid only \$37,000 in permitting fees.
- Future economic analyses by Nuke Watch intend to calculate and capture all possible burdens on the State in order to arrive at an accurate picture of the net economic benefits of the DOE presence in New Mexico. Other factors that need to be determined are what proportion of DOE money is actually retained in New Mexico, the dollar amounts of DOE in-State procurement and the gross product of business spinoffs from DOE facilities. However, one thing is already clear, and that is that DOE's exaggerated economic claims are simply not correct. State leaders, especially the governor, should insist on getting an accurate picture of potential economic benefits before embarking New Mexicans onto economic paths that will likely not deliver what they claim.

<sup>1</sup> The total DOE budget in New Mexico is just under the State government's entire budget of \$3.8 billion. With the addition of an estimated \$600 million for "Work For Others" (principally the Department of Defense) the cumulative budget for DOE-owned facilities in New Mexico is greater than the State's budget.

<sup>2</sup> *The Economic Impact of the Department of Energy on the State of New Mexico Fiscal Year 1998*, Lansford, Adcock, Ben-David and Temple, DOE Albuquerque Operations Office, August 5, 1999.

<sup>3</sup> *Economic Indicators and the Economic Impact of DOE Spending in New Mexico*, Lloyd J. Dumas, Professor of Economics and Political Economy at the University of Texas in Dallas, in collaboration with Colin King of Nuclear Watch of New Mexico, March 2003, <http://www.nukewatch.org/facts/nwd/DumasReport033103.pdf>

<sup>4</sup> *Regional Impacts of Federal R&D by Funding Source and Performer Type*, Donald Hicks and Si-Gyoung Lee, Vol. 28.6, p. 623.

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# **Economic Multipliers** **and the Economic Impact of DOE Spending in New Mexico**

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## **Summary of Conclusions**

This study was conducted as part of a Nuclear Watch of New Mexico project to evaluate the Department of Energy's (DOE) economic impact on the state of New Mexico.<sup>i</sup> As part of that ongoing project, this study examines the economic multipliers the DOE uses in its public relations and legal documents. The DOE's economic impact analysis program for New Mexico closed its doors at the end of 1999, after funding for the program was eliminated. As a result, the DOE's data is now four years old. Despite the age of its economic multiplier data, the DOE continues to make claims based upon them. In documents intended to meet compliance with the National Environmental Policy Act (NEPA), the DOE uses its economic data to support conclusions that expanded activities at the Los Alamos National Laboratory, the Sandia National Laboratories, and the Waste Isolation Pilot Plant, will greatly improve the economic viability of New Mexico.

This study examines the veracity of the DOE's multipliers, and subsequent DOE claims based upon that data. According to the senior researcher, who was initially contacted in late 2001, the underpinning data and economic model had never been electronically archived and was subsequently lost when computer replacements were completed. A Freedom of Information Act request was later submitted, which the DOE responded to in December 2002. The response included the complete data and economic modeling software developed by the DOE. However, time and funding ran short for this study, which prohibited a conclusive analysis of the data. As a result, it is impossible to directly analyze the accuracy of the data and model. In order to address this problem, this study undertook the task of examining data developed in seven independent reports, for regions and activities similar to those found in New Mexico. The

seven reports were written by the State of Nevada, the University of Alaska, the University of Arkansas, the University of Oklahoma, the University of Missouri, KPMG Peat Marwick for an Intel plant based in Rio Rancho, NM and a study conducted jointly by researchers at the University of Texas, Dallas, and the Korea Local Administration Institute, Seoul, South Korea, as well as the DOE's own studies.

All seven of the reports have been found to come to a common conclusion: the private sector tends to yield economic multipliers in the range of 1.5 to 2.0. Furthermore, these reports determine that the public sector tends to have multipliers below 1.5. This is contrasted with the DOE claimed multipliers, in its studies, of 2.4 to 3.5 for Fiscal Year 1998. These claims are not consistent with the findings of multiple, independent researchers. The DOE has greatly exaggerated its economic impact on New Mexico, misleading the public and lawmakers.

This report makes a conservative re-adjustment of the DOE multipliers. It adjusts them to reflect the findings for the private sector. With that adjustment, it is found that the DOE is overstating its total economic impact of \$10 billion on New Mexico by as much as \$6 billion; its impact on wages by as much as \$1.25 billion; and its impact on jobs by as much as 45,000 full time positions. Furthermore, it is even possible that the DOE may actually be harming the State due to the added burden its activities place on New Mexico's infrastructure, as well as the potential economic development gains the State is foregoing as a result of the DOE's focus on military-related rather than civilian-oriented research and development (R&D).

### **What Are Economic Multipliers?**

In the most general sense, an economic multiplier is a quantitative measure of economic impact that explicitly recognizes that economies (local, state, regional, national, or global) are interconnected networks of interdependent activity. When a change takes place in one part of such a network, its effects propagate throughout the system. These effects typically result in a larger total impact than the original change would have caused in isolation.

For example, when 200 workers are hired for a new road building project, employment tends to increase by more than the 200 jobs directly tied to building the road. This happens because, as materials

and equipment needed to build the road are purchased, this new spending creates additional jobs in the industries that supply those materials and equipment. People put to work by the road building project also spend the income they earn on ordinary consumer goods and services. This spending tends to create jobs in the businesses that produce those goods and provide those services. We can therefore define the “employment multiplier” as the number that is multiplied by the number of jobs directly involved in road building to yield the total number of jobs created, directly and indirectly, as a result of the project. If the total number of jobs created were 300, the employment multiplier in this example would be 1.5 ( $1.5 \times 200 = 300$ ). In a similar way, we can define an “income multiplier” that allows us to calculate total income generated by the project as a multiple of income directly generated; and an “output multiplier” that allows us to calculate the total value of output produced as a multiple of the value of the direct output (in this case, the value of the road).

In addition to the direct effect of an economic activity, there are also indirect effects and induced effects. Indirect effects are the impacts on the chain of suppliers to the economic sector whose activity we are considering to be the direct effect; induced effects are the changes in consumer spending that are generated. For example, if we are looking at the job impacts of a new manufacturing facility being built in New Mexico, the direct effect is the number of jobs created by the facility itself. The indirect effect is the number of jobs created at those firms that supply the facility with materials, equipment, etc. (and at the firms that supply those suppliers). The induced effect is the number of jobs created as a result of the additional spending done by households whose income has gone up because of the direct and indirect effects, including the jobs created due to higher spending by those households now earning more money because their members work at the firms that sell products to consumers.

There are three basic categories of multipliers. They differ in their method of integrating these various effects. Type I multipliers include only direct and indirect effects, and therefore tend to be the smallest. Type II and Type III multipliers include direct, indirect and induced effects, though they differ in the way that the induced effects are calculated. Type II multipliers are based on the assumption that there is a linear relationship between income and consumption spending, i.e. an X% increase in income will produce an X% increase in consumer spending. This is somewhat unrealistic. Consumer spending tends to rise

more slowly than income; as income rises, an increasing part of the additional income goes towards paying off debts or supplementing savings. Thus, Type II multipliers often overestimate the induced effect. Type III multipliers try to correct for this problem, and as a result are typically somewhere between 5%-15% smaller than the corresponding Type II multiplier.<sup>ii</sup> But while there is only one way for a relationship to be linear, there are many ways for it to be nonlinear, and therefore, a corresponding multitude of methods of calculating Type III multipliers. Because of the differing methods of calculating Type III multipliers, there is some controversy surrounding the “correct” method. In theory, Type III multipliers are likely to be more accurate.

### **Using and Abusing Multipliers**

Economic multipliers are extremely simple and convenient tools for calculating the total economic impact of an activity from the known data on direct jobs, income, output, etc., involved in that activity. But their simplicity is misleading and their convenience seductive. To be accurate, multipliers must be based on a thorough and realistic understanding of the underlying interconnected networks of interdependent activity that constitute the economy of the region. They are calculated on the basis of a mathematical model of the relationships in that economy, ordinarily using Input-Output Analysis, a modeling technique developed by Nobel Laureate Wassily Leontief.<sup>iii</sup> While input-output models are far from perfect, if they are constructed properly and without bias, they are capable of providing useful estimates of economic impacts, and thus providing reasonably accurate estimates of economic multipliers.

