EMID-702887

**DEPARTMENT OF ENERGY**
Environmental Management Los Alamos Field Office (EM-LA)
Los Alamos, New Mexico 87544

EMLA-23-BF310-2-1

August 31, 2023


Mr. Rick Shean
Designated Agency Manager
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6313

Subject: Submittal of the Data Summary Report for Sediment Sampling at Solid Waste Management Unit 16-008(a) in Technical Area 16

Dear Mr. Shean:

Enclosed please find two hard copies with electronic files of the "Data Summary Report for Sediment Sampling at Solid Waste Management Unit 16-008(a) in Technical Area 16." This report provides data to satisfy the requirements of the February 2010 approval of the "Supplemental Investigation Report for Consolidated Units 16-007(a)-99 and 16-008(a)-99 at Technical Area 16," and for New Mexico Environment Department (NMED) to evaluate future monitoring requirements.

If you have any questions, please contact Christian Maupin at (505) 6950-4281 (christian.maupin@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,

ARTURO DURAN

Digitally signed by ARTURO DURAN
Date: 2023.08.31 07:03:31 -06'00'

Arturo Q. Duran
Compliance and Permitting Manager
U.S. Department of Energy
Environmental Management
Los Alamos Field Office

Enclosure(s):
1. Two hard copies with electronic files:
   Data Summary Report for Sediment Sampling at Solid Waste Management Unit 16-008(a) in Technical Area 16 (EM2023-0569)

cc (letter and enclosure[s] emailed):
Laurie King, EPA Region 6, Dallas, TX
Steve Yanicak, NMED-DOE-OB
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August 2023
EM2023-0569

# Data Summary Report for Sediment Sampling at Solid Waste Management Unit 16-008(a) in Technical Area 16

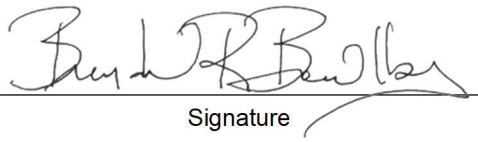
N3B Los Alamos

EM2023-0569

# Data Summary Report for Sediment Sampling at Solid Waste Management Unit 16-008(a) in Technical Area 16

August 2023

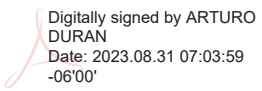
Responsible N3B program director:

| Printed Name | Signature | Title | Organization | Date |
|---|---|---|---|---|
| Brenda Bowlby |  | Program Director | RCRA Remediation Program | 8/24/23 |

Responsible N3B representative:

| Printed Name | Signature | Title | Organization | Date |
|---|---|---|---|---|
| Troy Thomson |  | Program Manager | N3B Environmental Remediation Program | 8/24/23 |

Responsible DOE EM-LA representative:

| Printed Name | Signature | Title | Organization | Date |
|---|---|---|---|---|
| Arturo Q. Duran | ARTURO DURAN  Digitally signed by ARTURO DURAN Date: 2023.08.31 07:03:59 -06'00' | Compliance and Permitting Manager | Office of Quality and Regulatory Compliance | |

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## 1.0 BACKGROUND

Solid Waste Management Unit (SWMU) 16-008(a), also known as the 90s Line Pond, consists of a 200-ft-diameter, unlined settling pond that received liquid waste from the high explosives (HE) sumps at processing buildings 16-89, 16-90, and 16-91 at Technical Area 16 (TA-16). The pond may have been 10 to 15 ft deep and was once a small-scale, HE-burning area. The pond received HE, barium, uranium, and organic chemicals. The inactive settling pond remains intact and seasonally collects and retains water. The site was initially investigated as part of a 1996 voluntary corrective action (VCA) (LANL 1997, 087847). Soil, sediment, and surface water samples collected at the site indicated the presence of soil and groundwater contamination.

The "Investigation Work Plan for Consolidated Solid Waste Management Units 16-007(a)-99 (30s Line) and 16-008(a)-99 (90s Line) at Technical Area 16" (LANL 2005, 089331) proposed additional sampling to determine the nature and extent of contamination. The investigation was implemented during 2006–2007 and documented in the "Investigation Report for Consolidated Units 16-007(a)-99 and 16-008(a)-99 at Technical Area 16, Revision1" (IR) (LANL 2008, 102052.18). The New Mexico Environment Department (NMED) approved the IR with direction on February 11, 2008 (NMED 2008, 100477). The approval with direction required Los Alamos National Laboratory (LANL or the Laboratory) to submit a work plan for implementing the additional investigation and remediation activities recommended in the IR and to install erosion-control best management practices (BMPs) in the tributary drainages to the 90s Line Pond. The proposed additional investigations and remediation were presented in the "Supplemental Investigation Work Plan for Consolidated Units 16-007(a)-99 and 16-008(a)-99 at Technical Area 16" (supplemental IWP) (LANL 2008, 104014). The supplemental IWP investigation and remediation activities were conducted in 2009 and the results presented in the "Supplemental Investigation Report for Consolidated Units 16-007(a)-99 and 16-008(a)-99 at Technical Area 16" (supplemental IR) (LANL 2010, 108279). The results of the IR and supplemental IR indicated that SWMU 16-008(a) does not pose an unacceptable risk to human health under the industrial, construction worker, and residential scenarios, and does not pose an unacceptable risk to ecological receptors. NMED approved the supplemental IR on February 16, 2010 (NMED 2010, 109020).

