

MEMORANDUM

TO: Benito Garcia, HRMB Bureau Chief

THROUGH: Bob Sweeney, RCRA Technical Compliance Program

FROM: Phil Harrigan, RCRA Technical Compliance Program *PH*

DATE: June 20, 1996

SUBJECT: SNL, OU 1334, RFI Work Plan

The following represent AIP comments regarding Sandia National Laboratories' (SNL) draft RCRA Facility Investigation (RFI) Work Plan for Operable Unit (OU) 1334, Central Coyote Test Area, dated October 1994. These comments are provided for the purpose of communicating the results of our technical review. They are not provided for the purpose of representing the regulatory position of the New Mexico Environment Department.

The work plan addresses investigations to be conducted at seven Environmental Restoration (ER) Sites: 9, 11, 57A, 57B, 61A, 61C, and 68.

General Comments

1. Page 4-7, Section 4.1.3.4: SNL states "limited confirmatory sampling may be initiated to demonstrate that a SWMU is eligible for an administrative NFA."

If evidence for a site is insufficient to support an administrative NFA proposal, a site investigation (and release assessment) is generally required. If the investigation indicates that concentrations of hazardous constituents are at acceptably low levels as determined by regulators, then the site may be proposed for NFA. Site investigation and release assessment sampling may, however, indicate the need for further investigation within an RFI. Therefore, investigators should not assume *a priori* that limited sampling will demonstrate that a SWMU is eligible for NFA.

2. Several maps in the work plan are not to scale or are drawn at only approximate scale. Correctly scaled maps should be provided in the work plan.

3. Local background sample fractions should be collected for each site and analyzed in the laboratory for gross α , gross β , and gamma spectrum, regardless of field screening.

4. For all seven sites, the individual contingency sampling plans may not be adequate.



5. Page 5-5, Section 5.1.3: SNL states **"Because of the limited precipitation, low permeability surface soil, limited mobility of the potential contaminants, and low infiltration rates (SNL/NM February 1994), groundwater is not considered a primary pathway and will not be investigated unless a hazardous source is identified."**

The ER sites are located adjacent to the Mazanita Mountains. Surface soils at the site are generally coarse-grained, and therefore, may exhibit relatively high permeabilities and infiltration rates. In addition, some potential contaminants at this site, such as VOCs, can exhibit considerable mobility.

For a given ER site, decisions regarding the investigation of ground water will depend on historical site information and the results of investigations and/or sampling.

Specific Technical Comments

ER Site 9, Burial Site/Open Dump

1. Page 5-7, Section 5.1.4: SNL states **"Level III analyses will be performed on all samples to support a baseline risk assessment if initial sampling shows COC concentrations above action levels or background concentrations."**

Detections of any contaminants above background generally warrant further field investigation (including sampling) until the severity of the problem is demonstrated to the satisfaction of the regulatory agencies. The use of action levels to support an NFA determination is not appropriate, unless a site has been fully characterized.

2. Page 5-7, Section 5.1.4: SNL states **"If a hazardous source is identified, additional data may be required to characterize the underlying soil media...."**

The waste piles can be sampled for TCLP metals and organics for the purpose of waste characterization. However, samples of soil beneath the waste piles must be analyzed for total metals and organics to investigate potential releases of hazardous wastes or hazardous waste constituents to the underlying media.

3. Page 5-9, Section 5.1.6.3: SNL states **"The background concentrations and activities will be compared to metal and radionuclide concentrations in soil and sediment at ER Site 9 to**

assess if a release has occurred to the environment."

Only 12 local background samples, to be collected at six locations, are proposed. Characterization data should be compared to approved sitewide background concentrations to determine whether contamination is present.

4. Page 5-12, Section 5.1.6.3, Debris Mounds 2 and 3: SNL states **"The debris exposed in mounds 2 and 3 appears to be principally nonhazardous solid wastes and will not be sampled."**

NMED cautions that generators are responsible for determining if their wastes are hazardous (40CFR 262.11).

5. SNL should provide information on the origin of the **"shallow crater-like feature"** northeast of Debris Mound 1. Sample results, if any, should also be provided.

6. According to Figure 5-5, Debris Mounds 2 and 3 extend to distances of 100 ft or more. One sample to be collected beneath each mound is not enough to investigate a potential release to the environment. Additional samples should be collected beneath each mound, spaced no more than 25 ft apart.

Wastes within the area defined as Debris Mound 3 appear to actually occur as discrete piles. Although a maximum spacing of 25 ft was recommended above, site conditions should influence the selection of judgmental sampling locations for this specific debris mound.

