ROCKY FLATS CITIZENS ADVISORY BOARD
MINUTES OF WORK SESSION
March 7, 1996

FACILITATOR: Reed Hodgin, AlphaTRAC

Eugene DeMayo called the meeting to order at 6 p.m.

BOARD / EX-OFFICIO MEMBERS PRESENT: Alan Aluisi, Jan Burda, Tom Clark, Ralph Coleman, Tom Davidson, Eugene DeMayo, Mike Freeman, Tom Gallegos, Paul Grogger, Mary Harlow, Susan Johnson, Sasa Jovic, Mike Keating, Jack Kraushaar, Beverly Lyne, Tom Marshall, LeRoy Moore, Gary Thompson / Dave Brockman, Jeremy Karpatkin, Steve Tarlton

BOARD / EX-OFFICIO MEMBERS ABSENT: Kathryn Johnson, Linda Murakami, David Navarro / Tim Rehder

PUBLIC / OBSERVERS PRESENT: Kenneth Werth (citizen); Frank Smith (citizen); Gerry Kelly (Kaiser-Hill); Kay Ryan (SWEIS); J. Anderson (citizen); Joe Rippetoe (IMAA); David Abelson (David Skaggs' office); Forrest Shoemaker (ComRad); Jim Stone (RFCC); Shawki Ilorahim (CSU); Mariane Anderson (DOE); Larry Helmerick (DOE); Carol Anderson (Kaiser-Hill); Carol Potnoe (Kaiser-Hill); Elizabeth Pottorff (CDPHE); Gordon Pierce (CDPHE); Robert W. Terry (CDPHE); Gerd von Glinski (citizen); Paula Elofson-Gardine (EIN); Susan Hurst (EIN); Don Scrimgeour (CAB interim project administrator); Ken Korkia (CAB staff); Erin Rogers (CAB staff); Deb Thompson (CAB staff)

PRESENTATION - THE ROCKY FLATS ENVIRONMENTAL MONITORING PROGRAM:

Kaiser-Hill (Gerry Kelly): Gerry gave an overview of some of the environmental monitoring programs currently used by Kaiser-Hill - effluent and ambient air, and surface and groundwater. The objective is to protect public health and environment, comply with regulations, identify trends, and assist with any emergency response necessary. For 1996, changes will be made to the program in order to make it more cost-effective. Those changes have produced an integrated monitoring program developed in concern with EPA, CDPHE and the cities of Broomfield and Westminster; expected to be completed by this summer. Highlights include:

Effluent monitoring - falls into two groups: 1) sources that have to be monitored continuously, the frequency of sample collection and screening reduced from 2 times per week to once a week; and 2) other sources to ensure emissions remain below the threshold, the frequency reduced from twice a week to once a month - analysis will be done once a year instead of every month.

Ambient air monitoring: monitor and collect samples from 41 locations - only three are routinely analyzed (samples are retained to be analyzed later if necessary). There are three types of air monitoring stations: 1) on-site (only remaining site is at the 903 pad); 2) site perimeter (2 stations providing data downwind); 3) off-site (5 COMRAD monitors remain).

Surface water monitoring: DOE no longer samples prior to discharge (CDPHE still monitors); sampling of Walnut Creek at Indiana has been eliminated (Broomfield will collect samples); and reduced frequency of waste water treatment plant sampling.

Groundwater monitoring: K-H is monitoring on a quarterly basis - approximately 150 wells are monitored. The number of wells monitored and frequency of analysis has been reduced in concert with regulatory agencies.

CDPHE (Steve Tarlton): CDPHE began monitoring during the 60s and 70s. After the AIP was signed in 1989, the program accelerated. Based on what was learned, CDPHE modified its monitoring plan.