The approval with directions for the IR required LANL to install erosion-control BMPs in the tributary drainages to the 90s Line Pond and submit proof of the installation to NMED no later than June 30, 2008. The controls were installed by LANL, and NMED approved the erosion controls on July 7, 2008 (LANL 2008, 102904; NMED 2008, 102291). NMED's approval of the supplemental IR required LANL to continue annual inspection, maintenance, and annual reporting of the controls, and also required collection of sediment samples from the 90s Line Pond every five years to determine if concentrations of contaminants are increasing in the pond sediments (NMED 2010, 109020). In 2016, NMED approved a request by LANL to submit the inspection and maintenance reports on a biennial basis, rather than annually (NMED 2016, 602089).

## 2.0 PURPOSE OF REPORT

In the December 2020 biennial inspection and maintenance report, the U.S. Department of Energy (DOE) and Newport News Nuclear BWXT-Los Alamos (N3B) requested that annual inspection and biennial reporting of erosion controls for 90s Line Pond drainages be discontinued (N3B 2020, 701158). The basis for this request was the well-documented stability of the drainages and controls. NMED's response to this request stated that the February 2010 approval of the supplemental IR required LANL to collect sediment samples from the 90s Line Pond every five years (NMED 2022, 701919). NMED noted that results of such sediment sampling had not been submitted and that NMED would need to review

sediment-sampling results to determine whether future monitoring should be decreased in frequency or discontinued. The sampling described in this report was performed in September 2022 to satisfy the requirements of the February 2010 approval of the supplemental IR, and to provide data for NMED to evaluate future monitoring requirements.

## 3.0 SCOPE OF ACTIVITIES

### 3.1 Sample Collection

Sediment samples were collected from three locations within the pond boundary and two locations in drainages upstream of the BMPs (Figure 3.1-1), as proposed in the supplemental IWP (LANL 2008, 104014). Consistent with the requirements of the supplemental IWP (LANL 2008, 104014), sediment samples were collected from the 0–1-ft depth interval and submitted to a preapproved off-site laboratory for analysis for explosive compounds, target analyte list (TAL) metals, volatile organic compounds (VOCs), and semivolatile compounds (SVOCs). Table 3.1-1 presents the samples collected and analyses requested, and Table 3.1-2 presents the geodetic coordinates of the sampling locations.

Sediment samples were collected in accordance with N3B-SOP-ER-2001, “Soil, Tuff, and Sediment Sampling.” Samples were collected using a stainless-steel auger, placed in a stainless-steel bowl, and transferred to sterile sample collection jars for transport to the Sample Management Office (SMO). Samples for VOC analysis were taken from the bottom of the sample depth interval and transferred immediately from the sampler to the sample container to minimize the loss of VOCs during the sample-collection process.

Quality assurance/quality control samples (field duplicates, field trip blanks, and rinsate blanks) were collected in accordance with N3B-SOP-SDM-1100, “Sample Containers, Preservation, and Field Quality Control.” Field duplicate samples were collected at a minimum rate of 1 per 10 investigation samples. Rinsate blanks were also collected at a minimum rate of 1 per 10 investigation samples to confirm decontamination of the sampling equipment. When VOC samples were collected, field trip blank samples were collected in conjunction with investigation samples at a minimum rate of 1 per day.

All sample collection activities were coordinated with the SMO. Upon collection, samples remained in the controlled custody of the field team until they were delivered to the SMO. Sample custody was then relinquished to the SMO for delivery to the off-site contract analytical laboratory.

### 3.2 Sample Analyses

The analyses requested for investigation samples were those specified for pond sediment sampling in the approved supplemental IWP and were analyzed for TAL metals, explosive compounds, SVOCs, and VOCs (LANL 2008, 104014; NMED 2008, 104334). Field duplicates of investigation samples were analyzed for the same analytical suites as the corresponding investigation samples. Equipment rinsate blanks were analyzed for the same inorganic suites as the related investigation samples. Field trip blanks were analyzed only for VOCs.

Analytical results meet the N3B minimum data quality objectives as outlined in N3B-PLN-SDM-1000, “Sample and Data Management Plan.” N3B-PLN-SDM-1000 sets the validation frequency criteria at

100% Level 1 examination and Level 2 verification of data, and at 10% minimum Level 3 validation of data.

- A Level 1 examination assesses the completeness of the data as delivered from the analytical laboratory, identifies any reporting errors, and checks the usability of the data based on the analytical laboratory's evaluation of the data.
- A Level 2 verification evaluates the data to determine the extent to which the laboratory met the analytical method and the contract-specific quality control and reporting requirements.
- A Level 3 validation includes Level 1 and 2 criteria and determines the effect of potential anomalies encountered during analysis and possible effects on data quality and usability. A Level 3 validation is performed manually with method-specific data validation procedures.

Laboratory analytical data were validated by N3B personnel as outlined in N3B-PLN-SDM-1000; N3B-AP-SDM-3000, "General Guidelines for Data Validation"; N3B-AP-SDM-3014, "Examination and Verification of Analytical Laboratory Data"; and additional method-specific analytical data validation procedures. All associated validation procedures were developed, where applicable, from the EPA QA/G-8 "Guidance on Environmental Data Verification and Data Validation"; the "Department of Defense/Department of Energy Consolidated Quality Systems Manual (QSM) for Environmental Laboratories"; the EPA "Superfund CLP National Functional Guidelines for Data Review"; and the American National Standards Institute/American Nuclear Society 41.5-2012, "Verification and Validation of Radiological Data For Use in Waste Management and Environmental Remediation."

## 4.0 SEDIMENT SAMPLING ANALYTICAL RESULTS

Decision-level data for the 2022 90s Line Pond sampling consist of results from five sediment samples collected from five locations.

### 4.1 Inorganic Chemicals

Five sediment samples were collected and analyzed for TAL metals. Table 4.1-1 presents the inorganic chemicals above background values (BVs). Figure 4.1-1 shows the spatial distribution of inorganic chemicals detected above BVs. There were too few samples to perform statistical comparisons to background data.