Aside from their inherent imperfections, there are two fundamental sources of error in economic multipliers derived from input-output models: 1) inaccuracies in the data used to estimate the input-output coefficients of the model<sup>iv</sup>; and 2) flaws in the design and structure of the model itself. When economic impact analysis is used for a political purpose, such as demonstrating the importance of a particular government or private sector activity (or set of activities) in order to build public support for the establishment, continuation or expansion of that activity, there is a great temptation to overstate the positive economic impact of the activity by overestimating the multipliers associated with it. Unfortunately, that is extremely easy to do. Aside from simply arbitrarily selecting a large value for the multipliers, it is possible to inten-

tionally “cook the books” by manipulating the structure of the model or by manipulating the data used to derive the model’s coefficients (or both). Of course, it is also possible for multipliers to be overstated unintentionally, as the result of ordinary human error in the design of the model, or in the collection, entry or analysis of the underlying data.<sup>v</sup>

In any case, it is worth keeping in mind that multipliers are not a measure of how valuable a particular activity is to the economy, but rather only a measure of the extent of its quantifiable input-output interactions with other economic activities. Even more important, when trying to assess whether a particular activity is a boon or a burden to the region’s economy, its impact should be compared with those of a plausible alternative and not with the complete lack of activity. Economic analysts must always think in terms of alternatives. Almost any public or private economic activity that provides some jobs and gives rise to some income will look better than the complete lack of activity. The only exception is an activity that imposes such heavy additional cost (say for infrastructure development or environmental cleanup) that these costs overwhelm the benefits derived from its payroll and purchase of non-labor inputs. In the case of the major DOE facilities in New Mexico, it is a distinct possibility that the impact of the extensive environmental contamination caused by more than five decades of operation will counterbalance at least some of their apparently positive economic impacts.

### **Assessing Economic Multipliers of DOE Activity in New Mexico**

The most recent available estimates of the economic impact multipliers associated with DOE activities in New Mexico as a whole are contained in a report issued by the DOE Albuquerque Operations Office in 1999.<sup>vi</sup> This report gives the value of the employment multiplier for DOE activities in the State in 1998 as 3.58; the economic output multiplier as 3.39; and the income multiplier as 2.39.<sup>vii</sup> All three of these multipliers are unusually high. Despite the fact that the DOE’s multipliers are high and the division within the Albuquerque Operations Office is closed, DOE continues to make claims based on the multipliers drawn from these studies.

The fact that these are all Type II multipliers implies that they are likely to be overstated by 5%-15% for that reason alone. But they even seem quite high compared to other Type II multipliers. In an

effort to explore the validity of these multiplier estimates, an attempt was made to examine the input-output model on which they were based. Apparently, the analysts who prepared these estimates did not use a standard, commonly used input-output model such as the IMPLAN model (originally designed by Wilbur Maki and now maintained by the Minnesota IMPLAN Group) or RIMS II (the U.S. Bureau of Economic Analysis, Regional Input-Output Modeling System). Instead, they used a model they specially developed for this analysis. According to the report, “The multipliers used to determine impacts result from the inter-industry, input-output models developed jointly by economists at DOE/AL and New Mexico State University (NMSU)”.<sup>viii</sup> There is nothing inherently wrong with using specially created input/output models. They can be very useful. Unfortunately, the special model used in the DOE analysis was not available for review at the time of this writing.<sup>ix</sup> Unless a model is accessible to others, there is no way to verify whether it was properly designed and hence whether its results are credible. Given the inability to access the model, the next logical step in attempting to analyze the validity of the multipliers is to examine the data underlying the model. This too proved impossible, since DOE initially denied that the model existed and did not provide the model until a Freedom of Information Act request was completed in December 2002.

The only remaining method of evaluating the validity of the DOE impact multipliers, short of entirely redoing the study (which would require funding and staffing far in excess of that available to Nuclear Watch of New Mexico) is by comparing them with other multipliers arrived at in other relevant studies. It is possible to get some feel for the plausibility of the DOE multipliers in this way.

KPMG Peat Marwick conducted one such relevant study from 1993-1995 of the economic impact of the expansion and retooling of Intel’s Rio Rancho Chip Fabrication facility in New Mexico. Using the IMPLAN input-output model, this study produced estimates of indirect and induced effects. Although the report of the study did not explicitly give values for the economic multipliers, taken together with their data on direct effects, these estimates of indirect and induced effects can be used to calculate economic multipliers for the facility. In this way, the employment multiplier was calculated at 1.99 in 1993 and 1.89 in 1995. The personal income multiplier was calculated at 1.67 in 1993 and 1.45 in 1995.<sup>x</sup> The change (decrease) seen during the two years studied reflects a change in the level of activity at the Intel plant,

specifically a change in the number of construction jobs. These multiplier estimates can then be compared with the estimates for DOE activities in New Mexico in 1998 (employment multiplier of 3.58 and income multiplier of 2.39, as given above). Using the higher of the Intel Report estimates to be conservative, the DOE estimated employment multiplier is roughly 80% higher  $[(3.58-1.99)/1.99]$ , while the DOE estimated income multiplier is 43% higher  $[(2.39-1.67)/1.67]$ .<sup>xi</sup>

The KPMG Peat Marwick study is hardly an anomaly. Indeed, when comparing economic studies from a range of other sources, it appears that the numbers arrived at by the DOE are the unusual ones. In a brief paper prepared by two economists at the University of Arkansas, the average economic multiplier for manufacturing industry in the State of Arkansas is given as 2.0.<sup>xii</sup> This is roughly the same as the employment multiplier given for the Intel manufacturing facility in New Mexico in the KPMG Peat Marwick study, and lies well below the DOE's multipliers. The population of Arkansas is only about 850,000 greater than New Mexico. It ranks 33<sup>rd</sup> among the states, while New Mexico ranks 36<sup>th</sup> by population (one useful criterion for establishing the reasonableness of comparing the two states).<sup>xiii</sup> A study done by analysts at the University of Oklahoma, using the IMPLAN model, estimated a Type III output multiplier (which would tend to be slightly lower than a Type II multiplier) for the aircraft manufacturing industry in Oklahoma (an important source of jobs and income in the state) at 1.75.<sup>xiv</sup> That too is in the general ballpark of the multipliers calculated from the Intel Report, especially given that it is a Type III multiplier. The Oklahoma study is substantially below the DOE's multiplier estimates. Oklahoma ranks 27<sup>th</sup> among the states in population.<sup>xv</sup>

To the extent that the Intel facility might be expected to be roughly comparable in its input/output impacts to that of DOE facilities in New Mexico taken as a whole, there does appear to be considerable exaggeration in the DOE multiplier estimates. But are these facilities actually likely to be similar in input-output impact? In general, private sector facilities such as the Intel Plant tend to have larger local economic impacts than public sector facilities such as the DOE especially when the public sector facilities are those of the national government. The reason is straightforward. Federal facilities tend to have supply chains that are typically national (or international) in scope. They tend to buy less from suppliers in the area in which the facilities are located. The choice of firms to supply public sector facilities is also often affected

by political considerations, rather than simply by the considerations of minimizing cost that tend to play a key role in the choice of suppliers by private sector firms. These considerations imply that the DOE estimated multipliers may be even more exaggerated than the comparison with Intel indicates.

Though they focused only on Midwestern, non-metropolitan counties, a study by analysts at the University of Missouri for 1984-86, estimated a federal government employment multiplier of 1.34 and a federal government earnings multiplier of 1.21.<sup>xvi</sup>

These government spending multiplier estimates may not be directly comparable with the DOE New Mexico multiplier estimates, since they deal with non-metropolitan counties, not the whole state (which would tend to make the multipliers smaller because there is less economic activity in predominantly rural regions). Nevertheless, the same study shows a comparably calculated private sector manufacturing employment multiplier of 1.54 and earnings multiplier of 1.72. This means, for calculations that reflect a comparable economic base, their private sector employment multiplier estimate is 15% higher than for the public sector, and the private sector earnings multiplier is 42% higher than the federal earnings multiplier (as expected). This provides greater evidence for the claim that public sector multipliers tend to be smaller than those for the private sector. That gives further credence to the argument that the DOE New Mexico multiplier estimates, which are much larger than those reported by Intel and a range of other reputable economic studies, are exaggerated.

Another way to get at this issue is by considering other public sector statewide economic impact studies. The Institute of Social and Economic Research (ISER) of the University of Alaska at Anchorage did one such study, "Alaska's Dependence on State Spending."<sup>xvii</sup> Alaska and New Mexico both have fairly low populations and only a few major population centers. Alaska ranks 48<sup>th</sup> among the states in population.<sup>xviii</sup> There are relatively high levels of government spending within both states, though in Alaska most of the spending appears to be by the state rather than the federal government. The report begins with the statement, "It would be hard to exaggerate Alaska's economic dependence on state government spending."<sup>xix</sup> Yet, despite this declared dependency, the study uses a multiplier of 1.35 for both employment and income.<sup>xx</sup> The DOE New Mexico study multiplier for employment is thus 165% larger than that estimated for Alaska  $[(3.58-1.35)/1.35]$ ; the DOE New Mexico income multiplier is 77% larger



[(2.39-1.35)/1.35]. This too further illustrates the likelihood that the DOE multiplier figures for New Mexico are considerably overestimated.

