

# RFCA Stakeholder Focus Group Meeting Agenda

**When:** December 13, 2000, 3:00 - 6:30 p.m.

**Where:** Broomfield Municipal Hall, Bal Swan and Zang's  
Spur Rooms

3:00 Introductions, Agenda Review, 11/29 Meeting Minutes Review

3:10 Open Discussion – Focus Group

4:00 RFCA Peer Review Meeting Update - Mary Harlow

4:15 Regulatory Analysis - Group Discussion

5:10 Break

5:30 Model Evaluation - Group Discussion

6:20 Topics for Upcoming Meetings

6:30 Adjourn

**RFCA Stakeholder Focus Group  
Attachment A**

Title: Agenda for December 13, 2000 Focus Group Meeting

Date: December 6, 2000

Author: C. Reed Hodgins  
AlphaTRAC, Inc.

Phone Number: (303) 428-5670

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**RFCA Stakeholder Focus Group**  
**December 13, 2000**  
**Meeting Minutes**

**INTRODUCTION AND ADMINISTRATIVE**

A participants list for the December 13, 2000 Rocky Flats Cleanup Agreement (RFCA) Stakeholder Focus Group meeting is included in this report as Appendix A.

Reed Hodgkin, Facilitator, reviewed the purpose of the Focus Group. He also reminded the Focus Group that everyone participating in the discussion should have read and understood the pre-discussion materials, and have asked questions as necessary, so that they are prepared to talk at the policy level about the issues in today's meeting.

Reed reminded the group that it was decided at the November 29, 2000 RFCA Stakeholder Focus Group meeting to combine the technical and the main sessions into one main session.

Reed summarized today's agenda:

- An open discussion where both technical and policy discussions may be held on the issues before the Focus Group,
- A proposed approach for selecting land use scenarios and target risk levels, brought to the group by Victor Holm,
- An update on the peer review process for the RFCA Agency Radioactive Soil Action Level (RSAL) review,
- Conclude the Focus Group discussion on the draft regulatory analysis report (Activity 1) from the RSAL review project, and
- A group discussion on the draft Model Evaluation report (Activity 2) from the RSAL review project.

A member of the Focus Group asked how the group would get feedback on its input to the draft reports. Reed responded that There are three ways in which members would get feedback. One is the dialogue in the Focus Group meetings, talking directly with

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the agencies and with each other. The Focus Group also has an ongoing process in place where the three agencies formally report on how the group's input is influencing decisions. The third method of feedback will be the revised drafts of the RSAL reports. Focus Group members should see their comments reflected in the revised reports, or, as needed, be able to ask for specific explanations of why their input was not directly used.

The November 29, 2000 RFCA Stakeholder Focus Group meeting minutes were reviewed and approved with the following modifications:

Dave Abelson of RFCLOG had the following suggestions and corrections:

- A key conversation wasn't captured properly in the minutes: the discussion where the Nuclear Regulatory Commission (NRC) rule is geared towards the goal of unrestricted clean-up.
- On page 8 of the minutes, the first question didn't really capture the flavor of the discussion; i.e., the NRC rule has capability as an ARAR to determine soil action levels (SALs), but it also has the capability to question the final clean-up levels. That needs to be filled out more.

A member of the Focus Group expressed concern that the question / answer format of portions of the minutes does not capture the full sense of the discussion. Reed responded that the question / answer format was used in the minutes to provide specific input to the agencies about the draft regulatory analysis report.

It was also noted that an incomplete sentence exists at the bottom of Page 7 in the minutes.

The corrections will be addressed and a revised set of minutes placed on the Rocky Flats Environmental Technology Site's (RFETS') RFCA Stakeholder Focus Group website, <http://www.rfets.gov/PublicItems/StakeFocusGroup/index.htm>.

## **REGULATORY ANALYSIS – GROUP DISCUSSION**

The Focus Group continued its discussion from the November 29, 2000 RFCA Stakeholder Focus Group meeting of the draft Regulatory Analysis report for the RSAL review. The group began its discussion with a proposed approach for establishing land use scenarios linked to target risk levels. The approach was presented by Victor Holm and documented in the pre-meeting packet.

Victor indicated that he was searching for a way to establish risk levels and land use scenarios as a policy decision prior to performing modeling and calculating RSAL values. In this approach, a spectrum of land uses would be identified, to include the nearby resident, the onsite resident (rancher, suburban, etc.), and the anticipated user (probably the Wildlife Refuge Worker).

He suggested that a threshold risk level within the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) risk range of  $10^{-4}$  –  $10^{-6}$  be pre-determined for each land use scenario in two ways:

- Relate a risk level to the land use scenario based on qualitative population size for each land use, and
- Relate a risk level to land use scenario based on the probability of the land use occurring.

Victor emphasized that all land use scenarios would have to AT LEAST meet the CERCLA threshold of  $10^{-4}$ . He stated that his proposal goes beyond CERCLA's acceptable level, imposing specifically more restrictive risk thresholds for land uses that involve more people. Land use scenarios involving relatively few persons would have pre-determined risk thresholds toward the  $10^{-4}$  end of the acceptable range. As land use scenarios involved more and more persons, the acceptable risk threshold would become more and more stringent, moving progressively toward the  $10^{-6}$  end of the acceptable range. Victor proposed that, for instance, nearby residents should be protected to a risk level of  $10^{-6}$ .

In this approach, an RSAL would be calculated for each land use / risk combination. The most restrictive (lowest) resulting RSAL would be adopted.

The second part of Victor's proposed approach would relate the risk level for a land use to the probability of the land use occurring. Less likely land uses (e.g., the Resident Rancher) would be assigned risk thresholds within the CERCLA range, but more toward the  $10^{-4}$  boundary. More likely land uses (such as the Anticipated User) would be assigned risk thresholds more toward the  $10^{-6}$  end of the CERCLA range.

The Focus Group discussed Victor's proposal following his summary.

It was asked if the approach involved looking at population risk instead of individual risk, and what the pros and cons of each were. Victor responded that population size is addressed in the definition of risk (e.g.,  $10^{-4}$  means 1 cancer per 10,000 persons). He indicated that population was being used qualitatively in his approach to set the allowable risk level so that large populations got even more protection than the CERCLA acceptable level.

A member of the Focus Group expressed concern that this approach appeared to allow greater risk for an individual of a small land use group than for an individual in a large land use group. Victor responded that all land users would be protected to the CERCLA acceptable level, but that this approach would reduce the overall cancer risk in the whole population. He indicated that this method would produce more protective risk thresholds than the minimum allowed by CERCLA.

The Focus Group discussion then broadened to include other land use scenarios and analysis approaches.

A member of the Focus Group stated that the RSAL analysis should be based on the most restrictive potential land use (presumably a Resident Rancher or similar user) for two reasons:

- If the potential population group with the highest risk is protected, all other groups will be protected, and
- The large uncertainties in the analysis and prediction of future conditions warrants a very conservative approach.

Another member of the Focus Group indicated that these approaches seemed to conflict with the approach put forward by the agencies: set the RSAL to protect the anticipated future user (probably Wildlife Refuge Worker), then use as low as reasonably achievable standards (ALARA) to clean up more as appropriate. The key conflict is that the Agencies would start with an RSAL based on a  $10^{-4}$  risk, then use ALARA to reduce the risk further. It was noted that the unrestricted use scenario could be used as a goal for the ALARA portion of the assessment (cleanup to unrestricted use if reasonably achievable on a case-by-case basis). It was stated that Victor's multiple land use approach would not necessarily be inconsistent with the Agencies' proposal, depending on how it was applied.

The U. S. Environmental Protection Agency (EPA) was asked how EPA had selected a value in the risk range for it's cleanups. Karen Reed responded that risk values are determined on a site-by-site basis.

Carl Spreng of the Colorado Department of Public Health and Environment (CDPHE) was asked to summarize experiences in selecting risk thresholds at other sites. He stated that the Fernald site first protected the onsite worker, then examined offsite population groups to ensure that their risks were within the CERCLA range. Weldon Springs calculated risks for a spectrum of use scenarios, then examined the results.

Several members of the Focus Group and the agencies confirmed a need to calculate RSALS based on both risk and on dose, then adopt the more restrictive result. It was noted that the Oak Ridge Reservation had calculated RSALs based on both dose and risk. Which method was more conservative varied from isotope to isotope. The agencies confirmed that the dose and risk calculations would be performed independently (e.g., dose results would not be simply converted to risk).

The Agencies indicated that the 25 mrem dose limit established in the NRC rule would be the basis for the dose portion of the analysis.

