S. HRG. 106–959

DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE

HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED SIXTH CONGRESS

SECOND SESSION

JULY 25, 2000

Printed for the use of the Committee on Environment and Public Works

U.S. GOVERNMENT PRINTING OFFICE

71–521 PS WASHINGTON : 2001

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2250 Mail: Stop SSOP, Washington, DC 20402–0001

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

ONE HUNDRED SIXTH CONGRESS

SECOND SESSION

BOB SMITH, New Hampshire, *Chairman*

JOHN W. WARNER, Virginia	MAX BAUCUS, Montana
JAMES M. INHOFE, Oklahoma	DANIEL PATRICK MOYNIHAN, New York
CRAIG THOMAS, Wyoming	FRANK R. LAUTENBERG, New Jersey
CHRISTOPHER S. BOND, Missouri	HARRY REID, Nevada
GEORGE V. VOINOVICH, Ohio	BOB GRAHAM, Florida
MICHAEL D. CRAPO, Idaho	JOSEPH I. LIEBERMAN, Connecticut
ROBERT F. BENNETT, Utah	BARBARA BOXER, California
KAY BAILEY HUTCHISON, Texas	RON WYDEN, Oregon
LINCOLN CHAFEE, Rhode Island	

DAVE CONOVER, *Staff Director*

J. THOMAS SLITER, *Minority Staff Director*

C O N T E N T S

Page

ADDITIONAL MATERIAL

DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE

TUESDAY, JULY 25, 2000

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The committee met, pursuant to notice at 9:35 a.m. in room 406, Senate Dirksen Building, Hon. Robert F. Bennett (acting chairman of the committee) presiding.

Present: Senators Bennett, Inhofe, Crapo and Boxer.

OPENING STATEMENT OF HON. ROBERT F. BENNETT, U.S. SENATOR FROM THE STATE OF UTAH

Senator BENNETT. The committee will come to order.

Let me offer my apologies for being late. I won't bore you with the details, but I will apologize to you because I recognize that we have to move quickly this morning. The life we lead in the week before the August recess, everybody has another hearing to go to and other demands on their time.

Senator Inhofe, who was the first one here, does have another committee meeting to go to. I will forego any opening statement of mine in order to hear his, so that we can accommodate his schedule.

[The prepared statement of Senator Bennett follows:]

STATEMENT OF HON. ROBERT F. BENNETT, U.S. SENATOR FROM THE STATE OF UTAH

Today's hearing of the full committee on Environment and Public Works will explore current regulatory policies for the disposal of low-level radioactive wastes. Specifically, the committee is concerned about the treatment of wastes that were originally generated at industrial sites involved in our nation's nuclear weapons program. Many of these sites are currently being remediated by the U.S. Army Corps of Engineers (USACE) under the Formerly Utilized Sites Remedial Action Program (FUSRAP).

BACKGROUND

The Department of Energy (DOE) originally created the FUSRAP program in 1974 to address radiological contamination at sites used by two of DOE's predecessor agencies, the Manhattan Engineering District (MED) and the Atomic Energy Commission (AEC), from the 1940s through the 1960s. The contaminants are primarily low levels of uranium, thorium, and radium, with their associated decay products. Mixed wastes are also present. From 1974 to 1997, the program was administered by DOE, which took the position that these wastes should be disposed of only in DOE facilities or in sites licensed by the Nuclear Regulatory Commission (NRC).

The Energy and Water Development Appropriations Act for fiscal year 1998 (FY98) P.L. 105–62, signed into law on October 13, 1997, transferred responsibility for the administration and execution of the FUSRAP program from the Department of Energy to the U.S. Army Corps of Engineers. At the time of enactment of P.L.

105–62, according to DOE, remediation was completed at 24 sites with some ongoing operation, maintenance and monitoring being undertaken by DOE. Remedial action was planned, underway, or pending final closeout at the remaining 22 sites.

LEGAL INCONSISTENCY AND CONCERNS

Following the transfer of the FUSRAP program the U.S. Army Corps of Engineers made an inquiry with the NRC regarding the agency's position on the relevance of its licensing program or rules and regulations for the disposal of FUSRAP wastes. Specifically, the Army Corps asked "Is an NRC license required for handling activities related to disposal of the FUSRAP wastes . . . ?" In a response from Robert L. Fonner, Special Counsel for Fuel Cycle and Safeguards Regulations, the NRC indicated that "Prior to the enactment of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), neither the AEC nor the NRC claimed statutory jurisdiction over the tailings from ore processed for source material." "UMTRCA gave NRC statutory authority over such tailings, but only over tailings resulting from activities licensed by NRC as of the effective date of the act (November 8, 1978), or thereafter." Mr. Fonner concluded that NRC had no basis to assert any regulatory authority over the handling of FUSRAP wastes generated prior to the 1978 enactment of UMTRCA. Further, the Fonner correspondence states that "There are no NRC rules or regulations that would preclude disposal of FUSRAP wastes at a Resources Conservation and Recovery Act (RCRA) disposal facility."

Since neither I nor our committee have closely analyzed this issue, any assessment on my part regarding what is happening here must be considered preliminary. Having said that, I have two strong—and quite negative—reactions to these developments. The first is that there are obvious deficiencies in a system that treats differently pre-1978 and post-1978 FUSRAP waste, when there is no physical difference between these two categories of waste and no difference in the health and safety dangers posed by the two categories.

The second reaction is of greater concern. Both the NRC and the Army Corps of Engineers have indicated that the disposal of FUSRAP wastes at RCRA facilities is not troublesome because the tailings are subject to regulation under other federal and state laws. However, because the Atomic Energy Act, as amended by UMTRCA, preempts the field of nuclear safety regulation for 11e.(2) byproduct materials, it appears that these materials would not be subject to any state regulation protecting the public from radiation exposure. Further, it is my understanding that the Environmental Protection Agency (EPA) does not have jurisdiction under RCRA to regulate these wastes. If my understanding is correct, then under the regulatory regime now in place pre-1978 wastes, even those with high radioactivity levels, will not be regulated by any federal or state regulatory agency. The regulatory vacuum created by this gap in the law is an unacceptable and dangerous state of affairs, and one that our citizens should not be exposed to.

Clearly, clarification is needed to address these inconsistencies in the law. NRC Chairman Richard Meserve has indicated to me in correspondence dated March 8, 2000, that "A legislative solution would be the most direct approach to clarifying the NRC's responsibilities under UMTRCA." It is my hope that the testimony given today will help this Committee move forward with legislation establishing a risk-based standard for the disposal of low-level radioactive wastes.

I look forward to today's testimony and welcome our witnesses.

Senator BENNETT. Senator.

OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. That is very kind of you. We do have our Armed Services Committee with Bill Cohen. It is in an area that I feel I really need to be. So thank you for allowing me to go first.

First of all, I would like to tell you, Mr. Chairman, that Dr. Westphal is one of my fellow Okies. We have known each other for a long time. I have always been honored to serve with him.

I am sorry I won't be able to stay for the entire committee hearing. This is an important hearing that we have today addressing low-activity radioactive waste. I want to repeat that: low-activity radioactive waste.

I have heard from radiation scientists that this level of radioactivity is something that you can be exposed to, more of it, in this room just because of the marble than you would the waste that we are talking about.

While I certainly understand the frustration of defining waste by the year it was produced instead of radiation of health threat, I don't think the appropriate response is just to send all the waste to an NRC. The most important issue is whether the waste is being properly handled and disposed of.

Based upon the experience of the program, I do not believe it is necessary to send all low-level waste to an NRC facility. There are dozens of sites, private sites, and the level of competition does have an effect on the cost of disposal.

Because of this issue and other radiation issues, I believe that Congress does need to take a close look at the radiation standards problem.

As the chairman of the Nuclear Safety Subcommittee, I intend to do just that. Last month the General Accounting Office issued a report on "Radiation Standards, Scientific Basis, Inconclusive and EPA and NRC Disagreement" continues. That is actually a quote there. That is the name of the report.

Three key findings were, this is the report you might remember that Senator Pete Domenici, was asking for. No. 1, U.S. radiation standards propounding protection lack a conclusively verified scientific basis according to a consensus of recognized scientists.

No. 2, lacking conclusive evidence of low-level radiation effects, U.S. regulators have in recent years set sometimes-differing exposure limits.

No. 3, costs of implementing radiation protection standards at nuclear cleanup and waste disposal facilities vary from site to site.

This report verifies what I believed all along, our radiation standards are not consistent. Because of this, 3 months ago I asked the Health Physics Society to develop legislative principles to address radiation standards.

I intend to use these principles drafted by scientific experts to write legislation, which I hope to introduce before the end of the year. I will be working on this issue with members of my subcommittee and other interested parties to craft a solution for all of our radiation standards issues, including the FUSRAP wastes, metal recycling, decommissioning of facilities in Yucca Mountain.

I realize this issue cuts across party lines. Certainly, I find myself philosophically disagreeing with our distinguished Senator from California many times and I am normally in agreement with the Senator from Utah, however, I believe in simply changing the date and requiring all wastes to be sent to the NRC licensed facility will be regulatory overkill and add nothing but additional cost.

I have been told that the costs are higher at an NRC licensed facility. I believe a better approach would be to look closely at all radiation standards.

I have a chart that shows some of the different costs of disposing of some of these wastes. No. 1, the wastes at the NRC site and dealing with above soil survey volume, the same amount of disposal at that site was $510 as opposed to when there is competition and it was $71.50.

So without objection, I ask unanimous consent to include this with my opening remarks, Mr. Chairman, in the record.

Senator BENNETT. Without objection.

Senator INHOFE. I do feel that most of this is money that was spent by the public sector. These are tax dollars and we should be as frugal as possible. I am sure you would agree with that statement. We should be as frugal as we can be with our disposal costs.

I thank you very much for allowing me to go on the record first.

Senator BENNETT. Well, thank you. We appreciate your comments and the preparation that you have put into them.

Senator Crapo, you arrived next. So let's hear from you and then Senator Boxer.

OPENING STATEMENT OF HON. MICHAEL D. CRAPO, U.S. SENATOR FROM THE STATE OF IDAHO

Senator CRAPO. Thank you, Mr. Chairman. In the interest of time I will not make an extensive opening statement. I do associate myself with the comments of Senator Inhofe and the concerns that he has raised. But I look forward to getting as quickly as we can to the witnesses, so I will forego any further statement.

Senator BENNETT. Thank you very much. Senator Boxer.

Senator BOXER. Mr. Chairman, do you want to make yours? I am not in a rush. I am going to be here the entire time.

Senator BENNETT. You are going to be here the entire time? Well, OK.

Senator BOXER. Yes, this is a very important issue to me, so I am happy to hear your comments. As a matter of fact, I look forward to hearing your comments.

Senator BENNETT. Thank you. I have indicated to all of the concerned parties that have come before me on this issue, committee members and committee staff, the various stakeholders and so on that my goal is to keep the hearing focused on the policy of how we dispose of FUSRAP waste.

There is a gap in the current regulatory statutes that needs to be addressed one way or the other. It does not to me make sense to have an artificial and arbitrary dividing line that is drawn by the regulators.

I think a risk analysis needs to be done to establish a standard that is protective of public health and safety. I agree that the primary goal should be public health and safety. The primary goal should not be some arbitrary regulatory decision.

So I am open to just about any kind of solution that makes sense and that is focused on public health and safety.

We should, I think, recognize that mildly radioactive wastes are different from other wastes. The Congress has made that decision and the arbitrary dividing line that has resulted from the way that decision was made and the way it has been interpreted is the reason that we are here today.

Waste streams that are hotter than the new standards should be disposed of at NRC licensed sites, regardless of the year in which they were generated.

So I have prepared a written statement outlining these general goals, but these are my goals for the hearing. This is the way in which I am approaching this. I think it is the responsibility of this

committee to focus on these goals and say our purpose here is to protect the safety and to remove regulatory uncertainty.

If we go at it with those two as our goals, probably in that order, then I think we will have achieved our responsible goal here.

So that is really all the focus that I have.

Senator Boxer.

OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. Thank you, Mr. Chairman. I am going to take my full 5 minutes. I want to thank you so much for requesting this hearing and I want to thank Senator Smith because he, of course, gave us the go-ahead to do it.

I do agree with the general thrust of your comments. But I perhaps feel a little bit strong about it and I want to tell you why.

When I learned that the Corps had disposed of 2,200 tons of radioactive waste in an unlicensed hazardous waste facility in Buttonwillow, CA, I was shocked. The facility sits atop aquifers that supply water to the central valley of California.

For those of you who don't know, that is the "bread basket" of California.

When I called the Corps, they told me, "Senator, this waste is so safe you could roll around in it." That is a direct quote from the Corps counsel.

What is this safe radioactive waste? Senator Inhofe talked about his view. But I want to talk about what it is. The radioactive waste dump at Buttonwillow is uranium, thorium, and radium. These radioactive materials can cause cancer, leukemia, and genetic defects. They persist in the environment for millions and billions of years.

Uranium–238, for example, has a half-life of 4.5 billion years. So when Senator Bennett says this waste is a little hotter, he is right.

When I started looking into it, I found that the Corps sent this radioactive waste to Buttonwillow even though Buttonwillow is not regulated by the Nuclear Regulatory Commission. The Corps does so under the FUSRAP, which is Formerly Utilized Sites Program.

The program focuses on cleaning up old Manhattan Project nuclear weapons facilities. I also learned that when the program was managed by the Department of Energy it required that all waste generated from clean-ups had to go to NRC-licensed facilities.

Of course, that is the policy issue that Senator Bennett refers to. That was the policy of the United States of America as long as it ran the clean-up program, as long as the Department of Energy ran it from 1974 to 1997.

The Department of Energy had this requirement because NRC-licensed facilities are especially equipped to deal with radioactive waste. They are sited to guard against radioactive waste leaking into the environment.

So if you look at the site in Utah or, for example, Washington State, you will find that they are sited to guard against radioactive waste leaking into the environment. They are not sited over aquifers, for example.

They are monitored to catch leaks if they do occur. They are required to be monitored and managed into perpetuity, to make sure the public health and environment are protected.

Now when the Corps took over the program in 1997, it wrote to the NRC. The Corps asked the NRC whether it was required to dispose of the radioactive waste at an NRC facility. The NRC responded with an answer that is even more remarkable than the fact that the Corps dumped 2,200 tons of radioactive waste at an unlicensed California dump, which is remarkable in and of itself.

The NRC said that if the radioactive waste was generated before passage of the Uranium Mill Tailings Radiation Control Act of 1978, the NRC would not regulate that waste.

If the waste was generated after the passage of the Act, NRC would require that the waste go to an NRC-licensed facility. The Buttonwillow waste, and indeed most of the radioactive waste resulting from FUSRAP clean-ups was generated before 1978. So according to the NRC answer to the Corps, the NRC would not require the Corps to dispose of this waste at a protected NRC-licensed facility.

If the NRC doesn't tell the Corps how to safely dispose of this radioactive waste, who does? The answer is: No one. Under the NRC interpretation of the law it appears that no Federal or State agency has the authority to require that the waste go to a licensed facility.

According to the Corps, this NRC position means the Corps can send the waste wherever it chooses, to hazardous waste facilities or even to regular landfills.

Is there a different between this pre- and post-1978 generated radioactive waste? Even if we take Senator Inhofe's point, oh, it's not so dangerous, is there a different between the waste that was generated before and after? None, except its birthday.

The radioactive waste is the same. It is just as harmful to people. It is just as harmful to the environment. What is the NRC's justification for the result that identical waste is protectively regulated in one case, but not on the other.

The NRC answers this question in its testimony. It says that it is not "unusual" for similar radioactive materials to be regulated differently. They say, "This is the result of the fragmented statutory regime governing radioactive materials."

So they are really laying it off on us. That is the bottom line. So that is why we felt, Senator Bennett and I, that this was a very important hearing. To me that answer is a frightening answer because it means that during this period of time before anyone was looking we could have caused tremendous problems.

It is not comforting to me. It is not comforting to the people of California, especially in Buttonwillow.

Now the Corps, for its part, assures me its actions in Buttonwillow are protective of public health and the environment. The Corps rejected my repeated request to remove the waste from California. I was promised that one and then we got a back off from the promise.

Now they say this waste is too dangerous to move. Now, first they told me I could roll around in it. I am glad I didn't do that. Because now they are saying it is too dangerous to move.

The story keeps changing. The Corps assures me its policy of disposing of this waste is a good idea. When I ask the Corps for envi-

ronmental and public health studies they can't give me anything because there are no studies.

The Corps and the NRC reversed a long-standing DOE policy of disposing the waste at NRC facilities without so much as a single study. I think that is just a very sad thing for the people of the United States of America to learn.

The citizens who would have to live each day near these facilities are extensively involved and should be extensively involved in the siting process, but not the way things are being done now. They don't even know anything about it.

The Buttonwillow community and other communities across the Nation that could become dumping grounds for the Corps have no say as to whether their hazardous waste facilities should be turned into radioactive waste dumps and have the Corps say, "Gee, we can't move it because now it is mixed with these other hazardous waste and it is very dangerous." Well, it wasn't dangerous when they put it there but suddenly it becomes dangerous when it is mixed with other wastes.

Why on earth was it put there to mix with these other wastes? It happened through the back door in California. It happened at the hands of the Federal Government.

We have a solution: Put this waste at a safe NRC-licensed facility such as the one in Utah, the one in Washington State.

So you can see, Mr. Chairman, this has been a lot of frustration on my part. I think sneaking this kind of waste into a facility without the proper permits was a horrendous thing. Then, sitting on your hands doing nothing when you are caught at it and now saying it is too dangerous to move. Those are answers?

I hope, Senator Crapo, you never have that problem in your State, and Senator Bennett, that you never have that problem in your State. I hope we can find an answer here and stop this situation from continuing because I don't want to see other States suffer from this anxiety the way the people of California have.

Thank you.

[The prepared statement of Senator Boxer follows:]

STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Thank you, Mr. Chairman. I would like to thank my colleague Senator Bennett for joining me in requesting this hearing.

When I learned that the Corps had disposed of 2,200 tons of radioactive waste at an unlicensed hazardous waste facility in Buttonwillow, California, I was shocked. The facility sits atop aquifers that supply water to the Central Valley of California.

When I called the Corps, they told me "Senator, this waste is so safe, you could roll around in it." What is this "safe" radioactive waste? The radioactive waste dumped at Buttonwillow is uranium, thorium and radium. These radioactive materials can cause cancer, leukemia and genetic defects. They persist in the environment for millions to billions of years. Uranium 238, for example, has a half life of 4½ billion years.

When I started looking into it, I found that the Corps sent this radioactive waste to Buttonwillow, even though Buttonwillow is not regulated by the NRC. It does so under FUSRAP, the Formerly Utilized Sites Remedial Action Program. The program focuses on cleaning up old Manhattan Project nuclear weapons facilities. The Corps involvement surprised me because it is so far outside of the navigation and flood control mission of the agency.

I also learned that when the program was managed by the Department of Energy (DOE), it required that all wastes generated from cleanups had to go to Nuclear Regulatory Commission (NRC) licensed low level radioactive waste facilities.

That was DOE policy for as long as it ran the cleanup program—from 1974 to 1997. The DOE had this requirement because NRC-licensed facilities are specially equipped to deal with radioactive waste. They are sited to guard against radioactive waste leaking into the environment. They are monitored to catch leaks if they do occur. They are required to be monitored and managed into perpetuity to make sure the public health and environment are protected.

When the Corps took over the program in 1997, it wrote to the NRC. The Corps asked the NRC whether it was required to dispose of this radioactive waste at an NRC-licensed facility.

The NRC responded with an answer that is even more remarkable than the fact that the Corps dumped 2,200 tons of radioactive waste at an unlicensed California dump. The NRC said that if the radioactive waste was generated before the passage of the Uranium Mill Tailings Radiation Control Act of 1978, the NRC would not regulate that waste.

If the waste was generated after the passage of that Act, the NRC would require that the waste go to an NRC-licensed low level radioactive waste facility. The Buttonwillow waste, and indeed most of the radioactive waste resulting from Formerly Utilized Sites Remedial Action Program (FUSRAP) cleanups, was generated before 1978. So, according to the NRC answer to the Corps, the NRC wouldn't require the Corps to dispose this radioactive waste at a protective NRC licensed facility.

If the NRC doesn't tell the Corps how to safely dispose of this radioactive waste, then who does?

The answer is no one.

Under the NRC interpretation of the law, it appears that no Federal or State agency has the authority to require that this waste go to an NRC-licensed low level radioactive waste facility.

According to the Corps, this NRC position means the Corps—can send the waste wherever it chooses—to hazardous waste facilities or even to regular landfills.

Is there a difference between this pre- and post-1978 generated radioactive waste?

None except its birthday. The radioactive waste is the same. It is just as harmful to people. It is just as harmful to the environment.

What is the NRC's justification for the result that identical waste is protectively regulated in one case, but not regulated at all in the other? The NRC answers this question in its testimony. It says that it is not "unusual" for similar radioactive materials to be regulated differently. They say "this is the result of the fragmented statutory regime governing radioactive materials."

The NRC answer isn't that its policy is protective of public health and the environment. The answer isn't that it makes good policy sense. The NRC answer is that when it comes to the regulation of radioactive waste, the regulatory regime doesn't make much sense. It doesn't make any sense because that's the way the NRC has chosen to regulate.

That's not comforting to me. That's not comforting to the people of Buttonwillow, California. And I doubt that answer will be comforting to other communities that become radioactive waste dumping grounds for the Corps.

The Corps, for its part, assures me that its actions in the Buttonwillow case are protective of public health and the environment. At the same time, the Corps has rejected my repeated requests to remove the waste from California, now saying the waste is too dangerous to move when at first it said I could roll around in it. The Corps also told me it has no authority to move the waste.

The story keeps changing.

The Corps also assures me that its policy of disposing of this waste at hazardous waste dumps is a good idea. When I ask the Corps for the environmental and public health studies they rely upon to tell me this policy is safe, they can't give me anything. Why? Because there are no studies. The Corps and the NRC reversed a long-standing DOE policy of disposing of this radioactive waste at NRC licensed facilities without so much as a single study.

Why do we need to have such studies? Hazardous waste facilities like Buttonwillow aren't sited with the disposal of radioactive waste in mind. Climate, geography, and other site characteristics figure heavily in the siting of a radioactive waste dump.

Extensive studies are prepared to help ensure that these long-lived and dangerous materials are not leaked into the environment. The citizens who would have to live each day near the facility are extensively involved in the siting process. They participate in hearings and help scrutinize studies.

Unlike radioactive waste facilities, hazardous waste facilities are only monitored for 30 years after they close to make sure they are not leaking. This is of little use where the waste is radioactive and stays that way for millions to billions of years.

The Buttonwillow community and the other communities across the Nation that may become dumping grounds for the Corps have no say about whether their hazardous waste facilities should be turned into radioactive waste dumps.

It just happens through the back door.

And it happens at the hands of the Federal Government. Now we have solution. Put this waste at safe, NRC licensed facilities such as the one in Utah.

I look forward to hearing from all the witnesses here today. I look forward to getting some answers. I renew my demand that the Corps remove this waste from California.

You never had the proper permits to put it there. You should make it right now by removing it.

Thank you.

Senator BENNETT. Thank you very much, Senator Boxer. We appreciate the passion with which you address this issue. Of course, you address most issues with a sense of determination to get at the bottom of things.

Senator BOXER. Thank you.

Senator BENNETT. Let me remind the witnesses of the 5-minute rule. We don't mean to be arbitrary about it, but again, given the situation we find ourselves in, a number of other Senators have other places that they have to go. We have a large number of witnesses.

I will place my full written statement in the record, summarizing it again and it was summarized with Senator Boxer. My problem is with the difference that comes solely on the basis of an arbitrary decision and why science is influenced by a date that Congress has arbitrarily picked is something I don't quite understand.

If everything is as safe as some of the studies to which Senator Inhofe referred would indicate, then none of it should be disposed in an NRC site. If some of it belongs in an NRC site, then obviously all of it does, to me.

But that is why we have the witnesses here to examine it. We appreciate the first panel that is with us. Mr. Shapiro, Mr. Paperiello, and Dr. Westphal. We will go in that order.

Please introduce yourselves and tell us briefly what your background is. I won't do that from here so we won't duplicate it, in the interest of time. We will hear from each of you in that order.

Mr. Shapiro.

STATEMENT OF MICHAEL SHAPIRO, DEPUTY ASSISTANT ADMINISTRATOR, OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, ENVIRONMENTAL PROTECTION AGENCY

Mr. SHAPIRO. Thank you, Mr. Chairman. My name is Michael Shapiro. I am the Deputy Assistant Administrator for Solid Waste and Emergency Response at the Environmental Protection Agency.

I am pleased to appear before you today on this panel of my colleagues from the Army Corps of Engineers and the Nuclear Regulatory Commission to address the subject of low-activity radioactive wastes and in particular the material referred to as 11e.(2) byproduct material from FUSRAP sites.

My brief statement this morning will focus on EPA's role in the regulation of FUSRAP wastes under the Uranium Mill Tailings Radiation Control Act, UMTRCA, the Comprehensive Environmental

Response Compensation and Liability Act, or Superfund, and the Resource Conservation and Recovery Act, RCRA.

As you will hear more this morning, most of the waste at FUSRAP sites is byproduct material covered by section 11e.(2) of the Atomic Energy Act. UMTRCA amended the Atomic Energy Act and gave EPA the regulatory responsibility to establish standards for the protection of public health, safety and the environment associated with the processing, transfer and disposal of 11e.(2) material.

Under UMTRCA, the Nuclear Regulatory Commission is responsible for implementing and enforcing these regulations. The NRC has interpreted UMTRCA as limiting its jurisdiction to 11e.(2) as generated at sites licensed during their operation and does not believe that it has regulatory jurisdiction over the pre-1978 11e.(2) material.

Initially, as you pointed out, the Department of Energy was responsible for managing the FUSRAP Program. In the Fiscal Year 1998 Appropriations bill, Congress transferred management to the FUSRAP program to the U.S. Army Corps of Engineers.

The Fiscal Year 2000 Energy and Water Development Appropriation Act states that the Corps shall undertake cleanup of the remaining FUSRAP sites under CERCLA. Seven of these sites are on the Superfund national priorities list. At these seven sites, EPA must approve the cleanup remedy selected by the Corps of Engineers.

The Corps does not have to receive EPA approval of the remedies selected at non-NPL FUSRAP sites, but does have to follow the Superfund regulations, called the National Contingency Plan or the NCP.

In particular, EPA's offsite rule, which is part of the NCP, implements the CERCLA requirement that waste removed from a site under the Superfund must be sent to a facility that is in compliance with Federal and State disposal requirements.

To assure that wastes removed under the NCP are disposed of in a way that protects human health and the environment, the party conducting the cleanup should request a determination of the offsite rule from EPA to assure that the disposal facility meets the requirements of that rule.

Finally, RCRA does not regulate 11e.(2) byproduct material. The RCRA statutory definition of solid waste specifically excludes source, special nuclear and byproduct material as defined by the Atomic Energy Act.

EPA regulations generally permit the disposal of non-hazardous waste in RCRA hazardous waste landfills. However, States may regulate the disposal of material that is not regulated as hazardous at the Federal level.

Some States have established their own standards for the disposal of certain federally unregulated materials such as Naturally Occurring Radioactive Material or NORM or the pre-1978 FUSRAP material.

RCRA hazardous waste landfills are designed to be highly protective disposal facilities and therefore may be suitable for the disposal of certain low-activity radioactive wastes.

However, because of the special characteristics of radioactive materials which are not addressed by RCRA regulations, the permits for such facilities would have to have additional conditions to limit the radioactivity of waste that can be accepted in order to ensure adequate public protection, to ensure appropriate monitoring, to protect ground water, and provide for worker protection.

In addition, EPA believes that adequate public participation is critical to achieving the public acceptance of these facilities.

In summary, several Federal agencies share statutory authority to ensure the safe cleanup and disposal of FUSRAP wastes.

EPA is committed under the current scheme to work with its Federal partners, as well as with other stakeholders to assure that FUSRAP sites are cleaned up in an environmental protective manner and that all of the applicable requirements for protection of human health and the environment are met.

Thank you for the opportunity to provide this statement. I welcome any questions following our statements.

Senator BENNETT. Thank you very much.

Mr. Paperiello.

STATEMENT OF CARL PAPERIELLO, DEPUTY EXECUTIVE DIRECTOR FOR MATERIALS, RESEARCH AND STATE PROGRAMS, NUCLEAR REGULATORY COMMISSION

Mr. PAPERIELLO. I am the Deputy Executive Director for Operations for Materials, Research, and State Programs at the Nuclear Regulatory Commission.

By education, I am a nuclear physicist and I am also a certified health physicist. I am here today to present the NRC's views on the management and disposal of low-level radioactive waste in the context of the FUSRAP program of the Army Corps of Engineers.

Because the Uranium Mill Tailings Control Act does not direct the NRC to exercise regulatory authority over milling activities and facilities that were not subject to license at the time of UMTRCA's passage, the NRC has not regulated the disposal of mill tailings resulting from the FUSRAP program.

We believe legislation would be required to give us the authority to regulate pre-UMTRCA mill tailings in the FUSRAP program. The Appropriations Committees, most recently the House Appropriations Committee report on the Energy and Water Development Bill for fiscal 2000 have clearly indicated the NRC is not intended to license the Corps' cleanup of contaminated FUSRAP sites.

We are aware that some want us to regulate the disposal of FUSRAP mill tailings and the arguments are based on the observation that pre-UMTRCA and post-UMTRCA materials are radiologically similar.

However, and I will repeat, it is not unusual for similar radioactive materials to be regulated differently. Because it has raised the most concern, I will focus on mill tailings, FUSRAP material disposed of in non-NRC regulated facilities and in particular RCRA subtitle Congress, hazardous waste disposal facilities.

Tailings, typically, have most of the uranium and thorium removed, but still contain other radioactive elements in the decay chains for uranium and thorium, especially Thorium 230 and ra-

dium. They also may contain hazardous chemicals used in the processing to extract uranium.

NRC requirements are based in part of EPA requirements similar to RCRA Subtitle (C) requirements. State-of-the-art mill tailings impoundments, like RCRA hazardous waste disposal cells, rely in part on a system of liners and leachate detection and collection systems to prevent the releases of hazardous and radioactive materials to the environment.

If we compare uranium mill tailings to other forms of comparable radioactive waste, the most similar is technologically enhanced natural radioactive material or TENORM.

This material, whose radioactivity has been enhanced as a result of human intervention includes the same radioactive elements as mill tailings. TENORM includes coal ash, uranium mining overburden, mill tailings from the extraction of non-radioactive elements from ores, and I would note that Buttonwillow is receiving this kind of radioactive material from MolyCorp.

Pipe scale and sledges from oil and gas production and water treatment sludge. The EPA reports that the TENORM volumes produced in the United States may exceed one billion tons a year. By comparison low-level waste annual production is about 60,000 tons or 1/10,000ths as much as TENORM.

However, most low-level wastes consist of considerably higher concentrations of reactor fission and activation products. Some low-level waste includes material contaminated with uranium or thorium.

If uranium mill tailings were not defined as by-product material by UMTRCA, they would be considered to be TENORM. Mill tailings, low-level waste and TENORM can have significant overlap in the ranges of radioactivity contamination.

From a risk perspective, all three containing uranium and thorium in the same ranges of concentrations are equivalent in risk. From a legal perspective, how they are to be disposed of varies. TENORM, according to a recent National Academy of Sciences report, is regulated in a rather fragmentary manner.

We have not conducted a comprehensive review of TENORM disposal practices in the United States. We are aware that some TENORM is disposed of in some RCRA subtitle C hazardous waste facilities.

Practices vary depending on the permit conditions for radioactive materials imposed by the State permitting agency and the radioactivity of the waste for disposal.

The NRC is aware that several facilities have concentration limits of 2,000 Picocuries per gram on the material they receive. At least one has limits on worker exposure.

Because mill tailings impoundments and hazardous waste cells are based on large part on the same EPA requirements, the NRC believes that both RCRA landfills and NRC license disposal facilities should be able to provide adequate protection for the public and the environment for TENORM and mill tailings types of material.

It may be necessary to place limits on the radioactive concentration of the material disposed of in a RCRA facility to ensure worker protection or other safety concerns are adequately addressed.

The sites that we know of that are accepting TENORM and FUSRAP material have such limits. In addition, we recognize that long-term stability of RCRA sites is achieved somewhat differently than an NRC license site.

If Congress believes the NRC should regulate the disposal of pre-UMTRCA mill tailings in the FUSRAP program, the NRC is willing to assist in amending UMTRCA.

This completes my statement. I would be pleased to answer any questions from the committee.

Senator BENNETT. Thank you very much.

Dr. Westphal.

STATEMENT OF HON. JOSEPH WESTPHAL, ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS), DEPARTMENT OF THE ARMY; ACCOMPANIED BY JULIE PETERSON, U.S. ARMY CORPS OF ENGINEERS, HAZARDOUS TOXIC AND RADIOACTIVE WASTE CENTER OF EXPERTISE, AND CAPTAIN NOELLE SIMPSON, U.S. ARMY CORPS OF ENGINEERS, ASSISTANT COUNSEL FOR ENVIRONMENTAL RESTORATION, REGULATION AND COMPLIANCE

Dr. WESTPHAL. Good morning, Mr. Chairman, Senator Boxer, Senator Crapo. My name is Joseph Westphal. I am Assistant Secretary of the Army for Civil Works. I thank you for the opportunity to testify before you today.

The Formerly Utilized Site Remedial Action Program, FUSRAP, as you know, was initiated in 1940 by the Department of Energy. In 1997, the Congress transferred the cleanup of the remaining 21 sites to the Army Corps of Engineers.

This morning, Mr. Chairman, I do have a couple of people sitting behind me who are in some ways more technically expert than I may be.

Senator BENNETT. So do I.

Dr. WESTPHAL. Accompanying me is Ms. Julie Peterson, who is a U.S. Army Corps of Engineers Health Physicist from our Hazardous Toxic and Radioactive Waste Center of Expertise in Omaha.

Also with me is Captain Noelle Simpson, a Corps Assistant Counsel for Environmental Restoration, Regulation and Compliance.

I have also asked Mr. Stephen Keefer, who represents the Army Audit Agency, to be available in the event you may have questions on that.

In this brief oral statement, and I will summarize very quickly, I want to make just a couple of points regarding the management and disposal of low-activity radioactive waste material under FUSRAP.

I believe that the Corps is managing and disposing of FUSRAP material in a manner that is fully protective of the public health and the environment.

Since assuming responsibility for FUSRAP in the fall of 1997, the Corps has accomplished a number of important milestones in the management of this program.

Some examples are seamless transition from the Department of Energy with no slippage in cleanup activities as a result of the transfer: partnerships with local communities, State and Federal

regulators: removal and safe disposal of about 325,000 cubic yards of material: completion of remedial activities at 3 of the 21 sites remaining to be completed and records of decision at 6 sites.

However, there are two issues that have been raised regarding the Corps' management and disposal of FUSRAP material. The first has to do with the regulatory status of FUSRAP material and the second, of course, involves the use of hazardous waste disposal facilities for some FUSRAP materials and specifically, as Senator Boxer pointed out, the Safety-Kleen facility near Buttonwillow, CA.

I have addressed both of these in my complete statement and Mr. Chairman, I ask that that be placed in the record.

Senator BENNETT. Without objection.

Dr. WESTPHAL. First, let me restate that the Corps is disposing of FUSRAP material in a way which is fully protective of public health and the environment and which also ensures the safety of individuals working at the disposal area.

The Corps has sought guidance from the NRC regarding the regulatory status of FUSRAP materials. The NRC has determined that certain FUSRAP materials do not fall under the NRC's regulatory jurisdiction.

On the matter of disposal, we believe that the Resource Conservation and Recovery Act, RCRA, Subtitle C, hazardous waste disposal facilities do provide for the safe and protective disposal of some FUSRAP material.

RCRA Subtitle C disposal facilities are hazardous waste facilities which are designed and constructed to protect the environment from a variety of hazardous materials.

These facilities all have designs and operating plans that include liners, leachate collection systems, surface and ground water monitoring, enforceable worker protection standards, perimeter security, emergency response plans, eventual caps upon unit closure, and long-term maintenance and land-use restrictions.

States or EPA issue permits for these facilities only after notice and public comment, including notice and comment on any permit provision dealing with radioactive materials.

They are located in geographic areas considered appropriate for disposal of hazardous waste, due in part to low precipitation and very deep subsurface intervals to ground water.

The same protective features will also protect public health and the environment from FUSRAP material. FUSRAP materials are not more likely to migrate offsite than any other hazardous material.

Additionally, there are materials in Subtitle C facilities that remain hazardous forever. Furthermore, State regulators of such facilities may require additional protective features for safe handling of radioactive materials as a condition for allowing the facility to accept radioactive material.

The Corps has only made limited use of RCRA Subtitle C disposal facilities for the disposal of FUSRAP materials that are not regulated under the Atomic Energy Act by the Nuclear Regulatory Commission.

Although the Corps estimates that as much as 80 percent of FUSRAP materials are not regulated by NRC, to date the Corps

has utilized Subtitle C disposal facilities for approximately 20 percent of its material.

The majority of the material disposed at Subtitle C facilities came from interim storage piles at the Middlesex, NJ site and was disposed at the EnviroSafe of Idaho facility.

All materials shipped to Subtitle C facilities were well below their acceptance threshold. For example, while EnviroSafe of Idaho accepts materials with an average activity level of up to 355 PicoCuries per gram, the material that the Corps shipped to EnviroSafe from one of the piles at Middlesex had an average activity level of only 18 PicoCuries per gram.

Similarly, the building debris, which the Corps disposed of at the Safety-Kleen facility at Buttonwillow, CA, had an average activity level of only 335 PicoCuries per gram, although Safety-Kleen is permitted to accept material with an average activity level of up to 2,000 PicoCuries per gram.

We have all learned an important lesson from the controversy which resulted from the Corps' use of the Safety-Kleen facility. Better communications with the regulators of FUSRAP disposal facilities are as important as communications with regulators responsible for how FUSRAP sites are remediated.

As a result, I have directed the Army Corps of Engineers to immediately establish a policy requiring the written concurrence of the regulatory agencies responsible for overseeing the disposal sites' operation, stating that the proposed disposal is consistent with applicable regulations and licenses or permits.

In the same vein, I have asked the Army Audit Agency to investigate all aspects of the Corps' use of the Buttonwillow facility for the disposal of demolition debris from Linde, Building 30 in Tonawanda, NY. I expect that this audit will help us determine how and where we can improve on the management of this process.

However, I can share with you the tentative conclusions reached by the Army Audit Agency which are that the Corps was in full compliance with all applicable laws and regulations and acted responsibly in protecting overall human health, safety and the environment.

Mr. Chairman, I will provide you and the committee members a copy of that final report as soon as it is available and I think it will be available in a month.

Senator BENNETT. Thank you.

In a way I am regretting now that we scheduled as many witnesses as we did because I think we could spend the next hour going through the testimony of the three of you.

Let me comment and summarize what I hear. No. 1, if a member of the public who had no idea what any of the acronyms meant had tuned into this hearing, he or she would be completely baffled.

The second thing that would come through to such an uninitiated hearer would be that basically nobody is responsible. EPA says, "Gee, it's not our responsibility." NRC says, "We are prohibited." The Army Corps says, "Well, we are doing the best we can and we are acting responsibly, more or less on a case by case basis."

There is a suggestion that the Appropriations Committee is involved. I am an appropriator. I have talked to Senator Domenici. He says he wants the authorizing committee to deal with it. Pretty

soon there are a whole bunch of chairs and this thing is falling between all of the chairs and nobody seems to be putting his arm around it. So that is what we are trying to do in this hearing.

Now, let me go to this chart for just a minute, because I find that very useful and maybe I am misinterpreting it. Let me just walk through it from my lack of scientific understanding and see if I understand what the chart is saying.

The first item up there says "soil." I think that means that Senator Boxer could roll around in that without too much difficulty. Is that a safe summary of what that first one means?

Mr. PAPERIELLO. Most people would agree to that.

Senator BENNETT. OK. Now the second one, byproduct material is riskier than soil. Would you still think she could roll around in that, even though it is a little riskier than soil?

Senator BOXER. Mr. Chairman, this is getting very personal.

Senator BENNETT. All right. I will roll around in it.

Senator BOXER. We can take turns. Senator Crapo can roll around the next one.

Senator BENNETT. All right. It is farther out on the chart. Is that——

Mr. PAPERIELLO. It is higher, right. It is a logarithmic scale.

Senator BENNETT. How dangerous is it? I recognize that things can be higher on the scale.

Mr. PAPERIELLO. Senator, it depends on the duration of the contact. If you walked over it, and I have stood on mill tailings piles, it is a small amount of radiation. I get more by flying across the country.

But remember, the reason for UMTRCA is in Grand Junction, CO, people used it as fill to build their houses on. You would not want to lie in it for 365 days a year. So it is a relative. You can handle much more, and people do, highly radioactive material, but with time, distance and shielding, you can keep the dose low. So it is a degree of protection.

Senator BENNETT. That is helpful. Now, you get to the third one, which is the farthest one, and it goes all the way over to the threshold of spent reactor fuel.

Mr. PAPERIELLO. Yes, sir.

Senator BENNETT. Isn't that what we are talking about, that third line, low-level waste?

Mr. PAPERIELLO. Again, as you can see, it has a large range and it depends on the legal definition. Once material becomes low-level waste, it can never "unbecome" low-level waste, regardless of concentration. Obviously, some low-level waste is extremely low and some is very high. That range is over 10 million in concentration. So whether we like it or not, the law puts different material in different boxes.

TENORM can be the exact same elements as 11e.(2) byproduct material or low-level waste and it is not regulated by the Federal Government.

Senator BENNETT. All right. I won't go down through the rest of the chart but you have just made the point that I think ought to be the point of these hearings, which is that inadvertently or through neglect or ignorance, whatever, Congress has put labels that do not conform with the scientific realities.

The regulators are responding to the labels, as they should, as they are required to, and the science is different. Is that a fair summary of where we are?

Mr. PAPERIELLO. Yes, sir.

Senator BENNETT. OK. I think that summarizes why it is proper for us to hold these hearings because I would like, at the end of the day, to have the regulations match the science. If indeed the science says this material is safe, I would be perfectly happy to have it taken to a non-regulated facility. If the science says this material is not safe, then I want it in an NRC facility and that seems to me to be the criteria that we should be trying to achieve here.

Mr. Westphal.

Dr. WESTPHAL. Mr. Chairman, let me put this in perspective. In these particular sites, which were sites of work on the Manhattan Project, the sites were cleaned up back in the 1946 era and beyond according to standards that were in effect at that time.

Later on, the Department of Energy came in and did further cleanup of these sites. So the really hot, high-level radiation was not present any more. These sites in some cases were being used for other purposes.

We continue now to clean what is remaining there and what is remaining is the 11e.(2) byproduct. Some of that material would be classified under that label for that material. The Corps would go in as it did in the site in New York, and take samples.

It took, in this particular case, 26 samples, but there were literally thousands of samples taken before then by the Department of Energy and by those agencies responsible for cleanup right after the Manhattan Project ceased its work.

It took those 26 samples and it determined that the average range was 335 PicoCuries per gram. There was one sample that was higher than 2,000. But based on that average and based on guidance from NRC and discussions with EPA, that material could then be moved. It met very stringent DOT regulations for the transporting of the material, and sent to a RCRA site that was permitted to accept that material but could not accept material beyond an average of 2,000 PicoCuries.

The Corps has also cleaned up sites where the characteristics are much higher than those averages I just listed. In those cases, those materials have been sent to Envirocare in Utah.

Senator BENNETT. Senator Crapo.

Senator CRAPO. Thank you very much, Mr. Chairman. Following up with regard to the chart for just a moment, is there any way to translate that chart into what we are talking about in terms of PicoCuries?

Mr. PAPERIELLO. No. 1 is about 10 PicoCuries per gram, roughly.

Senator CRAPO. You said one is about 20 PicoCuries per gram?

Mr. PAPERIELLO. Ten PicoCuries per gram. So 10 would be 100 PicoCuries per gram and 10 squared would be 1,000.

Senator CRAPO. If you look at 11e.(2) byproduct material, the maximum that could be contained in that material would be what, about a thousand?

Mr. PAPERIELLO. Jim said that he has looked at the document of concentrations and the range that he shows is what he can find in documentation.

In my mind, and I asked him this question before the hearing, theoretically, it seems to me, the Belgian Congo pitch blend ores that were used, I would have assumed were hotter. But I really don't know.

Most of the ores in the United States have not been very radioactive.

Senator CRAPO. But what you are showing by the chart there, and I realize you might have an example in some location that would vary, but if you look at that chart, we are talking about, isn't Line 2 the 11e.(2), isn't that what we are talking about in this hearing?

Mr. PAPERIELLO. Right.

Senator CRAPO. The maximum on that line would be somewhere around 1,000 PicoCuries?

Mr. SHAPIRO. Five thousand PicoCuries.

Senator CRAPO. So it starts somewhere down around 100 and goes up to about 5,000; is that how you read the chart?

Mr. PAPERIELLO. Yes.

Senator CRAPO. All right. Dr. Westphal, you indicated that the shipments that were sent that you are talking about average what, 355?

Dr. WESTPHAL. To the Safety-Kleen facility in California it was 335; to EnviroSafe in Idaho, it was 18.

Senator CRAPO. So we are talking about shipments that were well in the lower end of the range of that second line there on the chart?

Dr. WESTPHAL. There was one sample that scored higher than 2,000 out of the 26 samples.

Senator CRAPO. Where did that sample come from?

Dr. WESTPHAL. But again, we are talking averages, so they average under 2,000 with one peaking above 2,000. The Buttonwillow facility is permitted to accept up to an average of 2,000. So it can accept some material that may have peaked higher, but on the average it can't be higher than 2,000. So it is well below that.

Senator CRAPO. As I look at the chart, in terms of the various radioactivity that is shown for the various items listed there, with the exception of soil, it looks to me like every other category listed pretty much contains the entire range that is contained in the second line of the 11e.(2) byproduct material.

In other words, the low-level waste, the TENORM, the exempt source material and the low-level waste also all cover the same range of PicoCuries as does the 11e.(2) byproduct material; is that accurate?

Mr. PAPERIELLO. Yes. I made that point in my testimony. They overlap.

Senator CRAPO. Would that overlap justify regulating each of those items in the same manner?

Mr. PAPERIELLO. In my view as a health physicist, if it is the same element and the same concentration and has the same risk, the requirements ought to be the same. They are not, but I mean,

you could argue if it is the same element and it is the same concentration, it has got to be the same risk.

Now, there can be some differences in volumes and volumes make a very important difference.

Senator CRAPO. Let me make my point this way, then, if you look at soil, it overlaps low-level waste, TENORM and exempt source materials, sure. Should we regulate soil the same way we may regulate low-level waste?

Mr. PAPERIELLO. No.

Senator CRAPO. In other words, there is a difference between the lower end of the spectrum and upper end of the spectrum.

Mr. PAPERIELLO. Oh, yes.

Senator CRAPO. So wouldn't it make sense that our regulatory system should focus on the material that is being regulated rather than whether there is an overlap in a chart showing radioactive relativity?

Mr. PAPERIELLO. I would agree.

Dr. WESTPHAL. Senator, may I?

Senator CRAPO. Yes, Dr. Westphal.

Dr. WESTPHAL. As I understand it, and Dr. Paperiello, you can correct me on this if I am wrong, but in these sites the level of contamination that remains today in some of these sites has had over time, an opportunity to mix with clean soils, to be dispersed in the area.

So to some extent this material is dispersed and I suppose that is the reason that the NRC doesn't regulate this material. It is pre-1978. Post-1978 the material hasn't had those opportunities to disperse in soils and it is therefore much more dangerous to public health and NRC regulates that.

This is my understanding but you may have a different perspective.

Senator CRAPO. I note that my time has expired.

Senator BENNETT. We will have a second round on this.

Senator CRAPO. Thank you.

Senator BENNETT. Senator Boxer.

Senator BOXER. Mr. Chairman, I am going to probably need a couple of rounds. I want to just state that Dr. Westphal keeps saying, "The Buttonwillow site was permitted to accept up to 2,000 average Curies." They were not permitted by the Department of Health in California, to wit, a letter I ask unanimous consent to put into the record, dated July 1, 1999.

Senator BENNETT. Without objection.

Senator BOXER. "Dear General Ballard, Commander, Headquarters, U.S. Army Corps, The California Department of Health takes exception to the shipment and disposal of radioactive waste to the Safety-Kleen hazardous waste site."

It goes on to say, "For any facility not licensed or otherwise exempted by this department," meaning the Health Department, "to receive, store, dispose of any radioactive waste is a violation of California law and would subject the violator to potential monetary penalties and criminal prosecution."

They say, "For these reasons, the Department hereby gives notice that it will not approve or authorize any shipment such as that which has recently occurred at Buttonwillow and the Department

strenuously objects to the Army Corps transporting or authorizing transportation of radioactive wastes to unlicensed facilities.''

You have then subsequently told me you are not going to send it into the State unless the Department of Health signs off on it; is that correct?

Dr. WESTPHAL. Yes. I have instructed the Corps not to send any material to any State where they don't have in writing that the State agencies, whether there is one or in the case of California, in this case, maybe two agencies, have approved this.

Senator BOXER. Right now I am interested in this situation. The Department of Health never gave a permit, so when you talk about this being permitted, it is not correct. It was another agency and never went through the Department of Health.

I just want to confirm that you are not sending any more of this waste in there until and unless the Department of Health in California signs off on it. I will take it as a yes.

Now, when you talk about the testing, you said the Corps tests this material from the Manhattan Project. You don't test the material. A contractor tests the material, is that correct, before it goes off?

Dr. WESTPHAL. We have contractors that do that work.

Senator BOXER. You don't have any independent test? It is the contractor that cleans up the site that tells you what is in that waste; is that correct?

Dr. WESTPHAL. As I understand it, yes, Senator.

Senator BOXER. Well, that in and of itself, if we are looking at the law, I think is very, very important.

Mr. Paperiello, I want to say that I think I heard you say in answer to Senator Crapo, and I am glad if you said this, that you didn't see the rationale for having two different policies, in other words, if it is about a certain type of waste there ought to be one policy. Is that what you said?

Mr. PAPERIELLO. I said that all radioactive material that was the same element and the same concentration ought probably be regulated the same way. I recognize the legal system establishes distinctions. That is, as a physicist, I would say they are the same.

Senator BOXER. Thank you, because I think that is common sense. I think that is what the chairman is trying to get at.

Now, could you tell me what specific criteria are applicable for worker protection at a FUSRAP site as opposed to an NRC-licensed facility.

Dr. Paperiello, can you tell us the difference in terms of the safety?

Mr. PAPERIELLO. Well, at an NRC-licensed facility all the workers would be occupational workers. They can be exposed up to 5 rem per year, but this is essentially with their consent, informed consent, because we require the training of the workers, not only on how to protect themselves but what are the consequences of being exposed to radiation. Anything else, members of the general public, are only permitted to receive up to 100 milirem a year and again, there are various ways of parsing that down and we have done that.

On an occasional basis and as a practical matter, which usually involves family of medical patients, they can receive up to 500 milirem a year.

Senator BOXER. I am asking you, Are there different requirements at a NRC-licensed facility from a hazardous waste facility, FUSRAP?

Mr. PAPERIELLO. At a hazardous waste facility, in our view, the workers would be non-occupational workers and would be limited to 100 milirem.

Senator BOXER. I am interested in liability. Who will clean up sites? I will ask any of you to answer this. Who will clean up sites like Buttonwillow if radioactive waste leaks? We know the pre-1978 is covered under the other law because we now have two laws here, that the Department of Energy was responsible. But since the NRC interpretation is that waste generated after 1978 doesn't have to go to this.

But Safety-Kleen that received this waste just declared bankruptcy. They are going busto. Good call. Who is going to be responsible? Is it the Corps? Are we going to come back to the Corps if there is a problem? Is the Department of Energy still on the hook? Is the EPA on the hook? Who is on the hook? Do any of the three of you know? Who will mitigate the problems? Who has the long-term liability for this waste?

Dr. WESTPHAL. Well, Senator, first of all, the contracts do provide financial assurances as part of their contracting.

Senator BOXER. Who is responsible?

Dr. WESTPHAL. In this case, and I will have to defer a little bit to EPA, CERCLA is the law that guides the permitting of these facilities.

In the case of California, as I understand it, the EPA delegates that program, the RCRA program is delegated to the State, so it is a State agency that is ultimately responsible.

Senator BOXER. Oh, so the State agency is responsible even though you sent the waste when the appropriate State agency didn't give you a permit.

Dr. WESTPHAL. Well, you know, we have one bit of confusion here that I think is appropriate for all of us to fix. We talk about licensing and we talk about permitting. I was confused with that. I was using those words simultaneously and I find out that you can't.

When I referred to Buttonwillow as a permitted facility, what I was referring to is that the State has permitted this company to establish a landfill. The State has permitted the facility. That is what I am referring to.

Senator BOXER. Well, let me just say this, Mr. Chairman. Now I find out the State is responsible for this mistake. Not surprisingly, I am absolutely appalled. Under the old law, the DOE stood behind it. The Corps isn't going to stand behind this. They are going to say it is a State problem.

We have a letter from the State saying they had absolutely no say in getting this material into California, that the Corps goofed, they sent it in without proper permits and now the Corps says the State is responsible. This is one big mess.

The contractor went busto. They are gone. And it is going to be a huge fight if there is a problem. So if there is no other reason that this one, the liability question, we need to take another look.

Mr. SHAPIRO. Senator Boxer, could I add something?

Senator BOXER. It is up to the chair.

Senator BENNETT. Sure. Go ahead.

Mr. SHAPIRO. Under the provisions of the State permit there normally are financial assurance requirements that would be in place to cover the clean up and closure of the facility.

Senator BOXER. From who?

Mr. SHAPIRO. Those have to be provided by the company. As you have pointed out, Safety-Kleen has filed for Chapter 11 reorganization. They are still operating as a company attempting to reorganize.

If all else fails, the Superfund law is applicable. Superfund not only would provide the necessary authority for EPA to direct the clean up of the facility, but also to require compensation, not just from any remaining assets of the facility operator, if there are any, but also ultimately individuals or entities that send waste to that facility for disposal, which would include the Federal Government, if we contributed waste there, as well as a host of private companies that have sent waste to that facility.

So Superfund does provide broad authority to ultimately protect the public health.

Senator BOXER. So the Federal Government is responsible, in your opinion?

Mr. SHAPIRO. Ultimately we would be if there was no other source.

Senator BOXER. And the Corps is wrong saying the State is responsible.

Dr. WESTPHAL. No, I was referring to the permitting of the facility itself, that the State permits and provides the guidelines under which that facility would operate.

Senator BOXER. I am confused.

Senator BENNETT. In either event it is the taxpayer, Senator, whether it is the State taxpayer or the Federal taxpayer.

Senator CRAPO. Well, not under Superfund.

Senator BENNETT. Well, the taxpayer supports Superfund——

Senator CRAPO. Only when the fund is used. I mean Superfund allows the first take to be with the private sector.

Senator BOXER. I know. Unfortunately, we have a company that has declared bankruptcy.

Senator BENNETT. All right. Let me pursue another issue on the second round here.

Dr. Paperiello, there has been discussion about the average concentration of shipments. I am advised that FUSRAP waste from St. Louis send an NRC-licensed site concentrations of Thorium–230 as hot as 4,700 PicoCuries, but in a shipment with an average concentration of 1,500.

So if 2,000 were in fact the cutoff level, the shipment fell below that average. And yet there were concentrations as high as 4,700.

Can NRC perform its normal regulatory and enforcement responsibilities with respect to this material if it has no authority over

it? Someone else has to decide how hot is this particular thing and should it be separated.

Doesn't the Corps have authority over it because it was pre-1978 and you could know about his situation I have just described but not be able to do anything about it?

Isn't this a demonstration of how this is falling between chairs?

Mr. PAPERIELLO. Well, if it was pre-UMTRCA material it would not be under our jurisdiction. In terms of how you deal with the heterogeneous distribution, which is quite common, it would depend an awful lot on how the receiving facility was permitted.

I just don't know when a facility is permitted to receive material up to 2,000 PicoCuries per gram, whoever permits them, I don't know how they deal with the heterogeneity.

I wish I could give you an answer. I just don't know what they have done about that.

Senator BENNETT. Well, I think you can understand my concern here as a layman then. Let us say I am the CEO of the facility that is receiving this material. I am told, OK, it has an average concentration of 1,500 PicoCuries, so you can take it.

If I understand your question properly, I am responsible as the head of this facility, I am responsible to say, "Wait a minute. I can't take this particular truck load or car load or however it is shipped, because it is 4,700 PicoCuries."

I should stop that at the gate and say, "It can't come in, but the rest of it can?"

Mr. PAPERIELLO. Senator, let me deal with this the way we would deal with things that we license and we have to deal with heterogeneity and not homogeneous.

If I have a permit to receive 2,000 PicoCuries per gram, I would have to have an understanding with my regulator how they would let me average.

We have had a similar situation in our agency on disposal of radioactive gauges in low-level waste disposal sites. Well, you have a very radioactive source this big in a gauge.

Senator BENNETT. I am familiar with that.

Mr. PAPERIELLO. We have permitted averaging over the volume of a 55-gallon drum. But fundamentally, you do a risk analysis and say, "Really, is the risk, if this material were homogenized, any different than if it is a point source." We concluded for something like the gauges it is not a difference in risk. That is why we permitted it.

Senator BENNETT. I understand that. That is easy, to say "OK, we have 'x' number of gauges in this pile of material. As well as we make sure the gauges are not all lumped together in a single place, it is not a risk."

Is it my responsible as the CEO of the receiving facility to say, "I have to sort through this stuff as it comes in. We are not talking about gauges here. I have to sort through this stuff as it comes in to make sure that it is spread out throughout my facility in such a way as to take care of the risk?"

Dr. Westphal, does the Army Corps require that of somebody who comes in? Do you say, "OK, it is 1,500 PicoCuries, now you are responsible to make sure it doesn't aggregate so that one place where a worker or a leakage might occur it is 4,700 PicoCuries?"

Dr. WESTPHAL. I think I understand what you are getting at. I may ask Julie just to answer this question quickly, but because we were talking about how much more, if you are permitted in the State to receive an average amount, say 2,000 is the average, how much higher than that can it go? So if you have one sample that is that much higher, what limits it? I think there is industry guidance on that.

Ms. PETERSON. Well, not surprisingly, it is not an easy answer, like most of the answers given today. The laws governing averaging, they don't exist. They are disposal facility specific.

A general rule of thumb that we use is the three times rule. That is, there can be areas of elevated activity inside a single container. If that area of elevated activity is more than three times the acceptance criteria of the facility, in general that is considered unacceptable.

So for example, in the case of Buttonwillow we have an acceptance criteria of 2,000 PicoCuries per gram total activity. That is the average. If we have an area of elevated activity that is greater than three times that, greater than 6,000 PicoCuries per gram, in general that is not considered acceptable.

But there are not any rules out there on this. This is negotiated with the facility prior to shipment. It is negotiated with the facility's regulatory agency prior to shipment, just as the sampling regime is.

Senator BENNETT. I don't want to impose further on the time limit. Let me ask a question. If there is a quick answer, give it to me. If there is not, tell me and we will pass it.

Let us say, then, take Buttonwillow, you say the level is 2,000 and here comes a container that is 5,700 and that is pretty hot. Whose responsibility is it to deal with that 5,700? Should the Buttonwillow managers try to disperse that material and rearrange it in such a way that the container then goes down closer to the average or can they just say, "All right, as long as it is not over 6,000 we just bury it anywhere and it is done?"

Ms. PETERSON. No. The average activity in that container, with the volume of the container, cannot exceed 2,000. If the average activity in the volume of that container exceeds the 2,000 PicoCuries per gram average total activity, that container would be unacceptable. The facility has the ability to return that container to the waste generator.

Senator BENNETT. Senator Crapo, I need to understand that a little better, but go ahead, Senator Crapo.

Senator CRAPO. Thank you. Let me just try to clarify an issue that was discussed a little bit earlier and that is the issue of financial responsibility to handle these matters as they come up.

Mr. Shapiro, I think it is probably a question best answered by the EPA. You indicated that there are financial assurances provided by the managers of the facilities. Could you describe what that means and do they have to post bonds or what does it involve?

Mr. SHAPIRO. There are various mechanisms that are permissible and often States, in implementing RCRA regulations, may impose additional conditions and requirements, beyond what is required under RCRA.

There could be things like trust funds set up, bonds, insurance provisions. Any of those can be in certain instances self-insurance kinds of mechanisms can be used.

So there are a variety of options available to the regulating agency and the facility that is being permitted.

Senator CRAPO. But it is not just a promise that we will pay in the future. It has to be a financially guaranteed promise; doesn't it?

Mr. SHAPIRO. That is right.

Senator CRAPO. So that if the company goes bankrupt, the guarantee is still in place, either the insurance, the bond or whatever it is, it is still in place?

Mr. SHAPIRO. That is true in general. I think with respect to Safety-Kleen, and I don't know who the surety provider is for that particular Buttonwillow facility, but one of their principal providers of financial assurance was recently de-registered by the Treasury.

That does not necessarily mean their bonds are no longer secure, but it does present a question to regulators as to whether all of the assets could be available for assurance if they are backed by that company.

Senator CRAPO. The point is that it is not just an unsecured promise.

Mr. SHAPIRO. That is correct.

Senator CRAPO. It is a very well and usually solidly secure promise, isn't that true?

Mr. SHAPIRO. That is correct.

Senator CRAPO. Then as the next line of responsibility, the company itself would be on the line under Superfund; wouldn't it?

Mr. SHAPIRO. The company plus potentially companies that arrange for disposal of waste at that facility.

Senator CRAPO. So under Superfund they would be a responsible party that is potentially liable?

Mr. SHAPIRO. That is correct.

Senator CRAPO. And only at the point where a bond or a financial assurance failed, the managing company failed and all its assets were unavailable and the assets of any other responsible parties were unavailable, would you even then look to the Superfund itself, is that correct?

Mr. SHAPIRO. That is correct, although as you know, in some cases we use the Superfund money as sort of initial money to get work going.

Senator CRAPO. Then you would seek recovery of those Superfund dollars, wouldn't you?

Mr. SHAPIRO. That is right.

Senator CRAPO. In the remaining time that I have, let me get to what I think is the core question here. We have talked a lot about whether waste, similar waste should be treated similarly or not and as I see those charts you could use that argument to the extreme and say we should regulate every farmer and every person who has a garden in America by making them qualify as one of these storage facilities.

But the point that I think we have to ask ourselves here is are RCRA facilities adequately regulated to receive these FUSRAP ma-

terials that they are receiving under the law today and adequately protect the public health and the environment?

Mr. Shapiro, would you like to start?

Mr. SHAPIRO. Well, as I indicated in my statement, we think the design and operation of RCRA Subtitle C, hazardous waste facilities are designed to provide stringent protection against public and worker exposure to hazardous materials.

There are no Federal EPA requirements dealing with radioactive materials for those facilities. So additional protection, which we think is warranted, would have to be provided by the State agency permitting that facility.

EPA is aware that in a number of cases, including California, State agencies have imposed additional conditions on specific RCRA-C facilities and through those provisions have limited the ability for some of these facilities to accept low-activity radioactive materials.

However, EPA has not reviewed formally any of the State requirements, so we have not made our own determination about whether they are protective.

Senator CRAPO. Dr. Paperiello.

Mr. PAPERIELLO. Yes, it is our view that RCRA's facilities could probably receive a range of low-level radioactive material because in fact their design is very similar, not completely the same, as mill tailings sites.

So again, it is the question, as long as the range is limited, it could be safely disposed of.

Senator CRAPO. Thank you.

Dr. Westphal.

Dr. WESTPHAL. Well, as I understand it, the Department of Energy itself has disposed of this type of material in RCRA sites in the past. It is also my understanding that in many of these current sites they are already disposing of other similar types of material that are coming from the oil and gas industry, for example.

So I think EPA may be in the process of looking at the regulatory side of the nuclear part on these landfills and perhaps that is appropriate that it would affect more than just the FUSRAP program, it would affect other types of material that are currently going there.

I do believe that certainly what we have been doing and what I think we are going to do more stringently in the future, and the Army Audit Agency is helping us to identify ways in which to do this, is to improve our practices in which we assure that the facilities that the material is going to are properly permitted by the appropriate State agencies and have all those safeguards for not only the disposal of material, but also for the worker safeguards.

Senator CRAPO. Thank you.

Senator BENNETT. Senator Boxer.

Senator BOXER. Mr. Chairman, I want to make a couple of points for the record and then I am going to ask a question about cost.

First of all, an EPA official, John Frisco, who is an expert on this out in Region 9, disagrees with you, Dr. Paperiello, when he says that an NRC-licensed facility, he would say that is like an operating room, versus a hazardous waste facility, where some of the FUSRAP wastes are going, as a butcher shop.

So he certainly sees a heck of a difference between the facilities that the Corps is sending these materials to and they go all the way up to spent reactor fuel level, despite what might be said, as Senator Bennett pointed out. He sees a difference between these facilities.

Second point, Mr. Shapiro and Dr. Westphal, you may have given us really exciting news on Superfund because my reading of the law on section 101, section 22, excludes Superfund from handling this kind of waste.

So I hope you can direct me to the exact part of the law in Superfund that shows me Superfund is responsible for this kind of waste. Do you have that information on you? Can you cite the law? Please direct me because I have the law here.

Mr. SHAPIRO. I was just conferring with one of my staff. I think what you are pointing to is title two, which excludes certain UMTRCA facilities. But those are not the facilities that are the subject of the FUSRAP program. The FUSRAP program facilities are subject to CERCLA.

Senator BOXER. They are? Can you point to that? Not now. Show me in the law. Have they ever cleaned up a site that had nuclear waste on it? Can you cite those?

Mr. SHAPIRO. Has the Superfund program ever done it? Yes.

Senator BOXER. Tell me what those are.

Mr. SHAPIRO. I can provide you with a list after——

Senator BOXER. I am talking about a similar situation, a low-level waste. Has the Superfund come in and bailed out the taxpayers with private sector funding, etc.

I don't expect you to have that on the tip of your tongue. But when I read the law I don't see it the way you see it, so I need chapter and verse of where FUSRAP is covered by Superfund, No. 1, and No. 2, examples of where Superfund has cleaned up low-level nuclear waste.

Now, my question goes to cost. Corps officials have testified, Dr. Westphal, that disposal of FUSRAP material in NRC-licensed facilities is "more expensive by a magnitude of 2 to 10 times." That is not true.

I want to know when this gentleman made that testimony, was he unaware of the fact that existing contracts between the Corps and NRC-licensed and hazardous waste facilities have a cost difference of $19 per cubic yard. That is essentially a minor cost differential when you look at the transportation issue.

So I am curious as to why is this happening? Why are we being told it is 2 to 10 times when we have exact numbers here to show it is less than 25 percent and when you are adding transportation, it is even less than that.

Senator BENNETT. If you will yield, Senator, my understanding is that it is between 10 and 15 percent increased cost.

Senator BOXER. Ten to fifteen percent increased costs for all the safety of an operating room versus a butcher shop, to quote an EPA official.

Dr. WESTPHAL. Well, Senator, I don't have those figures. I will be glad to provide them for the record. I will tell you that in my involvement on this issue, and after speaking with you, I have basically taken the attitude within my agency that we are going to

deal with this issue first on the issue of safety and environmental protection and health effects, then we are going to assess that, and we are going to determine the economic impact after we do that.

[The requested information follows:]

The cost differential between using a RCRA Subtitle C disposal facility permitted to accept radioactive material and using an NRC-licensed facility under the Corps 1999 multiple award disposal contract is only $19.00 a cubic yard or 18%, for a common category of FUSRAP material. At the NRC-licensed facility the cost under the 1999 contract is $103.77 per cubic yard, while at the RCRA Subtitle C facility the cost is $84.50, which includes a $13.00 handling fee not applicable at the NRC-licensed facility. This $103.77 per cubic yard at the NRC-licensed facility under the current contract is a $45.73 or 30% reduction from the $149.50 per cubic yard which the same NRC-licensed facility charged for that category of material under a 1998 contract negotiated by the Corps primarily for use on Superfund sites, and it is a 52% reduction from the $215.00 per cubic yard which DOE was paying that facility to dispose of that category of material in 1997. The Corps believes that the difference between the price which DOE was paying in 1997 and charges for the same services under the 1999 contract is the result of the Corps policy to utilize alternative disposal when consistent with regulatory guidance and with protecting public health and the environment which increased competition to include RCRA Subtitle C facilities properly permitted to accept radioactive materials.

However, there are larger price differences between NRC-licensed facilities and RCRA facilities for one category of material, hazardous waste mixed with radioactive material. Even under the 1999 multiple award disposal contract, the lowest price for disposal of hazardous mixed waste at the NRC-licensed facility is $457.73 per cubic yard. For mixed waste debris, the cost may be as high as $968.80 per cubic yard at the NRC-licensed facility. For hazardous waste mixed with low-activity radioactive material that meets the RCRA Subtitle C acceptance criteria, the lowest cost for disposal is $110.00 per cubic yard, including a $13.00 handling fee not applicable to the NRC-licensed facility. For mixed waste debris, the cost may be as high as $168.00 per cubic yard at the RCRA Subtitle C facility, including the $13.00 handling fee.

Senator BOXER. That is good. Take a look at your own contracts. That is how we got the number. We asked to see it. If we can look at your contracts and we can add up the difference, you can do it, too.

The point I am making is I am glad to see you putting health first, but I also want to say to you that if you look at the numbers, what the Corps testified to, 2 to 10 times more, that was Corps Chief Counsel, Robert Anderson. Maybe he is here. His testimony before the Subcommittee of the House Appropriation is incorrect.

If you tell House members who are fiscally concerned that it is a 2 to 10 times more number, some people, not you, Doctor, not I, would say, ''Well, the money has to play a role.''

What we are saying is that we have looked at specific bids from specific companies and you have the numbers and we don't see that difference.

I see that my time is up. I would ask if I might put the rest of my questions in writing to Dr. Westphal and ask that I receive answers within a week or 10 days, if that is possible.

