

**PLAN FOR PREVENTION OF
CONTAMINANT DISPERSION**

**PUBLIC COMMENT
RESPONSIVENESS SUMMARY
Revision 2.0**

**U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant
Golden, Colorado**

ENVIRONMENTAL RESTORATION PROGRAM

March 1992

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APPENDICES

APPENDIX A -- LETTERS RECEIVED FROM PUBLIC COMMENTORS

Responsiveness Summary - Final
 Plan for Prevention of Contaminant Dispersion for the Rocky Flats Plant
 (P:\BRR\FBOA\364\RESPONSBL.SUM\03/23/92)

ADMIN RECORD

REVIEWED FOR CLASSIFICATION/UCN
 By F. J. Curran (U-W)
 Date 2-17-92

ACRONYM LISTING

BEIR	Biological Effects of Ionizing Radiation
CAA	Clean Air Act
CDH	Colorado Department of Health
CERCLA	Comprehensive Environmental Restoration Compensation Liability Act
COC	Contaminants of Concern
DOE	Department of Energy
DOE-HQ	Department of Energy-Head Quarters
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
HASP	Health and Safety Plan
HEAST	Health Effects Assessment Summary
HNU®	Brand Name - Photoionization Detector
IAG	Interagency Agreement
ICRP	International Council on Radiation Protection
IM/IRA	Interim Measures/Interim Remedial Action
NCP	National Contingency Plan
NCRP	National Council on Radiation Protection
NESHAPs	National Emission Standard for Hazardous Air Pollutants
OSHA	Occupational Safety & Health Administration
OU3	Operable Unit 3
OVA	Organic Vapor Analyzer
PEIS	Preliminary Environmental Impact Statement
PPCD	Plan for Prevention of Contaminant Dispersions
RAAMP	Radiological Ambient Air Monitoring Program
RCRA	Resource Conservation Recovery Act
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RFP	Rocky Flats Plant
SOPs	Standard Operating Procedures
VOCs	Volatile organic compounds

EXECUTIVE SUMMARY

The Plan for Prevention of Contaminant Dispersion (PPCD) Public Comment Responsiveness Summary presents formal responses to the comments voiced during the public hearing held at the Westminster City Park Recreation Center, Westminster, Colorado, on September 5, 1991. Written comments were also received during the public comment period. Copies of the letters are presented in their original form in Appendix A.

The PPCD is a document specified in the Interagency Agreement (IAG) between the Environmental Protection Agency (EPA), the Colorado Department of Health (CDH), and the Department of Energy (DOE) Rocky Flats Operations. The primary goals of the PPCD are to provide a management plan to prevent airborne transport of hazardous and/or radioactive materials and to include a proposal to evaluate the potential for and risk of windblown contaminants coming from the Rocky Flats Plant (RFP).

Section 1.0 of this Responsiveness Summary contains an overview of the efforts by RFP to involve and include the community at large in the process of making decisions relating to RFP's environmental restorative activities. RFP's Community Relations Plan includes public comment meetings such as the one held on September 5, 1991, during which commentors made suggestions and posed questions regarding the PPCD.

The commentors represented several organizations from the surrounding community. Individual members of the public were also represented in the written comment section. The comments were directed into several key areas, and a summary of these areas is provided in Section 2.0. Most of the comments were directed at the calculation input variables and assumptions used to back-calculate soil threshold concentration from an acceptable risk level. The remaining comments were spread across a multitude of issues ranging from air monitoring concerns to plant shut-down suggestions.

Some of the key issues raised during the public comment process addressed the evaluation of a "sitewide risk" posed to a potential receptor from all activities being conducted at RFP. This issue, among several others, was out of the scope (as defined in the IAG) of this document; however, responses have been provided in order to present a possible answer to the commentor's question. Due to the number of questions surrounding the potential of numerous intrusive activities occurring at one time, an additional evaluation was conducted. RFP has reduced the soil thresholds by a factor of 10 to account for multiple activities occurring simultaneously.

The use of surfactants as a prevention technique was also questioned. The evaluation of surfactants and other containment techniques will occur on an ongoing basis. Studies very similar to the PPCD will be conducted for each remedial action as required by the EPA. The scope of the PPCD included only intrusive activities, as required in the remedial investigation phases.

Many comments addressed the protection of the environment, workers, and honesty and openness of DOE. DOE and EG&G prepared the PPCD referencing the applicable regulations; the PPCD was developed through the concurrence of representatives from the EPA, CDH, and DOE.

SECTION 1

COMMUNITY INVOLVEMENT

The Rocky Flats Plant (RFP) has developed a Community Relations Plan to involve the public in the decision making process as it relates to the environmental restoration activities. The plan meets the community relations requirements of the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Interagency Agreement (IAG) between the Department Of Energy (DOE), Environmental Protection Agency (EPA) and the Colorado Department of Health (CDH) for Environmental Restoration (ER) Program activities. Activities under the community relations plan are also intended to meet requirements of the National Environmental Policy Act (NEPA).

While RCRA, CERCLA, and the IAG provide the basis for the Community Relations Plan, the plan is tailored to the concerns and needs of the community expressed during a series of interviews with nearly 100 local citizens. The interview participants also suggested community relations activities that would help the public become better informed about environmental cleanup at the plant and ensure early citizen involvement in the decision-making process. The Draft PPCD was made available to the public for the comment/review period of 60 days. An informational meeting was held August 13, 1991 at the Westminster Recreation Center. A public comment meeting was also held September 5 where public comments were received. These comments and the responses to them, along with public comments submitted in writing and their responses, were incorporated into the Final PPCD.

Other ongoing public information efforts include the periodic Rocky Flats Environmental Restoration Update, an active speaker's bureau for civic and educational organizations, and tour programs for groups and individual citizens. The Community Relations Department also responds to numerous inquiries and requests for information about plant activities.

Five public reading rooms, which provide public access to environmental restoration documents, are maintained by DOE, EPA and CDH, and the Rocky Flats Environmental Monitoring Council. The DOE Public Reading Room is located in the Front Range Community College Library in Westminster, Colorado.

Information Repositories

Rocky Flats Public Reading Room
Front Range Community College Library
3645 West 112th Avenue
Westminster, CO 80030
(303) 469-4435
Hours: M, T 12:00 pm - 8:00 pm
W 10:00 am - 4:00 pm
Th, F 9:00 am - 4:00 pm

Rocky Flats Environmental Monitoring Council
1536 Cole Boulevard, Suite 325
Denver West Office Building 4
Golden, CO 80401
(303) 232-1966
Hours: M - F 8:30 am - 5:00 pm

EPA Superfund Records Center
999 18th Street, Suite 500
Denver, CO 80202
(303) 293-1807
Hours: M - F 7:30 am - 4:30 pm

Colorado Department of Health
Hazardous Materials and Waste Management Division
4210 East 11th Avenue, Room 351
Denver, CO 80220
(303) 331-6733
Hours: M - F 8:00 am - 5:00 pm

U.S. Department of Energy HQ
FOI and Privacy Branch
AD234.1, 1G-051/FORS
1000 Independence Ave., S.W.
Washington, DC 20585
(202) 586-6025
Hours: M - F 9:00 am - 4:00 pm
(Eastern Time)

SECTION 2

RESPONSES TO COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD

On September 5, 1991, DOE held a public meeting to receive comments on the Plan for Prevention of Contaminant Dispersion (PPCD) for the RFP. These comments are presented here in the order in which they were received at the public meeting. Written comments were also provided by the City of Arvada, the Rocky Flats Cleanup Commission, Wheat Ridge United Neighborhoods, the general public, the CDH, and the City of Westminster. The comments received via letter were not verbally presented at the public meeting. The comments have been subdivided at points where the issue or subject changes, and the DOE response directly follows. All comments have been numbered sequentially to allow cross-referencing of responses. The table presented below provides an index of the comments. In addition, each issue listed in the table is briefly summarized below to provide the reader with an overview of public concerns with regard to the PPCD.

<u>ISSUE</u>	<u>COMMENTS REFERRING TO ISSUE</u>
Responsibility to and protection of workers, public, environment	2, 15, 19, 26, 38, 52, 78, 90
Real-time air monitoring; other monitoring	3, 11, 28, 30, 36, 62
Compliance with state regulations	4, 89
Soil threshold levels; contaminants in soil; fugitive emissions; use of surfactants in dust suppression	12, 20, 21, 24, 43, 56, 77, 85, 88
Contaminant dispersion from multiple activities	6, 37, 40, 41, 44, 60, 69, 79
Decontamination of equipment	7, 66, 86
Terms and acronyms used in PPCD	8, 54, 57, 58, 59, 64, 65, 67, 82
Air pathways; wind dispersion; Chinook winds	10, 17, 23, 31
Contamination of water supply: lakes, reservoirs, wells	16, 18, 29, 87
Containment	25, 55

Resuspension; dispersion of contaminants through excavation, construction, plowing or tilling	1, 27, 32, 61, 63
Calculations and methods and assumptions employed in PPCD	5, 13, 14, 22, 33, 34, 35, 46, 47, 48, 49, 50, 68, 70, 71, 72, 73, 74, 75, 76, 80, 81, 84
Impact of funding on the Plan; honesty and openness of the DOE; request for closure of RFP; appreciation of PPCD	9, 39, 42, 45, 51, 53, 83

Responsibility to and Protection of Workers, Public and the Environment

The comments addressed a variety of issues, each response was developed by referring to existing ongoing programs at RFP. The RFP remediation workers are protected by the Health and Safety Plans which incorporate the OSHA requirements and DOE Orders covering radiation protection standards. Health studies have been conducted by the National Cancer Institution an on those individuals who have worked at nuclear facilities. In addition to accessing these studies, CDH has information about ongoing studies to assess the health effects of operations at RFP. The ability of a Project Manager to be able to execute the PPCD requirements well be verified by independent field audits conducted by a separate Quality Assurance department. RFP is continuing its efforts to involve the public, opportunity of the management to "fully disclose" will be increasingly more apparent as the plant advances to the remediation phases. Two other comments were raised which focused on posting of contaminated areas and providing health insurance for those near the facility. The posing requirements have been fully adhered to as specified by the applicable regulations and the provision of health insurance has been deemed unnecessary.

Real-time air monitoring other monitoring

Six comments focused on monitoring of plutonium or requesting additional detail on how monitoring for radionuclides was clarified, radon interference and the need for laboratory analysis was also explained in the responses. Additional detail regarding monitoring techniques and capabilities is available in the EG&G Remediation Programs Standard Operating Procedures for field activities. The stack sampling program for RFP building emissions has bee developed in accordance with the 40 CFR Part 61 (NESHAP [National Emission Standard for Hazardous Air Pollutants]).

Compliance with State Regulations

Two comments focused directly on RFP compliance with the Clean Air Act and State Air Quality standards. During the public information meeting a comparison of mining industry standards was presented. The response addresses the EPA - NESHAPS requirements, the Colorado Ambient air Quality Standards including the total suspended particulate limit (greater than 10 micron diameters) of 150 $\mu\text{g}/\text{m}$ and the Air Pollution Emission Notice permit requirements. Each requirement was addressed by explaining the existing programs which are responsible for demonstrating compliance at RFP.

Soil Threshold Levels; Contaminants in Soil; Fugitive Emissions; Use of Surfactants in Dust Suppression

Nine comments were received in where the soil threshold tables were addressed along with the adverse impacts associated with the use of chemicals surfactants. Upon receipt of the comments additional research was put into the 881 Hillside maximum soil contaminant concentration numbers. The revised PPCD will include a maximum of 4.5 pCi/gm versus 0.9 pCi/gm as listed previously. Chemicals dust surfactants were researched extensively, the manufactures claims regarding effects on plants and infiltration to groundwater were reviewed. The effects appear to be minimal however, the potential for disrupting analytical results appears to be more probable. Other issues raised focused on plutonium daughter products and colloidal soil fractions which were both addressed specifically in their appropriate responses.

Contaminant Dispersion from Multiple Activities

Eight comments were received in which a central theme was derived; address the total risk from all activities including non-intrusive activities which have the potential for producing increased risk to the public. The responses included clarification of what activities were included and ones which are being addressed outside of the PPCD. A review of the past years field activity to account for multiple activities resulted in a reduction of the soil thresholds by a factor of ten. This reduction will account for multiple intrusion field activities occurring simultaneously. The main issue of accountability for all sitewide risks has not been required under the existing requirements however, additional research is being developed to coordinate this evaluation.

Decontamination of Equipment

These comments have been addressed in the Remediation Programs Standard Operating Procedures for filed activities. A specific procedure was referenced which specified the necessary steps to minimize the spreading of contaminated soils.

Terms and Acronyms used in PPCD

The acronym listing has been updated with the requested definitions.

Air Pathways; Wind Dispersion; Chinook Winds

Questions were raised regarding the frequency of Chinook winds around RFP. The 1990 meteorological data was reviewed again to verify the frequency and wind speed data. The results were included in the responses. The methodology used in the PPCD resulted in the development of soil threshold tables, in order to derive soil thresholds numerous air dispersion calculations were conducted.

Contamination of Water Supply: Lakes, Reservoirs, Wells

Three comments focused on the potential for contaminating the groundwater and the subsequent transport of these contaminants offsite to drinking water supplies. The response includes an explanation of the RFP groundwater monitoring program and a contact for having water tested by CDH. The reservoir cleanup suggestion was addressed by referring to the RFI/RI process for characterizing potentially contaminated areas, which will cover the area in question.

Containment

Two questions focused directly on the evaluation process for considering containment structures. The evaluation process as defined by the individual analysis of alternatives described in the "EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (EPA/540/G-89/004) was referenced.

Resuspension: Dispersion of Contaminants through Excavation Construction, Plowing or Drilling

Five comments focused on the accountability of soil resuspension and specifically what was done to explain suspect results of radioactive material being redeposited in new areas. The accountability of soil resuspension is documented in the RFP 1990 Environmental Monitoring Report. The assumptions used in the PPCD calculations bound the effects which could be derived from resuspension. Also discussed in the response are the following: (1) documentation requirements for soil sampling, (2) a more complete definition of earth moving activities, and (3) actual air monitoring results from tilling activities.

Calculations, Methods and Assumptions Employed in the PPCD

Twenty-three comments were received covering a variety of technical areas used in the calculations presented in the PPCD. Five comments required clarification on the vehicular assumptions used in the dispersion models. The model input variables were also questioned regarding "K" factors, silt content, breathing rates, exposure period, uncertainty and model selection. Each comment was addressed by quoting a reference source which can be verified by obtaining the documents listed in the bibliography. Nine comments out of the twenty-three were authored by CDH; most of these comments focused on dose assessment variables which were also referenced. There were a few comments that addressed specific items such as animal necropsy studies, plutonium risk derivation, and alpha recoil which were individually responded to by citing previous studies and current understanding of the state-of-the-art methodology.

Impact of Funding on the Plan; Honesty and Openness of the DOE; Request for Closure of RFP, Appreciation of PPCD

Seven comments criticized the RFP for being less than open on what was happening with regard to environmental restoration activities and actual monitoring results. The comments directed at plant closure were recognized and the Community Relations Plan was referenced several times in the responses. The funding issues were addressed by stating how the budgets are allocated from congress on down to the DOE-HQ level. One comment was made appreciating the step-by-step breakdown in the PPCD.

2.1 VERBAL COMMENTS RECEIVED DURING PUBLIC MEETING

**COMMENTOR: Penelope Deem
Director, Front Range Alternative Action Group**

Comment 1

I will address a number of concerns regarding the PPCD. First and foremost, this plan strikes me as a prime example of locking the barn door after the horse has been stolen. Since work resumed on Hillside 881 in the summer of 1990, a number of buildings have been erected on site. But, apparently, no precautionary measures were taken during foundation excavation and building construction to prevent dust and contaminant re-suspension. I was told that no excavation took place; I am very curious about what sort of foundations these buildings rest on.

Response to Comment 1

During the time of foundation excavation, a health and safety plan (HASP) was in effect to reduce fugitive dust emissions. The specific location of the buildings was not in areas of known contamination. Specific precautionary radiological screening procedures were in place and executed prior to intrusive activity startup. The logbook of operations documents the approximate date when this occurred. The foundations are commonly termed "slab on grade" and are found throughout the RFP complex.

Comment 2

Another item of note was the apparent lack of any respirators or other protective clothing available to workers during construction phases. I would hope that in the spirit of "better late than never", the basics of worker protection will be provided as the next phase of cleanup begins. As Mr. Joe Goldfield, a retired industrial engineer, has stated on numerous occasions, even in such operations as asbestos removal, these basics are a requirement.

Response to Comment 2

As stated in the project HASP, there are certain action levels which must be exceeded in order to trigger the donning of a respirator. This action level is determined through real time monitoring whereby an instantaneous readout of fugitive dust particulate concentrations determines the relative airborne

contaminant concentration level. If the workers did not wear respirators during this period, it indicated air conditions were acceptable. As a point of reference, all HASP's are required to incorporate federal Occupational Safety & Health Administration (OSHA) and state (Ambient Air Quality) standards.

Comment 3

Plant credibility, while never strong, achieved a new level of depth during the informational meeting here held August 13th. As a member of the Rocky Flats Cleanup Commission, I attended a meeting in August of 1990 that was held at the plant. We met with various project managers to discuss cleanup methodology on 881.

Many concerns regarding effective air monitoring were voiced. The information we were given stated emphatically that high volume air monitors were the only monitors not only in place, but available. Dr. Biggs at that time provided site managers with specifics as to available real time monitors.

