

EPA Comments on the Phase I RFI/RI Work Plan
for OU 10, the Other Outside Closure Units

Overall Comments

In general this work plan has improved considerably over the draft version. However, some problems and concerns still exist with the Applicable Relevant and Appropriate Requirements (ARARs), Data Quality Objectives (DQOs), Field Sampling Plan (FSP) and Baseline Risk assessment (BRA) portions of the work plan.

The ARARs/TBCs tables included in this work plan must be replaced by the Site-Wide Chemical Specific Benchmarks tables developed by DOE. This table will have to be revised in accordance with EPA comments which are forthcoming

The DQOs section describes a statistical approach to estimating the number of surface soil samples needed for each IHSS based on variability of the contaminants (metals) of each IHSS. This approach does not account for the physical setting, location and size of each IHSS. It appears that the statistical analysis was manipulated to support a number of surface soil samples to be taken at every IHSS (25 samples for "large" sites) and arbitrarily selecting 1/3 of the 25 samples for "small" sites. As a result, there is a potential for under characterizing some IHSS. In addition, the statistical analysis is based on the results of metal analysis for only a few sites when the known contamination at the majority of the sites is either organic or radioactive. Therefore, DOE must consider the physical setting, location, nature of the site and nature of contamination for each IHSS and use a statistical approach which better defines the number of surface soil samples needed to fully characterize each IHSS.

The FSP included in this work plan was found to be inadequate and insufficient to meet the objectives of the Phase 1 sampling activities. The major problems identified are the following. 1) inadequate number of surface soil samples, 2) inappropriate spacing grid for soil gas and HPGe surveys, 3) lack of surface soil samples for radiological parameters; and 4) inconsistencies between the text and FSP figures.

- The problem with the number of surface soil samples originates with the statistical estimating procedure as explained above.

- It appears that the spacing grid for soil gas and HPGe surveys to be conducted at each IHSS has been arbitrarily chosen and does not consider the size of the IHSSs. This can result in a failure to identify potential source areas DOE must

reevaluate the grid spacing to be used at each IHSS and present a rationale (statistical) for the values chosen.

- Stage 1 field sampling activities are to be conducted to provide enough information to further design the Stage 2 FSP activities. With this in mind, it is EPA's position that surface soil samples must be taken during Stage 1 for radiological analysis. This would help to verify HPGc survey results and further localize "hot" spots. The FSP needs to be revised as appropriate.

- There are several inconsistencies between the FSP text and the figures presented in this work plan. These inconsistencies are detailed in the specific comments presented below.

EPA's concerns with the BRA portion of the work plan are detailed in the specific comments presented below DOE must fully address these concerns.

Specific Comments

Section 2.1.9, Building 444/453 drum Storage area (IHSS 182), page 2-46. The text states that the top 4 inches of soil in a portion of the Drum Storage Area was removed because it was believed to be contaminated. Where did this soil go? Were any soil samples taken and analyzed after the removal of the soils? If they were, this work plan needs to present the analytical results in order to determine if there was any contamination left in the soils.

Table 4-1, Phase I RFI/RI Analytical Data Quality Objectives, page 4-5. This table lists data quality objectives for characterization of the vadose zone material and groundwater flow regime around each IHSS. However, the FSP presented in this work plan does not address these activities. The FSP must include sampling activities needed to meet the above objectives.

Section 4.2.4, Identify Data Quality Needs, page 4-11 This section states that surficial soil samples for nonradiological chemical and physical analysis will be taken for each IHSS. It is important that the FSP includes surficial soil samples for radiological chemical analysis in order to verify results of the radiological survey with HPGc detector and to further define or localize hot spots.

Section 4.2.4, Identify Data Quantity Needs, page 4-12 The text states that a statistical approach was used to estimate the number of surficial soils samples that may be needed to determine nonradiological data variability. This statistical approach does not account for the location, physical setting and size of the IHSS. It appears that the statistical analysis was manipulated to support an arbitrary number of samples to be taken at every

IHSS (25 samples for "large" sites and 8 samples for "small" sites) rather than statistically estimating the number of samples needed to characterize surficial soils at every IHSS. As a result, the number of samples chosen to characterize each IHSS may not be appropriate and some IHSSs may be over characterized while others may be under characterized. In addition, the statistical analysis is based on the results of metal analysis for only a few sites when the known contamination at the majority of the sites is either organic or radioactive

Section 4.2, Background and FSP Rationale, page 7-3 The text states that stage 1 sampling activities will include inspection of tanks and ancillary equipment to assess tank integrity and identify potential release location. The text further mentions that test pits will be excavated for underground inspection, and grab samples will be collected from the pits in areas of possible contaminant release. While this seems like a reasonable approach for assessing underground tank integrity, the FSP fails to include these field activities for IHSS containing underground tanks. This needs to be addressed.