Dr. WESTPHAL. Senator, may I finish one answer to the Senator's questions?

Senator BENNETT. Sure.

Dr. WESTPHAL. Senator Boxer, we know that obviously competition plays a factor in the cost and there are more RCRA-type facilities than there are NRC-licensed facilities. So that is probably related to the answer that you got.

I have asked the AAA, as I mentioned earlier in my statement, to do an assessment of the disposal of this material in the California site. In addition to that, I came back a few weeks later and asked AAA, the Army Audit agency, to also look at our contracting and business practices and to take a look to make sure that the procedures and the processes and the activities the Corps is employing here are appropriate to the site.

Now, that is not to make determinations that AAA is not capable of making determinations about the regulatory aspects of this material. They are not scientists. They are auditors and accountants.

Senator BOXER. Are they having public input, the AAA? That is not the Automobile Association of America, for the interest of the audience. It is the Army Audit Agency. Are they taking public input?

Dr. WESTPHAL. No. They go in. They interview a lot of people involved in the project.

Senator BOXER. Well, the answer is they are not. I just need to know.

Dr. WESTPHAL. No, there is no public comment period. It is an independent review.

Senator BOXER. Mr. Chairman, thank you. I want to thank the panel. I still say, "get rid of that waste in California because now there is no one for the folks to go to if there is a problem."

Senator BENNETT. We thank you all. We wish we had more time. If I might, I kind of conclude where I began, the question of who regulates the facility if the material is pre-1978 is still very murky, at least in my mind.

All of these questions about safety and PicoCuries and levels are important and it is worthwhile that we have spent the time that we have talking about them, but Dr. Paperiello, as you have said, from a scientific point of view, there is no difference whatsoever between 1978 waste and we as a government have allowed that issue to fall between the stools.

I am hoping, if not in this Congress certainly in the next, we will come to grips with that and end up ultimately with a system that is based on sound science and that says we don't differentiate in an artificial way on the basis of dates how we handle material.

We do, Dr. Westphal, which you say you are trying to do administratively, put health, safety and science first, and not worry about when the waste was generated.

Unfortunately, we in the Congress have created this anomaly. I think it means ultimately from this panel this morning that we in the Congress have got to step up to the responsibility of resolving it.

Thank you all for your testimony. We appreciate your time and the responses you will make to the written questions you will receive.

Senator BENNETT. We will now go to the second panel. We want to advise the people in the second panel that you will not be here as long simply because we don't have the time.

Now, in the interest of time, we will, as we did before, ask each of you to introduce yourself rather than my going through each of your histories. Although we do note that Mr. Slesinger used to be

a staffer of this committee, so we welcome you back home, if you will.

We will go again in the order in which you are seated—Dr. Scott, Mr. Adelman, Mr. Slesinger, and Mr. Thompson—and ask you each to observe the 5-minute rule as we go along.

Dr. Scott.

STATEMENT OF MAX SCOTT, PROFESSOR, LOUISIANA STATE UNIVERSITY

Mr. SCOTT. Thank you, Mr. Chairman. My name is Max Scott. I am an Adjunct Associate Professor of Physics and Astronomy and the System Radiation Safety Officer at Louisiana State University.

I have a Bachelor of Science degree from Texas A&M University, a Master's and Doctor of Philosophy degree from Purdue University. I am a certified health physicist and a Fellow of the Health Physics Society.

I have worked as an applied health physicist for over 39 years. For most of that time I have been involved with radiation safety issues relating to naturally occurring radioactive material and material similar to the majority of FUSRAP waste.

The views I express today are solely mine. Mention Three Mile Island or Chernobyl and most everyone can identify them. Mention Texas City and most likely people will identify a city in Texas. Over 500 people died in Texas City as a result of a ship that exploded, which was loaded with ammonia nitrate. Yet we routinely ship ammonia nitrate. I do not mean to belittle Three Mile Island or Chernobyl, but to emphasize the fact that there are risks in all human endeavors. For reasons that are not clear to me, anything associated with radiation appears to be reported more frequently and more intensely than other real or potential hazards.

Such reporting has engendered an undue fear of radiation and the potential health effects of exposure to radiation. I believe that we need to protect and provide for a safe environment and provide the degree of protection commensurately with the scientifically defined risk, not some perceived or extrapolated risk.

My goal today is to attempt to set out what I feel are reasonable approaches for the disposal of NORM waste and most FUSRAP waste. The alpha particle that is emitted when an atom of internally deposited Radium–226 decays does not know whether the radium atom originated in water treatment plant waste, a phosphorogypsum stack, a FUSRAP site or scale from petroleum production tubulars. If it has the potential to cause harm from one source, it has the potential to cause harm from all sources. NORM and most FUSRAP waste can be treated in a similar manner.

As a general philosophy, I subscribe to the proposed EPA guidance on radiation protection of the public. However, from a practical standpoint I believe the National Council on Radiological Protection and Measurements have prescribed annual limits from manmade sources, which are applicable. They are one millisievert per year continual exposure and five millisieverts per year for infrequent exposures.

The current regulations covering the disposal of NORM waste and FUSRAP waste are not consistent. For example, Michigan al-

lows bulk waste containing up to 50 PicoCuries of Radium 226 to be disposed of in Type Two solid waste landfills.

Uranium mill tailings containing unlimited quantities of Radium–226 can be disposed of by burial. Typical quantities range up to a few hundred PicoCuries per gram.

The Environmental Protection Agency has published guidelines for the disposal of Radium–226 in water treatment plant waste. Thereby, up to 2,000 PicoCuries per gram Radium–226 can be disposed of in facilities comparable to those developed under RCRA.

The Corps of Engineers has proposed and the Nuclear Regulatory Commission has given tacit concurrence for the disposal of FUSRAP waste in RCRA disposal facilities, dose to be limited to one millisievert per year.

In my opinion, there are two approaches whereby NORM and most FUSRAP waste can be disposed of so that the environment and the public are afforded adequate protection.

No. 1, dispose of the waste in Subtitle C and D, RCRA facilities at concentrations so that the average dose to an individual member of the public does not exceed one millisievert per year with a maximum dose not to exceed five millisieverts per year. Guidance should be provided to assure that the dose estimates are made using reasonable and practical exposure scenario.

No. 2, use the EPA guidance for disposal of water treatment plant waste utilizing municipal landfill and RCRA-type facilities.

I encourage you to draft and support legislation, which will provide for methods for the disposal of NORM waste and most FUSRAP waste in a practical and uniform manner utilizing RCRA-type facilities.

Thank you for the opportunity to express my views.

Senator BENNETT. Thank you, sir.

Mr. Thompson.

STATEMENT OF ANTHONY J. THOMPSON, ATTORNEY, URANIUM RECOVERY INDUSTRY

Mr. THOMPSON. Thank you, Senator. Thank you for the opportunity to appear before you. I have represented the domestic uranium industry during the development of the Uranium Mill Tailings Radiation Control Act and all of the regulatory proceedings at EPA and NRC subsequent to that and I currently represent probably a majority of the uranium recovery licensees.

So I am very familiar with the uranium recovery program and 11e.(2) byproduct material.

I respectfully submit that the issues here have been somewhat obfuscated and I regret to say that it is NRC that has obfuscated these issues in responses to the Hill.

The issue here is not whether it is pre-1978 or not. The issue of whether something is byproduct material is determined by the definition of 11e.(2) byproduct material that was promulgated by Congress in the Uranium Mill Tailings Radiation Control.

It doesn't depend on the concentration of radium or other radionucleides in the material or of the volume of the material. It is based on a definition.

Obviously, at the time the Mill Tailings Act was passed in 1978 all of the mill tailings in existence were pre-1978 mill tailings.

Let me refer you to page 1 of NRC's testimony. They say they were not directed to exercise regulatory authority over byproduct materials that existed prior to the Mill Tailings Act. Certainly not at DOE sites because DOE is a successor to the Atomic Energy Commission who along with NRC had authority and testified during the Mill Tailings hearings that it was going to clean up the FUSRAP sites.

The problem is that there is a leap here in NRC's logic. That comes on page 6. NRC acknowledges that DOE is going to clean up FUSRAP materials under its Atomic Energy At authority. On page 6, NRC says that "These tailings produced facilities such as FUSRAP sites, not under NRC-licensed at the time or thereafter, have not been regulated by NRC based on understanding NRC's authority does not extend to such facilities and therefore we can send them to a RCRA facility."

There is a leap there that is not explained. If the material is 11e.(2) byproduct material, then it must go to an Atomic Energy Act licensed facility.

Let me examine the record of NRC for just a moment. In 1980 when NRC promulgated the regulations that are implementing UMTRCA, they included a provision 40.2(B) that says,

> The commission will regulate byproduct material as defined in this part that is located at a site where milling operations are no longer active if such site is not covered by the Remedial Action Program of Title One of the Mill Tailings Act.

That doesn't say NRC-licensed facility. In fact, if you read that, it probably looks to preserve the flexibility, if they found an orphan site, that NRC could go in and require them to be a byproduct material license. They do that now.

If there is a mineral production facility in a State that creates source material NRC will come in and make them get a source material license.

Second, in a Federal Register notice in 1992, NRC stated in discussing FUSRAP wastes,

> Government contracts were issued for thorium source material used in Manhattan engineering district and early Atomic Energy Commission programs.
> Waste resulting from that processing disposal at these FUSRAP sites would qualify as 11e.(2) byproduct material.

DOE, in EM–0233 in April, 1995, in discussing FUSRAP material says,

> Waste types of FUSRAP sites. Much of the material resulting from processing or recovering uranium and thorium. This waste is a byproduct material known as 11e.(2) as defined under the Uranium Mill Tailings Radiation Control Act of 1978.

Now, if as DOE has said, it is 11e.(2) and NRC has said it is 11e.(2), why hasn't NRC addressed the issue of section 81 of the Atomic Energy Act which says,

> Section 81 provides that no person may possess, own, produce, transfer or receive 11e.(2) byproduct material without obtaining a license or other authorization from NRC.

So if this material is in fact 11e.(2) byproduct material, if it isn't at a DOE site or taken to another DOE site, it has to be taken to an NRC-licensed facility. A laboratory, if you send byproduct material to analyze it, cannot analyze a cupful of it unless it has a license.

Second, we submit, this is the uranium recovery industry, that section 83 doesn't say anything about a temporal limitation on byproduct material. The definition of 11e.(2) byproduct material doesn't say anything about a temporal limitation. It merely says if you have byproduct material now, you are going to have to do certain things with it in the future.

NRC has not addressed those as we have raised them with them in a number of contexts at the agency. If we are going to say now that risk of one is equal to risk of the other, then we are going to throw these definitions out.

OK, if you want to throw the definitions out and start clean, that is one thing. But keep in mind, the Congress that EPA and NRC developed this regulatory program for, based on their clear interpretation of the Mill Tailings Act, that they were supposed to be very conservative standards.

You have a thousand-year design requirement, no active maintenance, and you have a mandatory governmental custodian under the Mill Tailings Act. Those are the significant differences from a RCRA facility. Those cost lots of money. The U.S. Government has appropriated and DOE has spent $1.5 billion on Title One sites.

To close those sites in accordance with that one thousand-year design criteria, the Uranium Mill Tailings licensees under Title Two have spent hundreds of millions of dollars and are in the process of spending hundreds of millions more, to satisfy those design standards.

So if we are going to throw it out and say you can just send it to a RCRA facility that has a 30-year post-closure regulatory horizon, I think our people are going to want to come and look for some of their money back.

Thank you very much.

Senator BENNETT. Thank you, sir.

Mr. Slesinger.

STATEMENT OF SCOTT SLESINGER, VICE PRESIDENT, GOVERNMENTAL AFFAIRS, ENVIRONMENTAL TECHNOLOGY COUNCIL

Mr. SLESINGER. Thank you, Senator Bennett, Senator Boxer. My name is Scott Slesinger. I am vice president for Government Affairs of the Environmental Technology Council, a trade association that represents the leading companies involved in hazardous waste treatment, recycling, and disposal in the United States and Canada.

Our members operate 20 Subtitle C landfills in the United States, 3 of which have been selected by the Corps to take radioactive waste from the FUSRAP program.

Today I would like to address four issues. First and foremost, these landfills have been specifically sited, designed, constructed and permitted to dispose of a wide variety of low-activity radioactive waste often called NORM or naturally occurring radioactive material waste such as those produced during oil and geothermal explorations.

The acceptance of low-activity waste at these facilities is not an afterthought. These facilities were designed with this type of waste in mind.

At present in RCRA regulations these highly engineered and highly regulated landfills contain redundant detection and monitoring systems that have been proven so effective in protecting human health and the environment that they have become the gold standard for the world.

The primary concern of any RCRA landfill, be it just hazardous waste or one that takes low-activity radioactive waste, is to prevent any possible contamination of ground water.

RCRA landfill disposal cells are constructed with sophisticated liners and cap systems, which include multiple layers of natural clay and synthetic liners, supplemented by systems for removal of precipitation and for leak detection.

Also in Subtitle C landfills they have multiple systems that monitor and capture all leachate produced in the cells and pump it out for treatment. These engineering controls are in addition to the environmental considerations that originally led to the siting of these three facilities in arid conditions with annual rainfall that is less than the annual evaporation.

As a result of this combination of careful siting, sophisticated design and construction and redundant monitoring and leap detection systems, these facilities do not pose a threat to ground water.

In fact, when NRC looked at designing facilities, and were told by Congress to look at how RCRA's facilities were designed or how they should look at NRC facilities.

Second, look at the FUSRAP waste itself. This waste is radiologically similar to other low-activity waste that had been disposed at RCRA facilities for more than a decade. Remember, the FUSRAP waste we are talking about is primarily soil, concrete rubble, lumber and asbestos insulation, waste with low mobility.

Much of the historic wastes disposed at these sites are actually higher in radioactivity than the FUSRAP waste.

Third, each of the landfills that receive FUSRAP waste have strict State limitation on the level of radioactivity they can take. These facilities cannot and do not want to take low-activity radioactive waste that requires an NRC license.

The permit limitations the States have imposed on these are conservative in recognizing guidance prepared by the Conference of Radiation Control Directors which required it or who policy since 1990 is that waste above 2,000 PicoCuries of uranium, thorium, radium and other radionucleides should go to NRC-licensed low-level based repositories.

Furthermore, we understand that EPA in an unrelated rulemaking has completed a risk assessment comparing NRC-licensed low-level disposal sites, with RCRA Subtitle (C) facilities.

Using very conservative estimates in a 10,000 year model, EPA's analysis showed that Subtitle C facilities and NRC-licensed low-level waste disposal facilities are equally protected, at least with the isotopes and the radiation levels allowed in our RCRA permits for FUSRAP waste.

A word about employee safety. Employees of RCRA Subtitle C facilities are fully protected by specific safety training and health monitor standards established by OSHA for hazardous waste operation that include specific standards for protecting workers from exposure to radiation hazards.

Worker protection elements include personal dosimeters, medical surveillance of all field personnel, mandatory use of respirators to protect against the inhalation of alpha particles, NORM training with annual updates, monitoring of all NORM-related receiving and disposal operations using three different types of handheld radiation monitors.

I would like to respond to one point from Senator Boxer's opening statement. Hopefully during the questions and answers I will have time for more.

Safety-Kleen, one of our companies, mentioned this morning, has filed for Chapter 11 protection to reorganize the company's finances. It is important to remember that Safety-Kleen's financial assurances for closure and post-closure of the Buttonwillow facility remain in place and in force and that employees are still serving their customers, all of whom send their waste to our facilities to protect them from Superfund.

Most of the wastes that we get come to our sites because we assure our customers that their wastes will be properly handled. That is not changing at Safety-Kleen, even though we are going through reorganization.

Mr. Chairman, thank you for the opportunity to present our views. We look forward to your questions.

Senator BENNETT. Thank you.

Mr. Adelman.

STATEMENT OF DAVID E. ADELMAN, STAFF ATTORNEY, NUCLEAR PROGRAM, NATURAL RESOURCES DEFENSE COUNCIL

Mr. ADELMAN. Just let me thank the committee for giving me the opportunity to testify today. My name is David Adelman. I am a staff attorney and scientist with the Natural Resources Defense Council, based in Washington, DC.

I have a Ph.D. in Chemical Physics from Stanford University and a J.D. also from Stanford Law School. I am a member of the Environmental Management Advisory Board for the Department of Energy.

I want to begin by just setting out the major points I want to make. First, regulation of radioactive materials should not be contingent on the date on which it was generated. All FUSRAP radioactive materials should be treated consistently by disposing of them in NRC-licensed facilities.

Second, it is established law that the definition of radioactive byproduct material adopted by Congress in 1978 extended the NRC's regulatory authority over all wastes resulting from the extraction or concentration of radioactive source materials, i.e., all FUSRAP wastes.

Third, under the NRC's reading of the law, no Government entity has authority to regulate pre-1978 radioactive byproduct wastes. State authority is preempted by the Atomic Energy Act.

The EPA cannot regulate it under the Resources Conservation Recovery Act.

These people mentioned that FUSRAP began in 1974 to clean up the Manhattan Project error sites and involves removing and disposing of large quantities of hazardous and radioactive wastes.

One thing I would like to say here is that currently the Government is spending literally millions of dollars to clean up these sites, to remove these hazardous and harmful materials.

To claim that they are innocuous in some sense and at the same time to be expending large sums of money to clean up these facilities is a disconnect, to say the least.

The Corps took over the program in 1997 and estimates that there are about two million cubic yards of radioactive waste at all sites that were remediated.

So far, the Corps has disposed of approximately 2,200 tons of radioactive wastes at the Safety-Kleen facility in Buttonwillow, CA, another 150,000 tons at the EnviroSafe facility in Grand View, ID, both facilities only have RCRA Part C permits.

The NRC acknowledges that FUSRAP waste is byproduct material under the AEA. It claims however that because this waste was generated at unlicensed sites prior to 1978, disposal at a licensed facility is not required.

This is a highly formalistic argument that makes no sense legally, practically or technically. As a basic matter of policy, regulation of radioactive waste should be based on its hazardous characteristics, not when it was generated.

Congress adopted a new definition of radioactive byproduct material in 1978 to extend NRC's regulatory authority over all radioactive wastes generated in the course of the nuclear fuel cycle.

The statute's references to active and inactive sites, events, Congress's clear intent that the Act applied to pre-1978 wastes furthermore, in the leading legal case, Kerr-McGee, the court found that the purpose of the 1978 revision was to close a regulatory gap for all uranium and thorium mill tailings not previously regulated.

The governing case law is patently clear that all byproduct material is subject to NRC licensing unless it is managed by the Department of Energy.

Under the NRC's reading of UMTRCA, Congress intended the absurd result that no government entity would have the authority to regulation pre-1978 byproduct materials. As the Supreme Court has held, the AEA preempts States from exercising regulatory control over byproduct material while EPA is precluded from regulating such materials under RCRA.

It is inconceivable that Congress intended such a nonsensical result, namely effectively precluding the regulation of radioactive materials it has expressly found to pose significant threats to human health and the environment.

The NRC's position is counter to basic common sense and technical reasoning. There is no basis to distinguish between pre-1978 FUSRAP wastes from wastes generated after 1978, whether legally or scientifically.

This fundamental inconsistency prompted the Conference of Radiation Control Program directors formally to recommend that the NRC reverse its positions on this issue because it results in such waste being unregulated altogether, and also criticized the Corps management of radioactive materials.

Along with the absence of proper regulatory authority, disposing of radioactive wastes at RCRA facilities raises significant environmental concerns including inadequate monitoring and worker pro-

tection methods and regulations, and far weaker long-term institutional measures to prevent future releases and finally failure to provide an adequate public participation process.

The NRC and the Corps are propounding a fundamentally irrational reading of the AEA solely to save the Corps some money, allegedly. Along with being contrary to established law facing regulatory decisions governing radioactive waste disposal, solely on when the waste was generated, elevates erroneous legal rationalizing of their substantive health and safety issues and regulatory consistency.

For these and other reasons, Congress should clarify that UMTRCA requires all byproduct material to be disposed of at properly licensed facilities.

Thank you very much.

Senator BENNETT. Thank you.

I have to leave to go to a conference committee where I am the chairman of the Senate side. Senator Crapo will be rejoining us in a moment, I understand.

But let me just ask the other three members of the panel, Mr. Adelman has summarized pretty dramatically the regulatory situation saying Congress ought to clean this up and that the position of the NRC, you used the word "irrational."

Mr. ADELMAN. Yes, sir.

Senator BENNETT. Do the other three take exception to that?

Mr. SLESINGER. I would like to make one or two comments. First, we think that there is no logic to the 1978 date. We agree. We think the Congress needs to relook at the issue and essentially set a PicoCurie limit, not limits based on which category it comes under. That would make sense.

We also think, and we have a brief that is attached to our testimony, that Congress knew what it was doing and there was logic in 1978 when they made the pre- and post-1978 distinction but I don't think that is important today.

One thing I do disagree with in what Mr. Adelman said, and which I believe contradicts what is in EPA testimony and what all the States believe and that is there is what is called "omnibus authority" under RCRA for the States to put any other conditions they want in their permits, including limiting the number of PicoCuries.

So I don't think there is a gap. I think the States have the authority and can use that authority to allow and protect radioactive wastes from being disposed of anywhere.

Senator BENNETT. Do either of you want to make a quick comment?

Mr. THOMPSON. I guess my view is, as I said, that NRC's position on this issue has been inconsistent, but you can't say it is byproduct material and then say it is not subject to the Atomic Energy Act. I mean that is just not—and if you want to say we ought to look at risk versus definitions, that is fine.

You would have to do that with RCRA, too, because you have listed waste versus characteristic wastes. There may be no difference in the risk, but they are treated differently. So it is fine to take another look at it. Just recognize the NRC right now is inconsistent.

Senator BENNETT. Thank you.

Dr. Scott.

Mr. SCOTT. My only comment would be that there ought to be consistency. Dr. Paperiello pointed out that if it is a hazard, it is a hazard. To regulate it here and not there is ridiculous.

I would like to make one point concerning this chart up here. Most of the FUSRAP waste falls down on the lower end of the low-level waste. Low-level waste is a definition, not a measurement.

So to think that we are talking about FUSRAP waste being way out to the right end is incorrect. Thank you.

Senator BENNETT. Thank you for that clarification. My apologies for having to leave. Senator Boxer.

Senator BOXER. I think a point to be made, Dr. Scott, is one shipment of low-level waste may get you to that point, but if you keep getting more and more exposure, clearly there is a definition here.

You can't argue with that. You could say what you think, but the fact of the matter is, it would qualify as low-level if it went all the way to the right line.

Let me just say a couple of things here. You know this whole idea of this artificial date, and I have to say, Mr. Thompson, you made the best point about it, and you are from the uranium industry, you want the safest disposal. Your testimony bears tremendous weight with me because you are the ones that have to deal with it if it is a problem.

This whole business about Superfund, Mr. Slesinger, let me give you a little heads up on this point. If you are counting on Superfund bailing out some of your clients, you should know that there are approximately 1,200 sites that are on the Superfund list. Half of them have been cleaned up, but there are as many as 1,400 other toxic waste sites that qualify for placement on the list but haven't been placed on the list yet.

So just to let you know, changing this liability situation, if in fact Superfund does apply, which our EPA friends are going to let us know, because my reading of the law says it may not, but they are going to check it out. But even if it was a fact, that is relying on something that is big trouble.

So I think, you know, we need to go back and look at the way we treated this waste. But it reminds me, if you got sick in 1990, let's say, and there was suddenly a prescription drug that was available and you said, OK, if you got sick after that date you can get that good prescription drug, get the best there is. But if you got sick before that date, you can't get that prescription drug.

To me, you are looking at a difference here between handling the waste in one very safe way and another way where there are absolutely no government independent tests showing it is safe.

Mr. Slesinger, you talked about your customers. Who are your customers? You got very excited about your customers. Who are your customers?

Mr. SLESINGER. Out customers are most of the chemical companies in the United States, pharmaceutical companies, the Environmental Protection Agency where we get waste from Superfund sites, the Corps, of course, and other people who create hazardous wastes.

Senator BOXER. OK. Well, my customers are the people who live around these places, OK? They are my customers. They have absolutely no input into what happened at Buttonwillow, none at all.

I hope the company survives because if there is trouble, we are going after them. But they may not. You can go back in time. I looked at a number of these sites. A lot of your customers aren't around when the trouble starts.

So I hope for the sake of the people who live in my State that the company does survive. I hope they survive.

Now, in your opinion, were the workers at Buttonwillow told that they were receiving low-level nuclear wastes there before it came?

Mr. SLESINGER. They never received low-level. They received low-activity radioactive waste.

Senator BOXER. Were they ever told they were receiving low-activity radioactive waste because in my State they talk about low-level, but OK, use your term. Did they know they were getting some uranium? What were the other things? Uranium, radium, did they know that? The workers, were they told that?

Mr. SLESINGER. They were because they had been receiving it for over a decade from the oil industry, which has been sending drill scale——

Senator BOXER. Would you send me the documentation because we were told the workers were not told about this shipment, this particular shipment.

Mr. SLESINGER. I don't know if they were told about this particular shipment, but I will check with the company and see what I can find out.

As I said, the radioactive and the risk of the materials that came from the FUSRAP site were no different from the oil industry waste.

Senator BOXER. Then why did they have to go and get a permit if there was no difference?

Mr. SLESINGER. Because since they have had the permit——

Senator BOXER. They got another permit.

Mr. SLESINGER. The permit always said that they could take radioactive waste up to 2,000 PicoCuries.

Senator BOXER. They got a permit from the Department of Toxic Substances. The problem they had was they did not get one from the Department of Health. The Department of Health in California said, "Don't send it."

I mean you sit here and say this waste is lovable and wonderful. You know, I respect your view. I happen to agree with the view of Mr. Adelman on the point and I happen to agree with Mr. Thompson who says, "Look, we have done well with the program, there is no rationale to change it, but you have a different view, I am sure based on science; right?" Let me finish my point.

I am telling you that the Department of Health said stop sending this stuff. They don't look at it the same way as oil. Maybe you do, and that is fine. But can you point to one study that has been done on low-level waste that shows it should be handled the way you suggest?

Mr. SLESINGER. There have been a lot of studies on radioactive waste of the same isotopes and level of PicoCuries.

Senator BOXER. Government study?

Mr. SLESINGER. Yes.

Senator BOXER. A Government independent study. Can you direct me to it?

Mr. SLESINGER. I said the risk assessment that EPA has just completed for its mixed waste rule looks at this issue.

But I want to agree with you, Senator Boxer.

We don't say this stuff is safe and you want to roll around in it. It is dangerous. It needs to be properly handled. It is just as dangerous as the oil industry radioactive waste. It needs to be handled exactly the same way. If it is under 2,000 PicoCuries, our facilities are proper for that type of disposal.

Senator BOXER. Well, Mr. Chairman, let me just say, you maybe read the testimony, but Mr. Thompson, who is from the uranium industry, makes the point that there is absolutely no rationale for treating the waste differently by picking out a year.

I think that is where the chairman and I are coming down. He feels that the system is working with the NRC-licensed facility. It bears a lot of weight because he has got a lot of the waste.

I wanted to thank the panels because I know we are going to adjourn pretty soon.

We have had a disastrous experience in my State, quite clearly Senator Crapo has not had such an experience in his State. We have a situation where the people who live around the site are not happy with what has happened.

They don't understand why all of a sudden they are being exposed to this. They don't want to roll around in it. It was sent there without proper permits. I am just very hopeful that we can come up with some consistent policy here because it doesn't make sense to pick out an arbitrary date. We could do that in our lives and it just doesn't make sense. It is an arbitrary situation.

Again, relying on Superfund to come up and clean up the mess is a bad bet, because the program itself is way behind and I think we had a much better set up when we had the DOE rules. It just made sense. DOE stood behind it. They stand behind it. We are going to have one big mess on our hands if we don't straighten this out.

So I look forward to working with Chairman Bennett on this. I want to thank the entire panel. Whether I agree with you or not, I appreciate hearing your views.

Thank you very much, Mr. Chairman.

Senator CRAPO [assuming the chair]. Thank you very much.

First of all, let me say to the panel I apologize that I wasn't here to hear all of your testimony. I did have an opportunity to hear some of it on the TV screen in the back during an interview that I had to step out for.

I do have a couple of questions. I want to follow along just on the rationale of whether the fact that a radioactive material has the same level of comparative radioactivity means that it should be regulated entirely the same.

Mr. Thompson, again, I haven't yet had a chance to read your testimony, but I will. It is my understanding that you indicated that with regard to—and I am looking at the chart, still—I am assuming that what we are talking about is the 11e.(2) byproduct material. Am I correct there?

Mr. SLESINGER. Yes.

Senator CRAPO. If the 11e.(2) byproduct material is the same, are you saying it is the same because it is the same level of comparative radioactivity?

Mr. THOMPSON. What I am saying is that 11e.(2) byproduct material is based on a definition rather than even a level of radioactivity in it or the volume of the material. It is based on a definition that is based on the Atomic Energy Act. If you satisfy the definition, you are 11e.(2) byproduct material.

There is no *de minimis* quantity. There is no *de minimis* concentration. There are more materials that contain radium concentrations that are virtually identical with 11e.(2) byproducts.

Senator CRAPO. But they are defined differently in another Federal statute.

Mr. SLESINGER. They are not defined as Atomic Energy Act materials, therefore they are treated differently. On a risk basis, I would agree that they are the same type of materials.

Senator CRAPO. The same as what is called "low-level waste" on our chart there?

Mr. SLESINGER. Many of them are exactly the same kinds of materials that are similar in terms of radioactivity with the NORM wastes and things like that that are not covered by the Atomic Energy Act. It is based on a definitional difference.

Senator CRAPO. So if we follow the rationale that if they are not distinguishable based on their radioactive risk they should be regulated the same, then should we change the entire regulatory scheme that governs all of these wastes that are identified there on the chart so that as you look at each level of waste with a level of radioactive risk, and I assume we could create ranges, then we should have an entirely new regulatory regime that evaluates them in terms of radioactive risk rather than whether they are TENORM or exempt source material or low-level waste or 11e.(2) byproduct material?

Mr. THOMPSON. I understand that Senator Bennett and Senator Inhofe have suggested that we ought to take a look at that. I certainly wouldn't object to that. I wouldn't object to that at all.

It seems to me you would have to do this in hazardous waste areas as well because listed waste, as opposed to characteristic hazardous waste and chemical fields are based on definitions also, not on risk.

Senator CRAPO. The point here is that they are all based on definitions on different statutes.

Mr. THOMPSON. Yes, sir.

Senator CRAPO. And yet they all have certain characteristics that could be argued to be similar.

Mr. THOMPSON. They could be regulated the same way, yes, I would agree.

Senator CRAPO. If we took that line of reasoning, would it be correct to say that, I assume that nobody is going to suggest that we regulate soil in this way——

Mr. THOMPSON. No.

Senator CRAPO [continuing]. In this way, that we make any person who has any home garden, a farm, a plant or a place on the

earth get a permit, so that they can exist on the soil. I don't think anybody is taking that position.

So if that is true, would we take that segment which is identified as soil and run it down the chart there and say that we would not want to regulate low-level waste, TENORM or exempt source material that is down interest the category of risk of soil?

Mr. THOMPSON. Well, it wouldn't be TENORM if it was just soil. That is technologically enhanced, sir.

Senator CRAPO. According to that chart there, there is some TENORM that has the same level of radioactive risk as soil.

Mr. THOMPSON. But the difference is that the radiation levels have been enhanced in TENORM through some industry activity. But I would agree, you wouldn't regulate soil or would you regulate farming because farming creates more radon in the environment than any other single activity in life.

Senator CRAPO. I have actually had regulators tell me that we should regulate farmers because their wheels kick up dust and therefore they should all be required to bet an air quality permit. This was an air quality issue that they were talking to me about.

Mr. THOMPSON. Crazy.

Senator CRAPO. So the point that I am raising here is not entirely just an extreme point to make a case. There are people who would say this. So I want to make sure we all understand what we are talking about here.

Now, let us assume that we go beyond the soil level here. If we are going to start regulating in terms of comparative radioactive risk, that one category of low-level waste has a pretty broad band there.

Would you break that category up?

Mr. THOMPSON. It is broken up in a sense. There are Class A, B, and C wastes and they depend on the activity levels. You have more stringent requirements for the more radioactive wastes.

Senator CRAPO. Then we would do the same thing for TENORM?

Mr. THOMPSON. Yes. In fact, in 1983, EPA proposed to regulate, if you will, TENORM that exceeded 2,000 PicoCuries per gram by sending it to low-level radioactive waste facilities.

Senator CRAPO. Instead of just the narrow proposal that I think Senator Bennett is talking about of changing the date for the 11e.(2) byproduct material, if we undertook a massive overhaul here, would you think that would be appropriate? Should we do that if we look at this issue?

Mr. THOMPSON. I would think it made sense to look at an overhaul. Base it on a risk basis. It is going to be a big project.

Senator CRAPO. Mr. Adelman, would you agree with that?

Mr. ADELMAN. Environmentalists have argued for a long time about rationalizing this system of regulating radioactive materials, setting up a risk-based system would be very complicated and I think it would be certainly far superior to what we have right now.

One point to make, though, is the comparison between the NORM and the 11e.(2) could just as easily be made between 11e.(2) and the low-level waste. So in part what we have is a different base line here.

Mr. Slesinger is arguing, well, we should compare the 11e.(2) to the NORM and not regulate it. We would actually say that the

NORM is actually the exception to the rule and probably more of a historical artifact in that if we were reasonable we would actually be regulating that and that would be where the consistency would come from.

Senator CRAPO. I understand that. I think the point that I am trying to make is that the logical ending point of the argument that is being put forth here today in terms of consistency being the approach is a massive overhaul of the entire Federal Government's approach to regulation of radioactive material.

The question that I have come to as a result of that, and I see my time is up. Would it be OK if I proceeded and then you can go ahead?

Senator BOXER. Certainly. You are in charge.

Senator CRAPO. Well, I like to be accommodating.

Senator BOXER. I am happy to listen and I am learning, so please, I am not rushing anyone.

Senator CRAPO. All right. The question that brings me to then is this. Is all of this effort to obtain consistency an effort to achieve consistency for consistency's sake or is there a policy objective we can achieve here? Namely, it seems to me that the ultimate objective is public health, the environment and worker safety.

Then the question is, is the system that we have up there with four basic, different categories, some of them with categories within categories, is this system which may not be internally consistent viewed from a radioactive comparison perspective, is this system that is not consistent in that perspective threatening the health, the environment or the worker safety of our people in America?

Mr. Slesinger.

Mr. SLESINGER. I think that if we are going to rationalize what is what we would need to do is—we are using 2,000 PicoCuries because that is what the State said—if we could find and we could trust the risk assessment that looked at what the risk was, what the reasonable mismanagement scenarios were, we could set differentiations based on those numbers.

I think then you might want to cross across those lines, in the NRC's chart, and treat it based, again, on what the risk is. Clearly, the higher risk you should be taking care of differently than things that are a lot less risky.

I think that would make a much more logical way than what the law has done, which has been based on if it was part of the nuclear energy cycle or not or if it was used on a nuclear weapon or not.

It should be based on "How hot is it? How dangerous is it?" If it is dangerous we need to protect it more than if it is not as dangerous.

Senator CRAPO. So in other words, looking at just the low-level line there, when you get clear out into the outer ranges of that low-level waste, that is hotter and hotter and hotter waste. That should be regulated differently than the lower end of the scale for the same category of waste.

Mr. SLESINGER. That is correct.

Senator CRAPO. Mr. Scott, would you like to comment?

Mr. SCOTT. I might make a couple of comments. First, I agree with you. I think we ought to have a uniform set based on risks.

To give an example, Senator Boxer is concerned about the waste that went to California. Water treatment wastes from water treatment plants can range as high as into the 30,000 PicoCuries per gram of radium–226 and it is completely unregulated, to the best of my knowledge.

Senator CRAPO. It is not even on this chart here?

Mr. SCOTT. It would be TENORM.

Senator CRAPO. OK.

Mr. SCOTT. So I think your approach is the correct one. We should have a consistent set of limits commensurate with the hazard.

Now, if it is a hazard, I don't care where it comes from, it ought to be regulated. But if it is not a hazard, it shouldn't be regulated just because it comes under some definition that made it 11e.(2) waste or whatever.

But I emphasize that sometimes some of the regulatory agencies have put impractical scenarios on things and they have ratcheted levels down to where the risk of somebody actually getting hurt is infinitesimally small.

I wish that you people would make it consistent, but make it a practical scenario.

Senator CRAPO. You mean make it consistent and use common sense?

Mr. SCOTT. Yes, common sense on how you say this is a hazard or it is not. Excuse me I will try to shut up.

Senator CRAPO. Let me ask one last question then. In that context, forgetting about all these other aspects of the chart but just looking at the FUSRAP situation, is there a risk to the public health, the environment, or worker safety in the distinction that is currently in the law between the pre- and post-1978 wastes?

I would just ask any of you to please be brief because I have gone past my time.

Mr. Adelman.

Mr. ADELMAN. I think there are two basic concerns that we have. One is that as it is defined right now, they are currently disposing of materials at facilities that already receive some radioactive materials. That mitigates against some of our concerns about, for example, impacts on the workers.

Senator CRAPO. Right.

Mr. ADELMAN. As it is defined now, that is not necessarily the case. They could send it literally to any RCRA site because you are defining the radioactive materials out of existence.

The second point I would like to make, and this goes to your broader question, too, I think you have to look at this in terms that the government, whether State or Federal, is always contending with limited regulatory resources.

Currently, what we have right now, as NRC has admitted, is a very fragmentary regulatory system. Effectively, what people are seeking here is to make an already fragmentary system where you are not regulating NORM and actually expanding that by including materials that ought to be regulated and are regulated if they had been generated after 1978.

So in terms of risk, I would say that given those limited resources and the fragmentary system, we are potentially increasing the risk because of that.

Senator CRAPO. OK.

Mr. Slesinger.

Mr. SLESINGER. I think that all FUSRAP waste, pre- and post-1978, if it is less than 2,000 PicoCuries, can be adequately and safely handled in Subtitle C landfills.

We may be able to do a study that will show that the number that would be safe could be 3,000, 4,000, and 5,000. It may be 50,000. We believe the EPA has shown it is over 2,000.

We would think that that is the cutoff that we are interested in because our neighbors around our facilities were told when we built these facilities we were going to take certain hazardous wastes, we were going to take radioactive wastes up to this 3,000 PicoCurie level.

We would not want to go back and tell them, oh, now we are going to go up higher because some study said that it is OK.

Senator CRAPO. All right.

Mr. Thompson.

Mr. THOMPSON. Senator, first of all, we don't believe there is a distinction in the law between the pre-1978 and post-1978.

But the distinction in addressing the risk of either low-level radioactive waste as defined under the Atomic Energy Act, or 11e.(2) byproduct material, as interpreted by EPA and NRC in developing regulatory programs is essentially in the long-term care aspect because of the long-lived radionucleides like radium.

That is the two requirements that are most important are: No. 1, you have a 1,000-unit design requirement for 11e.(2); 300 to 500 years for low-activity radioactive waste depending upon the activity involved and you have a mandatory government custodian in both cases.

Those are things that are not applicable to either CERCLA or RCRA facilities.

Senator CRAPO. Mr. Scott.

Mr. SCOTT. I don't think there is a difference. If it is a hazard, it's a hazard.

Senator CRAPO. Senator Boxer.

Senator BOXER. If I could just followup, because I think your questions were very good. I am known for talking straight from the shoulder, so I am going to do it.

You have a situation where you have some economic interests that are in a little dispute over here; OK? You have the NRC-licensed facilities versus the hazardous waste facilities. You represent them. They are fighting over some business here. All I care about, and I know I speak for Senator Crapo, is what is safe.

Now, Mr. Slesinger, I am stunned that you throw out this 2,000 PicoCuries as if it is some deep study that was made. Do you know where that comes from? The Department of Transportation of the Federal Government says, if you carry 2,000 PicoCuries or more you have to put a plaque on your truck.

That doesn't speak to burying this stuff. Maybe facilities that you represent such as Safety-Kleen sit over aquifers.

So I am just saying common sense is what is needed. I agree with that completely. It says to me, common sense for the people, to give them the protection they need, if it ain't broke, don't fix it.

We have a system that was put into place. It has run really well. Ask Mr. Thompson. He is a client of it. It works. He knows how it works. DOE stands behind it. The workers are told directly. They take certain precautions. It works. There are facilities that are willing to take it.

So from the standpoint of my people that I represent, I like that system. I am very willing to look at the risks and if you want to say "x" number of Curies, that raises a lot of other issues. I say to my friend, because when they cleaned up the Manhattan Project, there is a huge fight going on that the contractor didn't really study and measure how hot the waste was.

So you go into a lot of other questions of credibility and other things. You can tell because I have, if you can tell, if you will, burned by the way the court dealt with this, shockingly, you know, sending this stuff to a facility that didn't get the proper permits from the State and now refusing to move it out because they say it is too dangerous.

You said it was not dangerous when it went in, why is it dangerous now? You know what, incredibly, their answer is? It got mixed up with that other hazardous waste site stuff in there, so it is really dangerous.

Excuse me, I thought you said it wasn't dangerous. Now you are telling me it is more dangerous because it is mixed up with this other non-nuclear waste. That is not an answer. You are telling me this stuff is more dangerous now in this mixed waste facility than it was when it went in.

So I have learned from a bad experience. I am trying my best to tell my colleagues, just like we have to with MTBE. We got hit with it first. I am trying to tell my colleagues, don't go California's way. I know you are working with me on this. We have to get rid of that stuff. It has poisoned a huge amount of our water supply.

I don't want to see colleagues coming by and saying, "Gee, you know, this stuff went in, it now mixed with other hazardous wastes. It is more dangers," et cetera, et cetera. So I think we have the answer in front of our noses. Keep it the way it was before. It is not that much more expensive. We have looked at the contracts. Make the uranium industry, I think, happier. I would say, Mr. Chairman, I admit I came in here with a preconceived notion. I admit that on the table, because of the reaction over the Safety-Kleen site.

But I believe the testimony I have heard today from the industry that is most effected, to the environmental group that doesn't represent any clients, and I appreciate Dr. Scott's feeling. But I do agree with him, we need uniformity, clearly. I think everyone agrees there is not rhyme or reason to the 1978 treatment.

He would say, forget about it; everybody should be able to take the lowest level. But at least we agree there ought to be uniformity.

My overriding concern is safety, safety, safety, safety, and safety. That is how I conclude it. I hope we can work together on this.

I have no more questions.

Senator CRAPO. Thank you very much, Senator. I believe we can work together. I agree with you that our common objective is safety, the safety of the workers, the public health, and the environment, and just making sure that we approach the issue properly.

We also want to thank the witnesses for their time and for their expertise here.

I should tell you that we will keep the record open until the end of next week. You may receive questions from some of the Senators who were not able to attend today. We ask you to respond to them promptly.

Senator CRAPO. Unless there is anything else, this hearing will be adjourned.

[Whereupon, at 11:53 a.m., the committee was adjourned, to reconvene at the call of the chair.]

[Additional statements submitted for the record follow:]

STATEMENT OF HON. ORRIN G. HATCH, U.S. SENATOR FROM THE STATE OF UTAH

Mr. Chairman, I am grateful for the opportunity to submit these comments before the committee today. The subject of "pre-1978 FUSRAP waste" has an esoteric sound to it, but it is one that warrants our attention. I believe that our current system for regulating waste from these Cold War nuclear and atomic sites has some gaping holes in it, and I applaud you for holding this oversight hearing today.

I was a member of this body when the Congress enacted the Uranium Mill Tailings Radiation Control Act (UMTRCA). We enacted this measure because we were concerned about the health and safety consequences associated with uranium mill tailings. We were concerned that uranium mill tailings were not regulated by the Nuclear Regulatory Commission, and our principal purpose in enacting UMTRCA was to confer new regulatory authority on the NRC.

However, I now understand that the NRC has indicated that it may be without authority to regulate tailings produced before 1978 and that the EPA does not believe it has authority over such material. This is rather remarkable since it often seems that EPA has a role in regulating everything.

There are persuasive arguments that the States lack authority as well. If all these perceptions are correct, we appear to have a regulatory vacuum. When matters of health and safety are concerned, we must make sure that someone is monitoring this situation and has appropriate authority to regulate.

I want to thank the committee for addressing this important matter. Thank you, Mr. Chairman.

STATEMENT OF MICHAEL SHAPIRO, PRINCIPAL DEPUTY ASSISTANT ADMINISTRATOR, OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, U.S. ENVIRONMENTAL PROTECTION AGENCY

INTRODUCTION

Good morning, Mr. Chairman and Members of the Committee. I am pleased to have this opportunity to appear before you today to discuss the low-activity radioactive wastes from Formerly Utilized Sites Remedial Action Program (FUSRAP) sites. My testimony will address the authorities that EPA has over the off-site disposal of wastes from FUSRAP sites and particularly the material referred to as 11e.(2) byproduct material. I will be dealing with EPA's authorities under the Uranium Mill Tailings Radiation Control Act (UMTRCA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), the regulations and policies that we provide that pertain to the off-site disposal of FUSRAP waste, and the Resource Conservation and Recovery Act (RCRA).

The Formerly Utilized Sites Remedial Action Program (FUSRAP) was established in 1974 to identify, evaluate, and remediate sites that were contaminated as a result of the nations early atomic energy program under the auspices of the Manhattan Engineer District and the Atomic Energy Commission. In the FY 1998 Energy and Water Appropriations Act, Congress transferred management of the FUSRAP program from the U.S. Department of Energy to the U.S. Army Corps of Engineers.

11E.(2) BY-PRODUCT MATERIAL AND THE URANIUM MILL TAILINGS RADIATION CONTROL ACT

According to the U.S. Army Corps of Engineers, most of the material at FUSRAP sites is residual radioactive material from the processing of ores for source material content. This material was first defined in the Uranium Mill Tailings and Radiation Control Act of 1978. UMTRCA's purposes were:

(1) to provide a program of assessment and remedial action at inactive uranium mill tailings sites, and

(2) to regulate mill tailings during uranium or thorium ore processing at active mill operations and after active operations to stabilize and control the tailings in a safe and environmentally sound manner and to minimize or eliminate radiation health hazards to the public.

UMTRCA amended Section 11e. of the Atomic Energy Act in, so that "e. The term "byproduct material" means:

(1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and

(2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

UMTRCA also delineated regulatory responsibility for 11e.(2) material. EPA was given the responsibility to establish standards for the protection of public health, safety, and the environment from radiological and non-radiological hazards associated with the processing, possession, transfer, and disposal of 11e.(2) byproduct material. These regulations appear in 40 CFR Part 192. UMTRCA gave the responsibility for implementing and enforcing EPA's regulations to the Nuclear Regulatory Commission. NRC has issued regulations in 10 CFR 40 that implement our standards and set forth criteria for licensing and operation of uranium processing facilities.

We understand that NRC has interpreted its UMTRCA jurisdiction as being limited to regulating 11e.(2) material generated only at a site licensed by NRC. Because FUSRAP sites were not licensed during their operations, NRC does not believe it has jurisdiction to apply its regulations, or implement ours, for disposal of 11e.(2) material resulting from FUSRAP cleanups. NRC also has said that they "believe that USACE FUSRAP activities are governed by CERCLA requirements in a manner which protects health and safety, and we do not see a need to ask Congress to provide regulatory authority to the NRC [over CERCLA on-site response actions.]" [1]

SUPERFUND AUTHORITIES OVER THE FUSRAP PROGRAM

Of the 23 remaining FUSRAP sites requiring clean up, 7 are on the Superfund National Priorities List.[2] For these sites, EPA and the Corps must approve the Record of Decision, which specifies the final remedy selected for a site. For the other (non-NPL) FUSRAP sites, the Corps does not have to receive EPA approval of the Record of Decision. The Superfund National Oil and Hazardous Substance Pollution Contingency Plan (NCP) provides for efficient, coordinated, and effective response to discharges of oil and releases of hazardous substances, pollutants and contaminants. It establishes the procedures for undertaking response actions under CERCLA. Section 611 of the Energy and Water Development Appropriations Act of 2000 States that the Corps shall undertake cleanup of these sites under CERCLA, including the NCP. EPA has been involved in the review of some non-NPL sites at the request of the Regions or USACE.

The Off-Site Rule

Part of the NCP is the Off-Site Rule (40 CFR 300.440). This rule implements the requirements of CERCLA 121(d)(3). CERCLA 121(d)(3) requires that waste removed under Superfund only go to a facility that is in compliance with Federal and applicable state disposal requirements, and be disposed of at a unit that is not releasing any hazardous waste, or constituents thereof, into the groundwater or surface water or soil. This rule has three main requirements for facilities receiving Superfund waste.

---

[1] Letter from Shirley Ann Jackson, NRC Chairman to Stephen C. Collins, Conference of radiation Control Program Directors, Inc., May 3, 1999.

[2] Latty Avenue Properties (This one FUSRAP site is listed as two NPL sites: Futura Coatings and Hazelwood Interim Storage Site), Hazelwood, Missouri; Shpack Landfill, Norton, Massachusetts; St. Louis Airport Site, St. Louis, Missouri; St. Louis Airport Site Vicinity Properties, St. Louis, Missouri; Maywood Interim Storage Site, Maywood, New Jersey; Wayne Interim Storage Site, Wayne/Pequannock, New Jersey; Middlesex, Sampling Plant, Middlesex, NJ.

(1) The receiving facility must be in compliance with RCRA or other applicable Federal or State requirements.

(2) At hazardous management facilities, the waste management unit receiving these wastes must not currently and should not be expected to release contaminants into the environment. Any releases from other units at the facility must be controlled.

(3) At other than hazardous waste management facilities, environmentally significant releases must be controlled.

To ensure that the waste removed under the NCP goes to a disposal facility that meets these requirements, the party performing the cleanup should contact the EPA regional office for the region where the disposal facility is located, and request a determination under the Off-Site Rule. When EPA receives a request for a determination under the Off-Site Rule, the Regional Office must determine whether the facility meets the requirements of the rule. If there is no standard, such as a regulation or a permit condition for a particular waste, then the facility is not in violation if it accepts that waste. If a facility is found in violation of a standard, then EPA notifies the facility, and the State, of the unacceptability. Once a facility has removed the cause of this unacceptability, EPA can make a determination that it can accept Superfund waste. If a facility has a violation that cannot be undone, such as an unpermitted air emissions release, then for the facility to again become acceptable, it must complete all actions that EPA determines are necessary to rectify the violation, e.g. paying all penalties, and prevent recurrences.

RESOURCE CONSERVATION AND RECOVERY ACT APPLICABILITY TO 11E.(2) MATERIAL

Under RCRA, EPA regulates solid and hazardous waste. Hazardous wastes are a subset of solid wastes that may cause or significantly increase illness, or may pose a hazard to human health or the environment when improperly managed. To be regulated as a hazardous waste, a material must first meet the definition of a solid waste, in other words, RCRA only allows EPA to regulate materials that are solid wastes.

The RCRA statutory definition of solid waste excludes "source, special nuclear and byproduct material as defined by the Atomic Energy Act." See 42 U.S.C. 6903(27). Therefore, materials meeting the AEA definition of byproduct material (which includes Section 11e.(2) material) are not regulated under RCRA, because those materials are not solid waste. To date, EPA has not distinguished between the kinds of material referred to in Section 11e.(2) generated before 1978 and such material generated after 1978, and EPA does not regulate any of this material under RCRA. EPA can regulate the hazardous waste components of wastes that contain mixtures of 11e.(2) material and RCRA hazardous wastes.

EPA's regulations do allow the disposal of non-hazardous wastes, in this case, 11e.(2) wastes, at hazardous waste facilities. Unless prohibited by some other regulation or permit condition, wastes that are not hazardous can be disposed of at a hazardous waste landfill. This allows companies to dispose of non-hazardous wastes at hazardous waste facilities with generally more controls than a municipal solid waste landfill, or an industrial non-hazardous waste landfill. Unless otherwise precluded, States authorized to operate the program under RCRA can, however, regulate material that is not regulated as hazardous at the federal level. Their regulations can be broader in scope than EPA's regulations, or they can be more stringent. States can, for example, establish standards for the disposal of specific types of federally unregulated radiological material (i.e., NORM, exempt, or "unimportant quantities"). In addition, state standards may be more stringent than federal standards. This provides flexibility to the States to fashion a regulatory program that responds to their particular situation so long as it is at least as stringent as the federal program.

CONCLUSION

In its FUSRAP cleanups, the Corps must follow the provisions of the National Oil and Hazardous Substances Pollution Contingency Plan, which includes the Off-Site Rule. Under the Off-Site Rule, 11e.(2) waste cleaned up under CERCLA authorities must be disposed of at a site that meets applicable, if any, standards for this material, as well as the other requirements of the rule. 11e.(2) byproduct material is outside of the scope of the Resource Conservation and Recovery Act, since by statute it is neither a solid nor a hazardous waste.

Mr. Chairman, thank you for this opportunity to address the Committee. I would be pleased to answer any questions you or the other Senators may have.

RESPONSES BY MICHAEL SHAPIRO TO QUESTIONS FROM SENATOR SMITH

Question 1. The EPA drafted a proposed rule this spring that discussed options for the disposal of low-activity mixed waste. The proposed rule specified conditions under which a RCRA subtitle C facility may accept certain mixed radioactive waste for disposal. Has the Agency determined that there is some level of radioactivity at which the risk posed by the material can be properly safeguarded when disposed of in a RCRA subtitle C facility?

Response. EPA has examined the potential for disposing of low-activity mixed waste in RCRA subtitle C facilities as background for a possible rule to identify safe disposal alternatives for some commercial mixed wastes. The draft proposed rule prepared by EPA has not been published in the Federal Register for public comment. EPA is evaluating concentrations of radionuclides in NRC-regulated mixed waste that would be acceptable for disposal in subtitle C facilities, provided certain other conditions were met. Under EPA's proposed approach, although EPA would maintain RCRA authority over the hazardous qualities, NRC would maintain Atomic Energy Act (AEA) authority over the radioactive qualities of mixed waste that qualified for disposal. (See also: answer to question 4 regarding when it would be acceptable to dispose of these wastes in a RCRA facility.)

Question 2. What methods did the Agency use in establishing radionuclide concentration limits?

Response. EPA is assessing the long-term performance of disposal sites (i.e., evaluating potential impacts to groundwater or potential exposures to nearby residents from radionuclides escaping the disposal cell) and from potential exposures to RCRA facility workers.

Question 3. Under the proposed rule, what are the instances that EPA has determined that the disposal of mixed radioactive waste in a RCRA facility is acceptable?

Response. EPA's unpublished draft proposal focuses on commercial mixed waste that is regulated by the NRC. If and when EPA promulgates a rule, NRC would need to issue requirements applicable to RCRA facilities that choose to accept low-activity mixed waste and have an oversight role at these facilities. There may be other administrative, procedural, or substantive requirements deemed appropriate for these facilities, but these would be determined through the rulemaking and implementation processes.

Question 4. What studies/risk assessments exist comparing NRC low-level radioactive waste disposal sites with EPA subtitle C facilities for the disposal of radioactive wastes?

Response. The risk assessment supporting the draft proposal is not final and is subject to change.

EPA has published a proposal that would allow certain mixed wastes to be disposed of in NRC or Agreement State licensed low-level radioactive waste (LLW) facilities without a RCRA permit (64 FR 64364, November 19, 1999). To support this proposal, EPA qualitatively compared the regulatory requirements and physical characteristics for existing RCRA subtitle C and licensed LLW disposal facilities. However, these comparisons were performed to assess whether the LLW disposal facilities would provide protective disposal for the hazardous constituents in mixed waste treated to meet the RCRA Land Disposal Restrictions.

NRC developed and issued a Branch Technical Position (BTP) that sets forth conditions under which electric arc furnace dust contaminated with cesium-137 could be disposed of in subtitle C facilities (62 FR 13176, March 19, 1997). NRC conducted a risk assessment to support the BTP, which EPA reviewed. This assessment also focused on the protectiveness of subtitle C facilities for this particular material, not on a comparison of performance with licensed LLW disposal facilities.

EPA and NRC have collaborated on guidance for siting and design of mixed waste disposal facilities, with the intent that dedicated mixed waste disposal facilities would satisfy both agencies' regulatory requirements and performance goals. See OSWER Directives 9480.00–14 (“Combined EPA–NRC Siting Guidelines for Disposal of Mixed Low-Level Radioactive and Hazardous Waste,” June 1987) and 9487.00–8 (“Joint EPA–NRC Guidance on a Conceptual Design Approach for Commercial Mixed Low-Level Radioactive and Hazardous Waste Disposal Facilities,” August 1987).

Question 5. Is the public notified of each individual shipment of waste to facilities that are permitted by your agency?

Response. EPA's RCRA regulations do not require notification of the public before each shipment of hazardous waste to a permitted facility. Notification of the types of hazardous waste that a facility can accept is part of the public participation proc-

ess when the facility applies for a permit. However, RCRA facilities are required to keep records of the description and quantities of each hazardous waste received at the facility. (See 40 CFR Part 264.73(b)(1))

Question 6. Is a RCRA subtitle C closure considered to provide permanent protection from the hazardous substances contained therein? Does the regulatory 30 [year] monitoring period indicate that closure is protective to the public for only 30 years?

Response. EPA considers its closure requirements to provide permanent protection from hazardous waste disposed of at RCRA Subtitle C facilities. The post-closure care period is for 30 years unless changed by the permitting authority. EPA recognizes that facility-specific conditions may exist that would support a post-closure care period of longer than 30 years to ensure permanent protection. At any point before the end of the post-closure period, the permitting authority can extend the post-closure period if necessary to protect human health and the environment. We would expect the permitting authority to extend the period where the unit still poses a significant threat to human health and the environment.

The requirement for a 30-year post-closure care period originated in RCRA regulations first promulgated in 1980. Therefore, no facilities have yet reached their 30-year time limit. Permitting authorities are still obtaining information on the performance of land disposal facilities, including ground water or leachate monitoring results. This information will prove valuable for permitting authorities who will determine whether it is necessary to extend the post closure care period for individual facilities.

Question 7. Regarding financial assurances at the Safety-Kleen Buttonwillow facility, has EPA assessed the financial circumstances or the reliability of the financial assurances provided under the permit?

Response. The State of California is authorized to operate the RCRA hazardous waste program, which includes the financial responsibility requirements. For the Safety-Kleen Buttonwillow facility, the financial assurance is provided by an insurance policy from the Reliance Insurance Company of Illinois. EPA is aware that on August 2, 2000, the California Department of Insurance removed Reliance Insurance from the List of Eligible Surplus Line Insurers so that they are no longer eligible to write new or renewal business in California as of that date. We understand that the California Department of Toxic Substances and Control is aware of this information and is determining whether Safety-Kleen will have to obtain a new financial assurance instrument forthis facility.

Question 8. Is there anything additional from the hearing that you would like to respond to, clarify or expand on? If so, please do so now.

Response. Paraphrased below are questions Senator Boxer asked during my testimony to the Senate Environment and Public Works Committee on July 25, 2000 that I would like to respond to in this letter.

Does EPA have the authority to expend Superfund Fund monies to pay for addressing FUSRAP wastes? Isn't this material exempt under the definition of release in CERCLA section 101?

Section 101(22) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended (CERCLA) exempts from the definition of "release", any release of source, byproduct, or special nuclear material from any processing site designated under section 102(a)(1) or 302(a) of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). Section 102(a)(1) refers to 24 uranium mill tailing sites that were inactive at the time UMTRCA was enacted, while section 302(a) refers to several uranium mills in New Mexico. We do not believe that this language prohibits actions under CERCLA at Formerly Utilized Sites Remedial Action Program (FUSRAP) sites and does not prohibit EPA from expending Superfund Fund monies to pay for response actions to address the type of waste found at FUSRAP sites. It appears that none of the FUSRAP sites are also sites designated under either section 102(a)(1) or 302(a) of UMTRCA. Therefore, the exemption under the definition of release for CERCLA would not apply to FUSRAP sites.

In addition, radionuclides are designated generically as hazardous air pollutants by Clean Air Act (CAA) section 112, and CERCLA section 101(14)(E) defines the term "hazardous substance" to include CAA hazardous air pollutants. Appendix A to 40 CFR 302.4 lists a large number of radionuclides that are considered hazardous substances, including those that are primary contaminants of concern at FUSRAP sites (e.g., radium-226, radium-228, thorium-230, thorium-232, uranium-234 and uranium-238). CERCLA gives EPA the authority to clean up releases of hazardous substances.

At what non-FUSRAP sites has CERCLA authority been used to address 11e(2) waste?

Non-FUSRAP sites with 11e(2) waste, or potential 11e(2) waste, which are being addressed under CERCLA authority include but are not limited to: Lindsay Light II, Chicago, Illinois; Kerr-McGee, Illinois; Weldon Spring Quarry, Missouri; and Fernald, Ohio.

RESPONSES BY MICHAEL SHAPIRO TO QUESTIONS FROM SENATOR BOXER

Question 1a. In your oral testimony, you stated that "RCRA hazardous waste landfills are designed to be highly protective disposal facilities and therefore may be suitable for the disposal of certain low-activity radioactive wastes." (a) Please provide any EPA or other environmental impact study or risk assessment that supports this statement.

Response. EPA is evaluating the potential risks from the conditional disposal of low-activity mixed wastes in RCRA subtitle C landfills. This risk assessment has not been finalized.

As noted in the answer to Question 5 from Senator Smith, NRC developed and issued a Branch Technical Position (BTP) that sets forth conditions under which electric arc furnace dust contaminated with cesium-137 could be disposed of in subtitle C facilities (62 FR 13176, March 19, 1997). NRC conducted a risk assessment to support the BTP, which EPA reviewed. This assessment also focused on the protectiveness of subtitle C facilities for this particular material, not on a comparison of performance with licensed LLW disposal facilities.

EPA has developed a draft document entitled "Suggested Guidelines for Disposal of Drinking Water Treatment Wastes Containing Radioactivity," which was mentioned in testimony prepared for the hearing, but which has not been finalized.

Question 1b. Please provide references to EPA's authority to permit RCRA facilities to handle and dispose of radioactive waste. If none exist, please indicate.

Response. RCRA provides EPA the authority to regulate solid and hazardous waste. The statute specifically excludes from the definition of solid (and therefore hazardous) waste "source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended." EPA's regulations under RCRA, however, do not preclude materials that do not meet the definition of "solid waste," such as "source, special nuclear, or byproduct material," from being disposed of at a RCRA facility.

Question 2. Please provide federal legal citations to the criteria governing the siting of hazardous waste facilities.

Response. The statutory provisions that relate to the siting of hazardous waste facilities are found in 42 U.S.C. 6924(a) and (b) and 6925(b) and (j). The regulatory requirements are found at 40 CFR 264 and 265, especially 264.18 and 265.18, and 40 CFR 270.41.

Question 3. Please provide the federal legal citations to the public notice requirements that attend the permitting of a hazardous waste facilities under RCRA, as well as the public notice requirements that attend the modification of hazardous waste facility permits under RCRA.

Response. The statutory provision governing public participation during the RCRA hazardous waste permit process is 42 U.S.C. 6974(b)(2). The regulatory requirements for public notice appear in 40 CFR 124 Subpart A & B, and for modifications in 40 CFR 270.42.

Question 4. Is there any federal environmental or public health legal standard which establishes a level below which radioactive materials may be disposed of in RCRA hazardous waste disposal facilities?

Response. EPA has no standard establishing a level below which radioactive materials may be disposed in RCRA hazardous waste disposal facilities.

In general, existing federal requirements for disposal of radioactive waste are based on the definition of the waste, not on risk or activity levels. We understand that NRC sometimes establishes levels for waste not requiring disposal in an NRC-licensed facility; however, such waste is not necessarily eligible to be disposed of in RCRA facilities. The state or other regulatory jurisdiction may have restrictions on such disposal. The Department of Energy has internal directives serving a similar purpose for its radioactive wastes.

For example, the NRC has published a staff branch technical position covering the disposal of emission control dust from electric arc furnaces or foundries (a hazardous waste identified as K061) that has been contaminated with cesium-137. Because this waste is both a RCRA hazardous waste and radioactive, it is a mixed waste. "The position provides the bases that, with the approval of appropriate regulatory

authorities (e.g., State permitting agencies) and others (e.g., disposal site operators), and with possible public input, could be used to allow disposal of stabilized waste at subtitle C, RCRA-permitted, hazardous waste disposal facilities." See 62 *Federal Register* 13176 to 13198 (March 19, 1997).

Question 5a. Dr. Paperiello of the NRC stated in his oral testimony that workers at an NRC-licensed facility are legally permitted to be exposed to 5 rem of radiation per year, and that this exposure is with the informed consent of the workers. He goes on the state that in the NRC's view, the workers at a hazardous waste facility would be limited to 100 milirem of exposure per year.

Does EPA have standards, regulations or other guidance concerning worker exposure and informed consent for hazardous waste facilities?

Response. EPA does not have standards or guidance that govern worker protection from radiation at hazardous waste facilities.

Question 5b. Are workers at RCRA facilities that handle radioactive materials given full radiation specific protective gear, as would be the case at NRC-licensed facilities?

Response. EPA has not established requirements for the disposal of radioactive material at a RCRA subtitle C facility and generally does not establish worker standards for hazardous waste over and above the need for health and safety plans and training. The determination as to whether workers that handled radioactive material at RCRA facilities would be required to have full radiation specific gear as would be the case at an NRC-licensed facility would need to be established based on OSHA standards as well as any State-specific standards that the facility may be required to meet.

Question 5c. Should the level of protection for RCRA workers be the protective risk range of 10–6 to 10–4 excess cancer risk as required under CERCLA?

Response. EPA defers to OSHA regarding the level of protectiveness which is appropriate for worker protection.

Question 6. The 100 milirem level identified by the NRC (discussed in question 6) greatly exceeds (by 70–7,000) the protection risk range required under CERCLA. Corps FUSRAP cleanups are required to comply with CERCLA. If the 100 milirem standard is in fact being applied by the Corps, isn't the Corps not complying with CERCLA?

Response. CERCLA cleanups are governed by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) which provides the regulatory framework for response actions. The NCP does not establish guidelines for the protection of the response workers at sites being cleaned up under CERCLA authority or at sites where CERCLA waste is disposed. The cleanup levels in the NCP apply to the reasonably anticipated future land use which includes workers that are not associated with the response activities. EPA under Superfund, as under RCRA, defers to OSHA regarding standards that would apply to response workers at CERCLA or waste disposal sites.

Question 7. In your oral testimony, you stated that "[u]nder the provisions of the State permit there normally are financial assurance requirements that would be in place to cover the clean up and closure of the facility." What are the financial assurances and the duration of those assurances required under RCRA? Are there circumstances under which a facility operator does not need to provide such assurance?

In response to questions from Senator Crapo on this issue, you responded that typically a hazardous waste facility operator has a financially guaranteed promise of some kind to deal with post-closure monitoring and cleanup. How long do such financial guarantees last? How long do the radionuclides involved in FUSRAP cleanups remain active in the environment?

Response. A RCRA hazardous waste disposal facility must demonstrate financial assurance for the costs of closure and post-closure care. The post-closure care period begins after the closure of the facility and is for 30 years, or an alternative period specified by the permitting authority. At any point before the end of the post-closure period, the permitting authority can extend the post-closure period if necessary to protect human health and the environment.

The requirement for a 30-year post-closure care period for disposal facilities originated in RCRA regulations first promulgated in 1980. Therefore, no facilities have yet reached their 30-year time limit. At this time, permitting authorities are still obtaining information on the performance of land disposal facilities, including ground water monitoring results for active and closed facilities. This information

should prove valuable for permitting authorities who in the future will determine whether it is necessary to extend the post closure care period for these facilities.

In addition, during the active life of a disposal facility it must demonstrate financial assurance for sudden and non-sudden liability coverage.

EPA does not impose these financial assurance requirements on States' and the federal government's disposal facilities.

The primary radionuclides in FUSRAP waste are isotopes of uranium, thorium, and radium. The most common uranium isotopes have half-lives of at least hundreds of thousands of years, while the more common thorium isotopes have half-lives of at least tens of thousands of years. The primary radium isotopes have half-lives of 1,600 (Ra-226) and 5.77 (Ra-228) years.

Question 8a. In discussing the Buttonwillow case, Dr. Westphal stated that so long as the radioactive waste shipped to Safety-Kleen averaged 2,000 picocurie/gram or less it met the requirements of the permit. ("But again, we are talking about averages, so they average 2,000 with one peaking above 2,000. The Buttonwillow facility is permitted to accept an average of 2,000. So it can accept some material that may have peaked higher, but on the average it can't be higher than 2,000.")

As you know, the validity of that permit term has been contested by the California Department of Health Services. That notwithstanding, nothing in the permit specifically allows the use of averaging to meet this permit condition. The use of averaging, depending on how it is applied, could render even the 2,000 picocurie/gram limit meaningless since it would enable the Corps to ship radioactive materials significantly higher than 2,000 picocuries by diluting the radioactive content with non-radioactive material.

On this issue, Senator Bennett posed a question to Dr. Paperiello that Dr. Paperiello could not answer. Senator Bennett asked what would happen if a shipment received at a facility was as hot as 4,700 picocuries but on average fell below 2,000 picocuries. In particular, Senator Bennett asked whether 4,700 picocurie material would have to be separated from the remaining material or whether it could, in effect, be diluted by less radioactive material and thereby averaged to meet the permit condition. Dr. Paperiello "[i]n terms of how you deal with heterogeneous distribution, which is quite common, it would depend an awful lot on how the receiving facility was permitted . . . I just don't know when a facility is permitted to receive material up to 2,000 picocuries per gram . . . I don't know how they deal with heterogeneity."

Please provide any EPA regulation, guidance or other document which provides how and whether RCRA facilities may or may not average in this manner.

Response. The RCRA regulations do not specify criteria for radioactive waste. Our understanding is that the permit for Buttonwillow is silent on the issue of averaging radioactivity levels.

Question 8b. Please provide any written authorizations or legal authority from the State of California which permits such averaging.

Response. EPA does not have information on California's authorities regarding averaging of radioactivity measures.