At the information meeting on August 13 of this year, I once again raised the question of real time air monitoring. Mr. Evered, you stated that real time air monitors have been in place since June of 1990. I asked for clarification on that, you again said June of 1990. I would strongly suggest that if plant managers are to continue blatantly lying to the public, that you at least coordinate your stories.

Response to Comment 3

High volume air samples are being used currently and have been in use on the 881 Hillside Project since June of 1990. Real time air monitoring for non-radiological constituents has also been conducted by RFP H&S staff using Piezeobalances and Minirams (see Appendix 7 of PPCD). High volume air sampling incorporates a motor to draw approximately six cubic feet per minute of potentially contaminated air through a glass fiber filter. This filter is then taken to a radionuclide counting facility on site. The filter must then decay for approximately three days, during which the radon daughter products (naturally occurring) die off, leaving only the long-lived radionuclides such as plutonium (Pu^{239}), americium (Am^{241}), cesium (Cs^{137}), and uranium (U^{238}). These long-lived radioisotopes are counted when there is no interference from the radon daughter products. Real time monitoring for long-lived alpha products is currently being developed but is not yet available for use. Low volume sampling utilizes a much slower draw on various filter media primarily used for heavy metals, organics, and other non-radiological hazardous constituents. The

sampler can be located on the worker lapel and this method is sometimes termed "worker breathing zone sampling." Both methods have been used at RFP in the past and are required to be used in the future. Since each method requires laboratory analysis, the term "real time" monitoring applied to high volume sampling was a misnomer.

Comment 4

Another evident area of concern is the acceptable levels of various contaminants that would need to be present prior to operational shut down. In even the most innocuous of shovel mining operations, strict compliance with state and federal clean air requirements are adhered to. The plan for 881 does not come close as it is presented to either state or federal regulations. At this point in time, the Colorado Department of Health and the EPA do not seem overly concerned with the unacceptable levels of air quality proposed in the PPCD.

At the August 13 meeting, representatives from both CDH and EPA were present on the panel. Neither could answer why the plant is under no apparent compunction to meet established clean air regulations.

It is clearly evident that the PPCD was put forth in an effort to convince the public that the plant is making a sincere effort to responsibly proceed with cleanup activities. The document is based on a lot of rhetoric and initially impressive figures pertaining to air quality and contaminant levels at which said levels would prompt cessation of activities.

The levels presented are questionable, nebulous at best, the obvious lack of adherence to state and federal clean air regulations, and the total lack of independent oversight indicate to me that you will proceed in whatever manner you choose as you have as you have always done, and which to date has been dishonest, irresponsible, and performed with an attitude of immunity.

You are accountable, and if you were to put as much energy into performing an honorable process of remediation rather than continually attempting to unsuccessfully convince the public that you are pursuing plant cleanup in a responsible manner, perhaps actual cleanup activities could proceed in both a more timely fashion and with much more honesty and effect an exchange with the communities that your actions effect. Thank you.

Question: Frazer Lockhart

Department of Energy Field Office, Rocky Flats

A question to clarify, if I could. You mentioned the 881 Hillside and that activity not meeting the state air quality standards, was that focus to the characterization activity or the plan and remeasure or were you referring to plan activities in general.

Answer:

Ms. Deem

Plan and remeasure as it is laid out in the PPCD.

Response to Comment 4

Ambient dust concentrations including CDH Air Quality Program parameters are continuously monitored. Dust concentrations are monitored at the fenceline by air monitors at the east side of the plant. DOE will continue to use that data to demonstrate the continued compliance with State Air Emission Regulations.

The DOE is continuing efforts to remediate the RFP in accordance with the IAG and EPA/CDH guidelines. The mining standards for fugitive dust emissions do not apply to RFP remediation activities; however, the air monitoring results obtained thus far indicate compliance for each intrusive activity measured to date.

The PPCD presents soil "threshold" concentrations for potential contaminants. These concentrations are based on exposures to the public due to dust-generating activities that would lead to a Lifetime Exposure Cancer Risk of 1×10^{-6} for carcinogens and/or a Hazard Quotient of 0.1 for non-carcinogens. These acceptable risk factors govern the requirements for implementing dust mitigating measures during expected intrusive field activities conducted as part of the RCRA Facility Investigation/Remedial Investigation (RFI/RI) occurring at the RFP.

Appendix 7 - Air Monitoring Requirements describes the methods for Compliance with the Clean Air Act (CAA). The threshold levels as presented are in fact below the CAA standards. These standards are considered to be inclusive of those applicable to the mining industry. An example is the requirement for respirators at one-tenth of a Derived Air Concentration (DOE Order 5480.11) are strictly adhered to, further preventing the continuation of

intrusive activities prior to coming close to the calculated thresholds. The remainder of the comment has been noted by EG&G and DOE.

COMMENTOR: Ken Korkia
Technical Assistant for the Rocky Flats Cleanup Commission

Comment 5

My comments tonight will be brief. I must admit that my first impression of this document was favorable. The organization is beneficial with the first section serving as an extended executive summary while the appendices provide the necessary detail. It is this detail, however, that causes my favorable impression to subside.

Specifically, I am concerned about the soil threshold levels that are calculated and presented in Appendix 5. These levels are so high that it is virtually assured that very few prevention measures will have to be carried out beyond those described for Stage 1. I am not convinced that proper conservatism was displayed in calculating these values.

Response to Comment 5

Several elements of conservatism were incorporated into the PPCD. These elements are primarily associated with assumptions made pertaining to potential contaminant concentrations in soil disturbed by intrusive activities. Additionally, the dispersion model used (Turner's X/Q) did not account for settling of dust (i.e., all dust generated by intrusive activities dispersed in a plume off site).

Conservative assumptions regarding contaminant concentrations include:

- 1) For radionuclides, it was assumed that contaminants are distributed homogeneously throughout the top 6-inch layer of soil. For a significant percentage of the RFP site, it is suspected that radionuclides are actually nearer the surface (approximately top 2 inches). This assumption increases the estimated dose for a receptor at the fenceline by a factor of three.
- 2) Volatile Organic Compounds (VOCs) were assumed to be distributed homogeneously throughout soils disturbed by activities, including major excavations. The VOCs were also assumed to be completely volatilized during these activities. Both of these assumptions are very conservative and lead to much higher exposure to receptors at the fenceline than can be realistically expected.

- 3) The exposure duration was more conservative than what is normally used in EPA Region VIII Risk Assessments for Industrial Workers Scenarios. The receptor intake was projected as 365 days per year at 10 hours per day. In reality this intake is not probable.

Comment 6

I am more impressed with the interim plan which takes the philosophy that if you detect dust, you take immediate steps to curtail its generation, regardless of any consideration of what level of contamination might be present. To me this represents true conservatism.

In consideration of the risk assessments it is stated that the action level is based on a 10^{-6} level to account for multiple contaminants and multiple pathways of exposure. What about multiple activities which are simultaneously going on at Rocky Flats? Obviously, normal plant operations contribute to the risk as well as any combination of remedial activities which might be carried out simultaneously. What accounting system is there that addresses these simultaneous risks? It seems to me that each risk is considered independently of what is happening across the plant site.

Response to Comment 6

Some of the methods of conservatism have been addressed in response to Comment 5. An example of a conservative assumption includes the following: soil contamination has been assumed to be heterogeneously distributed throughout each operable unit at the highest observed soil concentration. Actions to be taken prior to any sign of dust was specified in the Interim Plan for Prevention Contaminant Dispersion, which preceded the PPCD and is included in the PPCD as Appendix 8 (IPPCD). Monitoring will be conducted to determine when additional action is to be taken.

The National Contingency Plan (NCP, 54 FR 29820, March 8, 1990) addresses the added risk of a multiple hazard site. The 1×10^{-6} acceptable risk has been derived from the NCP recommendation, the 1×10^{-4} is the maximum allowable individual risk. In accordance with the National Emission Standard for Hazardous Air Pollutants (NESHAPs), 40 CFR Part 61, the combined effect from stack emissions will be evaluated for activities producing a dose to an off-site receptor. DOE Order 5400.5 "Radiation Protection of the Public and the Environment," specifies the exposure assessment limitation from all sources and pathways must be less than 100 mrem per year. This calculation involves combining the perimeter air sampling station results with all relevant pathways

(i.e., soil ingestion, plant/soil ingestion, etc.). The demonstration of compliance is documented in the Rocky Flats Plant Site annual Environmental Air Monitoring Report. Additionally, the air monitoring network is in place to provide additional data to support the ongoing assessment of multiple activities occurring at one time. Colorado Air Quality Control Regulation #8 (Title 5 CCR 1001) covers hazardous and/or toxic materials requiring the filing of Air Pollution Emission Notifications (APENs) with CDH describing emission rates and control measures. The DOE Order 5400.1 General Environmental Protection Program stipulates a demonstration of compliance to all of the aforementioned regulations.

Comment 7

In another area, I believe that more details could have been included in the plan with regards to the standard operating procedures for items such as general and heavy equipment decontamination.

Response to Comment 7

A procedure exists for both general equipment decontamination and heavy equipment decontamination (Environmental Management Standard Operating Procedures, SOPs FO.3 and FO.4, respectively), this process includes a fixed decontamination pad which is self-contained with rinsewater being disposed of as contaminated material. The potential for spreading contamination has been addressed through a mandatory screening requirement for all equipment leaving a controlled area. The likelihood of air contaminants dispersed via high pressure wash is addressed by performing this activity on concrete pads with splash guards.

Comment 8

Along these same lines, the document could become more user friendly if you didn't assume that people know what you are talking about when you mention things like OVA's, HNU's, and piezobalances. Perhaps you could provide a little more information on these pieces of equipment.

Response to Comment 8

The following instruments were explained in Appendix 7 - Air Monitoring Requirements, Section A.7.3. The Piezobalance® is a portable instrument used

to measure the mass concentration of respirable smoke, fumes, dust, and other aerosols in the .01 to 10 microns (μm) range.

The OVA, Organic Vapor Analyzer, is an instrument designed to measure trace quantities of organic materials in air.

The HNU is a portable trace gas analyzer manufactured by HNU Systems, Incorporated. It is used to detect, measure, and provide a direct reading of the concentration of a variety of gases in an industrial atmosphere.

Comment 9

Finally, I would like to call your attention to page 3 of the plan where you state, "This document has been developed from a working group approach and is considered to be a 'final PPCD.' A final responsiveness summary addressing public comments will be developed after the public has had an opportunity to thoroughly evaluate and publicly comment."

Now you should realize that many members of the public are sensitive to the idea that their comments don't have very much of an impact. They would like to believe that a document or a plan isn't final until they have had an input. Responsiveness summaries are often times looked upon as an exercise where the DOE addresses concerns with very standardized types of responses, similar to what one receives after writing an elected official. The document at this time should be called a "draft" final which is awaiting its final stage of approval by the public. After the public speaks, then it becomes a "final PPCD." This point seems very trivial, but to a sometimes skeptical public it is very important that the right impression be given.

Response to Comment 9

We recognize the importance of the public comment process and are taking whatever steps necessary to address the public concerns. Each public comment is being addressed with specific responses and references as appropriate. The public comment process will not be cut short or hindered in the production of this document. The "Final PPCD" is a document which has been approved by CDH after the public comment process has been completed.

COMMENTOR: Dr. Gale Biggs
Director, Rocky Flats Cleanup Commission

Comment 10

My written comments will be included as part of the Rocky Flats Cleanup Commission submittal.

My concerns are primarily with the air pathways. And I guess that I am concerned that this PPCD does not really address the air pathways. It is heavily based on soil samples and these are an integrated average over many years of time and they don't necessarily represent air concentrations. So I think that there needs to be a lot of work done to address the air pathways in this document.

Response to Comment 10

The air pathway is the focus of the PPCD. The risks associated with the air pathway have been evaluated using the EPA risk calculation guidance. This methodology is widely used in the Superfund process nationwide.

The threshold levels calculated for potential contaminants are independent of actual soil contaminant concentrations. The threshold levels indicate potential contaminant concentrations in soil that would lead to achieving the target threshold risk or hazard quotient due to generation of dust. In other words, the soil threshold concentrations ultimately translate to contaminant-in-air concentrations that, if exceeded, will result in a Lifetime Exposure Cancer Risk greater than 1×10^{-6} and/or a hazard quotient greater than 0.1.

Comment 11

There are two major emission sources; there is the plant exhaust and the fugitive emissions from the disturbed soil. About a year and a half ago as a member of the Governor Romer's Scientific Panel, we attempted to calculate an upper limit on what may be coming out of the plant. And we thought a rather simple approach to this would simply be to take the maximum amount of air flow that flows out of the ducts, multiply it by the lower detectable limit of the sensors and use that as an upper limit.

We found we were unable to do that because when we started trying to define the air flow through the system, we found that the pito (phonetic) tubes put in the ductwork had never been calibrated since they had been installed, so we couldn't

depend on the air flow out of the building. We tried to look at the lower detectable limit of the sensors. We found that they were so poorly located in the ductwork that we just didn't believe that they were represented at all. So, simply trying to put together two numbers, we were unable to do so to look at what maybe an upper limit complied emission. So that is still is an unresolved issue in my mind.

Response to Comment 11

The proper calibration and placement of stack samplers is specified in 40 CFR Part 60. The lower detectable limits have been listed in the annual Rocky Flats Environmental Monitoring Report. Also included is the combined effect of stack release and fugitive dust emissions coming from RFP to a maximally exposed individual. This calculation was performed using AIRDOS-EPA and other state-of-the-art dose assessment techniques.

Comment 12

In terms of the fugitive emissions, I think there are tremendous questions left in that area. I don't think they have been studied well, nor do I think they are even really understood. And, I expressed some of these concerns at the workshop, and I will not repeat those again tonight, but there was a study done several years ago by George Sehmel (phonetic) with Battelle Northwest. He looked at daughter products of uranium coming off from tailing piles. And he found that the radioactivity of the uranium as it left the tailings was probably maybe just a little above background. But, then when he started looking at the daughter products of these uranium emissions, he found out that there was an increase of an order of magnitude in the radioactivity off site than there was that was coming off the site itself due to this daughter relationship of radioactivity.

Also, another study done at the Trinity site in New Mexico looked at plutonium in the soil and what has happened to it as it aged over time. It was found that the plutonium 238 actually went down in the soil, got taken up in the plants and was brought out of the soil through the plants and in this way then got into the food chain both through ingestion as well as airborne as the plant dies and decayed. I don't think there had been any real looking at the daughter products of plutonium as it gets out into the environment or how it is transported through the airborne mechanism.

Response to Comment 12

Dr. Ward Whicker of Colorado State University (CSU) studied the RFP radioecology for many years. He has stated that Pu uptake by plants is in minute quantities (almost undetectable amounts). CSU has performed numerous studies on the 903 Pad resuspension of plutonium particles and additional studies have been conducted using greenhouse environments at CSU under Dr. Whicker.

The long lived daughter products of Pu⁻²³⁹ (the most abundant radionuclide) includes (U⁻²³⁵ and Pr⁻²³¹.) For Pu⁻²⁴¹ the daughter product is Am⁻²⁴¹. It takes thousands of years for plutonium to decay to any significant amount of daughter products. The mobility of these daughter products is known; studies conducted by Eisenbud et al. (1973) have been published. The dose conversion factors used in deriving the risk as a result of a intake via the airborne pathway have been included. The results of these and other studies indicate that the soil contaminant levels at RFP are not mobile or high enough to be resuspended into air via plant decay.

Comment 13

There is another concept that I have not heard mentioned at all yet, and that is the alpha recoil off from particles of plutonium. If a surface or a plutonium close to the surface ejects its particle inward or ejects its emissions inward into the particle, there is enough energy to blast a little piece of plutonium off from that plutonium particle. So, in essence, as that particle moves through the air, you are actually increasing the number of plutonium particles that you have downwind of where you started. I don't see that that is taken into account anywhere.

A major concern of mine is that these particles that are being blasted off as they move along are now of very respirable size; less than a micron in size, so they are going to be a real inhalation problem. And I don't think that that has been addressed at all in the airborne pathways part of this PPCD.

Response to Comment 13

Alpha particle recoil is a phenomena that is indeed possible. However, this document was not written to address the physics of radioactive decay and the adhesion to soil particles. This document provides a method to evaluate the risk from hazardous and/or radioactive air pollutants coming from RFP. The possibility of increased risk due to the inhalation of freed alpha particles resulting from the ejection of the plutonium particle has not been addressed in

the form of any regulatory mandate by the EPA, Nuclear Regulatory Commission (NRC), or any agreement state such as Colorado. The current regulatory framework incorporates the recommendations of the NCRP and ICRP which are the experts in this field. Alpha-particle recoil contribution has not been mandated nor mentioned in the RFP, EPA, or NRC risk assessment guidance.

Comment 14

I guess those are my major concerns at the moment. I do have another one which is kind of out of my area of expertise, but worries me a little bit.

That is how the risk level for plutonium was set. I was talking to someone yesterday and they indicated that plutonium risk levels were set from the old radium studies that were done many, many years ago, and that they were looking at mostly whole body and bone assessments. And, plutonium is really -- instead of getting into the bone like radium, it goes to the surface of the bone and as I understand that makes it even worse in terms of risk and that perhaps even a bigger concern is that plutonium really goes for the soft tissue. I don't think there has been any real looking at soft tissue risk elements here.

Those are some of the concerns I would like to ask you to look into in terms of your PPCD here. Thank you.

