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Los Alamos
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Official Correspondence Form

Name:	U1200320
Title:	NOTICE OF DISAPPROVAL - Phase II Investigation Work Plan S-Site Aggregate Area
Date Received:	2/15/2012
Addressee Name:	Michael J. Graham, ADEP
Originator:	John E. Kieling, NMED
Action Item Description:	Address Comments and Submit Revised Phase II IWP
Action Due Date:	3/15/2012
Responsible for Action:	Search Graham, Michael J
Responsible Office:	PADCAP
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EP2012-5034

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

February 14, 2012

George J. Rael, Assistant Manager
Environmental Projects Office
Department of Energy/National
Nuclear Security Administration
Los Alamos Site Office
3747 West Jemez Road, MS A316
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Michael J. Graham, Associate Director
Environmental Programs
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RE: NOTICE OF DISAPPROVAL
PHASE II INVESTIGATION WORK PLAN
S-SITE AGGREGATE AREA
LOS ALAMOS NATIONAL LABORATORY
EPA ID #NM0890010515
HWB-LANL-11-075

Dear Messrs. Rael and Graham:

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the Los Alamos National Security, LLC (LANS) (collectively, the Permittees) *Phase II Investigation Work Plan for S-Site Aggregate Area*, (IWP) dated September, 2011 and referenced by LA-UR-11-5388/EP2011-0285. NMED hereby issues this Notice of Disapproval with the following comments.

Specific Comments:

1. **Section.4.1.4.3, Proposed Activities at SWMU 11-006(a), page 12:**
   The Permittees propose to collect samples from depths of 9-10 ft and 14-15 ft below ground surface (bgs) at sampling locations 11-608781 and 11-608782, to define the vertical extent of 1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) contamination. During

Action Required

previous investigations, samples were collected from only one depth at these two locations. Triaminnotrinitrobenzene (TATB) was also detected in samples collected from one depth at these locations. Since the detected concentrations were below the estimated quantitation limit (EQL), the investigation report concluded that the vertical extent of TATB contamination was defined. The Permittees must include analysis of TATB for samples to be collected from these locations to ensure that the vertical extent of TATB contamination is indeed defined at solid waste management unit (SWMU) 11-006(a).

2. **Section 4.2.4.3, Proposed Activities at AOC 16-024(u), page 27:**
The Permittees propose to remove the top 5.5 ft of soil from a 5-ft radius around location 16-608920 because benzo(a)pyrene was detected at the concentration of 4.08 mg/kg that is above the industrial soil screening level (SSL) of 2.34 mg/kg. Several other contaminants of potential concern (COPCs) were also detected at this location. Confirmation samples are proposed to be collected to the east and north of the proposed excavation and analyzed only for benzo(a) pyrene. The Permittees must either analyze the proposed confirmation samples for a full suite to replace the data from the excavated location or include the data for all COPCs detected at this location, when evaluating risk for the site.

3. **Section 4.2.5.3, Proposed Activities at AOC C-16-050, page 29:**
The Permittees propose to remove the top 5.5 ft of soil from a 5-ft radius around locations 16-609514 and 16-609515 because benzo(a)pyrene was detected at the concentrations above the industrial SSL of 2.34 mg/kg. Several other COPCs were also detected at these locations. Confirmation samples are proposed to be collected to the north, west, and east of the proposed excavation and analyzed only for benzo(a) pyrene. The Permittees must either analyze the proposed confirmation samples for a full suite to replace the data from the excavated location or include the data for all COPCs detected at this location, when evaluating risk for the site.