Air: The levels of pollutants now are lower than generally found in the Denver area, and measured plutonium levels in the air have decreased over time. The trend of high levels of plutonium in the air was significantly reduced when production ceased; it has stabilized now at the low end. CDPHE runs two types of monitoring stations: 1) "D" & "E" stations monitor continuously for radionuclide analysis; 2) "X" stations periodically sample for particulate, inorganic, metals and VOCs analysis. Changes made in 1996 to air monitoring include: consolidating stations sampling plutonium and americium; changed plutonium and americium monitoring activities west and south of the site; and changed method of VOC sampling.

Water: CDPHE found that plutonium is mobilized during precipitation events. May's heavy rains produced one of the few times the level has gone above standard for ponds A4 and B5. However, pond C2 (located on Woman Creek - it intercepts flow from the South Interceptor Ditch) exceeded the standard - probably for more than a month - and it did have to be discharged. Generally, CDPHE has found there are no problems off-site, and its results usually are the same as DOE's. Changes made for 1996: consolidated sampling activities; reduced the number of analysis for BNAs, herbicides, and some metals; shift to "event" related sampling of Woman and Walnut Creeks; and discontinue ground water

sampling (CDPHE will now do split samples with DOE).

RESPONSE TO PRESENTATION:

Ward Whicker (CSU): Based on what he heard during the presentation, the monitoring programs sound fairly standard. He expressed concerns about the future of Rocky Flats - many releases will occur during environmental remediation activities. Management needs to be careful about disturbing the land; the cleanup may be worse than leaving it alone. Plutonium does not move readily - it has been found to move only in large events like what occurred last spring. However, small particles in the airstream are the biggest concern, and DOE needs to be aware of and concerned about the size of particles that may be released. He suggested DOE and Kaiser-Hill use a mobile monitoring station to monitor remediation activities at remote locations.

Gale Biggs: Gale discussed emissions, their sources, and monitoring of ambient concentrations. He noted that the Health Advisory Panel stated the most dangerous health exposure to the public was from the airborne pathway. He believes public health needs should be met first, then worry about complying with regulations. Highlights from his presentation include:

Stack emissions: Most emissions are very small particle size (0.045 microns), which pass through banks of HEPA filters. DOE and its contractor are spending more funds on stack emissions, but that's not the problem - it is fugitive emissions.

Fugitive emissions: These come primarily from soil and exposed sources, such as the exposed surface of the evaporation ponds. Except for high wind conditions, the particles being emitted are small in size. The majority of plutonium emissions from Rocky Flats are fugitive (estimated at from 60% to 99%). So shutting down every building on the site results in only a small reduction in emissions. Remediation involving surface cleanup will only increase emission. Soil emissions are very small particles, with some larger. Particles tend to decrease in size and increase in number - so as it moves downwind, you increase the number of particles, thereby exposing more people. The small particles attach to larger particles in the atmosphere (such as pollen and organic matter), but at what distance is unknown. Monitors probably will not be able to measure these particles.

Discussion & Q/A Session:

Question: What is the particle size that is of concern for inhalation as far as being embedded in the pulmonary system?

Answer: Primarily less than about a few microns - one, two or three, somewhere in that range. There's a pulmonary deposition about 80% or 90% that is deposited in the bone

marrow. Gases are a little different, you inhale it but it comes right back out. These small particles will play out in the lung tissue. I would expect the really small particles would have a high probability of playing out in the lungs. But they also can be deposited from the air.

Question: Regarding reducing the amount of sampling, as I understand they're going to begin heat-treating residues and plutonium, which means back in the nuclear operation. So your justification for reducing sampling because nothing was going on would be good if you continue to do nothing, but it's not a very good justification if you're actually starting nuclear operations again.

Answer: This reduction is for current operations. We are going to have project-specific monitoring as well that we have to integrate into our site-wide monitoring. We are going to do what's appropriate for future activities. We have been drawing up plans for future site activities such as ASAP.

Question: Is the state going to do the same thing?