Response to Comment 14

The risk estimates were based on the EPA Health Effects Assessment Summary Tables (1990 HEAST) which refers to National Academy of Sciences Biological Effects of Ionizing Radiation (BEIR V, 1991). These studies were conducted using the most up-to-date databases and represent the world consensus of expertise in this field. The accounting of soft tissue dose is discussed in the International Council on Radiation Protection (ICRP) Publication Number 30 (1977). The recommendations of the ICRP have been included in the HEAST tables used in this document.

COMMENTOR: Susan Hurst
Publisher of Environmental Information Network; Former
Board Director for the Rocky Flats Cleanup Commission

Comment 15

I did not have a chance to review the document, but I do have some concerns that I really would like to get into the record.

I had a question and I was wondering if they start a real aggressive cleanup, or if by some miracle they open the plant again and start their programs again, will the Health Department or EPA or DOE provide people within a five-mile radius with health insurance. And I guess drive-through chemotherapy is out. But, I was also thinking about the evacuation. We don't have evacuation plans that the community has ever been involved with. Everybody I have talked to it is like, "Oh, my God, what would they do that for?" So, I would like to see that implemented before any restart; a real aggressive cleanup starts happening out there. There is an awful lot of accidents that can happen.

Response to Comment 15

The question regarding health insurance compensation should be directed to CDH Public Relations Office (331-4609). The responsibility for emergency planning is directed by the State of Colorado. The Radiation Control Division (331-8480) could be contacted for more specific response actions. The plan which encompasses emergencies at RFP is called the Radiological Emergency Response Plan. RFP supports the state plan, which was formerly executed by the Division of Disastrous Emergency Services (DODES). Also, RFP, the state, and local emergency preparedness officials, participate in annual exercises to ensure that the plan is functional. CDH currently has the responsibility for maintaining this program. Public inquiries to CDH should be directed to Public Relations Office of CDH at 331-4609.

Comment 16

Also, around the 903 Pad area, I am concerned with the water that is seeping out from underneath that. You can probably look tonight and see how high Rocky Flats is. It is higher than a lot of ground around there. Their ponds are very inadequate to handle flash floods, if would indeed be told they were having any out there.

Also, where is the water going? For years upon years upon years, there has been a steady flow from Rocky Flats to Great Western Reservoir and Standley Lake and Mower Reservoir. Where in the hell is this water going to? I know it is going somewhere; the canals look awfully deep to me where a number of years ago they were pretty much bone dry; maybe two feet. I used to ice skate on those canals when I was a kid and they were always like a foot to two feet to the top. These canals have got to be 12-feet-deep at least. Just in the last two years, I've noticed, bingo, we've got water again. Where is it coming from? I think I would like to see that tested and have signs put up so the children won't play in the water like they like to do, anywhere else in the country, but here.

Response to Comment 16

The issues identified in the comment are 903 Pad seepage, detention pond capacity, the present water discharge and diversion system for RFP waters. Although these issues do not relate to the PPCD, a brief response is provided.

Seeps in the vicinity of the 903 Pad were the focus of a proposed interim measure/interim remedial action plan. Following an evaluation of the risk, no action was proposed. The seeps will be addressed in the final remediation. Seepage along the northern edge of the divide potentially affects the water quality of the B-Series Ponds. If the water is affected, it is treated by granular activated carbon units as discussed below. Seepage along the southern edge of the divide would potentially affect water quality in the South Interceptor Ditch. Water from the South Interceptor Ditch flows to Pond C-2. Treatment of Pond C-2 water is discussed below.

The terminal ponds were conservatively designed to handle a 100-year, 3-day flood event. There are three terminal ponds at RFP from which water can be discharged. These are Ponds A-4, B-5, and C-2. A fourth pond, Pond C-1, is a flow-through pond on the Walnut Creek drainage. Water from Pond B-5 is transferred to Pond A-4. Water in Pond A-4 is treated by granular activated carbon, sampled, and analyzed. After the analytical results have been reviewed for compliance with permit requirements and appropriate agreement criteria, the water is allowed to discharge to the North Walnut Creek drainage. It should be noted that the CDH collects and analyzes a predischARGE split of the treated effluent.

As previously stated, the discharge from Pond A-4 is released to the North Walnut Creek drainage. Water from Walnut Creek has been diverted around Great Western Reservoir by the Broomfield diversion ditch. Water in the diversion ditch flows to Dry Creek.

Pond C-2 has several modes of potential discharge. Granular activated carbon treatment units are utilized to treat Pond C-2 water. The treated water is sampled and analyzed. If the treated effluent meets the permit requirements and appropriate agreement criteria, the water is allowed to discharge to the Woman Creek drainage which flows to Standley Reservoir. If treatment criteria are not met the water either is transferred via a piping structure to Pond B-5 or released to the Walnut Creek Drainage. Flow from the plant via Walnut Creek is sampled as described above.

Comment 17

Also the Chinook winds--I don't know when the wind speed is below 15 miles an hour out at Rocky Flats. And they have proved before when they were trying to plow under the plutonium in the soil, we had elevated readings in all our air monitors. Thanks to Gary Potter negotiating with the county to give them a fugitive dust permit, I don't think this should be allowed to happen. If we have to, let's dome the whole thing over and take our prisoners out there and let them do it. We've got to come up with a plan other than, well, we are not sure about this but in the very end, the public that knows the issue, that doesn't have their economic base out there on inflated salaries, saying it is okay when they don't read the same things we do.

This complex cleanup book that I was reading while I have been home sick from work is a very big eye opener. Believe me, we have got stuff out there that should not be disturbed. Dome it over and then let's see what we can do, but I can't stand the thought of one more fall with 100-mile-an-hour winds bringing that shit to Denver, courtesy of Rocky Flats.

Do you have any questions for me?

Question: Mr. Lockhart

Yes, I had one, Susan. The canals you are talking about, are you meaning the ditches, the water ditches, a number of them that run west out of the foothills and a couple of them do go through Rocky Flats buffer zone.

Answer: Ms. Hurst

You bet they do. Yeah.

Question: Mr. Lockhart

Those are the ones you are referring to?

Answer: Ms. Hurst

I'm thinking the water is being diverted somewhere. There are too many water tables coming through and going down into Leyden and all that it just hasn't really been addressed yet.

Question: Mr. Lockhart

Your point is that they are dry now or that they have water in them now?

Answer: Ms. Hurst

It has fluctuated greatly, okay? Leyden has changed totally in the last 25 years. The lake is farther to the east where it used to be the west. And if you looked at some of those aerial surveys, you'll see americium levels are very high where it is now dry. And of course, as Gale was saying, the daughter products are what we are going to be having to look for, not just plutonium. The americium is a big problem.

Response to Comment 17

In Appendix 8 - IPPCD, the shutdown criteria is specified at 35 mph or when the wind speed exceeds 15 mph for two sustained 15-minute periods. An alarm is activated once this criteria has been exceeded. The joint frequency distribution for windspeed at RFP is included in the PPCD. For further clarification, approximately 66.4 percent of the time the windspeed is blowing in stability Class D. The wind speed is greater than 10 knots, 23% of the time (see Appendix 3, Attachment A.3.2, Wind Frequency Distribution).

At the time of tilling (discing) an air monitoring network was in place. The actual monitoring results obtained during this activity show an increased risk to a potential receptor as estimated in the airborne pathway.

Doming has been evaluated in Appendix 6 evaluated in Appendix 6 of PPCD. Constructability, cost, and implementability are key factors in the decision making process when soil concentrations require Stage 2 mitigation actions.

The water ditches west of the RFP are part of the surface water monitoring program onsite. Americium²⁴¹ is part of the analyte suite for which the water is examined and Am²⁴¹ was a COC in soils evaluated in the PPCD.

Comment 18

And that leads me to one more thing. The water reservoirs, how in the hell are we going to clean these up? I don't know of a way that is not going to resuspend those particles and be given into the water unless we can use a reverse osmosis system, deal with the brine, God knows how, but that would be one way. I would suggest, so that we don't have to inhale through the steam in your shower or whatever these added particle risks are for us. I don't want to die. I don't want my friends to die of the same stuff that everybody else is.

Response to Comment 18

The reservoirs are part of Operable Unit No. 3, and will be evaluated according to the IAG process.

Comment 19

Have we had epidemiological studies done of people that have moved away; families that have lost members? I would really like to see this stuff before we aggressively tackle the environmental problems out here. I mean a real good try.

Response to Comment 19

Numerous health studies have been conducted relating to the operation of nuclear facilities, including RFP. Studies have focused on the public and nuclear workers. The CDH has information about ongoing studies to assess the health effects of operations at RFP. Also, the National Cancer Institute looked at cancer death rates over the 35 years preceding 1985 in 107 U.S. counties where nuclear facilities were operating, including RFP. These rates were compared to those in 292 "control" counties with comparable populations. No significant differences were found.

COMMENTOR: Paula Elofson-Gardine
Executive Director of Environmental Information Network

Comment 20

I have a number of questions about this report. I feel that you have some problems with some of the tables in this report, page 38, soil contaminants. The radioactive contaminants are listed, and I am concerned about the validity of the numbers there considering 903 being up gradient from the 881 figures with radioactive seepage that we have addressed in the past year and a half.

We wrote a letter specifically to the plant about the seeps problem and had asked that a study had been done on that. And considering that 881 is down gradient, I have a little question about the validity of those numbers.

Response to Comment 20

According to the geohydrological data collected to date, the 881 Hillside is cross-gradient and not down-gradient to the 903 pad.

The contaminant concentrations used in the example scenario were taken from existing environmental data in the Rocky Flats Environmental Database System for 881 Hillside boreholes. Results obtained from the samplign activities performed more recently have shown the highest observed plutonium in soil reading to be 4.5 pCi/gm. The revised PPCD final report will reflect this addition.

These samples were collected during monitoring well installation in the 881 Hillside area. Most of the analytical results have undergone a data validation exercise to identify erroneous results.

Comment 21

Also, number 2, were those whole soil or surficial soil samples? Table 2.3.3 where well samples and soil threshold levels with vehicle traffic are acquired there, do these numbers represent re-suspension? If so, we obviously do not have a handle on dust re-suspension and re-entrainment.

Response to Comment 21

The "observed highest" and "average" concentrations for the principal contaminants (PC) listed in Table 2.3.3 were taken from the existing data for Operable Unit 1 (881 Hillside Area). This was included to provide a workable example scenario to illustrate the concepts in the PPCD. For this purpose, the "observed high" from existing borehole (i.e., whole soil) data was presented, regardless of sample interval or location. This is a conservative point of illustration because it over estimates the concentration of the PC at the surface which will account for resuspension. The average concentration presented is also conservative in that it is an average of those concentrations observed over the detection limit, and does not take into account numerous non-detects.

Threshold values for potential contaminants in soil disturbed by intrusive activities such as well drilling or vehicle traffic were determined based on predicted dust emissions resulting from their activities. Soil threshold levels are calculated to prevent any possible airborne contaminant plume to disperse off site resulting in an unacceptable threshold risk value for an off-site receptor (also see response to Comment 4).

Comment 22

Another issue is the rodenticides that are used widely at the plant to kill pocket gophers. According to the Inspector General testimony by Thomas Courtney, many animal species are under a control program because redistribution of plutonium in soil due to pocket gopher activity etc., there are few studies available, although I do have some of them on study of the native animals that are inhabiting this area. It seems odd though that there are a few tissue comparisons in the animal autopsies that have been done. I would like to see more data on the radioecology on those areas that have been Superfund designated.

Response to Comment 22

According to DOE Rocky Flats Operations, it is not DOE policy to use rodenticides or any other pesticide to control any animal species within the boundary of the RFP. Additionally, DOE has not been involved in the application of rodenticides or pesticides on private or publicly owned acreage surrounding RFP. DOE was responsible for a prairie dog control activity east of Indiana Street on county-owned property. This action consisted of tilling and re-seeding an area where a substantial prairie dog population existed.

In areas that have been Superfund designated, environment evaluations will be conducted for each of the RFP Operable Units. These evaluations generally consist of an evaluation of the animal species inhabiting an area. Appropriate tissue sampling and analysis is being conducted through the environmental evaluation process. Data from the environmental evaluations would be available as a result of the Operable Unit-specific environmental evaluations.

Comment 23

Also, are the release fractions reasonable considering the Chinook wind problems and plutonium and respirable dust fraction reports? It just doesn't seem to be copacetic. Also, the plutonium and respirable dust report from 1987, cited vehicular re-suspension as one of the worst problems in terms of the re-entrainment problem at the facility. I feel that there is a little bit of a fudge factor involved there in this report that it is not given enough attention.

Response to Comment 23

The response to comment No. 17 addresses the Chinook winds at RFP.

The IPPCD (Appendix 8 of the PPCD) includes the following criteria which is currently being implemented, a shutdown criteria of 35 mph (wind speed) or two sustained 15 mph for 15 minute durations. During non-work periods, soil piles will be covered to minimize dispersion. Vehicle re-suspension and the associated assumptions pertaining to vehicle traffic are discussed in Appendix 2 which includes a sensitivity analysis regarding vehicular resuspension.

Comment 24

Also, some of the soil decontamination reports from the past have listed colloidal components in the surficial soils that may have a propensity for further re-entrainment and resuspension that have not been cited in this report. I would ask that you go back and look at my PEIS (Preliminary Environmental Impact Statement) testimony that was submitted for all three PEIS processes in a bound volume that cites some of those reports that is more specific in terms of title and author and date and identification numbers etc.

Response to Comment 24

We recognize that one of the variables common to most of the dust emission models used for activities discussed in the PPCD is silt content. In every

activity scenario developed, it was assumed that at least 50 percent of the soil disturbed is within the silt fraction (<200 mesh which includes potential colloidal particles). This assumption is considered conservative with regard to dust emission, since much of the disturbed soil will have less than a 50 percent silt fraction. This conservative assumption accounts for the colloidal fraction of dust entrained in the air.

Comment 25

Fugitive dust emissions are extrapolated from mining studies, but radioactive dust has been characterized as submicron particles that are electrostatic in nature with infinity settling rates. How exactly do you propose to control those electrostatic radioactive particles if you are not containing your cleanup areas with domes or temporary buildings with electrostatic precipitators or similar technology that will help settle those particles out?

We have brought the containment with dome or temporary building concern to DOE and Rockwell, now EG&G, two and a half years ago, with the first 881 hearing. That has been ignored and pushed under the carpet repeatedly at every hearing since then. We'd like to know why there has been a refusal to acknowledge the need for containment with any kind of remediation.

Response to Comment 25

According to particle physics all aerosols have electrostatic properties independent of their radioactive composition and the nature in which they are generated. The proposed mitigative measures for dust control (wetting, application of surfactants, etc.) will control the electrostatic particles.

For enclosures in which dust control is important, several measures can be taken to prevent the loss of electrostatic radioactive particulates. These measures include:

- 1) Humidification of the controlled environment within the enclosure
- 2) Installation of an air treatment system consisting of Environmental Protection Agency High-Efficiency Particulate Absorption (HEPA) filtration, electrostatic precipitation, etc.
- 3) Maintenance of the controlled air within the enclosure at a pressure below the outside environment.

The need for containment has been evaluated based on the intrusive activity being implemented, the contaminants present in the soil being disturbed, the implementability of containment installation, and cost. The evaluation criteria have been specified in Appendix G of the PPCD. The decision flow diagram was presented in Figure 3 of the PPCD.

Comment 26

Also, in regards to the PPCD, we would like to know why there is not signage that this in fact the Superfund remediation site all along the roadways. It should be fenced off so children can't set haystack fires or enter the area of contamination with radiation, etc. There is no recognition that these areas are Superfund site or contaminated. That haystack fire that occurred had 217 times greater readings than the Colorado average of 0.4 of Pu.

Response to Comment 26

The remediation area is fenced and marked with "no trespassing" signs. Currently there are no additional posting requirements imposed on the RFP.

Soil and ash samples were collected from the haystack fire zone in May 1991, and analyzed. The average plutonium concentration in the soil was 2.7 picoCuries per gram (pCi/g) (not 86.8 pCi/g as inferred by the comment), which is three times state radiation control construction guideline of 0.9 pCi/g (described in Comment 77). This area has been designated as a remedial area.

Comment 27

Also, there was new hay brought into that haystack fire area that was matted down in that area east of 903 to abate the re-suspension. Five years ago there was hay brought in that has shown an accumulation over time with higher readings with the ash from that hay. We would like to know why there was an accumulation on the top portion of that hay since then, and is that a reflection of the resuspension and reattainment and spread from 903 still?

Response to Comment 27

This issue has been addressed at recent public meetings held by the Rocky Flats Monitoring Council Meetings, additional information can be obtained from the Executive Director by calling 232-1966. RFP also will investigate the accumulation as part of the forthcoming OU-3 RI/RFI study.

Comment 28

With discovery of tracking cesium and rings of trees, we would like to know why you have not applied the same methodology towards tracking plutonium and americium in the indigenous species of trees, etc., in the buffer zone area to check time extrapolations on uptake in the ecosystem in the area.

Response to Comment 28

The methodology for tracking cesium via plant uptake and concentration in tree rings can be applied successfully because of cesium's high susceptibility to plant uptake. The physical properties of plutonium and americium (i.e., large molecular size and insolubility) do not make these radionuclides susceptible to plant uptake and, as a result, they are not good candidates for this type of study. For example, plutonium uptake is approximately 200 times lower than that of cesium.

Comment 29

Also, the testing of private wells, 40 plus, between Indiana and Standley Lake should be undertaken to try to locate where the millions of gallons are going that are said that are to be released from the "C" series, but appear to be disappearing in sand lenses or fractures to the aquifers. If in fact we have subsurface drainage, resurfacing in wells, or groundwater contamination, we might as well make Great Western B-6 Pond and Standley Lake C-3 Pond.