A member of the Focus Group stated concern that the NRC dose standard of 25 mrem relates to a higher risk than the CERCLA range. CDPHE responded that the relationship between dose and risk is isotope-specific and the results would have to be calculated and then evaluated specifically for RFETS.

A member of the Focus Group expressed concern about the dose conversion factors and slope factors used in the modeling analyses, especially a potential change from International Council on Radiation Protection (ICRP) 30 dose conversion factors to those in ICRP 72. The credibility of some of the assumptions in the ICRP 72 methodology was questioned. It was noted that ICRP 72 methodology was used in the Risk Assessment Corporation (RAC) analysis and had been adopted as part of the NRC rule. The group agreed that it should be briefed on and discuss dose conversion factors and slope factors as a special topic in a future meeting.

Joe Legare of the U.S. Department of Energy (DOE) sketched and discussed a summary diagram of the process for the group. He indicated that the RSAL, CERCLA Criteria, ALARA, and Protection of Surface Water standard would all feed into a cleanup strategy for each Individual Hazardous Substance Site. The MINIMUM cleanup will be that which is triggered by the RSAL. CERCLA Criteria, ALARA, and Surface Water Protection will lead to more restrictive cleanups on an individual site basis. Once all of the strategies are defined, a Comprehensive Risk Assessment will be performed to ensure that the collective risk is within the CERCLA range. If the collective risk is not low enough, it will be necessary to modify the individual cleanup plans to lower the overall risk. Finally, the CERCLA requirement for 5 year reviews will initiate periodic reassessments of the cleanup, including strategy effectiveness, risk reduction, surface water protection, and ALARA. It may be that the CERCLA review interval of 5 years is not rapid enough. The Focus Group will need to examine this part of the process as well.

The need for the agencies and the Focus Group to address application of ALARA was discussed. The agencies indicated that ALARA would not be part of the RSAL setting

process, but would be applied to remedies once the RSAL had been used to define the minimum allowable cleanup. The agencies must work with the community to define how ALARA will be designed and implemented for RFETS. The Focus Group will play a key role in this discussion. The ALARA approach must be in place before the Interim Measure / Interim Remedial Action (IM / IRA) for the 903 Pad is drafted. A member of the Focus Group suggested that ALARA would be a good topic for an all-day workshop.

A member of the Focus Group indicated that it would be helpful to the community if the Agencies proposed as part of the Regulatory Analysis Report specific dose criteria and land use scenarios that would bound the analysis. This would define the "bottom line" cleanup from which ALARA would proceed.

CDPHE reflected that the idea heard from several Focus Group members would be to clearly establish dose and risk standards, evaluate a number of land use scenarios, compare the results for these scenarios to the standards, and plan a path forward from that point.

Reed asked the agencies if they had enough input from the Focus Group to prepare the next draft of the Regulatory Analysis report. DOE, EPA, and CDPHE confirmed that the input was sufficient to create the next draft.

## **RSAL PEER REVIEW UPDATE**

Mary Harlow, City of Westminster, described the status of the Peer Review process (Appendix B).

The Peer Review Process group held a conference call on Friday, December 8, 2000. The group selected primary and alternate peer reviewers for Activities 1 through 4. Jeremy Karpatkin, DOE, has been working with AlphaTRAC, Inc. to define process management for the peer review.

AlphaTRAC, Inc. is in the process of contacting the candidate peer reviewers to determine their availability and interest in this project and to interview them. The process is on track.

The Peer Review Process group needs input from this Stakeholder Focus Group to the following questions:

1. Activity 1: Regulatory Analysis: What questions will we ask the peer reviewers?
2. Activity 2: Computer Model Evaluation: What topics do you want discussed at the first workshop?
3. Activity 2: What date / time would you like to hold the first workshop?

The Peer Review process group is looking at the first two weeks in February 2001 for the first of two workshops, and the last part of April 2001 for the second workshop, which would be on the ALARA process.

A member of the Focus Group asked for the names of the peer reviewers. It was stated that the peer reviewers would be anonymous in order to ensure an impartial review.

## **ANNOUNCEMENT**

Joe Legare, DOE, made an announcement that Paul Hartmann has been promoted to an oversight function within DOE at RFETS. DOE will be finding a replacement for Paul in the RFCA Stakeholder Focus Group and will inform the group through AlphaTRAC.

## **MODEL EVALUATION GROUP DISCUSSION**

Reed asked each of the RFCA Agencies to express their objectives for the Model Evaluation discussion:

EPA: We're looking at the various models to be sure that we understand the models that are available and that we are comfortable with what's going to be selected. The input needed from this Group is: is there any reason from this Group's standpoint to not go ahead and use the RESRAD 6.0 model? If not, then the plan is to go forward with the model.

DOE: In order for us to choose the most appropriate model, we had to go through an analysis to evaluate each of the models that are out there. The input that DOE wants from the stakeholders is: have we succeeded in identifying the most appropriate model? In my evaluation, RESRAD was chosen by the RAC. It was modified by RAC. The basic platform was agreed or accepted by RAC so I thought that was a good starting point. There were some changes that RAC did and we think that the new RESRAD 6.0 has pretty well encompassed what RAC did independently, including a probabilistic approach and a new air resuspension module. We think we got where we need to be right now.

CDPHE: We shouldn't need to spend a great deal of time on this analysis. A working group that the agencies had when the oversight panel was looking at soil action levels a couple of years ago spent a whole lot of time looking at the available models.. The RESRAD model was the one that RAC chose to use, so we felt we should probably go with that. We wished to determine if the new 6.0 version of RESRAD included the main features of the RAC modification (probability and air resuspension) in a way comparable to RAC.

Reed summarized the objective for the Focus Group discussion: take the analysis that was performed in Draft 1 of the Model Evaluation Report and answer the question: did the analysis lay out the models so that they could be evaluated properly and was the right model chosen in this analysis?

The Focus Group then discussed the Model Evaluation report.

A member of the Focus Group asked about verification and validation of RESRAD 6.0. DOE indicated that the model had been verified and validated, but that the NRC was conducting an additional analysis as part of its formal adoption of the model. DOE

agreed to make the results of the verification and validation available to the Focus Group.

A member of the Focus Group referred to EPA's statement that it wished to develop a level of comfort with the RESRAD model and asked EPA to discuss what it meant by "comfort." A dialog on this topic occurred. Reed summarized that EPA's definition of comfort was "an understanding of what's going on in the model and why it's doing what it's doing and that it's producing results that are reasonable and well understood." EPA further stated that it would be comfortable when it had determined the weaknesses and strengths of the model and had satisfied itself that the weaknesses were tolerable.

Russell McCallister of DOE summarized the Model Evaluation report for the Focus Group. He indicated that the models evaluated were similar. There were three primary reasons for selecting RESRAD 6.0:

- The community is familiar with the RESRAD model,
- Version 6.0 of the model incorporates key new features that were employed by RAC in its analysis, and
- The NRC appears to be moving strongly to RESRAD 6.0 for its analyses.

A member of the Focus Group asked if RESRAD could evaluate the groundwater pathway. Russell indicated that it could. The Focus Group asked that this pathway be considered in the RESRAD calculations.

It was noted that an independent review of the air resuspension module in RESRAD would be conducted and included in the next revision of the Model Evaluation Report.

A member of the focus group emphasized the importance of understanding the sensitivity of the RESRAD model to inputs and pathways, especially as related to air resuspension. It was suggested that the RAC analysis of this area be carefully examined.

A member of the Focus Group asked if the Agencies were proceeding with the RESRAD 6.0 model. DOE responded that work had begun using RESRAD 6.0, and that this was the model of choice pending the results of the air resuspension review.

A member of the Focus Group emphasized the need to verify that the dose conversion factors used in the model were appropriate. A full discussion of whether to use ICRP 30 or ICRP 72 factors was requested.

Reed asked the members of Focus Group if there were other comments concerning the Agencies' choice of RESRAD 6.0 for the modeling analysis. There were no additional comments.

## TOPICS FOR UPCOMING MEETINGS

Reed indicated that the primary topics for the January 3, 2001 meeting would be New Science and the Peer Review Process. DOE suggested adding a presentation and discussion on the Industrial Area Sampling and Analysis Plan as it appeared time would allow. The Focus Group agreed to this suggestion.

Reed confirmed that there had been expressed a need to talk about slope factors and dose conversion factors and promised to place this topic on a future agenda for the group.