Answer: There are two things to look at. There is a regulatory function that works with them to monitor stack emissions. We haven't talked about that today, but the group that handles that activity spends time in the buildings, talks to people, figures out what they're going to do, and what kind of monitor would be appropriate to that emission based on the operations in that building. That's an ongoing process, and every time something changes we look at that. In terms of our ambient monitoring program, I don't see changes on that basis. When we get into cleanup, we will need more monitoring. That will be required specific to the activity, and will not be part of the ambient monitoring program nor the stack emissions program.

Question: On the ambient air monitoring, you mentioned that out of the 41 stations, three are routinely analyzed. Are the three constantly the same, and why did you select those three? Is there a record of high values?

Answer: Yes, they are the same ones. One is associated with the 903 pad, and the others are downwind of the prevailing winds. We chose those particular locations, the 903 pad because it's the strongest source - probably about 60% of the emissions from the plant come from that source. The other two locations are in the area that we would typically model as the most impacted region off-site, the perimeter along Indiana and U.S. 93. The highest values in the ambient perimeter network are seen in that region, as well as the modeling results and year-to-year predicting.

Question: I would like to let everybody know that the City of Westminster, City of Broomfield, and several other of the municipalities have been involved in a core group

that's been looking at this monitoring program. This is the first time this week we have seen the program that Rocky Flats has come up with. We have a lot of concerns, both cities, about this new program. I would like the audience to know that, that we have not given a consensus on this. Also, have you used any of the past monitoring data to help make the decisions on revising the monitoring network, and if so have those data been made available to the stakeholders?

Answer: The program that was described to you this evening is the program that was instituted this fall before the DQO process started. What you heard tonight is not the result of the DQO process in which the cities, the state and EPA are involved. Tat's not going to be manifested until this summer. Both the existing program and future programs do use past data. The programs that we're evaluating now will definitely reflect past data and concentrations.

Question: Has the company taken all that data, and made a data base out of the trends so you can see exactly what's been going on over the years there?

Answer: No, we're not that far along. We're still trying to identify our decisions and make our decision rules.

Question: Are your decisions more money based?

Answer: No. Our decisions are public health, environmental protection and compliance based. They're not money-based at all. My program is not separate from budget cuts. There are areas in which we can improve, and our budget has compromised our data. We think we'll have support to maintain an appropriate level of monitoring.

Question: I'm confused by what you're saying. You say that your program is being cut back, that it already has been cut back. I assume it has been cut back for economic reasons. But you say you're preparing a more robust monitoring program when the operations that are going to endanger the public and environment are really under way. Things have been dormant at Rocky Flats for more than five years, since 1989. Two big things that are going to happen which will pose a risk and danger are the processing of plutonium and residues, and the D&D or remediation work at the site including taking down buildings, etc. There may be disturbance of the soil. Those things need increased monitoring. But you're talking about a reduced program, and yet you say we're getting ready to have a bigger program. I need you to clarify.

Answer: The existing program to monitor existing activities has been reduced. When we start other programs, they're going to be augmented as appropriate. But the current program has been reduced. Funding is a factor, but a lot of the monitoring really wasn't necessary. We rely on much more than monitoring data to control our operations. We rely

much more on upstream process knowledge. Ambient monitoring, to a large extent, only confirms exposures we already know about. It's after the fact. What we do is concentrate our energies on tracking.

Comment: All monitoring discovers what's already happened. It's a rather imprecise science.

Response: Yes, so we spend our energy in trying to stay on top of processes, building activities, before anything happens, before there's a release. We monitor very closely and do lots of calculations to ensure that activities will not exceed the .1 monitoring threshold. Because it's imprecise, that's why we concentrate on upstream controls.

Question: You mentioned that your standard for the water was not health-based. Is there a way we can appeal that? Are we trying to move toward having that health based?

