

ROCKY FLATS PLANT  
GOLDEN, COLORADO

TECHNICAL REVIEW  
PLAN FOR PREVENTION OF CONTAMINANT DISPERSION

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY  
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## 1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) reviewed the Plan for Prevention of Contaminant Dispersion (PPCD) at Rocky Flats Plant (RFP), Golden, Colorado. PRC prepared this review for the U.S. Environmental Protection Agency (EPA) under Technical Enforcement Support (TES) 12, contract number 68-W9-0009, work assignment number C08061.

The purpose of the PPCD is to examine the different emission mechanisms from windblown contamination and to suggest methods for minimizing these emissions. The PPCD is well documented and technically adequate concerning dispersion modeling techniques. However, there are some significant questions, omissions, and inconsistencies that should be addressed before the PPCD is considered complete. Specifically, the area of program implementation, the use of air quality monitoring data as a means of characterizing risk assessments, and the intent of the PPCD should be reevaluated.

This review provides general (Section 2.0) and specific comments (Section 3.0) on the quality and effectiveness of the PPCD.

## 2.0 GENERAL COMMENTS

1. The primary objectives for developing and implementing the PPCD are to prevent the further dispersion of contaminants from RFP sources, and to quantify the potential for contaminants to become dispersed or resuspended so procedures to mitigate dispersion can be implemented. The PPCD was intended to accomplish more than merely suggest or propose which contaminants or conditions should be considered in addressing dispersion. The PPCD should include concrete plans concerning field activities and the implementation of the proposed mitigation techniques.

Rationale: The original intent of the plan was not fulfilled. It should be revised to reflect EPA's concerns.

2. The PPCD should determine and offer effective practices to mitigate problems and risks associated with contaminant dispersion. Although the plan discussed various mitigation techniques, it did not commit U.S. Department of Energy (DOE) to any specific course of action. An acceptable plan will institute appropriate standards, implement proper mitigation procedures, establish monitoring programs to verify the effectiveness of the implemented procedures, establish a decision making process, and specify actions that will be taken based

on those decisions. DOE should clearly define which mitigation techniques will be employed at specific areas throughout the site. In addition, an evaluation of the effectiveness of each mitigation technique should be discussed. This evaluation would be based on the results of the screening level assessment and would be a part of the decision making criteria.

Rationale: Designation of specific mitigation techniques is necessary to prevent exposure to on-site and off-site receptors during and after the facility investigations.

3. The screening level assessment focused on impacts at off-site receptors. The intent of the plan was to prevent potential exposure to workers at the site, as well as the public external to the plant. DOE should re-evaluate the predicted impacts to RFP workers as a result of mitigation techniques. Therefore, the threshold criteria for worker exposure should be utilized in the evaluation process. Lowest achievable emission rate (LAER), as low as reasonably achievable (ALARA), and national emission standard for hazardous air pollutants (NESHAP) threshold levels may not be appropriate. Also, the plan should illustrate whether or not the mitigation techniques achieve the selected health threshold requirements.

Rationale: The original intent of the plan was to evaluate mitigation techniques in order to reduce worker and public exposure to wind dispersed contaminants. The plan did not adequately address on-site exposure potential.

4. The plan did not present a quantitative basis for the selection of the DOE windspeed criteria of 15 miles per hour (mph). The effectiveness of this standard should be presented with supporting information.

Rationale: All standards used in the PPCD evaluation should be thoroughly discussed and validated.

5. The relationship between RFP and regulatory agencies such as EPA and the Colorado Department of Health (CDH) should be clarified. While the PPCD does mention the need for Rocky Flats and regulatory agencies to communicate, information and recommendations generated at RFP should be readily available to these regulatory agencies. All relevant regulatory agencies should be informed of and possibly represented at significant remediation activities. Appropriate regulatory agencies should be continually apprised of the situation concerning airborne contaminant dispersion.

Rationale: The ability of the EPA and CDH to oversee and review remediation efforts at Rocky Flats would be improved if these agencies have a clear understanding of how RFP management will collect and disseminate the windborne dispersion information.

