

Colorado Department of Health

Review and Comment

Final Phase I RFI/RI Workplan for OU 10

May, 1992

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General Comments:

1) As of April 21, 1992 (CDH letter to Frazer Lockhart), IHSS 124, including tank units 124.1, 124.2, and 124.3, has been transferred to OU 9. Please make appropriate modifications to this workplan.

Specific Comments:

Figure 1.3-3: This figure is supposed to illustrate the surface water systems and drainages on the Rocky Flats Plant. However, due to the size of the figure, the lack of color contrast, and the clutter of extraneous information, this map does not fulfill its intended purpose. Please modify or replace this figure.

Section 1.3.3.6: Text in this workplan explaining future population trends is not pertinent to the Workplan and should be removed. This would also be true of Figures 1.3-4, 1.3-5, and 1.3-6.

Figure 1.3-9: This figure obviously was not proofed. The following items are missing or wrong:

1. No date is given for the water level data used to construct this map.
2. No data is placed next to wellpoints.
3. Many contours are discontinuous and difficult to follow.
4. Extraneous sections of contours show up at various points on the map.
5. No key is provided to explain what we think are dry areas.
6. No topographic base is provided against which to compare the accuracy of the water table contours.

As the Division has stated in the past, we will not approve a workplan that includes shoddy or inaccurate maps and figures.

Figure 1.3-10: Please plot the data used to construct this map next to the appropriate wellpoints.

Section 2.1.15.1: The text indicates that the pondcrete storage on the 904 Pad is currently at maximum capacity. The Division would like to point out that all waste must be removed from a unit before the Closure process commences. As the IAG is constructed, both the Phase I RFI/RI and the Phase I IM/IRA constitute closure. Therefore, all waste must be removed from the 904 Pad before sampling for the RFI/RI begins.

Section 3.0: Since the draft version of this document was submitted to the agencies, DOE has prepared a list of "Benchmark" standards. The Division requests that this benchmark list be included in this document as a replacement for the chemical specific potential ARAR list currently in this section. In addition, text must be added that clearly states that DOE intends to analyze all the RFI/RI data to a level that supports the lowest benchmark for any given constituent.

Table 4-1: This table needs to be expanded to address the test pits (or whatever type of sampling is) planned to investigate the ancillary equipment and piping associated with any tanks.

Section 6.0: Regarding the schedule indicated for the Baseline Risk Assessment (BRA), the Division would like to point out that the Draft Phase I RFI/RI Report is due to the agencies on 8/26/94. This would include a complete draft BRA. Therefore, the Division urges DOE to make 8/26/94 the completion date for the BRA on this schedule, rather than the 2/28/95 date shown.

Section 7.0 - General Comments:

1) The Division submitted, as Section 7.0 - General Comment #1 to the draft version of this document, an explanation of how Closure, and specifically Clean Closure, could be handled even when there is widespread contamination in and around an IHSS. Our explanation emphasized the importance of establishing the contamination levels surrounding an IHSS so as to be able to discern what additional contamination, in and out of the IHSS, was contributed by the IHSS. It is still unclear to the Division how DOE intends to establish this surrounding or "background" level of contamination. Please clarify the intended strategy or expand the FSP to address this issue.

2) There are many changes to this version of the FSP which were not a result of agency comments. Some of the changes improve the FSP; others do not. The Division urges DOE to accompany any non-solicited changes with explanations. When changes are made that were not solicited, DOE is changing portions of a document that were "approved" or, at least, "approvable". In addition, since this is a final document, sections that were changed from the draft

version are still draft in that the agencies have not seen them before. Please keep this in mind when reviewing the following comments and when considering that we have withheld approval. By not submitting an approvable document on May 1, 1992, DOE has technically missed a milestone.

3) All soil gas surveys completed as a part of this RFI/RI must be accompanied by **random** soil cores. By confining the soil cores to soil gas anomalies, there is no way to cross-check the validity of the anomaly. In other approved workplans, one random soil core is being taken for every 15 soil gas samples with a minimum of one soil core per IHSS. Please change the FSP accordingly.