Site history is not well known; therefore, samples collected beneath the mounds should also be analyzed for volatile organics (VOCs), gross α , gross β , and gamma spectrum. During a visit to the site, it was noted that numerous rusty containers and aerosol cans, a 55-gal empty drum which originally contained methyl alcohol, and pieces of fiberboard (asbestos?) are present at Debris Mound 2. Data derived from field screening techniques (such as for VOCs), by themselves, are not acceptable for site characterization purposes.

The sample located furthest downstream in the arroyo (Figure 5-5, locations denoted by triangles) should be moved close to Debris Mound 2 (just downstream of it), or alternatively, another sample collected.

7. Page 5-12, Debris Mound 1: SNL states **"Characterization of Debris Mound 1 includes debris sampling to determine if the mound**

contains regulated hazardous waste and soil sampling beneath the mound to determine the extent of waste migration if a hazardous source is identified."

It is unclear if soil beneath Debris Mound 1 will actually be sampled. Sampling must be conducted beneath Debris Mound 1, even if TCLP tests demonstrate that the "**average**" mound debris is not a hazardous waste for the purpose of its removal and disposal.

According to Figure 5-5, Debris Mound 1 extends to a maximum distance of about 200 ft. The nine samples to be collected from the bottom of the three trenches are not enough to investigate a potential release to the environment. Additional samples should be collected beneath Debris Mound 1, spaced no more than 25 ft apart.

Each sample collected beneath the mound should also be analyzed for VOCs, gross α , gross β , and gamma spectrum. Field screening data, by themselves, are not acceptable for site characterization purposes, but can be useful for selecting specific sample locations.

8. Page 5-12, Debris Mound 1, Debris Sampling: It is unclear if "**three grab samples collected from the entire vertical profile at each trench location**" refer to the collection of composite samples. SNL should provide clarification.

9. Page 5-14, Table 5-2: The arroyo channel sediments should also be sampled for VOCs, gross α , gross β , and gamma spectrum.

10. Page 5-5, Section 5.1.3: SNL states "**The depth to groundwater at the site is approximately 138 ft bgl, according to a December 1991 measurement at the Schoolhouse well located approximately 1 mi west of ER Site 9 (IT May 1994a).**"

For this geologic environment, the Schoolhouse well is located too far away for the purpose of estimating depth to ground water at ER Site 9. In addition, given that bedrock crops out within a few hundred feet east of the site, ground water at Site 9 may occur at depths much shallower than 138 ft.

ER Site 11, Explosive Burial Mounds

1. Page 5-22, Section 5.2.4: SNL states "**Level III analyses will be performed on all samples to support a baseline risk assessment if initial sampling shows COC concentrations above action levels**

or background concentrations."

See comment #1, ER Site 9.

2. Page 5-24, Section 5.2.6.3: SNL states "The background concentrations and activities will be compared to metal and radionuclide COCs in soil within and adjacent to the fenced areas

at ER Site 11 to determine if COCs have been released to the environment."

Only 10 local background samples, to be collected at five locations, are proposed. See comment #3, ER Site 9.

3. Page 5-24, Section 5.2.6.3: SNL states "**Surface and near-surface soil samples will be collected to determine if the surface depressions may have released potential COCs to the environment by any potential burn tests.**"

Site history is not well known. Therefore, samples collected in the bottoms of the depressions should also be analyzed for VOCs, gross α , gross β , and gamma spectrum. Data derived from field screening techniques, by themselves, are not acceptable for site characterization purposes.

4. Page 5-27, Section 5.2.6.3: In reference to Former Debris Mounds, SNL states "**Two judgmental soil sample locations will be selected equidistant along the longest axis...**"

According to Figure 5-6, Debris mounds 2, 3, 4, 1, and 5 extend to distances of about 50, 60, 75, 100, and 100 ft; respectively. Two samples to be collected from the bottom of each mound are not enough to investigate a potential release to the environment. Additional samples should be collected beneath each debris mound, spaced no more than 25 ft apart. Because the widths of Debris Mounds 2 and 5 are large, additional samples should be collected on both sides of centerline.

Samples collected beneath the mounds should also be analyzed for VOCs, gross α , gross β , and gamma spectrum.

5. No sampling was specifically mentioned to verify cleanup of the radiological point source near Debris Mound 1.

ER Site 57A - Workman Site: Firing Area

1. Page 5-37, Section 5.3.1: SNL states "**The underground bunker contained two 5-gal and one 20-gal containers of liquid waste ...**"

SNL should provide information regarding the type(s) of liquid wastes and whether it was hazardous?

2. Page 5-37, Section 5.3.2: In reference to radiological area sources, SNL states "**These anomalies appear to result from the**

presence of manmade materials, rather than from tests conducted with radioactive materials."