6. Throughout the PPCD, the working definition for particulates varies. For instance on page II-1-19, paragraph 2, the contaminants of concern are inhalable particulates (also referred to as  $PM_{10}$  or particulate matter with an aerodynamic diameter of 10 micrometers or less). On page II-1-51, paragraph 2, the term total suspended particulates (TSP) is used to define particulates. One definition should be used consistently throughout the document.

Rationale: The term particulates is used extensively in the PPCD. Consistent definition and usage is important in terms of the accuracy and utility of the report.

7. The PPCD should include a table matrix summarizing (1) the particulate emission control devices with their relative effectiveness and limitations, and (2) the basic algorithms used to estimate emissions from wind erosion, vehicle movement, and intrusive soil activity.

Rationale: Summarizing this information allows the data to be more readily understood and synthesized, and improves the utility of the document.

8. The PPCD does not include a quality assurance/quality control (QA/QC) section.

Rationale: Programs in which data are synthesized through modeling or collected in the field need to be rigorously inspected. Any people that generate data should check their own work regularly (QC). Also, the data should be independently reviewed by individuals who have not been involved in the original data generation (QA).

### 3.0 SPECIFIC COMMENTS

1. Page I-1, Paragraph 2; Page I-13, Paragraph 2; and Page I-21, Paragraph 2. The procedures for mitigating windblown contamination should not be limited to "... DOE contractors, subcontractors, and their staff." These procedures should apply to all persons within the RFP.

Rationale: All persons within the RFP may potentially contribute to windblown contamination. Thus all persons should participate in the mitigation procedures.

2. Page I-5, Paragraph 2. The text states, "Samples of unpaved roadways must be taken to determine size gradation of soil particulates. Addition of issuing aggregate sizes should be done to ensure the success of chemical dust suppressant or watering efforts." The text should further explain (and provide references if possible) the process of adding different sized soil particles to unpaved roads to insure proper size distribution and to aid in suppressing particulate entrainment into the air.

Rationale: It is unclear how this is to be done. This appears to be a unique solution and additional support is needed to describe the procedure and its effectiveness.

3. Page I-5, Paragraph 3. The text states, "Dust control for paved roads consists of moving the material from the road." The PPCD should include an explanation of how this procedure will be accomplished.

Rationale: All procedures should be described completely. The process of moving the material may produce significant emissions. This solution could be worse than the problem.

4. Pages I-5, I-16, and I-275. There appear to be gaps in the chain of responsibility for minimizing airborne contaminant dispersion. In addressing the issue the text states, "It shall be the responsibility of all project managers to ensure that copies of this procedure are available to personnel as required." Project managers should also be responsible to see that this procedure is carried out. Strong penalties should be enacted for noncompliance with these procedures.

Rationale: Stronger or more detailed language should be used to insure compliance with these procedures.

5. Page I-6, Paragraph 3 and Page I-27, Paragraph 4. According to these sections, the emissions of windblown contamination from both vehicle movement and soil contamination will be minimized to levels which are ALARA. It is unclear what criteria will be used to determine compliance to within ALARA levels. A rigorous set of criteria should be developed, implemented, and disseminated to the appropriate regulatory agencies.

Rationale: This set of criteria is necessary for assessing the effectiveness of strategies for mitigating windblown contamination.

6. Page I-9, Paragraph 2. The text states, "A reduction in speed from 30 to 20 mph may reduce emissions by 33 percent ..." It does not state if this is the recommended speed limit reduction or to what level the windblown contamination is to be reduced. A proposed speed limit reduction is needed.

Rationale: The emission reduction discussion is informative, but a program specifically designed to significantly reduce windblown contamination by reducing vehicular speed (velocity), needs to be implemented.

7. Page I-16, Paragraph 4. The text states, "Methods of control of windblown contamination resulting from the above activities will be controlled through water spraying as specified below." There was no discussion as to the set of criteria to be used to determine the effectiveness of these activities. A rigorous set of criteria should be developed and discussed with the appropriate regulatory agencies.

Rationale: This set of criteria is necessary for assessing the effectiveness of water spraying for mitigating windblown contamination.

8. Page I-23, Paragraph 1. In discussing the vehicle velocity at which particulate emissions occur, a citation should be included to explain the statement, "Estimates of this threshold velocity vary from about 10 to 20 mph..." These figures are unattributed. The source of these figures should be cited.