Reed then asked the group if cleanup levels at other sites needed to be discussed further. The members agreed to place the discussion on hold and revisit it when the RSALs and ALARA discussions are further along.

## ADJOURN

The meeting was adjourned at 6:30 p.m.

**RFCA Stakeholder Focus Group  
November 29, 2000  
Meeting Minutes**

**Appendix A  
Participants List**

**RFCA Stakeholder Focus Group  
November 29, 2000  
Meeting Minutes**

**Appendix B  
Mary Harlow: RSAL Peer Review Process**

## RFCA Stakeholder Focus Group 12/13/00 Meeting Participant's List

NAME		ORGANIZATION / COMPANY
David	Abelson	RFCLOG
Christine	Bennett	AlphaTRAC, Inc.
Laura	Brooks	Kaiser-Hill Company, LLC
John	Corsi	Kaiser-Hill Company, LLC
Gerald	DePoorter	RFCAB
Rick	DiSalvo	US DOE - RFFO
Sam	Dixion	City of Westminster
Shirley	Garcia	City of Broomfield
Joe	Goldfield	RFSALOP
Steve	Gunderson	CDPHE
Mary	Harlow	City of Westminster
Jerry	Henderson	RFCAB
Reed	Hodgin	AlphaTRAC, Inc.
Victor	Holm	RFCAB
Jeremy	Karpatkin	US DOE - RFFO
Ken	Korkia	RFCAB
Joe	Legare	DOE
Ann	Lockhart	CDPHE
Carol	Lyons	City of Arvada
John	Marler	RFCLOG
Russell	McCallister	DOE-RFFO
Gary	Morgan	DOE-RFFO
Diane	Niedzwiecki	CDPHE
Karen	Reed	EPA
Rick	Roberts	RMRS
Dave	Shelton	Kaiser-Hill Company, LLC
Carl	Spreng	CDPHE
Noelle	Stenger	RFCAB
Honorable Hank	Stovall	City of Broomfield

**RFCA Stakeholder Focus Group  
Attachment B**

Title: Meeting Minutes for December 13, 2000 Focus  
Group Meeting

Date: December 26, 2000

Author: C. Reed Hodgkin  
AlphaTRAC, Inc.

Phone Number: (303) 428-5670

Email Address: [cbennett@alphatrac.com](mailto:cbennett@alphatrac.com)

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**RFCA Stakeholder Focus Group  
Attachment C**

Title: Paragraph 254 of the Rocky Flats Cleanup Agreement

Date: December 6, 2000

Author: Christine Bennett  
AlphaTRAC, Inc.

Phone Number: (303) 428-5670

Email Address: [cbennett@alphatrac.com](mailto:cbennett@alphatrac.com)

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SECRET

## Part 20 Periodic Review

254. The EPA and CDPHE will, pursuant to CERCLA section 121(c), review any remedial action associated with any final ROD that results in any hazardous substances, pollutants, or contaminants remaining on-site, no less often than every five years after the initiation of such final remedial action to assure that human health and the environment are being protected by the remedial action being implemented. To the extent that remedies have incorporated institutional controls, EPA shall review the continuing effectiveness of such controls, and shall evaluate whether additional remedial action could be taken that would reduce the need to rely on institutional controls. In making such an evaluation, EPA shall consider all relevant factors, including advances in technology and the availability of funds. If upon such review EPA finds that further remedial action by DOE is warranted to assure the protection of human health and the environment, DOE shall, consistent with sections 104 and 106 of CERCLA, implement remedial actions necessary to abate any release or threat of a release of a hazardous substance. The Parties agree that Part 19, shall not be construed as a limitation on the requirement for further remedial actions which might be required as a result of the five-year review mandated by CERCLA section 121(c). Part 10 shall be used to incorporate any requirement for further remedial actions.

**RFCA Stakeholder Focus Group  
Attachment D**

Title: Candidate Peer Reviewers for RSAL Review

Date: December 6, 2000

Author: Christine Bennett  
AlphaTRAC, Inc.

Phone Number: (303) 428-5670

Email Address: [cbennett@alphatrac.com](mailto:cbennett@alphatrac.com)

10/08 1020 Marty Redding called.

Bob Hammer referred him to me.

(303) 797-1468

10/26/1999 1230 MDT

CRH called. Got: VM Left msg for call on cell phone.

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Bill Cote  
Tetrattech

(303) 312-8829

10/26/1999 1232 MDT CRH called. Got: Bill

Arsenal: Cliff Cole (TRC) Foster Wheeler now.

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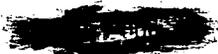
Cliff Cole

Foster Wheeler

(303) 289-0800  
(303) 988-2202

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1/4



(303) 796-7639 (H)

10/26/1999 1237 MDT

CRH called. Got: N/A

10/28/99 1445 MDT

CRH called. Got: Secy. Cliff no longer works there. No forwarding information.

10/28/99 1455 MDT

CRH called Cliff at home. Got: VM. Couldn't leave message.

10/29/99 0740 MDT

CRH called Cliff at home. Got: VM. Couldn't leave message.

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Bob Pearson

Radian Corporation

(303) 675-2631

10/28/99 1430 MDT

CRH called. Got: VM. Asked for call on cell phone.

10/28/99 1620 MDT

Bob called on cell phone.

Suggested possibly Bob Hammer – Tetrattech

Also suggested John Crouse as a contact for ideas only.

JMC Consulting

(303) 639-5144

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Ralph Peterson  
CH2MHill

(303) 771-0900

10/28/1999 1530 MDT

CRH called. Got: Secy. Asked for call on cell phone.

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Gale Biggs

(303) 494-4288

10/28/1999 1550 MDT

CRH called. Got: VM. Left message for call on cell phone.

10/29/1999 1125 MDT

CRH called. Got: Gale.

Knows someone who may be interested. Will talk to him and let me know.

Also: Bob King – Public Service. Has just taken over chair of AWMA local.

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Ralph Porter  
Woodward Clyde

740-2600

10/28/1999 1529 MDT  
CRH called. Got: Secy. No Ralph Porter there.

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Doug Fox

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John Crouse - contact for ideas only.

JMC Consulting

(303) 639-5144

Referred by Bob Pearson

10/29/99 1213 MDT  
CRH called. Got: VM. Left msg for call on cell phone.

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Bob King

Public Service Company

(303) 571-7760  
(303) 556-1758 (pager)

Referred by Gale Biggs.  
Has just taken over chair of AWMA local.

10/29/1999 1219 MDT

CRH called. Got: VM. Left msg for a call on cell phone.

**RFCA Stakeholder Focus Group  
Attachment E**

Title: RSAL Review Schedule

Date: December 6, 2000

Author: John Corsi  
Kaiser-Hill Company, LLC

Phone Number: 303 966-6526

Email Address: john.corsi@rfets.gov

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**DRAFT RSAL Public Process Proposed Schedule (Rev. 2, 11/29/00)**

Tasks	First Draft Distributed	Focus Group Meeting	Second Draft	Focus Group Meeting	Draft to Principals
Review process		CAB Meeting: 10/5/00 Focus Group: 10/25/00			
Task One (Regulatory Analysis)	10/27/00	11/8/00 and 11/29/00	1/3/01	1/31/01 & 2/28/01	3/15/01
Task Two (Model Evaluation)	11/20/00	12/13/00	1/3/01	1/31/01 & 2/28/01	3/15/01
Task Three (Parameter Evaluation)	1/26/01	2/14/01 and 3/14/01	4/6/01	4/25/01 and 5/9/01	5/16/01
Task Four (New Science)	11/3/00	12/13/00	1/3/01	1/31/01	2/15/01
Task Five (Cleanup levels at other Sites)	10/25/00	11/8/00	12/1/00	1/3/01	1/17/01

**Focus Group Meetings:**

<b>10/25/00:</b>	<b>11/8/00:</b>	<b>11/29/00:</b>	<b>12/13/00:</b>	<b>1/3/01:</b>
➤ Review and discuss RSAL process	➤ Regulatory Analysis 1 (Rev. 1 of Report)	➤ Regulatory Analysis 2	➤ Regulatory Analysis 3 ➤ Model Evaluation 1 (Rev. 1 of Report)	➤ Cleanup Levels 1 ➤ New Science 1
<b>1/17/01:</b>	<b>1/31/01:</b>	<b>2/14/01:</b>	<b>2/28/01:</b>	<b>3/14/01:</b>
➤ New Science 2	➤ Regulatory Analysis 3 (Rev. 2 of Report) ➤ Model Eval. 2 (Rev. 2 of Report)	➤ Parameter Evaluation 1	➤ Regulatory Analysis 4 (Rev. 3 of Report) ➤ Model Eval. 3	➤ Parameter Eval. 2
<b>3/28/01</b>	<b>4/11/01</b>	<b>4/25/01</b>	<b>5/9/01</b>	<b>5/23/01</b>
➤	➤ Outline of Report to Focus Group	➤ Parameter Evaluation 3 (Rev. 2 of Report)	➤ Parameter Evaluation 4	➤ Draft Report

**Formal Public Comment Period for RSAL Report:**

<b>6/7/01</b>	<b>8/7/01</b>	<b>9/7/01</b>
➤ Public Comment begins	➤ Public Comment Ends	➤ Final Report Released

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The wildlife refuge bill will prevent future development of the Rocky Flats Site. The bill also states that the designation should not lessen the level of cleanup. Many members of the community, including myself, favor free release of at least the buffer zone. One way to achieve all these goals is to establish a RSAL that is protective of all potential future users of the site including possible residents. While none of the federal guidance requires that catastrophic events be factored into the RSAL, it seems prudent to include random, but, possible events like range fires in the results.