4) DOE must either develop a revised SOP GT.8 for rad and non-rad surficial soil sampling before the implementation of this investigation begins or include equivalent SOPAs in the Workplan for these procedures. While the OU 1 Technical Memorandum (TM) 5 contained soil sampling methodology with which we agreed, the TM was not written as a surrogate SOP. Therefore, referring to the TM in the Workplan is not sufficient. Workplans are meant to be used by contractors and subcontractors in the field and, unless they are familiar with TM 5, the soil sampling will be unsatisfactory.

5) Several of the IHSSs in OU 10 are small enough to warrant only one HPGe survey location. Please explain how the HPGe survey will interpret any anomalies present in these IHSSs given only one data point and the fact that the HPGe instrument cannot distinguish which portion of its field of view contains an anomaly. In addition, please explain, relative to Clean Closure, how background levels of rad contaminants will be determined.

6) Please define the term "colimeter" relative to the HPGe survey.

7) To support Clean Closure for any IHSS that contains potentially contaminated paved areas, either samples of the paving or samples of paving rinsate will be needed to prove either that no further contamination exists on site or the levels of contamination that exist. We feel this should be done as early in the investigation (Stage I) as possible, but the choice is up to DOE.

Section 7.2: The fourth sentence of the second paragraph on page 7-3 should be modified to say "Soil gas samples will be extracted and analyzed where releases of VOCs are suspected from underground sources or on storage sites where spillage or leakage could have occurred when the site was unpaved."

The concept that surficial soil samples from Stage I will be used to "assess data variability and re-evaluate the quantitative DQOs for each IHSS" needs to be explained more fully. What exactly will be done with the Stage I data, how it will be analyzed, how it will be interpreted, and how it will affect subsequent stages of the RFI/RI need to be clarified.

The second sentence in the second paragraph on page 7-6 should be changed to read "This stage will also include drilling soil borings to begin the characterization of the nature and extent of the contamination in the vadose zone."

The first sentence in the fourth paragraph on page 7-6 should be changed to read "Stage 3 sampling may include collection of additional surficial soil samples and will include borings to continue assessment of the vertical and horizontal extent of contamination."

Table 7-1: This table needs to be modified. See Attachment A for the Division's recommended changes.

Section 7.3: The text should make clear that the HPGe radioactivity survey will be oriented to assure 100% coverage of the IHSS areas. In addition, the last sentence of the second paragraph of this section should be expanded to say "These radioactive anomalies, with a 150-ft spacing, will be investigated at a 75-ft spacing and confirmed with surficial soil samples."

The second paragraph on page 7-12 delineates how non-rad surficial soil samples will be located but does not explain how rad soil samples will be located. Please add text explaining this methodology, including random samples and hot-spot samples. This paragraph also incorrectly states that non-rad surficial soil samples will be "grab" samples. To be consistent with OU 1 Technical Memorandum 5 (DOE has implied this desire in Table 7-2), non-rad samples should be collected as composites (see OU 1 TM 5, page 2-6, section 2.1.2 for a complete explanation of the compositing methodology). Please see general comment 4 to Section 7.

Table 7-3: This table will need to be modified based on the incorporation of the attached comments.

In addition, a new column needs to be added to the "Surface Soil Analyses" portion for radionuclide analysis. IHSSs 170, 174, 175, 176, 177, 206, 213, and 214 should indicate that such an analysis will be completed.

It is unclear whether or not this table was meant to suffice for Attachments G and H to our comments to the draft version of this workplan. If so, it is not adequate. Please develop an equivalent to these attachments so as to clarify the analytical work for each sample type in each IHSS. Preparation of this type of table is in DOE's best interest because a specific analytical program will cost less than a broad program that the regulatory agencies will enforce as such. Attachments G and H are again included in these comments for your information.

Section 7.3.1: This section can be removed from this workplan.

Section 7.3.2: The second paragraph of this section states that trenches will be used to verify soil gas anomalies. Why? This is a departure from all of the other IHSSs where soil gas will be used in that soil cores are proposed to verify soil gas results. Please explain why soil cores are not proposed here and why less expensive options like hand-held auger sampling are not being considered.