Question 9. In his oral testimony, Scott Slesinger stated that "we understand that EPA in an unrelated rulemaking has completed a risk assessment comparing NRC-licensed low-level disposal sites with RCRA subtitle C facilities." It was my understanding that such a rulemaking is no longer being conducted. Is that correct? If not, what is its status? Please provide the risk assessment referred to in Mr. Scott Slesinger's testimony.

Response. The draft rule referred to by Mr. Slesinger has not been proposed for public comment and the risk assessment has not been finalized or released to the public. EPA is still considering a rule that would establish conditions under which subtitle C facilities could accept low-activity mixed waste for disposal. As part of any rulemaking, EPA will conduct a risk assessment to evaluate the potential impacts of subtitle C disposal of low-activity mixed waste. EPA has not directly compared the performance of NRC and RCRA disposal facilities. EPA would rely on NRC to issue any additional regulations that would be necessary beyond what RCRA requires to implement safe conditions for mixed waste disposal at RCRA facilities that choose to accept low-activity mixed waste. The risk assessment has not been released to the public.

Question 10. Do you agree that radioactive waste, wherever it is disposed of, should be disposed of to protect groundwater to at least the Maximum Contaminant Levels under the Safe Drinking Water Act, as is required under CERCLA?

Response. EPA believes that ground waters should be monitored and protected at waste disposal sites to ensure beneficial use and this includes ensuring that MCLs

established under SDWA are not exceeded, where ground waters are a current or potential source of drinking water.[1]

Question 11. If FUSRAP waste is permitted to be disposed of in non-NRC licensed facilities, how do we ensure that the disposal of such waste does not lead to the recipient facility becoming a future Superfund site?

Response. EPA is concerned that the disposal of wastes as a result of a CERCLA cleanup does not itself result in a future Superfund site. To address this concern, CERCLA waste disposed of off-site must comply with the Off-Site Rule (40 CFR 300.440). Because the USACE was directed to address FUSRAP sites under CERCLA authority in its 1999 appropriations, the wastes from these sites are subject to the Off-Site rule. This rule implements the requirements of CERCLA 121(d)(3). CERCLA 121(d)(3) requires that waste removed under Superfund only go to a facility that is in compliance with Federal and applicable state disposal requirements, and be disposed of at a unit that is not releasing any hazardous waste, or constituents thereof, into the groundwater or surface water or soil. This rule has three main requirements for facilities receiving Superfund waste.

a. The receiving facility must be incompliance with RCTA or other applicable Federal or State requirements.

b. At hazardous management facilities, the waste management unit receiving these wastes must not currently and should not be expected to release contaminants into the environment. Any releases from other units at the facility must be controlled.

c. At other than hazardous waste management facilities, environmentally significant releases must be controlled.

To ensure that the waste removed under the NCP goes to a disposal facility that meets these requirements, the party performing the clean up should contact the EPA regional office for the region where the disposal facility is located, and request a determination under the Off-Site Rule. When EPA receives a request for a determination under the Off-Site Rule, the Regional Office must determine whether the facility meets the requirements of the rule. If there is no standard, such as a regulation or a permit condition for a particular waste, then the facility is not in violation if it accepts that waste. If a facility is found in violation of a standard, then EPA notifies the facility, and the State, of the unacceptability. Once a facility has removed the cause of this unacceptability, EPA can make a determination that it can accept Superfund waste. If a facility has a violation that cannot be undone, such as an unpermitted air emissions release, then for the facility to again become acceptable, it must complete all actions that EPA determines are necessary to rectify the violation, e.g., paying all penalties, and prevent recurrences.

Question 12. Do RCRA facilities generally have site-specific meaningful public participation to ensure that the public is adequately informed if radioactive waste that will be received? What requirements are there for this kind of meaningful public participation for the pre-1978 11e.(2) waste?

Response. RCRA facilities have public participation requirements for hazardous waste. EPA's RCRA regulations do not require notification of the public before each shipment of hazardous waste to a permitted facility. However, notification of the types of hazardous waste that a facility can accept is part of the public participation process when the facility applies for a permit. These requirements generally do not apply to wastes, such as 11e.(2) byproduct material, that are not hazardous waste.

RESPONSES BY MICHAEL SHAPIRO TO QUESTIONS FROM SENATORS BAUCUS AND GRAHAM

Question 1. As a policy matter, what do you believe is the appropriate dividing line between NRC and EPA jurisdiction when it comes to regulating the disposal of low-activity radioactive waste materials? Should the NRC regulate those materials associated with the nuclear fuel cycle, leaving to EPA the regulation of other materials?

Response. EPA has not taken a position as to whether additional jurisdictional boundaries are necessary to govern low-activity radioactive waste material. For those materials that are subject to regulation currently, EPA appropriately has the responsibility and authorities to establish standards to protect public health and the environment. Under these authorities, EPA has already issued, or will issue, regulations applicable to nuclear fuel cycle material (see 40 CFR parts 190, 191, and 192,

[1] See 40 CFR 264 Subpart F for ground water monitoring requirements to detect contamination at RCRA facilities.

and the proposed 40 CFR part 197). EPA's regulations in these areas are typically implemented by NRC. EPA has found this division of responsibilities satisfactory.

Question 2. EPA's position seems to be that EPA is not authorized to regulate FUSRAP mill tailings under RCRA because the tailings are "byproduct material" under the Atomic Energy Act. Given that the NRC has taken the position that it cannot regulate the tailings either, are you comfortable with a regulatory system under which those tailings are regulated under neither the Atomic Energy Act or RCRA?

Response. EPA believes that there should be regulatory oversight to ensure that these wastes are managed appropriately. In situations where States have not filled the gap with an appropriate regulatory program, EPA would be concerned about the potential for mismanagement.

Question 3. It has been argued that the States are preempted from regulating FUSRAP material. What is EPA's position regarding that argument? And, if there is any preemption involved, would that affect your answer to the preceding question?

Response. EPA is not familiar with the argument that "States are preempted from regulating FUSRAP material." Therefore we cannot speak to this directly. It may be that the reference is to the status of FUSRAP wastes under RCRA, if it also meets the AEA definition of byproduct material. Generally, RCRA does not preempt state authority to regulated solid and hazardous waste. However, because RCRA excludes byproduct material from the definition of solid waste, a state cannot regulate this material as part of its RCRA authorized program. However, RCRA does not preclude States from regulating this byproduct material under other state or federal authorities. If the reference is to the AEA's preemptive effects on States, EPA believes that the question is more appropriately addressed by the NRC.

Question 4. What would you guess is the basis for the adoption of a 2,000 picocurie limit on waste activity?

Response. It appears that the 2,000 picocurie limit in the Buttonwillow permit is based on a United States Department of Transportation regulation. In the permit the following language appears:

"C. Prohibited Wastes

1. The Permittee shall not accept the following wastes and materials at the Facility: [H&S Code 25202]

a. Radioactive materials which either require special placarding because they exceed 2,000 picocuries/gram of activity as referenced in 49 CFR 173.403(y) or are defined as "NRC regulated source materials" as referenced in H&S Code 25805(m)."

The Department of Transportation has set 2,000 pCi/g as the threshold for placarding shipments as including "radioactive material" (see 31 FR 6492, April 29, 1966). This standard was adopted by DOT to increase harmony with international agreements, and was based on the International Atomic Energy Agency (IAEA) guidance entitled "Safety Series No. 6: Regulations for the Safe Transport of Radioactive Materials, 1964 Revised Edition" NRC also adopted IAEA's 2,000 pCi/g limit (see 10 CFR Part 71).

DOT (see 64 FR 72633, December 28, 1999) and NRC (65 FR 44360, July 17, 2000) have issued notices that the two agencies are considering rulemakings to amend their 2,000 pCi/g limits to harmonize with an updated IAEA 1996 guidance. Rather than the single 2,000 pCi/g limit, IAEA's 1996 guidance provides radionuclide specific activity levels based on a 1 mrem/yr dose to transportation workers.

STATEMENT BY CARL J. PAPERIELLO, DEPUTY EXECUTIVE DIRECTOR FOR MATERIALS, RESEARCH AND STATE PROGRAMS, NUCLEAR REGULATORY COMMISSION

Mr. Chairman, and Members of the Committee, it is my pleasure to be here today to present the U.S. Nuclear Regulatory Commission's (NRC) views on the management and disposal of low-activity radioactive waste. In that context, I also offer NRC's views on the Formerly Utilized Sites Remedial Action Program (FUSRAP) of the U.S. Army Corps of Engineers (the Corps). Because the Uranium Mill Tailings Radiation Control Act (UMTRCA) does not direct the NRC to exercise regulatory authority over milling activities and facilities that were not subject to license at the time of the effective date of UMTRCA, the NRC has not regulated the disposal of mill tailings resulting from the FUSRAP program.

The Commission has stated that, absent specific direction from Congress to the contrary, NRC will continue to refrain from regulating the Corps in its cleanup activities at FUSRAP sites. Attachment 1 to my testimony is a copy of the Director's

Decision which I issued on March 26, 1999, which is probably the most complete exposition of the Commission's position on this matter. Former Chairman Jackson laid out a briefer description of our policy in a April 28, 1999 letter (Attachment 2) which was reiterated in a July 29, 1999 letter signed by former Chairman Dicus (Attachment 3). Stated succinctly, the NRC recommends legislation if Congress intends that NRC regulate pre-UMTRCA mill tailings in the FUSRAP program. The NRC has not sought such authority or the necessary resources to regulate that material, and the Appropriations Committees, most recently in the House Appropriations Committee Report on the Energy and Water Development Bill for Fiscal Year 2000 (which was adopted by the conferees), have clearly indicated that Congress does not intend NRC to undertake licensing the Corps' cleanup of contaminated FUSRAP sites.

In my testimony, I will address not only how the disposal practices of the Corps compare with those that the NRC regulates, but also the broader topic of risk-informed disposal of radioactive material. In my presentation, I will address the following questions, among others:

- How do FUSRAP wastes compare with other similar radioactive wastes and the disposal of other wastes?
- Why are radioactive wastes with similar concentrations and hazards disposed of in different ways?
- What safety issues need to be addressed in the disposal of materials like FUSRAP wastes in RCRA Subtitle C hazardous waste landfills?

In the more than 2 years since responsibility for the FUSRAP program was transferred by Congress from the U.S. Department of Energy (DOE) to the Corps, we have heard from State officials; the Conference of Radiation Control Program Directors; commercial firms; legislators, both Federal and State, including two members of this Committee; members of the public; and environmental groups asking us to exert our regulatory authority over the disposal of pre-UMTRCA mill tailings, often within the context of activities of the Corps as it remediates FUSRAP sites. More recent concerns with respect to the disposal of mill tailings from FUSRAP sites have been raised in petitions submitted to NRC this year. These petitions are currently under review.

Some of the reasons offered for NRC regulation of FUSRAP material are legal and involve interpretation of the Atomic Energy Act (AEA) and the Uranium Mill Tailings Radiation Control Act (UMTRCA). In my March 1999 Director's Decision, I concluded we do not have the authority to regulate the Corps' handling of radioactive material at FUSRAP sites. Moreover, Congress has not provided NRC with any money or personnel to undertake an oversight role of any kind, and as I stated earlier, the Appropriations Committees have given the Commission clear guidance not to involve itself in FUSRAP.

Some of the arguments made by those who would have NRC license the Corps' activities are based on the observation that the pre-UMTRCA and post-UMTRCA materials are similar in radiological characteristics and should be treated the same. However, it is not unusual for similar radioactive materials to be regulated differently. This is the result of the fragmented statutory regime governing radioactive materials.

Finally, some reasons offered for NRC regulation of FUSRAP material are expressed in terms of health and safety and environmental concerns. Despite this view, we believe Congress has clearly given the Corps authority for remediation of FUSRAP sites pursuant to CERCLA in a manner that protects the public health and safety.

Nonetheless, if Congress believes NRC should regulate this area, the NRC stands ready to assist. However, the NRC would need additional resources to regulate FUSRAP material.

My testimony focuses on disposal of mill tailings from FUSRAP sites in non-NRC regulated facilities, in particular in Resource Conservation and Recovery Act (RCRA) Subtitle C hazardous waste disposal facilities. NRC mill tailings licensees do not use such facilities for radioactive waste disposal, because NRC-controlled radioactive materials and wastes are regulated under the Atomic Energy Act and, absent the addition of hazardous waste, are not subject to RCRA.

In order to put this discussion into context, I will address other types of radioactive wastes that are similar to mill tailings because of their radioactivity levels, and the presence of long-lived radioactive materials such as uranium, thorium, and radium. These similar materials with comparable hazards may or may not be regulated. If they are, then this may be accomplished by other agencies under programs which require disposal in specific kinds of facilities. I will compare the facilities used for disposal of these different materials and will discuss how they differ in their approaches for managing risk to the public and the environment.

FUSRAP

As part of the Nation's early atomic energy program, the Manhattan Engineering District and the Atomic Energy Commission performed work during the 1940's through the 1960's at a number of sites throughout the United States. The radiological contaminants at these sites involved primarily low-levels of uranium, thorium, and radium, with their associated decay products. DOE began FUSRAP in 1974 to study these sites and take appropriate cleanup action. By 1997, DOE had placed 46 sites in the program and had completed remediation at 25 sites. Remedial action was planned, underway, or pending final closeout at the remaining 21 sites.

DOE managed the program under its AEA authority. The AEA provided that NRC did not regulate these sites or have any oversight role as to their cleanup. On October 13, 1997, Congress passed the Fiscal Year 1998 Energy and Water Development Appropriations Act which transferred administration of FUSRAP to the Corps and appropriated funds to the Corps for the completion of FUSRAP activities.

Pursuant to a provision of the Fiscal Year 1999 Energy and Water Development Appropriations Act, the Corps is executing FUSRAP in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA). Under CERCLA, the Federal lead agency is exempt from licensing and permitting regulations for work done onsite, but not from the substantive requirements of any applicable or relevant and appropriate regulations.

A number, but by no means all, of FUSRAP sites contain pre-UMTRCA mill tailings, the focus of my testimony today. Section 11 e.(2) of the AEA defines the tailings or residue produced by the extraction of uranium or thorium from ore processed primarily for its source material content as byproduct material. Mill tailings typically have most of the uranium or thorium removed, but still contain other radioactive elements in the decay chains for uranium and thorium, especially thorium 230 and radium. Mill tailings also can contain hazardous chemicals used in or released from the processing to extract uranium, and these can include nitric, hydrofluoric, and sulfuric acids; ammonia; heavy metals; and benzene.

The standards applicable to the disposal of mill tailings cells were promulgated by the U.S. Environmental Protection Agency (EPA) and NRC conformed its regulations to these standards. For the non-radiological components of mill tailings, Congress directed EPA in UMTRCA to develop standards that offered a comparable level of protection as RCRA Subtitle C facilities. Therefore, tailings and related waste that were produced at facilities under an NRC license at the effective date of UMTRCA, or licensed thereafter, are regulated by NRC or Agreement States to meet regulations derived from RCRA. Those tailings produced at facilities (such as FUSRAP sites) not under an NRC license at that time, or thereafter, have not been regulated by NRC, based on the understanding that NRC's authority does not extend to such facilities. Thus, no NRC requirements have been applied to such tailings. Because of this, the Corps may dispose of its pre-UMTRCA mill tailings in RCRA hazardous waste facilities, subject to the authority of regulatory bodies such as EPA or State permitting agencies that administer hazardous waste programs. According to the Corps, the use of RCRA Subtitle C facilities in the FUSRAP program for disposal of certain kinds of radioactive wastes fosters competition, precludes capacity limitations, and minimizes schedule delays. The Corps' disposal contracts for FUSRAP wastes total several hundred million dollars.

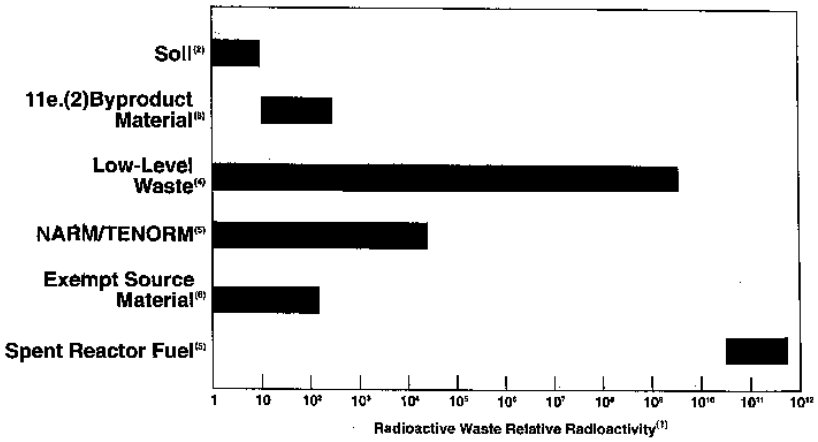
To put these disposals in different types of facilities into a risk context, I will discuss several kinds of radioactive wastes, how they compare in their radioactivity concentration, especially for long-lived radionuclides, and how each is disposed of.

COMPARISON OF MILL TAILINGS WITH OTHER RADIOACTIVE WASTE

Figure 1 illustrates the relative radioactivity of different kinds of radioactive waste, including spent fuel, naturally occurring and accelerator-produced radioactive material (NARM), exempt source material, technologically enhanced naturally occurring radioactive material (TENORM), low-level waste, mill tailings, and, for reference, soil (the units are relative with background soil radioactivity set at one). Low-level waste, NARM, TENORM, and mill tailings are characterized by wide ranges of radioactivity—from background or near background soil levels to levels that are 100 million times more concentrated than natural concentrations in soil. Although concentrations of radioactive material at the high end of the range for LLW are within a factor of 100 of the concentrations in spent fuel (and in fact overlap with some U.S. Department of Energy high-level radioactive waste), most radioactivity in LLW decays away within a few hundred years. The radioactivity of HLW and spent fuel also decays, but these wastes are more highly radioactive for very long periods of time.

TENORM is material whose radioactivity has been enhanced (i.e., increased or concentrated) as a result of human intervention. It includes coal ash from coal-fired power plants, uranium mining overburden, phosphate ore, pipe scale from oil and gas production, and water treatment sludge. In addition, the mineral extraction industry produces large volumes of TENORM with some of the characteristics of uranium mill tailings, including processing chemical residues. The EPA reports that TENORM volumes produced annually in the United States may be in excess of one billion tons. For comparison, the annual amount of LLW produced for disposal under the Low-Level Radioactive Waste Policy Amendments Act of 1985 is less than 100,000 tons, or one ten-thousandth as much as TENORM. If uranium mill tailings were not defined as 11e.(2) byproduct material by the AEA, they would be considered to be TENORM.

The range in radioactivity found in mill tailings, LLW, exempt source material, and TENORM significantly overlaps. These four groups of wastes are also similar in that they contain or may contain (for LLW) the long-lived isotopes of uranium, thorium, and/or radium. Thus, from a risk perspective, LLW, exempt source material, TENORM, and mill tailings are similar in that each contains very long-lived radionuclides, often in the same range of concentrations. However, from a legal perspective, they are regulated differently.



[1] Relative radioactivity is the ratio of the radioactivity concentrations for each material divided by the low-end for soil radioactivity. Numbers are approximate.

[2] Range for soils is from National Council on Radiation Protection and Measurements Report 50, "Environmental Radiation Measurements."

[3] 11e.(2) byproduct material is defined by its origin, not by any lower or upper bounds on concentrations. Byproduct material derived from ores with very high uranium or thorium content would be slightly higher than shown.

[4] Low-level wastes are defined in part by their origin, and some may be just above background levels in soil. Upper limits for Class A, B, and C LLW are defined in 10 CFR Part 61, but are not shown. Upper limit for LLW is average of Greater Than Class C waste in DOE Integrated Data Base Report (see note 5).

[5] Spent fuel from DOE Integrated Data Base Report, 1995, Revision 12, DOE/RW-0006. NARM/TENORM from same report and "An Assessment of the Disposal of Petroleum Industry Norm in Nonhazardous Landfills," Argonne National Laboratory, October 1996. Report No. DOE/EQ/W-31-109-ENG-38-8.

[6] 0.05% by weight uranium or thorium.

Figure 1. Comparison of Radioactivity Levels in Radioactive Wastes.

LAWS AND REGULATIONS FOR DISPOSAL OF MILL TAILINGS AND HAZARDOUS WASTES

Different laws and programs that apply to these different materials affect how they are regulated, even though they may pose a similar risk.—Mill tailings at licensed sites covered by UMTRCA are regulated by NRC under the AEA, and must be disposed of in tailings impoundments that meet applicable NRC regulations. As noted above, mill tailings not associated with licensed activities under UMTRCA are understood to be outside the NRC's regulatory authority, but they must be disposed of in a facility authorized by a permitting authority to receive such wastes. Our understanding is that a number of laws apply or may apply to such materials and to other forms of TENORM, including the Clean Air Act, Clean Water Act, Safe Drinking Water Act, CERCLA, and Toxic Substances Control Act (TSCA). None of these acts provides EPA with explicit authority over TENORM, but EPA is working under them to establish standards for TENORM. In the absence of such standards, the National Academy of Sciences has observed that public exposures to TENORM are

regulated by EPA in a rather fragmentary manner.)[1] In the absence of more definitive EPA regulations, some States have adopted their own regulations for TENORM. In practice, TENORM waste that is disposed of (as opposed to remaining in place at the site of generation or stored) may be placed in a RCRA Subtitle D landfill, a Subtitle C hazardous waste facility, or an NRC or Agreement State licensed LLW facility, depending on the State and the hazard of the TENORM. Exempt source material, source material with less than 500 parts per million uranium or thorium, has also been disposed of in RCRA Subtitle C hazardous waste facilities. The NRC is currently looking at its source material regulatory framework in consultation with EPA and a host of other Federal agencies and the States with the objective of more rationally addressing risks from these similar materials.

Because FUSRAP material mill tailings from FUSRAP sites are understood to be outside the regulatory authority of the NRC, the Corps has additional options for disposal of this material, instead of just placing it in an NRC-licensed tailings impoundment. As with TENORM, the Corps has allowed some FUSRAP material to be disposed of in RCRA hazardous waste facilities. FUSRAP material also has been disposed of in an NRC-licensed 11e.(2) disposal facility (Envirocare). The Corps has indicated that none of this material has been disposed of in a Subtitle D landfill.

COMPARISON OF HAZARDOUS WASTE FACILITIES WITH MILL TAILINGS IMPOUNDMENTS—ISOLATION OF WASTE FROM THE ENVIRONMENT

Mill tailings produced under an NRC license are required to be disposed of in special impoundments which meet detailed requirements. The NRC regulation is based on the EPA standards for mill tailings, which, in turn, are based on the EPA hazardous waste standards applicable to RCRA waste impoundments and landfills. State-of-the-art mill tailings impoundments, like RCRA hazardous waste disposal cells, rely, in part, on a system of liners and leachate detection and collection systems to prevent releases of hazardous and radioactive materials to the environment. Environmental monitoring, inspection, site selection, and other detailed requirements are also employed at these sites. Because mill tailings impoundments and hazardous waste cells are based in large part on the same EPA requirements, the NRC believes that both RCRA landfills and NRC-licensed disposal facilities are protective. It should be noted that NRC mill tailings regulations include requirements not found in EPA's RCRA regulations, such as government ownership of the tailings piles, and designs that provide for long-term stability (long-term is taken to mean a period of 1000 years, to the extent practicable, but in no case less than 200 years). EPA's regulations, on the other hand, have requirements for enduring institutional controls which are aimed at achieving a similar level of protection.

Practices at RCRA facilities vary depending upon the permit conditions for radioactive materials imposed by EPA or the State permitting agency, and the radioactivity of the waste *or intended to be disposed. The Buttonwillow hazardous waste facility in California, for example, accepts TENORM that is less than 2000 psi/gram (approximately 200 on the chart in Figure 1) in radioactivity concentration. The 2000 psi/gram threshold derives apparently in part from Department of Transportation regulations on shipment of radioactive material. Under those regulations, material with concentrations of radioactivity below 2000 psi/gram is not considered radioactive material for purposes of transportation. The EnviroSafe facility in Idaho, which accepts naturally occurring radioactive material and FUSRAP waste, is subject to permit conditions that specify limits for uranium, thorium, and other isotopes, and impose the same radioactivity concentration limit as specified for the Buttonwillow facility in California.

COMPARISON OF HAZARDOUS WASTE FACILITIES WITH MM TAILINGS IMPOUNDMENTS—WORKER PROTECTION

NRC and Agreement State requirements for uranium mills and mill tailings impoundments specify that a radiation protection program be implemented. This program is designed, among other things, to ensure that doses to radiation workers do not exceed 5000 millirem/year. NRC regulations also limit radiation doses from licensed operations to individual members of the public to 100 millirem/year. The program requires monitoring, recordkeeping, and implementation of design measures and operating procedures to keep radiation doses as low as is reasonably achievable.

It is our understanding that the State-issued RCRA permit for the EnviroSafe facility in Idaho provides that the criteria contained in the permit will assure that

[1] Evaluation of Guidelines for Exposures to Technolonically Enhanced Naturally Occurring Radioactive Materials, 1999, National Academy of Sciences, Board on Radiation Effects Research, National Academy Press, 281 p.

the potential dose to a worker handling FUSRAP material should never exceed 400 millirem/year. This is approximately the dose received on average by commercial aircraft flight crews and is more than an order of magnitude below NRC's worker standard. Because the NRC has no authority over this facility, it has not conducted any reviews of the procedures for controlling doses to workers. The actual doses to workers from FUSRAP material would depend upon the concentrations of the material received, the types of radionuclides, whether or not the waste was in a container (dust from soil, for example, could be inhaled by a worker), the number of shipments per year, the work practices, and the duration of exposure.

CONCLUSION

As I noted in the beginning of this testimony, if Congress believes NRC should regulate the disposal of pre-UMTRCA mill tailings in the FUSRAP program, the NRC is ready to assist Congress in amending UMTRCA. However, the NRC would need additional resources to regulate FUSRAP material. In my testimony today, I have provided a context in which a more comprehensive approach to regulating FUSRAP and similar materials might be considered by the Congress.

This completes my statement. I would be pleased to answer any questions from the Committee.

NUCLEAR REGULATORY COMMISSION,
Washington, DC, March 26, 1999.

Dr. THOMAS B. COCHRAN, *Director,*
Natural Resources Defense Council,
Washington, DC.

DEAR DR. COCHRAN: I am providing you with the Director's Decision that responds to your 10 CFR 2.206 petition, filed on October 15, 1998. The petition requested that NRC exert authority to ensure that the U.S. Army Corps of Engineers' (Corps) handling of radioactive materials in connection with the Formerly Utilized Sites Remedial Action Program (FUSRAP) is executed in accordance with a properly issued license and all other applicable requirements.

I have completed my review of the issues raised in your petition and the responses to your petition provided by the Corps and the Department of Energy (DOE). For reasons explained in the enclosed Director's Decision, DD–99–07, dated March 26, 1999 (Enclosure 1), your request has been denied.

As provided by 10 CFR 2.206(c), a copy of this Decision will be filed with the Secretary of the Commission, for the Commission's review. As provided by this regulation, the Decision will constitute the final action of the Commission 25 days after the date of issuance of the Decision, unless the Commission, on its own motion, institutes a review of the Decision within that time.

In addition, a copy of the notice that is being filed for publication with the Office of the Federal Register is also included as Enclosure 2, for your information.

Sincerely,

CARL J. PAPERIELLO, *Director,*
Office of Nuclear Material Safety and Safeguards.

[From the Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards]

Carl J. Paperiello, Director

In the Matter of The United States Army Corps of Engineers—Docket No. N/A (10 C.F.R. 2.206)

DIRECTOR'S DECISION UNDER 10 CFR § 2.206

I. INTRODUCTION

On October 15, 1998, Thomas B. Cochran, Ph.D., Director, Nuclear Program, Natural Resources Defense Council (NRDC) and James Sottile, IV, Caplin & Drysdale, Chartered, filed a petition on behalf of NRDC (the "petitioner") addressed to L. Joseph Callan, Executive Director for Operations, U.S. Nuclear Regulatory Commission (NRC). The petition requests that NRC exert authority to ensure that the Corps of Engineers' handling of radioactive materials in connection with the For-

merly Utilized Sites Remedial Action Program (FUSRAP) is effected in accord with a properly issued license and all other applicable requirements.

II. BACKGROUND

During the 1940's, 1950's, and 1960's, the Manhattan Engineer District and the Atomic Energy Commission performed work at a number of sites throughout the United States as part of the nation's early atomic energy program. Although many of the sites were cleaned up under guidelines in effect at the time, residual contamination remains at many of the sites today. The contaminants at these sites involved primarily low levels of uranium, thorium, and radium, with their associated decay products. The U.S. Department of Energy (DOE) began FUSRAP in 1974 to study these sites and take appropriate cleanup action. By 1997, DOE had identified 46 sites in the program and had completed remediation at 25 sites with some ongoing operation, maintenance, and monitoring being undertaken by DOE. Remedial action was planned, underway, or pending final closeout at the remaining 21 sites.

On October 13, 1997, Congress passed the 1998 Energy and Water Development Appropriations Act,[1] which transferred administration of FUSRAP to the U.S. Army Corps of Engineers (the Corps or USACE) and appropriated $140,000,000 to the Corps for the completion of FUSRAP activities. The language in the law reads as follows:

For the expenses necessary to administer and execute the Formerly Utilized Sites Remedial Action Program to clean up contaminated sites throughout the United States where work was performed as part of the nation's early atomic energy program, $140,000,000, to remain available until expended: Provided, that the unexpended balances of prior appropriations provided for these activities in this Act or any previous Energy and Water Development Appropriations Act may be transferred to and merged with this appropriation account, ?and thereafter, may be accounted for as one fund for the same time period as originally enacted.[2]

The legislative history behind this provision offers little guidance regarding the details of the Corps' new involvement. The Conference Committee report states that "(t)he conferees have agreed to transfer the Formerly Utilized Sites Remedial Action Program (FUSRAP) to the Corps of Engineers, and funding for this program is contained in Title I of the bill."[3] The House Appropriations Committee report indicates that this change stems from concerns over the cost of the FUSRAP program under DOE. The Committee report concludes that "(c)/early, the problem must be in the contract management and contract administration function performed by the Department of Energy and the management and operating contractors who actually subcontract for most of the cleanup work."[4] Finally, citing the Corps' efforts under the Formerly Used Defense Sites (FUDS) program, the report indicates that there are significant cost and schedule efficiencies to be gained by". . . having the Corps of Engineers manage the Department of Energy's FUSRAP program as well."[5]

Given the lack of guidance in the legislative history, two Members of Congress sought to clarify the law's intent through subsequent correspondence. In a November 6, 1997, letter to Energy Secretary Federico Pena and Defense Secretary William Cohen, Senator Pete Domenici and Representative Joseph McDade indicated, among other things, that:

> Transfer of the FUSRAP program to the U.S. Army Corps of Engineers makes management, oversight, programming and budgeting, technical investigations, designs, administration, and other such activities directly associated with the execution of remediation work at the currently eligible sites a responsibility of the Corps of Engineers. It should be emphasized that *basic underlying authorities for the program remain unaltered and the responsibility of DOE* [emphasis added].

The Energy and Water Development Appropriations Act for fiscal year 1999 (FY99), P.L. 105–245, continued the Corps' involvement as the implementing agency for the FUSRAP. In particular, the 1999 Act provided that response actions by the United States Army Corps of Engineers under FUSRAP shall be subject to the administrative, procedural, and regulatory provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. 9601 et seq.), and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR, Chapter 1, Part 300. In addition, the 1999 Act provided that, ". . . except

---

[1] Energy and Water Development Appropriations Act, 1998, Pub. L. No.105–62, 111 Stat. 1326 (1997)
[2] Id.
[3] H.R. Conf. Rep. No. 271, 105th Cong., 1st Sess., 85 (1997).
[4] H.R. Rep. No. 190, 105th Sess., 99 (1997).
[5] Id.

as stated herein, these provisions do not alter, curtail or limit the authorities, functions or responsibilities of other agencies under the Atomic Energy Act (42 U.S.C. 2011 et seq.). . . "[6]

To date, NRC has not regulated activities conducted under FUSRAP, including those activities conducted by the Corps since the transfer of the program. The petitioner, however, believes that NRC should regulate the Corps' FUSRAP activities, arguing that the:

> Appropriations Act did not purport to transfer authority over FUSRAP to the Corps. As such, according to the petitioner, the Corps may not legally administer the program absent proper oversight because, unlike DOE and (in most cases) DOE contractors, the Corps is not exempt from the licensing requirements of the Atomic Energy Act (see 42 U.S.C. § 2014(s). The petitioner further indicates that DOE has publicly stated that it cannot extend its licensing exemption for private contractors to the Corps and that DOE has no regulatory authority over the Corps for the latter's FUSRAP activities. The petitioner concludes that ". . . the Corps does not have the legal authority to run FUSRAP without first obtaining a license from the NRC."

In support of its position, the petitioner notes that the institutional mission of the Corps is not focused on the safety and security of the nation's nuclear activities. In addition, NRC's failure to regulate the Corps' FUSRAP activities is claimed to be inconsistent with the intent of the laws governing the utilization and cleanup of nuclear materials. Finally, the petitioner adds that, with very few exceptions, Congress intended that no person should be permitted to handle nuclear materials except in accordance with a license issued by NRC.

In a November 30, 1998, letter NRC informed the petitioner that the petition had been received and was currently under review. On the same date, NRC forwarded the petition to the DOE and the Corps for their comment. In a January 12, 1999, letter, the Chief Counsel for the Corps, Robert M. Andersen, responded to NRC's request. DOE responded to NRC's request in a January 14, 1999, letter from William J. Dennison, Assistant General Counsel for Environment.

The Corps' Response

In its response, the Corps states that it is not required to obtain a license from NRC for its FUSRAP activities. The Corps' response emphasizes that Congress directed the Corps to conduct its FUSRAP activities pursuant to the CERCLA.[7] The Corps' principal argument is that no NRC license is required because of the Federal permit waiver for on-site removal or remedial actions in § 121(e)(1) of CERCLA. The Corps also believes that the AEA exempts FUSRAP activity from NRC licensing. In its opinion, "Congress intended for USACE to fill the shoes of the AEC successor agency responsible for FUSRAP cleanup, that is DOE, an agency not considered a 'person' subject to licensing under the AEA." The Corps further posits that, in transferring the FUSRAP program, Congress expressed no intent that the agency obtain an NRC license for that activity and, instead, sought a seamless transition "unimpeded by procedural requirements outside of CERCLA."

Nevertheless, the Corps commits to meeting th?e substantive requirements of both the Atomic Energy Act (AEA) and CERCLA. It acknowledges that NRC license requirements may apply to portions of FUSRAP response actions conducted off-site, beyond the scope of the permit waiver. The letter concludes by acknowledging that the substantive provisions of NRC regulations are applicable or relevant and appropriate requirements (ARARs) for many FUSRAP response actions under CERCLA and, as such, the Corps will look ". . . to NRC for guidance in interpreting and implementing these requirements on the sites."

DOE's Response

DOE's response differs in several respects from that of the Corps. On the matter of DOE's continued involvement with FUSRAP and oversight of the Corps, the Department "respectfully disagrees" with the Corps. According to its submittal, DOE is not authorized to regulate the Corps' FUSRAP activities and cannot transfer its AEA authorities to the Corps. In the Department's view, "(t)he transfer legislation did not make the Corps a DOE contractor, or otherwise subject the Corps' activities to the control or direction of DOE." The letter also 'indicates that DOE and the Corps are currently developing a memorandum of understanding (MOU) to clarify their respective roles and responsibilities as a result of the legislative transfer.

Nevertheless, DOE believes that, with the exception of a few "administrative issues," there are no remaining issues between the two agencies that should affect

---

[6] Pub. L. No. 105–245, Title I.
[7] 42 USC §9601 et seq.

NRC's disposition of the NRDC petition. The letter concludes that NRC should "evaluate the licensability of the Corps' activities in the same manner as it would evaluate the activities of any other 'person' within the meaning of the Atomic Energy Act." DOE defers to NRC on this question. The letter does not contain a DOE position concerning the viability of the Corps' CERCLA argument.

III. DISCUSSION

The NRC staff has completed its evaluation of the petitioner's requests and the responses from the Corps of Engineers and the Department of Energy. For the reasons discussed below, the NRC denies the petitioner's request insofar as it calls on NRC to require the Corps to obtain a license for activities conducted at FUSRAP sites.

CERCLA Permit Waiver

Pursuant to § 121 (e)(1) of CERCLA, "(n)o Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite, where such remedial action is selected and carried out in compliance with this section."[8] This provision waives any NRC license requirements that would apply to the Corps' activities at FUSRAP sites conducted pursuant to CERCLA.

The Corps argues that, because Congress specifically subjected FUSRAP sites to the provisions of CERCLA in the 1999 Act, section 121 (e)(1) applies to Corps' response actions at FUSRAP sites. In developing regulations for the implementation of CERCLA, the Environmental Protection Agency (EPA) addressed the § 121(e)(1) waiver provision for Federal agency CERCLA response actions in § 300.400(e) of the National Contingency Plan (NCP). That provision states, in pertinent part:

"Permit requirements. (1) No federal, state, or local permits are required for on-site response actions conducted pursuant to CERCLA sections 104, 106, 120, 121, or 122. The term on-site means the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of response actions."[9]

In the preamble of the final rule which proposed this section, EPA provided:

> Proposed § 300.400(e)(1) states that the permit waiver applies to all on-site actions conducted pursuant to CERCLA sections 104, 106, or 122; in effect, this covers all CERCLA removal and remedial actions (all "response" actions). However, a number " of other Federal agencies have inquired as to whether this language would reach response actions conducted pursuant to CERCLA sections 121 and 120. In response, EPA has made a non substantive clarification of the applicability of the permit waiver in CERCLA section 121 (e)(1) to include on-site response actions conducted pursuant to CERCLA sections 120 and 121. . . . The addition of CERCLA section 120 simply recognizes that the permit waiver applies to Federal facility cleanups conducted pursuant to CERCLA section 120(e), which are also selected I and carried out in compliance with CERCLA section 121.[10]

Section 121 (e)(1) applies to Federal agencies such as the Corps in this case. The Corps may take the role of "lead agency" in a CERCLA cleanup action. The NCP defines "lead agency" as "the agency that provides the OSC/RPM to plan and implement response actions under the NCP. EPA, the USCG, another Federal agency, or a state. . . may be the lead agency for a response action."[11] The NCP also states that "Federal agencies listed in § 300.175 have duties established by statute, executive order, or Presidential directive which may apply to Federal response actions following, or in prevention of, the discharge of oil or release of a hazardous substance, pollutant, or contaminant.'"[12] The Corps, a branch of the U.S. Department of Defense, is among the agencies listed.[13] In the case of the FUSRAP program, Congress specifically designated the Corps as the "lead agency" in passing the 1999 Appropriations Act.[14]

---

[8] See also, 10 CFR § 300.400(e).

[9] 40 CFR 300.400(e)(1)

[10] 55 Fed. Reg. 8666, 8689 (1990) ("National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule) (emphasis added). This change echoed EPA's intentions stated in the proposed rule: "EPA proposes to state that on-site permits are not required for response actions taken by EPA, *other Federal agencies*, States, or private parties pursuant to CERCLA sections 104, 106, or 122." 53 Fed. Reg. 51394, 51406 (1988) ("National Oil and Hazardous Substances Pollution Contingency Plan; Proposed Rule) (emphasis added).

[11] 40 CFR 300.5 (emphasis added). The definition goes on to state, "The Federal agency maintains its lead agency responsibilities whether the remedy is selected by the Federal agency for non-NPL sites or by EPA and the Federal agency or by EPA alone under CERCLA section 120."

[12] 40 CFR 300.170.

[13] 40 CFR 300.175(b)(4)(i).

[14] Pub.L. No. 105–245, Title I.

As the Corps acknowledges in its letter, the permit waiver in § 121(e)(1) has been rarely addressed in the courts. In support of its position, the Corps does cite McClellan Ecological See Situation (MESS) v. Cheney, a case which held that a Resource Conservation and Recovery Act (RCRA) permit was not required when activities which might otherwise require a RCRA permit took place at a site only as part of a CERCLA removal or remedial action.[15] In McClellan, MESS, a citizens' group, filed suit against the Secretary of Defense, with regard to cleanup actions being taken at McClellan Air Force Base, under RCRA and certain state laws. MESS claimed, that McClellan was required to obtain a RCRA permit for the management of certain hazardous wastes on the base. The court held that an RCRA permit was not required, because the remedial activities were taken pursuant to CERCLA. The court relied on § 121(e)(1), stating, "Section 121(e) expressly provides that the activity does not have to be separately permitted."[16]

The Corps also cites United States v. City of Denver to uphold this interpretation of §121(e)(1).[17] In that case, the court held that CERCLA preempted a zoning ordinance which was in actual conflict with EPA's remedial order. The court stated, "[T]o hold that Congress

intended that non-uniform and potentially conflicting zoning laws could override CERCLA remedies would fly in the face of Congress's [sic] goal of effecting prompt cleanups of the literally thousands of hazardous waste sites across the country."[18]

In passing the 1998 and 1999 Appropriations Acts, Congress gave no indication that it intended to suspend the waiver provision in §121 (e)(1) of CERCLA in the context of the Corps' FUSRAP activities. The 1999 Act does say: "Provided, further, That, except as stated herein, these provisions do not alter, curtail or limit the authorities, functions or responsibilities of other agencies under the Atomic Energy Act (42 U.S.C. 2011 et seq.). . . " In its letter, DOE points to this language to support its argument that the Appropriations Act does not create any authority for it to regulate the Corps. In doing so, DOE interprets the term "provisions" as referring to the provisions of the Appropriations Act and not the provisions of CERCLA. The NRC staff agrees with DOE on this point. While the language appears to indicate that the transfer of the program to the Corps does not alter the extent of DOE and perhaps NRC authority under the AEA, there is no specific indication that the language is intended to direct NRC to regulate the Corps' administration of the FUSRAP program. In particular, there is no evidence that in including this phrase, Congress intended to limit the application of the §121(e)(1) permit waiver to the Corps' FUSRAP activities. In fact, nowhere in the reports for either the 1998 or 1999 Acts or in the text of the laws themselves did Congress give any hint that it intended NRC to regulate the Corps in its administration of the FUSRAP program. Instead, the inclusion of the specific reference to CERCLA suggests that Congress intended NRC to continue to refrain from regulating activities under the FUSRAP program even after DOE's role was reduced or discontinued.

As DOE states in its letter, the Corps has "consistently expressed the view that its authorities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) . . . " are sufficient for the Corps' administration of the FUSRAP program. By the time the 1999 Appropriations Act was passed, the Corps' administration of the FUSRAP program under CERCLA was a matter of public record[19] and NRC had not taken any steps to require the Corps to obtain a license from NRC. If Congress had intended NRC to regulate the Corps' activities at FUSRAP sites, it is likely that it would have specifically directed NRC to do so in passing the 1999 Appropriations Act.

We note, however, that the waiver in §121(e)(1) does not apply to off-site activities. To the extent that NRC and U.S. Department of Transportation (DOT) requirements apply to the transportation, transfer and disposal of Atomic Energy Act mate-

---

[15] 763 F. Supp. 431 (E.D. Gal. 1989). This holding was later vacated on the basis of subject matter jurisdiction. See McClellan Ecological Seepage Situation (MESS) v. Perry, 47 F .3d 325 (9th Cir. 1995).

[16] 763 F. Supp. 431, at 435. The court went on to note in dicta that where there has been treatment that requires a RCRA permit which is not associated with a remedial or removal action under CERCLA, such a permit would be required. Id.

[17] 100 F.3d 1509 (10th Cir. 1996).

[18] Id. at 1513. The Corps cited Ohio v. USEPA, 997 F.2d 1520 (D.C. Cir. 1993) in support of its § 121(e)(1) position. NRC would note that the case upholds a number of provisions in EPA's 1990 revision of the NCP, including § 121(e)(1). However, the court's discussion centers on EPA's definition of the term "onsite," and does not discuss the exemption provision, as a whole, in detail.

[19] See, e.g., Letter from Albert J. Genetti, Jr., U.S. Army Deputy Commander, U.S. Army Corps of Engineers, to Mr. Thomas B. Cochran and Ms. Barbara A. Finamore, Natural Resources Defense Council, May 20, 1998.

rial taken off of FUSRAP sites, the Corps has committed to following applicable requirements, including those for transfer under the AEA, shipment under the Hazardous Materials Transportation Act, 49 U.S.C. §5101, and NRC manifest requirements (e.g., 10 CFR §20.2006).[20]

NRC Authority Under UMTRCA

Many FUSRAP sites contain material over which NRC would have no regulatory jurisdiction regardless of whether the Corps is the lead agency in implementing the program and regardless of whether response actions by the Corps under the program are subject to CERCLA. In particular, of the 21 sites at which remediation has not yet been completed, 12 sites contain residual material resulting from activities that were not licensed by NRC at the time the Uranium Mill Tailings Act of 1978 (UMTRCA) became effective or at any time thereafter. As defined by the UMTRCA, NRC does not have authority to regulate cleanup of covered residual material resulting from an activity that was not so licensed.

The language of section 83 of the Atomic Energy Act (42 U.S.C. 2113(a)), was added to that Act by UMTRCA. Section 83 a. requires NRC to impose certain terms and conditions relating to cleanup with respect to any "license issued or renewed after the effective date" of section 83 for covered activities, and also imposes such terms or conditions on any such "license in effect on the date of enactment" of the section. No such responsibility was imposed upon NRC with respect to activities that were not under NRC license before the date of the enactment of section 83, if they were not licensed thereafter.

Prior to the enactment of UMTRCA, neither the AEC nor the NRC had statutory jurisdiction over residual material resulting from the processing of ore for source material. This position was taken by the AEC after careful legal analysis, and was subsequently adopted by the NRC when it succeeded to the AEC's regulatory functions. Though NRC exercised some control over such material in connection with licensed processing of ore for source material, it did not exercise jurisdiction at inactive sites where no license was in effect. UMTRCA was enacted because the Congress recognized that NRC did not have jurisdiction over radioactive residuals resulting from the extraction of uranium or thorium from ore processed for its source material content at inactive sites. This is evidenced by the floor remarks regarding the amended version of H.R. 13650, the bill that was enacted as UMTRCA. Senator Hart explained:

Although the NRC licenses active uranium mining and milling activities, existing law does not permit the Commission to regulate the disposal of mill tailings once milling and mining operations cease and the operating license expires. It is that authority to regulate tailings after milling operations cease, that we propose be given to the NRC.[21]

Because the residual material at many FUSRAP sites was generated in activities that were not licensed when UMTRCA was enacted, or thereafter, NRC today has no basis to assert any regulatory authority over handling of the residuals at those sites.

The NRC staff notes that many of the remaining sites (i.e., sites containing materials other than mill tailings) also raise some significant jurisdictional questions in their own right. For instance, a few of the sites may still be in legal possession of DOE even though the Corps is conducting clean up at the site under FUSRAP. While the issue of possession appears to be a matter of continuing discussion between the Corps and DOE, it is highly unlikely that NRC would have authority to require a license for cleanup activities conducted at a site which continues to be a DOE-owned or controlled site. In addition, the concentration of radioactive material at some of the remaining sites may not be sufficient to trigger NRC license requirements. While NRC does not have information sufficient to reach a final conclusion for specific sites, it is the NRC staff's understanding that some of these sites may contain only "unimportant quantities" of source material as defined under 10 CFR §40.13(a). If this is the case, the amount of material at these sites would not be sufficient to implicate NRC license requirements. Given the limitations of NRC jurisdiction under UMTRCA, the potential DOE ownership issues, and the possibility that several sites may contain "unimportant quantities" of source material, it is likely that the number of FUSRAP sites over which NRC may have jurisdiction would be very small even absent the CERCLA permit waiver.

---

[20] While the Corps will be following NRC's requirements in this area, it is unlikely that any specific NRC license requirements would apply to shipments from FUSRAP sites. However, the staff will request that the Corps contact NRC if it plans to ship material that does not meet one of the exemptions for a specific license in NRC regulations. See, e.g., 10 C.F.R. §71.10.

[21] 124 Cong. Rec. 518, 748 (October 13, 1978).

The Corps' Authority Under the Appropriations Act

In its response, the Corps states that the AEA also exempts FUSRAP activity from NRC licensing because Congress intended the Corps to fill the shoes of DOE, an agency exempt from NRC regulatory requirements under most circumstances. DOE disagrees with this characterization, claiming that, for the most part, it has no role in the FUSRAP program at this time (regulatory, contractual, or otherwise). As such, in DOE's view, the Corps cannot rely on any exemption in the AEA to avoid regulation by NRC. Nevertheless, DOE acknowledges that the transfer to the Corps did not completely eliminate the Department's involvement with FUSRAP. While the issues have yet to be resolved, DOE may have responsibility for inventory reporting of government-owned FUSRAP sites to the General Services Administration and may be required to conduct post-cleanup monitoring at some sites after the Corps' clean up activities cease.

DOE and the Corps are working on an MOU to address their disagreements regarding the nature of the transfer of the FUSRAP program and their respective responsibilities under the program. Until the disagreement has been resolved, either by the agencies or by further direction from Congress, the NRC staff need not reach a conclusion on the matter.

Nevertheless, in view of the clear applicability of CERCLA §121 (e)(1) to the Corps' activity at FUSRAP sites, the staff does not believe that it would be appropriate to require the Corps to obtain an NRC license for its activity at FUSRAP sites.

IV. CONCLUSION

In sum, Congress has given NRC no clear directive to oversee USAGE's ongoing effort under CERCLA to complete the FUSRAP cleanup project. Indeed, Congress has provided NRC no money and no personnel to undertake an oversight role. In addition, Congress has made it clear that the Corps is to undertake FUSRAP cleanup pursuant to CERCLA which waives permit requirements for onsite activities. In these circumstances, we are disinclined to read our statutory authority expansively, and to commit scarce NRC resources, to establish and maintain a regulatory program in an area where, under Congressional direction, a sister Federal agency already is at work and has committed itself to following appropriate safety and environmental standards.

Accordingly, I deny the petition insofar as it requests NRC to impose licensing and other regulatory requirements on the Corps for that agency's handling of radioactive material at FUSRAP sites. Both the permit waiver provision of CERCLA and the ambiguity regarding DOE's role in the program lead me to the conclusion that NRC should not inject itself into the FUSRAP program at this time. Absent specific direction from Congress to the contrary I NRC will continue to refrain from regulating the Corps in its clean up activities at FUSRAP sites.

As provided by 10 C.F.R. § 2.206, a copy of this Decision will be filed with the Secretary of the Commission for the Commission's review. The Decision will become the final action of the Commission 25 days after issuance, unless the Commission, on its own motion, institutes review of the Decision within that time.

Dated at Rockville, Maryland this 26 day of March, 1999.

CARL J. PAPERIELLO, *Director.*
For the Nuclear Regulatory Commission,
Office of Nuclear Material Safety and Safeguards

ENCLOSURE 2

NUCLEAR REGULATORY COMMISSION,
March 26, 1999.

MEMORANDUM TO: David L. Meyer, *Chief*

RULES REVIEW AND DIRECTIVES BRANCH DIVISION OF FREEDOM OF INFORMATION AND PUBLICATION SERVICES

OFFICE OF ADMINISTRATION, T60–39

FROM: John T. Greeves, *Director*
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

SUBJECT: Publishing Notice in the Federal Register Concerning Director's Decision Under 10 CFR 2.206

Attached please find one signed original, five copies, and an electronic version on a floppy diskette of the Federal Register Notice identified below for your transmittal to the office of the Federal Register for publication.

- Notice of Finding of No Significant Impact
- Notice of Availability of Environmental Report
- Notice of Opportunity for Hearing
- Notice of Availability of License Amendment Application for: 0 Notice of Availability of Draft EIS for: 0 Notice of Availability of Final EIS for:
- Notice of Preparation of Environmental Assessment

CONTACT: John H. Lusher, NMSS/DWM (301) 415–7694

- Environmental Assessment
- Notice of Availability of Final EIS for:
- Other Directors Decision Under 10 CFR .& 2.206 to deny the NRDC petition to regulate the U.S. Corps of Engineers in performing FUSRAP site cleanups.

ATTACHMENTS: As stated (2)

[7590–01-P] NUCLEAR REGULATORY COMMISSION

ACTION: ISSUANCE OF DIRECTORS DECISION UNDER 10 CFR 2.206

Notice is hereby given that by petition dated October 15, 1998, the Natural Resources Defense Council (NRDC) has requested that the U.S. Nuclear Regulatory Commission (NRC) exert authority to ensure that the U.S. Army Corps of Engineers' (the Corps) handling of radioactive materials in connection with the Formerly Utilized Sites Remedial Action Program (FUSRAP) is effected in accord with properly issued license and all other applicable requirements. As NRDC notes in its petition, FUSRAP began in 1974 as a program of the U.S. Department of Energy (DOE), and that DOE had identified a total of 46 sites for cleanup under FUSRAP. By 1997, cleanup of 25 of these sites had been completed. There are currently 21 sites still in need of remediation. In October 1997, Congress transferred funding for FUSRAP from DOE to the Corps. NRDC believes that the Corps should obtain an NRC license to I conduct activities under FUSRAP. At this time, the NRC has not required the Corps to obtain a license.

The request has been referred to the Director of the Office of Nuclear Material Safety and Safeguards. A copy of the petition was sent to DOE and the Corps, and DOE and the Corps were given the opportunity to comment.

By letter dated November 30, 1998, NRC acknowledged receipt of the October 15, 1998.

Petition: The Director, Office of Nuclear Materials Safety and Safeguards, has determined that the request should be denied for the reasons stated in the "Director's Decision Under 10 CFR 2.206" (DD–99-), the complete text of which follows this notice and which is available for public inspection in the Commission's Public Document Room, the Gelman Building, located at 2120 L Street, N.W. , Washington D.C. 20555, and is also available on the NRC Electronic Bulletin Board at (800) 952–9676.

A copy of this Decision has been filed with the Secretary of the Commission for the Commission's review in accordance with 10 CFR 2.206(c) of the Commission's regulations. As provided by this regulation, this Decision will constitute the final action of the Commission 25 days after the date of issuance unless the Commission, on its own motion, institutes review of the Decision within that time.

Dated at Rockville, Maryland, this 26 day of March 1999.

CARL J. PAPERIELLO, *Director,*
For the Nuclear Regulatory Commission,
Office of Nuclear Material Safety and Safeguards.

NUCLEAR REGULATORY COMMISSION,
Washington, DC, April 28, 1999.

Mr. CHARLES A. JUDD, *President,*
Envirocare of Utah, Inc.,
Salt Lake City, UT.

DEAR MR. JUDD: On behalf of the Commission, I am responding to your letter to Commissioner Merrifield dated January 25, 1999 in which you requested that the U.S. Nuclear Regulatory Commission (NRC) revisit its position regarding NRC jurisdiction over 11e.(2) byproduct material produced as a result of processing ore before November 1978. You compared the NRC current position to the NRC former policies on "Below Regulatory Concern" (BRC). In addition, you voiced a concern that the

NRC position that we lack authority over certain pre-1978 11e.(2) byproduct material will allow such material to be disposed of in sanitary landfills. This letter also responds to a separate letter of February 3, 1999, on the same subject from Mr. Anthony Breard, who at that time was your Manager of Government and Industry Affairs.

In response to your concerns, I will begin by clarifying that the NRC position on pre-1978 11e.(2) byproduct material is in no way related to the BRC policies. The NRC developed these policies in response to a Congressional directive in the Low-Level Radioactive Waste Policy Amendments Act of 1985. The BRC policies were intended to establish a level below which NRC would not regulate low-level waste (LLW) and other practices. Although the NRC has the statutory authority to regulate all LLW, the BRC policies would have established a framework for exempting, by rule or license, certain LLW from regulation based on the judgment that the health and safety impact from such LLW would have been below regulatory concern. As directed in the Energy Policy Act of 1992, the NRC withdrew the BRC policies in 1993.

Unlike the BRC policies, the NRC statutory authority to regulate pre-1978 11e.(2) byproduct material is limited. NRC jurisdiction to determine the disposition of waste or tailings from ore processed primarily for its source material content at a site not licensed by the NRC on or after 1978, was established by Congress in the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). Briefly stated, UMTRCA was enacted in 1978, amending the Atomic Energy Act of 1954 (AEA), and providing the NRC with jurisdiction over the byproduct material generated by the processing of ore at NRC-licensed sites. Section 83a. of the AEA was added by the UMTRCA and became effective on November 8, 1978, when UMTRCA was enacted. That section provides that any NRC license issued pursuant to Section 62 (which addresses the licensing of activities regarding source material) or Section 81 (which addresses the licensing of activities regarding byproduct material), which was issued or renewed on or after the effective date of Section 83a., must include conditions and terms related to the final disposition of all 2 byproduct material created by the activity at such sites, as well as the sites themselves. Therefore, NRC has statutory authority for the pre-1978 11e.(2) byproduct material that exists at sites licensed by the NRC on or after November 8, 1978. The critical factor in determining the NRC jurisdiction over the byproduct material in question is whether the site at which the processing took place *was licensed* by the NRC on or after the date Section 83a. became effective, not when the material was generated. As such, there are sites with pre-1978 11e.(2) byproduct material that are not under NRC authority, because these sites were not licensed by NRC at or after the time UMTRCA was passed. However, the pre-1978 11e.(2) byproduct material not regulated by the NRC is under the jurisdiction of other Federal and State agencies, including the Department of Transportation (DOT) and the Environmental Protection Agency (EPA).

Regarding your concern that disposal of unregulated pre-1978 11e.(2) radioactive waste would occur in community solid waste landfills, the U.S. Army Corps of Engineers (USACE), in its letter dated January 12, 1999 (enclosure), has indicated its commitment to protect the public health and safety, and the environment under the Formerly Utilized Sites Remedial Action Program (FUSRAP). The USACE States that it requires that "all waste materials sent offsite for disposal go to facilities with either a license or a Federal or State permit for the proper disposal of these materials," and that offsite shipments of FUSRAP waste will be transported in accordance with the Hazardous Materials Transportation Act, 49 U.S.C. § 5101 et seq. The USACE also must comply with applicable NRC, EPA, and DOT manifest requirements.

I trust that this reply clarifies our position and responds to your concerns.

Sincerely,

SHIRLEY ANN JACKSON.

NUCLEAR REGULATORY COMMISSION,
Washington, DC, July 29, 1999.

Hon. JOHN D. DINGELL,
U.S. House of Representatives,
Washington, DC.

DEAR CONGRESSMAN DINGELL: I am responding to your letter dated July 12, 1999, in which you discussed your concern about the U.S. Nuclear Regulatory Commission's (NRC's) regulation of the disposal of 11e.(2) byproduct material located at several Formerly Utilized Sites Remedial Action Program (FUSRAP) sites. Under the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), which added a

new section 83 to the Atomic Energy Act of 1954 (AEA) as amended, the NRC does not have authority to regulate the cleanup of this material if the material was not generated by an activity licensed by the NRC on the effective date of UMTRCA (November 8, 1978), or thereafter. (Note that I am using the term "pre-1978 section 11e.(2) byproduct materiar in this letter in order to follow the terminology used in your letter, and assume that the term is intended as a shorthand reference to residual radioactive material resulting from the processing of ores before the enactment of UMTRCA.)

You expressed a concern that because of its position on pre-197B 11e.(2) byproduct material, the NRC has determined that such material may be sent to sites regulated under the Resource Conservation and Recovery Act (RCRA) rather than to disposal sites regulated by the NRC. The NRC has stated only that there are no NRC rules or regulations that preclude disposal of the material at a RCRA facility, and that disposal of this material is subject to the jurisdiction of other Federal and State agencies. Additionally, there are NRC licensed facilities that have accepted pre-1978 11e.(2) byproduct material for direct disposal or processing and disposal in their mill tailings impoundments. For example, Envirocare of Utah has an NRC license that allows it to accept some forms of this material directly for disposal. Pre–1978 11e.(2) byproduct material presented to NRC or Agreement State licensed facilities for disposal or processing must comply with all requirements applicable to those facilities.

With regard to your specific questions:

1. How will this action improve protection of the public health and the environment?

Based on our knowledge of RCRA requirements, we believe that both RCRA landfills and NRG-regulated and licensed disposal facilities are protective. However, protection of the public health and environment is improved with the availability of additional waste disposal options, resulting in the cleanup and release of these sites for other uses. Also, see our response to Question 5 below.

2. Please provide copies of the studies NRC used in making its health and safety determinations.

To our knowledge, no formal NRC studies have been conducted to compare RCRA landfills and NRC licensed 11e.(2) byproduct disposal facilities. Rather, our position is based on our knowledge of RCRA and NRC requirements and experience in regulating waste disposal. In fact, NRC's groundwater protection requirements in 10 CFR Part 40, Appendix A, are based upon RCRA requirements in 40 CFR Part 264 (see, 40 CFR 192).

3. What are the qualitative differences in the radioactive constituents of pre- and post-1978 Section 11e(2) by-product material that compel NRC to require two distinct disposal standards?

The NRC does not have two distinct disposal standards in 10 CFR Part 40. It has no standard for FUSRAP material not within its legal competence. It is important to note that pre-1978 and post-1978 11e.(2) byproduct material have similar radiological characteristics, and in some cases, pose less risk than naturally occurring radioactive material (NORM) disposed of at some RCRA facilities. It is possible that pre-1978 11e.(2) byproduct material at unlicensed sites may have been commingled with other radioactive or hazardous material that may or may not currently be under NRC's jurisdiction. For post-1978 11e.(2) byproduct material, however, commingling has generally been prevented under NRC or Agreement State regulatory programs.

4. Please detail the differences between NRC requirements in radioactive waste disposal and disposal under RCRA, specifically:

a. What controls or protections exist at RCRA landfills that ensure the protection of public health, safety and the environment from radioactive byproduct material disposed at such facilities?

The Environmental Protection Agency (EPA) has an extensive set of regulations in 40 CFR 260 through 272 for the management of hazardous wastes. RCRA disposal facilities rely in part on a system of liners and leachate detection and collection systems to prevent releases of hazardous materials to the environment. RCRA regulations for disposal also address monitoring and inspection, site selection, and other detailed requirements. Most, if not all, of these controls would also help to protect public health, safety, and the environment from radioactive byproduct material. Indeed, some RCRA facilities are licensed to receive NORM and exempt source material, the controls for which would be similar to radioactive byproduct material.

b. What protections are in place to ensure worker health and safety from the risks of exposure to radioactivity at RCRA landfills that have accepted Section 11e.(2) byproduct material for disposal from the Army Corps of Engineers under the FUSRAP program?

EPA is in a better position to answer this question on the controls and protection of worker health and safety afforded by RCRA sites that may have accepted pre-1978 11e.(2) byproduct material for disposal from the U.S. Army Corps of Engineers under the FUSRAP program.

c. Do RCRA sites require a performance assessment to demonstrate long-term protectiveness for the disposal of radionuclides?

We do not know of any performance assessment required by EPA under RCRA to demonstrate long-term protectiveness for disposal of radionuclides. However, EPA is in a better position to answer this question. We are aware that some RCRA sites accept NORM and exempt source material. As noted in response to question 4(a), RCRA regulations for management of hazardous wastes would also be protective for management of radioactive materials.

d. What type of groundwater modeling is required of RCRA sites to ensure protection of groundwater quality for at least 1,000 years?

Our understanding is that EPA's requirements in 40 CFR 264, which cover RCRA facilities, do not require groundwater modeling. However, we understand that EPA does have policies that allow the appropriate use of groundwater modeling as a means of demonstrating compliance with the closure provisions at RCRA regulated units and the determination of groundwater Alternate Concentration Limits that are protective of human health and the environment. The specific applications and decisions based on the use of groundwater modeling will likely depend on the individual site conditions, and would be best answered by the EPA.

e. What type of public involvement have RCRA sites provided to allow for public input to allow the disposal of radioactive waste in facilities that have not been permitted or designed for the disposal of Section 11e.(2) byproduct material?

EPA is in a better position to answer this question on public involvement in the development of RCRA site requirements.

5. Overall, which sites are more protective of public health, safety and the environment relative to the disposal of radioactive byproduct wastes, RCRA landfills or NRC-regulated and licensed disposal facilities?

Based on our knowledge of RCRA requirements, we believe that both RCRA landfills and NRC-regulated and licensed disposal facilities are protective. While RCRA requires a more prescriptive design approach and relies, for example, on active institutional controls for long-term control of a site, NRC uses a more performance-based approach, pursuant to the requirements in UMTRCA, such that active, on-going maintenance is unnecessary to protect the public heath and safety and the environment from the effects of 11e.(2) byproduct material that has an extremely long half-life (e.g, about 80,000 year half-life for thorium-230). For that reason, EPA standards that have been incorporated in 10 CFR Part 40, Appendix A, require that uranium mill tailings impoundments be designed to be stable for 1,000 years, to the extent practicable, but in no case, less than 200 years. In general, we believe that NRC-regulated and licensed disposal facilities, because they are subject to requirements that focus on protection of public health, safety, and the environment from radiological hazards, may afford slightly more protection against radiological hazards.

6. In a [Director's Decision] dated March 26, 1999, NRC's Office of Nuclear Material Safety and Safeguards concluded that a waiver under the Comprehensive Environmental Response, Cleanup, and Liability Act of 1980 (CERCLA) does not apply to offsite FUSRAP disposal activities. What steps has the Commission taken to regulate offsite handling and disposal of Section 11e.(2) byproduct material?

The NRC has licensed Envirocare of Utah to provide disposal for this type of material. The Commission has also addressed the disposal of this type of material in impoundments at specific milling sites. Any material in the possession of an NRC or Agreement State licensee for disposal or for processing and disposal of the residuals from the processing in an NRC- or Agreement State-licensed facility is subject to the NRC's or Agreement State's jurisdiction and must meet all applicable Commission requirements. This includes, in the case of pre-1978 11e.(2) byproduct material, the applicable requirements in 10 CFR Parts 20 and 40 and the requirements for storage, processing, and disposal in the applicable NRC or Agreement State license.

7. Does NRC require additional Congressional direction or authority to regulate pre-1978 Section 11e.(2) byproduct material?

We believe legislation would be required to give NRC authority to regulate Section 11e.(2) byproduct material in the FUSRAP program. The NRC has not sought authority or the necessary resources to regulate that material, and we note that the House Appropriations Committee Report on the Energy and Water Development Appropriations Bill for Fiscal Year 2000 contains language that the NRC is not intended to license the Corps of Engineers in the Corps' cleanup of contaminated

FUSRAP sites. If Congress believes that the NRC should regulate the mill tailings resulting from activities not licensed by the NRC at the time or after UMTRCA was enacted, we stand ready to provide information and assistance to Congress in amending the Act. NRC would need additional resources to regulate pre-1978 section 11e.(2) byproduct material.

We trust this reply is responsive to your concerns. Please contact me if I can be of further assistance.

Sincerely,

GRETA JOY DICUS.

RESPONSES BY CARL PAPERIELLO TO QUESTIONS FROM SENATOR SMITH

Question 1. Is the public notified of each individual shipment of waste received by a facility licensed by your agency?

Response. Except for spent fuel, no. Our regulations for transportation of low-level waste (LLW) and 11e.(2) byproduct material do not require such notifications.[1] In practice, the only waste disposal facility with a U.S. Nuclear Regulatory Commission license is the 11e.(2) disposal cell at Envirocare. We do not notify the public for each waste shipment to that facility. The three operating low-level radioactive waste disposal facilities in the U.S. are licensed by Agreement States. Based on our discussions with these States, none requires notification of the public for each individual waste shipment.

Question 2. As far as risk is concerned, is there a difference between FUSRAP, NORM or low-level material if each were the same volume with the same level of radioactivity?

Response. The risk to human health from these different materials would be identical if persons were exposed to the same volumes and levels of radioactivity, assuming other factors affecting risk were the same.[2] None of these other factors affecting risk is unique to any one of these waste types.

Question 3. Can a worker at an NRC low-level radioactive waste disposal facility legally be exposed to more radiation than a worker at a RCRA subtitle C facility?

Response. No. The occupational dose limits for workers at NRC-licensed facilities are contained in 10 CFR 20.1201. The annual limit is a total effective dose equivalent of 5 rems (0.05 Sv).[3] The occupational dose limits for workers at non-NRC licensed facilities (such as a State or U.S. Environmental Protection Agency (EPA) permitted Resource Conservation and Recovery Act (RCRA) disposal facility) are contained in the Occupational Safety and Health Administration (OSHA) regulations at 29 CFR 1910.1096, "Ionizing Radiation." The whole body dose limit is 1.25 rems (0.0125 Sv) per quarter for workers in restricted areas controlled by the employer and subject to certain prescribed protective measures in OSHA's regulation. Although there are some differences between NRC and OSHA regulations as to how the dose is to be calculated, the differences are generally not significant. Workers at a RCRA Subtitle C facility accepting TENORM would ordinarily be covered by these OSHA radiation control requirements. However, if this is not the case such workers would be considered members of the general public, and therefore subject to EPA's guidance for exposure to members of the general public.

Particular RCRA facilities could also be subject to more stringent limits imposed by a State permitting agency.

---

[1] 10 CFR 71.97 requires that States receive advance notification of shipments of irradiated reactor fuel and of some shipments of other wastes in large quantities. In addition, NRC regulations require reporting of certain events (unplanned releases or exposures, including those from transportation, for example), and these are made public.

[2] Some of the other factors that could affect risk are the form of the material (e.g., whether it is soil, debris, or some other solid form), its physical and chemical characteristics (e.g., solubility), and human behavior (e.g., how many hours a worker might be exposed to the materials). As noted above, none of these is unique to any one of these waste types. Another factor affecting risk could be the presence of hazardous materials, in addition to radioactive materials, but these are not unique to any of these waste types either. Technologically enhanced naturally occurring radioactive materials (TENORM) may contain not only uranium, thorium, and/or radium, but also heavy metals, such as lead, cadmium, and mercury, and hazardous chemicals from leachate used to extract materials of value from ores. Like TENORM, some Formerly Utilized Site Remedial Action Program (FUSRAP) materials may also contain hazardous wastes that include metals that were not extracted from the ore, and leachate used to extract the uranium and/or thorium. LLW may also contain hazardous materials.

[3] In addition, licensees must implement a program to achieve doses that are as low as is reasonably achievable (ALARA). In practice, the ALARA program reduces doses well below 5 rems/year (0.05 Sv/yr).

