

Hswa LANL 5/1144/49/49-001(a-g)  
MDA-AB  
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State of New Mexico  
**ENVIRONMENT DEPARTMENT**  
**DOE OVERSIGHT BUREAU**  
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April 15, 1998

Mr. Mat Johansen, AIP POC  
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528 35th Street, MS A316  
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**RE: DRAFT BEST MANAGEMENT PRACTICES PLAN FOR POTENTIAL  
RELEASE SITES 49-001(b, c, d, and g)**

Dear Mr. Johansen:

Enclosed please find our review of the subject TA-49 document. A draft version of these comments was faxed to Michael Gilgosh and e-mailed to Dwain Farley on March 27, 1998. This critique is offered in the spirit of technical comment and does not represent the regulatory position of NMED.

If you have any questions regarding these comments, please do not hesitate to call Alice Mayer (672-0447) or Michael Dale (672-0449) of my staff.

Sincerely,

Steve Yanicak  
LANL POC

SY:am,md

Enclosure

- cc: Benito Garcia, NMED, Chief, HRMB
- Marcy Leavitt, NMED, Chief, GWQB
- Jim Davis, NMED, Chief, SWQB
- John Parker, NMED, Chief, DOE OB
- Allyn Pratt, LANL (ER, MS J521)
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**DOE OB COMMENTS ON  
DRAFT BEST MANAGEMENT PRACTICES PLAN FOR  
POTENTIAL RELEASE SITES 49-001(b, c, d, and g)**

1. **2.1 General Site Description, paragraph 1, sentence 4, page 1.**  
*"...1650 feet from a perennial stream in the bottom of Water Canyon."*

Water Canyon below TA-49 is documented as being an ephemeral reach.

2. **2.1 General Site Description, paragraph 3, sentence 4, page 1.**  
*"Some tests incorporated very small amounts of radioactive tracers, and many tests also used depleted uranium (uranium -238)."*

What type of tracers were used?

3. **2.2 Tests at Areas 2, 2A, and 2B, paragraph 2, sentence 2, page 3, and figure 2-3**  
*"The confinement provided by the tuff and sand backfill appears to have successfully contained the explosions and confined most materials to within a maximum radius of 10 to 15 feet from the point of detonation at the bottoms of the shafts."*

No data are presented to verify that materials (contamination as stated in figure 2-3) were indeed confined to 10 - 15 feet. Also, no data are provided as to the tensile strength of tuff in relation to the energy released from each of the individual tests. A concern (and possible scenario) which was not addressed in the report is the nature and extent of fracturing caused by detonations, and the pathway(s) for water and contaminant transport through the fracture system(s). It is possible that the observed water at CH-2 is not only from interflow, surface flow and perched zones, but also from water traveling through the fracture system (both natural and anthropogenic), and/or interconnected between the fracture system and the penetrations (shafts, boreholes, etc.). The proposed BMP appears to adequately address interflow and surface flow, but until the fracture-flow mechanism is evaluated, the movement of water cannot be solved.

4. **2.3 Moisture Conditions at Area 2, pages 4 and 5, General comment.**

Water-level fluctuations at CH-2 are theorized to be related to what processes? Are there enough data to correlate water level with precipitation, climate, etc.?

5. **2.3 Moisture Conditions at Area 2, paragraph 1, sentence 13, page 4.**  
*"Unfiltered samples of the water bailed from CH-2 in October 1977 and August 1978 contained 1.7 to 3.1 pCi/g of plutonium-239."*

Units should be pCi/L for a water sample.

6. **3.2.1, Surface Soils and Vegetation, paragraph 3, sentence 8, page 7.**

*“Elevated levels of other potential contaminants from Area 2 were also detected in the soil and vegetation samples; however, mean concentrations were typically much lower than the peak values, again indicating the highly localized nature of the constituent distributions.”*

Through time, these local “hotspots” may have migrated away from their source, and subsequently, lower-level “hotspots” or plumes may exist downstream, downwind, etc.

7. **3.2.1 Surface Soils and Vegetation, paragraph 4, sentence 6, page 7.**

*“Additional analysis indicated no volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyl (PCB), or toxicity characteristic leaching procedure (TCLP) metal levels above Environmental Protection Agency (EPA) guidelines (see OU 1144 R.I. Work Plan, page 7-37).”*

Were samples analyzed for HE and RCRA metals (not TCLP)? If so, what were the results?

8. **3.2.2 Subsurface Sampling, paragraph 2, sentence 4, page 7.**

*“The locations of these boreholes are shown in Figure 2-8.”*

Figure 2-8 is missing.

9. **3.2.2 Subsurface Sampling, paragraph 4, sentences 1 and 2, page 8.**

*“In addition to the aforementioned boreholes, a 700-foot deep corehole (49-2901) was drilled approximately 100 feet east of Area 2B in late 1993 as part of the Phase 1 R.I. The location of this hole is shown in Figure 3-2.”*

Borehole 49-2901 is not shown in Figure 3-2.