This paragraph also neglects to mention that, besides inspecting and pressurizing the tanks and pipelines, samples of any remaining tank inventory, sludge, or residue must be taken.

Also, the text indicates that three lines of soil gas sampling are planned which does not agree with Figure 7.3-2. Please correct the text.

Please add text clarifying how, and for what, the soil gas samples will be analyzed. This should also be included on the equivalent to Attachment G that will be included in the Workplan.

In addition, this section needs to more fully describe how the tank will be inspected (visually?? internal and external??) and how the ancillary equipment will be inspected (visually??). In addition, either standard operating procedures need to be developed before implementation of the investigation or SOPAs need to be developed in the workplan.

The Division will be unable to approve this workplan until discussions have occurred between DOE and the regulatory agencies regarding investigation of the entire tank farm (four tanks) associated with this IHSS.

Figure 7.3-2: The Division asks that, regardless of the outcome of the discussions mentioned in the previous comment, the soil gas survey and the surficial soil sampling program be expanded. Please refer to the attached version of Figure 7.3-2 with the Division's recommendations for program expansion (13 additional soil gas locations, 1 additional soil sample).

Section 7.3.3: The first sentence in the first partial paragraph on page 7-28 should be modified to read "Soil samples from 5-ft cores will be collected from random sites (1 per 15 soil gas samples) as well as anomalous soil gas areas and will be analyzed to further assess potential contamination at the site."

Section 7.3.4: This IHSS will undergo a soil gas survey, but the text does not include a discussion of soil cores used to confirm the soil gas. Please include appropriate text.

Section 7.3.5: This IHSS will undergo a soil gas survey, but the text does not include a discussion of soil cores used to confirm the soil gas. Please include appropriate text.

Section 7.3.6: This IHSS will undergo a soil gas survey, but the text does not include a discussion of soil cores used to confirm the soil gas. Please include appropriate text.

In addition, surficial soil samples need to be collected from any visually stained soil.

According to Figure 7.3-6, an evaluation of aerial photos revealed that a much larger area was used for storage than is included in the current IHSS boundaries. The Division believes that the proposed investigation should be expanded to include all areas used for storage.

The Division also asks that two additional soil gas sampling locations be added along the south side of Building 964 to complete the soil gas grid.

Section 7.3.9: Please explain why the surficial soil samples from beneath the pavement are being deferred to Stage II.

Section 7.3.10: This section needs to more fully describe how the tanks will be inspected (visually?? internal and external??) and how the ancillary equipment will be inspected (visually??). In addition, either standard operating procedures need to be developed before implementation of the investigation or SOPAs need to be developed in the workplan.

Section 7.3.11: The text of this section does not agree with Figure 7.3-11 with regard to soil gas sampling.

Section 7.3.12: Any samples taken in this IHSS should be analyzed for pH.