Answer: The original standards for Rocky Flats were set by the state Water Quality Control Commission in 1990, and that was based on the data available at the time and setting that minimum level. That was easily achievable, but it wasn't based on a strictly health standard. It's my understanding that in the action level group that's evaluating action levels associated with cleanup under RFCA is looking at a health based number and if that number is .15 picocuries per liter, which is about three times the value we now have. As soon as that information is completed, it will go out as part of the workshops that are going to go along with RFCA. We're comparing what they do against the .15 picocuries per liter. Today, you'll find a much lower concentration. But in the process we were charged with looking at a risk-based analysis.

Question: This has to do public involvement. In the presentation about the establishment of your integration team and DQO training, you said you initiated the DQO process in November, and stakeholder involvement is supposed to be happening in early 1996. What we've learned in the last two years here is that the earlier on that we have stakeholder involvement, the fewer times we have to go back. The only reason we're monitoring at all is because there are people outside the perimeter. It seems logical that at the outset we involve those people. Also, you describe that we have monitoring as appropriate as the work plans progressed, and I would say that's one of those words we need to define and stakeholders need to be intimately involved in. I would like to hear from DOE and the state how can we get some sort of a commitment from the department, or from Kaiser-Hill, to do this.

Answer: Two responses: First, the cleanup activities will be undertaken under one of the processes that are established. There's a PAM (Preliminary Action Memorandum) process, there's an IM/IRA process, and then there's the CERCLA record of decision process. That is a cleanup plan which goes out for public comment, and part of the plan is the

monitoring that goes with it. There is a public comment opportunity on the monitoring to be performed specific to a cleanup activity. Second, Kaiser-Hill this summer inherited a program that had been in effect at the plant where a lot of monitoring was being done within different programs, and it was not necessarily efficient. One of the things they are trying to do is to straighten them out so that we don't have a lot of individual duplication of monitoring within the site. The next step is for CDPHE and the cities to look at all the monitoring that's being done and make sure it fits together. It's a real challenge to get the inside-the-fence monitoring programs integrated.

Question: When asked if the data was available for stakeholders, you seemed to say no. If that's true, then on the three monitors on the ambient air, is that data also not available? What's available, what isn't available?

Answer: The data is available. But we haven't looked at it yet in our DQO exercise. For our revisions, our modifications of existing programs, we haven't yet looked at the past data. But it is definitely a basis for our existing programs, and it is available.

Question: There's no more production at the plant site with beryllium anymore, but are you familiar with Ryan's Pit which was just excavated and beryllium was found. I believe we should have beryllium monitoring still going on in the ambient air and in the surface waters.

Answer: We do monitor beryllium in the ambient stations. We monitor for beryllium at one spot, but that's probably not enough. We need to look at that, that's a good point. Again, we would have project-specific monitoring based on pollutants of concern for individual programs.

Question: The soil from Ryan's Pit was supposed to be microwave stabilized to get volatiles out. Even though you used sodium iodide, you never saw any radioactivity until the soil was analyzed. People were stabilizing that soil, so there must have been some releases of beryllium.

Answer: We do have beryllium at all five sites. But there are cleanup-specific plans, and the plans are flexible so that when they identify a pollutant of concern, they add it to the list.

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Rocky Flats Citizens Advisory Board
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Part II

Question: I'd like you to address the concern about particle size, and its implication that your monitoring to date may be inaccurate, and talk about if there are any plans or any way to improve on the monitoring accuracy.