Section 6.0, Schedule. This schedule must be updated in the revised final version.

Section 7 2, Background and FSP Rationale, page 7-3. The text states that surficial soil samples as required by the Stage 1 HPGe survey for radioactive analysis will be taken during Stage 2 sampling activities. It is EPA's position that these sampling activities should be carry out during Stage 1. The rationale for this is that it is important to verify HPGe survey results and to locate "hot" spots prior to designing the Stage 2 sampling activities. In this manner the appropriate number of boreholes needed for Stage 2 can best be estimated.

The text also states that soil cores drilled to a 5-foot depth will be used to verify the soil gas survey analytical results. The sample collection descriptions in the text and sample location maps throughout the FSP should describe the number and locations of these soil cores for each applicable IHSS. In addition, Table 7-3 (analytical program summary) should include the soil core analysis.

Section 7 3, Sampling Location and Frequency, page 7-7. This section defines grid spacing for HPGe survey and soil gas survey activities for "large" and "small" IHSSs. However, this section fails to present a rationale for the selected grid spacing. A 20 foot grid for soil gas survey and 150 foot grid with use of collimators for HPGe survey appear to be excessively large to characterize "small" IHSSs and may result in a failure to identify contaminated areas. DOE must reevaluate the grid spacing for HPGe and soil gas surveys.

Section 7.3, Sampling Location and Frequency, page 7-12. This section also indicates that surface soil samples will be analyzed for "nonradioactive" parameters. The purpose of this statement is unclear since radionuclides are listed in Table 7-4 (Phase I soil, sediment, and water sampling parameters) and the FSP specifically lists radionuclides as surface soil sample analytical parameters at several IHSSs (IHSSs 170, 174, 175, 176, and 208). The FSP should be revised to indicate that surface soil samples, both grab and composite at several IHSSs will be analyzed for radionuclides.

The text states that the data variability assumptions and actual calculations resulted in a recommendation for 25 or more surficial soil samples at each IHSS, regardless of its size. This has a potential to over or under characterize some IHSSs. It is EPA's position that size of the IHSSs has to be considered when estimating the number of samples needed.

It appears that 25 surficial soil samples at IHSS 176 selected by partitioning the IHSS into 50-by 100-foot cells are not sufficient to characterize the whole area and may result in a failure to identify potential source areas. DOE needs to reevaluate the number of samples needed considering the size of this IHSS.

Section 7.3, Sampling Location and Frequency, page 7-13 The text indicates that additional surface soil samples will be collected at each IHSS and analyzed for physical parameters, total organic carbon (TOC) content, and soil pH. These analyses should be included in Table 7-3 and locations for collection of these samples should be shown on each sample location map throughout the FSP.

Table 7-3, page 7-14. This table should include surface soil samples for radiological analysis.

Section 7.3 1, Radioactive Liquid Waste Storage Tanks (IHSSs 124.1, 124.2, 124.3), page 7-24. This IHSS is going to be investigated under OU 9. It needs to be removed from the scope of OU 10 field investigation.

Section 7.3.2, Oil Leak (IHSS 129), page 7-26 It is not clear how DOE is planning to investigate tank 4 separately from the other three tanks. These tanks are very close together and it will be very hard to define and determine whether any contamination found, originates from tank four and not from the others. This needs to be explained EPA recommends DOE investigate all four tanks in order to characterize more thoroughly any contamination present in this IHSS and to determine if contamination originates from tank four

In addition, the text describes three lines of soil gas data collection points to be sampled on a 10-foot grid. However, Figure 7.3-2 shows a triangular grid pattern of soil gas data collection points. Also, the legend on Figure 7 3-2 describes a 20-foot grid but an approximately 100-foot grid is illustrated. The text and figure should be revised to be consistent.

Section 7.3.3, P.U &D. Storage Yard - Waste Spills (IHSS 170), page 7-28. It appears that 25 surficial soil samples at IHSS 170 collected on a triangular grid with 100 x 50 feet are not sufficient to characterize the whole area and may result in a failure to identify potential source areas. DOE needs to reevaluate the number of samples needed considering the size of this IHSS.

In addition, Figure 7.3-3 shows an approximately 120 foot triangular grid spacing for all surface soil samples at IHSS 170. This figure needs to be revised to reflect the 100 by 50 foot grid stated in the text.

Section 7.3.5, S&W Building 980 Container Storage Facility (IHSS 175), page 7-31. The grid spacing for soil gas and HPGe survey of 20 feet and 75 feet respectively, appear to be excessively large for this IHSS which has dimensions of 25 feet by 25 feet. DOE needs to reevaluate these grid spacings in order to minimize missing a contaminated area.