Question 4. From the perspective of risk to public health and worker safety, do you believe that it is safe to dispose of low-activity radioactive wastes at RCRA subtitle C facilities that have permit requirements (i.e., concentration levels and worker safety measures) similar to those of the Buttonwillow facility, EnviroSafe facility and WCS facility?

Response. Based on our knowledge of RCRA requirements and our experience in regulating waste disposal, we believe that RCRA landfills are protective for low-activity wastes. Many of the standards governing RCRA landfills are similar to those required at NRC-licensed sites handling 11e.(2) byproduct material (tailings or wastes from extraction of uranium or thorium from ore). RCRA disposal facilities, like state-of-the-art mill tailings impoundments subject to NRC licensing, rely, in part, on a system of liners and leachate detection and collection systems to prevent releases of hazardous materials to the environment. RCRA disposal and NRC's mill tailings regulations also address monitoring and inspection, site selection, and other detailed requirements. These controls, help protect public health and safety and the environment from both radioactive and non-radioactive materials. NRC's mill tailings requirements are more explicit in requiring measures to ensure the long-term stability of the disposal facility.

NRC does not regulate the Buttonwillow, EnviroSafe, or Waste Control Specialists (WCS) facilities and therefore the NRC is not familiar with the details of their design and operation. We are aware that the Buttonwillow and EnviroSafe facilities have RCRA permits from their respective States authorizing up to 2000 picocuries/gram (74 Bq/g3 of radioactivity for disposal. WCS can accept up to 30 picocuries/gram (1.1 Bq/g) of radium[4] for disposal. EPA has endorsed up to 2000 picocuries/gram (74 Bq/g) of radioactivity for disposal in RCRA hazardous waste facilities.[5]

Given the above, we have no reason to believe that disposal of these types of materials as described has not been sufficiently protective.

Question 5. Is there anything additional from the hearing that you would like to respond to, clarify or expand on? If so, please do so now.

Response. We have no additional information to provide.

RESPONSES BY CARL PAPERIELLO TO QUESTIONS FROM SENATOR BENNETT

Question 1. In evaluating the regulation of FUSRAP wastes, I have been concernedabout the current regulatory situation. One of my greatest concerns is that if the NRC is not regulating pre-1978 waste, it is not clear to me who is. It has been argued to me that if this material is Atomic Energy Act (AEA) "byproduct material," it cannot be regulated by EPA under RCRA, even if NRC is not regulating it. Further, if this material is AEA "byproduct material," the States also are preempted from regulating it. In short, it is argued that the designation of this material as "byproduct material" under the AEA—a designation that I understand the NRC has given this material—means that if the NRC adheres to its current position that it lacks the authority itself, *no one at all* has the authority to regulate the material. What is your response to these arguments?

Response. We recognize that questions have been raised regarding the appropriate term to use in describing the ore-processing residuals at FUSRAP sites.[1] Terms applied to the material have not always been consistently applied. However, the issue you raise is primarily one of jurisdiction over clean-up of the material. Based on the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA) and its legislative history, NRC believes that the material in question constitutes pre-UMTRCA mill tailings not subject to NRC regulation, even though the material may be chemically, physically, and radiologically similar to section 11e.(2) byproduct material. The distinction between pre-UMTRCA and post-UMTRCA findings is a legal one, not a technical one.

The Commission's regulatory authority under UMTRCA only extends to mill tailings that have been produced by a person licensed by NRC as of the effective date of UMTRCA or thereafter. However, neither the language of the statute nor

---

[4] The total radioactivity, which includes the decay products of radium, would be several times larger than this amount. Buttonwillow and EnviroSafe iimits are expressed as total radioactivity.

[5] In June 1994, EPA published its MSuggested Guidelines for the Disposal of Drinking Water Treatment Wastes Containing Radioactivityf that allows for the disposal of up to 2000 picocuries/gram (74.4 Bq/g) of radium in RCRA hazardous waste facilities.

[1] This issue was specifically raised in a recent commission decision. However, the commission did not find it necessary to address the issue at that time. *International Uranium (USA) Corporation*, CLI-00-1, 51 NRC 9, 14 (2000).

the legislative history of UMTRCA suggests that States would lack the authority to regulate mill tailings not covered by either Title I or Title II of UMTRCA. Any State law regulating the disposal of FUSRAP processing residuals would not conflict with Federal law, because the Atomic Energy Act (AEA), as amended by UMTRCA, and NRC's implementing regulations do not address disposal of FUSRAP processing residuals.

It is NRC's view that the preemption of State authority by NRC regulation in the field of radioactive materials is limited to those materials and activities over which NRC has been given regulatory authority by Federal statute. This argument has support in Federal case law. In Illinois v. Kerr-McGee Chemical Corp.,[2] the Court of Appeals stated that "The Commission has exclusive authority to regulate radiation hazards associated with the materials and activities covered by the Atomic Energy Act. . . ."[3] As noted above, the ore-processing residuals from FUSRAP sites are not covered by the AEA for the purposes of NRC's regulatory jurisdiction, as amended by UMTRCA. Therefore, NRC's does not have exclusive authority to regulate the radiation hazards posed by the disposal of FUSRAP ore-processing residuals. Because NRC lacks jurisdiction over the disposal of FUSRAP mill tailings material, there is no bar of Federal preemption under the AEA with respect to this material and nothing in the AEA prohibits the States from regulating the disposal of that material.

Question 2. In several places, your testimony states that the Appropriations Committee has given the NRC guidance not to involve itself in FUSRAP waste. You reference language from last year's Energy & Water Appropriations committee report that indicates that Congress does not intend NRC to license the Corps' activities under GERCLA at FUSRAP cleanup sites. Does the NRC take this language to mean that it should not regulate off-site disposal of FUSRAP waste and require licensing of disposal sites?

Response. We do not believe that the Committee language specifically addresses the issue of off-site disposal of FUSRAP mill tailing wastes and we have not received Congressional direction on off-site disposal issues. Of course, if Congress believes that NRC should regulate the off-site disposal of these materials, we stand ready to provide information and assistance to Congress in developing the necessary legislation.

Question 3. Exactly where in §83 or in the related legislative history does it say that NRC has no authority over wastes that satisfy the definition of 11e.(2) byproduct material MED or AEC generated by processing for uranium or thorium if generated prior to 1978? (Please assume that such materials are under the control of a private entity and not DOE or are going to be removed from DOE control).

Response. The plain language of Section 83 explicitly directs the Commission to impose certain terms and conditions on "[a]ny license issued or renewed after the effective date of this section under section 62 or section 81 for any activity which results in the production of any byproduct material, as defined in section 11e.(2)." This language clearly indicates that NRC's regulatory authority and responsibilities for the material are prospective. That is, Congress intended NRC to reguiate only those mill tailings materials at existing licensees' sites and those newly licensed after UMTRCA was enacted.

The FUSRAP sites did not have NRC licenses as of the effective date of UMTRCA; therefore, the mill tailings produced at those sites are not subject to NRC regulatory authority. Because the FUSRAP mill tailings were not produced under an NRC license, it is not material over which NRC has control, and NRC lacks the authority to require a license for possession and disposal of it.

The legislative history indicates a Congressional intent for NRC authority under Title II of UMTRCA to apply only to existing and future licensed sites, not to unlicensed sites. The April 5, 1999, Director's Decision regarding NRC regulation of the U.S. Army Corps of Engineers' FUSRAP activities pointed to floor remarks by Senator Hart regarding the amended version of H.R. 13650, the bill from which UMTRCA was derived.[4] These remarks read:

> Although the NRC licenses active uranium mining and milling activities, existing law does not permit the Commission to regulate the disposal of mill tailings once milling and mining operations cease and the operating license ex-

---

[2] 677 F.2d 571 (7th cir.), *cert. denied*, 459 U.S. 1049 (1982).
[3] 677 F.2d at 581 (emphasis added).
[4] *United States Army Conzs of Engineers*, DD–99–7, 49 NRC 299 (1999).

pires. It is that authority to regulate tailings after miliing operations cease, that we propose be given to the NRC.[5]

The 1999 Director's Decision concludes that "[b]ecause the residual material at many FUSRAP sites was generated in activities that were not licensed when UMTRCA was enacted, or thereafter, NRC today has no basis to assert any regulatory authority over handling of the residuals at those sites."[6]

Other more specific references in the legislative history provide a clear indication of Congress' intent in passing the statute. In House Report 95–1480, Part 2, Congress stated that Title II would provide NRC "[a]dditional authority to effectively control tailings at these active and all future sites."[7] This statement indicates that the new authority provided to NRC would not extend to sites unlicensed at the effective date of UMTRCA. Elsewhere, the House Report, in explaining Title II, states that "Title II would prospectivelygrant the uranium mill tailings licensing function to the NRC."[8] This statement would have been meaningless, unless it was understood to mean that the legislation granted the regulatory function to NRC only with respect to then current and future licensed sites.

As a general matter, by passing UMTRCA, Congress sought to address the issue of mill tailings by creating two programs: a program for the remediation of unlicensed, inactive sites (Title I) and a regulatory program for licensed, active operations (Title II). The regulatory and remedial programs established by the Act did not, however, address all sites with mill tailings. In particular, it is clear from the legislative history that Congress was aware of the FUSRAP sites and concluded that those sites would not be handled under UMTRCA.

House Report 95–1480, Part 2 contains a section-by-section analysis and committee comments on UMTRCA. In the comment section regarding Title I of UMTRCA, the Report states:

> The committee understands there that [sic] are a number of federally owned or controlled sites with such materials or tailings, such as the TVA site mentioned earlier and a DOE site in Lewiston, N.Y., and some in New Jersey. The committee wants to have these sites identified by the DOE and have data concerning the health or environmental problems associated with the sites and on what, if anything, is being done to eliminate such problems and when.[9]

Each of the above-mentioned sites was a FUSRAP site at the time Congress enacted UMTRCA. Just before the quoted section of the report, Congress stated that DOE would be required to report to Congress on the health or environmental problems at Title I sites.[10] The fact that Congress specifically and separately identified these sites after it had issued a broad statement regarding reports on Title I sites indicates that Congress viewed the FUSRAP sites as separate and distinct from the Title I sites and that Congress felt it had to name the FUSRAP sites in order to ensure that DOE would report on both Title I and FUSRAP sites.

In addition to the House Report, Congress received testimony from James L. Liverman, the Acting Assistant Secretary for Environment at the newly created Department of Energy, the individual responsible for the FUSRAP program.[11] Liverman's testimony demonstrates that there were inactive sites that needed clean-up and that they were being addressed apart from Titles I and 11 of UMTRCA. In discussing a number of sites that DOE investigated to determine whether clean-up would be necessary, Liverman informed the House Subcommittee on Energy and the Environment that DOE was "[n]ot proposing that as a part of this bill because we have not yet accurately determined what the cost may be, but I do want to mention it because it is another thing that is coming across the table, but it is not covered in this legislation."[12] The sites referenced by Liverman were FUSRAP sites.

Question 4. Please explain why 10 CFR 40.2(b) makes no reference to such materials having to be licensed by NRC but rather appears to suggest that NRC can regulate such materials whether licensed or not as long as they are not at a DOE controlled Title I site.

---

[5] 124 CONG. REC. S18748 (daily ed. Oct. 13, 1978).
[6] 49 NRC at 308.
[7] H.R. Rep. No. 95–1480, pt. 2 at 30 (1978).
[8] *Id.* at 46 (quoting EPA Administrator Costle)(emphasis added).
[9] *Id.* at 41.
[10] *Id.*
[11] *See Uranium Mill Tailinas Control: Hearings on H.R. 13382, H.R.12938, H.R.12535, and H.R. 13049 Before the Subcomm. on Energy and the Environment of the House Comm. on Interior and Insular Affairs*, 95th Cong. 41 (1978).
[12] *Id.* at 42.

Response. We assume that the regulation in question is 10 CFR 40.2a ("Coverage of inactive tailings sites"). 10 CFR 40.2a states:

(a) Prior to the completion of the remedial action, the Commission will not require a license pursuant to 10 CFR chapter I for possession of residual radioactive materials as defined in this part that are located at a site where milling operations are no longer active, if the site is covered by the remedial action program of Title I of the UMTRCA. The Commission will exert its regulatory role in remedial actions primarily through concurrence and consultation in the execution of the remedial action pursuant to Title I of the UMTRCA. After remedial actions are completed, the Commission will license the long-term care of sites, where residual radioactive materials are disposed, under the requirements set out in § 40.27.

(b) The Commission will regulate byproduct material as defined in this part that is located at a site where milling operations are no longer active, if such site is not covered by the remedial action program of Title I of the UMTRCA. The criteria in Appendix A of this Part will be applied to such sites.[13]

Concerns have been raised that this regulation is inconsistent with the position that NRC lacks jurisdiction over pre-UMTRCA mill tailings. The inconsistency disappears if the intent of the regulation is understood. Section 83 of UMTRCA and the legislative history of UMTRCA make it clear that the scope of Section 40.2a is necessary in order to cover a specific type of site—a site at which processing no longer was taking place, but which retained a license as of the effective date of UMTRCA. UMTRCA's legislative history demonstrates that at least one, if not more, such sites existed. In his testimony before a Senate subcommittee, Dr. Liverman of DOE indicated that, although DOE had studied such a site at Edgemont, South Dakota, DOE excluded this site from its list of Title I sites because the site remained under license by the NRC.[14] The status of the Edgemont site was further addressed in section 21 of NRC's appropriations legislation for Fiscal Years 1982 and 1983. The Conference Report for the legislation explained that "[a]lthough the Edgemont site is an inactive uranium mill site, it was not included in the remedial action program established by [Title I of UMTRCA] because TVA [the Tennessee Valley Authority] held a current license from NRC for the mill."[15]

NRC adopted 10 CFR 40.2a in order to ensure that such a licensed site would not fall outside the reach of remedial action by either NRC or DOE. First, inactive Title I sites could be remediated by DOE under its UMTRCA authority. Second, active and future licensees of mill tailings sites could be regulated by NRC under its UMTRCA Title II powers. Third, at the time UMTRCA was enacted, FUSRAP sites were already under the authority of DOE (and were later transferred to the Corps of Engineers). Therefore, the only type of site that NRC needed to ensure would not be excluded from remedial action by either DOE or NRC was an inactive, but licensed site. Section 40.2a is intended to address these sites.

Question 5. Given that NRC and DOE as successors to the AEC have regulatory authority over AEA materials and that both agencies have stated that certain FUSRAP wastes qualify as 11e.(2) byproduct material, how is it possible for an unlicensed entity to have possession of such materials in light of § 81 of the AEA?

Response. As discussed in response to previous questions, it is the NRC's position that the mill tailings from the FUSRAP sites constitute pre-UMTRCA mill tailings not subject to NRC regulation. Accordingly, for the purposes of NRC oversight, the licensing requirements of Section 81 do not apply to this material.

Question 6. Is NRC reversing the position stated in 57 Fed. Reg. 20,527 (May 13, 1992) that materials that satisfy the 11e.(2) definition generated by MED/AEC "qualify as 11e.(2) byproduct material"? And if so, why?

Response. The Commission recognizes that there has not been consistency in the labels applied to the ore-processing residuals at FUSRAP sites. Nevertheless, when considered in its full context, NRC did not intend to convey in the 1992 Federal Register notice ("Uranium Mill Facilities, Request for Public Comments on Revised Guidance on Disposal of Non-Atomic Energy Act of 1954, Section 11e.(2) Byproduct

---

[13] *See* 45 Fed. Reg. 65521 (Oct. 3, 1980); as amended at 55 Fed. Reg. 45591, 45598 (Oct. 30, 1990).

[14] *See Uranium Mill Site Restoration Act and Residual Radioactive Materials Act: Hearings on S. 3008. S. 3078, and S. 3253 Before the Subcomm. on Energy Production and Supply of the Comm. of Energy and Natural Resources* 95th Cong. (1978) at 43. Additionally, the State of New Mexico submined testimony to the Senate committee in which it identified four inactive sites that were then under New Mexico Agreement State license, but which were excluded from the list of Title I sites. *Id.* at 115. Although two licensed New Mexico sites were eventually included in the Title I program, it appears that the other licensed, inactive sites were covered under the regulatory program created by Title II.

[15] H.R. Rep. No. 97–884, at 49 (1982).

Material in Tailings Impoundment and Position and Guidance on the Use of Uranium Mill Feed Materials Other Than Natural Ores") that the mill tailings at FUSRAP sites were 11e.(2) material. In that notice, NRC indicated that "[G]overnment contracts were issued for thorium source material used in the Manhattan Engineering District and early Atomic Energy Commission programs. Wastes resulting from that processing and disposed of at these [FUSRAP] sites would qualify as 11e.(2) byproduct material."[16] [emphasis added.]

This discussion of the FUSRAP wastes falls under section 4 of the notice entitled "Types of Wastes Being Proposed for Disposal of Tailings Piles." The introductory paragraph expressly states:

> The NRC and the Agreement States continue to receive requests for the direct disposal of non-11e.(2) byproduct material into uranium mill tailings piles. The following general categories of non-11e.(2) byproduct material illustrates the requests submitted to NRC and the Agreement States for disposal into uranium mill tailings piles licensed under authority established by Title II of UMTRCA: . . .[17]

FUSRAP is one of four general categories that follow the introductory paragraph. Elsewhere, the notice indicates that ". . . the term "non-11e.(2) byproduct material" will be used to refer to radioactive waste that is similar to byproduct material, as defined in the AEA in Section 11e.(2) but is not legally considered to be 11e.(2) byproduct material."[18] Given this context, it is our view that NRC clearly considered the FUSRAP processing residuals to be non-11e.(2) material. We believe that the phrase quoted, in part, in the question ("would qualify as 11e.(2) byproduct material") is best understood as indicating that the FUSRAP material "would qualify as 11e.(2) byproduct material" if it fell under NRC's jurisdiction in the first place. We understand that the notice could and should have been structured more carefully in order to avoid any misunderstanding. Nevertheless, the Commission believes that the notice classifies pre-UMTRCA mill tailings as non-11e.(2) byproduct material.

Response by Carl Paperiello to Question From Senator Moynihan

Question 1. The Conference of Radiation Control Program Directors (CRCPD) has formally urged the Commission to regulate radioactive byproduct material at FUSRAP sites that are generated prior to 1978. I note that Paul Merges with my state is the upcoming chair of the CRCPD. Why doesn't the NRC heed the advice of this 50-state radiation protection group and regulate pre-1978 FUSRAP waste just like it regulates the same waste generated after 1978?

Response. The NRC seeks to conform its actions to the law. UMTRCA has been understood to provide that the NRC does not have authority to regulate material generated at sites that were not licensed at the time UMTRCA was passed. If Congress believes that NRC should regulate these materials, we stand ready to provide information and assistance to Congress in amending UMTRCA.

Responses by Carl Paperiello to Questions From Senator Boxer

Question 1a. In your oral testimony, you stated that "[T]he NRC believes that both RCRA landfills and NRC license disposal facilities should be able to provide adequate protection for the public and the environment for TENORM and mill tailings types of material." You appear to base this assessment on the fact that some RCRA facilities have adopted limits on the amount of radioactive materials that may be accepted and "at least one" has limits on worker exposure."

Please provide the environmental and public health studies that form the foundation of your assessment.

Response. The basis for this statement is included in the response to Senator Smith's fourth question. RCRA Subtitle C landfills have a number of design features similar to those required for NRC-licensed mill tailings disposal facilities. The NRC's mill tailings regulations are based largely on the RCRA requirements. Our statement is also based on the fact that these facilities are explicitly authorized in their State permits to accept certain non-AEA radioactive materials, and some are subject to OSHA worker protection regulations for radiation exposures. The radioactivity concentration limit, 2000 picocuries per gram (74 Bq/g), in two of the facilities' permits (Buttonwillow and EnviroSafe), is the same as that contained in EPA

---

[16] 157 Fed. Reg. 20525, 20527 (May 13, 1992).
[17] *Id.* (emphasis added).
[18] *Id.* at 20526.

guidance for disposal of drinking water treatment waste in RCRA landfills.[1] Waste Control Specialists has a limit of 30 picocuries per gram (1.1 Bq/g) of radium, as noted in response to Chairman Smith's fourth question.

Question 1b. In your oral testimony, you stated that "[T]he NRC believes that both RCRA landfills and NRC licensed disposal facilities should be able to provide adequate protection for the public and the environment for TENORM and mill tailings types of material." You appear to base this assessment on the fact that some RCRA facilities have adopted limits on the amount of radioactive materials that may be accepted and "at least one" has limits on worker exposure.

Please indicate what federal legal requirements, if any, mandate that RCRA facilities provide the same level of worker protection, site closure assurances and radioactive monitoring as is required of an NRC licensed facility.

Response. NRC does not regulate RCRA facilities. As a result, EPA and OSHA are in a better position to describe the specific Federal requirements for ensuring that worker health and the environment are adequately protected at such facilities. However, as we note in response to Chairman Smith's fourth question, we believe RCRA hazardous waste facilities are protective for low- activity wastes because they are subject to detailed requirements and controls on site selection, monitoring and inspection and they use liners and leachate detection and collection systems to prevent releases to the environment. In addition, OSHA has established a 5 rem/yr. Limit for exposure to workers at non-NRC regulated facilities in 29 CFR 1910.1096. We also believe that NRC-regulated and licensed disposal facilities, because they are subject to requirements that focus on protection of public health, safety, and the environment from radiological hazards, may afford slightly more protection against radiological hazards.

As EPA testified, States are authorized under RCRA to establish standards for the disposal of specific types of Federally unregulated radiological material. In practice, State permitting agencies have prescribed conditions for acceptance of pre-UMTRCA mill tailings in RCRA permits.

Question 2a. Dr. Westphal invited you to respond to the following statement in his oral testimony, but you were not able to respond given time constraints. "As I understand it . . . in these sites [FUSRAP sites] the level of contamination that remains today in some of these sites has had over time, you know, the hot stuff has been removed, but the stuff that remains has had the opportunity to mix with clean soils and to be dispersed in the area. So to some extent this material is—and I suppose that is the reason that NRC doesn't regulate this material. It is pre-1978. Post-1978 the material hasn't had those opportunities to disperse in soils and it is therefore much more dangerous to public health and regulates that."

Does mixing radionuclides with clean soil reduce the radioactivity of the radionuclide, cause the radionuclide to be less long-lived or cause the radionuclide to be less harmful? If so, could you please provide documentation.

Response. The radiological properties of individual radionuclides, such as half-life and the type of radiation emitted and its energy, are not affected by dilution with clean soil. The risk to human health from soil contamireated with radioactivity, however, is often significantly affected by concentration, so that dilution would lower risk. "Clean" soils (or natural soils) contain uranium, thorium, and radium, which are the same radionuclides found in many radioactive wastes, including FUSRAP waste.

Protection of human health and the environment is not dependent solely on the particular radionuclides in radioactive materials. Generally, the lower the concentration, the fewer the number of controls that would be needed to safely manage radioactive materials containing uranium, thorium, and radium. Undiluted uranium mill tailings should be disposed in a regulated tailings impoundment or hazardous waste disposal facility. On the other hand, soil containing small concentrations of uranium, thorium, and radium requires no special treatment.

Question 2b. Dr. Westphal invited you to respond to the following statement in his oral testimony, but you were not able to respond given time constraints. "As I understand it . . . in these sites [FUSRAP sites] the level of contamination that remains today in some of these sites has had over time, you know, the hot stuff has been removed, but the stuff that remains has had the opportunity to mix with clean soils and to be dispersed in the area. So to some extent this material is—and I suppose that is the reason that NRC doesn't regulate this material. It is pre-1978. Post-

[1] U.S. Environmental Protection Agency, 1994. "Suggested Guidelines for the Disposal of Drinking Water Treatment Wastes Containing Radioactivity." Washington, D.C.

1978 the material hasn't had those opportunities to disperse in soils and it is therefore much more dangerous to public health and regulates that."

Is it the case that hazardous waste facilities have numerous chemicals that act as chelating or organic complexing agents, that, when mixed with radioactive waste, can increase the speed with which the radioactive waste migrates in the environment? What analyses, if any, has the federal government performed to estimate the risk this may pose to public health or the environment in the case of disposing of 11e.(2) waste at RCRA landfills.

Response. EPA or State permitting agencies are in a better position to answer this question. We note, however, that if such chemicals were present they would also affect migration of hazardous wastes, such as heavy metals.

Question 2c. Dr. Westphal invited you to respond to the following statement in his oral testimony, but you were not able to respond given time constraints. "As I understand it . . . in these sites [FUSRAP sites] the level of contamination that remains today in some of these sites has had over time, you know, the hot stuff has been removed, but the stuff that remains has had the opportunity to mix with clean soils and to be dispersed in the area. So to some extent this material is—and I suppose that is the reason that NRC doesn't regulate this material. It is pre-1978. Post-1978 the material hasn't had those opportunities to disperse in soils and it is therefore much more dangerous to public health and regulates that."

Further, is Dr. Westphal correct that NRC doesn't regulate pre-1978 byproduct material because that material had the opportunity to mix with clean soils and that NRC regulates post-1978 material because is it much more dangerous to public health since it hasn't had the opportunity to mix with clean soils? If so, please provide written documentation of this NRC rationale for not regulating pre-1978 material

Response. No. The NRC's basis for not regulating pre-UMTRCA mill tailings is a legal one, based on our understanding of UMTRCA and its legislative history.

Question 3. Do you agree that radioactive waste, wherever they are disposed of, should be disposed of to protect groundwater to at least the Maximum Contaminant Levels under the Safe Drinking Water Act, as is required under CERCLA?

Response. Our position, consistent with internationally recommended radiation practices, is that the regulatory dose criteria for radioactive waste disposal must be protective of health, safety, and the environment, considering all exposure pathways, including groundwater, with ample safety margins. NRC and EPA have had long-standing fundamental differences on how groundwater should be protected. These differences were the subject of a recent U.S. General Accounting Office (GAO) report,[2] which notes that EPA's maximum contaminant levels (MCLs) for drinking water are not up to date and are based on obsolete methods of radiation dose estimation. These result in radiation doses (for different contamination limits) that are over a thousand times lower than background radiation for some radionuclides, and, for others, well above the 4 mrem/year dose on which the MCLs were based. Accordingly, we do not believe that current MCLs provide a sound, rationale basis for decision-making with respect to protecting groundwater. However, we did note in our formal comments on the draft GAO report, "Low-Level Radiation Standards," that adoption by EPA of updated MCLs at a uniform 4 mrem/year total effective dose equivalent for each radionuclide would go part way to resolving our longstanding differences.

Question 4. Should facilities that receive 11e.(2) material be required to have groundwater monitoring requirements for specific radionuclides to verify that the facility is not leaking radioactive contaminants to the groundwater on- and off-site? Further, should there be action limits established for radionuclides that would trigger corrective action should the facility leak or should controls fail and exposures occur? How do RCRA facilities and NRC-licensed facilities compare in these areas?

Response. Monitoring of contaminant movement and leakage in a disposal facility is a standard tool for ensuring that facilities are functioning safely. EPA's RCRA regulations in 40 CFR Part 264 require monitoring, although radioactive materials are not specified in the list of constituents. EPA stated in its written testimony for the July 25, 2000, hearing of the Committee that States which regulate RCRA facilities can establish standards for the disposal of Federally unregulated radiological material, such as naturally occurring radioactive material (NORM), and material that is not regulated at the Federal level (this could include pre-UMTRCA mill tailings). Thus, State RCRA permitting agencies are responsible for determining and

[2] U.S. General Accounting Office, June 2000. "Radiation Standards: Scientific Basis Inconclusive, and EPA and NRC Disagreement Continues." GAO/RCED–00–152. Washington, D.C.

establishing the necessary permit conditions, including any that might be needed or required for radionuclides. In making a determination on monitoring, such agencies would probably consider the kinds and amounts of radionuclides being disposed of, the likelihood that barriers and controls would not function, and whether monitoring programs for hazardous materials would detect all leaks and therefore be a suitable surrogate for radioactive materials.

With respect to the comparison between RCRA facilities and NRC-licensed facilities, we note that NRC regulations and license conditions for licensed mill tailings impoundments specify detailed monitoring requirements for specific radionuclides. The monitoring required at RCRA facilities would depend upon the permit conditions established by the relevant State agencies.

Question 5. In your oral testimony, you stated that non-occupational exposures at facilities taking 11e.(2) material to be 100 millirem. It was my understanding, however, that NRC-licensed facilities are to produce collective doses to the public of no more than 25 milirem, drinking water doses of not more than 4 millirem, and air doses for non-NRC sites under NESHAP of 10 millirem. Is that correct? What are the applicable standards and citations?

Response. As a general rule, an individual member of the public cannot receive a total effective dose equivalent that exceeds 100 millirem per year (1.0 mSv/yr) from licensed activities. 10 CFR 20.1301 (a)(1). As you note, some NRC licensees are subject to a 25 millirem per year (0.25 mSv/yr) dose limit, such as those terminating their licenses in accordance with 10 CFR Part 20 Subpart E and those operating a uranium mill. No NRC regulations incorporate a 4 millirem per year (0.04 mSv/yr) dose limit, although EPA has established such a dose limit under the Safe Drinking Water Act as an "at the tap" standard for public drinking water. The air dose limit of 10 millirem per year (0.10 mSv/yr) originally contained in EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) is reflected in NRC regulations 10 CFR 20.1101 (d). EPA should be consulted for its applicability to non-NRC licensees.

With respect to non-NRC licensed facilities that accept radioactive materials, including mill tailings, according to the EPA testimony, State RCRA permitting authorities would establish the safety criteria for these facilities. These may be concentration limits (e.g., 2000 picocuries per gram (74 Bq/g)), or could be dose limits to members of the public and may also include design, siting, and operational controls.

Finally, and as noted earlier in our response to Chairman Smith's third question, OSHA has established a 1.25 rem (.025 Sv) per quarter (5 rem per year (0.05 Sv/yr)) limit for exposure of workers at non-NRC regulated facilities. 29 CFR 1910.1096. NRC regulations for workers under the 10 CFR Part 20 radiation protection program also allow up to 5 rem/year (0.05 Sv/yr). 10 CFR 20.1201. Workers at an NRC-licensed site who are not covered by the licensee's radiation control program (e.g., administrative staff in offices are often not covered) are considered by NRC to be members of the public, and subject to the 100 millirem per year (1.0 mSv/yr) dose limit in 10 CFR Part 20.

Responses by Carl Paperiello to Questions From Senators Baucus and Graham

Question 1. As a policy matter, what do you believe is the appropriate dividing line between NRC and EPA jurisdiction when it comes to regulating the disposal of low-activity radioactive waste materials? Should the NRC regulate those materials associated with the nuclear fuel cycle, leaving to EPA the regulation of other materials?

Response. The Commission believes that a re-examination of the dividing line needs to be conducted and has taken steps to begin this process, at least for low-level radioactive materials with uranium, thorium, and/or radium contamination. Historically, NRC has regulated materials generated by the nuclear fuel cycle, but not NORM or TENORM. Pre-UMTRCA mill tailings are also not regulated by NRC and are often similar radiologically to TENORM.

In a March 9, 2000, memorandum to NRC staff, the Commission directed the staff to initiate interactions with EPA, OSHA, the States, the Army Corps of Engineers, DOE, the Department of Interior, and the Department of Transportation to evaluate existing and planned regulation of low-level source materials, or materials containing less than 0.05% uranium and/or thorium. The Commission also requested that the staff explore the willingness of these agencies to assume responsibilities for certain levels of these kinds of materials. We believe that there may be opportunities for managing these low-end materials with more-risk informed and consistent ap-

proaches than the current approach that is largely based on the origin of the waste (e.g., the nuclear fuel cycle).

Question 2. You have taken the position that NRC does not have authority over the disposal of FUSRAP mill tailings. Does that mean that you cannot regulate the disposal of such material even at a site that is otherwise regulated by the NRC? Please explain your reasoning on this matter.

Response. Pre-UMTRCA mill tailings may be licensed if sent to an NRC or Agreement State licensee, under certain limited conditions. If the pre-UMTRCA mill tailings are sent to a licensed milling facility, where they are processed primarily for their source material content, such post-UMTRCA processing would convert the mill tailings into material that is under NRC jurisdiction. If the material is sent to an NRC licensee for direct disposal without processing, the tailings themselves would not be under NRC jurisdiction at the time of the transfer. The mere transfer of the pre-UMTRCA mill tailings cannot convert the material into post-UMTRCA section 11e.(2) byproduct material over which NRC has direct authority. However, NRC would have jurisdiction over the licensee and the licensed disposal activities. Although the pre-UMTRCA material itself would not be licensed, the licensee would be responsible under 10 CFR Part 20 for controlling the doses from all radioactive materials under its control, whether licensed or unlicensed. In such a case, NRC would take regulatory action to ensure that the licensee complies with all license and regulatory requirements in its handling and processing of material brought onsite.

Question 3. What would you guess is the basis for the adoption of a 2,000 picocuries limit on waste activity?

Response. The 2000 picocuries per gram (74 Bq/g) limit is incorporated into DOT regulations in 49 CFR 173.403 (expressed as 0.002 microcuries per gram in the regulation) in the definition of radioactive material. It is also in NRC regulations in 10 CFR 71.10 as the limit below which materials are exempt from NRC transportation requirements in 10 CFR Part 71. Below this concentration limit, DOT no longer considers material to be subject to the DOT regulations for shipping radioactive materials. The inclusion of the 2000 picocuries per gram (74 Bq/g) concentration limit in the regulation dates back to a revision to the DOT regulations in 1968. This revision incorporated the suggested regulations established by the International Atomic Energy Agency (IAEA) in Safety Series No.6, "Regulation for the Safe Transport of Radioactive Materials." The basis for the concentration limit is not provided in IAEA Safety Series No. 6 nor in FEDERAL REAISTER notices. However, the general philosophy in these regulations is that as the concentration of radioactive material increases, the requirement for more protective packaging and more stringent hazards communications increase in order to maintain safety of the public during the transportation process.

This limit has been used in areas other than transportation. For example, the EPA document, "Suggested Guidelines for the Disposal of Drinking Water Treatment Wastes Containing Radioactivity," states that waste with concentrations less than 2000 picocuries per gram (74 Bq/g) may be acceptable for disposal in RCRA hazardous waste landfills.

STATEMENT OF DR. JOSEPH W. WESTPHAL, ASSISTANT SECRETARY OF THE ARMY, DEPARTMENT OF THE ARMY OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

Thank you for the opportunity to explain the U.S. Army Corps of Engineers policies and practices with respect to the management and disposal of low-activity radioactive materials under the Formerly Utilized Sites Remedial Action Program (FUSRAP). Accompanying me today are: Ms Julie Peterson, a Corps health physicist, Ms Noelle Simpson, a Corps Assistant Counsel for Environmental Restoration, Regulation and Compliance, and Stephen Keefer and George Sunderland of the Army Audit Agency.

The Department of Energy (DOE) initiated FUSRAP in the 1 970's to address radiological contamination remaining at sites contaminated as a result of the Nation's early atomic energy development program. Most of these sites were cleaned up according to standards in effect when these activities were completed and released for unrestricted use. DOE reviewed several hundred possible sites. A total of 46 sites, five sites of which Congress later directed DOE to remediate, have been included in the program.

In October 1997, responsibility for completing cleanup at 21 sites where DOE had not yet completed remedial activities was transferred to the Corps in the Fiscal Year

1998 Energy and Water Development Appropriations Act (P. L. 105–62). The Corps actions in cleaning up FUSRAP sites since October 1997 may be summarized as follows:

- seamless transition from DOE: no slippage in cleanup activities as a result of the transfer;
- established partnerships with local communities, State and Federal regulators;
- executed a memorandum of understanding with the Department of Energy;
- awarded a nationwide disposal contract at rates of 50–60 percent or more less than what they were at the time of transfer;
- execution approaching or exceeding work scheduled during FY98 and FY99;
- removed and safely disposed of 324,000 cubic yards of material;
- completion of remedial activities at three of the 21 sites remaining to be completed; and
- Records of Decision at 6 sites.

The Corps has achieved this while putting worker safety, and the protection of public health and the environment first.

REGULATORY FRAMEWORK OF FUSRAP REMEDIATION

The Corps performs response actions at FUSRAP sites in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), as authorized in Section 611 of the Energy and Water Development Appropriations Acts for 2000. This statutory regime regulates the entire FUSRAP cleanup process, with external oversight from EPA and the States. This regulatory regime also sets criteria to guide the development of the final cleanup plan for the site. CERCLA and the NCP also set a framework for involving regulators and the public in the cleanup selection process.

For Federal agencies conducting response actions, CERCLA waives Federal, State and local procedural requirements of a permit for work performed entirely onsite. Although an agency is not required to adhere to the administrative aspects of permit requirements, the agency must meet the substantive requirements of an otherwise applicable permit. This permit waiver, however, does not extend to activities performed offsite, such as transportation and disposal.

The Corps follows applicable transportation requirements, such as the Department of Transportation (DOT) regulations under the Hazardous Material Transportation Act. These regulations specify marking, labeling, placarding, packaging, and shipping paper requirements for certain types of hazardous materials. Most FUSRAP materials do not meet the DOT regulatory definition of radioactive waste because the materials do not exceed 2,000 picocuries/gram.[1] FUSRAP material that is not covered by these transportation regulations is still tracked for accountability through a chain-of-custody form.

The NCP also mandates that all parties conducting remediation pursuant to CERCLA authority must comply with the offsite rule. Under this rule, the Corps notifies the EPA regional offsite coordinator where the disposal facility is located before materials are shipped to the disposal site. EPA determines whether the facility proposed for the disposal is in compliance with all permits or licenses, or has pending enforcement actions that indicate that the facility may present a risk of release to the environment. EPA must determine that the facility is acceptable under the offsite rule before any materials are shipped.

If more than one disposal facility is identified as a potential option for the waste material, a competitive process will be utilized to locate the facility which best meets the project needs. The criteria used in this competitive process may include technical factors such as past performance, waste management plan, technical expertise, management experience, and disposal and transportation costs.

Federal regulations to ensure the health and safety of workers at disposal sites are found either in worker protection standards promulgated by the NRC, for NRC licensed facilities, or by the Occupational Safety and Health Administration (OSHA) for hazardous waste disposal facilities permitted under RCRA. Both the NRC and OSHA standards provide comparable protection for workers responsible for the disposal of radioactive materials.

The disposal of all FUSRAP material offsite is regulated depending upon the materials and risks involved. The Corps reviews historical radiological survey and sampling data and also conducts its own characterization work to determine which hazardous materials are present, and in what quantities and concentrations. The Corps

[1] A picocurie is the smallest measure for the intensity of radioactivity contained in a sample of radioactive material. It represents one trillionth of a curie, or two disintegrations per minute.

then uses this information to determine the regulatory status of the material before disposing of the material in accordance with applicable laws and regulations, as well as the acceptance criteria of the receiving facilities. It is the responsibility of the operator of the disposal site to obtain all necessary State permits and licenses to dispose of the material. However, the Corps independently verifies that the disposal facility is licensed or permitted to accept the materials for disposal.

REGULATORY STATUS OF FUSRAP MATERIALS

While FUSRAP materials which are regulated under the Atomic Energy Act (AEA) must be sent to NRC or Agreement State licensed disposal sites, some low-activity FUSRAP materials may be disposed of at Resource Conservation and Recovery Act (RCRA) permitted facilities which allow disposal of such materials. NRC has stated that it does not have jurisdiction over residual materials, i.e., waste or tailings from the processing of ore for source material content, if two conditions are met: (1) the residual materials were generated prior to 1978, when the Uranium Mill Tailing Radiation Control Act (UMTRCA) was passed; and (2) the residual materials resulted from a processing operation that was not licensed in 1978 or thereafter. Included in such materials are residual contamination from materials generated by uranium processing facilities used during the Manhattan project. Those facilities were operated and later decontaminated and decommissioned by the Atomic Energy Commission and one of its successor agencies, the Department of Energy. DOE facilities that discontinued uranium operations dedicated to national security purposes were targeted for decontamination and cleanup. Those cleanups were, and are, conducted in accordance with FUSRAP. After 1978, active commercial processing of uranium from ore for use in the commercial nuclear industry was subject to NRC licensing as required by UMTRCA.

Congress passed UMTRCA in 1978 with the intent of expanding the jurisdictional reach of the Atomic Energy Act to specifically described uranium processing sites and materials that Congress found to represent a public health threat. UMTRCA established a bifurcated approach to addressing uranium mill tailings and milling waste. The Act is divided into two titles: Title I created a remediation program for specific sites designated in the Act where uranium ore processing had occurred prior to 1978 primarily for the supply of the nuclear programs of the United States; Title II established a regulatory program to address tailings and waste from active, licensed milling operations. Title II of UMTRCA gave the NRC jurisdiction over the tailings or waste produced from active ore processing activities licensed at that time or in the future. The legislative history of Title II of UMTRCA repeatedly focuses on the application of the requirements to existing or new licenses. The Congress was aware that this new statutory authority did not apply to all radioactive materials of a similar nature yet declined to expand the law to cover other types of sites, such as FUSRAP sites, containing similar materials.

The historic ore processing residuals at FUSRAP sites constitute a minute fraction of all the process wastes from mining, oil and gas production, water treatment during mineral processing, and other activities that contain the same naturally occurring radionuclides as these FUSRAP wastes and that are disposed at sites not regulated under the AEA. Most of these other materials are not disposed of at facilities licensed by the NRC or an Agreement State. All FUSRAP materials are disposed of at a facility licensed or permitted for disposal of radioactive materials, much of it at NRC facilities, and a smaller percentage at State-permitted disposal facilities with specified limits for low-activity radioactive materials.

The State regulators for the RCRA facilities that are receiving the low-activity FUSRAP wastes have specific provisions in their permits allowing for the disposal of these wastes at the facilities. The facilities are designed to manage these wastes, as well as RCRA hazardous waste, and in some cases wastes regulated under other statutes, such as the Federal Toxic Substances Control Act (TSCA), which regulates disposal of PCBs, asbestos, and other toxic chemical substances. These facilities all have designs and operating plans that include liners, leachate collection systems, surface and groundwater monitoring, worker protection standards, perimeter security, emergency response plans, eventual caps upon unit closure, and long term maintenance and land use restrictions. In short, they are engineered, subject to State regulation, to safely dispose of materials such as FUSRAP wastes. Permits for these facilities were issued only after notice and public comment, including public participation on the permit provisions dealing with radioactive materials. They are located in geographic areas considered appropriate for disposal of hazardous wastes, due in part to low precipitation and very deep subsurface intervals to groundwater.

The Corps will continue to dispose of FUSRAP materials with higher activity levels in NRC or agreement State licensed disposal sites, since they are the only facili-

ties which can accept higher activity materials, whether the materials themselves are NRC licensed or not. The Corps regards both NRC licensed and RCRA permitted disposal facilities as providing protection to workers and the communities around them from exposure to the hazardous substances, including radionuclides, that they are permitted or licensed to manage for disposal.

CORPS DISPOSAL POLICY

The Corps policy for the disposal of FUSRAP radioactively contaminated materials requires that waste material first be characterized via an evaluation of historical data and the use of appropriate analytical testing. Based on the characterization information, the Corps will identify potential disposal facilities for that waste material. Only facilities licensed by the Nuclear Regulatory Commission or an Agreement State, or facilities permitted by a Federal or State regulator to accept radioactive materials in accordance with applicable laws and regulations, will be considered candidates.

Prior to shipment of FUSRAP material to a disposal facility, the Corps policy requires that both the facility and its regulator be provided complete and accurate characterization information and that each agrees to its disposal at that facility. Moreover, the policy requires the written concurrence of the State and/or Federal regulatory agency indicating that the proposed disposal is consistent with applicable regulations and the license or permit.

LINDE SITE BUILDING 30 DEMOLITION AND DISPOSAL

The Linde Site is located on East Park Drive in the Town of Tonawanda, New York. Between 1942 and 1946, Linde Air Products, a subsidiary of Union Carbide Industrial Gases, was contracted by the Manhattan Engineer District to extract uranium from uranium ore received at the site. Linde Building 30 was one of five onsite buildings in which uranium processing occurred. Uranium extraction activities were discontinued in 1946 and the buildings were decontaminated and decommissioned from 1949 through 1953 to standards in effect at that time.

DOE designated the Linde Site as eligible for cleanup under FUSRAP in 1980. DOE released an Engineering Evaluation/Cost Analysis (EE/CA) pertaining to the demolition and disposal of Building 30 in November 1996 for public comment. The Corps issued an Action Memorandum and Responsiveness Summary for the Linde Site Building 30 Demolition and Disposal pursuant to this EE/CA in February 1998.

The Corps of Engineers awarded a work order to Radian International, LLC of Bethesda, Maryland in May 1998 to demolish and dispose of Building 30. Work included abandonment of utilities, removal of waste and debris stored in the building, asbestos removal, structural demolition, and offsite disposal of demolition debris. Prior to the demolition, all the waste and debris stored in the building were removed and disposed of at Envirocare in Clive, Utah, and the building interior, including surfaces of structural members, was cleaned of contaminated dust and loose materials. Those materials were also removed from the building and disposed of at Envirocare.

Building 30 had twice previously been surveyed with instrumentation to detect radiation. The first was during 1949–52, when the building was decontaminated to the standards in effect at the time, and again, by DOE, in the 1980–81 timeframe. Most recently, the Corps of Engineers conducted its own comprehensive radiation survey using modern detection equipment, followed by core sampling, prior to demolition and shipping. The twenty-six samples taken by Corps contractor verified the location and radiation levels of "hot-spots" identified by non-destructive electronic surveying for radiation contaminants. These samples measured in the picocurie level. The final sampling led to conservative estimates of the radiation level averages for the building structure.

Demolition of Building 30 was completed in September, 1998. The demolition debris was segregated and Radian competitively solicited bids for transportation and disposal of the material.

As a result of this competitive process the radioactively contaminated material was disposed as follows:

- 1,282.6 tons of soil, steel and miscellaneous waste, including all the material stored in Building 30, was shipped to Envirocare in Olive, Utah for disposal; and
- 2,164.42 tons of wood, masonry and interior asbestos were shipped to Safety-Kleen in Buttonwillow, California.

Different disposal facilities were selected based on the characterization, including level of activity, of the materials as compared to the permit or license limitations of the facilities, as well as debris size, transportation efficiency, cost, regulator

agreement to allow receipt of the material and other factors. Disposal was completed February 10, 1999.

USE OF SAFETY-KLEEN FACILITY NEAR BUTTONWILLOW, CALIFORNIA

Safety-Kleen's permit from the State of California for operation of the facility near Buttonwillow allows the disposal of radioactive materials with an activity level less than 2,000 picocuries/gram that are not NRC regulated source material. The permit contains no restrictions limiting Safety-Kleen to accepting only naturally occurring radioactive material ("NORM"). The Linde materials shipped to Safety-Kleen comprised construction debris, mostly broken concrete and wood, with residual amounts of radioactivity averaging 335 picocuries/gram, well below the limit in Safety-Kleen's permit. Furthermore, the Linde materials are not NRC regulated source material, but rather radioactive residuals from the processing of ores at a facility that was not licensed by the NRC in 1978 when UMTRCA was passed. Prior to shipment of the Linde construction debris to California, as requested by the Corps, Safety-Kleen telephonically informed both the California State Department of Health Services and Department of Toxic Substances Control of its plans to dispose of FUSRAP wastes prior to shipment from the Linde site. At that time, neither Department indicated that they had any concerns regarding the suitability of Safety-Kieen for the disposal of these wastes. Safety-Kleen followed the telephonic notification with a written notice to both Departments.

Subsequently, more than a month after the last shipment was received, the California Department of Health Services (DHS) wrote Safety-Kleen to express its concerns that Safety-Kleen was not properly licensed to accept radioactive materials. However, based on a review of the disposal by a team of radiation experts assembled by the DHS, the California Environmental Protection Agency and Health and Human Services Agency indicate, by letter dated August 25, 1999, to California State Assemblyman, Dean Florez, that there is "no reason to expect long-term problems at this facility." The State agencies also acknowledge that the facility's design of "two three-foot thick impermeable clay liners, three heavy gauge synthetic liners, and two leachate collection systems . . . is more than is required by State and Federal environmental laws." Because the materials involved are primarily solid concrete and wood debris which were previously cleaned and decontaminated, the Corps believes that potential for migration of entrained radioactive residues through the liners and into the environment is negligible. In addition, DTSC, the State agency responsible for implementing the California Resource Conservation and Recovery Act (RCRA) program, "has not found any violations—of the Resource Conservation and Recovery Act (RCRA) hazardous waste facility permit, which DTSC issued—by the company in accepting these shipments."

The California Department of Health Services (DHS) has advised the Corps that it is continuing to pursue its investigations of the FUSRAP disposal at the Safety-Kleen facility. Although the State's RCRA agency issued a permit to Safety Kleen, it appears that the California Environmental Protection Agency may not have fully coordinated its permitting action with the California Department of Health Services.

AUDIT BY THE ARMY AUDIT AGENCY

In response to questions about the disposal of Linde Building 30 materials, I have asked the Army Audit Agency (AAA) to investigate this action. The tentative conclusions reached by MA are that the Corps was in full compliance with all applicable laws and regulations and acted responsibly in protecting overall human health, safety and the environment. I will provide the final report to the Committee as soon as it is completed.

RESPONSES BY JOSEPH W. WESTPHAL TO QUESTIONS FROM SENATOR SMITH

Question 1. Please describe in more detail the process utilized by the Corps and/or the disposal contractor to ensure that FUSRAP materials do not exceed the disposal facility's acceptance criteria.

Response. The process that the U.S. Army Corps of Engineers uses to ensure that FUSRAP materials do not exceed the disposal facility's acceptance criteria begins with the initial radiological survey to determine the existence of contamination at the site which exceeds standards, and ends with the collection and analysis of samples required by the disposal contractor. During this process, depending on the size and complexity of the site, thousands of samples will be analyzed. Together with an understanding of the site history, these samples provide a complete and accurate picture of contamination there, including radionuclides, activity levels, and nature

of dispersion in the contaminated medium. Additional sampling along with other site characterization data is used to design and direct remedial activities and to determine disposal options. The data will determine the following: worker, public health, and environmental protections required during remedial activities; and whether the material can be cost effectively separated into more than one waste stream for more efficient disposal; whether contamination is evenly distributed throughout the medium which is contaminated. All sampling is done in accordance with standard protocols to ensure a high level of confidence in the characterization.

This process can be illustrated by the characterization of the Linde Building 30, at the Linde Site, Tonawanda, New York. The initial survey to determine the existence of contamination which exceeds standards in Building 30 and the materials stored there was performed in the late 1970's. It involved close to 700 samples, including, for example, over 320 total gross alpha and total gross beta/gamma measurements using approximately a 6-meter grid over the entire floor. In 1981 a follow-up survey was done with fewer samples to confirm the results of the first survey. Between 1988 and 1992 additional more extensive surveys were conducted to support remedial design engineering. These surveys involved close to 10,000 samples, including, for example, over 3,600 total gross alpha and total gross beta/gamma measurements on building floors, using approximately a 2-meter grid in areas identified as having elevated activity or a 5 meter grid for areas without elevated activity. Based on these surveys, the Corps determined that the material could be cost effectively separated into several waste streams for disposal at different kinds of facilities. In 1998 the Corps carried out a survey in accordance with the requirements established by the disposal facility.

At each FUSRAP site, the Corps requires its contractor to develop a specific plan outlining the process to be used for transportation and disposal of material from the site. The Corps reviews this plan to ensure compliance with all applicable Federal, state, and local requirements. The plan specifies the radiological, chemical, and physical/geotechnical testing that will be performed to adequately characterize and profile each waste stream to be disposed. Distinct waste streams may be segregated based on site history, process knowledge, physical/chemical characteristics, or the results of previous site investigations. The Corps-approved waste profile is provided to potential disposal facilities for review. After a disposal facility indicates that it may accept a specific waste stream, additional samples may be collected at the site and provided to the facility to allow the facility to conduct its own analytical testing. After completion of the waste profile and any pre-shipment sampling, both the Corps and the disposal facility are aware of the range of concentrations to expect in a specific waste stream. The Corps ensures that the selected disposal facility's regulator has approved any material for disposal prior to shipping. The Environmental Protection Agency is also notified to ensure compliance with the off-site rule in 40 CFR 300.440.

After receiving regulator approval, the material is prepared for transportation. At FUSRAP sites, this generally involves excavation of contaminated soil and placement into bulk containers such as railcars. An additional waste sampling regime is initiated at this time to ensure that the excavated material that is being placed in each container complies with the waste profile and with applicable Department of Transportation (DOT) requirements. The number and type of samples and/or radiological surveys required is based on a number of factors, including the homogeneity of the waste stream and the disposal facility's requirements. The number and type of samples/surveys may also depend on any potential regulatory requirements. After sampling is accomplished, the appropriate shipping documents are prepared by the contractor and submitted to the Corps for review. Material is not transported off-site until an appropriately trained Corps representative has approved of the shipment. The material is tracked from the time it leaves the FUSRAP site until it reaches the disposal facility. The disposal facility may take samples of the material prior to receipt and acceptance of the material for disposal.

Question 2. Please clarify the difficulties involved in removing the FUSRAP wastes from the Safety-Kleen facility near Buttonwillow, California. Has the placement of this material created a more dangerous condition? Could you explain?

Response. The placement of FUSRAP materials at the Safety-Kleen facility has not created a more dangerous situation. Safety-Kleen is a hazardous waste disposal facility permitted by the California under the Resource Conservation and Recovery Act (RCRA), also permitted to accept low-activity radioactive material not regulated under the Atomic Energy Act. Safety-Kleen routinely accepts radioactive materials from the oil industry which have the same radionuclides as FUSRAP material and comparable levels of activity. Furthermore, after an extensive review, the California Department of ToxicSubstances Control and Department of Health Services both ac-

knowledged in a letter to State Assemblyman Dean Florez, dated August 25, 1999, that there are no known safety or health risks to the community as a result of this disposal.

There are, however, several difficulties which would be involved in removing the FUSRAP wastes from the Safety-Kleen facility, just as there would be in attempting to remove any other identified waste stream material from an approved engineered disposal site. Any action to disturb a managed waste cell would require both the permission of the owner, and the approval of the State regulator. These cells are designed to receive hazardous waste for permanent disposal, and not to be reopened after the materials are placed. The owner could be expected to demand that the United States guarantee theintegrity of their waste cell, including the liner, in case of any damage caused by the excavation. The demand would extend not just to any immediate and obvious damage, but also to any long-term damage that could cause releases in the environment into the future.

The principal difficulty is that the FUSRAP material is now mixed with hazardous wastes. The Safety-Kleen facility at Buttonwillow is permitted by the State of California to receive a wide variety of hazardous wastes regulated under the Resource Conservation and Recovery Act (RCRA) and the California statutory equivalent. The materials from Linde were disposed of legally at the Safety-Kleen facility over a period of several months, and over eighteen months have passed since those shipments were completed.

Safety-Kleen has managed and disposed of other materials in the same area of the facility since the Linde shipments. Daily fill, hazardous wastes, debris and other solid waste from various sources have all been commingled with the Linde debris. The area could contain low-activity radioactive material, such as oil field waste, as well as PCBs, asbestos, metals, solvents, or a wide variety of other regulated hazardous wastes. No material could be removed until it had been characterized, an elaborate effort for hazardous waste from a variety of different generators. This would be required both for worker protection, and to determine the ultimate disposal facility for the materials. The receiving facility would have to have a RCRA permit covering all the listed and characteristic waste and constituents that turn out to be present, and, in addition, to provide for the acceptance of radioactive materials at the activity of whatever material is removed.

Question 3. If RCRA Subtitle C facilities were no longer able to accept FUSRAP material, how many competitive options would remain? What would be the effect on cost for disposal of this material? Is there historical evidence available to support the cost impact—(i.e. what was the cost when RCRA facilities were not an option?)?

Response. There are currently only two facilities with NRC licenses that are actively competing for FUSRAP disposal business. One is Envirocare of Utah, an NRC-licensed disposal facility, and the second is the International Uranium Corporation, an NRC-licensed uranium milling facility which has accepted some FUSRAP material as alternative feed stock under an amendment to its NRC license. Not all FUSRAP materials are suitable for use as alternative feed stock. There are two other facilities, one in New Mexico and one in Washington, licensed to accept 11e(2) materials, including the pre-1978 ore processing residuals which constitute a majority of FUSRAP materials. Both of these facilities have indicated that they currently have no interest in FUSRAP material. In addition to these four facilities which are licensed to accept 11e(2) ore processing residuals, there are also two facilities which operate under agreement state licenses and accept low-level radioactive wastes (LLRW). Both would require state approval to also accept pre-1978 ore processing residuals. Neither of these facilities has shown much interest in competing for Corps FUSRAP disposal contracts. There is also an agreement state licensed mill that has shown some interest in FUSRAP materials as alternative feed stock.

The Corps believes that if RCRA Subtitle C facilities were no longer able to accept FUSRAP material, its primary options would be limited to Envirocare of Utah and International Uranium Corporation. The latter, however, would only be available for material which could be used as alternative feed stock. The Corps has realized a 30 percent reduction in the cost it pays to Envirocare for the disposal of that material through its competitive bidding process. Based on this evidence, the Corps believes that disposal costs would substantially increase if RCRA Subtitle C facilities could no longer compete for the disposal of low-activity FUSRAP materials.

Question 4. What studies or reviews were completed by the Corps to ensure safe disposal of FUSRAP at RCRA facilities?

Response. Because the Corps does not regulate disposal facilities, it has not performed any independent study of the appropriateness of disposal of radioactive materials at RCRA hazardous waste facilities. The Corps looks to the regulators of RCRA-permitted and NRC-licensed disposal facilities to set the parameters for the

disposal of radioactive materials at a particular facility, based upon its location, design, and operational plans. However, from a worker protection standpoint, the Corps has reviewed existing radiation protection programs at targeted facilities. It has also reviewed facility-prepared dose modeling results at RCRA facilities and verified that the radiation dose to facility workers from their handling of low-activity FUSRAP materials is estimated to be less than 1 millirem per year.

The Corps also evaluates the qualifications of its contractors prior to award of a contract. Among the factors that the Corps evaluates are the contractor's performance record, adequacy of equipment and facilities, operational controls, including safety programs applicable to the work to be performed, and possession of the proper licenses and/or permits to execute the contract. For disposal of radioactive FUSRAP materials, the Corps will only use RCRA facilities, that have permits that specifically address allowable radioactive isotopes and/or allowable levels of radioactivity.

Following finalization in 1999 of the Corps multiple award disposal contract, the Corps assembled a team of technical experts, mostly from its Hazardous, Toxic and Radiological Waste Center of Expertise in Omaha, to visit the facilities which received an award under this contract. Reviews were conducted of facility permits and licenses, compliance audits, safety and health programs, and inspection records. These teams also met with regulatory agencies for each of the facilities to ensure clarity regarding the nature of the FUSRAP materials the Corps proposed to dispose of at these facilities under the 1999 contract.

Based on the facility permits, site visits, and meetings with regulators, the Corps believes that disposal of some low-activity FUSRAP materials at RCRA Subtitle C facilities with permits authorizing the disposal of radioactive material is protective of public health and the environment.

Question 5. Please explain how FUSRAP wastes are sampled and levels of activity are determined prior to shipment to disposal facilities.

Response. A FUSRAP site investigation and remediation involves multiple surveys and analytical sampling events prior to material being sent off-site for disposal. The analysis of historical information and all collected survey data is used by the Corps to develop and refine a conceptual site model that characterizes the nature and extent of the radiological contamination at the site. Each survey is designed to satisfy specific objectives and the analytical methods and data quality are chosen to ensure the objectives, will be met. Initially, a scoping survey is performed to determine the presence or absence of contamination within an area of the site. Scoping surveys are generally performed with hand-held radiation survey instruments and limited analytical samples are collected. When an area is found to be contaminated, additional characterization surveys are performed to determine the nature and extent of the radionuclides involved. Characterization surveys may involve the collection of a significant number of samples from various media within the contaminated area. For those areas requiring cleanup, surveys are performed to guide the remedial activities. Remediation support surveys are used by the Corps to ensure that the cleanup is complete. Data from these in-situ characterization and remediation surveys is often used to develop the waste profile that is provided to potential disposal facilities. Once the material has been removed, an additional waste sampling regime is initiated to ensure consistency with the waste profile and compliance with applicable Department of Transportation (DOT) requirements. Because each subsequent survey is not entirely independent of previous surveys, the characterization data may be used to supplement the ex-situ sampling. The number and type of samples and/or radiological surveys required after the material is excavated is based on a number of factors, including the homogeneity of the waste stream and the disposal facility's requirements. The number and type of samples/surveys may also depend on any potential regulatory requirements. For example, the range of specific activity in many FUSRAP waste streams will not approach the 2000 pCi/g DOT definition of Class 7 radioactive material. However, for those wastes whose range includes this level, additional sampling may be required. After sampling is accomplished, the appropriate shipping documents are prepared by the contractor and submitted to the Corps for review prior to the shipment being released from the site.

RESPONSES BY JOSEPH W. WESTPHAL TO QUESTIONS FROM SENATOR BOXER

Question 1. In your oral testimony, you stated that "we believe that Resource Conservation and Recovery Act, RCRA, Subtitle C, Hazardous Waste Disposal facilities, do provide for the safe and protective disposal of some FUSRAP material." As you know, FUSRAP material is radioactive and RCRA does not provide for the regulation of radioactive materials. Please provide the environmental and public health

studies that form the foundation for the Corps' view that RCRA facilities are protective.

Response. Although radionuclides are not a listed or characteristic hazardous waste under RCRA, states can, and most do, regulate the disposal of radioactive materials not regulated under the Atomic Energy Act. This regulation is often done in conjunction with the state RCRA program. Some states have chosen to prohibit or greatly restrict the disposal of radioactive materials at RCRA facilities. Other states, however, have examined the location, design, and operations of certain RCRA facilities and have authorized those facilities to accept radioactive materials up to a designated activity limit.

The Corps does not regulate these waste disposal facilities. The Corps looks to the regulators of RCRA-permitted disposal facilities, as well as NRC-licensed disposal facilities, to set the parameters of disposal of radioactive materials. The regulators of each facility are in the best position to know whether disposal of low-activity radioactive waste is appropriate at a particular facility, and whether such disposal is acceptable to the local community.

The Corps does, however, evaluate the qualifications of its contractors prior to award of a contract. The Federal Acquisition Regulations (PAR) require that the government make an affirmative determination that a contractor is responsible prior to award of a contract. Among the factors that the Corps reviews in order to determine whether a contractor is qualified to perform a contract are the contractor's performance record, financial resources (including bonds and other resources that secure financial obligations), adequacy of equipment and facilities, operational controls (including safety programs applicable to the work to be performed), and possession of the proper licenses and/or permits to execute the contract.

The Corps' decision to utilize certain RCRA permitted facilities as a disposal option for some low-activity FUSRAP materials included an evaluation of RCRA worker radiation safety. The Corps, for its own information, reviewed existing radiation protection programs at targeted facilities. The Corps also reviewed facility prepared dose modeling results at RCRA facilities and verified that the radiation dose to facility workers from their handling of low-activity FUSRAP materials is estimated to be less than 1 millirem per year.

For disposal of radioactive FUSRAP materials, the Corps is only using RCRA facilities, that have permits that specifically address allowable radioactive isotopes and/or allowable levels of radioactivity.

Question 2a. In your oral testimony, you state that FUSRAP sites were first cleaned up according to 1946-era standards. You then imply that DOE cleaned up FUSRAP sites to remove the waste with the high levels of contamination. You then state that '4we continue now to continue to clean up what is remaining there and what is remaining, I assume, is the 11e(2) byproduct. Some of that material would be classified under that label.''

Please reconcile this statement with the statement earlier in your testimony that only 20 percent of the FUSRAP waste the Corps has disposed of under the program has been sent to RCRA facilities, with the remaining 80 percent going to NRC licensed facilities.

Response. A principal reason why only 20 percent of FUSRAP materials are going to RCRA Subtitle C disposal facilities is the low-activity level acceptance criteria of the RCRA facilities. The Safety-Kleen facility near Buttonwillow, California, is permitted to accept material with an average activity level less than 2,000 picoCuries per gram (pCi/g). EnviroSafe of Idaho and Waste Control Specialists of Texas are permitted to accept some materials with an average activity level up to 355 pCi/g. However, there are multiple factors involved in determining the best disposal option for FUSRAP materials in addition to activity levels, these include, quantities, disposal permits and licenses, regulatory acceptance, transportation options, contracting options, and site and loading logistics.

Question 2b. Please provide documentation for your statement that only 20 percent of the waste the Corps has disposed of under FUSRAP has been sent to RCRA facilities.

Response. The table below shows that only 61,000 cubic yards out of a total of 347,000 cubic yards and 2,800 tons out of a total of 4,500 tons were disposed of at RCRA Subtitle C facilities. The RCRA hazardous waste disposal facilities on the table below are Safety-Kleen, EnviroSafe of Idaho, and WCS (Waste Control Specialists of Texas).

Site	Material	Disposed CY	Disposed Tons	Disposal Facility	Location
Ashland 1, ...	Soil	78,249		International Uranium	Utah
Tonawanda, NY				Corporation	
Ashland 2, ...	Soil	45,500		International Uranium	Utah
Tonawanda, NY				Corporation	
Bliss & Laughlin, ...	Metal Shavings & Mis-	60		Envirocare	Utah
Buffalo, NY	cellaneous Debris.				
Linde, ...	Soil	3,700		Envirocare	Utah
Tonawanda, NY					
	Soil, steel, metal de-		1,283	Envirocare	Utah
	bris &.				
	miscellaneaus decon				
	wastes.				
	Bldg. 30 wood, ma-		2,165	Safety Kleen	California
	sonry, &.				
	interior asbestos				
	Non-rad. scrap steel ...		111	Lewis Levin	New York
	Bldg. 30 North Bay		25	Integrated Waste	New York
	non-rad..				
	bldg. debris				
	Non-friable, non-rad. ...		17	Lakeview Land fill	Pennsylvania
	Asbestos				
Painesville, OH	Soil	1,326		Envirocare	Utah
St. Louis, MO	Soil	71,000		Envirocare	Utah
sites					
	Soil	381		EnviroSafe	Idaho
Colonie, NY	Soil (Mixed Waste)	952		Envirocare	Utah
	Mixed Waste drums	27EA		Envirocare	Utah
	(55 gal), stabilized				
	waste/debris				
	LLRW—125 tons metal		125	GTS Duratek	Tennessee
	debris				
	LLRW—Dry activated		27	GTS Duratek	Tennessee
	waste.				
	Unimporiant Source	3,000		EnviroSafe	Idaho
	Material Quantity				
	Non-contaminated		75	Ft Edwards.	
	Wood.				
	Chip				
	Clean Scrap Metal for		40		New York
	Recycle at local dealer				
W.R Grace, ...	Soil (Containerized rub-	150		WCS	Texas
Baltimore, MD	ble).				
DuPont	Structural Steel		536	WCS	Texas
Deepwater Plant, ...					
NJ					
	Drums Mixed Waste	9		PermaFix	Florida
	(55 Gal)				
	Bagged PPE	7		WCS	Texas
Maywood, NJ	Soil	45,355		Envirocare	Utah
Wayne, NJ	Soil	40,000		Envirocare	Utah
Middlesex, NJ	Soil	57,600		EnviroSafe	Idaho
	Structural Steel		137	EnviroSafe	Idaho
Program Total		347,289	4,541		

Question 2c. Please provide documentation that DOE performed work at each of the remaining FUSRAP sites to remove high levels of radioactive materials.

Response. The table below contains general information about earlier cleanups of FUSRAP sites, prior to the creation FUSRAP, which was provided to the Corps by the DOE. Typically earlier cleanups were designed to meet standards in effect at the time, in the 1940's, 1950's or 1960's when Manhattan Engineer District (MED) and early Atomic Energy Commission (AEC) work was completed at these sites. The table also shows which sites became contaminated because they were utilized for

storage or disposal of FUSRAP materials during this earlier cleanup. The Corps does not have detailed information regarding earlier cleanups, cleanup criteria used at that time of the location of all previous on- or offsite disposal areas. The Corps is doing document searches in conjunction with potentially responsible party (PRP) investigations at several of these sites. In all likelihood these investigations will provide the Corps with more documentation with respect to the earlier cleanups.