Response to Comment 29

The potential for contaminant migration into OU3 from RFP is being investigated in the RI/FS process. The sampling data to date has shown that contaminant migration is not occurring.

As part of the Phase I RFI/RI Work Plan for Operable Unit 3, five monitoring wells will be installed in the area of concern. CDH currently has the responsibility of domestic (private) well sampling. Domestic water samples can be analyzed by the CDH Radiation Control Division; for more information call 331-8480.

Comment 30

Do we have a toll-free number for what the daily readings are of resuspension and re-entrainment from remediation activities? I would like to know what the plutonium count for the day is, if you don't mind. Kind of like the pollen count and the plutonium count, I would really like to see us be able to track that.

Response to Comment 30

There are currently no plans for developing a toll-free telephone number for RFP for plutonium airborne concentrations.

Due to the analytical requirements, as discussed in response to comment 3, a daily plutonium airborne concentration estimate is not feasible. Additionally, air monitoring data is routinely evaluated by CDH and is provided to the RFP Monitoring Council. The perimeter sampling station results are summarized in the Annual Environmental Monitoring Report.

Comment 31

Also, there are dispersion maps that have been generated every 15 minutes for the last two years. You have greater than 40,000 dispersion maps from that process. We would like you to produce, go back and get a composite of the high concentration and probability areas of dispersions. You know, considering the SF-6 survey showing that your effluent reaches the Continental Divide, Greeley, Southeast Denver, etc., and in relationship to that, I would like to enter into testimony the "Living within a Radioactive Fall-out Zone" flyer that shows the Rocky Flats Advisory Notice and various extrapolations on the front, and the dispersion plumes on the back. This is a two-sided information sheet that I would like to enter into the record at this time.

Response to Comment 31

The air dispersion of contaminated fugitive dust being generated on-site is limited for the purpose of this discussion to the activities specified in the PPCD scope. The dispersion from borehole installation or vehicular traffic will not be measurable (less than detectable limits) at the site boundary. The information derived from the dispersion maps is a valuable tool for estimating the probability of contaminant plume deposition under accident conditions. The dispersion modeling used in creating the dispersion maps is based upon Gaussian Plume equations which are sufficient to meet the objectives of the PPCD.

Comment 32

I have other concerns about plowing not being safe out there. When you are taking samples you need to acknowledge whether or not it is done from a plowed area, where it is whole or surficial soil. Thank you.

Response to Comment 32

Health and safety plans, including dust control measures as listed in the PPCD are required. Dust control measures such as water application are strictly enforced in areas of known surficial contamination.

SOPs for soil sampling and the associated documentation are described in the EG&G RFP Environmental Management SOPs. Sampling activities, including a description of the location, sample type, and sample interval are routinely recorded by field personnel and subsequently entered into the Rocky Flats Environmental Database System. As a result, the sample source and description is documented.

COMMENTOR: Barb Moore
President of the Rocky Flats Cleanup Commission

Comment 33

The testimony offered tonight will not include our written comments. These will be prepared for the DOE at a later date. We would ask for an extension at this time for the written comments of September 27th of at least 15 days as there was a 15-day delay in receiving our copies of this document.

We feel that the emission rate calculations are based on liberal assumptions in the PPCD, which will result in inaccurate risk assessments to the public. Some of our concerns are the aerodynamic particle size multiplier K is being used liberally at .45 and needs to be set at 1.0.

Response to Comment 33

The Public Comment period was extended by the DOE to October 11, 1991.

Activities with models requiring K values include vehicle traffic, batch drop-test pits, unloading by scraper, and excavation by a front-shovel excavator. The actual K values used for the activities are the following:

<u>Activity</u>	<u>Aerodynamic Particle Diameter</u>	<u>K-Value</u>
Vehicle Traffic	$\leq 10 \mu\text{m}$	0.45
Batch Drop-Test Pits	$\leq 15 \mu\text{m}$	0.48
Unloading by Scraper	$\leq 15 \mu\text{m}$	0.48
Front-Shovel Excavator	$\leq 15 \mu\text{m}$	0.48

Each of the K-factors used accompanies the specific dust emission models used. The K-value used for vehicle traffic is actually higher than the recommended K-value of 0.36 for particle diameters $\leq 10 \mu\text{m}$. The remaining activities have conservative K-values since the respirable particle size was conservatively assumed to be $\leq 15 \mu\text{m}$. These factors were obtained from the CDH memo included in its entirety in Appendix 2.

Comment 34

The light vehicle traffic looks to be based on only one truck. It seems obvious that the traffic has to be much greater than what is being calculated in the PPCD.

Response to Comment 34

There were two levels of vehicle traffic defined: light and heavy. Light vehicle traffic assumes that the total distance travelled over dirt roads for a period of 10 hours (hrs) by vehicles supporting an activity is approximately 10 kilometers (km) (or 10 vehicle-kilometers). It was assumed that, typically, two vehicles would support an activity and would not exceed 5 km travelled (each) over dirt roads for a 10-hr period. Heavy vehicle traffic assumes that the total distance travelled over dirt roads by vehicles supporting an activity is approximately 100 vehicle-kilometers. It was assumed that, typically, 20 vehicles would support an activity and would not exceed 5 km travelled (each) over dirt roads for a period of 10 hrs.

Comment 35

We recommend that using a more conservative stability air class of F instead of the Sigma Y and G values. The DOE and EG&G need to use more conservative factors when using the Turner's equation. We feel that the soil threshold levels being used in this plan are extremely high. An example, the plutonium 239 and 240 is 20,000 pCi/g for drilling. This appears to be excessively liberal. Obviously, we feel that the soil threshold levels need to be set much, much lower.

As it is now, the level is so high that Stage 2 prevention activities may never be performed. The wind speeds are set too high and we do not find any plans for work stoppages for peak gusts. There is an implication that the respirable dust emissions will be in compliance at the property line. We feel that these emissions need to be met at 10 feet from any work site. This is because--this is the standard in which mining operations must comply with. Because of the nature of the contamination at Rocky Flats, respirable dust emissions should at least meet this standard.

Response to Comment 35

The stability air class used for the Turner X/Q model was D, which occurs 66 percent of the time (see Appendix 3, Meteorological Monitoring Results). This class is justified when applied to long-term annualized releases. Class F is ultra conservative and is more appropriate for emergency (i.e., accidental) releases.

The soil threshold values were derived using several conservative assumptions (see response to comment 5). The threshold levels for the potential contaminants are based on predicted risk values for receptors at the fenceline of the RFP site.

Wind speeds used in Stage II (15 and 35 mph) have been used since the 881 Hillside construction began. Measurements of dust concentrations using real-time instrumentation, as well as from fenceline RAAMP sampling, indicate that contaminant dispersion control using these wind speed criteria is effective.

In response to concerns for worker safety, outdoor work at RFP including environmental investigation activities is halted when wind speeds exceed 35 miles per hour. The public is protected at the fenceline by the PPCD and verified by the RAAMP. The worker is protected by health and safety requirements including real-time monitoring in the 10-foot zone.

Comment 36

Several real-time monitors need to be installed and used at each work site that will disturb any soil. We were not able to find any plan for decontamination for heavy equipment, and what resulting emissions this may contribute to the equation.

Response to Comment 36

Please reference Comment 3 for additional real-time monitoring discussion.

As discussed in the IPPCD and in the HASP requirements, real time monitoring will be conducted as specified. See response to Comment 7. A Field Operations procedure exists for general equipment decontamination and heavy equipment decontaminating (SOP FO.3 and FO.4, respectively). This process is self-contained with rinsewater being disposed of as contaminated material. The potential for spreading contamination has been addressed through a mandatory screening requirement for all equipment leaving a controlled area. The

likelihood of dispersed air contaminants via high pressure wash is addressed by performing this activity on concrete pads with splash guards.

Comment 37

This PPCD must also include all activity at Rocky Flats. As it is now, the activities planned for are confined and restrictive which may result in too many faulty assumptions, thereby putting the public in excessive risk.

Response to Comment 37

This comment is similar to Comment 6 which can also be referenced.

Comment 38

Finally, it appears that the project manager will have hundreds of tasks to perform coupled with his responsibilities of oversight. It would seem unrealistic to expect any single person, a project manager, to be able to reliably accomplish all the tasks that have been set forth before him in this PPCD.

Response to Comment 38

The project management role includes delegation of certain responsibilities. The ultimate responsibility for stop-work remains with the project manager. Each step as required by the PPCD is specified; most of the soil concentration evaluation and decision making (i.e., equipment selection, Stage 1 vs. Stage 2, etc.) is performed prior to startup of field activities. This entire process is continually audited by a separate quality assurance group in charge of field operations.

Comment 39

Again, I remind you that the Rocky Flats Cleanup Commission will be submitting extensive written comments regarding this document and we would ask for a timely response regarding the extension of the deadline. Thank you.

Response to Comment 39

A two-week extension was verbally granted during the public comment meeting by Mr. Fraser Lockhart of DOE, extending the public comment period to October 11, 1991.

COMMENTOR: Joe Tempel
Past President, Rocky Flats Cleanup Commission

Comment 40

I just have a couple of comments. I am concerned not only with what is in the report, but mainly what is not in the report.

I feel like the scope of the document has been limited to too great an extent. Right now it is limited to just the testing activities and the interim remedial actions. And I don't see anything in the chart that we saw before us tonight that would show that a similar study would be done for the remediation activities. I understand that there will be a study done for each individual remediation activity but nothing that will look at the additive impacts of each of those activities that would stir up dust and contamination.

Response to Comment 40

Please refer to comment response No. 6.

According to the EPA publication "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA EPA/540/6-89/004 Interim Final" which is referenced in the IAG as a compliance document, the following evaluation will be conducted:

Section 6.2.3.5 Short-Term Effectiveness

"Protection of the community during remedial actions - This aspect of short-term effectiveness addresses any risk that results from implementation of the proposed remedial action, such as dust from excavation, transportation of hazardous materials or air-quality impacts from a stripping tower operation that may affect human health."

The additive impact from multiple RI/FS and remediation activities occurring at the same time will be evaluated in the Site-wide Environmental Impact Statement (SWEIS). During the summer of 1991, when major investigative activities were being conducted on OU's 1&2, a maximum of six intrusive field activities were occurring simultaneously. The number of concurrent field activities (generally 3-4 intrusive activities were occurring simultaneously) in the future does not appear to be greater than this. A conservative though reasonable estimate of the number of future simultaneous field activities is a 50 percent increase over the summer 1991 activity period (i.e. 9 activities). In response to this and other similar comments and in accordance with risk-cost benefit practice, RFP has responded

by lowering the soil threshold levels by a factor of ten to account for multiple intrusion field activities occurring at once.

Comment 41

Nor, do I see any site-wide or plant-wide contaminant dispersion plan that would look at all activities on the plant, not only during the testing, remediation or interim remedial actions, but just the normal activities going on at the plant.

I think all of these things add up to certain risks that should be assessed and would probably affect the threshold levels which you've identified in the plant so far.

Response to Comment 41

The combined risk evaluation from all activities was addressed in the response to Comment 4 and 6. The established soil threshold levels are based upon a 1×10^{-6} lifetime excess cancer risk. A 1×10^{-4} is acceptable considering multiple sitewide activities, according to the NCP. As stated in the preceding response, the PPCD soil thresholds will be lowered by a factor of ten to account for multiple field activities. The annual environmental monitoring report includes effluent concentrations plus a calculated dose from fugitive dust emissions on an annual basis.

Comment 42

Finally, I am concerned that we may never have to use this plan even as it is defined now because I am concerned that funding for cleanup at Rocky Flats will be reduced drastically. There's indications in the paper that the five-year plan or the site specific plan will show much lower funding for Rocky Flats compared to the commitments that were identified in the IAG. And these commitments, we felt, were done in good faith and should be followed through. And if any site has an IAG, those sites should receive the priority for funding and not be relegated to a lower priority based on some other system of prioritization.

So, I am concerned that we need to make sure that Rocky Flats gets the funding for cleanup that it deserves. Thank you.

Response to Comment 42

Current funding levels of \$97 million for the Environmental Restoration program exceed the level identified in the FY92 Site Specific Plan. DOE remains committed to meeting the objectives laid out in the IAG. DOE-RFO identifies to DOE HQ the funding levels required to satisfy the IAG. DOE HQ, in consultation with the Office of Management and Business, determines the allocations to each DOE site. Compliance with the regulatory requirements is one of the primary criteria used in the allocation of funding for DOE facilities. However, other items such as risk reduction, uncertainty reduction, environmental impact, and socio-economic impacts, are other criteria which are considered.

There was opportunity for the public to be involved in the FY-92 funding process. A 60-day public comment period on the FY-91 Site Specific Plan began on February 15, 1991 and ended on April 15, 1991. The document was available in all public reading rooms. A public information workshop was conducted on February 27th, and a formal public comment meeting was held on April 1st. Written comments were accepted until April 15th. All comments were used to draft the 1992 Site Specific Plan.

2.2 WRITTEN COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD

WRITTEN COMMENTS: City of Arvada

Comment 43

Appendix 6: The use of surfactants and/or chemicals as a form of dust suppression during any remedial investigations should be the most innocuous chemical possible. This will assist in the current waste minimization efforts and reduce potential surface water quality impacts.

Response to Comment 43

There is certainly a concern over the addition of chemicals and surfactants as a means of dust suppression at the RFP. This concern warranted a rating of "implementable with major difficulty" when evaluating the use of chemical dust suppressants during development of the PPCD.

The use of innocuous chemicals as surfactants is extremely important to RFP. Water application is the primary contaminant control technique. Re-evaluation of surfactants will continue with this philosophy in mind as each project is undertaken.

Comment 44

Page 18, paragraph 1: "Other activities that have been proposed in Remedial investigation workplans..." For increased clarification the other activities should be listed.

Response to Comment 44

The text referred to in the comment was modified as follows: "Other intrusive activities such as trowel sampling, hand augering, or small power-augering have been proposed in RI workplans; however, based upon preliminary computations, the scenarios identified will result in the highest emissions."

WRITTEN COMMENTS: Wheat Ridge United Neighborhoods

Comment 45

Restarting the plutonium processing operation at Rocky Flats Plant (RFP) despite the "Plan for Prevention of Contaminant Dispersion" (PPCD) is incredibly ill-conceived at this time or in the future. Obviously, the world situation would indicate there is little need for further stockpiling of nuclear weapons.

Wheat Ridge United Neighborhoods (WRUN) is alarmed by the fact the Department of Energy (DOE) and our representatives in Washington could seriously consider such a move.

It would seem to be far more appropriate for the DOE and other officials to focus attention and be concerned with the health and safety of RFP workers and the tens of thousands of people who live in the area and are vulnerable to these hazards.

WRUN is strongly convinced that the DOE should terminate all production of plutonium until the real solution to the problem of "how to deal" with the radioactive waste products created by its production, is developed and perfected. Although millions (billions) of dollars have been spent studying the dangers/safety of the Plant, no solutions to the overriding problem of waste storage or disposal has been achieved.

We are also disturbed by the amount of money being spent on public relations to convince the people of the need to restart production of these weapons for purely economic reasons.

Since Wheat Ridge is located within the ten mile danger zone of RFP, we respectfully request the DOE and our elected officials to be especially aware of our concerns and will do everything possible to protect the health and safety of the entire area of the Rocky Flats Plant.

Response to Comment 45

The concerns of WRUN are noted, as requested. The DOE is committed to cleaning up RFP. The issue of resumption is determined by Congress and the President. Whether or not resumption of plutonium operations occurs, it is important to note that the PPCD is another safety measure designed to protect

the health of the public, environment, and workers. This document will be used for all restoration projects at RFP, and will help prevent the resuspension of contamination.

Public involvement is crucial to operations at RFP. You are encouraged to express your concerns to your representatives in Congress and at upcoming public meetings on resumption.

WRITTEN COMMENTS: Dr. Gale Biggs

Comment 46

In reviewing the PPCD I had difficulty following some of the calculations. Following is a list of questions that would help me continue. I shall be calling to follow up with you on these.

The following questions come from Attachment A.3.3 - Zone A calculations:

First page of attachment - Hole Drilling - Zone A. How many holes are to be drilled?

First page of attachment - Hole Drilling - Zone A. The Non-Radionuclide (solids) emission rate (g/s) is given as 6.94E-09. The Radionuclide emission rate (pCi/s) is given as 6.94E-03. What factors were used in the conversion from non-radioactive to radioactive emission rates made - e.g., from g/s -> pCi/s? Where does the E06 factor come from? This question should be repeated for all the calculations in this section - e.g., vehicle traffic, batch drop, scraper, and shovel. The same question is asked for Attachment A.3.4 - Zone B calculations.

Response to Comment 46

The exposure calculations were based on the installation of one hole (well) every day over a period of 5 years (1,825 days). This equates to a total of 1,825 wells drilled. This figure applies to hole drilling in all four zones (A, B, C, and 043).