It is unfortunate that both the input-output model and the data, used in conjunction with the DOE study of New Mexico, was not provided in a timely fashion. That fact has made it necessary to try to evaluate the plausibility of the DOE's economic impact multipliers in this roundabout way. Though each of these comparisons has its limitations, the whole pattern nevertheless demonstrates that it is very likely that DOE's multiplier estimates are far too high. If that is the case, the DOE's estimates of the economic impact of its facilities on New Mexico are correspondingly exaggerated.

One interesting additional piece of information makes the DOE estimates of its positive economic impacts on New Mexico seem even less plausible. The results of a 1993 analysis by Hicks and Lee of the regional economic impacts of Federal R&D spending across the nation shows federal civilian-oriented R&D to have an impact on employment approximately thirteen times larger than the employment effect of federal defense-related R&D.<sup>xxi</sup> The impact of civilian-oriented federal R&D on average annual income is estimated to be ten times larger than that of federal defense-related R&D.<sup>xxii</sup> These estimates are based on regression analysis, not input-output matrices, and are for nine multi-state regions that in combination cover the whole U.S.<sup>xxiii</sup> But since DOE spending in New Mexico is heavily weighted in the direction of defense-related R&D (e.g. at Los Alamos and Sandia Laboratories), this study strongly implies that there is a substantial loss of both employment and income to the State of New Mexico from present DOE R&D activities compared to what the State would likely experience if that R&D were focused on civilian-oriented work instead.<sup>xxiv</sup>

Suppose the DOE multipliers are adjusted downward to the range of 1.35-2.00 to make them more compatible with the multiplier estimates in the various studies we have cited (which seem relatively consistent with each other). This is a conservative adjustment as it does not take into account the evidence that federal spending, and even more so federal defense spending, has a much smaller economic impact. Instead, this adjustment merely reflects the data from the private sector activity in regions similar to New Mexico. The estimated impact of the DOE on aggregate economic activity in New Mexico would drop from \$10.24 billion in 1998 (according to the DOE study) to somewhere between \$4.06 billion–\$6.02 bil-

lion; estimated personal income generated by DOE activity in 1998 would drop from \$2.89 billion in 1998 (according to the DOE study) to somewhere between \$1.63 billion-\$2.42 billion; and estimated employment resulting from DOE activity in 1998 would drop from 72,453 jobs in 1998 (according to the DOE study) to somewhere between 27, 289 - 40,418 jobs.<sup>xxv</sup> These adjusted estimates imply that the DOE has overstated the economic impact of its facilities in New Mexico by roughly \$4 billion-\$6 billion in terms of economic activity and by roughly \$500 million to \$1.25 billion in terms of personal income. Similarly, the DOE study may have overstated the job generating effects of the DOE activities in the State by some 32,000-45,000 jobs.

Presuming that these corrected multipliers are more accurate, the clear implication is that the DOE activities offer no net gain. It is even possible that there is a significant net loss to the State as compared to the economic impacts of private activities of comparable scale, if such private sector activities can be recruited to replace them. As an example of a loss to the State, the New Mexico Environment Department's Hazardous Waste Bureau will spend \$860,000 of State funds during 2002 on environmental regulation at the Los Alamos National Laboratory.<sup>xxvi</sup> It is reasonable to expect further extensive costs associated with the Sandia National Laboratories within this Bureau alone. Even more striking is that if we apply the Hicks-Lee study and replace the present DOE defense-related R&D activities with civilian-oriented R&D, such as renewable energy R&D., there is the promise of very large economic gains to New Mexico in terms of both employment and income.

## **Conclusions**

The very impressive positive economic impacts of the DOE activities in New Mexico presented in the 1998 DOE study cannot be evaluated directly because both the model used to generate them and the data input into that model were at first claimed not to exist, and later not provided in a time frame that allowed for incorporation into this study. If the multipliers used by the DOE are compared with those developed in the variety of public and private sector economic impact studies that are generally consistent with each other, we find that the DOE multipliers seem implausibly large. Adjusting the estimates of the DOE economic impacts on New Mexico downwards in accordance with the range of multipliers derived in

these studies substantially reduces the estimated impact of the DOE on economic activity, personal income, and employment in the State. Furthermore, when compared with either private sector replacement activity or a re-orientation of the DOE R&D spending away from defense-related and toward civilian-oriented R&D, it appears that New Mexico gains little. Additionally, there is much evidence to indicate that the State suffers substantial economic loss (in terms of opportunity lost and the burden on infrastructure) as the result of the DOE activities in New Mexico.

## **Endnotes**

<sup>i</sup> Nuclear Watch of New Mexico is a Santa Fe, NM based non-profit that conducts analyses of U.S. nuclear weapons policy implemented by the Los Alamos and Sandia National Laboratories and the Waste Isolation Pilot Plant. Nuclear Watch of New Mexico's mission is to shed light onto the continued maintenance, development, re-design, and new designs of U.S. nuclear weapons and to educate the public on the ramifications U.S. nuclear weapons policy has on the local, state, national, and international level.

<sup>ii</sup> Horton, Gary A., "Economic Impact Analysis: Assessing the Effects of Economic Impacts: The Derivation and Application of Economic, Fiscal, Resource and Environmental Impact Multipliers;" Division of Forecasting and Economic Impact Analysis, Nevada Division of Water Planning; [www.state.nv.us/cnr/ndwp/forecast/econ\\_pg.4.htm](http://www.state.nv.us/cnr/ndwp/forecast/econ_pg.4.htm).

<sup>iii</sup> Leontief, Wassily, The Structure of the American Economy, New York, Oxford University Press, 1951.

<sup>iv</sup> The coefficients represent the fraction of one economic sector's output that becomes the input of another sector, or equivalently, the fraction of one sector's inputs that derive from the output of another sector.

<sup>v</sup> It is important not to overlook this possibility. I have done extensive research on the nature of human error and its implications. See Dumas, L.J., Lethal Arrogance: Human Fallibility and Dangerous Technologies, New York, St. Martin's Press/Palgrave, 1999.

<sup>vi</sup> Lansford, Robert R., Adcock, Larry D.; Ben-David, Shaul; and Temple, John, The Economic Impact of the Department of Energy on the State of New Mexico Fiscal Year 1998 (August 5, 1999). Funding for the economic studies program was apparently cut off in 1999.

<sup>vii</sup> Ibid, p.36-37.

<sup>viii</sup> Ibid., p.viii.

<sup>ix</sup> In a communication from Larry D. Adcock (the individual in charge of the DOE economic impact studies) to Colin King, Research Director, Nuclear Watch of New Mexico, Mr. Adcock indicated that the model no longer exists. Mr. Adcock told Colin King that the model was stored on old computers that were replaced and that the data was never archived on diskettes, CD ROMs, or any other form of mobile storage medium. Colin King then filed a Freedom of Information Act (FOIA) request for the model and supporting data. A response to that FOIA was provided in December 2002 which included all the modeling data for 1996 through 1998. However, given the complexity of unraveling DOE's unconventional model, time and funding did not allow for a complete analysis of the data at the time of this writing.

<sup>x</sup> The values were derived from calculations by Colin King, Research Director, Nuclear Watch of New Mexico, based on the analysis of the KPMG Peat Marwick Intel Report.

Colin King's derivations follow from this data published in the KPMG Peat Marwick report:

|  | 1993                   | 1995                     |
|--|------------------------|--------------------------|
| Intel direct employment (including construction) | 3,071                  | 5,577                    |
| Indirect and induced employment                  | <u>3,045</u>           | <u>4,941</u>             |
| Total of all employment                          | 6,116                  | 10,518                   |
| Direct wages                                     | \$150.4 million        | \$382.6 million          |
| Direct output                                    | <u>\$369.1 million</u> | <u>\$1,019.6 million</u> |
| Intel's total wages and output                   | \$519.5 million        | \$1,402.2 million        |
| Indirect and induced wages                       | \$100.8 million        | \$170.5 million          |
| Indirect and induced output                      | <u>\$199.4 million</u> | <u>\$333.2 million</u>   |
| Total indirect and induced                       | \$300.2 million        | \$503.7 million          |

To calculate the employment multiplier for 1993:

$$6,116 \text{ (total employment)} / 3,071 \text{ (direct employment)} = 1.99 \text{ (employment multiplier)}$$

For 1995:

$$10,518 \text{ (total employment)} / 4,941 \text{ (direct employment)} = 1.89 \text{ (employment multiplier)}$$

To calculate the personal income multiplier for 1993, use both the direct + indirect & induced wage earnings:

$$\$251.2 \text{ million (direct + indirect \& induced wages)} / \$150.4 \text{ million (direct wages)} = 1.67 \text{ (personal income multiplier)}$$

For 1995:

$$\$553.1 \text{ million (direct + indirect \& induced wages)} / \$382.6 \text{ million (direct wages)} = 1.45 \text{ (personal income multiplier)}$$

To calculate the economic multiplier for 1993, use total direct wages and output + total indirect & induced wages and output:

$$\$819.7 \text{ million} / \$519.5 \text{ million} = 1.58 \text{ (economic multiplier)}$$

For 1995:

$$\$1,905.9 \text{ million} / \$1,402.2 \text{ million} = 1.36 \text{ (economic multiplier)}$$

<sup>xi</sup> It is possible that the Intel Report also overestimated the economic impact of the facility in the longer term, since it was based on data taken from a time during which the facility was under construction. Both the construction jobs and the income earned by those working on construction disappear after construction is completed. If construction was more labor intensive than manufacturing at the facility (which seems likely), the employment and income impacts of the facility on New Mexico may have been overstated by KPMG's study.