Name of Site	Previous Cleanup
Madison, IL	Mallinckrodt Chemical Company was responsible for removing remaining uranium and cleaning up facilities following uranium metal extrusion operations and uranium rod straightening performed for Mallinckrodt by the Dow Chemical Company at Dow's Madison facility during the late 1950's and early 1960's
St. Louis Downtown Site, St. Louis, MO	Residuals from processing uranium ores from 1942–1957 were disposed of at the St. Louis Airport. Mallinckrodt Chemical Company decontaminated Plants I and 2 from 1948 through 1950 to meet the Atomic Energy Commission standards in effect at the time and AEC released these plants for use without radiological restrictions in 1951. AEC managed decontamination of Plants 10, 7, and 6E to meet AEC criteria in effect at the time and returned the plants to Mallinckrodt in 1962 for use without radiological restrictions
St. Louis Airport, St. Louis, MO	Disposal site for processing residuals from Mallinckrodt Chemical Co., 1946
St. Louis Airport, Vicinity Properties, St. Louis, MO	Vicinity properties were contaminated during shipment of Mallinckrodt materials to the Airport site or migrated from the Airport site to adjoining areas
Latty Avenue, St. Louis, MO	Materials stored at the Airport site were sold for extraction of any remaining radioactive materials and moved to Latty site in 1966–7. Contamination results from storage of FUSRAP materials at site while awaiting processing
Bliss and Laughlin, Buffalo, NY	Following completion of work performed for the AEC in 1952, the owner conducted a radiological survey and replaced some equipment because it was contaminated
Linde Air Products, Tonawanda, NY	Residuals from processing uranium ores during the early to mid-1940's were disposed of at the Ashland 1, Tonawanda, NY site
Ashland 1, Tonawanda, NY	Disposal site for processing residuals from Linde site, 1944–1946
Ashland 2, Tonawanda, NY	Ashland 1 materials were moved by the site owner to Ashland 2, 1974–1982
Seaway Industrial Park, Tonawanda, NY	Some Ashland 1 materials were also placed in the Seaway landfill, 1974–1982
Niagara Falls Storage Site, NY	DOE created on-site waste containment structure
Luckey, OH	In 1959, under contract to the AEC, the processing facility was decontaminated and processing wastes were consolidated in a dike-enclosed landfill on site
Painesville, OH	No evidence of any previous cleanup
Colonie, NY	National Lead Industry records show that radioactive materials were disposed of or stored at a designated area on site under an AEC license in 1961
CE, Windsor, CT	Site records show remediation in Building 3 and some outdoor areas during and after the AEC contract work, directed by either AEC or the Navy to comply with cleanup standards of the day. Soil from some outdoor areas was removed. Building 3 was cleaned in 1959/1960, 1962 and then in 1963/64
Shpack Landfill, Norton, MA	FUSRAP material disposed of in this domestic and industrial landfill
Maywood, NJ	Stepan Company cleaned up the site from 1961–1968 of residual wastes from thorium extraction operations carried out by the Maywood Chemical Corporation until 1958. Material from cleanup operations is stored at NRC licensed pits
Wayne, NJ	W.R Grace partially decontaminated the site in 1974. In 1975, storage license for radioactive materials was terminated by the NRC following site decommissioning and the site was released without radiological restriction

Name of Site	Previous Cleanup
Middlesex, NJ	Structures on the site were decontaminated in 1967 and the site was certified by the AEC for unrestricted use, in accordance with guidelines in effect at the time, and returned to the General Services Administration
Dupont Chamber Works, Deepwater, NJ	In 1948–1949 the AEC performed radiological surveys and decontamination of buildings at DuPont in accordance with guidelines in effect at the time. In 1949 the AEC released the buildings back to DuPont. In 1996, DOE completed decontamination of interior surfaces of Building 845 in preparation for demolition of the building by DuPont. In 1997 DuPont completed some chemical remediation of a portion of the central drainage ditch under RCRA. ORNL subsequently verified to DOE that DuPont's RCRA remediation had also successfully remediated this area for radiological contamination
W.R Grace, Baltimore, MD	In 1993, W.R. Grace decontaminated one of the buildings contaminated as a result of the early AEC activities at the site. There has been no other remediation of contamination resulting from early AEC activities. That work was completed in 1958

Question 2d. Please provide documentation underpinning your assumption that the materials the Corps is only disposing of 11e(2) byproduct material in the FUSRAP.

Response. The Corps is not disposing only of 11e(2) byproduct material in FUSRAP. In addition to the pre-1978 ore processing residuals, which constitute the largest single category of FUSRAP materials, the Corps has also identified lesser percentages of Low-Level Radioactive Waste (LLRW), Mixed Wastes, Naturally Occurring Radioactive Material (NORM), Hazardous Waste, and Special Nuclear Materials. Since not all FUSRAP sites have been fully characterized it is possible that additional categories will be identified.

Question 3. In discussing the Buttonwillow case, you stated in your oral testimony that the radioactive waste transported to California ''met very stringent DOT regulations for the transporting of those materials.'' What do those regulations require?

Response. Department of Transportation (DOT) hazardous materials regulations in 49 CFR Parts 172 and 173 specify marking, labeling, placarding, packaging, and shipping paper requirements for FUSRAP wastes meeting a specific DOT hazard class. They also specify training and certification requirements for employees dealing with hazardous materials. The hazard class most likely to apply to FUSRAP wastes is either Hazard Class 7 or Hazard Class 9. Hazard Class 7, Radioactive Material, applies to shipments with a specific activity greater than 0.002 microcuries (2000 picoCuries) per gram. Material covered by Hazard Class 7 requires special packaging, labeling, marking, and placarding. Marking, package labeling, and placarding requirements are found in 49 CFR Part 172. Packaging and transport requirements, including exceptions, for certain types of radioactive materials are found in 49 CFR Part 173. Hazard Class 9, Miscellaneous Hazardous Material, applies to shipments which include a hazardous substance under CERCLA or a hazardous waste under RCRA. The Corps requires that its contractors comply with the applicable provisions of 49 CFR Parts 172 and 173. In addition, the Corps tracks all its shipments through a change of custody form.

Question 4a. In discussing the Buttonwillow case, case you stated in your oral testimony that so long as the radioactive waste shipped to Safety-Kleen averaged 2,000 picocuries/gram or less it met the requirements of the permit. (''But again, we are talking about averages, so they average 2,000 with one peaking above 2,000. The Buttonwillow facility is permitted to accept an average of 2,000. So it can accept some material that may have peaked higher, but on the average it can't be higher than 2,000.'')

Response. As you know, the validity of that permit term has been contested by the California Department of Health Services. That notwithstanding, nothing in the permit specifically allows the use of averaging to meet this permit condition. The use of averaging, depending upon how it is done, could render even the 2,000 picocurie/gram limit meaningless since it would enable the Corps to ship radioactive materials significantly higher than 2,000 picocuries by diluting the radioactive content with non-radioactive material.

On this issue, Senator Bennett posed a question to Dr. Paperiello that Dr. Paperiello could not Senator Bennett asked what would happen if a shipment received at the facility was as hot as 4,700 picocuries but the average fell below 2,000 picocuries. In particular, Senator Bennett asked whether the 4,700 picocurie material would have to be separated from the remaining material or whether it could, in effect, be diluted by less radioactive material and thereby averaged to meet the permit condition. Dr. Paperiello "[I]n terms of how you deal with heterogeneous distribution, which is quite common, it would depend and awful lot on how the receiving facility was permitted . . . I just don't know when a facility is permitted to receive material up to 2,000 picocuries per gram . . . I don't know how they deal with heterogeneity."

Question 4b. Please provide any written documents indicating whether and how averaging was applied by the Corps in this case (e.g., did the Corps take the average per container, per rail car, per entire shipment?).

Response. The averaging was applied to the entire shipment of contaminated wood and masonry debris from the Linde, Building 30 demolition, to the Safety-Kleen disposal facility near Buttonwillow, California. The averaging was based on the 26 samples that were obtained in accordance with requirements established by Safety-Kleen. Prior to this sampling, the interior of Building 30 was decontaminated by vacuuming and pressure washing to reduce the amount of contaminated dust and other loose materials. Wood and masonry surfaces were then scanned for radioactivity. Based on scan results, the following samples were collected: three wood and three masonry samples were collected from areas exhibiting the highest radiation levels; three wood and three masonry samples were collected from areas exhibiting low radiation levels; and seven wood and seven masonry samples were collected from random locations. The average total activity for all 26 of these samples was determined to be 335 pCi/g, well below the 2000 pCi/g acceptance criteria of the Buttonwillow facility. This average was consistent with the more than 10 thousand samples taken during the site investigation phases of the remediation process.

Question 4c. Please provide any written authorizations or legal authority from the State of California which permits such averaging.

Response. The authority for averaging is implicit in Safety-Kleen's permit from the State of California, which defines permitted levels of activity in terms of the U.S. Department of Transportation (DOT) regulations, specifically 49 CFR 173.403(y). "The Permitee shall not accept the following wastes and materials at the Facility: a. Radioactive materials which either require special placarding because they exceed 2,000 picocuries/gram of activity as reference in 49 CFR 173.403(y) or are defined as "NRC regulated source materials." DOT regulations provide for averaging.

Question 4d. Your staff person Julie Peterson referred to a "general rule of thumb" being the "three times rule" in her response to the Committee on this issue. What is the authority for that "rule," how does that rule apply (e.g., per shipment, per drum, etc), how is it enforced on a facility-by-facility basis, and what is the scientific underpinning of that rule?

Response. The three times multiplier has been used since 1974 when the NRC's Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors, was published. It has provided guidance for acceptable surface contamination levels that have been used during reactor and other decommissioning activities. Its maximum acceptable values listed in the document are a factor of three times the average acceptable levels. The Department of Energy (DOE) (DOE Order 5400.5, Radiation Protection of the Public and the Environment) and the Department of Army (Department of Army Army Regulation 11–9, The Army Radiation Safety Program)—have also used these average and maximum criteria.

The more specific basis for use of the three times rule as an upper limit in conjunction with averaging is guidance issued by the U.S. Department of Transportation (DOT) together with the Nuclear Regulatory Commission. In accordance with NUREG–1608/RAMREG–003, which references International Atomic Energy Agency (IAEA) advisory material on qualitatively and quantitatively defining the non-homogeneity in a package containing low-specific activity (LSA) materials, a material may be considered *essentially uniformly distributed* when the calculated or measured specific activity difference between equal volumes does not vary by more than a factor of three. This guidance was intended to clarify the definition of "radioactive material" provided by DOT for its regulatory purposes. In accordance with DOT regulation 49 CFR 173, a material is radioactive if it has a specific activity greater than 2,000 pCi/g. The specific activity of a material in which the radionuclide is *essentially uniformly distributed* is the activity per unit mass of the material.

The concept of *essentially uniformly distributed* material within each shipping container has been incorporated into the FUSRAP waste acceptance criteria for EnviroSafe Services of Idaho, Inc. Additionally, the use of upper action levels that are three times the allowable average soil concentration have been incorporated in EnviroSafe's permit. At the Waste Control Specialists, LLP (WCS) facility in Texas, based on meetings between the Corps and state regulators, averaging over the volume of the container is generally acceptable for soil contamination. Though it is not specified in the WCS permit, State of Texas regulators have indicated that they might even allow elevated areas up to 10 times the average activity in a container.

Question 4e. Ms. Peterson also stated that "It is [the use of averaging] negotiated with the facility's regulatory agency prior to shipment . . . ." Please provide documents indicating how this issue was negotiated with the State of California and Safety-Kleen prior to the shipment of the Buttonwillow waste.

Response. Although the Corps did not negotiate with the State of California regarding the use of averaging prior to the shipment of Building 30 materials to Safety-Kleen, the Corps has since then established a practice of meeting with state regulators of disposal facilities which have contract for the disposal of FUSRAP materials. A team of technical experts from the Corps Hazardous, Toxic and Radiological Waste Center of Expertise in Omaha was assembled to visit the facilities which received an award under its 1999 multiple site disposal contract. The team discussed averaging and the three times rule with the facilities and state regulators to establish the position of the regulators on these issues which may not be expressly addressed in permits or regulations.

The Corps does not know whether state regulators were aware that Safety-Kleen was utilizing averaging in evaluating whether material met the facilities waste acceptance criteria. However, pursuant to their permit, Safety-Kleen was and is required to implement the Waste Analysis Plan (WAP) that was approved by the State of California. That plan contains the facility waste acceptance criteria and a description of the waste analyses that the permittee is required to obtain before waste acceptance. No additional surveys or samples were requested by either the California Department of Toxic Substances Control and the Department of Health Services, the averaging method to be employed was not questioned, and no state-imposed averaging protocols were specified. Safety-Kleen then determined that they had complied with their approved WAP and could accept the Building 30 material.

Question 5. The Corps is required to conduct FUSRAP response actions under CERCLA in accordance with the regulations developed by EPA (the NCP). However, at the Linde FUSRAP site, it appears that the Corps was in disagreement with EPA over what would constitute appropriate cleanup levels for the radioactive contaminants (radium, thorium, uranium) at the site. Since EPA has issued guidance on interpreting the NCP (*Use of Soil Cleanup Criteria in Subpart B of 40 CFR 192 as Remediation Goals for CERCLA Sites* (February 12, 1998) which specifies a cleanup level of 5 pico curies per gram for the sum of radium or thorium, what is the basis for the Corps selecting higher cleanup levels for these radionuclides? Also, EPA has recently issued guidance that addresses uranium cleanup levels (*Remediation Goals for Radioactively Contaminated CERCLA Sites Using the Benchmark Dose Cleanup Criteria in 10 CFR Part 40 Appendix A, I, Criterion 6(6)* (April 11, 2000). How did the Corps select the cleanup levels it used at Linde for uranium, and in the future does the Corps intend to use EPA's previously mentioned guidance documents? If the Corps does not use EPA's guidance documents for establishing cleanup levels, how does the Corps intend on attaining consistency across the FUSRAP program on how cleanup levels are decided?

Response. The Corps used Subpart B of 40 CFR Part 192, which sets standards for residual concentrations of radium-226 in soil at certain former uranium mill sites as a basis for establishing requirements for the Linde site. It states that radium concentrations at those former mill sites shall not exceed background by more than 5 picoCuries per gram (pCi/g) in the top 15 centimeters of soil and 15 pCi/g in any 15 centimeter layer below the top layer, averaged over an area of 100 square meters. Subpart B of 40 CFR Part 192 does not specifically address radionuclides other than radium.

In June of 1999, NRC amended its regulations at 10 CFR Part 40, Appendix A to address radionuclides other than radium at certain uranium mill sites. 10 CFR Part 40, Appendix A, Criterion 6(6) requires that residual concentrations of these other radionuclides will not result in a total effective dose equivalent (TEDE) that exceeds a benchmark dose established based on cleanup above background to the radium standards of 5 pCi/g in the top 15 centimeters and 5 pCi/g in subsequent 15 centimeter layers below the top layer and must be as low as reasonably achiev-

able (ALARA). This benchmark dose is used to establish allowable soil concentration levels for radionuclides other than radium.

The Corps used the benchmark dose approach of 10 CFR 40, Appendix A to determine the concentration limits for thorium and uranium at the Linde site. The Corps calculated that the comparable concentration limits for thorium-230 were 14 pCi/g in the surface and 44 pCi/g in the subsurface. Thorium-230 is the significant contaminant at the Linde site. The concentration limits calculated for total uranium were 554 pCi/g in the surface and 3,021 pCi/g in the subsurface. However, the Corps did not make these limits the cleanup standards for uranium in the cleanup plan it approved for Linde because prior to issuance of the new NRC guidance, in the proposed plan provided for public comment, Corps had proposed a 600 pCi/g maximum for natural uranium. In order to be consistent with the plan released for public review, the Corps retained the 600 pCi/g maximum for natural uranium as the cleanup standard for natural uranium. All soils with total uranium concentrations exceeding 600 pCi/g will be excavated and disposed of off site. However, the Corps estimates, based on the quantities and distribution of uranium in the soil and in comparison to quantities and distribution of thorium in the soil at the Linde site, that after remedial action is completed at Linde, the average residual concentration of uranium remaining on site will be 60.8 pCi/g.

EPA's Office of Solid Waste and Emergency Response has issued guidance documents at various times during the development of the aforementioned regulations. These documents provide EPA regional staff with guidance on implementation of the NCP in order to achieve some measure of consistency nationwide. The Corps has met with EPA staff to discuss 40 CFR Part 192 and EPA's related guidance and plans to have further discussions with EPA on the applicability of its guidance to the FUSRAP sites. Likewise, the Corps has met with NRC staff regarding 10 CFR Part 40, Appendix A, Criterion 6(6). The Corps intends to maintain consistency with regard to cleanup criteria at FUSRAP sites by consistently cleaning up in accordance with applicable or relevant and appropriate requirements.

Question 6. While the Corps does not have to receive EPA approval of the remedies selected at non-NPL FUSRAP sites, the Corps does have to follow the NCP. In particular, EPA's off-site rule, which is part of the NCP, implements the CERCLA requirement that waste removed from a site under the Superfund must be sent to a facility that is in compliance with Federal and State disposal requirements.

To assure that wastes removed under the NCP are disposed of in a way that protects human health and the environment, the party conducting the cleanup should request a determination of the off-site rule from EPA to assure that the disposal facility meets the requirements of that rule.

Did the Corps request a determination of the off-site rule from EPA prior to shipping the FUSRAP wastes to Buttonwillow?

Response. Because the Corps prime contractor had audited the Safety-Kleen facility near Buttonwillow, California, and determined that it was not in violation of its permit, the Corps did not request that the Environmental Protection Agency (EPA) regional off-site coordinator determine whether the Safety-Kleen facility was acceptable under the Off-Site Rule. Following the disposal of FUSRAP materials at the Buttonwillow facility, the Corps has discussed the off-site rule with EPA staff. Current Corps disposal policy requires compliance with the off-site rule before FUSRAP materials are shipped to a disposal facility.

The value of EPA's off-site rule is to prevent shipments of waste to facilities that have leaks, releases, or relevant permit violations. However, the EPA off-site coordinator does not evaluate whether a facility is authorized to accept a particular type of waste. Only the disposal facility and its specific regulatory agency or agencies can determine whether the facility is authorized to accept FUSRAP materials.

RESPONSES BY JOSEPH W. WESTPHAL TO QUESTION FROM SENATORS BAUCUS AND GRAHAM

Question. What guidance has the Army Corps provided to its contractors, who are disposing of FUSRAP material, for the purposes of testing, monitoring, transportation, and complying with Federal, State and local disposal regulations? Please provide the relevant guidance documents.

Response. EC 200–1–3 *Off-Site Disposal of Materials from the Formerly Utilized Sites Remedial Action Program* is the overarching guidance provided to contractors by the Corps related to off-site disposal of radioactively contaminated FUSRAP materials. Its purpose is to help assure: (1) compliance with all applicable laws and

regulations, (2) disposal is protective of human health and the environment, and (3) protects the public interest from both the health and fiscal perspectives.

Each solicitation for FUSRAP work, including on-site remediation, transportation, and disposal provides contract requirements with which contractors must comply. One such requirement is the Permits and Responsibilities Clause, PAR 52.236–7, which states that "[t]he Contractor shall be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work."

A listing of statutes/regulations and guidance with which the contractor must comply, as applicable, follows below. In addition, at each of our sites the contractor is required to develop a site/waste specific Transportation and Disposal Plan which incorporates guidance documents and other Corps requirements and how to comply with that guidance, including how material will be handled, shipped, and disposed of. The U.S. Army Corps of Engineers (USACE) reviews these plans to assure compliance with the contract requirements, applicable federal, state, and local regulations, and to assure the technical adequacy of the plans. Federal and state regulators may additionally review this plan.

USACE health physicists and other technical staff oversee and coordinate with the contractors on implementation of the Transportation and Disposal Plan. As a part of this coordination, the contractor and USACE determine Department of Transportation, Environmental Protection Agency and Nuclear Regulatory Commission requirements (see listing below for potentially applicable regulations) for transport of the material to the disposal facility. The USACE, the contractor, and the disposal facility determine sampling protocols per container based upon the disposal facilities Waste Acceptance Criteria and other factors, such as DOT hazardous material transportation hazard class definitions.

USACE GUIDANCE

- Offsite Disposal of Materials from FUSRAP, USACE, EC–200–1–3.
- Radiation Protection Regulation and Manual, USACE, ER/EM 385–1–80.
- Safety and Health Requirements Manual, USACE, EM 385–1–1.

OTHER GUIDANCE

- Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use, NRC, 1976.
- Standard Operating Safety Guidelines, U.S. Environmental Protection Agency (EPA), Environmental Response Branch, Hazardous Response Support Division, Office of Emergency and Remedial Response.
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health.
- Radiation Protection of the Public and the Environment, Department of Energy, DOE Order 5400.5, February 1990.
- Radioactive Waste Management, Department of Energy, DOE Order 435.1, 1999.
- Disposal sites also have specific data/information needs based on their permits/license and we insure that these data/information are collected.

STATUTES AND REGULATIONS

- Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA), 42 USC 9601–9675 (in particular 42 USC 9621(d)(3)).
- Atomic Energy Act (AEA) of 1954, as amended, 42 U.S.C. 2011–2296.
- Hazardous Materials Regulations, 49 CFR Parts 171 through 179, as applicable, U.S. Department of Transportation.
- Standards for Protection Against Radiation, 10 CFR Part 20, Nuclear Regulatory Commission (NRC).
- Safety and Health Standard, 29 CFR Part 1910 (General Industry), U.S. Department of Labor, Occupational Safety and Health Administration (OSHA).
    - 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, U. S. Department of Labor, OSHA.
    - 29 CFR 1910.1096 Ionizing Radiation, U.S. Department of Labor, OSHA.
- Safety and Health Regulations for Construction, 29 CFR Part 1926, U.S. Department of Labor, OSHA.
- Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, 40 CFR Part 192, U.S. Environmental Protection Agency (EPA).
- Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities, 40 CFR Part 264, EPA.

- Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities, 40 CFR Part 265, EPA.
- Land Disposal Restrictions, 40 CFR Part 268, EPA.
- Identification and Listing of Hazardous Waste, 40 CFR Part 261, EPA.
- National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 61, EPA.
- National Primary Drinking Water Regulations, Maximum Contaminant Levels, 40 CFR 141.11–141.16,EPA.
- National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR 300, EPA
- Accident Prevention, Federal Acquisition Regulations Clause 52.236–13.
- Applicable requirements of the states in which the radiological contaminated soil is being disposed.

RESPONSE BY JOSEPH WESTPHAL TO QUESTION FROM SENATOR MOYNIHAN

Question. I understand the Army Corps has calculated cleanup levels at the Linde site for uranium surface contamination at 554 pico curies per gram and subsurface contamination at 3,021 pico curies per gram—with an expectation that average post-cleanup uranium levels will be 60.8 pCi/g. What assurances has the Corps made to ensure that this expected cleanup standard will be achieved and will be protective of public health and safety?

Response. Based on cleanup goals presented in the Proposed Plan and Record of Decision for the Linde site, the Corps is committed to ensuring that no concentration of total uranium exceeding 600 pCi/g above background will remain at the site, with an expected average concentration for total uranium not to exceed 60.8 pCi/g above background. A post remedial risk assessment will be conducted to assure that the site falls within the acceptable CERCLA risk range, 10^4 to 10^6 increased risk. If risk associated with the Linde site does not fall within the acceptable CERCLA risk range after remediation, additional site soils will be excavated until the risk associated with the site falls within the acceptable range. As it has done at other sites in the Buffalo area, the Corps will coordinate the post-remedial action site assessment with State regulatory agencies to obtain their concurrence that the cleanup required by the Record of Decision (ROD) was achieved.

The Corps calculated a cleanup level of 554 pCi/g surface and 3,021 piC/g subsurface based on NRC regulations issued in July 1999, which are relevant and appropriate cleanup requirements at the Linde site. Prior to issuance of this new requirement, in the proposed plan provided for public comment, the Corps had proposed a 600 pCi/g maximum for natural uranium. In order to meet the commitment to the public which was implicit in the plan released for their review, the Corps retained the 600 pCi/g maximum for natural uranium as the cleanup standard for natural uranium in the plan approved by the ROD. All soils with total uranium concentrations exceeding 600 pCi/g will be excavated and disposed of offsite. Based on the quantities and distribution of uranium in the soil and the cleanup criteria for other radioisotopes in the soil at the Linde site, however, the Corps estimates that the average residual concentration of uranium remaining onsite will be 60.8 pCi/g after remedial action is completed at Linde.

ENVIROCARE OF UTAH, INC.,
Salt Lake City, UT, June 16, 2000.

MEMORANDUM

To: Al Rafati
From: Bret Rogers
CC: Andrew Drom

Re: FUSRAP Activity Shipped to Envirocare Compared to Activity in Wine

Per your request, I have summarized the total activity received by Envirocare for the FUSRAP sites and compared that to the activity contained in the wine as analyzed by the chem lab. The total activity from the FUSRAP sites is based on the Army Corps of Engineers manifested concentrations for Ra-226, Th-230, Th-232, and natural uranium. Based on analysis from the chem lab, the wine contained a total radionuclide concentration of 0.045 pCi/g. I conservatively assumed the same density as water for the wine to estimate a concentration based on actmity per mass (0.045 pCi/g). The following table lists the total concentration in the FUSRAP waste compared to the total concentration in the wine (pCi/g in waste per pCi/g in wine) for both the maximum concentration for a single shipment and the average concentrabon for all shipments.

Radionuclide Concentration of FUSRAP Waste to Wine (pCi/g waste per pCi/g wine)

Site	Average Conc. of All FUSRAP Shipments (pCi/g per pCi/g)	Maximum Concentration in a Single Shipment (pCi/g per pCi/g)
Wayne, NJ	8,420	194,000
Maywood, NJ	1,290	12,700
Middlesex, NJ	1,430	1,890
St. Louis, MO	9,070	188,000
Tonawanda, NY	2,780	8,530

Based on this data, the total radionuclide concenbration in the FUSRAP waste is approximately a factor of 1,000 to 200,000 ffmes that found in the wine.

One other note of interest. The EPA has issued a proposed revised rule making on National Primary Drinking Water regulations (65 FR 21576–21628, April 21, 2000). Contrary to the recent change in philosophy of other Federal agendes, the EPA continues to argue that any exposure to radiation can potentially cause harm and that risk associated with the exposure increases proportionally to the concentration of the radionuclide. The EPA states in the FR notice that the health risks from many of the radionuclide Drinking Water Standards have been underestimated in previous risk assessments.

Radcode	Data	Maywood	SLAPS	SKAPS VP	St. DTS	Wayne	SLAPS	St. DTS	HISS	Wayne
		Contract No								
		4004	4005	4011	4013	4024	4101	4102	4103	4104
Ra 226 (pCi/	Max of Concentration	2545.19	356.35	1.60	4295.21	1217.12	271.03	11.78	12.83	741.17
	Min of Concentration	0.02	0.82	1.56	0.16	3.50	0.51	0.01	0.60	2.29
	Average of Concentration.	18.46	13.69	1.60	38.92	155.84	64.65	1.41	2.37	122.04
Ra 228 (pCi/	Max of Concentration	2.37								
	Min of Concentration	2.37								
	Average of Concentration.	2.37								
Ra 230 (pCi/	Max of Concentration	244.01	694.37	10.22	1069.86	1217.12	4658.95	18.24	780.09	741.17
	Min of Concentration	0.24	2.79	0.00	0.00	3.50	8.66	0.00	7.44	2.29
	Average of Concentration.	4.20	227.72	10.02	34.53	128.81	1515.03	1.42	114.49	127.86
Th 232 (pCi/	Max of Concentration	12925.39	147.58	1.83	8.02	2417.30	16.88	0.12	5.42	1370.07
	Min of Concentration	1.81	0.00	1.39	0.00	0.06	0.50	0.00	0.48	0.13
	Average of Concentration.	62.70	1.86	1.79	1.63	357.92	1.34	0.00	0.70	212.31
U Nat (pCi/	Max of Concentration	33548.26	429.20	15.02	2961.34	1217.12	1196.21	841.98	15.51	741.17
	Min of Concentration	3.35	0.75	0.00	0.14	0.04	0.51	1.20	0.20	2.29
	Average of Concentration.	357.08	44.97	14.74	335.37	153.69	84.30	168.28	2.90	128.11
U 238 (pCi/	Max of Concentration		968.25							
	Min of Concentration		7.30							
	Average of Concentration.		30.26							
	Weight Shipped—Tons.	58,529.89	51,110.12	1,328.01	12,619.68	23,350.88	54,590.62	10,597.18	19,126.69	9,134.35
	Fraction of Total %	24.35%	21.26%	0.55%	5.25%	9.71%	22.71%	4.41%	7.96%	3.80%

RESPONSES BY THE DEPARTMENT OF ENERGY TO QUESTIONS FROM SENATORS SMITH AND BAUCUS

Question 1. In a March 13, 2000, letter from Idaho State Senator Clinton Stennett to Nuclear Regulatory Commission Chairman Richard Meserve, Sen. Stennett asked Chairman Meserve about appropriate health, safety and environmental protections of a RCRA subtitle C facility relative to the disposal of radioactive material.

Chairman Meserve responded: "Many of the standards governing RCRA landfills are similar in some respects to those required at NRC-licensed sites handling 11(e)(2) by-product material (tailings or wastes from extraction of uranium or thorium from ore). However, RCRA landfills are subject to State and/or EPA requirements. RCRA disposal facilities, like state-of-the-art mill tailings impoundments subject to NRC licensing, rely, in part, on a system of liners and leachate detection and collection systems to prevent releases of hazardous materials to the environment. RCRA disposal and NRC's mill tailings regulations also address monitoring and inspection, site selection, and other detailed requirements. Most, if not all of these controls, help protect public health and the safety, and the environment from both radioactive and non-radiological materials."

Does the Department agree with the Chairman that such controls provide protection from the risks associated with radioactive materials?

Response. Yes, the Department agrees with the Chairman that RCRA's requirements for disposal of hazardous wastes in landfills can provide protection from the risks associated with radioactive materials, as long as the quantities and concentrations of radioactive material are within the range considered in the risk analysis used for development of the waste acceptance criteria for the RCRA subtitle C facility.

Question 2. In a December 13, 1983 letter from Secretary of Energy Donald Paul Hodel to the Honorable John Evans, Secretary Hodel states: "FUSRAP waste does not typically qualify as low-level radioactive waste under the definition contained in the Nuclear Waste Policy Act of 1982."

Has there been a change in that position?

Response. No, there has not been a change in that position. While the program was with the Department of Energy, FUSRAP waste was generally treated as 11(e)(2) material rather than low-level waste.

Question 3. 11(e)(2) waste can be found with varying levels of radiation. Does the risk to human health and the environment change with the level of radiation?

Response. Risk from radioactive material changes with the level of radiation as well as other factors. For example, land use has a significant effect on the risk to human health. Further, the amount of material or soil between the source and a person has a significant effect on the level of risk.

Question 4. How many off-site, non-DOE licensed facility vendor options for the disposal of low-activity waste 11(e)(2) waste were available to the Department?

Response. When the Department requested bids for commercial disposal of 11(e)(2) material, two bids were received, as well as a number of expressions of interest. The companies submitting expressions of interest were not licensed by NRC, and so were not able to bid. Of the two companies that submitted bids, only Envirocare of Utah was judged to be responsive.

Question 5. How much of the 11(e)(2) waste was disposed of at a DOE licensed facility?

Response. The Department disposed of low-level waste from FUSRAP sites at both DOE's Hanford and Oak Ridge low-level waste disposal facilities. This low-level waste may have included small quantities of 11(e)2 waste, which is permissible under DOE policy, but the exact amount cannot be quantified with certainty because disposal records are not readily available.

Question 6. Do the Army Corps of Engineers and private contractors have the same options for disposal as the Department to send 11(e)(2) waste to a DOE licensed facility?

Response. While developing their current Memorandum of Understanding, the Department of Energy and the Corps of Engineers discussed the potential use of DOE disposal facilities for 11(e)(2) waste. In those discussions we agreed that, if no other disposal options were available to the Corps, then the Department would consider accepting 11(e)(2) waste from the Corps of Engineers, subject to completion of the necessary environmental reviews.

Question 7. We understand that during the Department's administration of FUSRAP, it was the Department's policy to dispose of AEA 11(e)(2) wastes only at

NRC licensed facilities, regardless of when those wastes were generated (in the case where off site disposal was provided). Did the Department adopt this policy in order to ensure the protection of public health and environment from the hazards posed by radioactive waste?

Please provide any Department guidance documents, policy statements or other statements reflecting the Department's policies concerning the disposal of 11(e)(2) wastes offsite, and the Department's rationale for providing that such disposal should take place at NRC licensed facilities.

Response. In general, the Department of Energy's (DOE) practice was that 11(e)2 material must be disposed of in a Nuclear Regulatory Commission (NRC) licensed disposal facility regardless of the date of the generation of those wastes. The Department's rationale for this practice was based upon the knowledge that these facilities were specifically designed for the protection of public health, safety and the environment against radiation hazards from large quantities of these materials. One exception to this practice was that other facilities, which were licensed to receive small quantities of radioactive material, could receive 11(e)2 material if the regulatory agency which licensed that facility agreed that such disposal was appropriate.

Submitted for the record is a copy of canceled DOE Order 5820.2A, "Radioactive Waste Management," which was in effect when FUSRAP was a DOE program. This order established general guidelines for DOE's management of radioactive waste. This DOE order was replaced by DOE Order 435.1 (also attached), effective July 9, 1999. Any documents dealing specifically with disposal under the FUSRAP were turned over to the Corps at the time of program transfer, along with contract files, and are not available to DOE at this time.

Question 8. In a March 8, 2000 letter from Senator Robert Bennett to Nuclear Regulatory Commission Chairman Richard Meserve, Senator Bennett asked Chairman Meserve whether he believed NRC licensing requirements for 11(e)(2) material are more protective of public health and environment than RCRA requirements.

Chairman Meserve responded: "In general, I believe that NRC-regulated and licensed disposal facilities, because they are subject to requirements that focus on protection of public health, safety, and the environment from radiological hazards, may afford more protection against radiological hazards."

Does the Department agree with Chairman Meserve's statement? Does Chairman Meserve's statement also reflect the Department's rationale for disposing of 11(e)(2) waste at NRC licensed facilities?

Response. The Department agrees that NRC radioactive materials management and disposal requirements are designed to protect the public and the environment. However, that does not necessarily mean that the technical design of non-NRC licensed disposal facilities would not provide the same level of protection for human health and the environment.

The Department's rationale for disposing of 11(e)(2) waste at NRC-licensed facilities was based upon the knowledge that these facilities were specifically designed for the protection of public health, safety and the environment against radiation hazards from large quantities of these materials.

Question 9. For 11(e)(2) waste disposed of off site by the Department prior to the transfer of FUSRAP to the Corps, what are the Department's long term custodial and other responsibilities over those 11(e)(2) wastes now at licensed NRC facilities? Is the Department responsible in perpetuity for ensuring that those materials do not migrate or otherwise threaten human health or the environment?

Response. The Atomic Energy Act established the requirements for the possession of 11 (e)(2) waste at NRC-licensed facilities, which could lead to the Department's acquiring long-term stewardship responsibilities at a site, subject to certain conditions, if the NRC requests the Department to assume this role. Under NRC licensing requirements, a facility owner or operator must provide a technical plan and a financial surety bond to support indefinite long-term stewardship.

To the extent that waste from FUSRAP is disposed of at these NRC-licensed sites, the Department might have potential. Long-term stewardship responsibility. If the Department is required to take custody of these NRC-licensed sites, it would be responsible for ensuring the site is maintained in a manner that protects human health and the environment until the materials no longer pose a threat of release.

Question 10. For 11(e)(2) waste disposed of by the Corps after FUSRAP was transferred to the Corps, what are the Department's long term custodial and other responsibilities over 11(e)(2) wastes disposed of at RCRA and other disposal facilities?

Response. NRC-licensed sites used by the Corps for disposal of 11(e)(2) material fall under the same mandate as other NRC-licensed sites for which DOE may be assigned stewardship responsibilities. The Department does not have any potential

stewardship role or responsibility for non-NRC-licensed sites utilized by the Corps for disposal of 11(e)(2) material.

The March 1999 Memorandum of Understanding (MOU) between the Department and the Corps makes clear that the Corps will be responsible for whatever post-cleanup liabilities result from its FUSRAP activities. Although the MOU does not specifically address the Corps' use of non-NRC regulated waste disposal facilities, it does make the Corps responsible for any liability to the Government resulting from the use of these facilities. Specifically, Article III.C.2.n. of the MOU assigns responsibility to the Corps for " . . . damages due to the fault or negligence of USACE or its contractors, and shall hold and save harmless DOE free from all damages arising from USACE FUSRAP activities to the extent allowable by law. . . ."

Question 11. Please identify what federal cleanup standards the Department applied to FUSRAP cleanups and 11(e)(2) waste in particular. Please provide the Code of Federal Regulations citation to those cleanup standards. In addition, please provide any Department policy or guidance documents, including guidance to DOE regional offices concerning FUSRAP cleanup standards. Finally, were state cleanup standards taken into account by the Department during its administration of FUSRAP and, if so, how?

Response. The Department applied the requirements in DOE Order 5400.5, "Radiation Protection of the Public and the Environment," to FUSRAP sites. This DOE Order adopted EPA's implementing regulations, promulgated pursuant to the Uranium Mill Tailings Radiation Control Act of 1978, "Standards for Remedial Actions at Inactive Uranium Processing Sites" (40 CFR 192). The regulations established cleanup standards for surface and sub—surface soils. In addition, the Department conducted many of its FUSRAP operations under the Comprehensive Environmental Response, Compensation, and Liability Act and worked with State and Federal environmental regulators to ensure that the standards utilized for cleanup were protective of human health and the environment. The Department also worked with State regulators in developing the DOE plan for cleanup of each FUSRAP site and considered State requirements.

Question 12. What were the Department's annual appropriations and how many FTE's were allocated for FUSRAP for each year the Department administered the program?

Response. The Department managed FUSRAP from 1974 to 1997. During that time, the annual appropriation grew in response to the needs of the program, and as more sites were included in the program, based on reviews of past involvement. As the program moved from conducting assessments to the actual cleanup of more and more sites, the appropriation grew as well, to support the higher level of action being carried out. The following is a list of the DOE appropriations from FY 1992 through FY 1997, when the program was transferred to the Corps.

Fiscal Year	1992	1993	1994	1995	1996	1997
Appropriation ($M)	$49.0	$40.9	$41.5	$74.1	$73.5	$74.0

The number of federal FTE's in the years referenced remained basically stable even though the program continued to grow. The number of FTE's in these years was a total of approximately 25 Federal employees in Headquarters and in the field.

Question 13. During the time the Department administered FUSRAP, did the Department send 11(e)(2) waste from a cleanup offsite to a facility other than a NRC licensed facility?

Response. The Department did this on one occasion, after consultation with State regulators and the NRC, regarding the release of this material for disposal. This waste had radioactive levels below NRC and DOE release limits and was released from radiological control, using established DOE protocols.

Question 14. What role does the Department have in developing, reviewing or approving cleanup plans developed by the Corps under FUSRAP?

Response. The Department has no role in developing, reviewing, or approving cleanup plans developed by the Corps under FUSRAP.

Question 15. The Corps has represented that under its "new multi-award disposal contract" it can dispose of FUSRAP 11(e)(2) waste at RCRA facilities for $85/cy. How does this price compare with disposal rates that DOE pays for disposal of ra-

dioactive wastes, such as radioactive wastes from Fernald, Ohio, at NRC-licensed commercial disposal facilities?

Response. The comparison of disposal of 11(e)2 material in a Resource Conservation and Recovery Act (RCRA) facility, to disposal of LLW in an NRC-licensed commercial disposal facility is difficult to make. The different licensing requirements and the differences in market demand account for a great deal of the difference in price. It should be recognized, however, that 11(e)(2) material is not classified as LLW, and therefore, any cost comparisons may be misleading. According to the Department's "Commercial Disposal Policy Analysis for Low-Level and Mixed Low-Level Waste" of March 9, 1999, the Department's costs for commercial disposal in an NRC-licensed facility for LLW (such as the material from the Department's Fernald, Ohio site) range from $130 per cubic yard to $164 per cubic yard.

STATEMENT OF L. MAX SCOTT, PH.D., PROFESSOR, LOUISIANA STATE UNIVERSITY

My name is L. Max Scott. I am an Adjunct Associate Professor of Physics and Astronomy and the System Radiation Safety Officer at Louisiana State University. I hold a Bachelor of Science Degree from Texas A&M University and a Master of Science and Doctor of Philosophy Degrees from Purdue University. I am a certified Health Physicist and a Fellow of the Health Physics Society. I have worked as an applied health physicist for over 39 years. For most of that time, either as a primary job responsibility through research grants or as a consultant, I have been involved with radiation safety issues related to naturally occurring radioactive materials (NORM) and similar materials like the majority of the waste resulting from the remediation of formally utilized site remedial action plan sites (FUSRAP).

I have received grants from the American Petroleum Institute, the Environmental Protection Agency, and the Mineral Management Service to study various issues related to the safety and disposal of NORM. As you may know, the State of Louisiana was the first State to specifically regulate NORM from petroleum production. I was a member of the committee of four that suggested those regulations. Subsequently, I served on other Louisiana committees concerning regulation and disposal of NORM. I was a member of the NORM advisory committee to the Conference of Radiation Control Program Directors during the drafting of the suggested State regulations for NORM. I am on the Health Physics Society NORM subcommittee. I am currently assisting two companies who are remediating FUSRAP sites and a company that is remediating a NORM site. I have consulted extensively with the petroleum industry, the fertilizer industry, the aluminum industry and to a lessor degree with other industries that encounter NORM.

The views that I express today are mine and do not necessarily reflect those of any industry, trade association, professional society, the State of Louisiana, or Louisiana State University.

Usually at this point in my presentation I give the audience an examination by asking them who were David Banner and Peter Parker. As you may know, David Banner was the incredible hulk. He became the incredible hulk after exposure to gamma radiation. Peter Parker became the spider man after he was bitten by a radioactive spider. Unfortunately, many of the young adults of today were introduced to radiation by this means. If you are as old as I am, your introduction to radiation was reading about the dropping of the atomic bombs at the end of World War Two. Mention Three-mile Island or Chernobyl and most anyone can identify them. Mention Texas City or Coconut Grove and more than likely people will identify a city in Texas and a place to gather coconuts. Yet over 500 people died in Texas City as a result of a ship which was loaded with ammonium nitrate that exploded, and Coconut Grove was a night club in Boston where more than 200 people burned to death in a fire. We routinely ship ammonium nitrate and some of us frequent night clubs. I do not mean to belittle Three-mile Island or Chernobyl, but to emphasize the fact that there are risks in all human endeavors. For reasons that are not clear to me, anything associated with radiation appears to be reported more frequently and more intensely than other real or potential hazards. For example, in the early 1990's a quantity of waste oil contaminated with trace amounts of radioactive material was incinerated in Louisiana. Although I did not personally count them, I was told that there were articles concerning the radioactive material in the local paper for 43 consecutive days. Subsequent studies revealed that the incineration did not result in exposure to the public. Such reporting has engendered an undue fear of radiation and the potential health effects of exposure to radiation. I believe that we need to provide a safe environment and provide that degree of protection commensurate with the scientifically defined risk, not some perceived or extrapolated risk. My

goal today is to attempt to set out what I feel are reasonable approaches for the disposal of NORM waste and most FUSRAP waste.

As has been pointed out today, depending on the source of the NORM, it may be unregulated, regulated in varying manners by some of the States, and in some limited cases by Federal agencies. It is my understanding that FUSRAP waste is regulated differently depending on the date that remediation occurred. The alpha particle that is emitted when an atom of internally deposited radium–226 decays, does not know whether the radium atom originated in water treatment plant waste, a phosphogypsum stack, a FUSRAP site, or scale from petroleum production tubulars. If it has the potential to cause harm from one source, it has the potential to cause harm from all sources.

According to the EPA (EPA 1993) the majority of FUSRAP waste is uranium, thorium, and radium. Recoginizing that various radionuclides have different radiological properties and thus pose differing exposure potential, NORM and FUSRAP waste can be treated in a similar manner.

As a general philosophy I subscribe to the proposed EPA guidance on radiation protection of the public (EPA 1994):

There should be no radiation exposure to the general public unless it is justified by the expectation of an overall benefit from the activity causing the exposure.

Doses to individuals and populations should be as low as reasonably achievable (ALARA).

The annual effective dose equivalent to individuals from all controlled sources combined, including sources not associated with operations of the nuclear-fuel cycle, but excluding indoor radon, should not exceed 1 millisievert (100 mrem).

Annual effective dose equivalent to individuals up to 5 millisieverts (500 mrem) may be permitted, with prior authorization, in unusual, temporary situations.

Continued exposure over substantial portions of a lifetime at or near 1 millisievert (100 mrem) per year should be avoided.

Authorized limits for specific sources or practices should be established to ensure that the primary dose limit of 1 millisievert (100 mrem) per year for all controlled sources combined and the ALARA objectives are satisfied, and the authorized limit for any source or practice, normally should be a fraction of the dose limit for all controlled sources combined.

However, from a practical standpoint I believe that the National Council on Radiological Protection and Measurements (NRCPM 1993) has prescribed annual limit for man made sources which are applicable for use in the disposal of NORM waste and most FUSRAP waste, ie.:

One millisievert (100 mrem) per year for continual exposure and 5 millisievert (500 mrem) per year for infrequent exposure.

The current regulations covering the disposal of NORM waste, and in some cases FUSRAP waste, are not consistent. It is not possible in the time allotted to cover the various regulations; however, I would like to discuss some of those which appear to offer practical solutions.

- Colorado allows for any radioactive material containing up to 40 pCi/g total alpha to be disposed of in nonhazardous solid waste disposal facilities (Mallory in DOE 1999).
- Michigan allows bulk waste containing up to 50 pCi/g radium–226 to be disposed of in a Type II solid waste landfill (nonhazardous) (MDEQ 1996).
- Louisiana allows for nonhazardous oilfield waste containing up to 30 pCi/g radium–226 to be disposed of in nonhazardous oilfield disposal facilities (LEC 1999).
- Uranium mill tailing containing unlimited quantities of radium–226, and thorium–230 can be disposed of by burial under the Uranium Mill Tailing Act. Typical quantities range up to a few hundred pCi/g (Title 40 CFR Part 192).

The Nuclear Regulatory Commission until recently allowed for the disposal or 30–35 pCi/g of uranium and 10 pCi/g of thorium by burial. Under specified disposal conditions these values can range up to 3000 pCi/g and 500 pCi/g respectively (46 FR 62061).

The Environmental Protection Agency has published guidelines for the disposal of radium–226 and radium–228 in water treatment plant waste (EPA1994):

- Solid waste containing 3 pCi/g radium–226 plus radium–228 and uranium at less than 50 mg/g (about 35 pCi/g) may be disposed of without institutional controls in a municipal landfill, if the volume of such waste does not exceed 10 percent of the total waste.
- Solid waste containing 3–50 pCi/g radium–226 plus radium–228 in facilities comparable to those developed under Subtitle D of RCRA.
- Solid waste containing 50–2,000 pCi/g radium–226 plus radium–228 in facilities comparable to those developed under Subtitle C of RCRA.

The Corps of Engineers has proposed and the Nuclear Regulatory Commission has given tacit concurrence for the disposal of FUSRAP waste in RCRA disposal facilities, dose to be limited to 1 millisievert (100 mrem) per year (Essig 2000).

In my opinion the only practical method of disposing of NORM and most FUSRAP waste is by burial in a landfill. Under these conditions the only practical exposure pathways are airborne particulates during disposal operations and leeching to groundwater over an extended period of time. Airborne particulate can be controlled by using appropriate dust suppression techniques. Thus, there is no exposure potential at the time the waste is disposed. I am neither a civil engineer nor a hydrologist; therefore, I cannot speak authoritatively regarding the likelihood of the groundwater pathway. However, it is my opinion that EPA provided adequate requirements for the construction of Subtitle C and D RCRA facilities to prevent appreciable leeching to groundwater.

In my opinion there are two approaches whereby NORM waste and most FUSRAP waste can be disposed of so that the environment and the public are afforded adequate protection.

1. Dispose of waste in Subtitle C and D RCRA facilities at concentrations such that the average dose to an individual member of the public does not exceed 1 millisievert (100 mrem) per year with a maximum dose not to exceed 5 millisievert (500 mrem) per year. Guidance should be provided to assure that dose estimates are made using reasonable and practical exposure scenarios. Such waste should not exceed 10 percent of the anticipated capacity of the disposal facility.

2. Use the EPA guidance for water treatment waste as framework as follows:

Develop comparable concentrations for uranium and thorium equivalent to those values proposed for radium–226 plus radium–228. As a matter of reference, I have included values for uranium and thorium which pose a similar risk to the radium values. These values were derived from ratios of the allowable discharges to sanitary sewer contained in 10 CFR Part 20, Appendix B, Table 3.

Disposal as follows:

- Municipal landfills:

3. pCi/g radium–226 plus radium–228, or 15 pCi/g total uranium or 1.5 pCi/g total thorium. For mixtures the sum of fraction rule to be applied. Volume of such waste not to exceed 10 percent of the anticipated volume of the facility. During disposal operations dust suppression techniques to be employed as necessary.

- Subtitle D RCRA waste facilities:

Up to 50 pCi/g radium–226 plus radium–228 or 250 pCi/g total uranium or 25 pCi/g total thorium. For mixtures the sum of fraction rule to be applied. Volume of such waste not to exceed 10 percent of the anticipated volume of the facility. During disposal operations dust suppression techniques to be employed as necessary.

- Subtitle C RCRA waste facilities:

Up to 2000 pCi/g radium–226 plus radium–228 or 10,000 pCi/g total uranium or 1,000 pCi/g total thorium. For mixtures the sum of fraction rule to be applied. Volume of such waste not to exceed 10 percent of the anticipated volume of the facility. During disposal operations dust suppression techniques to be employed as necessary.

I am sure that each member of this committee has cast votes and taken positions that were not in keeping with the desires of their constituents, but the positions taken were the best for the Nation as a whole. Drafting and supporting legislation regarding the disposal of NORM wastes and most FUSRAP waste may put you in that position.

I encourage you to draft and support legislation that will provide for methods to dispose of NORM waste and most FUSRAP waste in a practical and uniform manner utilizing RCRA type facilities.

Thank you for the opportunity to express my views.

STATEMENT OF ANTHONY J. THOMPSON, SHAW PITTMAN, ON BEHALF OF THE URANIUM RECOVERY INDUSTRY

The purpose of this testimony is to address an issue of great importance to the uranium recovery industry in the United States, specifically the Nuclear Regulatory Commission's (NRC), jurisdiction to regulate certain radioactive materials located at Formerly Utilized Sites Remedial Action Program (FUSRAP) sites under certain defined circumstances, i.e., when such materials are removed offsite from DOE control for final disposal. Whether the NRC properly has jurisdiction to regulate the materials located at the FUSRAP sites under such circumstances wholly depends on the regulatory status of the materials. The regulatory status of the materials turns on an interpretation of certain provisions of the Atomic Energy Act (AEA), as amended,

and NRC's implementing regulations. In short, the issue of whether NRC properly has jurisdiction over the materials depends on whether materials that were created prior to the enactment of the Uranium Mill Tailings Radiation Control Act ("UMTRCA") of 1978 (amending the AEA), and that satisfy the definition of "byproduct material" set forth in section 11e.(2) of the AEA, are in fact "byproduct material" subject to NRC regulation, when under the control of a "person" as defined by the AEA. DOE and NRC as successors to the Atomic Energy Commission (AEC) are not "persons" under the AEA, therefore do not require a license to handle 11e.(2) byproduct material.

NRC REGULATIONS AND POLICY

10 C.F.R. §40.2a ("Coverage of inactive tailings sites") developed in 1980 shortly after the passage of UMTCRA states in relevant part:

(b) The Commission will regulate byproduct material as defined in this Part that is located at a site where milling operations are no longer active, if such site is not covered by the remedial action program of Title I of the Uranium Mill Tailings Radiation Control Act of 1978. The criteria in Appendix A of this part will be applied to such sites.

See attached. This section requires NRC to regulate byproduct material located at sites where milling operations are no longer active, with the only caveat being that the site must not be covered by Title I of UMTRCA. Importantly, the provision does not limit the NRC's authority to byproduct material produced at a NRC licensed facility after the effective date of UMTRCA. For example, any FUSRAP materials meeting the definition of byproduct material in section 11e.(2) of the AEA, that were not subject to the DOE's control at that time are subject to NRC jurisdiction and Appendix A regulations. Therefore, any FUSRAP materials meeting the definition in section 11e.(2) that leave DOE control for final disposal must be subject to NRC regulatory oversight.

In 1992, NRC concluded that FUSRAP materials that satisfy the definition of "byproduct material" in section 11e.(2) qualify as 11e.(2) byproduct material, regardless of when the materials were generated. Specifically, NRC stated:

> Government contracts were issued for thorium source material used in the Manhattan Engineering District and early Atomic Energy Commission programs. Wastes resulting from that processing and disposal at these [FUSRAP] sites would qualify as 11e.(2) byproduct material.

57 Fed. Reg. at 20,527 (May 13, 1992) (emphasis added) (see attached).

More recently however, NRC has taken a position inconsistent with the 1992 Federal Register notice. Specifically, in a March 2, 1998 letter to Ann Wright of the U.S. Army Corps of Engineers (USACE), Robert L. Fonner, Special Counsel for Fuel Cycle and Safeguards Regulations, NRC (hereinafter "the Fonner letter"), stated that:

> UMTRCA gave NRC statutory authority over tailings [from ore processed for source material content], but only over tailings from activities licensed by NRC as of the effective date of the Act (November 8, 1978), or thereafter. See Section 83 of the Atomic Energy Act of 1954 as amended. . . .
>
> Because the residuals at the listed [FUSRAP] sites were generated long before NRC had any jurisdiction over tailings, and were never produced from source material extraction under NRC license, NRC today has no basis to assert any regulatory authority over the handling of those residuals at the listed sites.

Fonner Letter at 1. In short, the Fonner Letter asserts that NRC lacks jurisdiction over pre-1978 byproduct material because the Commission does not have the authority to regulate as 11e.(2) byproduct material tailings or wastes that were generated prior to the enactment of UMTRCA, unless those tailings or wastes were generated pursuant to an NRC-issued license. The letter goes on to conclude that since pre-1978 byproduct material cannot be regulated by NRC as 11e.(2) byproduct material, NRC regulations would not preclude the disposal of such material in a facility that is not licensed under the AEA (for example, a RCRA hazardous waste disposal facility). Id. at 2.

The Fonner Letter is not only inconsistent with NRC stated policy in the 1992 Federal Register and section 40.2a, but also with the Staff's acceptance of DOE's designation of the materials as 11e.(2) byproduct material in various decisions to license the processing and/or disposal of FUSRAP materials. See U.S. Department of Energy, The Formerly Utilized Sites Remedial Action Program (FUSRAP): Building Stakeholder Partnerships to Achieve Effective Cleanup, DOE/EM–0233 (April 1995), and Affidavit of Joseph J. Holonich, Deputy Director , Division of Waste Manage-

ment, Nuclear Materials Safety and Safeguards, in the Matter of International Uranium (USA) Corp., Docket No. 40–8681 MLA–4 (Jan. 29, 1999).

In sum, the Fonner letter's legally incorrect assertion that pre-1978 byproduct material is not 11e.(2) byproduct material subject to NRC's jurisdiction and its conclusion that such material can be disposed of in a facility that is not licensed under the AEA is inconsistent with NRC and DOE policy. The Fonner Letter correctly concludes however, that such material, when present at a FUSRAP site or other DOE-administered site, is not subject to regulation by NRC because the Department of Energy (DOE) is not required to be licensed by the NRC under the AEA to handle byproduct material.

THE PLAIN LANGUAGE OF THE AEA

"Byproduct material" is defined in section 11e.(2) of the AEA as follows: the tailings and wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.

42 U.S.C. § 2014e.(2). A plain reading of this definition shows that Congress did not impose any temporal limitations on the materials that qualify as 11e.(2) byproduct material. Similarly, Congress did not limit 11e.(2) byproduct material to include only materials produced pursuant to an AEA license. For purposes of AEA section 11e.(2), "byproduct material" is defined in terms of only two characteristics: (i) the type of material at issue (i.e., tailings and wastes), and (ii) the process by which the material was created (i.e., by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content). Importantly, Congress did not define 11e.(2) byproduct material in terms of when the material was produced or whether it was produced pursuant to an AEA license. In other words, notwithstanding the Fonner Letter's assertions, Congress did not define 11e.(2) byproduct material to mean tailings and wastes produced only after the date of enactment of UMTRCA or only after the effective date of UMTRCA. Congress also did not define 11e.(2) byproduct material to exclude material that was not produced pursuant to an NRC-issued license. As the plain language of the statute indicates, Congress understood that materials that meet the definition of 11e.(2) byproduct material generated prior to the effective date of UMTRCA outside the context of an NRC license are 11e.(2) byproduct material.

Further, section 81 of the AEA governs the NRC's licensing of "byproduct material." Section 81 provides that no person may own, possess, produce, transfer or receive 11e.(2) byproduct material without obtaining a license or other authorization from NRC. See 42 U.S.C. §2111. Notably, section 81 does not limit the license requirement to material created after the enactment of UMTRCA. Rather, section 81 applies to any material that meets the definition of byproduct material in section 11e.(2).

Finally, section 83 of the AEA upon which the Fonner letter relies does not support the proposition that NRC is without jurisdiction to regulate the FUSRAP material. The Fonner letter provides: UMTRCA gave NRC statutory authority over such [uranium mill] tailings, but only over tailings resulting from activities licensed by NRC as of the effective date of the Act (November 8, 1978) [sic] or thereafter. See, Section 83 of the Atomic Energy Act of 1954 as amended.

Fonner Letter at 1 (emphasis added). Here, the Fonner Letter cites Section 83 to support the assertion that NRC has regulatory authority only over tailings from activities conducted pursuant to an NRC-issued license that was either in effect on the effective date of UMTRCA or that was issued after the effective date of UMTRCA. This conclusion is based on an misinterpretation of section 83. Section 83 in no way limits NRC's authority to license pre-1978 byproduct material. Instead, that section simply prescribes certain provisions that must be included in licenses issued as of the effective date of UMTRCA. Specifically, Section 83 requires:

Any license issued or renewed after the effective date of [UMTRCA] . . . of any activity which results in the production of any [11.e(2)] byproduct material . . . shall contain terms and conditions . . . to assure that, prior to termination of such license;

(1) the licensee will comply with decontamination, decommissioning, and reclamation standards prescribed by the Commission . . . and;

(2) ownership of any [11e.(2)] byproduct material . . . that resulted from such licensed activity shall be transferred to (A) the United States or (B) the State in which such activity occurred [at the state's option].

42 U.S.C. §2113. In addition, Section 83 contains similar provisions regarding the inclusion in licenses of provisions requiring transfer of title to land used for the disposal of 11e.(2) byproduct material. In other words, AEA Section 83 requires that certain provisions pertaining to the transfer of ownership and custody over byprod-

uct material and the land used for its disposal must be included in 11e.(2) licenses that are issued after the effective date of UMTRCA and in licenses that were already in existence as of the effective date of UMTRCA. Although Section 83 prescribes certain provisions that must be included in 11e.(2) licenses, that section does not speak to the broader question of NRC's authority to license activities involving 11e.(2) byproduct material. Section 83 does not, nor was it intended, to limit NRC's authority to license the handling of pre-1978 byproduct material.

DOE'S DESIGNATION OF MATERIALS AS 11E.(2) BYPRODUCT MATERIAL

Further, as discussed above, the DOE has designated certain FUSRAP wastes as 11e.(2) byproduct material. Under the Atomic Energy Act (AEA), the DOE is self-regulating with respect to AEA materials.[1] Pursuant to that authority, DOE determined that certain material at FUSRAP sites constitutes 11e.(2) byproduct material.[2] Because DOE has designated certain material 11e.(2) byproduct material, that material must be sent to an AEA licensed facility when it leaves DOE control. Moreover, DOE's determination that certain FUSRAP material is 11e.(2) byproduct material should be entitled to deference since UMTRCA specifically grants to DOE the authority to determine whether materials qualify as "residual radioactive materials" subject to regulation under Title I, and the term "residual radioactive materials" encompasses materials that meet the definition of 11e.(2) byproduct material. With regard to FUSRAP material specifically, DOE is very familiar with the history and characteristics of the material and based its determination on this information. Moreover, deference to DOE's determination would be consistent with the past practices of the NRC Staff in its licensing decisions, where the Staff has, in fact, accepted DOE's designation of certain FUSRAP material as 11e.(2) byproduct material.

CONSEQUENCES OF INCONSISTENT POLICIES AND FONNER LETTER ASSERTIONS [3]

Due to inconsistent policy positions, the USACE, relying on the Fonner letter, contracted for the disposal of FUSRAP materials meeting the definition of 11e.(2) byproduct material in a non–11e.(2), non-AEA licensed RCRA site in Buttonwillow, California. The USACE also contracted for the disposal of FUSRAP material meeting the definition of 11e.(2) byproduct material in a NRC licensed 11e.(2) disposal facility owned and operated by Envirocare of Utah, Inc. Since the FUSRAP materials either meet the definition of 11e.(2) byproduct material or not, either the Buttonwillow facility or the Envirocare facility is creating commingled waste and is disposing of the material unlawfully.

Finally, and perhaps most importantly, from a public health and safety perspective, these FUSRAP materials are radiologically, chemically and physically similar to those generated pursuant to AEC contracts at what are now Title I and Title II sites. It is nonsensical to treat the FUSRAP materials differently from the materials at the Title I and Title II sites.

[From the Federal Register, Vol. 57, No. 93, Notices, Wednesday, May 13, 1992]

FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM (FUSRAP)

These sites primarily processed material such as monazite sands, to extract thorium for commercial applications. Government contracts were issued for thorium source material used in the Manhattan Engineering District and early Atomic Energy Commission programs. Wastes resulting from that processing and disposed of at these sites would qualify as 11e.(2) byproduct material. However, it is not clear that all the contaminated material at these sites result from processing of ore for thorium. At some sites there was also processing for rare earths and other metals. The DOE which accepts responsibility for the FUSRAP materials is investigating options for disposal and control of these materials. DOE estimates that a total of 1.7 million cubic yards of material is located at sites in 73 States. Recent proposals

---

[1] *See e.g.,* Testimony of Mr. James L. Liverman, DOE Acting Assistant Secretary, Hearings on H.R. 13382 Before the Subcomm. On Energy and the Environment, 95th Cong., 2nd Sess. 42 (June 26, 1978) (Stating that FUSRAP sites were subject to DOE control therefore not included in UMTRCA as inactive (Title I) sites or active (Title II)).

[2] *See,* U.S. Department of Energy, *the Formerly Utilized Sites Remedial Action Program (FUSRAP): Building Stakeholder Partnerships to achieve Effective Cleanup,* DOE/EM-0233 (April 1995).

[3] *See* Affidavit of Joseph J. Holonich, Deputy Director, Division of Waste Management, Nuclear Materials Safety and Safeguards, in the Matter of International Uranium (USA) Corp., Docket No. 40-8681 MLA–4 (Jan. 29, 1999).

have considered the transportation of FUSRAP materials from New Jersey to tailing piles at uranium mills in other States, such as Utah, Washington, and Wyoming.

STATEMENT OF SCOTT SLESINGER, VICE-PRESIDENT, GOVERNMENTAL AFFAIRS, ENVIRONMENTAL TECHNOLOGY COUNCIL

My name is Scott Slesinger. I am Vice-President for Governmental Affairs of the Environmental Technology Council (ETC), a trade association that represents the leading companies involved in hazardous waste treatment, recycling and disposal in the United States and Canada. Our members operate 20 Subtitle C landfills in the United States of which three have been selected by the U.S. Army Corps of Engineers (USACE or "Corps") to take very low-activity radioactive wastes from the Formerly Utilized Sites Remedial Action Program (FUSRAP).

My remarks today address the current and ongoing disposal of certain FUSRAP wastes at hazardous waste landfills regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA). We believe it is critical to understand that these wastes are high volume and low risk materials that contain very low concentrations of radioactivity. Typical shipments of FUSRAP waste include ore tailings, related residues and soil contaminated with very low concentrations of radioactive constituents. For instance, demolished buildings that had been used for research are part of the FUSRAP program. Prior to demolition, these buildings are cleaned using HEPA-filtered vacuuming and high pressure washing of all building surfaces to remove loose contamination. Then the buildings were demolished and the remaining building debris contained some residual low-activity residual radioactivity. These low-activity radioactive wastes are equivalent to other wastes certain Subtitle C facilities have historically disposed. These wastes are significantly below the "low-level" designation that has been subject to much congressional debate for the past years.

Our testimony will explain why we believe that the design and operational technology used by certain Subtitle C landfills for disposal of FUSRAP wastes is environmentally sound and fully protective of human health and the environment. We urge this committee to ensure that the Subtitle C option remains available as a safe alternative to the limited single licensed low-level waste (LLLW) disposal site option. Having multiple disposal sites lowers the cost and allows for a more expeditious cleanup of these sites. In addition, we will testify to our belief that there is no regulatory "gap" in the law. RCRA gives States omnibus authority to require additional requirements more stringent than the Federal standards. In the case of low-activity radioactive wastes, the States have done that and have established regimes to fully protect the public health, our employees and the environment.

These FUSRAP sites were used to support the nuclear activities of the Department of Energy's (DOE) predecessor agencies. The sites were used for research, processing and storage of uranium and thorium ores, concentrates and residues. When these facilities were no longer needed, they were decontaminated in accordance with guidelines acceptable at that time. However, under the more protective standards that came into existence in the 1970's, the Federal Government re-evaluated 31 sites for further cleanup. The FUSRAP program was initiated in 1974 to identify sites and to implement remediation.

Frustrated with the slow cleanup of FUSRAP sites in New York, New Jersey, Connecticut and Missouri, the Fiscal Year 1998 Energy and Water Appropriations Bill, transferred management authority over FUSRAP from the Department of Energy to the Army Corps of Engineers. In an effort to ensure that FUSRAP materials were managed in an environmentally sound and cost effective manner, the Corps continued an effort initiated by DOE to evaluate various management options including considering alternatives to the single low-level repository for some of the less radioactive FUSRAP wastes. These options included the use of hazardous waste treatment and disposal facilities regulated under RCRA (Subtitle C facilities).

The Nuclear Regulatory Commission (NRC) determined that some FUSRAP materials generated prior to 1978 were not regulated by NRC and contain levels of radioactivity low enough to be considered to be "insignificant" and therefore could be managed at Subtitle C facilities. Certain Subtitle C landfills have been permitted for low-activity wastes, and have traditionally taken oil exploration wastes and geothermal wastes containing "NORM," an acronym that stands for Naturally Occurring Radioactive Materials (NORM) and that in practice covers a very wide variety of low-activity wastes that have been safely disposed of in RCRA Subtitle C facilities

for decades. In fact, many of these NORM wastes are higher in radioactivity than most of the FUSRAP wastes.[1]

There has been some legal controversy on whether the by-product material generated before 1978 should be treated differently than post 1978 wastes. The NRC, in response to a petition from a licensee, is reviewing the legal issue and ETC has filed a brief detailing the legislative history on those legal issues. Our review of the legislative history points to clear congressional intent to limit the scope of the 1978 uranium mill tailings legislation to particular specified western remediationsites and to sites under current NRC licenses. FUSRAP sites did not fit either requirement, but were then being cleaned-up under other authorities by the chief administrative sponsor of the 1978 legislation, the Department of Energy. A copy of our brief is attached.

However, we cannot argue that there is any scientific rationale for the 1978 date. The Atomic Energy Act, as well as RCRA, regulates substances based on various policy considerations rather than risk. Toluene provides a good example. Toluene in a solvent must go to a Subtitle C facility for incineration or distillation recovery treatment. Toluene in a home product like nail polish can go to a municipal landfill, but toluene spilled at a remediationsite can often be left in place. In all three instances the concentration of the toluene may be the same but it is treated differently under different policies. The Atomic Energy Act has similar distinctions that seem to ignore science, but usually exist for some historic or policy reasons. We believe that disposal and treatment of all wastes, radioactive or hazardous should be handled based on their risk and reasonable mismanagement scenarios. In that case, we believe, along with the NRC and the Corps of Engineers that the science supports our position that by-product wastes less than 2,000 picocuries per gram can safely be disposed in specific Subtitle C facilities.

While most Subtitle C and Subtitle D landfills are precluded from disposing of radioactive waste much higher than background, a select few Subtitle C landfills have specific permit provisions and acceptance criteria, which are enforced by State regulators, that allow for the acceptance of low-activity wastes. Because these facilities were sited, designed, constructed and permitted specifically with such wastes in mind, these facilities can and do play an important role in the FUSRAP clean-up program by providing an environmentally sound, cost effective option for managing FUSRAP wastes at a time when such options are limited.

Each of the facilities that have received FUSRAP wastes have RCRA permit limits based on the concentration of radioactivity as expressed in picocuries per gram or its equivalent. Those specific limits are recognized in guidance of the Conference of Radiation Control Program Directors (CRCPD), the national organization of State radiation control directors. CRCPD policy since 1990 is that wastes above 2,000 pCi/g of uranium, thorium, radium and other NORM radionuclides should be disposed in a licensed low-level waste repository.[2] Furthermore, we understand that EPA, is an unrelated rulemaking, has completed a risk analysis comparing licensed low-level NRC sites with RCRA Subtitle C facilities. Using very conservative estimates and a 10,000-year model, EPA analysis showed that Subtitle C facilities and NRC licensed low-level waste disposal facilities are equally protective, at least for the isotopes and the radiation levels allowed in our RCRA permits for FUSRAP wastes. In 1994, EPA developed guidance to drinking water providers entitled Suggested Guidelines for the Disposal of Drinking Water Treatment Wastes Containing Radioactivity (EPA 1994). This document recommended that radium–226 and radium–228, common isotopes collected in drinking water filters and found at most FUSRAP

---

[1] Scale, a plaque-like mineral crusting, forms inside pipes and other equipment which concentrates radioactivity when these companies pump or otherwise process these natural resources (e.g., oil, natural gas, geothermal energy, phosphate) scaling on pipes and other equipment concentrates radioactivity. These wastes, often called NORM wastes, have always been disposed at these Subtitle C facilities due to their hazardous waste constituents (e.g., lead, arsenic, and benzene) although they are not regulated under RCRA. Although such plaque can reach levels of radioactivity of 100,000 picocuries per gram, these facilities are permitted by their state to take only wastes up to 2,000 pCi/gm.

[2] The E–4 Committee Report entitled "Report of the E–4 Committee on NORM Contamination and Decontamination/Decommission—Report 3," prepared by the CRCPD, notes that since 1990, the policy of the CRCPD was that wastes over 2,000 picocuries per gram should go to LLW sites. The report specifically describes: (a) uranium and thorium as NORM constituents in addition to the isotopes more common to oil, gas and geothermal production wastes; (b) uranium milling/recovery as "materials and activities known to be associated with elevated NORM levels,"; (c) that "slags, sludges and other loose NORM exceeding 2,000 picocuries per gram should go to a LLW disposal facility" and that "loose material exhibiting between 30 picocuries per gram and 2,000 picocuries per gram should go to a diffuse NORM disposal site", and (d) that "pipe scale" and other types of mechanically and/or chemically concentrated forms of NORM radiologic isotopes are still defined simply as "NORM".

sites, should be disposed in proper Subtitle C landfills if the wastes contained between 50 and 2,000 pCi/g of total radium.

At FUSRAP sites, when waste shipments contain concentrations near or above 2,000 pCi/g, they have been sent directly to a low-level repository. However, wastes that are below this level and are radiologically similar to radioactive wastes of natural gas and oil exploration, production, and refining that have been sent to properly permitted RCRA Subtitle C facilities. Since those facilities were designed and permitted with such wastes in mind, and have for many years been receiving wastes with concentrated levels of NORM, it is entirely appropriate that RCRA Subtitle C facilities have and should continue to play an important role in the safe management of low-activity waste from FUSRAP sites.