Regarding the factors used in the conversion from non-radioactive to radioactive emission rates: the non-radionuclide and radionuclide emission rates were determined independently of one another based on their initial concentrations in soil and the total dust emission from the activity (hole drilling). Specifically, each was calculated as follows:

Non-Radionuclides

Given the parameters as shown on the spreadsheet (Hole Drilling - Zone A of Attachment A.3.3), the non-radionuclide emission rate in grams of contaminant per second (g/s) is:

$$\frac{0.25 \text{ kg soil emitted}}{10 \text{ hr} \times 3,600 \text{ s/hr}} \times \frac{1000 \text{ g soil}}{\text{kg soil}} \times \frac{1 \text{ g Non Rad}}{1 \text{ E-06g soil}} = 6.94 \text{ E-09 g/s}$$

- * Assumed as original contaminant concentration in soil (1ppm - non-rad contaminate)

Radionuclides

Given the parameters as shown on the spreadsheet (Hole Drilling - Zone A of Attachment A.3.3), the radionuclide emission rate in grams of contaminant per second is:

$$\frac{0.25 \text{ kg soil emitted}}{10 \text{ hr} \times 3,600 \text{ s/hr}} \times \frac{1000\text{g soil}}{\text{kg soil}} \times \frac{1\text{pCi Rad}}{1\text{g soil}} = 6.94 \text{ E-09 pCi/s}$$

- kg = kilogram
- hr = hour
- s/hr = seconds per hour
- g = gram
- g/s = gram per second
- pCi = picoCuries
- pCi/s = picoCuries per second

This methodology for calculating emission rates at the source of activity for both non-radionuclides and radionuclides applies to all of the activity calculations for all of the zones.

Comment 47

In the scraper operations, how is the time of 317 hours arrived at as the total time for this activity to occur? How did you go from volume of topsoil to be removed to hour of operation?

Response to Comment 47

The scraper will remove approximately the top 12 inches (0.3m) of soil as part of the 881 Hillside French Drain installation activities. The total area of excavation to support this activity is approximately 318,000 ft² (29,540m²) based on an estimation that the "scraped" area will be approximately 120 ft wide by 2,650 ft long. This translates to a total volume (after applying a soil expansion factor of 15 percent - attributable to disturbing the soil by excavation) of

$$0.3 \text{ m} \times 29,540 \text{ m}^2 \times 1.15 = 10,191 \text{ m}^3$$

m	=	meter
m ²	=	square meters
m ³	=	cubic meters
hr	=	hours
min	=	minutes
ft	=	feet
ft ²	=	square feet

Given that the scraper capacity is 10.70 m³ (Caterpillar Model 621 E), the total time for excavation by scraper is (assuming 20 minutes per round trip of loading, transporting, and unloading a scraper):

$$10,191 \text{ m}^3 \times \frac{1 \text{ RoundTrip}}{10.70 \text{ m}^3} \times \frac{20 \text{ min}}{\text{RoundTrip}} \times \frac{1 \text{ hr}}{60 \text{ min}} = 317 \text{ hrs}$$

Comment 48

How were the VOC emission rates arrived at in the calculations? The detailed calculations for this parameter is not obvious.

How were the VKT calculated in the traffic sections? If a truck travelled 10 km each day for a year, then a total of 3,650 VKT/yr should result. Back calculating from the values in this section suggests that a total of 8,294 VKT/yr was used. Which number is correct? How many trucks are in operation at this site?

Response to Comment 48

As described in Appendix 2, VOCs are assumed to be distributed homogeneously throughout the soil being disturbed for the following activities:

- Drilling
- Minor excavation
- Major excavation
- Removal by scraper
- Excavation by front-shovel excavator

Conservatively, all VOCs present in a given mass of disturbed soil are assumed to be completely volatilized and emitted from the soil during the aforementioned activities. Once emitted, the VOCs are dispersed using the Turner model.

Example:

Drilling

Given the following regarding hole drilling:

D, Depth of Hole = 9 m

DI, Diameter of Hole = 0.2 m

DT, Bulk Density of Soil = 1.5 Mg/m³

T, Total Period of Drilling = 10 hr

$$\begin{aligned} \text{Total Mass of Soil Removed (Disturbed)} &= 0.25 \pi(DI)^2 D \times DT \\ &= 0.25 \pi(0.2\text{m})^2 9\text{m} \times 1.5 \text{ Mg/m}^3 \\ &= 0.42 \text{ Mg} \end{aligned}$$

mg = milligram

mg/m³ = milligram per cubic meter

Assuming the VOC concentration in this disturbed soil is 1 microgram per gram ($\mu\text{g/g}$), the total mass of VOC emitted is:

$$0.42 \times 10^6 \text{ g Soil} \times \frac{1 \times 10^{-6} \text{ g VOC}}{1 \text{ g Soil}} = 0.42 \text{ g VOC}$$

This translates to a VOC emission rate of:

$$\frac{0.42 \text{ g VOC}}{10 \text{ hr}} \times \frac{1 \text{ hr}}{3600 \text{ s}} = 1.17 \times 10^{-5} \frac{\text{g}}{\text{s}} \text{ VOC}$$

This emission rate at the source of activity is the dispersed concentration. The fence line concentration of the VOCs is predicted with the Turner model.

It was assumed that VOCs will not be emitted during the following activities:

- Light vehicle traffic
- Heavy vehicle traffic
- Transportation by scraper
- Unloading by scraper

The vehicle traffic and transportation by scraper activities will only disturb the top layer of soil (possibly 1 - 2 inches). This soil should not contain VOCs due to continuous exposure to air over a significant period of time. The unloading by scraper will not be a source of VOC emission since it was assumed that all of the VOCs associated with the soil in the scraper were emitted during the soil removal by scraper.

There were two levels of vehicle traffic defined: light and heavy. Light vehicle traffic assumes that the total distance travelled over unpaved roads by vehicles supporting an activity would not exceed 5 km travelled (each) over unpaved roads. Heavy vehicle traffic assumes that the total distance travelled over unpaved roads by vehicles supporting an activity is approximately 100 vehicle-kilometers. It was assumed that, typically, 20 vehicles would support an activity and would not exceed 5 km travelled (each) over unpaved roads.

The emission rate associated with either level of vehicle traffic was calculated based on 10-hr days.

Comment 49

In the topsoil transportation by scraper - Zone A, a value for the silt content of 80% was used. Elsewhere in the calculations a value of 50% was used. Why the change from 80% to 50% in the calculations?

Response to Comment 49

The 50 percent value was based on a review of soil data included with the *Soil Survey of Golden Area, Colorado*, U.S. Dept. of Agriculture, 1980. Fifty percent was estimated to be a typical value for soil throughout the plant site area and at all depths.

The 80 percent value used with the transportation by scraper model is based on the assumption that scraper activities will be associated primarily with construction of the 881 Hillside french drain. Soil in 881 Hillside area is almost exclusively Type 31, Denver-Kutch-Midway. This soil type has a silt content

that ranges around 80 percent in the top layer (the layer to be disturbed by scraper activity). Although scraper activities may not occur in all of the defined zones (A, B, C), the activity was modelled in each using the 80 percent silt content (adds a conservative element to the model).

Comment 50

In the topsoil removal by scraper, how was the number of trips arrived at? Is a percentage capacity of about 89% assumed?

Response to Comment 50

The scraper modelled is a Caterpillar Model 621 E with a bucket volume of approximately 10.7 m³. The number of trips was determined as follows:

- A. Area of excavation = 29,540 m² (see p.3 of this document)
- D. Depth of Topsoil Removal = 0.3 m
- V. Volume of Topsoil to be handled by Scraper = A x D
= 29,540 m² x 0.3 m
= 8,862 m³

The total number of round-trips was calculated assuming an expansion factor of 15 percent in the soil volume due to disturbance by the scraper.

$$\text{Round-Trips (RT)} = 8,862 \text{ m}^3 \times 1.15 \times \frac{1 \text{ RT}}{10.7 \text{ m}^3} = 952 \text{ RTs}$$

The duration of this activity is based on 20 min per RT.

$$952 \text{ RT} \times \frac{20 \text{ min}}{\text{RT}} \times \frac{1 \text{ hr}}{60 \text{ min}} = 317 \text{ hrs}$$

WRITTEN COMMENTS: Robert & Shio Northup

Comment 51

We are concerned about the past operation of Rocky Flats and also about any plans for prevention of contaminant dispersion.

The past operation of Rocky Flats shows a continuing pattern of faulty and inadequately operating equipment, thus endangering both employees and the surrounding environment and inhabitants.

The operators of the plant have hidden or lied to the Congress and public information about the actual situation of the plant.

All operators of waste disposal and of contamination have likewise misled the public, particularly about on-going safety for people living around disposal sites.

Therefore, it is with some real doubt that we in this area read about a plan for Prevention of Contaminant Dispersion. The first requirement, as you are now providing, is a public hearing and sharing of information. But this is of value only as you also pledge and continue to honor complete openness at every state of any plan and performance of such prevention.

Response to Comment 51

The public hearing process is being implemented as stated in the IAG. RFP has taken measures to integrate each applicable comment on the PPCD. The DOE has met with the EPA and CDH to discuss each comment response, specific compliance measures, and check points to verify the proper implementation of the PPCD.

Public participation in this comment process is of the utmost concern to the DOE. You are encouraged to express your concerns at the upcoming public meetings. The public comment process was also discussed in the response to Comment 9.

Comment 52

Second, the contaminant dispersion plan can have value only of (1) the process does not harm or threaten the workers engaged in such dispersion; (2) the process does not threaten or harm any community through which waste may be moved; (3) the process does not result in a full in an untested or unvalidated

means in a location that will harm the environment, wildlife, or future human use.

Response to Comment 52

A similar comment (no. 45) response should be referenced.

The DOE is committed to conducting operations at RFP in a manner that is safe for the public, environment and workers. Methodologies such as real time monitoring and perimeter air sampling are currently being conducted.

Comment 53

Finally, we hope Rocky Flats will be disassembled and closed. Its operations have been of greater threat and harm to its neighbors than to any potential enemy of the U.S. It is time to limit and to stop this harm to our present people and our children.

Response to Comment 53

The future mission at Rocky Flats is being evaluated under the programmatic EIS for modernization.

WRITTEN COMMENTS: Marcia Bryant

Comment 54

Page A-1-4: Last paragraph should be ambient air.

Response to Comment 54

The text has been modified as requested.

Comment 55

Appendix 6: The assumption used to discount activities like containment structure are not good.

Response to Comment 55

The evaluation criteria used in Appendix 6 is also referenced in the individual analysis of alternatives (section 6.2.3) EPA Guidance for Conductivity RI/FS under CERCLA (EPA/540/G89/004). Thorough evaluation into the use of containment structure led to our conclusion as noted in the PPCD. This conclusion was arrived at through input from experts familiar with work at Superfund sites in similar waste handling situations.

Comment 56

You need to give more consideration to dust suppression surfactants.

Response to Comment 56

Additional evaluations of surfactants will occur after considering the potential hazard as related to the soil contaminant concentration levels. There are numerous surface surfactants available, the most innocuous surfactant will be selected if required.

**WRITTEN COMMENTS: Gary W. Baughman
Unit Leader, Hazardous Waste Facilities
Hazardous Materials and Waste Management
Division
Colorado Department of Health**

Comment 57

Executive Summary: The last paragraph of this section should be changed to read "The PPCD has been developed with input from a working committee..."

Response to Comment 57

The text has been modified to reflect the comment.

Comment 58

Acronym List: Because this is a highly technical document that is being made available to the public, every effort should be made to include a definition for all acronyms included in the text. At a minimum, a definition of OVA and HNU should be added to this list.

Response to Comment 58

An acronym list has been developed, as suggested.

Comment 59

Section 1.1: The first paragraph on page 2 should be changed to read "A working group was formed to provide input into the development of a document addressing the intent of the IAG PPCD."

Response to Comment 59

The text has been modified as suggested.

Comment 60

Section 2.1.1: This section admits that there may be more than one "emission activity" underway at the same time. The text states that to simplify this

situation, the plant was subdivided into three modeling zones plus an additional off-site modeling zone. These zones do a good job of simplifying the model. However, they do not account for multiple concurrent activities. The text of the document must be modified to address this point. The Division suggests that DOE make a reasonable maximum estimate for the number of emission activities that could occur simultaneously. We further suggest that the soil threshold values be decreased by an amount of equal magnitude. In other words, if DOE estimates that a maximum of ten emission activities occurring simultaneously is the most that would ever take place, then the soil threshold values should be decreased by a factor of ten.

Response to Comment 60

The division has suggested that the soil thresholds be decreased an amount of equal magnitude if, for example, more than 10 activities are occurring at once at RFP. If multiple intrusive activities are occurring simultaneously at each site, and order of magnitude reduction of the soil thresholds is implied. In reviewing the remedial investigative activities conducted during the summer of 1991, a maximum of six intrusive activities occurred simultaneously. RFP has reduced the soil thresholds by a factor of 10 to account for multiple activities occurring simultaneously. No areas have shown contamination concentrations at the soil thresholds. Furthermore, activities would be shut down prior to this due to health and safety requirements. See the table below and refer to Figure 7.1 of the PPCD.

WORKER BREATHING ZONE SUSPENDED PARTICULATE CONCENTRATIONS, MEASURED AND ESTIMATED VALUES

A) Hollow-Stem Auger Drilling Operations

Respirable Particulate <u>mg/m³</u>	Total Particulate* <u>mg/m³</u>
0.01 to 0.05	0.03 to 0.15

B) Test-Pit Excavations and In-Pit Activities

Respirable Particulate <u>mg/m³</u>	Total Particulate <u>mg/m³</u>
up to 0.53	0.005 to 0.72

Notes: *Estimated from Respirable Particulate Measurements.

These measurements represent ranges. The average or typical measured concentration is usually well below the maximum. The Time-Weighted-Average concept can be applied when evaluating actual worker exposure versus the DAC or DAC/10.

Comment 61

Section 2.1.1.1: The Division believes that an additional emission scenario should be evaluated against the four already included in this section. This additional emission activity would be plowing and tilling. In the off-site areas, during the time frame covered by the PPCD, additional remediation (plowing and tilling) of the "lawsuit lands" may well be required. If a comparison of the emissions from tilling shows this activity to be within the range represented by those activities already included in the text, it would not have to be added to the list, but a discussion of plowing and tilling could be added to the text. However, this activity needs to be modeled to evaluate the adequacy of the soil threshold levels established for the off-site areas.

Response to Comment 61

During the period from June 1987 through December 1987 air samples were taken during tilling activities off site in Operable Unit 3.

Data compiled from these air samples provided plutonium concentrations in ambient air samples collected downwind of Jefferson County remedy acreage during the court-ordered tilling. Maximum values for plutonium-in-air concentrations were approximately 0.0002 pCi/m³. For plutonium, this translates to a Lifetime Exposure Cancer Risk (LECR) during a five year exposure period of:

$$\begin{aligned} \text{Total Intake} &= 0.0002 \text{ pCi/m}^3 \times 1.2 \text{ m}^3/\text{hr} \times 10 \text{ hr/d} \times 1,825 \text{ d} \\ &= 4.38 \text{ pCi Plutonium} \end{aligned}$$

$$\begin{aligned} \text{LECR} &= 4.38 \text{ pCi} \times 4.10 \times 10^{-8} \text{ pCi}^{-1} \\ &= 1.8 \times 10^{-7} \end{aligned}$$

*Pu 239 Slope Factor (HEAST)

$$\begin{aligned} \text{pci/m}^3 &= \text{picoCuries per cubic meter} \\ \text{hr/d} &= \text{hours per day} \\ \text{m}^3/\text{hr} &= \text{cubic meters per hour} \end{aligned}$$

The risk based on actual maximum concentrations of plutonium-in-air is 1.8×10^{-7} which is 5 times less than the target threshold risk of 1×10^{-6} .

Comment 62

Section 2.1.3.1.1: Please add (to the appropriate section, if this is not the correct one) a more complete explanation of the actual monitoring activities that will occur at each emission site by the Health & Safety H&S Coordinator or his designated substitute. This should include a description of the frequency of monitoring activities as well as a description of any equipment that will be used.

Response to Comment 62

Explanations of the required monitoring program, including instrumentation requirements, can be found in Appendix 8 - IPPCD. Specific monitoring protocols can be found in the Standard Operating Procedures for air monitoring of field activities (Rocky Flats Plant Standard Operating Procedures - Environmental Management Division). Presenting this type of detailed discussion would not be appropriate in this section. The other applicable sections will be reviewed for inclusion of the comment.

Comment 63

Section 2.1.4.1: The first bullet presented on page 30 should more completely delineate the types of earth moving activities that are governed by each of the two wind speed criteria.

Response to Comment 63

The text will be revised to incorporate a more complete description of the types of earth-moving activities.

Comment 64

Appendix 4: On page A-4-1, besides the lungs, additional "exchange boundaries" need to be listed in the first paragraph of subsection A.4.2.

In the same paragraph, please clarify the term "absorption" (e.g., tissue, skin, etc.).

Response to Comment 64

The text will be revised to include the additional discussion as suggested. Exchange boundaries will include other examples and "absorption" will be defined in the form of an example exposure.

Comment 65

Appendix 5: In the second sentence of the second paragraph on page A-5-2, please insert the words "for the inhalation pathway" after the existing text "soil threshold concentrations."

Please insert the same words at the same point in the first sentence of the third paragraph on page A-5-2.

In section A.5.4, a sample calculation is performed for beryllium. Please carry the symbol for beryllium (Be) through the entire calculation (i.e., 4.2 mg Be/sec or 4200 ug Be/sec -- instead of 4.2 mg/sec or 4200 up/sec).

A similar calculation for a radioactive material should be included in this section.

Response to Comment 65

The text changes suggested have been incorporated into the document.

Comment 66

Appendix 6: The fourth bullet on page A-6-3 reads "Minimize mud and dirt carryout from construction sites to paved roads..." This bullet should be expanded to include cleanup of any dirt and/or mud carryout which occurs.