Answer: The scientific panel on monitoring systems in 1989-1990 made several recommendations for things that the Health Department and Rocky Flats should add to their monitoring programs. We added a number of those. Among the things we added were PM10 sampling and precipitation sampling. At a number of meetings we talked about how efficient is an ordinary TSP sampler at sampling the larger size particles and the smaller size particles. A TSP sampler gathers the dust in the air into a single sample, then you analyze it. The theory behind using the particle sizing head is that the smaller the particle, the more deeply it's inhaled. The more deeply it's inhaled, the higher the radiation dose you would get from plutonium particles. The higher the radiation dose, obviously the greater the hazard and risk. With the particle sizing head, we were able to try and get a handle on how small the particles are that are breathed and what are the implications for public health. As we think about particles that are greater than 10 microns in diameter, we are talking about particles that are rather large and rather heavy. They may not remain in the air for long, or exist in the air. The smaller particles that are really too small to be trapped by this sampling device, we don't have enough insight to know whether it's a valid concern. We do know that particles attach themselves to larger particles, but we don't know how quickly that happens and how far downwind from the site or from the emission point that happens. That is an unanswered question. We will start graphing the results and looking at the distribution to see if that gives us additional insight. I would add that when we're talking about large particles that are pollens which are designed to float in the air, those particles behave very much like small particles, in terms of aerodynamic behavior. Small particles are efficiently captured by the samplers, and are captured in the size range that would be typically inhalable. For those with allergies, pollens are quite a concern in terms of inhalation. We're looking at the same phenomena in the samplers. These particles are designed to float, and by floating they are easily sampled by the samplers. The pollens, even though their diameter may be very large, behave as a much smaller particle. It would capture typically those pollens.

Question: You're talking about a more robust monitoring system as different activities take place at Rocky Flats. I'm still not clear where the plans for that more robust system of

monitoring are, and what sort of commitment you are making to implement a more robust plan.

Answer: When you refer to systems, remember we're talking about is a discrete remediation activity, anything from digging a hole in the ground to working on a building. Those systems are not necessarily going to look like the ambient monitoring systems we're talking about here, with multiple stations all over the site. In some cases they could, but that's not necessarily what we're talking about. The commitment to monitoring is regulatory because when they do that kind of work, they have to demonstrate they won't cause an impact from the work. Monitoring is a requirement.

Question: Required where? Where does that requirement come from?

Answer: The most significant driver is worker health, OSHA, not environmental. We're going to have environmental monitors, but we're going to have so much more to protect the workers. That's going to drive the monitoring more than anything. Because of OSHA, we have to worry about the workers, not a population that's downwind with a lot of dilution and dispersion. We have to protect the immediate area to comply with worker standards.

Question: Are there plans that are now drawn up for this extra monitoring?

Answer: They're vague, at the beginning of development. We don't yet know what the projects are going to be, what will be funded, and what the timing is going to be. The projects will have to be looked at together, so we can see cumulative impacts. The remediation programs that have been ongoing, small cleanup activities, each had monitoring components to the specific activity.

Comment: It is OSHA driven, and that's the wrong priority. When you talk about cleaning up soils out in the air, the major reason they don't want to cover the area to keep emissions from getting into the air is that they are afraid of OSHA. They're not afraid of public safety, because you can't prove what the public is being exposed to. That gives them an out. OSHA scares them more than public health.

Question: For what reason is the groundwater sampling being discontinued?

Answer: There are two reasons. First, it's a duplication of sampling that the plant is doing, and with our budget restrictions, that's an easy place to eliminate sampling and analysis costs. Second, over the last year and a half, we've been trying to get closure on analysis of minor amounts of plutonium found in the boundary groundwater wells. There is a report which analyzed that issue, and we did have low but detectable levels of plutonium in boundary groundwaters. Our analysis showed that the plutonium was not moving with

groundwater. When plutonium was moving in the water regime, it was probably in sediment or colloidal form and actually was coming into the well from the surface water, or the alluvial water adjacent from the storm event. Our conclusion was that we didn't need two sets of people monitoring it; we were comfortable with the plant's continued monitoring rather than us doing duplicating it.

Question: What about the other contaminants besides plutonium? There are significant other contaminants in the groundwater, and plutonium may be pretty limited compared to them - what's going to happen to those?

Answer: There's a significant amount of groundwater monitoring occurring at the site. One of our more successful collaboration relationships with Rocky Flats over the last two years has been in groundwater.

Question: I'm concerned the enforceability of what you're doing. You said there are various agreements with the state and the regulators.

Answer: The specific requirement comes from either RCRA or CERCLA. RCRA is the hazardous waste regulations, CERCLA is Superfund.