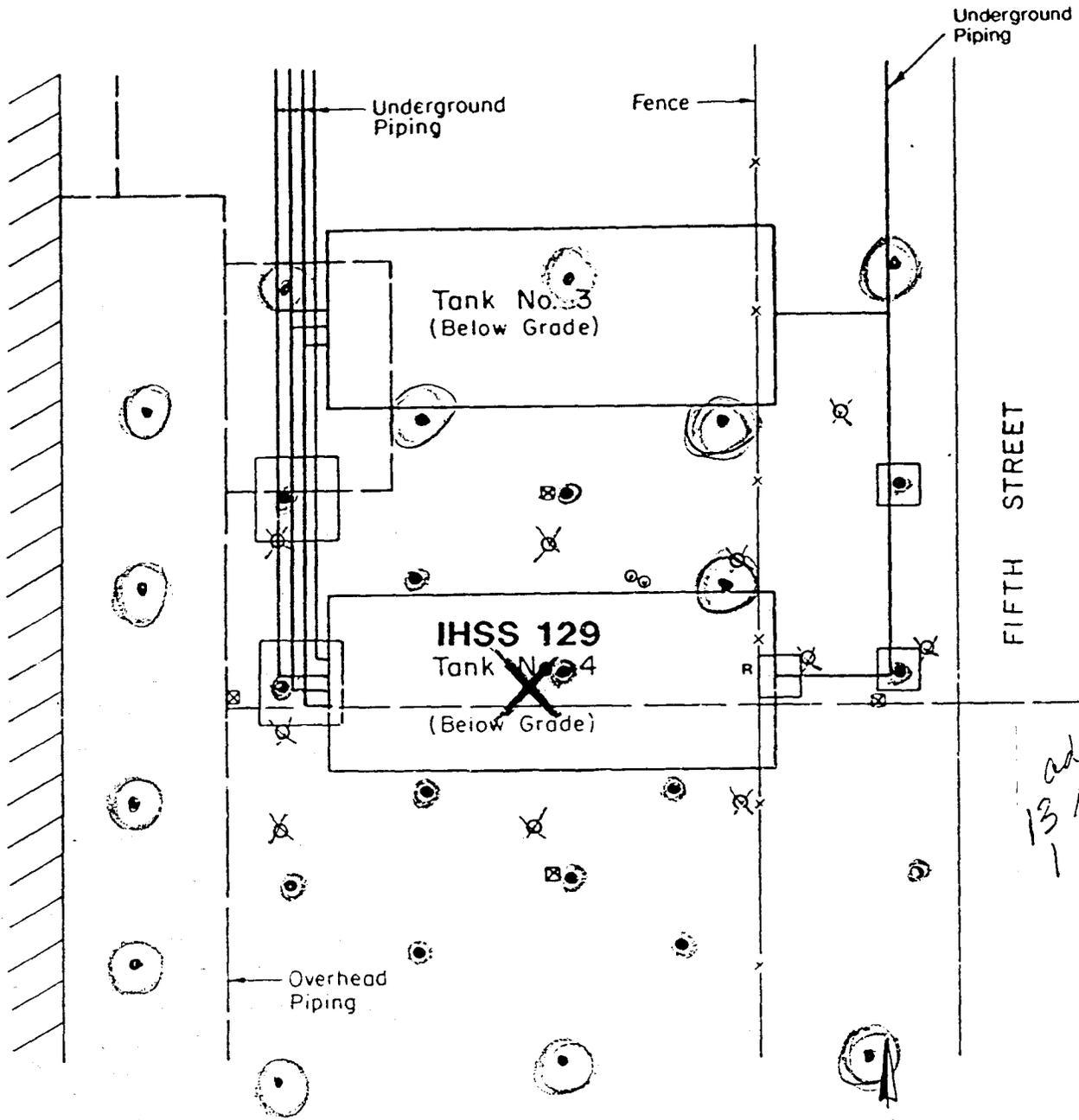
Section 7.3.15: Based on the possible contaminants in this IHSS, surficial soil samples need to be analyzed for BNAs, metals, and radionuclides.

Section 7.4.1: The text presented in this section is not consistent with OU 1 TM 5. TM 5 states that samples collected for radionuclide analysis will be collected both by the CDH method and the modified RFP method. In addition, in TM 5, these samples were not duplicated using a stainless steel scoop, trowel or spoon; nor were they "grab" samples as is indicated in the text. Regarding non-rad samples, the samples are taken using the RFP sampling jig (10x10x5 cm) and composited, not taken from a 6-inch depth as indicated in the text of the Workplan. As is indicated in the general comments to Section 7, the Division will be unable to approve this workplan until either a new SOP GT.8 or an SOPA is developed to clarify these procedures.

Section 7.4.2: Please refer to the general comments to Section 7 that are applicable to this section.

Section 7.4.3: This section needs to be expanded or a separate section developed that describes the procedures for collecting and sampling a soil core to confirm soil gas results. Additionally, an explanation of how the results of the soil core will be compared to the soil gas and the results interpreted need to be included.