Another item that had been discussed previously was inclusion of a vehicle wash area prior to entering a paved road. This should be addressed in the text in some manner.

Response to Comment 66

The text will be revised to reflect the comment regarding dirt and mud carryout. The heavy equipment decontamination procedure was (Appendix 8-IPPCD) in the PPCD. This activity utilizes the vehicle/equipment decontamination pad.

WRITTEN COMMENTS: R.W. Terry
Environmental Radiation Unit
Radiation Control Division
Colorado Department of Health

Comment 67

While I am sure there is a good understanding between the Department of Health, the Environmental Protection Agency and the Department of Energy about the objectives of the Plan, there are several matters that are unclear to me and may warrant amplification or further explanation. There are also a number of abbreviations that are used in the tables but are not included in the List of Acronyms, that are not part of the everyday jargon of health physics, and this review does not address those affected topics in any detail. Following are the inferences that I have drawn from reading the Plan, which may be in error.

Response to Comment 67

An acronym list has been prepared for inclusion in the revised text. This document utilizes language not only associated with health physics but with several other fields of expertise.

Comment 68

It appears that the purpose of actions that are specifically designed to limit dispersion of contaminants is to limit the hazard to (1) the off-site population, (2) the on-site population that is not engaged in remedial activities and (3) those persons who are engaged in remedial activities. The hazard is loosely defined as the risk of cancer to the affected populations through the inhalation pathway. As stated in Section 2.1.1.1, Step 4 (p. 21), Appendix 4 and Appendix 5, the calculation of "Soil Threshold Concentrations" is based on a one in a million (10^{-6}) lifetime risk level. It therefore seems that a one in a million risk limit serves as a basis for evaluation. However, this goal is not stated clearly and succinctly, and as a result the goal is not consistently applied to the calculations and table that are presented in the Plan.

Response to Comment 68

The comment suggests that the one-in-a-million risk limit is not stated as the basis for evaluation. Appendix 4 risk calculations specifically address this point (page A-4-6 second paragraph). The Executive Summary also includes this as a

goal and states that "risk-based soil thresholds for contaminants are derived." Sufficient wording will be added where appropriate in the revised text.

Comment 69

My understanding of risk-limiting goals such as a one in a million (10^{-6}) or one in ten thousand (10^{-4}) risk is that they ordinarily apply to each contaminant in each pathway, and the calculations and tables provided in the document appear to be consistent with that approach. However, missing from the Plan is the scope of activity that is subject to limitation of the hazard that would be addressed by the Plan. If a quantitative goal is established as some risk to an individual per lifetime, then should the risk from all RCRA-related activities at the Rocky Flats Plant over a 70-year period be included in the total permissible risk, with some part of that risk limitation allocated to RFI/RI, IM/IRA, No Action Period and Remedial Action Period activities, or is the quantitative limit applied only to those activities, or is the quantitative limit applied to each of those activities, or to some other subset of the total activities at the Rocky Flats Plant, or for each work order issued?

Presumably the scope of activity that would be evaluated against the quantitative goals will not be divided into very small increments simply to assure compliance with the goals.

Response to Comment 69

The acceptable risk level is applied to each RFI/RI Interim Measures/Interim Remedial Action (IM/IRA) no-action period, and remedial action period activity (5 years as stated in the IAG). Please refer to the discussion in the NCP (40 CFR Part 300, March 8, 1990). The duration of activities may change; however, the number of activities would remain fairly constant. The PPCD risk evaluation includes a conservative estimate of the activities proposed.

As stated in the NCP, "For systemic toxicants, acceptable exposure levels shall represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime or part of a lifetime, incorporating an adequate margin of safety... the 1×10^{-6} risk level shall be used as the point of departure for. . .multiple contaminants at a site or multiple pathways of exposure."

Please see response to Comment 6 regarding multiple simultaneous activities.

Comment 70

Section 2.1.1.1, Step 4 (p. 21) states that "assumptions that would err on the side of safety were consistently applied." Error is one of the reasons why remedial action is needed. A bias toward safe assumptions has been used routinely for several years in calculations of this type, and modification of this approach should not be requested for the Plan currently under review. However, future documents of this type should incorporate assumptions that will lead to the most accurate estimate of hazards, with an evaluation of the uncertainty in those estimates. Then, given the best estimate of hazard together with the uncertainty in the estimate, a margin for error can be applied as needed to the final result. Uncertainty in the calculations is described only in qualitative terms in Appendix 4 and we can therefore only take it as a matter of faith that the margin for error in the calculations that have been provided is sufficient.

Response to Comment 70

As discussed in response to Comment 5, there were several elements of conservatism incorporated into the calculations of soil threshold values. With the conservative assumptions used, it was more appropriate to qualitatively discuss uncertainty. Assumptions erred on the side of safety, therefore overprotecting, in light of decisions occurring under conditions of uncertainty.

Comment 71

I have reviewed the calculations that have been provided for (1) emission rate estimation for light vehicle traffic in Section 2.2.3 (pp. 35-36) and Appendix 2, (2) dispersion calculations in Appendix 3, (3) wind rose in Appendix 3, (4) receptor parameters used to calculate contaminant intakes in Appendix 4, and (5) the example calculation in Appendix 5.

I have used the values assigned to the variables included in the formula for estimating emission rates for light vehicle traffic that are provided in Appendix 2. Most of the default values are reasonable and consistent with the experience of the Environmental Radiation Unit. The default values produce an estimated emission rate of approximately 1 kg of surface soil per vehicle kilometer travelled (approx. 1 kg/VKT), which seems reasonable for the dry surface soil at Rocky Flats, for a 6000-pound vehicle with 2 axles and travelling about 10 mph. However, our experience suggests that a large pickup truck will probably travel 15-25 mph (miles per hour) over open ground and 20-35 mph over dirt roads onsite at Rocky Flats unless speed limits are posted and obeyed.

Therefore, in this case, assumptions that would err on the side of safety were not applied.

Response to Comment 71

It will be important to emphasize strict compliance with posted speed limits by vehicles supporting field activities at the RFP. Dust emissions are linear with vehicle speed which implies that a doubling of speed will result in doubling the amount of dust emitted at the source. Certainly, vehicle speed is the variable for dust emissions by vehicles that is most easily controlled. Changes in vehicle weight and the number of wheels have greater impacts than vehicle speed; however, these variables are relatively constant and more difficult to change. We recognize the need to maintain compliance with posted speed limits in areas of known contamination.

Comment 72

The dispersion calculations described in Appendix 3 are correct. Since we have routinely assumed a 1000-meter ceiling, this limitation should be placed on the model, but it will probably not affect the operating limitations that result from the calculations that have been performed. The narrative in Appendix 3 references Turner's X/Q model; the narrative should be modified to reference the Pasquill-Gifford model, using Turner's Workbook of Atmospheric Dispersion Estimates.

The wind rose in Appendix 3 is consistent with our qualitative observations at the Rocky Flats Plant and should be considered appropriately applied to the Pasquill-Gifford model.

A superior approach to the problem of atmospheric dispersion would be one similar to that employed in the UDAD or MILDOS codes or described in U.S. Nuclear Regulatory Commission (NRC) Regulatory guide No. 3.15. The MILDOS AREA variant or MILDOS, for example, is designed specifically for very-large-area sources and may be an appropriate technique for evaluation. The basic weakness of the approach used in the PPCD under review is that the selected receptor locations are certainly not the nearest neighbors to the plant, and are probably not the maximally affected residences. This approach is weakened even more by the absence of any evaluation of the hazard to members of the on-site population who are not engaged in remedial activities; according to Table 1 (p. 4), the hazard to that group is scheduled to be addressed in the Site-Specific H&S Plan, but would be addressed in a consistent manner if the NRC method of evaluation was employed in the Plan under review.

By using the NRC approach, contaminant uptakes to a person in each square on a grid are systematically calculated. The square with the largest offsite uptake (radiation dose, risk, non-radioactive uptake, or other) would ordinarily serve as the fence line calculation; the occupied square with the largest offsite uptake would ordinarily serve as the calculation for the nearest neighbor (often described as the maximally affected individual). The Radiation Control Division usually does not require specific methods of hazard evaluation, nor does this Division require that findings be restated simply to make it convenient for our staff to evaluate the report; the Plan has been written primarily to satisfy the information needs of the U.S. Environmental Protection Agency, not the NRC, and the information has been provided in that context; however, it is appropriate to point out that the evaluation that has been provided in the document is not adequate to demonstrate compliance with the Plan's stated goals.

Response to Comment 72

The Appendix 3 references to Turner's X/Q model will be modified to show "Pasquill-Gifford Model" as appropriate.

It is noted that certain advantages may have been realized through the use of atmosphere dispersion models other than the Pasquill-Gifford (Turner's X/Q) model. However, direction was given to make conservative assumptions (see comment response number 5) with regard to dust-generating activities and potential contaminant concentrations and to apply Turner's model when determining fence line concentrations.

We agree with the commentor in suggesting that UDAD or MILDOS codes would have been more appropriate. The working group recommended that a more simplistic model may be understood more easily by the general public. The efforts were focused more into developing the management plan than into evaluation of models.

The hazard to on-site employees has been addressed in several sections of the PPCD. On-site remedial workers are covered by the HASPs for each work order. The non-remedial workers are covered by the RFP Radiological Health program and sitewide monitoring system.

We disagree with the commentor's final point. The evaluation meets the objectives of the PPCD as presented in the IAG and clarified by the CDH/EPA.

Comment 73

The fractional leeward wind factor that is listed in Table A.4-1 is a difficult value to estimate, and a more precise and accurate means of estimating contaminant uptake would be found if the NRC method was employed, by using all of the data provided by the wind rose in a rational manner, consistently applied.

Response to Comment 73

The fractional leeward wind factor was calculated listing the wind rose for RFP-1990 (0600-1900 HRS MST). The wind rose was broken into four quadrants, each of the (16) compass directions have a relation percent contribution. The wind direction frequency was calculated to be approximately 40 percent of the time going from the northwest direction across the site towards a hypothetical receptor.

Comment 74

The receptor parameter that is used to calculate contaminant uptakes in Appendix 4, and described in Table A.4-1, appears to be appropriate for 10 hours of the day. The intake duration of 10 hr/day is an appropriate value for fugitive dust emissions during periods of work, but when work is in progress fugitive dust may be emitted from work sites during the remainder of the day. It does not appear that the hazard evaluation for the off-site population adequately addresses the time period outside the normal working day.

Response to Comment 74

The work sites included in the PPCD scope are required to cover up the soil piles during non-work hours. This covering activity will eliminate the production of fugitive dust emissions during this period.

Comment 75

A breathing rate of 1.2 m³/hr is equivalent to 20-liters-per-minute, a breathing rate ordinarily associated with light daytime activity. It is appropriate for active members of the offsite population and for members of the on-site population who are not engaged in remedial activities; it probably is a low estimate for persons who are directly engaged in remedial activities during periods of excavation, drilling or construction.

Response to Comment 75

As the commentor notes, a breathing rate of 1.2 m³/hr (*Radiological Risk Assessment*, Till and Meyer 1987) is appropriate for members of the off-site population. Since impacts are not calculated for on-site workers engaged in remedial activities, a different breathing rate is not required. The health and safety of remedial workers is evaluated on a case-by-case basis, often using real time measurements and monitoring.

Comment 76

An exposure period of 5 years may or may not be a reasonable value; the timetable for completion and the scope of activities addressed by the PPCD will affect this result. It appears, though, that the one in a million (10⁻⁶) performance objective, described in Section 2.1.1.2, Step 5 (p. 22), which is a lifetime cancer risk basis for calculations, is allocated to activities of 5 years' duration, which could leave 65 years during which no related risk could be allocated. The example calculation in Appendix 5 provides no clarification on this question.

Response to Comment 76

The 1×10^{-6} performance objective represents the lower end of a risk range (1×10^{-4} to 1×10^{-6}) considered acceptable by EPA (NCP 10 CFR 300) for risks from one source (e.g., an operable unit of a superfund site). This accounts for the potential of increased risk. Since the timetable for completion of activities as listed in the IAG addressed by the PPCD is 5 years, this is the value used in the calculation of soil thresholds. The commentor is correct in his observation. In light of the use of the lower limit of the acceptable range of risk from one source, the use of 5 years as the timeframe for activities covered by the PPCD is appropriate.

Comment 77

The most disturbing finding of this review is found in Table 2.3.2 (p. 39), titled "Soil Principal Contaminants/OU1 - 881 Hillside Area," Table 2.3.3 (p. 40), titled "Comparison of Measured Soil Concentrations to Threshold Levels," and Table A.1-1, titled "Principal Contaminants/OU1 - 881 Hillside Area." Each of

these tables lists the highest $^{239+240}\text{Pu}$ concentration in soil in the area as 0.91 picocuries per gram (0.91 pCi/gm). Such an assumption is simply unbelievable.

Although the 881 Hillside Area is nominally upwind of the 903 Pad Area, it is adjacent to the 903 Pad Area, an area with soil that is very heavily contaminated with plutonium. Plutonium concentrations in the IHSS 199 Remedy Acreage Area, 2 miles downwind from the 903 Pad Area and described in some detail in the Plan, run as high as ten times the value listed in the tables, and were part of the basis for a lawsuit and the settlement that has led to remedial activity, already in progress at that site.

The Agreement in Principle (AIP) states that the Department of Energy "agrees to comply with applicable state and federal environmental laws." The Interagency Agreement (IAG) is another document that implements the U.S. DOE's stated policy.

It is interesting to note that 0.91 pCi/gm is exactly equal to 2 disintegrations per minute per gram (2 dpm/gm). The State Board of Health Rules and Regulations Pertaining to Radiation Control have stated, since 1975, as follows:

- RH 4.35.1 Contamination of the soil in excess of 2.0 disintegrations per minute of plutonium per gram of dry soil or square centimeter of surface area (0.01 microcurie) presents a sufficient hazard to the public health to require the utilization of special techniques of construction upon property so contaminated. Evaluation of proposed control techniques shall be available from the Department of Health upon request.

This regulation was put forth by the Board of Health in response to a need for guidance to County Commissions, which were required to establish land development regulations for subdivisions under Colorado Revised Statutes (1973) Title 30, Article 28, Part 133. The use of the word "plutonium" in this context means $^{239+240}\text{Pu}$.

Because the regulation was motivated by a need to provide specific guidance for the subdivision of private property, it has not been applied to activities on property owned by the U.S. DOE. The principles of radiation protection that are incorporated into RH 4.35.1 do have as much applicability to on-site construction (and remediation) activities as they have to the subdivision and improvement of land for industrial, commercial or residential use. Under the circumstances, I recommend that this Division should take an active and

vigorous role in this matter, and require a detailed evaluation of the airborne radiation hazard from activities described in this document, in a context compatible with ordinary principles of radiation protection, so that compliance with the underlying principles of RH 4.35.1 will be met and clearly demonstrated.

Response to Comment 77

Soil concentration values were obtained from the Phase III 881 Hillside RFI/RI Workplan (3/8/91). Upon further review, additional data has been obtained which indicates the highest observed Pu²³⁹⁺²⁴⁰ reading to be 4.5 pCi/gm. The Final PPCD Report will be updated to reflect this addition.

The IHSS 199 soil concentration data has not been referenced in the PPCD. An example of soil contaminant concentration (i.e., 881 Hillside) has been included in the PPCD. The soil concentrations for IHSS 199 may indeed be higher than the 881 Hillside.

The State Radiation Control Regulation 4.35.1 applies to off-site locations where the public can reside. The PPCD was written to evaluate the risk to the public but also goes beyond RH 4.35.1 evaluating site specific activities and also takes into account the protection of workers. We believe the commentor is directing this evaluation comment to CDH.

Throughout this document and the PPCD plutonium is referred to as ²³⁹⁺²⁴⁰Pu.

Comment 78

Sections 2.1.4.1 (pp. 31-34), 2.2 (pp. 34-42), and 2.3 (pp. 42-48) provide specific guidance to Project Managers who are engaged in remediation activities. The outcome of operational practices for prevention for contaminant dispersion may be improved if these sections are written more clearly. The practices and procedures outlined in these sections, and in Appendix 8, titled "Interim-Plan for Prevention of Contaminant Dispersion," probably are sufficient to meet the objectives of the Plan, and the objectives of the principles of radiation protection that are incorporated into RH 4.35.1, as well.

However, these sections, and Appendix 8, do not provide any meaningful procedures for active control of fugitive dust emissions, and therefore are not sufficient to provide assurance that the objectives of the Plan or of RH 4.35.1 will be met.

Response to Comment 78

The specific procedures for execution of the PPCD are clearly presented in a step-by-step format in section 2.1.4.1. Additionally, each HASP that is developed for field activities references a compliance measure as required by the PPCD. There are several procedures that also contribute to the execution of the IPPCD. These procedures have been developed cooperatively by the EPA, CDH and DOE.

**WRITTEN COMMENTS: Ms. Susan Nachtrieb
Water Quality Coordinator
City of Westminster**

Comment 79

Section 1.2 states that the PPCD has been developed to ensure that the public is protected from the potential increased health risk associated only with inhaling windblown hazardous or dangerous constituents from the Rocky Flats Plant. Additional exposure pathways should be identified.

In the same section, contaminant dispersion and emissions other than those from intrusive activities should be included in the scope of the document.

Response to Comment 79

The inhalation pathway was identified as the pathway having the greatest potential for contributing dose. Other pathways such as dermal absorption and ingestion have been qualitatively evaluated and determined to be accounted for within the conservative input variables used in the development of the soil threshold levels.