10. **3.2.3 Moisture Conditions and Water Sampling, paragraph 1, sentence 9, page 8.**

*“It is interesting to note the small spike in the data where the moisture beneath the pad increases from about 5% to over 10% in the depth interval of 50 to 60 feet.”*

Are there any known surge deposits and/or geologic contacts at the 50' to 60' interval?

11. **3.2.3 Moisture Conditions and Water Sampling, paragraph 2, sentence 1, page 8.**

*“The dramatic difference in moisture content between the soils and tuff beneath the asphalt pad and those that are not beneath the pad is primarily caused by the lack of evapotranspiration beneath the pad.”*

What proof is there that the difference is caused solely by the lack of evapotranspiration beneath the pad? Is it possible that the shafts are being periodically saturated through fractures which would cause excess moisture beneath the asphalt pad?

12. **3.2.3 Moisture Conditions and Water Sampling, paragraph 3, sentence 5, page 9.**  
*"The subsurface interflow can directly enter and percolate down the sand-filled shafts and surface runoff can pond in the low spots, seep into the ground, and enter the shafts along with the interflow."*

All penetrations which cross the soil/tuff interface should be grouted so that direct communication down the annuli does not occur.

13. **3.2.3 Moisture Conditions and Water Sampling, paragraph 5, sentences 4 and 6, page 9.**  
*"Unfiltered samples of water bailed from CH-2 in October 1977 and August 1978 contained 1.7 to 3.1 pCi/g of plutonium-239." "Subsequent water samples taken in 1979 and 1980 were found to contain from 0.1 to 5.5 pCi/L of plutonium."*

Is there an explanation for the variance in the levels detected? Also, if it was a water sample, the units in sentence 4 should be pCi/L and sentence 6 should specify which isotope of plutonium is being discussed.

14. **3.3 Constituents of Potential Concern, paragraph 1, sentence 3, page 9.**  
*"The HE used in the tests is thought to have been consumed with high efficiency in the detonations and any residuals are negligible in quantity and potential hazard compared with the radionuclide and metal contamination known to be present (see OU 1144 Work Plan, page 7-18)."*

What type of HE compounds were used in the tests (RDX, HMX, TNT, etc)? Is tritium a contaminant of concern?

15. **Table 3.1, page 10.**  
*"Dissolved solids 22 g/l"*

The unit in common usage is mg/L. A dissolved solids content of 22,000 mg/L is high for a specific conductance value of 147  $\mu$ mhos/cm, which would normally correlate to about 115 ppm TDS.

*"pH 9.5"*

NMED sampled CH-2 on 3/10/97 and found the pH to be 8.28.

*"RCRA-regulated metals were not detected above action levels (TCLP procedure)."*

Is the TCLP used for waste characterization or site characterization? Are the action levels related to results obtained from a TCLP analysis or RCRA guidance?

*"Plutonium-239/240 (filtered) 1.1 ( $\pm$ 0.2) g/l"*

Is this residual material on the filter?

**16. 4 Justification for Implementing Best Management Practices, pages 11 -12.**

The first paragraph is misleading. Although LANL and USGS personnel found Frijoles Mesa competent prior to any detonation, this does not mean that it remained so after all testing was concluded. The potential for contaminant transport via unsaturated or saturated flow would no longer be negligible with the introduction of extensive fracturing. Paragraph 3 discusses the hydraulic conductivity of saturated Bandelier Tuff; this would be a good place to also discuss fracture flow. Paragraph 4 discusses moisture movement through moderately welded Bandelier Tuff; is this the case beneath TA-49 or has the tuff been altered by subsurface detonations? It is agreed, as stated in paragraph 6, that “*curent [misspelled] moisture conditions represent an obvious threat to contaminant isolation*”, however it is not agreed that the “*obvious actions*” this document proposes will completely correct the situation.

**17. 4. Justification for Implementing Best Management Practices.**

NMED DOE OB’s field observations at the asphalt pad and surrounding area for the past several years have shown that direct snowmelt infiltration at the MDA may be the greatest contributor (volumetrically) to interflow at the site.

**18. 5.1.1.2 ESH-ID Review, paragraph 4, sentence 2, page 15.**

*“However, as a best management practice, an air quality monitor will be installed during construction at a location northwest of the site.”*

Is northwest the predominant wind direction? It is suggested that at least one air station be placed in the predominant wind direction.