4. **Section 4.2.7.3, Proposed Activities at SWMUs 13-001, 13-004, 16-035, and 16-036, page 32:**
    a. The discussion regarding the vertical extent of arsenic refers to sampling location 16-608613, the correct reference should be 16-608612, not 16-608613. Arsenic was not detected above background value (BV) in samples collected at location 16-608613. It was detected at a concentration of 3.31 mg/kg in a sample collected from the location 16-608612 (5.5-6 ft bgs). Make appropriate revisions to the text.

    b. The IWP states that the lateral extent of chromium is defined at location 16-608620 and additional sampling is not required because chromium was detected at lower concentrations in samples collected from the downgradient locations 16-608607 and 16-608630. However, sampling locations 16-608607 and 16-608630 do not appear to be downgradient of location 16-608620 (*See* Plate 5). The extent of chromium is defined because it was not detected in samples collected from

Action Required

locations 16-608622 and 16-608625, which are downgradient of location 16-608620. No response required.

c. At location 16-608621, the vertical extent of contamination could not be defined because samples were only collected from one depth, i.e., 0.0-0.5 ft bgs. Several organic chemicals including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, pyrene, and TATB were detected at this location. The IWP proposes to collect samples from deeper intervals at this location (5-6 ft and 11-12 ft bgs) and analyze them only for pyrene and TATB. The Permittees must include all other detected organic chemicals in the analytical suite in the revised IWP.

5. **Section 4.2.8.3, Proposed Activities at SWMU 13-002, page 33:**
The IR concluded that the lateral extent of chromium was not defined at location 16-608658 and 16-608661. However, the IWP does not propose to collect additional samples to define the lateral extent of chromium because it was detected below the maximum background concentrations in samples collected at locations 16-611204, 16-611205, and 16-611206 in the Extended Drainages. Locations 16-611204, 16-611205, and 16-611206 are approximately 4,500 ft from location 16-608658 and 16-608661 and cannot be used to define the lateral extent. The Permittees must propose to collect additional samples in the drainage immediately downgradient of locations 16-608658 and 16-608661 to define the lateral extent of chromium.

6. **Section 4.2.9.3, Proposed Activities at SWMU 16-029(h), page 35:**
The IR concluded that the vertical extent of cesium-137 was not defined at location 16-608710. Cesium-137 was not detected in the surface sample but was detected in the tuff sample collected from the depth 5.5-6.0 ft bgs. The IWP proposes to collect samples from the depth intervals of 4-5 ft and 5-6 ft bgs at location 16-608710 that would be collecting samples essentially from the same depth as during the previous investigations. To define the vertical extent samples must be collected from greater depths than 6.0 ft (i.e., 11-12 and 17-18 ft bgs) as proposed for other sampling locations at SWMU 16-029(h).

7. **Section 4.2.9.3, Proposed Activities at SWMU 16-029(h), page 36:**
   a. The IR concluded that the lateral extent of chromium was not defined at location 16-608712. The IWP does not propose to collect additional samples to define the lateral extent of chromium because it was detected below the maximum background concentrations in samples collected at locations 16-611204, 16-611205, and 16-611206 in the Extended Drainages. Locations 16-611204, 16-611205, and 16-611206 are approximately 5,000 ft from location 16-608712 and cannot be used to define the lateral extent. Propose to collect additional samples in the drainage immediately downstream of location 16-608712 to define the lateral extent of chromium.

Action Required

b. The comment also applies to the manner in which lateral extent of lead was determined. The text indicates that the drainline exited from the southeast corner of the former building 16-478, extended 80 ft east of the sump, and discharged directly into Cañon de Valle. Sample must be collected in the drainage immediately downgradient of location 16-608701 to define the lateral extent of lead.

c. Plate 2 depicts the sampling locations in the Extended Drainages (e.g., 16-611204, 16-611205, and 16-611206,) but does not depict the location of SWMU 16-029(h) making it difficult for the reviewer to determine the spatial relationship between the SWMU and the sampling locations used to define the lateral extent. In future reports, if the Permittees want to use samples collected in the drainages to define the extent of contamination, figures must be provided that show the relationship between the sampling locations.