How can these goals be translated into principles for determining an RSAL? The first principle we must follow is to follow the applicable laws, federal regulations and guidance. While some may disagree with these, it is up to congress and the federal agencies to change them, not the community. Secondly we must follow established scientific methods. This means that the criteria, level of risk and confidence for the RSAL should be chosen in advance. The parameters should be based on established conservative scientific data not on preconceived misconceptions of the parameters. Lastly we must endeavor to make the process understandable to the community.

I offer the following suggestions:

- ☛ The definition of protective of human health should be the EPA cancer risk range of  $1E-4$  to  $1E-6$ .
- ☛ Unusual events such as range fires, especially those that would be diluted by the thirty year average mandated by the EPA risk range, should not exceed a fixed annual dose of say 25 mrem in the year they occur.
- ☛ A small number of scenarios should be used: 1) A resident; either a rancher or a suburban resident. 2) A wildlife refuge worker. 3) a wildlife refuge visitor. The thirty year exposure time and the small differences between children and adults (Rac report) suggest that child scenarios would only complicated the study without changing the result.
- ☛ The EPA specifies a wide range of cancer risk, spanning two orders of magnitude. How protective the RSAL is within range could be determined by the number of persons effected. The more persons effected the more protective it should be. Only one rancher will be exposed to the contamination at a time. About ten to twenty suburban residents could live on the most contaminated part of the site at once. Depending on worker policies of the wildlife refuge up to ten workers could be exposed to a conservative scenario. Up to several thousands visitors could be exposed. The residents, because few would be

involved, could be modeled near the maximum of the risk range, say  $1E-4$ . While some would say this is unacceptable, I remind them that the EPA has determined that  $1E-4$  is protective of human health. The wildlife worker should receive more protection, say  $5.0E-5$ . The public should receive the most protection. The risk should be near  $1E-6$ .

- ☛ The confidence we apply to a scenario should be in relation with its probability of occurring. The visitor scenario will definitely happen; therefore, the confidence should be high, say 90%. The wildlife worker will also definitely happen; but, the probability that the same worker will be on the site for thirty years and will always be working in the most contaminated area is low. A lower confidence level is therefore appropriate, say 80%. Since we do not envision any future resident being on the site a lower confidence yet should apply, say 50%.
- ☛ It is important to evaluate whether unusual but still possible events that have not been modeled into the lifetime risk estimate might provide a substantial risk to one of the scenario receptors. To evaluate this possibility several of these special scenarios should be run. Since they are admittedly rare events they will not be seen in the thirty year cancer risk estimates which are averages; but, they might still exceed the NRC's 25 mrem per year standard. Examples of these events are the range fire, including inhalation of the smoke, or drought that might entail a worker being exposed to large areas of bare soil.

The most conservative of the four scenarios should apply.

I must reiterate that this approach meets the free release criteria set out by the EPA and the NRC. A soil removal plan that meets this RSAL would not require any additional institutional controls; although, there may still be continued monitoring and engineering controls to meet the surface water standard.

**RFCA Stakeholder Focus Group  
Attachment F**

Title: Suggested approach to the setting of the RSAL

Date: November 30, 2000

Author: Victor Holm  
Rocky Flats Citizen's Advisory Board

Phone Number: (303) 989-9086

Email Address: vholm@aol.com

**RFCA Focus Group  
November 29, 2000 Meeting**

**DRAFT Actions for December 13, 2000 meeting**

1. Copy of paragraph 254 of the Rocky Flats Cleanup Agreement (AT)
2. List of candidate Peer Reviewers for RSAL Review (AT)
3. Additional options to be considered for developing an RSAL within the current regulatory framework (Focus Group Members)

December 6, 2000

Dear Stakeholder:

The Rocky Flats Cleanup Agreement (RFCA) Stakeholder Focus Group will meet at the Broomfield Municipal Center at One DesCombes Drive on December 13, 2000 from 3:00 to 6:30 p.m. The technical discussion meeting will be combined with the regular meeting as approved by the Stakeholders at the November 29 meeting.

The agenda for the December 13 meeting is enclosed (Attachment A). Please come prepared to continue our discussion on the Regulatory Analysis framework report and begin our discussion on the draft model evaluation report. Please review both of these reports and related information so that we can go right into group discussion without the need for education on the subjects.

Mary Harlow has also asked that we come to the December 13 meeting with answers to the following questions regarding peer review for RSAL Task 2, Model Evaluation:

1. Do we need peer reviewers for Task 2?
2. How many peer reviewers do we need for Task 2, if we need peer reviewers?
3. What are the questions we need to have answered?

The meeting minutes from the November 29, 2000 RFCA Stakeholder Focus Group are enclosed (Attachment B). Also enclosed are the following background materials requested by the Focus Group at the November 29, 2000 meeting or identified by the RFCA Parties:

- Copy of paragraph 254 of the Rocky Flats Cleanup Agreement (Attachment C)
- List of candidate Peer Reviewers for RSAL Review (Attachment D)
- Updated RSAL Review schedule (Attachment E)

Also attached is a memorandum to the Focus Group submitted by Victor Holm entitled, "Suggested approach to the setting of the RSAL" (Attachment F).

If you need additional information to prepare you for the Focus Group discussion on December 13, please contact the subject matter experts listed in the packet, or call Christine Bennett of AlphaTRAC, Inc. at 303 428-5670 (cbennett@alphatrac.com). Christine will help to find the appropriate resource for you.

You may call either Christine or me if you have any questions, comments, or suggestions concerning the RFCA Stakeholder Focus Group or the upcoming meeting.

Sincerely,

ADMIN RECORD

1/2



RFCA Stakeholder  
December 6, 2000  
Page 2 of 2

C. Reed Hodgkin, CCM  
Facilitator / Process Manager

# **New Information: Actinide Modeling and Windtunnel Tests**

**Bob Nininger  
Environmental Systems and Stewardship  
Kaiser-Hill LLC**

4/14



# Actinide Modeling

- **Wind and activities that disturb contaminated soil can result in actinide emissions to the air.**
- **Key element of future potential exposure/risk is resuspension of Pu and Am.**
- **In FY99 and FY00, modeling has been performed to examine various scenarios:**
  - **Chronic resuspension from contaminated soils, pre-and post-closure.**
  - **903 Pad Remediation**
  - **D&D of a Building with pockets of undetected contamination**
  - **Wildfire actinide emissions**