Fifteen inorganic chemicals were detected above BVs or not detected with detection limits (DLs) above BVs. These chemicals were as follows:

- Aluminum was detected above the sediment BV (15,400 mg/kg) in five samples with a maximum concentration of 31,700 mg/kg.
- Barium was detected above the sediment BV (127 mg/kg) in five samples with a maximum concentration of 3270 mg/kg.
- Beryllium was detected above the sediment BV (1.31 mg/kg) in two samples with a maximum concentration of 1.72 mg/kg.
- Chromium was detected above the sediment BV (10.5 mg/kg) in five samples with a maximum concentration of 17.8 mg/kg.
- Cobalt was detected above the sediment BV (4.73 mg/kg) in four samples with a maximum concentration of 7.62 mg/kg.

- Copper was detected above the sediment BV (11.2 mg/kg) in four samples with a maximum concentration of 19.1 mg/kg.
- Iron was detected above the sediment BV (13,800 mg/kg) in two samples with a maximum concentration of 16,800 mg/kg.
- Lead was detected above the sediment BV (19.7 mg/kg) in two samples with a maximum concentration of 25.3 mg/kg.
- Magnesium was detected above the sediment BV (2370 mg/kg) in one sample at a concentration of 2440 mg/kg.
- Manganese was detected above the sediment BV (543 mg/kg) in one sample at a concentration of 1070 mg/kg.
- Nickel was detected above the sediment BV (9.38 mg/kg) in four samples with a maximum concentration of 13.4 mg/kg.
- Selenium was detected above the sediment BV (0.3 mg/kg) in five samples with a maximum concentration of 1.57 mg/kg.
- Silver was not detected above the sediment BV (1 mg/kg), but had DLs above the BV in two samples (1.13 mg/kg and 1.22 mg/kg).
- Vanadium was detected above the sediment BV (19.7 mg/kg) in five samples with a maximum concentration of 30.8 mg/kg.
- Zinc was detected above the sediment BV (60.2 mg/kg) in two samples with a maximum concentration of 66.4 mg/kg.

### 4.2 Organic Chemicals

A total of five sediment samples were collected and analyzed for explosive compounds, SVOCs, and VOCs. Table 4.2-1 summarizes the analytical results for detected organic chemicals. Figure 4.2-1 shows the spatial distribution of detected organic chemicals.

Organic chemicals detected in sediment samples were as follows:

- Benzoic acid was detected in one sample at a concentration of 0.351 mg/kg.
- Di-n-butylphthalate was detected in four samples with a maximum concentration of 0.0948 mg/kg.
- Fluoranthene was detected in one sample at a concentration of 0.0148 mg/kg.
- Isopropyltoluene[4-] was detected in one sample at a concentration of 0.000644 mg/kg.
- Methylene chloride was detected in one sample at a concentration of 0.00262 mg/kg.

## 5.0 DATA EVALUATION

NMED's approval of the supplemental IR indicated that the purpose of the requested sediment sampling in the 90s Line Pond was to determine if concentrations of contaminants are increasing in the pond sediments (NMED 2010, 109020). To support this determination, the results from the sediment sampling performed in 2022 were compared with results from samples collected from similar locations and depths during the 1996 Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) and 2006–2007 investigation, as reported in the IR (LANL 2008, 102052.18). Samples collected during the 1996 RFI

and 2006–2007 investigation included nine samples collected within the depth interval 0 to 1.0 ft below ground surface (bgs) from the footprint of the 90s Line Pond or the drainage channels into the pond. These sample locations are identified in Table 5.0-1, and the locations are among those shown in Figures 5.0-1 and 5.0-2 for the RFI and 2006–2007 investigation, respectively. Samples from the other locations shown in the figures were from depths greater than 1 ft bgs and could not be used for comparison with the 2022 surface samples. Similarly, results from the supplemental IR (LANL 2010, 108279) were not included in this comparison because that investigation did not include collection of samples from depth intervals comparable to the 2022 samples.

Tables 5.0-2 and 5.0-3 present the frequencies of detections/detection limits above the sediment BV, range of concentrations, and average concentrations for inorganic chemicals for the 1996 and 2006–2007 samples and for the 2022 samples, respectively. For both sets of results, barium was the inorganic chemical most frequently detected above BV and at the highest concentrations compared to the BV. These results are consistent with the historical use of barium-containing HE at the 90s Line facilities.

The range of barium concentrations and average barium concentrations are similar for the two data sets, though overall, the 2022 results are slightly lower. The maximum barium concentration in the 1996 and 2006–2007 samples was approximately 36 times the sediment BV, while the maximum barium concentration for the 2022 samples was approximately 26 times the BV. For the other detected inorganic chemicals, the concentrations detected in the 2022 samples are similar to those in the 1996 and 2006–2007 samples. For inorganic chemicals other than barium, the ratio of maximum detected concentration to sediment BV ranged from 0.22 to 5.96 for the 1996 and 2006–2007 results and 1.1 to 5 for the 2022 results. Maximum concentrations for most inorganic constituents were slightly lower in the 2022 results, while the 2022 average concentrations were slightly higher than those for 1996 and 2006–2007.

Tables 5.0-4 and 5.0-5 present the frequencies of detection and maximum concentrations for organic chemicals for the 1996 and 2006–2007 sampling and the 2022 sampling, respectively. For the 1996 and 2006-2007 sampling, 12 organic chemicals were detected, at maximum detected concentrations ranging from 0.001 mg/kg to 0.75 mg/kg. In 2022, 5 organic chemicals were detected. Maximum concentrations ranged from 0.000644 mg/kg to 0.351 mg/kg. Only 1 organic chemical (4-isopropyltoluene) was detected in both 1996/2006-2007 and 2022.