**19. 5.1.1.2 ESH-ID Review, paragraph 7, sentence 2, pages 15 and 16.**

*“Although the activities at TA-49 Areas 2, 2A, and 2B are being performed as a best management practice to improve moisture conditions at the site and therefore do not require regulatory approval, presentations describing the planned activities are being made to the New Mexico Environment Department (NMED).”*

This may not be a true statement. There are issues that the Surface Water Quality Bureau (and possibly other bureaus) may want to address such as excess runoff and erosion downstream, as well as use, alteration and/or movement of contaminated fill, etc. In addition, due to the areal disturbance (structures, excavations, etc.), the NEPA process may be necessary. All regulatory issues should be fully examined before construction begins.

**20. 5.1.3 Trench Axis Borings, last sentence, page 17.**

*“The approximate locations of the borings are shown of Figure 5-1.”*

Figure 5-1 depicts the locations of site runoff and runoff controls, however, it does not show locations of borings.

21. **5.1.6 Borehole Plugging and Abandonment, paragraph 2, sentence 2, page 18.**  
*“Existing holes that are presently planned to be retained include the 123-foot deep test holes TH-1 through TH-5, the 150-foot deep R.I. sampling hole 49-2907, and the 500-foot deep core hole CH-2.”*

Are these holes grouted across the soil/tuff interface?

22. **5.2.2 Interceptor Trench, paragraph 2, sentence 6, page 20.**  
*“The soil that was originally excavated from the trench will be used in recontouring the surface of the test area to eliminate ponding.”*

Will these soils be characterized for hazardous and radioactive materials?

23. **5.2.3 Interceptor Berm, page 21.**

NMED DOE OB would like to stress that additional runoff will be added to the system, and monitoring should focus on the potential for erosion and contaminant transport.

24. **5.2.3 Interceptor Berm, paragraph 2, sentence 4, page 21.**  
*“Periodic removal of accumulated sediments will be required from the surface ditches.”*

These sediments may need to be characterized for hazardous and radioactive materials prior to removal.

25. **5.2.4 Runon and Runoff Monitoring, paragraph 1, sentence 7, page 21.**  
*“If the runon or runoff water is found to contain contamination exceeding action levels described in the monitoring plan, it will be collected for disposal at the TA-50 liquid waste facility.”*

Contaminants in these waters should not exceed WQCC standards.

26. **5.3 Asphalt Pad Removal and Fill Excavation, page 22, General comment.**

Make sure that all materials (soil/asphalt) have been characterized per RCRA guidance prior to removal and transport.

27. **5.3 Asphalt Pad Removal and Fill Excavation, paragraph 4, sentence 3, page 22.**  
*“Asphalt found to be radioactively contaminated will be sent to TA-54, Area G for disposal.”*

Is radionuclide-contaminated asphalt considered mixed waste? If yes, it should not be disposed of at Area G.

28. **5.3 Asphalt Pad Removal and Fill Excavation, paragraph 5, sentences 2 and 3, page 23.**

*“Although these materials will be isolated in drums or other suitable containers during construction, they are expected to be returned to the site during regrading and added to the on-site and off-site fill materials. Minor amounts of other radiologically contaminated inorganic materials from the site, such as metal fencing or concrete on fence posts, may also be added to the on-site and off-site materials.”*

Only clean fill should be used. Will the use of contaminated fill be construed as the creation of a new PRS by NMED?

29. **5.4 Downgradient Surface Contaminants, page 23.**

Baseline storm-water data should be collected at the mouths of each tributary affected.

30. **5.4 Downgradient Surface Contaminants, paragraph 1, sentence 1, page 23.**

*“Surface soils in the vicinity of Areas 2, 2A, and 2B will be screened for radiological contamination in a FIDLER survey as one of the R.I. sampling activities described .....”*

What activity concentrations (pCi/g) does the FIDLER correlate to? CPM to pCi/g?

31. **5.4 Downgradient Surface Contaminants, paragraph 2, sentence 5, page 23.**

*“If contamination is found, a specific NPDES discharge permit is expected to be required.”*

An NPDES permit for these point sources may be required prior to work.

32. **5.4 Downgradient Surface Contaminants, paragraph 3, sentence 5, page 24.**

*“Soils with low level contamination will be added to the fill materials and used in regrading Area 2, 2A, and 2B.”*

Please define low level. What about RCRA constituents?

33. **5.7 Site Restoration, Cleanup, Monitoring and Maintenance, paragraph 2, sentence 3, page 23.**

*“If the runoff water is found to contain contamination exceeding action levels described in recontouring plan, it will be collected for disposal at the TA-50 liquid waste facility.”*

What if the water does not conform to TA-50 acceptance guidelines?

34. **5.7 Impacts and Proposed Activities and Mitigating Measures, first bullet, page 25.**  
*“Upgradient runoff and site runoff would be concentrated at local discharge points and may contain elevated levels of constituents.”*

Concentrating runoff and runoff at specific points may increase erosion (e.g., high erosion due to the excavation activities at MDA-M).