# **Actinide Modeling Results**

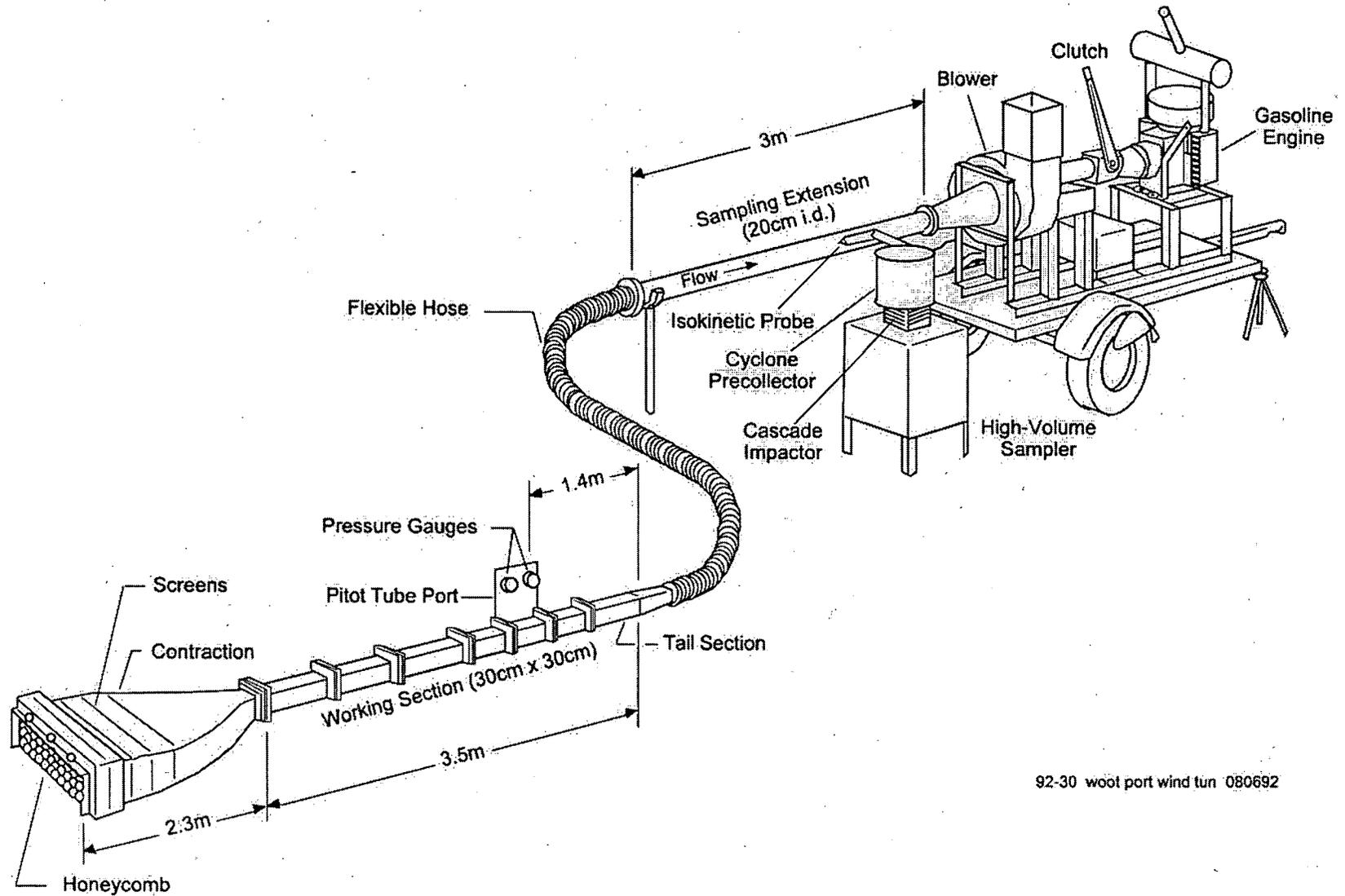
- **Modeling of chronic resuspension overpredicts air concentrations in predominant wind direction - toward Indiana.**
- **Post-D&D - Assuming cleanup to current Tier-1 levels, increased soil exposure may result in small increases in airborne concentrations**
- **During remediation of 903 Pad, emissions are not predicted in excess of protective standards.**
- **Wildfires will not result in smoke-borne Pu/Am exposures greater than protective EPA standard.**
- **Post-fire actinide concentrations in air were increased a factor of 5 compared to unburned scenario, pre-recovery.**

# **Unresolved Modeling Issues**

- **Have not modeled the contributions from exposed roadways on which there is actinide deposition.**
- **Observed soil-actinide concentrations on plants are not consistent with soil concentrations beneath plants.**
- **Site-specific resuspension factors existed only for vegetatively-covered soils; post-fire emission scenarios were not well characterized.**

**Planned prescribed Burn offered opportunity to characterize wind erosion.**

# Wind Tunnel Test Configuration



92-30 wool port wind tun 080692

# Wind Tunnel

Prescribed Burn Site -- April 7, 2000



# Wind Erosion Testing

April 2000

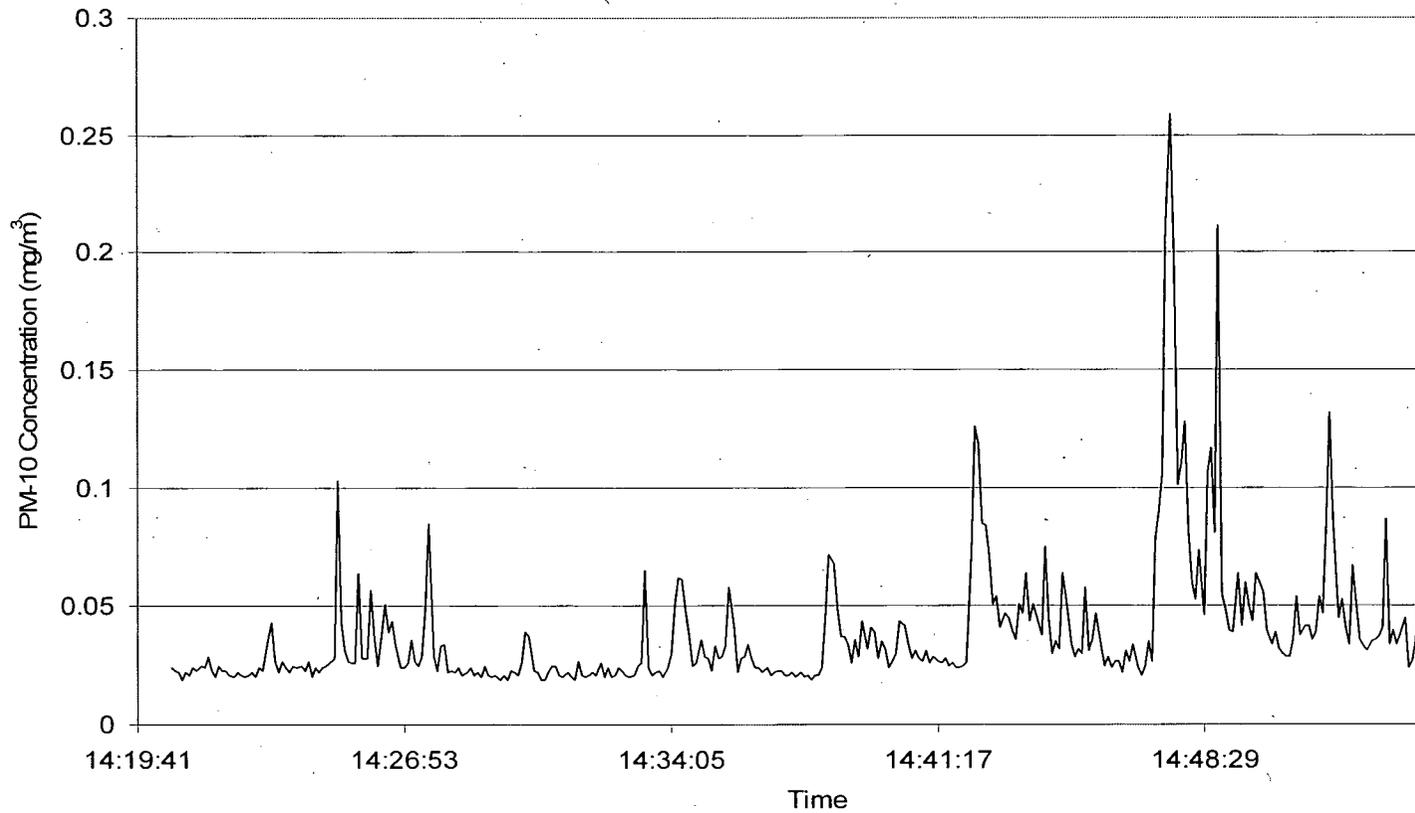


# **Wind Tunnel Test Objectives**

- **Measure Erosion Potential of burned and unburned soil plots.**
- **Observe differences in size-distribution of “burned” and “unburned” airborne dust.**
- **Measure “dustiness” of soils with different moisture content in burned and unburned areas.**
- **Determine differences in organic/elemental carbon in resuspended soils, burned and unburned.**
- **If sufficient radionuclides are present (Wildfire), compare relative activity in soil and airborne dust.**