8. **Section 4.3.4.3, Proposed Activities at SWMU 16-003(e), page 44:**
The IR concluded that the vertical extent of cobalt, copper, nickel, zinc, HMX, and hexahydro-1,3,5-trinitro-1,3,5,-triazine (RDX) was not defined at location 16-01443 where a sample was collected from only one depth (3.5-5.0 ft bgs). The IWP proposes to collect additional samples at this location to define the vertical extent. Samples are proposed to be collected from the depth intervals of 20-21 ft and 26-27 ft bgs. Samples also must be collected from shallower depths to better define the vertical extent. The IWP does not provide rationale for the proposed depth intervals. The Permittees must revise the IWP to propose collection of additional samples at depths of 10-11 ft and 15-16 ft bgs.

   In addition, the maximum concentration of these chemicals was detected in samples collected from the location 16-01443. The Permittees must propose additional step out sampling location to define the lateral extent of contamination. Samples must be collected from depth intervals of 4-5 ft, 10-11 ft, and 15-16 ft bgs at the step out locations and analyzed for cobalt, copper, nickel, zinc, HMX, and RDX. Revise the IWP accordingly.

9. **Section 4.3.5.3, Proposed Activities at SWMU 16-003(f), page 45:**
The IR concluded that the extent of contamination was not defined at SWMU 16-003(f) for several chemicals. The IWP proposes to collect additional samples at the existing three locations to define the vertical extent of contamination, but no additional step-out samples were proposed to define the lateral extent. During the previous investigation, samples were collected only from one or two locations at each of the two inactive high explosives (HE) sumps. Cobalt was detected at 32.7 mg/kg at location 16-609239 which is above the residential screening value of 23mg/kg for cobalt. Arsenic was also detected at a concentration of 9.61 mg/kg at location 16-609167, which is above the residential screening value of 3.9 mg/kg. The Permittees must propose to collect additional step-out samples to define the lateral extent of contamination at the site.

Action Required

10. Section 4.3.6.2, Nature and Extent of Contamination, page 46:
Section 4.3.6.2 lists chemicals for which extent is not defined at SWMU 16-003(g). In addition to the chemicals listed, the IR concluded that the vertical extent of fluorine was not defined. However, fluorine was not included in the chemicals listed in this section. Revise the section to state that the vertical extent of fluorine is not defined.

11. Section 4.3.6.3, Proposed Activities at SWMU 16-003(g), page 47:
The IR concluded that the extent of several chemicals was not defined at SWMU 16-003(g). During the previous investigation, samples were collected only from one location at each of the two inactive HE sumps. Additional samples are proposed to be collected at the two locations to define the vertical extent, but no step-out samples are proposed to define the lateral extent. Revise the IWP to propose additional step-out samples to define the lateral extent of contamination at this site.

In addition, to be consistent with other sites, sample must be collected from the depth intervals of 15-16 ft and 21-22 ft instead of proposed 20-21 ft and 26-27 ft at locations 16-609186 and 16-609187 or an explanation must be provided for the proposed depth intervals. Revise the IWP accordingly.

12. Section 4.3.7.3, Proposed Activities at SWMU 16-026(b), page 48:
The Permittees propose to remove the top 5.5 ft of soil from a 5-ft radius around location 16-609189 because benzo(a)pyrene was detected above the industrial SSL (2.34 mg/kg). Several other COPCs were also detected at this location. Confirmation samples are proposed to be collected to the north, south, and west of the excavation and analyzed only for benzo(a) pyrene. The Permittees must either analyze the confirmation samples for a full suite to replace the data from excavated location or include the data from excavated samples for all COPCs detected at this location, when evaluating risk for the site.