As required by law, RCRA Subtitle C facilities operate under the control of an extensive set of regulations promulgated by the Environmental Protection Agency (EPA). These regulations establish standards and specifications that address facility siting, design, operational controls, personnel safety and training, environmental monitoring and public participation.

As prescribed in regulations, these landfills are highly engineered, and contain redundant detection and monitoring systems to protect human health and the environment. Landfill disposal cells are constructed with sophisticated liner and cap systems, which include multiple layers of clay and synthetic liners supplemented by systems for removal of precipitation and for leak detection. A major concern at all landfills is the possible impact to groundwater. All Subtitle C landfills have multiple leachate and leak protection systems that monitor leachate to prevent any liquids from escaping the secure liner system of the landfill. When leachate is collected, it is pumped to the surface and treated. At the three RCRA Subtitle C sites that take FUSRAP wastes, these engineering controls are in addition to the environmental considerations that originally led to the siting of these facilities—arid, desert-like conditions with very little annual rainfall. In fact, at each of these sites, the evapotranspiration rate exceeds annual rainfall levels in simple terms, this means that what little rain does fall evaporates rapidly back into the atmosphere. As a result, local groundwater is not at risk. Indeed, unlike typical Subtitle C landfills, these three landfills rarely have leachate to pump. As added precautions, specific environmental monitoring requirements for air and groundwater are also included in the RCRA regulations and are often enhanced and expanded by specific permits requirements for each facility.

When a facility contemplates the acceptance of a new type of waste, the regulators determine if existing safeguards in the permit are adequate. If they are not, or if the regulatory agency requires additional or redundant protections, the facility's permit is modified under procedures set forth in existing statutes and regulations. The protective systems in place at RCRA Subtitle C facilities meet and in some cases exceed those present at NRC licensed facilities for disposal of FUSRAP related wastes. In addition, State regulatory agencies have broad omnibus authority under RCRA to modify permits to ensure protection of public health and the environment beyond the requirements of Federal law. States are not bashful in using this authority.

Despite the obvious similarity between RCRA Subtitle C and NRC licensed facilities, the radiation activity levels currently being received by Subtitle C facilities are generally orders of magnitude less than are contemplated at NRC licensed facilities. One such RCRA facility's acceptance criteria is nearly 30 percent below what the Occupation Safety and Health Administration considers necessary to require personal dosimeter monitoring, and below the level acceptable for pregnant workers. Additional regulations, where applicable, include Department of Transportation rules governing transportation and the worker safety programs of OSHA.

Employees at RCRA Subtitle C facilities are fully protected by specific safety, training and health monitoring standards established by the Occupational Health and Safety Administration (OSHA) for hazardous waste operations, as well as by permit requirements that are specific to the waste types being managed. OSHA regulations include specific standards for protecting workers from exposure to radiation hazards, which are similar to standards established by the NRC for facilities they license. All RCRA Subtitle C disposal facilities have long provided extensive worker health and safety programs for protection against exposure to toxic chemicals such as arsenic, chromium, lead, benzene, pesticides, and asbestos that can pose a very real threat of injury and disease, including cancer. However, with such protections in place, the toxic chemicals that are contained in "hazardous wastes" regulated under RCRA are routinely managed in a safe and secure manner every day at these RCRA Subtitle C facilities.

There has been much discussion about the long-term persistence of radionuclides in the environment due to their long half-lives and the time it takes for these chemi-

cals to decay to a safe non-radioactive State. It is important to note that much of the toxic hazardous waste that is safely disposed of in RCRA Subtitle C facilities never decays to a less toxic State. Wastes managed at RCRA Subtitle C facilities such as lead, asbestos, arsenic, and even dioxins and PCBs will essentially remain the same for tens of thousands of years. Thus, any suggestion that RCRA Subtitle C facilities are not capable of safely managing low-activity radioactive wastes, flies in the face of the fact that these facilities have been designed, constructed, operated and monitored to specifically to protect the population and the environment from the most dangerous substances we know. Such suggestions ignore the fundamental cornerstone of American environmental protection policy that gave birth to RCRA and has been proven successful in the 26 years since its enactment.

The Corps of Engineers has also been highly conservative and cautious in its selection of disposal facilities for the FUSRAP wastes. Our companies submitted multiple volumes of information and data to the Corps of Engineers as part of a bid solicitation process. In addition, teams of health physicists audited our facilities and found the facilities' program for acceptance of FUSRAP waste to be both adequate and protective. It has been our experience throughout this long process that the Corps of Engineers has in place a very comprehensive program to select and monitor potential disposal options for FUSRAP wastes.

It is our view that the Corps of Engineers, the regulatory agencies and the companies involved have all worked within the existing regulatory framework to offer a highly protective disposal option for FUSRAP wastes, and that additional regulation of this waste would be redundant and unnecessary. It is important to note that the acceptance criteria for each facility accepting FUSRAP wastes are fully enforceable by regulators. Noncompliance with these or any of the facility's permit conditions could result in administrative or civil action.

The development of multiple options for management of FUSRAP material is good public policy. The availability of the Subtitle C facility disposal option represents an environmentally sound, cost-effective management option for some FUSRAP material at a time when such options are limited. As NRC noted "protection of the public health and environment is improved with the availability of additional waste disposal options resulting in the cleanup and release of these sites for other uses." (Letter from NRC Greta Joy Dicus to Representative Dingell, July 29, 1999) Waste disposal options that we believe are at least equivalent in protecting the environment compared to the Licensed low-level Waste site alternative.

In conclusion, ETC agrees with the view that the pre vs. post 1978 distinction of by-product material has no technical basis. In fact, logic would suggest that all by-product waste below a certain level of radioactivity should continue to be allowed to be disposed at RCRA Subtitle C facilities with the proven capability and experience to handle low-activity radioactive wastes.

ETC believes that is ample evidence supporting our position that Subtitle C landfills are protective for disposal of by-product waste from FUSRAP sites and that no statutory changes are necessary. However, if statutory changes are contemplated, ETC believes that it should be based on sound science and the actual risk associated with this low-activity radioactive waste based on its radiation levels and potential health threat.

Mr. Chairman, thank you for the opportunity to present our views to your committee.

SUPPLEMENTAL RESPONSE OF ENVIROSAFE SERVICES OF IDAHO, INC. AND ENVIRONMENTAL TECHNOLOGY COUNCIL TO PETITIONS UNDER 10 CFR §2.206—SNAKE RIVER ALLIANCE

INTRODUCTION

The Snake River Alliance and Envirocare of Utah, Inc. have petitioned the Nuclear Regulatory Commission (NRC) to require that low-activity byproduct material from the Formerly Utilized Sites Remedial Action Program (FUSRAP) be disposed only at an NRC-licensed facility. See 65 Fed. Reg. 25,760 (May 3, 2000). Petitioner Envirocare of Utah, Inc. currently operates the only such landfill facility. As the basis for their request, petitioners allege that the NRC, under sections 81 and 84 of the Atomic Energy Act of 1954 (AEA), was given authority by Congress to regulate all section 11e.(2) byproduct material regardless of when it was generated, including tailings and wastes at FUSRAP sites resulting from the Manhattan Project and the nation's early atomic energy program (1940–1960) that were not subject to any AEA license requirement.

Thus, the petitions seek reversal of the NRC's position that:

(1) the AEA, as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), gives the NRC statutory authority only over byproduct material from activities licensed on or after the effective date of section 83; and

(2) Congress has expressly authorized the U.S. Army Corps of Engineers (USACE) to dispose of byproduct material from FUSRAP sites pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), which authorizes disposal at RCRA-permitted landfills.

See Directors Decision Under 10 CFR 2.206 (DD–99–07), 64 Fed. Reg. 16,504 (April 5, 1999); letter from NRC Commissioner Greta Joy Dicus to Congressman John D. Dingell dated July 29, 1999; letter from NRC Chairman Shirley Ann Jackson dated May 3, 1999; letter from NRC Special Counsel to USACE dated March 2, 1998.

Respondent EnviroSafe Services of Idaho, Inc. (ESII) submitted a preliminary response to the petitions on April 10, 2000, indicating that a more detailed response would be forthcoming. Petitioner Envirocare then submitted a supplement to its petition on May 5, 2000. After a more comprehensive review of the petitions and supplement, ESII and the Environmental Technology Council, a national trade association that represents the hazardous waste management industry, hereby submit this joint response.

SUMMARY OF RESPONSE

The petitions are based on a flawed interpretation of the AEA and a selective misreading of the legislative history of UMTRCA and related appropriations acts of Congress. Sections 83 and 84 were added to the AEA by UMTRCA in 1978. At that time, contrary to petitioners' claims, Congress was fully aware that FUSRAP sites were being addressed by the Department of Energy (DOE) under general AEA authority and the National Environmental Policy Act. Therefore, Congress expressly decided to exclude FUSRAP sites from the UMTRCA remedial program and the NRC's licensing authority over 11e.(2) byproduct material. Instead, Congress has exercised oversight and direction of FUSRAP primarily through the appropriations process.

At no time has Congress ever indicated that the NRC has licensing authority over byproduct material from FUSRAP sites, despite ample opportunity to do so. In fact, Congress has specifically directed that the FUSRAP program be implemented now by the Corps of Engineers, and that the remediation activities be subject to the administrative, procedural, and regulatory provisions of CERCLA and the National Contingency Plan. As a result, byproduct material from FUSRAP sites may properly be disposed, pursuant to the CERCLA offsite policy, at certain landfills that have received permits under Subtitle C of the Resource Conservation and Recovery Act (RCRA). These Subtitle C landfills have permits that contain terms and conditions related to disposal of low-activity radioactive wastes imposed by States under the "omnibus" authority of RCRA as necessary to fully protect human health and the environment.

DISCUSSION OF LEGAL AUTHORITY

I. Petitioners Misconstrue the NRC's Licensing Authority by Ignoring the Clear Intent of Congress in UMTRCA and Related Appropriations Acts

Petitioners ask the NRC to read sections 81 and 84 of the AEA in isolation, rather than properly construing the statute as a whole.[1] As the NRC is aware, sections 81 and 84 are part of a statutory scheme that includes section 83, and most importantly that reflects the intent of Congress in UMTRCA to exclude the cleanup of tailings and wastes at FUSRAP sites from the NRC's licensing authority.

Specifically, Congress enacted AEA sections 83, 84 and amendments to section 81 in the UMTRCA of 1978. The twin purposes of UMTRCA are clearly stated in section 2(b). First, with respect to "inactive mill tailings sites," the Act provided for "a program of assessment and remedial action at such sites . . . in order to stabilize and control such tailings in a safe and environmentally sound manner. . . ." 42 U.S.C. 7901(b)(1) (emphasis added). Title I of the Act is this remediation program for certain inactive sites. Second, Congress enacted "a program to regulate mill tailings during uranium or thorium ore processing at active mill operations and after termination of such operations. . . ." 42 U.S.C. 7901(b)(2) (emphasis added). Title II of the Act (sections 81–84) primarily regulates tailings from active mill operations.

---

[1] As the court warned in *Kerr-McGee Chemical Corp.* v. *NRC*, 903 F.2d 1(1990), a construction of the AEA may be "plausible enough on its face, [but] a statute must be read with an eye on its structure and purpose as well as a dictionary." *Id.* at 2.

In enacting UMTRCA, Congress was fully aware that DOE was addressing other inactive sites contaminated with tailings under the FUSRAP program. Congress expressly decided not to include FUSRAP sites under UMTRCA for good reasons. The House Committee on Interstate and Foreign Commerce explained:

> The committee understands that there are a number of federally owned or controlled sites with [residual radioactive] materials or tailings, such as the TVA site . . . and a DOE site in Lewiston, N.Y., and some in New Jersey. The committee wants to have these sites identified by the DOE and have data concerning the health or environmental problems associated with the sites and on what, if anything is being done to eliminate such problems and when.

H.R. Rep. No. 1480 Part 2, 95th Cong., 2d Sess. 41 (Sept. 30, 1978), reprinted in 1978 U.S. Code Cong. & Admin. News 7450, 7468 (emphasis added). The "TVA site" refers to the Elza Gate Site, Oak Ridge, Tennessee; the "DOE site" was the Niagara Falls Storage Site, Lewiston, New York; and the "New Jersey" sites were the Kellex/ Pierport site, the Middlesex Municipal Landfill, and the New Brunswick Site in New Jersey all of which were FUSRAP sites at the time Congress enacted UMTRCA.

In hearings before the House Subcommittee on Energy and the Environment, Mr. James L. Liverman, Acting Assistant Secretary, who was responsible for the FUSRAP program at DOE, explained why the FUSRAP sites were not included in the UMTRCA legislation. He said:

> About 4 years ago, as a result of questions on the Middlesex dump and on Palos Park in the Chicago area, Dr. Ray, then the Chairman of the Atomic Energy Commission, and I determined that we should take a relook at some 150 sites that had been turned back over to the private sector to utilize. . . . We felt it was important because we did not know and could not find the records that revealed exactly the status of those sites. So we started the detailed survey of them, and we are, perhaps, down the road a long way now, but it is clear that there must be something of the order of 30 out of the 150 or so that are going to demand some kind of cleanup action.
>
> We are not proposing that as a part of this bill because we have not yet accurately determined what the cost may be, but I do want to mention it because it is another thing that is coming across the table, but it is not covered in this legislation.

Hearings on H.R. 13382 Before the Subcomm. on Energy and the Environment of the House Comm. on Interior and Insular Affairs, 95th Cong., 2d Sess. 42 (June 26, 27 and July 10, 17, 1978) (emphasis added). Like the "Middlesex dump" (Middlesex Municipal, NJ), the Palos Park site in Illinois was also part of the FUSRAP program in 1978.[2]

In his testimony, Mr. Liverman further explained that FUSRAP sites: were deliberately eliminated by the Office of Management and Budget [from the Administration bill] because we needed to do a more detailed study of those sites and get a clear estimate so we could bring to the Congress a bill that made some sense. We will probably be back in the next 9 months to a year, if we need additional authorization to clean up, and that will depend upon the legal determination of who is responsible. In any case, we will be back for the appropriations to deal with those. Id. at 49 (emphasis added).

In view of this testimony, Congress decided not to include the FUSRAP sites within the scope of the UMTRCA legislation in 1978, and instead to oversee DOE's cleanup efforts mainly through the appropriations process. Congress focused the Title I remedial program on "certain" sites that required a new Federal cleanup effort. H.R. Rep. No. 1480 at 23. Congress limited Title I to the 22 locations specifically listed in UMTRCA section 102. The Secretary's authority to include other inactive sites that required cleanup was restricted to sites added within 1 year (reduced from 5 years in the original bills). Compare UMTRCA . 102 with H.R. 95–1480, H.R. Rep. No. 1480 at 2. This was important in order to control the overall costs of the program, because Congress had reached a difficult compromise on cost sharing between the Federal Government and the States.[3] Thus, Title I of UMTRCA was lim-

---

[2] According to DOE, the Palos Park site was transferred out of FUSRAP in 1990. *See FUSRAP Management Requirements and Policies Manual,* U.S. DOE Oak Ridge Operations (May 6, 1997), page 1–5, attached as Exhibit A hereto.

[3] Congress was "particularly concerned about the cost of this program." H.R. Rep. 1480 (II) at 34; 1978 USCCAN 7461. The costs for remedial actions, including both at the processing sites and any locations and structures contaminated with tailings from the sites, was to be borne 90 percent by the Federal government and 10 percent by the States. UMTRCA § 107. Costs of long-term maintenance and monitoring of final disposal sites were to be borne by DOE. States were

ited to inactive mill tailings sites where "there was once Federal licensing of the operations, but, due to a loophole in the law, the sites escaped control after operations ceased." H.R. Rep. No. 1480 (II) at 30; 1978 USCCAN 7457 (emphasis added).

Of course, Congress recognized that FUSRAP inactive sites were not "escap[ing] control" due to a "loophole" in the AEA, but instead were being addressed by DOE under both the AEA and additional authority from Congress. DOE relied on its general authorities in the AEA to protect public health and safety.[4] DOE also sought to fulfill its responsibilities under the National Environmental Policy Act to use all practicable means to implement a cleanup program at FUSRAP sites to assure environmental protection. 42 U.S.C. 4331(b).

Thus, at the time of the 1978 UMTRCA, Congress knew that FUSRAP sites were not escaping control, and Congress could better oversee DOE's implementation of FUSRAP through the appropriations process. As Congress realized, the formerly utilized sites that DOE was already investigating and remediating did not need to be included in the comprehensive regulatory regime for the safe disposal and stabilization of tailings under Title I. Nor did Congress need to include byproduct material from FUSRAP sites under the NRC's licensing authority for tailings resulting from active processing operations, since FUSRAP materials were already subject to AEA, NEPA, and statutory direction through appropriations acts.[5]

Subsequent to the UMTRCA, Congress has continued to oversee the FUSRAP in a manner that strongly confirms its prior legislative intent. In appropriations acts since 1978, Congress has always considered the FUSRAP as a separate and distinct program from the UMTRCA Title I remedial program, often providing direction to DOE on its cleanup responsibilities at FUSRAP sites. In the 1984 Energy and Water Development Appropriations Act (EWDAA), Congress specifically authorized DOE to conduct decontamination at four FUSRAP sites (Colonie, NY; Latty Avenue Properties, MO; and the Wayne and Maywood sites, NJ). Pub. L. 98–50. The 1985 EWDAA directed DOE to perform necessary response action at the St. Louis Airport site, and to develop the property as a disposal site for the waste from the response action activities conducted at vicinity properties and the Latty Avenue Properties. Pub. L. 98–360.

More recently, in the 1998 EWDAA, Congress included statutory language transferring the funding and responsibility for administering the FUSRAP from DOE to the Corps of Engineers. Pub. L. No. 105–62, 111 Stat. 1326 (1997). Congress further directed the Corps of Engineers to review the baseline cost, scope and schedule for each of the FUSRAP sites, "and determine what actions can be taken to reduce costs and accelerate cleanup activities." H.R. Rep. No. 190, 105th Cong., 1st Sess. 66 (July 21, 1997). In the 1999 and 2000 EWDAA, Congress directed that "response actions by the [USACOE] under this [FUSRAP] program shall be subject to the administrative, procedural, and regulatory provisions of the Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. 9601 et seq.), and the National Oil and Hazardous Substances Pollution Contingency Plan." Pub. L. No. 105–245, 112 Stat. 1838, 1843 (1998).

Through all of these appropriations acts, Congress had an ample opportunity to indicate that FUSRAP sites were covered under UMTRCA, or that the NRC should exercise license authority over tailings and wastes from FUSRAP sites. Congress has not done so, because there was no need to do so.

---

required to assume the costs of purchasing the inactive processing sites and any necessary new disposal sites. H.R. Rep. No. 95–1480 (I) at 14; 1978 USCCAN 7436.

[4] AEA § 31a.(5), referenced in *FUSRAP: Building Stakeholder Partnerships to Achieve Effective Cleanup*, DOE/EM–0233 (April 1995), attached as Exhibit B hereto, and AEA §§ 66 and 91(a)(3) ("The Commission is authorized to—provide for safe storage, processing, transportation, and disposal of hazardous waste (including radioactive waste) resulting from nuclear materials production, weapons production, and surveillance programs," referenced in "Legal Opinion—Authority to Decontaminate Middlesex Sampling Plant Site and Adjacent Private Properties" (June 19, 1978), attachment to FUSRAP: *Management Requirements and Policies Manual*, Exhibit A hereto.

[5] For the same reasons, the *Kerr-McGee* case is not relevant to the Commission's statutory interpretation here. As the petitioners acknowledge, the Kerr-McGee facility was licensed by the NRC, and thus the court's decision on the definition of section 11e.(2) byproduct material from NRC-licensed facilities is not applicable to FUSRAP sites. More importantly, the court's reasoning does not apply. The court invalidated an NRC interpretation that "recreate[d] the regulatory gap that the UMTRCA was designed to eliminate and exclude[d] from regulation for the protection of the public health some of the radioactive tailings that Congress intended to bring within the agency's authority." *Kerr-McGee*, 903 F.2d at 19. In this matter, as discussed above, Congress did not consider FUSRAP sites to fall within the "regulatory gap" that UMTRCA was intended to close, nor did Congress intend to bring wastes from FUSRAP sites within the agency's licensing authority. Thus, *Kerr-McGee* is not of concern.

Thus, petitioner Envirocare's claim that Congress never "specifically focused on FUSRAP" in the legislative history of UMTRCA, Pet. at 6–9, is simply wrong. Petitioners' central argument that Congress intended for NRC to regulate all byproduct material from all inactive sites is also clearly wrong. The truth is that Congress did focus on the inactive tailings sites in the FUSRAP and specifically decided not to regulate them under UMTRCA. Petitioners' entire case is based on the faulty premise that Congress was unaware of the DOE remedial program for FUSRAP sites, contrary to the extensive legislative history set forth above.

II. Because Envirocare Has Misrepresented the Legislative History, the Petitions are Based on an Erroneous Interpretation of Sections 81 and 84

The provisions of AEA sections 81, 83 and 84, as amended by UMTRCA, must be construed in view of the clear congressional intent in the legislative history. Kerr-McGee, 903 F.2d at 2. As the Commission may know, should its statutory interpretation be subject to judicial review, the court will first determine whether Congress directly addressed the matter. "If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress." *Chevron U.S.A., Inc.* v. *NRDC,* 467 U.S. 837, 842–43 (1984) (referred to as the Chevron Step I analysis). To discern congressional intent, the court must "stud[y] the statutory text, structure, and history" of the statute as a whole, and not each section in isolation. Ohio v. DOI, 880 F.2d 432, 441 (D.C. Cir. 1989). However, even if the court concludes that Congress's intent is not plain, the court must still defer to the agency's construction of the statute so long as it is reasonable. 467 U.S. at 844 (Chevron Step II). As set forth above, we believe Congress's intent that NRC's license authority does not extend to FUSRAP materials is clear. Even if a court should find the statute ambiguous, however, the NRC has adopted a reasonable construction of its license authority that should be upheld. In contrast, petitioners ask the Commission to adopt an interpretation of sections 81 and 84 in isolation that ignores the basic structure of UMTRCA and Congress's purposeful design.

At the outset, petitioners agree that section 83 gives the NRC licensing authority only over section 11e.(2) byproduct material that results from activities at sites licensed on or after the effective date. Why is the NRC's authority limited in this way? Congress intended the AEA amendments in Title II of UMTRCA to primarily focus on preventing future problems at active mill operations, and to supplement the DOE's cleanup authority at the 22 inactive sites under Title I. H.R. Rep. No. 1480 (I) at 13; Part II at 29. Consistent with this congressional intent, section 84 is not a broad grant of unlimited authority over "any" byproduct material from any site, as petitioners claim, but is limited by the purposes of UMTRCA. Specifically, section 84a. provides:

The Commission shall insure that the management of any byproduct material, as defined in section 11e.(2), is carried out in such manner as: (1) the Commission deems appropriate to protect the public health and safety and the environment from radiological and nonradiological hazards associated with the processing and with the possession and transfer of such material . . . ; (2) conforms with applicable general standards promulgated by [EPA] under section 275, and; (3) conforms to general requirements . . . comparable to requirements applicable to the possession, transfer, and disposal of similar hazardous material regulated by [EPA] under the Solid Waste Disposal Act. . . .

In their petitions to the Commission, petitioners argue that the phrase "any byproduct material" applies literally to any tailings or wastes from any processing sites, including pre-1978 material from FUSRAP sites. However, Congress used limiting statutory language that refutes petitioners' interpretation. In section 84, Congress authorized the NRC to insure protective management of "any byproduct material, as defined in section 11e.(2)." Why did Congress include this limiting language, rather than referring to "byproduct material" as generally defined in section 11.e? The statutory provision on its face does not refer to literally "any byproduct material," but only to tailings and wastes that Congress added in subsection (2) of section 11e. by amendment in UMTRCA. Congress added subsection (2) for the express purpose of supplementing the NRC's authority with respect to tailings from NRC-licensed active sites and Title I inactive sites, while at the same time clearly intending not to include FUSRAP sites, as discussed above. Thus, section 84 does not extend to byproduct materials from FUSRAP sites that Congress expressly decided to exclude from UMTRCA, and that are not subject to either section 83 or Title I.

Consistent with this interpretation, section 84a.(2) requires conformance with "applicable" general standards promulgated by EPA under section 275. In turn, section 275 applies only to "residual radioactive materials . . . located at inactive uranium mill tailings sites and depository sites for such materials selected by [DOE] pursu-

ant to title I of the [UMTRCA]" and "sites at which ores are processed primarily for their source material content or which are used for the disposal of such byproduct material." 42 U.S.C. 2022(a) and (b) (emphasis added). Thus, the statutory text taken as a whole reinforces the interpretation that section 84 applies only to byproduct material from Title I and NRC-licensed sites.

The House committee also confirmed this interpretation in its section-by-section analysis of UMTRCA. The committee explained that section 84 "authorizes the Commission to promulgate, implement and enforce regulations governing permanent Federal custody of uranium mill tailings disposal sites and governing the activities of the [DOE] under title I of the act." H.R. Rep. No. 1480 (I) at 21.[6] Section 83(a)(2) requires permanent Federal custody of tailings disposal sites only for byproduct material from NRC-licensed active sites. Likewise, Title I of the Act is limited to the 22 listed sites, and does not include FUSRAP sites. See also H.R. Rep. No. 1480(I) at 16, which summarizes the provisions of section 84 as follows: "In establishing requirements or promulgating regulations for licensing or for oversight of the Department's remedial activities, the Commission must set all standards and requirements." Congress's reference to "licensing" is clearly to new section 83 related to tailings at active processing sites, and the reference to DOE's "remedial activities" is obviously to the Title I program. Thus, Congress intended section 84 to be limited to these two purposes.

As a result, petitioners' argument that section 84 is "phrased in comprehensive, or catch-all, terms" is simply wrong. Section 84 applies to section 11e.(2) byproduct material that is subject to the NRC's licensing authority on or after the effective date of section 83 and to inactive sites covered under Title I, but clearly not to FUSRAP sites.

For the same reasons, section 81 also does not prohibit the management and disposal of byproduct material from FUSRAP sites. Section 81, as originally enacted in the AEA of 1954, was intended to restrict the domestic distribution of byproduct material, as that term is now defined in section 11e.(1), for research, commercial, and agricultural purposes, except as otherwise authorized. In the UMTRCA of 1978, Congress amended section 81 to include the highlighted language:

> No person may transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, own, possess, import, or export any byproduct material, except to the extent authorized by this section, section 82 or section 84.

The language "except to the extent authorized by . . . section 84" implicates the congressional intent to exclude FUSRAP materials. As discussed above, section 84 applies to 11e.(2) byproduct material from Title I sites and NRC-licensed operations, and not to FUSRAP sites. Thus, section 81 must be construed consistent with Congress's overall intent in UMTRCA to allow DOE, and now the Corps, to address cleanup of byproduct material from FUSRAP sites. By excluding such byproduct material from the scope of sections 83 and 84, Congress by necessary implication authorized under section 81 the possession and transfer of such FUSRAP materials for cleanup and disposal. This construction of sections 81, 83 and 84 is consistent with the structure of UMTRCA and with clear congressional intent.

For all of the foregoing reasons, petitioners' flawed interpretation of sections 81 and 84 should be rejected as contrary to the clear intent of Congress and to a reasonable construction of the statute. The Commission should reaffirm its position that the AEA, as amended by UMTRCA, gives it licensing authority only over byproduct material from activities licensed on or after the effective date of section 83.

III. The Disposal of FUSRAP Materials At Certain Subtitle C Landfills Is In Accordance With Stringent Standards Under Environmental Laws

Envirocare is wrong, and irresponsible, in its claims that byproduct materials from FUSRAP sites are being disposed at Subtitle C landfills "without health and safety protections." Envirocare Pet. at 2. As described above, Congress directed the Corps of Engineers to clean up FUSRAP sites in accordance with CERCLA and the National Contingency Plan. Under CERCLA, EPA has defined radionuclides as a hazardous substance. 40 CFR 302.4 and Appendix B. As a result, the Corps of Engineers has very extensive authority under CERCLA to ensure cleanup of radioactive-contaminated wastes, such as byproduct material, to standards that protect public

---

[6] Envirocare misrepresents this legislative history in its petition. Citing the specific committee explanation quoted in the text above, Envirocare asserts that section 84 "extend[s] to *all* section 11e.(2) tailings, including, as the applicable legislative history makes clear, tailings governed by the provisions of Title I of the Act." Pet. at 5 (bold emphasis added). As this response makes clear, however, Congress did no such thing. Congress did not extend section 84 to all tailings, "including" those from Title I sites, but rather *limited* section 84 to tailings from Title I sites and NRC-licensed active operations.

health and safety. In this regard, the Commission's standards in 10 CFR Part 40, Appendix A, may be considered "applicable or relevant and appropriate requirements" (ARARs) under CERCLA for FUSRAP sites, further ensuring protective standards.

Moreover, the CERCLA "offsite policy" expressly authorizes the removal of hazardous substances to landfill facilities, provided the facility "is operating in compliance with section 3004 and 3005 of the Solid Waste Disposal Act [i.e., RCRA] . . . and all applicable State requirements." CERCLA 121(d)(3), 42 U.S.C. 9821(d)(3). To ensure protection, the CERCLA offsite policy further provides that hazardous substances "may be transferred to a land disposal facility" only if the disposal unit is not releasing any waste constituent into the groundwater, surface water or soil. *Id*. Thus, CERCLA not only ensures health and safety protection, but authorizes offsite disposal of hazardous substances in secure RCRA-permitted landfills.

As the NRC has acknowledged, RCRA landfills are designed and operated with redundant protective systems equal to or better than the NRC-licensed facility: The Environmental Protection Agency (EPA) has an extensive set of regulations in 40 CFR 260 through 272 for the management of hazardous wastes. RCRA disposal facilities rely in part on a system of liners and leachate detection and collection systems to prevent releases of hazardous materials to the environment. RCRA regulations for disposal also address monitoring and inspection, site selection, and other detailed requirements. Most, if not all, of these controls would also help to protect public health, safety, and the environmental from radioactive byproduct material. Commissioner Dicus letter dated July 29, 1999 (emphasis added). Indeed, some RCRA landfills have been authorized to accept naturally occurring radioactive material (NORM) from oil exploration and production that pose no greater risk than the FUSRAP materials. The NRC has stated that: "Based on our knowledge of RCRA requirements, we believe that both RCRA landfills and NRC-regulated and licensed disposal facilities are protective." Id. (emphasis added). In fact, the NRC's protection requirements in 10 CFR Part 40, Appendix A, are based upon the RCRA standards in 40 CFR Part 264. Thus, the NRC itself has already directly refuted Envirocare's false claims.

Envirocare attempts to argue that the AEA, as amended by UMTRCA, somehow preempts EPA and the States from requiring Subtitle C landfills to comply with conditions in RCRA permits that ensure health and safety protection from disposal of radioactive waste. Envirocare Pet. at 4 n.2, 8–9; Supp. to Pet. This argument is absurd, and would have the improbable effect of nullifying many regulations and permits already issued by EPA and States. RCRA does define the term "solid waste" to exclude "source, special nuclear, or byproduct material," 42 U.S.C. 6903(28), and then defines "hazardous waste" to mean "a solid waste, or combination of solid wastes." 42 U.S.C. 6903(5). Thus, hazardous wastes are a subset of solid wastes, and byproduct material is thereby excluded from the definition of hazardous waste.

However, RCRA section 3005 includes a provision that is broader than Subtitle C coverage of hazardous wastes. Generally, section 3005 governs permits issued by EPA and authorized States to facilities that treat, store or dispose of hazardous wastes. While most of section 3005 therefore concerns hazardous waste, there is a provision in section 3005(c) referred to as the "omnibus" provision which is broader. The RCRA omnibus authority provides simply that: Each permit issued under this section shall contain such terms and conditions as the Administrator (or the State) determines necessary to protect human health and the environment. 42 U.S.C. 6925(c)(3).

EPA and the States use this omnibus authority to include additional terms and conditions in RCRA permits, based on the facility's permit application and the administrative record of the permit proceeding, that are necessary to ensure health and safety protection. Pursuant to this omnibus provision, certain hazardous waste landfill facilities have RCRA permits with conditions that authorize the disposal of low-activity radioactive wastes in accordance with stringent health and safety standards. These RCRA permit terms apply to waste materials that have less than a specified level of radioactivity, and do not specifically regulate "byproduct material" as defined in the AEA, so the question of Federal preemption is not implicated. Moreover, the States are authorized to impose omnibus conditions in RCRA permits pursuant to delegated Federal authority under the RCRA statute, further refuting Envirocare's preemption argument. In short, disposal at RCRA-permitted landfills of low-activity radioactive wastes from FUSRAP sites is stringently regulated, and Envirocare's claims are factually untrue and irresponsible.

Petitioners' arguments that the Commission's interpretation of its licensing authority allows "wastes involving potential hazards to the public to be exempted from the jurisdiction of both the NRC and the EPA," Summary of Pet. at 2, is a strawman

only. FUSRAP wastes are fully subject to EPA and State permits and standards under RCRA and other environmental laws.

IV. The Commission Should Determine That the NRC Licensing Exemption for DOE FUSRAP Activities Also Applies to the Corps of Engineers

There is also a sound argument that the Atomic Energy Act exempts DOE, and now by extension the Corps of Engineers, from NRC licensing for FUSRAP cleanup activity. The AEA definition of the term "person" includes a "Government agency other than the Commission." 42 U.S.C. 2014(s) (emphasis added). The "Commission" referred to in this definition of "person" is the former Atomic Energy Commission (AEC). 42 U.S.C. 2014(f). The AEC was abolished and its functions transferred to the NRC and the Administrator of the Energy Research and Development Administration (ERDA). 42 U.S.C. 5814, 5841. Thereafter, the ERDA was abolished and its functions transferred to the Secretary of Energy. 42 U.S.C. 7151(a), 7293. DOE is self-regulating while conducting FUSRAP pursuant to CERCLA remediation.

When Congress directed the Corps of Engineers to administer the FUSRAP, it did not relieve DOE of its overall responsibility for these sites. The Corps of Engineers has taken over administration of the FUSRAP, but the DOE, as the AEC successor agency responsible for the FUSRAP, has ultimate responsibility. Since the DOE, as the AEC successor agency, is not considered a "person" subject to NRC license authority, the Corps of Engineers which stepped into the shoes of DOE to administer FUSRAP cleanups should be covered by the same exemption. This is the statutory interpretation that best complies with Congress's intent that transfer of FUSRAP to the Corps of Engineers would "reduce costs and accelerate cleanup activities." H.R. Rep. No. 190, 105th Cong., 1st Sess. 66 (July 21, 1997). Imposing licensing requirements to which DOE was not subject would increase costs and delay cleanups.

In directing the Corps of Engineers to administer the FUSRAP, Congress did not express an intent that the cleanup and disposal of FUSRAP wastes be subject to AEA licensing requirements. The Conference Report that accompanied Pub. L. No. 105–62 indicated that Congress expected a seamless transition of FUSRAP from DOE to the Corps. H.R. Conf. Rep. No. 271, 105th Cong., 1st Sess 7 (1997). Congress expected the agencies "to make every effort to ensure that this transition goes smoothly, that execution of the program is maintained in accordance with current schedules, and that overall performance is improved." Id. A requirement that Subtitle C landfills with permits that authorize disposal of low-activity radioactive wastes must now also obtain NRC licenses to receive FUSRAP wastes would disrupt the transition, delay the current schedules, and fail to improve performance. This would be contrary to Congress's expressed intent.

The Corps of Engineers previously raised a similar argument before the Commission in response to a petition filed by the Natural Resources Defense Council to require NRC licensing of cleanup activities conducted at FUSRAP sites. See Director's Decision Under 10 CFR . 2.206, 64 Fed. Reg. 16,504 (April 5, 1999). While the DOE did not agree with the Corps' position, DOE did acknowledge its continuing responsibilities for FUSRAP, and it deferred on the question to the Commission. 65 Fed. Reg. at 16,506. The NRC staff decided not to reach a conclusion in the previous proceeding. *Id.*

DOE and the Corps of Engineers have now entered into a Memorandum of Understanding (MOU) regarding the FUSRAP dated March 17, 1999. See Exhibit C hereto. While the MOU states that "DOE does not have regulatory responsibility or control over the FUSRAP activities" conducted by the Corps, it does make clear that DOE has continuing responsibilities for FUSRAP, such as "long-term surveillance, operation and maintenance, including monitoring and enforcement of any institutional controls which have been imposed on a site or vicinity properties." MOU Art. III, C.1.e. As a result, NRC staff can now find that DOE and the Corps have addressed their respective responsibilities, and that it is appropriate to conclude that the AEA also exempts the disposal of FUSRAP wastes from NRC licensing because Congress intended the Corps to fill the shoes of DOE, an agency exempt from NRC regulatory requirements for the FUSRAP. This additional basis on which the Commission should deny the petitions will further support a final decision that may be subject to judicial review.

CONCLUSION

For all the foregoing reasons, EnviroSafe Services of Idaho, Inc. and the Environmental Technology Council respectfully urge that the relief requested in the petitions be denied. The Commission should reaffirm its position that its AEA license authority applies to section 11(e)(2) byproduct material from active processing operations, and does not extend to tailings and wastes from FUSRAP sites. As the Commission is aware, Congress has directed the Corp of Engineers to "reduce costs and

accelerate cleanup activities" at FUSRAP sites, 1998 EWDAA, and the Corps is doing so, and protecting the public health and safety, by utilizing certain RCRA-permitted landfills for disposal of FUSRAP materials. The NRC has not been authorized or funded by Congress to exercise license authority for disposal of tailings from FUSRAP sites.

RESPONSES BY SCOTT SLESINGER TO ADDITIONAL QUESTIONS FROM SENATOR SMITH

Question 1. Please explain the RCRA Subtitle C permitting process and compare that process to the NRC licensing process for low-level radioactive waste disposal.

Response. The permit process for a Subtitle C landfill is outlined in RCRA section 3005(a). The public comment procedures are in section 7004. The regulations detailing the requirements are codified in 40 CFR 124. The regulations follow the general rules of all federal environmental laws. Anyone who desires a Subtitle C permit is required to apply; their applications must be complete and meet all the requirements laid out in the regulations concerning the technical construction of the facility and the suitability of the geology. The public must have a full and fair opportunity to participate at every stage in the process. Appeals to the Courts are also available. A detailed outline of the procedure is listed in Appendix A

If the facility wants to amend its permit to accept a different type of waste, the public is notified and may request a hearing or may comment on the amendment. The major difference with the NRC program is in the requirements for construction. RCRA is very prescriptive. For instance, although in arid areas a liner system may be unnecessary, EPA still requires the double liner system. NRC uses a more results oriented approach. If the site does not need a double liner because of the lack of significant leachate and the risk modeling shows it is unnecessary, that redundant requirement is waived. Another important comparison is that RCRA landfills are designed with both synthetic and geological barrier systems (eg. clay). NRC licensed landfills used for low-activity waste are designed with only geological barrier systems.

Another difference is public perception. Although RCRA landfills are not usually seen as a positive development for a community, over 20 have been licensed in the United States. However, because of the public's concern with any wastes that are radioactive, siting such facilities is much more difficult because of public opposition. This is obvious with the problems with the low-level Compact inability to site facilities, and the controversy over Yucca Mountain. This has lead to difficulties in disposing of critical radioactive wastes associated with standard radiation cancer treatment as well as X-rays.

Response.

I. PROCEDURES FOR ISSUANCE, REVOCATION AND RENEWAL OF RCRA PERMITS

A. Statute

RCRA § 3005(a), 42 U.S.C. § 6925(a), provides: [T]he Administrator shall promulgate regulations requiring each person owning or operating and existing facility or planning to construct a new facility for the treatment, storage, or disposal of hazardous waste identified or listed under this subchapter to have a permit issued pursuant to this section. . . .

B. Regulations (Excerpts)

40 CFR § 124.1 Purpose and scope. (a) This part contains EPA procedures for issuing, modifying, revoking and reissuing, or terminating all RCRA . . . permits . . . .

40 CFR § 124.6 Draft permits. (a) Once an application is complete, the Director shall tentatively decide whether to prepare a draft permit . . . or to deny the application. . . .

(d) If the Director decides to prepare a draft permit, he or she shall prepare a draft permit that contains the following information:

- All conditions under . . . 270.30 and 270.32 (RCRA);
- All compliance schedules under . . . 270.33 (RCRA);
- All monitoring requirements under . . 270.31 (RCRA); and
- For: (i) RCRA permits, standards for treatment, storage, and/or disposal and other permit conditions under § 270.30 . . . .

• All draft permits prepared by EPA under this section shall be accompanied by a statement of basis (§ 124.7) or fact sheet (§ 124.8), and shall be based on the administrative record (§ 124.9), publicly noticed (§ 124.10) and made available for public comment (§ 124.11). The Regional Administrator shall give notice of opportunity for a public hearing (§ 124.12), issue a final decision (§ 124.15) and respond to com-

ments (§ 124.17). For RCRA . . . permits, an appeal may be taken under § 124.19 . . . .

II. OPPORTUNITIES FOR PUBLIC HEARING AND PUBLIC COMMENTS

A. Statute

RCRA § 7004(b), 42 U.S.C. § 6974(b), provides: Before the issuing of a permit to any person with respect to any facility for the treatment, storage, or disposal of hazardous wastes under section 6925 of this title, the Administrator shall:

- cause to be published in major local newspapers of general circulation and broadcast over local radio stations notice of the agency's intention to issue such permit; and
- transmit in writing notice of the agency's intention to issue such permit to each unit of local government having jurisdiction over the area in which such facility is proposed to be located and to each State agency having any authority under State law with respect to the construction or operation of such facility.

If within 45 days the Administrator receives written notice of opposition to the agency's intention to issue such permit and a request for a hearing, or if the Administrator determines on his own initiative, he shall hold an informal public hearing (including an opportunity for presentation of written and oral views) on whether he should issue a permit for the proposed facility. Whenever possible the Administrator shall schedule such hearing at a location convenient to the nearest population center to such proposed facility and give notice in the aforementioned manner of the date, time, and subject matter of such hearing. No State program which provides for the issuance of permits referred to in this paragraph may be authorized by the Administrator under section 6926 of this title unless the program provides for the notice and hearing required by this paragraph.

B. Regulations (Excerpts)

40 CFR § 124.10 Public notice of permit actions and public comment period. (b) For RCRA permits only, public notice shall allow at least 45 days for public comment.

(2) (i) For major permits . . . publication of a notice in a daily or weekly newspaper within the area affected by the facility or activity; (ii) For all RCRA permits, publication of a notice in a dailyor weekly major local newspaper of general circulation and broadcast over local radio stations.

40 CFR § 124.11 Public comments and requests for public hearings. During the public comment period provided under § 124.10, any interested person may submit written comments on the draft permit . . . and may request a public hearing, if no hearing has already been scheduled. All comments shall be considered in making the final decision and shall be answered as provided in § 124.17.

40 CFR § 124.12 Public hearings. (a)(1) The Director shall hold a public hearing whenever he or she finds, on the basis of requests, a significant degree of public interest in a draft permit(s); . . .

(2) The Director may also hold a public hearing at his or her discretion . . . .

(3) For RCRA permits only, (i) the Director shall hold a public hearing whenever he or she receives written notice of opposition to a draft permit and a request for a hearing within 45 days of public notice under § 124.10(b)(1)1; (ii) whenever possible the Director shall schedule a hearing under this section at a location convenient to the nearest population center to the proposed facility; . . . .

(4)–(6) [conduct of hearing].

40 CFR § 124.13 Obligation to raise issues and provide information during the public comment period. All persons, including applicants, who believe any condition of a draft permit is inappropriate or that the Director's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period (including any public hearing) under § 124.10. . . .

40 CFR § 124.15 Issuance and effective date of permit. (a) After the close of the public comment period under § 124.10 on a draft permit, the Regional Administrator shall issue a final permit decision (or a decision to deny a permit for the active life of a RCRA hazardous waste management facility or under § 270.29). The Regional Administrator shall notify the applicant and each person who has submitted written comments or requested notice of the final permit decision. This notice shall include reference to the procedures for appealing a decision on a RCRA . . . permit . . . .

III. APPEAL PROCEDURES TO ADMINISTRATOR

A. Statute

RCRA § 3005(c), 42 U.S.C. § 6924(c), provides: Upon a determination by the Administrator (or a State, if applicable), of compliance by a facility for which a permit is applied for under this section with the requirements of this section and section 6924 of this title, the Administrator (or State) shall issue a permit for such facilities.

B. Regulations (Excerpts)

40 CFR § 124.19 Appeal of RCRA . . . permits. (a) Within 30 days after a RCRA . . . final permit decision . . . has been issued under § 124.15, any person who filed comments on that draft permit or participated in the public hearing may petition the Environmental Appeals Board to review any condition of the permit decision. . . .

(c) Within a reasonable time following the filing of the petition for review, the Environmental Appeals Board shall issue an order granting or denying the petition for review. . . .

(e) A petition to the Environmental Appeals Board under paragraph (a) of this section is, under 5 U.S.C. 704, a prerequisite to the seeking of judicial review of the final agency action.

(f) For purposes of judicial review under the appropriate Act, final agency action occurs when a final RCRA . . . permit is issued or denied by EPA and agency review procedures are exhausted. A final permit decision shall be issued by the Regional Administrator:

(i) When the Environmental Appeals Board issues notice to the parties that review has been denied;

(ii) When the Environmental Appeals Board issues a decision on themerits of the appeal and the decision does not include a remand of the proceedings; or

(iii) Upon the completion of remand proceedings if the proceedings are remanded, unless the Environmental Appeals Board's remand order specifically provides that appeal of the remand decision will be required to exhaust administrative remedies.

IV. APPEAL PROCEDURES TO THE U.S. COURT OF APPEALS

RCRA § 7006(b), 42 U.S.C. 6976(b), provides: Review of the Administrator's action . . . in issuing, denying, modifying, or revoking any permit under section 6925 of this title . . . may be had by any interested person in the Circuit Court of Appeals of the United States for the Federal judicial district in which such person resides or transacts such business upon application by such person. Any such application shall be madewithin ninety days from the date of such issuance, denial, modification, revocation, grant, or withdrawal, or after such date only if such application is based solely on grounds which arose after such ninetieth day. Action of the Administrator with respect to which review could have been obtained under this subsection shall not be subject to judicial review in civil or criminal proceedings for enforcement. Such review shall be in accordance with sections 701 through 706 of Title 5.

Question 2. Please respond to the contention that FUSRAP waste disposed at the Buttonwillow facility is "more dangerous to move" now that is mixed with other hazardous waste.

Response. The statement that the waste is"more dangerous to move" is a mischaracterization of the facts. The waste is identifiable and could be removed, but doing so would necessarily result in some incremental, additional worker exposure to both radioactive and hazardous substances, while providing no public health and safety or environmental benefit. Removing the waste would follow engineering protocols but would require the movement of over 300,000 tons of soil and treated waste, including the FUSRAP wastes and the other waste disposed on top of it. The material is now safely disposed of and extensive analysis and monitoring by the State of California post-disposal concludes that there is no short- or long-term risk to the public or the environment from this material. There is no scientific, safety or environmental reason to move this waste.

Question 3. Does the FUSRAP waste that was disposed of at Buttonwillow pose a greater risk to the public than NORM material currently being disposed of at that same facility? Why or Why not?

Response. The wastes going to Buttonwillow pose no greater risk than the NORM material currently being disposed of at the same facility. The average level of radiation in NORM wastes from the oil industry is generally higher than the waste from the FUSRAP sites. The effect of radioactivity on cells and DNA is dependent on the dosage, not whether the source of the radioactivity is NORM, TeNORM or NARM wastes.

Question 4. How does the 1,000 year cap at NRC facilities compare to the required closure and post closure management under RCRA?

Response. The major differences between the NRC and RCRA caps are based on the different philosophies of the two programs. RCRA believes in technical standards that are all but inviolate. NRC has a more performanced-based approach that allows more flexibility based on geography and geology.

RCRA caps are intended to encapsulate the waste forever. The 30-year versus the 1,000 years is an apples and oranges comparison. The thirty-years in RCRA refers to **active** post closure management. Under RCRA, after a facility is closed, financial assurance must be in place to pay for continuous monitoring for at least 30 years. Above the landfill, a cap must be constructed in line with RCRA regulations that require a synthetic and geological (eg. clay) barrier to assure that no precipitation gets to the waste. For thirty years the groundwater is monitored under the waste. It is expected that within that period, the leachate will stop. If it continues, it is expected the facility will be required to continue to monitor and make whatever changes are needed to entomb the waste in a dry environment. 40 CFR 264.310(2). The goal is that the waste is encapsulated forever.

NRC facilities also need a cap to avoid water causing leachate. However, NRC's post closure policy is to monitor only once a year. However without liners, NRC assumes that the radioactive waste will leach over time. NRC believes that if low-level radioactive wastes are in an arid area landfill, there is no harm if the wastes leach out because they will be so diffused they would not be a risk. Under modeling NRC has conducted low-level facilities will theoretically be protective for 1,000 years or more. (Modeling beyond 1,000 is generally considered very speculative).

EPA modeling of hazardous wastes using the current RCRA cap and other regulations, even those mixed with low-activity radioactive wastes, shows that such waste will remain safe for longer than 1,000 years even if the cap is severely compromised.

Question 5. How does worker safety programs at RCRA facilities that have accepted FUSRAP material compare with that of NRC licensed facilities?

Response. All three facilities have extensive radiation monitoring, detection and worker protection programs in place.

- Waste Control Specialists is fully licensed by the state of Texas to treat, process and store all classifications of low-level radioactive waste, as well as low-activity FUSRAP-type wastes, and has in place radiation protection programs identical to or exceeding those of Envirocare.
- Safety-Kleen and EnviroSafe have in place significant radiation protection programs. For example:
- The Safety-Kleen and EnviroSafe programs exceed OSHA 29 CFR 1096 "Ionizing Radiation" protection standards and include specific procedures to isolate, control, and monitor NORM wastes, even though the radiation levels for the permitted waste with 2,000 pCi/g or less are too low to qualify the operation as a"Radiation Area" under 29 CFR 1910.1096(d)(3)(ii), (i.e. the disposal area does not have "the potential to generate a 1-hr dose in excess of 5 millirem, or in any 5 consecutive days a dose inexcess of 100 millirem.")
- Worker protection elements include: personal dosimeter and medical surveillance of all field personnel, including a comprehensive annual physical; strict adherence to ALARA (as low as reasonable achievable); mandatory use of respirators to protect against the inhalation of alpha-particles (low-energy, mass bearing particles); NORM training with annual updates; monitoring of all NORM-related receiving and disposal operations using 3 different types of hand-held radiation monitoring instruments.

Question 6. Is the public notified of each individual shipment to your members facilities?

Response. The public is notified when the permit is issued to what types of wastes the facility is allowed to accept. Since Subtitle C landfills can receive hundreds of trucks a day, it is neither practical nor useful to notify the community of each shipment. However, RCRA facilities are required to submit annual reports which provide in detail the type and source of wastes received for the calendar year. RCRA also has public notice provisions, and an opportunity for a hearing, whenever a permit is modified that could lead to different wastes coming to a facility. In this case, the original permits allowed for the acceptance of low-activity radioactive wastes. These sites received wastes from the oil exploration industry that are generally higher in radioactivity than the wastes from the FUSRAP sites.

STATEMENT OF DAVID E. ADELMAN, J.D., PH.D. STAFF ATTORNEY, NUCLEAR PROGRAM NATURAL RESOURCES DEFENSE COUNCIL

Chairman Smith and Members of the Committee, thank you for giving me the opportunity to testify today on the U.S. Army Corps of Engineers ("USACE") implementation of the Formerly Utilized Sites Remedial Action Program ("FUSRAP"). My name is David Adelman, and I am a staff attorney and scientist with the Natural Resources Defense Council ("NRDC"), which is a national non-profit membership environmental organization with offices in Washington, DC, New York City, San Francisco and Los Angeles. NRDC has a nationwide membership of more than 400,000 individuals. NRDC's activities include maintaining and enhancing environmental quality and monitoring Federal agency actions to ensure that Federal statutes enacted to protect human health and the environment are fully and properly implemented. Since its inception in 1970, NRDC has sought to improve the environmental, health, and safety conditions at and surrounding nuclear facilities operated by Department of Energy ("DOE") and its predecessor agencies and the commercial nuclear sector.

USACE's decision to dispose of radioactive wastes generated by FUSRAP actions at unlicensed facilities in California and Idaho, its failure to obtain a license from the NRC for its cleanup actions, and NRC's decision to permit these activities are contrary to basic common sense. For complex technical and historical reasons, Congress established two separate and distinct regulatory systems, one governing hazardous materials and the other radioactive elements. USACE's actions violate the basic principles of these distinct regulatory regimes and threaten human health and the environment.

The Resources Conservation Recovery Act ("RCRA") explicitly excludes radioactive contaminants from the list of chemicals it regulates, 42 U.S.C. 6003(27), while the Atomic Energy Act ("AEA") was promulgated solely to regulate radioactive materials—and preempts State regulatory authority over radioactive materials. The two regulatory systems have evolved separately to address the regulatory issues unique to managing each of these categories of chemicals. For example, in the case of the AEA, the long-lived nature (in some cases many thousands of years) of and radiation emissions from radioactive elements have required that specialized regulations be developed. Similarly, while Superfund applies to radioactive materials, until now all of the cleanup actions involving radioactive wastes have been undertaken by the Department of Energy or overseen by NRC, both of which have the authority, experience, and regulations in place to manage radioactive materials properly.

USACE and NRC are propounding a completely irrational reading of the AEA solely to save money on radioactive waste disposal. This interpretation of the AEA permits disposal of radioactive materials at hazardous waste facilities based entirely on whether they were generated prior to 1978 at a facility that was not licensed when (or after) the Uranium Mill Tailings Radiation Control Act was passed in November 1978. There is no technical basis to make this distinction, and no relevant difference in the radioactive constituents between the pre-and post-1978 byproduct wastes generated by FUSRAP. Moreover, the cost savings now could be more than offset in the future by cleanup and stabilization actions that may be required if radioactive contaminants are found to be leaking from unlicensed facilities.

Given the distinct regulatory schemes for hazardous and radioactive contaminants, NRC's and the USACE's interpretation of the AEA makes no sense from a policy perspective and sets a dangerous precedent, namely, that it is permissible for government agencies to shop for the cheapest form of waste disposal and to evade proper regulatory oversight, regardless of the regulatory requirements and technical considerations. USACE must not be permitted to dispose radioactive wastes at unlicensed facilities that are not designed, maintained, or monitored for their disposal and, for the analogous reasons, should be required to obtain a license from the NRC for its FUSRAP cleanup actions.

I. IMPLEMENTATION OF FUSRAP CLEANUP ACTIONS

FUSRAP provides for the clean-up and disposal of radioactive materials at various industrial facilities around the country that once performed work as part of the Manhattan Project and other early activities of the Atomic Energy Commission. DOE began implementation of FUSRAP in 1974 when it was recognized that a number of industrial sites associated with nuclear weapons and energy programs during the 1940's, 1950's, and 1960's contained substantial levels of radioactive contamination (primarily uranium and thorium).

According to DOE, a total of 46 sites have been identified for cleanup under FUSRAP. By 1997, cleanup had been completed at 25 of these sites. There are thus 21 remaining sites to be cleaned up under the program, located in Connecticut, Illi-

nois, Maryland, Massachusetts, Missouri, New Jersey, New York and Ohio. The cleanup work under FUSRAP consists primarily of the treatment or removal of soil and other substances containing radioactive "byproduct material," as defined in the AEA, 42 U.S.C. 2014(e). USACE estimates that about 2 million cubic yards of radioactive materials will require offsite disposal from FUSRAP sites.

A. Congress' Transfer of Responsibility for the FUSRAP Program to USACE

On October 13, 1997, Congress transferred administration of FUSRAP from DOE to USACE in the 1998 Energy and Water Development Appropriations Act, Pub. L. No. 105–62. Subsequently, in the Energy and Water Development Appropriations Act of 1999, Congress affirmed USACE's responsibility for and provided funding for FUSRAP. At this time, Congress also clarified two issues: (1) USACE's implementation of FUSRAP was "subject to the administrative, procedural, and regulatory provisions" of CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. Part 300; and (2) ". . . except as stated herein, these provisions do not alter, curtail or limit the authorities, functions or responsibilities of other agencies under the Atomic Energy Act. . . ."

USACE, however, does not have authority to handle the radioactive materials involved in implementing FUSRAP. According to a letter to the Secretaries of Energy and Defense from Senator Pete V. Domenici and Representative Joseph M. McDade, the Chairmen of the Senate and House Subcommittees on Energy and Water Development, the transfer of budget authority over FUSRAP to USACE was not intended to affect DOE's regulatory authority over the program. Instead, Congress apparently expected "that basic underlying authorities for the program [would] remain unaltered and the responsibility of DOE."[1] There is nothing in the Act to suggest a contrary result; the text does not grant USACE anything beyond budget authority over FUSRAP.

DOE maintains, however, that "[t]he [FUSRAP] transfer legislation did not make the Corps a DOE contractor, or otherwise subject the Corps' activities to the control or direction of DOE."[2] Further, while DOE defers to NRC to determine whether USACE is required to obtain an NRC license, the Department has stated that NRC "should evaluate the licensability of the Corps' activities in the same manner as it would evaluate the activities of any other "person" within the meaning of the Atomic Energy Act."

DOE has also questioned whether USACE could rely solely on CERCLA authority to avoid NRC oversight. Specifically, CERCLA exempts most cleanup activities from Federal, State, or local licensing requirements, 42 U.S.C. 9621(e); although, as NRC and USACE concede, this exemption applies only to activities at the cleanup site (i.e., not offsite shipments or disposal). Despite the unique challenges posed by environmental cleanups involving radioactive materials and USACE's lack of regulatory authority—or regulations—to handle radioactive materials, both NRC and USACE have invoked the CERCLA exemption to shield USACE from the AEA requirement that USACE obtain an NRC license.

B. The Risks and Problems Created by the Absence of Proper Regulatory Oversight

This is a profound problem for two reasons. First, the NRC has as its fundamental goal the safety and security of the nation's nuclear activities. The same cannot be said of USACE. Its institutional mission is, by design, focused on other matters. Certainly it must be acknowledged that the army's record of handling nuclear and other hazardous wastes is not good.[3] The dangers posed by the handling of radioactive waste counsel strongly in favor of NRC licensing of the FUSRAP program as administered by USACE. The numerous issues implicated by USACE's unregulated handling of FUSRAP wastes, including worker protection, cleanup standards, property rights, and long-term liability, can only benefit from NRC oversight.

Second, and more fundamentally, the laws governing the utilization and cleanup of nuclear materials are simply too important to allow them to be ignored. In recognition of the highly technical nature of radioactive materials and of the extreme dangers they pose, Congress reposed responsibility for the administration of those laws in the NRC and, to a lesser extent, DOE. In short, an environmental cleanup action involving radioactive materials is not your typical Superfund project, particu-

---

[1] Letter dated November 6, 1997, from Senator Pete V. Domenici and Representative Joseph M. McDade to Secretary of Energy Federico Pena and Secretary of Defense William S. Cohen.

[2] Letter dated January 14, 1999, from William J. Dennison, Assistant General Counsel for Environment at DOE, to John T. Greeves, Office of Waste Management at NRC.

[3] These fears have been borne out at one of the sites in North Tonawanda, New York, where USACE has proposed a cleanup standard that is 10 times weaker than that proposed by DOE when it was implementing the cleanup. To reduce costs, USACE is relying on substantially relaxed cleanup standards.

larly where, as here, the contaminants remain hazardous for many thousands of years.

The Linde FUSRAP site in Tonawanda, New York, demonstrates why NRC oversight is necessary. USACE's cleanup plan for the site will leave radioactive contamination in place that is 6 times, and possibly as high as 30 times, higher than any other comparable cleanup in the United States and at least 10 times the cleanup level previously proposed for the site by the Department of Energy. USACE has also been severely criticized by the Environmental Protection Agency ("EPA") and State authorities for its practice at the Linde site of diluting radioactively contaminated debris with uncontaminated materials in an effort to avoid having to dispose of it in a properly licensed facility.[4] Moreover, these actions along with USACE's policy of disposing radioactive wastes in unlicensed facilities located in California and Idaho have allegedly prompted EPA to launch a criminal investigation.

Congress has commanded that, with very few exceptions, no agencies other than DOE be permitted to handle nuclear materials except in accordance with a license issued by the NRC. To now allow USACE to handle the radioactive materials associated with FUSRAP cleanups without licensing and oversight by the NRC flouts congressional intent. As part of the transfer of authority over FUSRAP to USACE, Congress should require that it first obtain a license from the NRC.

II. OFF-SITE DISPOSAL OF FUSRAP RADIOACTIVE WASTES AT UNLICENSED FACILITIES

1. The Unlicensed Disposal Sites in California and Idaho

USACE's disposal of radioactive waste at unlicensed facilities is illegal and contrary to basic regulatory and health physics principles. USACE has dispose of radioactive wastes at two unlicensed facilities, the Safety-Kleen facility in Buttonwillow, California, and EnviroSafe in Grand View, Idaho. The illegal disposal of wastes at both of these sites has generated substantial public, State, and congressional attention. More than 2,200 tons, or about 83 rail cars, of radioactive waste from a site in northern New York State were disposed at the Safety-Kleen facility, which is permitted under Part C of the Resources Conservation Recovery Act ("RCRA"), 42 U.S.C. 6901 et seq., but neither designed nor permitted to receive such radioactive wastes. In June 1999, EnviroSafe won a $400 million contract to dispose 400,000–500,000 cubic yards of radioactively contaminated wastes; it has already received approximately 150,000 tons of radioactive wastes. In addition, USACE inadvertently sent another 86 tons of radioactive wastes to a non-hazardous, solid-waste landfill in Ohio.

The Safety-Kleen site potentially threatens critical groundwater resources. The Safety-Kleen facility is located above three aquifers and does not provide protective measures comparable even to those planned for the proposed Ward Valley radioactive waste dump—which has been the focus of broad public opposition in California. Equally importantly, neither the Safety-Kleen nor the EnviroSafe facilities have proper monitoring equipment for radionuclides or for protecting their workers from exposure to radiation, and there has not been any kind of public process—which is integral to NRC radioactive disposal facility siting requirements—to obtain acceptance from the local communities.

2. Disposal of Radioactive Wastes at Unlicensed Facilities is Neither Legally nor Technically Justifiable

Although USACE and the NRC concede that offsite disposal of radioactive waste is not exempt from NRC's licensing requirements, they claim that radioactive waste from certain FUSRAP sites (12 out of the remaining 21) is not covered by the AEA and need not be disposed at an NRC-licensed facility. However, precisely the same types of byproduct material removed from the remaining 9 FUSRAP sites are covered by the AEA, according to NRC and USACE, and must be disposed at NRC-licensed facilities.

The Atomic Energy Act mandates disposal of radioactive "byproduct material" at a licensed facility. 42 U.S.C. 2112, 2114 (prohibiting transfer or receipt of byproduct material at an unlicensed facility).[5] Accordingly, the NRC has long had a policy requiring disposal of byproduct material only at licensed facilities. This policy is based

---

[4] See *e.g.* the attached letter from Paul J. Merges, Director of the Bureau of Radiation & Hazardous Site Management at the New York State Department of Environmental Conservation, to Major Kally L. Eastman, Acting Commander of U.S. Army Engineering Buffalo District ("Attachment A").

[5] In enacting the Uranium Mill tailings Radiation Control Act ("UMTRCA") of 1978, Congress expanded the definition of byproduct material to include "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore primarily for its source material content." 42 U.S.C. § 2014(e)(2).

on the goal of protecting public health and the environment. USACE's disposal of byproduct material from certain FUSRAP sites at unlicensed facilities therefore violates the AEA and is contrary to long-established NRC policy.

The NRC and USACE acknowledge that radioactive wastes generated at the FUSRAP sites are "byproduct materials" as that term is defined in Section 11(e)(2) of the Atomic Energy Act, 42 U.S.C. 2014(e)(2).[6] However, they claim that because certain byproduct material was generated prior to 1978, the year in which UMTRCA was passed, and resulted from activities that were not licensed by the NRC in or after 1978, it is not covered by the AEA and need not be disposed at an NRC-licensed facility. Under this reasoning, such wastes could be disposed at a regular landfill if they do not contain hazardous constituents. Accordingly, the factor governing whether FUSRAP radioactive wastes must be disposed at an NRC-licensed facility is solely whether it was originally generated prior to the passage of UMTRCA.

NRC's and USACE's assertion that UMTRCA does not apply to pre-1978 wastes is contrary to established law. In the Findings and Purpose section of UMTRCA, Congress concludes that there are "potential and significant radiation hazard[s] to the public" from "mill tailings located at active and inactive mill operations." 42 U.S.C. 7901(a). In this section, Congress further states that "[t]he purposes of this Act are to provide—(1) in cooperation with the interested States, Indian tribes, and the persons who own or control inactive mill tailings sites, a program of assessment and remedial action at such sites . . . and (2) a program to regulate mill tailings during uranium or thorium ore processing at active mill operations. . . ." 42 U.S.C. 7901(b). Congress' intent in enacting UMTRCA is clear from this language: UMTRCA applies to byproduct material generated at sites closed prior to passage of the Act in 1978.[7]

The leading case interpreting UMTRCA, *Kerr-McGee* v. *NRC*, 903 F.2d 1 (D.C. Cir. 1990), affirms the plain meaning of the statute. In Kerr-McGee, the Court held that ". . . the definition of 'byproduct material' . . . adopted by Congress was designed to extend the NRC's regulatory authority over all wastes resulting from the extraction or concentration of source materials in the course of the nuclear fuel cycle." Kerr-McGee, 902 F.2d at 7 (emphasis in original). Moreover, it is implicit in the Kerr-McGee holding that UMTRCA applies retroactively to wastes generated prior to 1978, as the byproduct material in question was generated from 1931 until 1973, when the Kerr-McGee mill closed. This finding is further borne out in the Court's finding that the UMTRCA legislative history evinces two purposes:

[F]irst, to close the gap in NRC regulatory jurisdiction over the nuclear fuel cycle by subjecting uranium and thorium mill tailings to the NRC's licensing authority; and second, to provide a comprehensive regulatory regime for the safe disposal and stabilization of the tailings. Title I of UMTRCA provided a specific remedial program for 20 designated inactive uranium milling sites. Title II established a comprehensive remedial program for mill tailings at all other sites.

Kerr-McGee, 902 F.2d at 3. In concluding, the Court found that the new definition of byproduct material in UMTRCA "serves as the trigger for determining what materials are to be subject to the remedial program established by Title II"—the date of generation is not a relevant factor.[8] *Id*.

Equally important, States are preempted from exercising regulatory authority over byproduct material pursuant to the AEA, unless granted authority to do so by the NRC. *Pacific Gas & Electric Co.* v. *State Energy Resources Conservation and Development Commission* 461 U.S. 190 207–212 (1983); *EPA* v. *Colorado PIRG*, 261 U.S. 1, 7, 11–12, 19–22 (1976); 10 C.F.R. Part 8.4. Thus, states that are not NRC agreement States, are directly preempted from exercising regulatory authority over any byproduct material. On the other hand, if a State is an agreement State, it does not have authority to regulate byproduct materials for the same reason NRC has erroneously concluded that it cannot regulate pre-1978 byproduct materials; its authority is derivative of the NRC's.

---

[6] The AEA also prohibits the transfer or receipt in interstate commerce of any byproduct material unless licensed by the NRC or otherwise authorized under AEA Sections 82 and 84, 42 U.S.C. §§ 2112, 2114.

[7] Furthermore, the NRC has failed to acknowledge that Sections 81 and 84 of the AEA, 42 U.S.C. §§ 2112, 2114, impose additional requirements on the NRC beyond those imposed by Section 2113. Most notably, Section 2113 requies the NRC to "insure that the management of any byproduct material, as defined in section 11(e)(2), is carried out in such manner as . . . the Commission deems appropriate to protect the public health and safety. . . ." This further affirms that fact that the Commissions required to regulate the disposal of FUSRAP mill tailings.

[8] Indeed, the EPA has established precedent that wastes generated prior to the enactment of legal authroity bcome subject to a subsequent statute if they are exhumed during cleanup after passage of such statute. 57 Fed. Reg. 37298.

At the same time, EPA regulatory authority over radioactive wastes is precluded under RCRA, the only other potential source of regulatory oversight.[9] Accordingly, under the NRC's and USACE's reading of UMTRCA, Congress intended the absurd result that *no* government entity would have the authority to regulate pre-1978 byproduct materials despite it not differing in any meaningful way from post-1978 byproduct materials. It is inconceivable that Congress intended such a perverse result, namely, effectively *precluding* the regulation of radioactive materials it has found pose significant threats to human health and the environment.

USACE's decision to dispose of radioactive wastes in unlicensed facilities and NRC's decision to sanction it runs counter to basic common sense and technical reasoning. There is no basis to distinguish pre-1978 byproduct wastes from those generated after 1978, whether legally or scientifically. Indeed, in their own briefings, NRC staff have acknowledged as much by referencing portions of the Kerr-McGee opinion holding that UMTRCA applies to "all" byproduct material. See NRC's Staff's Brief and Evidence on Issues raised by The State of Utah (January 6, 1993).

As the Conference of Radiation Control Program Directors has found, it makes no sense from a technical perspective to base regulation of radioactive waste on when the material was generated. The Conference expressed particular concern that:

There is no consistent waste characterization method utilized by USACE. This is important because characterization of the waste dictates other factors such as worker protection procedures, cleanup standards, and disposal options.