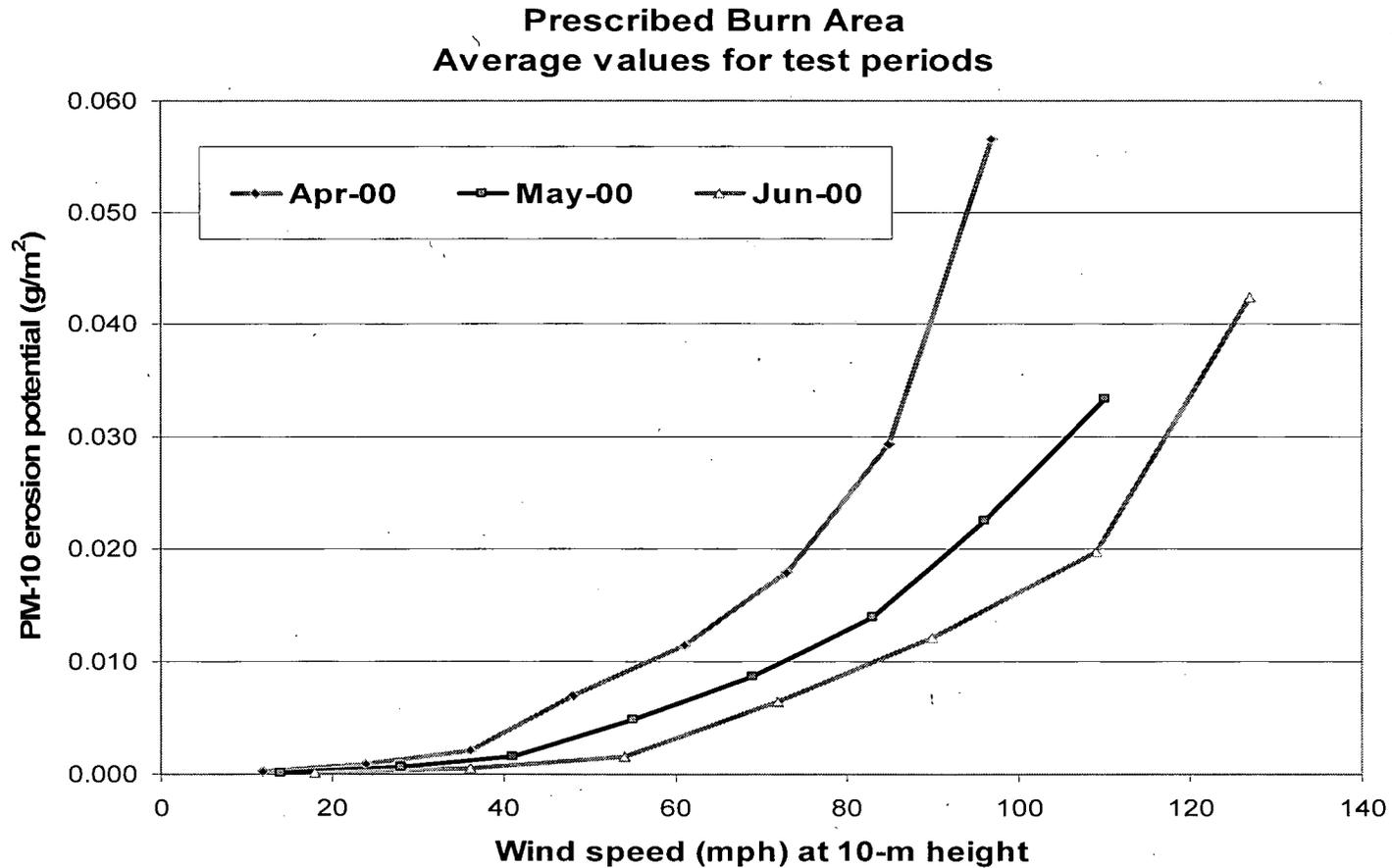
# DustTrak™ Resuspension Profile

CB-8B  
5/2/00



# PM-10 Release vs Wind Speed

## Prescribed Burn - DustTrak™ Measurements

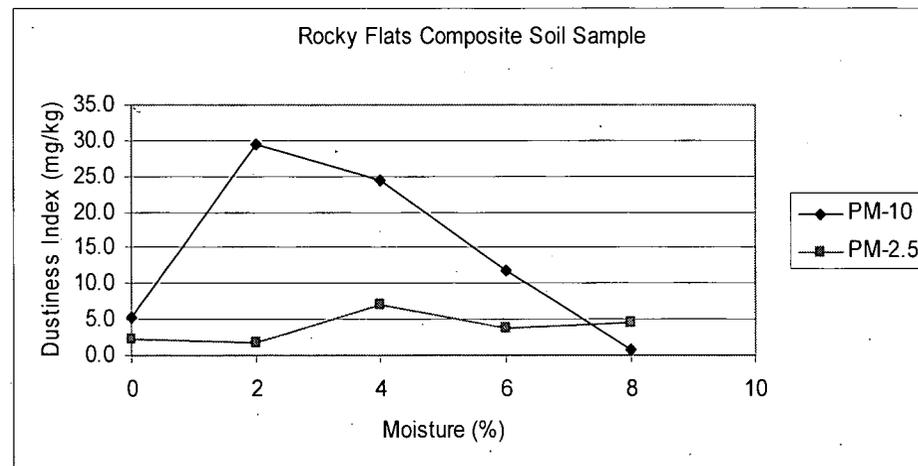
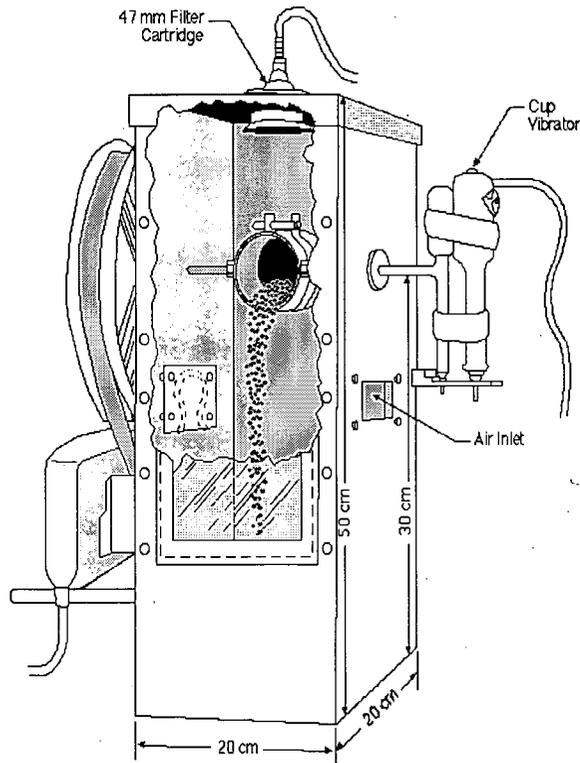


# “Dustiness Testing”

## Measure of Soil’s Tendency to Erode

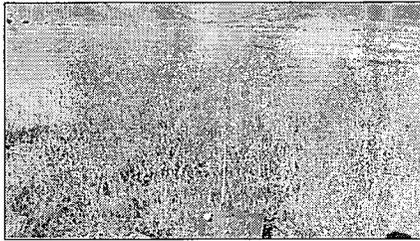
Table 1. Results of Preliminary PM-10 Dustiness Tests

Test ID	Sample label	Moisture (%)	Mass poured (g)	Mass collected (mg)	Dustiness index (mg/kg)
1	5/3 Burned Area #2	1.4	635.0	3.075	4.8
2	5/3 Burned Area #1	1.8	526.0	4.723	9.0
3	4/7 Surface Soil “D”	1.4	490.3	4.293	8.8
4	4/8 Adjacent to Plot CB-2	2.3	489.5	8.157	16.7

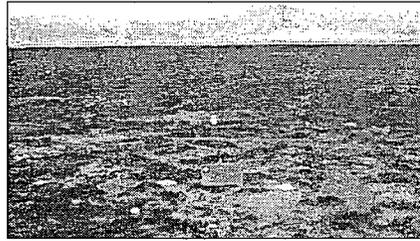


# Prescribed Burn Recovery

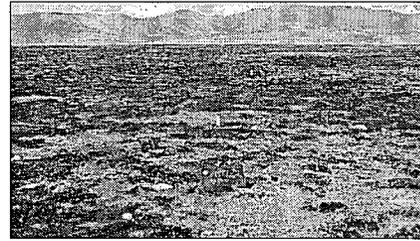
Time Series of 2000 Prescribed Burn Area at Rocky Flats Environmental  
Prescribed Burn Conducted on April 6,