Question: If the drivers are OSHA, is it true that worker standards are less protective than public health standards?

Answer: That's true, but I didn't say it was OSHA - I said it was CERCLA and RCRA. There is also an OSHA driver for worker monitoring; you have to protect the workers. There are two things that you're looking at, one is protecting public health, environment off-site, etc., and the other is workers. There are two drivers. The answer is you have to satisfy both. But what you find when you protect the worker, nine times out of ten you've covered all the environmental issues because it's so restrictive.

Question: In all the materials we've seen tonight in the way of mapping, are there observations and monitoring going on at a distance from Rocky Flats site - what is the logic that says we should not also be monitoring at a distance in population centers?

Answer: The Health Advisory Panel has been conducting an evaluation of historic releases from Rocky Flats to determine what the impact historically has been off-site. It's my understanding they're not seeing significant off-site impacts from major releases. The logic of sampling closer to the source rather than further from the source is that you have the ability to get more coverage of a pathway. The further out you get, in order to provide similar coverage, you would need many more samplers and it would get expensive.

Comment: When I was on the Citizens Sampling Committee, I pushed for getting some

samples out away from the plant and into the South Platte River valley, because that's where I thought the air currents would be taking a lot of this plutonium. As I recall, the committee results showed the plutonium levels dropped off but then stayed level all the way out into the South Platte River valley. I think there is an impetus for far-out sampling to be done.

Question: I've been doing some research on cancer in Colorado, and it seems that the male population aged 50-75 since 1988 to 1995, prostate cancer in the Jefferson County area is outpacing the rest of the nation by 600%. For all other cancers in the Jefferson County area, it has risen over 300% over the rest of the nation. Your monitoring Flats leaves me with great concern that Rocky Flats is the cause of cancer in Jefferson County area. It says to me your monitoring is not getting the job done. I know 10 men in the Arvada area who have prostate cancer just in the last three years; I'm one of them. They caught my prostate cancer in time. You're going to have to find a better way of monitoring all the plutonium particulates and other highly radioactive waste that's coming off the site. With stiff winds blowing downstream from Rocky Flats of 100 miles per hour, it's going to carry down to the entire metro area.

Comment: Colorado is number one in the nation for prostate cancer.

Answer: We have a group that's looking at health effects associated with Rocky Flats. We are performing two studies that should help define whether or not Rocky Flats has an impact on the surrounding community from a cancer or birth defect standpoint. We're setting up with DOE funding a cancer registry where cancer occurrence and deaths are tracked on a small scale across the state so we can see if there are areas of concentration around places like Rocky Flats. That project has been underway three or four years, so we don't have much in the way of results yet. The second is a birth defects registry that is similar, it looks at birth defects across the state to try to see if there are clusters associated with facilities like Rocky Flats.

Question: With the reduction in funding, and the reduction or elimination of certain monitoring apparatus and consequential monitoring being picked up by Broomfield and the state, external from Rocky Flats, who picked up the tab? Does Broomfield pay for its own monitoring? Does the state pay for this, or is there a cooperative effort of federal funding?

Answer: Our funding for this program is provided by DOE through a five-year agreement originally initiated between the governor and the Secretary of Energy to mitigate impacts on Denver from Rocky Flats. I believe the cities do their own monitoring and pay for that themselves.

Question: Once the historical data is collected, how will that be used and how will it

benefit the community?

Answer: Talking about the cancer and birth defects registry data - it's all after the fact, but if we can start seeing trends associated with vicinities, that's what we can do. It's very hard to take for example county-wide data and apply it to a facility like Rocky Flats. Also, Jefferson County is one of the fastest-growing counties in Colorado, a lot of people coming here from out-of-state. In the registries, they try to sort through that kind of information to look at occurrences. But it will help us in the future to know where to look.

Question: The environmental monitoring you're doing now, is it affecting the plant's mitigation plans?