13. Section 4.3.9.3, Proposed Activities at SWMU 16-026(d), page 50:

a. The IR concluded that the vertical extent of chromium was not defined at location 16-01465, but no additional samples are proposed to be collected at this location. The Permittees must propose to collect additional samples at location 16-01465 to define the vertical extent of chromium.

b. Additional samples are proposed at location 16-609185 to define the vertical extent of barium. Review of Table 8.10-2 of the IR indicates that barium was not detected in samples collected from 5.5-6.0 ft bgs at this location therefore, the vertical extent of barium is defined at this location. Explain why additional samples for barium analysis are necessary at this location.

c. Several poly aromatic hydrocarbons (PAHs) were detected in samples collected from location 16-01470, where samples were collected from only one depth. The PAHs were detected at higher concentrations in samples collected at location 16-01470 compared to the concentrations detected in samples collected at location

Action Required

16-609182. However, to define the vertical extent of PAHs, additional samples are proposed at location 16-609182, but not at location 16-01470 (except for phenanthrene and pyrene). The IWP proposes to collect samples from 5-6 ft and 11-12 ft bgs at location 16-01470 to define the vertical extent of only barium, phenanthrene, and pyrene. The Permittees must include analysis of anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,l)perylene, chrysene, and fluoranthene for samples to be collected from location 16-01470 to determine the vertical extent of contamination.

14. Section 4.3.10.3, Proposed Activities at SWMU 16-026(e), page 52:

a. The Permittees intend to remove the top 4 ft of soil around location 16-611878 because RDX was detected at 380 mg/kg which is greater than the industrial SSL (174 mg/kg), in a surface soil sample collected from this location. Several other organic and inorganic chemicals were also detected in samples collected from this location. No samples were collected east of this location during previous investigations to define the lateral extent of contamination. To confirm cleanup after the excavation, the IWP proposes collection of samples from three new locations (26e-1, 26e-2, and 26e-3). To replace the data, the samples collected from the new sampling locations must either be analyzed for full suite (same analyses conducted during previous investigations) or data from location 16-611878 for all COPCs identified for the site, must be utilized for conducting risk evaluations for the site.

b. Data from new location 26e-1 will be used to confirm cleanup to the east of location 16-611878, not west as stated. Revise the text accordingly.

15. Section 4.3.11.3, Proposed Activities at SWMU 16-029(a), page 54:

The Permittees propose to remove the top 3 ft of soil from a 5-ft radius around location 16-01453 because benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene were detected above their respective industrial SSLs in the near surface-soil samples. Several other COPCs were also detected at this location. Confirmation samples are proposed to be collected from north, south, east, and west of excavation from the depths of 0-1 ft and 3-4 ft bgs. The Permittees propose to only analyze these samples for benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene. The samples must either be analyzed for the full suite (same analyses conducted during previous investigations) to replace the data collected from location 16-01453 or include data from this location for all COPCs, when evaluating risk for the site.

16. Section 4.3.14.2, Nature and Extent of Contamination, page 57:

The IR concluded that the vertical extent of naphthalene was not defined at sampling location 16-01439 in the shared drainages. Section 4.3.14.2, that lists chemicals for which the extent is not defined in shared drainages, does not include naphthalene. Revise the IWP accordingly.

Action Required

17. Section 4.3.14.3, Proposed Activities at the Shared Drainages, pages 58-59:

a. Lead was detected above its background value (22.3 mg/kg) at a concentration of 59 mg/kg at sampling location 16-609221, where samples were collected only from one depth, i.e., 0-0.5 ft. The IWP proposes to collected additional samples at this location to determine the vertical extent of copper and several organic chemicals. The IWP must be revised to include the lead analyses for samples to be collected from this location.

b. At location 16-01434, benzo(a)pyrene was detected at 7.9 mg/kg in the sample collected from 0-0.5 ft bgs not 7.4 mg/kg as stated (*See* Table 8-16-3 of the IR). Revise the IWP accordingly.

c. The Permittees propose to remove the top 5.5 ft of soil from a 5-ft radius around locations 16-01653 and 16-609215 because benzo(a)pyrene was detected above industrial SSL in samples collected from these locations. The Permittees also propose to remove soil from the top 2.5 ft of soil from a 5-ft radius around location 16-01434 because benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene were detected above their respective industrial SSLs in samples collected from this location. After excavating soil, collection of confirmation samples is proposed in the vicinity of locations 16-01653 and 16-609215. These samples are proposed for analysis of benzo(a)pyrene only. Samples collected in the vicinity of location 16-01434 would be analyzed for benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene only. Several other COPCs were also detected at these locations. The samples must either be analyzed for the full suite (same analyses conducted during previous investigations) to replace the data collected from these locations or include data for all COPCs detected in the excavated samples when evaluating risk for the site.