<sup>xii</sup> Wayne P. Miller and Tracy Armbruster, "Economic Multipliers: How Communities Can Use Them for Planning," University of Arkansas Cooperative Extension Service, 1999. ([www.uaex.edu/other\\_Areas/publications/html/fscdd-6.asp](http://www.uaex.edu/other_Areas/publications/html/fscdd-6.asp))

<sup>xiii</sup> U.S. Census Bureau, U.S. Department of Commerce, Statistical Abstract of the United States: 2001 (p.21, Table No.18).

<sup>xiv</sup> David Penn and Michael Price (of the University of Oklahoma), "Economic Impact of Aviation and the Aerospace Industry in Oklahoma" (Final Report for the Oklahoma Aeronautics and Space Commission, Oklahoma Department of Transportation, September 1999).

<sup>xv</sup> U.S. Census Bureau, U.S. Department of Commerce, Statistical Abstract of the United States: 2001 (p.21, Table No.18).

<sup>xvi</sup> Curtis Braschler, John Croll, Bryan Phifer and John Kuehn, "Economic Base Multipliers and Community Growth," 1999, University Extension, University of Missouri-Columbia, p.2.

<sup>xvii</sup> Institute of Social and Economic Research (ISER), University of Alaska at Anchorage, "Alaska's Dependence on State Spending," ISER Fiscal Policy Papers, No. 5, April 1991.

<sup>xviii</sup> U.S. Census Bureau, U.S. Department of Commerce, Statistical Abstract of the United States: 2001, p.21, Table No.18.

<sup>xix</sup> Institute of Social and Economic Research (ISER), University of Alaska at Anchorage, "Alaska's Dependence on State Spending," ISER Fiscal Policy Papers, No. 5, April 1991, p.1.

<sup>xx</sup> *Ibid.*, p.3.

<sup>xxi</sup> Donald Hicks and Si-Gyoung Lee, "Regional Economic Impacts of Federal R&D by Funding Source and Performer Type," Regional Studies, Vol. 28.6, p. 623.

<sup>xxii</sup> *Ibid.*

<sup>xxiii</sup> Using multi-state regions would tend to make the effects look larger, but they would tend to have the same effect on the impacts of both federal civilian-oriented and defense-related R&D. Since we are looking only at these two in comparison with each other, there is no reason to believe that the relative impacts are exaggerated because of the use of larger-than-state regions.

<sup>xxiv</sup> In the mid-1990's, the author was a consultant under contract to the Industrial Partnership Office at Los Alamos National Laboratories (LANL), precisely on the issue of how the LANL could shift its research in directions more compatible with the needs of the civilian sectors of the economy. Such expanded civilian research possibilities certainly exist for the Labs. Unfortunately, the project was defunded while still in its embryonic stage. If the Hicks-Lee study is correct, the decision to halt the project may have imposed a much higher cost on New Mexico than is generally appreciated.

<sup>xxv</sup> Based on data in Lansford, Robert R., Adcock, Larry D., Ben-David, Shaul, and Temple, John, The Economic Impact of the Department of Energy on the State of New Mexico Fiscal Year 1998; August 5, 1999, Table 1, p. ix.

<sup>xxvi</sup> Revenue and Expenditures spreadsheet, Hazardous Waste Bureau, New Mexico Environment Department, Fiscal Year 2002.

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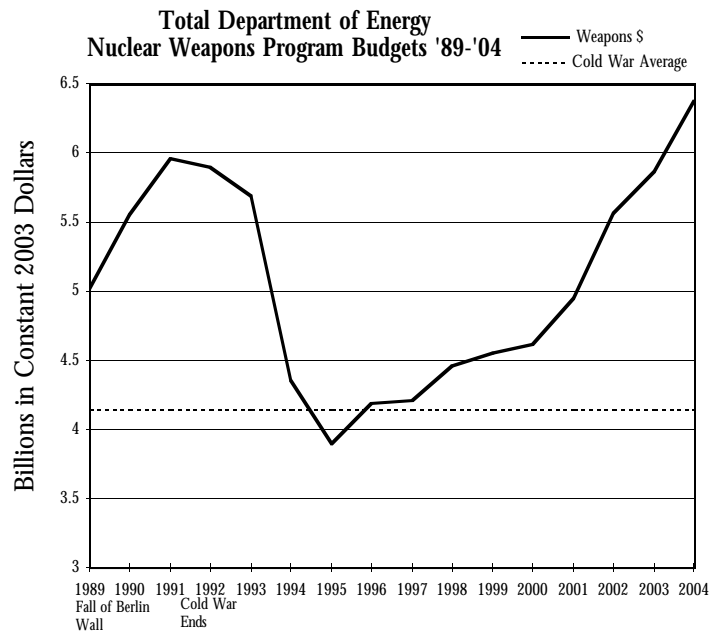
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## An Overview of Programs at the Los Alamos and Sandia National Laboratories: *Why Cleanup and Renewable Energy R&D Lose Out*

### Introduction:

The Cold War ended over a decade ago, yet one would hardly guess it from a glance at U.S. nuclear weapons budgets over the last decade. Even though the Soviet threat dissolved into bankruptcy, the U.S. continues to sink vast sums of money into research, development, design, re-design, and maintenance of its nuclear weapons stockpile. The close of the Cold War saw a phase in U.S. nuclear weapons policy that could have dramatically shifted the national laboratories away from nuclear weapons program to programs that are of more direct societal benefit. That new policy had its roots in the self-imposed nuclear weapons testing moratorium under the Bush Sr. Administration, but, unfortunately, a tremendous opportunity was lost. The national laboratories and the Department of Energy were too heavily entrenched in and financially committed to the nuclear weapons program. While facing massive budget cuts and restructuring as a result from the then pending ratification of the Comprehensive Test Ban Treaty and expected ratification of the Strategic Arms Reduction Treaty II, the national labs successfully persuaded Congress that a new research program was needed to ensure the “safety and reliability” of the U.S. nuclear weapons arsenal.<sup>1</sup> The treaties never made it past Congress, and it is doubtful they ever will.



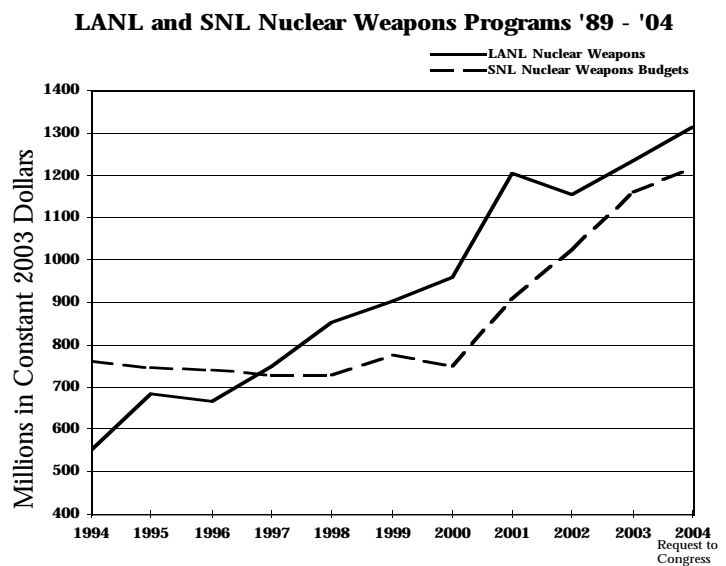
A moment to dramatically refocus the Nation’s priorities was lost, and a new nuclear weapons program was born whose primary goal is to ensure that nuclear weapons are preserved forever. That new program is called Stockpile Stewardship. According to the Department of Energy’s (DOE) National Nuclear Security Administration, or NNSA, (the semi-autonomous agency responsible for the U.S. nuclear weapons labs and programs) the thrust of this program is two-fold. First, it is tasked with maintaining a safe, reliable, and robust nuclear weapons stockpile and second, to create a complex super-computing system and a web of new, expensive experimental facilities to be used to simulate nuclear weapons tests.<sup>2</sup> In truth, however, the NNSA has undertaken an aggressive and comprehensive mission of upgrading the nuclear weapons stockpile and the facilities within the national laboratory complex responsible for that stockpile, in spite of international commitments made by the U.S. to disarm. Funding for nuclear

weapons programs dropped or stabilized for the individual national laboratories in the mid 1990s. It has since taken off towards the stratosphere, now more than half again what the Cold War average was in constant dollars. As a result, the national laboratories have maintained their historic and primary mission of nuclear weapons R&D and production, thereby denying other vital programs (such as cleanup) the attention that they so critically deserve.