Moreover, radioactive waste disposal practices at FUSRAP sites to date have involved disposal at facilities licensed by NRC or by agreement States or DOE-operated sites. The Conference formally recommended that the NRC reverse its determination that it lacks jurisdiction over pre-1978 byproduct wastes because it would result in it being "unregulated altogether."[10]

Disposal of radioactive wastes in unlicensed facilities raises important environment risks because these facilities are not designed to handle long-lived radioactive materials. The risks include threats to local groundwater (monitoring doesn't include radionuclides); inadequate or inappropriate worker health and safety regulations (inhalation standards for radionuclides are of particular concern); and failure to provide for long-term institutional controls to prevent future intrusions that could release contaminants from the site long after it has closed—this is a particular concern where long-lived radioactive materials, such as uranium and thorium, are involved. (See Attachment B at 2, 4) These deficiencies have important implications for DOE, which may become responsible for monitoring sites requiring institutional controls to protect the public and environment against releases of radioactive materials in the long-term. 42 U.S.C. 10171(b); see also 62 Fed. Reg. 39070 (July 21, 1997).

Disposing of radioactive wastes at a hazardous waste facility, or a solid-waste landfill, also circumvents proper public oversight. Because RCRA permitting does not contemplate disposal of radioactive wastes from industrial facilities, no prior notice is provided to the public that radioactive byproduct materials could be disposed at such facilities. The public therefore has no opportunity to assess radioactive waste disposal at RCRA facilities. This was a central issue for the Safety-Kleen site in California, particularly following the heated debate over the proposed siting of a low-level radioactive waste facility in Ward Valley. By avoiding any opportunity for public or California State review and comment, the disposal of radioactive wastes at the Safety-Kleen facility circumvented NRC-mandated public participation that applies to all properly licensed radioactive waste disposal facilities (see Attachment B at 4).

III. CONCLUSION

Although it is NRDC's position that the AEA clearly and unequivocally applies to all radioactive byproduct material, regardless of when it was generated, recent NRC and USACE actions demonstrate that further clarification by Congress of the applicability of NRC regulatory authority is necessary to safeguard the public and environment. Congressional intervention is of particular importance in this case because opportunities for court actions are limited under both Superfund, which limits Federal court jurisdiction until after a cleanup action completed, 42 U.S.C. 9613(h), and the AEA, which does not afford citizens or States the right to bring citizen

---

[9] *See, e.g.*, letter from Robert Perciasepe, Assistant Administrator in the Office of Air and Radiation at the EPA, to the Honorable Clint Stennett, Minority Leader, Idaho State Senate (Attachment B).

[10] Resolution Relating to Regulation of 11(e)(2) Radioactive Material, and the Transfer of the Formerly Utilized Sites Remedial Action Program (FUSRAP) to the U.S. Army Corps of Engineers (May 20, 1998) ("Attachment C").

suits. NRDC requests that Congress: (1) add language to the AEA further clarifying that UMTRCA applies to both pre-and post-1978 radioactive byproduct material; and (2) amend Superfund by requiring that, other than the DOE, government agencies or private entities undertaking Superfund cleanup actions involving radioactive materials obtain a license from the NRC.

ATTACHMENT A

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
Albany, NY, April 30, 1999.

Maj. KALLY L. EASTMAN, *Acting Commander,*
U.S. Army Engineering District, Buffalo District,
Buffalo, NY.

Re: Proposed Plan for the Linde Site, Tonawanda, New York (March 1999)

DEAR MAJ. EASTMAN: The New York State Department of Environmental Conservation has reviewed the United States Army Corps of Engineers' (USACE) Proposed Plan for the Linde site, Tonawanda, New York.

Pursuant to CERCLA, the Atomic Energy Act, and the New York State Environmental Conservation Law, we do not concur with the proposed plan as currently written. The major problems include the following: the proposed uranium cleanup criterion of 600 pCi/g is unacceptable; the Corps has not demonstrated that the 15 pCi/g radium-226 criterion is justified; the proposed plan does not include the use of an Independent Verification Contractor; and the methods the Corps plans to use to determine compliance with the cleanup criteria are not defined. Our specific comments are enclosed.

If you have any questions or need further information, please contact John Mitchell of this Bureau at (518) 457–2225.

Sincerely,

PAUL J. MERGES, PHD., *Director,*
Bureau of Radiation & Hazardous Site Mgt.,
Division of Solid & Hazardous Materials.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF SOLID & HAZARDOUS MATERIALS, BUREAU OF RADIATION & HAZARDOUS SITE MANAGEMENT

COMMENTS ON THE PROPOSED PLAN FOR THE LINDE SITE, TONAWANDA, NEW YORK (MARCH 1999)

CLEANUP CRITERIA

1. This Department's Cleanup Guideline for Soils Contaminated with Radioactive Materials, Division of Solid & Hazardous Materials Technical Administrative Guidance Memorandum 4003 ("TAGM 4003") should be in the category of "To Be Considered" when setting cleanup criteria for sites in New York State. It is one of the documents by which this Department judges the adequacy of proposed cleanup criteria.

2. One principle of TAGM 4003 is that radiation doses are to be assessed under, "reasonable scenarios for current and plausible future uses of the land." We agree with the Corps that the reasonable scenario for *current* use of the Linde site is industrial or commercial, but we cannot agree that industrial is the only plausible use of the land in the *future.* As we stated in our March 10, 1999 letter to Mr. Raymond Pylon on the Draft Technical Memorandum Linde Site Radiological Assessment, Tonawanda, New York, we do not agree with the proposed future use of the Linde Site as discussed in that document, or in the proposed plan. The fact that the site has been industrial for the past 60 years does not assure that it will not be put to residential use sometime in the future. Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a reasonable maximum exposure scenario should be assumed and cleanup goals set accordingly to ensure protectiveness, using best professional judgement. We believe that future uses of this property over the next 1,000 years could easily be of the residential nature (DOE had conservatively assumed a resident subsistent farmer scenario). Therefore, the USACE should model and discuss this scenario. Otherwise, it is difficult to conclude that the proposed alternative will meet the long-term effectiveness criterion of 30 CFR 300.430(e)(()(iii)(C).

3. This Department questions why the USACE decided to perform another radiological risk assessment at all, since the United States Department of Energy (DOE) had already performed one, which established a uranium cleanup level of 60 picocuries per gram (PCi/g). That criterion met two important objectives, doses calculated under the residential scenario (conservatively modeled as the resident farmer scenario) and the application of the ALARA (As Low As Reasonably Achievable) principle. All of the soil remedial efforts at the Linde Site performed to date have been undertaken to meet this cleanup criterion. The Corps has not provided a justification for decontaminating the rest of the site to a less protective standard.

4. The proposed plan includes a cleanup criterion for total uranium (natural uranium) of 600 pCi/g, which is about 286 pCi/g of U–238, 301 pCi/g of U–234, and 13 pCi/g of U–235. Uranium and thorium in concentrations grater than 0.05 percent by weight are subject to licensing under the Federal Atomic Energy Act, 10 CFR 40, and Agreement State laws and regulations. For U–238, a concentration of 0.05 percent by weight is approximately equal to an activity concentration of 167 pCi/g. We cannot agree to a cleanup criterion that could theoretically result in leaving on site radioactive material that would require a radioactive materials license. Such a cleanup criterion is not consistent with the goals of FUSRAP, nor is it acceptable to this Department. While the U.S. Nuclear Regulatory Commission is currently declining to regulate the 11(e)2 by-product material on this site, to our knowledge, it has not yet exempted any source material that the Corps may leave behind for the landowner to possess.

5. This Department would like to point out to the USACE that a cleanup criterion is not a below regulatory concern level. Licensed radioactive material is always licensed material unless it is disposed of under the radioactive materials laws and regulations. We are unaware of any USACE regulation authorizing licensed radioactive material to be disposed of without consideration of its licensed status. While the Linde wastes are not under radioactive material license, the "substantive requirements" provision of CERCLA would impose similar constraints. For example, this Department might not approve soils contaminated with hazardous components and containing radiouclides below a cleanup criterion being disposed of at RCRA C disposal facility in New York State. This fact is important to all parties involved in cleanups which result in higher than background levels of residual radioactive materials remaining onsite.

6. The preferred alternative presented in the proposed plan includes meeting the radium-226 standards in Subpart B of 40 CFR Part 192 (i.e., 5 pCi/g in the top 15 cm of soil and 15 pCi/g in any 15-cm layer below the top 15 cm). However, the proposed plan does not demonstrate that the 15 pCi/g criterion is appropriate. On February 12, 1998, the U.S. Environmental Protection Agency issued directive No. 9200.4–25, Use of Soil Cleanup Criteria in 40 CFR Part 192 as Remediation Goals for CERCLA sites. In that document, the EPA states,

> If the contaminants at a site are the same (i.e., radium-226, radium-228, and/or thorium) and the distribution of contamination is similar to that existing at Title I sites as described in 40 CFR Part 192 (i.e., little subsurface contamination from 5 to 30 pCi/g), then the 15 pCi/g standard is a potentially relevant and appropriate requirement for the site. . . . If the radioactive contamination at the site is unlike that at the uranium mill tailings sites regulated under 40 CFR 192, in that significant subsurface contamination exists at a level between 5 pCi/g to 30 pCi/g, the use of the 15 pCi/g standard is not generally appropriate.

Before the Corp concludes that the 15 pCi/g criterion is appropriate at the Linde site, it should revise the Proposed Plan to address the EPA directives and to demonstrate that the conditions described in the directive are met at that site.

GROUNDWATER IMPACTS

7. In our March 10, 1999 letter to Mr. Pylon, we informed the USACE that we would like additional time to review the information presented on the impacts of the deep well injections. In the interim, our geologist has reviewed the data. At this time we do not agree with the conclusion that ". . . groundwater at the Linde Site does not require remediation," as expressed in the last paragraph of section 2.1, Description of the Impacted Property, on page 6. We recommend that a limited extension of the monitoring within the contact zone aquifer be performed which would be designed (1) to provide a reasonable definition on the extent of the zone of disposal and the zone of contamination and (2) to characterize the nature of contamination within these two zones. Despite the statements made in the reports that the levels of contamination seen to date, and the levels of activity in the injected

wastewater itself, were consistently below regulatory standards, given the tremendous volume of material injected we need to be vigilant to insure that there are not some areas that contain unexpectedly high levels of activity.

INSTITUTIONAL CONTROL

8. This Department would like to see documentation that the United States Department of Energy (DOE) has concurred with the proposed cleanup level and the use of institutional control for this site. Since the USACE turns over to the DOE the responsibility for long term monitoring 2 years after the completion of brown fielded sites cleanup, we would like to make sure DOE agrees with this approach and recognizes its future obligation. When exposure controls are used, restrictions by USACE, and later DOE, should be employed to ensure that the controls remain in place, that they remain protective, and that they are effective in preventing exposure for as long as the radionuclides present at the site remain hazardous. Since the Linde site radionuclides have very long half-lives, DOE's acceptance of this role and potential liability should be obtained and documentation of it provided to us.

9. In addition, the plan should state how institutional controls will be applied. Specifically, will the USACE require Praxair, Inc. to place a deed notation or deed restriction on their deed in order to assure institutional control? If so, USACE should identify what law and regulation authorizes them to do so. The USACE should state whether it is prepared to address issues regarding the taking of property, which could result from requiring institutional control and thereby reducing the value of the property and limiting the landowner's ability to use it.

VICINITY PROPERTIES

10. Also, since the Town of Tonawanda landfill is a vicinity property to this site, it should be added to the listing on page 4, the first paragraph of section 2, Site Background, and some discussion to the fact that this site will be addressed under a separate record of decision at a later date should be added.

INDEPENDENT VERIFICATION CONTRACTOR

The use of independent verification contractors is a routine practice by other Federal radiological agencies, such as the Department of Energy and the Nuclear Regulatory Commission. As such, New York State expects the USACE to do likewise at the Linde site. It is very disappointing that a Federal agency remediating radiological contamination in New York State's environment is unwilling to subject its cleanup efforts to peer review, as would occur if the USACE employed an independent verification contractor. It is especially unfortunate when other Federal radiological agencies are willing to do when they are involved in similar cleanups in this State.

APPLICATION OF CLEANUP CRITERIA

12. This document does not discuss what mechanism will be used to determine compliance with the cleanup level. While the averaging over 100 m^2 areas is discussed, more recently at site cleanups the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) techniques are being applied. The document needs to address how a successful site cleanup will be determined.

13. With regard to Ra-226 concentrations averaged over 100 m^2 as specified in Subpart B of 40 CFR Part 192 (and potentially for uranium) we believe that averaging is allowable, as long as the upper end is bounded by some hot spot criteria. It should be noted for the record that this Department does not accept the derived concentration guideline level-elevated measurement comparison as derived by MARSSIM. Instead, the hot spot criterion should be some small multiple of the cleanup criteria. In addition, if the 100 m^2 areas are different than the MARSSIM survey units (since MARSSIM Class 1 survey units can be up to 2,000), the 100 m^2 units should be defined at the same time the MARSSIM final status survey units are established, to prevent manipulation of the areas so that an area passes. In addition, the MARSSIM grid should be tied into the UTM grid system to allow replication in the future, if necessary.

14. This document needs to discuss the sum of the fractions rule. While individual standards will have been established for each radionuclide of concern (which meet an acceptable risk base exposure level for that individual radionuclide), a discussion on how the presence of multiple radionuclides will be evaluated should be included. The acceptable method the Department endorses is the sum of the fraction rule.

DEFINITION OF MED

15. Please note that he correct term for the abbreviation MED is "Manhattan Engineer District," not "Manhattan Engineering District," as is currently being used in many USACE documents.

ATTACHMENT B

U.S. ENVIRONMENTAL PROTECTION AGENCY,
Washington, DC, June 26, 2000.

Hon. CLINT STENNETT, *Minority Leader,*
Idaho State Senate,
Boise, ID.

DEAR SENATOR STENNETT: This letter responds to questions to the Environmental Protection Agency (EPA) contained in your letter of February 28, 2000, to Chairman Richard Meserve of the Nuclear Regulatory Commission, concerning disposal of radioactive by-product material by the U.S. Army Corps of Engineers (USACE) under the Formerly Utilized Sites Remedial Action Program (FUSRAP). In particular, you expressed concern about the unregulated disposal of Atomic Energy Act (AEA) radioactive byproduct material (Section 11e.(2)) that was generated before 1978.

FUSRAP was established by Congress in 1974 to identify, evaluate, and remediate the environmental condition of private and Federal sites used in the early years of the atomic energy program by the Manhattan Engineer District and the Atomic Energy Commission (Department of Energy predecessor agencies). On October 13, 1997, the Energy and Water Resources Appropriation Act of 1998, Public Law 105–62, designated the USACE as the Federal agency with responsibility for the implementation of FUSRAP. USACE performs response actions for FURSRAP sites under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act as amended (CERCLA).[1] As such, the USACE is subject to the National Oil and Hazardous Substance Pollution Contingency Plan (NCP), which provides the blueprint for response actions under CERCLA.

There are a variety of wastes that the USACE may encounter while remediating the FUSRAP sites. Categories of wastes include solid and hazardous waste regulated under the Resource Conservation and Recovery Act (RCRA), as well as radioactive waste that may or may not be currently regulated by the Nuclear Regulatory Commission (NRC) under the Atomic Energy Act (AEA). Hazardous waste may be either separate from the radioactive materials, or commingled with them at mixed waste. With regards to the radiological waste, some of this waste may be the type of material referred to as "byproduct material" under Section 11e.(2) of the AEA ("the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content").

The Nuclear Regulatory Commission (NRC) generally has regulatory authority over source, special nuclear, and byproduct material except insofar as those materials are regulated by DOE specifically for its own activities. As you noted in your letter, the NRC determined that it does not have authority to regulate the kinds of material referred to in Section 11e.(2) produced prior to 1978, when Section 11e.(2) was added to the AEA by the Uranium Mill Tailings Radiation Control Act (UMTRCA).[2] Your letter asked what agency provides for protective disposal of this material if it is not regulated by NRC. Enclosed are responses to your questions regarding the material that NRC has determined is outside its jurisdiction.

We hope this information is helpful to you. If you would like more information, please contact the following staff: Robin M. Anderson (702–603–8747) for information on CERCLA responses; Dale Ruhter (703–308–8192) for information on pre-1978 byproduct waste disposal at RCRA sites; David Eberly (703–308–8645) for in-

---

[1] The Corps was directed to address FUSRAP sites under CERCLA authority in its 1999 appropriations language. In addition, James M. Owendoff, DOE, Acting Assistant Secretary for Environmental Management and Russell L. Fuhrman, Major General, U.S. Army Director of Civil Works signed the *Memorandum of Understanding between the U.S. Department of Energy and the U.S. Army Corps of Engineers Regarding Program Administration and Execution of the Formerly Utilized Sites Remedial Action Program (FURSAP) (March 1999) that also stated that cleanup would proceed under CERCLA authority.*

[2] Response to the October 15, 1998 petition from the National Resources Defense Council (40 FR 16504 (April 5, 1999). The NRC's position on pro-1978 11e.(2) material was repeated in the letter from Shirley Ann Jackson to Stephen C. Collins, Chairman of the Conference of Radiation Control Program Directors Inc. (May 3, 1999) and in a letter to the Honorable John Dingell from Greta Joy Dicus (July 29, 1999).

formation on the Off-Site Rule; or Dan Schultheisz (202–564–9349) for information on the Atomic Energy Act. We appreciate your interest in this matter.

Sincerely,

ROBERT PERCIASEPE,
Assistant Administrator.

TIMOTHY FIELDS, JR.,
Assistant Administrator.

RESPONSES BY ENVIRONMENTAL PROTECTION AGENCY TO ADDITIONAL QUESTIONS

Question 1. What are any radiation exposure issues presented by radioactivity levels under EnviroSafe's permit for FUSRAP waste disposal at its facility; and how do these [EnviroSafe's permit] limits compare with the EPA's requirements?

Response. We would not review EnviroSafe's radioactive disposal permit as part of our regulatory activities. Since we have not reviewed EnviroSafe's permit, we are therefore not prepared to comment on the specific radioactivity levels in the permit. However, there are certain principles that EPA thinks are important to the safe management of waste, and the degree to which these principles are met can serve as a basis for evaluating a particular disposal facility. The protectiveness of the facility should be measured against those principles. (See the discussion under item B below.)

EPA has not established requirements for the disposal of this type of material at a RCRA Subtitle C facility. As a RCRA-authorized state, Idaho may have a regulatory program that includes wastes that are outside the jurisdiction of RCRA since a State's program may be broader in scope than required under RCRA. We understand that Idaho state hazardous waste officials have worked directly with EnviroSafe to add FUSRAP-specific provisions to the facility's State permit.

Question 2. What are the appropriate health and safety protections necessary for workers, the public, and the environment relative to the disposal of radioactive materials that can be disposed at EnviroSafe's facility under its permit?

Response. It is important that waste disposal is protective of human health from carcinogenic and noncarcinogenic risks, and the environment, including worker health and safety. EPA's general measure of protectiveness under RCRA and CERCLA includes, but is not limited to, the risk range (generally 1 in 10,000 to 1 in 1,000,000 risk of contracting cancer), hazard index (HI) (generally a HI of less than 1 for noncarcinogens with the same toxic endpoint or mechanism of action), and protection of the environment. Protection of natural resources such as ground water is a key consideration in evaluating the protection of human health and the environment. EPA believes that ground waters should be monitored and protected to ensure beneficial use and this includes ensuring that Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act are not exceeded, where ground waters are a current or potential source of drinking water.[1] These standards are consistent with standards generally used under EPA statutes and particularly with respect to management of RCRA hazardous waste.

Typical protections for workers at a radioactive waste disposal facility would include shielding, limiting the time spent handling radioactive material, and dosimetry. Environmental monitoring that is capable of early detection of releases would be appropriate. Without more information, we cannot comment on the effectiveness of EnviroSafe's worker protection or monitoring programs for radionuclides.

Question 3. What is the EPA's authority and responsibility as to the regulation of the disposal of this material?

Response. Three statutes address EPA's authority and responsibilities over the disposal of this material: CERCLA, RCRA, and UMTRCA.

First, since the U.S. Army Corps of Engineers is performing the cleanups under CERCLA authority, the waste is subject to the CERCLA Off-Site Rule (40 CFR 300.440). EPA is concerned that the disposal of wastes as a result of a CERCLA cleanup does not itself result in a future Superfund site. To address this concern, CERCLA waste disposed of off-site must comply with the Off-Site Rule. In particular, receiving facilities must be in compliance with RCRA standards (if applicable) or other applicable Federal or State requirements. At hazardous waste management facilities, the waste management unit receiving the waste must not currently and should not be expected to release contaminants into the environment. Any releases

[1] See 40 CFR 264 Subpart F for ground water monitoring requirements to detect contamination at RCRA facilities.

from other units at the facility must be controlled. At other than hazardous waste management facilities, environmentally significant releases must be controlled. EnviroSafe in Idaho is currently acceptable to receive CERCLA waste under the Off-Site rule and received its most recent approval from EPA's Region 10 on March 14, 2000.

Second, under RCRA, EPA regulates solid and hazardous waste. Hazardous wastes are a subset of solid wastes that may cause or significantly increase illness, or may pose a hazard to human health or the environment when improperly managed. RCRA imposes more stringent requirements on hazardous waste than it does on non-hazardous solid waste. To be regulated as a hazardous waste, a material must first meet the definition of a solid waste, i.e., RCRA only allows EPA to regulate materials that are solid wastes. As explained below, EPA does not regulate the kinds of material referred to in Section 11e.(2) as either a solid or a hazardous waste.

The RCRA statutory definition of the term "solid waste" excludes "source, special nuclear and byproduct material as defined by the Atomic Energy Act." 42 U.S.C. § 6903(27). Correspondingly, EPA's RCRA regulations also exclude this Atomic Energy Act material from the definition of a solid waste. 40 CFR part 261.4(a)(4). Therefore, materials meeting the AEA definition of byproduct material (which includes Section 11e.(2) material) are not regulated under RCRA, because those materials are not solid waste. To date, EPA has not distinguished between the kinds of material referred to in Section 11e.(2) generated before 1978 and such material generated after 1978, and EPA does not regulate any of this material under RCRA.

Even if this pre-1978 material were determined to be solid waste for purposes of RCRA, these mining beneficiation wastes cannot currently be regulated by EPA as a hazardous waste. The tailings fall within an exclusion from regulation as a hazardous waste under 40 CFR 261.4(b)(7). This exclusion reflects Congressional intent that contain wastes, such as mining extraction, beneficiation, and processing wastes, should not be regulated as hazardous waste without a specific decision by EPA after submitting a report to Congress. EPA submitted the required report to Congress in 1985 and then determined that mining extraction and beneficiation wastes should not be regulated as a hazardous waste. Regulation of this pre-1978 material as a hazardous waste, if it were determined to be solid waste, would require a new regulatory determination that it should be regulated as a hazardous waste.

Third, the UMTRCA statute, which defined 11e.(2) byproduct material, delineated regulatory responsibility for 11e.(2) material. EPA was given the responsibility to establish standards for the protection of public health, safety, and the environment from radiological and non-radiological hazards associated with the processing, possession, transfer, and disposal of 11e.(2) byproduct material. These regulations appear in 40 CFR 192. UMTRCA gave the responsibility for implementing and enforcing EPA's regulations to the Nuclear Regulatory Commission. NRC has issued regulations in 10 CFR 40 that implement our standards and set forth criteria for licensing and operation of uranium processing facilities.

We understand that NRC has interpreted its UMTRCA jurisdiction as being limited to regulating this kind of material generated only at a site licensed by NRC. Because FUSRAP sites were not licensed during their operations, NRC does not believe it has jurisdiction to apply its regulations, or implement ours, for disposal of this kind of material resulting from FUSRAP cleanups. Regarding on-site cleanup activities, NRC affirms that they "believe that USACE FUSRAP activities are governed by CERCLA requirements in a manner which protects health and safety, and we do not see a need to ask Congress to provide regulatory authority to the NRC [over CRCLA on-site response actions]."[2]

Question 4. What is the EPA's position as to the disposal of this type of radioactive waste in a RCRA disposal facility?

Response. EPA does not regulate the disposal of this material through RCRA. EPA has some general principles that apply to the disposal of hazardous wastes, which it has incorporated into the Subtitle C standards. These principles and the standards may provide protection from some of the risks from the material that NRC has decided not to regulate, but this material can also carry risks that are not addressed by the RCRA standards. EPA has therefore suggested to the USACE that, if it ships this material to a facility that does not have an NRC license, the facility be designed and operated to accept the waste and ensure the protection of human health and the environment as discussed above. Safeguards to ensure the protection of human health and the environment include: permit conditions by the state that

[2] Letter from Shirley Ann Jackson, NRC Chairman, to Stephen C. Collins, Conference of Radiation Control Program Directors, Inc., May 3, 1999.

address radiological risks; ground water monitoring to ensure that radiological releases do not compromise the ground water as a natural resource; waste management practices to limit public exposure (either currently or in the future) to an acceptable risk range; corrective action requirements to ensure remediation if the disposal unit fails; and practices to ensure worker protection. These practices should include health and safety plans that specifically address radiation, waste analysis and acceptance criteria, and worker monitoring to ensure their protection. In addition, we believe it vitally important that the community is aware of the potential for local radioactive waste disposal and has been adequately informed and provided an opportunity for comment.

ATTACHMENT C

CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS, INC.,
Frankfort, KY, April 9, 1999.

Hon. SHIRLEY ANN JACKSON, *Chairman,*
U.S. Nuclear Regulatory Commission,
Washington, DC.

DEAR CHAIRMAN JACKSON: By letter dated March 2, 1998, from Robert L. Fonner (U.S. NRC) to Ann Right (USACE), the U.S. Nuclear Regulatory Commission (NRC) took the position that it has no regulatory authority over 11.e.(2) byproduct material generated prior to the enactment of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). This is primarily a concern where the U.S. Army Corps of Engineers (USACE) performs cleanups at the Formerly Utilized Sites Remedial Action Program (FUSRAP) sites without independent regulatory oversight. The membership of the Conference of Radiation Control Program Directors (CRCPD) welcomes the USACE's efforts and encourages cost-effective cleanup of these sites. However, we are concerned that without regulatory oversite of this radioactive material, there are no assurances that adequate measures are being taken to protect human health and the environment. In the absence of NRC regulation over the sites, State authority applies in some States, however, in others the material is unregulated altogether.

At FUSRAP sites which are being cleaned up by the USACE, there maybe no regulatory authority. When these sites were under the jurisdiction of DOE, the DOE regulated the site as provided in the Atomic Energy Act (AEA). The USACE has no legal authority to self regulate under the AEA. This is causing some problems at both the sites of generation as well as sites receiving wastes for disposal.

There is no consistent waste characterization method utilized by the USACE. This is important because characterization of the waste dictates other factors such as worker protection procedures, cleanup standards, and disposal options. To illustrate the magnitude of the problem, the USACE estimates that there are 1.5 million cubic meters (approximately 53 million cubic feet) of contaminated soil at the FUSRAP sites. These soils contain 11.e.(2) byproduct material, source material, low-level radioactive waste, naturally occurring radioactive material, and hazardous waste.

The CRCPD Board of Directors believes that the NRC has authority over these materials. There are two mechanisms that give the NRC this authority. First, 10 CFR Part 40 indicates that any material that has greater than 0.05 percent uranium by weight is source material, unless otherwise specifically exempted by the rule. We believe that much of the FUSRAP material would be subject to regulation under 10 CFR Part 40 if it is not subject to the requirements of UMTRCA. Second, a precedence has been established by the U.S. Environmental Protection Agency (EPA) that wastes generated prior to the enactment of legal authority (Resource Conservation and Recovery Act) are regulated under that authority when they are newly exhumed during cleanup. (37 FR 37298, August 18, 1992). EPA requires that when a hazardous waste is exhumed, it must undergo classification per 40 CFR Part 261 as if it were newly generated. Wastes that are classified as hazardous waste are then subject to the current requirements for handling and disposal. Thus, wastes that pose a threat are handled protectively regardless of when they were originally generated.

If, upon examination of these two mechanisms, NRC still believes it has no jurisdiction over this material, especially uranium and thorium, then we suggest that NRC approach Congress for appropriate authority to regulate this material. We would appreciate a written response regarding NRC's position on this matter by April 30, 1999, to enable the discussion of issues at CRCPD's Annual Meeting.

Thank you for your consideration of this matter. If you have any questions, please feel free to call Henry Porter, Chairperson, Committee E–5, Committee on Radioactive Waste Management at (803) 896–4245.

Sincerely,

STEVEN C. COLLINS,
CRCPD Chairman.

STATEMENT OF ALAN FELLMAN, PH.D., C.H.P.

My name is Alan Fellman. I have worked as a radiation safety specialist, or health physicist, for approximately 15 years. I have a masters degree in public health from the University of Michigan and a doctorate in radiological sciences from New York University. I am certified in the practice of health physics by the American Board of Health Physics. I have been asked by Envirocare of Utah to provide my views on radiological issues related to the safe disposal of Formerly Utilized Sites Remedial Action Program (FUSRAP) waste.

I began my work as a radiation safety specialist with the U.S. Environmental Protection Agency (EPA) Region II radiation branch. I worked for the EPA for 1.5 years before joining Malcolm Pirnie Inc., an 1,100 person environmental science and engineering consulting firm. For more than nine years, I was responsible for numerous projects involving radiation and radioactive materials. Specifically, as Malcolm Pirnie's senior health physicist, I was responsible for radiation safety, radiological site characterizations, data interpretation, and radiological risk assessments at several CCLA sites where the primary contaminants are radioactive. These sites included the U.S. Radium Corporation site in Orange, N.J., the Li Tungsten site in Glen Cove, N.Y., and the Welsbach/General Gas Mantle site in Camden and Gloucester City, N.J. I was responsible for radiological investigations of Phase II properties at the Maywood FUSRAP site in Maywood, N.J. and I headed up Malcolm Pirnie's efforts to characterize residual radioactive contaminants aboard the nuclear barge Sturgis. I was responsible for updating the health effects criteria documents on radium, alpha radioactivity, and beta/gamma radioactivity for the EPA Office of Water. I have worked on behalf of clients involved in litigation involving radium contamination of oil and natural gas production facilities as well as alleged radioactive contamination of ground water.

In August, 1999, I joined Communication Sciences Institute (CSI), Gaithersburg, Maryland. In my new position, I teach segments of several courses on various components of radiation safety and supervise a technical support contract which CSI maintains for the Radiation Safety Branch at the National Institutes of Health (NIH).

BACKGROUND ON FUSRAP WASTE DISPOSAL

The FUSRAP program was created in the 1970s to remediate sites where work had been performed during the early years of the atomic energy program in the United States. In general, the primary radiological waste streams at these sites consist of processed ore residues, or tailings, which contain elevated concentrations of thorium, uranium, and radium and their radioactive decay products. They are a type of low-level radioactive waste defined in the Atomic Energy Act (AEA) as byproduct material.

Prior to assumption of the FUSRAP program by the U.S. Army Corps of Engineers (USACE) in 1997, the manner in which FUSRAP wastes were disposed had not changed. All waste generated during the remediation of these sites had been sent to Department of Energy (DOE) approved and/or Nuclear Regulatory Commission (NRC) disposal facilities licensed to accept this material. Since the USACE assumed ownership of the FUSRAP program, there has been a decided shift in this long-standing practice. In 1998, the NRC interpreted the 1978 Uranium Mill Tailings Radiation Control Act (UMTRCA) to preclude NRC's authority to regulate byproduct material waste streams generated prior to the passage of UMTRCA. From a regulatory standpoint, this decision by NRC has had the effect of segmenting this type of waste into two distinct groups—pre-1978 material, under the authority of no Federal agency, and post-1978 material, under the authority of the NRC. Physically and radiologically, there are no differences between pre-1978 and post-1978 byproduct materials. By not exercising its regulatory authority over FUSRAP waste or other pre-1978 byproduct material, the NRC has transformed the USACE into a de facto self- regulating agency with no Federal standards to govern their disposal of FUSRAP waste. It has placed the USACE in a situation whereby they could be forced to choose between financial expediency and sound radiological practices.

POTENTIAL HAZARDS FROM THE USE OF UNLICENSED DISPOSAL SITES

The disposal strategy implemented by the USACE (described below) may result in exposure to radioactive materials among untrained workers at unlicensed disposal facilities. Under some circumstances, it may violate the intent of the as low as reasonably achievable (ALARA) philosophy, which is codified in most if not all Federal and State radiation protection regulations and is at the core of all radiation safety programs.

NRC's interpretation of the 1978 UMTRCA has provided the USACE with the option to dispose of FUSRAP waste at non-radiologically licensed Resource Conservation and Recovery Act (RCRA) Class C Landfills. Since the NRC has said it will not regulate FUSRAP waste, arguably the USACE is free to dispose of this waste anywhere. Although disposal of pre-1978 byproduct material at RCRA facilities may be somewhat less expensive in the short run, these facilities may lack appropriate radiological controls designed to protect the workers, the public, and the environment.

The USACE's current strategy on FUSRAP waste disposal is described in EC 200–1–3.[1] That strategy includes the following:

- Waste characterization;
- Identification of potential disposal facilities;
- Cost analysis;
- Compliance with the "off-site rule," as described in 40 CFR §300.440 (b)[2] and seek verification of compliance from USEPA's regional off-site coordinator (ROC);
- Notification of all appropriate regulators prior to shipment; and
- Compliance with appropriate NRC/Department of Transportation (DOT) transportation regulations.

Whereas most generators of low-level radioactive waste (llrw), including byproduct material, must dispose their waste in a NRC or Agreement State licensed disposal facility, NRC's UMTRCA interpretation forces the USACE to evaluate State regulations which address disposal of naturally occurring radioactive materials (NORM) or technologically enhanced naturally occurring radioactive materials (TENORM). Currently, 10 states have promulgated specific TENORM regulations. They are Arkansas, Georgia, Louisiana, Mississippi, New Jersey, New Mexico, Ohio, Oregon, South Carolina, and Texas. Other States may choose to allow some NORM waste disposal at RCRA Subtitle C and other types of facilities. Typically, disposal limits are included in operating permits at these facilities.

The evaluation of FUSRAP waste disposal options by the USACE therefore becomes an attempt to match the specific requirements of an interested disposal facility to the characteristics of a specific waste stream targeted for disposal. State regulations vary considerably with respect to radionuclide acceptance criteria and the type of environmental and worker protection afforded at their hazardous waste landfills. Some States with permitted RCRA Subtitle C facilities do not have an appropriate State agency to oversee andenforce regulations covering radioactive waste disposal. Permit compliance and implementation of radiation protection practices may be lacking at these types of facilities.

Some permit conditions simply do not make sense. For example, some RCRA Subtitle C facility permits limit radionuclide concentrations based on the DOT definition of non-radioactive material, e.g. materials containing less than or equal to 0.002 microcuries per gram (μCi/g) of material, or 2,000 picocuries per gram (pCi/g) of material. The origin and intent of this definition is based on providing for protection of the public from radioactive materials along transportation routes. It has no relevance to the safe disposal of radioactive materials, nor should it be misinterpreted as suggesting a lack of radiological risk to workers or members of the public posed by exposure to any specific concentration of radioactive material not exceeding this limit. In short, transportation is not synonymous with disposal, and to suggest otherwise is misleading.

Disposal at a NRC or Agreement State facility brings with it attendant radiological controls. There are no mandatory, enforceable protection provisions universally designed to limit radiological hazards at RCRA facilities. These facilities typically were not designed nor regulated to accept radioactive materials. In fact, RCRA specifically does not pertain to the types of radioactive material, including byproduct material, defined in the AEA and amendments. Therefore, the establishment of a RCRA facility does not include the rigorous environmental investigations which are

[1] U.S. Army Corps of Engineers. Engineer Circular 200–1–3, Off-Site Disposal Of Materials From The Formerly Utilized Sites Remedial Action Program, 3 January 2000.

[2] The off-site rule prohibits waste disposal from Superfund, or CERCLA sites at facilities which have had uncontrolled releases of any hazardous waste, constituent, or substance into ground water, surface water, soil, or air.

mandatory to obtain an NRC or Agreement State license to dispose of radioactive waste.

With the USACE free to dispose of pre-1978 byproduct material waste, such as FUSRAP waste, at RCRA facilities which have not been adequately characterized for radioactive waste disposal, the likelihood of a release of radioactive material to the environment increases. For example, a September 1999 report prepared for EnviroSafe Services of Idaho, Inc. (ESII), a RCRA-permitted landfill, concluded that upper aquifer groundwater will come in contact with the bottom of missile silos used for waste disposal in as little as 34 years.[3] NRC-licensed disposal facilities, on the other hand, are designed to isolate radioactive wastes from the environment for a minimum of 1,000 years and are required to be under Federal or State ownership in perpetuity. It is possible that environmental conditions at the ESII and other RCRA Subtitle C landfills would not satisfy the more rigorous criteria used to establish sites for radioactive waste disposal facilities. At a minimum, most RCRA facilities accepting FUSRAP wastes would need to modify their environmental monitoring programs to account for the radioactive constituents.

WORKER HEALTH AND SAFETY

A major concern for using RCRA landfills for the disposal of pre-1978 byproduct material is that workers at these facilities are not protected by the radiation worker protection standards found in 10 CFR Parts 19 and 20. These comprehensive NRC standards encompass all aspects of radiation worker protection. Licensees typically document radiation protection programs which cover radiation safety training requirements, dose limits (workers, general public, pregnant females, and minors), personnel dose and environmental monitoring, effluent limits, routine radiation surveys, bioassay programs, posting of areas, emergency response planning, and programs designed to keep worker exposure ALARA.

Of major importance are the training requirements included in the NRC andAgreement State standards. NRC regulations (10 CFR 19.12) mandate that any worker receiving more than 100 mrem/yr be provided with appropriate radiation worker training.

This training should include, at a minimum, instruction in:

- the storage, transfer, or use of radioactive material;
- the health protection problems associated with exposure to radioactive material and procedures to minimize exposure;
- applicable provisions of NRC regulations; individual responsibility to report any condition which could lead to a violation of NRC regulations;
- appropriate response actions to be taken in the event of any unusual occurrence; and
- radiation dosimetry and the availability of radiation exposure reports.

Unlicensed RCRA subtitle C facilities, on the other hand, are not subject to the NRC and Agreement State radiation protection standards. They are, however, subject to the ionizing radiation standard promulgated by the U.S. Occupational Safety and Health Administration (OSHA) in 29 CFR § 1910.1096. Unfortunately, the level of protection afforded workers covered by the OSHA standard falls far short of that provided by NRC and Agreement State standards, for several reasons:

(1) While NRC requires employers to provide worker training and the USACE [4] requires training for any individual potentially receiving a dose equivalent of 100 mrem per year, OSHA establishes training requirements for individuals frequenting a radiation area in 1910.1096(i)(2). Radiation areas are defined in 1910.1096(d)(3)(ii) as an area where an individual could receive 5 mrem in any one hour or 100 mrem in 5 consecutive days. Most facilities accepting FUSRAP wastes will not have any "radiation areas," so radiation safety training covering even rudimentary procedures for handling radiological materials will not be a regulatory requirement. Yet as described below, it is possible that workers at these facilities might receive radiation dose equivalents of several hundred mrem per year.

(2) NRC and Agreement State licensees and the USACE provide personnel radiation dose monitoring devices to any employee who might receive ten percent of the occupational limit, or 500 mrem in one year. In 1910.1096(d)(2), the OSHA standard requires personnel dosimetry for employees who might receive 25 percent of the 1.25 rem allowed in a calender quarter, or 313 mrem in three months. Based on this requirement, RCRA facility operators could allow workers to receive upwards of 1,000 mrem in one year without any mandatory personnel dose monitoring.

---

[3] Chuck Feast, Carlton Parker, and Richard Glanzman, CH2M Hill. September 1999. Rising Groundwater Study prepared for EnviroSafe Services of Idaho, Inc.

[4] USACE *Safety and Health Requirements Manual* (EM 385–1–1, September 3, 1996)

(3) NRC and Agreement State agencies employ inspectors who routinely audit licensees to check for compliance with regulations and conditions specified in the radioactive materials license. OSHA has no such staff; therefore, while unlicensed facilities are regulated by the OSHA standard, the reality is that no regulatory presence exists to document compliance, enforce requirements via citation of violations, assess penalties, and seek and approve corrective actions.

(4) Unlike NRC or Agreement State licensees, the operators of RCRA facilities covered by the OSHA standard are not required to develop and implement a radiation protection program, nor must they employ qualified radiation protection professionals, or health physicists, to ensure safe handling, disposal, and monitoring of radioactive materials.

For the reasons stated above, an unlicensed, minimally regulated facility accepting radioactive waste for disposal has the potential for unnecessary and unmonitored radiological exposure of workers.

What magnitude of doses might workers receive while working with pre-1978byproduct material? The RESRAD computer code (developed at Argonne National Laboratory by the DOE and widely utilized throughout the nuclear industry), allows us to estimate doses and corresponding health risks to individuals (e.g., workers, residents, etc.) based on exposure to radionuclides in soil. I performed several RESRAD calculations based on occupational scenarios where workers are exposed to soil-like material with radionuclide concentrations which are typical of FUSRAP waste for a work-year. Exposure to materials containing 2,000 pCi/g total activity (the exempt status from DOT regulations) was estimated to cause annual doses ranging from 375 mrem to 740 mrem, depending on the ratio of thonum to uranium in the waste stream. In 10 CFR 20, the NRC limits the annual dose to a member of the general public at 100 mrem. Annual doses were shown to exceed the l00 mrem limit to the general public based on exposure to waste containing only 20 pCi/g of thorium and its decay products and 10 pCi/g uranium and its decay products. Most FUSRAP waste contains at least these levels of radioactivity.

A comparison of the 375–740 mrem annual potential dose to workers at unlicensed facilities from FUSRAP wastes to dose limits established by various agencies may be useful. Compliance with the NRC decommissioning standard demands that licensees remove residual contamination from buildings and environmental media such that future occupants of the property will not receive doses which exceed 25 mrem annually. The EPA has also promulgated several standards and directives related to maximum acceptable annual doses to the public. These include 4 mrem from the ingestion of beta- and gamma-emitting radionuclides in drinking water (Safe Drinking Water Act), 10 mrem from the release of radionuclides to air (National Emissions Standards for Hazardous Air Pollutants- Radionuclides), and 15 mrem from residual radioactivity remaining at a remediated CERCLA site. The RESRAD results provided above due to occupational exposure to FUSRAP waste greatly exceed the NRC and EPA standards for members of the public. In EM 385–1–1, the USACE establishes the allowable dose to a USACE worker at the same limit established by the NRC for radiation workers (5,000 mrem/yr). However, Section 06.E.04 includes a suggested ALARA goal of 100 mrem/yr for USACE radiation workers. *It is not right that untrained workers at RCRA landfills could potentially receive a radiation dose that is several times greater than the ALARA goal which USACE recommends for its own radiation workers.*

HEALTH RISK COMPARISON

Another way to evaluate the potential impact from the disposal of FUSRAP wastes in an unlicensed facility is to express the radiation doses in terms of health risk. We attempt to limit exposure to ionizing radiation because a wide body of scientific research has found that radiation is a human carcinogen. While there is much controversy regarding the relationship between radiation doses less than 10 rem and risk, public health policy has been established based on the assumption that any radiation dose, regardless of how small, carries some carcinogenic risk. The doses calculated with the RESRAD code result in increased lifetime risks of developing cancer which range from approximately 4 x 10–3 to 9 x 10–3. By comparison, the EPA has as its goal a target risk reduction to the 104 to 104 risk range at CERCLA sites. In other words, the carcinogenic risks to workers at an unlicensed RCRA facility selected for disposal of FUSRAP wastes could exceed the acceptable risk range established by EPA under CERCLA.

UNIMPORTANT QUANTITY OF SOURCE MATERIAL EXEMPTION

NRC has established exemptions for some materials under their jurisdiction, including an exemption for "Unimportant quantities of source material" (10 CFR

40.13(a)). This exemption is not relevant to FUSRAP waste. The recently published NRC draft, NUREG–1717 titled *Systematic Radiological Assessment of Exemptions for Source and Byproduct Materials* states in section 3.2.1 that

"The estimated individual doses are greater than or equal to 1 mSv/yr (100 mrem/yr) but less than 10 mSv/yr (1,000 mrem/yr) for the following two (2) exemptions:

- 10 CFR 40.13(c)(1)(iii): Welding rods containing thorium, and
- 10 CFR 40.13(b): Unrefined and unprocessed ore containing source material."

Byproduct material from the processing of the source material exempted in 40.13(b) was expressly excluded from this exemption. FUSRAP waste consists of processed materials, while the 40.13(b) exemption is specific for *unrefined and unprocessed* ore. In many cases, the processed tailings contain radionuclide concentrations which exceed that of the original ore.

Although not stated in NIJREG–1717, the exclusion in 10 CFR 40.13(b) may be limited to unrefined and unprocessed ore because, as stated above, once the source materials are processed, the resulting tailings and millings often have even higher concentrations of some radionuclides. The processed waste residues, or tailings, are soil-like in appearance. They are often extremely non-homogeneous with respect to their concentrations of thorium, uranium, and radium. This makes it very difficult to properly and fully characterize these materials. This type of waste is typically shipped to disposal sites in bulk form. As such, the absorption or shielding capability of these soil-like materials can mask small volumes with high radionuclide concentrations, or "hot spots," that cannot be detected by typical radiation surveys. For example, a shipment of FUSRAP material was sent to a RCRA landfill in Buttonwillow, California with the certification that the contents were "non- radioactive" for transportation, i.e., less than 2,000 pCi/g of total radioactivity. However, sample data generated on that material prior to shipment show that some volume of material contained 3,600 pCi/g of total radioactivity, a factor of 1.8 times higher than the DOT exempt concentration.

I have been involved with similar situations concerning non-FUSRAP material contaminated with the same radionuclides of concern as FUSRAP wastes. The radiological survey of a container often reveals a relatively low exposure rate from gamma radiation emanating from the contaminated material. When the contents are spread out and investigated closely, there may be portions of the material exhibiting exposure rates more than ten times greater than from the containerized material. In these and similar situations, individuals involved should be radiation trained and appropriate radiation controls should be in place to limit the radiation exposure to the workers handling the material. It is precisely this uncertainty that is fundamental to the characterization of FUSRAP waste. It is exactly these types of situations which demand trained radiation workers to ensure that exposures are kept ALARA.

USACE COMPARISON TO MERLOT WINE

During a March, 2000 hearing of the House Energy and Water Subcommittee, Robert Anderson, general counsel of the USACE compared the radioactivity in a bottle of Merlot wine to the radioactivity present in FUSRAP waste.[5] Mr. Anderson was obviously misinformed, as his statement is both factually incorrect and scientifically meaningless. While most every food and beverage contains some amount of natural radioactivity, Brazil nuts, with up to 14 pCi/g of radium, contain the highest level of any radionuclide on a per gram basis of any commonly ingested product, including wine. FUSRAP waste, with its radium, thorium, and uranium content, typically contains much greater concentrations of radioactivity than Brazil nuts. In fact, the radioactivity in the waste exceeds the radioactivity concentration in the nuts by a factor ranging from approximately 10 to 150. The difference in radionuclide concentrations between the waste and a bottle of wine are even more significant, ranging up to a factor of several thousand times greater in FUSRAP waste.

Mr. Anderson's comparison is particularly troublesome, given the radiological hazards posed by the K–65 process waste currently buried at the USACE's Niagara Falls Storage Site (NFSS). The approximately 3,200 cubic yards of ore residues at the NFSS have average Ra-226 concentrations of 220,000 pCi/g and uranium concentrations which range from 460–670 pCi/g. These are extremely high levels of ra-

[5] There is no doubt that Merlot wine contains some natural radioactivity, as do most every food and beverage which we consume on a daily basis. On average we receive 20 mrem/yr from ingesting radionuclides such as potassium-40, carbon-14, hydrogen-3, radium-226, and thorium-232. Examples include Brazil nuts (14 pCi/g of radium-226), beer (less than one pCi/g of total radioactivity), and bananas (3 pCi/g of potassium-40). However, since we do not typically ingest FUSRAP waste, the attempt to use the natural radioactivity in wine or any other food or beverage as a basis of comparison to the risks posed by waste disposal is without merit.

dioactivity which pose unique health and safety hazards to workers. The USEPA, New York Department of Environmental Conservation, and the National Research Council have all recommended that the material be permanently disposed in a high level radioactive waste repository when one becomes available.

In addition to being misleading, statements such as the one made by Mr. Anderson demonstrate a disregard for the technical issues and the health and safety concerns that must be recognized when managing these wastes. It fails to acknowledge the risk that individuals choose to take, i.e. where they live, the foods they eat, consumption of alcohol and tobacco, and regulated radiation exposures as opposed to those that they may choose not to take, such as exposure to radioactive wastes in an unlicensed facility. These types of comparison statements typically foster resentment among members of the public as they are perceived as a personal insult to their intelligence. From the perspective of radiation protection, the USACE strategy, as reflected by Mr. Anderson's comment, has the appearance of circumventing well established regulations designed to protect the worker, public health and safety, and the environment.

CONCLUSION

In conclusion, the NRC, by failing to regulate pre-1978 byproduct material, has provided the USACE with an opportunity to reap cost savings on FUSRAP projects by disposing of waste at RCRA landfills. NRC has failed to meet its mission to keep radiation exposures as low as reasonably achievable by providing incentive for the USACE to carry out its mandate at FUSRAP sites by disposing wastes at unlicensed facilities staffed by untrained workers. These materials belong in a NRC or Agreement State licensed radioactive waste disposal facility.

STATEMENT OF ERIC C. PEUS, PRESIDENT, WASTE CONTROL SPECIALISTS LLC

Waste Control Specialists LLC (WCS) is a Texas-based waste management firm that offers innovative and cost effective solutions for the safe management of radioactive and hazardous materials. WCS operates a state-of-the-art facility in Andrews County, Texas, that is permitted for the treatment, storage and disposal of radioactive, hazardous and toxic materials.

FACILITY SITING

The WCS facility is located on a 15,215 acre site in the extreme western part of Andrews County, Texas, on the New Mexico border, approximately 30 miles east of the Department of Energy's Waste Isolation Pilot Project Facility. The closest communities to the facility are the cities of Andrews, TX, approximately 30 miles east of the site, and the city of Eunice, NM, approximately six miles west of the site. Within the overall site, WCS has developed a 1,338 acre facility which is fully permitted by the Texas Natural Resource Conservation Commission (TNRCC) and the U.S. Environmental Protection Agency for the treatment, storage and disposal of all Resource Conservation Recovery Act (RCRA) and Toxic Substances Control Act (TSCA) wastes. The currently permitted disposal area can accommodate more than 11 million cubic yards of waste. The WCS facility is the only RCRA disposal facility in the country that has been permitted after implementation of the RCRA "Land Disposal Restrictions" regulations, a situation that provides WCS customers with the broadest possible range of liability protection. In the nearly three years that the WCS facility has been in operation, no notices of violations have been issued for any regulated activities.

The WCS site features superior geology for purposes of long-term waste isolation. The facility sits on a very thick (800 to 1,000 feet) layer of highly impermeable Triassic red-bed clay. The clay comes to within approximately 20 feet of the surface. Within this clay formation, WCS has constructed a state-of-the-art RCRA disposal cell system. All waste authorized for disposal is placed in a RCRA cell with double plastic and clay liners, and a double leachate collection system. The end result is that WCS has constructed a full-scale, modern RCRA facility, which is itself fully contained within a massive, naturally-occurring bed of virtually impermeable clays that has been found to have been geologically stable for more than 10 million years. In the unlikely event that the facility's engineered barriers are somehow compromised, groundwater migration time through the natural barrier surrounding the facility has been calculated to be greater than 150,000 years.

The first usable groundwater below the naturally occurring clay layer is non-potable, and there is no evidence of any infiltration from the site. There is no surface or potable groundwater within 15 miles of the WCS facility. The local climate is ex-

tremely arid, with an evapotranspiration rate greatly exceeding the rate of annual rainfall. Due to the local climate, normal facility operations can be conducted throughout the entire year. The WCS site has direct rail access, a railcar unloading facility for bulk shipments, and easy access from nearby interstate highways.

The WCS facility enjoys strong support from the communities in Andrews County and neighboring New Mexico. The local citizens have expressly supported the use of the facility for the treatment, storage and disposal of hazardous, toxic and low-level and mixed radioactive waste. There have been no contested hearings for the permits and licenses that have been granted to the facility. This is due in significant part to the fact that the industry base of the region is oil and gas production, and the citizens are thus comfortable with and accepting of the risks of technology. They also fully understand the superior geological characteristics of the site.

FACILITY LICENSES AND AUTHORIZATIONS

The WCS facility holds the following licenses, permits and authorizations:

Low-Level Radioactive Waste Treatment, Processing, and Storage License

Issued: November 3, 1997, by Texas Department of Health.

Analysis Performed: Detailed review of 5,000-page technical application addressing facility engineering design, waste acceptance criteria, storage and processing technologies, health and safety monitoring, to ensure conformance with all applicable state and federal radiation control regulations.

Authorization: Authorized for treatment, processing and storage of Class A, B, and C low-level radioactive wastes from commercial sector. Storage authorized for up to seven years. In combination with RCRA waste license, this license allows WCS to treat, process, and store mixed wastes (hazardous wastes with radioactive contamination).

Industrial Solid Waste and Hazardous Waste Storage, Processing, and Disposal Permit (Resource Conservation and Recovery Act (RCRA) Wastes)

Issued: August 5, 1994, by Texas Natural Resource Conservation Commission.

Analysis Performed: Seventeen-month detailed technical and physical review of site characteristics, including groundwater and surface hydrology, geology, and seismic characteristics. Supported by 3,500-page technical application.

Authorization: Authorized for treatment, storage and land disposal of all 2,000 classifications of Resource and Conservation Recovery Act wastes.

Toxic Substances Control Act Land Disposal Authorization

Issued: December 2, 1994, by the U.S. Environmental Protection Agency.

Analysis Performed: Seventeen-month detailed technical and physical review of site characteristics, including groundwater and surface hydrology, geology, and seismic characteristics. Supported by 3,500-page technical application.

Authorization: Authorized for treatment, storage and land disposal of all categories of polychlorinatedbiphenyls (PCBs).

Naturally Occurring Radioactive Material (NORM) Disposal Authorization

Issued: September 9, 1997, by Texas Natural Resource and Conservation Commission.

Analysis Performed: Detailed review of technical application for radiation screening procedures to ensure conformance with all applicable state and federal radiation control regulations.

Authorization: Authorized for land disposal of NORM wastes exempt from state or federal licensing requirements (wastes under 150 picocuries per gram of uranium or thorium and under 30 picocuries per gram of radium, with a radon emanation rate of less than 20 picocuries per square meter per second).

Research, Development, and Demonstration Permit

Issued: October 24, 1997, by Texas Natural Resource and Conservation Commission.

Analysis Performed: Detailed review of proposed research, development, and demonstration activities to ensure that such activities can be conducted in an environmentally safe and sound manner.

Authorization: Authorized to perform research, development, and demonstration activities, up to pilot-scale level, of promising technologies for the treatment and remediation of contaminated soil and groundwater. Limited to use of wastes already on WCS site

This broad combination of licenses, permit sand authorizations allows the facility to provide a wide array of services to both commercial and government sectors. Cur-

rent storage capacity can accommodate approximately 300,000 cubic feet of low-level and mixed radioactive waste.

WCS does not currently possess a U.S. Nuclear Regulatory Commission (NRC) 10 CFR Part 61 license for disposal of low-level radioactive waste.[1] Texas regulations, however, allow WCS to dispose of certain source materials, NORM and a variety of other materials that are exempt from licensing in Texas. The Texas Department of Health (TDH) regulates treatment and storage of waste and licensing of radioactive material, while the Texas Natural Resources Conservation Commission (TNRCC) regulates disposal of LLRW. In a memorandum of understanding between the two agencies, if the TDH has exempted a radioactive material from licensing, then the material can be disposed of without regard to its radioactive properties under TNRCC authority. WCS has the authority to dispose of low-activity radioactive materials under its RCRA permit, and has in place an acceptance criteria which requires radiation surveys and analysis for all incoming shipments to insure that all material accepted for disposal meets the exempt requirements.

The following low-activity radioactive materials are classified as exempt from licensing under Texas regulations and can be disposed at the WCS facility:

- Source material from licensed or unlicensed facilities in any physical or chemical form in which the Uranium and Thorium is < 0.05% by weight;
- Rare earth metals, compounds, mixtures, or products containing less than 0.25% by weight Thorium or Uranium;
- Any finished product or part containing metal thorium alloys with Thorium < 4% by weight.
- Depleted Uranium in counterweights installed in aircraft, rockets, projectiles, missiles, or used as a shielding material;
- Various products manufactured under a specific license as being exempt from licensing; and
- Naturally Occurring Radioactive Materials (NORM) containing technologically enhanced radium-226 or radium-228 at less than 30 pCi/gm or any other NORM radionuclide less than 1 50 pCi/gm.

The WCS facility can also accept certain source material and NORM for disposal even if the generating facility was licensed by the NRC. This has been authorized by a policy adopted by the NRC that allows licensed facilities to ship certain source material without being manifested as LLRW to the WCS facility for disposal without further approval from the NRC. NORM disposal is regulated by the states, and those states that regulate NORM accept the Texasdisposal regulations by reciprocity.

WCS' RADIATION PROTECTION PROGRAM

A comprehensive environmental monitoring program is conducted at the WCS Facility under the requirements of the various existing RCRA and TSCA permits and the radioactive waste license.

The facility includes an onsite, EPA-approved analytical laboratory that is capable of performing various testing required for verifying the characteristics of hazardous and TSCA waste and also determining that the waste meets the RCRA leachability requirements after treatment. There is also a radiation counting laboratory that is capable of performing gamma spec and scintillation counting for confirmatory, survey, and general radiation protection purposes.

All work at the WCS facility involving the handling of any radioactive material is controlled by specific procedures and an approved Radiation Work Permit (RWP). All site design, operations and record keeping activities are controlled under a Nuclear Quality Assurance Program. All radioactive and hazardous material is shipped to the WCS facility in U.S. Department of Transportation (DOT) approved containers or meet DOT bulk shipping requirements. A Texas hazardous waste shipping manifest is required to document and certify the contents of each shipment. This manifest is used to certify that all waste shipments contain only radionuclides that meet Texas exempt levels. Receipt surveys are performed on all shipments, and samples may be taken on certain packages to verify compliance with all waste acceptance requirements. Exempt level radioactive material that does not contain RCRA or TSCA regulated materials, or that meets the RCRA requirements for disposal, is be immediately transported to the WCS onsite RCRA/TSCA disposal cell for final disposition.

---

[1] None of the existing LLRW disposal facilities are licensed under 10 CFR Part 61. The Hanford and Barnwell facilities were licensed before Part 61 was adopted and the Envirocare facility is not licensed as a Part 61 disposal facility by the State of Utah.

Exempt material containing RCRA constituents that require treatment is temporarily stored in the transportation containers in approved buildings awaiting staging for treatment and then moved to the Stabilization building for treatment and/or stabilization to meet the land disposal restrictions prior to disposal. Once received, the materials do not leave the WCS permitted facility and are handled only by appropriately trained and badged radiation workers. All operations involving the handling of any radioactive material is performed under the existing radiation safety program, regardless of the exemption status of the materials to be disposed or handled. Analyses have been performed which demonstrate that the treatment and disposal of exempt level radioactive materials will result in an annual dose above background that is less than 1 mrem/yr effective whole body dose to any member of the public and workers.

WCS CONTRACTS AND FUSRAP MATERIAL DISPOSAL

In addition to private sector contracts, WCS is under contract to the Department of Energy for mixed waste treatment, and with the Army Corps Of Engineers (Corps) for the disposal of low-activity radioactive waste, including waste from the FUSRAP program.

The WCS facility is authorized to dispose of the following FUSRAP waste as exempt material under its RCRA permit and existing Corps disposal contract:

- RCRA/TSCA Waste with residual radioactive material.
- low-activity Radioactive Waste—Uranium and Thorium less than 0.05% by weight.
- NORM Waste—less than 30 pCi/gm Radium and 150 pCi/gm any other NORM radionuclide.[2]

To date, more than 500,000 cubic feet of exempt-level material has been disposed of at the WCS facility. Approximately 10 percent of this volume has been from FUSRAP sites.

The Corps, WCS, and TDH staff has developed an excellent working relationship and a model process for approval of FUSRAP waste disposal at the WCS facility. The Corps' responsible district and its contractor determine if the waste meets WCS acceptance criteria and then send a letter, with detailed characterization data attached to the TDH, for each FUSRAP waste stream to request approval for disposal at WCS. If the TDH approves the request as meeting Texas exemptions, the Corps completes and sends a waste profile sheet to WCS for approval. If that profile sheet meets the WCS acceptance criteria, an authorization to ship letter is issued to the Corps.

Scientific analysis and experience to date clearly demonstrate that low-activity FUSRAP waste can be disposed of at permitted RCRA disposal facilities safely and that such disposal provides the equivalent public health and safety protection of disposal at licensed low-level radioactive waste disposal facilities. Various studies have shown that the long-lived toxicity of RCRA waste is comparable to low-level radioactive waste. RCRA disposal facility requirements meet or exceed NRC's 10 CFR Part 61 requirements in the following areas relating to design and institutional control:

- Active maintenance—RCRA requires a minimum of 30 years, versus five years for Part 61;
- Deed restrictions—RCRA has deed restriction requirements that prevent disturbing the cover after the Facility has been closed; Part 61 has no such requirements;
- RCRA facilities must meet prescriptive design requirements that include double liners, minimum permeability standards, and leachate collection and monitoring systems; Part 61 does not contain facility design requirements.

In addition, the WCS Facility includes a five-meter engineered cover which satisfies the NRC Part 61 intruder barrier requirement for Class C low-level radioactive waste. The WCS facility permits and licenses also require various financial assurance instruments that provide for equivalent levels of funding for site decommissioning and closure, site maintenance, and monitoring after closure, liability protection, and cleanup and removal of all waste stored on site under the license, if WCS cannot perform this activity.

These multiple layers of engineering and regulatory protection, in combination with appropriate financial assurance mechanisms, ensure that the disposal of low-activity FUSRAP wastes at permitted RCRA facilities provides significant and ap-

[2] Since the USNRC has determined that pre 1978 11e.(2) material is not regulated under the Uranium Mill Tailings Act, the TDH regulates this material for disposal purposes in Texas as NORM waste.

propriate protection of public health and safety. In addition, the use of such facilities provides the opportunity for significant savings for government disposal operations. It has been estimated that the safe disposal of FUSRAP material at permitted RCRA facilities will reduce overall program disposal costs by as much as $100 million, while fully maintaining protection of public health and safety.

CONCLUSION

The WCS Facility offers unique features that enhance long term waste isolation and liability protection. These include:

- Superior geology that enhances long-term waste isolation.
- State-of-the-art technology, design, and engineering.
- The only RCRA disposal facility permitted post land disposal restriction regulations.
- A comprehensive radiation safety program covering all operations.
- An unprecedented level of political and public support for all activities.

The disposal of FUSRAP wastes at the WCS site is a safe, environmentally sound use of a permitted RCRA Facility and provides protection of public health and safety that is equivalent to that which might be provided by an NRC licensed facility.

ENVIROCARE OF UTAH, INC.,
Salt Lake City, Utah, August 2, 2000.

Hon. BOB SMITH, *Chairman,*
Environment and Public Works Committee,
Washington, DC.

Re: FUSRAP Waste Management

DEAR CHAIRMAN SMITH: I am the president of Envirocare of Utah, Inc. (Envirocare) which is fully licensed by the U.S. Nuclear Regulatory Commission (NRC) to receive and dispose the type of waste—11e.(2) byproduct uranium mill tailings—that the U.S. Army Corps of Engineers (USACE) is cleaning up at various sites under the Formerly Utilized Sites Remedial Action Program (FUSRAP). As a follow-up to the July 25 hearing held in your committee on disposal of low-activity radioactive waste, I would like to offer my perspective on the FUSRAP program. I respectfully request that this letter be included in the of official written record for this hearing since I address issues such as disposal costs that were discussed at the hearing.

FUSRAP wastes are radioactive uranium mill tailings that exceed the criteria for contamination at sites at which they are currently located. The Government has required these wastes to be cleaned up and shipped off-site for safe disposal, because they contain unacceptably high concentrations of radionuclides. Envirocare has received wastes from several FUSRAP sites, and the following table illustrates some of the levels of contamination that have been documented through the waste profiling process used to accept these wastes at our facility.

Site—Location	Uranium			Radium-226			Thorium-232			Thorium-230		
(pCi/g)	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.
Wayne, NJ	4.25	3,280	200	99	8,805	346	1.14	9,246	797	1.14	1,580	172
St. Louis, MO	1	95,000	240	1	5,400	6	1	700	3	1	98,000	32
Hazelwood, MO	ND	4,000	42	ND	4,923	20.5	ND	440	2.6	ND	.282	120.8
Tonawanda, NY	0.32	2,973	1,490	ND	7.4	3.9	ND	3.54	1.8	ND	320.6	160.3

ANote: Uramum—238 reported for Tonawanda, NY
AND—Not detected

As shown by these data, the radiological contamination present in FUSRAP wastes varies. While the low end of the concentration range may lull some people into stating that the material is not very hazardous, the average and maximum concentrations cannot reasonably be dismissed as being without risk. We have asked Dr. Alan Fellman who is an expert in radiological hazards associated with these types of materials to review issues associated with the disposal of FUSRAP wastes. For the reasons set forth in his analysis, a copy of which I have enclosed for your review. Dr. Fellman believes that the disposal of FUSRAP wastes should be fully regulated by the NRC.

In 1978, Congress enacted a program to regulate the management and disposal of radioactive mill tailings—the Uranium Mill Tailings Radiation and Control Act (UMTRCA). During the debate on the passage of UMTRCA, the health, safety and environmental risks associated with radioactive uranium mill tailings were evaluated. As reported in the hearing before the Subcommittee on Energy and Power of the Committee on Interstate and Foreign Commerce of the House of Representatives, uranium mill tailings pose a perpetual hazard to the environment and a potential and significant radiation health hazard. The Committee reported the purpose of UMTRCA as follows:

> The [UMTRCA], as proposed, is intended to protect the public health and safety and the environment from hazards associated with wastes from uranium ore milling process. If enacted, the legislation will require every reasonable effort to be made by the States, the Federal Government, and private industry to provide for the disposal, stabilization and control in a safe and environmentally sound manner of such tailings to prevent or minimize the diffusion of radon or the entry of other hazards into the environment.

Under UMTRCA, Congress created a comprehensive management program for uranium mill tailings. The NRC created a licensing process to be used by parties seeking authority to commercially dispose of this material. Envirocare's uranium mill tailings disposal facility was licensed by the NRC in 1993 in accordance with this overall program. The NRC also performed a full National Environmental Policy Act (NEPA) review of the proposed licensing action at Envirocare and published an Environmental Impact Statement (EIS). The NRC's licensing process assures that disposal facilities are:

- Properly sited to assure isolation from environmentally sensitive areas;
- Properly designed to standards that would reasonably assure that the facility would be effective for 1,000 years;
- Properly managed by assuring that it had a radiation safety program that meets the requirements of 10 CFR Part 20 and the proper staff to administer the program;
- Properly track waste shipments through the use of radioactive waste manifests;
- Properly monitored to assure that it could detect emissions to the air, land, and ground water; and
- Properly financed by requiring that an adequate financial surety fund was provided to assure that the NRC could complete closure and long-term surveillance of the facility, if required.

The Department of Energy (DOE) had responsibility for FUSRAP before the program was transferred to the USACE in 1998. The consensus among Envirocare, Utah regulators, the NRC, and DOE was that in order to receive FUSRAP wastes for disposal, Envirocare was required to be licensed by the NRC. Envirocare worked with these agencies to comply with all requirements to legally accept and dispose of FUSRAP uranium mill tailings. Envirocare's license requires it to implement comprehensive programs to assure that its workers, the public, and the environment are not harmed during the active management of these wastes and during the long-term surveillance period following closure of the facility. At no time during Envirocare's licensing process did the NRC ever suggest that uranium mill tailings generated before 1978 could be disposed of at an unlicensed facility.

After the USACE took over FUSRAP from the DOE, it asked the NRC for an interpretation of UMTRCA that would allow it to dispose of FUSRAP uranium mill tailings at facilities not licensed by the NRC. An attorney in the NRC's Office of General Counsel (OGC) replied to the USACE that since Congress did not explicitly include existing uranium mill tailings in the mandatory licensing section (section 83a.) of the Atomic Energy Act (AEA), as amended by UMTRCA, the NRC did not have authority to regulate these wastes. The USACE seized upon this interpretation by the NRC to dispose of FUSRAP wastes in facilities that are not licensed for radioactive waste disposal.

Since the NRC OGC's interpretation was issued, the USACE has disposed of FUSRAP wastes at several Resource Conservation and Recovery Act (RCRA) facilities that are not regulated for the disposal of radioactive waste. However, RCRA does not contain any requirements or guidelines for the handling of radioactive materials. Such requirements are in the AEA and in regulations promulgated and enforced by the NRC. Indeed, RCRA cannot govern radioactive wastes, because RCRA, by its own terms provides that it is inapplicable to byproduct material as defined by the AEA. 42 USC sec. 6903 (27).

Envirocare firmly believes that the NRC's interpretation is wrong, and we have filed a 2.206 Petition with the agency requesting it to overturn its interpretation. Further, the USACE's implementation of this interpretation in its disposal of

FUSRAP waste in RCRA facilities is wrong, because such facilities are not designed, operated, or regulated for radioactive waste disposal.

Based on our review of the law it is clear that Congress never intended to limit the application of the unambiguous requirements of sections 81 and 84 of the AEA which, respectively, require the NRC to manage *any* 11e.(2) byproduct material (uranium mill tailings), and prevent any person from possessing 11e.(2) byproduct material without being licensed.[1] Further, section 84 was intended to fill regulatory gaps in UMTRCA and makes clear that Congress wished to regulate all mill tailings in a comprehensive manner. That is not to say that Congress specifically focused on FUSRAP. Rather, Congress intended to regulate *everything* that satisfied the definition of section 11e.(2) of the AEA. Certainly, Congress did not intend to exclude a significant category of tailings from the reach of the statute, as the NRC's interpretation does. Further, Congress considered uranium mill tailings to be a serious health and safety problem that required NRC regulation. Any interpretation that places a significant category of such tailings beyond the reach of the NRC therefore runs counter to Congress's intent to protect public health and safety.