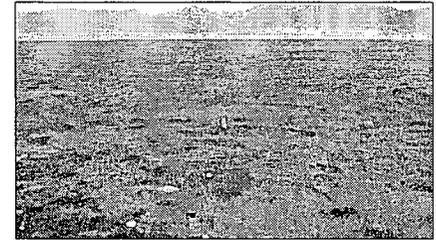
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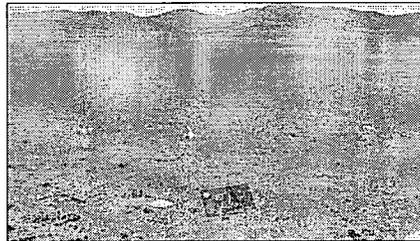
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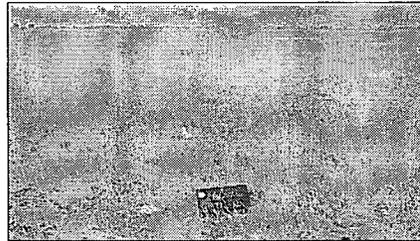
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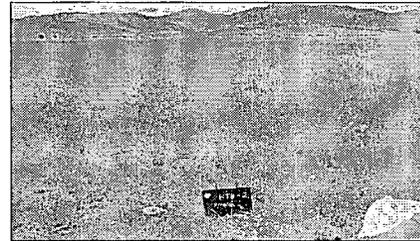
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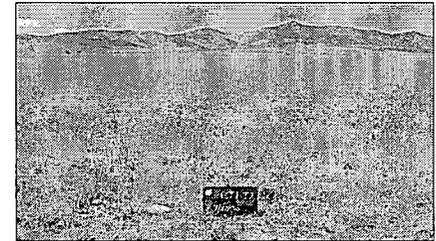
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6/28/00



8/10/00



9/27/00

# **“Wildfire” Wind Tunnel Testing**

**Wildfire on July 10**

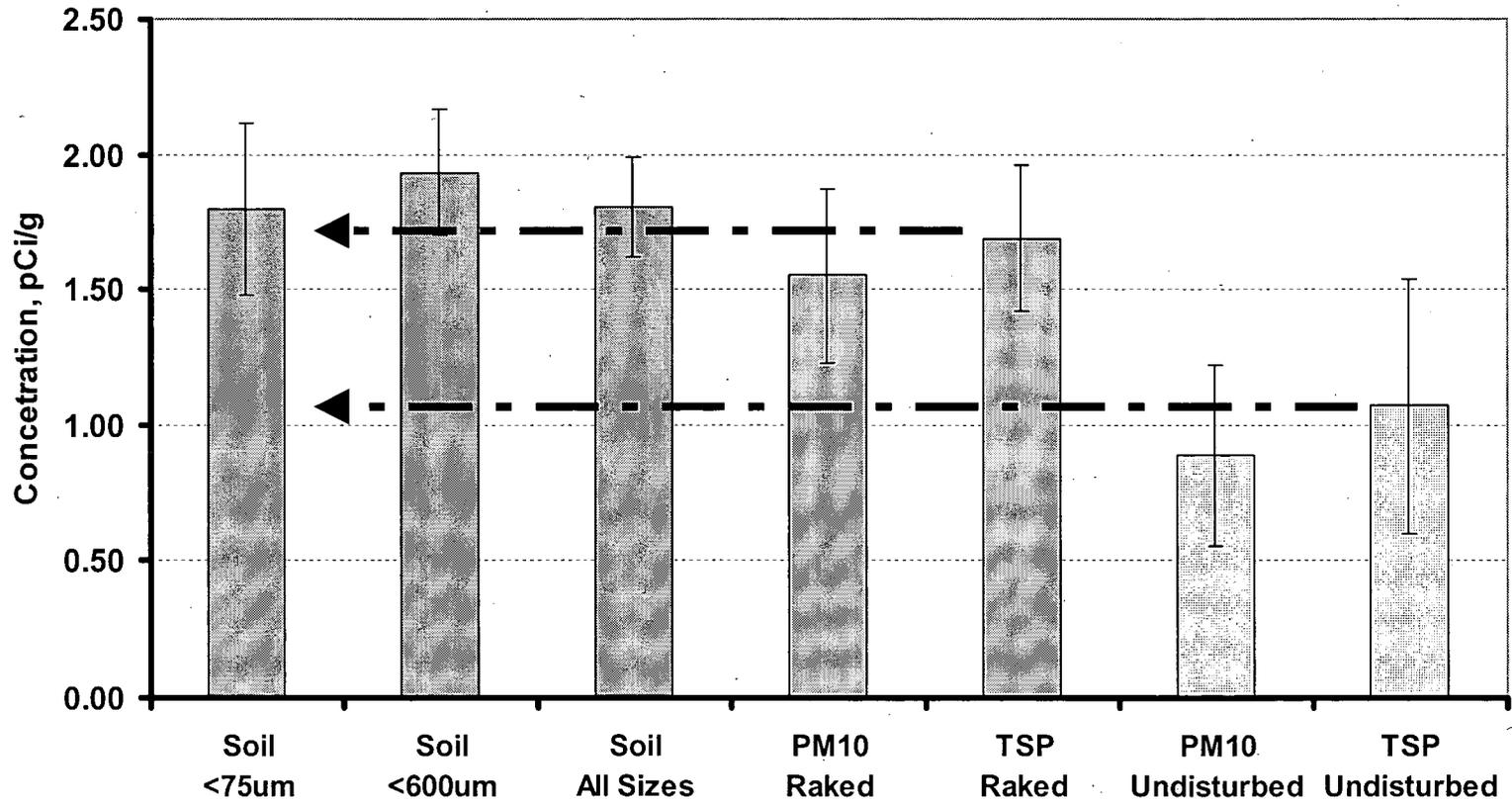
- **Same wind-tunnel tests as in Prescribed Burn.**
- **Single Test Event - no characterization of recovery associated with Wildfire.**
- **Added testing for radionuclide content in soil and in airborne dust.**

# Radionuclide Tests

- **Soil activity in “Wildfire” Area was known prior to the event - 2 to 5 pCi/g for plutonium.**
- **Provided opportunity to compare distribution of radionuclide activity in soil with comparable activity in airborne dust.**

# Activity Distribution -

## An Observation in "Wildfire" Burned Area



# **Path Forward**

- **Analyze results of wind-tunnel tests**
- **Integrate results with information already known regarding wind erosion at RFETS**
- **Model Post-fire Scenarios using wind-tunnel information and site observations:**
  - **Episodic nature of wind events**
  - **Limited erodible-soil reservoir**
  - **Wind-speed dependence**
  - **Distribution of actinides**
  - **Increased erosion potential related to fires**

To: RFCA Focus Group members  
From: LeRoy Moore  
Re: "NRC rule" (25 mrem/y permissible dose) as an ARAR

After a recent conversation with a person at EPA headquarters I asked about documentation for this person's comment that EPA does not accept NRC's 25 mrem/y standard as an ARAR under CERCLA. I also asked the basis for EPA's contention that  $3 \times 10^{-4}$  lifetime risk falls within the CERCLA risk range of  $10^{-4}$  to  $10^{-6}$ . Here are the answers I received. As background, it's well to remember that in some of its own documents EPA says a dose of 15 mrem/y = a risk of  $3 \times 10^{-4}$ . You'll note that the second issue, as stated here, is closely related to the first:

"1. The EPA position on use of NRC's standard is covered in a CERCLA directive: OSWER No. 9200.4-18, August 22, 1997, "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination," Stephen D. Luftig, Director, Office of Emergency and Remedial Response, and Larry Weinstock, Acting Director, Office of Radiation and Indoor Air. The relevant sections are a) the fourth paragraph under BACKGROUND and b) Attachment B. The Background paragraph states, in part: "...EPA has determined that the dose limits established in this [the NRC] rule as promulgated generally will not provide a protective basis for establishing preliminary remediation goals (PRGs) under CERCLA...Accordingly...cleanups...will typically have to be more stringent than required by the NRC dose limits in order to meet the CERCLA and NCP (Natl Contingency Plan) requirement to be protective." Attachment B reviews the regulatory and legal basis for the above statements, and analyses the deficiencies of the NRC standard.