Overall, the comparison of results from 1996 and 2006–2007 with results from 2022 do not indicate that contaminant concentrations are increasing with time in the 90s Line Pond sediments.

## 6.0 REFERENCES

*The following reference list includes documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID.ERIDs were assigned by the Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above).*

LANL (Los Alamos National Laboratory), February 5, 1997. "Voluntary Corrective Action Completion Report for Potential Release Sites at TA-16, 90s-Line," Los Alamos National Laboratory document LA-UR-96-3285, Los Alamos, New Mexico. (LANL 1997, 087847)

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LANL (Los Alamos National Laboratory), January 2010. "Supplemental Investigation Report for Consolidated Units 16-007(a)-99 and 16-008(a)-99 at Technical Area 16," Los Alamos National Laboratory document LA-UR-09-8193, Los Alamos, New Mexico. (LANL 2010, 108279)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), December 10, 2020. "Biennial Inspection and Maintenance Report on Erosion Controls in Drainages to the 90s Line Pond at Technical Area 16," Los Alamos National Laboratory letter (EMLA-2021-0018-02-001) to K. Pierard (NMED-HWB) from A. Duran (DOE-EM-LA), Los Alamos, New Mexico. (N3B 2020, 701158)

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NMED (New Mexico Environment Department), February 16, 2010. "Notice of Approval, Supplemental Investigation Report for Consolidated Units 16-007(a)-99 and 16-008(a)-99 at Technical Area 16," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 109020)

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NMED (New Mexico Environment Department), November 2022. "Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments," Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2022, 702484)

NMED (New Mexico Environment Department), March 14, 2022. "Review, Biennial Inspection and Maintenance Report on Erosion Controls in Drainages to the 90s Line Pond at Technical Area 16," New Mexico Environment Department letter to A. Duran (DOE-EM-LA) from R. Shean (NMED-HWB), Santa Fe, New Mexico. (NMED 2022, 701919)