From a health-based perspective, NMED does not distinguish a difference between radiological contamination left from tests, or the abandonment of (manmade) radioactive materials.

3. Page 5-40, Section 5.3.5.1: No sampling plan is presented for the purpose of verifying cleanup of the radiological contamination.

4. Page 5-43, Section 5.3.6.3: SNL states "**The background concentrations and activities will be compared to metal and radionuclide COCs in soil surrounding features at ER Site 57A to assess if a release has occurred to the environment.**"

Only 10 local background samples, to be collected at five locations, are proposed. See comment #3, ER Site 9.

5. Page 5-46, Section 5.3.6.3, Utility Poles: No sampling is planned along and beneath the high pressure pipes.

6. Page 5-46, Section 5.3.6.3, Gun Mounts: The gun mounts should be centered in the grid, and at least one sample collected on each side of the gun mounts.

7. Page 5-46, Section 5.3.6.3, Underground Bunker: SNL states "**If a drainline is connected to the drain, contingency sampling may be required.**"

If a drainline is connected to the drain, NMED recommends contingency sampling to verify the extent of contamination.

8. Page 5-46, Section 5.3.6.3, Debris Sampling: No sampling plan is proposed to investigate the scattered debris shown in Figure 5-19. Also, the scattered debris should be described.

9. Page 5-50, Table 5-6: Sample fractions should also be collected and analyzed for gross α , gross β , and gamma spectrum at the wind tunnel and other concrete pads; utility poles, underground bunker, Debris Mound 1, Debris Mound 2, and Debris Mound 3.

VOC samples should also be collected beneath Debris Mounds 1, 2, and 3; and beneath the machine shop area at the wind tunnel pad.

10. Although a significant concern, no sampling is specifically

planned for the machine shop area.

A pipe, sticking out of the ground, is located on the east side of the wind tunnel/machine shop pad. Information should be provided regarding the purpose of this pipe.

11. Signs posted around Building 9900 read "**Flammable Liquid**" and "**Danger No Smoking**". Designate the type of flammable liquid.

12. Soils in the open center part of Pad 4 need to be sampled.

13. Information should be provided regarding what, if anything, is under the steel plate north of Pad 2 (could this be another underground bunker?).

ER Site 57B - Workman Site: Target Area

1. Page 5-58, Section 5.4.4: SNL states "**Level III analyses will be performed on all samples to support a baseline risk assessment, if initial sampling shows COC concentrations above an action level or background concentrations.**"

See comment #1, ER Site 9.

2. Page 5-52, Section 5.4.2: Section 5.4.2 says that all field radiological measurements were "**approximately at the background activity level (Appendix F).**"

The location of the radiological point source should be specified. No sampling plan is presented for the purpose of verifying cleanup of the radiological point source. The values of the field radioactivity measurements and the background activity level should be provided.

Also, see comment #3, Site 9, regarding background activity levels.

3. Page 5-60, Section 5.4.6.3: SNL states "**The background concentrations will be compared to COCs in soil present at ER Site 57B to assess if a release has occurred to the environment.**"

Only 10 local background samples, to be collected at five locations, are proposed. See comment #3, ER Site 9.

4. Page 5-65, Table 5-8: Sample fractions should also be collected and analyzed for gross α , gross β , and gamma spectrum beneath the pits and the area between the tower bases.

VOC and SVOC samples should also be collected beneath the pits.

5. At least two samples should be collected from the bottom of each pit at depths of 0-6 inches, 18-24, and 114-120 inches. Composite samples should not be collected for any sample fraction.

6. No sampling of the debris mound and beneath the debris mound is mentioned. If these wastes are removed, and are shown in the process as being strictly nonhazardous construction demolition debris, then sampling will probably not be necessary (for this specific case).

7. Information regarding the purpose of the small concrete pad (dated 4-1-44) that is located south of the south tower base should be provided.

8. Information regarding the purpose of the small concrete pad that is located northwest of the northern extent of the debris pile (near the power pole) should be provided.

ER Site 61A - Schoolhouse Mesa Test Site: Blast Area

1. Page 5-72, Section 5.5.4: **SNL states "Level III analyses will be performed on all samples to support a baseline risk assessment if initial sampling shows COC concentrations above an action level or background concentrations."**

See comment #1, ER Site 9.

2. Page 5-72, Section 5.5.5: **SNL states "Radiological point source and area source anomalies are distributed over the ER 61A site (Figure 5-28)."**

No sampling plan is presented for the purpose of verifying cleanup of the radiological sources. Point sources are not shown on Figure 5-28.