"2. The above-noted Attachment B also cites the regulatory basis for use of a  $3 \times 10^{-4}$  lifetime risk to satisfy the CERCLA range of  $10^{-4}$  to  $10^{-6}$  lifetime risk [actually, this numerical range was established in the National Contingency Plan regulations, at para. 300.430(e)(2)(i)(A)(2) as the implementation of CERCLA's more general requirement that cleanups assure protection of human health and the environment, at para. 121(d)(2)(A)]. The first key point in Attachment B is cited from an OSWER Directive (9355.0-30, April 22, 1991, "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," Don R. Clay, Assistant Administrator) which says: "The upper boundary of the risk range is not a discrete line at  $1 \times 10^{-4}$ , although EPA generally uses

1x10<sup>-4</sup> in making risk management decisions. A specific risk estimate around 10<sup>-4</sup> may be considered acceptable if justified based on site-specific conditions." The second key point is contained in the last paragraph of section 1.1 of Attachment B, which notes that EPA concluded, in its rulemaking for radionuclides under the Clean Air Act, that 3x10<sup>-4</sup> was essentially equivalent to 1x10<sup>-4</sup>, but that 5.7x10<sup>-4</sup> was not. The Attachment also reviews a number of other examples and concludes that they are consistent with the view that 15 mrem/y is consistent with the CERCLA risk range, and that the NRC 25 mrem/y is not. The bottom line here is that when dealing with orders of magnitude EPA found, correctly, that the boundary between two adjacent orders of magnitude (e.g., between 10<sup>-3</sup> and 10<sup>-4</sup>) lies halfway between them on a logarithmic scale (e.g., the boundary between 1x10<sup>-3</sup> and 1x10<sup>-4</sup> is halfway on a logarithmic scale, which is 3x10<sup>-4</sup>).

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My comments: First, perhaps someone from EPA can provide us with the pertinent texts mentioned in the foregoing.

Second, given the above, I raise again a question I posed to Dan Miller on Nov 8 when he very gave his very clear presentation on ARARs to the Focus Group. May it be, I asked then and repeat now, that the NRC rule (which permits a dose of 25 mrem/y) as adopted by the State of Colo meets some but not all conditions of being an ARAR? That is, it appears to be "applicable" and "relevant" but not "appropriate" -- not appropriate because it fails to meet the CERCLA risk requirement.

When I posed this question on Nov. 8 Dan Miller replied: "Under CERCLA . . . we have to go through NRC, figure out what number we come up with." I take this to mean that the agencies are required to determine whether or not an existing state regulation (such as the adoped NRC rule) is in fact an ARAR -- that is, whether it fits all three ARAR conditions.

What is happening now seems to be exactly what Dan described. The agencies propose to look at various future use scenarios according to several dose and risk options, including 25 mrem/y (the NRC rule) and risk at 10<sup>-4</sup>, 10<sup>-5</sup>, 10<sup>-6</sup> (risk levels within the CERCLA range).

If the words from EPA quoted above are correct, their correctness should be confirmed by the projected calculations.

Title: Determination of "Member of Public" for NRC Dose Based or CERCLA Risk Based Cleanup Standards

Date: December 5, 2000

Author: Richard DiSalvo  
U.S. Department of Energy  
Rocky Flats Field Office

Phone: 303-966-4765

Email Address: [richard.disalvo@rf.doe.gov](mailto:richard.disalvo@rf.doe.gov)

Background – The RFCA Parties are evaluating the Colorado Radiation Control Regulations "decommissioning rule" for radioactive materials licensees found at 6 CCR 1007-1 Part 4, section 4.61, to determine those portions of the rule that would be Applicable or Relevant and Appropriate Requirements (ARARs) pursuant to CERCLA. Colorado, as an NRC Agreement State adopted a decommissioning rule that contains essentially the same provisions as the NRC decommissioning rule found at 10 CFR 20, Subpart E. According to the decommissioning rule, annual dose rates from residual contamination must not exceed 25 millirem and be "As Low as Reasonably Achievable" (ALARA) for unrestricted use or restricted use. See, Part 4, section 4.61.2 and .3, and 10 CFR 20.1402 and 1403.

According to CERCLA's implementing regulations, termed "the National Contingency Plan", compliance with ARARs is one of the two threshold criteria for remedy selection at CERCLA sites. See, 40 CFR 300.430 (e)(9)(iii) A and B, and (f)(1)(i)(A). The other threshold criterion is that the remedy must provide overall protection of human health and the environment, for which the goal is identified at 40 CFR 300.430 (e)(2)(i)(A)(2) as an upper bound lifetime cancer risk to an "individual" of between 10E-6 to 10E-4.

Among other issues of interest to the RFCA Parties and the public for this evaluation are the regulatory provisions that define or identify the human receptor to which the annual radiation dose (ARAR) or lifetime cancer risk (CERCLA) standards apply. This receptor is generally referred to as a "member of the public", but the regulatory requirements are much more specific.

This paper provides general information regarding these regulatory requirements. Since the Colorado Radiation Control Regulations and the NRC Regulations do not differ on the terms discussed herein, the NRC citations are given in this discussion. Also, because the Colorado decommissioning rule is based on the NRC rule, the information developed by the NRC in proposing and finalizing its rule is helpful in interpreting the Colorado rule.

Discussion – The decommissioning rule dose rate standard applies to the "average member of the critical group". The "critical group" is defined at 10 CFR 20.1003, and "means the group of individuals reasonably expected to receive the greatest exposure to residual activity for any applicable set of circumstances." The preamble to the rule explains further that the "critical group would be the group of individuals reasonably expected to be the most highly exposed considering all reasonable potential future uses of the site." See, 62 FR 39067 (A.4.2). The "average member" is "an individual who is assumed to represent the most likely exposure scenario based on prudently conservative exposure assumptions." *Id.* at 39068. As one example, the preamble discusses the residential use scenario, and states "the critical group could be persons whose occupations involve resident farming at the site, not an average of all residents at the site."

According to the preamble the NRC considered whether the standard should apply to the "most exposed person" rather than an "average person." The NRC found that, consistent with other NRC guidance, ICRP practice, National Academy of Sciences recommendations and EPA's proposed Federal radiation Protection Guidance for Exposure to the General Public, use of the average person approach is appropriate. See, 62 FR 39067 (A.2.2.1) and 39067-68.

According to the NRC's Draft Regulatory Guide DG-4006, "Demonstrating Compliance with Radiological Criteria for License Termination," section C.1, dose modeling for the average member of the critical group should be derived based on the methods in Draft NUREG-1549, "Guidance on Using Decision methods for Dose Assessment to Comply with Radiological Criteria for License Termination." Use of these methods results in a "derived concentration guideline" (DCGL). The DCGL is the concentration of residual radioactivity above background that, if distributed uniformly throughout a survey unit, would result in a 25 millirem per year dose to the average member of the critical group. This guidance provides for the use of generic screening scenarios and parameters associated with the DandD computer code. If conditions are reasonably expected to differ from the DandD code default parameters that would result in a significant increase in dose, then the DandD code use might not be justified. Thus, NRC requirements focus on parameters related to the "average person" in the critical group.

CERCLA regulations do not explicitly identify the "individual" to which the risk standard applies. The preamble to the NCP indicates EPA's preference for use of policy and risk assessment guidance for risk assessment related to the "reasonable maximum exposure scenario" (RME) rather than establishing regulatory definitions. See, 55 FR 8701 (and also 40 CFR 300.430 (d)(3), which provides that ARARs and pertinent guidance be identified in a timely manner).

The "Risk Assessment Guidance for Superfund: Human Health Evaluation Manual, Part A through D" (RAGS) is the EPA's guidance for determining cancer risks. EPA stated that, "The reasonable maximum exposure scenario is 'reasonable' because it is a product of factors, such as concentration and exposure frequency and duration, that are an appropriate mix of values that reflect averages and 95<sup>th</sup> percentile distributions", and thus does not include unrealistic assumptions and scenarios. See, 55 FR 8701. The NCP does require evaluation of factors, such as sensitive populations, to support potential remedial action alternatives. See, 40 CFR 300.430 (d)(2).

The EPA is currently conducting a RAGS review as part of its regulatory reform initiatives, which includes a review of the current concepts in the RME. The RAGs approach to determine the carcinogenic hazard multiplies the carcinogenic slope factor (SF) posed by a hazardous substance by the average daily intake of that substance over an assumed lifetime of 70 years. The SF is an upper bound estimate of cancer risk per mass of hazardous substance contacted per unit body weight per day, and are extrapolated to give the highest possible linear slope (within the 95% confidence limit) at low exposure doses. This results in a determination of a "reasonably maximally exposed individual" for a given RME scenario.

RAGS Part D now requires the use of probabilistic risk assessment methodology. Thus, the range of values to be used to determine exposure factors used for average daily intake for any RME scenario is important in estimating an individual maximum exposure.