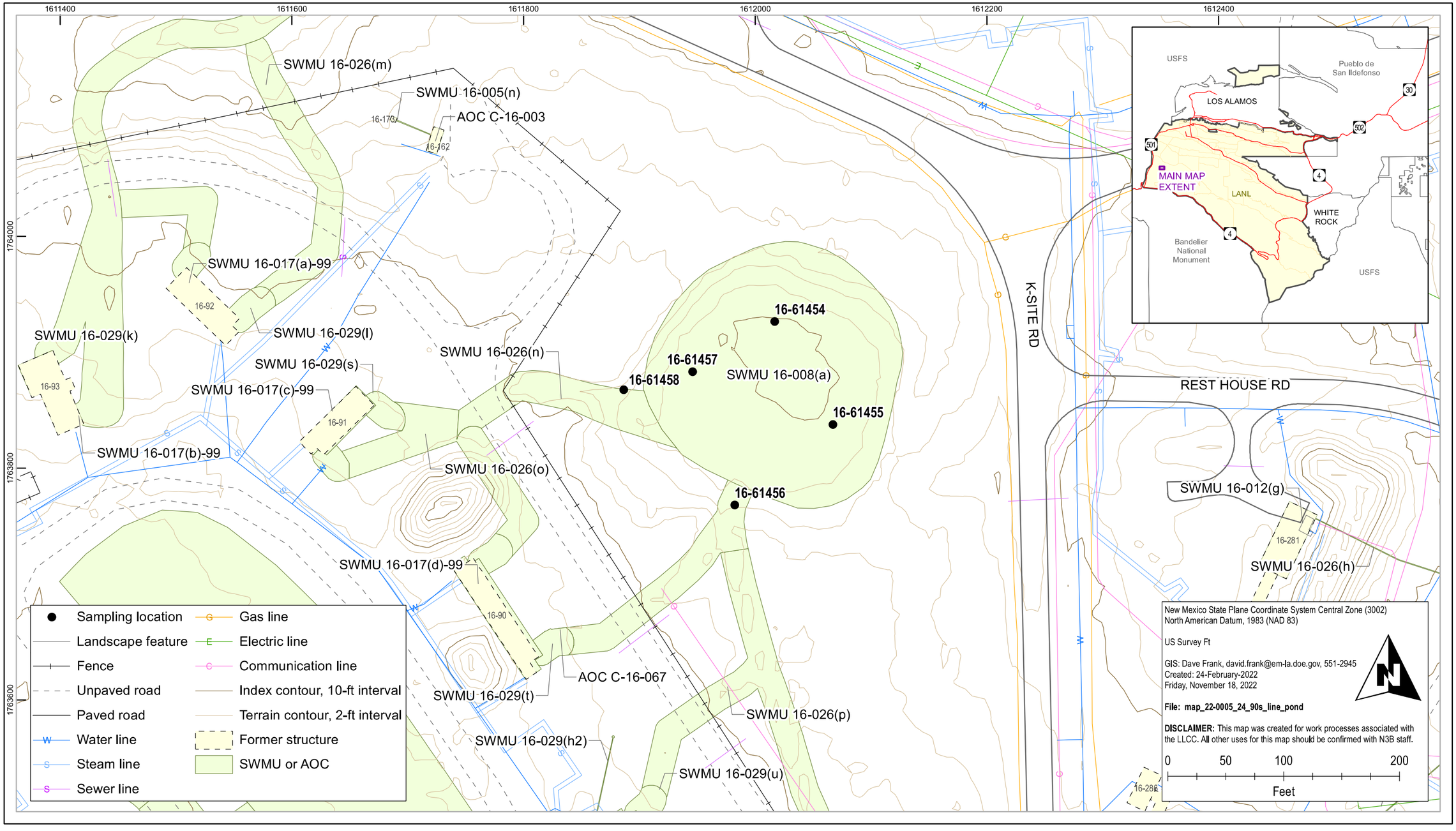


**Figure 3.1-1 90s Line Pond sediment sampling locations for 2022 sampling**

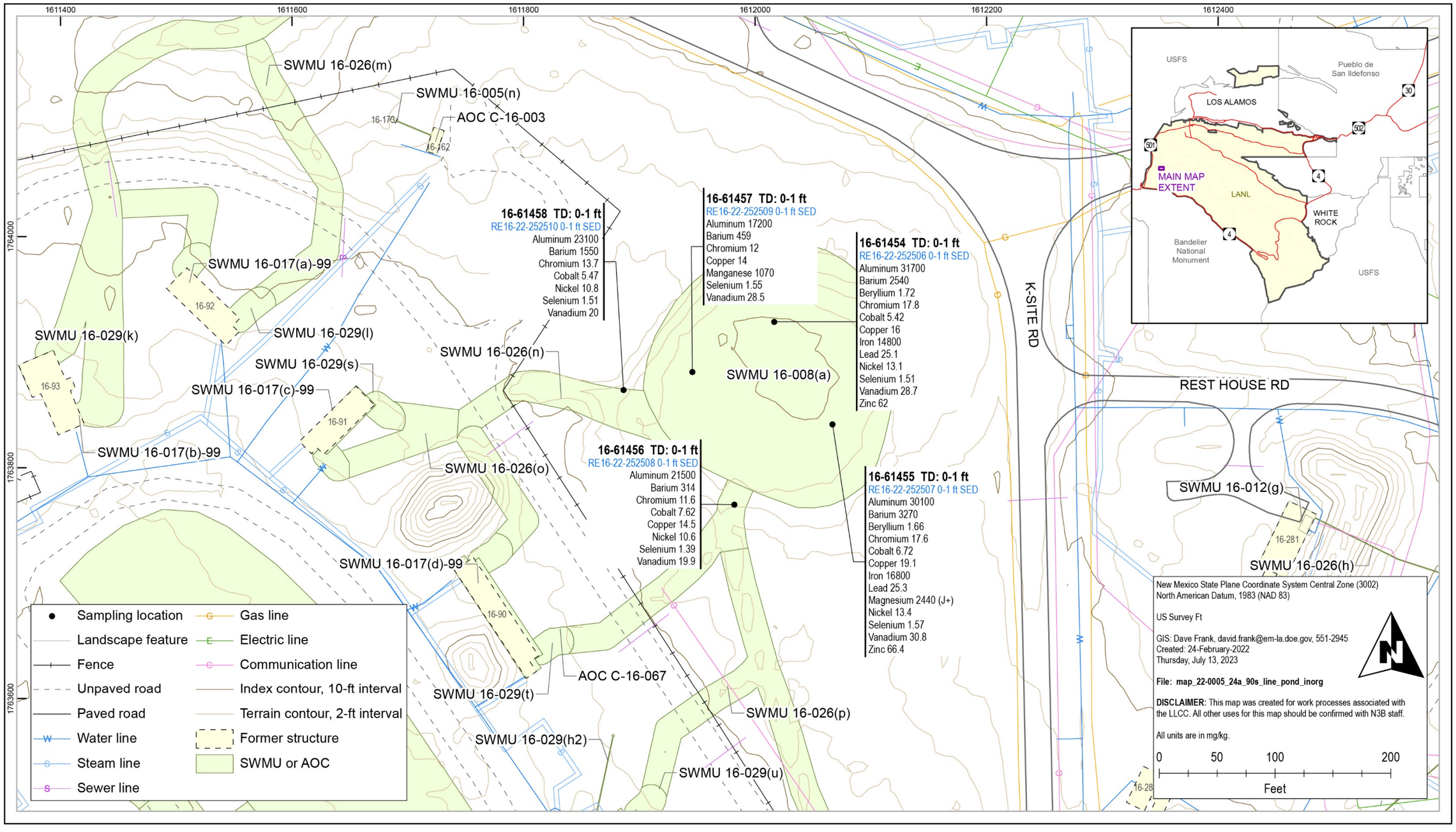


**Figure 4.1-1 Inorganic chemicals detected above BVs in 2022 90s Line Pond sediment samples**

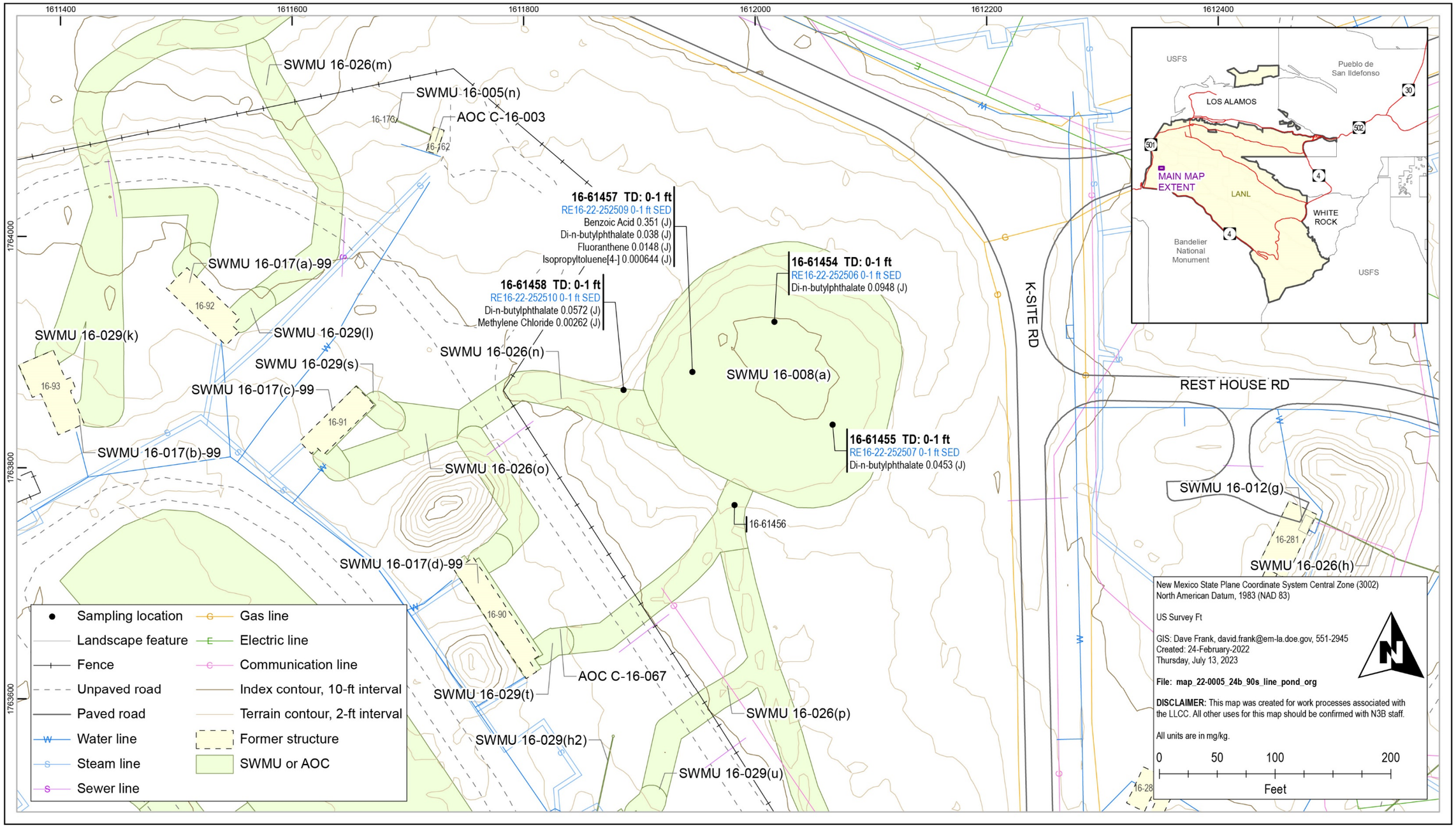


**Figure 4.2-1 Organic chemicals detected in 2022 90s Line Pond sediment samples**


Source: LANL 2008, 102052.18, p. 51

**Figure 5.0-1 Pre-2006 RFI sampling locations for Consolidated Units 16-007(a)-99 and 16-008(a)-99**


Source: LANL 2008, 102052.18, p. 53

**Figure 5.0-2 2006–2007 sampling locations for Consolidated Units 16-007(a)-99 and 16-008(a)-99**

**Table 3.1-1**
**Samples Collected and Analyses Requested for 90s Line Pond, 2022 Sampling**

| Sample ID | Location ID | Depth (ft) | Media | TAL Metals | Explosive Compounds | SVOCs | VOCs |
|---|---|---|---|---|---|---|---|