The NRC's interpretation has led to a nonsensical designation of uranium mill tailings byproduct material as pre-1978 and post-1978. Virtually all FUSRAP waste was generated before 1978, so it falls under the "pre-1978" designation. The basis for regulating radioactive mill tailings has not changed, nor are the tailings in the FUSRAP program different (any less radioactive) than those that the NRC requires to be regulated by UMTRCA. There is no difference between pre- and post-1978 uranium mill tailings. There is no sound policy or technical reason why FUSRAP materials should be excluded from a program that clearly covers all uranium mill tailings existing in the United States.

Notwithstanding the foregoing arguments as to why the NRC's interpretation of the law is wrong, it also is important to understand that under the NRC's interpretation, *no one* has authority to regulate the disposal of so-called "pre-1978" section 11e.(2) mill tailings. Both the NRC and the USACE have indicated that the NRC's lack of authority over such pre-1978 11e.(2) mill tailings is not troublesome, because the tailings are subject to regulation under other federal and state laws. Yet, because the AEA preempts the field of nuclear safety regulation for such materials, they are not subject to *any* other regulation (including purported state regulation) intended to protect against radiation exposure. Moreover, such materials are not within the Environmental Protection Agency's (EPA) jurisdiction under RCRA. Thus, the NRC's current interpretation of the relevant statutes leaves the disposal of these materials entirely unregulated.[2]

Further, I would like to address the USACE's representation that the cost to dispose of these wastes at a licensed facility is 2 to 10 times more expensive than at an unlicensed facility. The facts simply do not support this assertion. The USACE solicited bids to perform disposal of FUSRAP and other wastes and awarded its Multi-Award Disposal Contract in 1999. The USACE's solicitation for the disposal of FUSRAP waste referred to that material as "11e.(2) Materials generated prior to November 8, 1978. . . . This material is not subject to regulation under the Atomic Energy Act authority." Based upon the offers it received, the USACE awarded contracts for the disposal of this waste to both Envirocare and to EnviroSafe Services of Idaho, Inc. (EnviroSafe) which operates a RCRA hazardous waste disposal facility.

Under these contracts, the USACE's disposal cost per cubic yard for radioactive FUSRAP soils delivered in gondola rail cars is $103 for Envirocare and $83 for EnviroSafe. (The EnviroSafe price includes a transload fee of $13 per cubic yard to ship the waste from a railroad transfer facility to its site. Envirocare has rail access directly into its site, so there is no additional transfer cost.) Thus, Envirocare's price is 24% more than EnviroSafe's, not 2 or 10 times (200% to 1000%) more. These are the prices that are relevant for the vast majority of FUSRAP wastes. Using other prices or scenarios does not accurately reflect the costs that the USACE incurs by using these two disposal facilities.

The difference in the disposal prices at the two facilities is attributable to the difference in the performance characteristics. Envirocare's price reflects the added health and safety and other programs that are required to comply with its NRC license, which are the requirements implemented by the NRC to assure that UMTRCA is properly implemented. Assuring that a site is properly sited, designed,

---

[1] These arguments are fully set forth in the 2.206 Petitions filed with the NRC by Envirocare and an Idaho environmental advocacy group, the Snake River Alliance.

[2] This argument is fully set forth in the *Supplement to Petition under 10 C.F.R. §2.206 Regarding NRC Interpretation of Uranium Mill Tailings Radiation Control Act* that we have filed with the NRC.

monitored, managed, and funded may result in a higher price, but these requirements are necessary to assure that workers and the public are protected and that the materials will not become a high cost liability in the future.

Further, Envirocare has ample capacity to dispose of FUSRAP wastes fromthroughout the country. For example, we have unloaded as many as 66 gondola railcars a day, and we have disposed of as much as 60,000 cubic yards of 11e.(2) waste in a three-month period. For comparison purposes, the USACE's St. Louis FUSRAP budget has supported disposal of only 60,000 cubic yards in a year. Any notion that the use of NRC-licensed facilities for the disposal of FUSRAP waste will, somehow, slow down the Army Corps' remediation of these sites is not based in reality.

In closing I would like to reiterate the need to properly manage FUSRAP wastes in NRC-licensed facilities. The protection provided by a facility specifically licensed to receive and dispose of radioactive wastes assures that both present and future generations of Americans are protected from the health risks associated with these materials. The slightly higher costs attendant to these facilities are well worth the additional health and environmental protections they provide.

I appreciate your consideration of my views. The NRC's legal interpretation and the USACE's implementation of that interpretation are wrong on both policy and health and safety grounds, and I urge your Committee to address this situation as soon as possible. If you have any questions or if you would like additional information, please let me know. Thank you.

Very truly yours,

CHARLES A. JUDD.

SAFETY-KLEEN CORP.,
Columbia, SC, August 4, 2000.

Hon. ROBERT C. SMITH, *Chairman,*
Senate Committee on Environment and Public Works,
Washington, DC.

DEAR CHAIRMAN SMITH: On behalf of Safety-Kleen Corp., the largest hazardous and industrial waste management firm in North America, I would like to thank you for conducting the July 25, 2000, hearing on the disposal of low-activity radioactive waste. In general, I believe the hearing shed much-needed light on the facts surrounding the safe, cost-effective and environmentally sound disposal of very low-activity FUSRAP wastes at facilities permitted by states pursuant to the Resource Conservation and Recovery Act.

I was deeply disappointed, however, that attacks were made on Safety-Kleen's Buttonwillow secure landfill regarding its receipt of FUSRAP wastes for disposal, and I respectfully request that this letter and the attached materials be included in the record in rebuttal to the erroneous statements made.

In addition to the issues set forth in my July 21, 2000, letter to you, which is attached, three other equally troubling, and equally false, allegations were raised during the hearing:

1. One member of the Committee stated that Safety-Kleen has gone "busto," an apparent reference to Safety-Kleen's filing for protection under Chapter 11 of the U.S. Bankruptcy Code. Safety-Kleen has sought such protection, but two points are essential:

- Safety-Kleen is not going out of business. We are maintaining normal business operations at all our facilities while reorganizing. We entered Chapter 11 as the largest hazardous and industrial waste management firm in North America, and it is our intention to emerge from Chapter 11 in the same capacity.
- All of Safety-Kleen's financial assurance mechanisms and obligations remain in place and in force. Safety Kleen remains responsible under the law for its facilities—for the safe operation, closure, and post-closure care as required by our permits—and Safety-Kleen will honor those responsibilities.

2. It was alleged that the FUSRAP waste Safety-Kleen disposed of is now "too dangerous to move." This is a gross mischaracterization. The waste is identifiable and could be removed, but doing so would necessarily result in some incremental, additional worker exposure to both radioactive and hazardous substances, while providing no public health and safety or environmental benefit. The material is safely disposed of and extensive analysis and monitoring by the State of California post-disposal concludes that there is no short- or long- term risk to the public or the environment from this material. There is no scientific, safety or environmental reason to move this waste.

3. It was alleged that Safety-Kleen workers were not told they were handling radioactive materials. Since the Safety-Kleen Buttonwillow facility routinely receives low-activity radioactive waste for disposal, and has done so for more than a decade, all workers managing waste at the facility receive radiation protection training on a regular basis. The radiation protection training manual, which we are not submitting for the record due to its approximately 1,000 pages of material (but which we would be pleased to submit to the Committee if so requested), is comprehensive and meets the criteria proscribed in OSHA 29 CFR 1910.1096. In fact, this program actually requires a lower annual exposure rate for our workers (100 mrem/yr) than that allowed for workers at an NRC licensed facility (500 mrem/yr). In addition, all materials received for disposal are tested at the facility gate to ensure conformity with the manifest. The FUSRAP material was specifically tested for radioactivity.

Attached are the following documents:

- My July 21, 2000, letter to you providing factual information regarding the permitting of the Buttonwillow facility and the disposal of FUSRAP materials at that facility.
- A May 9, 2000 letter, with attachments, to Julie Anderson of EPA Region IX documenting the erroneous nature of statements made by Ms. Anderson in a December 17, 1999, letter to Bryan Bone of the Buena Vista (CA) Resource Conservation District. Many similar erroneous statements were made during the July 25, 2000, hearing. The Safety-Kleen letter corrects and documents Ms. Anderson's numerous factual, legal and scientific errors and seeks retraction of her letter.
- A copy of the January 6, 2000, letter to Senator Boxer from Winston Hickox, Secretary of the California EPA, attaching the Agency's August 25, 1991, letter to California Assemblyman Dean Florez concluding that the disposal of FUSRAP wastes at Safety-Kleen's Buttonwillow facility did not violate RCRA and that the material poses no short- or long-term public safety or environmental concerns.

I would greatly appreciate your inclusion of these documents in the hearing record, and we look forward to working with you should the Committee decide to pursue these issues further. If you have any questions or concerns, please do not hesitate to contact me at 803–933–4202 or Safety-Kleen's Washington representative, John Kyte, at 202–530–4557.

Sincerely,

GROVER WRENN,
Chief Operating Officer.

ATTACHMENTS

SAFETY-KLEEN CORPORATE HQ,
Columbia, SC, July 21, 2000.

Hon. ROBERT C. SMITH, *Chairman,*
Senate Committee on Environment and Public Works,
Washington, DC.

DEAR CHAIRMAN SMITH: As you approach next week's hearing on the disposal of wastes from the Formerly Utilized Sites Remediation Action Project (FUSRAP), I would like to mention a few items of concern to Safety-Kleen, the largest hazardous and industrial waste management firm in North America.

I understand from my staff that your interest in these issues is focused on public health and safety and the implications of the statutory designation under which some FUSRAP wastes are regulated by the Nuclear Regulatory Commission and other such wastes are not. I agree that this is an appropriate issue for Congressional inquiry, and we are supportive of efforts to develop an approach to disposing of these wastes that is based on potential public health and safety concerns.

My primary concern with regard to the hearing is the potential for it to be diverted from the public policy focus and onto Safety-Kleen's Buttonwillow, CA, secure hazardous waste landfill. I am sure you are aware that concerns have been raised regarding our receipt of FUSRAP wastes at that facility. But I must in all candor tell you that those concerns are not based on an accurate or factual understanding of the permits held by our facility or of the state and federal approval process leading up to our receipt of those wastes. This remains so despite our best efforts to educate our critics and provide them with documentation supporting our position.

The facts are as follows:

- Safety-Kleen's Buttonwillow facility is a RCRA Subtitle C landfill fully permitted by the State of California to receive low-activity radioactive wastes containing up to 2,000 picocuries per gram of residual radiation.

• The Buttonwillow facility was sited, designed, constructed and permitted specifically with such wastes in mind.
• The facility has been receiving such wastes, primarily from the oil industry, for more than a decade without concern or objection.
• The State of California was fully apprised of, and approved, our receipt of 2,200 tons of FUSRAP wastes, which averaged 353 picocuries per gram, considerably lower than many of the wastes we have previously received and disposed of without objection.
• The FUSRAP wastes are no different radiologically from any of the other types of low-activity wastes, commonly called NORM (naturally occurring radioactive material) wastes, that we have received in the past.

In addition, since we received the FUSRAP wastes, the State of California has reviewed the approval process and conducted an extensive on-site review of the disposal activities, and determined that the disposal of FUSRAP wastes was proper and poses no short or long-term public health and safety concern. A copy of the joint letter from the Secretaries of the California Department of Health Services and the California Environmental Protection Agency is attached.

As a company whose livelihood depends on strict compliance with all applicable laws, it is most distressing for Safety-Kleen to be repeatedly attacked, as we have been, particularly when those attacks are based on erroneous or incomplete information. We are concerned that such inaccurate or erroneous information may surface again during the hearing next week, and I simply wanted you and other members of the Committee to know the facts prior to the hearing. We have previously shared with Committee staff the full set documents that support our position, should you desire to see them.

If you have any questions or concerns, please do not hesitate to contact me at 803–933–4202 or Safety-Kleen's Washington representative, John Kyte, at 202–530–4557.

Sincerely,

GROVER WRENN,
Chief Operating Officer.

SAFETY-KLEEN CORP.,
Columbia, SC, May 9, 2000.

Ms. JULIE ANDERSON, *Director,*
U.S. EPA Region IX,
San Francisco, CA.

Re: Response to December 17, 1999, USEPA letter to Mr. Bryan Bone of the Buena Vista Resource Conservation District, Regarding the Acceptance of FUSRAP Waste from the U.S. Army Corps of Engineers by Safety-Kleen at the Permitted RCRA Subtitle C Landfill near Buttonwillow, CA [EPA ID No. CAD980367965]

DEAR MS. ANDERSON: I am writing in regard to your letter of December 17, 1999 to Mr. Bryan Bone of the Buena Vista Resource Conservation District in Kern County, California. Your letter was in response to Mr. Bone's letter to President Clinton dated September 21, 1999. These two letters concern the acceptance of approximately 2,200 tons of building debris (i.e., wood, concrete, and asbestos) containing residual low-activity radionuclides by the Safety-Kleen (Buttonwillow), Inc. RCRA Subtitle C permitted disposal facility from the United States Army Corps of Engineers that was generated at the Linde Site, in Tonawanda, NY, under the Formerly Utilized Sites Remedial Action Program (FUSRAP).

Your letter contains several statements and/or conclusions that are either partially or wholly inaccurate, and several important developments regarding this disposal activity that could have or should have been known to you are entirely omitted. The end result is a letter that is factually inaccurate and highly misleading. That letter is now being used by activists and candidates for elected office to portray Safety-Kleen in an unfair, negative manner. Your letter has just now come to our attention, a fact that is disturbing in its own right, and I am requesting that you review the information provided below and send a letter of correction to Mr. Bone and any other parties that may have received the December 17, 1999 letter.

There are five primary issues with which Safety-Kleen has concerns: (1) compliance with our RCRA hazardous waste permit; (2) the knowledge and pre-approval of receipt of this waste by the State of California prior to its shipment to Safety-Kleen; (3) the wholly inaccurate use of the term "low-level" radioactive material to describe this waste; (4) the scientifically and legally insupportable distinction im-

plied between concentrated naturally occurring radioactive materials (NORM) "and manmade" low-level radioactive residues; and, (5) the allegation that "Safety-Kleen may have incorrectly characterized the waste as NORM."

1. *Compliance with our RCRA Permit.*—Safety-Kleen's Buttonwillow disposal facility is fully and properly permitted by the California Department of Toxic Substances Control (DTSC) to receive and dispose of a variety of low-activity radioactive wastes, regardless of origin, so long as such material is below a certain level of radioactivity and not under the purview of the U.S. Nuclear Regulatory Commission (NRC). In an August 25, 1999 letter, cosigned by Mr. Winston Hickox, Secretary of Cal/EPA and Mr. Grantland Johnson, Secretary of Health and Human Services, on behalf of Gov. Gray Davis, the State of California clearly stated that Safety-Kleen complied with the provisions of it's RCRA Permit in accepting and disposing of the Linde wastes. This letter was also sent to Sen. Barbara Boxer on January 6, 2000, a fact which even a cursory investigation of the issues would have revealed. (See Attachment No. 1.) As you will note, the State of California explicitly stated the following conclusions:

- DTSC has not found any violations—of the Resource Conservation and Recovery Act (RCRA) hazardous waste facility permit which DTSC issued—by the company in accepting these shipments. The RCRA permit for this facility allows the disposal of wastes containing less than 2000 picocuries per gram that are not regulated by the Nuclear Regulatory Commission (NRC).
- There is no short-term risk to public health or the environment from this waste based on a full-site survey by DTSC and DHS. That survey found absolutely *no* radiation above background levels;
- Neither DTSC nor the Regional Water Quality Control Board, the Cal/EPA department charged with implementing the Clean Water Act and related water quality and groundwater protection laws and regulations, have any reason to expect any long-term environmental problems stemming from the disposal of this waste, and that "the facility was designed and constructed, with oversight and approval from these Cal/EPA organizations, to prevent toxic materials from migrating to groundwater;"
- The design of the landfill liner system at the Safety-Kleen facility is more than is required by State and Federal environmental laws and regulations;
- The facility has an "extensive system of groundwater monitoring, including an advanced neutron probe system, to assure that the wastes do not migrate to groundwater. In its 18 years of operation, no releases to groundwater have been found anywhere at the facility."

2. *Notification by Safety-Kleen to DHS–RHB Prior to Accepting the Linde Site Waste.*—You state: "The low-level radioactive material was apparently shipped and buried without the knowledge or approval of the RHB" (the DHS Radiologic Health Branch). This statement is wholly incorrect. First, the waste is not "low-level" radioactive material as defined by State and Federal law and regulation. Second, written and verbal notifications and disclosures were made to both DHS and DTSC regarding this project a full month prior to the acceptance of any FUSRAP wastes at the Buttonwillow facility. The issue regarding the definition of "low-level radioactive waste" is discussed below. As for notification of the State of California, Safety-Kleen officials specifically discussed this Linde Site project with the appropriate officials from both Cal/EPA and the California Department of Health Services—Radiologic Health Branch (DHS) approximately 1 month prior to the start of the Linde Site waste shipments, and memorialized those discussions in an explicit letter of understanding to all parties dated October 21, 1998. (See Attachment No. 2.) The first shipment of this waste did not arrive at the Buttonwillow facility until late November 1998.

The October 21, 1998 letter from Safety-Kleen to both Gerard Wong of DHS-RHB and Tony Hashemian of DTSC verified acceptability of the disposal of the Linde Site waste at the Buttonwillow site as long as: (1) the waste met the conditions of RCRA Permit Condition II.C.1.A. (i.e., NRC-exempt low-concentration radioactive waste up to 2,000 picocuries per gram); and (2) the waste was cleared by the appropriate authority for this project, such as the Nuclear Regulatory Commission. Mr. Gerard Wong is the Chief of Licensing at the DHS-RHB, and is thus the appropriate contact for such projects.

Approximately 6 months after this notification, Mr. Ed Bailey, chief of RHB, received an inquiry from Mr. Paul Merges of New York's RHB regarding California's approval of the disposal of the FUSRAP wastes. Due to an apparent breakdown in internal communications, Mr. Bailey was apparently unaware of the oral and written notification from Safety-Kleen, which prompted Mr. Bailey's factually and legally incorrect letter to Safety-Kleen on March 10, 1999. (See Attachment No. 3).

That letter was received on the same day the last shipment of Linde Site wastes was placed into the RCRA Subtitle C landfill at the Buttonwillow facility.

The record is clear that the appropriate State of California agencies were fully and properly notified of the nature, origin and intended disposal of the Linde Site wastes at Safety-Kleen's Buttonwillow facility. That Mr. Bailey may not have been personally aware of that notification is irrelevant.

3. *The Inaccurate use of the Term "Low-Level Radioactive Waste."*—Your letter makes numerous references to the Linde Site wastes as "Low-Level" radioactive material or waste. "Low-Level" waste is a term of art, defined under Federal and State law. It is not a catch-all phrase, and to use it as such is both inaccurate and highly misleading. An illustrative analogy would be to call all solid waste "RCRA Hazardous Waste"(i.e., while all "low-level" waste is in fact "radioactive material/waste", not all "radioactive material/waste" is "low-level.") Low-level radioactive waste can only be disposed of in facilities licensed pursuant to the authority of the U.S. Nuclear Regulatory Commission (NRC), whether exercised by the NRC directly or by a State under the Agreement State Program. The Linde Site waste received by Safety-Kleen waste is *not* "low-level" radioactive material or waste.

With specific regard to Safety-Kleen, the NRC has taken the position that an NRC license is not required for the disposal of FUSRAP waste from the Linde Site. (See Attachments Nos. 4 and 5.) In rejecting petitions from both the Natural Resources Defense Counsel and the Conference of Radiation Control Program Directors, NRC has specifically stated that the U.S. Army Corps of Engineers, its subcontractors or disposal facilities, are not required to be licensed under NRC authority. The NRC Director's Decision under 10 C.F.R. § 2.206 (published April 5, 1999) clearly proscribed NRC from exercising regulatory authority over FUSRAP sites. Further, the NRC has concluded that it had no rules or regulations which would preclude disposal of certain FUSRAP waste at a permitted RCRA Subtitle C site, such as the Buttonwillow facility.

The information provided to Safety-Kleen by the U.S. Army Corps of Engineers and/or its subcontractor Radian International established that the Linde Site waste disposed of at the Safety-Kleen Buttonwillow facility was: (1) not NRC-licensed material; (2) at recorded concentrations of less than 2,000 picocuries per gram; and (3) not NRC-regulated "source material" under section 11(e)(2) of the Atomic Energy Act.

Therefore, this material cannot in any context be properly called "low-level" radioactive waste or material, and EPA's repeated misuse of that term has been of significant negative consequence to Safety-Kleen.

4. *The Acceptance of Concentrated NORM by Safety-Kleen.*—Your letter implies that the residual low-activity waste from the Linde Site is somehow not NORM (naturally occurring radioactive material) because it is "manmade." However, the term manmade is of no relevance, either scientific or legal, with regard to radioactive wastes or materials. The term "manmade" does not come from a statute, regulation or scientific reference—it is a fiction. While the term NORM has caused some confusion among those who seek to give it a literal meaning, your December 17, 1999, letter does accurately provide examples of concentrated NORM wastes that the Buttonwillow facility has historically accepted in a legal and safe manner since the early 1980's when it was first permitted: "Examples of material containing naturally occurring radioactivity include oil and gas production equipment such as pipes, pumps, oil flow lines, manifold piping, valves, meters, screens and filters." These examples are also consistent with the EPA's Office of Air & Radiation Guidance Document, dated April 29, 1993, entitled "Diffuse NORM Wastes—Waste Characterization and Preliminary Risk Assessment". This Guidance Document also specifically cites FUSRAP projects as ". . . currently being managed under several Federal programs implemented specifically to mitigate potential public health and environmental impacts from numerous NORM contaminated sites." (See Attachment No. 6.)

NORM is a term that lacks statutory definition and is just now being examined by State and Federal agencies that may be considering some future effort at promulgating NORM regulations. The EPA itself is currently in the process of developing a new "TENORM" website. In the current TENORM website home page, EPA states: "Until recently, TENORM was referred to simply as NORM (naturally occurring radioactive materials). 'Technologically enhanced' was added to distinguish clearly between radionuclides as they occur naturally and radionuclides that human activity has concentrated or exposed."

California does not define or regulate NORM, despite its ubiquitous presence in the environment, especially in oil exploration, production and refining operations in California's Kern County, where Safety-Kleen's Buttonwillow facility is located. In fact, the facility was sited in Kern County due in large part to the disposal needs

of the oil industry. While the Federal Government, including the Department of Energy, NRC and the EPA (with the exception of the U.S. EPA's general authority under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986) have made it abundantly clear that they do not regulate FUSRAP waste, it would appear that without effective NORM regulations in California, DHS (like their Federal counterparts) lack regulatory authority.

The California regulations contained in Title 17 C.F.R. § 30180(c)(1) State in part: "The following concentrations and quantities are exempt from these regulations and from licensing requirements: Any naturally occurring radioactive material, except source material, in concentrations which occur naturally." There is a dearth of authority either in the Title 17 C.F.R. regulations, California statute, or decisional law, regarding the definition of the phrase "which occur naturally." DHS has not promulgated regulations defining NORM and providing NORM waste management guidelines for the numerous sources of NORM waste generated in California. Nor has DHS actively pursued any regulation of known NORM waste streams generated during oil exploration, production and refining operations, geothermal energy production, natural gas production, or the many other well-known and documented sources of NORM contaminated wastes within California. Each of the aforementioned NORM waste categories from the petroleum, natural gas, geothermal and other industries produce NORM which has been concentrated as scale and sediment in pipes, pumps, valves, surface impoundments, or by other physical, mechanical and/or chemical mechanisms that can concentrate NORM constituents during the production process. The pertinent regulatory agencies (DHS, DTSC and RWQCB), and the regulated industries in California, including waste generators and disposal facilities, have operated for more than a decade with a functioning understanding that the phrase "which occur naturally" in Title 17 C.F.R. § 30180(c)(1) includes mechanisms that can concentrate the radiologic isotopes in the waste (e.g., scale formation). This is consistent with your December 17, 1999, letter.

In addition, prior written communications between DTSC and DHS regarding the management of radioactive wastes at RCRA disposal facilities in California, DTSC stated that *intent* of a "radioactive waste prohibition" in a RCRA permit only refers to "NRC regulated" radioactive wastes. (See Attachment No. 7.) In a discussion regarding another Safety-Kleen RCRA facility, the permit for which contains a prohibition on "radioactive Materials and/or wastes," DTSC stated: "This permit condition is intended to preclude the Facility's acceptance of high level and low-level source wastes which are regulated by the Nuclear Regulatory Commission under the Code of Federal Regulations (CFR) Parts 10 and 20." The historical management of concentrated NORM waste at this California RCRA Subtitle C landfill was also discussed in this letter: "The Facility historically and presently accepts wastes from the petroleum and geothermal industries which contain *concentrated levels* of Naturally Occurring Radioactive Materials (NORMs)" (emphasis added). Thus, the historic and continuing acceptance of concentrated NORM wastes at California RCRA disposal facilities is well established and has been formally acknowledged as fact by the State of California.

A report prepared by the Conference of Radiation Control Program Directors, entitled "Report of the E–4 Committee on NORM Contamination and Decontamination/ Decommission—Report 3," specifically describes: (a) uranium and thorium as NORM constituents, in addition to the isotopes more common to oil, gas and geothermal production wastes; (b) uranium milling/recovery as "materials and activities known to be associated with elevated NORM levels"; (c) that "slags, sludges and other loose NORM exceeding 2,000 picocuries per gram should go to a LLW [low-level waste] disposal facility" and that "loose material exhibiting between 30 picocuries per gram and 2,000 picocuries per gram should go to a diffuse NORM disposal site"; and (d) that "pipe scale" and other types of mechanically and/or chemically concentrated forms of NORM radiologic isotopes are still defined simply as "NORM".

Finally, a recent report on TENORM prepared for the EPA by the National Academy of Sciences, entitled "Evaluation of Guidelines for Exposures to Technologically Enhanced Naturally Occurring Radioactive Materials," concluded

- There was no evidence that the properties of NORM differ from the properties of any other radionuclides in ways that would necessitate the development of different approaches to risk assessment.
- The differences between EPA proposed guidelines for TENORM and similar guidelines developed by other organizations were judged not to be based on scientific and technical information. On the basis of the review conducted, "these differences in the guidelines for TENORM developed by EPA and other organizations were judged to be based essentially on differences in policy judgments for risk management."

Three things appear clear with regard to NORM wastes: (1) There is an abundance of literature, much of it from the EPA itself, which describes wastes that are radiologically similar to the Linde Site FUSRAP waste as "NORM"; (2) California's functioning definition of "NORM" is essentially the same as the U.S. EPA's definition (i.e., NORM = TENORM = NORM); and, (3) the handling of the FUSRAP NORM waste is no different than the handling of NORM wastes received by Safety-Kleen from oil and gas production equipment such as pipes, pumps, oil flow lines, manifold piping, valves, meters, screens and filters—the facility permit is blind to origin.

5. *Safety-Kleen may have incorrectly characterized the waste as NORM.*—The Linde Site FUSRAP waste disposed of at the Safety-Kleen Buttonwillow facility does not fit any definition of radioactive material under the Atomic Energy Act. The waste could be described as "pre-1978 11e.(2) byproduct material" (a title not described in statute or regulation), or as "pre-1978 11e.(2) byproduct material NORM waste," or simply as NORM or TENORM. What is of critical importance to this situation is that the waste was not subject to regulation under the AEA because it was generated by a non-NRC-licensed facility (the Linde Site) prior to 1978, and therefore is not low-level radioactive waste or low-level waste as defined by statute. (42 USC 2011 et. seq.)

Since this waste was not low-level radioactive waste, and because its concentrations of radioactivity were very low, the U.S. Army Corps of Engineers and its subcontractor, Radian International, applied a generic definition of Naturally Occurring Radioactive Material ("NORM") to the Linde Site FUSRAP waste that was disposed of at the Safety-Kleen Buttonwillow facility. Safety-Kleen relied upon the U.S. Army Corps of Engineers' and Radian International's characterization of the Linde Site FUSRAP waste as NORM, a characterization that was consistent with Safety-Kleen's interpretation of the applicable statutes and regulations.

Even though the Safety-Kleen Buttonwillow facility has discontinued taking NORM waste from the FUSRAP program, the Army Corps of Engineers continues to ship NORM waste from FUSRAP sites, including waste from the Linde Site, to other RCRA-permitted facilities that do not possess NRC or Agreement-State licenses for radioactive waste disposal. Over the last 6 months, FUSRAP waste has been shipped by the Army Corps of Engineers to RCRA Subtitle C landfills in Idaho and Texas under approval from both Federal and State regulatory agencies. The State of Texas specifically refers to this FUSRAP waste as "NORM". (See Attachment No. 8.)

In conclusion, your letter of December 17, 1999, to Mr. Bryan Bone of the Buena Vista Resource Conservation District, has caused significant harm to Safety-Kleen, its customers and employees, and it has caused unnecessary and unwarranted concern on the part of California citizens and elected officials. The significance of the factual, legal and scientific errors cannot be overstated, and the damage cannot be undone by Safety-Kleen alone. Therefore, we request an immediate retraction or clarification of the errors cited above, and an apology for the ensuing confusion caused. Good public policy demands no less.

Safety-Kleen is committed to compliance with all laws, regulations, and permit conditions at all of our facilities, as well as an overarching commitment to environmental protection. No other company in North America has invested an equivalent level of resources to protecting public health and the environment through the safe and responsible management of toxic and hazardous wastes. Every year, Safety-Kleen recycles, treats, and safely disposes of more hazardous and toxic industrial wastes than any other company in North America. With over 400,000 customers relying on Safety-Kleen to manage their industrial wastes, we take our reputation very seriously and cannot stand idly by when a Federal regulatory agency makes egregious mistakes that cut to the core of that reputation.

I would be happy to discuss this issue in more detail with you and your staff if necessary. Please do not hesitate to contact me at (803) 933–6430. Thank you.

Sincerely,

PHIL RETALLICK,
Vice President of Corporate Compliance.

ADDITIONAL SUPPORTING DOCUMENTS

- February 6, 1998 letter from Richard Bangart of the NRC's Office of State Programs to Paul Merges of the New York Department of Environmental Protection—Bureau of Pesticides and Radiation;
- April 21, 1999 letter of inquiry regarding FUSRAP from Chairman Tom Bliley and Ranking Member John Dingell, of the U.S. House of Representatives Committee

on Commerce, to Lieutenant General Joseph Ballard, of the U.S. Army Corps of Engineers, and General Ballard's response dated May 21, 1999;

- RCRA Hazardous Waste Facility Permit issued by the California DTSC, dated April 6, 1996, and Waste Discharge Requirements issued by the RWQCB, dated May 28, 1996;
- Federal Register publication on April 5, 1999 of the NRC's decision rejecting the petition by the Natural Resources Defense Council dated October 15, 1998 regarding the U.S. Army Corps of Engineers' handling of radioactive materials in connection with FUSRAP sites;
- Memorandum of Understanding between the Department of Energy ("DOE") and the U.S. Army Corps of Engineers dated March 19, 1999 delineating the responsibilities of these two parties over the 21 active remaining FUSRAP sites, including the Linde Site, whereby the U.S. Army Corps of Engineers is charged with establishing cleanup standards at active sites in consultation with Federal, State and local regulatory agencies;
- Documents received by Safety-Kleen from the U.S. Army Corps of Engineers and/or its subcontractor Radian International, reflecting analysis of the Linde Site FUSRAP waste indicating concentrations of less than 2,000 picocuries per gram;
- U.S. Army Corps of Engineers Issue Paper entitled "FUSRAP Waste Disposal Alternatives" dated July 7, 1998, which lists Buttonwillow, as well as 10 other RCRA Subtitle C facilities, as suitable disposal facilities for FUSRAP waste such as the Linde Site waste;
- The U.S. Army Corps of Engineers' public affairs document dated May 1999 reflecting the U.S. Army Corps of Engineers' position regarding disposal of the Linde Site waste at the Safety-Kleen (Buttonwillow), Inc. Facility;
- Letter dated October 12, 1999 from Gregory Johnson of the U.S. Army Corps of Engineers to Richard Ratliff of the Texas Department of Health-Bureau of Radiation Control regarding the exempt status of NORM waste from the W.R. Grace FUSRAP site in Curtis Bay, MD, and the letter of concurrence dated October 27, 1999 from the Texas Department of Health to the U.S. Army Corps of Engineers;
- "Standard Operating Procedure (S.O.P.)—Site Specific Health And Safety Plan for the management of waste containing Naturally Occurring Radioactive Materials (NORMs), Safety-Kleen (Buttonwillow), Inc.," which is utilized by the Safety-Kleen (Buttonwillow), Inc. Facility for NORM disposal projects, including the FUSRAP waste from the Linde Site;
- Waste characterization and material profile information prepared by Radian International for the U.S. Army Corps of Engineers including but not limited to material profile form prepared on behalf of the U.S. Army Corps of Engineers dated September 20, 1998;
- Project information from the Safety-Kleen (Buttonwillow), Inc. Facility regarding the disposal of the Linde Site FUSRAP waste including: (a) waste radiation monitoring data, (b) personnel training information, and (c) personnel radiation dosimetry reports;
- Letter dated May 20, 1999 from Ed Bailey of the Department of Health Services' Radiology Health Branch ("DHS") to California Assembly Member Dean Florez stating that the evaluation by DHS and DTSC staff that was conducted at the Safety-Kleen (Buttonwillow), Inc. Facility subsequent to the disposal of the FUSRAP waste from the Linde Site showed ". . . no radiation levels above normal background levels" and "no known safety or health risk to the community.";
- Letter dated April 9, 1999 from the Conference of Radiation Control Program Directors to the NRC requesting clarification regarding a potential regulatory vacuum over the disposal of FUSRAP wastes, and any subsequent related responses from the NRC to the Conference of Radiation Control Program Directors;
- Documents submitted to the Southwestern Low-Level Radioactive Waste Commission ("Commission") and testimony before such Commission by both Safety-Kleen and the U.S. Army Corps of Engineers including but not limited to (a) documents dated June 1, 1999, June 11, 1999, and July 29, 1999, from Safety-Kleen to the Commission and (b) transcripts of the Commission's meeting held June 11, 1999 in which the U.S. Army Corps of Engineers defended their position that the FUSRAP waste from the Linde Site was neither "source material" nor "Low-Level" waste which would require an NRC (or Agreement State) license under the Atomic Energy Act or related State programs (including the California Radiation Control Act);
- Uniform Hazardous Waste Manifests, Waste Verification Information, and other shipping/receiving paperwork associated with the transportation to, and acceptance of, the Linde Site FUSRAP waste at the Safety-Kleen (Buttonwillow), Inc. Facility between November 1998 and March 1999;

- Draft "Project Completion Report, Demolition and Debris Removal, Former Linde Building 30" dated May 5, 1999, prepared by Radian International (a.k.a. Dames & Moore) for the U.S. Army Corps of Engineers;
- Both draft and final comprehensive post-project evaluation documents prepared by the U.S. Army Corps of Engineers in response to questions posed by U.S. Senator Barbara Boxer regarding the shipment of the Linde Site FUSRAP waste by the U.S. Army Corps of Engineers to the Safety-Kleen (Buttonwillow), Inc. Facility;
- The following reference documents related to the occurrence, characterization, monitoring, health and safety, regulations, and disposal of NORM waste, which were maintained and used by Safety-Kleen as part of their NORM waste handling protocol, including: (a) Department of Health Services and Department of Conservation (Division of Oil, Gas and Geothermal Resources) document #TR49, 1996 (draft) entitled "A Study of NORM Associated with Oil and Gas Production Operations in California": (b) U.S. EPA, Office of Air and Radiation, document #RAE–9232/1–2, April 29, 1993, entitled "Diffuse NORM Wastes-Waste Characterization and Preliminary Risk Assessment"; (c) Interstate Oil & Gas Compact Commission document (1994), entitled "Understanding the Basics of Naturally Occurring Radioactive Material (NORM) in the Oil and Gas Industry"; (d) William Feathergail Wilson, PennWell Books document (1994), entitled "NORM-A Guide to Naturally Occurring Radioactive Material"; (e) CRCPD Publication 94–6, April 1994 Conference of Radiation Control Program Directors, Inc., entitled "Report of the E–4 Committee on NORM Contamination and Decontamination/Decommissioning-Report 3"; (f) Philip T. Underhill, St. Lucie Press document (1996), entitled "Naturally Occurring Radioactive Materials-Principles and Practices"; and
- January 31, 2000 letter from Bill R. Ross of Safety-Kleen to Ed Bailey of DHS and attached testing documents regarding the low concentration of radionuclides in the leachate generated in Safety-Kleen (Buttonwillow), Inc. facility's landfill containing the Linde Site FUSRAP waste (i.e., Landfill WMU 34) in comparison to two other RCRA landfills at the facility that contain no FUSRAP NORM waste but have accepted NORM waste from local oil fields.

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY,
Sacramento, CA, January 6, 2000.

Hon. BARBARA BOXER,
U.S. Senate,
Washington, DC.

DEAR SENATOR BOXER: Thank you for your letter to Governor Gray Davis dated October 1, 1999 regarding the acceptance of waste from the Formerly Utilized Sites Remediation Program ("FUSRAP") at a permitted hazardous waste disposal facility near Buttonwillow, Kern County, California. The cleanup of FUSRAP sites and the proper disposal of contaminated debris is an important environmental issue. My primary concern, like yours, is the protection of the environment and health of California's families.

As you know, there is an on-going investigation by California's Department of Health Services (DHS) of the issues raised by acceptance of this waste. The results of the initial inquiry into the matter have been communicated in a letter to Assembly member Dean Florez dated August 25, 1999 jointly signed by myself as the Secretary of the California Environmental Protection Agency (CalEPA) and the Secretary of the Health and Human Services Agency (HHSA). As you know, DHS, is a part of HHSA and the Department of Toxic Substances Control (DTSC), who issue the facility's hazardous waste facilities permit, is part of CalEPA. For your information, I have attached a copy of the letter.

I look forward to working with you on this issue once the final results of the on-going investigation are available.

Sincerely,

WINSTON H. HICKOX,
Agency Secretary,
California Health and Human Services.

ATTACHMENT

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY,
Sacramento, CA, August 25, 1999.

Hon. DEAN FLOREZ,
California State Assembly,
State Capitol,
Sacramento, CA.

DEAR ASSEMBLY MEMBER FLOREZ: Thank you for your letter to Governor Gray Davis regarding the disposal of radioactive material at the Safety-Kleen hazardous waste site in Buttonwillow, Kern County. We would like you to know what our respective departments and boards have been doing in this matter.

The Department of Health Services (DHS), in the California Health and Human Services Agency, has been actively involved in gathering and reviewing information on the material disposed at Buttonwillow. This preliminary analysis and site visit supports the previous DHS communication to you that there is no immediate threat to public health or surrounding communities.

To ensure a comprehensive review, DHS has established a team of radiation experts to coordinate all aspects of the Buttonwillow radioactive waste review. Included on the team along with DHS are two of the California Environmental Protection Agency (Cal/EPA)organizations, the Department of Toxic Substances Control (DTSC) and the Regional Water Quality Control Board, Central Valley Region, which regulate the Safety-Kleen site through permits issued under their respective hazardous waste management and water quality authorities. During the week of August 9, 1999, DHS staff traveled to Albany, New York, to consult with the New York State radiation control agency, and then to Buffalo, New York, to review the United States Army Corps of Engineers' records and data on the source of this waste material. DHS has also been evaluating external consultants who might be able to provide an independent review of the State's analysis of these wastes.

Some issues have already been resolved. First both DHS and DTSC concur that "there is no known safety or health risk to the community," as DHS stated in its letter to you on May 20, 1999. That conclusion stems in part from testing conducted jointly by DHS and DTSC which found *no* radiation above background levels at the site.

Moreover, state environmental agencies have had continuing oversight of this hazardous waste facility. DTSC and the Regional Board also have no reason to expect long-term environmental problems stemming from this disposal. The facility was designed and constructed, with oversight and approval by these Cal/EPA organizations, to prevent toxic materials from migrating to groundwater. The facility has two 3-foot thick impermeable clay liners, three heavy gauge synthetic liners, and two leachate collection systems in place. This design is more than is required by State and Federal environmental laws. The facility also has an extensive system of groundwater monitoring, including an advanced neutron probe system, to assure that the wastes do not migrate to groundwater. In its 18 years of operation, no releases to groundwater have been found anywhere at the facility. If any releases are ever found, regulatory and financial mechanisms are in place to assure that corrective action would be implemented immediately. In short, we have no reason to expect long-term problems at this facility, but are vigilant to assure that none occur.

While the DHS assessment will proceed independently, DTSC has not found any violations—of the Resource Conservation and Recovery Act (RCRA) hazardous waste facility permit which DTSC issued—by the company in accepting these shipments. The RCRA permit for this facility allows the disposal of wastes containing less than 2000 picocuries per gram that are not regulated by the Nuclear Regulatory Commission (NRC). From the information currently known, the wastes here averaged only 335 picocuries/gram. Furthermore, the NRC has clearly stated that they do not have jurisdiction over these specific wastes and that disposal is not prohibited in RCRA hazardous waste facilities. However, DTSC has no jurisdiction over radioactive waste regulated by DHS or any federal agency.

We continue working with our constituent organizations to resolve any remaining regulatory issues expeditiously. In the meantime, we hope that this letter is helpful. We look forward to working with you on this matter in the future.

Sincerely,

WINSTON H. HICKOX,
Agency Secretary,
California Environmental Protection Agency.

GRANTLAND JOHNSON,
Agency Secretary,
California Health and Human Services Agency.

CALIFORNIA HEALTH AND HUMAN SERVICES AGENCY,
Sacramento, CA, May 20, 1999.

Hon. DEAN FLOREZ,
California State Assembly,
State Capitol,
Sacramento, CA.

Dear ASSEMBLY MEMBER FLOREZ: Thank you for inviting us to the meeting with you, your staff, and officials from Safety-Kleen Services, Inc. We appreciated the opportunity to discuss the disposal of materials from the Linde Site in New York at Safety-Kleen's Buttonwillow hazardous waste disposal site. We share your health and safety concerns regarding this matter.

As we discussed, the Department of Health Services Radiologic Health Branch conducted an on-site radiologic evaluation at the Buttonwillow site, accompanied by the Department of Toxic Substances Control, on May 18, 1999. The evaluation included radiation monitoring of the site's surface. We found no radiation levels above normal background levels. For that reason, we believe that there is no known safety or health risk to the community.

We intend to continue to gather all available documentation and data regarding the specific material buried at the Buttonwillow site. Safety-Kleen has pledged to cooperate in this review. After we have completed our review and analysis, we will make a determination as to the appropriate section to be taken.

The Department of Health Services appreciates the opportunity to discuss this issue with you. We will keep you informed of our review of the Buttonwillow site.

Sincerely,

EDGAR D. BAILEY, C.H.P., *Chief,*
Radiologic Health Branch.

U.S. SENATE,
Washington, DC, October 1, 1999.

Hon. GRAY DAVIS, *Governor*
Sacramento, CA.

Dear GOVERNOR DAVIS: I am writing to you on an urgent matter and with great confidence that you will join with me in halting the dangerous practice of accepting radioactive waste at hazardous waste disposal facilities in California.

As you know, hazardous waste facilities lack the special worker protection standards, community notification provisions, monitoring requirements and site closure assurances that radioactive waste disposal facilities licensed by the Nuclear Regulatory Commission are required to provide.

In the last 12 months, the U.S. Army Corps of Engineers has disposed of approximately 2,200 tons of radioactive debris at a hazardous waste facility operated by Safety-Kleen, Inc., in Buttonwillow, California. I understand that the site sits atop aquifers that connect to a larger aquifer that supplies drinking water to the San Joaquin Valley.

While your Department of Health Services informs me that State law prohibits such disposal, Safety-Kleen holds a Resource Conservation Recovery Act permit issued by the former administration's Department of Toxic Substances Control which allows the facility to dispose of radioactive materials. Shockingly, both DHS and DTSC have told me that the DTSC has no authority to include that provision in the permit.

While I plan to introduce legislation which would clearly require that this waste be disposed of only at facilities licensed to accept radioactive waste, I urge you to immediately stop hazardous waste facilities in California like Safety-Kleen's Buttonwillow facility from accepting such waste.

I look forward to working closely with you to protect the health and safety of our California constituents.

Best regards,

BARBARA BOXER,
U.S. Senator.

SAFETY-KLEEN CORPORATE,
October 21, 1998.

Mr. GERARD WONG, *Chief,*
Radiological Materials Licensing Branch,
California Department of Health Services,
Sacramento, CA.

Mr. TONY HASHEMIAN, SR., *Permitting Project Manager,*
California Department of Toxic Substances Control,
Sacramento, CA.

Re: NORM Waste from the U.S. Army Corp of Engineers "Linde Bldg. 30 Demo & Debris Project"

Dear MR. WONG and MR. HASHEMIAN: This letter is a follow-up to the telephone conversation today regarding the acceptance of NORM (i.e. Naturally Occurring Radioactive Materials) at our "Lokern" facility. The "Lokern" facility (i.e. the "Safety-Kleen (Buttonwillow), Inc." facility, previously the "Laidlaw Environmental Services (Lokern), Inc." facility) is a fully permitted RCRA Subtitle C landfill permitted to accept NORM waste, both non-hazardous and hazardous, up to a maximum concentration of 2,000 pCi/g concentration (as per permit condition II.C.1.a of the hazardous waste facility permit issued to the facility). From both a historical waste acceptance perspective and a future waste approval perspective, the Lokern facility can accept NORM waste that meets the following criteria:

1. Meets the limitation of Permit Condition II.C.1.a (i.e. < 2,000 pCi/g concentration); and
2. "Has been cleared by the proper authorities, including any local, state or federal agency either in California or the state of origin, involved with the project such as NRC, DOE, State or City Radiological Health agencies, etc.".

The Lokern facility is fully authorized to accept this NORM material consistent wiht existing permits and authorizations because: 1. The U.S. Army Crop of Engineers' "Linde Bldg. 30 Demo & Debris Project" has been deemed not a regulated source material (i.e. neither "low-level" or "transuranic") under concurrence of the Department of the Army and the NRC; and, 2. The levels of radiological nuclides are well below the 2,000 pCi/g limit (i.e. will not require D.O.T. placarding as a radioactive material).

By copy of this letter, I am informing Mark Sylvester, Program Manager with Radian International (301.584.1678) and contractor to the U.S. Army Corp of Engineers for the "Linde Bldg. 30 Demo & Debris Project", that this waste is acceptable at the Lokern facility subject to all state and RCRA standards (e.g. state and federal waste classification standards, LDR treatment standards, etc,). If any party has additional questions or comments regarding this project please do no hesitate to contact me at 408–451–5082.

Sincerely,

BILL R. ROSS, P.E., *Director,*
Regulatory Affairs—Western Division,
Safety-Kleen Services, Inc.

CALIFORNIA HEALTH AND HUMAN SERVICES AGENCY,
Sacramento, CA, March 10, 1999.

Mr. BILL R. ROSE, P.E., *Director,*
Regulatory Affairs, Western Division,
Safety-Kleen Services, Inc.
Los Angeles, CA.

Dear MR. ROSE: This letter is in reference to your letter of October 21, 1998, to Dr. Gerard Wong of the Department of Health Services (DHS), Radiologic Health Branch (RHB) and Mr. Tony Hashemian of the California Department of Toxic Substances Control regarding the disposal of certain "NORM" materials.

Following discussions with officials in the State of New York, I have concluded that the subject material has been incorrectly characterized.

Please be advised that any naturally occurring radioactive materials in concentrations exceeding the concentrations found in nature are subject to regulation and licensing as radioactive materials in California. The status accorded to a material or waste by another legal jurisdiction has no bearing on this California determination. Disposal of radioactive materials must be at a site that is licensed by this Depart-

ment to dispose of radioactive waste or otherwise approved by this Department. At the present time there is only one site in California licensed to dispose of radioactive wastes from other persons, and that site is not currently built or operating.

The Safety-Kleen (Buttonwillow), Inc., site is not licensed by RHB to dispose of any radioactive waste. In fact, this facility is not even licensed to receive or store radioactive material of any sort. For the facility to receive, store, or dispose of any radioactive waste, including the material described in your letter, would be a violation of California law and would subject you to potential monetary penalties. Such a violation is also a misdemeanor.

I hope that this letter unequivocally states this Department's position regarding the disposal of the wastes alluded to in your letter.

I would appreciate your confirmation that no wastes such as were described in your letter have been received by Safety-Kleen Services, Inc. If you have any questions, please contact me at (916) 322–3482.

Sincerely,

EDGAR D. BAILEY, C.H.P., *Chief,*
Radiologic Health Branch.

DEPARTMENT OF THE ARMY,
CORPS OF ENGINEERS OMAHA DISTRICT,
Omaha, Nebraska, February 13, 1998.

ROBERT L. FONNER, ESQ., *Special Counsel,*
Fuel Cycle, and Safeguards Regulations,
U.S. Nuclear Regulatory Commission,
Rockville, MD.

Dear MR. FONNER: Reference is made to the Formerly Used Sites Remedial Action Program (FUSRAP) which Congress recently transferred from the Department of Energy to the U.S. Army Corps of Engineers (USACE) for execution. As part of the USACE work on FUSRAP projects, we are evaluating the various disposal options for the different waste materials at the sites. There is some question whether the Nuclear Regulatory Commission (NCR) has exercised its regulatory jurisdiction over these sites, or the waste materials from them. This letter is intended to seek a clarification on the position of the NRC regarding its regulatory approach to FUSRAP waste.

There are a number of the sites where processing activities occurred in support of the Manhattan Engineer District (MED) or Atomic Energy Commission (AEC) and which now contain low-activity radioactive material. We are evaluating the alternatives available for off site disposal of materials from these sites. It is our understanding that the NRC does not regulate these sites as a result of the historical MED or AEC activities or require that the materials be disposed at an NRC licensed facility. The following is a list of these sites:

- Ashland 1 & 2
- Seaway
- Linde
- St. Louis Downtown Site (SLDS)
- SLDS Vicinity Properties (VPs)
- St. Louis Airport Site (SLAPS)
- SLAPS VPs

This list does not include all of the FUSRAP sites currently in the program, however it is a list of those sites where processing activities resulted in at least some part of the radioactive materials now requiring remediation under FUSRAP.

The materials at these sites are not source material or special nuclear material as defined in 10 CFR 40.4. Neither do they meet the NCR definition of byproduct material in 10 CFR 30.4, which includes "any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizine special nuclear material". Rather, these wastes were derived from the processing of ore for it source material content during those historical operations in support of the MED or AEC.

In our evaluation of disposal alternatives, we are interested in determining if one of the options may be disposal of FUSRAP materials from these sites at facilities with Resource Conservation and Recovery Act (RCRA) Subtitle C permits, but which do not have NRC or Agreement State licenses. Based on our inquiries to some RCRA hazardous waste disposal facilities, some facility operators may be willing to accept the material for disposal provided we can demonstrate to them that the material is not subject to NRC licensing requirements. To satisfy the concerns of these

potential disposal facilities, it is requested that the following information be provided:

1. Is an NRC license required for handling activities related to disposal of the FUSRAP wastes from the sites listed above?

2. Are there any rules or regulations which would precluded disposal of the FUSRAP wastes described above at a RCRA disposal facility?

We greatly appreciate your efforts regarding this matter. If there are questions or concerns, please contact Ann Wright, HTRW Ceneter of Experise Counsel at (402) 697–2466. Please send your reply to the attention of Ms. Wright.

Sincerely,

MARCIA C. DAVIES, PH.D., *Director,*
USACE Hazardous, Toxic and Radioactive
Waste Center of Expertise.

NUCLEAR REGULATORY COMMISSION,
Washington, DC., March 2, 1998.

Ann Wright, Esq., *Counsel,*
HTRW Center of Expertise,
U.S. Army Corps of Engineers,
Omaha, NE.

Dear MS. WRIGHT: We are replying to Dr. Davies' letter of February 13, 1998, which requested that our reply be addressed to you. Dr. Davies requested responses to two questions regarding the Nuclear Regulatory Commission's position on the relevance of its licensing program or its rules and regulations to the disposal of certain wastes generated in the Corps' administration of the Formerly Utitized Sites Remedial Action Program (FUSRAP). Dr. Davies specifically asked about waste from eight sites listed in her letter (we have assumed that the St. Louis Airport vicinity properties includes the Latty Avenue site). These sites are: Ashland 1 & 2, Seaway landfill, Linde (now Praxair), St. Louis Downtown site, St. Louis Downtown vicinity properties, St. Louis Airport site, and St. Louis Airport vicinity properties. According to our information all of the listed sites are contaminated with residuals from the processing of Congo pitchblende for the Manhattan Engineering District project or shortly afterwards for the Atomic Energy Commission (AEC).

The first question asks: "Is an NRC license required for handling activities related to disposal of the FUSRAP wastes from the sites listed above?

Answer: No NRC license is required for the handling activities for the radioactive residuals at those sites. Prior to the enactment of the Uranium Mill Tallings Radiation Control Act of 1978 (UMTRCA) neither the AEC nor the NRC claimed statutory jurisdiction over the tailings from ore processed for source material. NRC exercised some safety and environmental control over such tailings only in conjunction with the licensed processing of ore for source material, drawing primarily on National Environmental Policy Act requirements for environmental mitigation. UMTRCA gave NRC statutory authority over such tailings, but only over tailings resulting from activities licensed by NRC as of the effective date of the Act (November 8, 1978), or thereafter. See, Section 83 of the Atomic Energy Act of 1954 as amended. Such activities are understood to be the processing of ore or other material primarily for source material. Section 209 of UMTRCA also ordered NRC to consolidate regulation of tailings with the licensing of source material extraction. Regulations for the handling and disposal of such tailings are to be found, accordingly, in 10 CFR Part 40, Domestic Licensing of Source Material, as an adjunct to source material licensing.

Because the residuals at the listed sites were generated long before NRC had any jurisdiction over tailings, and were never produced from source material extraction under NRC license. NRC today has no basis to assert any regulatory authority over the handling of those residuals at the listed sites. *Cf. Bowen* v. *Georgetown University Hospital,* 488 U.S. 204 (1988) (on the issue of retroactive application of rules).

The second qeustion asks: "Are there any NRC rules or regulations which would preclude disposal of the FUSRAP wastes described above at a RCRA disposal facility?"

Answer: There are no NRC rules or regulations that would preclude disposal of the described FUSRAP wastes at a Resources Conservation and Recovery Act (RCRA) diaposal facility. NRC rules on waste disposal in 10 CFR Part 20, Subpart K, Waste Disposal, apply only to licensees disposing of licensed material. As discussed above in answer to the first question, the waste in question is not licensed material. Licensed material is source, by product or special nuclear material within

the licensing competence of NRC. Further, in this context neither the Corps of Engineers nor RCRA permitted sites are licensees of the agency. Accordingly, the restrictions on disposal in Subpart K are not applicable. 10 CFR Part 61 is also not applicable since it applies only to the procedures and requirements for obtaining a license for commercial disposal of licensed source, byproduct and special nuclear material. Restrictions as to waste form and content and manifesting are applicable only to licensed materials shipped by a licensee for disposal at a licensed site. See. 10 CFR 20.20006(a)(1)(i)(effective March 1, 1998). Therefore, we conclude that there are no rules or regulations of the NRC that would preclude disposal of the described FUSRAP wastes at a RCRA site.

For your information, I am enclosing copies of recent correspondence between NRC, The State of New York, and citizen of the State. This correspondence is related to the Tonowanda sites which are included in the list of sites in Dr. Davies' letter, albeit under other names. If you have any further questions, please call me, at (301) 415–1643.

Sincerely,

ROBERT L. FONNER, *Special Counsel,*
Fuel Cycle and Safeguards Regulations.

"DIFFUSE NORM WASTES—WASTE CHARACTERIZATION AND PRELIMINARY RISK ASSESSMENT"—EXECUTIVE SUMMARY

ES.1 INTRODUCTION

In September 1989, the Environmental Protection Agency (EPA) released a preliminary draft risk assessment characterizing generation and disposal practices for wastes that contain relatively low-levels of naturally-occurring radioactive materials (NORM). Such wastes are typically generated in large volumes and, in some cases, may be put to commercial uses instead of being disposed of as wastes. The draft risk assessment report was prepared as an initial step to help determine if standards governing the disposal and reuse of NORM waste and material are warranted. Diffuse NORM wastes and materials are of such large volumes and relatively low radionuclide concentrations that it was deemed inappropriate to include them within the scope of other proposed rulemaking activities. A second draft risk assessment was issued in May 1991. Comments on the draft reports indicated that there was a need to further review the data, assumptions, and models used in those reports, provide additional information on categories of diffuse NORM waste that were not explicitly addressed, and perform additional risk assessments. This report, prepared in response to those recommendations, presents the results of further characterization efforts and an updated and revised risk analysis. As with the earlier reports, the analyses presented here are only intended to help EPA decide whether regulations for diffuse NORM need to be developed. If EPA decides regulation is warranted, a much more detailed and complete risk analyses will be developed and presented in a Background Information Document that will accompany proposed regulations.

ES.2 WASTE VOLUME AND ACTIVITY SUMMARY

All soils and rocks are known to contain some amounts of naturally-occurring radioactive material (NORM). The major radionuclides are uranium and thorium, and their respective decay products. Radium, one of the decay products, and its subsequent decay products, are the principal radionuclides of concern in characterizing the redistribution of radioactivity in the environment by human activity. Radium is normally present in soil in trace concentrations of about one picocurie per gram (pCi/g). Certain industrial processes, however, tend to concentrate the radioactivity to much higher levels in the resulting waste or byproduct material. Other industrial processes may simply make it more accessible to humans. Such processes include mining and beneficiation, mineral processing, coal combustion, and drinking water treatment, among others. Some of the NORM wastes or materials are generated in large quantities and are typically disposed or stored at the point of generation. At times, however, NORM materials and wastes are used in various applications instead of being disposed. Both disposal and reuse may result in unnecessary radiation exposures, potential adverse health effects, and environmental contamination.

NORM waste generation, reuse, and disposal practices are characterized in this report for eight NORM sectors. The largest inventories of NORM waste are associated with metal mining mineral processing, phosporous production, uranium mining, and ash from coal combustion in utility and industrial boilers. Each of these processes generates large volumes of waste with annual production rates of several

million metric tons. Annually, these NORM sectors can generate in excess of one billion metric tons of waste. Smaller amounts of wastes are generated by the petroleum industry as oil and gas pipe scale and sludge, from geothermal energy production, and by drinking water treatment facilities. Phosphate fertilizers, while not a waste, are included in this analysis for perspective because of their elevated radium concentrations. It is estimated that nearly 5 million metric tons of these fertilizers are applied to agricultural fields annually.

Section ES.2 presents a summary of NORM waste generation practices, annual waste generation rates, and average NORM radionuclide concentrations, as summarized in Table ES–1. Utilization practices are discussed in Section ES.3 and the preliminary risk assessment is summarized in Section ES.4.

The Martha Oil Field, located in northeastern Kentucky, occupies an area in excess of 50 square miles. Oil production began in the early 1920's and secondary recovery operations or waterflooding commenced in 1955. Ashland Exploration, Inc., operated UIC-permitted injection wells in the area. Approximately 8,500 barrels of fresh water were being injected per day at an average pressure of 700 pounds per square inch. Several field investigations were conducted by the U.S. Environmental Protection Agency, Region IV, to appraise the potential for the extent of contamination of ground-water resources. Field inspections revealed widespread contamination of underground sources of drinking water (EPA87).

Finally, there have been a number of other isolated cases where the improper disposal of NORM waste has resulted in increased direct radiation exposures. The use of elemental phosphorus slag to construct roads in Pocatello, Idaho, has resulted in increased radiation exposures to twice background levels in some areas.[1] In Mississippi, the use of pipes contaminated with radium scale in playground-equipment, fences, and welding classes has resulted in unnecessary radiation exposures to students using that equipment.[2]

4. CURRENT FEDERAL REMEDIAL PROGRAMS DEALING WITH NORM WASTE

In addition to the sources of NORM waste discussed in this report, there are a number of other projects currently being managed under several Federal programs implemented specifically to mitigate potential public health and environmental impacts from numerous NORM contaminated sites. It should be noted that these programs were designed to target similar types of public health and environmental concerns, as is addressed in this report. For illustrative purpose, such Federal programs include:

- The DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP).
- Sites on the National Priority List (NPL) associated with the presence of elevated levels of naturally occurring radionuclides.
- DOE's Uranium Mill Tailings Remedial Action Program (UMTRCA).

Each of these programs has been under way for several years with a large number of sites having been fully characterized and remediated. In addition, exposure and risk assessments for members of the public have also been performed. They established a base of technical experience and regulatory precedents that may be useful in evaluating the potential risks associated with other NORM contaminated sites or waste generation sector. This section briefly describes these three programs and summarizes some of the experiences at selected sites.

4.1 FUSRAP Program

FUSRAP is a DOE program concerned with sites that were formerly utilized to support the nuclear activities of DOE's predecessor agencies, the Manhattan Engineering District and the Atomic Energy Commission (DOE90), The sites were primarily privately or institutionally owned and used for research, processing, and storage of uranium and thorium ores, concentrates, and residues. When these facilities were no longer needed, they were decontaminated in accordance with guidelines acceptable at the time. However, under today's more restrictive environmental standards, the Federal government has established a program to re-evaluate 31 sites (DOE90). As a results, FUSRAP was initiated in 1974 to identify and characterize candidate sites, develop, and implement remediation programs.

The majority of the FUSRAP sites are concerned with uranium and thorium contaminated soils, although some sites still have a few of the original facilities and structures. Also, some of the FUSRAP sites are concerned primarily with radium-226 and involve contaminated soils that have been moved offsite and used as backfill materials in vicinity properties. One such site is the former Vitro Rare Metals

[1] Personal communication, Donald Hendricks, July 27, 1988.
[2] Personal communication, Eddie Fuentes, State Department of Health, Jackson, MI, February 19, 1988.

Plant in Canonsburg, PA. The plant was operated by Standard Chemical Company and some time after 1911, Standard Chemical began extracting radium as bromide or sulfate from carnotites ore at this site. The property was purchased by Vitro Rare Metals Company in 1922.

From 1930 to 1942, Vitro extracted radium and uranium salts from onsite residues and carnotite ore. Form 1942 to 1957, operations were shifted to the recovery of uranium from various ores, concentrates, and scrap materials under Manhattan Engineer District and Atomic Energy Commission contracts. During the early years of World War II, the Vitro Plant processed a substantial portion of the high-grade Congo uranium ores and nearly all of the Vanadium Corporation of America's uranium bearing sludge. The last Atomic Energy Commission contract with Vitro ended in 1957. Since then, the property has changed owners several times and has been leased to tenant companies for light industrial uses.

The original facility consisted of 18 buildings on an 18-acre site. Solid wastes were accumulated in mounds located away from the site buildings. Early survey work indicated that adjacent roads and fields showed above background radiation levels, suggesting that waste material had eroded from its original position or was used for fill.

Between October 1956 and January 1957, about 6,000 tons of waste residue containing 0.0097 percent U_3O_8 were removed for disposal from the Vitro site with the approval of the AEC's Oak Ridge Operations Office. The waste residues were dumped into a landfill on a Pennsylvania Railroad property in Burrell Township, PA.

A subsequent review of the Canonsburg records under the Atomic Energy Commission and the Energy Research and Development Administration (now (the DOE) site survey program indicated a lack of sufficient data to verify that existing conditions at the site were radiologically acceptable. Oak Ridge National Laboratory conducted several radiological surveys of the Canonsburg Industrial Park from March through July 1997. The program assessed radon and decay product concentrations in buildings, surface and subsurface contamination levels on and near the site, radiation levels above the surface on and near the site, and radon concentrations near the site.

ENVIRONMENTAL PROTECTION AGENCY,
Sacramento, CA, September 16, 1996.

Mr. GERALD C. WONG., Ph.D., *Chief,*
Department of Health Services,
Sacramento, CA.

Re: The Hazardous Waste Facility Permit (HWFP) for the Laidlaw Environmental Services Inc., (Imperial Valley) Facility (Facility), located in Imperial Valley EPA I.D. No. CAD000633164

MR. WONG: It was a pleasure talking to you on the phone this morning. Enclosed please find a copy of the final Hazardous Waste Facility Permit (HWFP) for the above reference Facility.

Permit condition III.A.6.b identifies "Radioactive Materials and/or wastes" as a prohibited waste. This permit condition is intended to preclude the Facility's acceptance of high level and low-level source wastes which are regulated by the Nuclear Regulatory Commission under the Code of Federal Regulations (CFR) Parts 10 and 20.

The Facility historically and presently accepts wastes from the petroleum and geothermal industries which contain concentrated levels of Naturally Occurring Radioactive Materials (NORMs). The Facility's HWFP would also authorize the acceptance of radionucleides that have decayed through numerous half-lives such that the waste "no longer spontaneously emits significant levels of ionizing radiation".

The Department of Toxic Substances Control defers to the Department of Health Services, Radiological Materials Branch for the definition of when a radiological material has decayed to the point that it "no longer emits significant levels of ionizing radiation". Such a material would no longer be considered a "radioactive waste" as defined in the Health and Safety Code 114710(g), and could be accepted at the Imperial Facility.

If you have any questions concerning this issue please contact me at (916) 255–3581.

Sincerely,

CHARLES SNYDER,
Hazardous Substances Engineer.

TEXAS DEPARTMENT OF HEALTH,
Antonio, TX, October 27, 1999.

GREGORY E. JOHNSON, P.E., *Chief,*
Department of the Army,
Baltimore, MD.

Re: Concurrence of Exemption for Contaminated Metal Waste (Concrete and Soil) from the W.R. Grace Facility

DEAR MR. JOHNSON: This is in response to your letter dated October 12, 1999, requesting concurrence that waste contaminated with low-levels of radioactive material are exempt under Texas Regulations for Control of Radiation.

My staff has reviewed the data you submitted and agrees that the concentration of radioactivity in the waste you propose to ship to Waste Control Specialists, Andrews County, TX, is below the limit of Naturally Occurring Radioactive Material and is exempt from regulations under Title 25 Texas Administrative Code 289.259(d).

Relative to the concentration of radioactive material contained within the material described within your letter dated October 12, 1999, the Bureau of Radiation Control, therefore, concurs that the waste may be disposed of without regard to its radioactivity.

If you have any questions, please contact Mr. Pete Myers, Deputy Division Director for Licensing, (512) 834–6688 extension 2209 or Pete.Myers@tdh.state.tx.us.

Sincerely,

RICHARD A. RATLIFF, P.E., *Chief,*
Bureau of Radiation Control.

Mr. RICHARD RATLIFF, *Bureau Chief,*
Texas Department of Health,
Austin, TX.

DEAR MR. RATLIFF: The purpose of this correspondence is to request your concurrence with our intent to ship certain radiologically contaminated waste from the W.R. Grace facility, Curtis Bay, MD, Formerly Utilized Sites Remedial Action Program (FUSRAP) site (WR Grace Site) to the Waste Control Specialists LLC (WCS), Andrews County, TX facility.

We have an estimated 150 cubic yards of building rubble and soils containerized in preparation for disposal. The building rubble and soils came from the renovation of portions of building 23 at the WR Grace Site. The building debris and soils will be repackaged for safe and efficient transportation. Enclosure A provides background information regarding the WR Grace Site history, license considerations, material characterization, and data sheets.

The building debris and soils contain trace quantities of byproduct material. The Nuclear Regulatory Commission (NRC) has issued a directors decision under 10 CFR 2.206 (Enclosure B), which states the NRC has no regulatory jurisdiction over byproduct material, as defined in 11(e)(2) of the Atomic Energy Act of 1954 as amended (AEA), which was generated prior to 1978. The Texas Administrative Code defines materials not regulated under the AEA, whose radionuclide concentrations have been increased by or as a result of human practices as naturally occurring radioactive material (NORM). The building debris and soils are also exempt from NORM licensing pursuant to 25 Texas Administrative Code § 289.259(d). Furthermore, the material does not required manifesting pursuant to 10 CFR § 20.2006.

Therefore, unless your Bureau has any objections, we intend to ship the building debris and soils to the WCS facility, which is permitted to accept trace quantities of NORM, as soon as possible.

We look forward to your concurrence with our proposed approach. Please advise us in writing if this approach is acceptable. If you have any questions, please call me at 410–672–2207 or our technical point of contact, Mr. Hans Honerlah, at 410–962–9184. Thank you for your consideration in this matter.

Sincerely,

GREGORY E. JOHNSON, PE, *Chief,*
Hazardous, Toxic and Radiological Waste Branch,
USACE, Baltimore District.

RESPONSES BY RICHARD MESERVE TO QUESTIONS FROM SENATOR BENNETT

Question 1. Would you agree that the Commission should rethink its reluctance to regulate pre-1978 material?

Response. In addition to your letter, the Commission has received a number of other inquiries relating to its position on the pre-1978 material. In light of the concerns expressed by the various stakeholders, the Commission is well aware of the differing views on this important issue. A legislative solution would be the most direct approach to clarifying the NRC's responsibilities under UMTRCA.

Question 2. Would you agree that NRC licensing requirements for this material are more protective of public health and the environment than RCRA requirements?

Response. Both RCRA landfills and NRC-licensed disposal facilities are protective. In general, I believe that NRC-regulated and licensed disposal facilities, because they are subject to requirements that focus on protection of public health, safety, and the environment from radiological hazards, may afford more protection against radiological hazards.

Question 3. Would you agree that the decision in *Kerr-McGee* v. *NRC* (903 F.2d 1, D.C. Cir. 1990) supports NRC regulating all FUSRAP waste?

Response. Yes. I believe the decision in *Kerr-McGee* v. *NRC* does tend to support the NRC regulation of pre-1978 FUSRAP waste. However, this specific issue was not addressed by the court. Consequently, there is ambiguity as to the extent of the NRC's authority in this area. Thus, a legislative solution is the most direct approach to clarifying the NRC's responsibilities under UMTRCA.

Question 4. Would I, as NRC Chairman, support legislation that would absolutely make clear that pre-1978 FUSRAP waste should be regulated and disposed in licensed sites?

Response. If Congress believes that the NRC should regulate such waste, I stand ready to assist the Congress in amending UMTRCA. The NRC would need additional resources to regulate pre-1978 material.

○