Much has been written on the economic repercussions of the Cold War for the U.S. and the Soviet Union and how both nations neglected important social programs and infrastructure. However, very little attention is being paid to the DOE current spending spree, endorsed by Congress, on nuclear weapons programs. The proposed 2004 funding is the second highest ever, in constant dollars, beat only by the 1985 funding level at the height of Ronald Reagan's military build-up. Though this fact sheet is not the place to discuss the over-arching issues of the U.S. nuclear weapons program versus the important social needs this Nation currently faces, it will underscore the overwhelming emphasis that nuclear weapons programs receive at the two national laboratories in New Mexico and the environmental impact of these programs in this State. This paper initially started as an examination of the de-prioritizing of environmental cleanup at New Mexico's nuclear weapons labs. However, new questions emerged, such as the George W. Bush plan to create a so-called "hydrogen economy" as announced in his 2003 State of the Union Address. The Administration has chosen nuclear power to be the primary source for its hydrogen initiative. Accordingly, Nuclear Watch of New Mexico wanted to see how hydrogen research funding would be affected. Substantially increased funding for hydrogen research, if tied to nuclear materials, would have had an environmental impact of no small significance. While we were at it, we also decided to include all renewable energy research and development efforts at the labs, as they also serve as an indicator of the true focus of the national laboratories in New Mexico.

## Nuclear Weapons:

In its budget request for Fiscal Year (FY) '04, the DOE asked for \$6.38 billion for its nuclear weapons programs.<sup>3, 4</sup> This is 54% over the yearly Cold War average spent by the DOE and its predecessors from FY '48 to FY '92 as demonstrated in the graph on the previous page.<sup>5</sup> Budgets had dramatically shrunk directly after the Cold War. By FY '95 funding for the entire nuclear weapons program was down to its post-Cold War low, a mere \$3.89 billion. It is worth noting that the FY '95 budget was the lowest funding level since FY '80, but they were to begin rising again in FY '96. The FY '04 request is 64% higher than the funding received in FY '95. Out of the requested \$6.38 billion for total nuclear weapons programs in FY '04, Los Alamos National Laboratory (LANL) and Sandia National Laboratories (SNL) will receive \$2.53 billion combined, 40% of the total nuclear weapons budget for DOE.<sup>6</sup>



**LANL:** Out of the \$2.53 billion to be divided between the two New Mexico national laboratories, LANL will receive the larger share. The DOE has requested that LANL's nuclear weapons programs be funded at \$1.31 billion. This accounts for 76% of the entire \$1.72 billion of DOE funding for the lab in FY '04. This leaves 24% for other programs, including cleanup (only 2% of total DOE funding) of 60 years of environmental contamination left behind by the nuclear weapons program.

**SNL:** Sandia will receive \$1.23 billion for its nuclear weapons programs in FY '04. Total DOE funding has been requested at the level of \$1.51 billion, meaning that nuclear weapons R&D and production consumes 81% of DOE's funding for the lab, leaving a mere 19% for other R&D programs, including SNL's often touted renewable energy projects.

Both LANL and SNL receive funding under a category called "Work for Others." Work for Others would include agencies such as the Department of the Army, Health and Human Services, National Aeronautics and Space Administration, as well as others. These agencies provide separate funding for research projects that they have commissioned the labs to work on. During the 1990s, Work for Others funding at SNL was between \$200-\$400 million annually in addition to the funding already received from DOE. At LANL, the funding was between \$100-\$200 million annually. FY '02 Work for Others funding at LANL was \$246.5 million. At the time of this writing, funding under the Work for Others category in FY '03 and FY '04 is not publicly available for either lab, and funding at SNL for FY '02 is not publicly available.

The DOE, and more particularly the directors of LANL and SNL, want us to believe that they are on the cutting edge of research programs on topics ranging from environmental restoration to cleaner energy generation and energy efficiency, and renewable energy sources. Hand-in-hand with this argument is a not so tacit claim that nuclear weapons programs are no longer the heartbeat of the two labs. In late September 2002, John Browne, then Director of LANL, was quoted by local media as stating that "[LANL's] role in the next 10 to 20 years [will be] one that will focus more on reducing the threat of biological weapons and finding ways to reduce pollution in the atmosphere."<sup>7, 8</sup> This is an interesting projection, and one that NWNM would welcome, but it is a projection that is at odds with historic budgetary trends. Those trends have demonstrated that nuclear weapons programs take priority above all else, and it is highly unlikely that the trend will change in the coming decade. For Browne's claims to be fulfilled, the DOE and the national laboratories would have to undergo massive restructuring and refocusing of their current mission of nuclear weapons R&D and production. Such a refocusing would require a drastic policy change originating from the highest levels of the Federal government, specifically the Executive Branch. Even if there were some degree of policy change, it is highly unlikely that funding for the programs that Browne mentions will ever come close to the funding levels currently enjoyed by the nuclear weapons R&D and production mission. History itself can be very telling about the overwhelming emphasis the DOE and national labs have and will continue to place upon nuclear weapons R&D and production programs above all else.



## Urgent Needs, Shrinking Budgets:

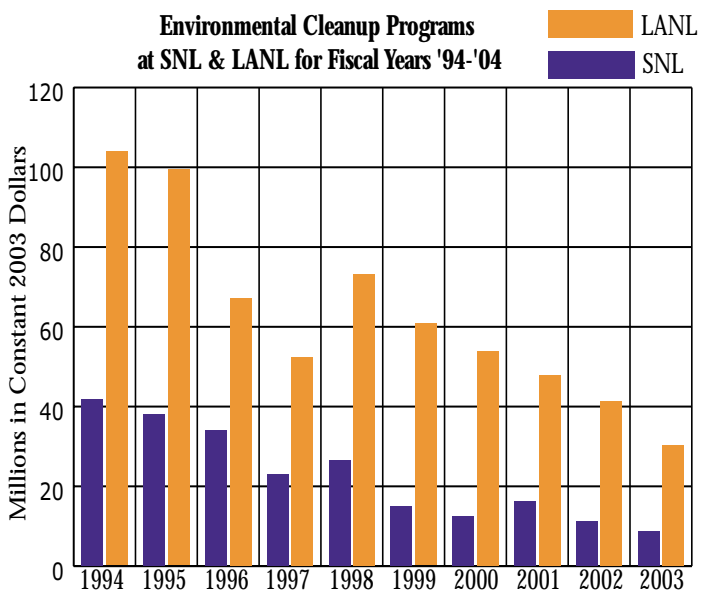
### Declining Funding for Cleanup Programs

**Environmental Cleanup:** DOE categorizes its “Environmental Management” programs into two classes. The first is environmental restoration (ER) and the second is waste management (WM). ER programs at both New Mexico laboratories are responsible for cleaning up the hazardous, mixed, and radioactive wastes generated during the Cold War era.<sup>9</sup> During the Cold War, there were poor or even no environmental standards that regulated releases of contaminants. As an example, for years LANL dumped radioactive waste water directly into the canyon systems found throughout laboratory property. Solid wastes were dumped into unlined pits and trenches, which are now beginning to leak into the surrounding environs. The ER program attempts to address these issues, but not as quickly and effectively as NWNM and State regulators would like to see.

WM is generally considered to be the management, packaging, and disposal of wastes generated from the ongoing post-Cold War nuclear weapons missions. WM is not cleanup, as it does nothing to remove existing contaminants from the soil and water at the national labs. In essence, WM is the continuation of business as usual. The New Mexico Environment Department (NMED), armed with environmental laws such as the Resource Conservation and Recovery Act (RCRA), is now in the process of attempting to compel both LANL and SNL to meet their ER obligations for some 50 years of negligent dumping of wastes. In its most laudable effort to date, NMED has issued Corrective Action Orders to LANL and SNL.

DOE and the respective labs’ managers, the University of California (UC) and Sandia Corporation (a wholly owned subsidiary of Lockheed Martin Corporation), are vigorously challenging these Orders in court. If they are successful, the precedent set would greatly weaken the ability of all 50 States to effectively regulate environmental compliance by Federal facilities within their boundaries.

The DOE has neglected environmental restoration at all of its facilities within the nuclear weapons complex. Under the early Clinton Administration, ER programs were heavily funded, but with the Republican takeover of Congress and the appointment of more conservative DOE officials, funding for ER programs has dropped dramatically. Furthermore, DOE has lumped together ER and WM funding in its annual aggregate “Environmental Management” budgets, which is a blatant obfuscation of the facts. Combining these two budget categories makes the DOE look good on paper and enables it to make the claim to Congress and the public that it is pursuing a rigorous cleanup schedule that is amply funded, a claim that reality on the ground proves false. This is particularly noticeable at SNL and LANL. By breaking down the combined WM/ER budget category, ER receives about half of the total environ-



mental management program funding at each lab. This sounds good in theory, but the funding levels are ultimately very poor, despite the environmental degradation caused by five decades of contamination. NMED has declared that there is an “imminent and substantial endangerment to health or the environment” at both labs.<sup>10</sup> The sorry tale of DOE’s lack of fiscal commitment to cleanup at the labs can be seen in the graph on the previous page.