Answer: Some of the data we're collecting on particle size and occurrence should be able to be tied back into remediation activities by looking closer at mitigating particulate dust, getting it out of excavations, etc. Another point is that the actions levels working group associated with the Rocky Flats Compliance Agreement is coming up with cleanup standards and we're going to have to monitor to those requirements. Our programs are going to have to reflect those new standards.

Question: Since CDPHE is going to do all the monitoring on the ponds, don't you think it would be good for your quality assurance to split those samples?

Answer: We could do that. I think that's a good idea. Usually when we get a sample, we have enough to run several analyses, we usually have enough to do another analysis if we need to. But we do not have another sample. We used to have splits; they were very helpful because there have been occasions where our results were higher or DOE's results were higher, and we looked at both the results.

Question: You indicated that there was going to be a system of monitoring drawn up for the future. If that's the case, I would appreciate it if you would get back to the Board with that information. I do think good monitoring outweighs cost issues. There have been serious questions raised about whether or not the monitoring now gives us the assurance that we need. You're planning on changing the monitoring system in the summer - I'm wondering how much money you think you're going to save over what period of time and where that money's going to go.

Answer: I don't know how much I'll be able to save. We've already reduced the programs, from '95 to '96. I don't know the outcome of our DQO process. I don't think there will be that much more reduction. We're down to bare bones. I have no idea if I'm going to save anything. I have no idea where we're going to end up. Right now, we're just talking about '95 to '96, and we are having this process to evaluate where we are. If we reduce too much, if we can reduce some more, if we can integrate some more, we don't know. That's

what the whole process is about.

Question: You've reduced your monitoring to a certain level. Do you know how much money you have saved thus far, and where does that money go?

Answer: Ballpark - five to ten million. It goes to risk reduction, to special nuclear material stabilization, I believe.

Comment: Can you get back to us with more exact figures on what the savings from the change to the monitoring has been for the plant, and where it's gone?

Question: The problems with the cancer registries are missed cases, and with cancer's latency of 25-40 years, there are problems of missed cases. The cancer and birth defect registries are a good start. We don't have real good health status indicators for community health status regarding low-level radiation exposure, it's not available. Can the off-site exposure monitoring be coded in a way to be used by those who are developing more useful health status indicators?

Answer: There are lots of elegant models that exist. All our radiation protection guidelines are really based on 40 years of radiation biology research in which we try to relate risk to dose. We can compute dose reasonably well, and we have some idea of what the risk will be from a given dose, particularly if the dose is high. There is still, unfortunately, a lot of debate about the affects of low doses. To my knowledge, there have been no real scientifically proven effects of radiation at doses below about 10 rem to humans. You can extrapolate, but most people feel the linear extrapolation is likely to be conservative. The best you can do is to look at large populations of people and try to do associations. It's a real difficult problem.

Question: You have been dancing around the topic of sub-microscopic plutonium particles - I want to know what are the potential dangers to the public for exposure to this kind of particle?

Answer: From what I've been able to gather, this first form of plutonium is a soluble plutonium. It doesn't make any difference whether it's on pollen, etc. If it gets into you and sits there for very long, it can be absorbed and you can be getting a dose from it. We've got to talk about plutonium in both its soluble and particulate form. There are some data that bear a little bit on this, maybe not directly as to the question or whether these little particles are out there. One of the most interesting things we have done over the last couple of years is to actually measure plutonium in the urine of living people. Using fission track analysis, we've looked at about 15 people that live immediately downwind of Rocky Flats that have lived there a long time, and we had a control group of people from the Fort Collins area. What we found is that with ordinary radiochemical techniques, the

levels of plutonium in urine are so small that they're below our detection limits. We found that we really could see no difference in the plutonium levels between people who live in the Fort Collins area and people who live right next to Rocky Flats. Now if there were high doses, and there were a lot of the small soluble plutonium getting into people, you'd think that you might be able to see it in urine. This we have not seen. And we've also not seen much in the way of plutonium in the autopsy tissues of people. Also, we've taken samples from Rocky Flats out to 20 miles or so, and we see a decline and then it levels out where we run into the global fallout plutonium that's all over the northern hemisphere. Plutonium tends to attach to soil extremely strongly. If you try to leach plutonium from Rocky Flats soils, it takes extremely strong acids to get it out, you can't do it with water, and if any of it were soluble, you'd think it would go into the water phase. There is still some resuspension going on at Rocky Flats, we can see it in plants. I think the resuspension is declining, and it's because the plutonium is slowly moving into the soil.