Building 443



FIFTH STREET

**Legend**

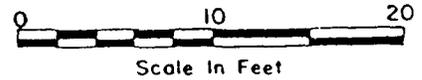
- ☒ Previous Soil Sample Location
- ⊙ Proposed Soil Gas Sample Locations (20 ft. Grid)
- R Tank Residue Sample
- Inspection Pit Location
- ⊗ Proposed Surficial Soil Sample Location

Note: Tank locations are from the closure report, and have not been verified by facility drawings.

Excavations for inspection will occur at pipe elbows, fittings and valves.

**X** add soil sample  
**⊙** add soil gas sample

*add -  
13 soil gas  
1 soil sm*



U.S. DEPARTMENT of ENERGY  
Rocky Flats Plant, Golden, Colorado

FIGURE 7.3-2  
Proposed Sampling Locations for  
Oil Leak (IHSS 129)

Table 7-1

Phase I Investigation  
Operable Unit 10

Page 1	Activity	Purpose	Location	Sample Number
	Stage 1			
	1. Radiation Survey	Identify areas of anomalous gamma ray radiation readings	Entire IHSS area	IHSS dependent
	2. Soil Gas Survey	Locate plumes of VOCs	Entire IHSS area - grid spacing IHSS dependent	IHSS dependent
	3. Soil Cores	To confirm soil gas results	1 random sample/15 soil gas samples and at soil gas anomalies. Taken at depth of soil gas probe.	To be determined by soil gas program
	4. Surficial Soil Samples	Begin characterization of surface contamination	On grid thruout IHSS	IHSS dependent
	5. Inspect Tanks and Ancillary Equipment	Establish tank and ancillary equipment integrity	Tanks and ancillary equipment	IHSS dependent
	6. Sample Tank Residue	Determine what remains in tanks	IHSS dependent	IHSS dependent
	TECHNICAL MEMORANDUM 1			
	Stage 2			
	7. Surficial Soil Samples	Further characterize surface contamination	IHSS dependent	Determined by statistical analysis
	8. Soil Borings	a) Characterize subsurface vadose zone conditions and contamination b) Transect and sample plumes identified by soil gas	2 borings/hot - spot and borings in surface staining  3 borings transecting each plume 1 boring at highest VOA reading and 2 add'l borings continuing down gradient from the first	To be determined  To be determined
	TECHNICAL MEMORANDUM 2			

Table 7-1

Phase I Investigation  
Operable Unit 10

Page 2	Activity	Purpose	Location	Sample Number
Stage 3 9. Soil Borings		Continue assessment of the presence/absence and nature/extent of subsurface contamination	Based on Stage 2 borings	To be determined
TECHNICAL MEMORANDUM 3				
Stage 4 10. Soil Borings		Complete assessment of contaminants in the subsurface	Based on Stage 3 borings	To be determined
11. Sediment and Surface Water Samples		Phase I and Phase II data	IHSS area -- as appropriate	To be determined
12. Install piezometers, BAT samplers or equivalent, and tensionmeter nests		Begin to establish groundwater parameters	IHSS dependent	To be determined
TECHNICAL MEMORANDUM 4				