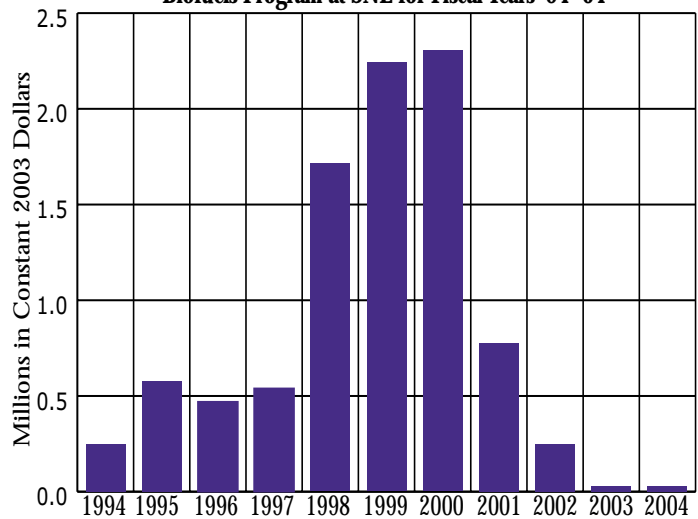
In FY ‘94, funding for cleanup was at its highest levels since the ER program’s inception. LANL’s ER program saw funding levels of \$104.2 million and SNL’s program was funded at \$41.9 million. By FY ‘03 that funding is down to \$30.3 million for LANL and \$8.6 million for SNL, which is a decrease of 71% and 79% respectively. Funding for ER programs at LANL makes up 2% of the lab’s total DOE funding. For SNL, ER funding consumes about 1/2 of 1 percent of SNL’s DOE funded budget. Complete budget data is not yet available for FY ‘04 on ER programs pending decisions by DOE.

### Declining Budgets for Renewable Energy R&D Programs

**Biofuels:** Fuels based upon biomass appear to be a very promising source of energy, allowing farmers, small towns and large cities to capture gases such as methane from decomposing solid wastes and generate electricity by burning that methane. Furthermore, biomass fuels such as wood, corn, etc., may be used to extend the life of the massive and costly coal fired electricity generating plants by replacing coal with biofuels. Such a substitution, in addition to being a renewable fuel cycle, could greatly reduce the amount of heavy metals (like lead) that are produced by firing plants with coal.

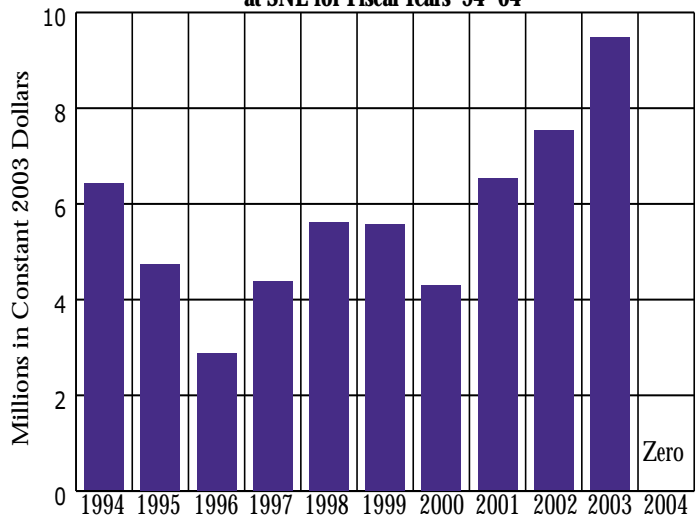
The only national laboratory that receives discrete funding for biofuels and biomass R&D is SNL. In FY ‘00 DOE dedicated \$2.31 million to such programs, but that has now been decreased to \$30,000 in FY ‘04, representing less than 1/10 of one percent of SNL’s total DOE funding. In comparison to the highest point of funding in FY ‘00, funding for biofuels programs has been slashed by 99%.

Biofuels Program at SNL for Fiscal Years '94-'04



Note: LANL receives no funding for Biofuels Programs.

Energy Storage Technologies Programs at SNL for Fiscal Years '94-'04

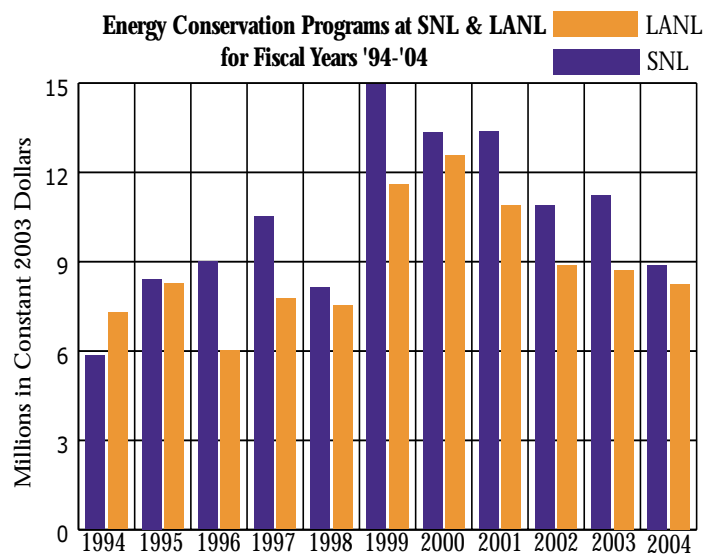
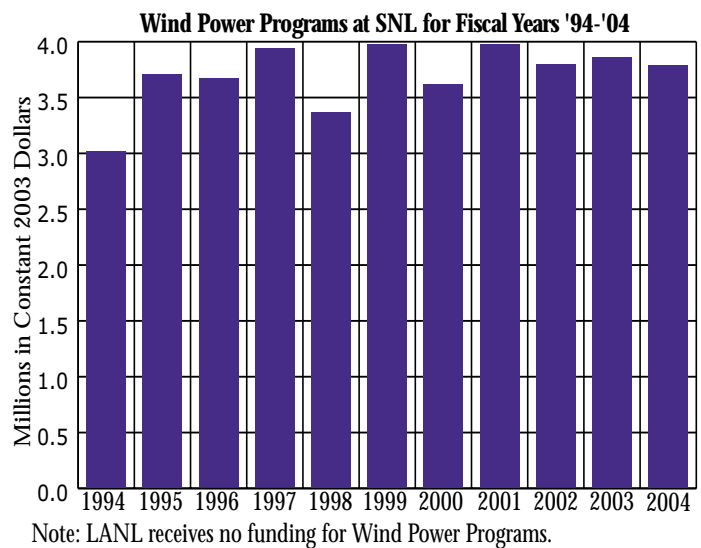


Note: LANL receives no funding for Energy Storage Technologies.

**Energy Storage Systems:** This SNL program, which includes research on advanced battery technologies, had actually seen a rise in funding over the past decade. For FY '03 the DOE had requested that the program be funded at \$9.5 million. However, DOE removed funding for it in FY '04. The FY '03 funding was a three-fold increase in funding compared to its previous low point in FY '96. It is unfortunate that funding has been eliminated for energy storage technologies. Research in this field will become increasingly important, particularly as more hybrid (gas/electric) and electric cars make a bid to enter the U.S. market.

**Wind Power:** The DOE has requested that SNL's wind power research program be funded at a level of \$3.8 million in FY '04. Funding for this program would be less than 1/4 of one percent of SNL's total funding from DOE in FY '04. This is probably the most shockingly under-funded program. Wind energy production is one of the fastest growing sources of electricity in the U.S., and New Mexico is commonly thought to be one of the best states to locate wind farms. Technologies developed by SNL could greatly benefit the State economy by creating high-tech spin-off opportunities. Furthermore, wind energy technologies, and the development of wind farms could greatly improve smog problems now seen in the Middle Rio Grande Valley that are due in part to the coal fired power plants in the Four Corners region of the State. The use of wind power would also greatly reduce water consumption were it to be used as an alternative to the State's coal fired plants.