18. Section 4.4.2.2, Nature and Extent of Contamination, page 63:

The IR concluded that the vertical extent of barium and lead contamination was not defined at location 16-05820 at AOC C-16-074. The IWP discussed the lateral extent of contamination but did not address the vertical extent of barium and lead contamination. However, review of the data indicates that the vertical extent of contamination is defined at location 16-05820. Samples collected from 10.0-11.0 ft bgs at this location did not indicate presence of either barium or lead. The Permittees must revise the text to clarify that additional sampling is not required to define the vertical extent of barium and lead.

19. Section 4.4.3.2, Nature and Extent of Contamination, page 64:

a. During previous investigations barium was detected in soil samples collected at location 16-03077 at 444 mg/kg; samples were collected only from one depth at this location and the IR concluded that the vertical extent of barium was not defined. Propose to collect additional samples at this location for analysis of barium to define the vertical extent at SWMU 16-029(x).

Action Required

b. Copper and silver were detected at the concentrations of 71.2 mg/kg and 49.8 mg/kg, respectively, at location 16-03174, where samples were only collected from one depth. The Permittees propose to collect samples from east of this location to define the lateral extent, but do not propose additional samples to define the vertical extent. Revise the IWP to propose additional samples to define the vertical extent of copper and silver at this location.

c. The IR concluded that the vertical extent of fluoranthene was not defined at location 16-03058; however, the IWP does not propose analysis of fluoranthene for samples to be collected at this location. Add analyses of fluoranthene to the analytical suite for the samples collected from this location to define the vertical extent.

20. Section 4.4.3.3, Proposed Activities at SWMU 16-029(x), page 65:
Samples are proposed to be collected at location 16-609482 from the depths of 9-10 ft and 15-16 ft bgs to define the vertical extent of RDX and 1,3,5-trimethylbenzene. Samples collected from 15.0-17.0 ft bgs during previous investigations indicated the presence of both these compounds. To be consistent with the sampling strategy proposed in the IWP, revise the proposed depths for collection of samples to 22-23 ft and 27-28 ft bgs at this location to define the vertical extent.

21. Section 4.4.5.3, Proposed Activities at SWMU 16-025(x), page 68:
Surface samples (0.0-1.0 ft bgs) were collected from locations 16-03015 and 16-03017 during previous investigations. Uranium was detected at both of these locations above the BV of 1.82 mg/kg. The IWP proposes to collect additional samples to define the vertical extent of uranium. The proposed depths for collection of samples are 9-10 ft and 15-16 ft bgs for location 16-03017 and 11-12 ft and 17-18 ft for location 16-03015. No rationale is provided for selection of these depth intervals. To be consistent with the sampling strategy, propose to collect samples from 5-6 ft and 11-12 ft bgs at these locations. Similarly at locations 16-609492 and 16-609494, the depth intervals for proposed sample collection must be revised to 11-12 ft and 16-17 ft bgs.

22. Section 4.4.8.3, Proposed Activities at SWMU 16-024(n), page 72:
The lateral extent of zinc is not defined northwest of location 16-609304, rather than 16-609301 as stated. Similarly, the lateral extent of zinc is not defined downgradient of location 16-609301, instead of 16-609304 as stated. Revise the text to correct the sampling location designations where lateral extent of zinc is not defined.

23. Section 4.4.9.3, Proposed Activities at SWMU 16-034(n), page 74:

a. Mercury was detected at 28.4 mg/kg in a sample collected from the depth of 5.5-6.0 ft at location 16-609773. The concentration decreased with depth but was above the above the SSL of 23 mg/kg. The Permittees propose to collect two additional samples at this location to define the vertical extent of antimony. Propose to analyze the samples for mercury.