Section 7.3.6, S&W Contractor Storage Yard (IHSS 176), 7-33 See third comment above on Section 7.3 on page 7-12

Also, the text indicates that 25 surface soil samples will be collected inside IHSS 176 and two surface soil samples will be collected outside the site boundary. However, Figure 7.3-6 shows 23 surface soil sampling locations inside IHSS 176 and four surface soil sampling locations outside the site boundary. The text and figure should be revised to be consistent.

Section 7.3.7, Building 885 Drum Storage Area (IHSS 177), page 7-35. The text states that a soil gas survey to the north of building 885 will not be necessary. However, Figure 7.3-7 shows five soil gas data collection points north of Building 885. The text and figure should be revised to be consistent.

In addition, the text indicates that 10 surface soil samples will be collected, eight along the perimeter of Building 885 and in surface water ponding areas south and southwest of Building 885 and two samples outside the fence south of Building 885. However, Figure 7.3-7 shows seven surface soil sampling locations around the perimeter of building 885, and one outside the fence south of Building 885. The text and figure should be revised to be consistent.

What is the rationale for taking 10 surface soil samples for this IHSS?

Section 7.3.9, Building 444/453 Drum Storage Area (IHSS 182), page 7-40. The FSP for this IHSS should include the contingency to take grab samples on stained areas.

Section 7.3.11, Inactive D-836 Hazardous Waste Tank (IHSS 206), page 7-42. The text indicates that soil gas samples will not be collected at IHSS 206. However, Figure 7.3-11 shows proposed soil gas sample locations for IHSS 206. The text and figure should be revised to be consistent.

Section 7.3.12, Inactive Building 444 Acid Dumpsters (IHSS 207), page 7-42. EPA suggests DOE visually check for any concrete cracks. If the concrete is intact, EPA recommends conducting the HPGe survey and taking some concrete and soil samples in those areas showing high readings. In the case that visual concrete cracks are found, EPA recommends conducting the HPGe survey and placing some boreholes at or near the areas where the concrete cracks are observed. In this manner, DOE can ensure targeting any potential migration of contaminants to vadose zone soils.

Section 7.3.13, Inactive 444/447 Hazardous Waste Storage Area (IHSS 208), page 7-45. The text states that this IHSS is covered by asphalt. Later it states that three surficial soil samples will be taken in the center of the IHSS on a soil area. It is not clear whether the whole IHSS is covered by asphalt or whether there are some uncovered areas. This needs to be explained.

Section 7.3.14, Unit 16 Building 980 Cargo Container (IHSS 210), page 7-45. This section needs to present the rationale for collecting only six surficial soil samples for this IHSS.

Section 7.3.15, Unit 15, 904 Pad Pondcrete Storage (IHSS 213), page 7-47. The text indicates that surface soil samples will be collected on a 100 by 150 foot sampling grid. However, Figure 7.3-15 shows approximately 100 foot triangular grid pattern on the western and southern sides of IHSS 213, and approximately 70 foot triangular grid pattern on the northern and western side of IHSS 213. In addition, the text indicates that metals will most likely be concentrated in ditches adjacent to the site. However Figure 7.3-15 shows surface soil sampling locations based only on grid patterns and does not indicate that any drainage ditch surface soil sampling locations are planned. The text and figure should be revised to be consistent.

Section 8.1, Overview, page 8-1. Although it is stated that "The vadose zone sampling program will not provide enough data to develop a quantitative risk assessment and, therefore, will be determined via qualitative evaluations", it may be necessary to

include contaminants in this zone if residential use assumptions form the basis of the risk assessment. Under this assumption, homes with basements would be constructed on-site. Soil excavation for these basements would involve transferring vadose zone soil to the surficial zone where construction workers and residents could be exposed to contaminated soils.

Section 8.1, Overview, page 8-4. Although the RAGS (EPA, 1989a) suggest alternative sources of toxicity information, the Integrated Risk Information System (IRIS) is considered the preferred source of toxicity information. RAGS states that "Information in IRIS supersedes all other sources. Only if information is not available in IRIS for the chemical being evaluated should the sources below be consulted." Because IRIS toxicity values are the only EPA verified values, they should be used exclusively. Only when IRIS does not provide values for specific chemicals, should alternative guidance be sought from Health Effects Assessment Summary Tables (HEAST) and EPA's Environmental Criteria and Assessment Office.