DISCUSSION ON PRIORITIZATION OF ISSUES FOR THE 1996 WORK PLAN (Eugene DeMayo): Those Board members who have not submitted their prioritization list were asked to get those to the staff as soon as possible. Ken Korkia prepared and discussed a draft work plan based on those issues. CAB committee co-chairs will meet to discuss and revise the work plan (meeting scheduled for 5 - 6:30 p.m. on Thursday, March 14, at the CAB office).

OTHER ISSUES:

Clarifying Board terms. Terms were selected at the retreat, and those Board members not in attendance at the retreat had terms selected randomly. There is no limitation in the number of terms that a Board member can serve. Members must seek reappointment at the end of their respective terms. Anyone who is interested in being on the Board is encouraged to submit an application.

Officer nominations for April elections. CAB members were encouraged to nominate someone for, or seek an office. Elections will be held at the April meeting. The chair, vice-chair and secretary have held their respective office the two-year maximum as specified in the bylaws. Eugene asked Board members to submit nominations to the office (a form was provided to Board members, which should be returned to the CAB office).

E-mail needs assessment. Board members were asked to return a survey to Erin so that she can look at the results and determine what may be needed to use this communication capability.

Meeting room change and related issues. CAB members discussed the possibility of moving monthly Board meetings to the Arvada Center. Arvada would be able to provide an in-house microphone system for use during the meetings. Although some Board

members were interested in moving to the Arvada Center, most were comfortable with the arrangement at Westminster City Hall and did not wish to move at this time. This item was tabled. In addition, one Board member discussed the issue of having Board members eat meals during meetings without providing anything to public attending the meetings. Some suggestions were made for changing the room configuration, and it was also suggested that Board members meet at 6 p.m. for dinner, then have the public portion of the meeting begin at 6:30.

Board member resignation. Mike Freeman noted that he will be relocating to Chicago within the next two months or so, and would have to resign the Board at that time.

PUBLIC COMMENT PERIOD:

Comment: Joe Rippetoe: I would like to request that the Board invite Manufacturing Sciences Corporation to come in and give an update or presentation addressing the status of the NCPP project.

Response: Steve Tarlton: As a member of the Steering Committee for NCPP. There will be a public meeting in April to discuss economic conversion activities at Rocky Flats, including NCPP and some of the others that are underway. The reason there hasn't been one before now is that the NCPP funding was uncertain until January. Tom Marshall: The Site Wide Issues Committee has NCPP on its lists of items to follow and review. Something will come forth, but the committee hasn't begun to look at it.

NEXT MEETING:

Date: April 11, 1996, 6 - 9:30 p.m.

Location: Arvada Center for the Arts and Humanities, 6901 Wadsworth Boulevard, Arvada

Agenda: 1998 DOE budget submittal; RFCA summary; recommendation on hazardous waste identification rules

ACTION ITEM SUMMARY: ASSIGNED TO:

1) Submit prioritized issues list to staff for work plan development - Board members

2) Complete and return survey on e-mail to Erin - Board members

MEETING ADJOURNED AT 9:40 P.M. (* Taped transcript of full meeting is available in CAB office.)

MINUTES APPROVED BY:

KATHRYN M. JOHNSON

Secretary, Rocky Flats Citizens Advisory Board

The Rocky Flats Citizens Advisory Board is a community advisory group that reviews and provides recommendations on cleanup plans for Rocky Flats, a former nuclear weapons plant outside of Denver, Colorado.

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