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b. Samples are proposed to be collected from new location (34n-2) northeast of existing sampling location 16-609773 to define the lateral extent of several inorganic and organic chemicals. Several organic chemicals were detected at this location; however, the Permittees have only selected analyses for benzo(b)fluoranthene, fluoranthene, 4-isopropyltoluene, phenanthrene, pyrene, and toluene. Add anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, and chrysene to the analytical suite.

24. Section 4.4.11.3, Proposed Activities at SWMU 16-017(v)-99, page 77:
The IR concluded that the extent of contamination was not defined for aluminum, barium, calcium, magnesium, and cobalt at location 16-609436. The IWP proposes to collect additional samples at this location to define the vertical extent but does not address the lateral extent. The Permittees propose to remove the top 5.5 ft of soil from a 5-ft radius around location 16-609436 and collect samples from the north, south, east, and west of this location to confirm that the extent of benzo(a)pyrene contamination is defined. The Permittees must include analyses of aluminum, barium, calcium, magnesium, and cobalt to the analytical suite proposed for confirmation samples. Revise the IWP accordingly.

25. Section 4.4.12.2, Nature and Extent of Contamination, page 79:
The IR concluded that the concentrations of barium increased with depth at most locations and the extent of barium was not defined at the Courtyard Periphery Area. Similarly, the extent of calcium, cobalt, and silver is not defined for the site. However, the IWP addresses only the lateral extent, not the vertical extent. Revise the IWP to indicate that the vertical extent of barium, calcium, cobalt, and silver is not defined. The Permittees did not propose to collect additional samples within the Courtyard Periphery Area because of historic preservation restrictions.

26. Section 4.4.12.2, Nature and Extent of Contamination, page 80:
The vertical extent of several organic compounds is not defined at location 16-609296, but some of these compounds were not included in the discussion. For example, acenaphthene, anthracene, and benzo(a)anthracene were not detected in the surface sample but were detected in the sample collected from 5.5-6.0 ft bgs. In addition, the vertical extent of RDX is not defined at locations 16-609281 and 16-609283 (*See* IR, page 247). However, the vertical extent of these chemicals was not included in the discussion of extent of contamination. Conduct a thorough review of the data and revise the discussion to include all chemicals for which vertical and lateral extent is not defined. The Permittees did not propose to collect additional samples within the Courtyard Periphery Area because of historic preservation restrictions.

27. Table 5.0-1, Summary of Investigation Methods, page 330:
Table 5.0-1 states that for Hand-Auger Sampling, "The sample material is transferred from the auger bucket to a stainless-steel sampling bowl before the various required sample containers are filled." However, section 5.4.1 indicates that the samples for

Action Required

volatile organic compounds (VOC) analysis will be collected immediately upon retrieval of the split-spoon core barrel to minimize the loss of VOCs during the sample-collection process. After the VOC samples are collected and field screened, the remaining sample material will be placed in a stainless steel bowl, and the material will be broken, if necessary, to fill the material into sample containers. Resolve the discrepancy and revise the IWP accordingly. Include a detailed description of VOC sample collection. The samples must be collected and preserved using appropriate methods that minimize the loss of VOCs.

The Permittees must address all comments and submit a revised Phase II IWP by **March 15, 2012**. As part of the response letter that accompanies the revised IWP, the Permittees must include a table that details where all revisions have been made to the IWP and that cross-references NMED's numbered comments. All submittals (including maps and tables) must be in the form of two paper copies and one electronic copy in accordance with Section XI.A of the Order. In addition, the Permittees must submit a redline-strikeout version that includes all changes and edits to the IWP (electronic copy) with the response to this NOD.

Please contact Neelam Dhawan of my staff at (505) 476-6042 should you have any questions.

Sincerely,

John E. Kieling
Acting Chief
Hazardous Waste Bureau

cc: D. Cobrain, NMED HWB
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