| RE16-22-252506 | 16-61454 | 0–1 | SED | N3B-2022-3143 | N3B-2022-3143 | N3B-2022-3143 | N3B-2022-3143 |
| RE16-22-252507 | 16-61455 | 0–1 | SED | N3B-2022-3143 | N3B-2022-3143 | N3B-2022-3143 | N3B-2022-3143 |
| RE16-22-252508 | 16-61456 | 0–1 | SED | N3B-2022-3143 | N3B-2022-3143 | N3B-2022-3143 | N3B-2022-3143 |
| RE16-22-252509 | 16-61457 | 0–1 | SED | N3B-2022-3143 | N3B-2022-3143 | N3B-2022-3143 | N3B-2022-3143 |
| RE16-22-252510 | 16-61458 | 0–1 | SED | N3B-2022-3143 | N3B-2022-3143 | N3B-2022-3143 | N3B-2022-3143 |

Note: Numbers in analyte columns are request numbers.

**Table 3.1-2**
**Surveyed Coordinates for 2022 90s Line Pond Sampling Locations**

| Location ID | Easting (ft) | Northing (ft) |
|---|---|---|
| 16-61454 | 1612016.624 | 1763926.357 |
| 16-61455 | 1612066.917 | 1763837.493 |
| 16-61456 | 1611982.092 | 1763768.054 |
| 16-61457 | 1611945.754 | 1763883.111 |
| 16-61458 | 1611886.172 | 1763867.518 |