The scope of the PPCD was graphically presented in Table 1 on page 4 of the document. Other sitewide activities having the capability of producing a fugitive dust commission are addressed in other documents. Such as the Remedial Investigation/Feasibility Study (RI/FS) studies as proposed in the IAG.

Comment 80

In Drawing 2, the map incorrectly depicts the boundaries of the RFP. Also, it was our understanding that the OU-3 receptor is located at the plant boundary. According to the map, it is located 1/2 mile southeast of the boundary.

Response to Comment 80

The boundary depicted on Drawing 2 was checked and verified to be correct.

The Operable Unit (OU-3) receptor placement (1/2 mile southeast of the plant) was intentional. OU-3 area is comprised of several Individual Hazard Substance Sites (IHSS) as illustrated on Drawing 2. If the OU-3 receptor were placed at the plant boundary, the receptor would be upwind of OU-3.

Comment 81

In section 2.1.1.2 and Appendix A.4.4, a safety factor of 0.1 is used in the risk assessment calculations. It may be appropriate to use a safety factor of 0.01 to calculate risk to sensitive humans.

Response to Comment 81

The use of 0.01 hazard index for each noncarcinogen would be overly conservative considering that the average number of contaminants is less than twenty with a limited number of simultaneous dust generating activities occurring at once. The EPA Risk Assessment Guide for Superfund Sites describes the use of the hazard index in the following context:

"While any single chemical with an exposure level greater than the toxicity value will cover the hazard index to exceed unity, for multiple chemical exposure, the hazard index can also exceed unity even if no chemical exposure exceeds its RfD."

Sensitive populations have been incorporated by the EPA into the Reference Dose (RfD) limitations.

Comment 82

In section 2.1.3.3, please define "relevant particle sizes."

Response to Comment 82

The glass fiber filters have pore openings at different diameters, typically the 0.5 micron opening is used to allow for an adequate draw. The respirable particle size fraction is from 0.2 - 10.0 microns Aerodynamic Median Aerosol Diameter as referenced in the International Council on Radiation Protection Publication No. 30 (1992).

Comment 83

Section 2.1.3.1, Westminster appreciates the clarity of the "PPCD Step by Step Breakdown."

Response to Comment 83

Thank you. Your comment is appreciated.

Comment 84

In Table 2.3.3, and A.2.2, it appears that calculated threshold values for support vehicle traffic assume that only one vehicle will be utilized per intrusive activity. Is this a realistic model?

Response to Comment 84

See responses to Comments 34 and 48.

Comment 85

In A.6.3.1, characterization of topsoil should be completed before moving and/or relocating the soil during a major excavation activity.

In the same section, please describe the "low covered pile" method of soil storage.

Response to Comment 85

The text will be revised to include the identification of this evaluation in Appendix 6. The topsoil evaluation will occur as stated in Step 2 in Section 2.1.4.1 PPCD Step-by-Step Breakdown. This step incorporates an evaluation of all the soil data defining the contaminants and relative concentrations prior to initiating the field activities.

"Low covered pile" means a test pit covered by a tarp.

Comment 86

Section A.6.2.3, the document states a procedure for containment and disposal of contaminated drill cuttings. In addition, decontamination SOPs for drills, augers, trucks, etc., should be addressed.

Response to Comment 86

This comment has been addressed in comment responses numbered 7, 66, and 86. Drill cuttings are covered during non-intrusive activity periods.

Comment 87

Section A.6.4, discusses the various dust control measures under consideration. Westminster believes measures must be taken to ensure groundwater and surface water are protected from contamination when aqueous or chemical dust control methods are used. The plan should include provisions for surface water monitoring to identify impacts associated with the use of copious amounts of water.

Has it been demonstrated that there is no increase in contaminant mobility in soils, in addition to no impact to groundwater or surface waters, when using the water/surfactant dust control measures? If so, please document the study or approved practice.

Response to Comment 87

The amount of water applied is considered to be small and would not be capable of mobilizing as presented in the comment. Use of water as a dust control measure would not mobilize contaminants any more effectively than normal rainfall. If a surfactant were the control measure of choice, measures would be taken to prevent saturation of the soil. Effective dust control can be achieved by wetting with small volume of surfactant, thus minimizing the migration of contaminants to below their existing level.

As a further consideration, the routine surface water and ground water monitoring programs at RFP are comprehensive. The programs in place will allow for the identification and monitoring of the impacts, if observed, adverse or otherwise. These programs are detailed in the Rocky Flats Plant Site Environmental Report which is an annual publication and can be provided upon request. There has been no indication of increased contaminant mobility in soils due to the application of surfactants.

Comment 88

Table A.6-4, Westminster is particularly concerned about chemical suppressants and surfactants that may adversely affect vegetation. Defoliation may lead to soil erosion and increased soil dispersion.

Response to Comment 88

Please see response to Comment 43. Also, the selection of chemical suppressants and/or surfactants if necessary, will be done with much discretion, selecting innocuous surfactants as a priority. Potential impacts will be evaluated prior to their use in dust mitigation efforts.

Comment 89

A table of the current Clean Air Act standards or limits would be helpful for comparison purposes.

Response to Comment 89

In response to the request, an explanation of the CAA standard (40 CFR Part 61, Subpart H) is provided:

Subpart H - National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities:

§61.25 Standard:

"Emissions of radionuclides to the ambient air from Department of Energy facility shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr."

According to the RFP 1990 Annual Rocky Flats Plant Site Environmental Monitoring Report the whole body dose (Effective Dose Equivalent) as a result of the airborne pathway was 0.52 mrem/yr. This assessment was conducted using the AIRDOS-EPA and RADRISK computer codes. Input to these codes including the estimated soil resuspension of Pu⁻²³⁹, ²⁴⁰, ²⁴¹, and Am⁻²⁴¹.

The Colorado Ambient Air Quality Standards specify a total suspended particulate limit (greater than 10 micron diameter) of $150 \mu\text{g}/\text{m}^3$ as a secondary standard for particulate matter (40 CFR Part 50.6 and Colorado Regulation for Air Pollution Control Part 14, 1989). The perimeter samplers have not measured airborne particulate matter at or near the state limit at the RFP boundary.

RFP may also be required to file for an Air Pollution Emission Notice (APEN) permit with the Colorado Air Quality Division which specifies emission rates and appropriate filtration devices for facilities and activities resulting in a hazardous or toxic substance release. The PPCD focuses on the remedial investigation activities including interim remedial actions, actual site remediation may require the submittal of APEN applications.

Comment 90

As an added precaution, the Standley Lake Protection Project should be in place prior to the undertaking of remedial actions at the Plant site. This would provide the necessary protection for Standley lake, which serves as a drinking water supply for 180,000 people. This extra step is needed in the event surface water were to become contaminated during future operations, cleanup or construction activities.

Response to Comment 90

The health protective measures for prevention of contaminant dispersion are not expected to result in surface water contamination.

APPENDIX A

LETTERS RECEIVED FROM PUBLIC COMMENTORS



city of arvada
8101 RALSTON ROAD
ARVADA, COLORADO 80002
PHONE 303-421-2550

RECEIVED
U.S. D.O.P.
R.F.O. ROOM

1991 SEP 23 A 9 34

Office of the City Manager
431-3000

September 18, 1991

Ms. Beth Brainard
U.S. Department of Energy
Rocky Flats Public Affairs Office
P.O. Box 928
Golden, Colorado 80402-0928

RE: Comments on the Final Draft of the Plan for Prevention of Contaminant Dispersion.

Dear Ms. Brainard:

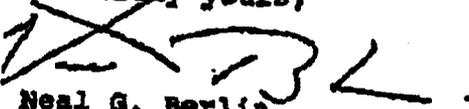
The City of Arvada appreciates the opportunity to comment on the Final Draft of the Plan for Prevention of Contaminant Dispersion (PPCD). Arvada, one of the closest communities to Rocky Flats, has always regarded Rocky Flats' impacts on air quality as a primary concern.

The plan is well written and thoroughly defines actions for dispersion minimization activities. Please find our limited comments below:

1. Appendix 6., The use of surfactants and/or chemicals as a form of dust suppression during any remedial investigations should be the most innocuous chemical possible. This will assist in the current waste minimization efforts and reduce potential surface water quality impacts.
2. Page 18, paragraph 1., "Other activities that have been proposed in Remedial Investigation workplans ..." For increased clarification the other activities should be listed.

Thank you again for the opportunity to comment on the Final Draft of the PPCD. I look forward to incorporation of our comments into the Final Plan. If you have any questions, please do not hesitate to contact me.

Sincerely yours,


Neal G. Berlin
City Manager

12084

SHS
LE

9-15-91

WHEAT RIDGE UNITED NEIGHBORHOODS

P.O. Box 1202
Wheat Ridge, CO 80034
September 5, 1991



Further response to the Federal Government Plan to re-start
nuclear weapons production at Rocky Flats Plant:

Restarting the plutonium processing operation at Rocky Flats Plant (RFP) despite the "Plan for Prevention of Contaminant Dispersion" (PPCD) is incredibly ill-conceived at this time or in the future. Obviously, the world situation would indicate there is little need for further stockpiling of nuclear weapons.

Wheat Ridge United Neighborhoods (WRUN) is alarmed by the fact the Department of Energy (DOE) and our representatives in Washington could seriously consider such a move.

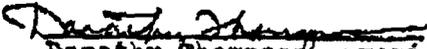
It would seem to be far more appropriate for the DOE and other officials to focus attention and be concerned with the health and safety of RFP workers and the tens of thousands of people who live in the area and are vulnerable to these hazards.

WRUN is strongly convinced that the DOE should terminate all production of plutonium until the real solution to the problem of "how to deal" with the radioactive waste products created by its production, is developed and perfected. Although millions (billions) of dollars have been spent studying the dangers/safety of the Plant, no solutions to the overriding problem of waste storage or disposal has been achieved.

We are also disturbed by the amount of money being spent on public relations to convince the people of the need to restart production of these weapons for purely economic reasons.

Since Wheat Ridge is located within the ten mile danger zone of RFP, we respectfully request the DOE and our elected officials to be especially aware of our concerns and will do everything possible to protect the health and safety of the entire area of the Rocky Flats Plant.

Respectfully submitted,


Dorothy Thompson, president

WATER RESOURCES

*Mr. Clean air
Zellock's group*

September 13, 1991

TO: Beth Brainard - DOE Fax # 966-6633
David Maxwell - EG&G Fax # 273-6048 →

FROM: Gale Biggs *Gale*

SUBJECT: Plan for Prevention of Contaminant Dispersion

*273-
6068*

In reviewing the PPCD I had difficulty following some of the calculations. Following is a list of questions that would help me continue. I shall be calling to follow up with you on these.

The following questions come from Attachment A.3.3 - Zone A calculations.

First page of attachment - Hole Drilling - Zone A. How many holes are to be drilled?

First page of attachment - Hole Drilling - Zone A. The Non-Radionuclide (solids) emission rate (g/s) is given as 6.94E-09. The Radionuclide emission rate (pCi/s) is given as 6.94E-03. What factors were used is the conversion from non-radioactive to radioactive emission rates made - e.g., from g/s -> pCi/s? Where does the E06 factor come from? This question should be repeated for all the calculations in this section - e.g., vehicle traffic, batch drop, scraper, and shovel. The same question is asked for Attachment A.3.4 - Zone B calculations.

In the scraper operations, how is the time of 317 hours arrived at as the total time for this activity to occur? How did you go from volume of topsoil to be removed to hour of operation?

How were the VOC emission rates arrived at in the calculations? The detailed calculations for this parameter is not obvious.

How were the VKT calculated in the traffic sections? If a truck travelled 10 km each day for a year, then a total of 3,650 VKT/yr should result. Back calculating from the values in this section suggests that a total of 8,294 VKT/yr was used. Which number is correct? How many truck are in operation at this site?

In the topsoil transportation by scraper - Zone A, a value for the silt content of 80% was used. Elsewhere in the calculations a value of 50% was used. Why the change from 80% to 50% in the calculations?

In the topsoil removal by scraper, how was the number of trips arrived at? Is a percentage capacity of about 89% full assumed?

2936 South Paris St.
Aurora, Co. 80014
July 30, 1991

PPCD Comments

Beth Brainard, Public Affairs Officer
U.S. Department of Energy
Rocky Flats Office, PO Box 928
Golden, Co. 80402-0928

Dear Ms Brainard:

We are concerned about the past operation of Rocky Flats and also about any plans for prevention of contaminant dispersion.

The past operation of Rocky Flats shows a continuing pattern of faulty and inadequately operating equipment, thus endangering both employees and the surrounding environment and inhabitants.

The operators of the plant have hidden or lied to the Congress and public information about the actual situation of the plant.

All operators of waste disposal and of contamination have likewise misled the public, particularly about on-going safety for people living around disposal sites.

Therefore, it is with some real doubt that we in this area read about a plan for Prevention of Contaminant Dispersion. The first requirement, as you are now providing, is a public hearing and sharing of information. But this is of value only as you also pledge and continue to honor complete openness at every stage of any plan and performance of such prevention.

Second, the contaminant dispersion plan can have value only if (1) the process does not harm or threaten the workers engaged in such dispersion; (2) the process does not threaten or harm any community through which waste may be moved; (3) the process does not result in a fill in an un-tested or un-validated means in a location that will harm the environment, wild-life, or future human use.

Finally, we hope Rocky Flats will be disassembled and closed. Its operations have been of greater threat and harm to its neighbors than to any potential enemy of the U.S. It is time to limit and to stop this harm to our present people and our children.

Sincerely,

Robert and Shio Northrup
Robert and Shio Northrup

ROBERT W. JSHIO ^{and} NORTHUP
2935 SOUTH PARIS ST.
AURORA, COLORADO 80014

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1991 AUG - 1 A 9 21



PPCD Comments

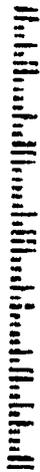
Beth Bralnard, Public Affairs Officer

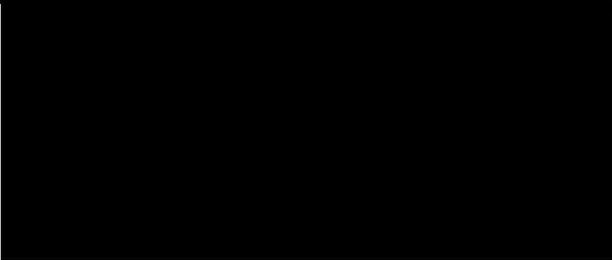
T.S. Department of Energy

Rocky Flats Office

PO BOX 928

Golden, Co. 80402-0928





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1991 SEP 25 A 8:04

Mrs. Beth Binard,
Public affairs officer,
U.S. Dept. of Energy,
Rocky Flats office,
P.O. Box 928,
Golden, CO
80402-0928

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1991 SEP 25 A 8:04

Submitted by

You need to give more
consideration to dust
suppression methods.

Appendix B Measurement
used to do current activities
like containment structures
are not good.

Exec. Summary OK.

P. H-1-11 last paragraph
should be underlined.

Comments on PCEB



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Pueblo Office
(719) 543-8441

ROY ROMER
Governor

JOEL KOHN
Interim Executive Director

COLORADO
DEPARTMENT
OF HEALTH

October 9, 1991

Mr. Frazer Lockhart
U. S. Department of Energy
Rocky Flats Office
P.O. Box 928
Golden, Colorado 80402-0928

RECEIVED
U.S. DEPT. OF
ENERGY
OCT 11 4 50 PM '91

RE: The Plan for Prevention of Contaminant Dispersion (PPCD),
Final Draft, July, 1991

Dear Mr. Lockhart,

The Colorado Department of Health, Hazardous Materials and Waste Management Division (the Division), has reviewed the above referenced document prepared by DOE and its prime operating contractor EG&G. The Division's comments are attached.

If you have any questions regarding these matters, please call Joe Schieffelin of my staff at 331-4421.

Sincerely,

Gary W. Baughman
Unit Leader, Hazardous Waste Facilities
Hazardous Materials and Waste Management Division

cc: Martin Hestmark, EPA
Scott Grace, DOE
Paul Bunge, EG&G
Dennis Smith, EG&G
Barbara Barry, RFPD

Colorado Department of Health

Review and Comment

Plan for Prevention of Contaminant Dispersion
Final Draft, July, 1991

General Comments:

Please note that the comments of Mr. Rob Terry of the CDH Radiation Control Division, many of which are general in nature, are attached in their entirety. These comments need to be addressed along with the other CDH comments presented below.

Specific Comments:

Executive Summary: The last paragraph of this section should be changed to read "The PPCD has been developed with input from a working committee"

Acronym List: Because this is a highly technical document that is being made available to the public, every effort should be made to include a definition for all acronyms included in the text. At a minimum, a definition of OVA and HNU should be added to this list.

Section 1.1: The first paragraph on page 2 should be changed to read "A working group was formed to provide input into the development of a document addressing the intent of the IAG PPCD."

Section 2.1.1: This section admits that there may be more than one "emission activity" underway at the same time. The text states that to simplify this situation, the plant was subdivided into three modeling zones plus an additional off-site modeling zone. These zones do a good job of simplifying the model. However, they do not account for multiple concurrent activities. The text of the document must be modified to address this point. The Division suggests that DOE make a reasonable maximum estimate for the number of emission activities that could occur simultaneously. We further suggest that the soil threshold values be decreased by an amount of equal magnitude. In other words, if DOE estimates that a maximum of ten emission activities occurring simultaneously is the most that would ever take place, then the soil threshold values should be decreased by a factor of ten.