3. Page 5-74, Section 5.5.6.3: **SNL states "The background concentrations and activities will be compared to metal and radionuclide concentrations in soil and sediment at ER Site 61A to determine if a release has occurred to the environment."**

Only 12 local background samples, to be collected at six locations, are proposed. See comment #3, ER Site 9.

9. Dark gray pieces of plastic (?) debris, metal shrapnel, and orange resinous materials are scattered over the entire area. SNL should provide descriptions of these materials (are these materials hazardous and/or radioactive?).

ER Site 61C - Schoolhouse Mesa Test Site: Schoolhouse Building

1. Page 5-83, Figure 5-34: SNL should clarify whether the CEARP soil data was acquired from sampling conducted in 1988 or 1989.

2. Page 5-85, Section 5.6.2: SNL states "**Five composite samples were analyzed for HE compounds, VOCs, metals, and radionuclides.**"

Composite samples are not generally accepted for the purpose of site characterization.

3. Page 5-85, Section 5.6.2: SNL states "**Gamma spectrometry screens of soil samples were (sic) indicated normal background activities for potassium-40,...**"

See comment #3, ER Site 9, in regard to background activities.

4. Page 5-85, Section 5.6.2: SNL states "**Aluminum, barium, ...silver and radium concentrations were less than the method detection limit.**"

The preceding sentence lists detections for each of these metals. Also, the value for cadmium (107 $\mu\text{g/L}$) does not match that of Table 5-11, page 5-86, listed as 1.7 $\mu\text{g/L}$. Obviously, cadmium concentrations of 107 $\mu\text{g/L}$ in ground water would be a concern.

5. Page 5-85, Section 5.6.2: SNL should provide the exact location of the one "**1b**" of HE compounds.

6. Table 5-11, Page 5-86: The Schoolhouse well (so called "**East Well**") has been sampled numerous times by SNL's Sitewide Ground-Water Surveillance Group. All available ground-water data should be summarized in the RFI work plan.

The reported concentration for nitrate as nitrogen (5.2 mg/L, Table 5-11) is relatively high, and thus is a concern. Other sampling at the Schoolhouse well has produced similar results. The drainfield/leachfield associated with historical machine shop activities are also a concern. Monitor wells are recommended at the Schoolhouse site to investigate potential ground-water contamination.

Soil samples should be collected from boreholes drilled in the drainfield/leachfield area.

5. Page 5-85, Section 5.6.2: SNL states "**Calcium, iron, manganese, potassium, and sodium were determined to be within the range of background for groundwater in this region.**"

Background concentrations for these specific ground-water constituents were not determined in SNL's Phase II interim report *Background Concentrations of Constituents of Concern to the Sandia National Laboratories/New Mexico Environmental Restoration Project*. Additional information and references should be provided by SNL regarding how the above conclusion was reached.

NMED AIP staff have determined background concentrations for these constituents in the report *Background Ground-Water Quality of the Kirtland Air Force Base Area, Bernalillo County, New Mexico*. SNL staff may wish to consult this report.

Ground water occurs at a relatively shallow depth at this site. It is recommended that ground water be investigated at this site as part of the RFI.

6. Page 5-89, Section 5.6.4: SNL states "**Level III analyses will be performed on all samples to support a baseline risk assessment if initial sampling shows COC concentrations above an action level or background concentration.**"

See comment #1, ER Site 9.

7. Page 5-89, Section 5.6.5.1: SNL states "**Air sampling may also be conducted at the site to support a baseline risk assessment if COCs are detected above action levels or background concentrations.**"

Results of air sampling are not acceptable for the purpose of site characterization.

8. Page 5-93, Section 5.6.5.3: SNL states "**The background concentrations will be compared to metal and radionuclide COCs in soil surrounding features at ER Site 61C to assess if a release has occurred to the environment.**"

Only 12 local background samples, to be collected at six locations, are proposed. See comment #3, ER Site 9.

9. Page 5-93, Section 5.6.5.3, Sink Drain Line

The drainline/leachfield must be located before samples are collected. The proposed trenches may not be adequate. Trenching should be conducted until the drainline/leachfield are delineated. Samples should be collected in those areas most likely to have received wastes.

Field screening data, by themselves, are not acceptable for site characterization purposes.

10. Page 5-99, Table 5-13: In addition to those shown in Table 5-13, soil samples collected from the sink drainline, the Schoolhouse Building, the drainage to the arroyo channel, and the arroyo channel sediment should also be analyzed for VOCs, gross α , gross β , and gamma spectrum.

11. SNL should provide information on whether there was a septic system located at the Schoolhouse which could have caused elevated nitrate in ground water.