**Table 4.1-1**
**Inorganic Chemicals above Background Values at 90s Line Pond, 2022 Samples**

| Sample ID | Location ID | Depth (ft) | Media | Aluminum | Barium | Beryllium | Chromium | Cobalt | Copper | Iron | Lead | Magnesium | Manganese | Nickel | Selenium | Silver | Vanadium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sediment BV**[a] | | | | **15,400** | **127** | **1.31** | **10.5** | **4.73** | **11.2** | **13,800** | **19.7** | **2370** | **543** | **9.38** | **0.3** | **1** | **19.7** | **60.2** |
| **Construction Worker SSL**[b] | | | | **41,400** | **4390** | **148** | **134**[c] | **36.7** | **14,200** | **248,000** | **800** | **na**[d] | **464** | **753** | **1750** | **1750** | **614** | **106,000** |
| **Industrial SSL**[b] | | | | **1,290,000** | **255,000** | **2580** | **505**[c] | **388** | **51,900** | **908,000** | **800** | **na** | **160,000** | **25,700** | **6490** | **6490** | **6530** | **389,000** |
| **Residential SSL**[b] | | | | **78,000** | **15,600** | **156** | **96.9**[c] | **23.4** | **3130** | **54,800** | **400** | **na** | **10,500** | **1560** | **391** | **391** | **394** | **23,500** |
| RE16-22-252506 | 16-61454 | 0–1 | SED | 31,700 | 2540 | 1.72 | 17.8 | 5.42 | 16 | 14,800 | 25.1 | —[e] | — | 13.1 | 1.51 | 1.13 (U)[f] | 28.7 | 62 |
| RE16-22-252507 | 16-61455 | 0–1 | SED | 30,100 | 3270 | 1.66 | 17.6 | 6.72 | 19.1 | 16,800 | 25.3 | 2440 (J+)[g] | — | 13.4 | 1.57 | 1.22 (U) | 30.8 | 66.4 |
| RE16-22-252508 | 16-61456 | 0–1 | SED | 21,500 | 314 | — | 11.6 | 7.62 | 14.5 | — | — | — | — | 10.6 | 1.39 | — | 19.9 | — |
| RE16-22-252509 | 16-61457 | 0–1 | SED | 17,200 | 459 | — | 12 | — | 14 | — | — | — | 1070 | — | 1.55 | — | 28.5 | — |
| RE16-22-252510 | 16-61458 | 0–1 | SED | 23,100 | 1550 | — | 13.7 | 5.47 | — | — | — | — | — | 10.8 | 1.51 | — | 20 | — |

Note: Results are in mg/kg.

[a] BVs from (LANL 1998, 059730).

[b] SSLs from (NMED 2022, 702484).

[c] SSL for total chromium.

[d] na = Not available.

[e] — = Not detected or not detected above BV.

[f] U = The analyte was analyzed for but not detected.

[g] J+ = The analyte was positively identified, and the result is likely to be biased high.

**Table 4.2-1**
**Organic Chemicals Detected at 90s Line Pond, 2022 Samples**

| Sample ID | Location ID | Depth (ft) | Media | Benzoic Acid | Di-n-butylphthalate | Fluoranthene | Isopropyltoluene[4-] | Methylene Chloride |
|---|---|---|---|---|---|---|---|---|
| **Construction Worker SSL[a]** | | | | **1,100,000[b]** | **26,900** | **10,000** | **2740[c]** | **1210** |
| **Industrial SSL[a]** | | | | **3,300,000[d]** | **91,600** | **33,700** | **14,200[c]** | **5130** |
| **Residential SSL[a]** | | | | **250,000[d]** | **6160** | **2320** | **2360[c]** | **409** |
| RE16-22-252506 | 16-61454 | 0–1 | SED | —[e] | 0.0948 (J)[f] | — | — | — |
| RE16-22-252507 | 16-61455 | 0–1 | SED | — | 0.0453 (J) | — | — | — |
| RE16-22-252509 | 16-61457 | 0–1 | SED | 0.351 (J) | 0.038 (J) | 0.0148 (J) | 0.000644 (J) | — |
| RE16-22-252510 | 16-61458 | 0–1 | SED | — | 0.0572 (J) | — | — | 0.00262 (J) |

Note: Results are in mg/kg.

[a] SSLs from (NMED 2022, 702484) unless otherwise noted.

[b] Construction worker SSL calculated using the equations outlined in (NMED 2022, 702484), incorporating toxicity and chemical-specific parameters from EPA regional screening level tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

[c] Isopropylbenzene used as a surrogate based on structural similarity.

[d] SSL from EPA regional screening tables (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables)

[e] — = Not detected.

[f] J = The analyte was positively identified, and the associated numerical value is estimated to be more uncertain than would normally be expected for that analysis.

**Table 5.0-1**
**RFI and 2006–2007 Sampling Locations in the 90s Line Pond within Depth Interval 0.0–1.0 ft bgs**

| Sample ID | Location ID | Depth (ft) |
|---|---|---|
| 16-02357 | 0316-96-0087 | 0.0–0.5 |
| 16-02358 | 0316-96-0088 | 0.0–0.5 |
| 16-02359 | 0316-96-0089 | 0.0–0.5 |
| 16-26647 | RE16-06-71667 | 0.0–0.5 |
| 16-26651 | RE16-06-71716 | 0.0–0.5 |
| 16-26652 | RE16-06-71717 | 0.0–0.5 |
| 16-600935 | RE16-07-4282 | 0.0–0.5 |
| 16-600936 | RE16-07-4287 | 0.0–0.5 |
| 16-600937 | RE16-07-4294 | 0.0–0.5 |