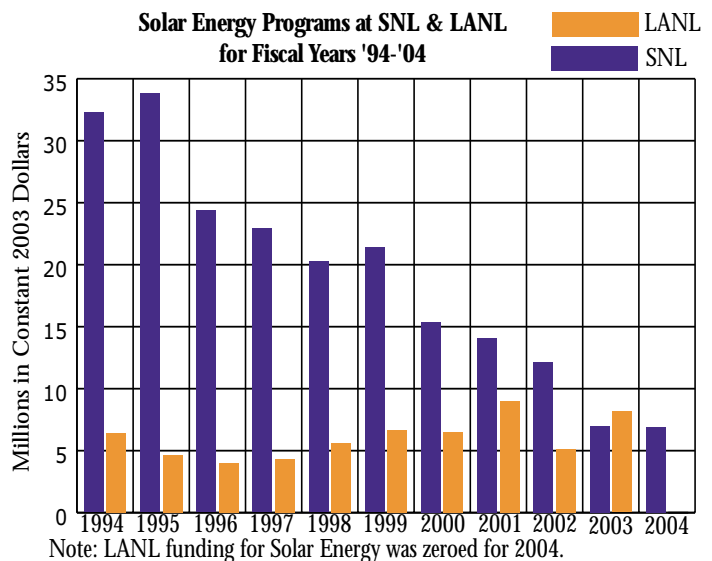
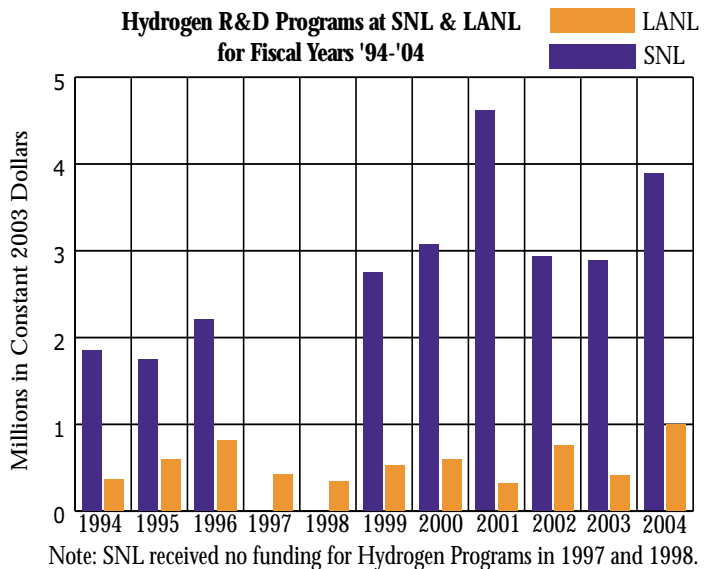
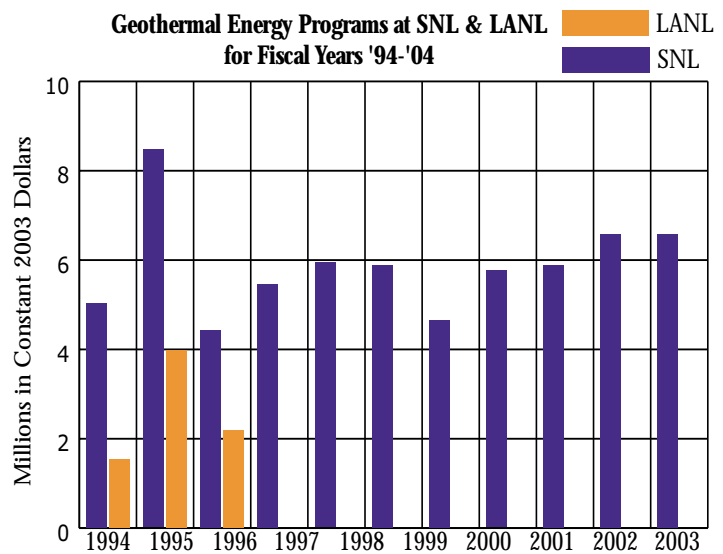
**Energy Conservation:** Research under this category is conducted at both LANL and SNL. Work in this field supports Federal agency initiatives to improve the use of electricity and heating and air conditioning systems in office buildings, among other things. This program also provides the public sector with new technologies, materials, equipment, and appliances that reduce the nation's consumption and waste of energy. The DOE requested funding for this program at LANL and SNL for FY '04 is \$8.27 million and \$8.91 million respectively. FY '99 saw the peak funding rate at \$11.63 million and \$14.99 million respectively. In comparison to overall DOE funding for LANL and SNL, energy conservation receives less than 1/2 of one percent at LANL and just over 1/2 of one percent at SNL.



**Geothermal Energy:** LANL has not received funding for geothermal energy research since FY '96, despite the fact that the Jemez Mountain range, in which LANL is situated, is a hotbed of geothermal activity. For FY '04, DOE requested that SNL's geothermal energy program be funded at a level of \$6.6 million, or just under 1/2 of one percent of SNL's total DOE funding. This is surprising given that New Mexico has strong potential for energy production due to the amount of geothermal activity within the State. Application of this technology could also provide the State with economic benefits, including jobs generated from the development of geothermal energy production.

**Hydrogen Energy Sources:** This category, which includes research in hydrogen fuel cell technology for applications such as automobiles will receive funding at the level of \$1.0 million and \$3.9 million at LANL and SNL respectively for FY '04. This translates into a budget commitment of 1/4 of one percent at LANL, and 1/2 of one percent at SNL. The lack of funding for this program boggles the mind, given that hydrogen fuel technology promises to be one of the more important energy frontiers in the coming decade, and that President George W. Bush declared in his 2003 State of the Union Address that substantial resources would be devoted to hydrogen research in FY '04.

**Solar Energy:** During the mid-90s, SNL invested a sizeable amount of money into solar energy technology development. In FY '95 solar energy R&D received a budget commitment of \$33.94 million. That funding, however, has dropped to a paltry \$6.92 million requested for FY '04. At LANL the funding is yet worse, at a mere \$8.18 million last year and zeroed in FY '04. In comparison to the DOE's total funding for the two labs in its FY '03 request, solar energy R&D



will receive 1/2 of one percent at SNL and zero at LANL. On a commercial scale solar energy is much more land-use intensive than wind energy.

However, given the potential in the Southwest it is shocking that so little effort by the two national labs goes into technologies that could be used to make solar energy capture more efficient and economical.

### **Downbeat:**

The above-discussed programs are the only cleanup and renewable energy R&D programs that receive specific line-item budgets in DOE's congressional funding requests over the past decade. The two national labs may perhaps conduct research on renewable energy within other budget categories (i.e., at the sub-program level), however the funding for such research can be certain to be miniscule. As a result, funding at the sub-program level would not make a calculable difference in the figures presented above. Therefore, these program descriptions represent an accurate and complete picture of LANL and SNL's commitment to renewable energy R&D over the past decade.

The DOE's SNL funding request for FY '04 for renewable energy programs R&D totals \$30.16 million, or 2.0% of SNL's total budget. Further, renewable energy R&D will receive only 10.3% of the SNL funding that is not already solely dedicated to nuclear weapons R&D and production.

At LANL, renewables have a total requested funding level of \$9.27 million for FY '04. That amounts to just over 1/2 of one percent of LANL's total DOE operating budget. Of the funding not specifically earmarked for nuclear weapons programs, renewables will receive only 2.2% of LANL's financial commitment to non-nuclear weapons budget items. We find this to be a strange irony as both labs are owned by and operated for the so-called Department of *Energy*.

### **A Nuclear Weapons Tax?:**

Both national labs have a program called Laboratory Directed Research and Development (LDRD). LDRD is an internal tax of up to 6% on all DOE funding that the lab can apply to other programs at its discretion. The LDRD funding is intended to "maintain the scientific and technical vitality of the laboratories; enhance the laboratories' ability to address future DOE missions; foster creativity and stimulate exploration of forefront science and technology..."<sup>11</sup> Because of the great emphasis placed upon nuclear weapons by the DOE and its national laboratories, LDRD primarily supports advanced nuclear weapons R&D. SNL taxed its budget to the tune of 5.5% in FY '02, thereby re-directing \$78 million from other programs such as cleanup and renewable energy R&D to support its primary mission of nuclear weapons work. If SNL taxes its budget at the same 5.5% level in FY '04, funding for cleanup and renewable energy R&D will be decreased by more than \$1.66 million. If LANL were to do the same, funding for cleanup and renewables would be decreased by \$2.16 million, the majority of it to benefit nuclear weapons work at the labs.

## **Conclusion:**

The public relations machines at the labs may be in high gear in an attempt to remake the labs' historic image as designers, developers, and producers of nuclear weapons. Just under the surface, however, is the underlying truth that they remain overwhelmingly committed to nuclear weapons and that they stake their own ongoing future on that commitment. In internal program documents, neither LANL nor SNL attempts to paint a different picture. In its 2002 Institutional Plan, LANL states that "LANL's core mission is nuclear stockpile stewardship..." LANL relegates research programs, such as renewable energy and the environment (cleanup), to the category of being merely "Ancillary."<sup>12</sup> Such statements collide with the claims of former lab Director Browne when he asserts that research programs such as the environment will come to the forefront of the lab's strategic mission. In its 5-year Institutional Plan, SNL opens the section titled "Strategic Objectives and Intermediate Goals" with "Nuclear Weapons: Our Primary Mission."<sup>13</sup> The nuclear weapons industry in New Mexico is far from over; to the contrary, it is growing by leaps and bounds. All this is at the cost of important R&D programs, such as renewables and long-needed environmental cleanup, which could have a positive impact on our State's economy as well as our environment.