Phase I Analytical Program  
OU 10

FIGURE G

IHSS	Sample Type	Media	Total		Be	H3	Nitrate	Gross		U	U	U	Pu	Am	Cs	Sr	
			U	Cr				233/234	235								238
124	Surficial Soil Samples (grid)	Soil	X		X		X	X	X	X	X	X	X				
	Surficial Soil Samples (rad hotspots)	Soil	X				X	X	X	X	X	X	X				
	Surficial Soil Samples (other hotspots)	Soil															
	Soil Cores (con firm soil gas)	Soil															
	Soil Borings (soil gas plumes)	Soil			X		X	X	X	X	X	X	X				
	Soil Borings (rad hotspots)	Soil	X		X		X	X	X	X	X	X	X				
	Soil Borings (tank sides)	Soil			X		X	X	X	X	X	X	X				
	Sediment	Sediment			X		X	X	X	X	X	X	X				
	Surface Water	Water		X	X		X	X	X	X	X	X	X				
	Ground Water	Water		X	X		X	X	X	X	X	X	X				
	Tank Residue	Sludge		X	X		X	X	X	X	X	X	X				
	129	Surficial Soil Samples (grid)	Soil														
Surficial Soil Samples (other hotspots)		Soil															
Soil Cores (con firm soil gas)		Soil															
Soil Borings (soil gas plumes)		Soil															
Soil Borings (tank sides)		Soil															
Ground Water		Water															
Tank Residue		Sludge															
170		Surficial Soil Samples (grid)	Soil	X		X		X	X	X	X	X	X	X			
		Surficial Soil Samples (rad hotspots)	Soil	X				X	X	X	X	X	X	X			
		Surficial Soil Samples (other hotspots)	Soil														
		Soil Cores (con firm soil gas)	Soil														
		Soil Borings (soil gas plumes)	Soil			X		X	X	X	X	X	X	X			
	Soil Borings (rad hotspots)	Soil			X		X	X	X	X	X	X	X				
	Sediment	Sediment	X		X		X	X	X	X	X	X	X				
	Surface Water	Water	X		X		X	X	X	X	X	X	X				
	Ground Water	Water	X		X		X	X	X	X	X	X	X				
	174	Surficial Soil Samples (grid)	Soil	X		X		X	X	X	X	X	X	X			
		Surficial Soil Samples (rad hotspots)	Soil	X				X	X	X	X	X	X	X			
		Surficial Soil Samples (other hotspots)	Soil														
Soil Cores (con firm soil gas)		Soil															
Soil Borings (soil gas plumes)		Soil			X		X	X	X	X	X	X	X				
Soil Borings (rad hotspots)		Soil			X		X	X	X	X	X	X	X				
Ground Water		Water	X		X		X	X	X	X	X	X	X				
175		Surficial Soil Samples (grid)	Soil	X		X		X	X	X	X	X	X	X			
		Surficial Soil Samples (rad hotspots)	Soil	X				X	X	X	X	X	X	X			
		Surficial Soil Samples (other hotspots)	Soil														
		Soil Cores (con firm soil gas)	Soil														
		Soil Borings (soil gas plumes)	Soil			X		X	X	X	X	X	X	X			
	Soil Borings (rad hotspots)	Soil			X		X	X	X	X	X	X	X				
	Ground Water	Water	X		X		X	X	X	X	X	X	X				









FIGURE H  
(cont.)

IHSS	Sample Type	Med/In	TAL		TCL		TCL		TCL		Filtered		Total TAL				
			Metals	TOC	Volts	Semi V	Pen	U 239/240	Pu 237/240	Cs 137	Sr 89/90	Am 241	Pb	Cr	MeIabs	Be	TDs
207	Soil		X		X		X										
	Soil		X*	X**	X*		X*										
	Sediment		X	X	X		X										
	Surface Water		X	X	X		X										
	Ground Water		X	X	X		X										
208	Soil		X		X		X										
	Soil		X*	X**	X*		X*										
	Soil		X	X	X		X										
	Sediment		X	X	X		X										
	Surface Water		X	X	X		X										
210	Soil		X		X		X										
	Soil		X*	X**	X*		X*										
	Soil		X	X	X		X										
	Sediment		X	X	X		X										
	Ground Water		X	X	X		X										
213	Soil		X		X		X										
	Soil		X*	X**	X*		X*										
	Soil		X	X	X		X										
	Sediment		X	X	X		X										
	Surface Water		X	X	X		X										
	Ground Water		X	X	X		X										
	Asphalt or Paving		X	X	X		X										
214	Soil		X		X		X										
	Soil		X*	X**	X*		X*										
	Soil		X	X	X		X										
	Sediment		X	X	X		X										
	Surface Water		X	X	X		X										
	Ground Water		X	X	X		X										
	Asphalt or Paving		X	X	X		X										
BAT Samples	Water		X	X	X		X										
	Water		X	X	X		X										

X\* - Sample taken from a 6' composite  
X\*\* - Sample taken from a 2' composite