Rationale: These could be critical values and a precise citation would add clarity and allow the information and its context to be evaluated.

9. Page I-28, Paragraphs 2, 3, and 5; and Page I-29, Paragraph 1. These sections state that a particular windblown contamination control method will be applied "as required" or "as deemed appropriate". A more specific criterion for determining the effectiveness of these methods as well as an accurate definition of the terms "as required" or "as deemed appropriate" is needed.

Rationale: This set of criteria are necessary for assessing the effectiveness of strategies for mitigating windblown contamination.

10. Pages II-1-1 and II-1-2. There is no clear description on estimating the source emission rates for gasses due to volatilization. The volatilization of gasses is one process by which

gasses are emitted into the atmosphere. The source emission rates and methods used to calculate these rates should be discussed in the text.

Rationale: Volatilization is an important method of entraining some types of contaminants into the atmosphere and this process should be discussed completely.

11. Pages II-1-12 and II-1-13. In determining the portion of total wind erosion losses that would be measured as suspended particulates, the PPCD used a value of 2.5 percent (thus reducing the particulate emission values due to wind erosion by 97.5 percent). This value, referred to in the modified wind erosion equation as variable A, may be too low. As stated in page II-1-13, paragraph 1, a review of the literature revealed values for variable A to be estimated between 1 and 38 percent. A higher value for the variable A should be chosen. Otherwise, more extensive citation should be given to justify the use of a 2.5 percent value for A.

Rationale: A higher value for the variable A would yield a conservative overestimate of particulate emission rates. It is usually desirable to slightly overestimate particulate emission rates when determining risk assessments.

12. Page II-1-20, Paragraph 3. The text states, "Contaminant levels potentially available to contribute to windblown contamination will be ascertained by the RCRA Facility Investigation/Remedial Investigation (RFI/RI) process as a separate task." An estimate of conservative contaminant levels should be included in this document and a conservative risk assessment should be conducted prior to implementation of RFI/RI activities at the site.

Rationale: This is one of the initial steps in determining risk assessments. For the protection of workers at the site, conservative risk assessments should be available before beginning the RFI/RI process.

13. Page II-2-57, Paragraph 3. While there is extensive discussion of air dispersion modeling, ambient air quality monitoring is ignored. Air quality monitoring should be considered in characterizing risk assessments for airborne contaminant such as particulate and organic, inorganic, and radioactive constituents. It is agreed that air quality monitoring is more expensive and labor intensive than air dispersion modeling. However, it is imperative that air quality monitoring be a significant part of risk assessment for airborne contaminants. A detailed description of air quality monitoring should be submitted in a revised version of the PPCD before this plan is considered complete.

Rationale: Even though air dispersion modeling is an adequate predictive device in many instances, air quality monitoring can augment and verify the results of the air dispersion models. Also, the air quality monitoring can serve to verify modeling results and establish background contaminant levels around RFP.

14. Page II-2-65, Paragraph 2. The text states, "Estimates will be generated in  $\mu\text{g}/\text{m}^3$  or  $\text{Ci}/\text{m}^3$  for each contaminant. For contaminated soil surfaces the study will be confined to the uppermost layers of soil, or that layer which is likely to be suspended." There is no clear discussion given on how to distinguish between the concentration of the particulates themselves and those contaminants attached to the particulates. The PPCD should include significant discussion of measuring contaminant concentrations in the soil and converting these values into concentrations in the air. These contaminants are adsorbed on particulates and are then entrained into the atmosphere.

Rationale: This is an important area of discussion which should be clearly stated to define the precise calculations to be performed.

15. Page II-2-69, Paragraph 4. There is incomplete discussion on the air dispersion models to be used. Choosing appropriate EPA approved air dispersion models depends on several factors such as (1) the length of time of the emissions (referred to as continuous or instantaneous releases); (2) the level of sophistication (a screening model uses worst case meteorological information while a refined model uses actual meteorological data); and (3) unique conditions altering air flow (such as wakes created by the presence of nearby buildings). Possible EPA-approved dispersion models are the Industrial Source Complex Short Term, PUFF, and SCREEN. A description of the models to be used is needed.

Rationale: For air dispersion modeling to be an effective method of predicting air emission concentrations, a clear understanding of which models to be used is important.