Section 2.1.1.1: The Division believes that an additional emission scenario should be evaluated against the four already included in

this section. This additional emission activity would be plowing and tilling. In the off-site areas, during the time-frame covered by the PPCD, additional remediation (plowing and tilling) of the "lawsuit lands" may well be required. If a comparison of the emissions from tilling shows this activity to be within the range represented by those activities already included in the text, it would not have to be added to the list, but a discussion of plowing and tilling could be added to the text. However, this activity needs to be modeled to evaluate the adequacy of the soil threshold levels established for the off-site areas.

Section 2.1.3.1.1: Please add (to the appropriate section, if this is not the correct one) a more complete explanation of the actual monitoring activities that will occur at each emission site by the H&S Coordinator or his designated substitute. This should include a description of the frequency of monitoring activities as well as a description of any equipment that will be used.

Section 2.1.4.1: The first bullet presented on page 30 should more completely delineate the types of earth moving activities that are governed by each of the two wind speed criteria.

Appendix 4: On page A-4-1, besides the lungs, additional "exchange boundaries" need to be listed in the first paragraph of subsection A.4.2.

In the same paragraph, please clarify the term "absorption" (e.g., tissue, skin, etc.).

Appendix 5: In the second sentence of the second paragraph on page A-5-2, please insert the words "for the inhalation pathway" after the existing text "soil threshold concentrations."

Please insert the same words at the same point in the first sentence of the third paragraph on page A-5-2.

In section A.5.4, a sample calculation is performed for beryllium. Please carry the symbol for beryllium (Be) through the entire calculation (i.e., 4.2 mg Be/sec or 4200 ug Be/ sec -- instead of 4.2 mg/sec or 4200 ug/sec).

A similar calculation for a radioactive material should be included in this section.

Appendix 6: The fourth bullet on page A-6-3 reads "Minimize mud and dirt carryout from construction sites to paved roads . . ." This bullet should be expanded to include cleanup of any dirt and/or mud carryout which occurs.

Another item that had been discussed previously was inclusion of a vehicle wash area prior to entering a paved road. This should be addressed in the text in some manner.

COLORADO DEPARTMENT OF HEALTH
Radiation Control Division
Environmental Radiation Unit

MEMORANDUM

To: R.M. Quillin

Date: October 3, 1991

From: R.W. Terry

Subject: U.S. DOE Plan for the
Prevention of Contaminant
Dispersion (PYCD), final
version

As per your request, I have reviewed the U.S. Department of Energy's Final Plan for the Prevention of Contaminant Dispersion, dated July 1991.

While I am sure there is good understanding between the Department of Health, the Environmental Protection Agency and the Department of Energy about the objectives of the Plan, there are several matters that are unclear to me and may warrant amplification or further explanation. There are also a number of abbreviations that are used in the tables but are not included in the List of Acronyms, that are not part of the everyday jargon of health physics, and this review does not address those affected topics in any detail. Following are the inferences that I have drawn from reading the Plan, which may be in error.

I. GOALS OF THE PLAN

It appears that the purpose of actions that are specifically designed to limit dispersion of contaminants is to limit the hazard to (1) the offsite population, (2) the on-site population that is not engaged in remedial activities and (3) those persons who are engaged in remedial activities. The hazard is loosely defined as the risk of cancer to the affected populations through the inhalation pathway. As stated in Section 2.1.1.1, Step 4 (p. 21), Appendix 4 and Appendix 5, the calculation of "Soil Threshold Concentrations" is based on a one in a million (10^{-6}) lifetime risk level. It therefore seems that a one in a million risk limit serves as a basis for evaluation. However, this goal is not stated clearly and succinctly, and as a result the goal is not consistently applied to the calculations and tables that are presented in the Plan.

My understanding of risk-limiting goals such as a one in a million (10^{-6}) or one in ten thousand (10^{-4}) risk is that they ordinarily apply to each contaminant in each pathway, and the calculations and tables provided in the document appear to be consistent with that approach. However, missing from the Plan is the scope of activity that is subject to limitation of the hazard that would be addressed by the Plan. If a quantitative goal is established as some risk to an individual per lifetime, then should the risk from all RCRA-related activities at the Rocky Flats Plant over a 70-year period be included in the total permissible risk, with some part of that risk limitation allocated to RFI/RI, IM/IRA, No Action Period and Remedial Action Period activities, or is the quantitative limit applied only to those activities, or is the quantitative limit applied to each of those activities, or to some other subset of the total activities at the Rocky Flats Plant, or for each work order issued?

Memorandum to R.M. Quillin from R.W. Terry, 3-Oct-91
U.S. DOE Plan for Prevention of Contaminant Dispersion

Page 2

Presumably the scope of activity that would be evaluated against the quantitative goals will not be divided into very small increments simply to assure compliance with the goals.

II. CALCULATIONS AND ASSUMPTIONS

Section 2.1.1.1, Step 4 (p.21) states that "assumptions that would err on the side of safety were consistently applied." Error is one of the reasons why remedial action is needed. A bias toward safe assumptions has been used routinely for several years in calculations of this type, and modification of this approach should not be requested for the Plan currently under review. However, future documents of this type should incorporate assumptions that will lead to the most accurate estimate of hazards, with an evaluation of the uncertainty in those estimates. Then, given the best estimate of hazard together with the uncertainty in the estimate, a margin for error can be applied as needed to the final result. Uncertainty in the calculations is described only in qualitative terms in Appendix 4 and we can therefore only take it as a matter of faith that the margin for error in the calculations that have been provided is sufficient.

I have reviewed the calculations that have been provided for (1) emission rate estimation for light vehicle traffic in Section 2.2.3 (pp. 35-36) and Appendix 2, (2) dispersion calculations in Appendix 3, (3) wind rose in Appendix 3, (4) receptor parameters used to calculate contaminant intakes in Appendix 4 and (5) the example calculation in Appendix 5.

I have used the values assigned to the variables included in the formula for estimating emission rates for light vehicle traffic that are provided in Appendix 2. Most of the default values are reasonable and consistent with the experience of the Environmental Radiation Unit. The default values produce an estimated emission rate of approximately 1 kg of surface soil per vehicle kilometer travelled (approx. 1 kg/VKT), which seems reasonable for the dry surface soil at Rocky Flats, for a 6000 lb. vehicle with 2 axles and travelling about 10 mph. However, our experience suggests that a large pickup truck will probably travel 15-25 mph over open ground and 20-35 mph over dirt roads onsite at Rocky Flats unless speed limits are posted and obeyed. Therefore, in this case, assumptions that would err on the side of safety were not applied.

The dispersion calculations described in Appendix 3 are correct. Since we have routinely assumed a 1000 meter ceiling, this limitation should be placed on the model, but it will probably not affect the operating limitations that result from the calculations that have been performed. The narrative in Appendix 3 references Turner's X/Q model; the narrative should be modified to reference the Pasquill-Gifford model, using Turner's Workbook of Atmospheric Dispersion Estimates.

The wind rose in Appendix 3 is consistent with our qualitative observations at the Rocky Flats Plant and should be considered appropriately applied to the Pasquill-Gifford model.

A superior approach to the problem of atmospheric dispersion would be one similar to that employed in the UDAD or MILDOS codes or described in U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide No. 3.15. The MILDOS AREA variant of MILDOS, for example, is designed specifically for very-large-area sources and may be an appropriate technique for evaluation. The basic weakness of the approach used in the PPCD under review is that the selected receptor

Memorandum to R.M. Quillin from R.W. Terry, 3-Oct-91
U.S. DOE Plan for Prevention of Contaminant Dispersion.

Page 3

locations are certainly not the nearest neighbors to the plant, and are probably not the maximally affected residences. This approach is weakened even more by the absence of any evaluation of the hazard to members of the on-site population who are not engaged in remedial activities; according to Table 1 (p. 4), the hazard to that group is scheduled to be addressed in the Site-Specific H&S Plan, but would be addressed in a consistent manner if the NRC method of evaluation was employed in the Plan under review.

By using the NRC approach, contaminant uptakes to a person in each square on a grid are systematically calculated. The square with the largest offsite uptake (radiation dose, risk, non-radioactive uptake, or other) would ordinarily serve as the fence-line calculation; the occupied square with the largest offsite uptake would ordinarily serve as the calculation for the nearest neighbor (often described as the maximally affected individual). The Radiation Control Division usually does not require specific methods of hazard evaluation, nor does this Division require that findings be restated simply to make it convenient for our staff to evaluate the report; the Plan has been written primarily to satisfy the information needs of the U.S. Environmental Protection Agency, not the NRC, and the information has been provided in that context; however, it is appropriate to point out that the evaluation that has been provided in the document is not adequate to demonstrate compliance with the Plan's stated goals.

The fractional leeward wind factor that is listed in Table A.4-1 is a difficult value to estimate, and a more precise and accurate means of estimating contaminant uptake would be found if the NRC method was employed, by using all of the data provided by the wind rose in a rational manner, consistently applied.

The receptor parameter that is used to calculate contaminant uptakes in Appendix 4, and described in Table A.4-1, appears to be appropriate for 10 hours of the day. The intake duration of 10 hr/day is an appropriate value for fugitive dust emissions during periods of work, but when work is in progress fugitive dust may be emitted from work sites during the remainder of the day. It does not appear that the hazard evaluation for the off-site population adequately addresses the time period outside the normal working day.

A breathing rate of $1.2 \text{ m}^3/\text{hr}$ is equivalent to 20 liters per minute, a breathing rate ordinarily associated with light daytime activity. It is appropriate for active members of the offsite population and for members of the on-site population who are not engaged in remedial activities; it probably is a low estimate for persons who are directly engaged in remedial activities during periods of excavation, drilling or construction.

An exposure period of 5 years may or may not be a reasonable value; the timetable for completion and the scope of activities addressed by the PFGD will affect this result. It appears, though, that the one in a million (10^{-6}) performance objective, described in Section 2.1.1.2, Step 5 (p. 22), which is a lifetime cancer risk basis for calculations, is allocated to activities of 5 years' duration, which could leave 65 years during which no related risk could be allocated. The example calculation in Appendix 5 provides no clarification on this question.

III. STATEMENTS OF FACT

The most disturbing finding of this review is found in Table 2.3.2 (p. 39), titled "Soil Principal Contaminants/OU1 - 881 Hillside Area," Table 2.3.3 (p. 40), titled "Comparison of Measured Soil Concentrations to Threshold Levels,"

Memorandum to R.M. Quillin from R.W. Terry, 3-Oct-91
U.S. DOE Plan for Prevention of Contaminant Dispersion

Page 4

and Table A.1-1, titled "Principal Contaminants/OU1 - 881 Hillside Area." Each of these tables lists the highest ²³⁹⁺²⁴⁰Pu concentration in soil in the area as 0.91 picocuries per gram (0.91 pCi/gm). Such an assertion is simply unbelievable.

Although the 881 Hillside Area is nominally upwind of the 903 Pad Area, it is adjacent to the 903 Pad Area, an area with soil that is very heavily contaminated with plutonium. Plutonium concentrations in the IHSS 199 Remedy Acreage Area, 2 miles downwind from the 903 Pad Area and described in some detail in the Plan, run as high as ten times the value listed in the tables, and

were part of the basis for a lawsuit and the settlement that has led to remedial activity, already in progress at that site.

The Agreement in Principle (AIP) states that the Department of Energy "agrees to comply with applicable state and federal environmental laws." The Interagency Agreement (IAG) is another document that implements the U.S. DOE's stated policy.

It is interesting to note that 0.91 pCi/gm is exactly equal to 2 disintegrations per minute per gram (2 dpm/gm). The State Board of Health Rules and Regulations Pertaining to Radiation Control have stated, since 1975, as follows:

RH 4.35.1 Contamination of the soil in excess of 2.0 disintegrations per minute of plutonium per gram of dry soil or square centimeter of surface area (0.01 microcurie) presents a sufficient hazard to the public health to require the utilization of special techniques of construction upon property so contaminated. Evaluation of proposed control techniques shall be available from the Department of Health upon request.

This regulation was put forth by the Board of Health in response to a need for guidance to County Commissions, which were required to establish land development regulations for subdivisions under Colorado Revised Statutes (1973) Title 30, Article 28, Part 133. The use of the word "plutonium" in this context means ²³⁹⁺²⁴⁰Pu.

Because the regulation was motivated by a need to provide specific guidance for the subdivision of private property, it has not been applied to activities on property owned by the U.S. DOE. The principles of radiation protection that are incorporated into RH 4.35.1 do have as much applicability to on-site construction (and remediation) activities as they have to the subdivision and improvement of land for industrial, commercial or residential use. Under the circumstances, I recommend that this Division should take an active and vigorous role in this matter, and require a detailed evaluation of the airborne radiation hazard from activities described in this document, in a context compatible with ordinary principles of radiation protection, so that compliance with the underlying principles of RH 4.35.1 will be met and clearly demonstrated.

IV. OPERATIONAL PRACTICES FOR PREVENTION OF CONTAMINANT DISPERSION

Sections 2.1.4.1 (pp. 31-34), 2.2 (pp. 34-42), and 2.3 (pp. 42-48) provide specific guidance to Project Managers who are engaged in remediation activities. The outcome of operational practices for prevention for contaminant dispersion may be improved if these sections are written more clearly. The practices and procedures outlined in these sections, and in Appendix 8, titled "Interim-Plan for Prevention of Contaminant Dispersion," probably are sufficient to meet the

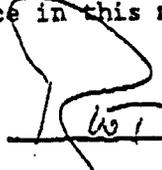
Memorandum to R.M. Quillin from R.W. Terry, 3-Oct-91
U.S. DOE Plan for Prevention of Contaminant Dispersion

Page 5

objectives of the Plan, and the objectives of the principles of radiation protection that are incorporated into RH 4.35.1, as well.

However, these sections, and Appendix 8, do not provide any meaningful procedures for active control of fugitive dust emissions, and therefore are not sufficient to provide assurance that the objectives of the Plan or of RH 4.35.1 will be met.

If you have any questions or comments about the information that I have provided, or if you believe that any of the information that I have provided is in error, or if I can be of any further assistance in this matter, please do not hesitate to call me at x4816.



cf: Jake Jacobi
file 4-8000



CITY OF WESTMINSTER

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OCT 11 10:13

October 10, 1991

Public Works and Utilities

3400 West 93rd Avenue
Westminster, Colorado
80030

303.430.3400
FAX 303.430.5857

Ms. Beth Brainard
Public Affairs Officer
U.S. Department of Energy
Rocky Flats Office
Post Office Box 928
Golden, Colorado 80402-0928

Dear Ms. Brainard:

Thank you for the opportunity to comment on the Draft Plan for the Prevention of Contaminant Dispersion (PPCD). The City of Westminster would like to submit the following comments for your consideration.

Section 1.2 states that the PPCD has been developed to ensure that the public is protected from the potential increased health risk associated only with inhaling windblown hazardous or dangerous constituents from the Rocky Flats Plant. Additional exposure pathways should be identified.

In the same section, contaminant dispersion and emissions other than those from intrusive activities should be included in the scope of the document.

In Drawing 2, the map incorrectly depicts the boundaries of the RFP. Also, it was our understanding that the OUS receptor is located at the plant boundary. According to the map, it is located 1/2 mile southeast of the boundary.

In section 2.1.1.2 and Appendix A.4.4, a safety factor of 0.1 is used in the risk assessment calculations. It may be appropriate to use a safety factor of 0.01 to calculate risk to sensitive humans.

In section 2.1.3.3, please define "relevant particle sizes."

Section 2.1.4.1, Westminster appreciates the clarity of the "PPCD Step by Step Breakdown."

In Table 2.3.3, and A.2.2, it appears that calculated threshold values for support vehicle traffic assume that only one vehicle will be utilized per intrusive activity. Is this a realistic model?

In A.6.3.1, characterization of topsoil should be completed before moving and/or relocating the soil during a major excavation activity.

In the same section, please describe the "low covered pile" method of soil storage.

1307a

MHS
27



Beth Brainard
October 10, 1991
Page 2

Section A.6.3.3, the document states a procedure for containment and disposal of contaminated drill cuttings. In addition, decontamination SOPs for drills, augers, trucks, etc., should be addressed.

Section A.6.4, discusses the various dust control measures under consideration. Westminster believes measures must be taken to ensure groundwater and surface water are protected from contamination when aqueous or chemical dust control methods are used. The plan should include provisions for surface water monitoring to identify impacts associated with the use of copious amounts of water.

Has it been demonstrated that there is no increase in contaminant mobility in soils, in addition to no impact to groundwater or surface waters, when using the water/surfactant dust control measures? If so, please document the study or approved practice.

Table A.6-4, Westminster is particularly concerned about chemical suppressants and surfactants that may adversely affect vegetation. Defoliation may lead to soil erosion and increased soil dispersion.

A table of the current Clean Air Act standards or limits would be helpful for comparison purposes.

As an added precaution, the Standley Lake Protection Project should be in place prior to the undertaking of remedial actions at the Plant site. This would provide the necessary protection for Standley Lake, which serves as a drinking water supply for 180,000 people. This extra step is needed in the event surface water were to become contaminated during future operations, cleanup or construction activities.

Thank you for the opportunity to comment on the Draft Plan for the Prevention of Contaminant Dispersion. If you have any questions, please contact me at 430-2400 ext. 2183.

Sincerely,

Susan Nachtrieb

Susan Nachtrieb
Water Quality Coordinator

cc: Dave Kaunisto, Acting Water Resources Manager