12. SNL should provide information on what was machined at the schoolhouse (were radiological materials machined or used at the schoolhouse?).

ER Site 68 - Old Burn Site

1. Page 5-104, Section 5.7.1: Information should be provided to define a SNAP reactor.

2. Page 5-106, Section 5.7.2: The CEARP data, representing sample composites, are not suitable for the purpose of site characterization. Detection limits are not given in Table 5-14. Field and laboratory quality control results are also not presented.

3. Page 5-106, Section 5.7.2: SNL states "**Acetone is a common laboratory contaminant, and the toluene values were less than 10 $\mu\text{g}/\text{kg}$, suggesting that these VOC detections may be false positives.**"

The toluene detections should be considered valid, unless verified otherwise.

4. Page 5-111, Section 5.7.4: SNL states "**Level III analyses will be performed on all samples to support a baseline risk assessment if initial sampling shows COC concentrations above an action level or background concentrations.**"

See comment #1, ER Site 9.

5. Page 5-111, Section 5.7.5: Radiological Anomalies
Information should be provided regarding where the 240 radiological point sources are located at ER Site 68. No sampling plan is presented for the purpose of verifying cleanup of the point sources.

6. Page 5-114, Section 5.7.6.3: SNL states "**The background concentrations and activities will be compared to metal and radionuclide COCs in soil and sediment surrounding and within features at ER Site 68 to assess if a release has occurred to the environment.**"

Only 16 local background samples, to be collected at eight locations, are proposed. See comment #3, ER Site 9.

7. Page 5-114, Section 5.7.6.3, Borrow Pits: Composite samples are not suitable for the purpose of site characterization.

8. Page 5-114, Section 5.7.6.3, Burn Pan: Composite samples are not suitable for the purpose of site characterization.

At least 4 discrete soil samples should be collected beneath the burn pan at two depths (0-6 inches and 18-24 inches). These samples should be collected, even if sediments in the burn pan are found to be nonhazardous for the purpose of their removal and disposal.

9. Page 5-116, Section 5.7.6.3, Debris Mounds: The proposal to collect only one sample beneath each debris mound may be inadequate, depending on the dimensions of each individual mound. Samples should be collected beneath each debris mound, spaced no more than 25 ft apart.

10. Page 5-116, Section 5.7.6.3, Drainage Ditch and Overflow Basin, and Plastic-Lined Pit: The proposed sampling for these three features is inadequate. The overflow basin and the plastic-lined pit should be investigated in a similar way to that done for the burn pan. At least 4 discrete soil samples should be collected beneath the overflow basin and the plastic-lined pit.

Additional samples should be collected along the bottom of the drainage ditch, spaced no further than 25 ft apart.

11. Page 5-116, Section 5.7.6.4: The contingency sampling plan may not be adequate. See also comment #1, ER Site 9.

12. Page 5-117, Table 5-16: The proposed sample fractions for some features are inadequate, and should also include the following:

Sample fractions should be collected and analyzed for gross α , gross β , and gamma spectrum beneath the borrow pits, burn pan, drainage ditch, overflow basin, plastic-lined pit, and at sampling locations proposed for arroyo channel sediment.

Sample fractions should be collected and analyzed for VOCs beneath the borrow pits, burn pan, drainage ditch, overflow basin, plastic-lined pit, and at sampling locations proposed for arroyo channel sediment. Field screening data, by themselves, are not acceptable for site characterization purposes.

Sample fractions should be collected beneath the burn pan and analyzed for total SVOCs (not TCLP SVOCs).

Sample fractions should be collected beneath the burn pan and analyzed for total metals (not TCLP metals).

13. There is a debris mound (12 ft by 3 ft) not shown on the Site 68 maps. The mound is located immediately east of the utility poles, and contains burned pieces of pipe(?).

14. There is a relatively large debris mound located about 1000 ft northeast of ER Site 68, across the arroyo. This debris mound, definitely a concern, is not shown on the maps of Site 68. If it is to be included as part of ER Site 68, information concerning this debris mound should be provided in the RFI work plan. Otherwise, this information should be provided to the regulatory agencies in a separate document.

15. Page 5-110, Section 5.7.3: SNL states "**The depth to groundwater at the site is approximately 199 ft bgl based on measurements at the KAFB 1902 well located approximately 0.5 mi north of ER Site 68 (IT May 1994a).**"

For this geologic environment, KAFB-1902 is located too far away for the purpose of estimating depth to ground water at ER Site 68. In addition, given that limestone bedrock crops out within a few hundred feet west of the Burn Pan, ground water at Site 68 could occur at depths much shallower than 199 ft.