In a recent analysis of the impacts of renewable energy infrastructure development, such as the construction of wind farms, geothermal plants, and solar energy sources, the New Mexico Public Interest Research Group (NMPIRG) came up with some interesting data. Using conservative models and data developed by the DOE's National Renewable Energy Laboratory (RNEL), NMPIRG asserts "New Mexico could generate over 116,000 GWh/y [gigawatt hours per year] of electricity" from wind, "over three times the amount the state generated in 1999."<sup>14</sup> According to the U.S. Bureau of Reclamation states that 5 GWh/y is enough to supply electricity to 625,000 homes for one year. NMPIRG writes that total wind generating capacity grew in the Nation by 60% during 2001. Taking that model and existing knowledge of prime locations in New Mexico for wind generation, they claim that by 2010 New Mexico could be "generating more than 3,500 GWh/y of electricity emission free."<sup>15</sup> Calling for an aggressive but still reasonable approach to renewable energy development, NMPIRG claims that by 2010 New Mexico could be generating a majority of its energy from renewable sources, which, when combined with energy efficiency and conservation programs, would allow the state to replace many of its conventional energy generators, such as coal, and still remain a large exporter of electricity to other states. Such a transition, NMPIRG asserts, would not hit the consumers' pocket book, as the cost of renewable energy production is easily on a par with conventional power per kW/h given recent advances in technology. Furthermore, they claim that such initiatives would have a net gain of "4,200 additional jobs by 2010."<sup>16</sup> These jobs would come in the form of technically skilled maintenance crews, as well as possible small companies dedicated to supplying or manufacturing parts for the energy systems.

Should the national labs refocus their attention away from nuclear weapons towards renewables and environmental technologies, the potential for spin-off would be immense. Additionally, there would be a direct conduit between the R&D community and direct field application. This in turn could further advance the degree of efficiency as well as increase job potential. NMPIRG's projection of a net gain of 4,200 new jobs by 2010 is more than half the number of jobs that were held at SNL's Albuquerque facilities during 2003. Therefore, without even considering the secondary and tertiary job impacts, and a

possible “high-tech” boom that would likely result in a reasonable but aggressive renewable energy program, it is clear that the direct beneficial impact on the State’s economy would be vast.

There are huge untapped potentials, yet those potentials are being neglected at both DOE national laboratories and at the State level. New Mexico is gifted with a huge research and development community centered around the national laboratories, as well as an ideal climate and geology that make it a prime potential source for renewable power generation. Combined, these two factors could make New Mexico a model of renewable energy development for other states. Why is this not happening?

## **Recommendations for Citizens:**

### **Cleanup:**

- Let your members of Congress know what you think is appropriate funding necessary for DOE to meet all of its cleanup requirements;
- Tell your members of Congress that funding for cleanup at DOE facilities should be exempt from the “nuclear weapons tax,” also known as Laboratory Directed Research and Development;
- Let Congress know what you think about DOE’s failure to segregate waste management and cleanup funding from each other, thereby obfuscating the true amounts of dollars being used to restore the environment;
- Let New Mexico Governor Bill Richardson and your New Mexican State Legislators know what you think about the New Mexico Environment Department’s increasing efforts to compel DOE to clean up;
- Tell the New Mexico Environment Department’s office of the Secretary how you feel about their Corrective Action Orders against LANL and SNL; and
- Write letters to your local newspaper describing the negligence of DOE’s cleanup programs. Help dispel the myth that the nuclear weapons business is over.

### **Renewables:**

- Let the State Legislature know what you think about a strong renewable energy R&D and implementation effort;
- Tell Governor Richardson what you think about making renewable energy development a policy of his Administration;
- Educate local city and county level government, as well as chambers of commerce, about the local job creation possibilities of renewable energy development;
- Let your New Mexico Congress people know what you think are appropriate funding levels for renewable energy R&D programs at LANL and SNL. Additionally, let them know what you think about a cooperative partnership between LANL and SNL and the State, local communities, and utility companies which would provide the research and development base behind a strong renewable energy program.
- If an option, choose to specifically purchase “green” energy from your utility company.

### **Notes:**

<sup>1</sup> The U.S. Senate did ratify START II, however during consideration of the treaty prior to its ratification in Russia the Dumas inserted additional requirements. These requirements needed re-ratification by the U.S. Senate. However, foreign policy

conservatives within the Senate, lead by Jesse Helms, killed the treaty.

<sup>2</sup> For more information on the Stockpile Stewardship Program and the nuclear weapons work that fall under its rubric, please see the following documents: *Alterations, Modifications, Refurbishments, and Possible New Designs For the US Nuclear Weapons Stockpile, An Overview of Current and Planned U.S. Nuclear Weapons*, and *Focus On LANL & Sandia: The NNSA's FY04 Nuclear Weapons Budget*. These documents can be found electronically at [www.nukewatch.org](http://www.nukewatch.org).

<sup>3</sup> A Federal Fiscal Year begins October 1 and ends September 30 of the following calendar year.

<sup>4</sup> All FY '04 budget figures are for DOE's funding request to Congress. During the appropriations process, it is likely that Congress will make some adjustments, in recent years always adding to the nuclear weapons programs.

<sup>5</sup> The Cold War average was compiled from *Atomic Audit*, Stephen I. Schwartz, Editor, The Brookings Institution Press, 1998. All other budget figures have been compiled from DOE Congressional Budget Requests, LANL and SNL Institutional Plans, and LANL Comprehensive Site Plans. All budget figures have been adjusted to 2003 dollars using the Consumer Price Index, as calculated by the Federal Reserve Bank.

<sup>6</sup> The U.S. has three nuclear weapons national laboratories within the DOE's nuclear weapons complex, Los Alamos in Northern New Mexico, Lawrence Livermore 40 miles east of the San Francisco Bay Area, and Sandia with its main lab in Albuquerque, New Mexico. Sandia also has satellite labs at Livermore, CA, the Nevada Test Site, and at Kauai, Hawaii (the southern end of the Pacific missile testing range). The first two labs are the nuclear design labs, with some major production mission as well. Sandia designs all of the non-nuclear components (such as firing and fusing systems) and also mates nuclear weapons to delivery systems, plus produces key non-nuclear components as well. For much more on all three labs, go to [www.nukewatch.org](http://www.nukewatch.org).

<sup>7</sup> *Albuquerque Journal, North Edition*, "Lab Not Pursuing Pits," September 27, 2002.

<sup>8</sup> In early January 2003 LANL Director John Browne resigned from his position amidst allegations that the Lab's upper management covered up fraud and theft of government property. Investigators have determined that lab employees stole lab computers and printers, and used government purchase cards for personal transactions such as the purchase of thousands of dollars in golf equipment and an attempted purchase of a \$30,000 Ford Mustang.

<sup>9</sup> Mixed wastes are a combination of hazardous and radioactive wastes generally regulated under the Resource Conservation and Recovery Act (RCRA), a Federal law which gives states primary regulation authority.

<sup>10</sup> "Secretary's Determination of an Imminent and Substantial Endangerment to Health and the Environment," issued for SNL, NMED, September 3, 2002, [http://www.nmenv.state.nm.us/HWB/SNL/order/SNL\\_ORDER\\_SNG.pdf](http://www.nmenv.state.nm.us/HWB/SNL/order/SNL_ORDER_SNG.pdf). "Determination of an Imminent and Substantial Endangerment to Health and the Environment" issued for LANL, NMED, May 2, 2002, <http://www.nmenv.state.nm.us/HWB/lanl/ISE.pdf>.

<sup>11</sup> Institutional Plan, FY 2002-2007, Sandia National Laboratories, p. 6-41.

<sup>12</sup> Institutional Plan, FY 2002-2007, Los Alamos National Laboratory, p. 1.

<sup>13</sup> Institutional Plan, FY 2002-2007, Sandia National Laboratories, p. 3-3.

<sup>14</sup> "Clean Energy Solutions, Energy Efficiency and Renewable Energy in New Mexico," Marianne Zugal and Brad Heavner, NMPIRG Educational Fund, March 2002, p. 16, <http://www.nmpirg.org/reports/CleanEnergyReport.pdf>.

<sup>15</sup> *Ibid.*

<sup>16</sup> *Ibid.*, p. 39.

Comments, questions, and corrections are always welcomed. Please address them to Colin King, Research Director, Nuclear Watch of New Mexico, 551 West Cordova Rd., 808, Santa Fe, New Mexico, 87505, (505) 989.7342, or [colinking@nukewatch.org](mailto:colinking@nukewatch.org).

Colin King, June 2003