Several DOE documents are cited as possible sources of information on exposure/dose. Although these documents may be helpful in certain circumstances, exposure assumptions in DOE guidance are, for the most part, based on guidance from the International Commission on Radiological Protection (ICRP). As its name implies, the focus of the ICRP is to provide protective radiologic standards for occupational exposures. The exposure assumptions are, therefore, conventionally based on the standard human receptor commonly referred to as "reference man," who is in perfect health and is 20 to 30 years of age. This reference standard does not represent the majority of the general population, which would be the target population under a residential scenario at RFP. It is well known that the physiological assumptions based on reference man assumptions do not apply to women or children. Therefore, exposure assumptions used to determine exposure/dose in the HHRA should be derived from information based on general population. The exposure factors handbook presents the single best EPA derived data base, and should be used as the major source of input parameters in exposure algorithms. It should be noted that alternative exposure factors which will be used in the HHRA should be approved by the EPA prior to completion of the study and should be well documented and referenced in the HHRA.

Figure 8.2-1, page 8-10. The flow chart and sequence of selecting COCs has major design flaws and violates the established principals detailed in RAGS. No class A carcinogens should be eliminated from the HHRA, even if the frequency of detection is less than 5 percent and the on-site concentration is not statistically different from background. As the flow chart indicates, the order of applied criteria could potentially allow such a decision. By the time the carcinogenic criteria are

evaluated, carcinogens could already have been eliminated. RAGS states that "...before eliminating potentially carcinogenic chemicals, the weight-of-evidence classification should be considered in conjunction with the concentrations detected at the site. It may be practical and conservative to retain a chemical that was detected at low concentrations if that chemical is a Group A carcinogen." The statement in the work plan that the carcinogenic screening step "...does not eliminate a chemical from further consideration. Instead, it automatically identifies carcinogens for inclusion in the risk assessment, even if detected at low concentrations, " is disingenuous, since potent human carcinogens could have been previously eliminated.

Page 9-4, first bullet: Modify this sentence to state, "Determine whether there have been adverse effects from contamination in biota tissue selected by applying the Target Biota Taxa selection criteria and collected within specific IHSS or their zone of influence." For consistency and technical correctness, it is important to apply the criteria developed by the Risk Assessment Technical Working Group before conducting a tissue sampling program.

Page 9-8, Paragraph 1. The text discusses planted trees and landscaping around buildings. This habitat type is not identified as a habitat for study, however. The rationale for ignoring a habitat that may provide cover and food for organisms at OU 10 should be provided or the habitat should be included in the study.

Page 9-15, last bullet: This sentence is inconsistent with the data quality objectives stated in section 9 2 1. The collection of data on the histopathology of selected tissues should be part of an ecotoxicological investigation, the third and last component of the environmental evaluation. DOE has erroneously included this work as part of the Phase I component. This bullet should be deleted.

Page 9-17, Table 9-1. The meaning of the term species compliance in the title is not clear. The term should be defined in the text or the table title changed.

Page 9-19: It is not clear why the paragraph beginning, "when insufficient data for the EE exists. " is included. The objective of the work plan is to ensure that sufficient data is collected. EPA recommends that this paragraph be deleted. It implies that the scope of the field investigation may be expanded with no apparent justification.

Page 9-24, Section 9.4 4 5, Preliminary Ecotoxicological Investigations: It is unclear why DOE would consider histopathological investigations during Phase I even on fortuitous samples. In addition to being inconsistent with the

process described in Section 9.1, EPA believes that until contaminant distribution in the environment is understood and mechanisms of exposure to biota are demonstrated, histopathological investigations are premature.

Page 9-28, Figure 9.5-1: Inhalation of resuspended surficial soils is a potential exposure route for reptiles, amphibians, mammals, and birds. Also, direct contact at the source of contamination should be considered. EPA suggests that in conjunction with this conceptual model, DOE develop a representative food chain to ensure all potential exposure pathways are accounted for and the potential for bioaccumulation is addressed. However, before DOE begins this effort, Phase I should be completed. Until levels of contamination are understood and the ecosystem is defined, a very comprehensive conceptual model is needed. When this information is available (upon completion of Phase I), a more refined and potentially much less complex conceptual model can be developed.

Page 9-30, Section 9.5 1 3, Contaminants of Concern: EPA disagrees with any changes to the selection criteria for both contaminants of concern and target taxa. This criteria has been developed for application over the entire Rocky Flats Plant site. EPA recognizes that the industrial area will not require the level of effort that other biologically rich operable units may. The proper application of the agreed upon selection criteria will demonstrate the reduced level of effort required. By changing the criteria itself, however, DOE is prejudging the outcome of the environmental evaluation. Deleting consideration of acute and chronic toxicity for example, is not justified. However, if no biota receptors exist, proper application of the selection criteria will lead to the conclusion that acute and chronic toxicity is not demonstrated.