**Table 5.0-2**
**Summary of Results of Inorganic Chemicals above BV in 1996 and 2006–2007 90s Line Pond Samples**

| Chemical | Sediment BV[a] | Number of Samples | Number of Detects above BV | Number of DLs above BV | Minimum Result | Maximum Result | Maximum Detected Concentration | Average Result |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 15,400 | 9 | 3 | 0 | 5100 | 22,000 | 22,000 | 12,570 |
| Antimony | 0.83 | 9 | 0 | 3 | [0.436] | [6] | n/a[b] | 2.28 |
| Arsenic | 3.98 | 9 | 3 | 0 | 0.91 | 6.32 | 6.32 | 2.87 |
| Barium | 127 | 9 | 9 | 0 | 309 | 4610 | 4610 | 2070 |
| Beryllium | 1.31 | 9 | 3 | 0 | 0.5 | 2.25 | 2.25 | 1.1 |
| Cadmium | 0.4 | 9 | 0 | 6 | 0.17 | [3.1] | 0.222 | 0.775 |
| Chromium | 10.5 | 9 | 3 | 0 | 3.6 | 16.6 | 16.6 | 8.92 |
| Cobalt | 4.73 | 9 | 7 | 0 | 2.48 | 28.2 | 28.2 | 7.69 |
| Copper | 11.2 | 9 | 4 | 0 | 6.3 | 64.4 | 64.4 | 16.9 |
| Iron | 13,800 | 9 | 3 | 0 | 5290 | 25,600 | 25,600 | 12,540 |
| Lead | 19.7 | 9 | 3 | 0 | 7.1 | 27.6 | 27.6 | 16.1 |
| Magnesium | 2370 | 9 | 2 | 0 | 653 | 3540 | 3540 | 1830 |
| Manganese | 543 | 9 | 1 | 0 | 143 | 1260 | 1260 | 387 |
| Nickel | 9.38 | 9 | 4 | 0 | 3.6 | 18.3 | 18.3 | 9.44 |
| Selenium | 0.3 | 9 | 2 | 7 | [0.43] | [9.31] | 1.26 | 2 |
| Silver | 1 | 9 | 0 | 3 | [0.0796] | [1.1] | 0.217 | 0.473 |
| Vanadium | 19 | 9 | 4 | 0 | 8.6 | 36.4 | 36.4 | 20.6 |
| Zinc | 60.2 | 9 | 2 | 0 | 22.6 | 99.9 | 99.9 | 43.5 |

Notes: All results are in mg/kg. Brackets indicate result below DL.

[a] BVs from (LANL 1998, 059730).

[b] n/a = Not applicable.

**Table 5.0-3**
**Summary of Results of Inorganic Chemicals above BV in 2022 90s Line Pond Samples**

| Chemical | Sediment BV[a] | Number of Samples | Number of Detects above BV | Number of DLs above BV | Minimum Result | Maximum Result | Maximum Detected Concentration | Average Result |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 15,400 | 5 | 5 | 0 | 17,200 | 31,700 | 31,700 | 24,720 |
| Barium | 127 | 5 | 5 | 0 | 314 | 3270 | 3270 | 1627 |
| Beryllium | 1.31 | 5 | 2 | 0 | 1.02 | 1.72 | 1.72 | 1.4 |
| Chromium | 10.5 | 5 | 5 | 0 | 11.6 | 17.8 | 17.8 | 14.5 |
| Cobalt | 4.73 | 5 | 4 | 0 | 4.45 | 7.62 | 7.62 | 5.94 |
| Copper | 11.2 | 5 | 4 | 0 | 9.85 | 19.1 | 19.1 | 14 |
| Iron | 13,800 | 5 | 2 | 0 | 11,600 | 16,800 | 16,800 | 13,440 |
| Lead | 19.7 | 5 | 2 | 0 | 16 | 25.3 | 25.3 | 20.2 |
| Magnesium | 2370 | 5 | 1 | 0 | 1390 | 2440 | 2440 | 1930 |
| Manganese | 543 | 5 | 1 | 0 | 191 | 1260 | 1070 | 420 |
| Nickel | 9.38 | 5 | 4 | 0 | 8.92 | 13.4 | 13.4 | 11.4 |
| Selenium | 0.3 | 5 | 5 | 0 | 1.39 | 1.5 | 1.5 | 1.51 |
| Silver | 1 | 5 | 0 | 2 | [0.11] | [1.22] | n/a[b] | 0.54 |
| Vanadium | 19 | 5 | 5 | 0 | 19.9 | 30.8 | 30.8 | 25.6 |
| Zinc | 60.2 | 5 | 2 | 0 | 32.7 | 66.4 | 66.4 | 50 |

Notes: All results are in mg/kg. Brackets indicate result below DL.

[a] BVs from (LANL 1998, 059730).

[b] n/a = Not applicable.

**Table 5.0-4**
**Summary of Results of Organic Chemicals**
**Detected in 1996 and 2006–2007 90s Line Pond Samples**

| Chemical | Number of Samples | Number of Detects | Minimum Detected, Concentration | Maximum Detected Concentration |
|---|---|---|---|---|
| 3,5-Dinitroaniline | 6 | 2 | 0.254 | 0.268 |
| Amino-DNTs | 3 | 1 | 0.75 | 0.75 |
| Bis(2-ethylhexyl)phthalate | 9 | 2 | 0.068 | 0.108 |
| Butanone[2-] | 9 | 1 | 0.009 | 0.009 |
| Chloroform | 9 | 1 | 0.00494 | 0.00494 |
| Dichloroethene[cis-1,2-] | 9 | 1 | 0.001 | 0.001 |
| Isopropyltoluene[4-] | 9 | 3 | 0.001 | 0.005 |
| RDX | 9 | 1 | 0.207 | 0.207 |
| Toluene | 9 | 4 | 0.003 | 0.006 |
| Trichloroethene | 9 | 3 | 0.002 | 0.006 |
| Trichlorofluoromethane | 9 | 2 | 0.002 | 0.003 |
| Trinitrotoluene[2,4,6-] | 9 | 1 | 0.134 | 0.134 |

Note: All results are in mg/kg.

**Table 5.0-5**
**Summary of Results of Organic Chemicals Detected in 2022 90s Line Pond Samples**

| Chemical | Number of Samples | Number of Detects | Minimum Detected, Concentration | Maximum Detected Concentration |
|---|---|---|---|---|
| Benzoic acid | 5 | 1 | 0.351 | 0.351 |
| Di-n-butylphthalate | 5 | 4 | 0.038 | 0.0948 |
| Fluoranthene | 5 | 1 | 0.0148 | 0.0148 |
| Isopropyltoluene[4-] | 5 | 1 | 0.000644 | 0.000644 |
| Methylene chloride | 5 | 1 | 0.00262 | 0.00262 |

Note: All results are in mg/kg.